

ENERGY AND COMFORT. ANALYSIS OF INTEGRATED “LOW-EX” SOLUTIONS

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ABSTRACT The climate control solutions encompassed in the concept "Low-Ex" or low exergy, have a promising future in achieving efficient facilities aimed at meeting the objectives of Directive 2010/31/UE. These systems make use of heat transfer fluids at temperatures close to the indoor environment and limit the waste consumption of the systems, such as pumps and fans. Moreover this technology allows a very interesting combination with renewable energy sources.

In addition, the optimization of energy consumption in buildings depends largely on the degree of user comfort. In this context, the discomfort generated by unfavorable radiant mean temperatures, conditions the use of the thermostats set-point. Low exergy systems, which use moderate thermal levels and encourage radiant exchange, may offset these situations naturally optimizing the temperature set-point.

This work, as part of a larger study called TECNOCAL, analyzes the energy consumption in relation to the comfort, obtained for different situations and climatologies. This is being done with the use of energy simulation software, where different types of facade and interior spaces are being modeled. The conclusions obtained, allow us to define the criteria for efficient design of systems based on these technologies. The design of the IDOM office buildings in Bilbao and Madrid, which correspond to different climatic areas in Spain, is presented as a clear example of the possibilities of these “Low-Ex” solutions.