



A Circular Economy`s approach to healthy and low-carbon building

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Buildings account for 40% of total energy consumption in the European Union. The indications are that this will increase, simply because of growth in the number of buildings over time. It is also important to have in account that bioclimatic design and building engineering physics issues, directly related to energy performance and to well-being of the occupants, should be properly considered. According to Directive 2010/31/EU/EPBD (recast), new buildings or subjected to major renovation must meet the requirements of "near Zero Energy Buildings" (nZEB) by mean of reducing the need for energy through implementation of energy efficiency measures and by the offsetting of the remaining needs through the use of renewable energy systems, as addressed by Circular Economy`s model (Kephalopoulos et al., 2017). Several studies show that, in most cases, the savings occurred over a building lifespan exceed the energy involved in the production process for the current insulation products - accounting the embodied and operational energies - during the whole building life-cycle. However, should be pointed that most of these insulation materials and products are oil-based, thus associated with a negative carbon footprint and with extreme environmental burdens. Built Environment has been pointed out as one of the most important factors that affect human health: in accordance with the principles of the Circular Economy, more sustainable and healthy alternatives are found in different renewable materials characterized by low emissions, low embodied energy and out-waste design, as disclosed by LCA methodology (Crawford, 2011) for structural, insulation and coating materials. Bio-based materials and products such wood, bamboo, cork, straw or hemp, among others, contribute significantly to the carbon neutrality of buildings, gathering energy efficiency, healthy indoor air and thermal comfort during its life-cycle, fostering Circular Construction and the implementation of the Sustainable Development Goals (SDGs).

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