An Improved Integrated Approach To Improving The Efficiency Of Energy Management Of Residential Buildings.

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ABSTRACT

This article brings information about an improved comprehensive approach to improving the efficiency of energy management of residential buildings, a comprehensive approach to improving the energy efficiency of buildings, methods for assessing the effectiveness of energy-saving solutions

Keywords: residential, building, energy, investments, Sales Analysis, use of environmentally friendly materials, design principles, interior comfort

Introduction.

Considering the population of the Republic of Uzbekistan and the increase in their income, the acceleration of urbanization processes and the corresponding changes in the consumer structure, by 2030, the demand for energy resources in the field of buildings can increase by 2.5 times (61.2 million.t.n.e.up to). Under such conditions, it is necessary to adopt a set of measures to improve energy efficiency in this area in order to prevent the growth of the difference between demand and energy supply, to ensure uninterrupted energy supply of housing, commercial and administrative buildings and to ensure the social right of people.

Today, almost half of the total energy consumption in Uzbekistan corresponds to the contribution of heating the premises (24.1 million per year).t.n.e.). At the same time,the energy consumption of buildings in Uzbekistan compared to developed countries is 2-2.5 times higher. It turns out that the 1-year average energy construction in Uzbekistan will spend 0.8 %, agriculture 6.0 %, transportation 9.0 %, energy and industry 35.0% and the population and communal sector 49.2%. It can be seen that in Uzbekistan, consumption in a year is 50% of all energy that is kilinable, or 24.1 million. the equivalent of tons of oil corresponds to the contribution of buildings. The issues of saving energy in the construction and construction of building projects remain unnoticed, which leads to excessive energy consumption.

Modern architecture-ensuring energy efficiency in the construction of residential and administrative buildings, industrial facilities and the reconstruction of existing ones by applying construction solutions and new, energy-saving types of construction structures, as well as insulating materials. In the following years, the rural construction houses that were rising in our Republic were an important step in the construction of individual and low-rise

residential buildings. With this, large-scale work was carried out to improve the architectural appearance of rural settlements, increase the level and quality of life of rural residents due to the construction of individual low-rise housing on model projects, and to rapidly develop engineering and transport communications, social infrastructure facilities in the village [1,2].

Methods

The research work used mathematical modeling, comparison, the Rits method, the Petrov – Galyorkin method, methods of analysis, generalization, observation, measurement and experimental verification.

Result.

In our country, in addition, taking into account the orientation of the building in relation to the sun in reducing the total energy consumption of buildings that are now being built, referring to the problems of saving the resources of energy sources, using solar energy, applying alternative energy options, which are becoming an urgent topic all over the world today, to increase the thermal insulation

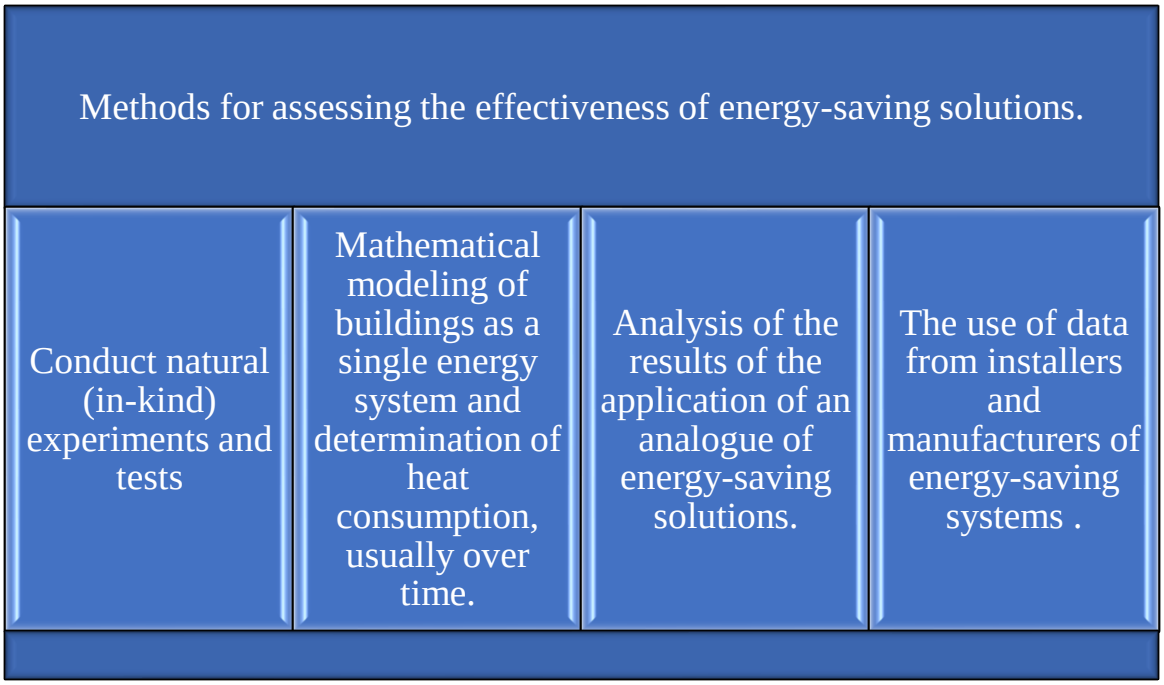
Discussion.

Speaking about the complex approach to solving energy saving issues, it becomes clear that in addition to heat loss structures of buildings and heating systems, other aspects must be taken into account. The integrated approach should cover three basic and popular principles of Sustainable Development: a balance of environmental, economic and social aspects. All three rules must set the criteria for buildings to be evaluated and compared. As you can see, energy istemoli is one of the many criteria.

An integrated approach to building energy efficiency involves additional aspects such as size.

- investments,
- sales analysis,
- use of environmentally friendly materials,
- design principles,
- internal comfort, etc.
- Now, let's take a closer look at them.

1. The volume of investments is one of the most important aspects of making decisions on the implementation of measures aimed at improving energy efficiency. No energy saving project can be implemented where it is not economically feasible. In regions where urban spending is much higher than in rural areas, there is a difference in price levels during economic growth and economic crisis. Common investments include architectural design, technical design, construction of a building of the desired quality, including full-scale construction of the technical equipment of the building, as well as VAT (value added tax) [1,3].



2. Analysis of the profitability of the building during its life cycle. The energy efficiency of the premises and the economic aspects of the measures applied must be balanced. It is necessary to determine the economically optimal level by analyzing the profitability of the building, taking into account the entire life cycle of the building. The EU program 2030/31 / EC refers to the level of energy efficiency "at an economically acceptable level" at the lowest price in the calculated economic period. Low funds are determined taking into account capital. Costs, technical and operational costs (energy and savings costs, energy input), if available, and waste disposal, are carried out where available.

3. Integrated residential planning. The most important aspects of integrated planning include:

- their compactness, including the presence of shortcuts to up and down traffic areas or workplaces;
- short distance by public transport;
- stable quality of life;
- introduction of compact types of buildings to minimize heat loss;
- use of maximum natural light;
- maximum use of solar energy for passive heating, ensuring the possibility of using an area heating system;
- minimizing environmental damage;

4. Comfortable climate in buildings. Any building needs to design and build a healthy, safe and comfortable indoor climate [4,5].

The construction plan and detailed technical plans must meet the climatic requirements for buildings defined in national legislation. When planning how to keep the heat, it is necessary to take into account the condition of the building. Buildings must be designed and constructed in such a way that indoor air does not contain water vapor concentrated in buildings (windows, frames, walls, ventilation systems, etc.) and does not cause damage. Humidity in the room should remain within the specified values. Rules and instructions, sound absorption measures should be adopted. In the design and construction of buildings, the concentration of volatile organic compounds should be taken into account and minimized in accordance with the requirements of national legislation. In addition, it is necessary to take into account the concentration of radon and, if necessary, take special measures to reduce it or meet the requirements of national regulations.

5. Ecological materials. Building materials are part of the building assessment and are essential to the assessment of all building systems. In the European Union, all building materials must have a label. It indicates that the materials are used and distributed in the countries of the European Union, as well as tests are carried out and the materials meet all the requirements. However, this label does not mean that the material is environmentally harmful or environmentally hazardous. According to the "CAPEM" project, ecomaterial is a material / product that has a negative impact on the environment and has a negative impact on health. For example, during the reconstruction or modernization of the building, it is necessary to be careful not to use or replace materials containing the following harmful substances: asbestos, freons; substances containing cadmium (for example, paints); substances with a high content of solvents, plastics or formaldehydes, resins; Uncertified wood, adhesives and bitumen, tropical wood paints, except when approved by the Forestry Council. Energy standard. When planning or making a decision to build a house, the energy standard determines its subsequent energy consumption. In addition, technical measures necessary to achieve a certain energy standard are determined. Currently, there are two well-defined standards: the first is determined by the national legislation of each country, and the second is called the "passive building standard". The criteria for evaluating building energy standards are based on the use of heat energy equal to one square meter per year. Among the best examples are the non-zero energy buildings and the passive building standard. Basics of design. Design is a key step in achieving a good high energy standard as well as an attractive appearance of the building. There are several basic design principles used in the design of energy-efficient buildings: compactness of the building, optimal zoning and location, use of sunlight, natural light, shading

and thermal protection. Sophisticated thinking should be used in the design phase, as well as in the construction and management process. Flexibility in the use of the building or its parts should be ensured. Quality control. Even the best planning is useless if the technical application of the construction project is not correct. There is a need for monitoring and inspection during the building use planning, design and construction completion stages. The quality control process is evaluated as a project implementation evaluation. Usually, the project is approved in accordance with the requirements of national legislation. Further monitoring (on a regular basis) is carried out during the entire construction process. All construction processes must be inspected and measured. Independent certification provided by various certification schemes and a set of strict rules (for example, a passive building certificate) can be introduced [6]. Roof insulation. According to estimates, it can be about 10-20% of the total heat loss through the surface of the roof. Regardless of climatic conditions, it is recommended to use insulating roofing material with a thickness of at least 15-20 cm (thermal conductivity λ = 0040 W / μ). For a passive house in the Central European climate, 40 cm of insulation is required for low-energy houses, with a thickness of 30 cm. Background isolation. The walls of most homes are the largest source of energy loss and have the greatest impact on energy consumption. Walls can provide about 20-30% of the total heat loss. Regardless of climatic conditions, it is recommended that the minimum external insulation of walls is less than 10 cm (l = 0040 W / mK). Average 24 cm for energy efficient houses, 35 cm for passive house in Central European climate. Separation of the floor. The floor can affect 5-10% of the total heat loss. It is important for comfort. The best way to keep your feet warm without warming your hands is to separate or soundproof the floor. 4 cm (l = 0040 W / mK) small floor insulation is recommended. Up to 16 cm for an energy-efficient house, 30 cm for a passive house in the Central European climate. Heat transfer coefficient of windows. In addition to solar gain, windows account for about 15% of total heat loss through heat transfer. The amount of lost heat energy mainly depends on the number of windows and the thickness of the frame, as well as the degree of filling the window glass with "Foam". The energy quality indicator of windows is the heat transfer coefficient (U-value). The U-value of all glass (UW) includes the glass U-value, frames and loss through thermal bridging across the glazing. Basically, older windows have a single frame with a UW value of about 5.6 V / K. Double panes and outer coated glass have a UW value of up to 2.3 W/C. In modern three-glass depth, the UW value can reach 0.8 W / m^{20}S.13. The tightness of the building. Heat loss refers to the flow of heat from the interior of the building to the exterior. Thus, the hermeticity of the building shell is of great importance in preventing heat loss. Overheating through the flow of coating structures can reach 10%. Damages can be significantly reduced when resilience is enhanced and controlled. Air permeability testing can measure building integrity and detect leaks. The minimum air density of the new building should be lower than the air exchange rate - 3 times per hour (ie <3 h-1). A good ratio is less than 1 hour. For passive houses, viscosity should be less than 0.6 h-1.14. Ventilation. Nowadays, with energy-efficient construction and renovation, ventilation is often underestimated. In most cases, the main way to save energy in existing buildings is to replace old windows with new, closed and energy efficient ones. The other side of such actions is the lack of air exchange due to the lack of fresh air. This leads to an increase in humidity in the room and the creation of climatic conditions favorable for mold growth. A ventilation system equipped with heat recovery is a solution to increase the energy efficiency of the building [7]. The presence of such a system is mandatory for a house of passive standard. Heating and cooling. Typically, heating and cooling systems must be optimized to increase building energy efficiency. Among them are the use of efficient boilers, the use of low-temperature heating systems and condensate boilers, well-optimized heaters (radiators, heating zones, etc.). It is recommended to use high-efficiency pumps that save energy. Hot water insulation of all pipes of the heating

system and hot water supply leads to a decrease in heat loss. The installation of a thermostat with automatic temperature control for heating elements allows you to control the temperature [1]

Conclusion.

As a result of the conducted theoretical researches, based on obtaining objective data on the residual properties of heat protection and sound insulation of barriers that expand priority research in the field of heat protection, a single-built residential building is operated for the climatic conditions of the Republic of Uzbekistan. An improved model has been developed for the problems of thermal renewal of external barrier structures of buildings and increasing the level of sound insulation.

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