Environmental assessment of insulation materials along life cycle

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The insulation materials have a significant effect in decreasing the energy consumption of buildings for a sustainable development. To obtain high energy efficiency and low environmental effects, the diverse set of insulation materials can be used for the optimal design of buildings. The aim of the present work is to find insulation material solutions for building applications with low environmental effects and low thermal conductivity. In this study, AHP is used for finding the most harmless insulation material with respect to environmental effects such as air pollution, waste water, solid waste and various macro criteria for the building design project. Multi-criteria decision making is applied on life cycle evaluation of four type of thermal insulation materials including polyurethane, EPS, glass wool and rock wool associated with environmental effects. With the method of AHP, criteria within the life cycle of insulation material providing thermal insulation for 1 m^2K/W are chosen in this research. Manufacturing area data statistics, general market process regulations, energy consumption, bad emission and life cycle source consumption of the four products are investigated and analyzed.

Biography

Lutfu S Sua holds a PhD on Production and Operations Management from University of Mississippi. His research interests include mathematical modelling, renewable energy efficiency and system design.

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