MARKET BASED MECHANISM

Perform, Achieve and Trade

India
World CO₂ Emission Savings

New Policies Scenario is the central scenario in WEO-2010
   > assumes cautious implementation of recently announced commitments & plans, even if yet to be formally adopted

The 450 Scenario sets out an energy pathway consistent with the goal of limiting increase in average temperature to 2°C

Share of cumulative abatement between 2010-2035

- **Efficiency**: 50%
- **Renewables**: 18%
- **Biofuels**: 4%
- **Nuclear**: 9%
- **CCS**: 20%

Source: WEO 2010
India – CO₂ Emission Reduction

Share of cumulative abatement between 2010-2035

- Efficiency: 51%
- Renewables: 32%
- Biofuels: 1%
- Nuclear: 8%
- CCS: 8%

Graph showing CO₂ emissions from 2007 to 2035 with different scenarios.
Energy Profile - India

**GHG Emissions Across Sectors**

- Energy Intensity - Industrial Sector

**Energy Intensity of Industry Sector (mtoe per Billion Rs. GDP)**

**Commercial energy consumption in Industry (in mtoe)**

- Agriculture: 334.41, 18%
- Waste: 57.73, 3%
- Electricity: 719.31, 38%
- Other Manufacturing Industries: 165.31, 9%
- Iron & Steel: 117.32, 6%
- Cement: 129.92, 7%
- Other Energy Industries: 238.71, 12%
- Transport: 142.04, 7%
PAT Scheme Goals and action points

- Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the products more affordable.

- Creation of mechanisms that would help finance demand side management programs in all sectors by capturing future energy savings.

- Specific Energy Consumption (SEC) reduction targets for the 477 energy-intensive units which are designated consumers under the Energy Conservation Act.

- Developing fiscal instruments to promote energy efficiency.
Perform, Achieve & Trade (PAT) Mechanism

- The market based mechanism to enhance the cost effectiveness in improving the Energy Efficiency in Energy Intensive industries through certification of energy saving which can be traded

**Stakeholders**
- **Administrator**
  - Set target and compliance period

- **Designated Consumers**

- **Auditing Agencies**
  - Independent
  - Monitor, verify and certify

- **Market Place**
  - Transaction of energy efficiency instrument

**Processes Involved**
- **Set Targets**
  - Setting targets on the basis of current specific energy consumption
  - Set compliance period
  - May take into account Location, Vintage, Technology, raw materials, product mix etc.

- **Monitoring & verification of targets by Designated Energy Auditors (DENA)**
  - Check if designated consumer has achieved targets
  - Underachievement: Obligations to buy ESCerts or pay penalty
  - Overachievement: Issuance of ESCerts for banking for later use or trade

- **Trading of ESCerts**
  - Participation by Designated consumers on platform provided by Power Exchanges
  - Symmetrical flow of information
PAT Activity Flow Sheet

Getting Information Through Base Line Format ➔ Data Compilation/Evaluation ➔ Target Setting [Declaration of Base Year, Target Year]

Baseline & Target Setting (based on last three years)

Communication to BEE and SDA ➔ Preparation Performance Assessment Document (PAD) ➔ Communication to Designated Consumer

Verification of PAD through DENA ➔ Issuance of e-Certs after successful M&V ➔ Validation of PAD through DENA & submission of compliance doc.

Market for Trade

(Annual submission but the target compliance for three years)
## Challenges

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Mandatory</th>
<th>Voluntary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach</td>
<td>Entity</td>
<td>Project</td>
</tr>
<tr>
<td>ESCerts Price</td>
<td>Market</td>
<td>Regulated</td>
</tr>
<tr>
<td>MRV</td>
<td>3rd Party</td>
<td>Self Verification</td>
</tr>
<tr>
<td>Targets</td>
<td>Potential</td>
<td>Investments</td>
</tr>
<tr>
<td>Baseline</td>
<td>Measured and Verified</td>
<td>Self certification</td>
</tr>
</tbody>
</table>
Challenges

• Technical
  • Scale of Production (Installed Capacities)
  • Use of Raw Material
  • Process Technology
  • Vintage
  • O & M Practices
  • Type of Product Output
  • Variation in output/product
  • Plant boundary
  • Variation in fuel quality
  • Plant load factor
  • Monitoring & Verification
PAT Scheme: Background & Scope

- Covers 477 designated consumers in 8 sectors

- All DCs consume about 165 mtoe energy

- Targets would be given to all DCs to achieve the same within a time frame
  - Achievement > Target \(\Rightarrow\) E-Scerts
  - Achievement < Target \(\Rightarrow\) Purchase E-Scerts / Penalty

- National Target = 6.6 mtoe at the end of 1st PAT Cycle (by 2014-15)
Concept of Target, Compliance, Escerts & Penalty

Baseline SEC

Target SEC

Target

Issued Escerts

Achieved SEC

Penalty

Compliance

Purchase Escerts

Scenario 1

Scenario 2
Specific Energy Consumption

- As the SEC is calculated on a Gate-to-Gate concept, the definition of plant boundary plays an important role.

\[ \text{SEC} = \frac{E}{P} \]

**Table:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Baseline SEC</th>
<th>Target SEC</th>
<th>Reduction in SEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Diagram:**

- All forms of Energy (Electricity, FO, NG, Coal, Others)
- Plant Boundary
- PROCESS
- Product (Kg)
- SEC = E / P
- Baseline SEC
- Target SEC
- Reduction in SEC
PAT Scheme: Approach Towards Target Setting

• Sectoral Target will be on pro-rata basis of energy consumption among 8 sectors to achieve National Target

• Establishment of Baseline:
  • As per reported data of last 5 years (2005-06 to 2009-10)
  • Normalization Factor (capacity utilization)
  • Arithmetic Average of last 3 years value

• Targets to be statistically calculated based on relative SEC approach after grouping the DCs suitably

• The target reviewed by an expert committee before notification
General Rules for Establishing Baseline

• Definitions:
  - Baseline Year : 2009-10
  - Baseline Production \( (P_{\text{base}}) \) : Avg. of 2007-8, 2008-9 & 2009-10
  - Baseline SEC \( (\text{SEC}_{\text{base}}) \) : Avg. of 2007-8, 2008-9 & 2009-10
  - Baseline CU% \( (\text{CU}_{\text{base}}) \) : Avg. of 2007-8, 2008-9 & 2009-10
  - Target SEC \( (\text{SEC}_{\text{target}}) \) : SEC as estimated in 2014-15
  - Target : % reduction from \( \text{SEC}_{\text{base}} \)

• Estimation of Energy Saving (MTOE) :
  \[
P_{\text{base}} \left( \text{SEC}_{\text{base}} - \text{SEC}_{\text{target}} \right)
\]
Target is Plant Specific ….. Less for Energy Efficient & High for Energy Inefficient Plant

- **Covers units using about 165 million toe/year**
  - Gate-to-gate specific energy consumption, collectively, to be about 5.5% less in 2013-14 than it was in 2008-09
  - Less efficient units have larger SEC %-reduction targets – so that the collective SEC reduction is 5.5%

- **Energy Savings Certificates (and penalties) would be based on difference between the achieved SEC & the target SEC and the base year Production**
SEC Spread in Baseline & Target Year

- **17 DCs**
- **Pulp & Paper Sector**
  - Wood Based
  - Chemical Pulping Process
  - Non-Specialty paper
- **Higher Target for Energy In-Efficient Plants**
- **Baseline SEC**
- **Target SEC**
- **Target Range**: 3.04% to 8.51%
- **Absolute Energy Saving**: 84067 TOE
- **Low Target for Energy Efficient Plants**

8.51%
SEC Spread as per Grouping of DCs in Pulp & Paper Sector

100% market Pulp

Wood: Ch. Pulping + NSP

Wood: Ch. Pulping + SP

RCF: News Print

Wood: News Print

RCF: Non-News Print

Agro based

GTG SEC (TOE/MT)
THANK YOU

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