



# Indian Cement Sector SDG Roadmap







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अमिताभ कांत  
Amitabh Kant  
मुख्य कार्यकारी अधिकारी  
Chief Executive Officer



भारत सरकार  
नीति आयोग, संसद मार्ग,  
नई दिल्ली-110 001  
Government of India  
NATIONAL INSTITUTION FOR TRANSFORMING INDIA  
NITI Aayog, Parliament Street,  
New Delhi-110001  
Tel. : 23096576, 23096574 Fax : 23096575  
E-mail : ceo-niti@gov.in, amitabh.kant@nic.in

## FOREWORD

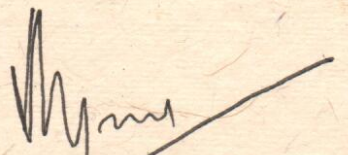
The Sustainable Development Goals (SDGs) represent a unanimous commitment by world leaders which set out a universal and ambitious development agenda embracing economic, environmental and social aspects of the human and planetary wellbeing.

As one of the fastest growing economies of the world that is also home to a predominantly young population of more than 1.3 billion aspiring people and 8% of the world's biodiversity, India holds a significant stake in the successful outcome of this global effort. Whether the world would be able to meet the SDG targets largely depends on India's progress. India is alive to its historic responsibility and has played a prominent role starting with the formulation of SDGs. As our Prime Minister asserted, much of the country's National Development Agenda is mirrored in the SDGs and the SDGs are being carefully pursued both at national and subnational levels.

Businesses have a critical role to play in the realization of the SDGs as sources of finance, engines of economic growth and employment, and drivers of innovation. The SDGs also provide a framework to support businesses in managing risks, developing new age technologies and products and identifying potentially historic market opportunities.

At NITI Aayog, we recognise the leading role of the private sector in contributing to the nation's success in achieving the SDGs. It is a matter of satisfaction for us that the World Business Council for Sustainable Development (WBCSD) and the member companies of its Cement Sustainability Initiative (CSI) in India have taken proactive steps towards a strategic assessment of how this important industrial sector interacts with, impacts, and is impacted by, various aspects of the physical and socio-economic environment and how it may contribute even more materially to making our world a better place.

I congratulate the WBCSD for having convened and supported the effort to create a roadmap on SDG implementation for the cement sector in India. I am certain that this will have far-reaching impact for the sector, the associated value chain, the nation and the world. I hope that other sectors shall follow the example set by the cement industry and work towards creating similar sector-specific roadmaps for their respective operations.



(Amitabh Kant)



# Foreword

## Message from the United Nations Industrial Development Organization (UNIDO)

The United Nations Industrial Development Organization (UNIDO) has the global mandate to foster and facilitate the transition to inclusive and sustainable industrial development. As such, UNIDO applauds the efforts the Indian cement industry is making as it takes the lead on this cement roadmap to achieve the Sustainable Development Goals (SDGs).

In 2015, the 193 Member States of the United Nations universally adopted "Transforming our World: the 2030 Agenda for Sustainable Development. The Agenda is an outcome of an unprecedented consultative process that brought national governments and millions of citizens worldwide together to negotiate and adopt ambitious goals covering five pillars for sustainable development: planet, people, prosperity, peace and partnerships.



**Dr. René Van Berkel**  
Representative (India)  
United Nations Industrial Development Organization

The Agenda comprises 17 SDGs with 169 associated targets, converging into one destination: the journey to the future we want. The 17 SDGs are integrated and ambitious, and hence indivisible. It is the first time ever that industry has been explicitly included in the development agenda, specifically the achievement of inclusive and sustainable industrialization (SDG9). This reflects the widespread recognition that industry is indispensable in achieving inclusive and sustainable economic growth.

Business needs the SDGs, as they offer a compelling growth strategy for individual businesses, for business generally and for the world economy. The SDGs also urgently need business because until private companies seize the market opportunities SDGs create, their abundance won't materialize. For India alone, experts estimate the size of the SDG business opportunity at USD \$1 trillion by 2030 in four main sectors: food and agriculture; cities; energy and materials; but also health and well-being.

The cement sector is critical to progress across a broad spectrum of SDG targets. Cement as a product is indispensable to achieving the ambitious Goals for cities and infrastructure (SDGs 11 and 9). Innovations in cement technology, plants and value chains are necessary to achieving Goals on water, energy, decent work, sustainable consumption and production, and terrestrial ecosystems (SDGs 6, 7, 8, 12, 13 and 15). In addition, the sector's business practices and partnerships offer an opportunity for positive contributions in the areas of health, education, gender equality and reduced inequalities (SDGs 3, 4, 5 and 10). Opportunities for positive change abound and the Indian cement industry has started pursuing them, particularly regarding low-carbon and energy efficiency transitions, and health and safety. The present SDG Roadmap presents a deeper and integrated set of actions to enable cement companies to lead the way in realizing the SDGs.

## Message from the Swiss Agency for Development and Cooperation (SDC)

The implementation of the Sustainable Development Goals (SDGs) calls for the adoption of an integrated and inclusive approach to address societal needs and create shared value. The role of the private sector in the SDG implementation agenda is widely recognized as necessary to achieve transformational impact globally. The Swiss Agency for Development and Cooperation (SDC) strongly supports a multistakeholder approach to achieving the SDGs globally. In this context, SDC has been actively engaged in various global thematic areas, including health, migration, water, food security and climate change.



**Marylaure Crettaz Corredor**  
Head of the Swiss Agency for  
Development and Cooperation, India

The present report profiles the prioritized impact opportunities and related actions that are necessary for the implementation of the SDGs in the cement sector. The main takeaway is the key partnerships that would support the translation of sectoral commitments into action. This report showcases the ways in which the cement sector supports India's actions to meet the 2030 Agenda.



**This report showcases the ways in which the cement sector supports India's actions to meet the 2030 Agenda.**



SDC has been supporting the development of low-carbon cement for the last several years in many countries and India has been the focus of major activities. The present work also reflects SDC's commitment to creating a low-carbon built environment. We believe that the India-specific cement sector roadmap paves the way for other sectors and countries to come forward and develop similar commitments for SDG implementation.

## Message from WBCSD

The Sustainable Development Goals (SDGs) have the potential to unleash innovation, economic growth and development at an unprecedented scale. They also represent a significant market opportunity for business, estimated to be worth at least USD \$12 trillion per year by 2030.

However, the ambitious, transformative agenda that the SDGs represent goes beyond business as usual. In particular, realizing the goals – and unlocking the business opportunities they represent – will require a critical mass of companies to pioneer new forms of collaboration. This is often most effective at the sector level.

WBCSD supports its member companies as they integrate the SDGs into their business models. Through our SDG Sector Roadmap project, we are championing the development of robust SDG roadmaps to guide and inspire entire sectors as they seek to optimize their contributions to the SDGs.



**Filippo Veglio**  
Managing Director, People  
WBCSD

India has played an important role in the inception of the SDGs and will also be integral to realizing them. Because of the size of its population, its stage of development and its fast-growing economy, there can be no sustainable world without a sustainable India.

The Indian cement sector has been working for many years to address the various sustainability challenges facing the sector. Under the auspices of the WBCSD Cement Sustainability Initiative (CSI) India program, nine companies (ACC, Ambuja Cements, CRH India, Dalmia Cement (Bharat), HeidelbergCement India, Orient Cement, Shree Cement, UltraTech Cement and Votorantim Cimentos) and the Cement Manufacturers' Association of India developed the Low-Carbon Technology Roadmap for the Indian Cement sector in 2013. This first country roadmap based on the International Energy Agency's sectoral technology roadmaps has paved the way for similar roadmaps in Brazil and other countries. These nine sustainability leaders represent more than 60% of the production capacity in the world's second largest cement market.

These companies have come together once more to develop this first country-specific sectoral roadmap based on the WBCSD's SDG Sector Roadmap Guidelines framework. I commend the sector's commitment to collaborating on this transformative agenda to address the risks and capitalize on the opportunities presented by the SDGs. It is heartening to note that the sector has also set key performance indicators to monitor progress against the prioritized actions.

WBCSD will continue to support the sector as it delivers on its commitment to the 2030 Agenda for sustainable development. I wish the sector the very best for their journey on this path.



# Executive summary





## Purpose

The Sustainable Development Goals (SDGs) are a universal framework that the private sector can use to drive sustainable development, presenting new strategic opportunities for industry.

The SDG framework provides the opportunity to renew and integrate sustainability efforts in order to meet national and global aspirations by 2030. India's cement sector, the second largest in the world, will play a crucial role in supporting national SDG implementation. What's more, aligning the sectoral priorities with India's sustainability priorities is important for the success of the sector and for the country.

The Indian Cement Sector SDG Roadmap is the first country-level SDG Roadmap initiative. It is led by nine Indian cement companies convened by the World Business Council for Sustainable Development (WBCSD).

The Roadmap's purpose is to explore, articulate and help realize the potential of the sector to contribute to the 2030 Agenda for Sustainable Development through an integrated approach that recognizes material sectoral challenges and opportunities to meet societal needs. India's success is critical to delivering the SDGs globally. Aligning with the country's sustainability priorities is important for the cement sector's success.

## Method and approach

In the development of this Roadmap, the cement sector has implemented the three-step framework described in the [WBCSD SDG Sector Roadmaps](#).<sup>1</sup> In doing so, participating companies and industry associations have established a collective understanding and position on several key factors, including:

- the sector's SDG interactions across the cement value chain;
- key areas where the sector can make the most transformative contributions to the SDGs; and
- actions that the sector can take to maximize its SDG impact.

The Roadmap's priority SDGs are based on the impact opportunities identified for the cement sector and key interactions throughout the sector value chain.

The Roadmap's eight impact opportunities and related actions that contribute to the high-priority SDGs for the sector are grouped into four key themes:

1. **Energy and climate;**
2. **People and communities;**
3. **Circular economy; and**
4. **Natural resources management**

Cross-cutting priorities that influence impact opportunities include:

- **human rights;**
- **low-carbon economy; and**
- **innovation in processes, products and services, and technology.**

The impact opportunities are mapped against three key pathways through which the cement sector can support the SDGs:

- **Products** – to address challenges that currently lack a viable solution;
- **Processes** – to improve the way the sector operates;
- **Partnerships** – to leverage collective resources and drive mutual value propositions.

## Priority SDGs for the sector

The Roadmap's eight impact opportunities for the Indian cement sector contribute to 12 of the 17 SDG goals and deliver on 19 of the 169 SDG targets.

Moving forward, the companies involved in the development of this Roadmap will establish working groups to advance the impact pathways identified and set up appropriate frameworks to track and communicate progress. The contributors to the Roadmap also strongly encourage other companies throughout the sector value chain to adopt the Roadmap and align their activities and strengthen partnerships to accelerate progress on SDG goals.

The following table summarizes the eight impact opportunities and actions identified across the four themes and lists the prioritized SDGs linked to each impact opportunity.



Photo credit: Dalmia Cement (Bharat)



## Energy and climate



## People and communities

### Low-carbon transportation and logistics

- Augment rail, marine and other inland waterway-based transport
- Encourage long-term contracts with railways
- Increase use of low-carbon fuels for road transport
- Encourage rail/road transportation to transition to greater use of electric energy/renewable sources
- Scale efforts for gradual transition to bulk transport (e.g., construction of bulk cement terminals)
- Scale efforts to build new plants near waterways or rail networks to reduce and share road transport loads
- Scale efforts to localize and integrate supply chains and optimize transport routes
- Scale use of locally sourced alternative fuels for transport
- Incentivize and build the capacity of suppliers to reduce their carbon footprint
- Encourage transportation and logistics providers to define carbon reduction targets

### Resilient and sustainable built environment

- Scale research and development efforts to develop sustainable and resilient building products
- Collaborate with the construction and infrastructure sector to develop climate-resilient infrastructure and provide customized solutions and durable and resilient building materials (cement) through partnerships with architects and urban planning departments
- Partner with research institutions to develop sustainable and innovative products
- Scale sustainable building product portfolios (e.g., roofs, building envelope solutions)

### Energy efficiency and use of clean energy

- Increase use of renewable energy in manufacturing units
- Improve thermal and electrical energy efficiency of manufacturing plants



### Skills enhancement

- Collaborate with academic institutions to develop advanced technical and vocational courses for youth to meet cement, concrete, construction and allied building material sector skills gaps
- Expand and implement cement sector-oriented skills training programme and vocational training for youth and adults
- Link company-specific skills initiatives to state and national skill development initiatives
- Scale implementation of existing employment-linked training courses (sector agnostic)

### Enhance diversity and inclusiveness

- Increase numbers of women in the workforce at entry, management and board level
- Increase recruitment of workforce members with a disability
- Strengthen policies supporting diversity and inclusion across workforce
- Scale involvement and access to local vendors and suppliers

### Transport safety

- Develop a safety rating system for drivers (similar to Bureau of Energy Efficiency (BEE) energy rating system; Ministry of Transport may consider developing a rating system for drivers/logistics providers, etc.)
- Increase dissemination of journey risk management, safe load and defensive driving training for drivers
- Install in-vehicle monitoring system (IVMS) and GPS-based vehicle tracking system for dedicated fleet
- Extend health and safety measures to market fleet
- Scale health and well-being initiatives for drivers
- Build capacity of transportation and logistics providers







### Circular economy

#### Using waste as resource

- Increase production of blended cements, including composite cement, to optimize use of alternative materials (fly ash/slag/other waste products)
- Increase replacement of virgin raw materials with alternative raw materials/other substitutes (e.g., construction demolition waste, foundry sand, crushed rock fines, refractory bricks, cement kiln dust)
- Scale R&D efforts and innovation to use alternative materials
- Scale efforts to maximize recycling of construction and demolition waste
- Increase sustainable construction practice training and awareness to optimize the use of building materials and other natural resources (e.g., skill building for masons)
- Increase adoption and use of alternative waste-derived fuels (e.g., municipal solid waste (MSW), hazardous wastes, waste tires, others)
- Develop public-private partnership model by working with local urban bodies on waste segregation and management of MSW through co-processing in cement kilns



### Natural resources management

#### Natural resource management

- Develop and monitor detailed biodiversity and ecosystem management plans for all sites and monitor implementation, including closure and site rehabilitation
- Enhance employee awareness and capacity building on biodiversity conservation
- Increase source water vulnerability assessment studies (to identify and assess potential risks that may jeopardize sufficient water availability of desired quality for industrial facilities)
- Scale up rain water harvesting efforts
- Increase use of low-grade limestone and in the process reduce dependency on high-grade limestone and extend quarry life



# Introduction

## What are the Sustainable Developmental Goals?

The Sustainable Development Goals (SDGs) are a collection of 17 Global Goals resulting from a multi-year multi-stakeholder global consultation universally adopted by the 193 United Nations Member States as part of the 2030 Agenda for Sustainable Development. These 17 Global Goals each include specific targets (a total of 169) to achieve by 2030. The SDGs cover environmental, social and economic development issues, including poverty, hunger, health, education, global warming, gender equality, water, sanitation, energy, urbanization, and social justice. Achieving the SDGs not only requires significant efforts by national governments, but also material contributions from the private sector, civil society, communities and individuals.

## What do the SDGs mean for business?

Governments have universally resolved to implement the SDGs. However, they will not be able to realize them without strong private sector engagement: as an engine of economic growth and employment, as a source of investment, and as a driver of technology and innovation.

Aligning with the SDGs presents new strategic opportunities for the sector. The goals provide a framework for the provision of business solutions while addressing some of the cement sector's key needs. Companies that are able to deliver inclusive and sustainable products and services aligned with these ambitions are likely to be more innovative, better at unlocking new market opportunities and attracting the best talent.

The SDGs provide companies with a new lens to analyze and address operational and regulatory risks, as well as a tool to secure a strong and enduring license to operate.

## Why does the Indian cement sector need an SDG Roadmap?

India is the fastest growing major economy in the world today.<sup>2</sup> The country, which is home to 1.3 billion people and 8% of the world's biodiversity, has the potential to contribute to the overall positive impact of and value creation through SDG implementation.

The country is committed to high growth rates to lift its people out of poverty and to the large-scale development of infrastructure and housing as it seeks to move from an emerging economy to a developed one. Swift development is creating opportunities along with social and environmental challenges. Rapid urban expansion and migration to cities have caused housing shortages, particularly for economically weaker sections of society. Existing cumulative housing supplies for all three income groups (low, medium and high) have been grossly inadequate.<sup>3</sup> India's energy consumption will triple by 2030 under a business as usual scenario.<sup>4</sup>

The Indian cement sector has an active role to play in providing solutions to these challenges and helping to realize sustainable growth. India is the second largest producer of cement in the world and has witnessed high growth recently. The Indian cement sector has a track record of implementing initiatives to drive growth and operational excellence. The sector recognizes that cement manufacturing and related operations contribute to climate change. It has taken proactive measures in India, such as producing a Low Carbon Technology Roadmap (LCTR)<sup>5</sup> and implementing its recommendations, resulting in lower emissions intensity. For continued success and long-term value creation, the sector will need to align its long-term sustainability and business strategies with the SDGs.

The Indian Cement Sector SDG Roadmap is an initiative led by nine Indian cement companies convened by the World Business Council for Sustainable Development (WBCSD). This group formed as the Cement Sustainability Initiative (CSI) in India in 2009. As of 1 January 2019, the CSI program moved to the [Global Cement and Concrete Association \(GCCA\)](#). WBCSD continues to lead the work on SDGs and will collaborate with GCCA on the topic going forward.

Transitioning to a more sustainable and resilient cement sector requires an integrated approach that recognizes material sectoral issues, challenges and opportunities for improvement to meet societal needs. The SDGs provide a structured framework to further enhance the good work that the cement sector has already done through the WBCSD's collaborative approach. These companies are leading the way in sustainability by seizing the opportunities that collaboration creates. While the initiative addresses all 17 SDGs in some way, both by the sector and across the value chain, the development of an SDG Roadmap will help to prioritize and coordinate the effort.

### Vision

The Indian cement sector aspires to **demonstrate leadership** by identifying areas where the sector can have the most impact in realizing the SDGs by accelerating **innovation**, scaling successful **stewardship** initiatives, and creating new opportunities for **collaboration**.

### Mission

The Indian cement sector is committed to implementing the Roadmap, measuring progress with clear KPIs and seeking new partnerships to continually evolve and expand the sector's contribution to the SDGs.



## What are the next steps for the Roadmap's implementation?

The Roadmap's implementation requires a shared understanding by all stakeholders of how the SDGs can create shared value, enhance collaboration with key partners and identify new business opportunities. The Indian cement sector has:

- 1. Prioritized SDG targets;**
- 2. Identified impact opportunity themes and drafted key actions for business; and**
- 3. Explored potential partnerships to increase impact.**

The Indian cement sector can use the Roadmap as a tool to influence its value chain partners to further scale and accelerate impact.

## What are the goals of the Roadmap?

In 2017, 23 cement companies came together through the WBCSD's CSI to examine and evaluate the new frameworks set by the SDGs for those areas most critical to the cement and concrete manufacturing sector. Over 100 participants representing cement companies, trade associations, United Nations agencies, non-governmental organizations, financial institutions and multilateral agencies – from more than 30 countries – considered opportunities for collective action by CSI members.

The forum confirmed the need for a collaborative approach to better understand how the sector can enhance engagement to scale up solutions for a sustainable business environment, both in India and worldwide. This Roadmap is an initiative to identify the pathways to take the sector in this direction. The Roadmap will promote:

- The achievement of direct and indirect sector-related SDGs and their targets;
- Dialogue between organizations, sectors and countries through the use of existing networks and platforms;
- The revitalization of sectoral, cross-sectoral and global partnerships; and
- Monitoring and evaluation of the implementation of the SDGs for the sector.



## Approach and methodology

We created this Roadmap by applying the [WBCSD SDG Sector Roadmap Guidelines](#) framework, which provides sectors with a step-by-step process to explore, articulate and realize a common vision for how the sector can contribute to realizing the SDGs.

The Roadmap development process included:

- A literature review of ongoing national and sectoral initiatives in the country and a review of impact opportunities available for the cement sector to contribute to material environmental, social and economic issues.
- The exploration of interactions between the cement sector value chain and the SDGs, including:
  - Identification of the sector's current level of positive and negative impact on the goals and their contributing targets;
  - Assessment of the sector's untapped potential to impact each goal and the potential for accompanying opportunities to create business value; and
- Mapping of SDGs in a materiality matrix to understand sector priorities.
- Interviews and discussions with WBCSD CSI members in India to understand the key successes of and challenges facing the Indian cement sector and also to understand linkages with other sectors.
- Interviews and discussions with key external stakeholders to understand the current and potential future alignment with SDGs throughout the value chain.<sup>6</sup>
- Compilation of information, data and insights obtained through a literature review, interviews, analysis and workshops with WBCSD CSI member companies in India and stakeholders. The workshops established:
  - The Roadmap's vision and purpose;
  - A prioritized list of the significant impact opportunities for the cement sector with respect to the SDGs;
- Short-, medium- and long-term actions to realize impact opportunities;
- Potential partnerships with relevant sectors to create scalable impact;
- Enablers for the effective implementation of actions (outlined under each impact opportunity) to meet the SDGs;
- KPIs for actions outlined under each impact opportunity, to measure and evaluate progress.

This Roadmap presents impact opportunities and actions along with KPIs that the cement sector companies are committed to tracking as a preliminary measure.

### The Indian cement sector will:

1. **establish clear ambitions and targets based on the impact opportunities;**
2. **undertake performance review at a later stage.**





## Cement sector interaction with the SDGs throughout the value chain



### Procurement of raw materials



### Production



### Logistics and support



### End use, restoration and others

- Land and biodiversity
- Selection of raw materials
- Employee welfare
- Local communities
- Occupational health and safety
- Effective management of environmental impacts

- Energy efficiency
- Alternative fuels, raw materials
- Employee welfare
- Local communities
- Reducing GHG emissions and effective management of other environmental impacts
- Occupational health and safety
- Building partnerships

- Partnerships and support for raw materials
- Logistics and transportation
- Reducing GHG emissions
- Employee welfare
- Building partnerships
- Local communities

- Sustainable and innovative products and product information
- Circular economy
- Learning and development
- Building partnerships to enhance a circular economy



Photo credit: Ambuja Cements

# The cement sector and the SDGs





# Sector overview - Introduction

## Background

India is the second largest producer of cement in the world. India's cement sector plays a vital role in its economic growth and provides direct employment to more than one million people and many more indirect jobs across the country. It employs about 20,000 people<sup>7</sup> downstream for every million tonnes of cement produced.

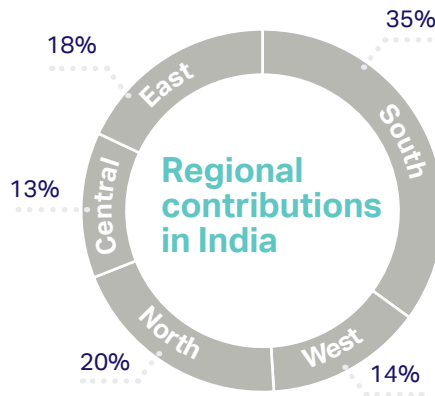
The Indian government deregulated the cement sector in 1982 and the sector has since attracted large investments from both Indian and foreign investors. The availability of raw materials locally to manufacture cement has also been a key factor enabling the sector's growth.



## Production capacity:

Production capacity for the sector is approximately 500 million tonnes. The [Cement Manufacturers Association \(CMA\)](#) estimates that this will increase to nearly 550 million tonnes by 2020. The top 20 cement companies in India account for almost 70% of total cement produced. Some 99% of installed capacity lies with the private sector.

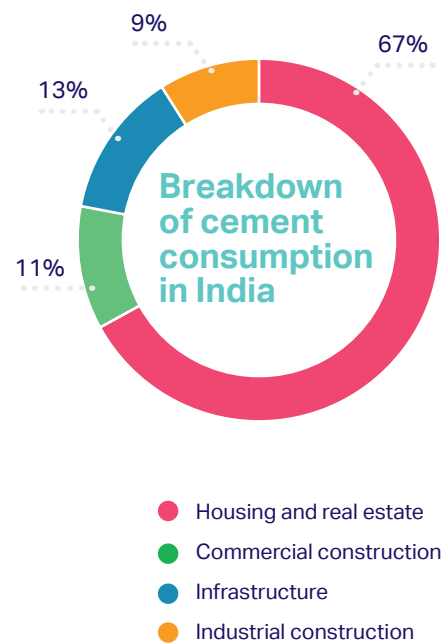
There are 210 large cement plants in India, which account for 500 million tonnes of installed capacity, while 350 mini-cement plants make up the rest. Of the large plants, 77 are located in three of India's 29 states: Andhra Pradesh, Rajasthan and Tamil Nadu.



Southern India contributes the most to installed capacity, with 35%, followed by northern India at 20%.

## Demand and consumption:

The cement demand is expected to grow by 7-8% in 2019.<sup>8</sup> As such, with the rising demand for cement and the development of large infrastructure and construction projects, the CMA expects the Indian cement sector to benefit substantially and continue to grow fast over the next few years.



The housing and real estate sector accounts for approximately 67% of total cement consumption in India.

## Investments

With growing demand owing to increased construction and infrastructure activities, the cement sector in India has seen substantial investments and developments in recent years. According to data released by the Department of Industrial Policy and Promotion (DIPP), cement and gypsum products attracted foreign direct investments (FDI) worth USD \$5.26 billion between April 2000 and June 2018.

## Key investments in the Indian cement sector include the following:

- Existing key players are making robust investments in enhancing production capacity over the next three to four years;
- Many players are planning to expand and strengthen their presence in India's eastern, southern and western markets;

- Cement players are opting for inorganic growth or brownfield acquisitions to speed up capacity expansion and achieve cost efficiency.

## Facts and figures

- The Indian cement sector accounts for approximately 8% of global cement production. The CMA estimates that cement production in India will reach **1.360 billion tonnes** annually by 2050.
- The cement sector is the **fifth-largest contributor to India's economy**, bringing in INR 105.44 billion (USD \$1.52 billion) in excise taxes in 2015-16.
- Cement deliveries are the **second largest revenue source for Indian Railways**, contributing INR 69 billion (USD \$0.99 billion) per annum in freight revenue in fiscal year 2017-18.<sup>9</sup>
- The Indian cement sector is a **leading employment provider** in the manufacturing sector contributing to **1 million** direct employment opportunities. The sector employs about **20,000 people downstream for every 1 million tonnes of cement produced and consumed**.<sup>10</sup>
- Indian cement companies have defined their corporate social responsibility (CSR) policies and focus areas and are implementing CSR programs focusing on their operational sites and on a broader geographic scale. Key themes for CSR projects include:
  - a) healthcare – sanitation, drinking water, HIV/AIDS;
  - b) education – skill enhancement initiatives;
  - c) gender equality and women's empowerment;
  - d) environmental protection; and
  - e) rural development and livelihoods.

The sector's **contribution to CSR has often exceeded the mandatory 2% of net profit**.<sup>11</sup>

- **Investments made into CSR activities** in the 2016-17 financial year amounted to **INR 2.2 billion** (USD \$ 0.03 billion),<sup>12</sup> or 3.7% of after-tax profits. Of this total, companies spent 38% on education and training and 23% on healthcare and sanitation. The Indian cement sector has implemented several CSR initiatives,<sup>13</sup> including:
  - Planting nearly **50 million trees**;
  - The sector adds over **1,200 hectares** of forest every year.<sup>14</sup>
  - The creation of more than **60 water bodies** in drought-prone areas for rainwater harvesting;
  - The adoption of more than **700 neighborhood villages** for the provision of basic education, primary healthcare, water supply and clean environment; and
  - The establishment of **225** primary and secondary **schools** and financing of **25 colleges**.



Photo credit: UltraTech

- By adopting state-of-the-art technological interventions, innovative production techniques and climate-resilient resource optimization measures, cement manufacturers in India are gradually integrating sustainability principles within their growth aspirations. Some examples of how the sector has integrated **energy efficiency and low-carbon transition**:
  - Indian cement companies top the Carbon Disclosure Project (CDP) table owing to the reduced carbon footprint in their cement production process.<sup>15</sup> This is in part due to better access to alternative materials from other carbon-intensive sectors. The sector also benefits from newer and more efficient cement plants driven by high market growth in the region.
  - The cement sector is a significant player in the Bureau of Energy Efficiency's (BEE) ongoing Perform, Achieve and Trade (PAT) scheme for energy savings and one of the best performing sectors in energy efficiency. The sector has achieved the PAT Cycle Reduction target by about 1.81 times by reducing 1.48 Mtoe (million tonnes of oil equivalent) compared to the target of 0.815 Mtoe. The sector has already **surpassed the targets of the government's PAT scheme by 80%**, making it one of the most energy-efficient globally.<sup>16</sup>
  - Specific energy consumption achieved by some Indian cement plants – at 676 kcal/kg of clinker and 63.9 kWh/tonne of cement – are comparable to those of the best in the world; the sector's **best performing plants consume 19% less energy than the global average**.
  - Indian cement companies have identified and implemented energy-efficiency solutions, exceeding the anticipated savings identified in the *Low-Carbon Technology Roadmap* (LCTR) developed in 2013 by WBCSD and the International Energy Agency (IEA).



- The Indian cement sector is on track to meet its 2030 LCTR targets. **Direct CO<sub>2</sub> emission intensity fell by 5%** in 2017 in the Indian cement sector compared to the 2010 baseline. The sector reduced its carbon dioxide emission intensity, including onsite captive power plant (CPP) power generation, by 6.8% compared to the 2010 baseline. The alternative fuels thermal substitution rate (TSR) increased 5-fold from 2010 to 2017. **The sector consumed more than 1.2 million tonnes of alternative fuels** in 2017.<sup>17</sup> The sector is looking at **investments of between INR 2 trillion (USD \$30 billion) and INR 3.8 trillion (USD \$50 billion)** to achieve the CO<sub>2</sub> emission reduction target envisaged for 2050.<sup>18</sup>
- The sector **reduced its direct CO<sub>2</sub> emission intensity** by 32 kgCO<sub>2</sub> per tonne of cement to **588 kgCO<sub>2</sub>** per tonne in 2017, mainly due to increased use of alternative fuel and blended cement production, coupled with a reduction in the clinker replacement factor.<sup>19</sup>
- The CMA estimates the waste heat recovery (WHR) potential of the Indian cement sector at 800 MW and the present installed capacity at approximately 307 MW.
- The Indian cement sector is the largest consumer of fly ash produced by India's thermal power plants annually. It also consumes almost 100% of slag produced by India's steel plants. The sector is enhancing **resource efficiency** efforts for blending and the use of alternative fuels, as well as the implementation of waste heat recovery systems.
- **Over 95%** of manufacturing plants have taken on **water stewardship, transitioning from wet/semi-wet production practices to dry processes**. Almost 99% of installed capacity in India uses dry process manufacturing; companies have installed half of this capacity in the last 10 years.
- The Indian cement sector has been steadily progressing in using **waste as a resource** through the substitution of alternative fuels and raw materials (AFRs) over the years. Apart from the large-scale use of wastes such as fly ash and slag in cement manufacturing, AFRs include the use of different kinds of hazardous and non-hazardous wastes. This reflects the sector's commitment to the Swachh Bharat Abhiyan (Clean India) nationwide campaign that aims to clean up the streets, roads and infrastructure of India's cities, towns and rural areas. The waste management rules give preferential status to co-processing and have allowed many types of hazardous and non-hazardous wastes to be co-processed without the need for companies to undertake co-processing trials. Of particular note:
  - The number of cement plants using **AFRs** has increased from 12 plants in 2010 to **59 plants** in 2016.
  - The AFR **thermal substitution rate increased** from 0.6% in 2010 to **4%** in 2016. This accounts for **1.6 MT of alternative fuel use** in the Indian cement sector. Current AFR substitution levels **save 1.1 million tonnes of coal per annum**, which is 0.5 million tonnes of oil equivalent.

Picture: Carbon sequestration through algae cultivation



Photo credit: Ambuja Cements

# Future outlook – Establishing opportunities

India's built environment needs in housing, transportation and infrastructure for 2030 is yet to take shape.

This phase of urban transformation represents significant opportunities for domestic and international investments. Further, the India Brand Equity Foundation expects India's real estate sector to contribute 13% to the country's GDP by 2025 and to reach a market size of INR 69 trillion (USD \$0.99 trillion) by 2030.<sup>20</sup> India's cement industry will play a pivotal role in this future growth path as cement is paramount to infrastructure development, with an estimated cement production of 1.36 billion tonnes by 2050 in the country.<sup>21</sup>

The outlook for the cement sector is stable and the sector expects overall demand to increase.

Cement demand in India stems from three main sectors: housing and real estate, public infrastructure and industrial development. National initiatives such as Housing for All, projects like dedicated freight corridors and ports, metro rail and smart cities, and growth of the industrial sector are the key drivers and opportunities for the cement sector in India.

The factors below have informed the impact opportunities for the Indian cement sector. The section on impact opportunities sets out the related actions.

## Demand for green built environment

An estimated 40% of the country's population will reside in urban areas by 2030. This would require the addition of 700 to 900 million square meters of urban (residential and commercial) space every year.<sup>22</sup> The World Economic Forum estimates that India's green building market will double by 2022,<sup>23</sup> supported by growing awareness and policy provisions. India's Nationally Determined Contributions (NDCs) to the Paris Climate Agreement require a 33-35% decrease in annual greenhouse gas (GHG) emissions by 2030,<sup>24</sup> further emphasizing the need to green the built environment.

## Government initiatives

The Government of India has established major plans for investments in housing and infrastructure development.

The government expects these plans to significantly boost cement demand in the country and support the growth of a sustainable Indian cement sector. Some initiatives include the following:

- **Allocation in budget 2018-19:**  
The Union Budget has allocated USD \$92.22 billion for infrastructure development in 2018-19 (compared to USD \$76.31 billion in 2017-18).
- **Affordable housing fund:**  
In the 2018-19 budget, the Government of India announced the setting up of a USD \$3.86 billion Affordable Housing Fund under the National Housing Bank (NHB) to provide credit to homebuyers.
- **Pradhan Mantri Awas Yojana – Gramin scheme:** The government has proposed the outlay of USD \$5.097 billion to build 4.9 million houses under the Pradhan Mantri Awas Yojana – Gramin scheme in the Union Budget 2018-19.
- **Infrastructure development:**  
The government has a strong focus on infrastructure development to boost economic growth, including:
  - **Dedicated freight corridors:**  
The government expects infrastructure projects such as dedicated freight corridors and new and upgraded airports and ports to further drive construction activity.
  - **Rural road and rail networks:**<sup>25</sup>  
The government also plans to extend its rural road network scheme connecting all eligible habitations under Phase III of Pradhan Mantri Gram Sadak Yojana (Prime Minister's Rural Road Scheme), renovate about 600 railway stations and suburban railway infrastructure, and renew 26,000 km of railway lines.

- **Metro rail expansion:**  
As of March 2019, India has 638.91 km of operational metro lines; the metro rail projects in Mumbai, Bangalore and Hyderabad are in the expansion phase, aiming to add approximately 500 km of rail lines by 2021-22.
- **Smart cities mission:**  
This initiative by the Government of India aims to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens. This initiative currently covers 100 smart cities.
- **Bharatmala project:**  
This is a new umbrella program for the highway sector focuses on optimizing freight efficiency and passenger movement across the country by bridging critical infrastructure gaps through effective interventions such as the development of economic corridors, inter corridors and feeder routes, national corridor efficiency improvements, border and international connectivity roads, coastal and port connectivity roads, and greenfield expressways. The government intends to build 83,677 km of roads, spending INR 6.92 trillion over the next five years.
- **Expansion/addition of airports:**  
The International Air Transport Association estimates that the Asia-Pacific region will drive the largest growth in terms of total new passengers, with India taking third place globally.<sup>26</sup> To keep up with rising demand, the Government of India is planning to increase the budget for the development of new airports and the expansion/modernization of existing ones. Airport modernization and connectivity projects are underway across major cities.



## Logistics and connectivity

Indian Railways recorded its highest ever total loading of cement and clinker, at 114 million tonnes in a year, and highest ever incremental loading, at 9.26% in 2017-18. The rise in the share of road transportation has increased from 36% of total dispatches in the 1980s to over 65% in 2017-18.

A majority of cement plants now have their own truck fleets and could benefit from the government's enhancement of road infrastructure. Also, the cement sector is keen to promote the bulk loading of cement and fly ash for more efficient handling (bulk wagons carry 40-50% more cement), leading to faster loading and evacuation, thus improving turnaround time. This development fosters faster growth of the Indian cement sector to address upcoming market demand while boosting GDP growth.



# Method and approach for prioritization of SDGs

The Roadmap is the first collective initiative by the Indian cement sector to extensively map and prioritize the 17 SDGs and their 169 targets in the context of the sector as a whole. Although the cement sector can contribute to all 17 SDGs, this Roadmap seeks to go deeper and identify the SDGs – and the respective targets thereunder – where the cement sector has the most potential to drive transformation and innovation while having a lasting SDG impact. We completed this prioritization exercise collaboratively with the involvement of participating cement sector companies and representatives from industry associations, WBCSD and external experts.

## We undertook six activities:

1. Exploration of how the cement sector value chain interacts with each SDG;
2. Identification of the sector's current level of positive and negative impact on the SDGs;
3. Assessment of the sector's untapped potential to impact each goal and the potential for accompanying opportunities to create business value,
4. Mapping of SDGs in a materiality matrix to understand sector priorities;
5. Interviews and discussions with WBCSD CSI member companies in India to understand the key successes and challenges facing the Indian cement sector and also to understand sustainability inter-linkages with other sectors; and
6. Interviews and discussions with key external stakeholders to understand the sector's current level of alignment with SDGs throughout the value chain.


We completed the activities above at the SDG target level based on participants' knowledge of the sector and third-party industry expertise, alongside published literature. We conducted further discussions with WBCSD CSI member companies in India, presenting information, data and insights obtained through literature review, interviews and discussions with stakeholders and with member companies reviewing a list of prioritized SDG targets.

We mapped a final list of 19 SDG targets across 12 SDGs against eight impact opportunities where the sector has the most potential to contribute to the SDGs. For each of the impact opportunities, WBCSD CSI member companies agreed on the key indicators that will be used to monitor progress and on the time frame for taking action.

Below, a prioritized list of sub-targets and associated SDGs mapped against finalized impact opportunities.


## List of SDG targets prioritized for the Cement Sector Roadmap

**5 GENDER EQUALITY** 5.5



- Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.

**6 CLEAN WATER AND SANITATION** 6.4



6.5

- By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.
- By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

**7 AFFORDABLE AND CLEAN ENERGY** 7.3



- By 2030, double the global rate of improvement in energy efficiency.

**8 DECENT WORK AND ECONOMIC GROWTH** 8.5



- By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.

## List of SDG targets prioritized for the Cement Sector Roadmap

<div data-bbox="156 479 392 633">  <p>9.4</p> <p>9.5</p> </div> <ul style="list-style-type: none"> <li>By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.</li> <li>Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.</li> </ul>	<div data-bbox="628 479 865 633">  <p>10.4</p> </div> <ul style="list-style-type: none"> <li>Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality.</li> </ul> <div data-bbox="628 831 865 985">  <p>11.2</p> <p>11.6</p> </div> <ul style="list-style-type: none"> <li>By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.</li> <li>By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.</li> </ul>	<div data-bbox="1106 479 1342 633">  <p>12.2</p> <p>12.4</p> <p>12.5</p> </div> <ul style="list-style-type: none"> <li>By 2030, achieve the sustainable management and efficient use of natural resources.</li> <li>By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.</li> <li>By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.</li> </ul>
<div data-bbox="156 1464 392 1619">  <p>13.1</p> <p>13.a</p> <p>13.2</p> </div> <ul style="list-style-type: none"> <li>Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.</li> <li>Integrate climate change measures into national policies, strategies and planning.</li> <li>Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.</li> </ul>	<div data-bbox="1106 1464 1342 1619">  <p>15.2</p> </div> <ul style="list-style-type: none"> <li>By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.</li> </ul>	



# Impact opportunities

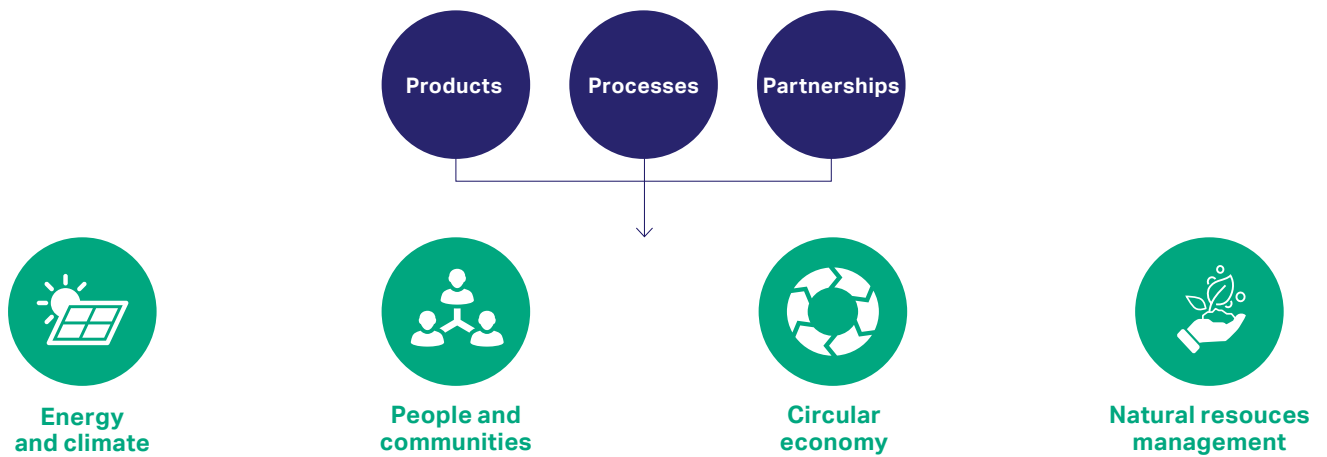


WBCSD CSI member companies in India identified 19 targets under 12 SDGs as priority engagement areas for the sector. They identified these areas with the understanding that interdependencies exist across all the SDGs and specific contributions related to one goal and target can potentially contribute positively or negatively to other goals. This is something that the sector should remain conscious of and alert to moving forward. For the selection of key impact opportunities for the sector, we included the following screening criteria:

- Additionality principles, e.g., thinking beyond business-as-usual (BAU) scenarios in setting targets;
- Sector leadership roles;
- Possibilities/potential for collaboration and partnerships;
- Consideration of possible barriers, enablers and accelerators; and
- Setting of KPIs to allow easy tracking of Roadmap implementation progress and broader business benefits for the companies.

Based on these screening criteria, WBCSD CSI members identified four themes that are most critical to aligning the sector's growth and success with India's sustainable development:

1. **energy and climate;**
2. **people and communities;**
3. **circular economy; and**
4. **natural resource management.**



### Impact opportunities across key SDGs for the sector



Although the member companies did not identify SDG 17 (Partnerships for the goals) as a priority goal, the spirit of partnership and collaboration that it embodies is a recurring theme throughout this Roadmap and indeed is central to the exercise of undertaking a sector Roadmap itself.

# Description of the cross-cutting priorities

The Indian cement sector envisions strong, inclusive and sustainable growth for the country. This Roadmap identifies multiple high-potential impact opportunities; three cross-cutting priorities that companies must achieve to maximize impact intersect these opportunities. These priorities will be critical to the sectoral interventions as introduced below.

## Human rights

Ensuring corporate respect for human rights is the starting point for delivering the Roadmap. The Indian cement sector must follow the United Nations Guiding Principles on Business and Human Rights<sup>27</sup> and the Indian National Guidelines on Responsible Business Conduct.<sup>28</sup> This will further enhance the integration of social responsibility elements in all future sector actions and will help the sector to maximize its potential to drive positive impacts on people throughout the value chain.



## Low-carbon economy

Spurred by the Paris Climate Agreement, the transition to a low-carbon economy is beginning to transform industries worldwide. The scale of challenges posed by climate change will require the sector to adopt holistic thinking and embrace systemic change.

The Indian cement sector represents about 7% of the country's energy and process CO<sub>2</sub> emissions and is the largest industrial emitter.<sup>29</sup> Given this background and the growing need to safeguard the future, the Indian cement sector has been taking proactive measures to carve out a low-carbon pathway for the sector, under the aegis of the 2013 [Low-Carbon Technology Roadmap \(LCTR\)](#) for the Indian cement sector. Since 2010, WBCSD CSI members in India have been acting to reduce CO<sub>2</sub>.

The sector's direct CO<sub>2</sub> emissions intensity (kgCO<sub>2</sub>/t cement) went down by 32 kgCO<sub>2</sub>/t cement to 588 kgCO<sub>2</sub>/t cement in 2017 compared to the 2010 baseline year. With this reduction, the sector has already achieved the objectives for 2020 as projected in the LCTR. The sector will now be making significant efforts to reach the additional 40% reduction required to meet the 2050 objectives.

Aptly designed modern concrete buildings can use 75% less energy throughout their life cycle. The cement sector has a major role to play in providing low-carbon products to the construction and infrastructure sector, thus catalyzing sustainable growth and reducing greenhouse gas (GHG) emissions across multiple value chains and across a building's life cycle.

## Innovation in processes, products and services and technology

The sector is continually looking for opportunities to improve the quality of its products and reduce its environmental and social impacts. Embracing technological advances and innovations is the way forward in accelerating operational excellence. Digitalization is essential to achieving operational efficiency, transparency and real-time visibility. This trend promises across-the-board changes in various aspects of manufacturing, ranging from quality control to overall supply chain efficiency.

Some cement companies have begun to apply digital technologies in their operations. Some of the applications that they have already implemented or tested include automated vehicle management, fuel management, centralized monitoring and control of operations, automated cement packaging, live tracking of orders, sensor-based technologies, and drone technology deployment to avoid overloading of wagons.

Indian industry is starting to apply artificial intelligence (AI), machine learning and digitalization, seeing benefits in operational efficiency, transparency and real-time visibility. These technologies offer great potential in energy performance, reuse of materials, protection and restoration of natural resources, and building resilient infrastructure. To derive larger benefits from these projects, companies must also invest in training their staff on the above technologies to further improve process efficiency.

Further, a host of integrated digital solutions are available for cement companies to adopt at a larger scale in the areas of plant production control, process control, process optimization, quality control, laboratory management, and the installation of smart instrumentation within operations.

It is essential to counterbalance the negative impacts on job availability within and outside the sector that may occur due to these technological innovations.



# Impact opportunities

The Indian cement sector can only realize the impact opportunities identified in this section at the scale necessary to make a significant contribution to the SDGs through timely, continued and combined efforts. With a view to advancing these impact opportunities and fulfilling the potential that they represent, this Roadmap also identifies a series of short-, medium- and long-term actions that constitute “action pathways” to deliver each opportunity and to inspire the sector to pursue tangible progress on the SDGs.

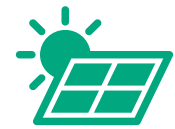
The proposed timelines (short-term (S), medium-term (M) and long-term (L)) indicate the timeframe by which the actions will begin to show expected outcomes. Short-term actions will typically show results within one to three years and long-term actions will show results by 2030 and will be based on the success of reaching medium-term results.<sup>30</sup>

The actions also present KPIs that will help the sector track progress on achieving SDG objectives.

The actions take into account known barriers to implementation and deployment, potential solutions and ways to accelerate SDG impact. We have established the agreed actions (as presented in each of the impact opportunities) based on the sector’s understanding of ways to create step-change impact in one or more prioritized SDGs. The tables across the following pages highlight the final actions for each thematic area. Each action links to the SDGs and targets to which it most profoundly contributes. Furthermore, each action establishes external support and categorizes such support in terms of the technical, financial and legal support that companies may require to make tangible progress on successfully achieving identified actions.



# Energy and climate



## Transition to low-carbon and sustainable transportation and logistics

The requirement to move both raw materials and finished goods in large volumes drives the cement sector's transport intensive nature. The inward movement of input materials, particularly coal, gypsum, slag and limestone and the outward movement of the finished product to consumption centers require huge transportation volumes.

In addition, some raw materials, such as cement-grade limestone, are available in only a few locations in the country, which lengthens transport routes. Transportation accounts for about 20% of the retail price of cement.

As the industry decarbonizes its plant operations, transport will continue to take up an increasing proportion

of the sector's GHG impact unless the industry takes action. Therefore, the industry is working on solutions to reduce transport-related emissions and expects to make significant progress in terms of reducing emissions related to heavy and long-distance haulage. Select actions for the transition to low-carbon and sustainable transportation include the following:

### Low-carbon transportation and logistics - Actions

Value chain: Transportation and logistics					
Actions	Indicators	Key partners	Enablers	SDG targets involved	Timelines
<ul style="list-style-type: none"> <li>Augment the rail, marine and other inland waterway-based transport</li> <li>Encourage long-term contracts with Indian Railways</li> </ul>	<ul style="list-style-type: none"> <li>Percentage increase in rail, marine and inland waterway-based transport</li> <li>Percentage reduction in Scope 3 emissions</li> </ul>	<ul style="list-style-type: none"> <li>Indian Railways</li> <li>Transport and logistics providers;</li> <li>Suppliers and transport associations</li> <li>Ministry of Road Transport and Highways</li> <li>Cement Manufacturers Association (CMA)</li> </ul>	P	<div style="background-color: #f96; padding: 2px;">9.5</div> <div style="background-color: #f96; padding: 2px;">11.6</div> <div style="background-color: #2e8b57; color: white; padding: 2px;">13.2</div>	M
<ul style="list-style-type: none"> <li>Increase use of low-carbon fuels for road transport</li> <li>Encourage rail/road transportation to transition to greater use of electric energy/renewable sources</li> </ul>	<ul style="list-style-type: none"> <li>Percentage of transport operations transitioning to low-carbon fuels</li> <li>Percentage reduction in Scope 1 emissions (for own fleet)</li> <li>Percentage reduction in Scope 3 emissions (for market fleet)</li> <li>Change in Scope 2 emissions (for own fleet)</li> </ul>	<ul style="list-style-type: none"> <li>Transport and logistics providers</li> <li>Suppliers</li> <li>Transport associations</li> <li>Ministry of Road Transport and Highways</li> <li>CMA</li> <li>Ministry of Oil &amp; Gas</li> <li>Ministry of Power</li> </ul>	P T	<div style="background-color: #f96; padding: 2px;">9.5</div> <div style="background-color: #f96; padding: 2px;">11.6</div> <div style="background-color: #2e8b57; color: white; padding: 2px;">13.a</div>	M
<ul style="list-style-type: none"> <li>Scale up efforts for gradual transition to bulk transport (e.g., construction of bulk cement terminals)</li> <li>Scale efforts to build new plants near waterways or rail networks to reduce and share the load of road transport</li> <li>Scale efforts to localize and integrate supply chains and optimize transport routes</li> <li>Scale use of locally sourced alternative fuels</li> </ul>	<ul style="list-style-type: none"> <li>Percentage reduction in Scope 3 emissions</li> </ul>	<ul style="list-style-type: none"> <li>CMA</li> <li>Transport associations</li> <li>Ministry of Road Transport and Highways</li> <li>Local municipal authorities and waste management authorities</li> <li>CMA &amp; Confederation of Indian Industry – Indian Green Building Council (CII-IGBC)</li> </ul>	P	<div style="background-color: #f96; padding: 2px;">9.5</div> <div style="background-color: #f96; padding: 2px;">11.6</div> <div style="background-color: #2e8b57; color: white; padding: 2px;">13.a</div>	L
<ul style="list-style-type: none"> <li>Incentivize and build the capacity of suppliers to reduce their carbon footprint</li> <li>Encourage transportation and logistics providers to define carbon reduction targets</li> </ul>	<ul style="list-style-type: none"> <li>Number of capacity building programs for transport and logistics providers on transportation efficiency, carbon footprint reduction</li> <li>Percentage reduction in Scope 3 emissions</li> </ul>	<ul style="list-style-type: none"> <li>Transport and logistics providers</li> <li>Suppliers</li> <li>Transport associations</li> <li>Training institutes</li> </ul>		<div style="background-color: #f96; padding: 2px;">11.6</div> <div style="background-color: #2e8b57; color: white; padding: 2px;">13.a</div>	M

**Enablers** The sector would require policy support for marine and waterway-based transport, biofuels/blending, electric mobility and the use of alternative fuel (compressed natural gas (CNG)/hybrid/biofuel). Further access to affordable technology to upgrade the existing fleet to consume alternative fuels cost-effectively and the provision of government financial support to small fleet owners to upgrade their fleet vehicles and in promoting clean energy would be essential. CMA, IGBC and consumer awareness would play a big role in the shift to bulk transfers.



## Energy and climate

### Resilient and sustainable built environment

The intensifying physical impacts of climate change pose major risks to the real estate and infrastructure industry. It is increasingly evident that climate change has impacted seasonal temperature patterns, sea levels,

and the intensity and frequency of extreme weather events. In view of this emerging megatrend and its implications on the built environment, the development of resilient and sustainable infrastructure is critical.

The country's investments in new infrastructure and smart cities present tremendous potential to integrate sustainable and resilient features.

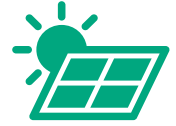
### Resilient and sustainable built environment (infrastructure and housing) - Actions

Value chain: Cement sector customers (real estate and infrastructure)					
Actions	Indicators	Key partners	Enablers	SDG targets involved	Timelines
<ul style="list-style-type: none"> <li>Scale research and development efforts to develop sustainable and resilient building products</li> </ul>	<ul style="list-style-type: none"> <li>Number of products developed and percent net sales from such solutions</li> <li>Number of green building/ infrastructure projects with features to withstand physical risks of climate change (challenges for cement companies to access to this data)</li> </ul>	<ul style="list-style-type: none"> <li>Construction and real estate companies</li> <li>Green building associations – CII Green Business Centre (GBC) and IGBC</li> <li>Global cement associations (Europe, UK, others)</li> <li>World Cement and Concrete Association (WCCA)</li> <li>CMA</li> </ul>	<ul style="list-style-type: none"> <li>P</li> <li>T</li> </ul>	<ul style="list-style-type: none"> <li>9.5</li> <li>13.1</li> </ul>	<ul style="list-style-type: none"> <li>L</li> </ul>
<ul style="list-style-type: none"> <li>Collaborate with the construction and infrastructure sector to develop climate-resilient infrastructure, provide customized solutions and durable and resilient building materials (cement)</li> </ul>	<ul style="list-style-type: none"> <li>Number of infrastructure and housing sector projects executed with integrated features for enhanced climate resilience</li> </ul>	<ul style="list-style-type: none"> <li>Research and academic institutions</li> <li>National Council for Cement and Building Materials (NCBM)</li> <li>Bureau of Indian Standards</li> <li>Investors (mobilizing investment in climate resilient structures)</li> <li>CMA</li> </ul>	<ul style="list-style-type: none"> <li>P</li> <li>T</li> </ul>	<ul style="list-style-type: none"> <li>9.5</li> <li>13.1</li> </ul>	<ul style="list-style-type: none"> <li>L</li> </ul>
<ul style="list-style-type: none"> <li>Partner with research institutions to develop sustainable and innovative products</li> </ul>	<ul style="list-style-type: none"> <li>Number of innovative products/ solutions launched in the market/ market share</li> <li>Percentage reduction in Scope 3 emissions</li> </ul>	<ul style="list-style-type: none"> <li>Research and academic institutions</li> <li>NCBM</li> <li>Bureau of Indian Standards</li> <li>Investors (mobilizing investment in climate resilient structures)</li> <li>CMA</li> </ul>	<ul style="list-style-type: none"> <li>T</li> </ul>	<ul style="list-style-type: none"> <li>9.5</li> <li>13.1</li> </ul>	<ul style="list-style-type: none"> <li>M</li> </ul>
<ul style="list-style-type: none"> <li>Scale sustainable building product portfolios (e.g., roofs, building envelope solutions)</li> </ul>	<ul style="list-style-type: none"> <li>Number of innovative products/ solutions launched in the market/ market share</li> <li>Percentage reduction in Scope 3 emissions</li> <li>Percentage of revenue from sustainable products</li> </ul>	<ul style="list-style-type: none"> <li>Research and academic institutions</li> <li>NCBM</li> <li>Bureau of Indian Standards</li> <li>Investors (mobilizing investment in climate resilient structures)</li> <li>CMA</li> </ul>	<ul style="list-style-type: none"> <li>P</li> <li>T</li> </ul>	<ul style="list-style-type: none"> <li>9.5</li> <li>13.1</li> </ul>	<ul style="list-style-type: none"> <li>M</li> </ul>

**Enablers** This would require investments in R&D for the development of sustainable building products and related solutions and to bring them to market. It would also require policy support to influence demand for these products and to encourage innovative product manufacturing.

- Enablers** P Policies T Technology F Finance  
**Timeline** L Long-term M Medium-term S Short-term





## Energy and climate

### Energy efficiency and use of clean energy

India currently ranks among the top energy consumers in the world.<sup>31</sup> With India's population and GDP expected to grow in the future, energy demand will rise significantly, along with associated GHG emissions. Fossil fuels are the main source of energy generation and as such are a major contributor to GHG emissions and to climate change. The Intergovernmental Panel on Climate Change (IPCC) now projects

that the average temperature globally will increase by 3°C - 6°C by the end of century.<sup>32</sup> To relieve pressure on energy supplies and reduce carbon emissions, it is essential to move to a more efficient and cleaner energy system. Countries will likely use various mechanisms to drive this transformation. The Indian cement industry is a significant contributor to GHG emissions (almost 7% of the country's emission footprint).

It has also played a leadership role in reducing carbon emissions through the implementation of the Low-Carbon Technology Roadmap, including: the adoption of state-of-the-art technological interventions; innovative production techniques; and climate-resilient resource optimization measures. The sector must maintain and enhance efforts to achieve energy efficiency and low-carbon growth on an ongoing basis moving forward.

### Energy efficiency and use of clean energy - Actions

Value chain: Operations					
Actions	Indicators	Key partners	Enablers	SDG targets involved	Timelines
<ul style="list-style-type: none"> <li>Increase use of renewable energy in manufacturing units</li> </ul>	<ul style="list-style-type: none"> <li>Total installed renewable energy capacity</li> <li>Percentage increase in renewable energy generation</li> <li>Percentage reduction in Scope 1 and Scope 2 emissions</li> </ul>	<ul style="list-style-type: none"> <li>Renewable energy technology providers</li> </ul>	<ul style="list-style-type: none"> <li>P</li> <li>T</li> </ul>	<ul style="list-style-type: none"> <li>7.3</li> <li>13.2</li> </ul>	<ul style="list-style-type: none"> <li>M</li> </ul>
<ul style="list-style-type: none"> <li>Improved thermal and electrical energy efficiency in manufacturing units</li> </ul>	<ul style="list-style-type: none"> <li>Specific thermal energy</li> <li>Specific electrical energy</li> </ul>	<ul style="list-style-type: none"> <li>Research and development organizations</li> <li>Industrial bodies</li> <li>Technology providers</li> <li>Ministry of Power</li> </ul>	<ul style="list-style-type: none"> <li>P</li> </ul>	<ul style="list-style-type: none"> <li>7.3</li> <li>13.2</li> </ul>	<ul style="list-style-type: none"> <li>M</li> </ul>

**Enablers** Policy support will help the sector accelerate the adoption of renewable energy. Currently, cement companies face challenges in terms of obtaining approvals for group captive or open access in certain states.







# People and communities

## Skills enhancement



Cement manufacturing has changed dramatically in India in the last 20 years. It is essential to upgrade the knowledge and skills of the workforce in order to keep pace with the changes in cement manufacturing technology, machinery and input materials, and to tackle new process-related problems that may arise. Further, the sector's future will demand additional

technical workers at all levels trained in the operation and management of modern cement plants. Currently, the sector is experiencing a deficit in its trained workforce, which is causing an adverse impact on the sector's growth. Collaboration with academia and institutions to enhance skills and initiatives and policy support from state and union governments are essential

to running these programs. It is also indispensable to define the shared objectives of the industry in specific markets to avoid duplication of efforts and increase the impact and coverage of programs. Furthermore, upskilling benefits the people as it helps to future-proof their careers and provides them with enhanced earning opportunities.

## Skills enhancement - Actions

Value chain: Cement manufacturing and entire value chain					
Actions	Indicators	Key partners	Enablers	SDG targets involved	Timelines
<ul style="list-style-type: none"> <li>Collaborate with academic institutions to develop advanced technical and vocational courses for youth in order to bridge the present gap that exists in sector-specific skills required for the cement, concrete, construction and allied building materials sector</li> </ul>	<ul style="list-style-type: none"> <li>Number of new advanced technical courses developed for the sector <i>(Note: Courses that address the upcoming sustainability challenges for the sector, such as technology for the development of sustainable products)</i></li> </ul>	<ul style="list-style-type: none"> <li>National Council for Cement and Building Materials (NCB)</li> <li>Engineering colleges/universities</li> </ul>		<div style="background-color: #c00000; color: white; padding: 2px; text-align: center;">4.4</div> <div style="background-color: #c00000; color: white; padding: 2px; text-align: center;">8.5</div>	<div style="background-color: #000080; color: white; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">S</div>
<ul style="list-style-type: none"> <li>Expand and implement cement sector-oriented skills training program and vocational training for youth and adults</li> </ul>	<ul style="list-style-type: none"> <li>Number of workshops, seminars conducted on cement sector-specific technical and vocational needs</li> <li>Number of graduate engineers covered by technical and sector-oriented training</li> </ul>	<ul style="list-style-type: none"> <li>National Council for Cement and Building Materials (NCB)</li> <li>Engineering colleges/universities</li> <li>State- and national-level skills institutes</li> </ul>		<div style="background-color: #c00000; color: white; padding: 2px; text-align: center;">4.4</div> <div style="background-color: #c00000; color: white; padding: 2px; text-align: center;">8.5</div>	<div style="background-color: #000080; color: white; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">S</div>
<ul style="list-style-type: none"> <li>Link company-specific skills initiatives to state and national skill development initiatives</li> <li>Scale up implementation of existing employment-linked training courses (sector agnostic)</li> </ul>	<ul style="list-style-type: none"> <li>Number of candidates covered by employment-linked training courses</li> </ul>	<ul style="list-style-type: none"> <li>State- and national-level skills institutes</li> <li>National Skill Development Corporation (NSDC)</li> <li>Skill and Entrepreneurship Development Institute (SEDI)</li> </ul>		<div style="background-color: #c00000; color: white; padding: 2px; text-align: center;">4.4</div> <div style="background-color: #c00000; color: white; padding: 2px; text-align: center;">8.5</div>	<div style="background-color: #000080; color: white; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">S</div>



# People and communities

## Enhance diversity and inclusiveness



Companies that embrace diversity and inclusion in all aspects of their business outperform their peers.<sup>33</sup> There is significant correlation between a diversified team, higher profitability and financial outperformance.

Companies are increasingly seeing inclusion and diversity as key enablers for growth and a competitive advantage. Globally, leading companies have recognized the importance of creating environments encouraging a variety of different voices.

This not only includes workforce diversity but also diversity within the supplier base. High-performing organizations implement diversity policies that help instill inclusion, respect and appreciation across the entire workforce.

### Enhance diversity and inclusiveness - Actions

Value chain: Cement manufacturing & entire					
Actions	Indicators	Key partners	Enablers	SDG targets involved	Timelines
<ul style="list-style-type: none"> <li>Increase number of women in the workforce at entry, management and board levels</li> <li>Increase recruitment of workforce with a disability</li> </ul>	<ul style="list-style-type: none"> <li>Percentage increase in women employees</li> <li>Percentage increase in recruitment of employees with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>Local communities and NGOs</li> <li>Suppliers and contractors</li> <li>Academic institutions</li> <li>National Skill Development Centre (NSDC)</li> <li>Ability Foundation (national cross disability organization) or other NGOs working in similar areas</li> </ul>	P	<div style="background-color: #e91e63; color: white; padding: 2px;">4.4</div> <div style="background-color: #ff9800; color: white; padding: 2px;">5.5</div> <div style="background-color: #9c27b0; color: white; padding: 2px;">8.5</div> <div style="background-color: #e91e63; color: white; padding: 2px;">10.4</div>	S
<ul style="list-style-type: none"> <li>Strengthen policies supporting diversity and inclusion across the workforce</li> </ul>	<ul style="list-style-type: none"> <li>Workforce diversity</li> </ul>	<ul style="list-style-type: none"> <li>Local communities and NGOs</li> <li>Suppliers and contractors</li> <li>Academic institutions</li> <li>National Skill Development Centre (NSDC)</li> <li>Ability Foundation (national cross disability organization) or other NGOs working in similar areas</li> </ul>		<div style="background-color: #e91e63; color: white; padding: 2px;">4.4</div> <div style="background-color: #ff9800; color: white; padding: 2px;">5.5</div> <div style="background-color: #9c27b0; color: white; padding: 2px;">8.5</div> <div style="background-color: #e91e63; color: white; padding: 2px;">10.4</div>	S
<ul style="list-style-type: none"> <li>Scale involvement and access to local vendors and suppliers</li> </ul>	<ul style="list-style-type: none"> <li>Percentage of new vendors that are local</li> <li>Number of local vendors/suppliers on board annually</li> <li>Percentage of procurement budget spent on local suppliers</li> </ul>	<ul style="list-style-type: none"> <li>Local vendors and suppliers</li> <li>Local communities and NGOs</li> </ul>		<div style="background-color: #e91e63; color: white; padding: 2px;">4.4</div> <div style="background-color: #ff9800; color: white; padding: 2px;">5.5</div> <div style="background-color: #9c27b0; color: white; padding: 2px;">8.5</div> <div style="background-color: #e91e63; color: white; padding: 2px;">10.4</div>	S

**Enablers** Policy support could help encourage and build the capabilities of local suppliers.

## People and communities

### Transport safety



Transportation networks connect business supply chains spread over diverse geographies. Well-functioning, efficient and safe transport networks are a prerequisite for trade, economic growth and development, and enhanced quality of life.

Reported road related fatalities for 2018 are 150,785.<sup>34</sup> Some of the factors contributing to road accidents include inadequate law enforcement, a surge in the number of trucks and cars on the roads, and a flood of untrained drivers.

Over the years, the cement sector has witnessed growth in production and a corresponding rise in road transportation share,<sup>35</sup> thus further emphasizing the need to strengthen road safety programs implemented by companies in the sector.

### Transport safety - Actions

#### Value chain: Transportation and logistics

Actions	Indicators	Key partners	Enablers	SDG targets involved	Timelines
<ul style="list-style-type: none"> <li>Develop a safety rating system for drivers (similar to Bureau of Energy Efficiency (BEE) energy rating system; Ministry of Transport may consider developing a rating system for drivers/logistics providers, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Number of drivers receiving proficiency training</li> <li>Percentage reduction in accidents/incidents</li> </ul>	<ul style="list-style-type: none"> <li>Transport and logistics providers</li> <li>Training institutes</li> <li>Suppliers</li> <li>Transport associations</li> <li>Ministry of Transport</li> </ul>		<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #28a745; color: white; padding: 2px 5px; margin-bottom: 5px;">3.6</div> <div style="background-color: #ffc107; color: white; padding: 2px 5px;">11.2</div> </div>	<b>S</b>
<ul style="list-style-type: none"> <li>Increase dissemination of journey risk management, safe load and defensive driving training for drivers</li> </ul>	<ul style="list-style-type: none"> <li>Number of drivers covered</li> <li>Number of refresher courses provided</li> <li>Percentage reduction in accidents/incidents</li> </ul>	<ul style="list-style-type: none"> <li>Transport and logistics providers</li> <li>Training institutes</li> <li>Suppliers</li> <li>Transport associations</li> </ul>		<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #28a745; color: white; padding: 2px 5px; margin-bottom: 5px;">3.6</div> <div style="background-color: #ffc107; color: white; padding: 2px 5px;">11.2</div> </div>	<b>S</b>
<ul style="list-style-type: none"> <li>Install in-vehicle monitoring system (IVMS) for dedicated fleet</li> </ul>	<ul style="list-style-type: none"> <li>Number/percentage of fleet with installed IVMS/GPS (global positioning system)</li> </ul>	<ul style="list-style-type: none"> <li>Technology providers</li> <li>Transport and logistics providers</li> </ul>	<b>P</b>	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #28a745; color: white; padding: 2px 5px; margin-bottom: 5px;">3.6</div> <div style="background-color: #ffc107; color: white; padding: 2px 5px;">11.2</div> </div>	<b>S</b>
<ul style="list-style-type: none"> <li>Install GPS-based vehicle tracking system for dedicated fleet</li> </ul>	<ul style="list-style-type: none"> <li>Number/percentage of fleet with installed IVMS/GPS</li> </ul>	<ul style="list-style-type: none"> <li>Technology providers</li> <li>Transport and logistics providers</li> </ul>		<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #28a745; color: white; padding: 2px 5px; margin-bottom: 5px;">3.6</div> <div style="background-color: #ffc107; color: white; padding: 2px 5px;">11.2</div> </div>	<b>S</b>
<ul style="list-style-type: none"> <li>Extend health and safety measures to market fleet</li> </ul>	<ul style="list-style-type: none"> <li>Number of contractors enrolled to implement health and safety measures (transfer of liability clauses included as part of contract agreement, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Transport and logistics providers</li> <li>Training institutes</li> <li>Suppliers</li> <li>Transport associations</li> </ul>		<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #28a745; color: white; padding: 2px 5px; margin-bottom: 5px;">3.6</div> <div style="background-color: #ffc107; color: white; padding: 2px 5px;">11.2</div> </div>	<b>S</b>
<ul style="list-style-type: none"> <li>Scale health and well-being initiatives for drivers</li> </ul>	<ul style="list-style-type: none"> <li>Percentage decrease in absenteeism</li> <li>Increase in job satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>Transport and logistics providers</li> <li>Training institutes</li> <li>Suppliers</li> <li>Transport associations</li> </ul>		<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #28a745; color: white; padding: 2px 5px; margin-bottom: 5px;">3.6</div> <div style="background-color: #ffc107; color: white; padding: 2px 5px;">11.2</div> </div>	<b>S</b>
<ul style="list-style-type: none"> <li>Build capacity of transportation and logistics providers</li> </ul>	<ul style="list-style-type: none"> <li>Percentage reduction in accidents/incidents</li> <li>Number of workshops/seminars (on road safety, driver competency and training needs) conducted for transportation and logistics providers</li> <li>Percentage of sector (transport/logistics) workforce trained on defensive driving techniques</li> </ul>	<ul style="list-style-type: none"> <li>Transport and logistics providers</li> <li>Training institutes</li> <li>Suppliers</li> <li>Transport associations</li> </ul>		<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #28a745; color: white; padding: 2px 5px; margin-bottom: 5px;">3.6</div> <div style="background-color: #ffc107; color: white; padding: 2px 5px;">11.2</div> </div>	<b>S</b>

**Enablers** Policy support could encourage or mandate installation of vehicle monitoring, global positioning systems for commercial fleets.





## Circular economy



A circular economy is linked to the promotion of resource efficiency, taking into account the full life cycle of the cement sector, from initial planning and manufacturing of cement and construction products to final demolition. As an integral part, it includes a well-organized, optimal and efficient system for the collection, characterization, reduction, reuse and recycling of wastes to the greatest extent possible, followed by the recovery of energy and other resources before ultimately disposing of the absolutely non-reusable components. Improving resource efficiency throughout the infrastructure and buildings life cycle will also support the sector's efforts to reduce the environmental impacts associated with the built environment.

Millions of tonnes of hazardous and non-hazardous solid waste and a lack of adequate infrastructure to deal with it in an ecologically sustainable manner are affecting the country's ecosystem. Improperly managed landfills, land availability to construct new landfills, the release of toxic gases from landfills, fire incidents, illegal waste dumping, odor issues and health impacts on local communities are a few examples of waste management problems the country is facing.

Cement demand in India will continue to grow. On the other hand, the natural resources used as raw materials and fuel by the cement sector are depleting quickly and acquiring new reserves is becoming more difficult. This includes limited availability of the required grade of limestone.

The majority of the limestone deposits available in the country are of marginal grade. Many of the deposits that have come up or are likely to come up for auction have high silica, low to sub-optimal calcium oxide (CaO) grades and high magnesium oxide (MgO) content as well. Cement companies cannot use this type of deposit in the cement manufacturing process without blending it with high-grade limestone. The sector must make greater use of waste materials and by-products from other industries as valuable raw materials and fuels. The co-processing of different types of wastes in cement kilns as alternative raw materials and fuels is one of the ways through which companies can mitigate to a large extent the waste management challenge the country is facing.



## Using waste as a resource - Actions

Value chain: Operations and end of life					
Actions	Indicators	Key partners	Enablers	SDG targets involved	Timelines
<ul style="list-style-type: none"> <li>Increase adoption and use of alternative waste derived fuels (e.g., municipal solid waste (MSW), hazardous wastes, waste tires, others)</li> <li>Develop public-private partnership model by working with local urban bodies on waste segregation and management of MSW through co-processing in cement kilns</li> </ul>	<ul style="list-style-type: none"> <li>Percentage increase in use of waste derived fuels</li> </ul>	<ul style="list-style-type: none"> <li>Pollution control boards</li> <li>Local urban bodies/ municipal corporations</li> </ul>	<ul style="list-style-type: none"> <li>P</li> <li>T</li> <li>F</li> </ul>	<ul style="list-style-type: none"> <li>12.2</li> <li>12.4</li> <li>12.5</li> </ul>	<ul style="list-style-type: none"> <li>M</li> </ul>
<ul style="list-style-type: none"> <li>Increase replacement of virgin raw materials with alternative raw materials/other substitutes (e.g., construction demolition waste, foundry sand, crushed rock fines, refractory bricks, cement kiln dust)</li> <li>Increase production of blended cements, including composite cement to optimize use of alternative materials (fly ash/slag/other waste products)</li> <li>Scale R&amp;D efforts and innovation to use of alternative materials</li> </ul>	<ul style="list-style-type: none"> <li>Percentage of blended cement in total cement production</li> <li>Percentage of composite cement in total cement production</li> <li>Percentage/volume reduction in use of virgin raw materials</li> <li>Percentage/volume increase in use of alternative raw materials</li> </ul>	<ul style="list-style-type: none"> <li>Research and academic institutions</li> <li>Technology providers</li> <li>Sectors providing alternative materials- steel, power, other</li> <li>Cement manufacturers</li> <li>Ministry of Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>P</li> </ul>	<ul style="list-style-type: none"> <li>9.4</li> <li>9.5</li> <li>12.2</li> <li>12.4</li> </ul>	<ul style="list-style-type: none"> <li>M</li> </ul>
<ul style="list-style-type: none"> <li>Increase training on and awareness of sustainable construction practices to optimize the use of building materials and other natural resources (e.g., skill building for masons)</li> </ul>	<ul style="list-style-type: none"> <li>Number of masons covered by training and awareness initiatives</li> <li>Number of technical service engineers appointed in each market</li> <li>Sites visited by technical service engineers to train and educate the construction agency and the builder</li> </ul>	<ul style="list-style-type: none"> <li>Construction Skill Development Council of India</li> </ul>		<ul style="list-style-type: none"> <li>4.4</li> <li>8.5</li> </ul>	<ul style="list-style-type: none"> <li>M</li> </ul>
<ul style="list-style-type: none"> <li>Scale efforts to maximize recycling of construction and demolition waste</li> </ul>	<ul style="list-style-type: none"> <li>Percent increase in recovery and percent increase in reuse of construction and demolition waste</li> </ul>	<ul style="list-style-type: none"> <li>Ready-mix manufacturers and aggregate manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>P</li> <li>T</li> </ul>	<ul style="list-style-type: none"> <li>12.4</li> <li>12.5</li> </ul>	<ul style="list-style-type: none"> <li>S</li> </ul>

**Enablers** Policy changes can have significant impact on achieving scalable success on the impact opportunities presented above. Key areas are availability of waste materials, their pricing, and the safe handling of recycled concrete at the end of its useful life. Further access to the right technology and financial incentives to encourage and promote the use of alternative fuels and raw materials will also play a big role. State and central policy on the responsible disposal of concrete and other construction and demolition waste in coordination with the cement sector can promote resource recovery from waste material.



## Natural resources

### Water

Usable water is essential for drinking, health and sanitation, energy, food and other goods and services. Competing demands for water continue to rise (from agriculture, households, energy generation, industrial use, ecosystems, etc.) and the effects of climate change are exacerbating the challenges associated with water quality and availability.

Currently 600 million Indians face high-to-extreme water stress, with 21 major cities expected to run out of groundwater as soon as 2020, affecting around 100 million people. NITI Aayog projects that by 2030, the country's water demand will be twice the available supply,<sup>36</sup> implying severe water scarcity for hundreds of millions of people.

The sector must assess its water risk (physical and non-physical) exposure in order to implement sound water stewardship strategies. This includes addressing risk at the watershed level.

### Biodiversity

Natural resources (land, water, biodiversity and genetic resources, biomass resources and forests) provide the foundations for human survival, progress and prosperity, and they have been degrading fast. Biodiversity is crucial for the country's ecosystems to maintain balance, combat pollution,

address climate change, and protect water quality and other natural resources.

Careful biodiversity impact management at sites is a material issue and a fundamental requirement for the sustainable operation of the cement sector.

The sector is currently facing a shortage of skilled technical resources in niche fields such as biodiversity management.

The sector must be increasingly mindful of its impacts on biodiversity and how it can address these impacts to maintain and enhance ecosystems.

## Natural resource management - Actions

### Value chain: Operations and end of life

Actions	Indicators	Key partners	Enablers	SDG targets involved	Timelines
<ul style="list-style-type: none"> <li>Develop detailed biodiversity and ecosystem management plans for all sites and monitor implementation, including closure and site rehabilitation</li> <li>Enhance employee biodiversity conservation awareness and capacity building</li> </ul>	<ul style="list-style-type: none"> <li>Percent of sites with quarry rehabilitation plans in place</li> <li>Percent of decommissioned sites rehabilitated</li> <li>Number of active sites where biodiversity issues are addressed as per international best practices</li> <li>Number of workshops conducted for biodiversity management</li> <li>Number of sites for which baseline biodiversity surveys are conducted</li> </ul>	<ul style="list-style-type: none"> <li>International Union for Conservation of Nature (IUCN)</li> <li>India Business and Biodiversity Initiative (IBBI) of the Confederation of Indian Industry (CII)</li> <li>Local NGOs, GIZ</li> <li>Academic institutions</li> </ul>	P	15.2	S
<ul style="list-style-type: none"> <li>Increase source water vulnerability assessment studies</li> <li>Scale up rain water harvesting efforts</li> </ul>	<ul style="list-style-type: none"> <li>Number of sites covered for hydrological modelling/water vulnerability assessments</li> <li>Raw water savings achieved</li> <li>Percentage of sites that have implemented rain water harvesting measures</li> <li>Water risk assessment and reporting in sustainability/annual report</li> <li>Targets for reductions in freshwater consumption and increases in rainwater harvesting/groundwater recharge</li> <li>Percentage of products that use less water in construction</li> </ul>	<ul style="list-style-type: none"> <li>Central Ground Water Board</li> <li>State/central governments</li> <li>CSR trusts for other companies/sectors</li> <li>Local NGOs</li> </ul>	P	6.4 6.5	S
<ul style="list-style-type: none"> <li>Increase use of low-grade limestone and in the process reduce dependency on high-grade limestone and extend quarry life</li> </ul>	<ul style="list-style-type: none"> <li>Amount of low-grade limestone used</li> <li>Increased mine life</li> </ul>	<ul style="list-style-type: none"> <li>Research and development organizations</li> <li>Industrial bodies</li> <li>Ministry of Mining</li> </ul>	P T	12.2 12.4 12.5	L

**Enablers** To achieve scalable success on the impact opportunities presented above, the sector requires enabling policies for state governments to partner with companies on water and biodiversity management programs, as well as policy support on the use of low-grade limestone and incentives for companies that contribute to extending the lifespans of quarries. Policy support for the development of educational programs to augment the availability of skilled resources for biodiversity management aspects are required to maximize the positive impact of biodiversity management programs.



# The road to 2030

The cement sector makes a critical contribution to India's sustainable development. This Roadmap reflects the broader actions – supported with key performance indicators – that will guide the sector to achieve its strategic priorities, mission and vision while contributing to achieving the SDGs.

The Roadmap presents the interconnected nature of the sector's activities and the common goals on which the sector is and will be working. The articulation of the key impact opportunities and actions highlighted in this report is the first step on the road to continued SDG engagement.

Moving forward, leading cement sector representatives will look to advance its implementation. This will include ongoing efforts to:

- Develop strategic partnerships within and outside the sector by leveraging this Roadmap;
- Deepen engagement with companies involved in this report on the impact opportunities and to create forums to share knowledge;

- Develop a baseline to capture the status of existing initiatives linked with the impact opportunities and to define targets for improvement accordingly;
- Develop targeted working groups to advance the different action points identified in the Roadmap, convening the most relevant expertise to deliver progress; and
- Establish appropriate mechanisms and frameworks to regularly report on progress against the Roadmap and to keep stakeholders updated.

## Strategic partnership between the Global Cement and Concrete Association (GCCA) and WBCSD

Nine major cement companies, including several WBCSD CSI members, formed the Global Cement and Concrete Association (GCCA) in January 2018. The GCCA works on cement and concrete sector sustainability issues.

The WBCSD transferred the work that its Cement Sustainability Initiative carried out to the GCCA on 1 January 2019. The two organizations have set up a strategic partnership to facilitate the sustainable development of the cement and concrete sectors and their value chains. The new partnership aims to create synergies between work programs to benefit both organizations and their respective member companies.

India is a positive reflection of this partnership, with the work of the WBCSD Cement Sustainability Initiative in India transforming into GCCA India. WBCSD has been pleased to foster and support the CSI in India, which has a track record to be proud of, and is committed to ensuring the program's smooth transition and a successful future for the GCCA in India. The GCCA India will take forward the actions from this Roadmap.



Photo credit: UltraTech

# References

- <sup>1</sup> WBCSD. (2018). *SDG Sector Roadmaps*. Retrieved from <https://www.wbcsd.org/Programs/People/Sustainable-Development-Goals/SDG-Sector-Roadmaps/Resources/SDG-Sector-Roadmaps>.
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## Contributors:

- Co-chairs of the Steering Committee:  
Ambuja Cements Limited:  
Sandeep Shrivastava  
  
Dalmia Cement (Bharat) Limited:  
Ashwani Pahuja, Sanjay Jain  
  
UltraTech Cement Limited:  
Surya Valluri, Vishal Bhavsar
- All Steering Committee members.

## Coordination:

WBCSD:  
Esha Sar, Joe Phelan, James Gomme

ERM:  
Neena Singh, Swaroop Banerjee, Sai Pranit, Shubha Shanbhag, Bryan Hartlin, Linden Edgell

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For more information on this document, contact:

Esha Sar,  
WBCSD  
[sar@wbcsd.org](mailto:sar@wbcsd.org)

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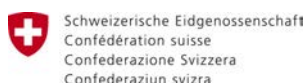
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**World Business Council  
for Sustainable Development**

Maison de la Paix  
Chemin Eugène-Rigot 2B  
CP 2075, 1211 Geneva 1  
Switzerland

WBCSD India  
4th Floor, Worldmark 2  
Aerocity, New Delhi 110037  
India

[www.wbcsd.org](http://www.wbcsd.org)

