



BUREAU OF ENERGY EFFICIENCY

Government of India, Ministry of Power





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Presentation on Perform, Achieve and Trade (PAT) Scheme

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Energy Conservation ACT- 2001
(EC Act – 2001)



Energy Conservation Act (EC Act-2001)

- Energy Conservation Act 2001 (EC Act, 2001) was enacted by Government of India in 2001 to provide legal framework and institutional arrangements for enhancing energy efficiency.
- EC Act led to the creation of Bureau of Energy Efficiency (BEE) to implement the provisions of the Act.
- The mission of BEE is to develop policies and strategies based on self-regulation and market principles with a goal of reducing energy intensity of the Indian economy.



Legal Mandate of Central Government under Energy Conservation Act, 2001

- Power to notify Designated Consumers (DCs) from energy intensive sectors
- Power to prescribe specific energy consumption targets
- Monitoring and Verification by Accredited Energy Auditors
- Mandatory reporting to BEE by DCs
- *Compliance by purchase of Certificates*
- *Penalty for non-compliance – linked to level of non-compliance*

**Amendment to EC Act.*



Major Obligations for DCs As Per EC Act

- EC Act schedule provides list of 15 energy intensive industries and other establishments to be notified as designated consumers (DC).
- DCs to appoint or designate Energy Managers who shall be in charge of activities for efficient use of energy and its conservation.
- The information with regard to energy consumed
- Get energy audits conducted by Accredited Energy Auditors.
- Implement techno-economic viable recommendations.
- Comply with norms of specific energy consumption.
- Submit report on steps taken



Need of PAT Scheme



Need for PAT Scheme

The National Action Plan on Climate Change (NAPCC) was released by Prime Minister of India in June 2008.

- 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



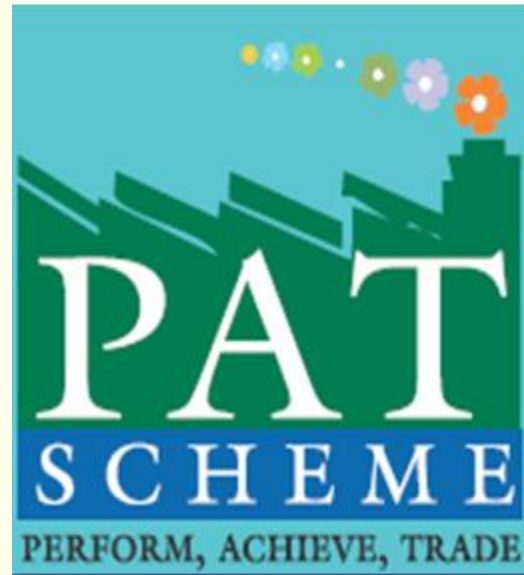
NMEEE – Four New Initiatives

- NMEEE under National Action Plan on Climate Change mandates :
- 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**)
 - Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the products more affordable. (**Market Transformation for Energy Efficiency**)
 - Creation of mechanisms that would help finance demand side management programs in all sectors by capturing future energy savings. (**Energy Efficiency Financing Platform**)
 - Developing fiscal instruments to promote energy efficiency (**Framework for Energy Efficient Economic Development**)



Perform, Achieve & Trade (PAT) Scheme

- 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.
- The scheme builds on the large variation in energy intensities of different units in almost every sector
- With respect to Sec 14(g) of the EC act, the Government has notified targets (in the form of SEC) for 478 DCs in the eight industrial sectors during March 2012 under the PAT cycle-I.
- The energy intensity reduction target mandated for each unit is dependent on its current efficiency : the reduction target is less for those who are more efficient, and is higher for the currently less-efficient units.

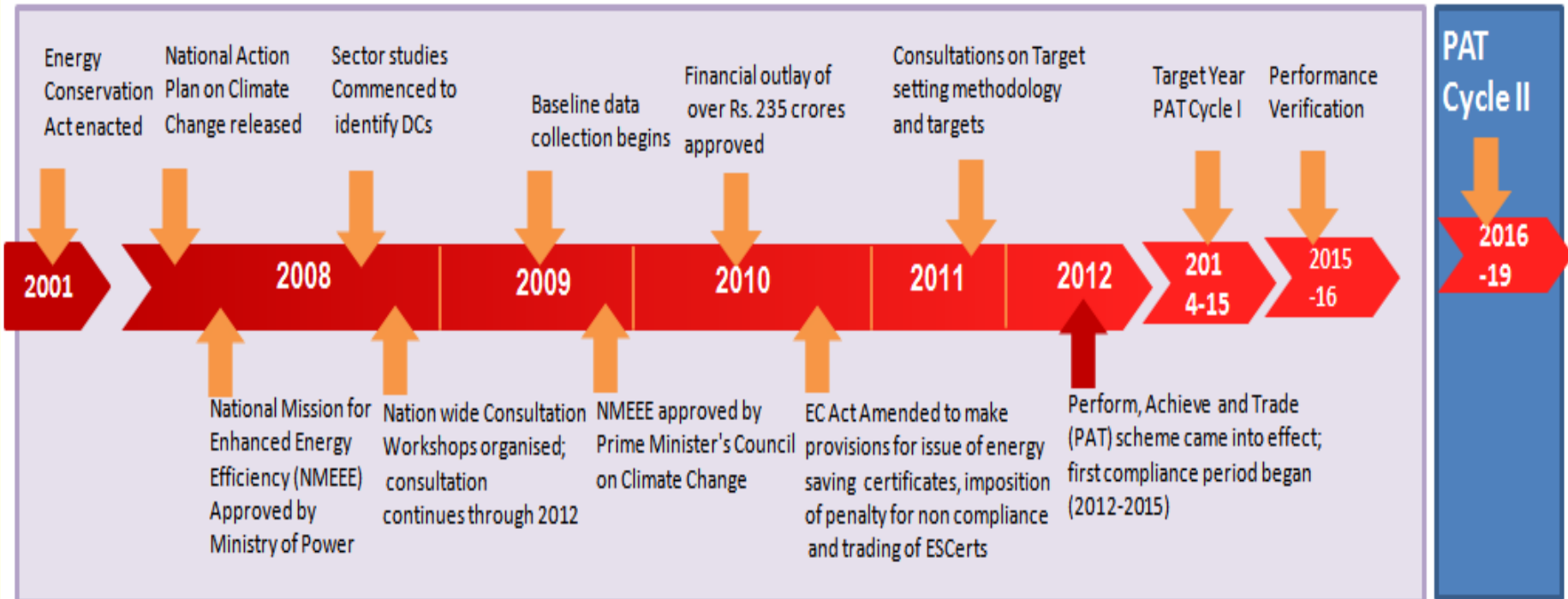


PAT Scheme



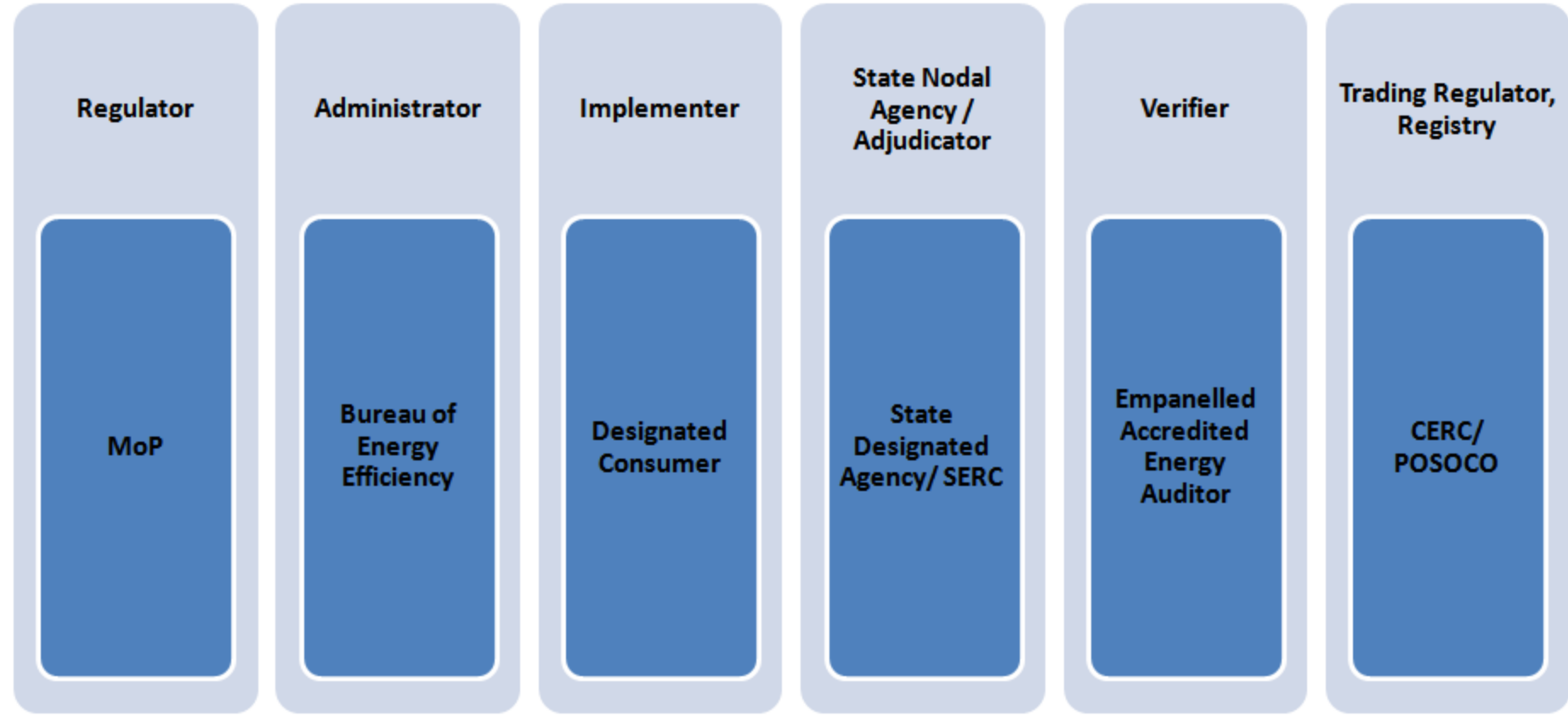
Overview of PAT Scheme

Perform Achieve and Trade (PAT): A regulatory instrument to reduce specific energy consumption in energy intensive industries, with an associated market based mechanism to enhance the cost effectiveness through certification of excess energy saving which can be traded.



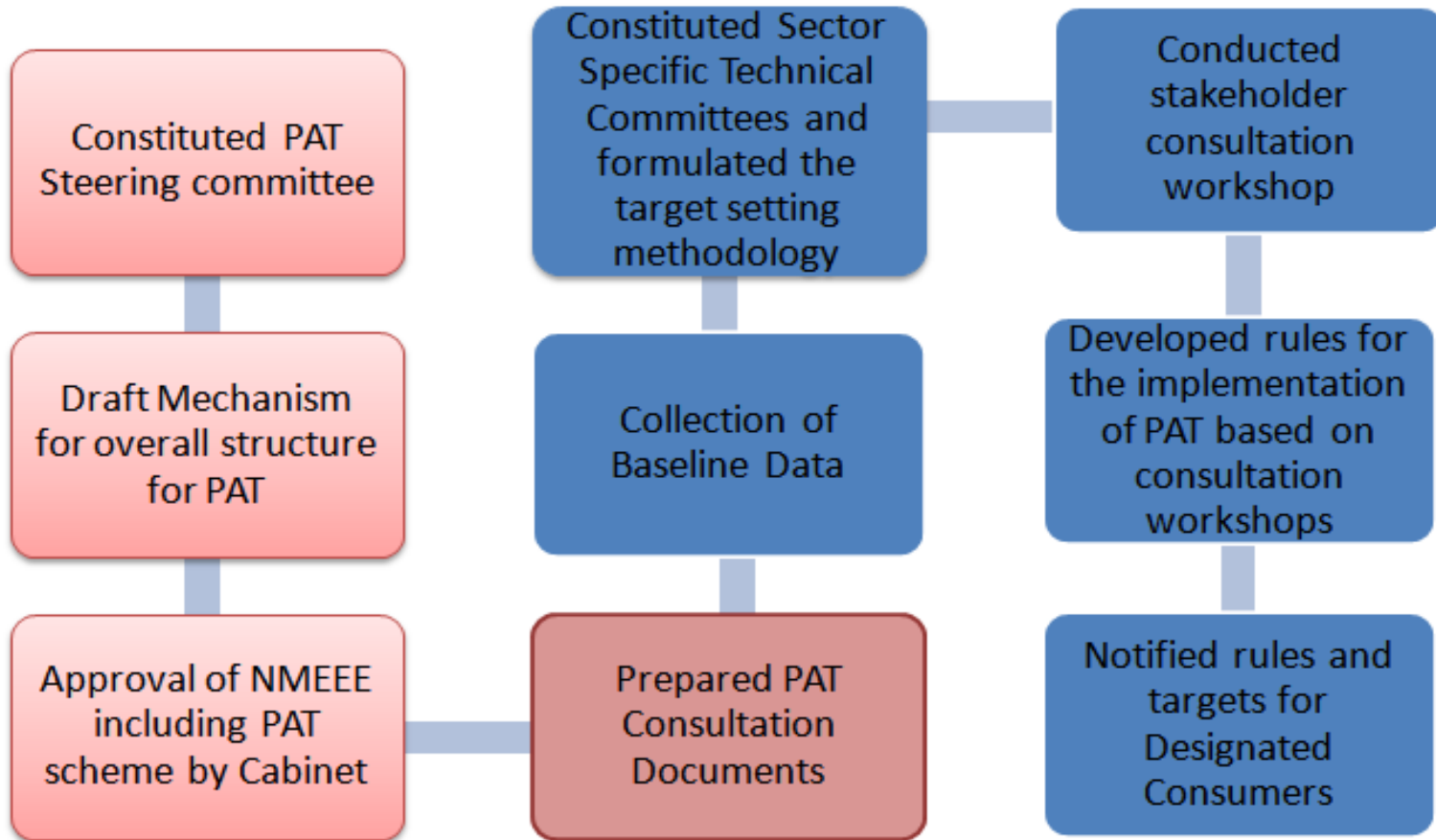


Stakeholders





Evolution of PAT Scheme





Phases in PAT Scheme

This Scheme involves three phases.

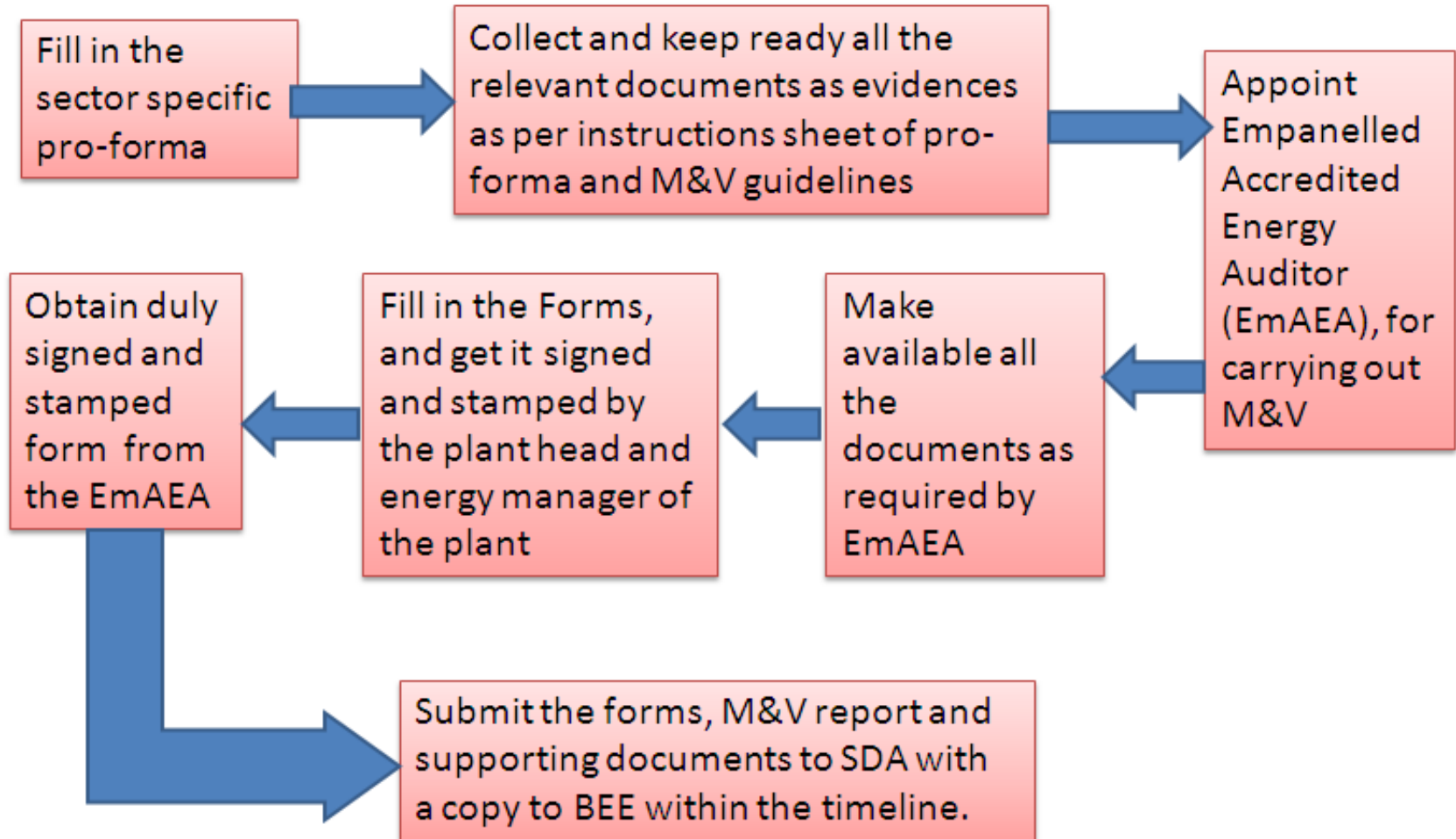
Target Setting Phase: First phase involves 'goal setting' which requires the setting of specific energy consumption (SEC) target for each plant on the basis of their current energy intensity. The target specifies the percentage by which a plant has to reduce its energy intensity in a 3-year period.

Reduction Phase: wherein the designated consumer tries to reduce its energy intensity according to the set target. This is called Perform and Achieve.

Trading Phase: The final phase is the 'trading phase' where the consumers who have surpassed their SEC target will be credited with tradable permits or ESCerts. A penalty will be levied on the designated consumers in case the SEC targets are not met.

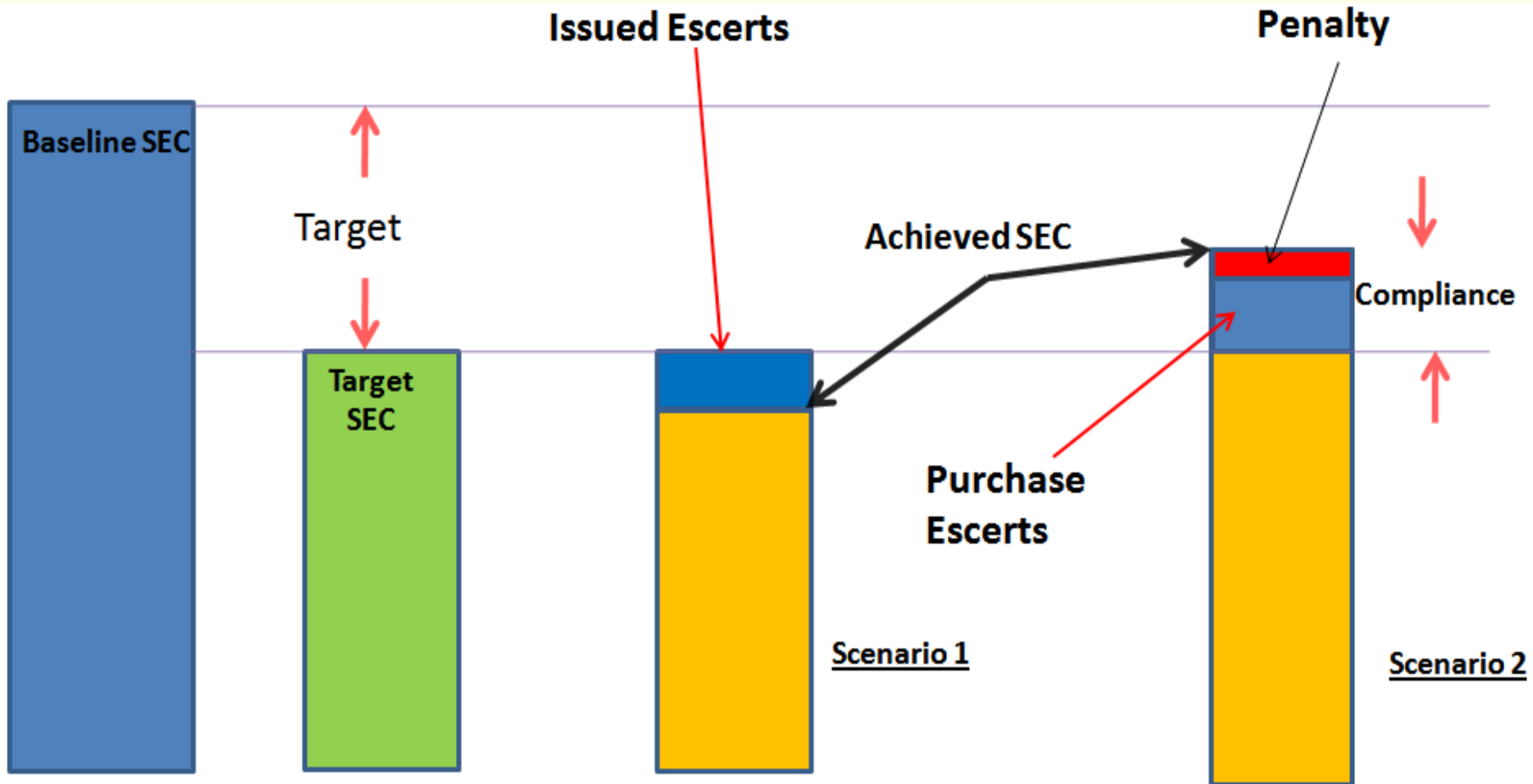


Role of Designated Consumer in PAT Scheme





Concept of Target, Compliance, ESCerts & Penalty





Procedure for issue of Energy Savings Certificates (ESCerts)

- Central Govt. after receiving recommendation from Bureau issue ESCerts of desired value to DC within 45 days.
- ESCerts shall only be in electronic form
1 ESCerts= 1 tonne of Oil Equivalent (toe) = 10968 INR
- The DC who has been issued energy savings certificates may sell them through the power exchange.
- ESCerts issued in current cycle shall remain valid till compliance period of next cycle.
- ESCerts purchased by DC for compliance shall after their submission to Bureau stand expire.



Penalty & Adjudication

As per Section 26 of EC Act,

- If any DC fails to comply with the timelines of PAT M&V procedure, he shall be liable for a penalty of Rs. 10 lakh, in addition to Rs. 10,000 per day.
- If any DC fails to comply with the provisions, he shall be liable to a penalty of Rs. 10 lakh, with an additional penalty of the price of every metric ton of oil equivalent target not achieved or he shall buy ESCerts.
- Any amount payable under this section, if not paid, may be recovered as if it were an arrears of land revenue.



PAT cycle - I



PAT Cycle-I Notified Sectors

S. NO.	Sectors	Annual Energy Consumption Norm to be DC (mtoe)	No. of Identified DCs
1	Power (Thermal)	30000	144
2	Iron & Steel	30000	67
3	Cement	30000	85
4	Aluminium	7500	10
5	Fertilizer	30000	29
6	Paper & Pulp	30000	31
7	Textile	3000	90
8	Chlor- Alkali	12000	22
	Total		478



Target of PAT cycle-I

- There were 478 energy intensive industries identified in 8 sectors as Designated Consumers, the target fixed in PAT cycle-I is to reduce energy consumption of **6.686** Million Tonne of Oil Equivalent.
- Annual reduction of carbon dioxide emission is about **23 million tonnes**
- PAT cycle-I began in 2012, target year is 2015, each cycle is of 3 years.
- 2015-16 is the assessment year for cross verification and issuance of ESCerts.
- PAT cycle is a rolling cycle, every year new sectors and industries will be added in new cycle .



Achievements of PAT cycle- I

S. NO.	Sectors	No. of DCs	Savings (Million toe)	% Increase in savings
1	Aluminium	10	0.73	59%
2	Cement	75	1.44	76%
3	Chlor- Alkali	22	0.10	100%
4	Fertilizer	29	0.83	73%
5	Iron & Steel	60	2.10	41%
6	Paper & Pulp	26	0.26	117%
7	Textile	82	0.12	71%
8	Thermal Power Plant	123	3.06	(-)5%
	Total	427	8.64	29%

- Savings of about 8.67 Million TOE from verified DCs.
- Mitigation about 31 million tons of CO₂.



Challenges Faced

- Reporting
- Normalization
- Integration
- Documentation
- Communication
- Adoption
- Evaluation



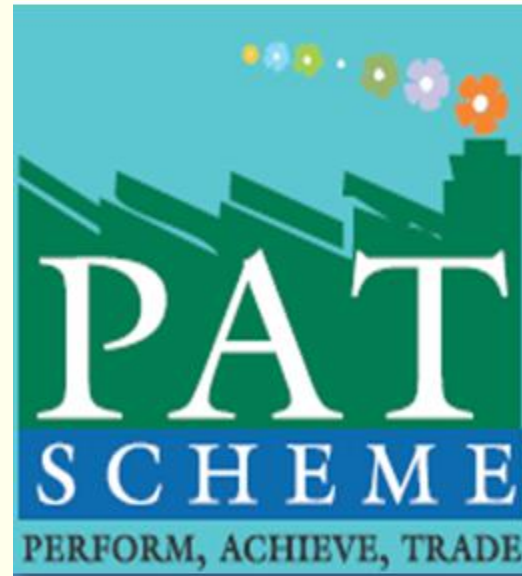
Challenges Faced

- Having evolved through complex challenges in developing efficiency metrics and normalization parameters, the first cycle thus far has resulted in development of a unique framework oriented towards rewarding demonstrated energy efficiency in large industries.
- Decision-making is still based on 'Investment and payback' and not on 'life cycle costing approach' which leads to less efficient equipment.



Challenges Faced

- Low capacity utilization, inconsistent quality and unreliable availability of coal leads are the major impediments for PAT cycle I, Lack of skilled labour leading to inefficient operations and thereby poor energy performance.
- Trading mechanism will depend on number of ENERGY SAVINGS CERTIFICATES issued, will depend on the targets achieved by Designated Consumers. Overachievement / Underachievement may impact trading prices of ENERGY SAVING CERTIFICATES.



PAT Cycle - II



PAT Cycle-II Notified Sectors

Sr. No	Sector	No. of DCs in PAT I	Additional DC in PAT Cycle-II	Total no. of DCs PAT -2
1	Aluminium	10	2	12
2	Chlor-Alkali	22	3	24
3	Textile	90	14	99
4	Pulp & Paper	31	4	29
5	Iron & Steel	67	9	71
6	Fertilizer	29	8	37
7	Cement	85	27	111
8	Thermal Power Plants	144	22	154
9	Refinery	NA	18	18
10	DISCOMS	NA	44	44
11	Railway	NA	22	22
Total				621



PAT Cycle-II

- Deepening of PAT (existing sectors): Inclusion of more units from existing sectors.
- Widening of PAT: Inclusion of more units from new sectors
 - New sectors: Refinery, Discoms, Railways.
- Energy savings target is 8.869 Million toe

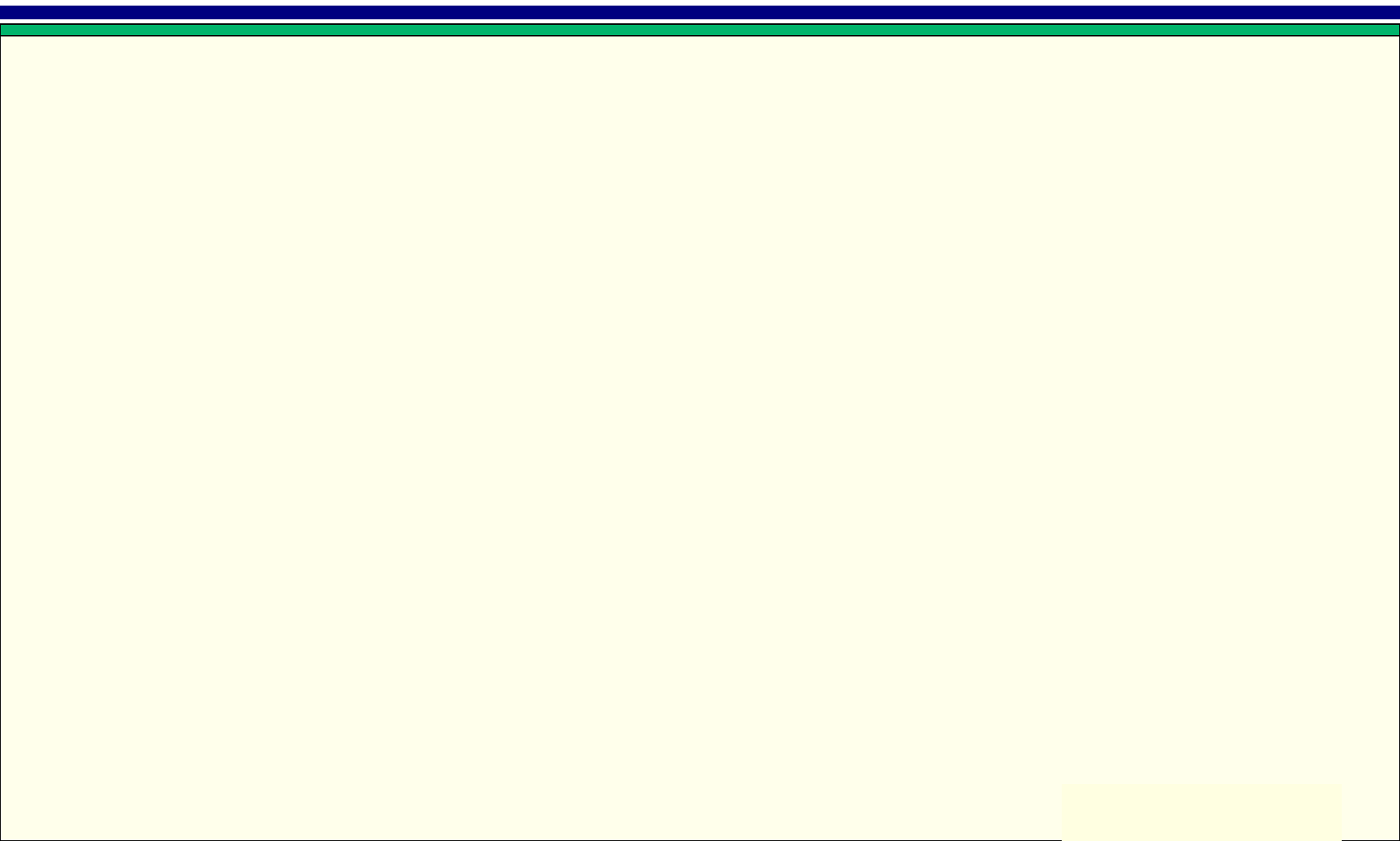


Way Forward

PAT Scheme is the initiatives to make industries energy efficient and to reduce emissions. PAT cycle-I is demonstrating a trend and evolving to a more mature, robust and inclusive stage after several phases of learning-by-doing approach, thereby carrying forward the learning and best practices from one cycle to the next and shedding of redundant and counter-productive practices.



Thank You!





Specific Energy Consumption (SEC)

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

