CII National Award for Excellence in Energy Management 2022

Kothari Petrochemicals Limited

Manali, Chennai

TEAM MEMBERS

Mr. K. Srinivasan
AGM Maintenance

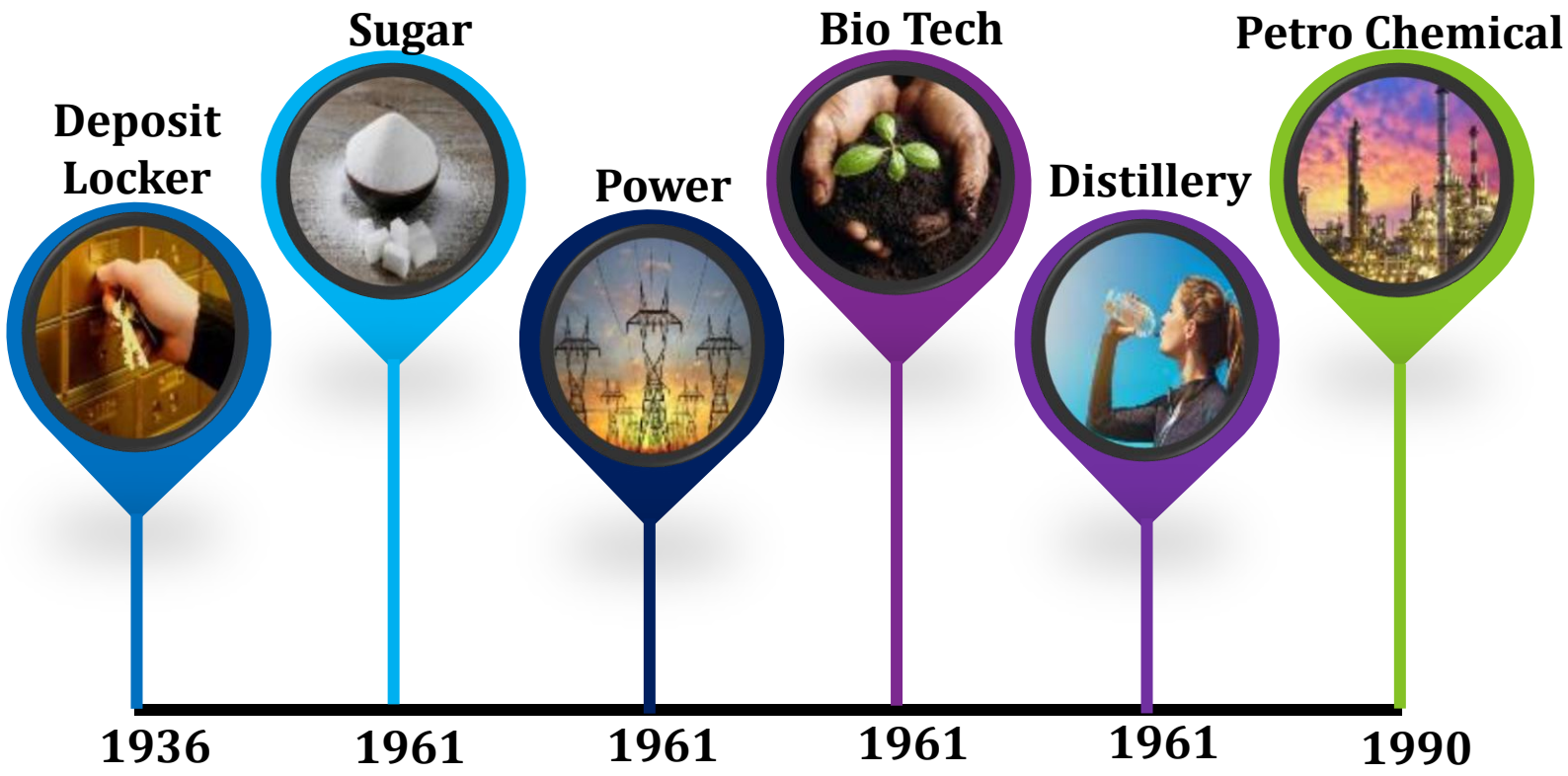
Mr. Anand BR
AGM Technical Service

Mr. Saravanan. J
Energy Manager

1. Kothari Petrochemicals Limited

Kothari Petrochemicals Limited, KPL, is a part of the renowned **“HC Kothari Group”**

Founded in 1990, KPL is the largest producer of premium quality Polyisobutylene in India



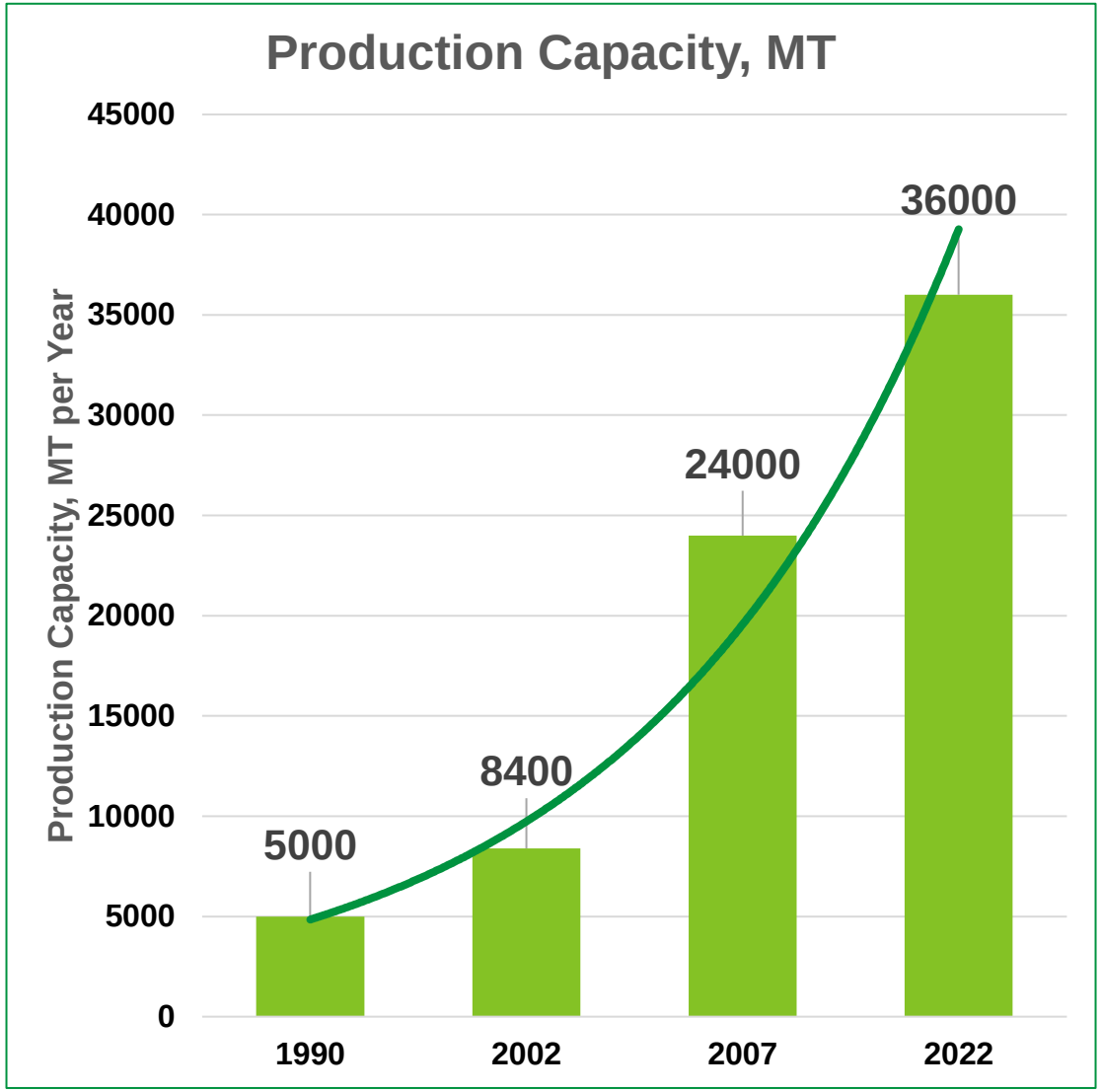
1. Kothari Petrochemicals Limited

The production capacity of the plant has been enhanced continuously over the years

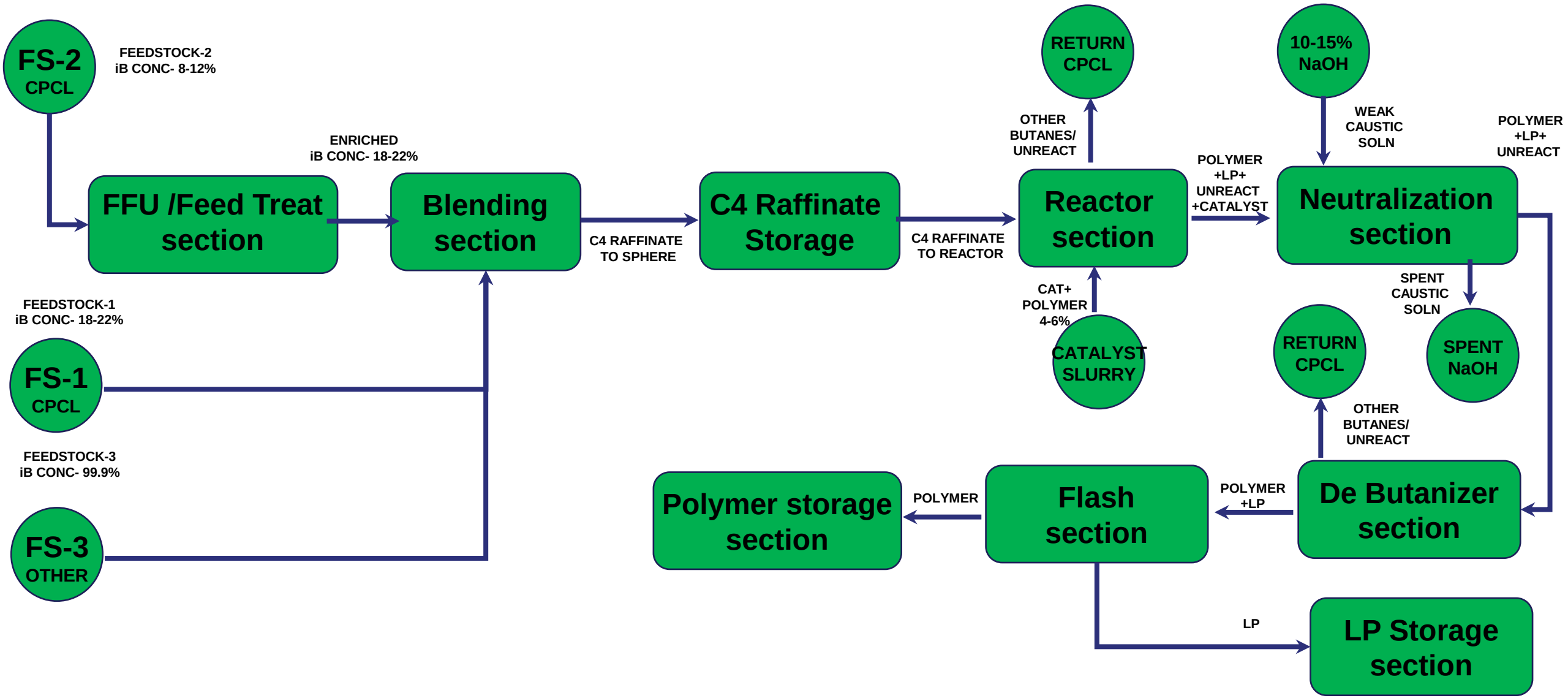
With Installed capacity of 5000 MTA, the capacity of the plant now is 36000 MTA – 620% increased capacity

KPL's Commendable projects related to Energy

- 2MW Captive Power Plant – 2018
- Feed concentration increase for better conversion, enhanced production without increase in raw materials
- 249.6 KW solar farm installed within the plant premises
- 250 KLD effluent treatment plant
- Debottlenecking project implemented successfully in 2022

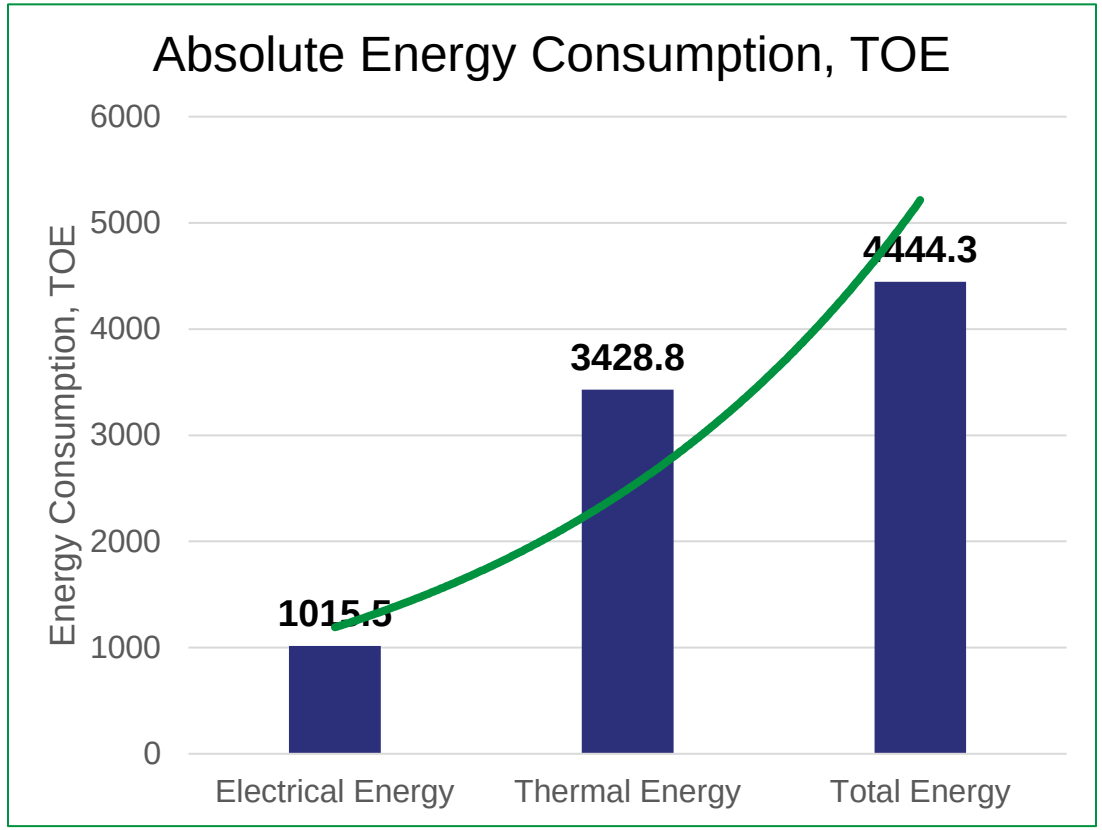


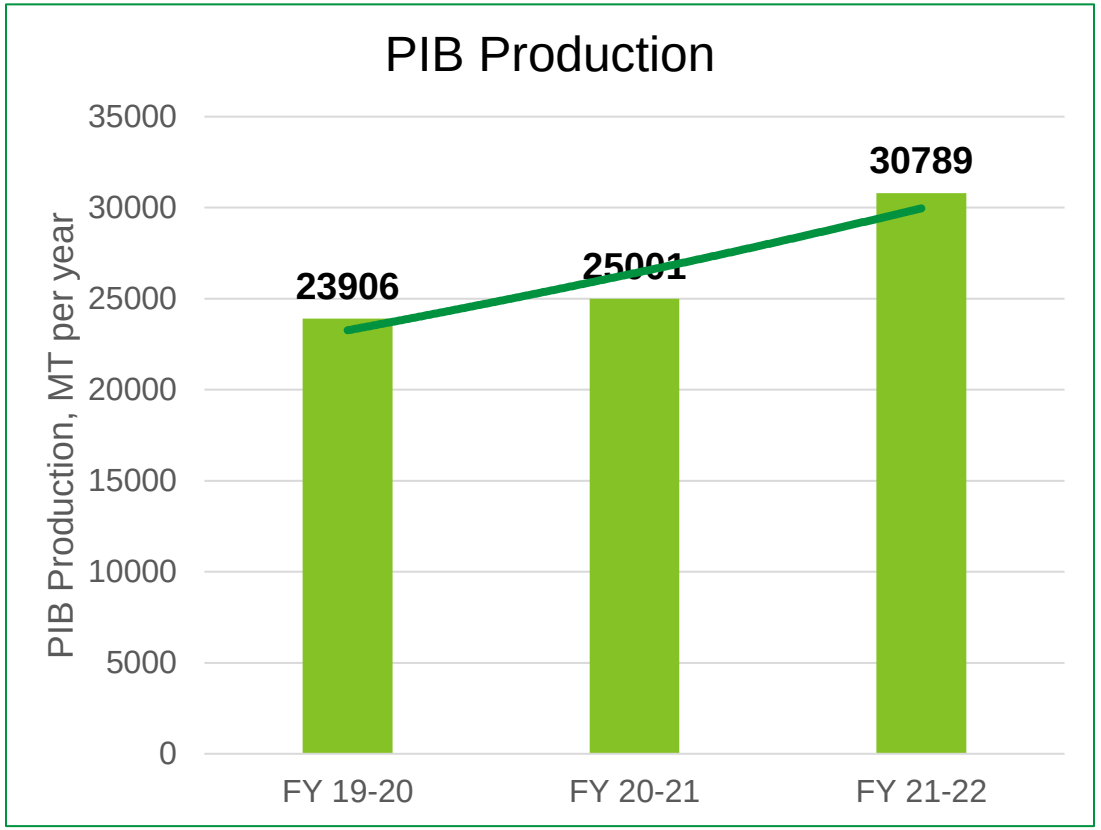
2. Manufacturing Process – PIB



*iB- isobutylene; LP-Light Polymer; CPCL-Chennai petroleum corporation limited

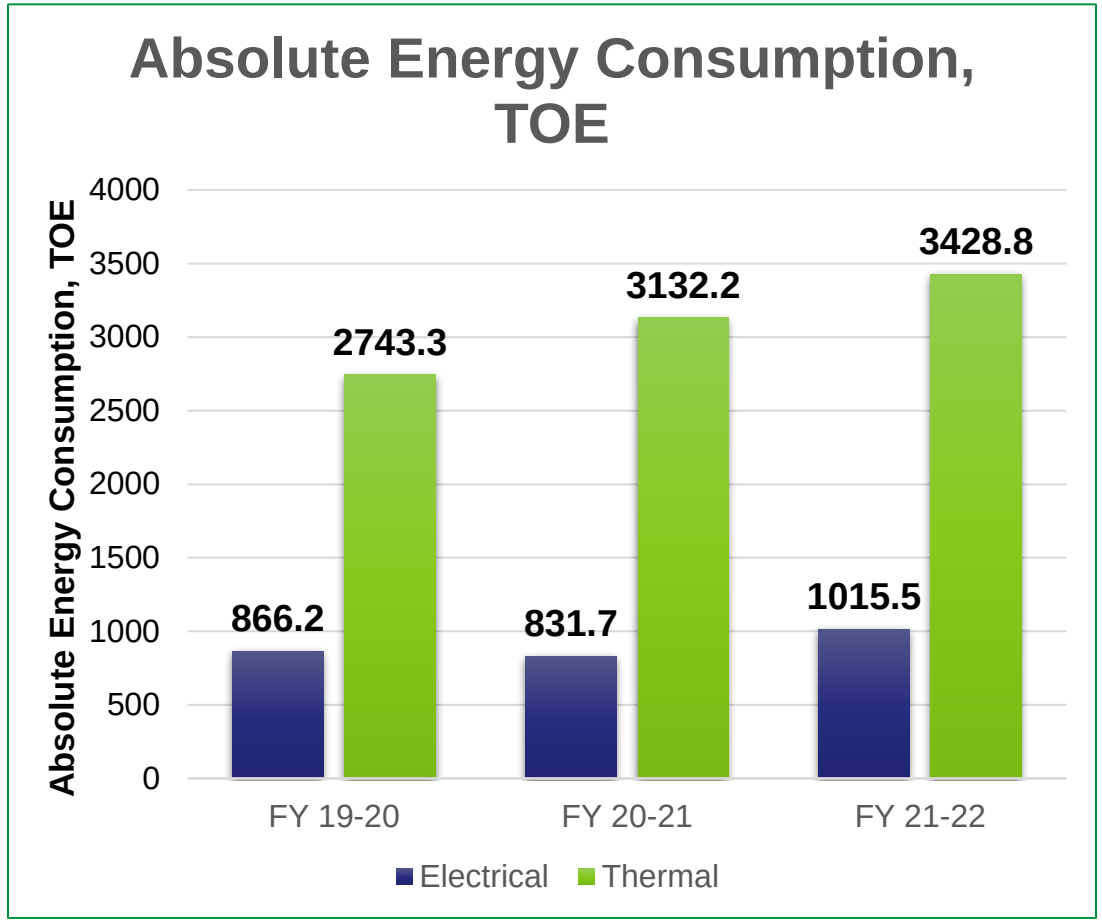
3. Specific Energy Consumption

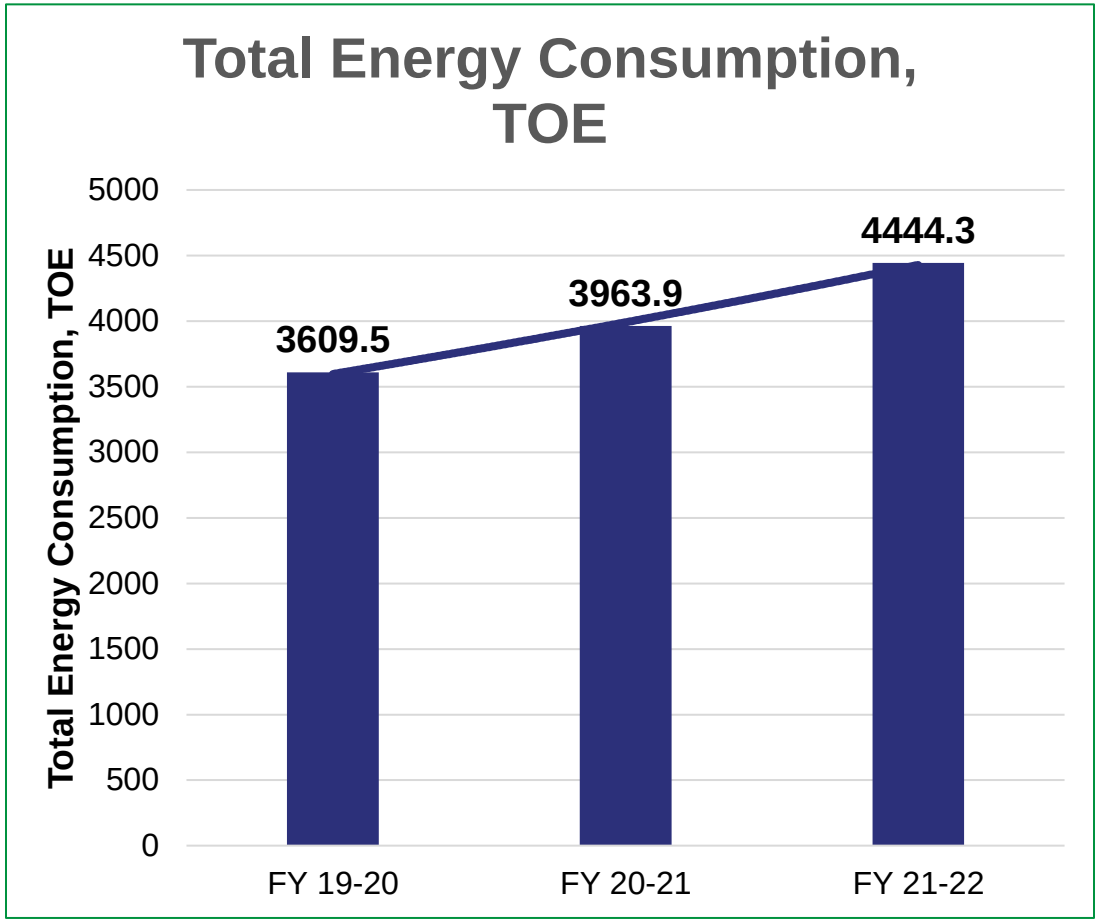




23.2% Increase in PIB Production
Increased productivity through in-house process optimization

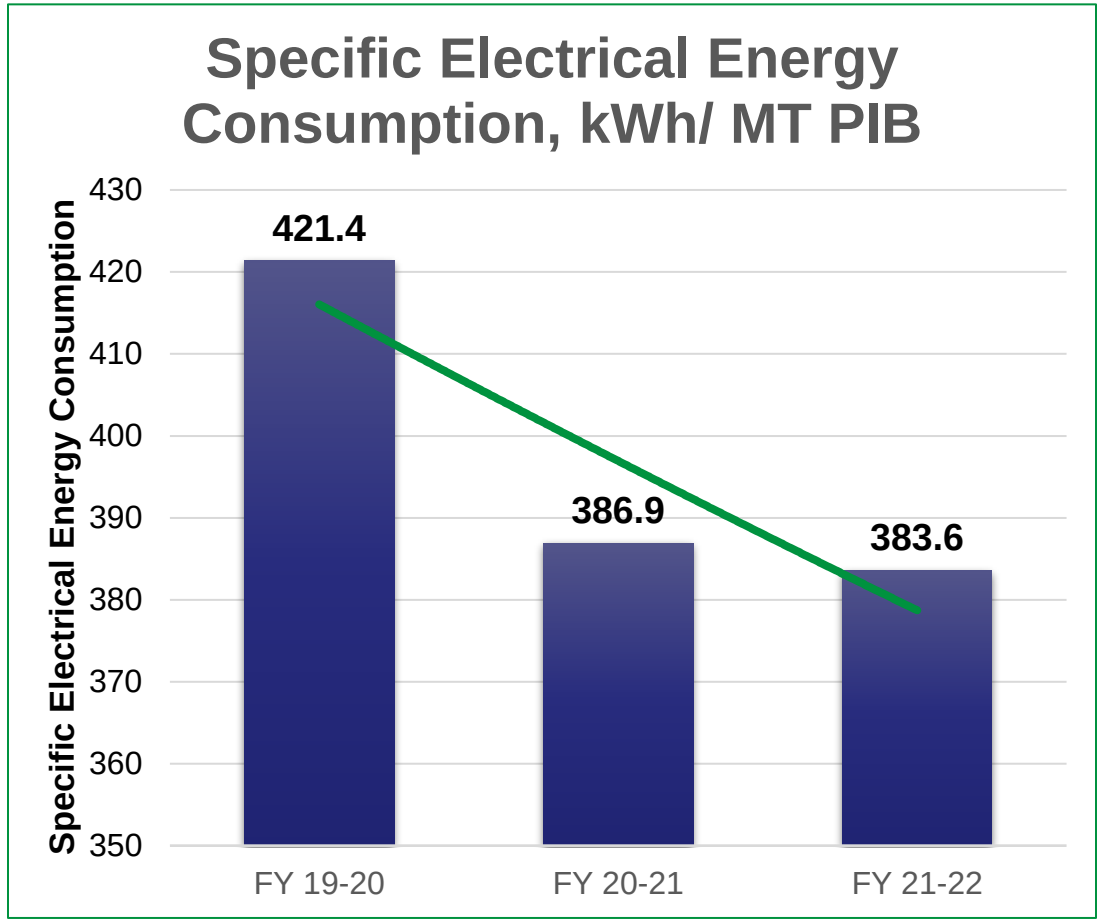
3. Specific Energy Consumption

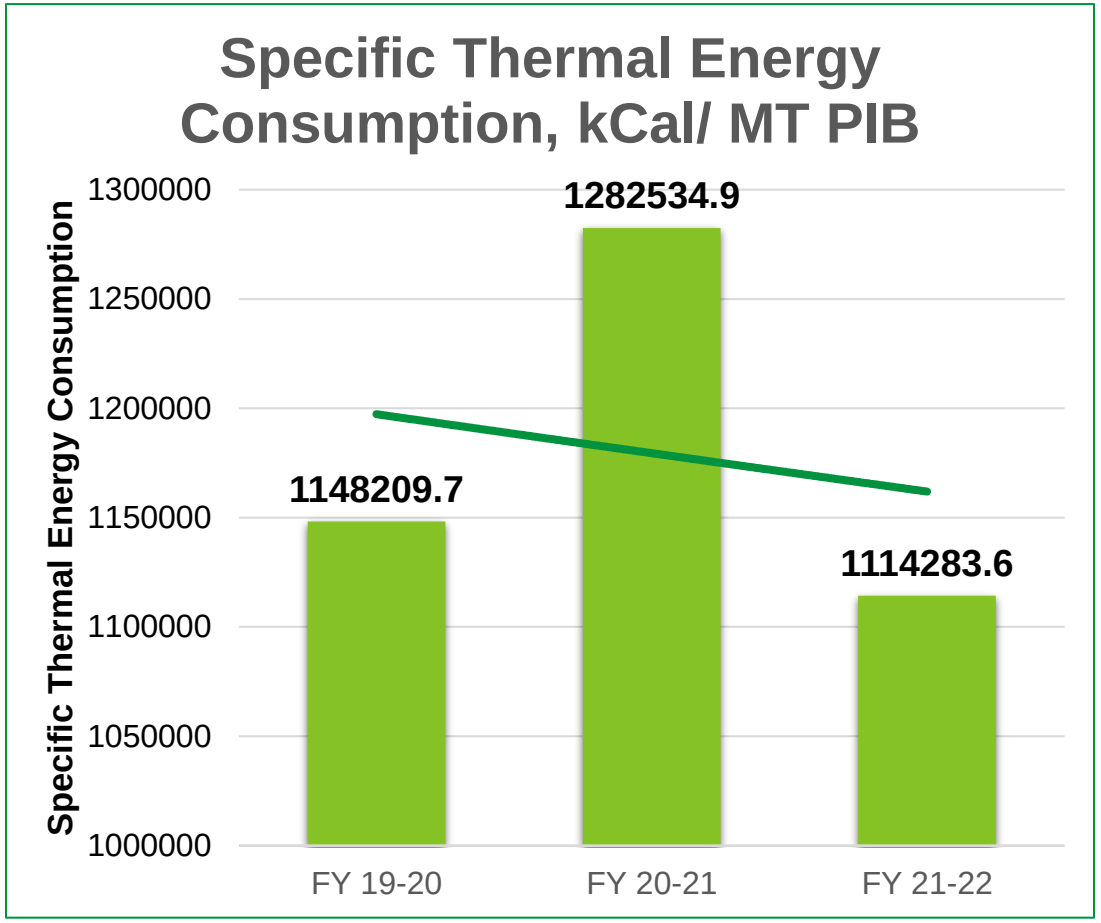




22.1 % increase in Electrical and **9.5%** increase in Thermal Energy Consumption
12.1% increase in Total Energy Consumption

3. Specific Energy Consumption





1 % decrease in Specific Electrical Energy Consumption
13 % decrease in Specific Thermal Energy Consumption

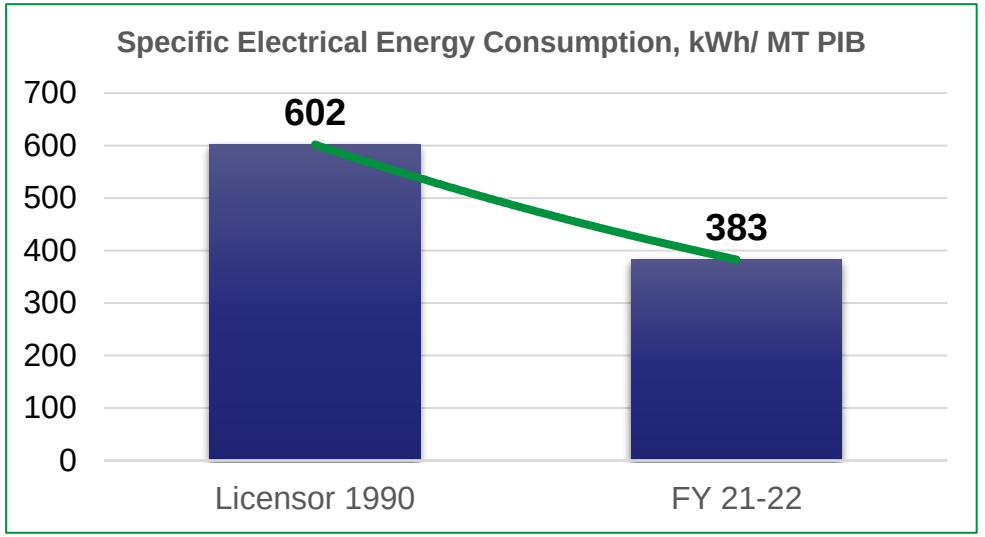
4. Benchmarking

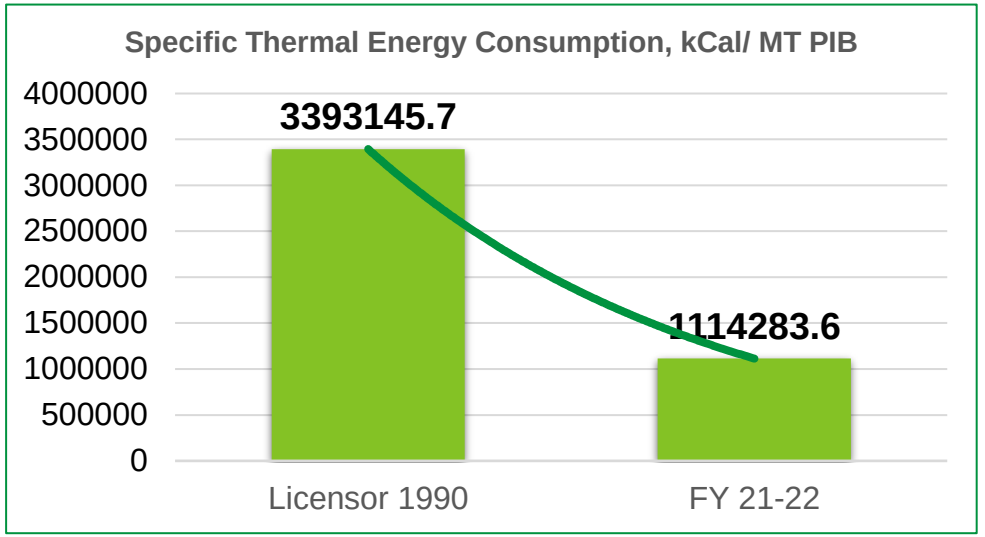
- Specific Electrical Energy Consumption
  - Licensor – 602 kWh/ MT PIB
  - FY 21-22 – 383 kWh/ MT PIB

- Specific Thermal Energy Consumption
  - Licensor – 33 lakh kcal/ MT PIB
  - FY 21-22 – 11 lakh kcal/ MT PIB

- **36.4%** reduction in specific electrical energy consumption
- **66.7%** reduction in specific thermal energy consumption

Since KPL is monopoly in PIB production in India National Benchmarking local competitors Specific Energy Consumption not available





4. ENCON project planned in FY 22-23

Title of the Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Investment (Rs in Million)	Comment
Plant monitoring and Energy utilization tracking software			0.18	New online portal is being implemented to monitor the performance of equipment and energy utilization
Condensate network study and optimization			0.15	
Control valve to optimize cooling water flow to exchangers	0.99	1613	1.04	

4. ENCON project planned in FY 22-23

Title of the Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Investment (Rs in Million)	Comment
Feed precooling using process stream		1700	3.2	
Butane compressor VFD Provision	0.07		0.78	Under trial study
VFD for feed and process pumps	0.05			
Segregation of pure feed from impurity removal system				Under trial study

5. Energy saving projects in last 3 years

Financial Year	No. of Energy saving projects	Investment (INR Million)	Electrical Savings (Million kWh)	Thermal Savings (Million kcal)	Savings (INR Million)	Impact on SEC (Electrical, Thermal)
FY 2019-20	4	3.61	0.17	2511.3	8.9	**15.9%** reduction in total SEC (TOE/MT PIB)
FY 2020-21	5	1.3	0.09	1158.9	2.1	**7.0%** increase in total SEC (TOE/MT PIB)
FY 2021-22	6	3.24	0.06	1661.41	4.0	**10.6%** reduction in total SEC (TOE/MT PIB)

6. Innovative Projects Implemented

Project: Closed Loop Drain Collection System
Description: Process pump local drain points, Sampling drain points are connected to closed loop drain system, to collect process fluid which is earlier drained in gutter. The material is collected as slop and reprocessed.
Investment: Rs. 24.65 lakhs
Benefits Achieved: 1. Slop material recovered as prime product by processing 2. Better housekeeping and reduced load to EWR
Payback Period: 4.4 months

7. Utilisation of Renewable Energy Sources

Financial Year	Technology (Electrical)	Type of Energy	Onsite/ Offsite	Installed Capacity (MW)	Generation (million kWh)	% of overall electrical energy
FY 2019-20	Captive power plant, Solar Farm	Husk Biomass as fuel to CPP, Solar Energy	Onsite	2 MW CPP 249.6 KW Solar	9.67	97.7 %
FY 2020-21	Captive power plant, Solar Farm	Husk Biomass as fuel to CPP, Solar Energy	Onsite	2 MW CPP 249.6 KW Solar	10.07	91.8 %
FY 2021-22	Captive power plant, Solar Farm	Husk Biomass as fuel to CPP, Solar Energy	Onsite	2 MW CPP 249.6 KW Solar	9.67	91.9 %

91.9 % of Electrical Energy generated through Renewable Energy Sources

7. Utilisation of Renewable Energy Sources

Financial Year	Technology (Thermal)	Type of Energy	Installed Capacity (Million kCal)	Generation (million kcal)	% of overall thermal energy
FY 2019-20	CPP – Steam	Husk Biomass as fuel	20 Million kCal	27449	88.1 %
FY 2020-21	CPP – Steam	Husk Biomass as fuel	20 Million kCal	32064	84.2 %
FY 2021-22	CPP – Steam	Husk Biomass as fuel	20 Million kCal	34307	84.6 %

84.6 % of Thermal Energy generated through Renewable Energy Sources

8. Waste Utilisation and Management

Financial Year	Type of Waste	Quantity (MT/year)	GCV	Waste as percentage of total fuel
FY 2019-20	Off-gas	624.6	4550 kcal/kg	10.0 %
FY 2020-21	Off-gas	890.5	4550 kcal/kg	12.6 %
FY 2021-22	Off-gas	762.8	4550 kcal/kg	10.1 %
FY 2021-22	Off Spec product recovery and reprocessing	10.2	-	-

10.1% of waste Off-Gas is recovered

9. GHG Inventorisation

Scope of emissions considered

Scope 1 – Captive power plant, Thermic Fluid Heater

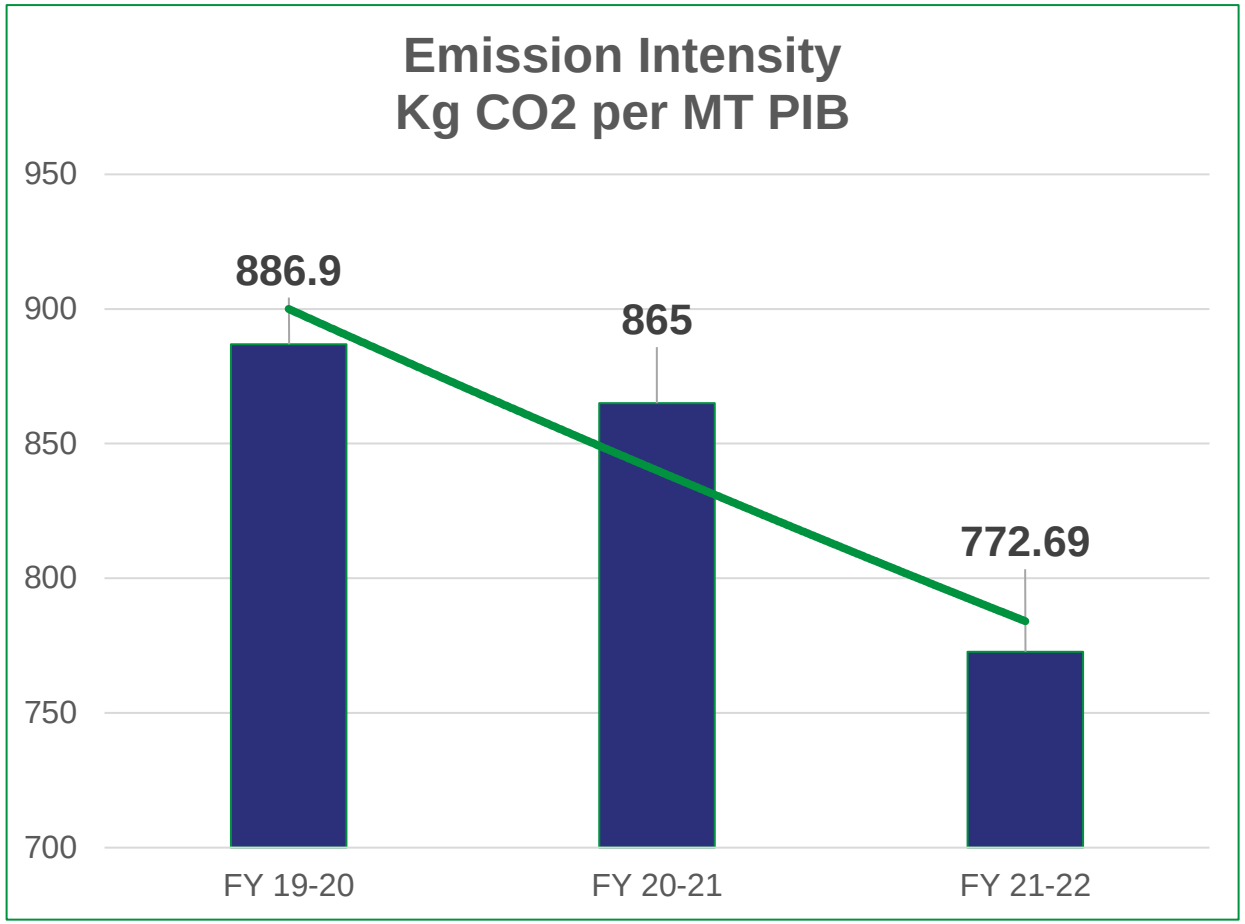
Scope 2 – Power from Electricity Board (EB)

Absolute CO2 Emissions

FY 19-20 : 20894 ton CO2

FY 20-21 : 20240 ton CO2

FY 21-22 : 23790 ton CO2



10.6% Reduction in Energy Intensity from previous financial year

Electric Vehicles for Plant Usage

Kothari PETROCHEMICALS LTD

Electric car and Electric forklift are procured for plant usage to reduce CO2 emissions

An estimated amount 2 tons CO2 emission per annum is reduced by utilizing these electric vehicles

Cycles provided to all employees
To encourage use of cycles and public commute to work

11. Teamwork, Employee Involvement & Monitoring

- Total and specific energy consumption is monitored through **online portal** and report is reviewed on daily, monthly and annual basis
- Review Meeting is chaired by **Managing Director**, Whole Time Director, and Vice President Operation.
- Separate budget of **Rs. 24.5 lacs** is approved for **ISO 50001** implementation and energy conservation activities
- Based on energy audit findings, further budget shall be allotted for projects
- Energy conservation trainings are included in our **annual training plan** for employees

Energy Day Celebration – Dec14, 2021

Energy Committee Team

KPL has formed a separate team for addressing Energy Utilisation in the plant.

All employees are encouraged to bring the ideas for energy conservation.

They can provide their suggestions in our online portal, which will be reviewed and addressed through the energy cell.

12. Implementation of ISO 50001

KPL has initiated **implementation of ISO 50001** in this financial year

As a start, Training on ISO 50001 will be given to Core Energy Committee Members

KPL has the combination of ISO 9001, ISO 14001, ISO 45001 in place

Investment of energy saving projects on total turnover of the company (FY 21-22) : 0.1%

Since KPL have taken a **major shutdown and revamping of the entire plant on April 2022**, the major projects ans investments are accounted for the current financial year FY 22-23

13. Learning from CII Energy Award

- Digitalization of Energy Management System through online portal.
- Provision made for installing Energy Meter Monitoring system during the revamp electrical network distribution
- Created energy management cell to actively implement ENCON projects and improving awareness on Energy Conservation
- Procured ultrasonic measurement kit for leak audits, trap and bearings monitoring

Routine Energy Management Practices

KPL employs regular energy management practices

- Leak identification
- Insulation survey
- Steam trap audit

Awards and Recognitions

KPL has been constantly recognized for Excellence in **Energy** and **EHS** Management by organizations such as CII, ICC, FICCI, National Safety Council