

Study about Zero Energy Buildings Design in reference to building material and cost in India

VijaykumarRajabhauSutar(Author 1)

Prof.Ar. Prasad Kulkarni (Author 2)

J.N.E.C Aurangabad S.Y.M. Arch (General)

ABSTRACT: The main objective of this paper is to study perfect Net Zero Energy Building. It is reported that 30 to 40% of all of the primary energy used worldwide is used in buildings. Worldwide Buildings consume up to 40% of the total global energy and 30% of carbon dioxide emissions. This high energy use may directly or indirectly affects the environment. Also it causes climatic changes, degrades the environment and increases the air pollution. Hence it is necessary to reduce the energy consumption in the building and necessary steps to be taken to make the buildings more environmentally sustainable. In recent years, zero energy building concepts is developed on this problem. The zero energy building uses natural energy sources to meet the energy requirements of the building. Toward this end, many governments promote zero energy buildings. A zero-energy building is a building with zero net energy consumption; it means the total amount of energy used by the building on an annual basis is equal to the amount of energy produced on the site or off the site. This paper aimed at and suggests ways of improving the energy usage by the occupants. In this work, we have reviewing some literature on zero energy buildings in India.

INTRODUCTION: India is the developing country and has become one of the major energy consumers in the world. This is due to industrial growth and globalization which increases the

energy demand of the consumers. The total amount of energy used by the building on annual basis is roughly equal to the total amount of renewable energy created on the site. The concept of a Net Zero Energy Building (NZEB), one which produces as much energy as it uses over the course of a year, recently has been evolving from research to reality. Buildings have a significant impact on energy use and the environmental impact. Buildings use almost 40% of the primary energy and approximately 70% of the electricity. The energy used by the building sector continues to increase, primarily because new buildings are constructed faster than old ones are demolished. Few study reported that the buildings contribute approximately 50% of the world's air pollution. 40% people rely on wood, charcoal, or animal waste to cook their food despite the availability of technical solutions. 2 million people die annually from diseases caused by indoor smoke – more than deaths from malaria. An estimated 1 billion people use health services without electricity. • Over 291 million children go to primary schools without access to any electricity. Almost 50% of vaccines in developing countries are ruined due to poor cold chain services. **KEYWORD:** - Building, climatic change, Net Zero Energy Building, Energy efficiency.

METHODOLOGY:

This research is done on the analysis of the literature available. Three research papers are been analyzed and the conclusion is based on the study .

LITERATURE REVIEW

In this work, we want to study and analyze the zero energy building available in India. The study will be carried out based on the need of zero energy building and method of reducing the building energy consumption and energy conservation. The zero energy concepts will reduce global warming and helps to retain the nature. The specialty of the zero energy building, Assembly building project, is that the whole building is made keeping sustainability and green building in mind. The every aspect of the building was planned with 'green' approach, showcasing the latest in HVAC technology alongside recycled materials. Also it is necessary to optimize the usage of water, chilled water and hot water and STP and solar energy conversion using suitable energy conversion devices.

1. Net Zero Energy Cost Building: The electricity bill Is covered every year by virtue of design and production Of energy at the site.
2. Net Zero Energy Emission Building: The energy Emission is measured in mass of carbon
3. Net Zero Source Energy Building: A building that Purchases or produces as much energy for a year by Accounting the energy produced at the source.
4. Net Zero Site Energy Building: A building that Produces at least as much renewable energy as it uses The energy, over the course of a year. Solar Photovoltaic generator, Patented, PLC controlled, single-axis sun-tracking solar PV system ,67 kWp capacity; 1,40,000 kWh/yr , 40% more power compared to fixed installations , 24 hrs remote monitoring system, The tracking systems are 99% recyclable. Small Wind-turbine (proposed) ,10 kW; low noise < 35 dB ,Constant energy generation from wind speeds above 3 m/s ,Automatic switch-

off at wind speeds of 16 m/s and rising, Efficient from every direction - does not need to point in the direction of the wind to maximize power generation. Lighting of the building of HVAC System This unit is provided with solar PV panels of 3 kW capacity and these panels are mounted on the roofs tilted south direction to get maximum solar energy. However addition of more number of solar panels will make the building more sustainable. Each room in the building has LED lights which reduces the energy consumption. The glass blocks in the roof allows the sun light enter the building. The bamboo pergolas provided in the building make an efficient, cost effective and environmental friendly shading device. The steel frame was used in the building construction as it helps to complete the building in short period. Rain Water Harvesting System The building has rain water harvesting system which collects the rain water that runs off from the roof of the building and is collected in a recharge tank. Hence it recharges the water table beneath. The roof pipes are embedded with radiant cooling pipes with chilled water flowing through them giving the place a natural air cooling effect. Interior and furniture In Assembly, low volatile organic compounds (VOC) paints are used to reduce the VOC emission. The furniture provided in the building is made of bamboo and other renewable materials. This reduces the carbon foot print.

ADVANTAGES

1. Reduces the menace of destruction of the nonrenewable conventional energy resources.
2. The cost of energy of a NZEB does not increase with time relative to the similar non- renewable energy building.
3. Future legislative restrictions and carbon emission taxes/penalties may force expensive retrofits to inefficient buildings.

4. It is an area contractionary technique which requires a less area for the installation of setup.

DISADVANTAGES

1. Initial cost is much higher i.e. a money blockage technique which recovers after a few years.

2. Variation of weather plays a vital role for that the PV solar system is not sufficient for all type of weather.

3. High skilled labor is required of having necessary information for the installation of setup.

CONCLUSION In conclusion, we decided that for our Zero Energy Project using solar energy is the best energy source in regards to saving energy and cost efficiency.

The zero energy concepts will reduce global warming and helps to retain the nature. The specialty of the zero energy building, Assembly project, is that the whole building is made keeping sustainability and green building in mind. The every aspect of the building was planned with 'green' approach, showcasing the latest in HVAC technology alongside recycled materials. it is necessary to optimize the usage of water, chilled water and hot water and STP and solar energy conversion using suitable energy conversion devices. The building automation system will help in optimizing the above said parameters. The Assembly building is developed to construction zero energy building and functionality of zero energy building in energy saving.

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