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PROSPECTS FOR THE DEVELOPMENT OF ENERGY-SAVING BUILDINGS IN UZBEKISTAN.

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Abstract. The research aims to reduce energy consumption in residential areas by improving the thermal performance of building structures, as well as the introduction of energy-efficient and low-carbon technical solutions. Such measures will save natural and financial resources, reduce greenhouse gas emissions into the atmosphere. One of the modern trends in housing construction is the design and construction work, taking into account the convenience, environmental and energy efficiency of the houses to be built.

Keywords: energy saving, alternative, consumption, green building, green economy, environment, buildings and structures, resource, saving.

Introduction: It is known that the demand for electricity in the world is growing day by day. At the same time, the supply and construction of buildings and structures under construction with energy-efficient building materials is a requirement of the times. Reducing the use of natural resources for heating is one of the global challenges.

Materials and Methods: Today, the widespread introduction of energy-saving technologies and alternative energy sources in the economy, social sphere and construction industry is a key priority of the Uzbek government. In order to accelerate the process, a joint project "Support to the development of energy-efficient rural housing in Uzbekistan" has been implemented since 2017 in cooperation with the United Nations Development Program and the Ministry of Construction of the Republic of Uzbekistan and with a grant from the Global Environment Facility (GEF). The main goal of the project is to provide the rural population of Uzbekistan with improved and comfortable living conditions that do not harm the environment. $ 136.6 million has been allocated for this purpose.

A lot of work has been done since the project was launched. Based on the Presidential Decree No. PQ-4028 of November 24, 2018, a subsidized green mortgage lending scheme was developed to increase the demand for energy-efficient (ET) and low-carbon (KU) rural housing. Cheap one- and multi-storey ET and KU country houses have been built in five regions of Uzbekistan. The construction of a model house with zero energy consumption has also started in the “Yoshlik” mahalla in Nurafshan, Tashkent region. In November 2019, Tashkent hosted a business forum on "Energy saving solutions in Uzbekistan: current status and prospects for development." The event provided an opportunity to demonstrate the existing financial mechanisms of a market economy, exchange views and experiences, and discuss the prospects of "green building" and "green economy". As part of the second component of the project, a one-day business forum was held on December 9, 2021 on "Energy-saving materials and technologies in Uzbekistan: prospects for the

development of the existing market for the development of green building in the country." The main local partners are the Ministry of Construction, the Ministry of Energy, the Ministry of Economy, the Ministry of Finance, the Center for Hydrometeorological Service under the Ministry of Emergency Situations (Uzhydromet), the State Committee for Land Resources, Geodesy, Cartography and State Cadastre, Ecology and Environment. State Committee for Protection, “Qishloq Qurilish Invest” LLC, “Qurilloyha” LLC, “Qishloq Qurilish Bank” JSCB, regional and district khokimiyats, project engineering companies, representatives of institutes and educational institutions, international organizations, local manufacturers and others attended. The event was also attended by representatives of international financial institutions - the Asian Development Bank, the Islamic Development Bank, the European Bank for Reconstruction and Development and KfW.

In her welcoming remarks, Doina Munteanu, UNDP Deputy Resident Representative in Uzbekistan, noted that 30% of greenhouse gas emissions come from the construction sector, given the ongoing climate change. stressed that the issue of energy efficiency of buildings is becoming increasingly important. “As the scale of housing construction in Uzbekistan grows year by year, there is a huge potential to reduce greenhouse gas emissions by ensuring the energy efficiency of buildings built using energy-efficient and low-carbon materials and technologies,” Ms. Muntyanu said.

In Uzbekistan, buildings account for 49% of total energy consumption, or 17 million tons per year. (tons of oil equivalent). Accelerated industrialization and sustainable population growth will significantly increase the economy’s need for energy resources, as well as exacerbate negative anthropogenic impacts on the environment.

Currently, the Ministry of Energy of the Republic of Uzbekistan for 2021-2023, together with international funds and organizations, is developing projects for the installation of equipment for renewable energy sources in apartment buildings under construction in about 1,000 apartments in the regions and 410 private plots of land. Adviser to the Minister of Energy Aziz Alimuhamedov said that with the introduction of 1,000 mini-solar PVP installations with a capacity of 2 kW per year in all regions of the country - an opportunity to generate an additional 4.0 million kW / h of electricity per year, and this year about 2 , 0 million cubic meters of natural gas savings. In addition to presenting the project results and its future plans, evaluation of new approaches and solutions, updating the database of materials and technologies on energy efficiency, acquaintance with innovations in the field of building materials, representatives of various manufacturing companies and suppliers of energy-saving materials and technologies allowed the exchange of knowledge and experience between. "Human natural energy resources are gradually depleted, the cost of extracting and processing primary fuels and energy resources is rising, and their inefficient use is having a negative impact on the environment," he said. Efficient use of resources through innovative approaches to construction, as a solution to this problem, is now one of the priorities in Uzbekistan. This project aims to reduce energy

consumption in the residential sector by improving the thermal performance of building structures, as well as the introduction of energy-efficient and low-carbon technical solutions. Such measures will save natural and financial resources, reduce greenhouse gas emissions into the atmosphere. One of the modern trends in housing construction is the design and construction work, taking into account the convenience, environmental and energy efficiency of the houses to be built. We know that the world's main sources of energy (oil, gas and coal) are. Experts estimate that the maximum lifespan of energy sources can last up to 100 years. In many developed countries, almost half of energy consumption comes from homes. Therefore, one of the main ways to save resources is to improve the energy efficiency of buildings. The main principle of energy-efficient house design is that the building is durable and at the same time can maintain a comfortable indoor temperature without the use of ventilation and heating systems using alternative energy sources. The criteria for classifying such houses are energy consumption: if the annual heating costs of buildings are less than 90 kvh / m2, the house is considered energy efficient; Less energy saving if less than 45 kvh / m2; If it is less than 15 kvh / m2, the energy consumption is zero (nothing is used for heating, but energy is required to prepare hot water). The first experimental energy-saving building appeared in Manchester (USA) in 1974 after the global energy crisis. It was an office building requested by the General Services Office to test and identify the best energy saving technical solutions. The energy consumption of the building was reduced due to the efficient use of solar radiation, two-story enclosed structures and computer control of the building’s engineering equipment. The implementation of this project has laid the foundation for the construction of energy-efficient buildings around the world. Work on improving energy efficiency is being carried out successfully in Europe. According to various sources, between 2,000 and 10,000 such houses have been built in Western European countries. Targeted government programs have been developed in Denmark, Germany and Finland to build such energy-saving and energy-efficient buildings. is able to maintain a comfortable indoor temperature without the use of ventilation and heating systems. The criteria for classifying such houses are energy consumption: if the annual heating costs of buildings are less than 90 kvh / m2, the house is considered energy efficient; Less energy saving if less than 45 kvh / m2; If it is less than 15 kvh / m2, the energy consumption is zero (nothing is used for heating, but energy is required to prepare hot water). The first experimental energy-saving building appeared in Manchester (USA) in 1974 after the global energy crisis. It was an office building requested by the General Services Office to test and identify the best energy saving technical solutions. The energy consumption of the building was reduced due to the efficient use of solar radiation, two-story enclosed structures and computer control of the building’s engineering equipment. The implementation of this project has laid the foundation for the construction of energy-efficient buildings around the world. Work on improving energy efficiency is being carried out successfully in Europe. According to various sources, between 2,000 and 10,000 such houses have been built in Western European countries. Targeted government programs have been developed in Denmark, Germany and Finland to build such

energy-saving and energy-efficient buildings. However, the main entrance will require the design of the drum and the house will be built facing south, because the main source of heat for heating the house is solar energy. Houses are prevented from being touched by other buildings and trees. The heat transfer resistance of the walls should not exceed 0.15 kW / m2, for which internal or double (internal and external) thermal insulation is used. Today, the development of rural livelihoods in the country, the construction of housing on the basis of standard projects is closely linked with the development of rural infrastructure and the construction of infrastructure facilities. In accordance with the "Program of affordable housing in rural areas for 2017-2021, approved by the Decree of the President of the Republic of Uzbekistan No. PQ2639" dated October 21, 2016, many houses and apartments were built on the basis of standard projects. the family in need of improved housing conditions was provided with housing. In our country, the issue of construction of energy-efficient, energy-efficient housing is one of the most important factors in the development of the construction industry. Enrichment with these features is identified as a key task. Decree of the President of the Republic of Uzbekistan dated November 14, 2018 No PF-5577 "On additional measures to improve the state regulation of the construction industry" also provides for the construction of housing from January 1, 2020 It is strictly stipulated that the equipment must be equipped with energy-efficient and energy-saving equipment at the stage of design and survey and construction and installation works. In this regard, our project "Support to the development of energy-efficient rural housing in Uzbekistan", which has been implemented since 2017 in cooperation with the Global Environment Facility and the Ministry of Construction of the Republic of Uzbekistan, is noteworthy. The project is expected to reduce household energy consumption and greenhouse gas emissions. As part of the project "Support to the development of energy-efficient rural housing in Uzbekistan", 800 low-carbon three-room energy-efficient houses were built in Samarkand, Surkhandarya, Fergana, Khorezm and Bukhara regions. In each of these houses, photovoltaic power plants (FES) with a capacity of 300 watts (FES) are installed and operating for lighting needs. Ten of these houses are equipped with solar water heaters with a capacity of 200 liters. However, this level of energy consumption in the building is maintained for 3 to 5 years, and then begins to increase again. An energy survey is needed to determine the reasons for this decline in energy efficiency. Therefore, it is recommended that the energy audit be conducted on average every four years. It should be noted that in the framework of our project "Support to the development of energy-efficient rural housing in Uzbekistan" in cooperation with the Global Environment Facility and the Ministry of Construction of the Republic of Uzbekistan, 800 energy-efficient photovoltaic power plants with a capacity of 300 watts were built in 2019. FES) is installed. An energy audit will be conducted on 60 houses selected between these buildings and ordinary model houses built under the State Program in 2018. This approach allows comparing energy-efficient homes with conventional homes and analyzing the effectiveness of using energy-efficient and low-carbon technologies to reduce heat and electricity consumption in rural homes. The widespread introduction of energy audits and the use of renewable energy

sources are important and untapped resources. It will help solve the problem of natural gas and oil shortages in the future, and experts say it could save consumers twice as much on energy costs.

Conclusions: This approach allows comparing energy-efficient homes with conventional homes and analyzing the effectiveness of using energy-efficient and low-carbon technologies in reducing heat and electricity consumption in rural areas. The widespread introduction of energy audits and the use of renewable energy sources are important and untapped resources.

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