Indian Journal of Structure Engineering (IJSE)
ISSN: 2582-922X (Online), Volume-1 Issue-2, November 2021

"Low Carbon Buildings for Sustainable Constructions"

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Abstract*: Greenhouse gases emissions are very important for every structure and environment. Greenhouse gases are increased now a days due to changes in climatic conditions by involving human activities in the last decades. In this main contributor is carbon content and carbon dioxide and methane in the environment. The main solution is to limit the changes in the climatic conditions. To reduce the use of carbon emissions in construction of Buildings and construction of Industrial structures. Structures which are made from timber and steel are produce less carbon and greenhouse gases compared to the concrete and steel structures. By using reused and recyclable materials we can reduce the carbon footprints and greenhouse gases as well as to develop low carbon materials. We need to design low carbon buildings to avoid climatic changes in the environment. Which will be give renewable performance. This paper gives a knowledge and help to reduction of carbon footprints on buildings. The main concept of this paper is reducing the emissions and reduce the carbon footprints and increase the life of the structure and to make the structure sustainable.

Keywords: Low Carbon Buildings, Greenhouse Gases, Global warming, Carbon footprint, Carbon dioxide emissions.

I. INTRODUCTION

Low carbon buildings are primarily used for sustainability and economic growth. It causes not damaging to the environment. So, it can be useful for future generations. The main cause of pollution is climate change due to carbon content, greenhouse gases emission and global warming. These are most important causes for damaging the buildings. Most of global warming due to carbon emissions only. These are about twenty percentage. Low carbon buildings are very important now a days. Which saves the life of the structure. Which doesn't harm to the environment. It is environmentally friendly in nature. It is used to reduce the degradation of the environment. It is a performance-based reduction of carbon content in the building. It is cheaper, flexible and affordable. Low carbon buildings are easy to monitor. Low carbon buildings are the buildings, which are designed to construct for very little or no carbon during their life time. Buildings are responsible for GHG emissions about thirty-eight percentage, twenty percentage for residential and eighteen percentage for commercial. Industries are the most causing global warming. Low carbon buildings are specifically engineered buildings and designed for GHG reduction emission in mind. It consists of less GHG compared to normal commercial buildings. In this climate

Manuscript received on 31 March 2021 | Revised Manuscript received on 06 April 2021 | Manuscript Accepted on 15 November 2021 | Manuscript published on 30 November 2021.
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Fig. Low carbon materials

change is neutral. By comparison of regular buildings releases more than GHG emission than low carbon building. The goal of every year is to reduce the greenhouse gas emissions by twenty percentage. These are used for applied to regulated energy.

i.e., Heat, Cool, Ventilation and Lighting. Carbon footprint is a common term used in low carbon buildings. The total quantities of emissions of carbon dioxide and GHG are commonly known as carbon footprint. Calculating the carbon footprint is the only way to the beginning of carbon management.

Footprints can also calculate for products. Calculation of carbon footprint is important because

- To manage the footprints
- To reduce the emissions
- To report the footprint accurately
- Improve efficiency
- Part of Environmental management system

Fig. Performance of Carbon Building

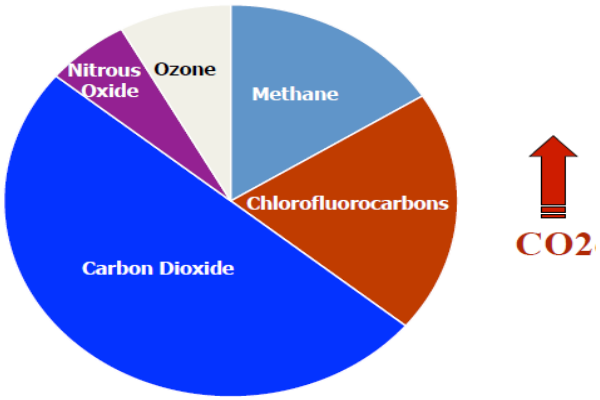


Fig. Contributor to Global warming

II. ADVANTAGES OF LOW CARBON BUILDINGS

Zero carbon

- Low carbon materials
- Efficiency
- Renewable Energy
- Safe
- Secure
- Sustainable
- Durable
- Affordable
- Reducing greenhouse gas emissions
- Energy infrastructure
- Energy efficiency
- Renewables

III. LITERATURE REVIEW

The Earth's temperature is increased in the last five decades. Which may lead to global warming. The Increasing of temperature which may results in increasing climatic change. These are the important phenomena in changes in environmental climatic conditions. The main important gases which are responsible for global warming are carbon dioxide (Co2) and methane (CH4) and Hydro fluoro carbon's (HFC). These are the main important gases for increasing or rising the temperature in the environment. In this most of activities caused by humans only.

Twenty percentage global carbon emissions are subjected to buildings and constructions. The largest emissions are occurred in the sections of transportation, electricity and building operations etc. compared to summer season emissions are more in winter season due to warm up buildings etc.

IV. LOW CARBON MATERIALS

Construction Materials

I. Raw Materials

- Material uses are limited
- Mining Resource is un-suitable
- Over uses may cause Environmental Damage

II. Energy Materials

The Main causes for Energy Resources is

- Pollution
- Greenhouse gas emission
- Expenditure of Energy

V. METHODOLOGY

Methods for carbon impact assessment

1.Basic ratio calculation

For different buildings and structures, the basic ratio calculations are different. Basic ratio calculation of Carbon impact is different for large structures and small structures. The ratio can be calculated by using different structural decisions. For analysis using different types of materials to determine the carbon footprint. Different carbon emissions are seen for reference in previous research works on different materials. This is especially important for larger structures.

2.Life cycle assessment

This is useful apparatus for potential ecological load. It is used to calculate environmental effects of a service. There are four steps in life cycle assessment.

They are as follows;

Definition of the goal

- Input and output for environmental subjects
- Potential ecological effects and evaluation Interpretation of Impact inventory and phases

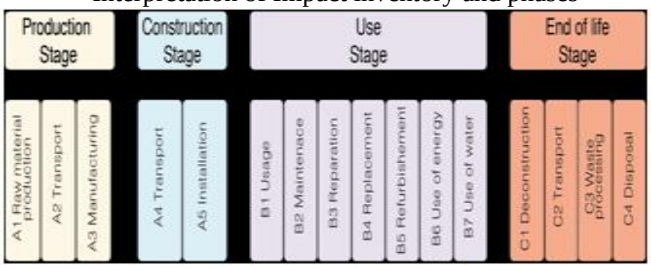


Fig. Life cycle stages in a building

Reducing heat loss to comfort in winter season but may results in overheating in summer.Trend towards lightweight buildings (timber material construction).Increased internal temperatures so, ventilation cooling is used.Heat demand is reduced and generate the need for cooling in summer.Appropriate control of solar radiation entering into the building.Thermal mass provides temperature stability and surface temperature can help cool in summer.Light weight constructions may over heat and high internal surface temperature in summer.

VI. RESULTS

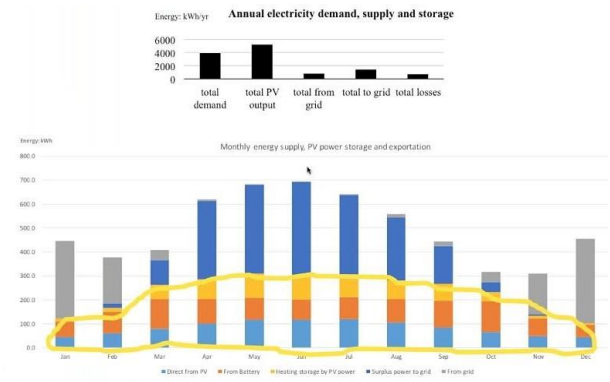
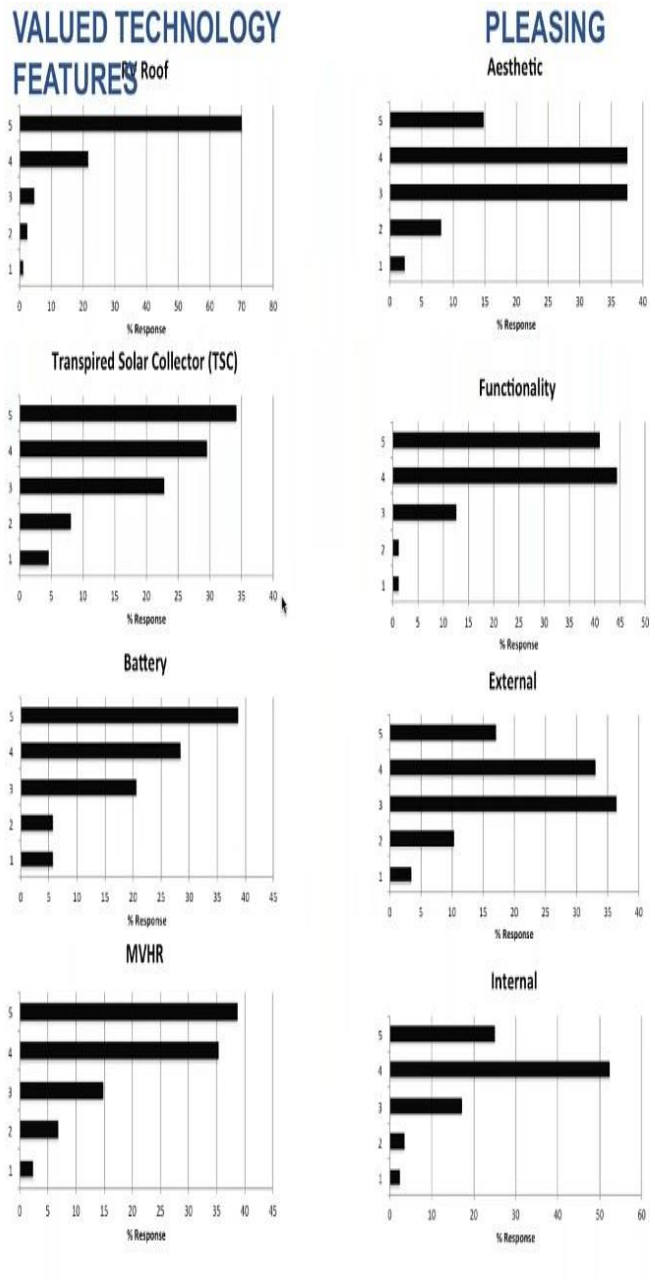
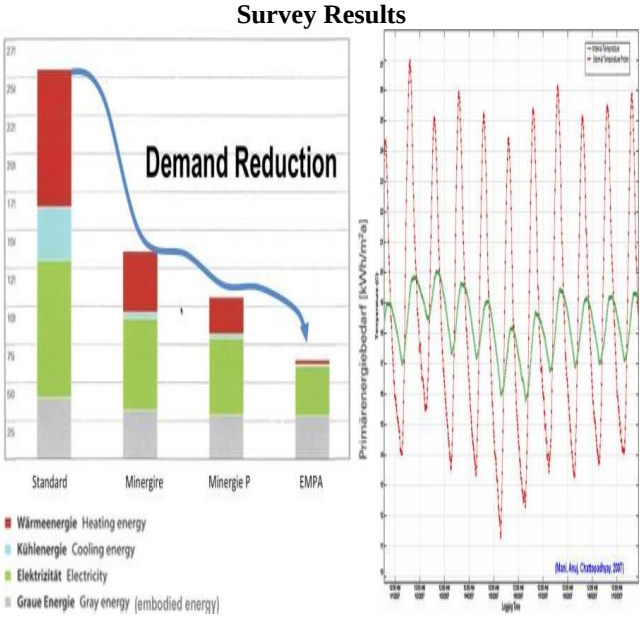


Fig. Energy positive performance results



Survey Results



Climatic Response

VII. CONCLUSION

Low carbon buildings are very important in now a day to reduce the impacts on the buildings. It is achievable by using of green materials for the construction of building. The main aim of low carbon building is to reduce the emissions from the environment to the building. To improve the life span of the building and reduce the costs as well. The most important of low carbon building is eco-friendly in nature. It is a sustainable building. To reduce future impacts on the surrounding building. It is used as recycled building material.

ACKNOWLEDGEMENT

My sincere Thanks and Acknowledgement to my dear Aunt G Durgakka for always supporting and inspiring and motivating to us to conduct this research work successful. I learnt a lot from her. Thank you very much. This Research Paper is Dedicated to My Parents Gomasa Sammaiah and Gomasa Sammakka for always supporting and encouraging to me in hard time and also My Special thanks to My Sister Rajamani and My Loving Brother Vijay.

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