



” Energy-saving houses

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Increases in energy prices and heating costs of buildings significantly influence the growing interest in modern technologies that allow to reduce these expenses. In order to lessen the house's demand for heat, it is good to get a closer look at the concept of an energy-efficient building.

PICTURE 1. ENERGY-SAVING HOUSE



Source: <https://www.dobrzemieszkaj.pl>

The operating costs should be considered as early as at the stage of choosing a house project. Then we should think about how to locate the house on the plot and what solutions to apply to reduce heating bills during the operation.

In order to increase the energy efficiency of the house it is worth to locate the day zone (living room and dining room) from the south or south-west side of the plot. Such a location and the use of large glazing provide the increased thermal comfort of the building. Rooms such as bathroom, dressing room, locker and garage do not need much light, so they can be located on the north side. An optimal location for a bedroom and a kitchen is the east side, because these rooms will be sunny in the morning and cooler in the evening. The house should be divided not only into functional but also thermal zones. The temperature difference between the adjacent rooms should not be too big.

If we want to reduce our heating bills, we should opt for a house with a small area. A smaller house means less heat loss, which is related to the surface of the partitions, through which it flows out. The surface of the partitions also depends on the shape of the house. The shape of the energy-saving building is characterized by a simple, compact body, usually based on a rectangular plan. It is a good idea to check the shape factor of the building (A/V). It is the ratio of the area of all partitions to the volume of the building. The value of the coefficient should be as small as possible.

An energy-efficient house should be at least one-floor building, because a significant part of the energy escapes through the roof. Such a solution will help to minimize heat loss, which depends on the ratio of the roof area to the usable area - it is the largest in one-storey houses. The roof of the low-energy house should be straight and flat, without any kinks that would cause the biggest heat loss.

It is essential to use appropriate building materials that will protect the house from heat loss. During the construction of an energy-efficient house, materials with high thermal mass (e.g. brick, concrete and stone) are used. However, materials with low thermal mass, such as steel and wood, are not suitable.



It is very important to ensure an adequate degree of thermal insulation. In order to prevent additional heat from being given away to outside through external partitions (walls, windows, roof and floor), whether thermal bridges (incorrectly thermally insulated fragments of external partitions), it is necessary to ensure that the insulation is tight. Insulation materials are constantly being improved to have less thickness and better properties.

When choosing an energy-efficient house, it is worth to decide on additional internal installations, which increase the energy efficiency of the building and have a large impact on reducing the costs associated with its heating. Such solutions include solar installations, mechanical ventilation and floor heating. In energy efficient houses, modern devices with high efficiency are the source of heat (e.g. heat pumps).

An important aspect is the heating energy demand - how much energy is needed to provide comfortable living conditions. According to the current regulations, an energy-efficient house needs a maximum of 70 kWh/sqm per year. This is 50 kWh/sqm less than a traditional single-family house, but 55 kWh/sqm more than a passive house. However, it is worth remembering that passive houses acquire energy passively, without additional installations.

The cost of an energy-efficient house is much higher than the construction of a traditional house. However, the investment costs will pay back in a few years through low operating costs. Energy efficient house is not only a fashionable construction. With constantly growing bills for heating it becomes a great idea to save money. It seems very probable that energy-saving houses will soon become a new standard.



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