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MY FINAL DEGREE PROJECT SERVES TO TRANSFORM THE WORLD

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Title of the Final Degree Project (FDP)

Integration of Passivhaus standard in Isozaki Atea through renewable technologies

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Degree

Ingeniería Electrónica Industrial y Automática

Sustainable Development Goals (SDG) to which FDP contributes

- 7. Energía asequible y no contaminante,
- 11. Ciudades y comunidades sostenibles,
- 13. Acción por el clima

Abstract

This study aims to analyze the cost-effectiveness of integrating an energy efficiency standard in Isozaki Atea (Bilbo, Spain), as an exemplary exercise to test the economic and ecological benefits that the refurbishment of a building like this could bring. The first half of the document focuses its efforts on covering the informative study in the world of construction and sustainability. It begins by describing the historical context of the home and its social impact and explaining the meaning of Passive House and the characteristics necessary to obtain certification, analyzing the state of the art of these. Finally, a brief introduction to the building to be analyzed is given. After this purely theoretical drafting, an analysis of alternatives is carried out, seeking to specify as much as possible and as objectively as possible concepts such as; the approach to be taken into account, which technologies will be installed in the building, which designs these technologies will have, etc. This analysis is developed using the weighted sum technique, seeking to be as coherent as possible. Once the system design is defined, different calculations are carried out using simulators and mathematical models. These calculations consist of obtaining the values of the energy demand of the building and the energy values obtained by the photovoltaic and wind power installations proposed. After the analysis of the energy values, economic profitability analysis is carried out, making a balance of costs and benefits and checking the subsidies that the project could obtain. These "budgets" have been obtained by consulting suppliers and producers, as well as installers of

this technology in the Basque Country area. Finally, an analysis is carried out, assessing all the values, both energetic and economic, checking and discussing the profitability and proposing changes or adjustments. Likewise, observing the values and multiple opinions obtained through different interviews with professionals in the field of construction, sustainability and energy efficiency, an overall observation has been made. As the conclusion of the study, it is observed that energy efficiency, as well as the Passivhaus standard, is a start toward a building system more committed to sustainability, but even so, energy performance is not equivalent to sustainability, but energy performance belongs to a group of factors that favor building sustainability.

Contribution to the SDGs of the 2030 Agenda

An example exercise to test the cost-effectiveness of integrating this standard in pre-existing buildings can contribute to developing and supporting a sustainable mentality and highlight the need for the incorporation of the Sustainable Development Goals (SDG), from the Agenda 2030 adopted by all united nations member states in 2015, specifically the SDGs related to energy, that is, 7, 11 and 13.