

Value-chain approach to decarbonizing the building and construction sector in India

Concept Note

Context

The science is clear – limiting global warming to 1.5°C would require the world to reach net-zero emissions by mid-century¹. To this end, United Nations Framework Convention on Climate Change (UNFCCC) launched a global campaign called Race-to-Zero to mobilize leading net-zero initiative from cities, regions, businesses, universities, and biggest investors. With the Paris Agreement realizing the role of the non-state actors including businesses to mobilize bold climate actions, the businesses will play a crucial role in the success of Race-to-Zero campaign. So far, 1,675 businesses across the world have successfully qualified to join Race-to-Zero².

Despite the pandemic, the world witnessed significant changes with net-zero commitments doubling in 2020 covering two-thirds of global emissions³. However, winning the race-to-zero would require disruptive sectoral transformations. Built environment (or buildings) would require 100% of the projects due by 2030 or after, to be net-zero carbon in operations with at least 40% less embodied carbon compared to current practice³.

In the recent past, a few Indian businesses such as Mahindra Group, Dalmia Bharat Limited, Infosys, etc. have indicated laudable ambition to achieve net-zero emissions (and/or carbon neutrality)⁴. This would imply that the commercial spaces such as buildings in the factories, buildings used for office space, etc. shall form part of race-to-zero journey. A few governments and private-owned buildings are adopting sustainable measures to reduce embodied and energy-use emissions. For example, Indira Paryavaran Bhavan, the office building of the Ministry of Environment, Forests and Climate Change, uses 70% less energy than conventional buildings. It has received the highest rating of GRIHA 5 star and LEED Platinum. The building meets its 1.4 million electricity demand through 930 kW roof top solar PV and applies several energy conservation and green building principles⁴. Similarly, Indira Gandhi international airport became the first airport in Asia Pacific to achieve Level 4+ accreditation⁵ under Airport Council International's (ACI) Airport Carbon Accreditation program which has terminals compliant to Green Buildings Standards. However, such ambitions would require scale-up across the entire value chain of building and construction sector.

The proposed stakeholder consultation aims to catalyse the key actors in the building and construction sector to identify key actions to put the sector on net zero path.

Buildings and Construction Value Chain

Building and the construction sector is a very diverse and fragmented value chain. The sector has the largest global material footprint and materials used are associated with significant natural resources. Because of its significant resource demand, production, and consumption of building materials, use of energy and resources during operations and maintenance, there are significant environment impacts such as climate change.

¹ IPCC Special Report: Global Warming of 1.5°C, 08 Oct 2018

<https://www.ipcc.ch/sr15/>

² News: Race to Zero builds momentum, 22 Mar 2021

<https://racetozero.unfccc.int/the-race-to-zero-is-on/>

³ UNFCCC Report: Transforming our Systems Together – A global challenge to accelerate sector breakthroughs for COP26 and beyond, 28 Jan 2021

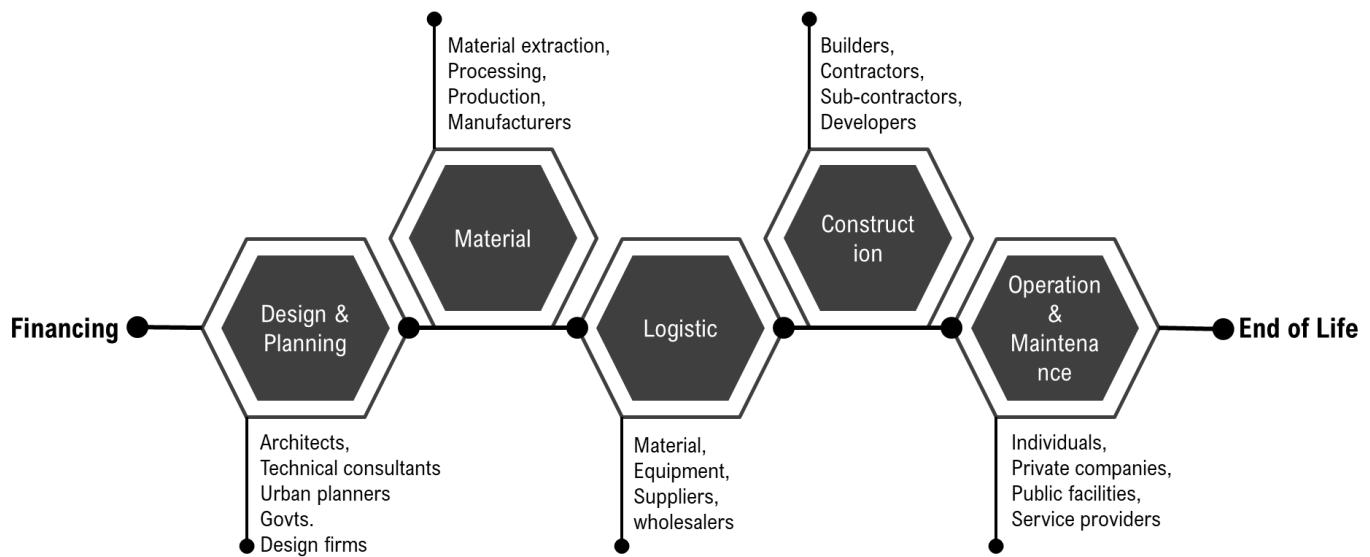
<https://racetozero.unfccc.int/wp-content/uploads/2021/02/Race-to-Zero-Breakthroughs-Transforming-Our-Systems-Together.pdf>

⁴ Net Zero Energy Buildings, Case Studies, Indira Paryavaran Bhawan, MoEFCC

<https://nzeb.in/case-studies/nzebs-in-india/nzebs-in-india-case-studies-list/ipb-case-study/>

⁵ GMR's Delhi Airport to become Net Zero Carbon Emission Airport by 2030-First Airport in Asia Pacific Region to achieve Level 4+ Accreditation under Airport Carbon Accreditation of ACI

[https://www.newdelhiairport.in/blog/gmr-delhi-airport-to-become-netzero-carbon-emission-airport](https://www.newdelhiairport.in/blog/gmr-delhi-airport-to-become-net-zero-carbon-emission-airport)



India is expected to become the third largest construction market by 2022 with infusion of US\$1.4 trillion on infrastructure projects through National Infrastructure Pipeline (NIP) between 2019 and 2023⁶. Real estate sector in India is expected to reach a market size of US\$1 trillion by 2030 from US\$120 billion in 2017 and contribute 13% to the country's GDP by 2025⁷.

Such a growth has consequences for the environment and calls upon a holistic approach. Building and Construction sector in India contributes to ~25% of India's carbon emissions in 2016⁸. The urban floor space share is expected to reach 60% by 2040 of total floor space in India as compared to 45% in 2019⁹, which in turn will also increase the energy use and hence, the carbon emissions. Therefore, India can ensure growth while be sensitive about the climate risks associated with the businesses in this sector. The value-chain approach can help identify hotspots and shape corresponding actions built on available knowledge and expertise.

Where we need to be?

According to IEA⁷, building sector witnesses decoupling of emissions and activities in stated policy scenario (STEPS) where electricity use rises by a factor of three between 2019 and 2040 and share of fuel use rises to 50% from less than 20% today. In sustainable development scenario (SDS), there are much stronger efforts to improve the efficiency of buildings and appliances.

The policy levers such as building electrification, energy efficiency standards, improved labelling, retrofitting existing buildings, and rebate on cooling, ventilation and other appliances are considered for deep decarbonization pathway for the building sector in the Energy Policy Simulator (EPS)¹⁰. The impact on the CO₂e emissions have been summarized through the graph provided below:

⁶ IBEF report: Indian Infrastructure Sector in India, Jan 2021

<https://www.ibef.org/industry/infrastructure-presentation>

⁷ IBEF Indian Real Estate Industry Report, Nov 2020

<https://www.ibef.org/industry/real-estate-india.aspx>

⁸ India's Third Biennial Update Report to the UNFCCC, 20 Feb 2021

<https://unfccc.int/documents/268470>

⁹ IEA, India Energy Outlook 2021, Feb 2021

<https://www.iea.org/reports/india-energy-outlook-2021>

¹⁰ Energy Policy Simulator is free and open-source system dynamic model that can estimate the impacts of various policy packages and offer objective, quantitative analysis to help develop smart packages of policies that can work in concert to deliver climate goals. Please note that the policy levers are limited to those that are available in the simulator.

<https://india.energypolicy.solutions/>



Source: Energy Policy Simulator India

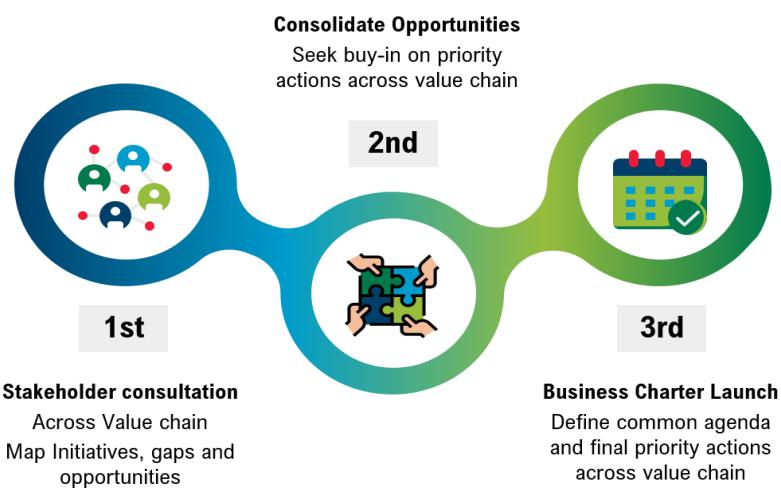
The result shows that with deep decarbonization in building sector considering the optimal implementation schedule would result in the ~3% emission savings as compared to business-as-usual scenario. This percentage would get further enhanced with decarbonized power sector and considering a few other policy levers that are cross-sectoral.

Our proposal

Decarbonizing the sector would require coming together of multiple stakeholders across the value chain along with Regulatory agencies, financing agencies, investors, and academia.

WRI India in partnership with the core partners, will conduct four virtual stakeholders' consultations (90 minutes each) to discuss and strategize reduction of embodied carbon and increase material efficiency along with increasing the operational (or building) efficiency. Overall approach involves following three broad steps:

- 1) Stakeholder consultation to understand the value chain and identify key areas of engagement.
- 2) Consolidate the opportunities by seeking buy-in on priority actions and key opportunities.
- 3) Business Charter Launch: Define common agenda and prioritise actions for stakeholder group.



Based on the virtual stakeholders' consultations, WRI India in collaboration with core partners and participating organizations will prepare a voluntary business charter and call to action regarding decarbonized building and construction sector and race-to-zero. The business charter will be launched around COP26.

Stakeholder consultation sessions and timeline

	Session 1	Session 2	Session 3	Session 4	Business Charter Launch
Theme	Net Zero by Design	Construction and Operations	Occupiers Perspectives	Material Efficiency	Net Zero Building and Construction Sector
Proposed date	June 25 th 2021	July 2 nd 2021	July 9 th 2021	July 16 th 2021	Launch October 2021
Time	2:30 PM – 04:00 PM IST				
Suggested guests	Architectural and design firms Engineering firms Technical consultants Urban Planners Governments	Builders and Construction companies Sub-contractors Developers Equipment suppliers	Facility operators. Private businesses managing the building stock Public facilities, Service providers	Cement, Steel, Glass manufacturing companies Alternative Building Materials Technology developers Construction and demolition waste processors	Signatories from outreach and stakeholder consultation sessions
Key Questions (non-exhaustive)	<ul style="list-style-type: none"> What are prescriptive design guidance and material specifications that can be mainstreamed to reduce embodied carbon emissions? What are the barriers to adopt life cycle assessment for the products in construction and building sector and ways to mitigate them? How can design choices – floor space, orientation, etc. – help in reducing the overall carbon emissions throughout the life cycle? Is there enough knowledge available for determining the impact of materials used during the construction – e.g., knowledge on materials used, where they are sourced from, environmental implication of resource extraction? What are the best practices that can be adopted for India in terms of efficient envelope strategies and energy efficient technologies? What are the opportunities that can be explored to procure non-virgin steel, and cement and other materials to increase the material efficiency of the building while reducing the GHG emissions? What are the enabling conditions (policy, finance, etc.) to scale-up low-carbon alternatives for building materials? What are the innovative financing opportunities that can be explored to promote re-use and recyclability? What enabling conditions are required for strategic investments in environmental product declarations (EPDs), data disclosure and R&D to find new carbon-free production processes? What are the likely impacts of transitioning to the net-zero buildings and construction sector on environment (GHG emissions, air pollution, waste, and resource use), social life (health and wellbeing), and economic development (cost efficiency – operational costs, utility bills, real-estate value and time efficiency – permits, regulatory compliance and investors)? What are the likely impacts of transition to net-zero buildings and construction sector on existing jobs and workers (including women, migrant labourers)? 				
Core partners/ Moderation	Alliance for an Energy Efficient Economy (AEEE), EcoCollab, Mahindra Lifespace Developers Limited (MLDL), EcoCollab, World Resources Institute India (WRI India)				

Output: Business Charter on priority action for Net Zero Building and Construction sector

The business charter will focus on identifying the priority actions and key opportunities for various stakeholder groups – from decision makers, private sector, civil society, and/or research institutes on reducing emissions from buildings and construction value chain. It will also, focus on recommendations for developing strategy for transitioning to Net Zero Building and construction sector.