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Energy Efficient Buildings

November 1, 2009

Abstract:

This report on Energy Efficient Buildings examines the concepts of energy efficiency in both commercial and residential building designs.

Efficient energy use means simply using less energy to provide the same level of service. An example would be insulating a building to use less heating and cooling energy to achieve the same temperature. Another example is installing fluorescent lights and/or skylights instead of incandescent lights to attain the same level of illumination. Efficient energy use is achieved primarily by means of a more efficient technology or process rather than by changes in individual behavior.

A building's location and surroundings play a key role in regulating its temperature and illumination. For example, trees, landscaping, and hills can provide shade and block wind. In cooler climates, designing buildings with an east-west orientation to increase the number of south-facing windows minimizes energy use, by maximizing passive solar heating. Tight building design, including energy-efficient windows, well-sealed doors, and additional thermal insulation of walls, basement slabs, and foundations can reduce heat loss by 25 to 50%.

Modern building practices often demonstrate little regard for energy efficiency or the larger economic, environmental or social impacts of the built environment. Green building attempts to break with these practices. Early efforts to bring change to the building sector in the 1960s through the 1980s generally focused on single issues such as energy efficiency and conservation of natural resources. Green building now integrates a wide range of building design, construction, and operation and maintenance practices to provide healthier living and working environments and minimize environmental impacts. Crucial to the success of green building has been the application of integrated design principles, a whole-building-systems approach, which brings together the key stakeholders and design professionals as a core team to work collaboratively from the early planning stages through to the building's occupation.

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