Growth of Green Building Sector and Sustainable Life

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Abstract. From the early 2000’s, the knowledge of sustainable building had been raised gradually; hence its implication was also seen in many countries. It had made a revolution in Construction industry. Over Few decades many engineers and architects are doing vigorous research on sustainable engineering and Energy Efficiency. On the other hand we will be discussing about DC Buildings as they are scalable, affordable and flexible. This paper helps us to understand the concept of green building and net zero building. This paper also focuses on the need for green building and net zero building in the modern day. Here a multidisciplinary approach to a green and net zero building be discussed.

1. Introduction
In the Rising demand of Energy has put everyone to find alternative methods to generate required energy which can help to reduce the stress on the energy sector. On the other side of a coin, researchers and common people are forced to either reduce their energy consumption or to find a much more efficient method of consumption. Hence various governments across the globe had initiated to provide various certifications and incentives for every constructions such as residential buildings, commercial buildings, educational institutes, hospitals etc. hence the concept of Green Building and Net zero buildings arises. Based on the energy Certifications there are many incentives provided by the governments. This paper drives through various Idea’s and methodologies which can be taken up to reduce the amount of losses and consumption which in turn can increase the overall efficiency.

2. Concept of Green Building and Net Zero Building
Green Building or Green constructions are a combination of construction and the application of process that completely adhere with environmental responsibilities and the resources used to construct are up to its highest efficiency throughout the life-cycle of the building. Anything which consumes low water, optimization of energy efficiency, conservation of natural resources & low waste generation are commonly known as green building.

Green construction is also called green construction, a structure that use resource efficient during the lifetime of a building, from sitting, building, operating , maintaining, restructuring and demolition[1]. All the project partners will work tightly in this way [2]. Green Architecture expands the classical problems related to the environment, infrastructure, sustainability and comfort of buildings [3] and supplements them. While new technology is constantly being introduced to supplement existing
strategies in the construction of greener facilities, a general aim is for green buildings to minimize the environmental effect of buildings on safety and the natural world by utilizing the electricity, water and other resources effectively, preserve the wellbeing of residents and increase the efficiency of employees. Green buildings usually involve energy-saving measures. Architects mainly try to gather details to reduce air flow from the building construction envelope to reduce operating energy use. Architects and Designers also provide windows, additional insulation protection to the walls. Windows and walls are oriented, and the arcade, porches and windows and roofs are laid out in shade [4]. Perfect placement of windows can also provide natural light and reduce electricity requirements during the day. Furthermore an individual can install solar water heater which reduce the cost of energy .Therefore, the most rapid and cost efficient ways of reducing greenhouse gas emissions are to increase the energy efficiency of buildings with rising energy prices.

The activities which majorly contribute to the energy consumption are heating, cooling followed by the lighting equipment's [5]. The energy consumption of buildings’ greenhouse gas emissions is considerably greater than that of transport. Thus for a New Construction of Building the mode of radiant cooling can be employed which comprises of water as cooling fluid and a motor accompanied by a cooling structure which can be inspired by honeycombs.

Figure 1. Side View of an Installed Radiant Cooling Tower

Figure 1 Depicts the Side view of the Radiant Cooling tower, in this method a layer of pipes are fitted inside the flooring which carry water through it. This radiant cooling method requires only water and a motor to re-circulation of the water throughout the process.

Figure 2. View of the pipes fitted inside the flooring

Figure 3. View of the valves used to differentiate hot and cold water
Figure 4 briefly explains the workflow of the radiant cooling process in which the water is used as a circulating fluid, the cold water (25°C) flows through the pipes which are laid underneath the flooring. It absorbs the heat from the outside and transfers the heat to the flowing water which is pumped to the overhead cooling tower which again it cools the water. On the other hand, a net zero building is also known as a zero energy building which consumes no energy from the grid, in other words, the building is capable to generate the required energy for the complete utilization. Zero energy building also contributes for the reduction in carbon footprint in the atmosphere. A zero energy building can have one or more methods of generating the required energy such as solar, wind, Bio-Gas etc.

3. DC Microgrid Setup for Every Green Building
To be misaligned with conventional we can proceed with complete DC Setup of the building as we know DC has low losses. The DC micro grid can comprise of one or multiple renewable sources.

The Figure 5 shows the possibilities of generation of energy with the help of nature. They can comprise of Wind Energy of rating 800 watts depending upon the wind profile of the area of building. Most evidently in the modern days due to the increase in efficiency of solar cells plays a key role in generation of energy more economically. As currently the region which lie near the equator have very high potential for generation of power with help of sunlight. On an average these area’s receives 5.5 hours of sunshine.
Also instead of using an individual DC-DC Converter we can use a Single Multiport DC-DC Converter, because every DC-DC Converter causes a loss which count for the reduction in the overall efficiency of the generation and transmission of generated power. So Rather than going for multiple DC-DC Converter which causes high losses we can utilize single Multiport DC-DC Converter.

By this Method we can harness the available Renewable energy and by the help of Human powered generator comprises of Treadmill, Cycling with dynamo fixed can Help in both ways like Exercises and generating power which can be used later. So it creates a win-win situation. The most renowned DC Voltage System for DC House/Building is the 48V.

On the other hand we can rely on natural lighting during the presence of sunlight with a method known as Solar Light tube [6] which can provide light with help of sunlight. By this method we can save nearly Energy required for the led bulb for Nearly 7 hours. So each unit of energy we save can reduce the amount of CO₂ carbon footprint.
4. Conclusion
The humans have always relied on nature for everything and on the fore coming days we have to rely on the Natural Renewable Energy Resources for our day to day energy demand, if we Cope up with some of the above Topics we can nearly reduce the amount of Consumption and need for relying on the main energy Grid for our energy usage. Every energy Saved Counts for Reduction in Carbon Footprint.

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