India’s Market Based Scheme for energy intensive Industries – A critical review
Perform, Achieve and Trade Scheme

- PAT - a **market based mechanism** – is a key component of National Mission on Enhanced Energy Efficiency (NMEEE)

- A **mandatory** energy efficiency improvement scheme for large energy intensive industrial sectors

- **8** energy intensive industrial sectors were covered in the 1st Cycle (April 2012 to March 2015) which share about **35%** of total energy consumed by the country

- About **4%** reduction in Specific Energy Consumption (SEC) was targeted in a **3-year** period The SEC reduction targets were “**Industry specific**” – Less Target for good performing industries and high targets for inefficient ones
Perform, Achieve and Trade Scheme - Goal and Expectations

- **Goal**
  - Energy Saving of 6.7 million tonnes of oil equivalent (mtoe) in Cycle 1

- **Expectation**
  - Unlock energy efficiency *market opportunity* of over $5000 million
  - Establish *energy management systems* in industries
  - Skill development and creation of *employment opportunities*
  - Create a conducive environment for *competitiveness* in industrial business
  - Inventorise information through effective monitoring, reporting and verification

- **Key stakeholders** - Designated Consumers (DCs), industry associations, Accredited Energy Auditors (AEA), Energy Managers, Power Exchangers, Relevant Ministries, banks
Perform, Achieve and Trade Scheme - formulation

1. Constituted PAT steering committee
2. Preparation of consultation document
3. Stakeholder consultation workshop
4. Draft mechanism for PAT
5. Baseline data collection
6. Development of rules
7. Approval from Cabinet
8. Formulation of technical committee
9. Notified rules and targets

REDUCING GHG INTENSITY OF GDP BY 33-35% OF 2005 LEVELS BY 2030 → THROUGH ENERGY EFFICIENCY
ESCerts Trading

DC 1
Complied to PAT
Baseline SEC
Target SEC
Achieved SEC
No Trading

DC 2
Complied to PAT
Baseline SEC
Target SEC
Achieved SEC

DC 3
Complied to PAT
Baseline SEC
Target SEC
Achieved SEC

DC 4
Complied to PAT
Baseline SEC
Target SEC
Achieved SEC
Non Compliance

ESCerts Issued
Trading Exchange

ESCerts purchased

Penalty
Critical review

1. Stakeholder Consultation Process
   - Over 60 stakeholder consultations have been conducted
     - Baseline and Target setting approach,
     - Monitoring & verification (M&V) and
     - other provisions of PAT Scheme
   - 92% respondents are satisfied with the consultation process of BEE
   - 60% felt that there is a scope for improvement in communication strategy and stakeholder engagement in consultation

2. Baseline Data & Baseline Energy Audit

<table>
<thead>
<tr>
<th>Availability of Baseline Data</th>
<th>Usefulness of Energy Audit</th>
<th>Quality of the Auditors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully 97%</td>
<td>Good exercise and Useful 85%</td>
<td>Very Good 49%</td>
</tr>
<tr>
<td>Partially 3%</td>
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Critical review contd..

3. Monitoring & Verification (M&V) Process

- **M&V Documents**: 75% of the DCs highlighted the documents were useful but it can be simplified in subsequent cycles

- **M&V Approach**: 84% of the DCs Agree on ‘Normalization Methodology’

- **Independent Verifiers**: About 110 independent verifiers empaneled by BEE
  - 70% DCs are satisfied with the available independent verifiers and timely completion of M&V activity
  - 67% DCs are satisfied with quality of Verifiers
  - 32% of the DCs have concerns about non-Availability of Sector Experts

- **M&V Data and Records**:
  - Availability is not an issue – 74% of the verifiers have highlighted that they have large volume of measured data than estimated data
Critical review contd..

4. Actions Taken by DCs

- Technical Intervention (Cross-cutting technologies, Waste Heat Recovery)
- Operational Intervention (Process fine-tuning, Increasing Capacity Utilization)

**Action taken by DCs**

- Invested and took benefits of NF 55%
- Made Investments 42%
- Purchase of Escerts 0%
- Benefits of NF 3%

**Range of Investment made by DCs**

- INR<1 Crore 16%
- INR> 1 Crore but <50 Crore 63%
- INR> 50 Crore 21%

NF : Normalization Factor
ESCerts : Energy Saving Certificates
INR : Indian Rupees
DC : Designated Consumer

Source: ICF Analysis
5. Driving Factors to Make Investments

- 67% DCs have felt that the target is stringent for 3-year compliance period, 74% DCs have exceeded the target.

Driving Factors for DCs for PAT Compliance

<table>
<thead>
<tr>
<th>Factor</th>
<th>Figures in (%)</th>
</tr>
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<tbody>
<tr>
<td>Knowledge about Escerts price and availability</td>
<td>6.2</td>
</tr>
<tr>
<td>Public Recognition</td>
<td>10.3</td>
</tr>
<tr>
<td>Share Holders Pressure</td>
<td>0.0</td>
</tr>
<tr>
<td>Penalty Provision</td>
<td>12.4</td>
</tr>
<tr>
<td>Good Action Plan</td>
<td>25.8</td>
</tr>
<tr>
<td>Extra Revenue through Escerts</td>
<td>19.6</td>
</tr>
<tr>
<td>Regulatory Compulsion</td>
<td>25.8</td>
</tr>
</tbody>
</table>

Regulatory Compulsion & Good Action Plan (51% of DCs)
Critical review contd..
6. How industries have proposed to achieve its targets?

<table>
<thead>
<tr>
<th>PAT cycle 5</th>
<th>Future</th>
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<td>.</td>
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<tr>
<td>PAT cycle 3</td>
<td>Active</td>
</tr>
<tr>
<td>2017-20</td>
<td></td>
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<tr>
<td>PAT cycle 2</td>
<td></td>
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<tr>
<td>2016-19</td>
<td></td>
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<tr>
<td>PAT cycle 1</td>
<td>Completed</td>
</tr>
<tr>
<td>2012 - 15</td>
<td></td>
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<table>
<thead>
<tr>
<th>Improvements in O&amp;M</th>
<th>Generic technologies</th>
<th>Sector specific technologies</th>
<th>High data analytics Optimisation</th>
</tr>
</thead>
</table>

Data analytics and optimization will play pertinent role in future

Size of the bubble denotes saving potential and associated opportunities
Results – Outcome of PAT cycle 1

There are 306 DCs who have been cumulatively issued about 38.50 lakh ESCerts in lieu of their excess energy saving against the targets and there are 110 DCs that are cumulatively entitled to purchase about 14.50 lakh ESCerts to meet their shortfall to meet energy saving targets.

<table>
<thead>
<tr>
<th>Energy Saving</th>
<th>Emission Reduction</th>
<th>Capacity building</th>
<th>Savings</th>
<th>Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>5635 MW 8.67 mtoe</td>
<td>31 Million tonnes of CO2</td>
<td>5000+ Engineers and operators</td>
<td>Saved due to energy consumption</td>
<td>Encouraged investments for energy efficient technologies</td>
</tr>
<tr>
<td>1.25% of India’s total primary energy supply</td>
<td>1.93% of India’s total emissions</td>
<td>13718 Energy Auditors &amp; Managers 219 Accreditation</td>
<td>Rs 9,500 Crores</td>
<td>Rs 24,517 Crore invested</td>
</tr>
</tbody>
</table>
Impacts of PAT Scheme

**Success**
- Change in management outlook towards EE
- Proactive Investments in EE
- Technology Intervention
- Data Monitoring & Accounting
- Engagement of Certified Energy Auditors/Managers

**Concerns**
- Scheme Administration and Facilitation
- Data Quality
- Complex target setting methodology
- Verifiers (Quantity & Quality), M&V
- Prediction of ESCerts Quantity & Price

**Way forward**
- Support to India’s INDC commitment
- India has notified targets for 2nd PAT Cycle in March 2016 (11 Sectors, 621 DCs) and 3rd PAT cycle in March 2017 (116 DCs)
- Energy Saving Target of **8.87 MTOE by 2018-19** and **1.06 MTOE by 2019-20**.
- Strong, yet Simplified M&V - Focus on measured data
- Promotion of ESCOs and Widening and Deepening of the Scheme
THANK YOU