IGBC

Confederation of Indian Industry

IGBC's Guidance Framework for Net Zero Carbon Buildings

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Disclaimer

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The selection and description of the content in this document are to illustrate approaches towards decarbonisation. The document is developed based on the present market scenario and stakeholders' perspective, so as to facilitate the building projects initiate the adoption of Net Zero Carbon concepts.

If you have any comments or have noticed any error, kindly write to us at igbc@cii.in

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Introduction:

Climate change is posing an existential crisis for humanity. With rising global temperatures, melting ice caps, rising sea levels and man induced natural calamities, the effects of climate change are now more evident than ever before.

During the latest UN Climate Change Conference of the Parties (COP 26), India has committed to achieve Net Zero emissions by 2070. To achieve the Net Zero ambition, India committed that, by 2030, the renewable capacity would be increased to 500 GW, 50% of the energy requirement will be non-fossil fuel based, reduce the carbon emissions by 1 billion-tonne and the carbon emission intensity of economy would be brought down by 45%.

The government of India over the last two decades has initiated several new missions & policies which support the path towards net zero carbon buildings, cities and nation. To name a few missions & policies – Energy Conservation Act (2001) – Energy Conservation Building Code, National Action Plan on Climate Change (2008) – Perform Achieve Trade Scheme, National Solar Mission (2010), Swachh Bharat Mission (2014), Green India Mission (2015), Smart City Mission (2015), National Energy Policy (2018) and Sustainable Public Procurement (2018).

The building sector of our country has an excellent opportunity to take the leadership role for accelerating the uptake of Net Zero.

IGBC's Mission on Net Zero:

The Green Building Movement in India has been spearheaded by CII's IGBC since 2001, by creating awareness amongst the stakeholders. Thus far, the Council has been instrumental in enabling 7.97 billion sq.ft. of green building footprint in the country. The Council's activities have enabled a market transformation with regard to the green building materials and technologies. IGBC continuously works to provide tools that facilitate the adoption of green building practices in India.

On Earth Day - 22 April 2021, CII-IGBC has launched 'Mission on Net Zero', a journey to achieve Net Zero buildings by 2050 in all aspects i.e., Energy, Water, Waste & Carbon. The vision of CII-IGBC is to facilitate **'India to become one of the foremost countries in transforming to 'Net Zero' by 2050'.** This initiative facilitates adoption of Net Zero concepts to support market transformation towards total building sector decarbonisation. To accelerate the adoption of Net Zero concepts in the country, IGBC has launched exclusive rating systems for Net Zero Energy, Net Zero Water and Net Zero Waste to Landfill.

IGBC's Mission on Net Zero would have far reaching impacts on built environment in the country. The key aspects of the Mission include – creating a National movement on Net Zero, engaging policy/decision makers to focus on Net Zero principles, capacity building & knowledge sharing, and promoting technologies, that would result in quantum jumps in carbon reduction. To support the mission, so far, more than 300 organisations from the Indian building sector have committed to achieve Net Zero status for their new & existing buildings.

Many leading organisations in the country are also redefining their policies in line with the government policies and global trends to address climate action mitigation measures and carbon emissions.

IGBC's Guidance Framework for Net Zero Carbon Buildings:

To initiate the adoption of Net Zero Carbon concepts by the organisations at their building project level, a guidance framework is developed under the leadership of Ar Sandeep Shikre, Chairman, IGBC Net Zero Carbon Committee. More than 50 industry leaders and subject matter experts from different sectors have contributed to the development of this guidance framework.

IGBC believes that the guidance framework would support the organisations to initiate GHG accounting and categorise the emissions under Scope 1, 2 & 3 at project level. Based on the inventorisation and emission intensity, appropriate emission reduction measures and abatement strategies can be developed by the organisations to ensure offset of carbon emissions.

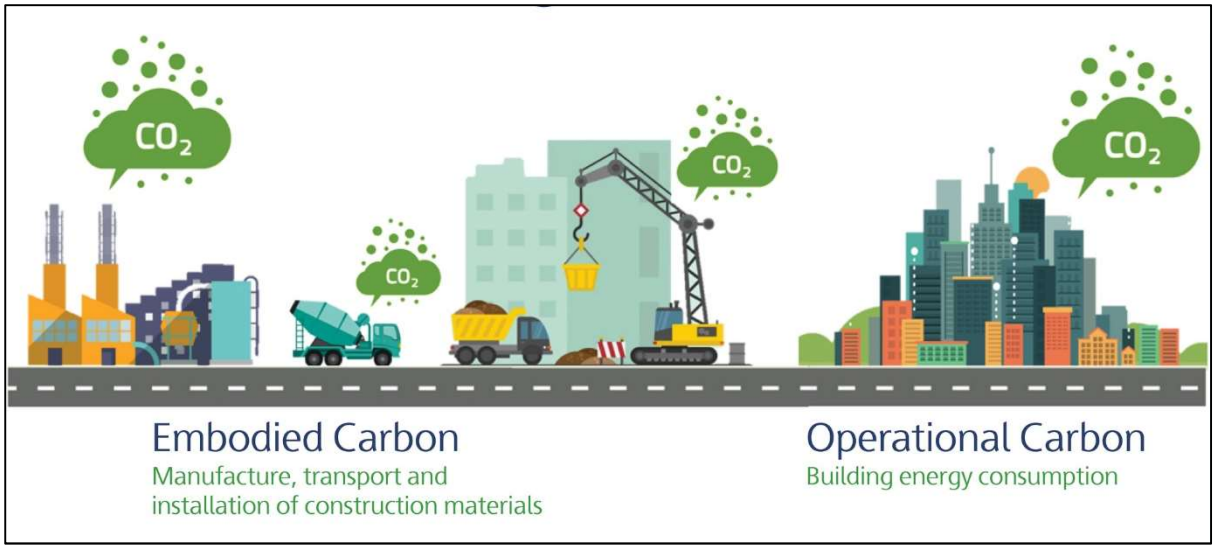
Net Zero Carbon Building: Definition -

A **Net Zero Carbon building** is highly resource efficient and offsets all direct & indirect carbon emissions on account of its construction and operation.

Carbon Emissions during Life Cycle of Buildings:

Carbon is generally classified in three categories - Embodied carbon, Operational carbon and End-of-life carbon.

- **Embodied carbon** is the result of supply chain (transport), extraction, processing and manufacturing of building materials, prior to construction and during construction or renovation activities.
- **Operational carbon** is from the use of energy, materials and generation of waste during building operations and renovations.



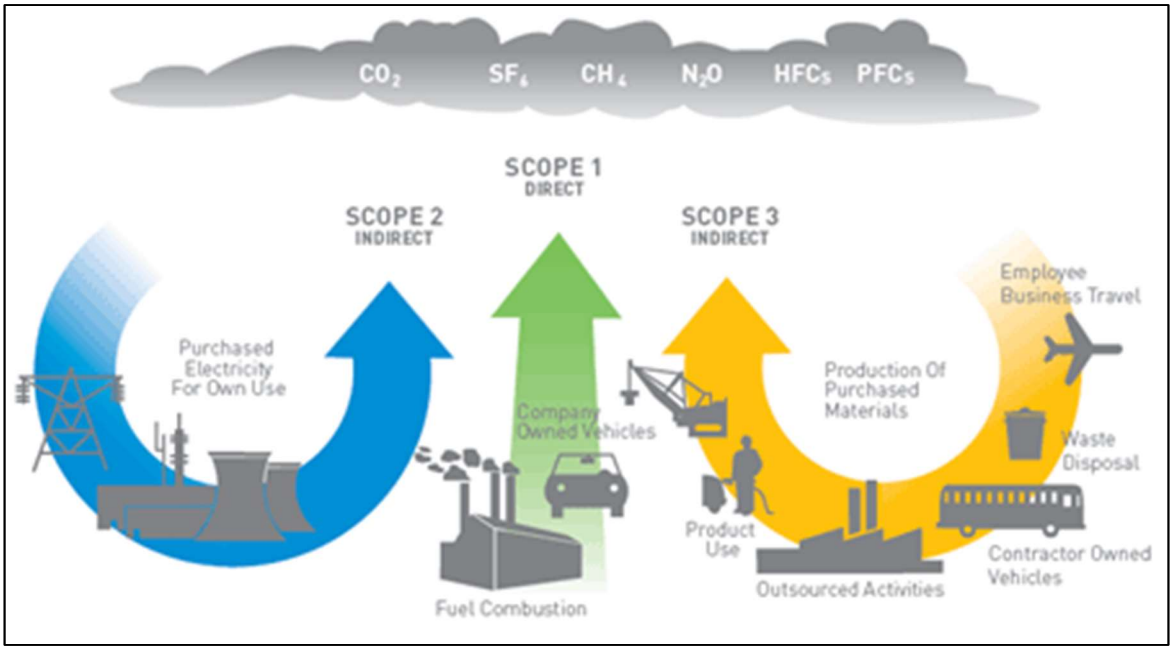
- **End-of-life carbon** shall also be considered which is pertinent during the demolition of buildings and recycling of materials & technologies (resource circularity).

The net zero carbon buildings shall therefore address the offset of emissions all through the life of the building i.e., Design, Procurement, Construction, Operations, Retrofits, End-of-life and Recycling.

The concept of Net Zero Carbon is applicable to all typologies of built environment i.e., buildings and large developments – Residential, Non-residential, Campuses, Townships and Cities.

Inventory of Emissions as per International Standards:

The first step towards a Net Zero Carbon building is the inventory of carbon emissions i.e., Scope 1, 2 & 3. The World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) defines & categorises the emissions as below, through their GHG protocol. As per the GHG protocol, the inventorisation of six GHG gases including CO2, SF6, CH4, N2O, HFCs & PFCs need to carried out. From a building perspective, the CO_2 emissions during construction and operations account for majority of the Green House Gas (GHG) emissions in the construction sector.



GHG Scope - 1, 2 & 3 Emissions

- Scope 1 - Direct emissions (from the burning of fuel, e.g., DG Sets)
- Scope 2 - Indirect emissions (from the use of electricity)
- Scope 3 - Other Indirect emissions (sources not controlled by the organisation e.g., supply chain, employee commutation)

The emissions can be either direct or indirect and can be defined as:

- Direct emissions – from sources that are owned or controlled by the reporting organisation
- Indirect emissions – from sources that are owned / controlled by a third party but whose emissions are nevertheless influenced by the reporting organisation

The inventory of GHG emissions is carried out based on the scope and the priority of Buildings. The emissions are usually based on the Life Cycle Analysis (LCA) of products (embodied carbon) and whole building (operational carbon). The analysis is performed by use of softwares and predefined data sets of material & fuel emissions.

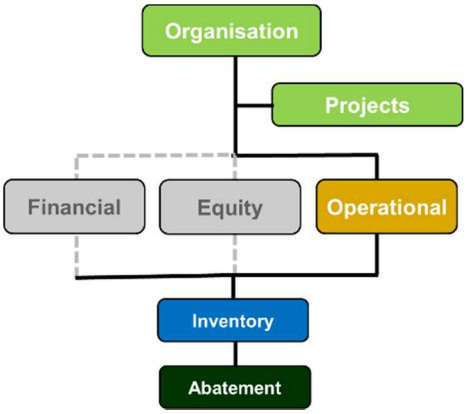
Reference standards on GHG Inventory and Management:

- ISO 14064-1:2018: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals
- ISO 14064-2:2019: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements
- ISO 14064-3:2019: Specification with guidance for the validation and verification of greenhouse gas statements
- GHG Accounting as per WBCSD's GHG Protocol: Corporate Accounting and Reporting standard

Boundary Conditions:

In case of Net Zero Carbon buildings, carbon inventorisation needs to be carried out at the project level by defining the boundary conditions. As per the international standards, any of the following boundary conditions can be considered for inventorisation:

a. Equity Share – Account for emissions based on the corporate's equity share in the operations of the building
b. Financial Control – Account for 100% of the emissions from the buildings, that are financially controlled by the corporate's
c. Operational Control – Account for 100% of the emissions from the buildings, that have operational control by the corporate's



The building projects are recommended to follow 'Operational Control' to inventorise the carbon emissions.

Scope of Inventorisation for Stakeholders:

The stakeholders (i.e., Owner, Developer & Tenant) shall account the carbon emissions from different stages of the building life cycle, based on their scope and control.

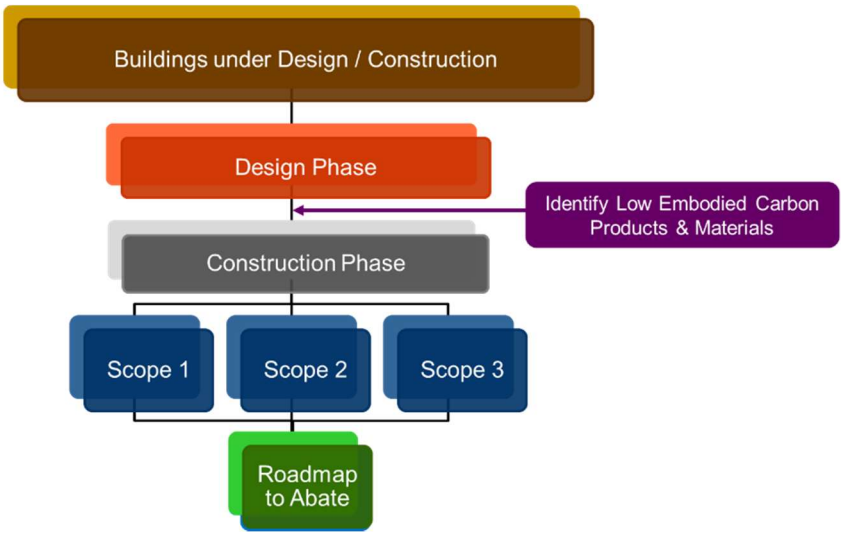
Stakeholder	Design	Construction	Operations
Owner	Applicable	Applicable	Applicable
Developer	Applicable	Applicable	Optional
Tenant	-	-	Applicable

Suggested approach for inventorisation during different stages of the project is as below:

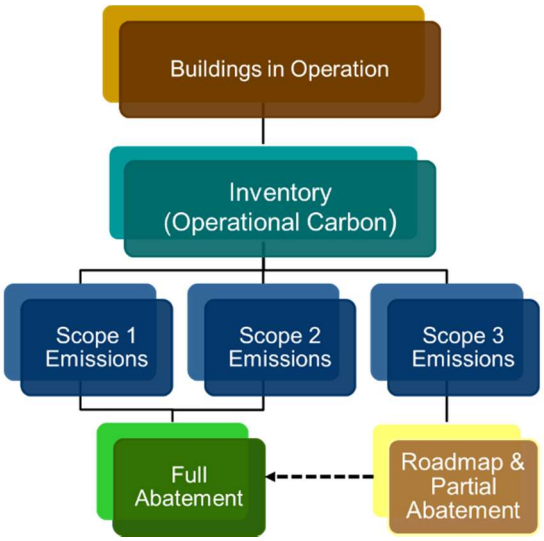
a. Design Phase: During design phase, the design team has to consider products and materials having lower embodied carbon for construction. The embodied carbon details need to be sourced from the manufacturers/suppliers based on the life cycle analysis of the products and materials.

b. Construction Stage: During the construction phase, the projects shall inventorise the embodied carbon emissions based on the quantities that are used and embodied carbon details sourced from the manufacturers. To start with, projects may consider major products and materials such as Cement, Concrete, Steel, Aluminium, Glass, Tiles, etc., for accounting the embodied carbon emissions.

The project shall include the direct & indirect emissions during construction phase on account of fuels used (Scope 1), the electricity consumption (Scope 2) and the emissions due to transport of material & workforce (Scope 3).



c. Operation Stage: Projects that are in operation for a minimum of one year, shall inventorise the emissions (Scope 1, 2 & 3) during building operations [for the reporting year]. The project may aim at abating the emissions on account of Scope 1 & 2 completely and Scope 3 emissions partially. The project shall also have an abatement roadmap for remaining Scope 3 emissions.



Key Emission Abatement Strategies

Once the inventory of GHG emissions is completed for the reporting year, the organisations/ projects shall develop a roadmap with short & long-term abatement strategies to fully decarbonise. Some of the strategies to reduce the emissions are:

- Scope 1 & 2
  - Maximising energy efficiency through passive architecture elements and latest technologies
  - Maximising deployment of on-site renewables and use of off-site green power
  - Maximising water conservation through use of efficient plumbing fixtures & systems
  - Reduction in specific waste generation

- Scope 3
  - Promoting low carbon building materials & construction technologies
  - Embracing clean, safe and connected mobility (e.g., E-vehicles)
  - Reducing emissions due to travel – Work from home, Virtual events

After reducing the emission intensity, the projects shall adopt measures to abate 100% of the carbon emissions through:

- Creating carbon sinks and carbon capture storage systems
  - E.g., Mass plantation - A fully grown tree captures ~20 kg of CO_2 / year
- Investments in off-site renewables
- Purchase of carbon credits, green bonds, energy saving certificates (under PAT Scheme)

Way Forward:

- IGBC recommends organisations to sign-up for the 'IGBC's Net Zero Mission' and formulate policy to achieve Net Zero Carbon status for their new & existing building projects.
- As a first step, the organisations can identify one or two pilot projects to initiate the adoption of Net Zero Carbon concepts, by inventorising Scope 1, 2 & 3 emissions and develop a broad roadmap for abating the carbon emissions.
- IGBC, with the support of subject matter experts, projects & stakeholders, will develop an exclusive rating system for Net Zero Carbon Buildings (Pilot Version) to facilitate & support the projects achieve Net Zero Carbon status.

About CII
(Confederation of Indian Industry)

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society through working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry.

Founded in 1895 and celebrating 125 years in 2020, India's premier business association has more than 9,100 members, from the private as well as public sectors, and an indirect membership of over 300,000 enterprises from around 291 national and regional sectoral industry bodies.

With 68 offices, including 9 Centres of Excellence in India, and 11 overseas offices in Australia, China, Egypt, France, Germany, Indonesia, Singapore, South Africa, UAE, UK and USA, as well as institutional partnerships with 394 counterpart organizations in 133 countries, CII serves as a reference point for Indian Industry and the international business community.

About IGBC
(Indian Green Building Council)

The Indian Green Building Council (IGBC), part of the Confederation of Indian Industry (CII) was formed in the year 2001. The vision of the council is, "To enable a sustainable built environment for all and facilitate India to be one of the global leaders in the sustainable built environment by 2025".

The council offers a wide array of services which include developing new green building rating programmes, certification services and green building training programmes. The council also organises Green Building Congress, its annual flagship event on green buildings.

The council is committee-based, member-driven and consensus-focused. All the stakeholders of construction industry comprising of architects, developers, product manufacturers, corporate, Government, academia and nodal agencies participate in the council activities through local chapters. The council also closely works with several State Governments, Central Government, World Green Building Council, bilateral multi-lateral agencies in promoting green building concepts in the country.

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