STRATEGIES TO ENHANCE THE ENERGY EFFICIENCY OF BUILDINGS APPLICATION IN THE CANARY ISLANDS

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1. Introduction.

Energy efficiency is one of the techniques that can be used to obtain a reduction in primary and final energy consumption and in CO2 emissions. The European Union has established a series of targets in this respect [1], with one of the strategic lines of action involving the energy efficiency certification of buildings [2,3].

The aim of this paper is to study the sensitivity of the energy efficiency of a building to different modifications to the energy performance of the various systems present in the building. The degree of sensitivity will be studied according to the modification carried out and the climate conditions in the area the building is located. Different cases in the Canary Archipelago will be analysed for residential, office and commercial buildings.

2. Experimental.

Different scenarios were established for each building typology according to the energy sources used in the building systems and the existence or otherwise of own energy generation using renewable energy sources. The systems considered are those of heating, cooling, domestic hot water and lighting.

Assessment of the energy certification for each of the cases was carried out using the official procedure as set out in European Directive 2010/31/EC [2].

3. Results and Discussion.

For the particular case of office buildings and in a specific climatic area, the actions carried out according to the different scenarios enabled a 42.9% reduction in the number of tonnes of CO_2 emitted annually, from 59.9 to 34.2 tCO_2/year.

4. Conclusions.

The extent of the improvement after application of the modifications for the same scenario can differ depending on the climatic zone where the building is located.

For the same climatic zone, the extent of the improvement obtained in the energy efficiency of a building differs depending on the actions that are undertaken.

5. References.

[1] European Parliament and council. Directive 2012/27/EC of 25 October 2012 on energy efficiency. Official Journal of the European Union 2012: p. L315/1 – L315/56

[2] European Parliament and council. Directive 2010/31/EC of 19 May 2010 on building energy efficiency. Official Journal of the European Union 2010: p. L153/13 – L153/35

[3] S. Deng, R.Z. Wang, Y.J. Dai. How to evaluate performance of net zero energy building - A literature research. Energy 71 (2014) 1-16