CII National Award for Excellence in Energy Management 2024

Kothari Petrochemicals Limited,

Manali, Chennai

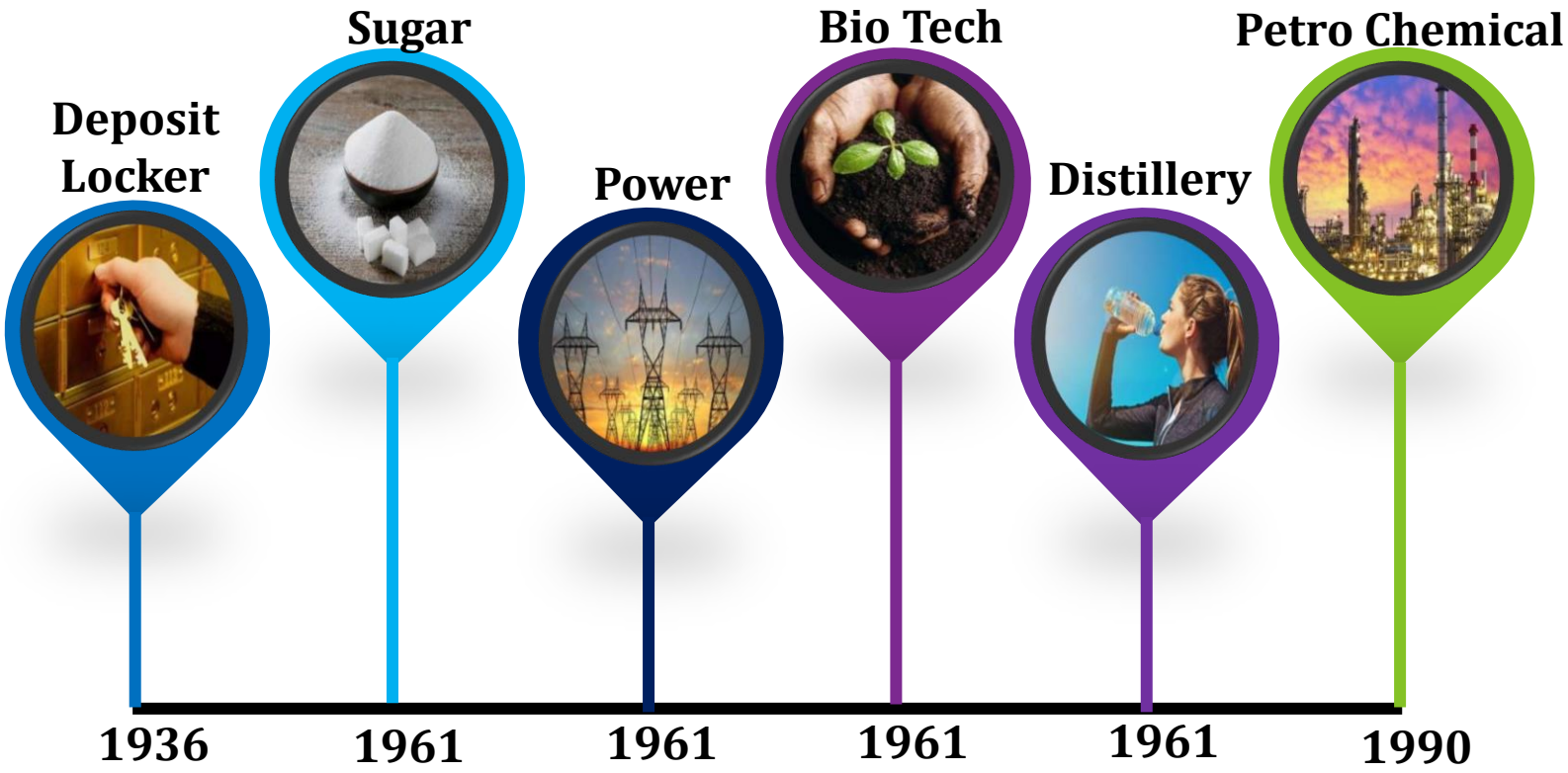
Polyisobutylene Unit, Manali, Chennai.

Presenting Team Members	
Mr. K. Srinivasan	AGM-Maintenance
Mr. B. R. Anand	AGM-Technical service
Mr. Ajai Aravind	Senior Engineer-TLS

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



Facilities

48000 MTA Polyisobutylene Production facility

2MW Captive Power Plant

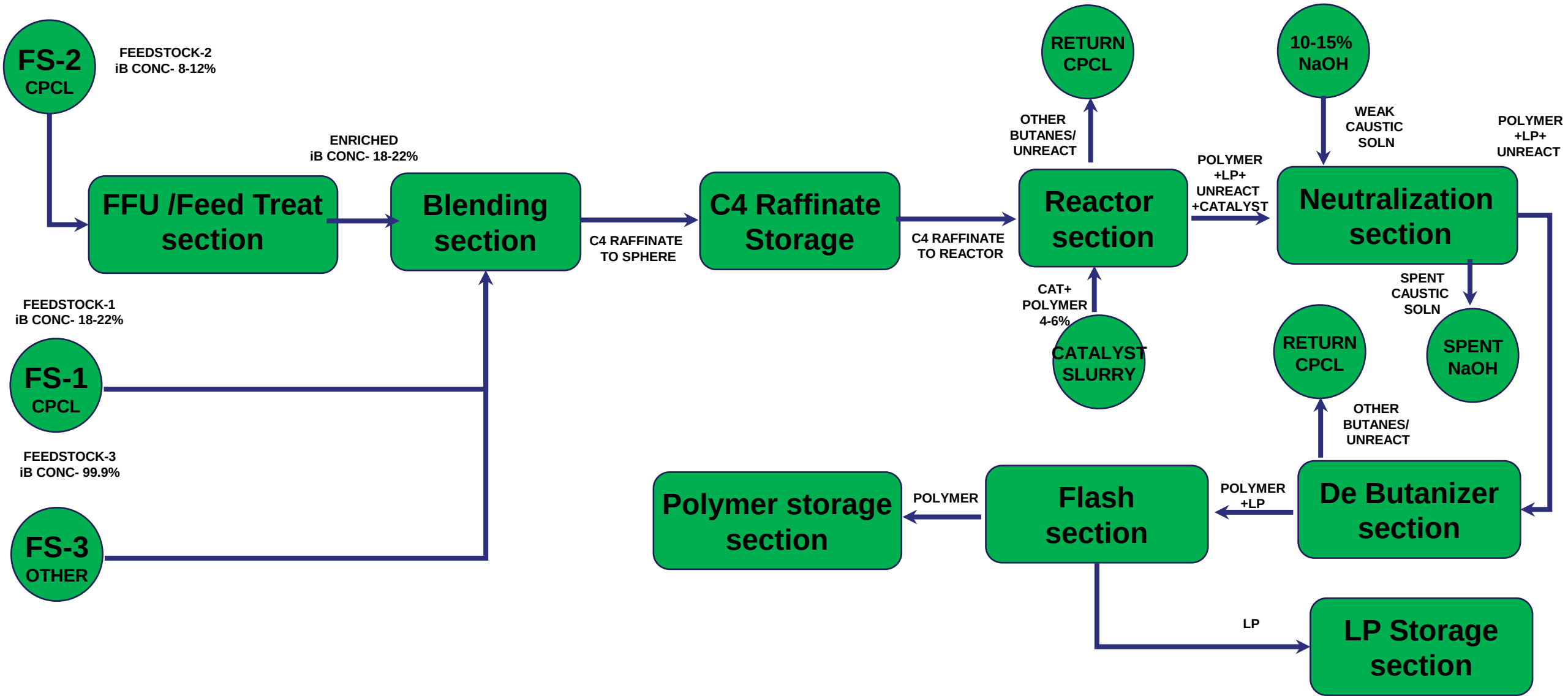
250 KW Solar Farm

210 KLD Effluent Treatment Plant

20 lakh Kcal Thermic Fluid Heater

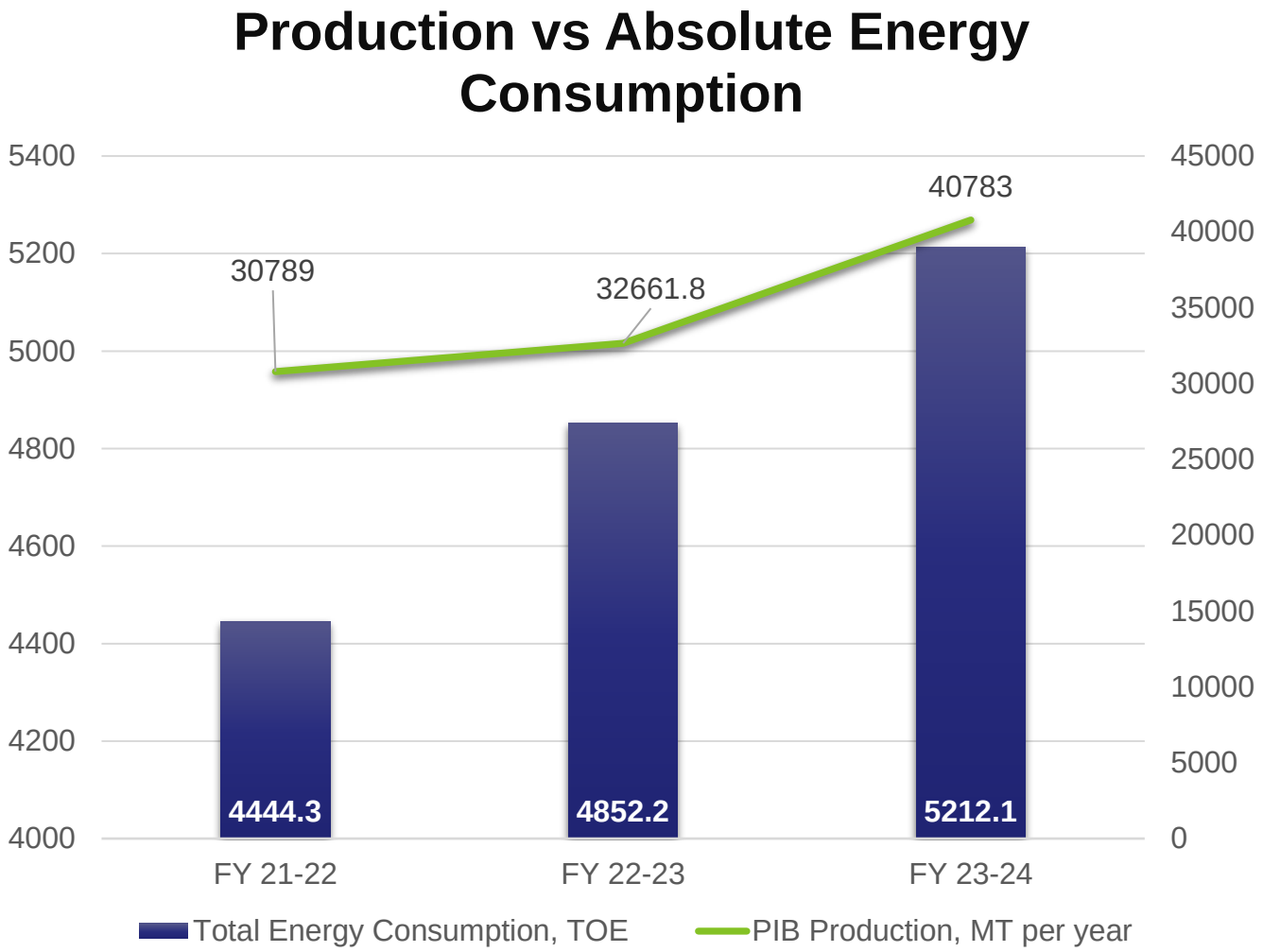
4000 KL capacity Rainwater Harvesting Pond

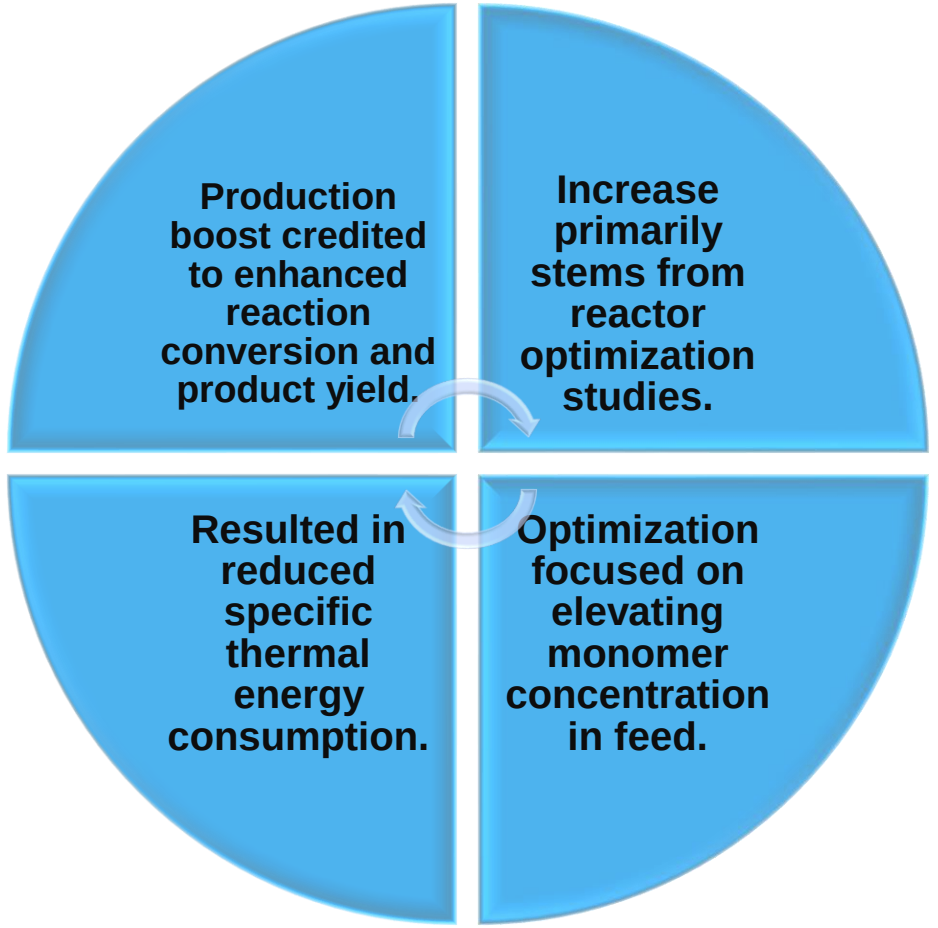
2. Manufacturing Process – PIB



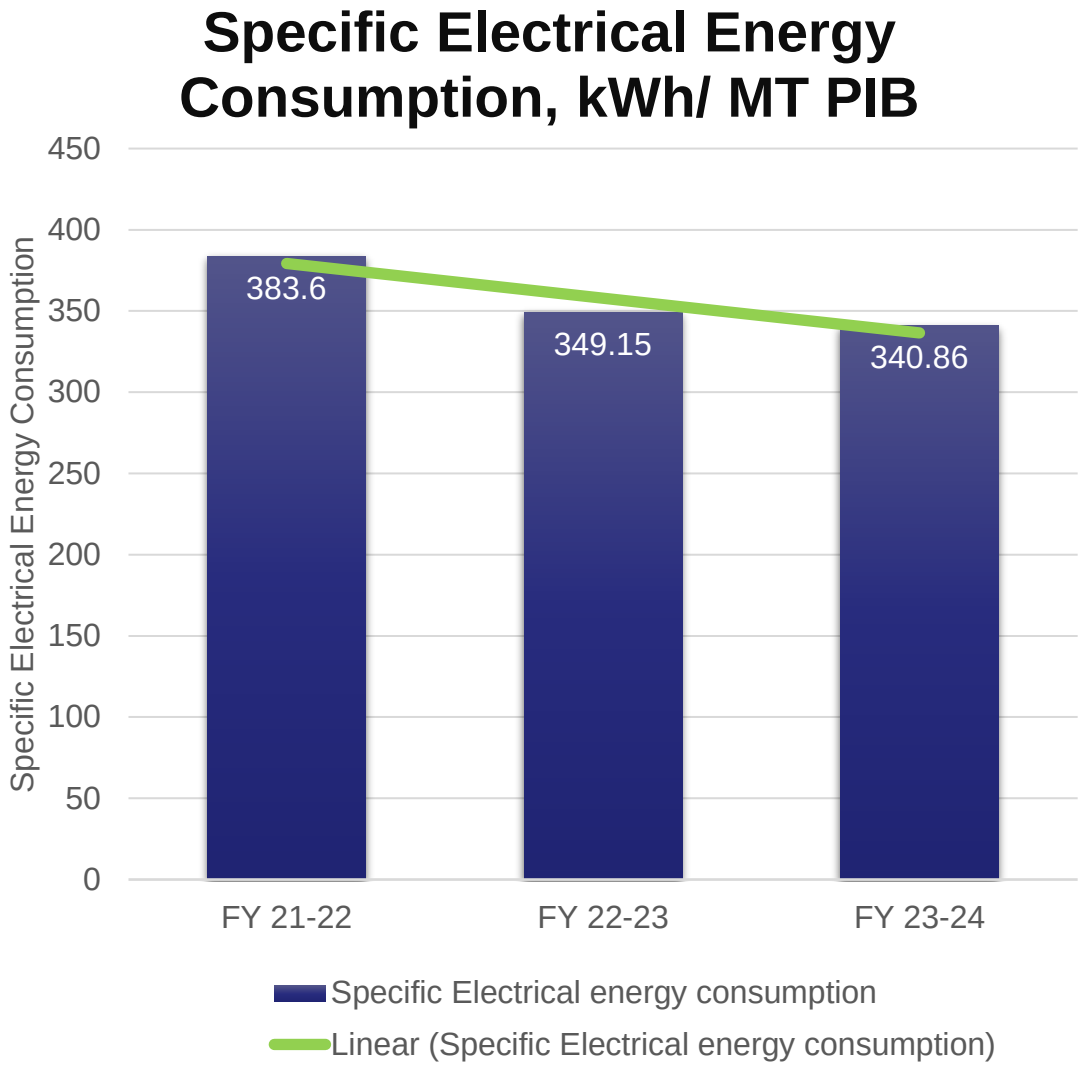
*iB- isobutylene; LP-Light Polymer; CPCL-Chennai petroleum corporation limited

3. Specific energy consumption



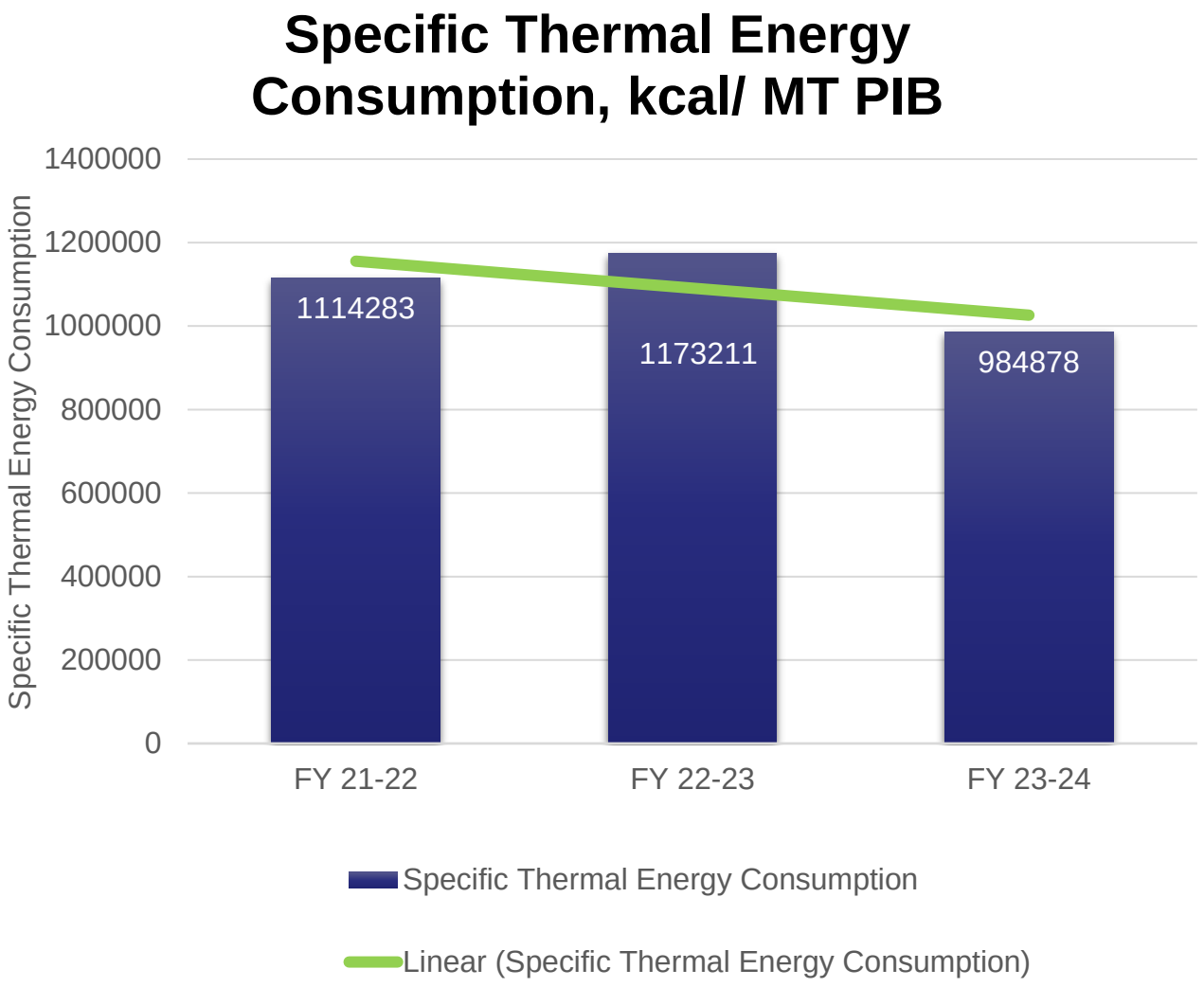


4. Specific electrical energy consumption



- There has been a significant reduction in the specific electrical energy consumption – **2.37%**
- Many energy-saving initiatives are carried out during the debottlenecking project.
- VFD provided process pumps.
- Utilization of air compressor as common utility for PIB plant and CPP
- VFD provisions for PA fan and screw compressor in CPP

5. Specific thermal energy consumption



- The specific thermal energy consumption is **decreased by 16.05 %** from the previous FY.
- Installation of PRDS system for HP steam exchangers
- Flux maxiox fuel saving device for thermic fluid heater to increase fuel effeciency and thus reducing fuel consumption by 4%

6. Benchmarking

Specific Electrical Energy Consumption

- FY 23-24 – 340.86 kWh/MT PIB
- FY 22-23 – 349.15 kWh/ MT PIB

Specific Thermal Energy Consumption

- FY 23-24 – 984878 kcal/MT PIB
- FY 22-23 – 1173211 kcal/ MT PIB

Since KPL is monopoly in PIB production in India National Benchmarking is not applicable

7. ENCON project planned in FY 24-25

Title of the Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Investment (Rs in Million)	Comment
Screw Type Air Compressor	0.162	-	5	The existing reciprocating type Air compressor was planned for replacement, the net energy saving from the modification is captured
Suction flow control valve provision for butane compressor	-		0.5	Compressor suction control thro DCS based on load requirement which is currently in manual mode
High Efficiency Motor replacement in gas compressor				Offers received from vendors, yet to be finalised
Pressure pump for condensate transfer	0.010	-	1.7	Instead of electrical pump, steam powered pump is planned to transfer the condensate
Additional Solar Installation	0.2		4	100 kW additional roof top solar installation planned

7. ENCON project planned in FY 24-25

Title of the Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Investment (Rs in Million)	Comment
Additional VFD installation for pumps	0.26	-	6	New VFD installation has been planned for pumps and butane compressors.
Installation of product heat recovery exchanger	-	0.13	3	Under study
Energy Audit			0.5	Energy audit for the overall plant is planned to find the energy saving opportunities. Benefits yet to arrive.
Steam trap audit	-		1.2	Steam trap audit was completed for all the traps installed in the plant. Opportunity for savings were explored and implementation under progress

8. 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 2021-22	6	3.24	0.06	1661.41	4.0	10.6% reduction in total SEC (TOE/MT PIB)
FY 2022-23	10	74.97	0.853	1789.06	44.451	2.0% increase in total SEC (TOE/MT PIB)
FY 2023-24	7	2.64	0.391	159.67	28.44	14.2 % reduction in total SEC (TOE/MT PIB)

9. Innovative Projects Implemented

Kothari PETROCHEMICALS LTD

Project: Installation of flux Maxiox device in Thermic fluid heater
Description: The device utilizes magnetic flux to treat the fuel, for enhancing its properties. It is a maintenance free device safe for handling hydrocarbon operations and does not require external power.
Investment: **Rs. 1,55,000**
Benefits Achieved: - Improved fuel efficiency by enhancing its properties, which leads to complete combustion of the fuel thus leading to reduced fuel consumption. - Increase in calorific value and thermal efficiency of fuel, - Reduction in carbon built-up and stack emissions
Payback Period: 0.15 months

10a. Utilization of Renewable Energy Sources

Financial Year	Technology (Electrical)	Type of Energy	Onsite/ Offsite	Installed Capacity (MW)	Generation (million kWh)	% of overall electrical energy
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 %
FY 2022-23	Captive power plant, Solar Farm	Husk Biomass as fuel to CPP, Solar Energy	Onsite	2 MW CPP 249.6 KW Solar	9.28	79.9 %
FY 2023-24	Captive power plant, Solar Farm	Husk Biomass as fuel to CPP, Solar Energy	Onsite	2 MW CPP 249.6 KW Solar	9.46	82.3%

10b. Utilization of Renewable Energy Sources

Financial Year	Technology (Thermal)	Type of Energy	Installed Capacity (Million kCal)	Generation (million kcal)	% of overall thermal energy
FY 2021-22	CPP – Steam	Husk Biomass as fuel	20 Million kCal	34307	84.6 %
FY 2022-23	CPP – Steam	Husk Biomass as fuel	20 Million kCal	31655	81.0 %
FY 2023-24	CPP – Steam	Husk Biomass as fuel	20 Million kCal	30894	86.3 %

11. GHG Inventorisation

Scope of emissions considered

Scope 1 – Captive power plant, Thermic Fluid Heater

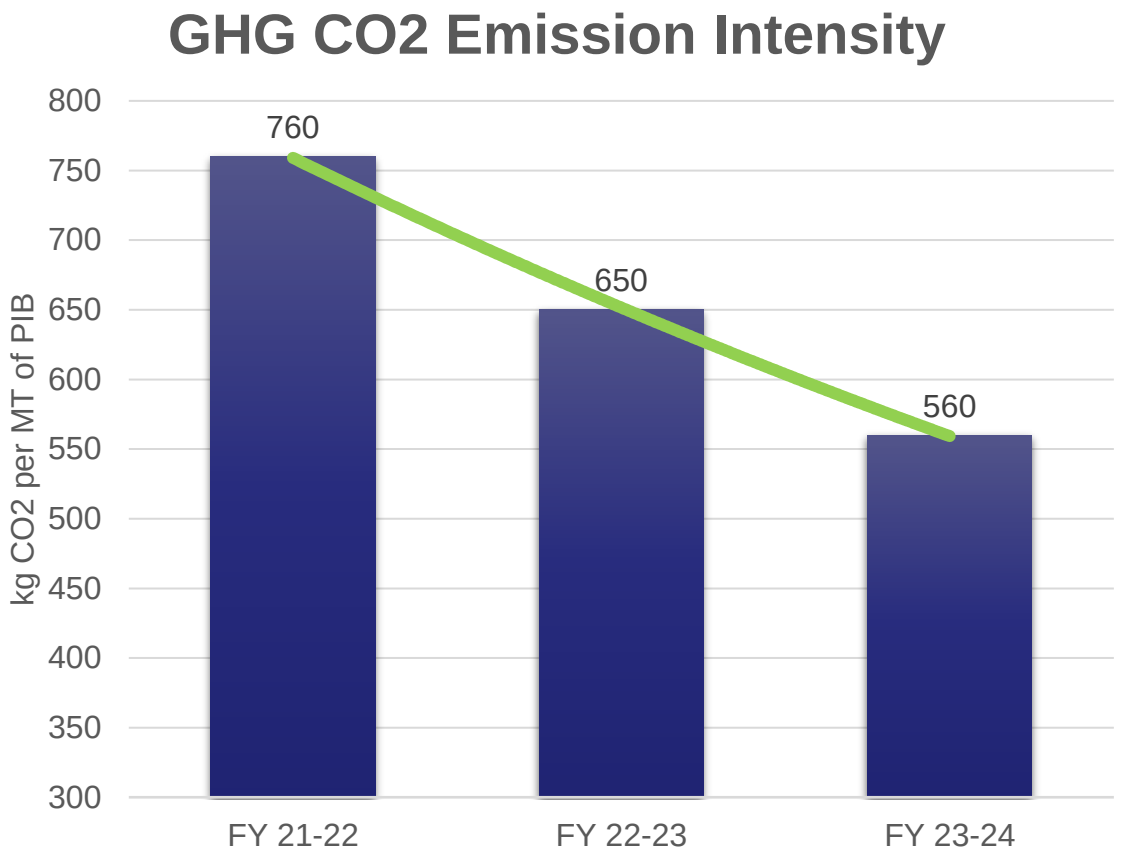
Scope 2 – Power from Electricity Board (EB)

Absolute CO2 Emissions

FY 21-22 : 23790 ton CO2

FY 22-23 : 24044 ton CO2

FY 23-24 : 19902 ton CO2



12. Waste utilization and management

Financial Year	Type of Waste	Quantity (MT/year)	GCV	Waste as percentage of total fuel
FY 2021-22	Off-gas	762.8	4550 kcal/kg	10.1 %
FY 2021-22	Off Spec product recovery and reprocessing	10.2	-	-
FY 2022-23	Off Spec product recovery and reprocessing	10.2	-	-
FY 2023-24	Off-gas	1166.78	4550 kcal/kg	59 %
FY 2023-24	Off Spec product recovery and reprocessing	237.1	-	-

13.EMS system-ISO 50001 Implementation

Kothari Petrochemicals is delighted to announce that we have achieved ISO 50001 certification, underscoring our steadfast commitment to sustainable energy management.

This milestone not only showcases our relentless efforts to reduce our environmental footprint but also positions us as a leader in the industry by adhering to exemplary practices.

14.Awards and Recognitions

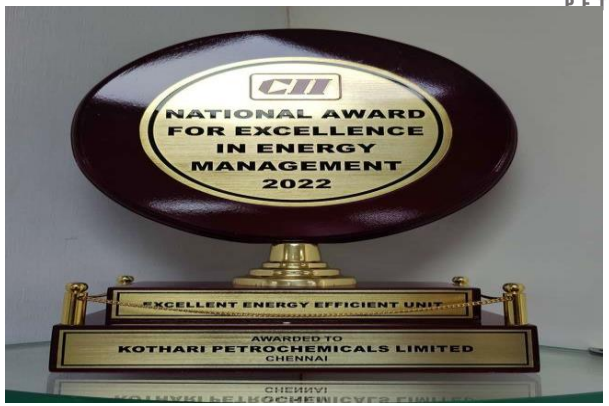
For the fourth time in a row, Team KPL was presented with the **"National Award for Excellence in Energy Management 2023"** in the General Sector Category during the 24th CII Energy Efficiency Summit, which took place in Hyderabad in September 2023.

At the inaugural TCM Awards ceremony held in Hyderabad on December 19, 2023, the KPL family was given the **Total Cost Management Award - Sustainability Champion** in the merit category by the Confederation of Indian Industries (CII).

This acknowledgment is proof of our steadfast dedication to sustainable methods.

Other Prestigious awards received by KPL for Energy Management

Winner of National Energy Conservation Award 2022 by BEE



National Award for Excellence in Energy Management by CII -2022

Excel Industries Award for Excellence in Energy Conservation & Management by ICC -2021

Chemicals & Petrochemicals Awards by FICCI - 2022

15.“Green innovation, sustainable solutions”

Each year on 14th Dec, KPL hosts the Energy Saving Awareness-Cycle event to boost public awareness of energy conservation.

This initiative not only promotes the benefits of reducing energy consumption but also encourages sustainable practices through interactive activities.

16.Cycle to Work

In line with our ongoing commitment to sustainable transportation, we actively encourage our staff to commute by bicycle.

Around 10-14% of our employee's commute by cycle to work.

Our employees' decision to commute by bicycle resulted in a reduction of around **110 to 120 kg of CO2 emissions per month**

Each month, employees who commute by bicycle receive a carbon offset certification as a token of appreciation.


Kothari
PETROCHEMICALS LTD
"Be a part of the solution not a part of the pollution"

Certificate of Carbon Offset

LET'S GO GREEN

This certificate Honors that

Mr._____ Employee No._____

Offset

_____kg of Carbon Dioxide

by supporting

Kothari Petrochemicals Limited

for the month of_____

Your contribution helps combat climate change and support the sustainability of our environment for future generations.

P. Premapiriyan
Vice President - Operations
Kothari Petrochemicals Ltd.

17. CNG VEHICLE FOR EMPLOYEE OFFICE COMMUTE

- A significant step forward in our commitment to environmental sustainability at Kothari Petrochemicals.
- In line with our dedication to reducing our carbon footprint and promoting ecofriendly practices, we have recently acquired new Compressed Natural Gas (CNG) vehicles in January 2024 for office commute purposes.
- **Over the past four months, we have successfully transitioned from diesel to CNG, replacing approximately 9,680 liters of diesel with this renewable energy source. This achievement represents a complete shift from fossil fuels to sustainable energy solutions.**

18. Learning from CII Energy Award

1. To strengthen the energy review on a continual basis, digitalization of the Energy Management System was planned. We have approached several vendors and discussions under progress for implementation.
2. ISO 50001-2018 system was successfully implemented.
3. Installation of flux maxiox fuel saving device for thermic fluid heaters
4. Implementation of energy audit across the whole plant.
5. Energy Cell with members from all departments have been active in contributing towards implementation of ENCON projects, and to increase awareness among all level of employees on Energy Conservation.
6. A dedicated online portal is in place, such that employees can provide their suggestions related to energy conservation measures related to their workplace.

Thank You