

Financial Opportunities in Climate Change Initiatives

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Conference on Climate Change: Issues and Opportunities

Guwahati, 11th September 2002

Industry's Concerns

Why should the Indian industry be bothered about climate change?

- Since it would have to bear impacts due to climate change
- It offers business opportunities like clean technology transfers and energy efficiency improvements
- Funding mechanisms are also available

Climate Change Impacts on Industry

Industries that would be effected due to climate change

- 1. Directly sensitive to climate**
- 2. Dependent on climate-sensitive resources**
- 3. Markets sensitive to climate change**

Directly sensitive to climate

➤ Coastal industries

- Hotels
- Coastal industries (salt manufacturing, fisheries, refineries on coast etc)

➤ Coastal infrastructure

- Ports
- Railway networks (e.g. Konkan Railways)
- Roads

➤ Change in energy consumption

- Increased space cooling requirements in Building and transportation sectors
- Due to changed irrigation requirements

Dependent on climate-sensitive resources

- Almost all industries, since energy prices would be effected
- Agro-industries
 - Food
 - Beverages
- Industries dependent on forestry
 - Building sector
 - Paper
 - Power generation
- Shipping

Markets sensitive to climate change

- Energy infrastructure
- Change in transport demand due to population migration, changed agro-product movements
- Insurance sector

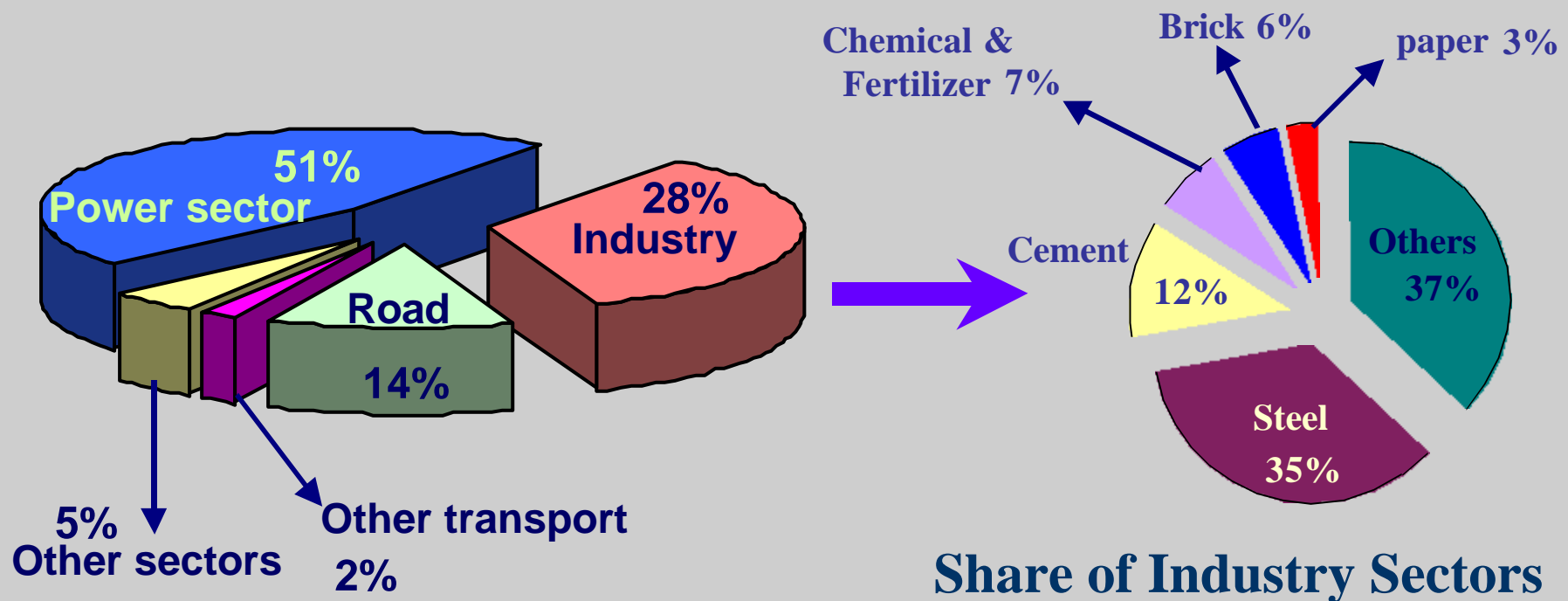
Indian Industrial CO₂ Emissions

India: Total CO₂ Emissions (2000)

260 Million Tons of Carbon

3% of global emissions

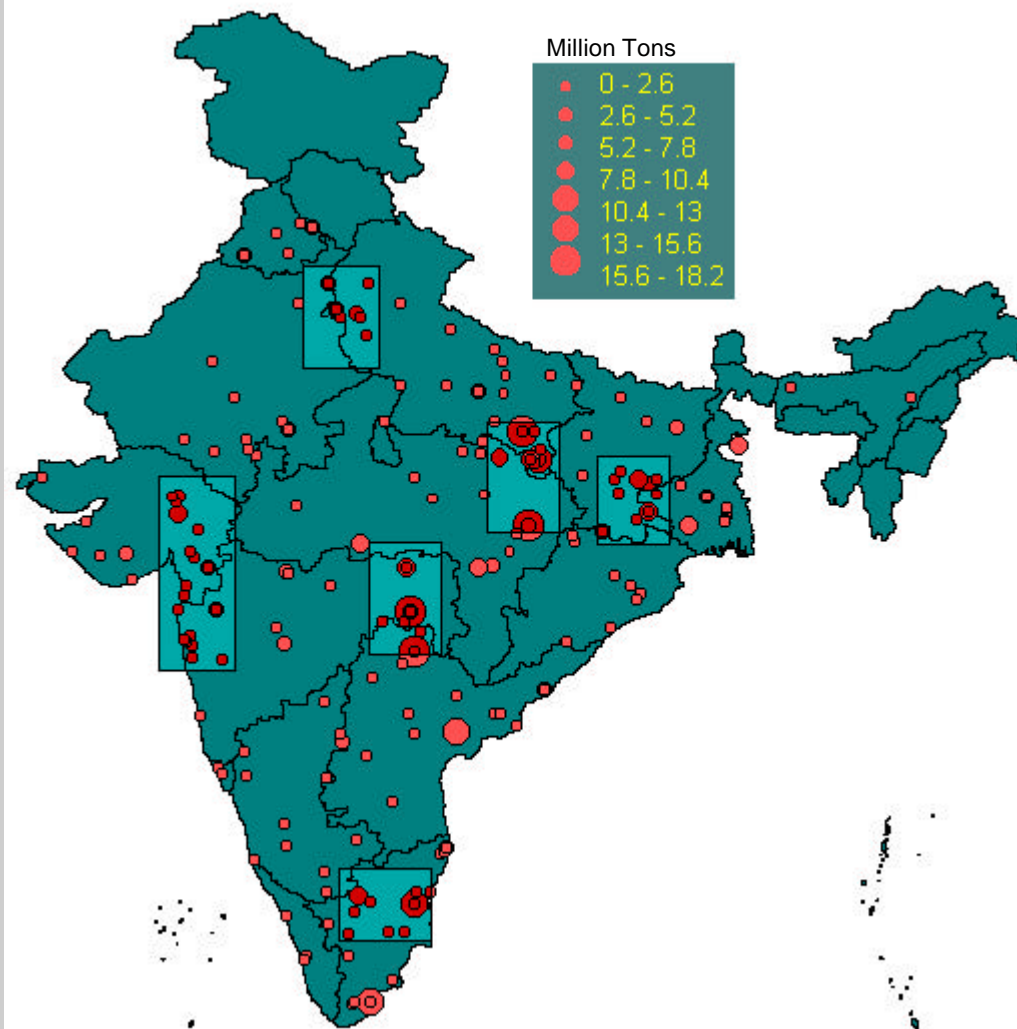
5.5% annual growth rate



Industrial Large Point Sources (LPS): CO₂ Emissions

Emission details	No. of LPS	CO ₂	
		LPS (Tg)	LPS/Total
Power	94	365	47
Steel	11	48	6
Cement	85	68	9
Fertilizer	31	14	2
Sugar	28	0.7	0.09
Paper	33	2.9	0.37

Tg (Teragram) = Million ton



Carbon Market Opportunities

Global Carbon Market

- **Size: 0.5 Billion ton / year (in 2010)**
- **Enlarging demand**
- **Global supply (no transport cost)**
- **Market price (Minus US in Kyoto Regime)**
 - ❖ **\$10/ tC (with global flexibility in C mitigation)**
 - ❖ **Up to \$ 450 / tC (only domestic mitigation by developed countries)**

Co-operative Mechanisms for Projects Financing

Global Environmental Facility (GEF)

- Incremental Cost

Prototype Carbon Fund (World Bank)

- Finance for Mitigation

Activities Implemented Jointly (AIJ)

- Bilateral/ No Credit for GHG Saving

Clean Development Mechanism(CDM)

- Kyoto Protocol (Article 12)

Emissions Trading

- Kyoto Protocol (Article 17)

Potential Project Areas

Energy	<ul style="list-style-type: none">• Demand Side management (DSM)• Co-generation• Biomass based projects• Renewables	○
Transportation	<ul style="list-style-type: none">• Fuel change• Public transportation	
Urban Infrastructure	<ul style="list-style-type: none">• Waste to energy• Waste to compost• Water pumping efficiency	π
SEQUESTRATION Forestry	<ul style="list-style-type: none">• Mining Sector development• Land for infrastructure projects	π

Realizing Carbon Benefit for Projects

- ◆ For enhancing the project related returns for commercially viable projects
 - ↳ easier to reach financial closure
- ◆ For moving projects with marginal investment grade to investment grade
- ◆ Can jump start sectors
 - ↳ Power sector
 - ↳ Renewable energy
 - ↳ Urban Infrastructure
- ◆ Project must reach financial closure over and above the carbon money
- ◆ Un-viable projects are unlikely to be impacted

Financial selection criteria

Project viability	Significance of carbon finance
-ve IRR	Carbon funds critical If high cost/tC: difficult to find investors
Marginal IRR	Carbon funds critical; Cost/tC moderate; Investment attractive
Marginal IRR with un-addressed risk/barriers	Viability improves greatly; Low cost/tC Investment attractive
+ve	Viable without carbon financing Can be used to enhance

Coal to Gas Switch for Power Plant

	Units	Coal Power	Gas Power
Fuel Price	Rs./ GJ	80	150
Generation Cost	Rs./ Kwh	2.2	2.5
Carbon Emission	kg/ Mwh	290	160
Sulfur Emission	kg/ Mwh	6	0
Ash	kg/ Mwh	240	0

Mitigation

	kg/Mwh
Carbon	130
Sulfur	6
Ash	240

@ 6000 Hrs per year Operation

➤ 780 Tons of Carbon saved/ MW

@ Rs 480/ tC

➤ Rs. 0.06/ Kwh

CDM Project:

Renovation of Coal Power Plant

	Units	Old Plant	New Plant
Efficiency	%	35	38
Renovation Cost	Mill. Rs./ MW	-	2
Carbon Emission	kg/ MWh	290	267
Sulfur Emission	kg/ MWh	6	5.5
Ash	kg/ MWh	240	220

	kg/MWh
Carbon	23
Sulfur	0.5
Ash	20

@ 6000 Hrs per year Operation

➤ 138 Tons of Carbon CERUs/ MW

@ Rs 480/ tC

➤ Rs. 65,000 per Year/ MW

@ Rs. 80/GJ Coal Price

➤ Fuel Saving of Rs. 420,000/ MW

Conclusions

- 1. Indian industries would be effected in varying degrees due to climate change**
- 2. It makes business sense to be climate friendly**
- 3. Opportunity to expedite energy efficiency initiatives**
- 4. Funding mechanisms exist**
- 5. Industrial federations may help in reducing transaction costs**

Thank you