



Key Issues of the Post-2012 Climate Change Framework
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Monitoring and reporting of information
in
The Indian power sector

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Context

- Power sector accounts for approximately 50% (520 Mt CO₂-eq) of Indian emissions
- Predominantly coal-fired
- Emissions from coal-fired power expected to more than double between 2007-08 and 2016-17
- Power sector the focus of many GHG-related policies and measures
- Significant information on the performance of this sector available

MRV-relevant role & Functions of CEA

Central Electricity Authority is statutory organization constituted under Electricity (Supply) Act 1948. [Replaced by the Electricity Act, 2003].

- Collection and compilation of data concerning generation, transmission, trading, distribution and utilization of electricity.
- (Data collection powers mandated by law).

Monitoring & Review in Power Sector

CEA is the Statutory Authority to seek Information and Monitor performance of power sector.

All power plants, captive units and industries consuming electricity at high and extra high voltages are regularly monitored.

65 formats mandated, 28 relating GHG emissions

CEA analyses the data and prepares review Reports for Government.

On-line reporting / monitoring of power sector is under way.

Administrative Review is done by MOP and Planning Commission

MNRE compiles data on renewable energy generation.

Other concerned Ministries monitor their respective areas.

Many reports are available in public domain.

Energy Coordination Committee provides the over all policy direction.

Limitations of present MRV System

- Extensive GHGs relevant data collected.
 - Multiplicity of reporting and Monitoring.
 - Focus on performance against targets.
 - Verification not always done.
 - Most plants report data, few defaulters.
 - Too many formats, irrelevant details solicited.
 - Reports received by fax, requiring data entry efforts.
 - Some reports not in public domain due to 'commercial' sensitivity.
- Renewable energy data not fully covered.
- On-line reporting system not in place.

Improvements in MRV System

- Monitoring of Renewable Energy by CEA.
- CEA and BEE are making efforts to improve the system.
- Mission oriented implementation of Climate Change Action Plan will address these reporting shortcomings.
- Energy efficiency trading will improve the system.
- On-line reporting system is under development.
- A system for reporting power plant efficiency parameters is also being developed under Indo-German Energy Programme.

Review Reports of CEA

- **GHG data can be generated from following reports:**
 - **Daily Generation Overview.**
 - **Daily Coal Stock at Thermal Power Stations.**
 - **Daily Report on Hydro Reservoir Level.**

 - **Monthly Review of Power Stations**
 - **Monthly Generation Report**
 - **Monthly Coal Allocation & Supply Report**
 - **Monthly Fuel Allocation & Supply Report on gas based stations.**
 - **Monthly Power Supply Position.**

 - **Annual All India Electricity Statistics.**
 - **Annual Thermal Power Performance Review.**
 - **Annual Hydro Power Performance Review.**
 - **Growth of Electricity Sector in India from 1947 till date.**
- **Installed capacity of Power Utilities in different States.**
- **CEA occasionally brings out many special reports. Most of these Reports are available on CEA's Website.**

CO₂ Baseline Database

- CEA and Bureau of Energy Efficiency undertake the task of Carbon Market Development in India.
- Based on plant-wise information on all operating Power Stations, CEA has worked out 'CO₂ Baseline Database for the Indian Power Sector'
- Draft Version gradually updated from October 2006.
- Latest data (version 4.0) published in 2008.
- Valuable tool for CDM project developers (>600 renewable energy projects developed).
- Latest version includes CO₂ baseline emission factor for coal based power units, also new Supercritical units.
- India –1st nation to develop CO₂ baseline emission factor for power sector.

GHG relevant information in CO₂ Database

- Baseline Data contains plant-wise and unit-wise information on:
 - Date of Commissioning
 - Capacity in MW as on 31.03.08.
 - Type of the Unit.
- Following data on CO₂ emissions is available year-wise from year 2000-01 to year 2007-08.
 - Fuel (main)
 - Fuel (secondary)
 - Net Generation
 - Absolute Emissions tonnes CO₂
 - Specific Emissions tonnes CO₂ per MWh.

Climate Change Action Plan

- Climate Action Plan to be implemented in a Mission Mode.
- **Eight 'National Missions'** responsible for achieving adaptation and mitigation goals:
 1. **Solar Mission: thrust on solar power and renewable energy.**
 2. **Mission for Enhanced Energy Efficiency: Tradable Certification of energy efficiency and fiscal measures.**
 3. **Mission on Sustainable Habitat: Energy Conservation Building Code; Urban Waste Management- electricity from waste; modal public transport.**
 4. **Water Mission: thrust on water conservation.**
 5. **Mission for Sustaining the Himalayan Ecosystem.**
 6. **Mission for a Green India, Carbon Sinks etc.**
 7. **Mission for Sustainable Agriculture: New thermal resistant crops, new credit and insurance mechanisms.**
 8. **Mission on Strategic Knowledge on Climate Change.**

GHGs mitigation action plan

Power Sector:

- New units based on super-critical technology.
- Phasing out of old inefficient coal fired units.
- Major R&M and efficiency improvements in 210, 250 and 500 MW units that make up 80% of capacity
- Reduction in T & D losses
- Efficiency improvement through:
 - Mapping of thermal power stations:
 - Energy Efficiency Cells at power stations
 - Energy Audit of Power plants
 - CDM projects using CEA's Baseline Emission factors.

GHGs mitigation action plan – Contd.

Other Sectors:

The proposed action plan aims at sustainable growth through:

- An appropriate mix of Energy, Efficiency, Equity and Environment.
- Market based mechanism - through trading of energy savings: 'Perform Achieve and Trade' (PAT).
- Energy efficient appliances - Market Transformation for Energy Efficiency (MTEE).
- Financing demand side management through - Energy Efficiency Financing Platform (EEFP).
- Fiscal instruments - Framework for Energy Efficient Economic Development (FEEED)

Projected CO₂ Emissions (Coal fired stations)

Year end	Capacity*	Total CO ₂ (MT)	CO ₂ /Kwh (Kg)	Th. Eff. (%)
2007-08	70,570 (562)	520	1.08	32.4
2011-12	116,610 (708)	722	1.02	35.3
2016-17	175,095 (1,164)	1,152	0.99	36.4

- *Figures in parenthesis: generation in Billion Kwh

Source: CEA's Concept Paper on Model Power Plant

Summing Up

- India's present per capita CO₂ emissions at 1.2 tonne are well below the world average of 4.5 tonnes.
- Power programme being heavily coal dependent, there is an ample scope for reduction in CO₂ emissions.
- All India CO₂ emissions rate declined in the power sector
 - 0.79 tonnes of CO₂/MWh in 2007-08 from 0.85 tonnes of CO₂/MWh in 2002-03
- **'Low Carbon Path'** strategy is based on a multi-pronged approach:
 - Efficiency improvement in the entire energy chain.
 - All round reduction in Energy Intensity.
 - Introduction of cleaner technologies.
 - Renewable energy, grid-connected and off-grid.
 - Thrust on nuclear generation capacity.

Summing Up – Contd.

India's approach towards the climate change concerns are based on:

- Strong institutional and legal framework.
- Comprehensive reporting and monitoring.
- CEA's analysis and data in public domain.
- Awareness about ill effects of uncontrolled CO₂ emissions.
- A well-designed CDM programme in place.
- CO₂ baseline Database available in public domain.
- Energy Coordination Committee under the Prime Minister takes care of inter-sectoral coordination.
- Prime Minister's Climate Change Council guides and supervises country's climate change strategy.
- A Cabinet Committee on Climate Change is responsible for implementation.



Thank You!

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