



TATA Steel BSL Limited, Khopoli.

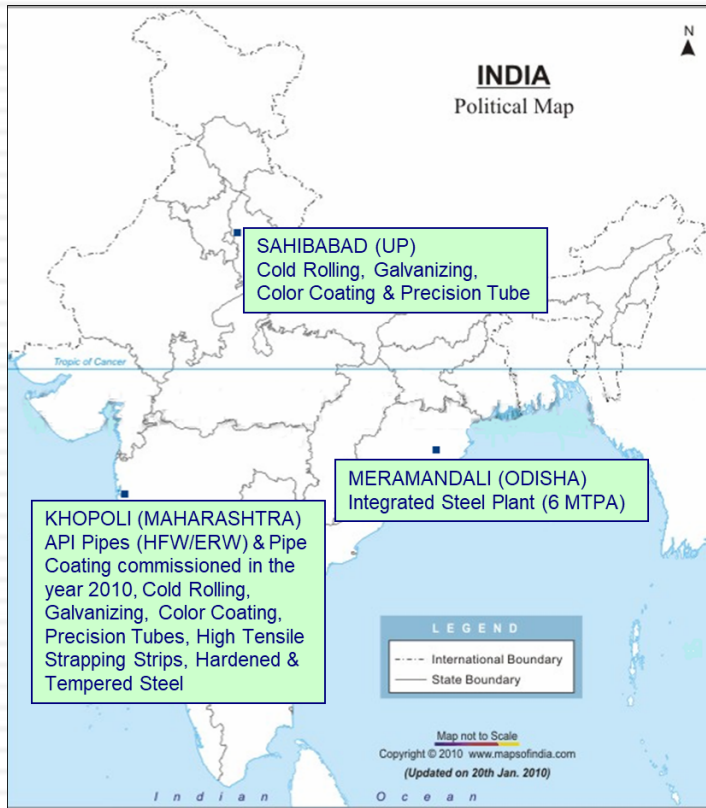
Mr. Brajesh Nahar (VP-Operation)

Mr. Hemendra Tiwari (DGM)

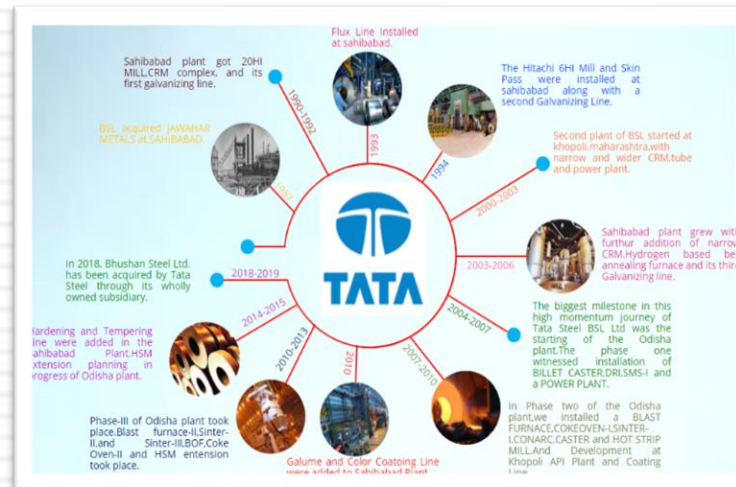
Mr. Vijay Patil (Jr. Manager)

1.1 Company Profile

Plants & Products



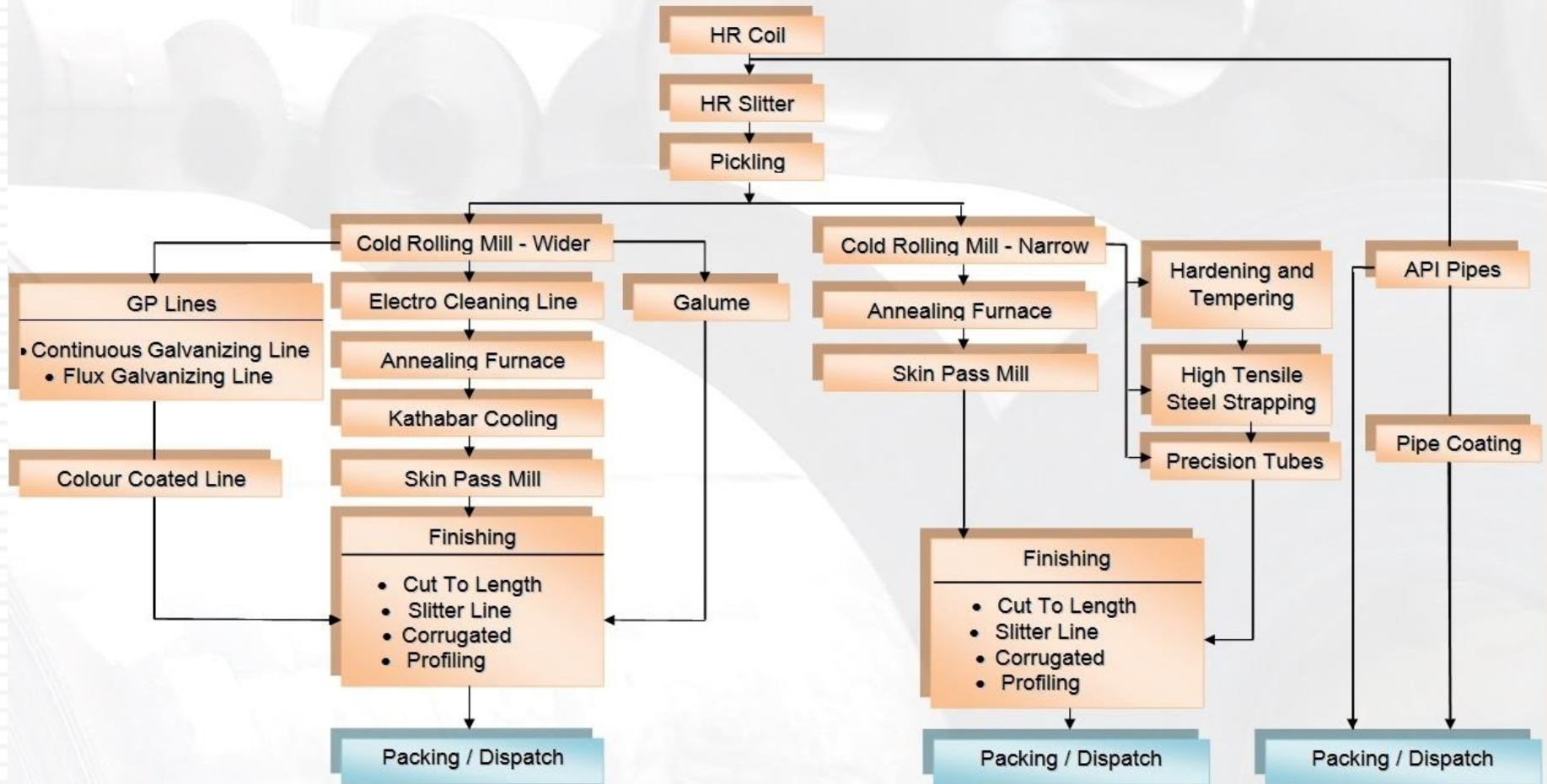
TATA Steel BSL Limited, Khopoli



1.2 Company Process



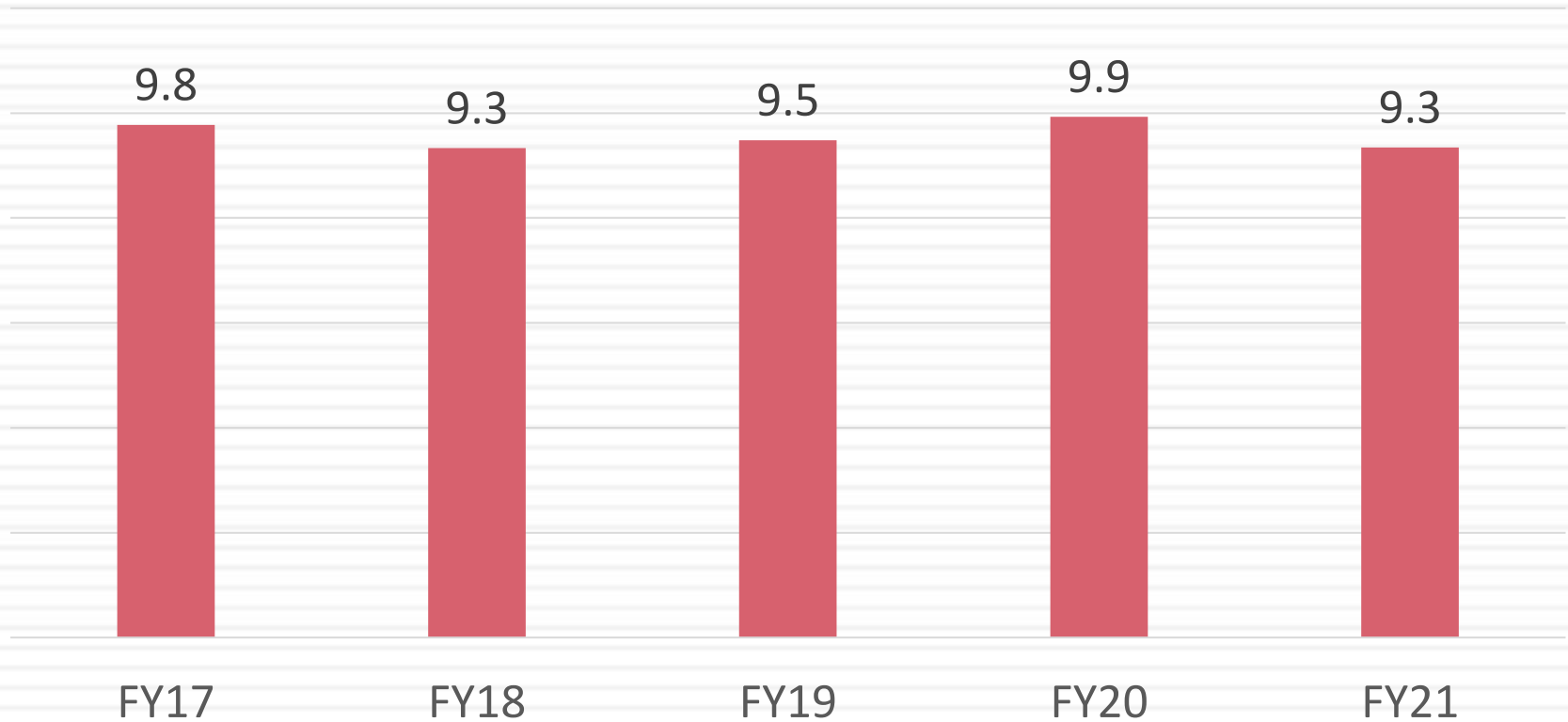
Process Flow for Khopoli Plant



3.1 Energy Consumption Overview



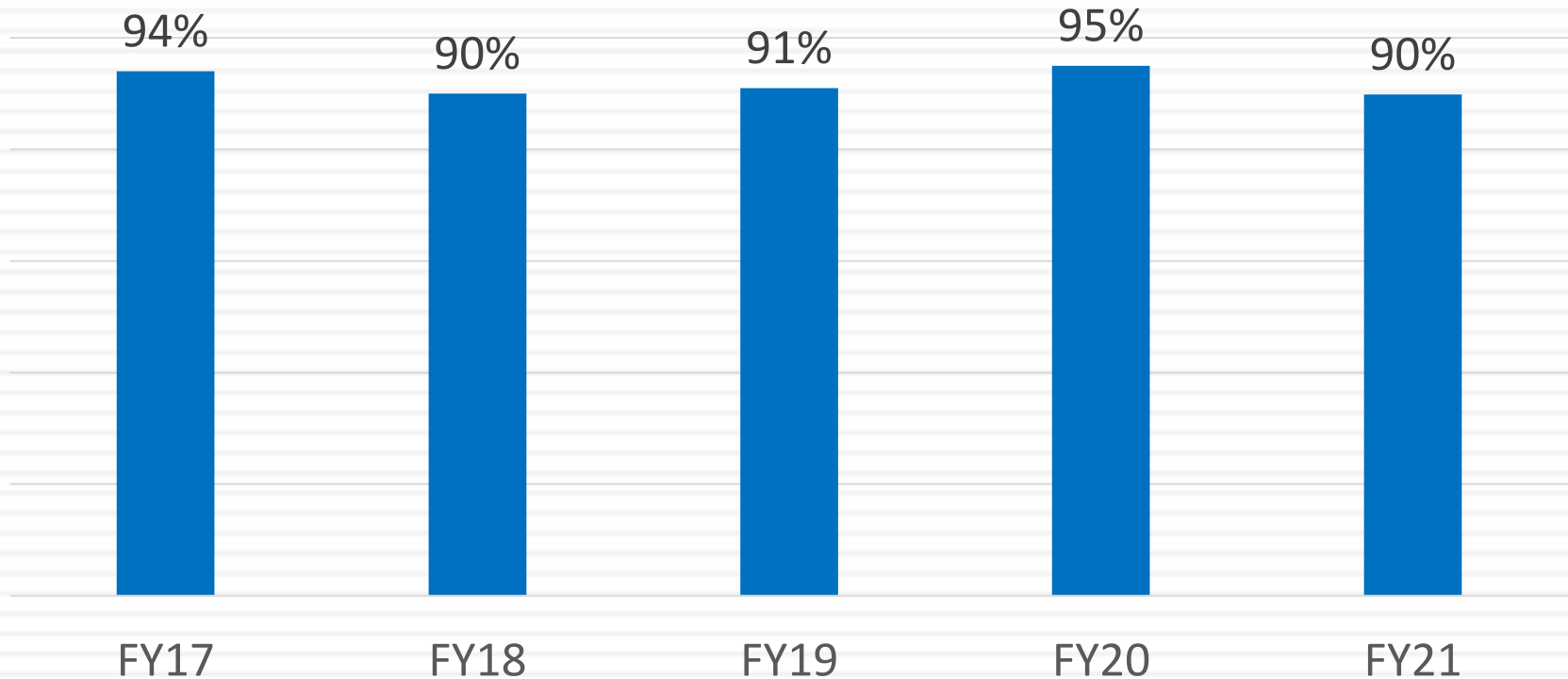
■ Production in Lakhs tonne



3.1 Energy Consumption Overview



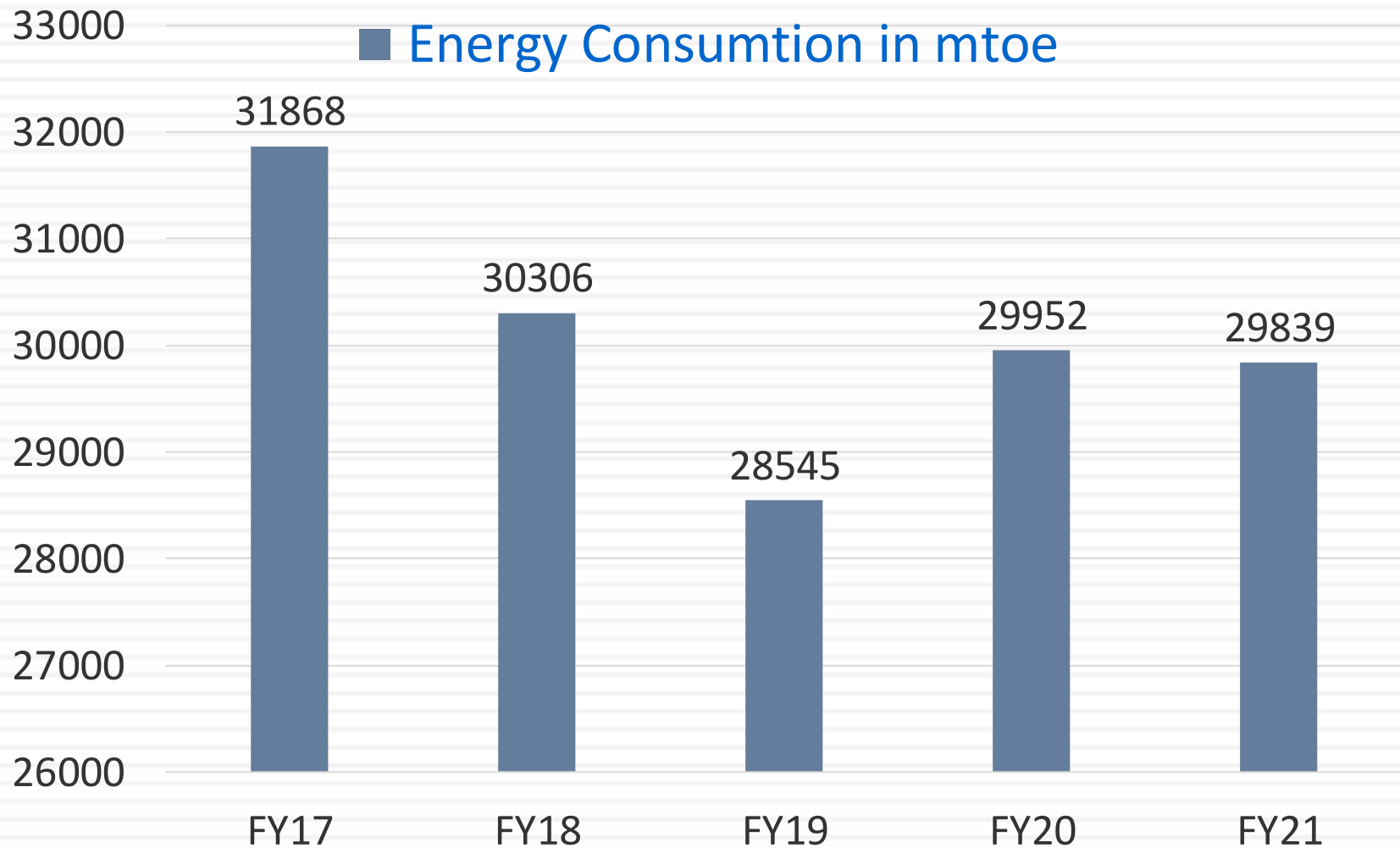
■ Production in Percentage of Capacity



Considering six Products out of seven whereas 7th product i.e LDP not considered, as not established yet.



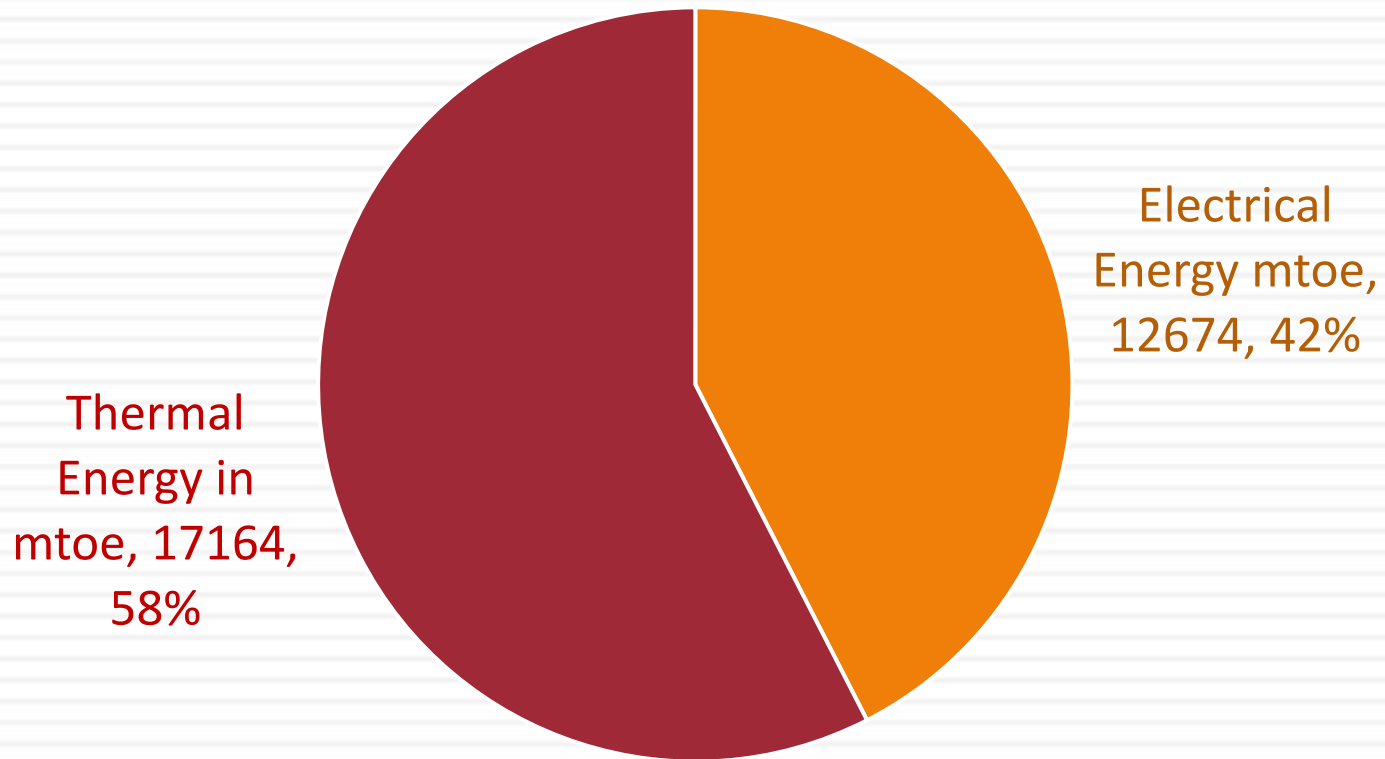
3.2 Energy Consumption Overview



3.3 Energy Consumption Overview

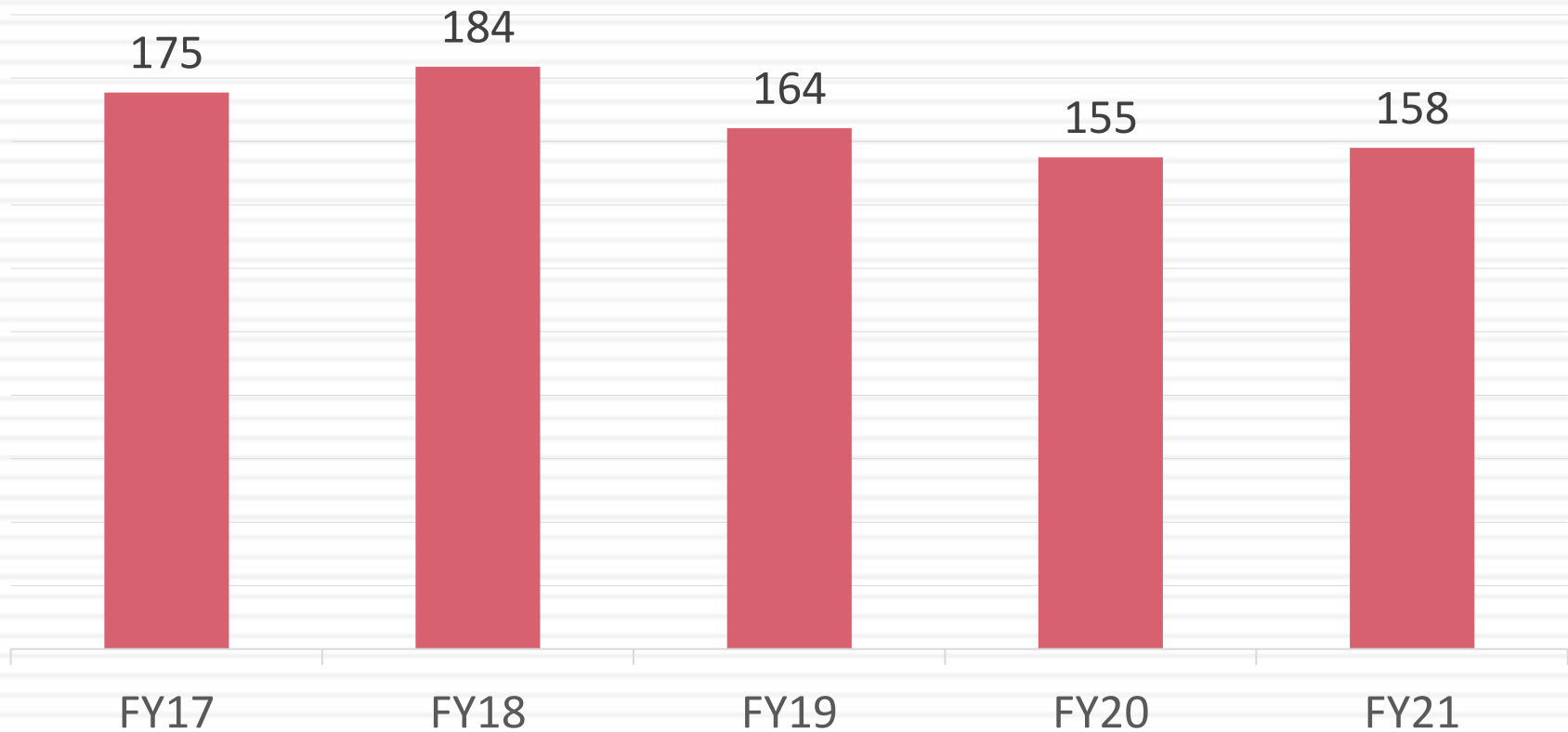


Electrical & Thermal Energy Share FY21



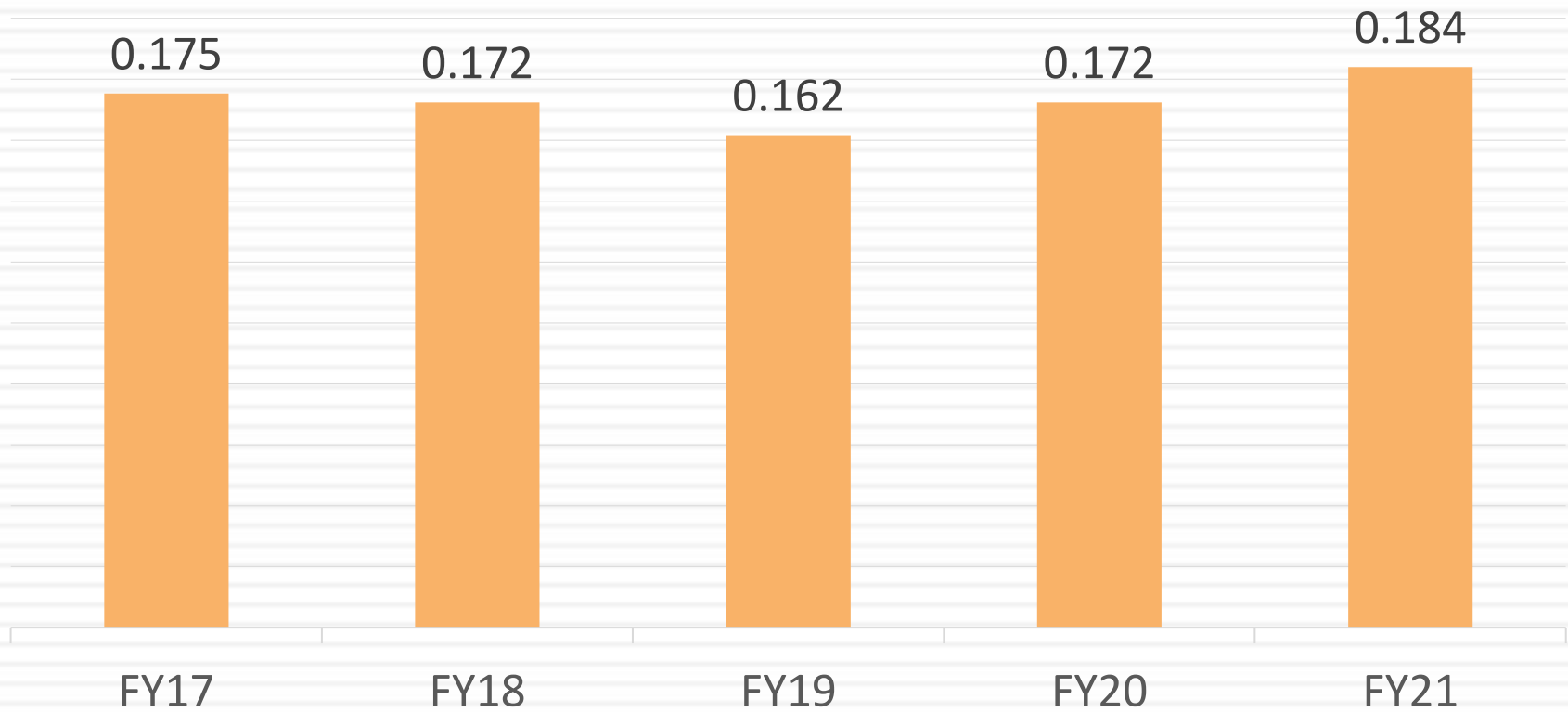
3.4 Sp. Energy Consumption (FY17-21)

■ Electrical SEC in KWh/tonne of Production



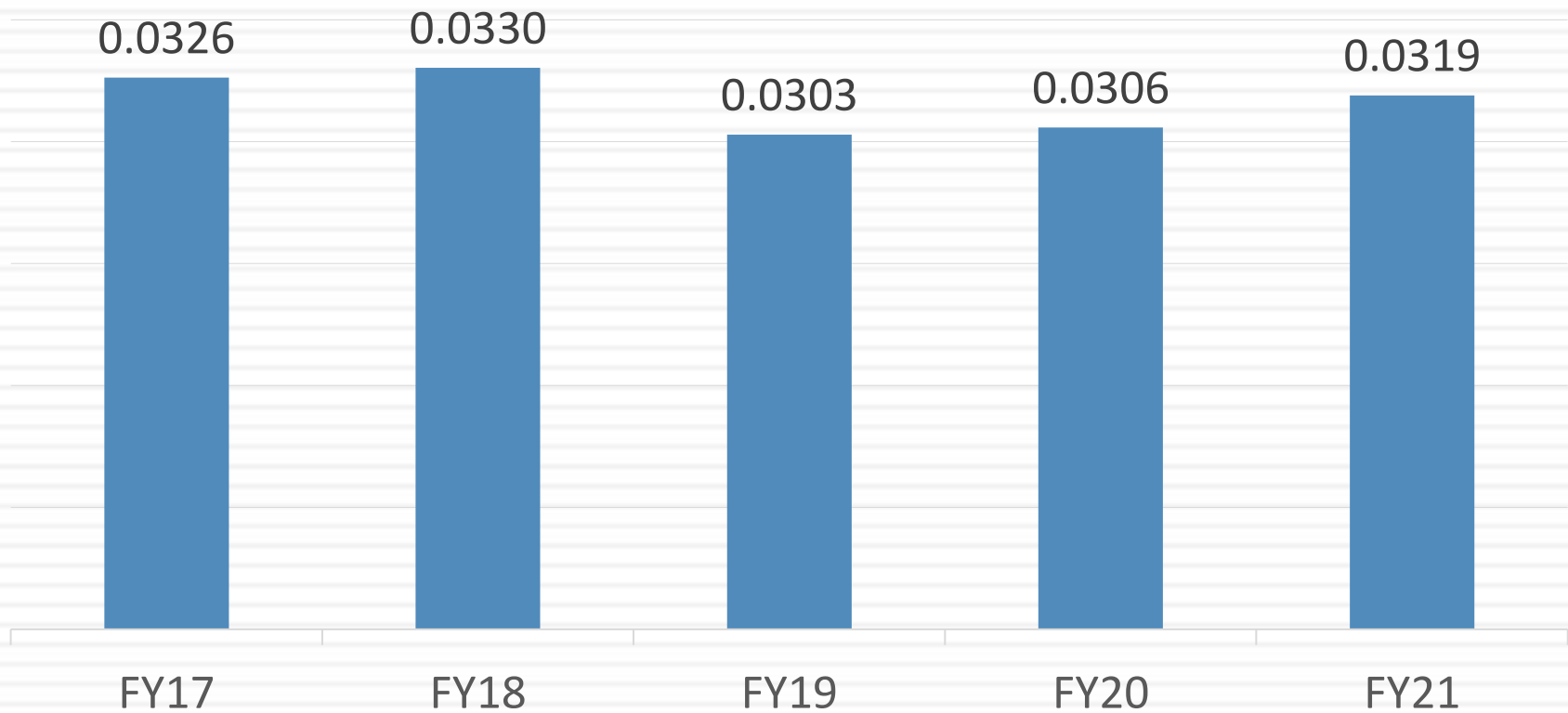
3.5 Sp. Energy Consumption (FY17-21)

■ Thermal SEC in million Kcal/tonne of Production



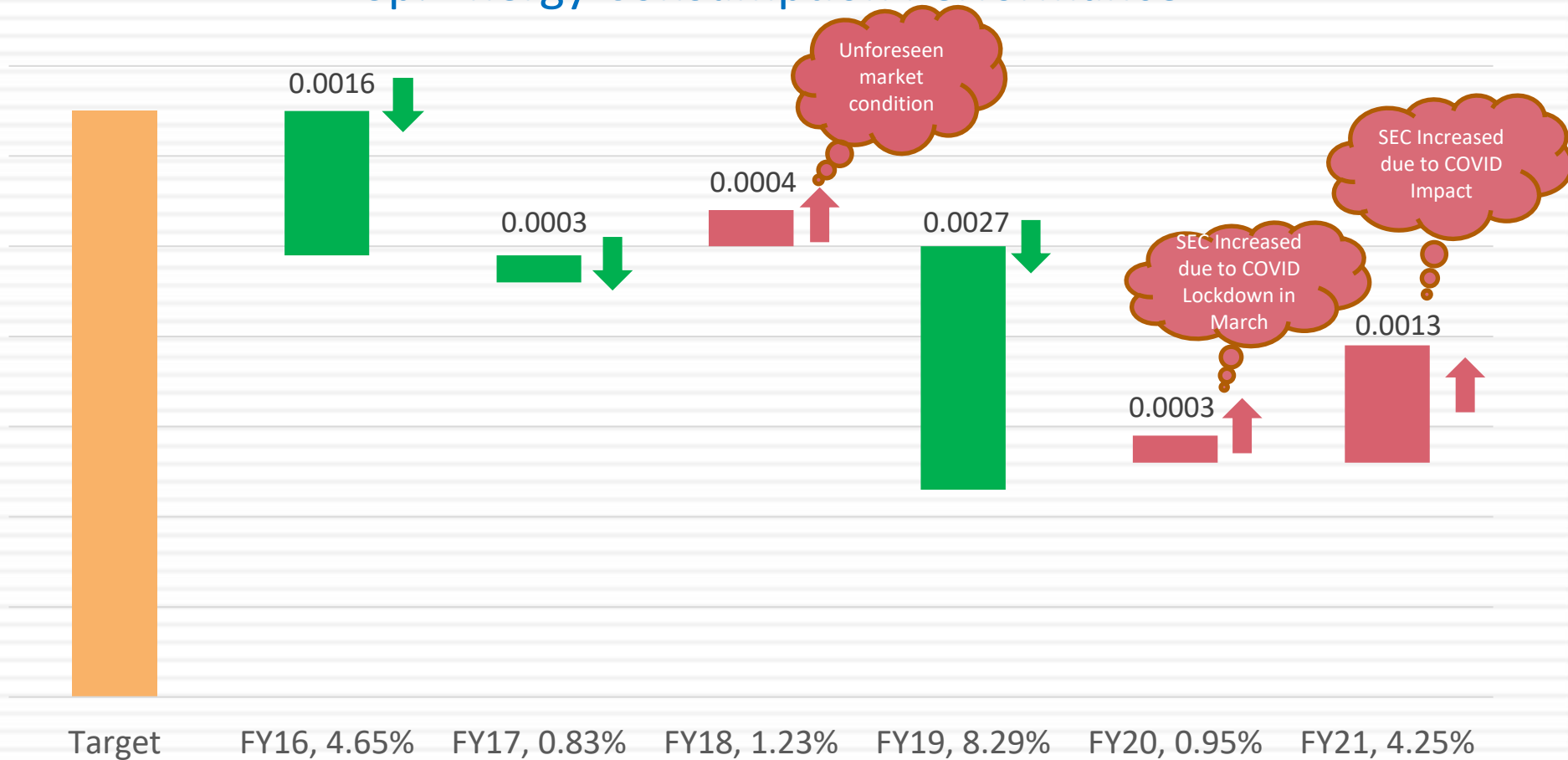
3.6 Sp. Energy Consumption (FY17-21)

■ Total SEC in mtoe/tonne of Production

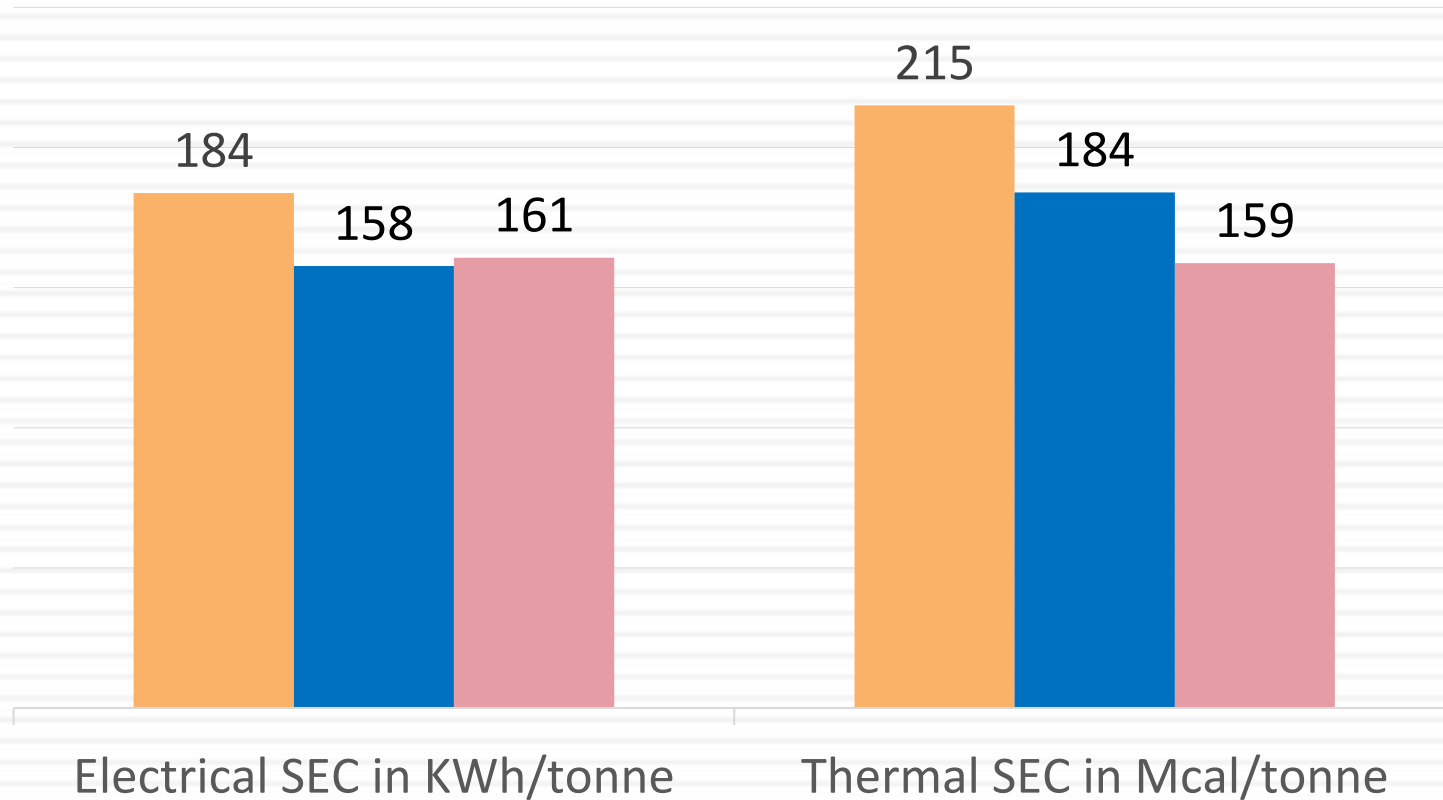


3.7 Sp. Energy Consumption (FY17-21)

Sp. Energy Consumption Performance



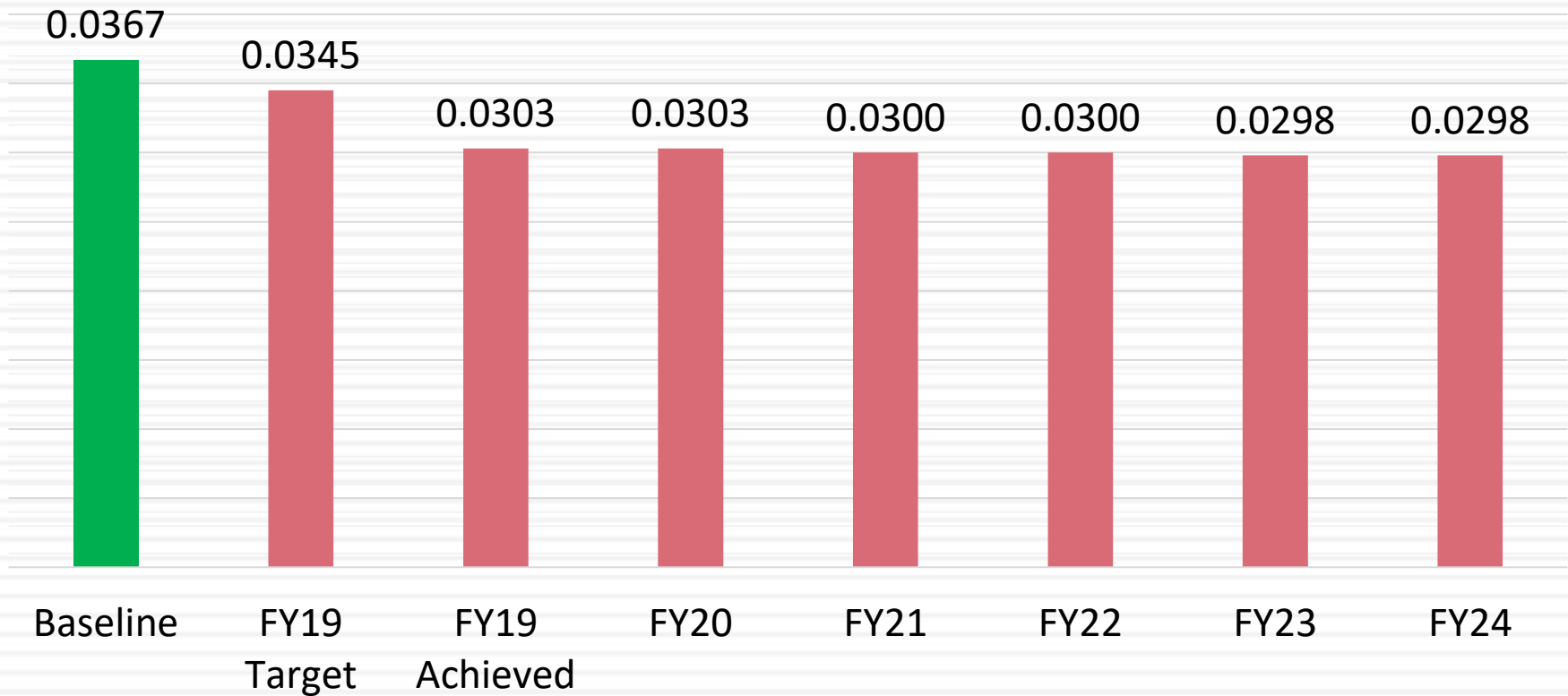
4.1 National Benchmarking



■ JSW, Tarapur ■ TSBSL, Khopoli ■ Target Plan

4.2 SEC Target Long Term

Five Year Target Plan in mtoe/tonne



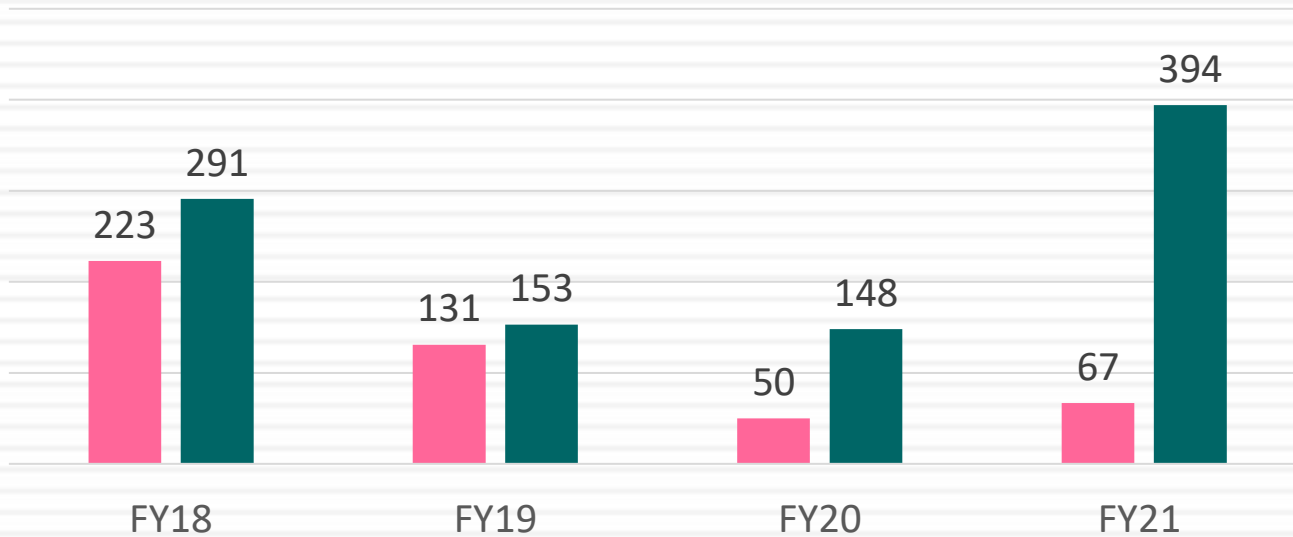
4.2 Major Encon project planned in FY 2021-22

| Sl No | Project Details | Investment s Lakh Rs | Savings Lakh Rs | Payback |
|-------|---|-------------------------|--------------------|---------|
| 1 | Replacement of Energy Efficient motors under National Motor replacement Program (NMRP). | 91 | 48 | 2 |
| 2 | VFD installation in air blower motor in IBL Boiler. | 2.38 | 0.88 | 3 |
| 3 | VFD to be installed on Feed water pump of Oil-fired boiler. | 2.3 | 2.3 | 1 |
| 4 | VFD installation at CT fans of cooling tower | 1.5 | 9.1 | 1 |
| 5 | Thyristor control for NH3 cracker furnace. (Power Plant Electrical) | 1 | 1.2 | 1 |

5.1 Energy Saving projects implemented

| Year | No of Proposals | Investments in Lakhs | Savings in Lakhs |
|---------|-----------------|----------------------|------------------|
| 2017-18 | 15 | 223 | 291 |
| 2018-19 | 14 | 131 | 153 |
| 2019-20 | 9 | 50 | 148 |
| 2020-21 | 6 | 67 | 394 |

■ Investments in Lakhs
 ■ Savings in Lakhs



5.2 Energy Saving projects implemented FY21

| SI No | Project Details | Investments Lakh Rs | Savings Lakh Rs | Payback in Months |
|-------|---|---------------------|-----------------|-------------------|
| 1 | Stopped Cryogenic Plant (Nitrogen plant) after Modification of PSA Plant 2 & 3 for Nitrogen generation. | 60 | 338 | 2 |
| 2 | Auto power control system on Grid to compensate KVAR on DG through PLC programming, improved from 0.990 to 0.994. | 0.30 | 39 | 1 |
| 3 | In TSBSL township, Belgate and utility area 100 no.s of 250-Watt lights replaced with 75-watt LED lights. | 2.3 | 5.06 | 6 |
| 4 | MILL -1 & Mill-2 DC motor blower off and field current reduced from 20 Amp to 5 amps during line idle condition. | Nil | 4.29 | NA |
| 5 | Use of LED lights or replacement with conventional light. | 4.64 | 6.4 | 9 |
| 6 | CCL Steering Unit HPP auto stop after 5 min. of line stopped od idle condition. | Nil | 1.5 | NA |
| | Total | 67.44 | 394.28 | |

5.4 Energy Saving projects implemented FY20

| Sl No | Project Details | Investments Lakh Rs | Savings Lakh Rs | Payback (months) |
|-------|--|------------------------|--------------------|---------------------|
| 1 | Efficiency improvement of PSA-3 (Nitrogen Plant) through modification in the existing system (Utility). | 40 | 104.87 | 5 |
| 2 | Installed 2 no. of Air Amplifier at forming section & reduced 25% air consumption out of initial usage (API Electrical). | 0.16 | 0.73 | 3 |
| 3 | Power consumption reduced by covering GL pot during line stand by (Wider Electrical). | 0.00 | 24.74 | NIL |
| 4 | Installed 3 no. shut off valve and programmed it with line run command to air consumption (API Electrical). | 0.07 | 0.92 | 1 |
| 5 | Replacement of conventional light with LED light & control through relay logic. | 8.74 | 11.51 | 9 |
| 6 | Submersible pump installed in place of commercial cent. pump in Tube mill (Tube Mill-4 th shed). | 0.70 | 4.02 | 2 |
| 7 | CCL Steering Unit HPP auto stop after 5 min. of line stop (Wider Electrical). | 0 | 1.50 | NIL |
| | Total | 49.67 | 148.29 | |

5.3 Energy Saving projects implemented FY19

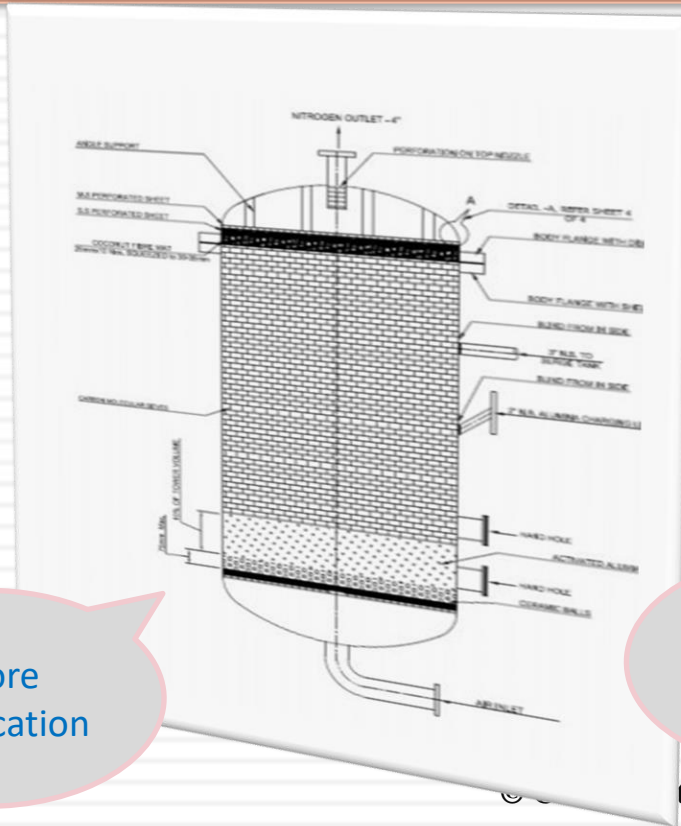
| SI No | Project Details | Investments Lakh Rs | Savings Lakh Rs | Payback (months) |
|-------|---|---------------------|-----------------|------------------|
| 1 | Temperature of PMP reduced from 640 C to 630 C during idle condition in GP-2 (Production). | 0 | 15.62 | NIL |
| 2 | Enhance the effectiveness of HAG to reduce the use of HF furnace at chromic cycle in GP-2 (Production). | 0 | 19.00 | NIL |
| 3 | Install 260TR 4 th no. chiller with new energy efficient chiller (Utility). | 87.97 | 48.96 | 22 |
| 4 | VFD Installation and process parameter optimisation. | 3.30 | 15.99 | 2 |
| 5 | Replacement of conventional light with LED light & control through relay logic. | 38.28 | 37.64 | 12 |
| 6 | Pumping System Modification and Design. | 1.40 | 15.99 | 1 |
| | Total | 130.95 | 153.2 | |

6.1 Innovative Projects implemented

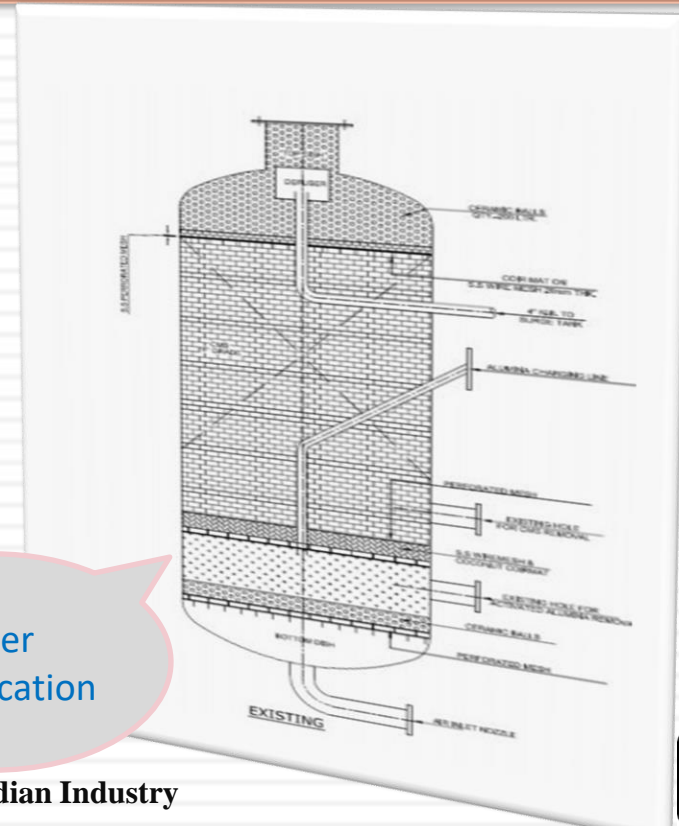
Project Title :- Modification of Existing PSA-3 Plant (Nitrogen plant) to improve the efficiency of Plant.

Problem Statement :- The PSA-3 Plant was not running on full capacity and so the efficiency was down whereas the other inputs (compressed air, power, NH₃ etc.) was same as per design.

Action Taken :- 1. We had modified the design of PSA-3's both towers and taken the improvised process of nitrogen generation cycles of towers. Also replace the accutor valve (Plug type to Angle type) to prevent leakage and passing. 2. We changed the quantity as well as quality of CMS (carbon molecular sieves) and alumina.



Before Modification

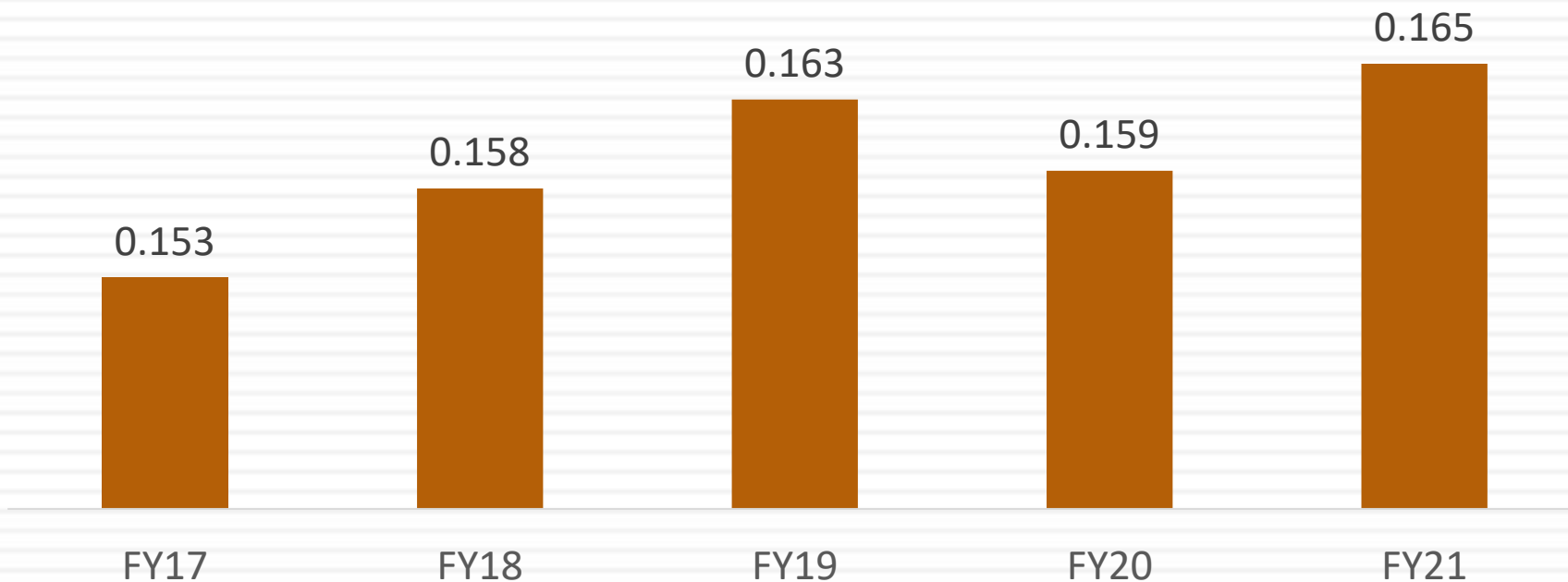


After Modification

9.1 GHG Inventorisation



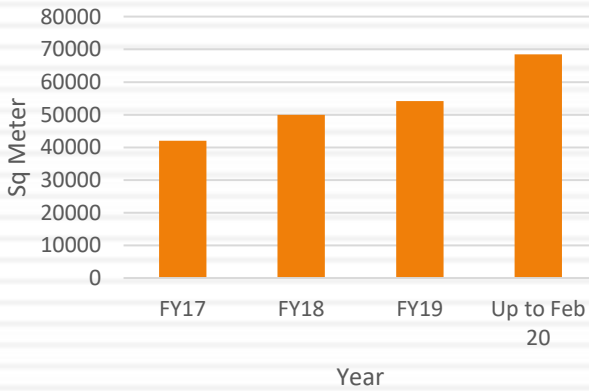
CO2 Emission in tonne per tonne of Production



9.2 Plantation of 25000 nos sampling using MIYAWAKI Method



Green Belt Development in Sqm



| Year | Area sqm | % |
|--------------|----------|----|
| FY 17 | 42000 | 13 |
| FY 18 | 50000 | 16 |
| FY 19 | 54200 | 17 |
| Up to Feb 20 | 68500 | 21 |



9.3 GHG Inventorisation

Installation of Continuous Ambient Air Quality Monitoring Station (CAAQMS) to monitor the ambient air quality within company premises.



9.4 GHG Inventorisation



| Sr. No. | Carbon Emission Reduction Action Plan | Co2 Emission (Ton/Year) |
|---------|---|-------------------------|
| 2 | Solar PV plant of 1 MWp at Roof-top. | 1148 |
| 3 | Replacement of Normal street-light to solar street-light. | 16 |
| | Total | 1164 |



10.1 Teamwork, Employee Involvement & Monitoring

Inauguration



Energy walk



Training and Energy Awareness Sessions



Painting and drawing competition



10.2 Teamwork, Employee Involvement & Monitoring

Environment Day walk



Tree Plantation in Plant & TSBSL Township



Environment Stewardship Training and Awareness



Prize Distribution



11.1 Implementation of ISO 50001

EnMS ISO50001

ISO 50001 Implemented in year 2015

04 Certified Lead Auditors

06 BEE Certified Energy Auditors/Managers

24 Internal Auditors

Total 879 Employees covered in Energy Awareness Training.

Conducting Quarterly Review meeting on energy Conservation Practices .

Energy Week Celebration

Presentation for energy conservation & current scenario given from MEDA person

Awareness session for employees on Energy Conservation opportunity & for ladies on energy conservation in household appliances

Painting Competition, Essay Competition & Departmental Energy Conservation Presentation

Training and awareness on Energy Conservation Techniques by PAT Consultant Mr. Puneet Hegde.

Pick and win Contest on energy conservation, global warming, environment, renewable energy.

Audit Culture

Base Line Energy Audit- Yr.2010

Optional Energy Audit- Yr.2013

Steam Walk Through Audit- Yr.2014

Pump Audit- Yr.2016

Steam Detailed Audit- Yr.2017

Insulation Audit- Yr.2017

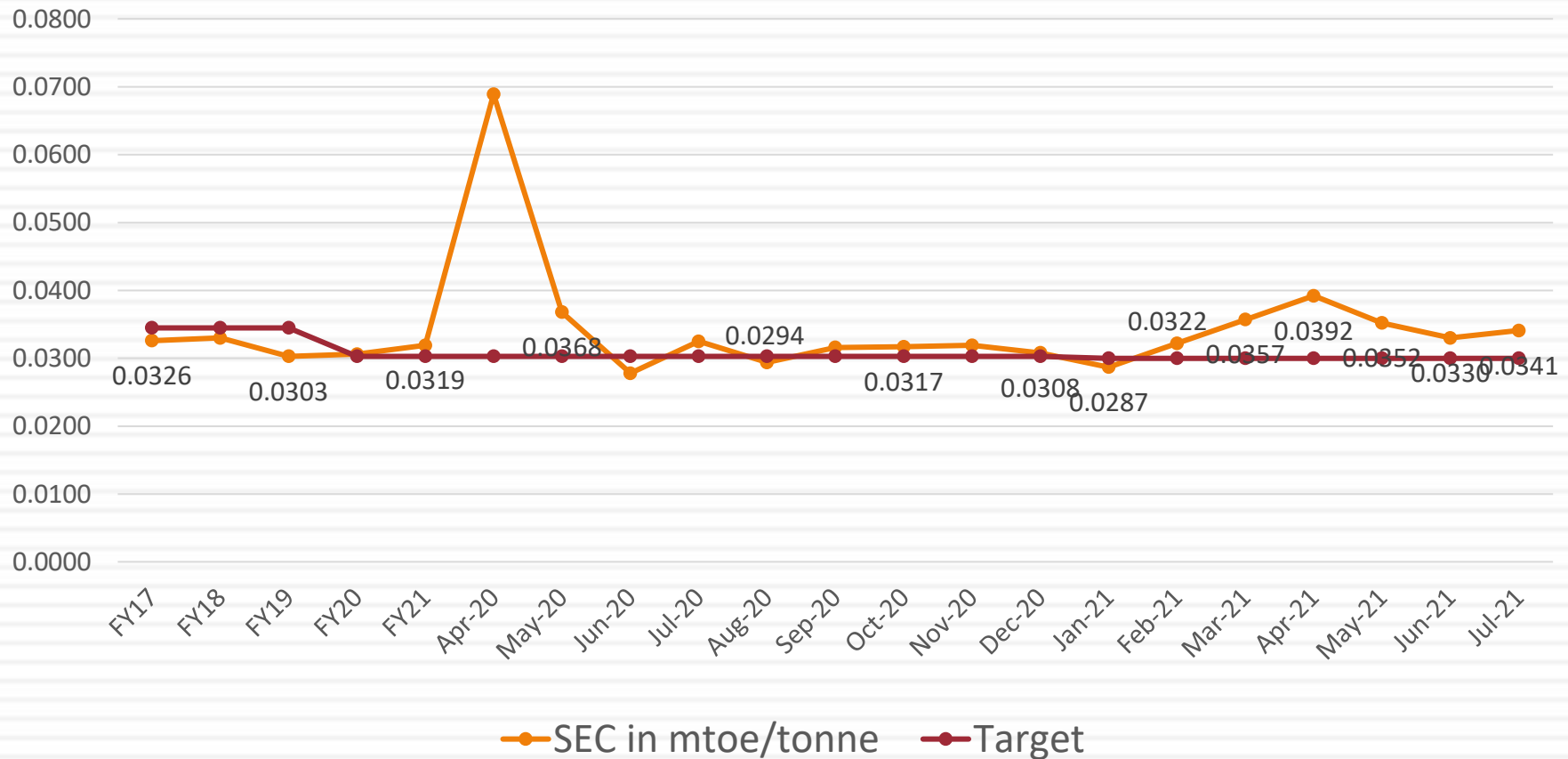
MEA Audit Nov.18

Thermal Audit Jan.2019

11.2 Monitoring of Energy Performance



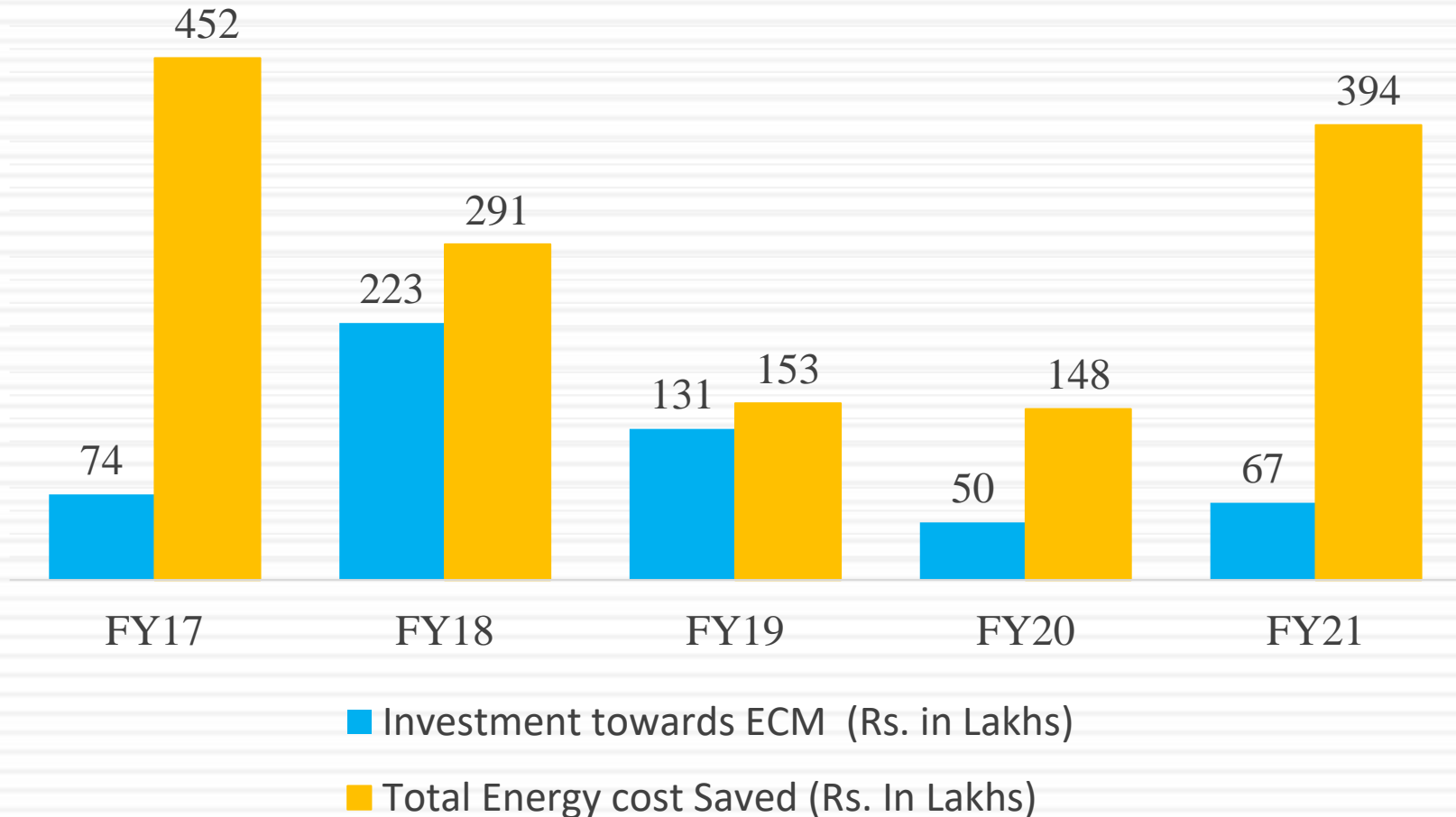
Energy Performance (SEC) Monitoring



11.2 Investment of energy saving projects



Investment Vs Energy Saving in Lakh Rs.

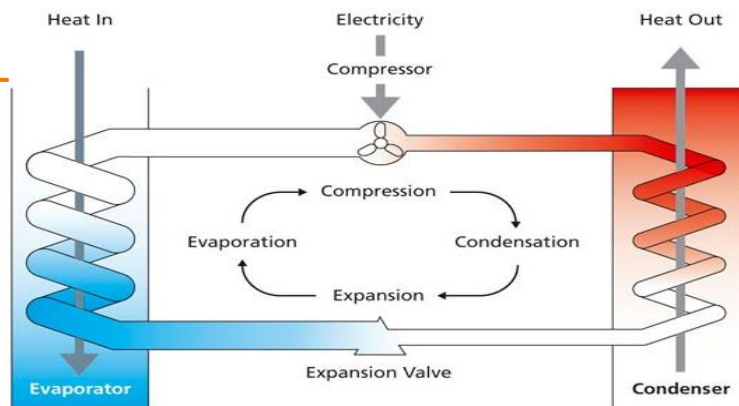


12.1 Other Innovative technologies Under implementation

Heat Pump

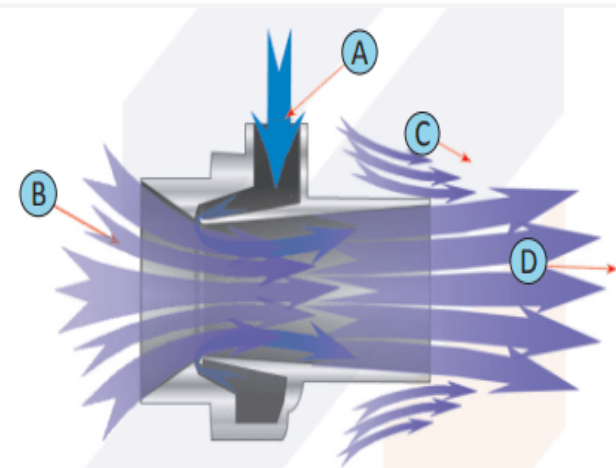
Heat is taken in from the ambient

$$2 - 3 \text{ KW} + 1 \text{ KW} = 3 - 4 \text{ KW}$$



The system pumps heat from a low temperature reservoir to a high temperature

Air Amplifier

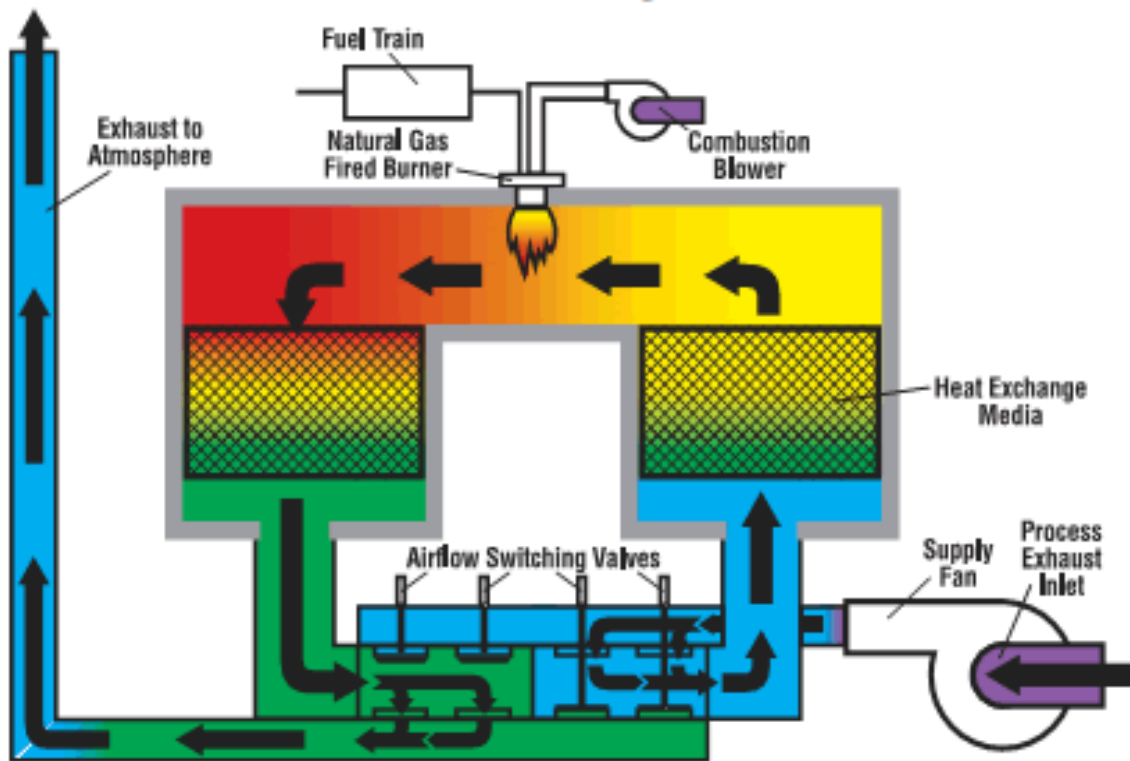


A small amount of compressed air enters the annular chamber at point (A) that is then throttled through a small ring nozzle at high velocity and into the inside of the amplifier over a Coanda profile. The compressed air stream clings to the Coanda profile as it enters the inside walls of the amplifier and thereby creating a vacuum that induces the outside air at point (B) converting the pressure into the amplified airflow. The amplified of airflow leaves at the exit at point (C). Airflow is further amplified downstream at point (D) by entraining additional air from the surroundings at the exit.

12.2 Other Innovative technologies Under implementation

Regenerative Thermal Oxidizer

Regenerative Thermal Oxidizer Airflow Diagram

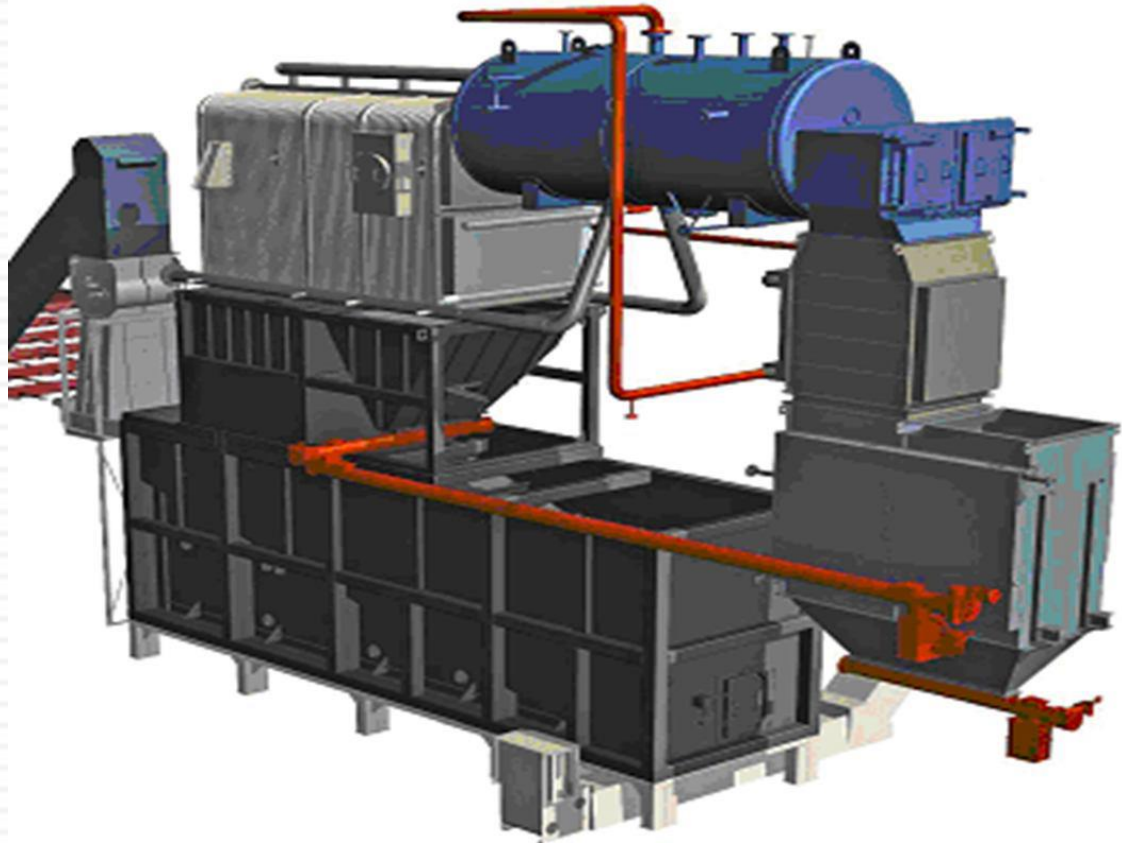


ROT is an extremely efficient thermal oxidizer that uses number of ceramic beds, either loose saddles or honeycomb blocks, to absorb heat from its exhaust gases. It then uses this captured heat to pre-heat the process incoming process air stream and destroy air pollutants contained in this air stream, at temperature ranging upto 1000°C.

12.3 Other Innovative technologies Planned

Biomass based Green Fuel Briquette Boiler
in place of Conventional Fuel fired Boiler.

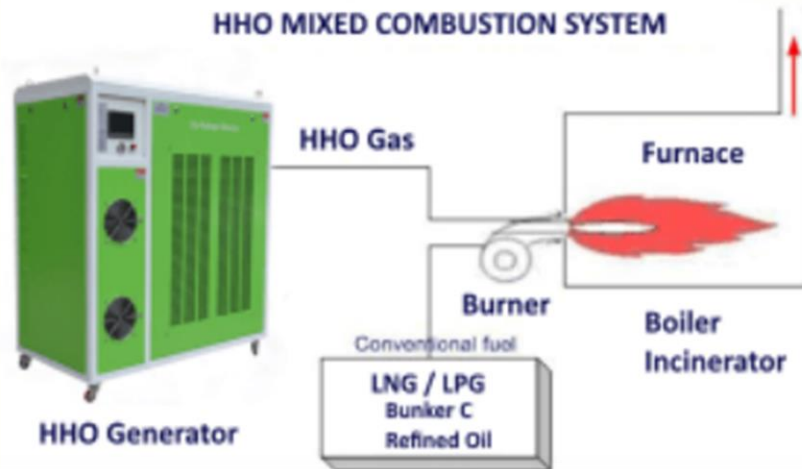
- Optimum Cost-Effective Steam Price
- Guaranteed Boiler Uptime & Efficiency throughout the Product Lifecycle
- No investment for boiler plant and machinery by customer
- Significant SPM reduction in emissions



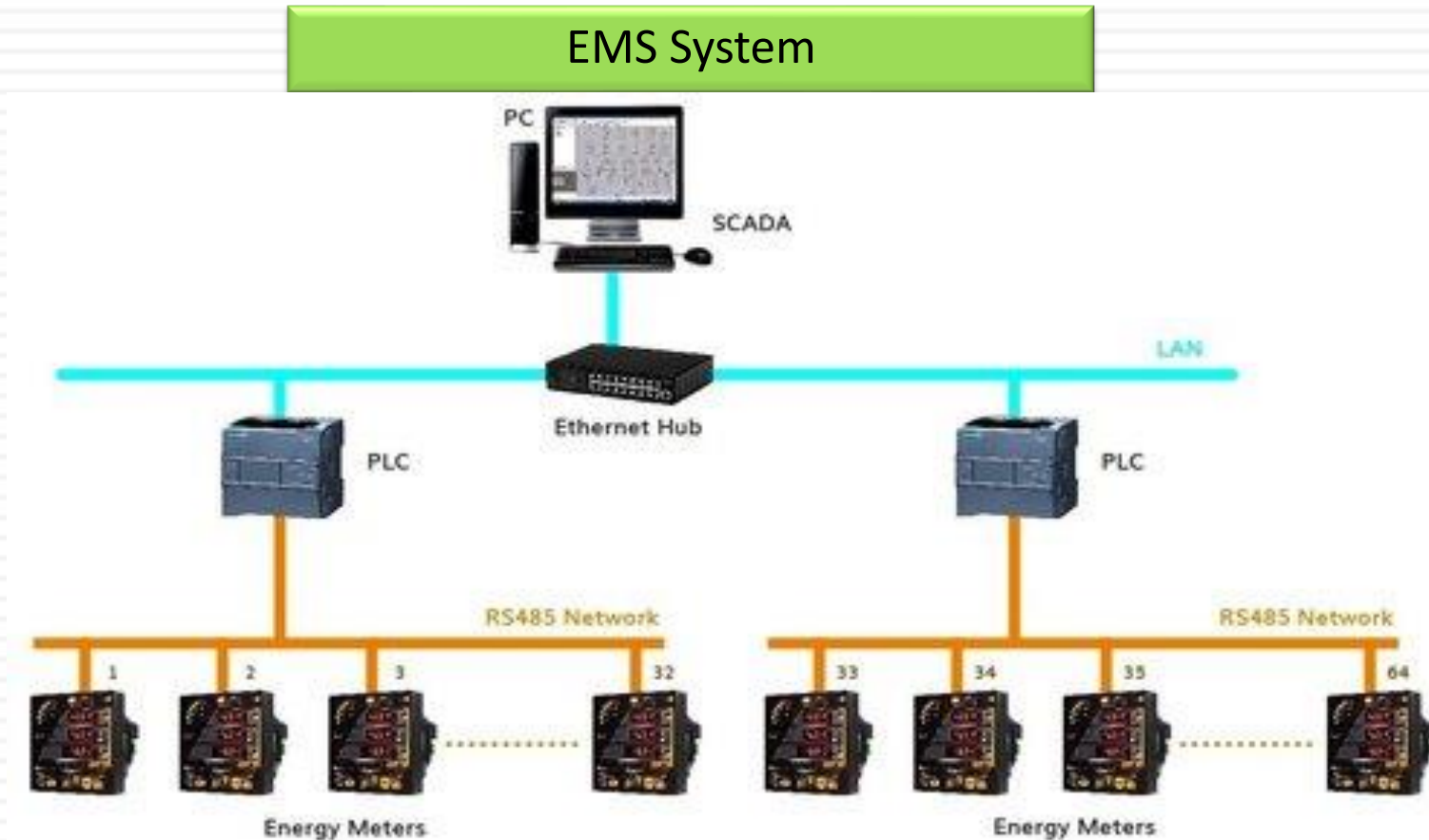
12.4 Other Innovative technologies Under implementation

HHO mixed Combustion System

- HHO mixed combustion system gives fuel savings are in the range of 20% to 50%.
- Emission of soot, smoke and toxic pollutants which are reduced better than 90%.

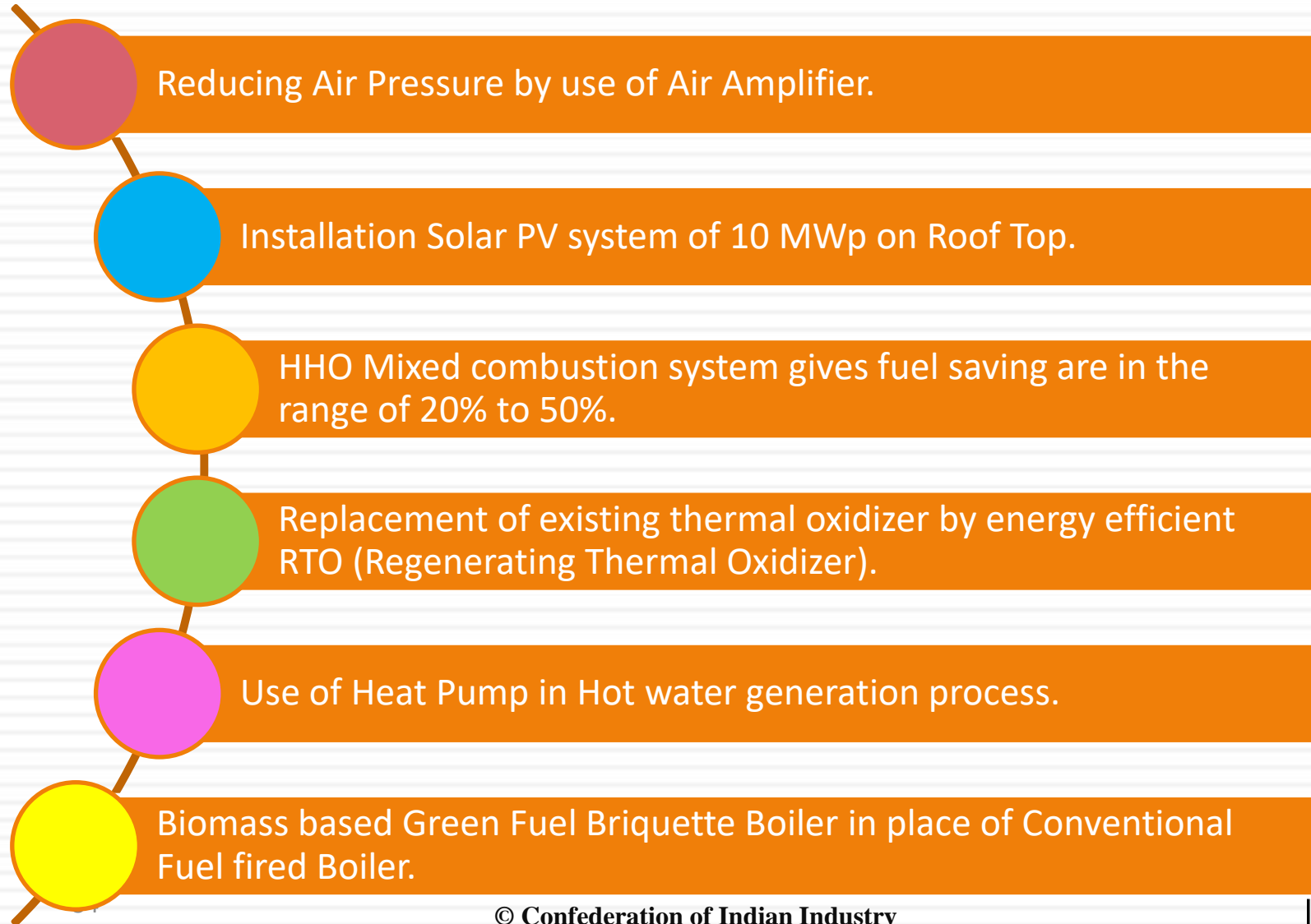


12.4 Other Innovative technologies Under implementation



Energy Management System (EMS) allows utilities to better visualize, operate, optimize, and maintain transmission and sub transmission networks.

13.1 Long Term Vision on EE



Any other relevant information



"Energy Efficient Unit" award in 20th National Award for Excellence in Energy Management 2019 arranged by CII (Confederation of Indian Industry).



2nd position in **National Energy Conservation Award** in steel sector (Year 2015-16).



1st Position in **9th state level energy conservation award** in steel sector from MEDA (Maharashtra Energy Development Agency) (FY 2012-13).



3rd Position in **8th state level energy conservation award** in steel sector from MEDA (Maharashtra Energy Development Agency) (FY 2011-12).

Thank you

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