

Cementing a sustainable future



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INDIA TODAY STANDS at a crucial juncture, as it needs to accelerate development activities while mitigating carbon emissions to achieve its net-zero target by 2070. As a result, various sectors, including cement, are focusing not only on production and meeting consumer demand but also on reducing emissions. The cement industry, which must meet a burgeoning construction demand and fulfil India's ambitious infrastructure targets, is integrating sustainability into every strategy.

But this is just the beginning. The industry must double down on its efforts and invest even more time and resources to further reduce its carbon footprint. It's time for the industry to intensify its emission reduction actions and lead the charge toward a sustainable future.

Advancing processes, mitigating emissions

The cement industry has made significant strides in reducing emissions, driven by the dual imperatives of sustainable development and regulatory compliance. It has adopted a multifaceted approach to minimise its environmental impact.

One of the primary steps that has been taken is the adoption of alternative raw materials. By utilising waste products such as fly ash and slag, the industry reduces its use of limestone, lowering greenhouse gas emissions,

and promoting a circular economy. This shift is complemented by the increased use of blended cements which incorporate these alternative materials.

Another crucial step in reducing carbon emissions in the industry is transitioning from fossil fuels to alternative energy sources. Cement manufacturers are increasingly adopting solar and wind energy, biomass, municipal solid waste, and used tires. Advancements in technology and improved combustion processes have made using these alter-

native energy sources more efficient and cost-effective, significantly reducing the industry's carbon footprint and promoting sustainability.

Moreover, energy efficiency is a critical area of focus. Indian cement companies have implemented advanced technologies like waste heat recovery systems, which capture and reuse heat generated during manufacturing. This converts waste heat into usable electricity and hence reduces overall emissions. Additionally, the adoption of modern clinker production techniques, such as pre-calciners and pre-heaters, has significantly improved thermal efficiency, leading to lower carbon dioxide emissions per tonne of cement produced.

The industry is also moving

towards eco-friendly transportation. Today, road transport is the primary mode of transportation, but efforts are being made to switch to more environment-friendly options such as trains and waterways, which emit fewer emissions than diesel-powered trucks. In addition, cement producers are emphasising the use of environment-friendly fuels for their vehicles, such as compressed natural gas. This is meant to minimise environmental impact and help create a more sustainable and greener future.

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Water conservation is another priority, with measures like air-cooled condensers, rainwater harvesting, sewage treatment, and recycled water usage being implemented. Most cement manufacturers have also established a robust environmental, social, and governance framework to ensure alignment with sustainability goals and regularly measure progress.

Notably, digitalisation and automation have attracted the industry's attention due to their potential to facilitate emission reduction. The integration of advanced data analytics and automation systems allows for real-time monitoring and optimisation of production processes. This ensures that operations run at peak efficiency,

minimising waste and reducing energy usage. Predictive maintenance powered by artificial intelligence helps in anticipating equipment failures, thereby avoiding unplanned downtimes and ensuring smoother, more efficient operations.

The manufacturers have also increased efforts to make their operations eco-friendly. For instance, the industry is producing blended cement varieties such as PPC, PSC, and CC while adhering to Bureau of Indian Standards norms. This approach reduces natural resource use and greenhouse gas emissions. Exploring limestone calcined clay cement as a sustainable alternative is also an option that manufacturers are considering. However, limited availability of alternative blending materials close to cement manufacturing locations is a bottleneck. Additionally, a policy push to promote the use of blended cement would be beneficial.

One of the sectors that India's ambitions for sustainability hinge significantly on is the cement industry. With over 250 million people projected to join the urban population in the next 20 years and a slew of infrastructure projects on the horizon, the demand for cement will skyrocket. The industry is not just expected but also obligated to ramp up to meet these goals, and it is well-placed to play an important role in tackling the colossal task of reducing India's environmental footprint.