Cement Production India

<table>
<thead>
<tr>
<th>year</th>
<th>Capacity Mn T</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>228.3</td>
</tr>
<tr>
<td>2022</td>
<td>605.8</td>
</tr>
<tr>
<td>2027</td>
<td>975.6</td>
</tr>
</tbody>
</table>

Coal requirement for cement plant -2030- 150 Mn T

The availability of linkage coal a major concern for the cement industry. Even importing coal is not the best option. Will have to compete with power plants. The industry has no choice but to use waste derived fuels.
Linkage coal for Cement sector

No new Coal allotment to Cement industry. Coal materialization thru linkage has come down from 14.8 mill T in FY 06 to 11.9 in FY 11.

Data based on CMA member companies.

Alternate fuel use in Cement kilns

<table>
<thead>
<tr>
<th>Country</th>
<th>% TSR by AFR</th>
<th>Country</th>
<th>% TSR by AFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>83</td>
<td>Sweden</td>
<td>29</td>
</tr>
<tr>
<td>Switzerland</td>
<td>48</td>
<td>Luxemburg</td>
<td>25</td>
</tr>
<tr>
<td>Austria</td>
<td>46</td>
<td>Czech Republic</td>
<td>24</td>
</tr>
<tr>
<td>Norway</td>
<td>35</td>
<td>Japan</td>
<td>10</td>
</tr>
<tr>
<td>France</td>
<td>34</td>
<td>United States</td>
<td>25</td>
</tr>
<tr>
<td>Belgium</td>
<td>30</td>
<td>India</td>
<td>Less than 1</td>
</tr>
<tr>
<td>Germany</td>
<td>42</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: CEMBUREAU
### Waste generation in India

<table>
<thead>
<tr>
<th>Type of waste</th>
<th>Quantity Mil T</th>
<th>Quantity Mil T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal waste</td>
<td>58.4</td>
<td></td>
</tr>
<tr>
<td>Hazardous waste</td>
<td>A+B+C</td>
<td>6.21</td>
</tr>
<tr>
<td>A recyclable</td>
<td>3.08</td>
<td>3.08</td>
</tr>
<tr>
<td>B Land fillable</td>
<td>2.72</td>
<td>2.72</td>
</tr>
<tr>
<td>C Incinerable</td>
<td>0.41</td>
<td>0.41</td>
</tr>
<tr>
<td>Total</td>
<td>64.61</td>
<td></td>
</tr>
</tbody>
</table>

Municipal waste alone can generate 9 mil T of RDF to replace 4.5 Mil T of coal. Equivalent to 22% of current coal requirement for cement plant operation. Does not include other non-hazardous waste.

### Incinerable waste generation in India

<table>
<thead>
<tr>
<th>State</th>
<th>Hazardous waste incinerable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maharashtra</td>
<td>36.75%</td>
</tr>
<tr>
<td>Gujarat</td>
<td>26.12%</td>
</tr>
<tr>
<td>A P</td>
<td>7.61%</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>5.54%</td>
</tr>
<tr>
<td>U.P</td>
<td>3.78%</td>
</tr>
<tr>
<td>Punjab</td>
<td>3.57%</td>
</tr>
<tr>
<td>WB</td>
<td>3.03%</td>
</tr>
<tr>
<td>TN</td>
<td>2.68%</td>
</tr>
</tbody>
</table>

Total Incinerable waste generation: 0.41 MTA
Total Incinerable waste capacity: 0.32 MTA
Deficit of incineration capacities: 0.09 MTA
UltraTech - Leading Indian Cement Manufacturer has taken this Challenge as Technology Mission.

The advantages of co processing of alternate fuel in cement plant

- Co processing ranks higher in the waste processing hierarchy.
- Residence time of combustion gases above 1000°C in excess of 3-4 seconds – ensures complete destruction of pollutants.
- Complete destruction of organic compounds.
- Total neutralization of acid gases, sulphur oxides and hydrogen chloride, by the active lime in the kiln load, in large excess to the stoichiometry.
- Embedding of the traces of heavy metals in the clinker structure with very stable links (metallic silicates formation).
- No production of by-products such as ash or liquid residue from gas cleaning.
The advantages of co processing of alternate fuel in cement plant

- Produces overall environmental benefits by reducing releases to air, water and land.
- Maximizes the recovery of energy while ensuring their safe disposal
- Saving of non renewable fossil fuels. Substitution of coal with waste. Savings are made through resource conservation and associated CO2 emissions.
- Reduced burden on TSDF
- Immobilization of toxic and heavy material
- Reduced NOx emissions when using certain types of waste

UltraTech Cement in India

- Rajasthan- Three Integrated Units( Aditya Cement works, Kotputli cement works and Birla white cement plant)
- Chhattisgarh- ( Hirmi Cement Works, Rawan Cement Works)
- Maharashtra- (Awarpur Cement Works, Hotgi cement Works, Ratnagiri Cement Works)
- Madhya Pradesh- ( Vikram Cement Works)
- Karnataka- (Rajshree Cement Works, Ginigera Cement Works)
- Tamil Nadu –(Reddipalayam Cement Works, Arakkonam Cement Works)
- Gujarat - Gujarat Cement Works, Narmada Cement Jafrabad Works, Magdalla Cement Works
- Andhra Pradesh – ( Andhra Pradesh Cement Works)
- Uttar Pradesh- ( Dadari Cement Works, Aligarh Cement Works)
- Haryana- ( Panipat Cement Works)
- Punjab- ( Bhatinda Cement Works)
- West Bengal ( West Bengal Cement Works)
- Orissa – ( Jharsuguda Cement Works)
Industrial Wastes We Co-Process

- **Automobile Industry** (Paint Sludge, Phosphate Sludge, ETP Sludge, Spent Catalyst, Waste Oil)
- **Textile Industry** (ETP Sludge, Waste Oil)
- **Pharmaceutical & Bulk Drug Industry** (Spent Carbon, ETP Sludge, Spent Catalyst, Mother Liquor, Waste Oil, Still Bottom Residue, Spent and distillation Residue)
- **Soft Drink Industry** (ETP Sludge, Spent Carbon)
- **Petroleum Refinery**
- **Pesticide Industry**
- **Paint and Dyes Industries**
- **Agro Waste and Biomass** (Rice Husk, Soya Husk, Mustard Husk, Ground Nut Husk, Saw Dust etc)
- **Tyre Chips, Rubbers, Plastics and polythene**
- **MSW/RDF**

Overall AF Consumption

![Graph showing overall AF consumption from 2010-11 to 2012-13](chart.png)

<table>
<thead>
<tr>
<th>Year</th>
<th>% AF Weight</th>
<th>% TSR</th>
<th>Qty (in Lac MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-11</td>
<td>1.84</td>
<td>1.26</td>
<td>0.68</td>
</tr>
<tr>
<td>2011-12</td>
<td>1.80</td>
<td>1.13</td>
<td>0.71</td>
</tr>
<tr>
<td>2012-13</td>
<td>2.28</td>
<td>2.00</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Targeted % TSR for FY 2012-13
Overview of AF Usage in UltraTech (Based on Material)

- Hazardous waste: 43%
- Non-Hazardous waste: 15%
- Biomass fuel: 42%

Alternative Raw Material

- Utilization of Fly ash, Slag as substitute materials for cement production. Potential to use LD slag, spent pot liners, lime sludge.
- 16.81 million tonnes of recycled material used during FY-10-11 and FY-11-12.
**Storage Yard & Feeding System at RDCW**

- We have a well covered storage yard with good ventilation, concrete floor and leachate collection drainage system.
- A special and fully mechanized feeding system with hopper, belt conveyor, weigh feeder etc.
- Fully dedicated handling vehicle like dozer.
- Special manpower for pre-processing, handling and monitoring of waste fuel feeding.
- Pump for feeding liquid/semi solid material like sludge.
- Plastic and wood shredding machine for size reduction.

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**Alternate Fuel Feeding System at RDCW**

![Diagram of Alternate Fuel Feeding System at RDCW]

- **UNLOADING AREA**
- **TRANSFER TOWER**
- **BUCKET ELEVATOR**
- **UNLOADING AREA**
Alternate Fuel Feeding System at RDCW

Storage Yard at RDCW With Different Wastes
Municipal Solid Waste Plant at Jaipur (Rajasthan)

(Future plan and Support required)

- Policy to encourage waste generators to divert incinerable waste to cement plant.
- To include “co processing” in Hazardous wastes (Management, Handling, and Transboundary Movement) Rules, 2008 and place it above incineration.
- To create a class of waste processing facilities for fuel homogenization and preparation for Industry.
- Polluters pay principle to be enforced.
- Need for better coordination between regulatory authority, TSDF operators, and cement industry.
- Inter States movement permission.
- Permit import of non-hazardous waste such as Tyres and RDF.
Thank you