Build Ahead

with **Xynteo**

CARBON LABELLING: A POWERFUL TOOL FOR DECARBONISATION

HOW INDIA CAN ROLL OUT A CARBON LABELLING PROGRAMME FOR BUILDING MATERIALS



Build Ahead

Founded by Xynteo, Build Ahead is an industry-first coalition consisting of forward-leaning businesses, including cement producers, construction players, financiers and technology enablers, that have come together to accelerate decarbonisation efforts across the Indian construction value chain. Our coalition members include Jones Lang Lasalle (JLL), Godrej Construction, Lodha, JSW Cement, SED Fund, Saint Gobain and UltraTech Cement. Through collective action and collaboration, the Build Ahead coalition aims to support India's pledge of achieving net-zero emissions by increasing the adoption of lowcarbon building materials in the design, construction, use and end-oflife phases of real estate, construction and infrastructure projects.



Xynteo is a purpose-driven advisory firm that helps businesses find new ways to grow by shaping their cultures so they think and act differently; creating innovative, regenerative business models to compete and thrive; and helping clients embrace radical crosssector, cross-border collaboration so they can tackle system challenges. Our partnerships and communities include the Leadership Vanguard, Vikaasa, Europe Delivers, Build Ahead, Energy Leap and Xynteo Exchange.

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EXECUTIVE SUMMARY

In recent years, India has experienced a remarkable surge in construction activity, reshaping its urban and rural landscapes at an unprecedented pace. Fuelled by rapid urbanisation, infrastructure development, and government initiatives, the construction sector has emerged as a vital engine of economic growth and social transformation. The market size of India's real

estate sector is expected to grow more than ten-fold in the next 25 years¹.

The construction boom not only reflects the country's aspirations for modernisation but also poses significant challenges and opportunities in terms of sustainability, urban planning, and socio-economic development. With 51%² of India's population expected to be living in urban centres by 2047, the urban housing shortage currently estimated at 19 million (mn)³ would have to be narrowed, necessitating large volumes of new construction. This rapid growth brings with it the challenge of ensuring that development is sustainable. Understanding the dynamics and implications of this is crucial for policymakers, businesses, and communities alike as India navigates its path towards becoming a global economic powerhouse while staying on track for its sustainability and decarbonisation targets.

The construction sector is a significant contributor to carbon emissions, necessitating innovative measures to reduce its environmental impact. The built environment contributes close to 39% of global carbon emissions, a third of which originate from the manufacturing of the materials used in construction. The construction value chain needs to understand,

measure and track these emissions to ensure that mitigation measures can be implemented. This necessitates the need for carbon labels for construction materials.

This paper explores the potential and challenges of implementing a carbon labelling programme for construction materials in India, outlining key considerations for stakeholders, industry players, and policymakers.

A carbon labelling programme for construction materials in India would be a firm step to foster a paradigm shift towards sustainable construction practices which can enable a market transformation for reducing carbon emissions associated with construction.

For such a programme to take root it would need collaborative efforts from key stakeholders across the value chain. This paper aims to highlight the role that relevant stakeholders can play to bring such a programme to life.

Key steps that would be needed to roll out this programme are summarised below:

1. Create an industry platform which collaborates with key stakeholders for the

- development of a standardised framework and methodology for such a carbon labelling programme
- 2. Policy support to incentivise for adoption of carbon labels from both government and financial institutions
- 3. Engage with the manufacturers on capacity building for carbon footprint assessment
- 4. Leverage the reach and experience of industry bodies to understand the concerns of

² Ibid.

³ Ibid.

¹ "India Real Estate Vision 2047", Knight Frank and NAREDCO, 2023

different stakeholders in the value chain and create awareness around the needs and benefits of such a programme

5. Improve data accessibility for the manufacturers to enable carbon assessments, and for consumers to better understand the carbon labels and their implications.

CONTEXT: WHY ARE CARBON LABELS NEEDED IN CONSTRUCTION?

Human activities, notably fossil fuel burning, release significant greenhouse gases (GHGs), chiefly carbon dioxide (CO₂), driving climate change concerns. Fossil fuel combustion, including natural gas, coal and oil, releases stored carbon, elevating atmospheric CO₂ levels. Industrial operations through processes such as combustion and chemical reactions are significant contributors to GHG emissions, exacerbating climate change.

The built environment contributes approximately 39% of global carbon emissions, of which ~11% is attributed to embodied carbon, i.e., the emissions that arise from producing, procuring, and installing the materials and components that make up buildings. Currently, **embodied carbon forms almost 30% of the carbon footprint of the built environment**, arising primarily from the major building materials used in construction, i.e., cement, concrete, steel, aluminium, glass and ceramics. This share is expected to increase to **more than 50% by 2050**, as operational carbon, i.e., the emissions related to the use phase of the building, is increasingly being addressed through end-use energy efficiency of appliances and the gradual decarbonisation of the grid/energy supply systems through renewable energy. With an estimated 60% of building stock expected in India by 2050 yet to be built, embodied carbon <u>**must**</u> be addressed up front, or it risks high carbon intensity building materials being "locked in" for decades.

Although low-carbon alternatives to conventional building materials are emerging, there is a need to build awareness of the imperative to shift to low-carbon materials, as well as the provision of accurate information of the carbon intensity of different materials. This information can be provided through a robust framework of carbon labels for construction materials.

The idea of carbon labelling for construction materials is to provide final consumers with accurate and comprehensible information regarding the carbon footprint of various materials. The purpose of this labelling is to encourage consumers, i.e., real estate developers and builders, to choose low-carbon products, by taking the environmental effect of the materials they use in building projects into account.

WHAT IS CARBON LABELLING FOR CONSTRUCTION MATERIALS?

Figure 1. What is needed for a Carbon Labelling Programme

Carbon labelling requires a comprehensive assessment of the carbon

Footprint assessment	footprint of construction materials—considering their entire life cycle, from raw material extraction to transportation, use and end-of-life disposal/recycling.
Transparent communication	Carbon labelling requires display of the calculated carbon footprint of the material and the corresponding rating in a simplified and comprehensible manner.
Standardised metrics	Carbon labelling needs establishment of standardised metrics and methodologies to maintain consistency across variety of construction materials.

Significance of carbon labels

A carbon label serves as a crucial tool in promoting sustainability and informing consumer choices. Displaying the carbon footprint of a product or service provides valuable information regarding its environmental impact, particularly in terms of GHG emissions. This transparency empowers consumers to make more environmentally conscious decisions, fostering a shift towards low-carbon alternatives and incentivising companies to reduce their carbon emissions throughout the supply chain.

Moreover, carbon labels play a pivotal role in raising awareness about the carbon intensity of various products and services. They help individuals understand the broader implications of their consumption habits and encourage them to prioritise options with lower carbon footprints. Additionally, carbon labelling initiatives can drive innovation and encourage businesses to adopt cleaner technologies and more sustainable practices, contributing to global efforts to mitigate climate change. Widespread adoption and standardisation of carbon labels can significantly contribute to achieving broader environmental goals and fostering a more sustainable economy.

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TYPES OF CARBON LABELS

There is a variety of possibilities for choosing the type of carbon label. Some of them are:

1. Eco-labelling schemes which award a mark or logo based on the fulfilment of a set of criteria. Such schemes are based on the ordinal scale system and do not consider

relative performance criteria. For example, schemes such as Nordic Ecolabel, Good Environmental Choice Australia, ECO Mark India and Green Pro India

- 2. Self-declarations by manufacturers and businesses. Such schemes can be either based on the ordinal scale system, not considering relative performance criteria, or based on the cardinal scale system, considering relative performance criteria. For example, declarations by manufacturers regarding the recyclability of products or biodegradable packaging
- 3. LCA-based eco-labelling schemes which provide life-cycle data declarations for products. Such schemes are based on the cardinal scale system, considering relative performance criteria. For example, schemes such as Carbon Footprint, Carbon Trust and Carbon Footprint for Products (JEMAI).

Further, carbon labelling can be represented in multiple formats based on the ratio indices proposed in the GHG protocol:

- **1. Time ratio:** When the data is represented in comparison to the global warming potential of GHGs emitted over two time-periods, typically 20 years and 100 years, e.g., carbon footprint of the same product can be 5 kgCO₂ GWP 20 or 8 kgCO₂ GWP 100
- **2.** Category ratio: When the data is represented in terms of GHG emitted/value of product or vice versa, in comparison to another product, e.g. carbon footprint for a company can be represented in terms of kgCO₂/rupee of revenue
- **3.** Intensity ratio: When the data is represented in terms of GHG emitted per unit of activity or economic output (electricity consumed or per service, etc.), e.g. the average carbon intensity of electricity in India is 0.82 kgCO₂/kWh.

Another format of presenting carbon labels is in the context of reduction. The reduction can be in represented in variety of forms such as

- 1. Reduction against a product category baseline
- 2. Reduction against an industry benchmark

3. Reduction against previous year's carbon footprint

4. Reduction planned over a period.

However, several factors need to be taken into account for reduction based labels.

1. If the reduction is to be shown against a product category baseline, then as a first step, a baseline needs to be set before comparative performance can be evaluated, certified and labelled

2. Similarly, showing reduction against a previous year or period would require evaluation and certification of previous performance as well, which may not be a feasible exercise for a substantial portion of manufacturers

 Depicting planned reduction over a period would lead to concerns of greenwashing
 Also, showing reduction against any baseline/benchmark would be an iterative process only after the first round of absolute labels are published. At the next stage of label evolution, a secondary label on comparative information depicting the reduction against a baseline can be published.

In this context, reduction labels may not be a plausible labelling programme for the Indian building materials sector today.

Considering all of the above, we recommend the following as a carbon label for the Indian building materials sector.

OUR RECOMMENDATION

For ease of comparison and understanding, we recommend that an LCA-based carbon label be adopted for construction materials industry, initially focusing on lifecycle stages which contribute the highest to the carbon footprint (e.g. A1-A3). The carbon intensity should be presented in comparable terms e.g. kgCO₂/kg of product and use the same time-scale of GWP, e.g. GWP 20.

SAMPLE CARBON LABEL

CARBON INTENSITY LABEL				
XYZ Cement Company	Specifications			

Carbon label for: Ordinary Portland Cement	0.740 kgCO2e / kg GWP 20
Production Location:	LCA stages: Valid up to:
Barmer, Rajasthan	A1-A3 31-Mar-2025
Authorised representative:	To know more:
Mr. ABC, Head of QA	Scan QR code to verify
Contact: abc@xyz.com	this label and know more

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GLOBAL EXAMPLES OF CARBON LABELLING PROGRAMMES

The examples below illustrate the global efforts to incorporate carbon labelling into various sectors, providing consumers and businesses with information to make environmentally responsible choices.

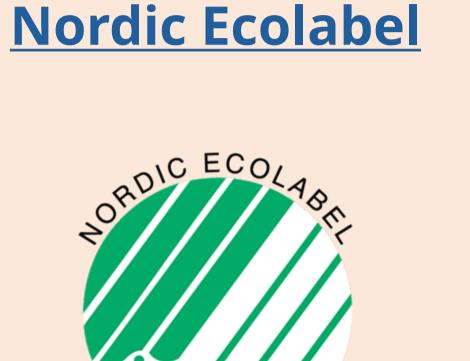
Figure 2. Global Carbon Labelling Programmes

Country	Programme	Description
	<u>Carbon Trust</u>	 Certification and labelling for products and services through its Carbon Trust Standard Covers various sectors such as consumer goods and
United	CARBON TRUST	 products, food and beverages, electrical appliances, building materials and packaging Certifications now recognised globally.
Kingdom	Carbon Footprint Limited	 Offers a Carbon Footprint Certification for products and services Covers various sectors, such as transportation, clothing, food and boyerages, electrical appliances

	carbon footprint	 Clothing, food and beverages, electrical appliances, building materials and packaging Allows companies to display the carbon footprint of their products on labels.
Japan	Carbon Footrprint for Products (CFP) COO2 Ecoleaf	 CFP and EcoLeaf are carbon labelling programmes by Japan Environmental Management Association for Industry (JEMAI). These have now been integrated and are now operated as Japan EPD Program by SuMPO Covers various sectors, such as clothing, commodities food and beverages, printing and building materials Aims to certify products with lower carbon footprints and promote sustainable consumption in Japan.



Nordic countries



- Nordic Ecolabel, also known as the Swan label, is established in Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden)
- Covers various sectors, such as cleaning products, cosmetics, clothing, food and beverages, electrical appliances and building materials



information

• This is under revision⁴.





- GreenPro is issued by the Confederation of Indian Industry (CII)
- It indicates that the product meets certain criteria and has lower environment impact
- It is a focused ecolabel, designed specifically for endusers from the building and manufacturing sector.

Draft notification on Ecomark Certification Rules 2023

KEY BENEFITS OF CARBON LABELLING PROGRAMMES

 Figure 3. Benefits of a Carbon Labelling Programme

 Area of Focus
 Benefits

Environmental Awareness Awareness Carbon labelling raises awareness among stakeholders, including builders, architects and consumers, about the environmental impact of construction materials.		Increased awareness fosters a culture of sustainability, driving demand for eco-friendly materials and encouraging the adoption of green building practices.
Emission ReductionCarbon labelling incentivises the use of materials with lower carbon footprints, contributing to the overall emission reduction in the construction industry.		This aligns with India's goals for mitigating climate change and reducing the environmental impact of construction activities.
Sustainable Urban DevelopmentCarbon labelling supports sustainable urban development by guiding the selection of materials with lower environmental impact.As India experiences rapid urbanisation, this approach can contribute to the creation of environmentally responsible urban infrastructure.		urbanisation, this approach can contribute to the creation of
Market Transformation and InnovationCarbon labelling drives a market transformation towards sustainable 		Manufacturers are motivated to develop new, eco-friendly materials, fostering a culture of innovation and sustainability within the construction sector. It will also help first movers create differentiation for their products in the market.
Regulatory Compliance and Certification Certification Compliance and building certification programmes, promoting regulatory compliance		Construction projects that prioritise certified materials may qualify for green building certifications, contributing to India's sustainable construction goals.
Awareness and Demand		Consumers become agents of change, actively seeking construction materials with lower carbon footprints, thereby influencing market trends.
Efficiency and Circular Economy	Carbon labelling encourages resource- efficient practices and promotes materials that align with circular economy principles.	It supports the responsible sourcing of raw materials, minimises waste, and contributes to a more sustainable and resource-efficient construction industry.

COMMON CHALLENGES IN CARBON LABELING PROGRAMMES

Figure 4. Challenges for a Carbon Labelling Programme

Area of Focus

Challenges

Potential Mitigation

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Obtaining accurate and comprehensive data on the carbon footprint of products throughout their lifecycle can be challenging.	Encourage suppliers to provide transparent and standardised data on carbon emissions. Invest in data collection technologies and tools to improve data accuracy and reliability.
Different organisations may use varying methodologies and assumptions for calculating carbon emissions, leading to inconsistencies and incomparability between carbon labels.	
Implementing a carbon labelling programme incurs costs related to data collection, analysis, certification, labelling and compliance, which may be perceived as prohibitive.	Offer financial assistance or grants to offset initial implementation costs for businesses. Explore opportunities for cost-sharing and collaboration among industry partners.
Ensuring that consumers understand the significance of carbon labels, interpret them accurately, and trust the information provided can be challenging.	Launch consumer education campaigns to increase awareness of carbon labelling and its significance. Ensure transparency and clarity in labelling schemes to build consumer trust. Provide easily accessible information and resources to help consumers interpret carbon labels accurately.
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	Small and medium-sized enterprises	
	(SMEs) and businesses with limited	Provide financial incentives or
SME Adoption	resources may struggle to afford and	subsidies to support SMEs and
	undertake necessary assessments	businesses with limited resources.
	effectively.	

Supply Chain Complexity Products often have complex supply chains involving multiple suppliers, subcontractors, and intermediaries. Tracking carbon emissions across Collaborate with supply chain partners to improve transparency and traceability. Prioritise key suppliers and focus efforts on high-impact areas within the supply chain.

	these supply chains can be difficult.	Leverage technology solutions such as blockchain to enhance supply chain visibility.
Greenwashing	Businesses may face accusations of greenwashing if their carbon labeling efforts are perceived as superficial, misleading, or inconsistent with actual environmental performance.	Establish robust verification and certification processes to ensure the credibility and integrity of carbon labels. Comply with industry standards and best practices for transparent communication of sustainability claims Implement mechanisms for independent auditing and oversight to detect and address instances of greenwashing, such as the recently released guidelines on the prevention of greenwashing ⁵ .

POTENTIAL IMPACT OF CARBON LABELLING

The potential impact of carbon labelling for emissions reduction can be visualised through the consumption of different types of cement. The carbon intensities of the key types of cement available today are summarised below.

	Types	Carbon Footprint ⁶	
	Ordinary Portland Cement	740 kgCO ₂ /ton	
Available Cement Types	Portland Pozzolana Cement	511 kgCO ₂ /ton	
	Portland Slag Cement	304 kgCO ₂ /ton	
	Composite Cement	348 kgCO ₂ /ton	

Use of PPC and PSC, in place of OPC, can result in an emissions reduction of anywhere between 30% and 50%. A carbon label with emissions information will allow the consumer to choose the lowest emission cement available, delivering real impact for promoting sustainable construction practices.

⁵ Draft Guidelines for Prevention and Regulation of Greenwashing

⁶ India average intensity as per Global Cement and Concrete Association (GCCA)

CARBON LABELLING FRAMEWORK FOR INDIA

While carbon labelling for construction materials in India offers substantial benefits for sustainability, addressing these challenges requires collaborative efforts from government bodies, industry stakeholders, and consumers. Strategic policy frameworks, standardisation efforts, and educational initiatives can contribute to the successful implementation of carbon labelling practices in the Indian construction sector.

Key Stakeholders and Roles

Implementing a carbon labelling programme for construction materials would require collaboration among diverse stakeholders across the construction industry, regulatory bodies, and the broader community. Identifying and engaging these key stakeholders would be crucial for the success of the programme. Here are the key stakeholders for a carbon labelling programme:

Figure	Figure 5. Key Stakeholders and their Roles					
	Government Agencies	Environmental Organisations	Industry Associations	Research Institutions		
	Provide support for regulatory frameworks, set the relevant standards, create incentive structures and oversee the programme.	Advocate for policy and standards. Work for increasing awareness and monitor compliance.	Facilitate collaboration and provide industry insights and support for promoting adoption of carbon labelling.	Actively engage to work towards the development of accurate carbon assessments and identifying alternative materials.		
	Manufacturers	Construction Industry	Financial Institutions	Consumers		
<section-header></section-header>	Carry out product assessments, participate in the certification process, disclose carbon footprints through labels and adopt low- carbon practices.	Incorporate carbon footprints in the material selection criteria and focus on adopting low-carbon materials.	Incorporate criteria for usage of low carbon materials in projects financing framework. Offer incentives for the use of carbon labelled/ low-carbon products.	Make informed choices after considering carbon footprint information published on carbon labels and drive the demand for sustainable materials.		

Rollout Strategy

Rolling out a carbon labelling programme for construction materials in India would require a systems collaboration approach that considers the complexity of the construction industry and the diverse stakeholders involved. The key aspects to be looked at for initiating and implementing a carbon labelling programme would include:

1. Stakeholder engagement: This would involve identifying and engaging the key stakeholders within the construction value chain, including government agencies, and

engaging them to devise the requisite methodologies and framework for a carbon labelling programme. A key enabling mechanism for this would be the establishment of working groups with representatives from various stakeholders to ensure diverse perspectives and expertise. Such working groups can define the programme scope, including the types of construction materials covered, and the life cycle stages to be considered, and setting the programme objectives, such as reducing carbon emissions,

promoting sustainable practices, and enhancing consumer awareness

- 2. Develop standardised methodology: Through stakeholder engagement, a key outcome must be the development of standardised methodology for arriving at the information required to be provided on the label. This can be achieved through focussed efforts on standards, while working with industry experts, research institutions, and standards organisations to develop standardised methodologies for calculating carbon footprints. Ideally, the methodology should look at the life cycle assessment concept to cover the end-of-life uses as well for the materials to make the programme comprehensive
- **3. Establish certification criteria:** Clear criteria for certifying construction materials needs to be established. In addition to their carbon footprints, other factors such as water usage, resource efficiency, and social impact can also be considered. Another key aspect to be looked at is establishing correlation with existing standards and certifications to enable smooth implementation
- **4. Pilot phase:** A pilot phase is pivotal to the success of a carbon labelling programme. This would enable the assessment of the feasibility of the programme, identify challenges, and gather feedback from participants to refine the methodologies and framework for the programme. For this to be successful, a diverse group of manufacturers, suppliers, and construction projects is required to participate in the pilot phase
- 5. Public awareness: Developing outreach campaign to raise awareness about the benefits of carbon labelling among manufacturers, builders, architects, and consumers. Create training programmes to guide stakeholders on how to calculate and reduce carbon footprints
- **6. Monitoring and review:** Implement mechanisms to monitor the ongoing performance of the programme, including regular audits and reviews. Establish a feedback loop with stakeholders to continuously improve the programme.



Figure 6. Roadmap of Key Actions for Carbon Labelling Programme





OUR RECOMMENDATIONS

The key stakeholders within this value chain can be mapped into three distinct categories — supply side for the material manufacturers, demand side for the material consumers and policy side, which acts as the enablers. Based on this distinction, the supply side and policy side are the key influencers for the implementation of a carbon labelling programme in the construction value chain. In this context, the key recommendations for them are:

For supply side

- 1. Formulate a collaborative platform on which stakeholders can interact with each other and exchange ideas for working together to formulate the framework and methodology for a carbon labelling programme
- 2. Initiate interaction and collaboration with international partners for exchanging ideas to be able to learn from in-force carbon labelling schemes
- 3. Co-develop and implement capacity-building programmes to enhance the

understanding and proficiency in carbon footprint assessment, labelling standards, and consumer communication strategies

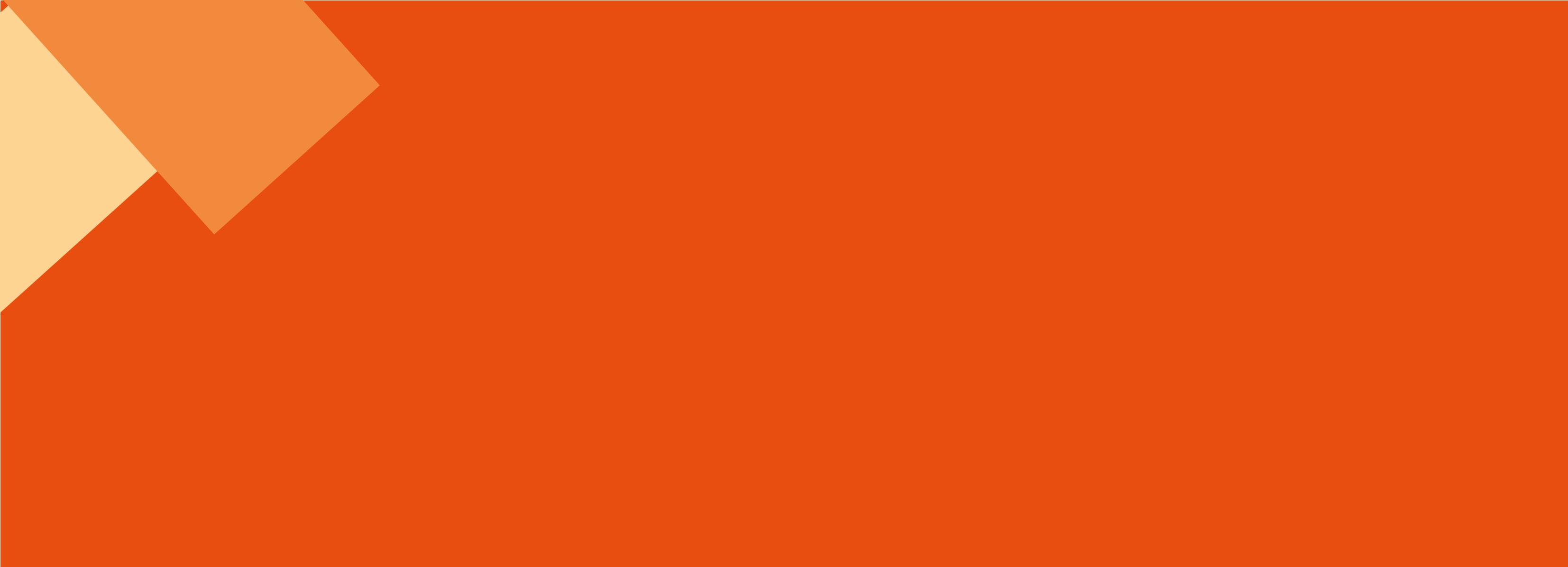
4. Develop comprehensive public awareness campaigns to educate consumers about the importance of carbon labelling, how to interpret carbon labels, and the environmental implications of purchasing decisions.

For policy side

- 1. Collaborating with industry platform to integrate a carbon labelling programme with national goals on climate action and sustainable development objectives
- 2. Promote voluntary participation in carbon labelling programmes to encourage industry engagement and innovation, while considering incentives and recognition mechanisms
 - to incentivise participation
- 3. Create incentivisation schemes for consumers opting for sustainable choices by making buying decisions after due considerations to carbon labels
- 4. Establish platforms for the transparent reporting and disclosure of carbon footprint data, enabling consumers and stakeholders to access information easily and make informed choices
- 5. Develop financing frameworks incentivising both the supply and demand sides towards low-carbon materials and carbon labelling.

The introduction of a comprehensive carbon labelling policy for construction materials would be a strategic step towards sustainable development. It will align India with the global efforts to mitigate climate change. The success of the policy hinges on collaborative efforts, regulatory support, and proactive engagement with all stakeholders. Stakeholders, industry participants, and policymakers need to consider a variety of factors as they navigate the possibilities and difficulties of addressing climate change, and adopting a carbon labelling scheme for building materials in India will be landmark step in the direction of decarbonising the built environment in India.

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