Study On Net Zero Energy Building

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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. NZEBs are very unique because they produce energy that is useful for the environment and cost effective for the construction. 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

I. INTRODUCTION

Nationally and internationally various individuals and research companies are creating new and exciting energy systems 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 ways to building a better future. During the last 20 years more than 200 reputable projects claiming net zero energy balance have been realized all over the world which extensively utilize the renewable energy sources to earn the tag of ZEB. Sunrays, wind, rain, tidal energy and geothermal heat are some examples of Renewable Energy Resources. Reduced total net monthly cost of living. Reduced risk of loss from grid blackouts. Reduced total cost of ownership due to improved energy efficiency.Net zero energy buildings saving 50% to 70% energy with compare to typical residential buildings.

II. LITERATURE REVIEW

A self-sufficient, energy saving, non-polluting, zero energy building 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. As environmental issues reduction advertises the need to save energy, demand for energy in houses is bound to increase. Green buildings with the highest level of energy efficiency are now being projected as NZEBs with the use of renewable energy technology for energy production. The NZEB approach has currently gained prominence in whole world.

III. METHODOLOGY

A. Solar Power System:

In this system solar panel is placed on the terrace or roof of building. The solar panels convert the sun's energy into electricity which is either stored or used in building. Benefits of Solar Power System.

- The energy and heat from the sun is free and unlimited.
- Operational cost is almost negligible.
- Renewable clean power that is available every day of the year, even cloudy days produce some Power.
- Can be installed virtually anywhere in a field to on a building.
- Used batteries to store extra power for use at night.
- Solar power system requires very little maintenance and last for many years.

B. Solar Water Heater:

Solar Water for home is 3.30 and 4.29 kilowatts and if the need of the house is more than extra kilowatts can be installed. It is generally installed at the terrace.

A solar water heater comprises of an array of solar collectors to collect solar energy and an insulated tank to store hot water. Both are connected to each other. This system works throughout the year. Only in winter the amount of water is slight less.

C. Rain Water Harvesting:

It is a technique of collection and storage of rain water into natural reservoirs or tanks, or the infiltration of surface water in to subsurface Aquifers (before it is lost as surface runoff). Volume of water can be harvested.

Let's assume plot of 100sq.m area with height of the rainfall 0.6 m (600mm or 24 inches) so volume of rainfall over the plot = Area of plot x height of rainfall assuming that only 60% of total rainfall is effectively harvested.
Total volume of water harvested = 100 x 0.6 = 60,000 liters
60% of total volume of water harvested = 60,000 liters x 0.6 = 36,000 liters

D. HVAC System:

HVAC system air is cooled by a chiller system that either chills or heat water. The water is then sent thru copper tubes not under a high pressure to the coils which gets cooled with chilled water and is connected to the blowers at various location in

house, thus the house gets chilled.. Attach to each compressor is chiller system. So, at a time when there is a single family the 1.5 tons or 2 tons compressor is working automatically depending upon the weather and if there is requirement of higher chilling like there is some function in the house then both compressor starts working simultaneously in random and chills the house.

E. LED Lights:

Three main types of light Bulbs

- Incandescent light bulbs
- Compact fluorescent light bulbs (CFL)
- Light emitting diodes light bulbs (LED)

IV. CONCLUSIONS

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 affect 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.

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