

National Mission for Enhanced Energy Efficiency (NMEEE)

The National Action Plan on Climate Change released by the Prime Minister on 30th June, 2008, recognizes the need to maintain a high growth rate for increasing living standards of the vast majority of people and reducing their vulnerability to the impacts of climate change. The Action Plan enunciates the following principles:

- *Protecting the poor and vulnerable sections of society through an inclusive and sustainable development strategy, sensitive to climate change.*
- *Achieving national growth objectives through a qualitative change in direction that enhances ecological sustainability, leading to further mitigation of greenhouse gas emissions.*
- *Devising efficient and cost-effective strategies for end use Demand Side Management.*
- *Deploying appropriate technologies for both adaptation and mitigation of greenhouse gases emissions extensively as well as at an accelerated pace.*
- *Engineering new and innovative forms of market, regulatory and voluntary mechanisms to promote sustainable development*

The National Action Plan outlines Eight National Missions, representing multi-pronged, long-term and integrated strategies for achieving key goals in the context of climate change. These 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 for Strategic Knowledge for climate change

The Ministry of Power (MOP) and Bureau of Energy Efficiency (BEE) were tasked to prepare the implementation plan for the National Mission on Enhanced Energy Efficiency (NMEEE). NMEEE spelt out the following four new initiatives to enhance energy efficiency, in addition to the programmes on energy efficiency being pursued by MOP and BEE. They are:

- a) 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. (**Perform Achieve and Trade**)
- b) Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the products more affordable. (**Market Transformation for Energy Efficiency (MTEE)**)

- c) Creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings. (**Energy Efficiency Financing Platform (EEFP)**)
- d) Developing fiscal instruments to promote energy efficiency namely **Framework for Energy Efficient Economic Development (FEEED)**

2. The Mission seeks to upscale the efforts to unlock the market for energy efficiency on a PPP basis, which is estimated to be around Rs. 74,000 crores (Annex-I). The total avoided capacity addition as a result of these initiatives is expected to be 19,598 MW. Given that these savings will happen at the demand side, the avoided investment in generation, transmission and distribution sector will be to the tune of Rs. 1,95,980 crores. The total CO₂ emissions that will be reduced is estimated to be 98.55 m tonnes as a result of these initiatives.

3. The following are the recommendations in respect of operationalisation of the new initiatives as well as the institutional structure, financing and timelines.

3.1 Perform Achieve and Trade

(a) Methodology for setting Specific Energy Consumption (SEC) norm for each designated consumer

- Differential targets for different Designated Consumers (in the Thermal Power, Iron & Steel, Aluminium, Cement, Fertilizer, Chlor Alkali, Paper, Textile and Railways sectors) based on their current SEC, to be assessed on a gate-to-gate basis L ?
- For thermal power plants and fertilizer plants, the SEC targets to be harmonised with current tariff setting context - CERC and Ministry of Fertilizer to undertake this
- Detailed baselines for each unit and the current SEC to be measured and verified by BEE
- Other energy intensive industries like Petroleum Refineries/Petrochemicals/ Gas Crackers/Naptha Crackers, Sugar, Chemicals, Port Trust, Transport sector (industries and services), Hydro Power stations/ Electricity Transmission and Distribution Companies and Commercial Buildings and Establishments will be added to the list of DCs and included in the PAT scheme in a phased manner.

(b) Promotion of Trading of ESCerts

- Verification process for SEC of each designated consumer in the baseline year and in the target year by an accredited verification agency or by energy auditors, selected for this purpose by the BEE- selection criteria recommended
- Issuance process for Energy Savings Certificates (ESCerts) to those designated consumers who exceed their target SEC reduction- transparent regulatory framework for their issuance, monitoring and verification, and reconciliation protocols outlined.

- Trading Process for ESCerts - can be carried out bilaterally between any two designated consumers (within or across the designated sectors), or on special platforms for their trading which are created in the power exchanges
- Compliance and reconciliation process for ESCerts- accounting and depository protocols to be evolved

(c) Fungibility of ESCerts

- MNRE may take this fungibility into consideration while formalizing the REC structure.
- The conversion factor must be transparent based on verifiable parameters like kgoe.
- A joint group of the agencies administering the PAT mechanism and the REC mechanism could agree to the linkage mechanism between the RECs and the ESCerts once both the mechanisms are operational

(d) Amendments to EC Act, 2001

- **Financial Penalty for Non-compliance:** The present inconsequential level of penalty will not deter any designated consumer from being non-compliant with the SEC reduction requirements. Section 26 of the EC Act needs to be suitably amended. The penalty should be greater than the cost of equivalent energy to meet the shortfall in targets.
- **Compliance by Purchasing ESCerts:** DCs may be allowed to meet their obligation through purchase of ESCerts, by way of an enabling amendment in section 14 of the Act.

(e) PAT mechanism is a purely national scheme aimed at increasing the energy efficiency in energy intensive industries/ establishments in India and has no relationship with CDM or any such international scheme to incentivise emission reduction. SEC reduction targets under the PAT mechanism do not create any international obligations and must not have any relationship with them.

3.2 Market Transformation for Energy Efficiency (MTEE)

(a) Leveraging international financing instruments for promoting energy efficiency

- Project preparation to utilise bi-lateral/ multilateral funds for energy efficiency

(b) Promotion of the Programme of Activities (PoA) of CDM in various sectors

- To accelerate energy efficiency measures by leveraging CDM by reducing transaction cost
- Public sector leadership and involvement for aggregation of projects
- PoA for Household lighting, Municipal DSM (Mu DSM), Agriculture DSM (Ag DSM), SME sector, Commercial Buildings sector and Distribution Transformers.

(c) Identification of CDM Potential in Energy Efficiency Projects

- **Renovation/ Retrofit:** energy efficiency projects that modify existing energy consuming equipment, processes or systems, or which modify the usage of Installations;
- **Replacement:** energy efficiency projects that replace existing Installations, with other Installations;
- **Green-field:** energy efficiency projects that install new installations that consume less electricity than other installations of the same type;
- **Fuel switch:** fuel switching projects; and
- **Captive generation:** on-site electricity generation that replaces supply from the National Electricity grid.

(d) Adopting a National CDM Roadmap with an objective to increase the global CER market share by at least 10%

- Preparation of new CDM Methodologies
- Promoting incentives in the public sector
- Increasing the numbers of Designated Operational Entities (DOEs) accredited by CDM Executive Board

3.3 Energy Efficiency Financing Platform (EEFP)

(a) Overcoming barriers to financing of energy efficiency projects

- Promoting a robust ESCO market
- Enhancing awareness and information
- Tackling institutional barriers by provision of guarantees, tax incentives, etc.
- Leveraging CDM

(b) Appropriate Government interventions for creation of energy efficiency market

- Increasing demand for energy services through Government programmes creation of bankable energy efficiency retrofit projects in public sector
- Accreditation of ESCOs through rating agencies like CRISIL and ICRA to improve comfort level of financial institutions.
- Creating a pool of trained manpower through national certification examinations.
- Stimulating the state public sector through their Designated Agencies and Utilities to take up ESCO based projects at the state level.

(c) Expansion of Energy Efficiency Financing Platform - PTC already on board; PFC, REC, IREDA, ICICI, SBI, IDBI, etc. to be encouraged to participate. The following value addition being offered through EEFP:

- Lending for ESCO projects on non-recourse basis.
- Capacity building and awareness of the personnel in banks and FIs on performance contracting issues
- Aggregation of energy efficiency projects as a result of BEE schemes in different sectors
- Experience sharing and dissemination of national and international best practices in the field of energy efficiency financing

(d) Price Transparency in Performance contracts for ESCO projects

- Standardisation of the methodology covering the entire project cycle from audit to performance measurement and verification
- Robust baseline setting that takes into account seasonal and occupancy variations, renovations, etc.
- Design of standard performance contract
- Design of a robust payment security and financial mechanism
- Transparent and credible monitoring and verification protocols

(e) Capacity Building of Banks and Financial Institutions

- To disseminate the information on opportunities for financing EE projects in different sectors
- To provide necessary financing guidelines and skills to appraise EEC projects
- To enhance the capacity of bankers to different business models through the case studies on the financial viability of various forms of ESCO contracts.
- To train the banks and financial institutions for all appraisals associated with energy efficiency projects

3.4 Framework for Energy Efficient Economic Development (FEEED)

(a) Providing comfort to lenders by provision of a risk guarantee for performance contract (Partial Risk Guarantee Fund (PRGF))

- Addressing credit risk and transaction structuring barriers to energy efficiency finance by acting as a first loss, subordinated recovery guarantee fund
- Engaging and building capacities of commercial financial institutions to provide financing for energy efficiency projects on a commercially sustainable basis.

(b) Venture Capital Fund for Energy Efficiency (VCFEE)

- Initial seed capital from Government budget-can be expanded by contributions from other agencies as well.
- The two instruments (PRGF and VCFEE) may be used for promoting energy efficiency in manufacturing of energy efficient products in small and medium sector, energy efficient retrofits in government buildings and municipalities through the ESCO route.
- Fund can be managed by the institutional framework of EESL

(c) Incentives to Central Public Sector Undertakings (CPSUs) to take up energy efficiency

- Policy guidance to CPSUs to take up energy efficiency projects in their own facilities. This guidance could include issues like procurement of energy efficiency products by application of life cycle cost analysis, undertaking energy audits of all the existing facilities and implementing their recommendations, adoption of Energy Conservation Building Code (ECBC) launched by Ministry of Power for all new constructions, etc.
- Special parameter (to be called Energy Efficiency Performance Index (EEPI) on the line of KPI) may be added to the MoU guidelines from 2010-11
- An expert committee comprising of representatives from Ministry of Power, BEE and Department of Public Enterprises to formalise the same.
- Promoting Energy Efficient Public Procurement

(d) Support and Assistance to Electricity Regulatory Commissions for stimulating Utility driven DSM

- Develop a mechanism to enable utilities to recover the costs incurred in performing DSM related activities- appropriate incentives to be structured.
- Develop guidelines for evaluating DSM options and integrating DSM options with supply side options.
- DSM plan, design, preparation, period, load research, consumer surveys, cost-benefit assessment, technology assessments, etc.
- Evolve suitable monitoring and verification protocols for DSM programmes.

(e) Tax/ Duty Exemptions for Promotion of Energy Efficiency

- Income and Corporate tax incentives for ESCOs/ Venture Capital funds, etc. in energy efficiency
- Providing infrastructure status to ESCO business
- Graded excise duty for STAR labelled equipments in favour of higher efficiencies ✓

4. Institutional Arrangements for NMEEE- The Mission must have a very close coordination with BEE and must work under the overall regulatory, administrative and policy guidance of MOP and BEE. The Mission Director should be supported by

(a) 2 DDG (JS level) officers to be created in BEE alongwith 27 other posts, mostly at officer level in BEE to support Mission implementation.

(b) Creation of a Joint Venture corporate entity, Energy Efficiency Services Ltd. (EESL) as an Implementation Entity for energy efficiency

(c) Monitoring of NMEEE- 3 tier monitoring structure- Quarterly monitoring by PMO, monthly monitoring by Secretary (Power), and fortnightly monitoring by DG, BEE.

5. Financial requirement

(a) Non recurring (Rs. 220.88 crores)

- Mandatory baseline survey for all Designated Consumers (Rs. 45.88 crores)
- Setting up of a trading platform for PAT Mechanism (Rs. 5 crores)
- Provision of Partial Risk Guarantee fund and Venture Capital fund for enhancing energy efficiency (Rs. 170 crores)

Provision of funds from the budget of the Government from 2009-10 to 2011-12.

(b) Recurring (Rs. 7.5 crores/annum)

- Monitoring and verification of sample DCs for ensuring the credibility of PAT Mechanism (Rs. 4.6 crores/ annum)
- Administrative expenses as a result of the additional work and positions sought for BEE (Rs. 3 crores/ annum)

This additional recurring expenditure to be met by enhancement of corpus fund of BEE by Rs. 75 crores of BEE to take care of this additional recurring expenditure.

(c) Total financial requirement

Item	2009-10	2010-11	2011-12	Total
PRGF& VCFEE	120.27	24.6	24.6	169.47
PAT Scheme	50.88	-	-	50.88
Augmentation of BEE corpus	75.00	-	-	75.00
Total	246.15	24.6	24.6	295.35

(d) Financial requirement for EESL

- EESL to be created by four CPSUs namely PFC, REC, PGCIL and NTPC with an equity investment of around Rs.190 crores as recommended separately by Ministry of Power

6. Timelines

S.No	Issue	Timeline
1	PAT	SEC studies- December, 2009 Unit baselines- July, 2010

		Trading platform- July, 2010
2	MTEEE	CDM Roadmap- March, 2010 PoA for Municipalities- December, 2009 PoA for Agriculture/ DTs- March, 2009 PoA for buildings- March, 2009
3	EEFP	Ongoing
4	FEEED	Taxation issues- Budget for 2009-10 Funds to BEE- 2009-10, 2010-11 amd 2011-12
5	Capacity building and training modules for banks and FIs	December, 2009
6	Setting up of EESL	October, 2009 (decision by CPSUs)

Assessment of Energy Savings and Investment

The total avoided capacity addition as a result of these initiatives is expected to be 19,598 MW and the investment requirement is Rs. 74,000 crores. Given that these savings will happen at the demand side, the avoided investment in generation, transmission and distribution sector will be to the tune of Rs. 1,95,980 crores. The total CO₂ emissions that will be reduced is estimated to be 98.55 m tonnes as a result of these initiatives. The details are as under:

PAT Scheme

There are 714 designated consumers which are covered under the PAT Scheme. These include the industries from the Aluminium, Cement, Chlor-alkali, Fertilizers, Integrated Steel Plant, Pulp & Paper and Textile industries. On the basis of the investment made, energy saved and total savings in rupees accrued by the industries in respective sectors during the years 2004 - 2008, the investment required to save 1 ton oil equivalent energy was calculated. The data was compiled using the Energy Conservation Award Questionnaires, which have been received in the respective years. On the basis of data from Industry Association directories, Central Electricity Authority, TERI Handbooks and National Energy Conservation Award Questionnaires, the total energy consumption in Million Tons Oil Equivalent (MTOE) for the respective industries was computed. Using trend analysis, estimation of energy savings in the next 3 years for the each respective sectors was also calculated. On this basis, the total savings in energy and the investments to be made to achieve these savings is as under:

S. N	NAME OF THE SECTOR	TOTAL ENERGY CONSUMPTION (million tons oil equiv)	AVG. % SAVING IN 3 YEARS	SAVING IN TOE	TOE SAVED/LAKH INVESTMENT	TOTAL INV IN LAKHS
1	Aluminium	1.4	6	84000	1.048	80158.31312
2	Cement	14.47	8	1157600	3.080	375864.3305
3	Chlor Akali	0.43	6	25800	10.330	2497.519596
4	Fertilizers	28.8	5	1440000	13.819	104202.5624
5	Integrated Steel Plant	35.5	5	1775000	16.319	108767.6472
6	Pulp & Paper	3.8	7	266000	3.378	78738.50697
7	Textile	6.05	8	484000	13.993	34588.81321
8	Thermal Power	151.7	3	4551000	2.000	2275500

	Stations					
	TOTAL			9783400		3060317.693

The total savings will be 9.78 mtoe and 26.21 mt of GHG emissions resulting in avoided capacity addition is expected to be 5263 MW in the first 3 years of the implementation of the scheme and an investment of about Rs. 30,000 crores is expected to be made by the industry.

Market Transformation through DSM

S N	Market Type	Investment Potential, Rs (crores)	Energy Savings (KWh)	Energy Savings (MW)
1	Industrial	12100	49.00 billion	7000
	Generic Energy Efficiency	4200	23.70 billion	3400
	Process Energy Efficiency	7900	25.30 billion	3600
2	Commercial	570	1.71 billion	553
	Government Owned			
	Offices	340	0.76 billion	360
	Hospitals	85	0.87 billion	140
	Private Owned			
	Hotels	144	0.18 billion	53
3	Municipal	1300	3.70 billion	1688
4	Agriculture*	30000	30 billion	5095
4	Total	44000	74.40 billion	14335

The total GHG emissions reduction is expected to be 72.74 mt.

**Agriculture DSM will require a replacement of estimated 2 crores pumps that are presently in operation, most of them being inefficient given that electricity prices are either very low or nil in most states. Targeting 50% of pumps replacement on PPP mode in next 2-3 years would entail an investment of about Rs. 30,000 crores.*