



Perform Achieve & Trade

SEC Targets for Petroleum Refineries for PAT Cycle - II

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Baseline Fixation and Target Setting Methodology

PAT Cycles Baseline Fixation

| Sr No | Item | PAT Cycle I | | PAT Cycle II | |
|-------|-------------------|--|--|--|--|
| | | 478 DCs | Existing DCs 478 Nos | New DCs in Existing Sector | New DCs in New Sector |
| 1 | Data Reporting | Five Years (2005-10) | One Year (2014-15) | Three Years (2012-15) | Three Years (2012-15) |
| 2 | Baseline Year | Average of three years (2007-10) | One year (2014-15) | One year (2014-15) | One year (2014-15) |
| 3 | Pro-forma | Through Form I and Pro-forma | Through developed Form I and Pro-forma | Through developed Form I and Pro-forma | Pro-forma development under final stage through Form I and Pro-forma |
| 4 | Data Verification | Baseline Energy Audit | M&V | Baseline Data Verification through pro-forma | Baseline Data Verification through pro-forma |
| 5 | Data Fixation | Baseline Energy Audit In Assessment year | M&V with certain changes in Formulae of Product and Power mix in AY data | Baseline data Verification Report | Baseline data Verification Report |

PAT Cycle Target Fixation

| Plant | Baseline Average Production | Baseline Average SEC | Realtive SEC | Total Energy Consumption | %Target | Savings | To be Energy Saving |
|---------|-----------------------------|----------------------|--------------|--------------------------|---------|----------------|---------------------|
| | Tonne | toe/t | | toe | | | |
| Plant 1 | 369939 | 1.274 | 1.000 | 471302 | x | 4713.023 | 4713.02x |
| Plant 2 | 358967 | 1.364 | 1.071 | 489631 | 1.07x | 5242.203 | 5242.20x |
| Plant 3 | 178530 | 1.400 | 1.099 | 249942 | 1.10x | 2746.615 | 2746.61x |
| Plant 4 | 79587 | 1.428 | 1.121 | 113650 | 1.21x | 1273.882 | 1273.88x |
| Plant 5 | 37635 | 1.780 | 1.397 | 66990 | 1.40x | 935.9712 | 935.97x |
| | | | | 1391516 | | 14911.7 | 14912.7x |

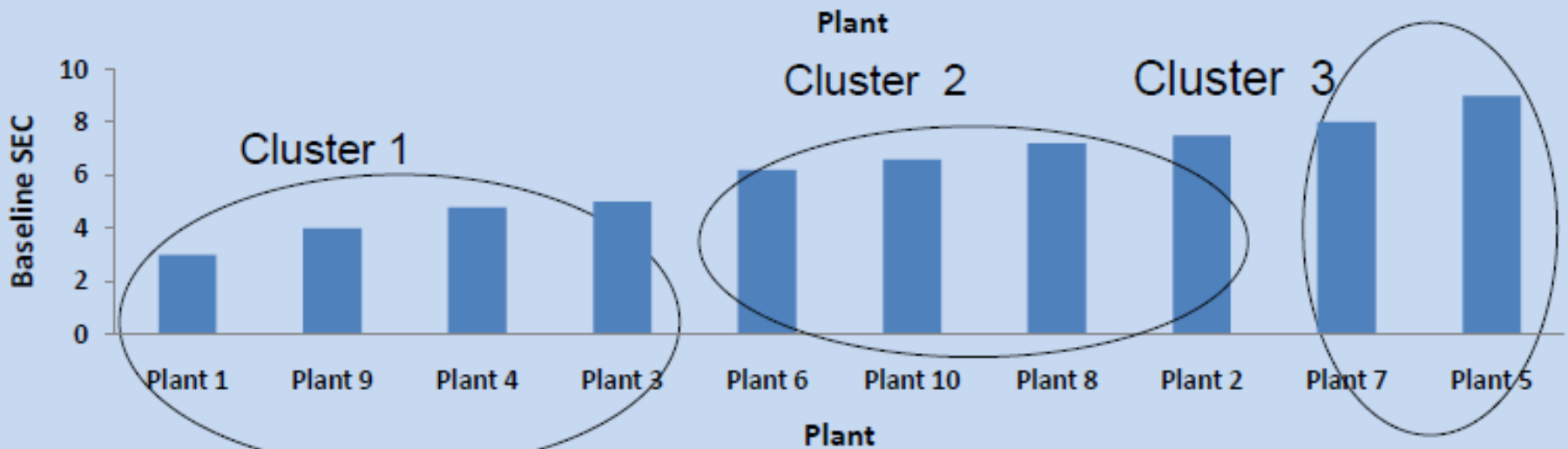
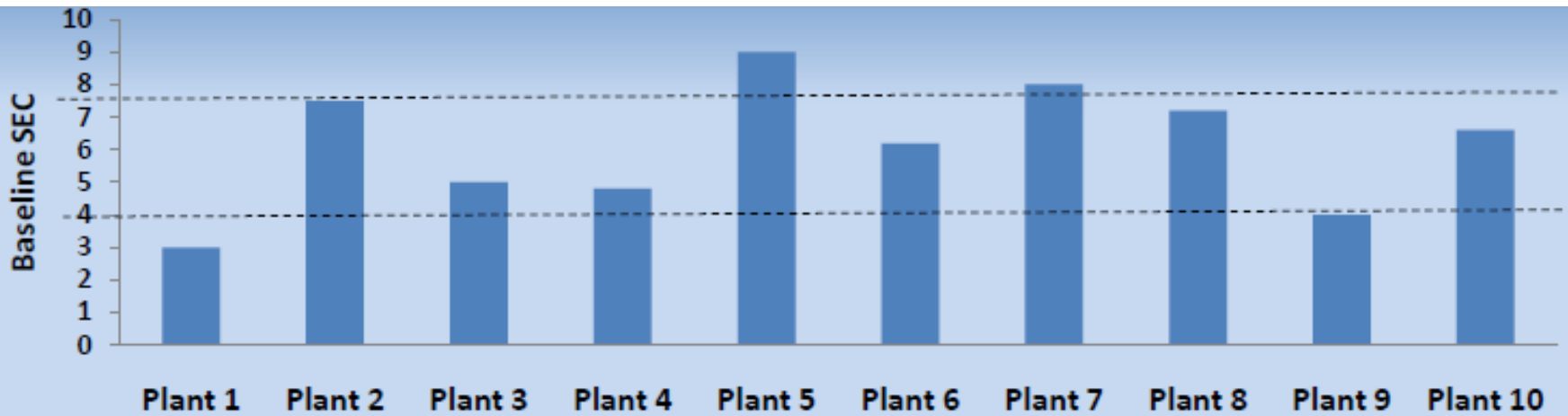


| | | |
|----------------------|-----------------|------------|
| Total Saving | 14912.7x | toe |
| Target Saving | 104000 | toe |
| x | 6.97 | % |

PAT Cycle Target Fixation

| Plant | Baseline Average SEC | Target % | To be SEC | To be toe |
|---|----------------------|----------|-----------|----------------|
| | toe/t | | toe/t | toe |
| Plant 1 | 1.274 | 6.97 | 1.185 | 438434 |
| Plant 2 | 1.364 | 7.467 | 1.262 | 453072 |
| Plant 3 | 1.400 | 7.664 | 1.293 | 230787 |
| Plant 4 | 1.428 | 7.817 | 1.316 | 104766 |
| Plant 5 | 1.780 | 9.744 | 1.607 | 60463 |
| Total energy consumption at the end of three years | | | | 1287523 |
| Total energy consumption in baseline year | | | | 1391516 |
| Energy saving during the period | | | | 103993 |

No. of sub-group depends on bandwidth of baseline SEC

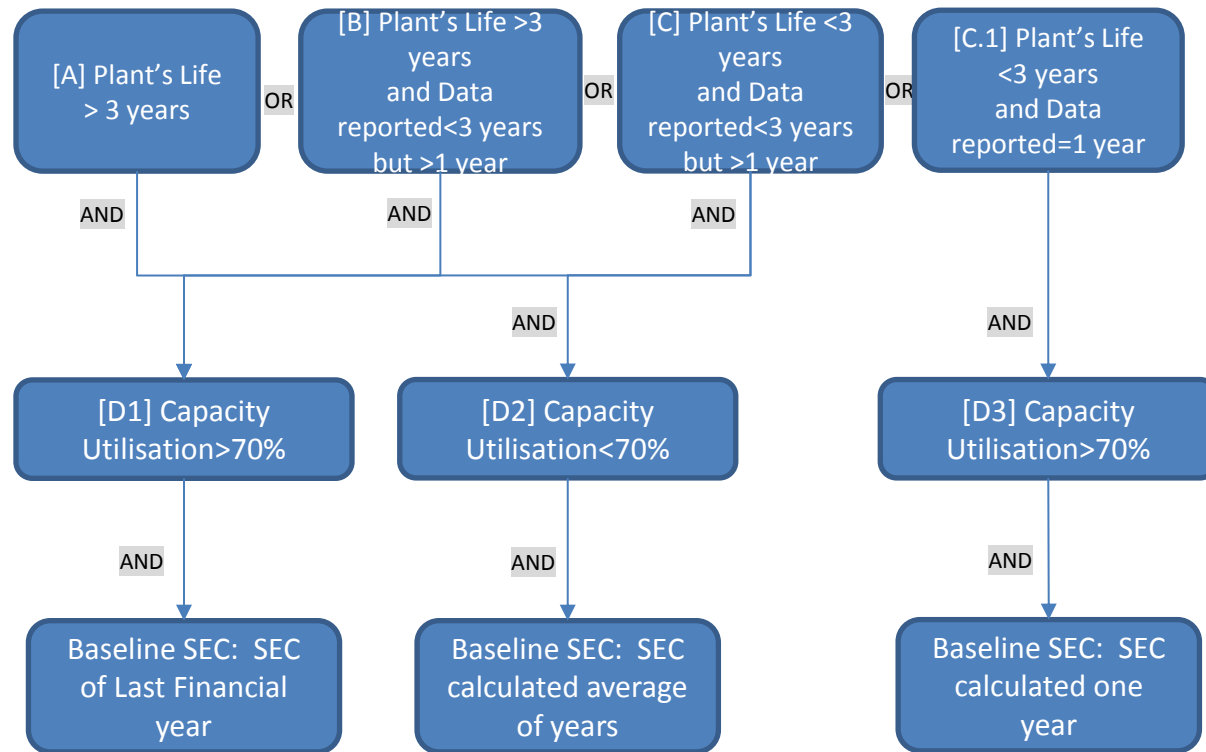


Type of DCs for PAT Cycle II

- Existing DCs in existing 8 sectors
- New DCs in existing 8 sectors
- New DCs in new Sectors

Baseline Fixation-New DCs in existing and new sector

Baseline SEC Calculation- Based on Last financial year data



[E] Baseline SEC Fixation Condition

- Baseline Specific Energy Consumption will be calculated based on the last financial year data, if any conditions mentioned in (A) or (B) or (C) and condition mentioned in (D) are satisfied for the last financial year.
- In case, conditions are not satisfied for the last financial year, average of all those year where above mentioned conditions are satisfied shall be considered for calculating baseline specific energy consumption

Last financial year of three year reported data will be considered as the Baseline year for the new DCs in PAT Cycle II (Majority of the DCs)

Capacity Utilisation

The Capacity Utilisation referred to in this rule is the ratio of actual production(s) per unit of time, to maximum potential installed or established production capacity per unit time of a unit/major process of plant/establishment for the operating period(s).

(g) The Capacity Utilisation and Plant Loading Factor shall be calculated as per following equations:

Capacity Utilisation:

Capacity Utilisation % (CU%) =

$$(C1 \times ICU1 + C2 \times ICU2 + \dots + Cn \times ICUn) \times 100 / (C1 + C2 + \dots + Cn)$$

Where: $ICU1 \dots n = (P 1..n \times 8760) / (Hr1..n \times C 1..n)$

$C 1..n =$ Installed or Established Production capacity in tonne per annum for 1..nth product

$P 1 \dots n =$ Actual Production in tonne per annum for 1..nth product

$Hr1..n =$ Nos of operating hours in Hours per annum for 1..nth product

$ICU 1..n =$ Intermediate Capacity utilization of 1..nth product for the operating period

Target Setting Methodology

▶ (I) Average rate of reduction

- in specific energy consumption across the designated consumers sectors'

▶ (II) **Policy objectives**

- of keeping the target of reducing the specific energy consumption a few percentage points above the average rate of reduction

Target Setting

Proposed to be based

- **Average rate of reduction in specific energy consumption (SEC) across all the designated consumers sectors + Policy objectives of keeping the target of reducing the specific energy consumption a few percentage points above the average rate of reduction**

Target Setting

(II) Policy objectives

- INDC
 - Intended Nationally determined Contribution (INDC): reduction of emission intensity by 33-35% of GDP by 2030 from the base year of 2005
- GOALS
 - Reduction in energy intensity between 2016 and 2019 by 7 %

(II) Policy Objective

Target Setting

- % rate of reduction per year as per policy objective (Energy Conservation)= 2.3% per year
- Net ESCerts available in PAT Cycle II will be over 2 mtoe
- **Total Saving Required: $19.6 + 2 = 21.6$ mtoe**

Global best DC Sector

Differentiation between Global best and other sector

•*The target for the global best sector(s)*

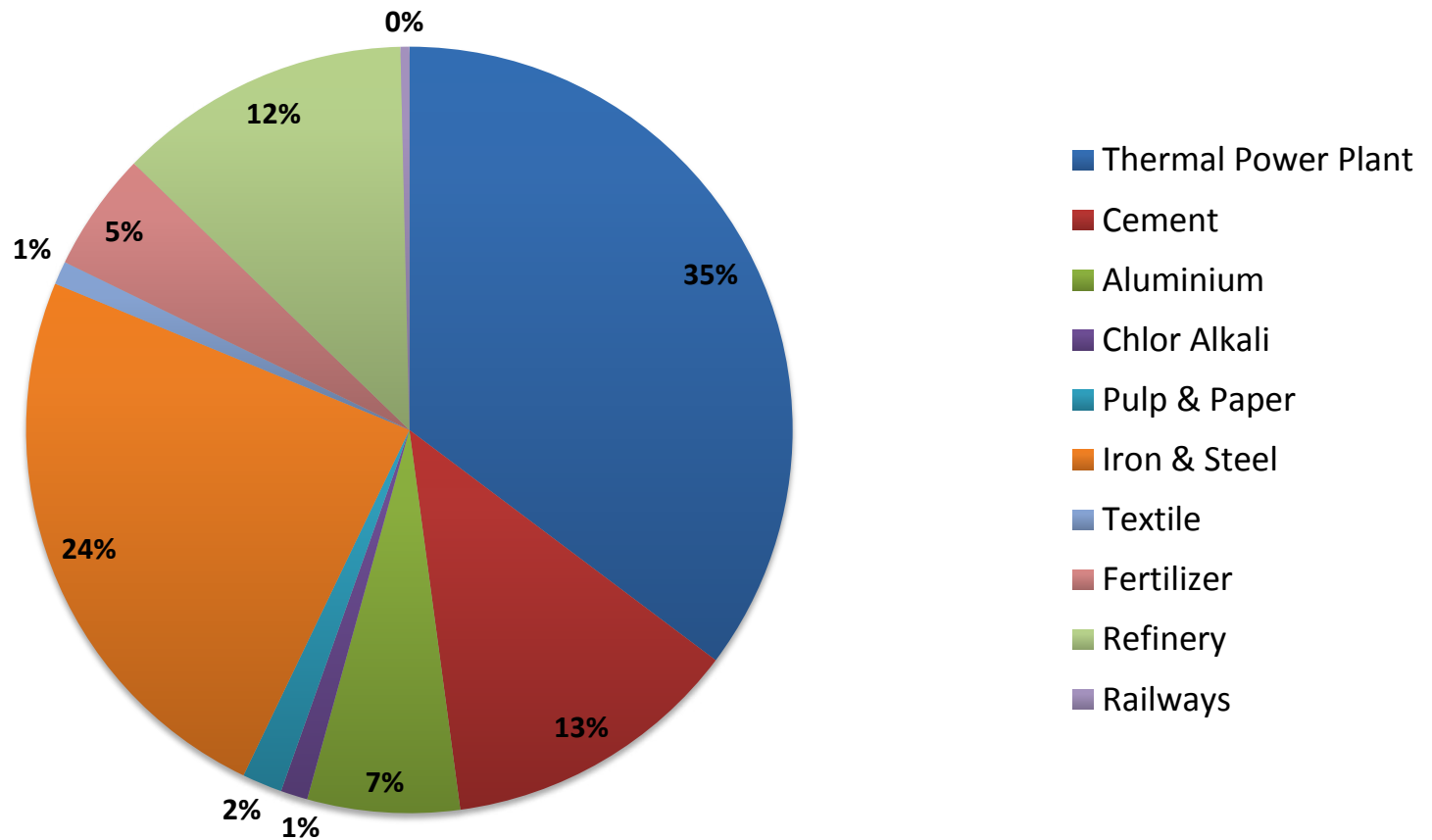
•*The target for other sector*

Sectoral Targets - PAT Cycle – II

| S. No | Sector | No of DCs | Energy Consumption (million toe) | Energy Savings (million toe) |
|-------|---------------------|------------|----------------------------------|------------------------------|
| 1 | Thermal Power Plant | 154 | 120.16 | 3.13 |
| 2 | Cement | 111 | 21.43 | 1.12 |
| 3 | Aluminium | 12 | 10.66 | 0.57 |
| 4 | Chlor Alkali | 24 | 1.77 | 0.101 |
| 5 | Pulp & Paper | 29 | 2.68 | 0.15 |
| 6 | Iron & Steel | 71 | 40.44 | 2.14 |
| 7 | Textile | 99 | 1.48 | 0.087 |
| 8 | Fertilizer | 37 | 8.25 | 0.446 |
| 9 | Refinery | 18 | 18.5 | 1.10 |
| 10 | Railways | 22 | 1.39 | 0.033 |
| | Total | 577 | 226.76 | 8.877 |

Sectoral Targets - PAT Cycle – II

Energy Savings (million toe)



Refinery wise Targets

| S.No. | REFINERY | 2014-15 (Submitted by Refineries) | | | 5.97% Reduction | | |
|-------|-------------|-----------------------------------|------------------------|---------|-----------------|------------------|----------------|
| | | MBN | Crude T'put Th.Bbls | NRGF | Target MBN | MBN Reduction | % Reduction |
| 1 | RIL-DTA | 50.9986 | 217778 | 9.3592 | 48.7585 | 2.24 | 4.39 |
| 2 | RIL-SEZ | 51.9504 | 260659 | 10.2586 | 49.6259 | 2.32 | 4.47 |
| 3 | EOL | 64.0900 | 142936 | 6.7898 | 60.5522 | 3.54 | 5.52 |
| 4 | HMEL | 71.5700 | 51829 | 9.1914 | 67.1582 | 4.41 | 6.16 |
| 5 | NRL | 74.0800 | 19659 | 6.8615 | 69.3533 | 4.73 | 6.38 |
| 6 | PANIPAT | 73.1075 | 103709 | 5.6067 | 68.5041 | 4.60 | 6.30 |
| 7 | BARAUNI | 81.5084 | 43727 | 5.4943 | 75.7862 | 5.72 | 7.02 |
| 8 | MATHURA | 77.6819 | 62237 | 5.0721 | 72.4844 | 5.20 | 6.69 |
| 9 | GUJARAT | 76.6785 | 96614 | 6.1183 | 71.6144 | 5.06 | 6.60 |
| 10 | BPCL-MR | 78.2458 | 95818 | 4.4566 | 72.9725 | 5.27 | 6.74 |
| 11 | HALDIA | 71.7170 | 55695 | 5.3785 | 67.2870 | 4.43 | 6.18 |
| 12 | BPCL-Kochi | 78.3944 | 78496 | 4.2178 | 73.1011 | 5.29 | 6.75 |
| 13 | MRPL | 83.5806 | 108063 | 5.6517 | 77.5638 | 6.02 | 7.20 |
| 14 | HPCL-VISAKH | 81.6838 | 65350.4 | 4.4128 | 75.9370 | 5.75 | 7.04 |
| 15 | BORL | 85.3144 | 44618 | 8.3414 | 79.0453 | 6.27 | 7.35 |
| 16 | HPCL-MUMBAI | 87.8100 | 53971 | 5.3405 | 81.1688 | 6.64 | 7.56 |
| 17 | CPCL | 92.5762 | 76025 | 4.4791 | 85.1945 | 7.38 | 7.97 |
| 18 | BONGAIGAON | 99.8950 | 17729 | 4.8351 | 91.3000 | 8.59 | 8.60 |

Major Obligations for DCs

- **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 (clause 14(I)).**
- **The information with regard to energy consumed (clause 14(a)) in Form 1**
- **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**

Thank You