



Energy-Saving Materials In Residential Architecture

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ABSTRACT

The article discussed and gave recommendations on equipping the outer coatings of the building with modern energy-efficient materials and innovative technologies, creating a microclimate in a residential area through architectural and spatial form and design solutions, and comprehensive use of the solution and the “smart home” style in arranging the internal environment.

KEYWORDS

Architecture, energy-saving materials, affordable housing, environmentally friendly and energy-saving materials, modern building materials.

INTRODUCTION

The President of the Republic of Uzbekistan approved the updated Program for the construction of affordable housing in rural areas of Uzbekistan for 2017-2021 based on improved standard housing projects. The program has identified new directions and challenges that will open up promising

opportunities for the construction of high-energy and low-carbon buildings that will deliver greater energy savings and greenhouse gas emissions. will reduce the negative impact on the environment.

The main aim of the scientific article is the effective use of environmentally friendly and

energy-saving materials in the construction of housing in rural areas and their introduction into practice with the help of innovative technologies [1-7]. Based on the purpose of this scientific article, the following tasks were identified:

- Study the world experience in housing construction;
- To study the practice of using energy-saving materials in housing construction in the world;
- Study of the architecture of Uzbekistan, the history of housing construction, the materials used and building materials;
- Study the disadvantages of building existing residential buildings;
- Suggest ways to efficiently use solar and wind energy;
- Based on theoretical skills, recommend the basic principles of creating an energy-efficient complex system and its consistent implementation;

The main goal is the effective use of environmentally friendly and energy-saving materials in the construction of housing in rural areas and their implementation with the help of innovative technologies.

MATERIALS AND METHODS

If we now focus on buildings and structures in European countries, then projects created by an architecture and design firm in Washington (USA) are equipped with energy-efficient homes, self-managed energy and resources. The house is designed to retain heat as much as possible. The projects were based on special devices and used a water collection system to save water and clean water. The windows were large, of luxurious glass. One of these projects is a five-star green residence in Washington. The total area of the house is 3900 square meters, and the equipment and technologies used for the construction, materials are

specialized in energy saving [5-8]. The architectural solutions of the interior and exterior of the building are made according to the energy-saving design system. One of the modern trends in the field of housing construction in Europe is the design and construction of buildings, in which planning solutions are combined with environmental friendliness and energy efficiency. According to various experts, the main sources of energy are oil, gas and coal reserves. In developed countries, almost half of energy consumption is in residential buildings. Therefore, one of the main ways to save resources is to improve the energy efficiency of buildings.

For this reason, residential construction in European countries today is a preliminary analysis of the energy efficiency of a building and the materials used in it, in the process of innovative design. The main principle of energy-efficient home design is to maintain a comfortable room temperature using a heating and ventilation system by maximizing the location of the building and using alternative energy sources.

Modern building materials and technologies, from energy-saving materials to design proposals for walls, not only save energy but also make the aesthetic appearance of the building attractive. Now you can provide such indicators, each of which (taking into account the thermal resistance and insulating properties of the outer surface layer of the building). However, these data and materials were used successfully in the north. If we pay attention to proven energy-saving wall structures, then when designing energy-saving walls, we must first of all pay attention to their material, because there are a lot of types of insulation materials, such materials can be used depending on climatic conditions [7-10].

Their air resistance depends on their ability to absorb air and accumulate moisture, as well as on the rate of evaporation (structural design). Modern timber frame walls not only reduce

energy consumption but are also checker-shaped and maintain the relative humidity level in the room, which increases their overall well-being. Considering that the basis of an energy-efficient home solution is the processes associated with heating and heat loss, the main components of the thermal conductivity of a building are the external elements of the house, and winter temperatures in low-rise buildings also negatively affect home comfort. Only with rational planning and energy saving will the house be warmer and more efficient, the easiest way to reduce heat loss is to reduce the outer surface of the building, large outer surfaces of the house will cause large heat losses. What to look for when designing an energy-efficient building. First of all, we need to study where the house that we are building will be built, the ecology and climate of this place. It is important to know how to use heating systems correctly in order to reduce heat loss. Basic heating is often used for space heating. When building a house, it is necessary to pay great attention to the decoration of the outer walls and the judicious use of the materials from which the wall decoration follows. Since the charm of a home is its decoration, it is a barrier to heat loss.

It is known that in the process of reforms in Uzbekistan, the standard of living of the rural population is increasing, the appearance of our cities and villages is changing, comfortable houses are being built with modern amenities and communications, the social sphere and production. Special attention is paid to infrastructure development [9-11]. In particular, the results of the study showed the need to develop fundamentally new approaches that ensure high efficiency of construction, fully taking into account the real needs and purchasing power of the population, as well as the national mentality and living conditions in rural areas. Considering these factors, a house built from energy-saving, heat- and frost-resistant materials will undoubtedly become one of the most

important innovations not only for the residents of Uzbekistan but also for the entire world community. During the research work, the products that should be used in construction were studied and an alternative version of this apartment building was developed so that the apartment building could adapt to cold winters and hot summer weather. It is advisable to consider the following factors. From energy-saving building materials during project development:

- “gas block”,
- NASA paints,
- 2 functional smart windows ClimaGuard,
- Solar lamps “Master Led, PROPAP PRIM SRL”,
- Insulators for external walls “Facade panels WPC”,
- “wind generator”,
- “solar panels” were used

CONCLUSION

Thanks to a comprehensive architectural and design solution, including energy-saving materials, innovative technological equipment can give residential buildings a modern shape and a perfectly equipped environment. As a result, a modern comfortable social environment and opportunities for people are created. To this end, the following recommendations are given:

- Introduction of energy-efficient materials, innovative technologies for the production of electricity from natural resources;
- The above solutions are reflected in the external and internal architectural-spatial and design complex solution of the residential building. Efficient use of new, creative technologies using the energy of external environmental influences (sun, wind);
- Equipping the exterior coatings of the private building with modern energy-

efficient materials and innovative technologies;

- Creation of microclimate in residential premises through architectural-spatial form and design solution;
- Integrated use of Smart Home technologies in the development of a comfortable internal environment.

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