

In an energy-efficient prefabricated house, we strive to minimize the costs associated with maintaining it. A house is a long-term investment, so it must, in addition to comfort and aesthetics, be primarily economic in operation. In recent years, energy-saving houses have been growing in popularity and more and more of them are being built in Poland and in the world. Modern Investors are paying more and more attention to the costs of not only the construction itself, but also the subsequent operation of the building, because they are aware of the ever-increasing costs of energy and the maximum reduced demand for it in buildings of heavy wooden prefabricated construction.

The basic criterion we should use when making decisions about our own home should be the income statement. Ready energy-saving houses, based on a well thought-out design, need 2-3 times less energy than houses in traditional construction, while providing their users with comfortable living conditions. This is the fact that the wall of the prefabricated house is completely filled with insulators with high thermal parameters. Thermal insulation of the external partition is determined by the heat transfer coefficient of the partition $U [W / m^2K]$ it determines how much heat penetrates through $1 m^2$ of surface in 1 second with a temperature difference on both sides of it equal to 1 degree C.

The demand for thermal energy of buildings is expressed using the so-called seasonal heat demand coefficient (EA). In standard homes that meet current standards, EA is equal to approx. $120 kWh / m^2year$, while the seasonal heat demand for energy-efficient homes ranges from $15 - 70 kWh / m^2year$.

Among energy-efficient houses, the lowest ratio is characterized by passive houses and ZERO energy houses, which bring the largest savings. The ecological awareness of investors has increased and therefore they are looking for optimal solutions that allow cheap and ecological heating of the house at the same time.

In energy-efficient homes, any heating system can be used and in any case it will bring satisfactory results. However, it is worth following the most important selection criterion, which is later energy efficiency of the installation. Investing in a modern and economical installation will certainly compensate for low future operating fees. Heat pumps are increasingly used in this area, but even electric heating, which may seem inappropriate, because it is absolutely associated with very high electricity bills in this case becomes completely profitable for the investor. It should be remembered, however, that to heat rooms with such high thermal insulation, very little energy is needed, because its loss is insignificant. Specialists believe that the lower the energy demand, the more expensive it's sources become cheaper to operate.

The basic assumption that should be met is the use of maximum energy saving potential of each building block. At this point, it is extremely important to correctly understand the benefits of investing in an energy-efficient house from wood from the first day of its use, as well as a complete analysis of the costs associated not only with construction, but also with equipment.

Energy-saving wooden houses

What wooden house can be described as energy-saving? In Poland, it is a building in which the indicator of seasonal heat demand is 30-70 kWh / m² per year, while the applicable regulations for a residential building speak for an indicator value of up to 95 kWh / m² per year. However, the ideal is autonomous (zero-energy) house or passive house, in which the annual energy consumption does not exceed 15 kWh / m².

Achieving a low heat demand factor is associated with the inclusion of many elements in the house project and advanced technological solutions that affect the efficiency of the entire investment.

Wooden houses - location and design of the house

Already at the stage of choosing a plot and location of the building relative to the world, the investor can have an impact on future operating costs. A perfect solution is e.g. a flat plot without trees on the south side, with a compact building, in which rooms with large windows are sunny, and the bathroom, bedroom and utility room with garage - shaded.

Exterior windows and doors should be characterized by high thermal insulation and tightness, with minimal thermal bridges.

Due to the high tightness and the lack of possibility of fresh air entering through the partitions in modern energy-saving buildings, mechanical ventilation is required. The best is the supply and exhaust ventilation with heat recovery, i.e. the recuperation system, which can additionally be equipped with a ground heat exchanger. It acts as an intake of fresh air, cooling it in summer and heating it in winter. This installation will reduce energy losses, which in the case of standard gravity ventilation reach up to 40% of the total energy demand.

Energy-saving wooden houses

An example of a healthy energy-efficient home can be a wooden house. Its undoubted advantage is the possibility of achieving good thermal parameters with a small wall thickness. Thanks to this, you can get about 10% larger usable area compared to a brick building, while maintaining the same external dimensions.

Skeleton in wooden houses

One of the known technologies of wooden energy-efficient construction are skeletal buildings popular in Canada and Scandinavia. This technique is based on a wooden structure filled with a layer of insulation material, most often mineral wool. The advantage of this technology is short implementation time (approx. 3 months), and dry assembly, allowing for winter work without technological breaks. It is possible thanks to erecting the building only from wooden elements, mounted with nails and metal fasteners.

The whole structure is relatively light, which reduces the size and bearing capacity of foundations, and thus reduces costs. Also, modernization and reconstruction of a wooden house does not pose major problems, especially when it comes to rearranging walls or repairing or replacing installations.

Wooden houses - construction technologies

There are three ways to erect wooden houses:

1. from individual elements on the construction site,
2. from prefabricated prefabricated elements,
3. using large-scale modules previously manufactured in production halls.

An important aspect in favor of choosing a prefabricated wooden house is not only the very short construction time, but also the quality of implementation of individual elements and a guarantee of unchanging price. Performing parts of the structure in the halls allows you to control the temperature and humidity there, which prevents, among others moisture in the elements.

Roof and walls of wooden houses

The walls in a wooden house are most often made of healthy pine wood, chamber dried, with humidity up to 16-18%. Properly prepared wood is devoid of fungal spores and larvae, as well as resistant to fire.

External walls from the inside are usually finished with gypsum board, while on the outside the façade is made in the form of plaster, vinyl cladding, wooden or made of clinker brick or logs.

Interior walls in a wooden house are built mainly in frame technology using plasterboard, wooden boards or wooden beams. Gypsum plasterboard can be used both in the room, kitchen and bathroom, while in rooms with increased humidity, special, waterproof varieties should be used, i.e. boards in which absorbency has been reduced by means of impregnation.



After fixing them to metal frames and leveling and painting the wall with a primer, they can be freely finished, painted, glued wallpaper, laid ceramic tiles or clinker bricks.

Both the external walls and the roof slope in a wooden house should consist of correctly selected and arranged layers of vapor and windproofing foil and thermal insulation, which will ensure optimal humidity and humidity in the rooms.

The thickness and type of thermal insulation in a wooden house depend on the energy efficiency class that the building should have. You can use any solutions to cover the roof, from ceramic, cement and bituminous tiles, through roofing sheet to wooden shingles, aspen shavings or thatched cane roofs.



There is no need to protect the structural elements inside the building against the action of fungi and insects, sufficient protection is a properly carried out wood drying process and protection only for those places that are exposed to direct moisture. During the construction of a wooden house, it should be remembered that even by the slightest structural errors it can lose the name of an energy-efficient building.