



NEW GENERATION BUILDINGS THAT EFFECTIVELY USE ENERGY AND THEIR UZBEK EXPERIENCE

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Annotation. This scientific application includes energy efficient buildings, low energy need buildings, Ultra low energy need buildings, zero energy need buildings, plus energy or asset houses, passive buildings, healthy buildings, energy neutral buildings, intelligent, intellectual, brief information is given about high-tech buildings and other buildings, about the signs characteristic of them, about their various possibilities and certain features, about the growing types of construction of buildings of a new generation that effectively use energy in general, and about the prospects for their use in the conditions of Uzbekistan.

Key words: energy efficient; low energy need; Ultra low energy need; zero energy need; plus energy need; passive building; healthy; smart, intellectual, high-tech; energy neutral buildings.

Introduction. All of the buildings currently under construction must be buildings that efficiently use energy sources. Because about 50% of the total energy resources spent are spent on residential buildings. In subsequent years, the shortage of energy sources and their prices sharply increased, as a result of the rapid development of all sectors of the national economy as a result of the growth of the population of traditional, non-renewable energy sources (oil, gas, coal and other sources, the fact that it is running out necessitates the construction of all buildings today as buildings that effectively use energy sources. When it is called buildings that use energy efficiently, it is understood that on the basis of the latest achievements of modern techniques and technologies, an economically rational use of energy resources is achieved in the functioning of a particular building. The main principle for the design of such premises is to maintain the internal temperature in an optimal state without the use of a heating system and ventilation due to the maximum hermetization of the building and the use of alternative energy sources. In this, the energy efficiency of the building is achieved mainly due to the reduction of heat loss and the rational use of thermal energy in all energy processes, without worsening the final result [1,2,3]. Now let's briefly dwell on buildings that effectively use energy, their types, capabilities and other different characteristics.

Research methodology. The main goal of building buildings that effectively use energy is to increase the efficiency of a complex of norms that determine the teplotekhnical and energetic characteristics of buildings. These consist in creating comfortable conditions that effectively use energy sources, providing the building with good thermal protection. In general, the construction of a building consists of the following stages: design, preparation of building materials, products and structures, construction and installation work, transfer of the building to Operation (Service), drawing up an energy passport of the building and its certification after one year of use. According to the certification, the class of energy efficiency of the building is determined [7,8].

The energy efficiency of the building is influenced by the thermal protection of all shells blocking the building, the protection of external barriers, especially window-frames from air(wind)combined areas, and the presence of a system that keeps the parameters of the internal air at the level of the norm. The level of energy efficiency is determined by the amount of heat that went to heat the building.

The energy efficiency of the building is determined by the following characteristics: the amount of thermal energy that goes to heat the building; the Listed heat transfer coefficients of the blocking shells; the average carrity of the air exchange of the building; the compactness of the building and the glazing of the facade.

Efficient use of energy in buildings is achieved through efficient consumption of energy resources and automation of work processes.

The design of an energy efficient building can be made up of the following steps:

- Organization of the microclimate;
- selection of external conditions;
- choosing an architectural and construction solution;
- assessment of the temperature, humidity and air regime;
- selection of solutions schemes for engineering systems.

The energy consumption of the building can be reduced at the expense of:

- building density lifting;
- orientation of buildings in relation to the sides of the horizon and taking into account the main direction of the wind;
- correct choice of building shape, floors, room height, Building width, facade Division, building compactness;
- the correct choice of thermal protection and heat resistance of external barrier structures;
- correct selection of facade glazing;
- Organization of thermal protection of the attic and the underground part of the building;
- determination of the humidity and air regime of the building;
- the correct choice of room planning, air access from the outside and migration routes.

The teploenergetic (thermal energy)properties of a building are determined by:

- thermal protection properties of external blocking structures;
- the thermal energy that a building consumes in a year;
- the specified capacity of the heat supply of the building.

Nowadays, buildings built with various concepts began to appear in World Construction practice. The new generation of buildings includes[7,9,10]:

1) energy efficient building and its characteristic signs:

- effective use of energoressurs;
- reduction in energy needs by an average of 50%.

2) low energy need building:

- specific energy needs 60 kW.s/ (m².year) no more than;
- application of modern heat-shielding materials.

3) ultra-low energy need building:

- the specific energy requirement is 30 kW.s/(m².year) less than;



- application of high efficiency heat protection materials;
 - reduction of surfaces of external blocking structures;
 - low permissible natural light.
- 4) building with zero energy needs:
- the specific energy need is zero;
 - not cost-effective;
 - high capital funding.
- 5) Plus Energy house or asset House:
- it produces more energy than it consumes itself using built-in solar cells, collectors, heat pumps, recuperators, grunted heat exchangers and other engineering devices;
 - accumulates excess energy;
 - Transmits to the central system.
- 6) Passive House:
- application of unconventional energy sources, low need for energy from traditional sources;
 - super-protected of blocking structures;
 - abundance of window-frames in the southern orientation of the facade;
 - 15 kW of specific energy needs.s/ (m2.years) not be much.
- 7) Healthy Building:
- improved microclimate of the room;
 - protection of the environment;
 - application of environmentally friendly building materials.
- 8) intelligent, intellectual, high-tech building:
- High computer technology application to optimize heat and air flow in the room;
 - environmental safety.
- 9) neutral building material building:
- low need for building materials;
 - reuse of building materials.
- 10) energy neutral building:
- low need and energy consumption;
 - use of renewable energy sources;
 - optimal use of the required energy.

In Uzbekistan, the energy consumption of buildings is up to 2.5 times higher than in developed countries, and by 2030 the country's energy needs increased by another 2.5 times (equivalent to 61.2 million tons of oil equivalent) compared to the current one. These indicators make it necessary to raise all buildings under construction and reconstruction in our country to the level of buildings that efficiently use energy. 50% of the total energy spent on the economy of Uzbekistan (equivalent to 24.1 million tons of oil equivalent) will be spent only on buildings. Many buildings were built during the former Union, and their service life also passed. It does not meet the requirements of the present day at all. Due to outdated engineering communications, poor-quality insulation of the outside of buildings and other problems, the energy consumption of buildings has increased several times compared to that of developed countries.

In Uzbekistan, 39% of greenhouse gases released into the atmosphere are due to buildings. As can be seen from the information presented, buildings should be at the center of measures to increase energy efficiency and reduce energy consumption.

In Uzbekistan, too, a lot of visible work has been carried out to save non-renewable energy sources and reduce their negative impact on the environment, increase the types and size of the use of renewable energy sources, increase the energy efficiency and energy efficiency of buildings [2-8, 11-12]

President of the Republic of Uzbekistan dated August 22, 2019 "increasing the energy efficiency of the sectors of the economy and the social sphere. In the Resolution No. 4422" on the introduction of energy-saving technologies and operational measures for the development of renewable energy sources", issues of energy audit in business entities, support for the development of renewable energy sources, innovative measures for the introduction of energy-saving technologies are defined[4].

According to the decree of the president of the Republic of Uzbekistan dated November 14, 2018 No. 5577 "on additional measures to improve the state regulation of the construction industry", from January 1, 2020, it was established that housing construction facilities should be equipped with energy-efficient and energy-saving building materials[5].

In the resolution of the president of the Republic of Uzbekistan dated July 10, 2020 No. 4779 PP "on additional measures to increase the energy efficiency of the economy and reduce the dependence of sectors of the economy on fuel and energy products by attracting available resources" in 2020-2022 to increase the thermal protection of buildings in all regions of the, issues of reducing energy needs for heating and cooling needs in high-rise residential areas are envisaged due to the introduction of devices of renewable energy sources[6].

As a clear example of the work on the design and construction of new generation buildings that will effectively use energy in Uzbekistan in the following years, we can say that a working project of the reconstruction of the SVT National University was developed in cooperation with the Research Institute of Housing Design in Tashkent and the Cambridge University of Great Britain. The annual energy requirement that this building goes to heating is 44.5 kW.m². This amount is no more than the figure spent by "houses with low energy consumption" under construction in European countries. Many examples can be given from the work carried out in Uzbekistan in cooperation with foreign countries on the design and construction of new generation buildings that effectively use similar energy.

Conclusion. In a nutshell, the energy consumption of buildings is currently the main indicator in determining the quality of modern projects, but in doing so, the task of ensuring microclimate conditions in building rooms remains the main indicator. Energy, which is the main indicator of a new generation of buildings that use energy efficiently, is determined by the amount of heat that the efficiency level has largely gone to heat this building, which is determined by the coefficient of heat transfer of the blocking shell, the average air exchange rate of the building, the form of the building, it will be inextricably linked with the glazing of the facade and several other parameters. At the same time, effective use of energy in buildings is also achieved as a result of efficient consumption of energy resources and automation of work processes.

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