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From Grey to Green

Raman Bhatia, Managing Director, Servotech Renewable Power System, outlines how renewable energy integration, innovation and carbon capture can transform cement from a high-emission material into a driver of sustainable growth.



Cement forms the backbone of infrastructure and development, but it also contributes significantly to global CO₂ emissions due to its energy-intensive production processes. As India accelerates its growth trajectory while committing to Net Zero ambitions, the focus on reducing the carbon footprint of cement production is more urgent than ever. We believe the theme of the 3Cs: Cut, Cement, Carbon, captures this transition with clarity, reflecting the need to rethink traditional manufacturing approaches, integrate renewable energy, and embrace new technologies that balance productivity with sustainability.

India's cement industry in the Net Zero era

Cutting emissions in the cement industry is both an environmental necessity and a business imperative. Traditional cement production generates a lot of carbon from the fuels as well as the production process itself. To cut these emissions, producers are increasingly looking at fuel substitution with renewable energy sources, adopting waste heat recovery systems and integrating automation to maximise efficiency. Energy accounts for nearly a third of cement manufacturing costs, making energy efficiency a natural entry point for cutting carbon.

Renewable energy technologies are emerging as transformative solutions. Servotech Renewable has been contributing to this shift by delivering solar power systems, energy storage and green technology solutions that allow industrial plants to reduce dependence on fossil fuels. By integrating renewable energy directly into cement production units, the industry can meaningfully lower its energy-related emissions without compromising on output.

Equally important is innovation in cement itself. Supplementary cementitious materials such as fly ash, slag and calcined clay are viable substitutes that not only lower emissions but also utilise industrial by-products, contributing to a circular economy. The integration of green chemistry principles, alongside process innovations, is helping manufacturers reimagine cement as a material that supports sustainability goals. Servotech's expertise in delivering scalable renewable energy infrastructure further complements these innovations, providing the reliable, clean power required to operate energy-intensive systems associated with advanced cement production technologies.

"Our mission aligns with the vision of transitioning industries to cleaner, smarter, and more sustainable operations."

Carbon capture and utilisation are the third pillar of this transition. Even with the best practices in efficiency and fuel substitution, cement production will always generate some level of unavoidable CO₂ due to calcination. To achieve true decarbonisation, the industry must actively invest in technologies that capture carbon at source and either store it or convert it into usable materials. Globally, pilot projects have already demonstrated the potential of carbon capture systems, and India is beginning to explore these avenues with growing interest. What makes this compelling is the possibility of turning a waste product into a resource that can be used for producing construction materials, fuels or chemicals, thereby creating an entirely new value chain.

A collaborative ecosystem involving manufacturers, renewable technology providers and policymakers is essential at this point to create a roadmap that is both technically feasible and economically viable.

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Servotech Renewable is playing a vital role in this ecosystem, as our technologies provide the renewable backbone required for decarbonisation efforts to succeed. By supporting cement plants in their transition to clean energy and offering advanced solutions for power stability, we ensure that ambitious sustainability goals translate into ground-level action.

The cement industry's contribution to India's GDP and infrastructure development is undeniable, but so too is its responsibility to align with the nation's climate commitments. The journey toward decarbonisation requires bold investments, steady innovation and a willingness to adopt technologies that may initially seem disruptive but ultimately secure long-term growth. For decades, cement has symbolised strength and durability, but now it must also symbolize responsibility and sustainability. For us, the 3Cs framework highlights a future where cement is no longer viewed as a hard-to-abate sector but as an industry that took bold steps toward transformation.

Our mission aligns with this very vision, transitioning industries to cleaner, smarter, and more sustainable operations. Our expertise across renewable energy, energy storage, and green technology provides the tools and infrastructure for sectors like cement to embrace decarbonisation meaningfully. As India pushes forward on its Net Zero journey, the cement industry's ability to cut emissions, innovate materials, and capture carbon will define not just the future of infrastructure but the resilience of our environmental and economic systems. By integrating renewable power and carbon-neutral technologies, we can reimagine cement as a foundation not only for urban development but for a truly sustainable tomorrow.



ABOUT THE AUTHOR:
Raman Bhatia, Managing Director, Servotech Renewable Power System, is a renewable energy leader with over 25 years of experience driving India's solar growth through innovation and sustainable solutions.