# PROBLEMS OF THERMAL INSULATION OF CIVIL BUILDINGS

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**Annotation.** This article discusses how much energy is lost through wall structures and how much is available from around the world, using energy-efficient building materials to conserve energy.

**Keywords:** energy-efficient structures, residential buildings, energy, dry hot climate.

The fact that the world's energy consumption has doubled in the last 30 years [1] proves how high the demand for fuel and energy resources will be in the near future. Therefore, the issue of energy conservation is one of the most pressing issues due to such a sharp increase in the amount of energy consumed in the world. According to the International Energy Agency and the Center for Economic Research, the population and gross domestic product. Taking into account the growth of energy consumption in Uzbekistan by 2030, the amount of energy consumption will increase from 60 million tons to 150 million tons. may increase. Taking into account the sharply continental climate of Uzbekistan (dry-hot in summer and cold in winter), the cooling and heating systems in summer alone consume 24.5 million tons of oil equivalent (million tons) of energy per year[2].

The main potential of energy saving in Uzbekistan is in the field of operation of public buildings, and a large amount of energy consumption falls on residential buildings with insufficient external thermal insulation. According to experts, the housing stock has the potential to save more energy than community buildings through the use of energy-saving measures (Figure 1).

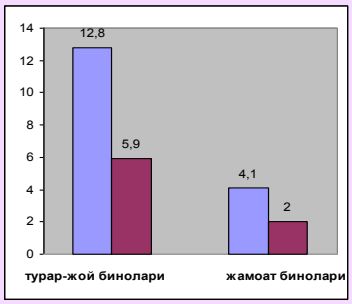



Figure 1. Energy saving potential of civil buildings (million tons)

As can be seen from the diagram above, the technical potential of energy saving in the housing stock is quite high. In the EU, this figure is 150 kWh (Figure 2).

Energy saving policy in the European Union was adopted in 2002 by the European Parliament and the Council of the European Union. Implemented on the basis of the directive [3].

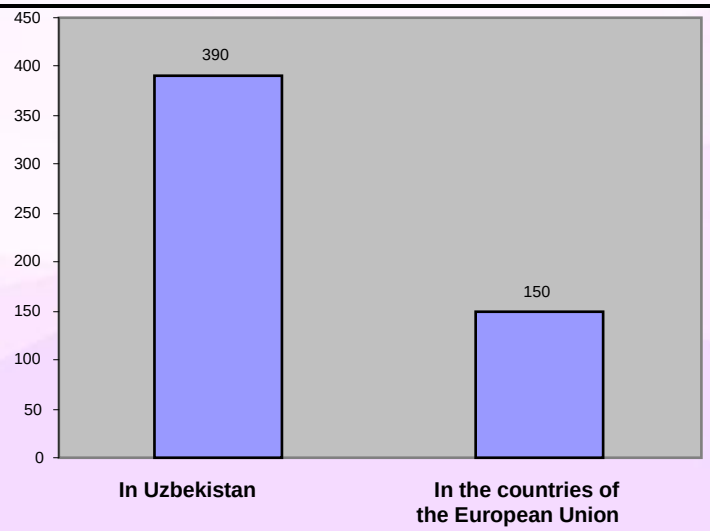



Figure 2. Relative energy consumption per 1 m² area per year (kWh / m²)

However, the diagram in Figure 2 shows that the amount of energy consumed in Uzbekistan per 1 thousand units per year is 2-2.5 times higher than in developed countries [2].

Also, the normative value of the heat transfer coefficient given in the KMF in Uzbekistan is lower than in developed countries (Table).

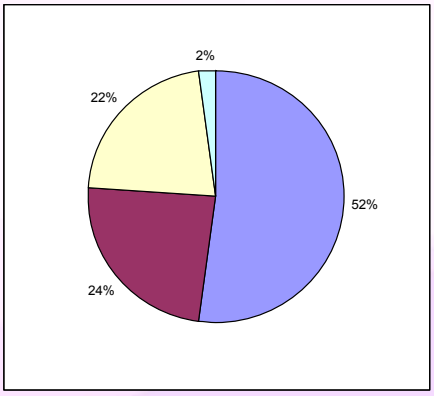
Table

Normative values of thermal conductivity (W / (m2 0C))

| Names of States | For exterior walls | To cover the attic volume | For windows and doors |
|---|---|---|---|
| Germany | 0,5 | 0,3 | 1,6 |
| Finland | 0,28 | 0,22 | 1,9 |
| Belarus | 0,5-0,4 | 0,33 | 2,0 |
| Uzbekistan | 0,71-0,45 | 0,6-0,4 | 2,56-2,38 |

The main reason for the above is that more than 90% of residential buildings in Uzbekistan were built 25 years ago and do not meet modern energy efficiency indicators. As a result, buildings designed on the basis of technologies and standards that do not meet the requirements of energy efficiency, not built on the basis of modern materials, have an average of 35% through the exterior walls, 25% through the roof and 10% through the windows and windows. To prevent these losses, it is necessary to take certain measures for the design and reconstruction of residential buildings in an energy-efficient manner. The effectiveness of the measures taken, according to industry experts, is shown in the diagram (Figure 3).

The diagram shows that more than 50% of the energy can be saved only by improving the external thermal insulation of the building. Also, modernization of engineering networks can save 22%, and the use of thermal energy metering system - 24% [2].




1- 52% at the expense of heat insulation;
2- 24% at the expense of heat energy accounting;
3- 22% due to modernization of engineering networks;
4- 2% at the expense of renewable sources.

Figure 3. Measures to ensure energy efficiency of public buildings

The following basic architectural and constructive principles of energy saving of residential buildings should be followed [1]:

- optimization of the architectural-compositional form of the building;
- optimal placement of the building relative to the sunset; - Increasing the thermal resistance of the exterior structure of the building;
- Increasing the thermal resistance of light-transmitting structures, which is a transparent structure of the building;
- Improving the ventilation structure in buildings, etc.

The combined use of the above factors reduces energy consumption in the building, but the main factor is to increase the thermal resistance of the external structure. For this reason, in order to increase the operational reliability of the housing stock and turn it into world-class energy-efficient buildings, it is possible to replace the old, high-density, exterior wall and wall material, which has been in operation for many years. At the same time, it is necessary to transfer the external walls of concrete single-storey residential buildings to multi-storey structures, taking into account the fact that they do not meet the requirements of modern energy saving. It is important to quickly determine the protective properties of the worn-out exterior wall from the residual heat, to calculate the thermal insulation material and thickness, to carry out thermal insulation work and to constantly monitor and operate the technical condition of buildings after reconstruction.

**References.**

1. B.M. Shoikhet “Concept of an energy efficient building European experience” Magazine “Energy saving” No. 7/2007.
2. Analytical report prepared by the Center for Economic Research (CER) with the assistance of the UN Development Program joint project “Improving the energy efficiency of buildings in Uzbekistan: directions of reforms and expected effects ”. Tashkent-2014. 59 pages.
3. Jean-Baptiste Rieunier. Low energy houses in Europe multi-comfort house concept: Sat. report International scientific and practical conference "Effective heat and sound insulation materials in modern construction and housing and communal services" 2010.
4. Olimov, Shirinboy Sharofovich. "THE INNOVATION PROCESS IS A PRIORITY IN THE DEVELOPMENT OF PEDAGOGICAL SCIENCES." (2021).
5. Mamurova D. I. Application of Advanced Information Technologies of Training at Drafting Lessons //Eastern European Scientific Journal. – 2018. – №. 6.
6. Salimovich, Sharipov Sohib, and Nematova Mohibegim Fazliddinovna. "Dictionaries in Modern Life." *International Journal on Integrated Education* 2.6: 166-168.
7. Bafaevich, A. B., & Baratovna, A. M. (2021). The Importance of Teaching Methods of Fine and Applied Arts. *Middle European Scientific Bulletin*, *9*