

Energy performance

What is the energy performance of a building?

The energy performance of a building is the capability to function more efficiently and use less energy. In practical terms, it represents the capacity of the building to ensure comfortable living and working conditions without putting too much strain on our budget. The energy performance of a building is affected by many different factors at the same time, such as **thermal insulation and the type of heating, cooling, ventilation or lighting.**

What is a thermal upgrade?

A thermal upgrade is the modification of a building and its services in order to reduce energy consumption. Thermal upgrade works adapt the existing building to the applicable thermal insulation requirements and result in direct energy savings, providing tangible financial benefits for the household members. All this helps reduce our energy bills while also contributing to environmental protection. However, we often cannot afford a comprehensive thermal upgrade including the above-mentioned works and have to choose which of them to perform first.

The right approach is to start with thermal insulation

Energy savings in buildings – what affects the bills?

The energy consumption of a building can be affected by many factors, such as the condition of its external walls, location and orientation, type of heating, ventilation and cooling system, thermal bridges and windows and doors.

Effective insulation – your key to energy savings!

Imagine you could reduce your energy bills by almost half! That is precisely what good polystyrene insulation could do for you! The benefits of using polystyrene boards and the estimated savings thanks to the thermal insulation can be checked at www.poznajstyropian.pl

Polystyrene-based thermal insulation in Energy Performance tests

To determine the impact of the individual factors on the final energy consumption in the building and its properties, the Małopolska Energy Efficient Building Laboratory (MLBE) of the Faculty of Civil Engineering at the Cracow University of Technology conducted an analysis by calculating energy performance.

Total demand for final energy before and after the installation of thermal insulation using polystyrene boards in a house from the 1960s. with an area of approx. 127 m²

Total final energy demand kWh/year	Without thermal insulation	Insulation with polystyrene boards, white EPS 70 16 cm 0.039 W/m-K	Insulation with polystyrene boards, grey EPS 70 13 cm 0.032 W/m-K	% difference before and after
Solid fuel boiler	50,530.48	30,979.13	30,974.80	-38 %
Gas boiler	44,273.24	26,655.54	26,651.65	-39 %
Heat pump	11,301.41	6,898.09	6,897.11	-39 %

Costs of heating the building with bituminous coal and natural gas

ITEM	UNIT	DIFFERENCE			HOUSE HEATING COSTS 2022		DIFFERENCE
		DEMAND BEFORE	DEMAND AFTER THERMAL INSULATION		WITHOUT THERMAL INSULATION	WITH THERMAL INSULATION	
BITUMINOUS COAL	[PLN/year]	6.64 t	3.5 t	-47 %	PLN 15,447.13	PLN 8,150.06	PLN 7,297.07
NATURAL GAS	[PLN/year]	37,210.42 kWh	19,592.72 kWh	-47 %	PLN 9,452.56	PLN 4,977.14	PLN 4,475.42

Based on the MLBE report.



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As shown, appropriate polystyrene insulation reduces energy consumption by 39%. This means that we spend less on heating in winter and cooling in summer. When this number is referred to the costs of heating the building using two popular heat sources - bituminous coal and natural gas - this translates into a reduction of demand by 47%, which would have provided tangible savings last season.

Energy consumption and the energy-efficiency rating of the building

The energy demand of buildings has increasing significance in the context of European programmes and regulations designed to conserve energy and protect the environment in the future. Each member state will define energy-efficiency ratings for buildings on a scale of A+ to G, where A+ represents passive buildings, which do not consume any energy, and class G represents uninsulated buildings, with the highest energy consumption. The rating of our building will also directly determine if and for how much it can be rented or sold. Even now, thermal insulation using polystyrene is one of the pillars of subsidy programmes such as, for instance, Clean Air. As indicated on the website of the programme, 667,534 applications were submitted in 2018-2023, half of which concerned thermal upgrades.



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