

# Mitigation and Development Strategies in India

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**Manish Kumar Shrivastava**



The Energy and Resources Institute

# NAPCC (2008)

Prior to NAPCC

The Energy Conservation Act 2001

Electricity Act 2003

Integrated Energy Policy 2006

S & T Policy 2003

New Environment Policy 2006

Under to NAPCC

National Solar Mission

National Mission on  
Enhanced Energy Efficiency

National Mission on  
Strategic Knowledge

Green India Mission

# Parallel to NAPCC Missions

## Low Carbon Committee's Interim Report (2011)

- To support 12<sup>th</sup> Five Year Plan
- Based on quantitative projections

Sl.	Growth Scenarios	2005 Emissions	2020 with 8% GDP Growth		2020 with 9% GDP Growth	
	Higher and Lower Ends of the Range		Determined Effort	Aggressive Effort	Determined Effort	Aggressive Effort
1	Emissions at 2005 Levels (MT CO <sub>2</sub> -eq)	1,433	4,571	4,571	5,248	5,248
2	Actual and Projected Emissions (MT CO <sub>2</sub> -eq.)	1,433	3,537	3,071	4,016	3,521
3	Emission Intensity (grams CO <sub>2</sub> -eq/Rs. GDP)	56.21	42.47	36.87	42.79	37.51
4	Percentage Reduction in Emission Intensity	–	24.44%	34.40%	23.88%	33.27%

# Parallel to NAPCC Mission

## Low Carbon Committee's Interim Report (2011)

- Provides a menu of options that can reduce India's emission intensity



**Demand side management:** Domestic, Commercial, Industrial, Agricultural

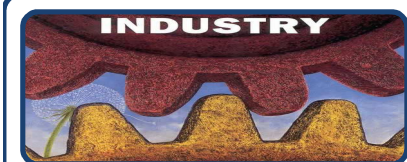
**Supply side option:** Coal based generation (Super critical/ultra super critical; R&D on commercial deployment of IGCC; R&D CCS; Gas based power generation; Renewable energy; Nuclear power



**Avoid:** Urban planning, minimizing commuting needs (Increasing the share of rail in freight transport)

**Shift:** Modal, Usage of more efficient modes of transport (public and non-motorized transport )

**Improve:** New carbon efficient technologies (Fuel efficiency norms for vehicles)



Iron and Steel

Cement

Oil & Gas



Use of **energy efficient appliances**

**Energy Conservation Building Code (ECBC)** and Green Buildings Rating System

**Energy Performance Index (EPI):** research on EPI values for various climatic zones and type of buildings



**Green India Mission (GIM) :** Enhancing carbon sinks in forests and other ecosystems; also highlights need for resilience building and adaptation.

# Two different approaches

## Low Carbon Committee

- Technological options
- Policy Options
- Regulatory solutions
- consultation

## NAPCC

- Target and implementation driven
- Incentives
- Institutional support
- consultations

**Little overlap in terms of sectoral details but Missions include many LCC recommendations**

# Potential NAMAs in India

## from NAPCC missions and LCC Report

### Standards and labeling schemes

- BEE star labeling in lighting/appliances (domestic/buildings)
- Mandatory implementation of ECBC for commercial buildings (buildings)
- Green Building Rating System (buildings)
- Energy performance Index (EPI) (buildings)
- Mandatory public transport accessibility indicators for large developments (transport)
- Vehicle labelling/fuel labelling/rating systems (on a kmpl basis) (transport)
- Minimum efficiency standards (transport)
- Corporate fleet efficiency standards (with mechanisms to penalize non-conformance) (transport)

### Technology adaptation and transfer programs

- IGCC (power generation)
- CCS (power generation)
- Resource efficient technologies (transport)
- Resource efficient technologies (CDQ, SCOPE21, COREX) (industry)

### Financial instruments

- Capital/operational subsidy for bus operations , reimbursing taxes and duties paid on fuel (transport)
- Tax on personal vehicles (transport)

# Potential NAMAs in India

## from NAPCC missions and LCC Report

### Plans/policies/regulations

- Ultra super critical/super critical turbines (power generation)
- Biomass based power for decentralized use (power generation)
- Solar power; Nuclear power (PHWR, FBR) (power generation)
- Replacement of inefficient agricultural pumps (agriculture)
- Modal shift/ road to rail (transport)
- DFCs (transport)
- Engaging private sector in infrastructure projects (transport)
- Double the area under afforestation (forestry)

### Capacity building and data-gathering

- Awareness building on efficient lighting/star labeling (buildings)

### Research & development

- Development of indigenous standards on testing & verification (buildings)
- IGCC/CCS (power)

### Market instruments

- PAT (industry)
- REC (power generation)

# NMEEE – Four New Initiatives

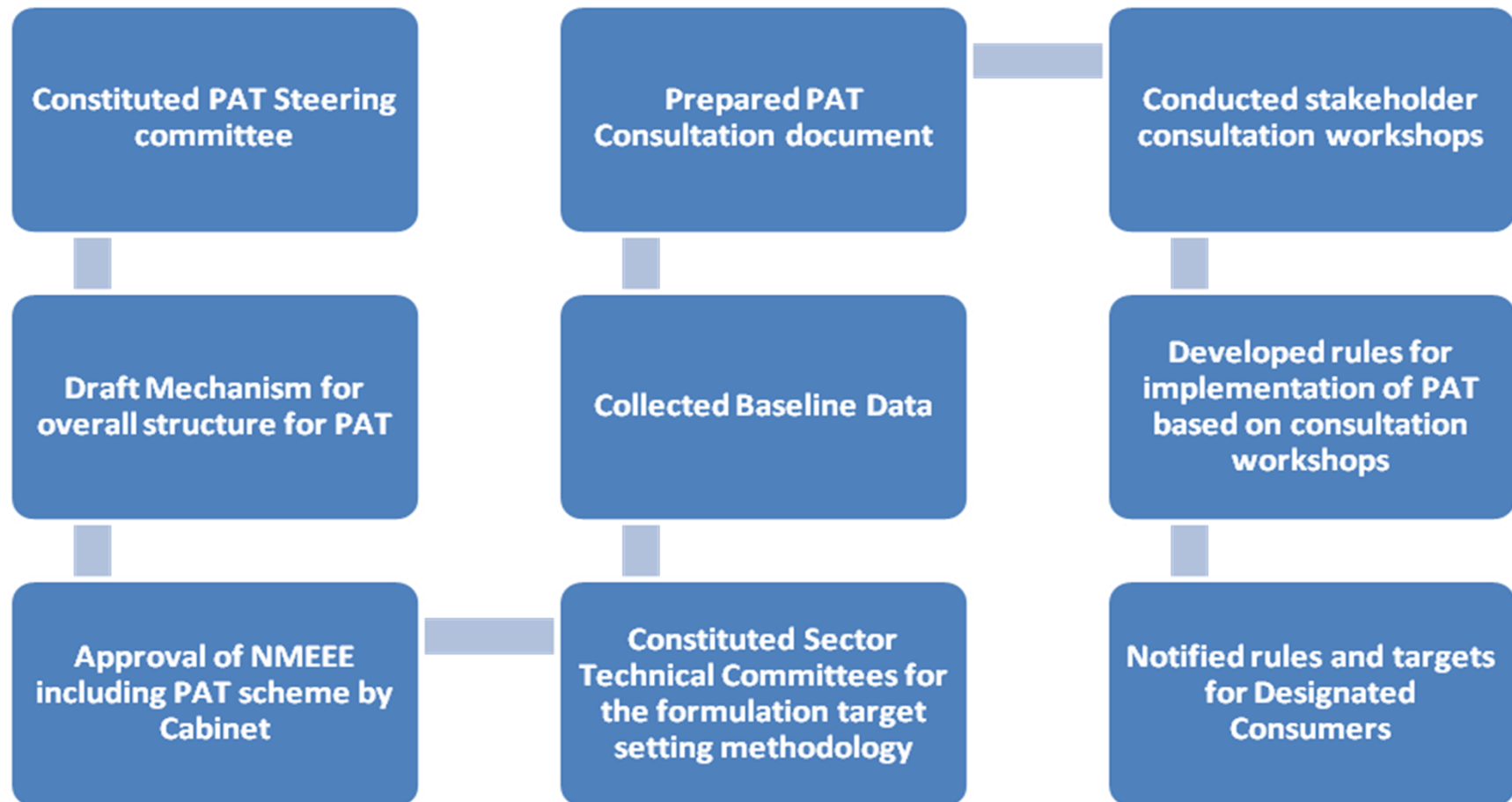
- ***Perform Achieve and Trade (PAT)***: A market based mechanism to enhance cost effectiveness of improvements in energy efficiency in energy-intensive large industries and facilities, through certification of energy savings that could be traded.
- ***Market Transformation for Energy Efficiency (MTEE)***: Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the products more affordable
- ***Energy Efficiency Financing Platform (EEFP)***: Creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings.
- ***Framework for Energy Efficient Economic Development (FEEED)***: Developing fiscal instruments to promote energy efficiency



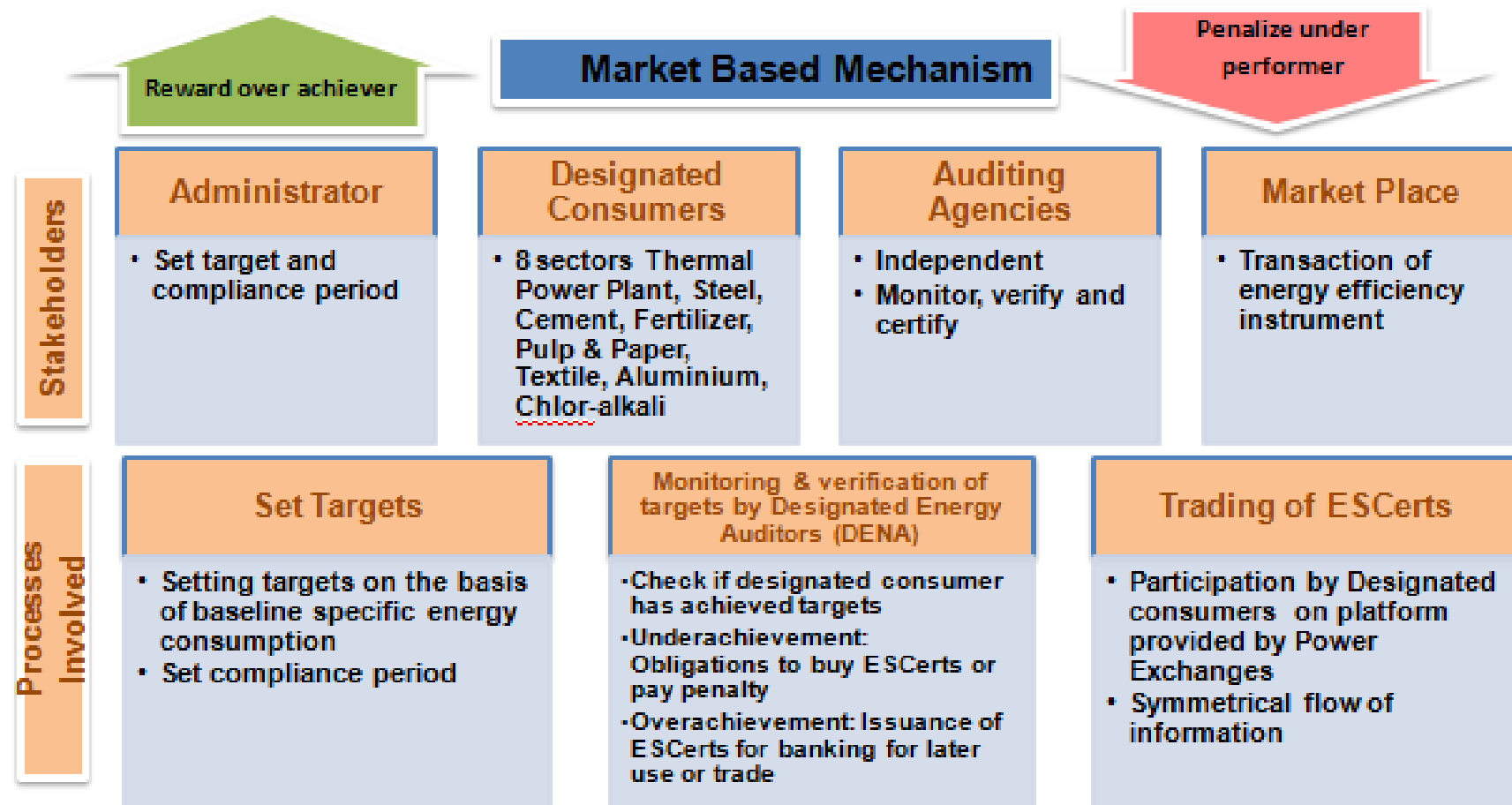
# Case Study: PAT Scheme under the NMEEE

- Under Energy Conservation Act 2001
- BEE/MoP Nodal Agency
- Gives specific energy saving targets on gate-to-gate basis to 478 companies in 8 sectors
- State agencies and PAT-net for reporting
- Trains Designated Entities for MRV
- Compliance: Trade + Penalty + Banking
- Support: Technology compendium, Project assessment unit, Venture Capital Fund, Initial purchase of ESCerts by govt.

# PAT Scheme: Evolution



# PAT Scheme: Governance



BEE, July 2012

## Number of Designated Consumers (DCs) as notified under Indian Energy Conservation Act

Industry Sector	Annual Energy Consumption Norm to be DC (toe)	No. of Identified DCs
Aluminum	7500	10
Cement	30000	85
Chlor-Alkali	12000	22
Fertilizer	30000	29
Pulp & Paper	30000	31
Thermal Power	30000	144
Iron & Steel	30000	67
Textiles	3000	90

Data and capacity issues: Instead of initial >700 to 478 DCs

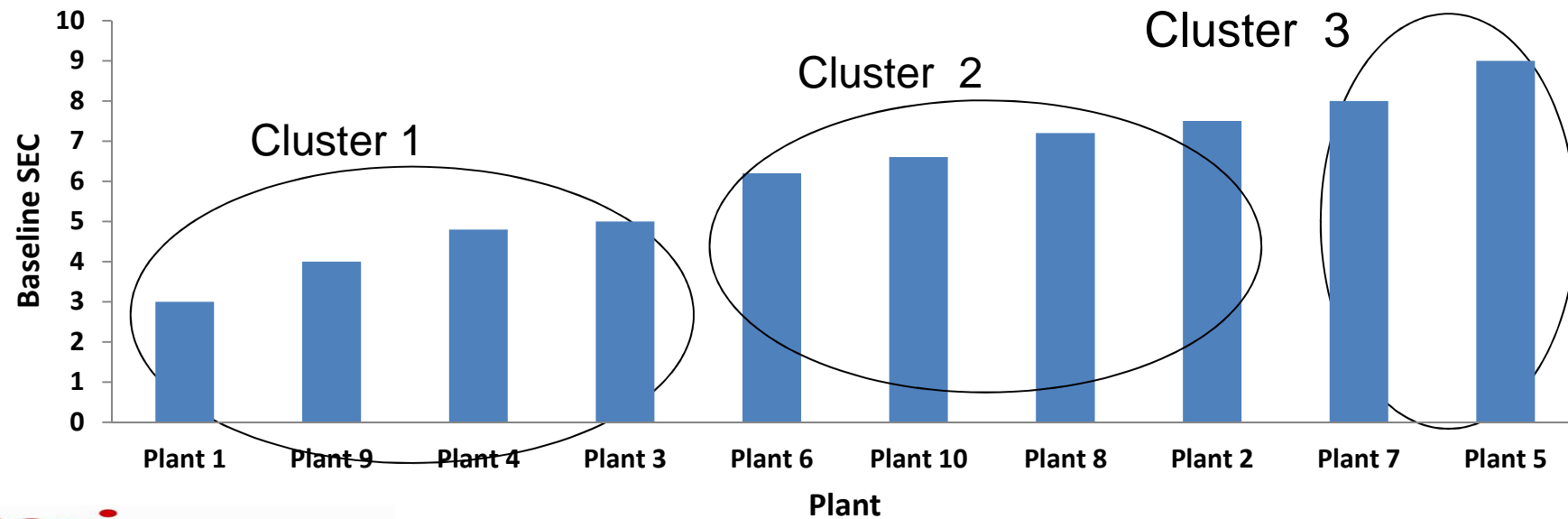
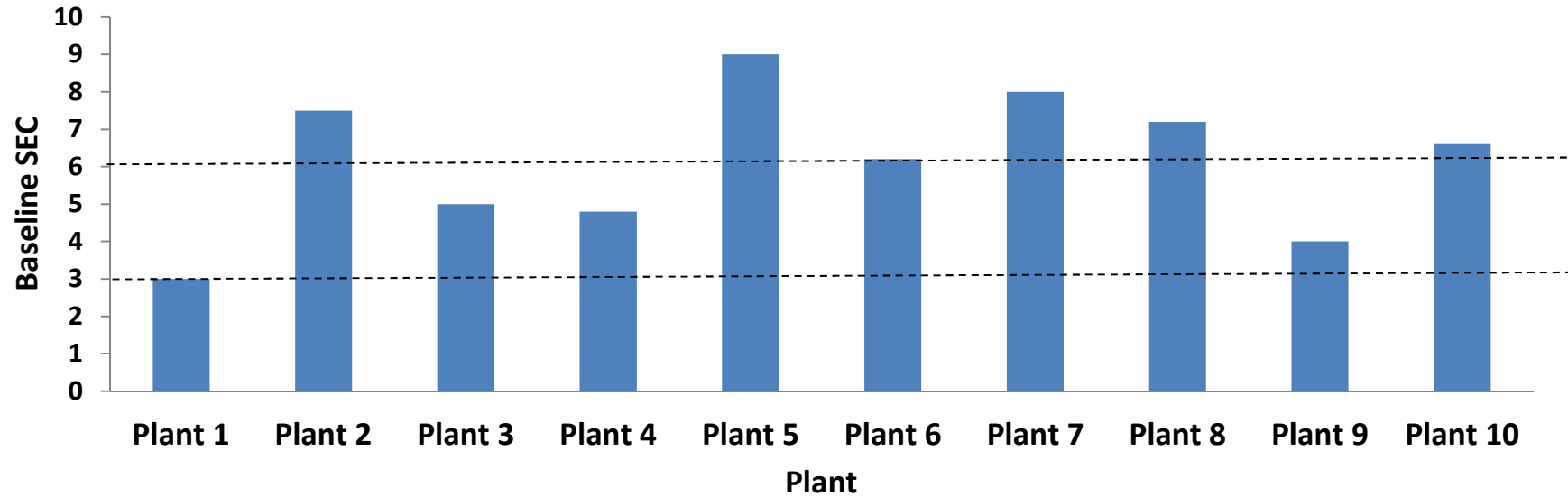
# Benchmarking and targets: Large Energy Usage Bandwidth

The energy usage pattern varies widely in industries of a particular sector due to various **diversities** like:

1. Scale of Production (Installed Capacities)
2. Use of Raw Material
3. Process Technology
4. Vintage
5. O & M Practices
6. Type of Product Output etc.

Factors of Diversity	Most Affected Sectors
a) Raw Material Input	Pulp & Paper, Fertilizer, Power Plant, Textile
a) Quality of Raw Material / Fuel	All sectors
a) Process & Technology	Aluminium, Iron & steel, Chlor-Alkali, Paper
a) Final Product output	Textile, Iron & Steel, Aluminium
a) Vintage	All Sectors
a) Capacity Utilization	All sectors

# Target allocation



# Broad points

- Legal backing and clear authority
- Institutionalize data collection
- An easy reporting system
- Constant engagement with stakeholders
  - Understand concerns
  - Training and awareness
- A mix of support, flexibility, penalty,

Thank you for listening  
[mshrivas@teri.res.in](mailto:mshrivas@teri.res.in)



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