

Study on Net Zero Energy Building of Residential Building

Nirali Vansola¹, Vikas Bhavsar²

¹PG Student M.E. (Civil) Infrastructure Engineering, L.D.R.P Institute of Technology & Research Gandhinagar

²Ass. Professor, Dept. of Civil Engineering, L.D.R.P Institute of Technology & Research, Gandhinagar

Abstract - Now days in all over the world 30 to 40% of total energy is used by building units. Environment is affected by high energy use from building units. Also, it causes climatic changes, problem related to environment. Hence it is necessary to reduce the energy consumption in the building and also make the building eco- friendly. The Net zero energy building is developed to overcome this problem. The zero-energy building uses renewable energy sources to meet the energy requirements of the building.

Key Words: photovoltaic, thermal system, solar energy, building orientation

1. INTRODUCTION

India is the developing country and has become one of the major energy consumers in the world. High consumption of resources is one of the major issues in our country. The heavy consumption of resources is not only extremely costly but also extremely bad to the environment. Energy efficient building is the one of the superior way to building a better future. The net zero energy buildings use the Renewable Energy Resources. The source of energy which can be used again and again without threatening the nature so much is known as Renewable Energy Resources. Sunrays, wind, rain, tidal energy and geothermal heat are some examples of Renewable Energy Resources. Some activities like reuse of paper, growing organic food, and reduce the use of water and electricity have over the years proved to be useful, but none of them have provided a proper solution to this recent problem the way Zero Energy Homes have. Unlike typical households that consume vigorous amount of energy, (NZEBS) produce the equal amount of energy they consume resulting in zero net energy consumption. The cost of energy of a net zero energy building does not increase with time relative to the similar non- renewable energy building. Net zero energy buildings saving 50% to 70% energy with compare to typical residential buildings. This project is more comfortable, more reliable sustainable and better for the environment.

2. LITERATURE REVIEW

The photovoltaic solar panels are the best solution for generation of the 2 electricity. The installation of the solar panels initially would be costly, but in the long run the owner of the building would save money on their energy bill. The goal of all passive solar heating systems was to capture the sun's heat within the building's elements and release that heat during periods when the sun is not shining. At the same

time that the building's elements (or materials) are absorbing heat for later use, solar heat is available for keeping the space comfortable.

DESIGN ASPECT

Building orientation means the way a building is situated on a site and the positioning of windows, rooflines and other features. The orientation of building often is determined by site consideration. However, the best location for solar access will vary from site to site depending on site shape, orientation and topography, and shading from trees and neighboring building. Green roofs institute buildings by preventing heat from transmitting through the building roof. The reduction of heat gain from the roof will reduce the cooling energy consumption of air conditioning system. Well-designed solar shading devices can significantly reduce building peak cooling load and corresponding energy consumption and enhance daylight utilization in buildings.

FINANCIAL ASPECT

The most criticized issue about constructing environment friendly building is the cost. Photo-voltaic, new appliances & morden technologis tend to cost more money. Most green building cost a premium ranging from 2%-12% in india, but yield 10 times as much over the entire life of building.

HEALTH ASPECT

Many factors, including temperature, humidity, light, noise, chemical pollutants, odors, personal health, job or activity requirements and psychological factors, interact the comfort and health of building occupants. Several major factors affect indoor air quality like the quality of the outside air, the location of outside air intakes, construction material, furnishings, equipment, filtration and ventilation efficiency, occupants and maintenance.

FUNCTIONAL DESIGNING

The ground floor of the building consists of one hall, two bedrooms, one dinning, one kitchen. The allocations of the rooms in the plan has been done with due consideration of sun diagram as per the requirement of zero energy building. The first floor of the building consists of one hall, two bedrooms, one dinning, one kitchen. The allocations of the rooms in the plan has been done with due consideration of sun diagram as per the requirement of zero energy building. The plan has been prepared using Auto CAD software.

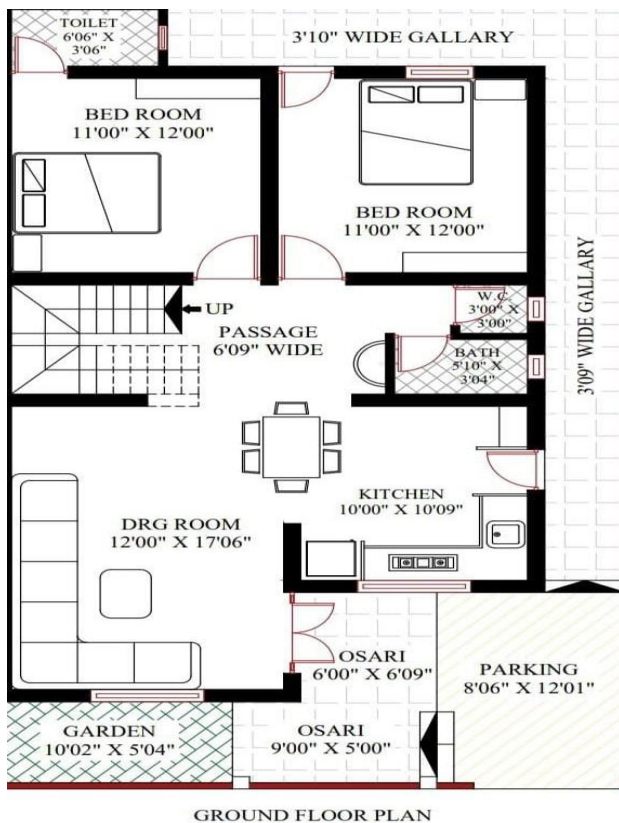


Figure: 1

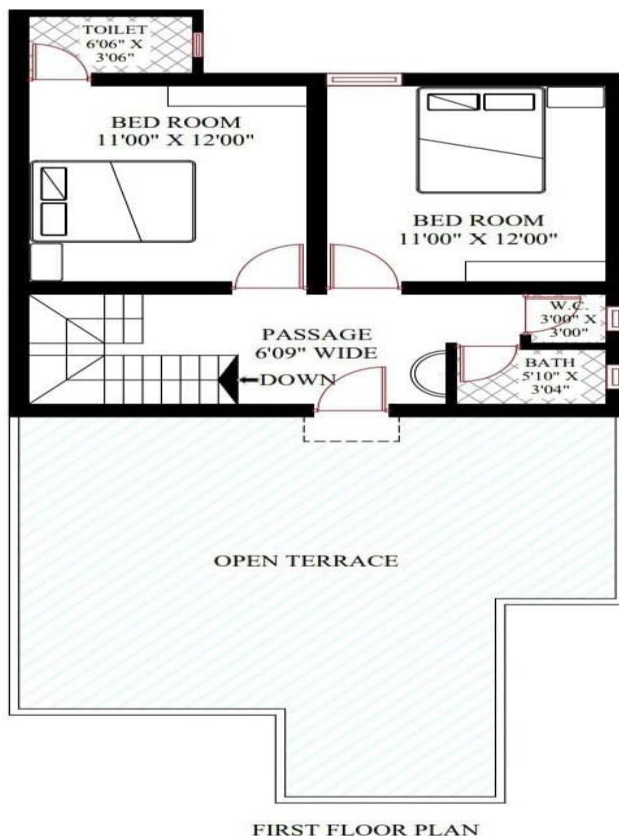


Figure: 2

MATERIAL ASPECTS

Net zero energy building materials offer specific benefits to the building owner and building occupants:

- Reduced maintenance/replacement costs over the life of the building
- Energy conservation
- Improved occupant health and productivity
- Lower costs associated with changing space configurations
- Greater design flexibility

3. CONCLUSION

The NZEBs can reduce about 30% of electric energy consumption with compared to the typical building. About 30% to 40% of all of the primary energy in the world is used in buildings. This high energy use may directly or indirectly affects the environment. The PV solar panels are the best solution for production of the electricity. The energy efficient building concepts is very unique and very useful for a healthy environment as it reduces the harmful gasses emission in the environment by the ordinary buildings. By using the renewable sources the NZEBs can produce the energy and reduce the harmful gases like carbon dioxide, chlorofluorocarbon, hydrogen sulfide etc. and 4 plays an important role to reduce the environmental pollution.

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