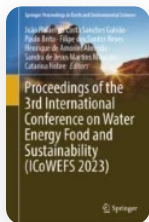


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# Sustainability Assessment of Building Rehabilitation Solutions: The Mid 70s Portuguese Building

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## Abstract

The Energy Performance of Buildings Directive (EPBD) establishes improvements to buildings' comfort conditions and energy performance, bringing them closer to buildings with almost zero energy needs, namely the Nearly Zero Energy Building (NZEBs). The assessment tools for sustainable construction, more recognized internationally, are LEED and BREEAM, and in Portugal is the LiderA. The application of those tools promotes energy efficiency and decarbonization of buildings, as referred to in the Portuguese Long-Term Strategy for Building Renovation (LTRS-PT) until 2050. In this case, a house representative of the construction of the period between 1971 and 1980 in Portugal was chosen to evaluate environmental sustainability using LiderA. In the current conditions, the LiderA rating class of the house was D. To improve the performance of the building were identified balanced rehabilitation solutions without excessive automation. The presented solutions should avoid transforming the house into a complicated device with operational difficulties or specialized operation. In this way, the proposed interventions in the building and systems are based on renewable sources, prioritizing energy and water efficiency. Furthermore, as a contribution to the health and well-being of the occupants, we considered measures related to indoor air quality (IAQ) and noise minimization. In addition, the encouragement of native species has contributed to ecological enhancement. With that proposals, the house rating class using LiderA improved from class D to class A+.

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