

India and Japan: Potential for Environmental Cooperation

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Major Environmental Opportunities in India

- Clean Development Mechanism (CDM)
- “Perform, Achieve, Trade” (PAT) - Tradeable Energy Efficiency Certificates
- Tradeable “Renewable Energy Certificates” (REC)
- Appliance labeling
- Environmental Management Plans of Industrial projects
- Green Buildings
- Automobile Fuel Efficiency standards

Clean Development Mechanism

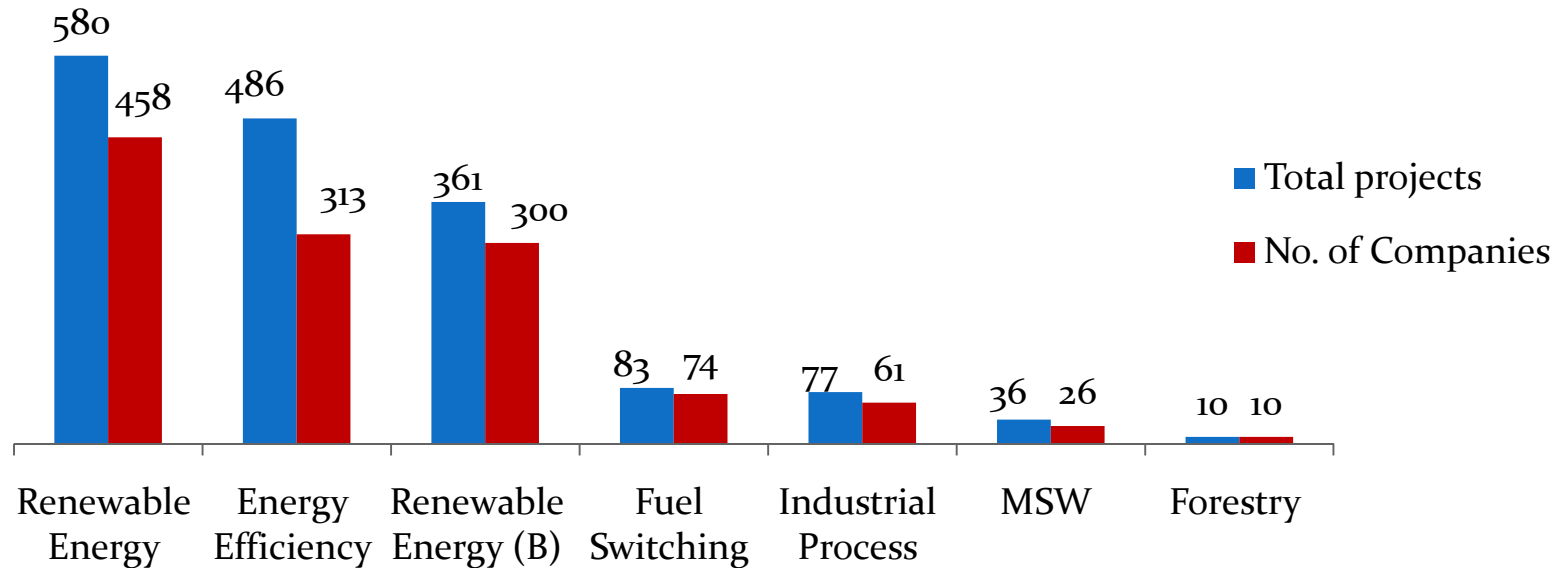
Indian CDM Portfolio - A snapshot

- Over 1633 projects in the current Indian CDM pipeline (as on April 2010)
- Representing over 50 sectors
- Spread over 28 states (Maharashtra: 223, Tamil Nadu: 192, Gujarat: 191, Karnataka: 167, Andhra Pradesh: 119)
- Expected CERs (till 2012): 639 million
- No. of projects: RE (580), EE (486), RE (B) (361), FS (83), IP (77), MSW (36), Forestry (10)
- Over 1100 Indian corporates are part of the CDM pipeline, (48 are PSUs)

Indian CDM Portfolio - A snapshot

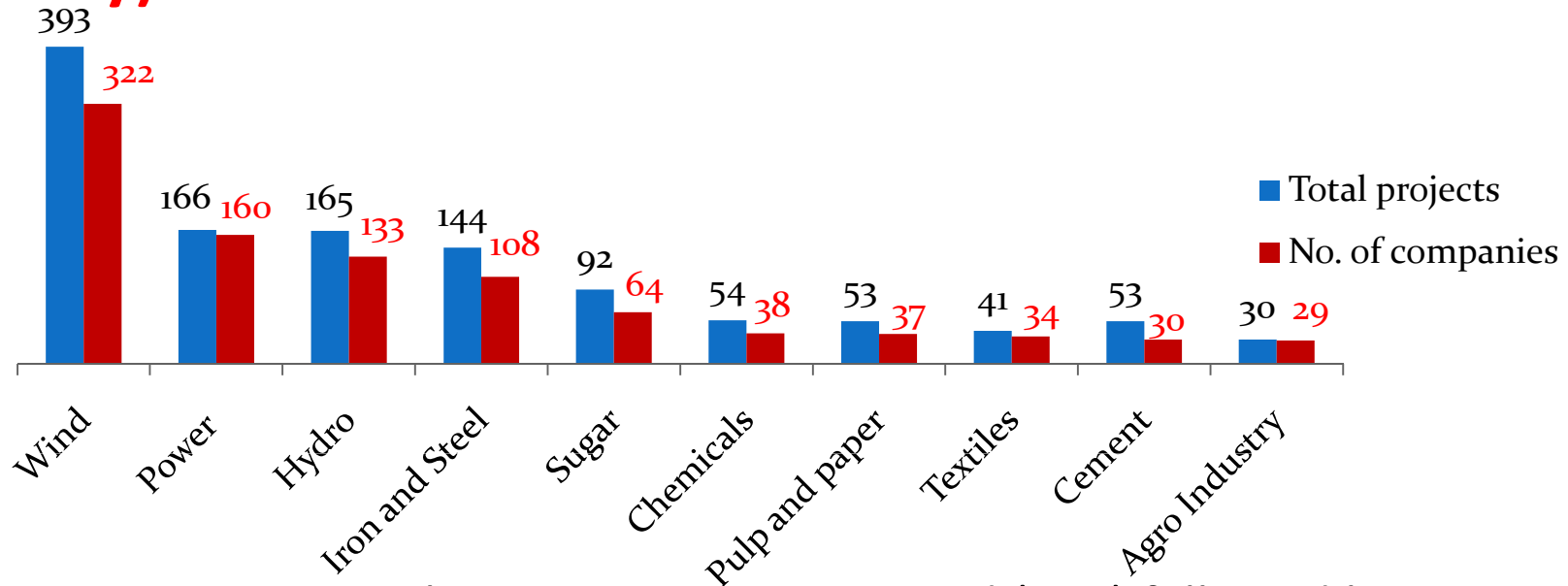
- Renewable Energy (580) remains the dominant project category, 120 new RE projects in the wind, hydro and solar sector have been added since July 2009
- Under Energy Efficiency – Cement, iron & steel, power, chemicals, fertilisers and pulp & paper are the top sectors
 - Buildings, bricks, tyres, carbon black are emerging sectors under EE
 - In renewable biomass projects, power, sugar, textiles, pulp & paper are the top sectors

Participation of Indian Corporates by Project Category



- RE most dominant category – 458 companies involved in 580 projects
- Other high yielding categories are EE (313 companies) and RE biomass (300 companies)
- Only 3 corporates involved in forestry projects which are mostly dominated by community based organisations
- 48 PSUs involved in various projects

Participation of Indian Corporates by Sector (by project activity)



- Most common sector by project activity is Wind (322) followed by Power (160), Hydro (133) and Iron and Steel (108), Sugar (64)
- Interestingly, there is limited representation from other energy intensive sectors such as – Oil & Gas (11), Distillery (20), Fertilisers (15), Petrochemicals (11) etc.
- New entrants include dairy (1 RE (B) project), salt industry (1 EE project), polymers (1 RE (B) project)
- India's first industrial cluster project initiated by Textile industry (EE)

“Perform, Achieve, Trade” (PAT) - Tradeable Energy Efficiency Certificates

Perform, Achieve & Trade (PAT) Mechanism

- Specific Energy Consumption (SEC) reduction targets for about 700 energy-intensive units which are designated consumers under the Energy Conservation Act, 2002.
 - Targets would be percentage reduction of current SEC
 - Percentage reduction requirement based on Current SEC as a ratio of the best in the sector
 - Target setting for the power generation and fertilizer sectors through the existing tariff-setting processes
 - SEC measurement and verification by BEE through accredited auditors
 - 3-year period to meet targets; New set of targets to be set for next three year period
 - Penalty – equal to cost of excess energy – levied for non compliance

PAT - Energy Savings Certificates will incentivize actions

- Issuance of Energy Savings Certificates (ES Certs) to units for energy-efficiency improvements in excess of their targets
 - ES Certs can be traded, and used for compliance
 - Trading can be carried out bilaterally, or on special platforms in the power exchanges
- Fungibility with Renewable Energy Certificates can be provided
 - Conversion factor (kWh to toe) to be determined
 - Joint group of agencies to agree to the linkage, compliance and reconciliation processes
- Amendments to the Energy Conservation Act
 - Designated consumers to be able to show compliance through SEC reduction and/or procurement of ES Certs
 - Financial penalty for non compliance to be linked to quantum of non compliance

PAT – current status

- 714 units in 9 energy intensive sectors notified as Designated Consumers under EC Act. The sectors are: Aluminum, Cement, Iron & Steel, Chlor Alkali, Thermal Power Plants, Fertilizer, Pulp & Paper, Textiles and Railways.
- Plant-wise data gathering is underway and will be completed by October 2010.
- Methodology for target setting under preparation
- The protocols for trading, monitoring and verification will be set up by October, 2010
- Notifications for Accredited Energy Auditors issued
- Amendments to EC Act passed by Parliament

PAT – Next Steps

- Complete consultations with industry by November 2010
 - Data requirements, and associated measurement & verification protocols
 - Methodology for target setting
 - Design of the trading scheme, especially for early price discovery
- By December, 2010
 - Notification of targets and operational rules
 - Notification of designated verifiers
 - Creation of trading mechanism
- First cycle of PAT to commence on 1st April, 2011; targets to be met by 31st March 2014

Tradeable “Renewable Energy Certificates” (REC)

Renewable Energy Achievements & Estimated Annual Emission Reduction

Technology	Achievement	Emission reduction tonnes CO2	Total Potential by 2032	Emission reduction potential tonnes CO2
Wind	12009 MW	20.7 Million	48500 MW	83.6 Million
Biomass	901.1 MW	5.0 Million	16881 MW	82.1 Million
Small Hydro	2767 MW	7.0 Million	15000 MW	38.0 Million
Cogeneration	1411 MW	6.4 Million	5000 MW	19.4 Million
Waste To Energy	72 MW	0.5 Million	2700 MW	10.5 Million
Solar	12 MW	0.024 Million	20000MW	31.9 Million
Biogas units (2 m3)	4.2 million units	3.6 millions (assuming 50% operational)		
SHS + Solar Lanterns	1.4 Million units	0.10 Million		
SWH	3.53 million	1.4 Million		
Total		45 Million tons		265.5 Million

Renewable Energy Policy Provisions

Electricity Act 2003

Section 3: *National Electricity Policy and Plan for development of power system based on optimal utilization of resources including renewable sources of energy*

Section 61(h): *Tariff Regulations by Regulatory Commission to be guided by promotion of generation of electricity from renewable energy sources in their area of jurisdiction*

Section 86(1)(e): *Regulatory Commission to specify Purchase Obligation from renewable energy sources*

Tariff Policy

Para 6.4 : *“Pursuant to provisions of S 86(1) (e) of EA 2003, Appropriate Commission shall fix minimum percentage for purchase of power from renewable energy sources taking into account availability of such sources in the Policy region and its impact on retail tariffs*

Renewable Energy Policy Provisions-Contd

National Action Plan on Climate Change

4.2.2 : Starting 2009-10, the national renewables standard (excluding hydropower with storage capacity in excess of daily peaking capacity, or based on agriculture based renewable sources that are used for human food) may be set at 5% of total grids purchase, to increase by 1% each year for 10 years. SERCs may set higher percentages than this minimum at each point in time

Central and state governments may set up a verification mechanism to ensure that the renewables based power is actually procured as per the applicable standard

Appropriate authorities may also issue certificates that procure renewables based power in excess of the national standard. Such certificates may be tradeable, to enable utilities falling short to meet their renewables standard obligations

In the event of some utilities still falling short, penalties as may be allowed under the Electricity Act 2003 and rules there under may be considered

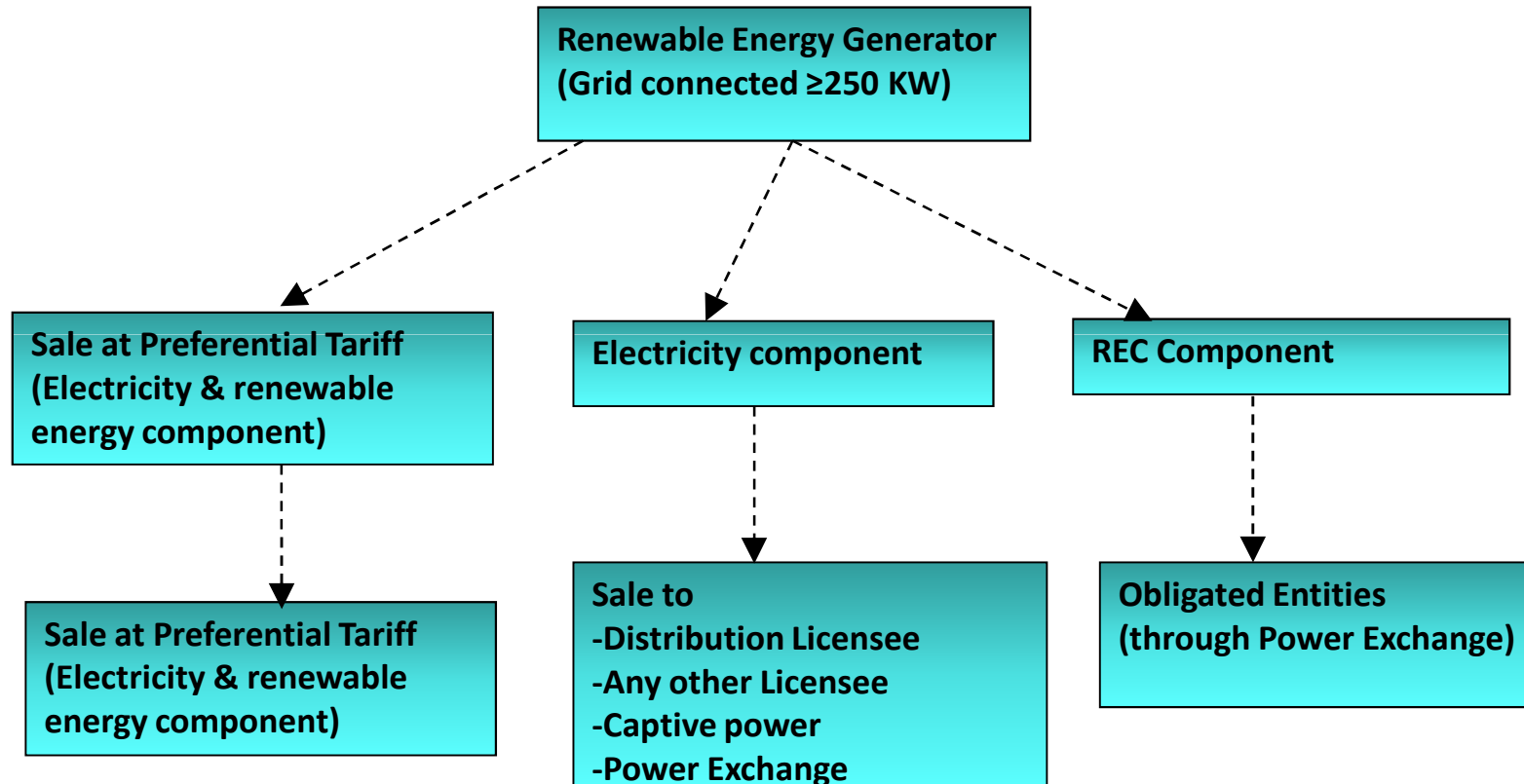
Renewable Energy Certificate-Context

- Electricity Act, 2003 and the National Action Plan on Climate Change provide for a roadmap for increasing renewable share
- Renewables are not distributed evenly across country- it inhibits SERCs from specifying higher renewable purchase obligation
- Renewable Energy Certificate (REC) seeks to:
 - Create a nation wide renewable energy market
 - Expected to overcome geographical constraints and provide flexibility to achieve RPO compliance

NAPCC Advice-Renewable Energy Requirement

Year	Electricity Generation (BU)	Renewable Share (BU) <i>(5% in 10-11 with 1% increase/year)</i>	Corresponding Capacity (MW) <i>(@30% CUF)</i>
2009-10	772		
2010-11	826	41	15716
2011-12	884	53	20180
2012-13	946	66	25191
2013-14	1012	81	30805
2014-15	1083	97	37081
2015-16	1159	116	44085
2016-17	1240	136	51888

Renewable Energy Certificate



Renewable Energy Certificate-Salient Features

- CERC Regulations notified
- Registration by Central Agency- NLDC has been notified as Central Agency-procedure for Central agency notified
- Accreditation would be done at State level by State Agency (SA) to be designated by SERC
- Monitoring Mechanisms : Appointment of Compliance Auditors by CERC for post monitoring of the REC Transactions
- Issuance of REC by Central Agency based on injection certificate
- REC exchange through power exchanges approved by CERC
- Certificates will be exchanged within floor (minimum) price and forbearance (ceiling) price decided by CERC time to time - CERC has notified Forbearance and Floor Prices
- Model SERC Regulations finalized, 12 SERCs have issued draft regulations and 6 SERCs have also finalized

Energy Efficiency Appliance Labeling

Standards and Labeling Program

- Enables the consumer to make an informed choice about energy saving, and thereby the lifetime cost of marketed household and other appliances.
- In operation since April 2006.
- Energy efficiency standards for different labels (1*, 2*, 3*, etc.) are notified by Bureau of Energy Efficiency (BEE) under the Energy Conservation Act, 2003.
- Claims of manufacturers are verified by BEE, and label is awarded which may be affixed on appliance by manufacturer for consumer information.

Standards and Labeling...

- *Currently mandatory for:* No Frost Refrigerators, Tubular Fluorescent Lamps, Room Air Conditioners, and Distribution Transformers.
- *Currently voluntary for:* Direct Cool Refrigerator, Induction Motors, Agricultural Pump Sets, Ceiling Fans, LPG Stoves, Electric Geysers, Color TV, washing Machine.
- Details from: www.bee-india.nic.in

Environmental Management Plans of Industrial projects

Requirements of Environmental Appraisal for Buildings Projects

- 39 Categories of Industrial/Real estate projects are required to undergo mandatory environmental appraisal, based on a EIA, in terms of the *Environmental Impact Appraisal Notification, 2006*, under the *Environment Protection Act*.
- Appraisal involves preparation and approval of an environmental management plan (EMP), which is monitored and enforced.
- *Technical Guidance Manuals* identifying specific environmental concerns in each sector, performance standards, and suggested technology solutions have been prepared.
- Further information: www.envfor.nic.in

Green Buildings

Green Buildings:

- 2 legal provisions:
 - *Mandatory*: Environmental Impact Notification, 2006
 - *Voluntary*: Energy Conservation Building Code (ECBC), 2007

EIA Notification, 2006

- All buildings with “activity area” > 20,000 m² are required to undergo mandatory environmental appraisal by the State Level regulators.
- “Check List” EIA in terms of a standardized format is to be prepared. The check list incorporates the provisions of the ECBC.
- Environmental Management measures are evaluated in terms of a published technical guidance manual.
- For further information: www.envfor.nic.in

Energy Conservation Building Code (ECBC)

- Launched in June 2007.
- Specifies energy performance requirements of all commercial buildings to be constructed in India with a electrical connected load of 500 kW or more.
- ECBC provides design norms for:
 - Building envelope inc. thermal performance for walls, roofs, and windows
 - Lighting systems, inc. daylighting, and lamps and luminaire performance.
 - HVAC system inc. chillers and air distribution.
 - Water heating and pumping, inc. requirements for solar water heating

ECBC...

- ECBC provides for 3 points for compliance:
 - Performance requirements for each system and subsystem.
 - Performance requirements for systems involving tradeoffs between subsystems.
 - Building level performance.
- *Further information:* www.bee-india.nic.in

Automobile Fuel Efficiency

Automobile Fuel Efficiency

- Prime Minister directed BEE to prepare and notify automobile fuel efficiency standards under the Energy Conservation Act, 2002.
- Expected to come into force from January 2011; may include voluntary (learning) phase.
- Technical due diligence had already been done by BEE; consultations with industry underway.
- *Stay tuned to:* BEE-India.nic.in

THANK YOU!