

# Challenges in Implementing India's National Action Plan on Climate Change



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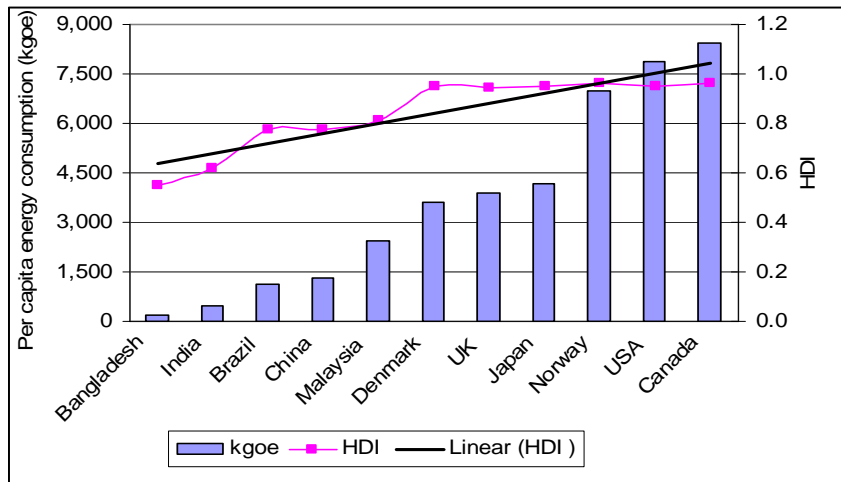
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## Structure of Presentation

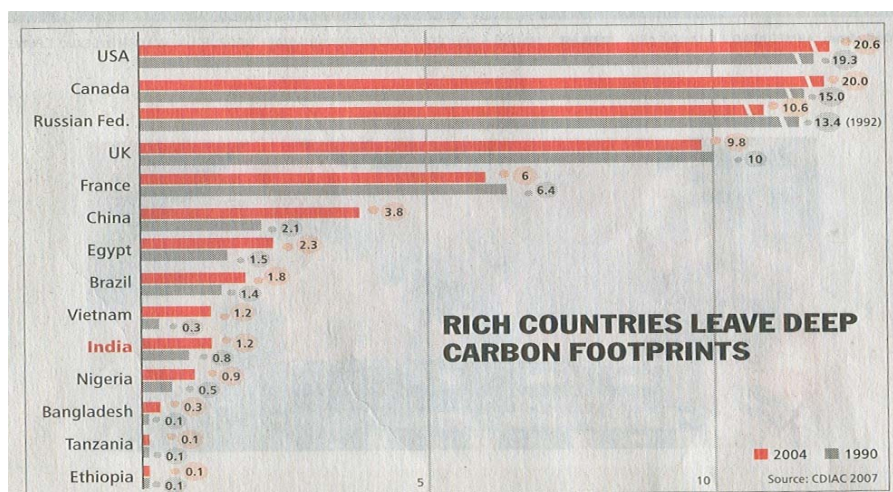
- Context
- Ongoing Response Measures
- National Action Plan- Strategy & Principles
- Financial Implications of two National Missions – Solar and Energy Efficiency
- Discussions



## Energy is Critical For Development and Improving HDI



## Per Capita CO<sub>2</sub> Emissions



## India's Actions on Adaptation

- i. Crop improvement and research (22)
- ii. Drought proofing and flood control (19)
- iii. Health improvement and prevention of disease (19)
- iv. Risk financing (6)
- v. Disaster management (6)
- vi. Forest conservation (12).
- vii. Poverty alleviation and livelihood preservation (30)

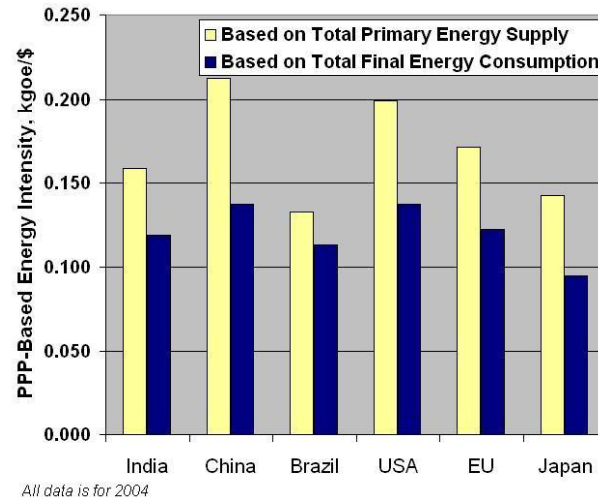
*The most effective response strategy to counter anthropogenic climate change is poverty alleviation!*

*Note: Figures in brackets indicate number of Schemes identified under each category*

### Expenditure on adaptation activities as percentage of GDP and percentage of total budgetary outlay

Year	GDP (US\$ bn)	Grand Total of Exp. Budget (US\$ bn)	Exp. on adaptation programmes (US\$ bn)	Exp. on adaptation as % of total Govt. exp.	Exp on adaptation as % of GDP
2000-01	466	84	3	3.5	0.6
2001-02	493	91	3	3.5	0.6
2002-03	512	101	4	4.0	0.8
2003-04	556	119	5	4.4	0.9
2004-05	597	126	5	4.2	0.9
2005-06	651	127	10	8.2	1.6
2006-07	712	145	15	10.6	2.2

## India's Energy Intensity is amongst the Lowest in the World



- Japan, Denmark, UK and Brazil have lower energy intensity
- Energy intensity is declining at about 1.5% per year

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## National Strategy

- Adapt to climate change
- Enhance ecological sustainability of India's development path
- Recognize climate change as global challenge
- Participate in globally cooperative actions based on CBDR
- Ensure equity in entitlement to global atmospheric resources

## Principles of India's NAPCC

- Inclusive and sustainable development strategy,
- Efficient and cost-effective strategies for Demand side management
- Accelerated deployment of appropriate technologies
- Innovative market, regulatory, and voluntary mechanisms
- Effective linkages with civil society and public-private partnerships

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## The Eight Missions

- **Solar**
- **Enhanced Energy Efficiency**
- **Sustainable Habitat**
- **Water mission**
- **Himalayan Ecosystems**
- **Greening of India**
- **Sustainable agriculture**
- **Strategic knowledge of climate**
- **Others**

## National Solar Mission

- Increase the share of solar energy in the total energy mix
- Decentralized distribution of energy
- Creation of more affordable, more convenient solar power systems and storage

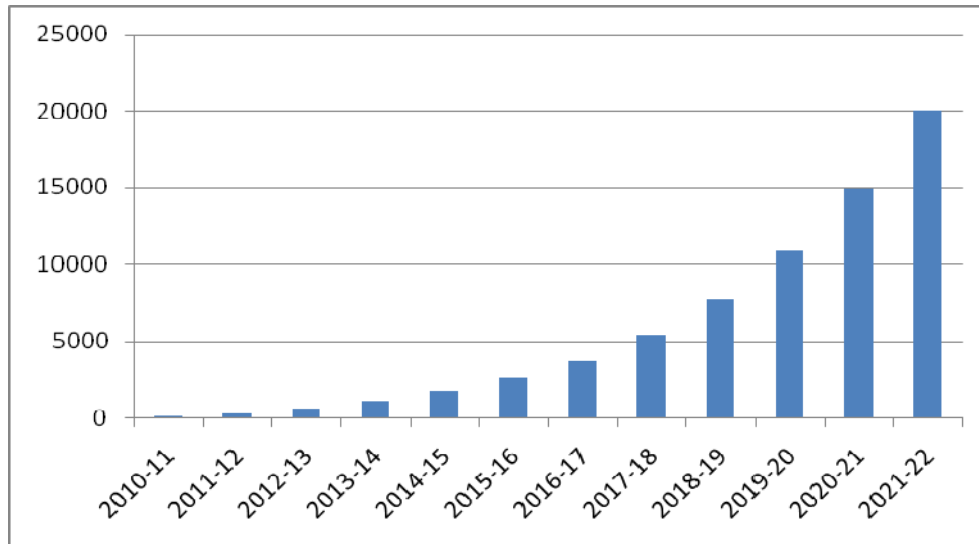
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## Proposed roadmap to 20 GW by 2022

Application Segment	Likely Capacities (by 2022)
Utility (grid) power	12000 MW
Rooftop and other distributed solar power systems	3000 MW 1 million solar roofs
Rural Installations (rural grid plants + stand-alone applications)	3000 MW
Other distributed solar power applications (e.g.: telecom towers)	2000 MW
Solar lighting, heating & other applications	Solar lighting for 20 million households Solar collector area of 20 million square metres for heating applications;

Total power generation capacity based on solar energy is expected to be 100 GW

## Ramp up of solar capacity



## Expected Benefits

- This will result in substantial savings of kerosene, diesel and fuel oil
- 20 million solar lights – this will avoid use of 1 bn ltr of kerosene per annum in 2022
- 20 million sq. m thermal collectors
  - 350 mn liter of fuel oil
  - 9 bn kWh of Electricity and 7500 GW of Coal base power generating capacity
- 3000 MW of roof top PV and 3000 MW of solar thermal will displace diesel 1050 mn liters diesel

**PV as well as solar thermal based power systems to achieve grid parity by 2022**

## Requirement of funds till 2021

Activity	Amount Rs crores
Generation based Incentive (GBI)	45,525
Grant for demonstration projects	350
Grant for R&D, capacity-building	6,000
Rural Electrification & lighting	850
Solar thermal	400
Interest subsidy	10,000
<b>TOTAL</b>	<b>63,125 (EURO 9 bn)</b>

## National Mission for Enhanced Energy Efficiency

- Enhance cost effectiveness of improvements in energy efficiency in energy-intensive large industries and facilities
- Shift to energy efficient appliances through innovative measures
- Mechanisms for financing demand side management programmes
- Fiscal instruments to promote energy efficiency.

## Initiatives to Enhance Energy Efficiency

- A market based mechanism through certification of energy savings that could be traded. **(Perform Achieve and Trade)**
- Accelerating the shift to energy efficient appliances through innovative measures. **(Market Transformation for Energy Efficiency)**
- Financing demand side management programmes by capturing future energy savings. **(Energy Efficiency Financing Platform)**
- Developing fiscal instruments to promote energy efficiency namely Framework for Energy Efficient Economic Development **(FEEED)**

## Designated Sectors – under PAT

Sector	Minimum energy consumption for designated consumer (in tons of oil equivalent per year)
Thermal Power Plants	30000
Fertilizer	30000
Cement	30000
Aluminum	7500
Iron & Steel	30000
Chlor-Alkali	12500
Pulp & Paper	30000
Textiles	3000
Railways	Diesel loco sheds and workshops

## Action under Market Transformation for Energy Efficiency

- Promotion of the Program of Activities (PoA) of CDM in various sectors to reduce transaction cost with public sector leadership and involvement
- Identification of other sectoral opportunities in CDM that can be tapped
- Identification of barriers that have prevented the growth of carbon markets

## Program of Activities

- Require that all public investment and over time, all public operations are assessed for carbon finance potential
- Promote programmatic CDM to reduce transaction costs and aggregation of small EE projects
- Develop and implement a National CDM strategy for energy efficiency
- Create a Revolving Fund to promote carbon finance
- Promote market access for the energy efficiency projects in small industries
- Enhance capacity building and training

## Barriers to CDM in India

- Lack of Carbon Market
- Uncertain post 2012 regime
- Lack of Concerted Strategy
- Lack of Methodologies
- Lack of Incentives in the public sector
- Issue of additionality and traceability
- Relative Absence of Financial sector
- Lack of the Designated Operational Entities (DOEs)

## Expenditure to estimate baseline in eight designated sectors

Industries	Total Number	Unit Cost of Energy Audit (Rs)	Total Cost of Energy Audit (Rs)
Thermal Power Plants, Fertilizer Sector	170	10 Lakhs	17 Crores
Cement, Chlor-Alkali and Iron & Steel Sector	260	6 Lakhs	15.60 Crores
Other Sectors	332	4 Lakhs	13.28 Crores
<b>Total</b>	762		45.88 Crores (EURO 6.55 mn)

## Recurring Expenditure (Rs. Crores)

Item	2009-10	2010-11	2011-12	Total
PRGF& VCFEE	120.27	24.6	24.6	169.47
PAT Scheme	50.88	-	-	50.88
Augmentati on of BEE corpus	75.00	-	-	75.00
Total	246.15	24.6	24.6	295.35 (EURO 42 mn)

**Total Additional Expenditure for the implementation of EE is Rs. 485 crores**

**Does not include any capital expenditure**

## Barriers to financing and deployment of:

### Renewable Energy Technologies

- Lack of long-term reliable policies and regulatory measures.
- Inability to enforce legal structures or overall accountability to implement plans for RETs.
- Lack of suitable finance and business models.
- Lack of awareness among investors about RETs, and the rates of return available.
- Lack of a level-playing field between the development of RETs and conventional energy projects

### Energy Efficiency

- **Market barriers:**
  - Lack of government support
  - Scarcity of capital
  - Preference for modernization
  - Lack of utilities based DSM programs
  - EE opportunities in SMEs is large – but they lack capital
- **Institutional barriers**
  - Not familiar with performance contracts
  - Companies prefer asset based purchases rather than service based purchases
  - Utilities involvement will require new institutional arrangement

Regional Cooperation in sharing of experiences and joint R&D will help in barrier removal

## Market based instruments – what needs to be done

- Encourages Private sector investments in RE & EE (ex: financial flows in CDM are much higher than GEF or WBG)
- Works well in fairly developed markets
- CDM should be flexible to promote projects which may not satisfy additionality but promote sustainable development
- Innovative financial mechanisms along with a stable carbon market at the global level required

## Key Issues in Financing

- Current resources of financing from International Financial Institutions, public and private sector are not adequate to lead to a low carbon pathway. Therefore,
  - Adopting Energy Efficiency through appropriate policy measures (energy labeling, energy efficiency certificates, etc)
  - Regional cooperation through energy trade and joint investments

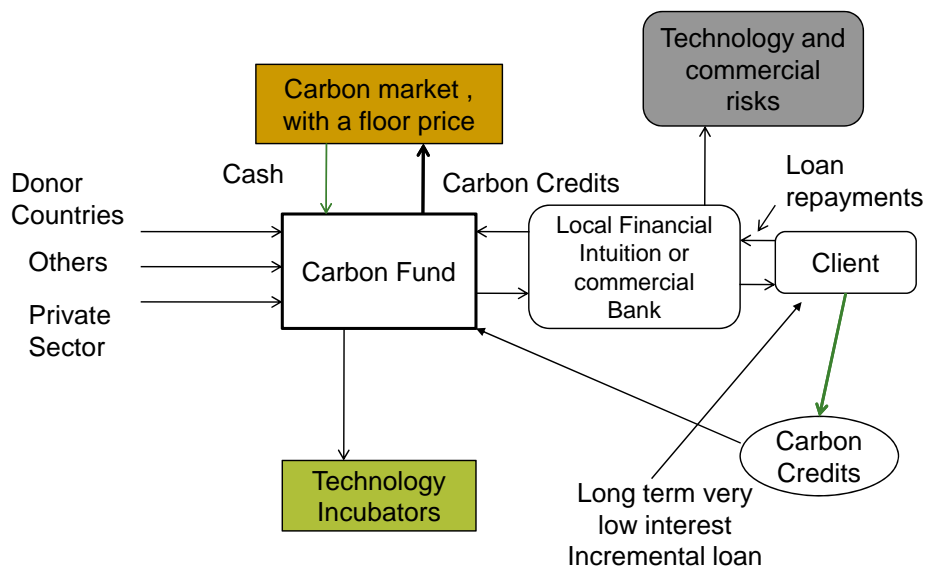
***Higher demand-side investment is more than outweighed by lower capital needs on the supply side, especially in the power sector***

## The Way Forward – Regional cooperation

- To tap the large non-fossil resource available in the region – which is concentrated in a few countries.
  - Building energy infrastructure
- Joint R&D at the academic level and in national labs
- Set-up technology incubators during the pre-commercialization phase
- Demonstration of technologies in various countries

***Need new institutions to address climate change***

## Tapping Carbon Markets – innovations required



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