

Highlights of the Project



Capacity Building initiatives

National Events, Conferences, Workshops and Seminars

Conducted various technical sessions during annual CII events like “Green Cementech”, “Waste management Summit” and “National Seminar on Co-processing”, where speakers from Pollution Control Boards, waste generators, co-processing cement plants, experts, industry representatives, and waste pre-processing companies shared their views. **More than 300 delegates participated in these sessions.**

Publications and Bulletins

Various publications were released to create awareness among the Indian industries, and including a status paper on AFR usage, best practices manual, a note on pre-processing of waste, and step by step procedures to be followed for co-processing approvals and transporting hazardous waste.

National Missions

Organized National missions to best operating cement plants in India with co-processing facilities, for groups of industry representatives and Policy makers from CPCB and SPCBs. **More than 100 delegates participated in the missions.**

A unique website launched on AFR (www.ciiwasteexchange.org) which shares the data on co-processing and hazardous waste generation



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Milestones in this Initiative

AFR Substitution (Thermal Substitution Rate) of the Indian Cement Industry increased from <1% to >4%

More than 36 cement plants started co-processing wastes as AFRs by setting up co-processing facilities

Some of the participating State Pollution Control Boards have developed a specific action plan and implementation schedule to promote co-processing in cement plants

More than 7 cement plants set up pre-processing facilities to convert non-homogenous wastes into AFRs having desired quality parameters

>2 TSDFs started supplying pre-processed waste mix to cement plant for use as AFs

Some of the State Pollution Control Boards approved inter-state transportation of hazardous waste

Recognition of co processing in policy framework

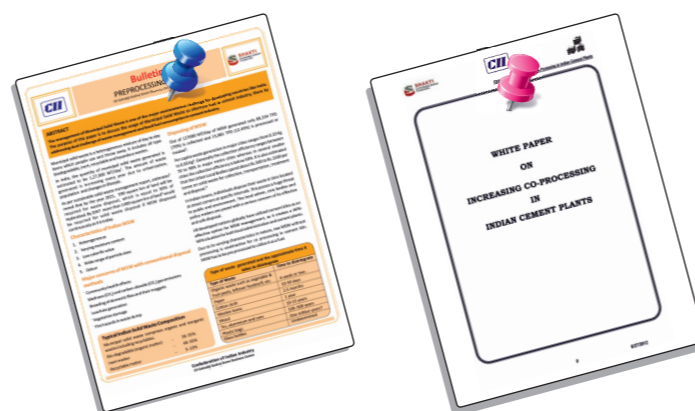
Way Forward

Government should establish a National level mission on co-processing, and co-processing should be established as one of the pillars for reducing GHG emissions of the country.

As a guiding principle, co-processing should be practised as a preferential option over land filling/ incineration for management of non-recyclable waste derived out of industrial or municipal sources.

Pre-processing platforms should be developed in every State of the Country instead of land filling sites, so that the waste can be processed and disposed in a scientific and sustainable manner.

Government to promote economically sustainable public private partnerships to produce Refuse Derived Fuel (RDF) from MSW for co processing.



About CII

The Confederation of Indian Industry (CII) is a non-government, not-for-profit, industry-led and industry-managed organization, playing a proactive role in India's development process. Founded in 1895, India's premier business association has around 8000 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 200,000 enterprises from around 240 national and regional sectoral industry bodies.

CII - Sohrabji Godrej Green Business Centre (CII - Godrej GBC), a division of Confederation of Indian Industry (CII) is India's premier developmental institution, offering advisory services to the industry on environmental aspects and works in the areas of Green Buildings, Energy Efficiency, Water Management, Renewable Energy, Green Business Incubation and Climate Change activities.

About Shakti Sustainable Energy Foundation

Shakti Sustainable Energy Foundation works to strengthen the energy security of India by aiding the design and implementation of policies that support renewable energy, energy efficiency and sustainable urban solutions.

Shakti Sustainable Energy Foundation was established in 2009 to support India's developmental and energy security objectives.

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Co-Processing: Journey Towards Low Carbon Economy

Pillar to support India's Intended Nationally Determined Contribution (INDC)

Confederation of Indian Industry

2016

Project Background

The Indian Cement Industry, one of the most efficient in the world, emitted 137 million tonnes (Mt) of CO₂ in 2010, approximately 7% of the India's total man-made emissions¹. In a BAU scenario, CO₂ emissions are projected to reach 490-835 Mt of CO₂ by 2050 - a 255% to 510% increase compared to 2010 levels².

Some key levers, which could limit the potential increase of emissions to 275 - 468 Mt of CO₂ by 2050³, were identified for Indian Cement Industry as part of an earlier activity to chart out a low emissions technology roadmap for the cement industry. Increased use of alternative fuels and raw materials has been identified as one of the pillars to support India's Intended Nationally

Carbon emission Projections for Indian Cement Industry (in Million Tonnes)			
2010			
Market condition		Business as usual	By implementing reduction levers
Low demand	137	488	275
High Demand		835	468
Potential to reduce emission intensity by 45% in 2050 compared to 2010 levels			

Confederation of Indian Industry (CII) is working on an initiative to facilitate the use of urban and industrial waste as Alternate Fuel and Raw Materials (AFR) in Indian cement industry. This Project is supported by Shakti Sustainable Energy Foundation (SSEF), which works to strengthen the energy security of India by aiding the design and implementation of policies that support energy efficiency and renewable energy.

The objective of the project started in 2011, is to reduce the emission levels by accelerating co-processing initiatives in the country by leveraging the cement sector and, thereby, support India's progress towards a low carbon economy.

References

- 1,2,3 Low carbon technology roadmap for Indian Cement Industry
- 4 Task force on waste to energy, planning commission
- 5 Central pollution Control Board
- 6 CEMBUREAU, SINTEF

Determined Contribution (INDC) towards low carbon emissions.

Co-processing is the use of waste as raw material, or as a source of energy, or both, to replace natural mineral resources and fossil fuels such as coal, petroleum and gas in industrial processes.

Co-processing waste in Industry will result in dual benefits of resource conservation and scientific and sustainable solution for waste management in the country.

The Basel convention highlighted the suitability of cement kilns for co-processing of hazardous and other wastes and has also brought out technical guidelines for the same and India is also a Signatory to this convention.

The following characteristics of the cement kiln make it ideal for co-processing wastes:

High operating temperature; Flame > 1800°C and material upto 1450°C

Longer Residence time in an oxygen rich atmosphere; about 6 to 9 seconds above 1100°C

No residues are left, which in case of incineration still requires to be land filled as ash.

Further the acidic gases, if any generated during co-processing gets neutralized, since the raw material is alkaline in nature

Waste Generation Scenario in India

Municipal Solid Waste (MSW)

Urban India generates about 62 million tons of Municipal Solid Waste (MSW) per annum, and, under a business as usual scenario, MSW generation is projected to be around 165 million tons by 2030⁴. Further, if the waste continues to be disposed in same manner as currently used, by 2047, the area required for waste disposal is estimated to be 1400 Km², which is equivalent to size of the Delhi city.

Clearly, it is an imperative that better systems of waste management are developed and promoted in the country. One of the objectives of the Swachh Bharat Mission (SBM) is to implement modern and scientific MSW management.

S.no	Countries	% of Thermal Substitution by AFR
1	France	32
2	Germany	35
3	Norway	45
4	Switzerland	47
5	USA	25



Cement kiln is the superior technology and internationally accepted way to better manage waste. Refuse-derived fuel (RDF), which is a segregated combustible fraction of solid waste in the form of pellets or fluff produced by pre-processing of solid waste created from MSW, has the potential to substitute 7-8% of the total fuel requirement of the Indian cement industry by 2025.

Hazardous Waste

As per Central Pollution Control Board (CPCB) estimates, there are 41,523 hazardous waste generating units in India⁵.

Total Generation	7.90 Million Tonnes/ Annum
Land fillable	3.32 Million Tonnes /Annum
Recyclable	3.98 Million Tonnes /Annum
Incinerable	0.60 Million Tonnes /Annum

The 0.6 Million T of incinerable waste and the 3.32 million T of landfill able waste is currently disposed off in common waste management facilities having incineration and land fill facilities leading to the loss of vital resource value present in them besides having potential to cause severe risk to the environment if not operated in an environmentally sound manner.

Co-processing can be very effectively used for management of these hazardous incinerable and landfill able wastes leading to resource conservation and reduction in GHG emissions in the country.

Utilisation of different hazardous and non-hazardous wastes from industrial, Municipal and other sources in cement kilns through co-processing is a win win option for managing them in an environmentally sound and economically viable manner.

Highlights of the Project

Expert Group: Creation of working group involving 8 State Pollution Control Boards to support and guide the project activities

Extensive Stakeholder Discussions: Round table discussions in 8 different States among all stakeholders of AFR to understand the opportunities and barriers to co-processing. More than 225 participants shared their views in various round table discussions.

Policy Changes: Industry recommendations on drafting the new Hazardous Waste Management Rules 2015 was submitted to Ministry of Environment, Forest and Climate Change (MoEFCC) and also working with Ministry on the new rules.

International Mission: Organized International AFR mission to cement plants and AFR pre-processing platforms in Germany, Switzerland, Malaysia, Philippines and France. Exposure to international best practices for the team of State and Central Pollution Control Board officials, representatives from Cement Manufacturers' Association and the Indian cement industry.

White Paper on Co-processing: A white paper titled "Increasing Co-Processing in Indian Cement Plants", which includes present scenario and challenges in India, international best practices on policy and recommendations specific to Indian cement industry, was submitted to MoEFCC.

