Steering Green and Sustainability through Life Cycle Assessment software's in Construction Industry

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Abstract. Oppression from construction industry to environment is unavoidable but construction industry has potential to more sustainable future for earth. Succeeding sustainability terms in construction and building industry could not be limited to the quantity of building. Sustainability could also achieve through considering design and select materials without or with low environmental impact in building industry. There are various environmental impacts that are associated with the use of materials during the lifecycle of building materials from cradle to grave, such as: raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. Life Cycle Assessment (LCA) is the formal methodology and process that investigates the environmental impact of a building material product at every stage in its life. LCA has been widely used in many countries and its current application has been extended to include government policy, strategic planning and product design. LCAs can be costly and time consuming, thus software technology use to eliminate these obstacles in material assessment. Many kinds of LCA software exist with different capability whoever the selecting among existing sample is different. This paper is providing critical review and comparison some LCA software and standards with convinced specification. Finally, the process for environmentally sustainable design is highlighted with some standards that exist for LCA.

Introduction

The construction industry consumes great quantities of energy and raw materials. The construction and operation of buildings require more energy than any other human activity [1]. Building and construction activities worldwide consume 3 billion tons of raw materials each year or 40 percent of total global use [2, 3]. In 2006, the International Energy Agency (IEA) estimated that buildings used 40 percent of primary energy consumed globally, accounting for roughly a quarter of the world's greenhouse-gas emissions [4]. The global construction industry consumes more raw materials than any other economic activity, which shows a clearly unsustainable industry. Hence, this industry is one of the sectors that must reduce its environmental impact and essentially it is not an environmentally friendly process.

The construction industry impacts on environment and human has been compassed from the use of raw materials during construction, maintenance and renovation to the emission of harmful substances throughout the building's life cycle [5]. Oppression from construction industry to environment is unavoidable but construction industry has potential to become more sustainable in the future for earth. Aligning the sustainability term in construction process can be achieved in materials selection process with or without low impact on environment and human health. The tracking down of sustainable development puts the construction industry in the front both globally and nationally as one of the most significant contributors to the depletion of natural resources [6]. In order to overcome the increasing concern of today's resource depletion and both developed and developing countries, life cycle assessment (LCA) can be applied to decision making in order to improve sustainability in the construction industry.

Conclusion

Construction is one of the largest end users of environmental resources and one of the largest polluters of man-made and natural environments. Fundamentally, materials play an important role in enhancing the overall performance of a building and in achieving the goal for sustainable construction in the industry. The LCA method provides guidelines for materials selection that quantifies and compares inflows of materials and energy and outflows of emissions of materials on a life cycle perspective for possibilities of improvement. Although, LCA is a complex and expensive methodology, but progression of LCA software lead to resolve the complexity of this method in material science. Totally, Life Cycle Assessment (LCA) Software Reduce cost and risk in material selection, increase energy and resource efficiency in buildings.

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