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Use of renewable energy: Way to energy efficient buildings

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An efficient building is one which conserves energy, reduces unnecessary energy consumption, greenhouse gas emissions and demand for non-renewable resources.

Mala Singh, CMD,PEC Greening India

The policy making authorities have recognised that demand side actions such as energy conservation and energy efficiency are imperative for India's energy policy. Implementing a comprehensive approach in the direction of green architecture and use of non-commercial system of energy production and other equipment and tools alongside renewable source of energy are useful in creating energy efficient buildings.

Importance of energy efficiency for a building

Energy has emerged as a serious economic issue and top priority for policy makers. Unsustainable energy supply and huge demand have serious implications. "The current worldwide mix of energy resources is weighted heavily toward coal, oil and natural gas. In addition to emitting greenhouse gases, these resources are non-renewable: their quantities are limited or they cannot be replenished as fast as they are consumed," says Mala Singh, CMD, PEC Greening India

Though estimates regarding the remaining quantity of these resources vary, it is clear that the existing reliance on non-renewable energy sources is not sustainable and involves increasingly destructive extraction processes, uncertain supplies, escalating market prices, and national security vulnerability. Buildings are on the front line of this issue because of their high consumption of energy.

"Accounting for approximately 40 per cent of the total energy used presently, buildings are significant contributors to these problems," asserts Mala. Studies have shown that efficient buildings and appropriate resource use offer opportunities to save money while reducing greenhouse gas emissions.

The Indian Green Building Council (IGBC) advocates that by incorporating energy efficiency, renewable energy and sustainable green design features into a building at the outset, one can play a significant role – not only controlling building's energy consumption – but also contributing to achieving a sustainable energy structure for our society.

In addition, Mala explains the key benefits of energy efficient buildings as:

- Financial savings: Buildings that operate more efficiently have a reduced energy demand. That means lower operating costs.
- Reduced carbon footprint: By generating less energy, the buildings emit fewer greenhouse gases. That means improved environmental performance.
- Environmental legislation: Organisations operating in energy-efficient buildings will find it easier to comply with the tightening environmental

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regulations. That means improved productivity.
- Sustainable credentials: Environmentally-responsible organisations gain a reputation for ethical operation. That means enhanced profitability.
- Increased security: reducing energy demand helps protect energy security. That means more resources for future generations.

Making building energy efficient

The Indian Green Building Council (IGBC) outlines that an energy-efficient building must contain elements from three categories:

- The building must contain energy-efficient technologies that when operating as designed, will effectively reduce energy use. In other words, it is impossible for an energy-efficient building to be poorly insulated in a cold climate or have a low COP chiller in a hot climate.
- The building must supply the amenities and features appropriate for its occupants. Thus, a building must provide suitably conditioned air, lighting, and equipment.
- The building must be operated in such a manner as to be efficient. The evidence of this operation is low energy use relative to other, similar, buildings.

An efficient building may not excel in all three of these aspects, but the building must offset an “average” value in one aspect with “excellent” values in the others.

A very clever and attentive operator, for example, might be able to extract low energy use from an only moderately efficient physical plant. Therefore, in Mala’s opinion, an efficient building is one which conserves energy, reduces unnecessary energy consumption, greenhouse gas emissions and demand for non- renewable resources. They provide significant savings over conventional buildings.

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