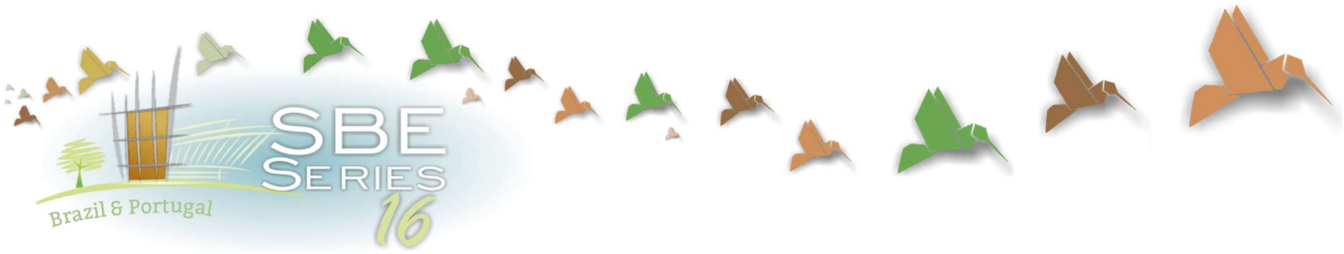

Sustainable Architecture - Analysis of constructive processes, techniques and materials

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ABSTRACT: The current consumption rate of fossil fuels and natural resources in the construction activities is unsustainable. Actually this activity consumes resources well above natural systems restoration capacity, being responsible for 30% of world's carbon emissions. The efforts to increase sustainability using energy from renewable resources should include innovation in the construction methods and the valorization of waste through its reuse or transformation which has obvious economic and environmental advantages, allowing savings of natural and material resources.

The present work aims to evidence the contribution that existent materials and constructive techniques can provide for sustainable development in the construction sector, supporting innovative ad eco-friendly techniques and processes that reduce Environmental Impact, identifying the reasoning for preservation of the natural resources and endorsing the use of renewable energies. For a better understanding of the Sustainable Development concept, a prominent attention is dedicated to notions related with materials, such as life cycle and embodied energy, natural resources consumption and the consequences of their massive extraction and use, namely the GHG emissions.

The outcome of this research presents the results related with sustainable architectural techniques and processes, using "environmentally friendly" materials, and analyses its applicability in a physical architectural model developed in this work. With the aim of attaining a sustainable architecture, an evaluation is proposed at the different life cycle stages, as the CO2 emissions calculation and the analysis of the network supplied energy savings provided by the renewable energies used, as well as the feasibility of material's recycling at the end of its useful life. Moreover, it is explained an evaluation for the model's environmental performance.

Keywords *Sustainable architecture, renewable energies, natural resources, construction waste, environmental performance.*