

TITLE OF DIPLOMA THESIS

Design of residence with almost zero energy consumption and cost comparative analysis with a conventional residence

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ABSTRACT

The energy problem is an issue that is of the utmost importance and at the center of interest in recent years. The building sector contributes greatly to the excessive energy consumption reaching the percentage of 40%.

This diploma thesis presents the methods and systems that can be used in a residence to reduce energy consumption and produce the required energy on the ground while reducing pollutant emissions. The basic methods are divided into the following major categories. Passive or active systems, bioclimatic design, the mechanical systems and the exploitation of renewable energy sources.

In the last chapter of the paper thesis, with the help of the program TEE-KENAK, all the possible methods for an energy upgrade of the dwelling are assessed in order to apply the most efficient ones to achieve a nearly zero energy building. Then the cost of the methods that are used is calculated and analyzing the cost benefits and the energy savings in order to calculate the payback period. To achieve the most accurate results, detailed calculations were made that are presented at the end of the diploma.

KEYWORDS

Zero energy consumption, private residence, financial evaluation.