



Presentation of PMR Expression of Interest

Country - INDIA
Date – 28 October 2011

Policy Context for GHG Reduction

India's emissions profile, main mitigation objectives, and strategy

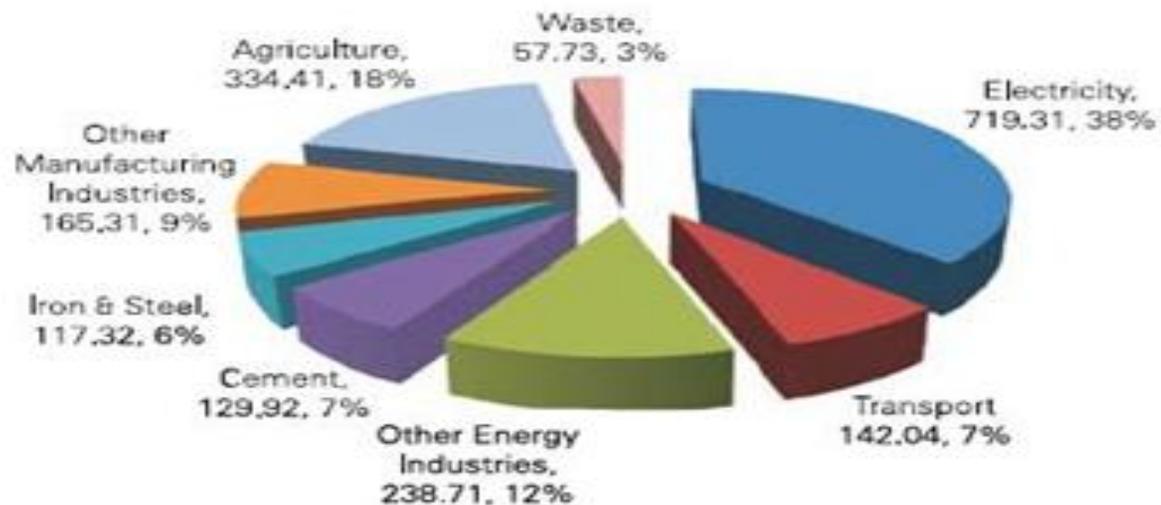
- India ranks 5th in aggregate GHG emissions in the world behind USA, China, EU and Russia in 2007. India's share of global GHG emissions in 2005 is 4.9%. (*source: WRI, 2009*)
- However, India has (i) an intensity of emissions per unit of GDP that is at par with the world average (ii) per capita emissions that are among the lowest in the world
- Emission intensity is 0.28 kg CO₂e per \$ of GDP in PPP terms
- Per capita emissions is 1.18 tonnes CO₂e compared to world average of 4.38 tonnes (*source: IEA, 2009*)
- Energy related Cumulative CO₂ emissions 1850-2006 are 2.4% of the World total (*source: CAIT, WRI*)

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- ◆ India's GHG Emissions 2007 level : India is the first non-Annex I country to publish such inventory on the basis of assessment made by INCCA
- ◆ In 2007, India's greenhouse gas (GHG) emissions by sources and removal by sinks were 1727.71 million tons of CO₂ equivalents (or 1904.73 million tons of CO₂ equivalents without land use, land use change and forestry), with the largest shares from electricity generation (38%), agriculture (18%) and other energy industries (12%).

Figure 1:



Source: Interim Report of the Expert Group on Carbon Strategies for Inclusive Growth, May 2011

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- According to the Integrated Energy Policy, expansion needs for power generation until 2032 are vast, with estimated increases from fourfold to as much as six fold. During the same period, demand for fuel used in road transport may increase more than fivefold.
- These increases are a natural consequence of income growth and greater availability and delivery of basic services. They occur even with investments that improve supply-side energy efficiency—such as greater thermal efficiency in new power plants and reduced technical losses in transmission and distribution—and demand-side efficiency improvement through continued industrial modernization and other means.

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- National Action Plan on Climate Change (NAPCC) was announced by Prime Minister Manmohan Singh in June 2008, and consists of eight national missions outlining existing and future policies addressing climate mitigation and adaptation.
- In December 2009, **India announced a voluntary target to reduce the emissions intensity of its GDP by 20 to 25 percent over the 2005 levels by 2020.**
- With its relatively low carbon footprint and a steadily declining carbon intensity over the last decade, India will further its contribution to reduce climate change by this voluntary target.

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- NAPCC identifies measures that promote our development objectives while also yielding co-benefits for addressing climate change effectively.
- The eight missions are:
 - National Solar Mission
 - National Mission for Enhanced Energy Efficiency
 - National Mission on Sustainable Habitat
 - National Water Mission
 - National Mission for Sustaining the Himalayan Ecosystem
 - National Mission for a Green India
 - National Mission for Sustainable Agriculture
 - National Mission on Strategic Knowledge for Climate Change

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- ◆ Various modeling projections indicate that the largest share of greenhouse gas emissions in India will continue to be from the power sector (captive generation and grid supply) by 2032.
- ◆ For instance, an Expert Group (on Low Carbon Strategies for Inclusive Growth) indicated that should India wish to sustain 9 percent economic growth until 2020, it will need to increase its installed capacity to 377 GW (from current levels of 172 GW).
- ◆ According to these projections, emission from the power sector could be in the range of 1452 to 1620 million tonnes of CO₂ equivalents by 2020 (from the current 719 million tonnes of CO₂ equivalent).

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- ◆ Hence, any effort in this sector, **whether on the introduction of renewable sources of energy, or reduction of the demand**, has the potential to significantly reduce the total quantity of emissions against a business as usual scenario.
- ◆ A key element of the Strategy is that energy efficiency measures must be promoted and brought up to a scale that permits significant reductions in energy intensity of India's GDP growth.
- ◆ Likewise, wherever possible, conventional energy use should be substituted with renewable energy sources
- ◆ These two imperatives correspond closely to the first and second National Missions under the NAPCC, i.e. the Solar Mission and the National Mission on Enhanced Energy Efficiency.
- ◆ Accordingly, GoI proposes to seek PMR support to deepen and broaden the reach and implementation performance of these two National Missions.

Key Sectors Targeted by GHG Mitigation Strategy

Mitigation potential for identified sectors and challenges to addressing mitigation.

- **NATIONAL MISSION ON ENHANCED ENERGY EFFICIENCY**

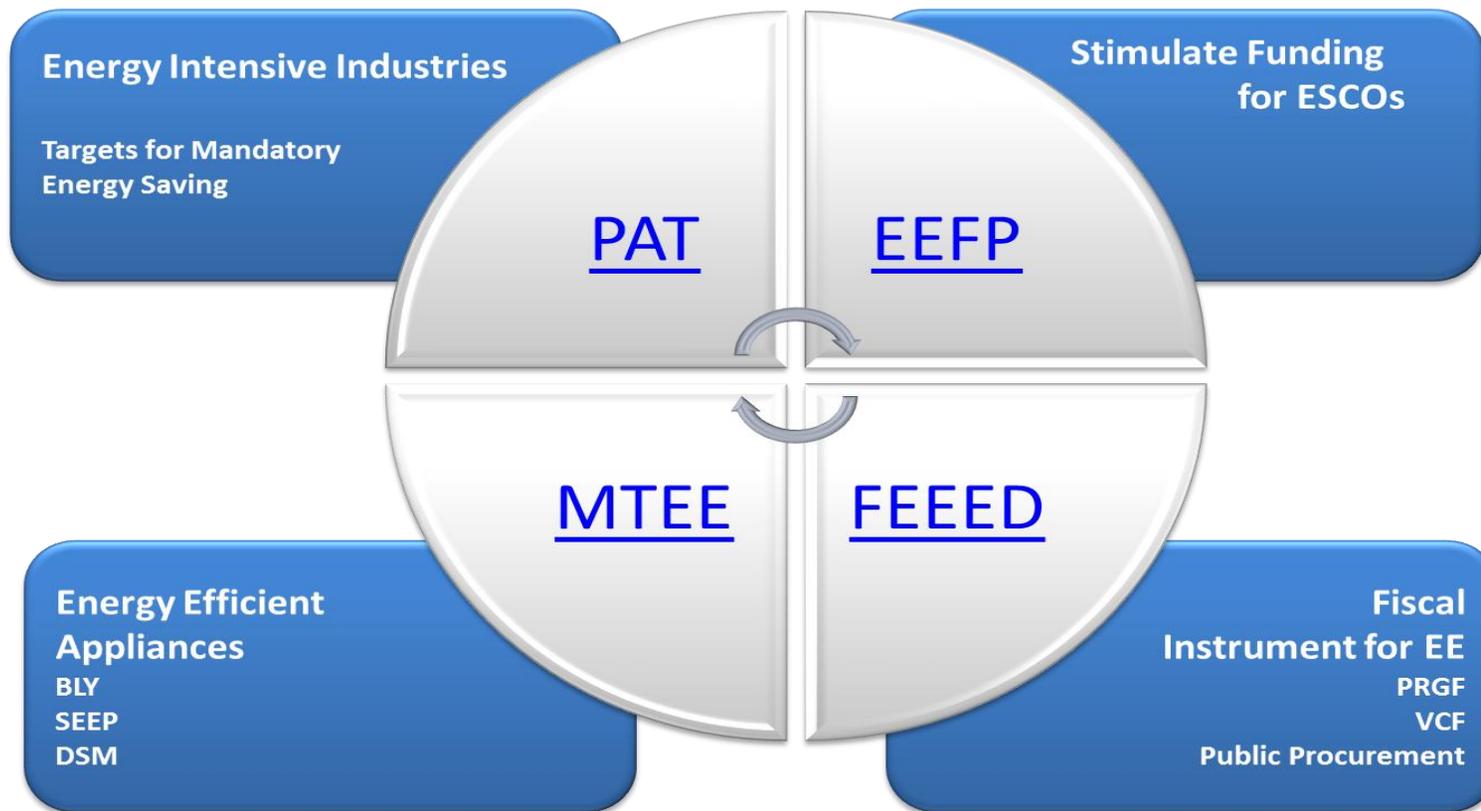
The goals of National Mission for Enhanced Energy Efficiency (NMEEE) are to **implement market-based approaches to unlock energy efficiency opportunities**, estimated to be worth about Rs. 7,400 million or ~ USD 35 billion.

- Energy Efficiency (EE) can play a key role as India struggles to meet its development goals under severe environment and resource constraints. Several EE options are less expensive than coal or gas-based generation, and therefore, should be the “first resource” considered for fulfilling demand.
- However, despite the apparent attractiveness of several EE options, **their diffusion and adoption is sluggish.**

Key Sectors Targeted by GHG Mitigation Strategy

Mitigation potential for identified sectors and challenges to addressing mitigation

- NATIONAL MISSION ON ENHANCED ENERGY EFFICIENCY (cont.)**



Key Sectors Targeted by GHG Mitigation Strategy

For sectors targeted for mitigation, describe the mitigation potential for each and the activities already undertaken (or planned). You may also consider including any challenges identified to addressing mitigation.

- **NATIONAL MISSION ON ENHANCED ENERGY EFFICIENCY (cont.)**
- ◆ By 2014-15, NMEEE is expected to have made the following gains:
 - Annual fuel savings in excess of 23 million ton of oil equivalent (toe)
 - Cumulative avoided electricity capacity addition of 19 GW
 - CO2 emission mitigation of 98 million tons per year

Experience with Current Market Instruments

Existing experience with market-based instruments and how market-based instruments will contribute to meeting national mitigation objectives and fit into the national GHG mitigation strategy.

- ◆ The Perform Achieve Trade (PAT) System is a market-based mechanism under NMEEE to enhance energy efficiency in energy intensive industries, known as Designated Consumers (DCs)
- ◆ DCs will be given Specific Energy Consumption (SEC) targets to meet over a period of three years
- ◆ If they surpass energy savings above the target benchmark, they qualify for earning Energy Saving Certificates (ESCerts), which could be traded with DCs who fall short of their given targets
- ◆ All entities who do not meet their targets will need to buy ESCerts or pay penalty
- ◆ PAT is targeted at saving 6.6 mMTOE which amounts to an avoided capacity of 5623MW over a period of three years

Experience with Current Market Instruments

Briefly outline existing experience with market-based instruments, including notable challenges or results. Where applicable, describe how market-based instruments will contribute to meeting national mitigation objectives and fit into the national GHG mitigation strategy.

- The Energy Conservation Act 2001, provides the framework for efficient use of energy and its conservation. There are 15 sectors that are large and energy-intensive. Nine of these are covered under the PAT scheme at present
- Designated Consumers account for 25% of GDP and about 45% of commercial energy use in India.
- The PAT mechanism uses market forces (voluntary trading of ESCerts) to drive the incorporation of energy efficiency measures in these high energy-intensive sectors

Experience with Current Market Instruments

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- Challenges overcome have included establishment of baseline and setting of targets, as well as definition of plant boundary
- **The next stage will require broadening the coverage of PAT** from the current nine sectors to the remaining six identified in the Energy Conservation Act. The key challenge ahead is for the Bureau of Energy Efficiency to set targets that avoid penalizing already efficient industries and going easy on non-compliant ones

Interest in Market-Based Initiatives and Support from PMR

- ◆ **Market Based Mechanism for Transportation Service Sector and SME (Small and Medium Enterprise)**
- ◆ **Transportation Service Sector**
 - Sector will include Air, Rail and Road transport service sector
 - Situation analysis study to assess potential and background for institutional setup
 - Identification of potential segment and key stakeholders
 - Institutional mechanism will be developed
- ◆ **SME (Small and Medium Enterprises)**
 - Identification of clusters
 - Situation analysis for identified clusters
 - Institutional mechanism
- ◆ **PMR Support would expand the PAT Scheme to the Small and Medium Enterprise (SME) sector which accounts for 40% of GDP, and to transportation fuel efficiency (road, rail and air transport).**

Experience with Current Market Instruments

Existing experience with market-based instruments and how market-based instruments will contribute to meeting national mitigation objectives and fit into the national GHG mitigation strategy.

Renewable Energy Trading Certificates

- ◆ Under Indian Electricity Act 2003, the State Electricity Regulatory Commission (SERC)s set targets for utility companies to purchase some percentage of their total power from renewable energy sources. These targets, called Renewable Purchase Obligations (RPOs), vary from state to state due to the potential of renewable energy.
- ◆ If the utility company is unable to buy its share of renewable energy, it can compensate that by buying the RECs from the market to make up for the shortfall

Experience with Current Market Instruments

- ◆ Under the REC Mechanism, when Renewable Energy is generated (solar, wind, biomass, etc), the energy is divided into two components – the physical commodity electricity and a tradable certificate, which is the Renewable Energy Certificate(REC).
- ◆ The commodity electricity is sold to the distribution company/utility(or any user) at a mutually agreed tariff while the REC can be traded in the exchange. The utility companies can make up for their shortfall in meeting the RPO targets by buying the RECs from the exchange
- ◆ The denomination of each REC is 1 MWh(1 REC = 1000 units(kWh) of electricity generated). In other words, the electricity producer can sell 1 REC for every 1000 units of electricity generated.

Interest in Market-Based Initiatives and Support from PMR

INDIAN SOLAR CITIES PROGRAMME (UNDER NATIONAL SOLAR MISSION)

- ◆ The Indian Solar Cities Programme is a GoI-MNRE initiative to support Urban Local Bodies to prepare a roadmap for a minimum 10% reduction in projected demand for conventional energy in five years. Fifteen cities out of a target of 60 have already been approved to prepare master plans.
- ◆ Two cities (Nagpur and Bhubaneswar) have already adopted comprehensive policies on renewable energy and energy efficiency. Their pilot projects include solar water heating in municipal hospitals, energy audits for buildings, energy efficient street lighting, comprehensive awareness programs, and introduction of a matching funds approach
- ◆ Capacity building support from PMR is needed to accelerate the implementation of the Indian Solar Cities Programme, specifically consisting of baseline data gathering, GHG calculation and accounting.

Other Relevant Initiatives and Partners

- ◆ India has also posed a project on **Partial Risk Guarantee Fund** for CTF funding under World Bank.

PMR Focal Point & Envisaged Institutional Partners

Institutional setting within the country to plan and coordinate work on the PMR at the domestic level

- ◆ The Ministry of Environment and Forests is the nodal agency responsible for coordination of external support to India's Climate Change activities and will lead the work of the PMR
- ◆ The Ministry of Environment and Forests will work with the Ministry of Power on the implementation of the National Mission on Enhanced Energy Efficiency
- ◆ The MoEF will work with the Ministry of New and Renewable Energy on the development and implementation of the Indian Solar Cities Programme.

Contact Information for PMR Focal Point

- ◆ **Sh. R.R. Rashmi, Joint Secretary,
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