Alternative fuels and raw materials: a win-win solution for the Indian cement industry

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As India builds its cement capacity, the demand for coal to fire existing and new kilns is forecast to rise exponentially, as are the country’s GHG emissions. To counteract this trend, India’s government is increasingly promoting the benefits of alternative fuel and raw material use. Moreover, the use of such substitutes is also expected to reduce the growing volumes of waste to be landfilled, providing a further benefit to the country’s population and environment.

India is the second-largest cement producer in the world after China and is expected to see its 350Mt production capacity double over the next decade. This will result in a huge surge in coal demand. The Planning Commission of India’s 12th Five-Year Plan (2012-17) on the cement industry suggests that its demand for coal will increase to 63-96Mt by the end of the period.

As various studies have shown that the use of alternative fuels and raw materials (AFRs) greatly reduces fossil fuel use and its resultant GHG emissions, the use of AFRs becomes particularly significant. However, the current thermal substitution rate (TSR) of fossil fuels by alternative fuels in India ranges between only 0.5-1 per cent, which is far below the double-digit rates achieved in developed countries where rates are as high as 60 per cent. This is due to a number of policy and regulatory bottlenecks along with technical and financial issues which, in many cases, are interlinked. The GHG mitigation cost through AFR use is reasonable, and there is a significant replication potential across the entire national cement industry. Other benefits include an effective and efficient means of managing urban and industrial waste, which is increasingly a cause for major concern. Therefore, the use of AFRs in cement production presents great benefits for countries like India.

Multi-stakeholder action to tap into AFR potential

In 2012 India’s Institute for Industrial Productivity (IIP) launched a multi-stakeholder initiative: ‘Increasing the TSR in the Indian cement industry by promoting the use of alternate fuels and raw materials.’ This project is anchored in the Cement Manufacturers’ Association of India (CMA) and, since its inception, has made substantial progress in addressing policy and regulatory hurdles, spreading awareness about the subject and challenges related to financing such initiatives. IIP has also been successful in creating a critical mass of important stakeholders around this initiative.

Action plan for promoting AFR

The project has resulted in the stakeholder-designed implementable action plan for increasing AFR use in the cement industry with a vision to increase the TSR from the present level of less than one to 15 per cent by 2020 through addressing technical, policy, regulatory and financial barriers. Released in 2013 by B K Chaturvedi of the government’s Planning Commission at the First International Conference on ‘Enhanced Usage of Alternate Fuel and Raw Materials (AFR) Co-processing in Cement Plants’ (jointly organised by IIP and CMA), this report was an outcome of a technical review, analysis and extensive interactions with key stakeholders. It is now recognised as a guiding document in India’s efforts to expand AFR use in the cement industry.

Policy impetus
To identify and resolve the regulatory and policy issues, a Forum of Regulators was created with high-level representation from State Pollution Control Boards of major cement-producing states in India. The forum met regularly to deliberate on the key policy and regulatory bottlenecks, and issued a series of five White Papers/Policy Briefs. These were developed following inputs from the members of state pollution control boards, technical experts, industry representatives and references to international best practices, journals and research documents.

The five White Papers/Policy Briefs broadly cover the following themes:
- amendment of the Hazardous Waste Management Rule under the Environment Protection Act to include co-processing in cement plants as a disposal option
- technical guidelines on environmentally-sound preprocessing facilities to prepare homogeneous waste mixes suitable for co-processing in cement kilns
- emission standards for co-processing of AFR material in cement kilns, including hazardous wastes, along with emission monitoring methodology
- increasing the percentage utilisation by cement plants of fly ash generated from coal-based power stations and refuse-derived fuel (RDF)
- guidelines for transportation and storage of hazardous waste.

The resultant policy prescriptions have been acknowledged by India’s Central Pollution Control Board (CPCB), the apex body for the formulation and implementation of environmental policies under the Ministry of
Environment and Forests (MoEF). The CPCB also hosted the last meeting of the Forum of Regulators, in which it proposed to set up a ‘National Task Force on Co-processing’ to take forward the recommendations of the forum. This task force, which has now been set up by CPCB, is a major policy win for furthering the agenda of AFR usage and will help in scaling it up.

New financing opportunities
One of the barriers for promoting AFR is linked to the low return on investment for such initiatives, making it unattractive for the industry to take up such projects in a ‘business-as-usual’ scenario. Keeping this in mind, IIP and its partners proposed an innovative approach to unlock finances for AFR projects by having recourse to the new Companies Act 2013. Section 135 of the act mandates all companies above a threshold size to report their Corporate Social Responsibility (CSR) initiatives and a mandatory two per cent of Profit Before Tax (PBT) spending on CSR activities. The new act aims to make corporate governance more effective, and further enhance the constructive participation and role of corporate India in the country’s socio-economic development.

Due to the new legislation, investment into CSR in India is expected to see a manifold increase. With an estimated CSR corpus of over INR2.1bn (US$35m), the cement industry will be one of the major contributors to the CSR pie, and effective utilisation of this fund can significantly impact the rate of progress towards the goal of inclusive social development. Along with the funds, the cement industry can also bring expertise on better environmental sustainability practices.

To tap into this opportunity, IIP organised a virtual roundtable discussion in March 2014 with CEOs of top cement companies. Convened by the director general of the Indian Institute for Corporate Affairs (IICA), this discussion saw industry participants pledge support for such an initiative, all keen to work together in developing policy recommendations for both the Companies Act as well as cement industry CSR policy. IICA now aims to consider MSW co-processing as a valid CSR activity under the new Companies Act in consultation with the industry. Such a provision would unlock significant funding for implementing such projects. Driving the use of MSW as a coal substitute in cement kilns involves converting MSW to RDF. This will not only result in significant CO2 emission reduction (due to savings in coal use and the avoidance of landfill-related methane emissions) but will also address the ever-pressing environmental challenge of the management and safe handling of solid waste, particularly in cities, which is increasingly a major concern. In addition, society will benefit due to a reduction in waste dumps and their associated environmental hazards while protecting the livelihood of marginalised sections of the society in the supply chain.

Meeting industry compliance targets
The Bureau of Energy Efficiency (BEE) has initiated a scheme called ‘Perform, Achieve and Trade’ (PAT), a market-based trading scheme that aims to improve industries by trading in energy efficiency certificates in energy-intensive sectors.

Through the scheme’s subsequent cycles, BEE plans to enhance the scope and target of energy efficiency improvements. The bureau is keen on establishing a Knowledge Exchange Platform to facilitate peer-to-peer learning, exchange of best practices and exposure of the Indian cement industry to innovative approaches in this area at the international level. As PAT targets become increasingly stringent in subsequent cycles, options like AFR would become extremely important, and there is a strong possibility to also link up AFR work with future PAT obligations/commitments.

The way forward
Co-processing of waste in cement kilns clearly provides an opportunity for fossil fuel savings and GHG mitigation, with reasonable mitigation costs and enormous replication potential. Other benefits include an effective and efficient means of managing urban and industrial waste, which is increasingly becoming a major concern. Therefore, the use of alternative fuels and raw materials in cement production presents a win-win situation for a country like India. As a result, IIP is committed to accelerating its successful, multi-stakeholder initiative that promotes AFR use in the cement industry. Recent successes have opened up new opportunities with key government ministries and agencies with very proactive industry participation. Capitalising on these opportunities has helped in achieving scale and speed for transformational impact, which is essential in ensuring success for such a large-scale initiative.

References


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MSW co-processing in cement kilns holds significant potential to considerably reduce India’s landfilled municipal waste volumes.

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