The Indian cement industry is one of the most efficient in the world, producing 1.13 Gt CO₂ in 2010, approximately 7% of its total greenhouse CO₂ emissions. The industry has already achieved a reduction in total CO₂ emissions to a level on average of 0.56 tCO₂/t (2010-2015). A more detailed and rigorous analysis has shown a significantly higher level of energy efficiency in India.

In the absence of appropriate technology development and policy action, CO₂ emissions from the Indian cement industry are projected to reach between 488 MtCO₂ (Zero-Cement Case) and 882 MtCO₂ (High-Cement Demand Case) by 2050.

The technologies, policies, frameworks and institutional systems and architectures that are needed to reach a pathway towards emissions reduction to a level of 275 MtCO₂ by 2050, in line with the Intergovernmental Panel on Climate Change’s 2° warming scenario, are illustrated in this study. The technologies and policy frameworks and investment needs outlined in this roadmap could limit the potential for such technologies in the future, social acceptance, economic feasibility and political will and policy development, and financial mechanisms, must be supported.

The additional investment required to reach emissions reduction targets is in the range of between 1020 billion and 2200 billion INR (2010-2050) or, in terms of 2015 Rupee, 130-280 billion INR. Additional financial support is needed from the industry, in manufacturing processes, as a substitute for fossil fuel or natural raw materials.

R&D to move through pilot to demonstration phases to create an investment climate that will stimulate the scale of investment in key technologies and help accelerate the adoption of low carbon technology.

To share experience and knowledge.

To support the availability and potential of carbon use for example through algal growth for carbon sequestration at cement plants. Globally, approaches to increase the speed and scale of implementation.

Participate in the demonstration of a full-scale post combustion cement plant and development of a pilot-scale oxy-fuel cement plant.

IEA/WBCSD Roadmap targets

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<th>Year</th>
<th>2012</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
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<td>2010</td>
<td>2015</td>
<td>2020</td>
<td>2025</td>
<td>2030</td>
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<td>2040</td>
<td>2045</td>
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<tr>
<td>488 MtCO₂</td>
<td>275 MtCO₂</td>
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Key actions in the next ten years

- Decisive action by all stakeholders is critical to realise the vision laid out in this roadmap. Inadequate deployment of existing technologies towards emissions reductions could lead to similar outcomes.
- Adequate and predictable long-term finance is critical to realise the vision laid out in this roadmap. To achieve the envisioned emissions reductions, strong, sustained and supportive policy, institutional and financial frameworks are required.
- Decisive action by all stakeholders is critical to realise the vision laid out in this roadmap.
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Projected cement production in the Low- and High-Demand Cases

Low-Demand Case
High-Demand Case

Additional investments required to reach the CO₂ emissions in the 2DS from the 6DS (business-as-usual scenario) in India

Low-Demand Case
High-Demand Case

Low-Carbon Technology for the Indian Cement Industry

Key indicators for Indian cement industry to reach 2DS

Progress indicator for share of alternative fuels and raw materials (AIR) in thermal energy use

Progress indicator for clinker-to-cement ratio

Progress indicator for specific intensity of thermal requirements (excluding potential from WHR)

Progress indicator for carbon captured by global and Indian cement industry