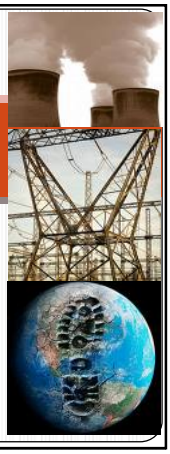
Low Carbon Roadmap for Indian Cement Industry



Confederation of Indian Industry
CII – Godrej GBC

Agenda

- Introduction
- Climate Change
- GHG Emission – Present Scenario
- Low carbon growth
- Stakeholder Engagement
- Way forward

Climate Change

- Impact of GHG on climate change
  - Proven beyond doubt
- Several countries
  - Already impacted by climate change
  - Businesses, agriculture, services, economy affected
- Need to evolve a holistic approach globally to combat climate change
  - More onus on industry to accept & discharge responsibilities

Global Initiatives

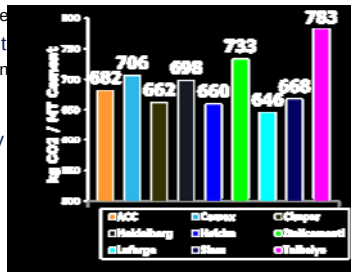
- Several Initiatives across the world
- Voluntary targets
  - Canada - 20% below 2006 level by 2020
  - US - 17% below 2005 level by 2020
  - EU – 20-30 % below 2005 level by 2020
  - Russia – 25% below 1990 level by 2020
  - China - 40% reduction emissions per GDP compared to 2005 by 2020
- Reduction Endeavours
  - Industries / Businesses supplement Nation's commitments

Global Initiatives

- All leading companies ready with Carbon Footprint & Mitigation Strategies
- Leading retail chains – Walmart, Tesco
  - Insist on Carbon Footprint
  - Basis for customer buying

Global Initiatives

- Cement industry
  - Positive response
- Carbon footprint
  - All leading cemen companies
- Mitigation strategies ready
- Business decisions based on carbon footprint



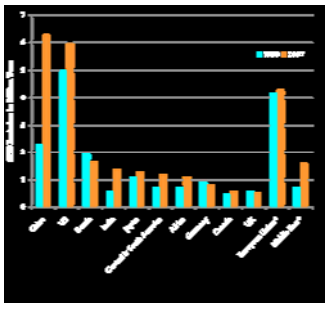
Cement - GHG Reduction Targets*

- By 2010
  - Holcim : 20%
  - Lafarge : 20%
  - Heidelberg Cement : 15%
  - Titan : 15%
  - Taiheiyo : 3% (from 2000 baseline)
  - Siam : 670 kg/ton cementitious product
- By 2012
  - Votorantim : 10%
  - Italcementi : 690 kg/ton cementitious product
- By 2015
  - Cemex : 25%
  - CRH : 15%

* Intensity reduction from 1990 levels

India & Climate Change

- India
  - One of the fastest growing economies
  - Fast growing GHG emissions
- Per capita emission (2007)
  - India – 1.2 T
  - World – 4.5 T



GoI on Climate Change

- PM - India's per capita emission levels will never exceed that of developed countries
- India cannot and will not take on emission reduction targets because:
  - Poverty eradication, social & economic development priorities
  - Each human being has equal right to global atmospheric resources (i.e., Principle of Equity)
- India will continue to be a low-carbon economy
- India has already unveiled a National Action Plan on Climate Change (8 national missions)

Voluntary emission reduction of 20-25% of 2005 levels by 2020

GoI on Climate Change - Industry

- National Action Plan on Climate Change
- Energy Efficiency
  - Proposes Perform, Achieve & Trade (PAT)
  - Energy Labeling of appliances
  - Implementation of Energy Conservation Act 2001
- Renewable Energy
  - Renewable energy certificates
- Guidelines for industry
  - New cement plants GHG Emissions to be less than 0.75 ton CO_2 / ton cement

GHG & Cement Industry

- Cement Industry – major contributor to global GHG Emissions
  - 5% of global anthropogenic emissions
  - Emissions from process & energy
- Recent IEA report
  - Global Cement production increased 54% between 2000 & 2006
  - Production to increase from 2.55 Bil T (2006) to 4.40 Bil T (2050, High Growth forecast)
- Significant focus on sustainable growth of cement sector globally

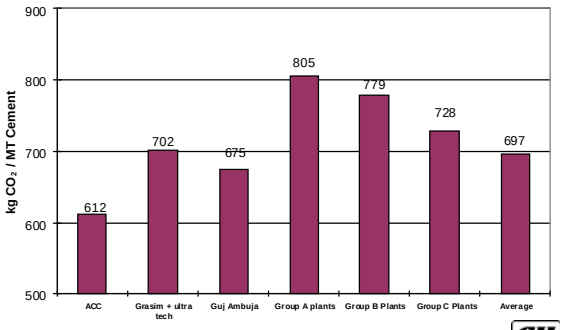
Low Carbon Roadmap for Indian Cement Industry

- Indian Cement Industry
  - To gear up to meet nation's commitments
- This report
  - Roadmap for identifying 20% GHG Emission Intensity reduction opportunities
  - Explore technological, business & market opportunities
  - Role of stakeholders

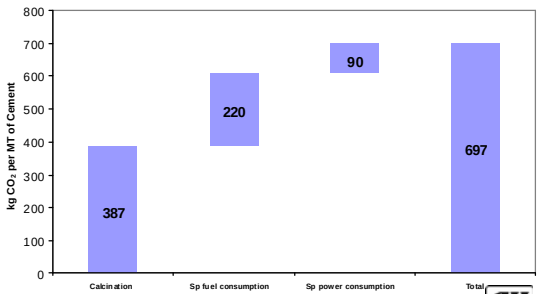
Capacity of Plants Covered under study

Sl No	Group	Capacity MMTPA	No of plants	Cement Production, MTPA	Share of Country's Production
1	ACC			21.4	11.8
2	Ambuja			18.8	10.4
3	Grasim + Ultratech			32.1	17.7
4	A	< 1.5	6	6.0	3.3
5	B	1.5 -3.0	6	10.3	5.6
6	C	>3.0	5	17.1	9.4
			Total	105.6	58.2

GHG in Indian Cement Industry



GHG Emission Breakup – Scope 1&2



Low Carbon Cement opportunities

1. **Generation and Utilisation of Power from Waste Heat Recovery**
2. **Use of alternate fuels & Bio mass**
3. **Improving energy efficiency & Increasing blended cement portion**
   a. **Increasing the Blended Cement portion further**
   b. **Increasing the Percentage of Additives in Blended Cement**
   c. **Further improvements in Electrical energy consumption**
   d. **Further improvements in Thermal energy consumption**
   e. **Producing Composite cement**
4. **Producing limestone based cement/ Low grade cement**
5. **Transport Logistics**

Low Carbon Cement - Reduction potential

Activity	unit	Present Level	Proposed Level (2020)	Impact Reduction in kg CO_2/ MT Cement
Power from WHR	MW	30	300	14.5
Alternate fuel	% substitution on Thermal basis	Low	10	22.0

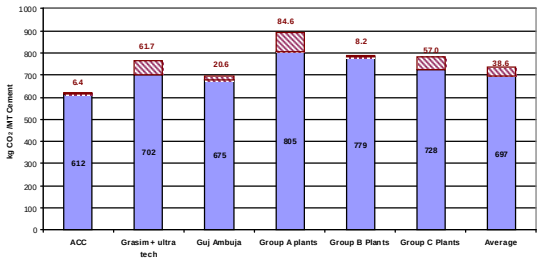
Low Carbon Cement - Reduction potential

Activity	unit	Present Level	Proposed Level (2020)	Impact - Reduction in kg CO_2/ MT Cement
Blended cement	%	74.0	90.0	38.9
Additives in PPC	%	27.0	32.0	33.0
Electrical Energy	kW / MT cement	82.0	72.0	2.2
Thermal Energy	kcal/ kg Clinker	743	737	1.5

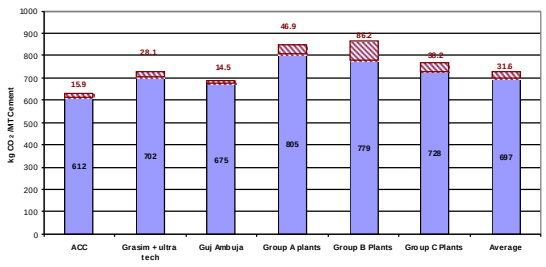
Low Carbon Cement - Reduction potential

Activity	unit	Present Level	Proposed Level (2020)	Impact - Reduction in kg CO_2/ MT Cement
Composite cement	%	0.0	2.0	1.6
Filler in OPC	%	1.0	5.0	25.0
Logistics				0.5
Overall Total		697	555.7	141.3

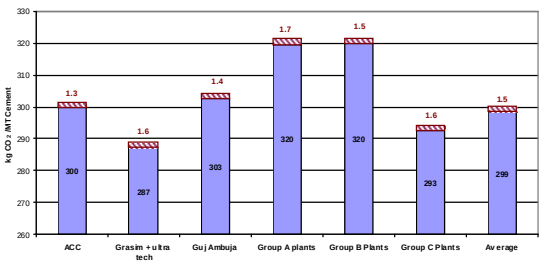
Current GHG Emission level & Reduction potential from Blended Cements



Current GHG Emission level & Reduction potential from Additives in Blended Cements



Current GHG Emission level & Reduction potential from Specific Fuel consumption



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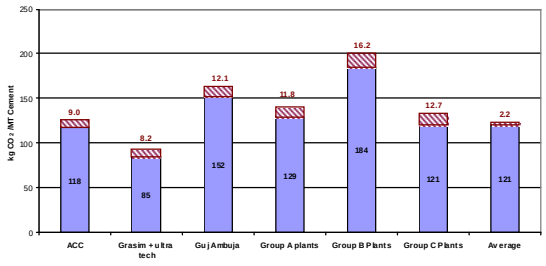
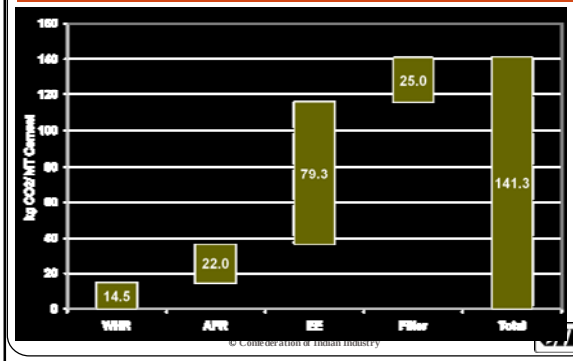


Low Carbon Cement - Reduction potential



Roadmap ahead

1. Carry out GHG Emission Inventorization
2. Identify areas for reduction
   1. Explore short term and long term reduction targets
   2. Chalk out action plan for reduction
3. Involve GHG reduction consideration in business making decisions
   1. Blended cement
   2. Alternate fuel
   3. Waste heat recovery

Thank you

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