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The Eco-Efficient Construction: A Review of Embodied Energy in Building Materials

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Abstract : The building construction industry consumes a large amount of resources and energy, both during construction (embodied energy) and during the operational phase (operating energy). This paper presents a review of the literature on low carbon and low embodied energy materials in buildings. The embodied energy comprises the energy consumed during the extraction, processing, transportation, construction, and demolition of building materials. While designing a nearly zero energy building, it is necessary to choose and use materials, components, and technologies that allow to reduce the consumption of energy and also to reduce the emissions in the atmosphere during all the Life Cycle Assessment phases. The appropriate choice of building materials can contribute decisively to reduce the energy consumption of the building sector. The increasing worries for the environmental impact of construction materials are witnessed by a lot of studies. The mentioned worries have brought again the attention towards natural materials. The use of more sustainable construction materials and construction techniques represent a major contribution to the eco-efficiency of the construction industry and thus to a more sustainable development.

Keywords : embodied energy, embodied carbon, life cycle assessment, architecture, sustainability, material construction
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