PAT ⇨ CCTS Scheme & Way Forward

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PAT and CCTS Scheme Overview & Way Forward

थिरुवनंतपुरम/Thiruvananthapuram
०७/०८/२०२४
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Presentation Outline

1. About Bureau of Energy Efficiency
2. PAT Scheme Overview
3. PAT Scheme Outcomes
4. Bureau's Initiatives
5. Feasibility Study under "Tyre Sector"
6. Baseline Energy & Emission Audit for "Tyre Sector"
7. About Indian Carbon Market – CCTS

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Bureau of Energy Efficiency

Bureau of Energy Efficiency

Ministry of Power

About Bureau of Energy Efficiency (BEE)

The Government of India set up Bureau of Energy Efficiency (BEE). on 1st March 2002 under the provisions of the Energy Conservation Act, 2001

Vision

- To improve Energy Intensity of Indian Economy thereby contributing towards sustainable development of country.

Mission

- To develop policy and strategies with a thrust on self-regulation and market principles, within the overall framework of the Energy Conservation Act (EC Act), 2001 with the primary objective of reducing energy intensity of the Indian economy.

Objective

- To reduce energy intensity in the Indian economy.

Main Function of BEE

Regulatory Functions

- Develop minimum energy performance standards for equipment and appliances under Standards and Labelling
- Develop minimum energy performance standards for Commercial Buildings
- Develop Energy Consumption Norms for Designated Consumers
- Certify energy managers and energy auditors (EM,EA, AEA)

Promotional Functions

- Create awareness and disseminate information on energy efficiency and conservation.
- Arrange and organize training of personnel and specialists in the techniques for efficient use of energy and its conservation.
- Strengthen consultancy services in the field of Energy Efficiency.
- Promote research and development.

Activities of BEE

Awareness Programs

- General Awareness
- Energy Conservation Awards
- Painting Competition

Strengthening Institutional Capacity of Partners

- Strengthening of State Designated Agencies (SDAs)
- International Cooperation

National Mission for Enhanced Energy Efficiency (NMEEE)

- Perform, Achieve and Trade (PAT)
- Financing Energy Efficiency Programme (FEEP)

Demand Side Management

- Agriculture DSM (including Cold Chain)
- Municipal DSM
- Energy Efficiency in SMEs
- Capacity Building of DISCOMs

Transport Sector

- Fuel Efficiency Norms
- Electric Vehicle (EV)
- EV infrastructure
- Railways

Buildings EE

- ECBC Commercial
- ECBC Residential
- Star Labelling of Buildings

Equipment & Appliances

- Standards & Labelling
- Large scale deployment of LED bulb (UJALA)

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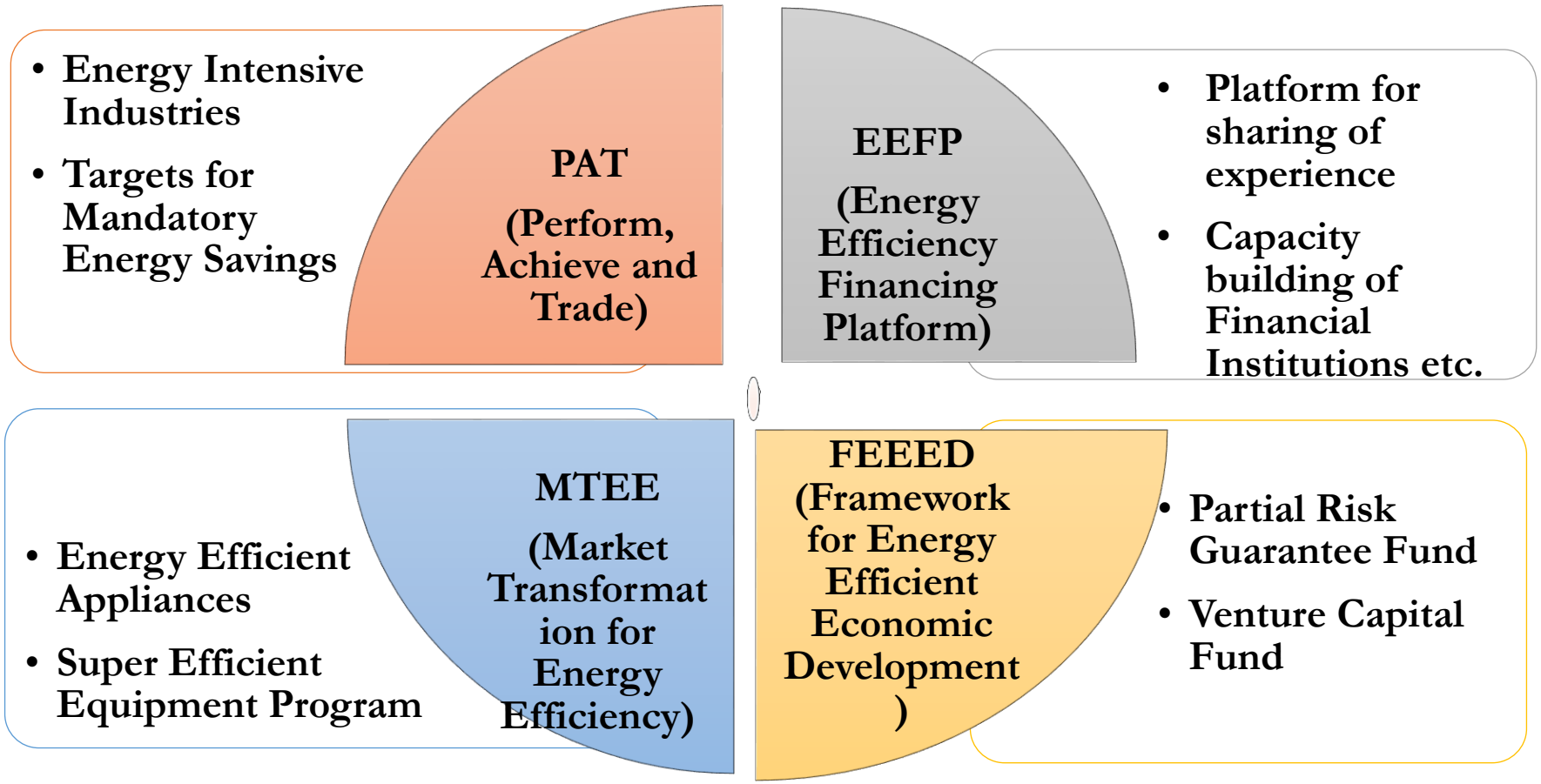
PAT Scheme Overview

Bureau of Energy Efficiency

Ministry of Power

Background

A Mission under National Action Plan on Climate Change (NAPCC)



Perform, Achieve and Trade

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.

Process Flow

Step 1: Identification of Sectoral Threshold Level and Potential of Energy Saving for given Sector in EC Act.

Step 2: Identification of Prospective DCs in given sector and Conduct Baseline Audit.

Step 3: Fixation of Baseline Production, Baseline SEC and Target SEC for DCs whoever above sectoral Threshold.

Step 4: PAT Cycle of 3 years initiated for DC to achieve the Target SEC

Step 5: Conducting M&V Audit (to be carried out by DCs)

Step 6: Evaluation of M&V Audit Reports and all Forms.

Step 7: Finalize the DC Achieved SEC and accordingly finalize the Final No. of ESCerts for DC.

Step 8: Recommendation of ESCerts to MoP for issuance.

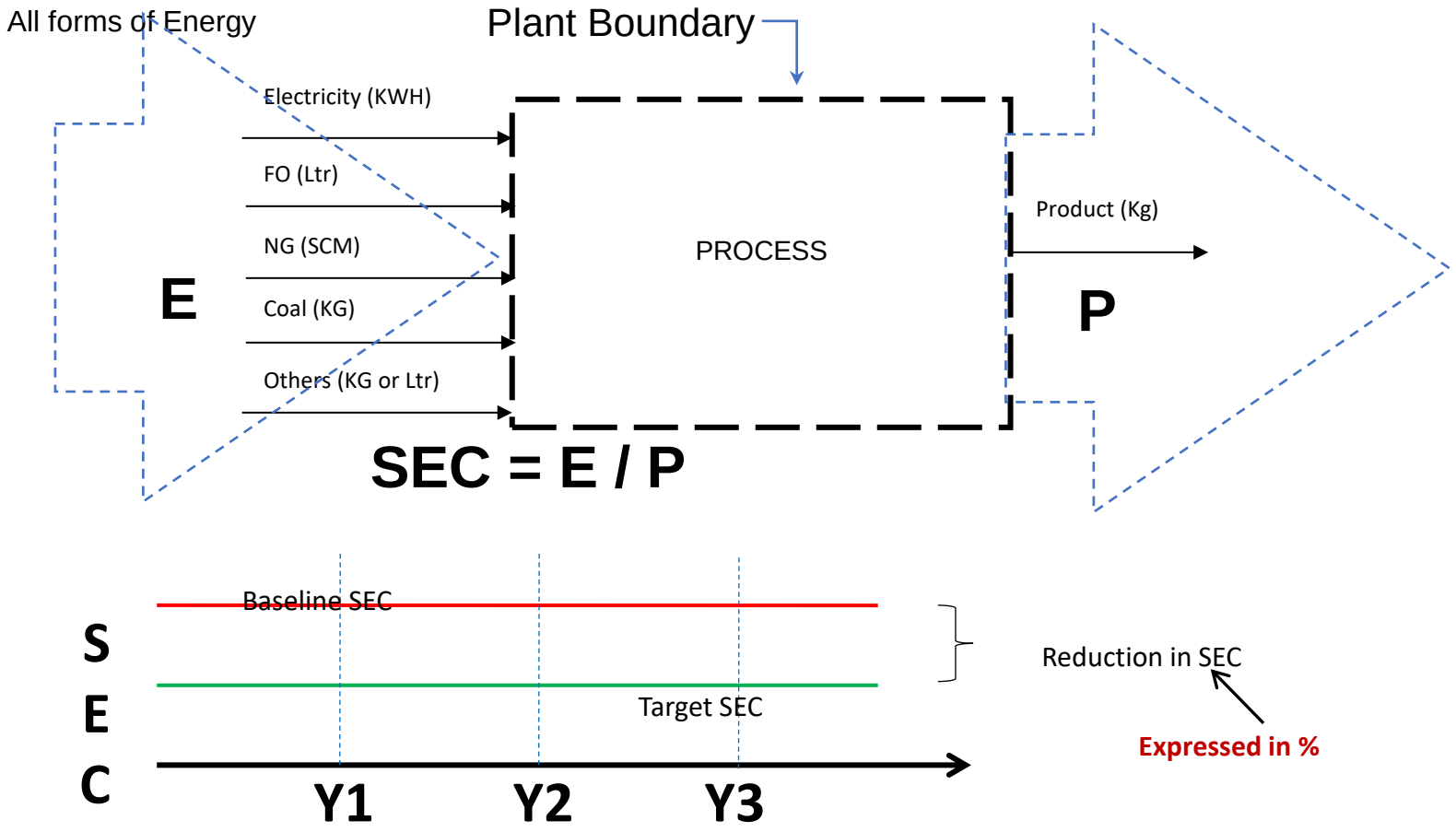
Step 9: ESCerts issuance on PATNET.

Step 10: Trading of ESCerts.

Step 11: New PAT Cycle.

PAT Scheme: G-t-G Concept

Gate-to-Gate concept



Background

Regulatory Framework

- **Energy Conservation (EC) Act 2001**
- **Norms for Energy Intensive Industries**
- Standard & Labeling
- Energy Conservation Building Code
- Demand Side Management
- Certification of Energy Professionals

EC Act Empowers Central Government w.r.t to PAT :-

- Establish Energy Consumption norms and standards for Designated Consumers (DCs).
- Direct DCs to comply with above norms and standards.
- Issue ESCerts to DCs who overachieve for trading

Background

Regulatory Framework- Amendments

The Energy Conservation (Amendment) Act, 2022, No. 19 Of 2022

Dated: 19th Dec 2022

EC Act Empowers Central Government:-

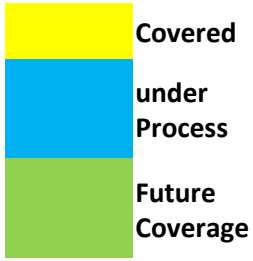
- "**Carbon Credit Trading Scheme**" means the scheme for reduction of carbon emissions notified by the Central Government under clause (w) of section 14.
- '(h) **"energy"** means any form of energy derived from fossil fuels or non-fossil sources or renewable sources.
- specify **minimum share of consumption of non-fossil sources** by DCs as energy or feedstock, provided different share of consumption may be specified for different types of non-fossil sources for different designated consumers.

Sectoral Coverage as per EC Act 2001

As per EC Act 2001 Schedule II	As per Amendment in Schedule II of EC Act 2001 (vide S.No. 09 (E) dt. 3rd Jan 2022	As per Amendment in Schedule II of EC Act 2001 (vide S.No. 2523 (E) dt. 6th Jan 2023
1. Aluminum; 2. Fertilizers; 3. Iron and Steels; 4. Cement; 5. Pulp and Paper; 6. Chlor Alkali; 7. Sugar; 8. Textile; 9. Chemicals; 10. Railways; 11. Port Trust; 12. Transport Sector (Industries and Services); 13. Petrochemical, Gas Crackers, Naphtha Crackers and Petroleum Refinery; 14. Thermal Power Stations, Hydel Power Stations, Electricity transmission companies and distribution companies; 15. Commercial Buildings or Establishment.	1. Aluminum; 2. Fertilizers; 3. Iron and Steels; 4. Cement; 5. Pulp and Paper; 6. Chlor Alkali; 7. Sugar; 8. Textile; 9. Chemicals; 10. Railways; 11. Port Trust 12. Transport Sector (Industries and Services) 13. Petrochemical, Gas Crackers, Naphtha Crackers and Petroleum Refinery 14. Thermal Power Stations, Hydel Power Stations, Electricity transmission companies and distribution companies; 15. Commercial Buildings or Establishment. 16. Ceramic; 17. Glass; 18. Zinc; 19. Copper; 20. Mines Including exploration.	22. Dairy; 23. Automobile Assembly Units; 24. Tyre Manufacturers; 25 Forging; 26. Foundry; 27. Refractory;

Sectoral Threshold Level

Sr. No	Sector	Annual Energy Consumption (MTOE), Sectoral Threshold Level
1	**Aluminum**	7,500
2	**Chlor-Alkali**	12,000
3	**Textile**	3,000
4	**Pulp & Paper**	7,500
5	**Iron & Steel**	20,000
6	**Fertilizer**	30,000
7	**Cement**	30,000 & 10,000 for CGU
8	**Thermal Power Plants**	30,000
9	**Refinery**	90,000
10	**DISCOMS**	All Licensed
11	**Railway**	70,000
12	**Buildings**	500
13	**Petrochemicals**	1,00,000
14	**Sugar**	10,000
15	Chemical	3,000
16	Ceramic	5,000
17	Glass	10,000
18	**Zinc**	20,000
19	Copper	10,000
20	Port Trust	500
21	Dairy	2,500
22	**Automobile Assembly Units**	3,000
23	**Tyre Manufacturer**	7,000
24	Forging	1,500
25	Foundry	5,000
26	Refractories	3,000



PAT Family…

Sector / No. of DCs	PAT Cycle I	PAT Cycle II	PAT Cycle-III	PAT Cycle-IV	PAT Cycle-V	PAT Cycle-VI	PAT Cycle-VII	PAT Cycle-VIII	Total Notified DCs Notified till Apr'2023
	(FY'12-15)	(FY'16-19)	(FY'17-20)	(FY'18-22)	(FY'19-22)	(FY'20-23)	(FY'22-25)	(FY'23-26)	
Aluminum	10	12	1	-	1	-	12	1	**14**
Cement	85	111	14	1	12	37	120	25	**200**
Chlor- Alkali	22	24	-	2	2	-	24	1	**29**
Fertilizer	29	37	-	-	-	-	0	0	**37**
Iron & Steel	67	71	29	35	23	5	134	66	**270**
Paper & Pulp	31	29	1	2	8	2	24	7	**55**
Textile	90	99	34	7	16	7	120	38	**206**
Thermal Power Plant	144	154	37	17	17	-	152	0	**239**
Refinery	-	18	-	-	-	20	0	0	**20**
Railways	-	22	-	-	-	-	26	0	**26**
DISCOMs	-	44	-	-	-	-	95	0	**96**
Petrochemical	-	-	-	8	-	-	0	0	**8**
Buildings	-	-	-	37	31	64	0	0	**133**
Total	**478**	**621**	**116**	**109**	**110**	**135**	**707**	**138**	**1333**

PAT Scheme Geographical Coverage

State	No. of DCs
Chhattisgarh	104
Chandigarh	1
Daman Dwep	1
Delhi	30
Dadra and Nagar Haveli	14
Goa	19
Gujarat	135
Himachal Pradesh	17
Haryana	26
Jharkhand	35
Jammu & Kashmir	3
Karnataka	91
Kerala	25
Lakshadweep	1
Ladakh	1
Manipur	1
Maharashtra	107
Meghalaya	10

State	No. of DCs
Mizoram	2
Madhya Pradesh	53
Nagaland	1
Odisha	101
Punjab	41
Pondicherry	3
Rajasthan	96
Sikkim	1
Tamil Nadu	99
Tripura	6
Telangana	35
Uttarakhand	8
Uttar Pradesh	77
West Bengal	81
Andhra Pradesh	75
Bihar	14
Assam	17
Arunachal Pradesh	1

Energy Intensive Industries in PAT - CCTS Scheme (Transition)

PAT Scheme
(SEC Reduction Target)

Baseline Audit in 8 Sectors

2007-10 → Cycle-I (2012-15) → Cycle-II (2016-19) → Cycle-III (2017-20) → Cycle-IV & V (2018/19-22) → Cycle-VI (2020-23) → Cycle-VII (2022-25) → Cycle-VIII (2023-26)

Total 26.98 mTOE Energy Savings (I to VI)

CCTS Scheme

2025 → CCTS-I (2025) → CCTS-n → 2030

Proposed for 849 DCs
FY 2025-28

I&S, Cement, P&P, Textile, C&A, Fertilizer, Refinery, Aluminum, Zinc, Copper and Petrochemical Sectors

Also Proposed for New Sectors

Tyre Manufacturers, , Automobile Assembly Units, Dairy, Ceramics etc.

Proposed to cover >200 Obligated Entities

Total 1333 nos. of DCs in 13 Sectors

2012-2025

S.No.	CCTS Sector
1	Iron & Steel
2	Cement
3	Aluminium
4	Chlor-Alkali
5	Pulp & Paper
6	Refinery
7	Petrochemical
8	Textile
9	Zinc & Copper

S.No.	PAT Sector
1	DISCOM
2	Railway
3	Thermal Power Plant
4	Sugar

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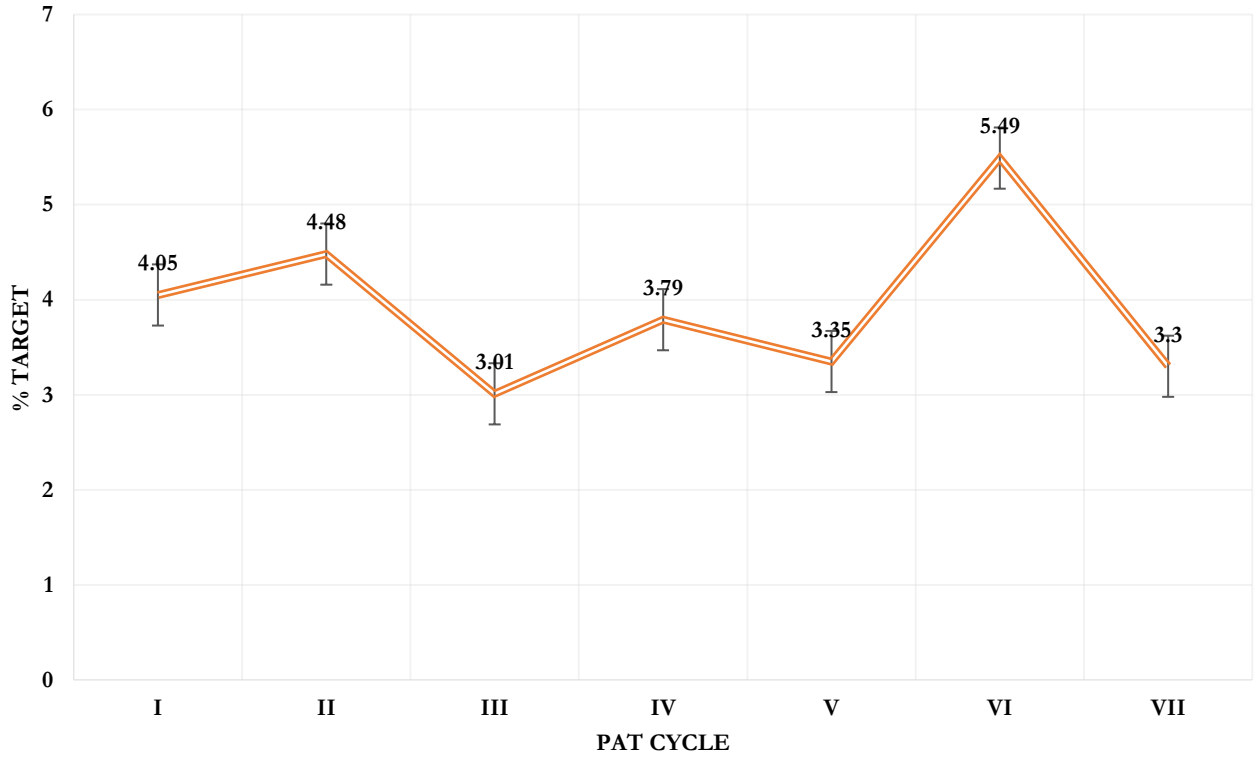
PAT Scheme Outcomes

Bureau of Energy Efficiency

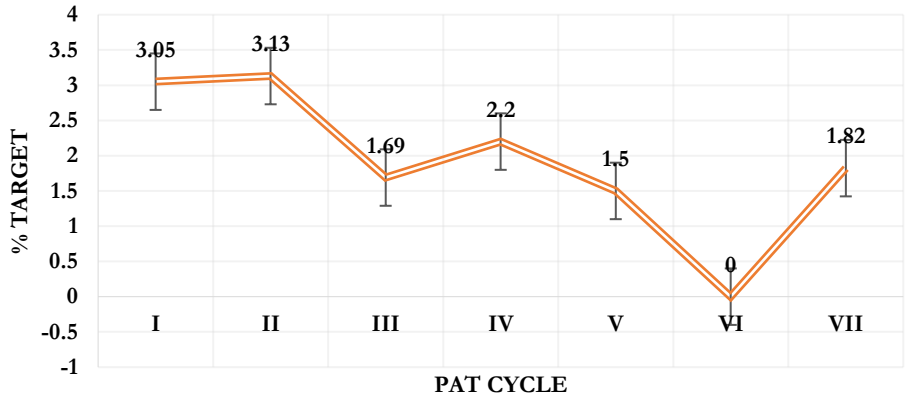
Ministry of Power

Target Trajectory: PAT Scheme

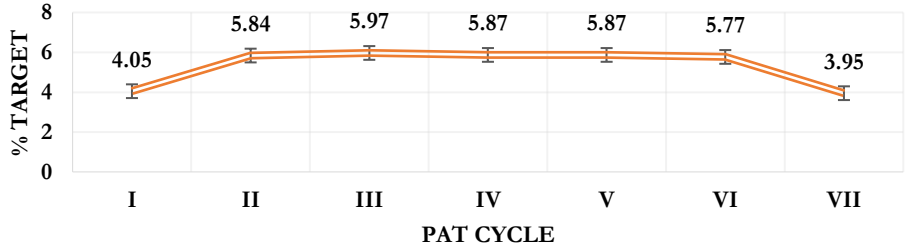
ALL SECTORS



THERMAL POWER PLANT



MANUFACTURING SECTORS



Realized Impacts of PAT Scheme

Energy Saving

25.77 mtoe

3.55 % of India's

Total primary energy supply

Emission Reduction

110.66 million tonnes of CO_2

11.36% of India's

emissions

Skill Development

Capacity building:
12000+ Engineers and operators

17975 Energy Auditors & Managers
285 Accreditation

ESCerts Trading

95.63 lakhs ESCerts were awarded.
50.71 lakhs ESCerts entitled to Purchase. 12.98 lakhs ESCerts traded in PAT-I

Investment

Encouraged investments for energy efficient technologies for domestic manufacturing

Rs. 56,100 Crore invested

Savings

Rs. 57,368 Crores

from saved **energy consumption**

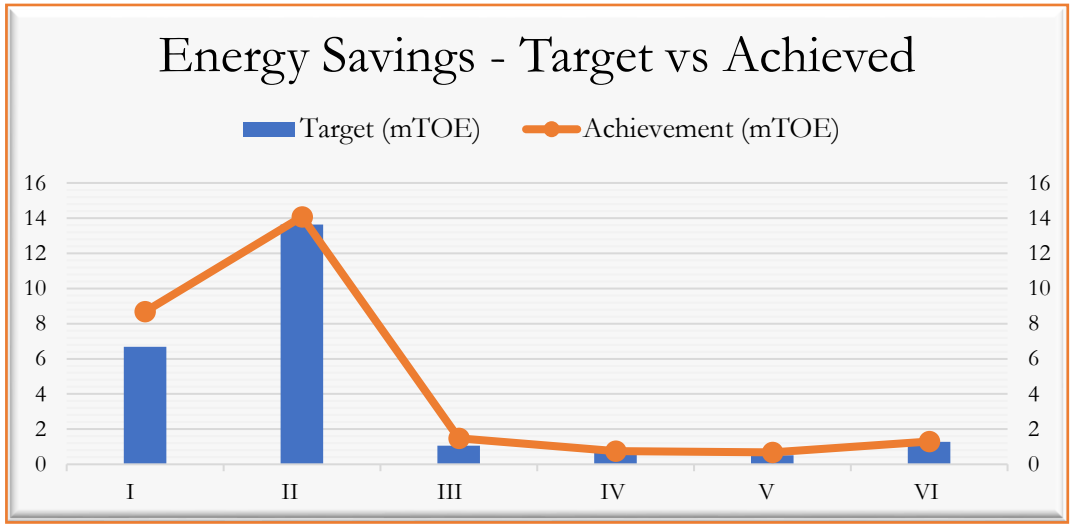
PAT Cycle I – V

PAT Cycle I

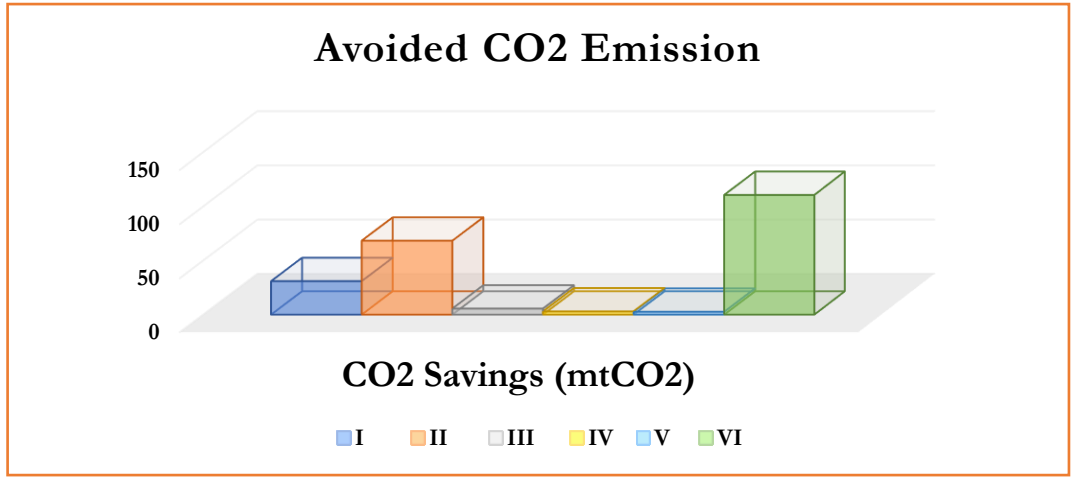
PAT Cycle I – V

PAT Scheme – Achieved Savings

S.No.	PAT Cycle	Total DCs	Target (mTOE)	Achievement (mTOE)
1	I (FY 2012-15)	478	6.68	8.69
2	II (FY 2016-19)	621	13.63	14.08
3	III (FY 2017-20)	116	1.06	1.48
4	IV (FY 2017-20)	106	0.69	0.75
5	V (FY 2017-20)	110	0.51	0.68
6	VI (FY 2017-20)	135	1.28	1.3
G. Total			23.85	26.98



PAT Cycle	Avoided CO2 Savings (mtCO2)
I	31
II	68.43
III	5.59
IV	2.96
V	2.68
G. Total	110.66



BEE Other Initiatives

- **Feasibility Study : Phase I** – Sugar, Non Ferrous (Zinc & Copper), Glass, Chemicals – Alkali Chemical (Soda Ash, Potassium Hydroxide) , Inorganic Chemicals, Organic Chemicals, Pesticides (Technical), Dyes and pigments, Pharmaceuticals IAPI), Ceramic and Mining

Phase II – Port trust, Dairy, Transport Sector, Edible Oils, Breweries and Distillery, Beverages, Food processing, Cold Storage , Refractories, Heavy Engineering Manufacturing.

- **Potential Assessment Study, ISO 50001 Implementation & Mapping of Thermal Power Plants.**
- **Multimedia Videos on EE Technologies & Demonstration of innovative Energy Efficient technology in PAT Industries.**
- **Establishment of Advanced Institutional Technology Demonstration Centre (AITDC) at NPTI Badarpur, Delhi.**
- **Implementation of Energy Monitoring System in PAT Industries.**
- **Collaboration with premier research institute/academic such as IITs, NCCBM, CPPRI, NITs, NISST etc. for R&D on Clean Technologies and Demo EE projects.**
- **ADITEE Scheme to finance the EE projects for Large/MSME industries by means of Interest Sub-Intervention plan with a total budget ~2,000 Rs. Crore.**

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Feasibility Study: Tyre Manufacturing Unit

Bureau of Energy Efficiency

Ministry of Power

About the Study

Study Conducted in April'2022 at Chennai-Madurai-Trichy, Chitoor-Medak, Banmore-Dhar, Pune-Mumbai-Ambarnath-Nasik-Nagpur-Aurangabad, Limda-Baruch, Kottayam-Kalamsesery-Peramba Clusters

Major Stakeholders: Automotive Tyre Manufacturers' Association (ATMA), Automotive Component Manufacturers Association of India (ACMA), Indian Tyre Technical Advisory Committee (ITTAC)

Area Covered: Production and Energy Profile, Sectoral Energy Saving Potential, Major Plants & location, Product Categorization, Market Size, Current Sectoral Policies, Process Technologies, etc.

Energy Benchmarking of the Sector

Major Finding of the Study

India has the 6 major companies with 8% share globally.

Total 41 Tyre manufacturing companies in India including 9 major manufacturers

Average specific energy consumption of 9.5 GJ/ton (0.226 TOE/ton) of Tyre manufactured in India.

Electrical energy consuming areas: (40% of Total Energy Input) - Thermal energy consuming areas: (60% of Total Energy Input)

Energy Saving Potential ~ 25 %

Shifting to EE Technology and RE enhancement

Annual Sectoral Threshold 7,000 TOE

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Baseline Energy & Emission Audit
Tyre Sector

Bureau of Energy Efficiency

Ministry of Power

Process Flow for Baseline Audit

- **Step 1:** Stakeholder Consultation with Lime Ministry, ATMA, ITTAC, Tyre Manufactures & others.
- **Step 2:** List of prospective Tyre units (4-wheelers & 2-wheelers) and Finalization of Scope of Work.
- **Step 3**: Finalization of Baseline Audit Agencies with parallel communication with ATMA, Tyre Units and SDAs.
- **Step 4:** Formation of Sectoral Technical Committee by means of seeking the nomination from Department for Promotion of Industry and Internal Trade (DPIIT), ATMA, ITTAC, BIS, Indian Rubber Material Research Institute (IRMRI), Major Tyre Manufactures; subject to the approval from **NSCICM**.
- **Step 5:** Conducting the Baseline Audit (tentatively between **Oct-Dec'2024**) for FY 2021-2024.
- **Step 6:** Fixation of Baseline Figures and Target Figures (tCO2eq/t) and subsequent approval of same from Sectoral committee and NSCICM.
- **Step 7:** Publication of Draft Target Notification by MoEFCC in public domain for comments.
- **Step 8:** Final Notification by MoEFCC under Environmental Protection and Conservation Act (EPC), 1986.
- **Step 9: CCTS Cycle Starts w.e.f. 1st April 2025.**

About the Audit

The objective of conducting the study is to inventarization of baseline GHG emission (tonne of CO2e) and establishment of **GHG Emission Intensity (GEI) (tonne of CO2eq / tonne of product)** of Obligated Entity (OEs) in Tyre Sector.

General

- Collection and Review of the energy consumption, GHG Emission and production data of last 3 years in the Sector Specific Pro-forma (SSPF) for the years FY 2021-22, 2022-23 & 2023-24 by visiting the plant physically.

Technical

- Study the process of the entire plant considering a gate-to-gate concept which would mention type & quantity of energy and emission sources consumed, self-generated energy and emission, process technology, raw material, process by-products, product output and various variable factors which affect the energy consumption and emission significantly.

Others

- Investigate possible emission reduction options and identify the emission reduction opportunities.
- Recommend various technically sound and economically viable measures to reduce GHG Emission Intensity.

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Indian Carbon Market

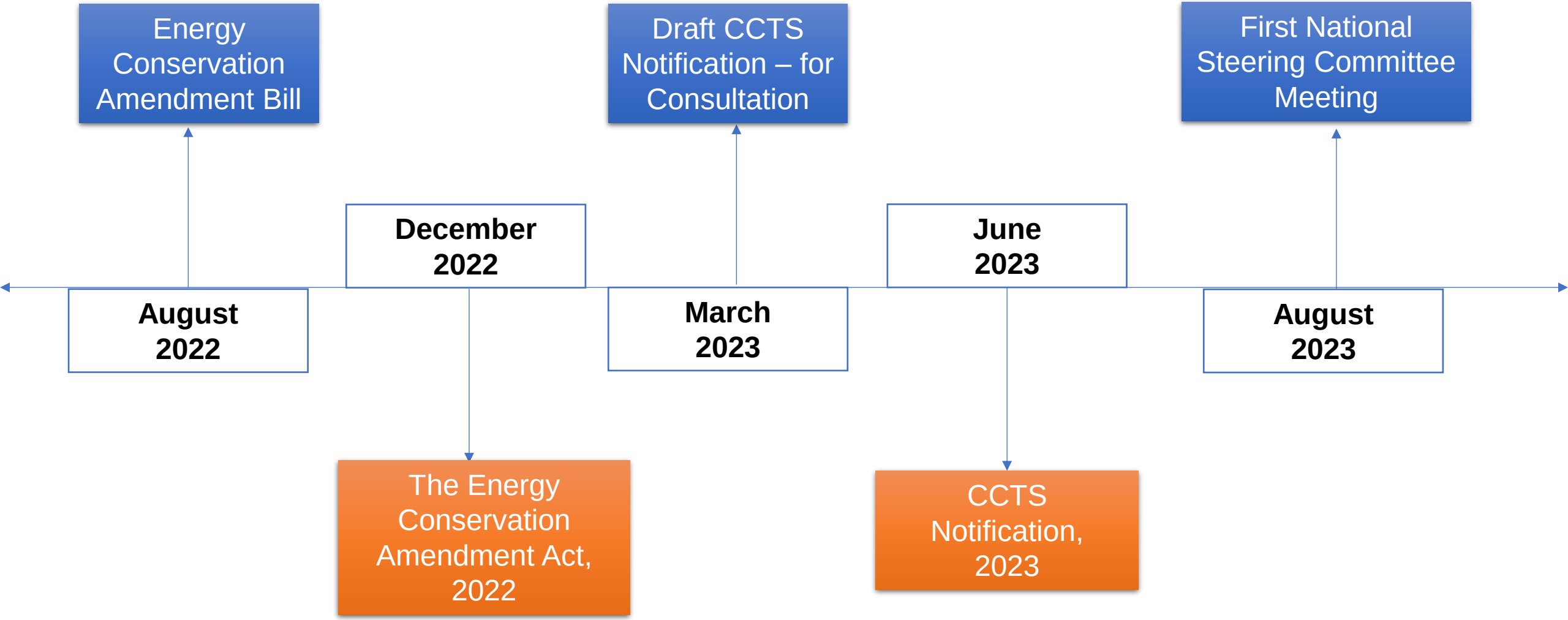
Bureau of Energy Efficiency

Ministry of Power

Presentation Outline

1. Indian Carbon Market Framework
2. Target setting approach (broad)

Key Milestone – Indian Carbon Market



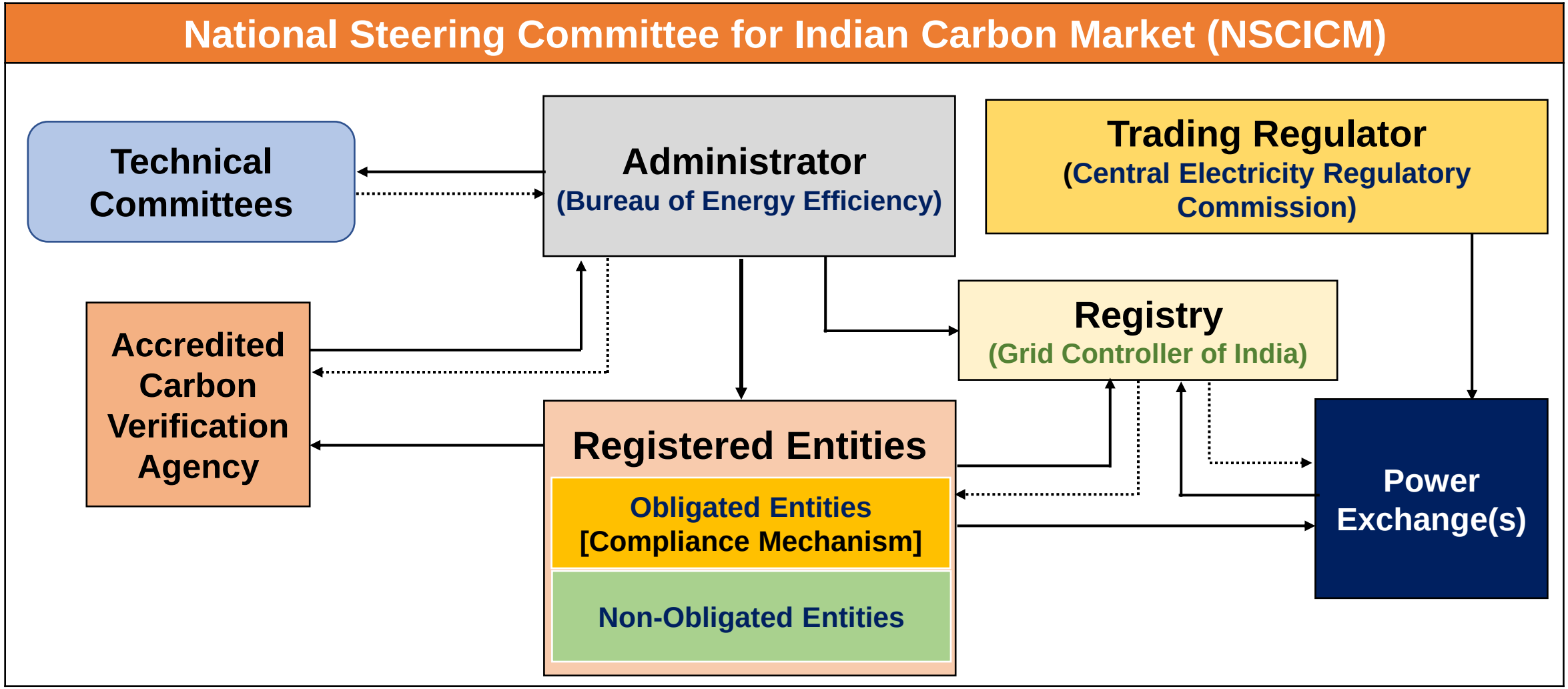
Institutional Framework

National Steering Committee for Indian Carbon Market (NSCICM)			
Chairperson		**Co-Chairperson**	
Secretary, Ministry of Power		**Secretary, Ministry of Environment, Forest and Climate Change**	
Members			
Ministry of Finance	NITI Aayog	Ministry of Power	Ministry of Environment, Forest and Climate Change
Ministry of New and Renewable Energy	Ministry of Steel	Ministry of Coal	Ministry of Petroleum and Natural Gas
Ministry of Agriculture and Farmers Welfare	Ministry of Chemical and Fertilizers	Central Electricity Authority	Grid Controller of India Limited
Department of Environment of State Government representing State – (2)	Expert Members - (2)** Other Members - (3)*	Member Secretary: Director General, Bureau of Energy Efficiency	

*CII & FICCI – also has been included as coo-opted members

**Shri Upendra Tripathy & Shri R R Rashmi as experts

Institutional Framework



Transition from Specific Energy Consumption (SEC) to Specific GHG Emissions (SGE)

SEC ~toe/t to SGE ~ tCO_2e/t

Current Approach under PAT

$$SEC = \frac{\text{Total Energy input to the plant boundary (TOE)}}{\text{Equivalent Product or Output (t)}}$$

Transition

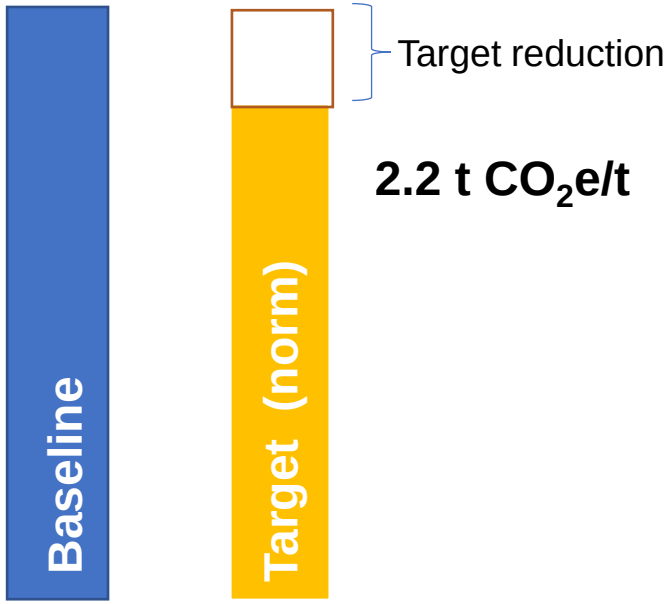
Proposed for Compliance Mechanism Approach under CCTS

$$SGE = \frac{\text{Total GHG Emissions from DCs } (tCO_2eq)}{\text{Equivalent Product or Output (t)}}$$

Compliance Mechanism

Baseline

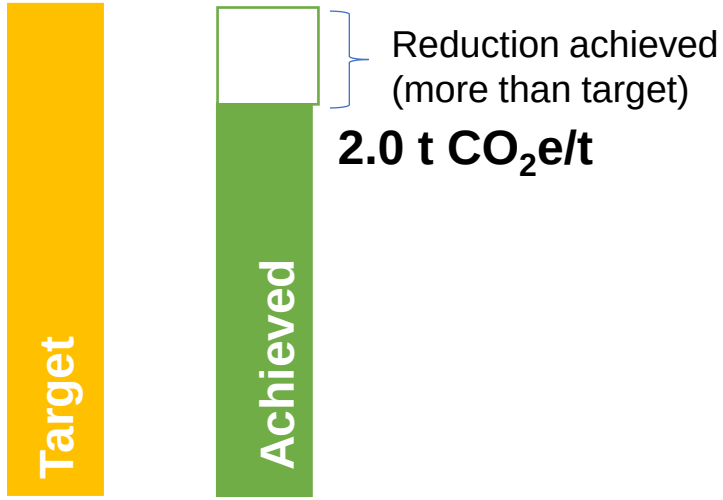
2.5 t CO_2e/t



Case I
Exceeding the Target

Credits to be issued (t CO_2e)
(0.2 t CO_2e/t * Production)

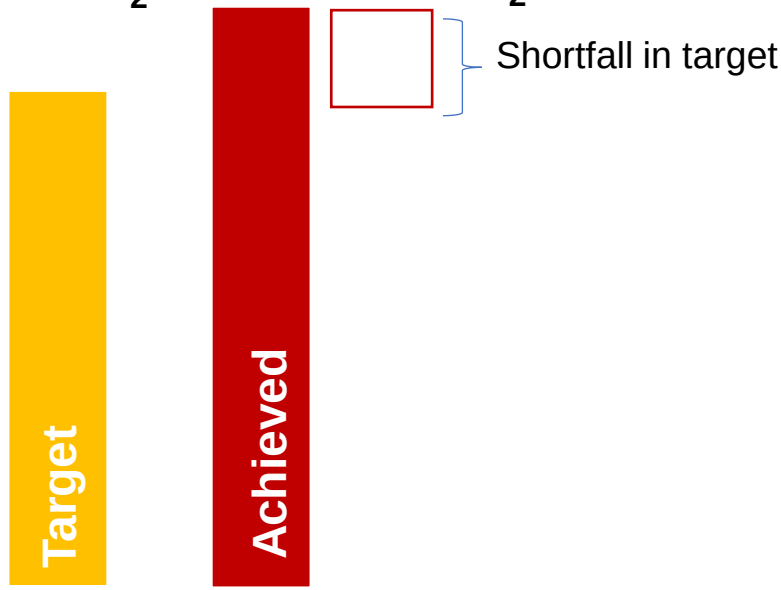
2.2 t CO_2e/t



Case II - Shortfall in target

Credits to be purchased (t CO_2e)
(0.2 t CO_2e/t * Production)

2.2 t CO_2e/t **2.4 t CO_2e/t**



Issuance/purchase of CCCs will be post verification

CCTS – Proposed Approach for Target Setting

Compliance Mechanism – GHG Coverage

- **GHGs to be included** : CO_2 and PFC

- CO2 – From fuel combustion and process emissions

- PFC – From aluminium smelting operations

- GHGs to be converted into CO2e by using GWP as referred in India Biennial Update report to UFCCC

Proposed GHGs to be covered

GHGs	Combustion	Process
CO_2	Yes	Yes
CH_4	No	-
N_2O	No	-
PFC	-	Yes

Rationale for not including CH4 and N2O:
- Currently CH4 and N2O currently not been monitored
- Even if to include – will require to apply default factors
- E.g. – EU ETS Covers – CO2, N2O (Nitric Acid) and PFC
- Other gases contribution minimum in overall emissions

Direct and Indirect Definition – ISO 14064-1: 2018

Emissions to be considered

(i) **Direct GHG emissions** are emissions from sources that are owned or controlled by the obligated entity and includes emissions from combustion of any type of fuel (fossil) burnt in stationary (fixed) equipment, such as boilers, gas turbines, kiln, or furnaces to generate heat, mechanical work, and steam.

(i) **Direct process emissions** from industrial processes means emissions other than combustion emissions occurring because of chemical reactions between substance or their transformation

(ii) **Indirect GHG emissions** means GHG emissions that are a consequence of the activities of the obligated entity but occurred at sources outside the obligated entity establishment and shall include – indirect emissions from electricity purchased from grid, and emissions from electricity and heat imported outside plant boundary.

Note: GHG emission intensity targets within 2025-28 for the obligated entities shall be calculated only on the basis of emission related to sources as (i) and (iii) highlighted above, subsequently targets will be calculated based on (i), (ii) and (iii)

As per GHG Protocol	Covered under CCTS	Terminology used in CCTS
Scope 1	Yes	Direct
Scope 2	Yes	Indirect
Scope 3	No	-

GHG Emission Trajectory

The GHG emission intensity reduction trajectory will be developed for the considered sectors based on the:

a) India's nationally determined contribution commitments.
b) Potential for fuel switch, use of non-fossil fuel energy/feedstock and decarbonisation in the sector.
c) Available technology and associated cost of their implementation.

Technical Potential

Economic Potential

Procedure for Target

Step 1

Discussion and finalization with Technical Committee established for the sector

Recommend to BEE

Step 2

BEE to recommend targets to Sub – Working Group to finalize the targets

Sub Working group to recommend to NSCICM

Step 3

NSCICM to consider the suggestion by Sub Working Group

NSCICM to further recommend the targets to the Central Government for Notification

Target Setting Approach

Baseline emissions

- Energy related emissions
- Process related emission

- Estimated using the actual energy consumption and default factors

Emission Intensity Calculation (SGE)*

$$\frac{\text{Total Emissions}}{\text{Production}}$$

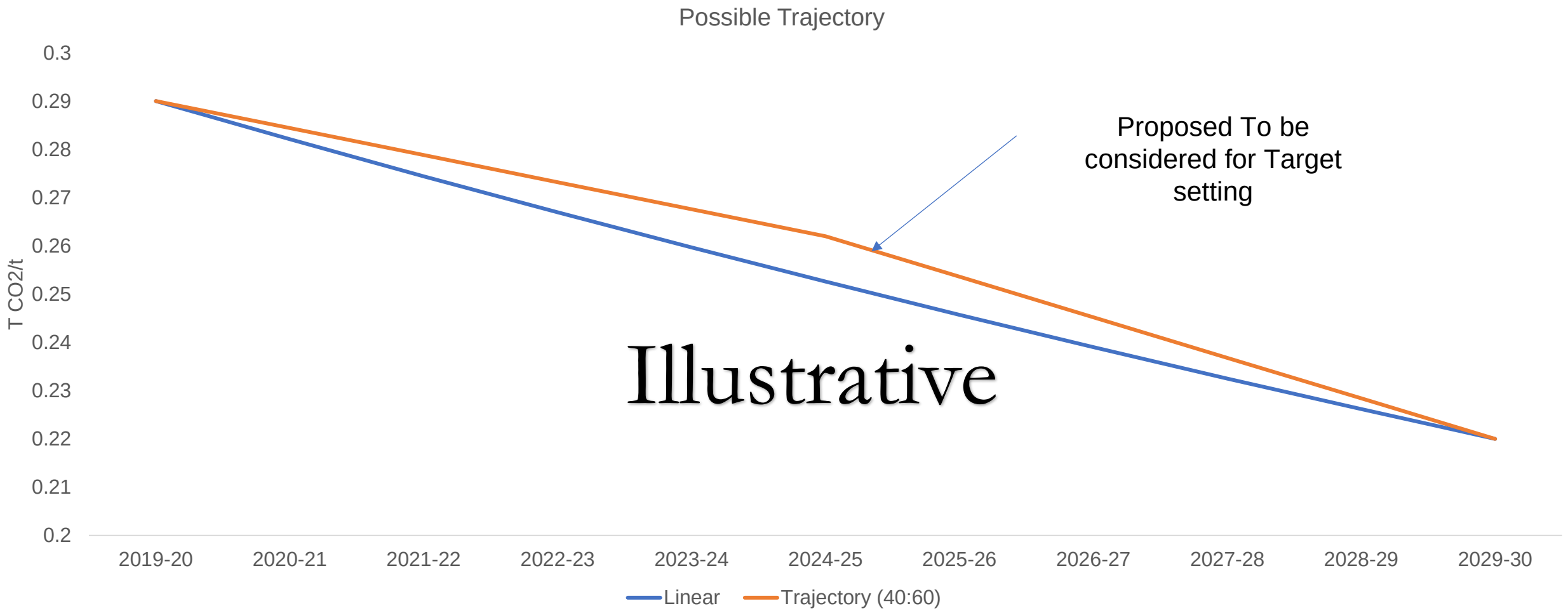
- Target on Energy-related Emissions
- Achievement on Total Emissions

Target

- Derive Relative SGE
- Estimate yearly target

*SGE – Specific GHG Emissions

Possible Trajectory



Step 1 – Baseline Emissions

Unit	GHG Emission - energy (t CO2)	GHG Emission - process (t CO2)	Total GHG Emissions (t CO2)
Unit 1	245,688	No Process emissions Illustrative	245,688
Unit 2	803,310		803,310
Unit 3	870,904		870,904
Unit 4	345,629		345,629
Unit 5	309,933		309,933
Unit 6	363,991		363,991
Unit 7	899,950		899,950
Unit 8	940,885		940,885
Unit 9	347,798		347,798
Unit 10	1,132,859		1,132,859
Unit 11	435,181		435,181
Unit 12	187,243		187,243
Unit 13	215,975		215,975

Step 2 – Emission Intensity – Baseline

Unit	Production (t)	SGE - Energy (t CO2/t)	SGE Process (t CO2/t)	SGE Total (t CO2/t)
Unit 1	621,629	0.395		0.395
Unit 2	2,803,293	0.287		0.287
Unit 3	3,027,000	0.288		0.288
Unit 4	1,086,642	0.318		0.318
Unit 5	782,419	0.396		0.396
Unit 6	966,642	0.377		0.377
Unit 7	3,122,673	0.288		0.288
Unit 8	2,810,708	0.335		0.335
Unit 9	1,065,680	0.326		0.326
Unit 10	5,121,175	0.221		0.221
Unit 11	2,024,572	0.215		0.215
Unit 12	630,578	0.297		0.297
Unit 13	577,173	0.374		0.374

Illustrative

Step 3 – Calculate Relative SGE & % Target

Obligated Entity	Baseline SGE (tCO_2/t) – only energy component	Relative SGE with respect to best	Target Calculation	% Reduction
Unit 11	0.215	1	1.0X	6.64%
Unit 10	0.221	1.03	1.03X	6.82%
Unit 2	0.287	1.33	1.3X	8.86%
Unit 3	0.287	1.34	1.3X	8.86%
Unit 7	0.288	1.34	1.3X	8.89%
Unit 12	0.297	1.38	1.4X	9.17%
Unit 4	0.318	1.48	1.5X	9.82%
Unit 9	0.326	1.52	1.5X	10.06%
Unit 8	0.335	1.56	1.6X	10.34%
Unit 13	0.374	1.74	1.7X	11.55%
Unit 6	0.377	1.75	1.8X	11.64%
Unit 1	0.395	1.84	1.8X	12.19%
Unit 5	0.396	1.84	1.8X	12.23%

Illustrative

SGE – Specific GHG emission

Sectoral Average Reduction 9.6% is to be achieved say in three years

Step 4 – Yearly Targets for GHG Reduction

Obligated Entity	Baseline GHG intensity	Target - Year 1 (20%)	Target Year 2 (35%)	Target Year 3 (45%)
Unit 1	0.395	0.385	0.369	0.347
Unit 2	0.287	0.282	0.273	0.262
Unit 3	0.287	0.282	0.273	0.262
Unit 4	0.318	0.312	0.301	0.287
Unit 5	0.396	0.386	0.369	0.348
Unit 6	0.377	0.368	0.353	0.333
Unit 7	0.288	0.283	0.274	0.262
Unit 8	0.335	0.328	0.316	0.300
Unit 9	0.326	0.319	0.308	0.293
Unit 10	0.221	0.218	0.213	0.206
Unit 11	0.215	0.212	0.207	0.201
Unit 12	0.297	0.292	0.282	0.270
Unit 13	0.374	0.365	0.350	0.331
Wt. Average	**0.288**	**0.282**	**0.273**	**0.261**

Illustrative

All units in t CO_2e/t -

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