Towards Modern Technology and Traditional Form—Evolution of the Form of Energy-Efficient Houses in Poland over the Last Decades †

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Abstract: The article is an attempt to capture the problem of changes occurring in the last dozen or so years in the architecture of energy-efficient houses in Europe, including Poland, in the light of economic and legal conditions. In the studies subordinated to the analysis of the literature, the focus was on those features of energy-efficient buildings that are derived from the logic of solutions of traditional country houses. The genesis of the form of the modern energy-saving house can be found in the principles of building and situating houses developed through the experience of previous generations. These principles took into account the specificity of the climate and existing local conditions. Modern energy-saving construction adds new technologies and new building materials to the traditional form.

Keywords: energy-saving architecture; passive house; traditional country house

1. Introduction

The idea of sustainable development has become particularly important in recent years. The supporting of an economy that uses resources more efficiently, is more environmentally friendly and is more competitive is one of the three interrelated priorities that were set out in the document prepared by the European Commission in March 2010, Europe 2020. At the end of 2019, a series of documents that summarized the established goals for the following decade were presented and analyzed, in which sustainable development goals were identified as those that should be considered as a binding investment framework [1] in subsequent years.

In 2015, all UN member countries adopted the resolution “We are transforming our world: Agenda for sustainable development 2030”. It sets out Sustainable Development Goals to be achieved by the world by 2030. These goals will cover three dimensions of sustainable development: economic growth, social inclusion and environmental protection. Matters of ecology and environmental protection in the context of the architect’s activities can be considered paramount.

2. Description of the Issue

The Polish National Fund for Environmental Protection and Water Management currently promotes two standards for energy-efficient buildings: passive buildings (NF15) and energy-efficient buildings (NF40) [2]. In the light of applicable regulations and changing investor awareness, low-energy houses are slowly becoming the standard. With each subsequent year, energy-saving solutions are becoming increasingly available, and the profitability of implementing such an investment increases. The aesthetics of residential buildings are also changing. The most desirable form of passive buildings is a form referring to a traditional country house.
The analysis of changes in the form of an energy-efficient house was carried out based on a library query and a review of websites presenting residential buildings with varying degrees of energy efficiency built over the last two decades. The substantive research was supported by the analysis of legal acts and documents on the broadly understood topic of energy saving. Attention was drawn to the relationship between the evolution of the energy-efficient house form and the changing regulations that set the requirements for energy-efficient homes and the fashion that shapes the style of a modern residential home.

The problem of saving mineral resources and energy is one of the challenges that does not disappear despite the passage of years. The growing demand for energy, fluctuations in the prices of energy raw materials and environmental pollution force the ever-greater intensification of energy-saving measures. Regulations and standards that reflect these activities are becoming more and more restrictive. Countries such as Poland have found themselves in a peculiar situation where the growing energy demand is imposed by a significant dependence on imported natural gas and almost complete dependence on foreign oil.

According to data from five years ago, in Poland, as well as in other countries, buildings are responsible for the consumption of over 40% of energy [3]. Due to increasingly restrictive building regulations and standards, the consumption of non-renewable energy sources is systematically decreasing. Shaping a residential environment in accordance with the principles of ecology and energy saving is one of the most important tasks that investors and architects are facing in the 21st century. By making design decisions, the architect becomes co-responsible for the natural environment. It is the architects at the design and implementation stages that propose solutions and systems that will guarantee adequate comfort for users with minimal energy consumption. In addition to technical solutions that use modern materials and technologies, and the accuracy of the construction work, the key to success is to rationalize the form and location of the building, and shape its immediate surroundings [4]. A consideration of the energy efficiency of the building itself should go hand in hand with an ecological approach to the entire investment, including the way of life of the residents.

3. Results

Energy-efficient architecture has many faces. The Polish experience in passive construction covers the last dozen or so years. Energy-saving construction is usually associated with a period not preceding the last decades of the 20th century. However, it should be noted that traditional folk architecture is an economic solution developed over generations, often resulting from poverty. Today, many energy-efficient houses do not differ in aesthetics from typical contemporary Polish single-family houses. A fragmented block, often with a very complicated or flat roof, has a reduced energy consumption rate due to a thicker layer of thermal insulation, airtight windows and/or heating and ventilation installations using heat recovery. With the appearance of the first passive houses in Poland, the aesthetics of energy-saving buildings are evolving towards a house with a traditional, rectangular block with a gable roof [5]. Although the requirements for low-energy houses do not specify the form of the building, among the rules for energy-saving construction in the first place are a compact form, an uncomplicated roof and the appropriate arrangement of rooms to create a heat buffer from the north side of the house.

4. Conclusions

The fashion for modern barn-like houses seems to be advantageous from an ecological point of view. A simple archetype form of the house is recommended for a passive building. One can also consider it a contemporary interpretation of a traditional country house. Traditional folk architecture, through centuries of experience, has developed logical rules for building and situating houses. Traditional folk construction solutions, supplemented with modern materials and technologies, meet energy-saving standards that correspond to the modern idea of low-energy development [6]. They support the architects through heightened awareness of economics and ecology.
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