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DECARBONISING HARD-TO-ABATE SECTORS

The cement sector along with steel, accounts for 14 per cent of the global carbon emissions and 47 per cent of the industry's overall tally. On its own, the cement sector is estimated to be responsible for 7-8 per cent of the world's carbon footprint, but it also creates large-scale employment and a safer habitat for human beings. At the same time, we are collectively focusing on reducing the carbon emission from the sector through innovations in technology and processes such as Carbon Capture and Storage (CCS) or Use, new energy sources like hydrogen and alternative raw materials like municipal or urban waste.

Even though the traditional abetment levers can help cut emissions by one fifth by 2050, as per estimates, the cement companies face two strategic challenges in the initial phase; to choose the best way to achieve decarbonisation in terms of operational and technological advances – such as better clinker substitutes, greater capacity utilisation, and increasing equipment effectiveness as well as new growth opportunities through products that encourage the creation of a sustainable value chain.

Broadly, the need for developing new technologies and fuel sources is critical for all the hard-to-abate industries. Such an action must focus on a few key elements such as low-emissions energy technologies including hydrogen and biofuels, decarbonisation of mobility, both within and outside the factories, and the use of alternative resources such as municipal waste that is abundant in a country like India, seeking a viable disposal solution. Sectors such as cement and steel would also create millions of jobs across sectors while implementing these solutions.

India is already leading the efforts with the domestic cement sector having a carbon emission which is 15 per cent lower than the rest of the world, on an average. At Dalmia Cement, we have brought it down to 30 per cent the global average through years of hard work and innovations. We are heavily focussed on containing our carbon footprint

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Carbon capture: Though we don't have all the answers to the biggest shift required – to cut carbon emissions in the calcination process which, by nature itself is carbon-intensive, the industry is investing in expensive processes like carbon sequestration and even carbon capture. As of now, carbon capture is not viable since it is costly to capture carbon and the supply where there is demand.

Europe is undertaking pilot projects, helping cement companies set up carbon capture facilities by subsidising them. This may not be the right approach in India since the industry is not keen for the government to subsidise such efforts at an experimental stage.

But we can consider some natural methods by which we can "absorb' the carbon dioxide in the most natural way. For example, India has huge wastelands across the country, and if we can plant trees in those wastelands, the trees can absorb the carbon dioxide.

We can counter but this approach requires huge tracts of land and an enabling policy framework. There are other proven nature-based solutions for carbon sequestration/avoidance such as Bio char utilisation for soil application, Alternate Wet & Dry irrigation method for cultivation of low land rice or Soil organic carbon fixation.

Innovate with everything: The industry has been experimenting with ideas such as lowering the limestone component and adding CO2 to cure the concrete, to make it stronger.

In short, as much as 5-7 per cent of the carbon output could be appropriated during the production process while products like carbon-cured concrete could open a new segment of premium products among environmentally conscious buyers.

Need for sheer determination: While the hunt for carbon reducing technologies will eventually happen, product innovations will also help the carbon footprint. For example, green cement is fashionable, but the consumers may not want to pay a higher cost for it. Consumer acceptance of green cement faces challenges due to limited awareness, cost perceptions, and resistance to change in traditional construction practices. Overcoming these hurdles requires efforts to educate consumers on environmental benefits, emphasise long-term cost savings, and promote green cement within established industry norms.

Search for abundant alternatives: In the pursuit of a circular economy, cement kilns are at the forefront of sustainability, leveraging a diverse array of waste materials like biomass, agricultural residues, municipal solid waste and industrial by-products as alternative fuels. This innovative approach not only diminishes carbon emissions but also promotes a circular model by repurposing waste into valuable energy sources, thereby reducing reliance on traditional fossil fuels. Co-processing plays a pivotal role by integrating waste materials such as fly ash, slag, and silica fume as substitutes for conventional raw materials, minimising waste generation and fostering a closed-loop system.

Furthermore, waste heat recovery systems capture excess heat from cement production, transforming it into a valuable resource for power generation and other industrial processes, embodying the principles of a circular economy in the cement manufacturing sector. These alternative fuels not only provide a greener energy source but also help in waste management and promote circular economy practices. Estimates show that the use of waste and biomass can cut the emissions by nearly 10 per cent globally, by 2050. Such alternative and enduring natural energy sources will help us present a better corporate balance sheet and an incredible ESG score before the investors. BW

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