

***Indian Industry: Climate Change,
CDM & Renewable Energy***

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Today

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- India: Current Scenario
- Impacts of Climate Change: India, Global Economy
- India: Leading by Example
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Confederation of Indian Industry

- Competitiveness of India Inc.
- India's **largest & oldest** apex body
- Not-for-profit registered society
- **90,000 members**, includes > 300 associations
- Only industry body to have separate Department of specialists for Sust. Dev't. (former *Env Mgmt Div*)
- 60 offices in India, 9 overseas offices
- Partnerships with nearly 100 countries (300 MoUs)
- Interface between govt. & industry
- Manufacturing + service sectors
- **www.cii.in**

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Role of CII

- Strengthen industry role in economic development
- Reinforce industry's commitment to society
- Globalisation of Indian industry & integration
- Create awareness & support industry efforts
- Quality, environment, H&S, inclusive growth, affirmative action
- Address special needs of SSI
- Diaspora
- Policy intervention, awareness, advisory services
- 6 Centres of Excellence

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CII-ITC Centre of Excellence for Sustainable Development

Mission Statement

- Enable transformation of Indian businesses through proactive adoption of approaches and practices that promote Sustainability.....
- thus contributing to India's agenda for inclusive growth & sustainable development.

Objectives of CESD

- 1. Promote awareness** on sustainability issues
2. Encourage sustainability **thought leadership**
- 3. Capacity building** for sustainability performance
4. Recognise excellence in **sustainability performance**

India - Environmental Challenges

- Our Greatest asset: More than 1.1 billion people
 - Population growth rate : 1.6 % per annum
 - GDP growth rate : 9.2 % per annum
 - Shift in economy: agriculture to mfg / service
 - Changing life-styles & consumption patterns
- Spending on environmental protection 0.5% of GDP (vs 1-3 % in developed economies)
- Our Greatest Challenge: Sustainable Development

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India - Environmental Scenario

- Forest Cover : 19.27% of geographic area
- 4th largest & 2nd fastest growing producer of GHGs
- 1.16 billion people (16.7% of world)
 - 27.8 % Urban
 - 72.2 % Rural
- By 2015: Five Indian cities will be among the 30 largest cities in the world

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India - Environmental Scenario

- Total no. of states / union territories: $28+7 = 35$
- Cities / urban agglomerations with population over 1 Million: 42
- Agriculture & Agro-based Industries
 - Accounts for ~35% of GDP
 - Accounts for ~18 % of total value exports
 - Employs ~65% of the total workforce

Environmental Business Drivers

- Environmental regulations
- Pressure from civil society
- Judiciary
- MEAs
- International Directives / Other requirements

Annual Environmental Damage Cost in India

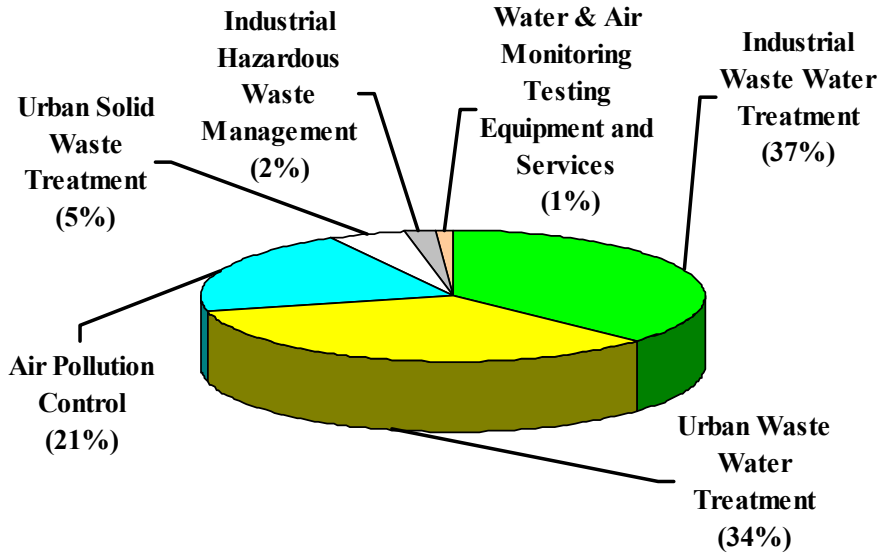
(SOURCE : WORLD BANK)

	(Billion US \$)
● Water pollution	5.7
● Air pollution	1.3
● Land degradation	2.7
Total	9.7

Annual Environmental Damage Cost in Other Countries & Regions

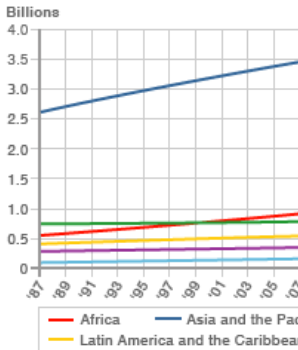
	(billion US \$)
● Eastern Europe	16.5
● Mexico	11.3
● China	11.0
● India	9.7
● Avg. industrialised nation	4.7

India's Environment Market: Sectors

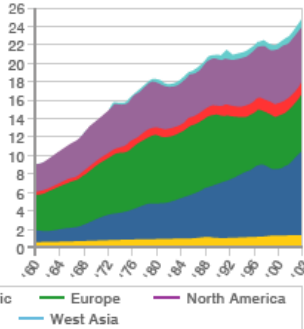


The Changing World

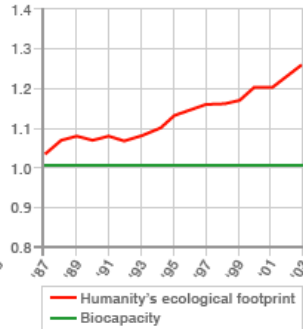
POPULATION GROWTH



REGIONAL CO2 EMISSIONS FROM FOSSIL FUELS, 2006
Billion tonnes per year



HUMANITY'S ECOLOGICAL FOOTPRINT
Number of Earths



SOURCE: UN

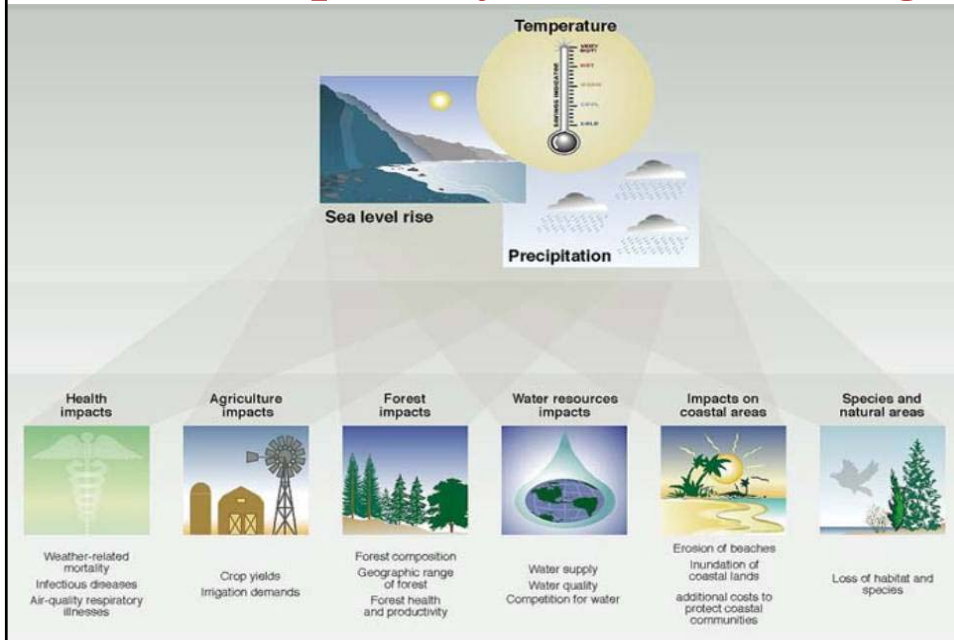
Green House Gases

			GWP
● Carbon Dioxide	CO₂	60%	1
● Methane	CH₄	32%	21
● Nitrous Oxide	N₂O	6%	310
● Hydrofluorocarbons	HFCs		
■ HFC-23			11,700
■ HFC-125			2,800
■ HFC-134a			1,300
■ HFC-152a			140
● Perfluorocarbons	PFCs	CF₄ / C₂F₆	6,500 / 9,200
● Sulfur hexa fluoride	SF₆		23,900

CO₂ Emissions & Developing World

- Total CO₂ emissions worldwide: ~ 23 bn t
- Developing countries responsible for just over 1/3rd of world's GHG emissions; but they emit < 1/5th as much per person as industrialized nations.
- By 2100, developing countries will emit 2-3 X as much as the developed world.

Adverse Impacts of Global Warming



Climate Change: Impacts on India

- 20% of coastal population may need to migrate
- 25% of country's population would be exposed to increased cyclone
- 70% plants may not be able to adapt to new conditions
- More than 20,000 villages may be deserted
- Adverse impact on agricultural yield

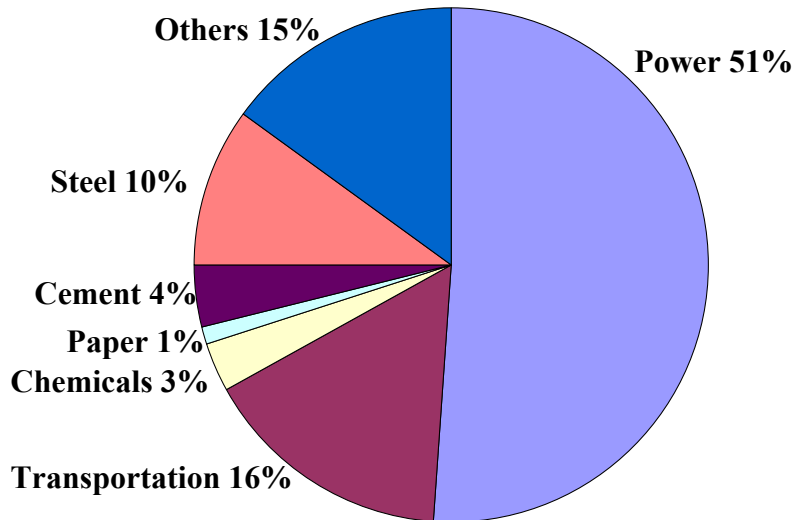
Climate Change: Risks to Business

- **Supply-chain risk:** Vulnerability of inputs (e.g., energy, agricultural products)
- **Product & Technology risk:** Various technologies will be at risk due to carbon constraints
- **Litigation risk:** Threat (lawsuits) to units emitting GHGs
- **Reputation risk:** Several practices may harm reputation
- **Physical risk:** Direct impact: drought, flood, rising sea level
- **Competitive risk:** Additional cost due to regulation
- **Regulatory risk:** Frequent change (tightening of) regulatory provisions

India: Current Scenario

- India is a responsible nation and is committed to growth with environmental responsibility.
- Has delivered a GDP growth rate of 9-10% with only 3.7% growth in its total primary energy consumption.
- India has achieved energy-GDP de-coupling at much earlier stage of its development cycle.
 - GDP growth rate has been higher than projected even though power capacity addition has been lower (only 50%) than planned
 - Industrial growth and profitability has been high even though oil prices have shot up [\$135/barrel]

CO₂ Emissions by Indian Industry



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Energy Saving Potential - India

Industry Sectors	Energy Saving Potential (%)
Textiles	25
Pulp & Paper	25
Ferrous Foundry	20
Glass & Ceramics	20
Cement	15
Chlor-alkali	15
Petrochemicals	15
Fertilizers	15
Iron & Steel	10
Aluminum	10
Refineries	10

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CDM : Indian Industry Perspective

- India needs energy efficient technologies to reduce GHG emissions
- Vast, untapped potential
- CDM could help to overcome financial constraints associated with adoption of cleaner technologies
- RETs are among low cost options for carbon mitigation

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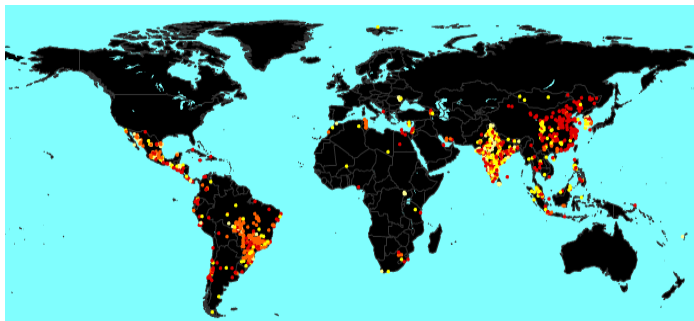
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Global Overview of the CDM

1066 registered CDM projects
~1.27 billion CERs expected
from current regd. projects till
end-2012

In pipeline:
> 3,000 projects (including regd.
projects)
> 2.7 billion CERs expected by
end-2012



Assumption: no extension of crediting periods

Map and statistics accessible at <http://cdm.unfccc.int/>

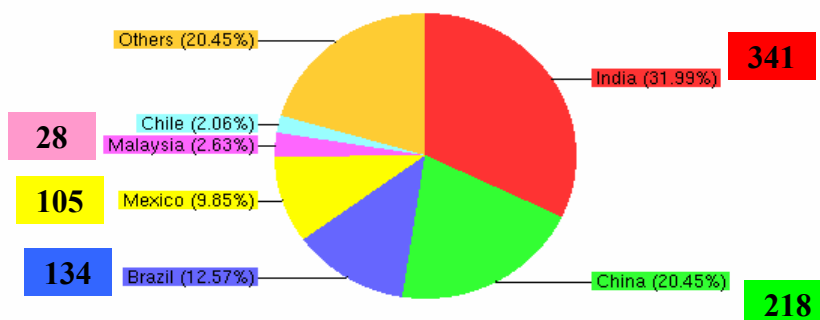
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Registered CDM projects (by country)

Registered project activities by host party. Total: 1,066



<http://cdm.unfccc.int> (c) 26.05.2008 16:53

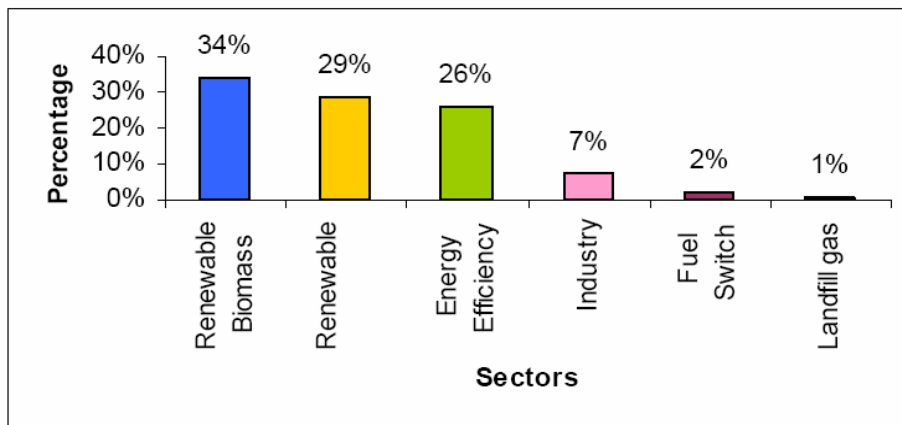
Registered Projects: Expected CERs

Rank	Country [no. of CDM projects]	Annual Avg. CERs (mn)
1	China [218]	111
2	India [341]	30.6
3	Brazil [134]	18.2
4	Korea [18]	14.6
5	Mexico [105]	7.37
6	Argentina [13]	4.08

Registered CDM Projects by Scope

- Energy industries (non-renewable / renewable sources) - 54.05% (576)
- Waste handling & disposal - 20.38% (217)
- Fugitive emissions from fuels (solid, oil & gas) - 8.11% (86)
- Agriculture - 6.21% (66)
- Manufacturing industries - 5.26% (56)
- Chemical industries - 2.56% (27)
- Energy demand - 1.31% (14)
- Fugitive emissions from production & consumption of halocarbons and SF₆ - 1.24% (13)
- Mining / mineral production - 0.58% (6)
- Transport - 0.15% (2)
- Afforestation / reforestation - 0.07% (1)
- Metal production - 0.07% (1)

Registered CDM Projects in India - Segmented by Sector



Some Recent Developments

- Energy Conservation Act 2001
- BEE set up - national nodal agency to initiate and co-ordinate EE activities in domestic, commercial, industrial, agriculture
- UNDP-GEF project with Ministry of Steel's EE projects for small & medium SRRMs
- Green Building concept - e.g. CII Green Business Centre at Hyderabad (2nd in world - Pt rating)
- HVFACC concept : CII-CIDA-CanMET Project
- Incineration of wastes in cement kiln
- NCPCC projects for SME clusters
- Potential for EE / industrial projects 600 mn tCO₂
- India's Integrated Energy Policy (2006) : Fulfilling Long term energy security and sensitive to climate change concerns
- The *Energy Conservation Building Code 2007* (ECBC) through the nodal agency **Bureau of Energy Efficiency** (BEE)

Some Recent Developments (2)

- Voluntary Disclosure of GHG Emissions by Indian companies: CII, WWF-India & Carbon Disclosure Project
- Moves to include Carbon Credit for futures trading on Commodity Exchanges
- India's 2nd National Communication to UNFCCC for National Emissions Inventory (Industrial Processes and Product Use sector being handled by CII)
- CII Discussion Paper [Towards a Low Carbon Economy]
- Mr. R K Sethi appointed as Chairman of CDM Executive Board
- COP-13 at Bali [⇒ Bali Roadmap]

Some Recent Developments (3)



- Limits of Small Scale A&R CDM projects revised to 16 kt from 8 kt
- Abolished payment of Registration fees and Share of proceeds from CDM projects in LDCs
- EB to approve Switch from Non-Renewable Biomass to Renewable Biomass methodology
- Adoption of VVM
- Encourage Regional Distribution of CDM
- Adoption of Annual Report of EB

Potential CDM Project Areas - India

- Energy efficiency **improvements (energy use, energy recycling, specific energy consumption, etc.)**
- Fuel switching (**coal vs diesel vs gas**)
- Electricity **generation and transmission**
- Renewable energy **sources (bio-diesel, solar, wind)**
- Demand-side management
- Oil & Gas
- Transportation
- Afforestation, **reforestation, land-use projects**
- Waste management (**waste-to-energy, etc.**)



India Leading by Example

Challenges	Response
Massive Educated Unemployment	World leader in IT, ITeS, Biotech, Research services <ul style="list-style-type: none"> ● Has 75% of CMM Level 5 software centres ● Provides software services to >185 Fortune 500 cos. ● IT sector employs million+ people
Lack of Technology	Indian companies made several global acquisitions: access to cutting edge technology one of the objectives <ul style="list-style-type: none"> ● Tata Steel acquired Corus ● Suzlon acquired RE Power, Hansen ● Hindalco acquired Novelis
Poor telecom infrastructure, Low tele-density	One of the fastest growing telecom market in the world <ul style="list-style-type: none"> ● Indian telecom network 7th largest in the world (2001) ● Call rates one of the cheapest in the world ● Plethora of world-class services and service providers

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India Leading by Example - 2

Challenges	Response
Food security Scarcity of food, milk and other agricultural products	Green Revolution Yellow Revolution White Revolution Blue Revolution
Energy: Expensive and short in supply Severe electricity shortage High petroleum prices	Massive Energy Efficiency Programme <ul style="list-style-type: none"> ● Implementation of Energy Efficiency Conservation Building Code (ECBC) ● Successful Energy Labeling & Certification Programme ● Many companies in energy intensive sectors adopted best practices in energy efficiency. Now they are among the best in the world

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India Leading by Example - 3

Challenges	Response
Depleting Energy Resources	India now one of world leaders in RE <ul style="list-style-type: none">• ~10,000 MW RE installed capacity in place• Dedicated FIs and R&D institutions on RE (e.g., IREDA, C-WET)• Indian company [Suzlon] now world's 4th largest wind energy company• Exclusive RE SEZ being set up in India• India emerging as a export hub in wind, solar, biomass equipment
Climate Change	Country gearing towards low carbon path of development

Some other Issues in CDM projects

- Long project cycle - several layers of screening
- Fluctuations in carbon prices
- Uncertainty of carbon market
- Lack of tested models for financing CDM projects
- Transfer of technology - IPR issues?
- Programmatic CDM projects?

India Economy: Opportunities for Climate Change Initiatives

- Technologies and practices affecting long-lived systems are difficult to penetrate once assets have been constructed
 - Power plants, industrial facilities last 50+ years
 - Buildings, once built, stand for many decades
 - A car or truck has a life span of 15-20 years
- India is a new economy; likely to add industrial / capital assets in the future
 - Developed nations first retire old assets before building new assets based on clean technologies
 - India can directly opt for clean technologies

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India: Strategies for Climate Change

- Moderate energy demand by ↑ energy efficiency
 - Improve vehicle fuel efficiency
 - ❖ Set fuel economy standards for vehicles
 - Implement building energy codes
 - Appliance & equipment energy ratings
 - Encourage use of voluntary benchmarks for industry sector energy efficiency
- Accelerate deployment of RETs
- Switch to cleaner conventional energy technologies
 - Super-critical / Ultra super-critical boiler
 - Integrated Gasification Combined Cycle (IGCC)
 - Coal Bed Methane
 - In-Situ Coal Gasification

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India: Strategies for Climate Change (2)

- R&D on collaborative Public-Private Partnership basis to provide long-term solutions
 - ❖ Hydrogen / Fuel Cell
 - ❖ Carbon Capture and Sequestration
 - ❖ Biomass feed-stocks / bio refineries
 - ❖ Generation-IV N-reactors
 - ❖ Advanced network design
- Set-up free and open Energy / Carbon Markets
- Promote Green Buildings
- Promote Clean and Efficient Transportation solutions

The Way Forward

- Government
 - Policies that enable
 - ❖ Collection / collation of targeted information
 - ❖ Develop understanding of climate change impacts on India and response options
 - ❖ Focus on Adaptation
 - ❖ Supporting and Leveraging private actions
 - ❖ Create Climate-friendly technologies fund
 - ❖ Policy and regulation

The Way Forward (2)

- Industry
 - Adopt & emulate good practices
 - Focus on Small-Scale Industries
 - Access climate-friendly technology funds
 - Partner R&D efforts to develop low / no carbon technologies
 - Measure carbon footprint, and voluntarily report data on GHG emissions

The Way Forward (3)

- Civil Society
 - Promote awareness about impacts of climate change
 - Campaign to effect behavioral change
 - Work with Government & other players as partners in sustainable development

Recent CII Initiatives

- COP-8 (2002): Climate Technology Bazaar concept
- Movement of Green Buildings (LEED ratings)
- High Volume Fly Ash Concrete
- Awareness programmes on CDM / CC
- Launch of Carbon Disclosure Project
- 2nd National Communication to UNFCCC
- APP-7
- CII Discussion Paper on Low Carbon Economy

Thank You

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