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MAIN ASPECTS OF ENERGY CONSERVATION IN CIVIL ENGINEERING

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Abstract
This scientific study is about the day-to-day increase in the world's energy resources, about the end of non-renewable, conventional energy sources(oil, gas, coal, etc.),the current state of use of non-traditional and new-generation energy sources (solar energy, wind energy, hydropower, biomass, etc.) in the countries of the world, information is given about the directions of energy conservation, the types of energy conservation measures, the consideration and analysis of energy conservation measures on the example of each system and devices that consume energy, the measures that should be carried out in energy conservation buildings.

Keywords: energy conservative homes; energy efficient homes; energy resources; trditional energy resources; the unconventional energy sources; renewable energy sources; nonrenewable energy sources; electricity; gas; oil; coal.

1. Introduction

According to the accounts of expert scientists, if we use non-renewable, traditional energy sources (gas, oil, coal) at the level of the need on this day, it turns out that their reserves can exceed 100-150 years. In addition, considering the rapid development of the national economy since the beginning of the 21st century, producing the number of building materials, skyscrapers, public and residential buildings, and unreasonable using from all energy sources at present, it is likely that the reserves of traditional, non-renewable energy sources will not reach even 100 years. A sharp increase in the population of countries in the world, especially those located on the continents of Asia and Africa, is also increasing the need of the world's population for energy sources day by day. If we see this situation on the example of the Republic of Uzbekistan, then the population of the country is increasing by an average of 500 thousand people per year. So, by 2050, the population of the Republic of Uzbekistan can exceed 50 million people [1,2].

At present, the main part of the traditional energy source spent in the national economy, non-renewable energy sources (gas, oil, coal and others)of the organization, in many countries, their

contribution to the average of 85-90%, for while in some developed countries (including countries EC) 75-80% and in some it's also low indicator consists of. All of these are present in the economy, mainly non-renewable re-form if it does not go over the place to be advancing at the expense of traditional energy sources, who is showing. Giving away of the energy crisis in the world besides stand different (1974 OPEC oil exports in the year of organization of the countries that raise the price of oil to about 5 percent of the volume of oil extraction in order to have decreased as a result of its price was increased to 70 percentages. Then the energy crisis OPEC member organization from such Europa energy security and independence began to secure their own countries and this in turn the head on different energy efficient technologies and the creation of energy efficient buildings have caused). We can consider that which we see the issue, that is, the subject of energy frugality today, our economy for the further development of the main pressing. All of the information listed above, first and foremost the people in agriculture renewable energy sources (solar, wind, geothermal, the waves of the sea, the waves in the ocean, the beach and the sea which is formed from biomass energy, wood, wood-coal, peat, of slanes, bitumen sand, water flows into hydro and others big and small) increase in weight, and all traditional and non-traditional energy sources, rational, economical with the use that is showing that should be done [1,2,3].

2. Literature Review

In the development of the emergence and construction of energy-efficient and energy-efficient buildings, German scientist Wolfgang Faist, Swedish scientist Yeu Adamson, American researcher David Orr, English architect Norman Foster, Russian scientist Yu.A.Tabunshikov, I.Bashmakov, R.Avezov, Ye.A.Nasonov, R.Yu.Marakaev, Ye.A.Shipachyova, S.khodzhaev The services of and others are great. In Particular, Yu.A.Tabunshikov's monograph "energy efficient buildings", published in 2003, provides accurate data on popular energy efficient and energy efficient buildings built in countries around the world during the period 1972-2003. Russian scientist I.Bashmakov, on the other hand, was awarded the International Nobel Prize for his extensive research work on building energy efficiency[1,3,4,5].

3. Result and Discussion (Analysis and Results)

The first energy-efficient and energy-efficient buildings began to appear in the 70s of the 20th century. An example of this is the 6-story administrative building built in Manchester, United States in 1972, and the innovative, energy efficient “EKONO-HOUSE”, a 6-Story, 2-sectional administrative building built in Otoniemi, Finland in 1973-1979. At the expense of a volumetric solution, heat loss is reduced in these buildings, the surface of the outer wall is reduced and some are brought into cubic form, the glazing surface is reduced (up to 10%), the roof tiles are flat and painted in a light color with a low coefficient of absorption of solar radiation, the northern sides are not mirrored, vertical, the energy need in these buildings was several times lower than the heat and electricity needs of buildings built in Finland and the United States at the time[4,6,7].

As can be seen from the above examples, the main goal of building modern, energy - efficient and energy-efficient houses built on the basis of new type (pilot) projects was to determine the overall

effect of energy saving by applying architectural and opposition solutions aimed at saving energy resources in all buildings built within this new direction and after it.

The average energy requirement of old-built houses in Russia is 600 kW per year. s/m^2.The energy requirement of houses built after the release of new building standards and regulations(SNIP 23-02-2003 “thermal protection of buildings”) in 2003 is 350 kW. downgraded to s/m^2. The cost of building such energy efficient homes at 1 m2 was 8-12% higher than that of ordinary homes. But the additional costs that went to build such energy-efficient houses justify themselves in 7-10 years [11].

In European countries, however, the one-year energy need of energy-efficient homes built under similar conditions is 120-150 kW.s / M2 [11].

Approximately 40-50% of the total energy currently being developed is being spent on buildings. For example, in the countries of the European Union, this figure is 40% [5].

According to analysis, by 2050 68% of the population lives in cities, which is 2 in the next 80 years mlrd.ga nearby requires the construction of new houses. Around 40% of the world's energy-related SO2 emissions also fall into the construction industry [5].

That is why it is necessary to use all available energy sources wisely and save them at the level possible. One of the main ways to save energy resources is to increase the energy efficiency of buildings.

When developing concepts for the development of architectural design of the 21st century, architects and builders are required to more broadly apply project solutions that take into account the conservation of Natural Resources in urban composition and work projects of individual buildings and, as much as possible, the efficient use of newly formed energy sources and, first of all, solar 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. Energy consumption of buildings is 2-2.5 times more than in developed countries. According to experts from the industry, in 2030 the energy needs of buildings in Uzbekistan increased by 2.5 times (equivalent to 61.2 million tons of oil equivalent).

Many of the buildings were built during the former Union period, which also expired. Does not meet current requirements at all. Due to outdated engineering communications, poor-quality insulation of the exterior of buildings and other problems, the energy consumption of buildings has increased several times compared to that of developed countries. In Uzbekistan, 39% of smoke gases released into the atmosphere are accounted for by buildings. It can be seen from the cited data that buildings should be at the heart of measures to increase energy efficiency and reduce energy consumption. There have also been many visible works in Uzbekistan to save non-renewable energy sources and reduce their negative impact on the environment, increase the types and size of renewable energy use, increase the energy efficiency and energy efficiency of buildings [1,3,22]. Since January 1, 2020, according to the decree of the president of the Republic of Uzbekistan No. 5577 of November 14, 2018, the conditions for the construction of housing structures with energy-efficient and energy-saving building materials have been established [8]. “On additional measures to increase the energy efficiency of the economy and reduce the dependence of economic sectors on fuel and energy products by attracting available resources” in the decision of the president of the Republic of Uzbekistan No. PQ-4779 adopted on July 10, 2020, in 2020-2022, to increase the thermal protection of

buildings in all regions of the Republic,, due to the introduction of devices of renewable energy sources, issues of lowering energy needs for heating and cooling needs in apartment buildings are envisaged[9]. Around the world, 40-50% of the energy currently being developed is spent on buildings (mainly housing and communal services facilities). For example, in the countries of the European Union, this figure is 40% [5,19,20]. That is why the present day, first of all, presupposes the rational, saving-saving use of all energy sources in housing and communal services, that is, the development of energy conservation measures.

When developing energy conservation measures, the following will be necessary:

1) the object must be fully inspected and the most energy loss must be determined;

2) it is necessary to determine the technical essence of the expected improved principles of economy;

3) it is necessary to determine the size of the annual economy;

4) to perform the proposed recombination, it is necessary to determine the composition of the indicated equipment, their approximate prices, prices for their transportation, installation and launch;

5) the amount of total economic benefit from the proposed recombination must be evaluated.

The technologies with the lowest energy consumption in the system are optimal technologies and are implemented.

There are 3 areas of energy conservation:

The first direction is considered very efficient and low-cost in the initial direction of the energy saving policy, which is the rationalization of the use of fuel and energy. Fuel and energy consumption can be reduced by 12-15% as a result of the deployment.

The second direction is the restructuring of the economy system and the development of the work of small and large – scale industries. In this, the economy of resources is 10-12%.

The third direction is achieved through the application of energy-efficient technologies, processes, hardware and equipment in large energy-intensive sectors of Housing and communal services. This direction reduces energy resource needs by 25-30%.

There are 3 types of energy conservation measures: (a) low cost; (b) moderate cost; (v) high cost.

The self-coverage period of low-cost measures is less than 2 years. They are carried out during the current period of activity of budgetary organizations or enterprises.

The self-coverage period of moderate cost measures is 2-5 years. These measures are carried out at the expense of private funds.

The period of self-coverage of high-cost measures is more than 5 years, which require additional investments.

Now let's briefly consider energy conservation measures on the example of each system and devices that consume energy. The most heat losses in the Heat Supply occur mainly in heat-consuming equipment, that is, in the heating and hot water supply system. In particular, as a result of the uneven supply of heat in the heating system and improper design of the system, 5-15% will be spent on heat cancellation, as a result of the absence of regulation of heat transfer parameters and the non-compliance of heat characteristics with current weather conditions, 15-20%. In the case of hot water supply, up to 25% is lost due to the lack of circulation of hot water, up to 15% due to the absence of hot water regulators or lack of working condition, up to 10-15% of heat is lost due to internal wasted

leaks and contamination of heat exchange surfaces when heating water. In addition to these, the following measures of energy conservation are also used in the heating system [10,18,22]:

- good compaction of door and window seats(rooms) and heat cancellation due to high-quality blocking(filling) of window frame slits in rooms can be reduced by up to 20%, or by replacing old frames with two or three-layer glass pocket, while energy consumption can be reduced by up to 20-30%;
- as a result of increasing the thermal protection of external barrier structures (external walls, floors, attic partitions and roof partitions), 15-30% thermal energy can be economy;
- as a result of automation of the heating system, heat consumption can be reduced to 8-25%. As a result of the installation of thermostatic regulators, heat can be economy up to 50-60%;
-carrying out various explanatory work with the population through the media on a regular basis about the saving and use of all energy sources is also of great importance in saving energy sources;
-in order to save energy sources in the hot water supply system, it is necessary first of all to insulate all pipes that serve in the system, thermal pipes, pipes that have passed through sanitary and technical channels and basements, taking into account the weather conditions of the place. Constant washing of pipes in all heat transfer systems, cleaning, timely replacement of those with defects are also important in saving energy sources.

It is advisable to carry out the following measures to save energy in heat transfer systems:

-in the case of heat transfer systems, especially for long distances, the pipes must be arranged by the right methods and insulated with good quality, taking into account the conditions of the place. In heat transfer systems, up to 20% of heat is currently being wasted;
-if the heat transfer pipes are passed underground and the groundwater level is not deeply located, the void loss of thermal energy due to the fact that the pipes are flooded for various reasons and the insulation of the pipes is broken, can be 50% and even more. In such places, special isolations should be applied;
- pumps with a low useful operating coefficient in the system must be replaced with modern pumps, while old pipes with defects must be replaced with pre-insulated ones;
-if the energy loss rate in heat transfer systems exceeds the norm, complex verification work should be carried out and the reasons for the loss of heat cancellation should be determined, and measures should be taken to correct it in a timely manner.

4. Conclusions und Commendations

The energy consumption of the building is mainly due to the correct choice of building density, orientation of the building in relation to the sides of the horizon and taking into account the main direction of the Wind, The Shape of the building, floors, room height, Building width, facade division, the correct choice of building compactness, the correct choice of thermal protection and heat resistance of, air can be lowered at the expense of the right choice of entrances and migration routes from the outside.

According to expert assessments, when systematically applying all energy conservation measures, it turns out that the energy expenditure on services at residential facilities can be reduced by 2-3 times.

Summarizing the measures taken to implement energy conservation in the above-mentioned buildings, we can make additions and briefly express them as follows:

-it is necessary to limit the construction of all buildings, especially residential, cultural and domestic, service buildings, electrocity, boiler rooms, and reconstruct existing ones, and replace certain devices with modern energy efficient ones, so that the project norms and service aspects do not meet the requirements of modern resource economy;

- electronic meters passed from modern state standards should be installed in the premises, which take into account all energy sources. In short, the same “smart homes” and “smart construction” methods as in developed countries should be used more widely, which means that energy consumption in all energy systems and devices is controlled electronically, energy saving through materials used in construction work and achieving natural climate control, reducing the cost of construction by using energy efficient building materials, as well as spending less energy;

- special attention should be paid to the study of the experiences of developed countries with extensive experience in the construction of energy-efficient buildings, especially those of countries close to us in terms of climatic conditions, issues in energy supply;

-it is necessary to support the development of model projects and constantly encourage their authors, which envisage the use of modern energy-efficient methods(materials) and technologies aimed at improving the energy efficiency of buildings;

-it is necessary to conduct various scientific conferences on the study of advanced foreign experiments accumulated in the field of energy management measures and research the prospects for their use in the conditions of Uzbekistan, make media speeches, make meetings at science centers and enterprises, conduct seminar trainings, round tables with the participation of foreign specialists, prepare pilot projects and carry out various other

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