An INOX GFL Group Company

CII National Award for Excellence in Energy Management

Conserve Energy –To Preserve Future

Gujarat Fluorochemicals Limited

1. Sh Mukesh Jain : Head –Power Plant
2. Sh Nitin Chaudhary : AGM-TS
3. Sh Hardik Barot : Manager – Power Plant

1. Overview

The Inox Group, established more than 90 years ago, is a well regarded USD multi Billion group with diversified presence across **7 business verticals**. It includes 5 listed companies with a combined market cap of **~USD 4.3 Bn**. The group has recently restructured in two different groups

Chemicals businesses of the company falls under InoxGFL

Chemical Business

- Gujarat Fluorochemicals Ltd, leading Indian Chemicals Company
- Business verticals : Fluoropolymers, Fluorospecialities & Chemicals.
- The largest PTFE / fluoropolymer manufacturer in India

- Inox Wind Ltd is a fully integrated player in the wind energy market and provides end-to-end turnkey solutions

- Inox Wind Energy Ltd is the holding company of wind business & demerged from GFL Ltd in FY 21

Market leader in diverse set of industries: Significantly ahead of nearest competitors

ABOUT

- Headquartered in Noida, India, Gujarat Fluorochemicals Limited (GFL) is an Indian Chemicals Company with over 30 years of expertise in Fluorine Chemistry
- An ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 certified organisation
- Established player in Fluoropolymers, Fluorospecialities, Refrigerants and Chemicals
- 1989 - commencement of Company's first commercial operations with India's largest Refrigerant manufacturing unit at Ranjitnagar, Gujarat, India
- 2007- started operations at Dahej, Gujarat, India - manufacturing facility for Fluoropolymers
- Vertically integrated Operations - from natural minerals to Fluoropolymers
- Three manufacturing facilities in India, Fluorspar mine in Morocco, offices and warehouses in Europe and USA
- Accredited by CRISIL, India's largest rating agency - AA (stable) rating for long term credit and A1+ rating for short term credit

2. Product Portfolio

FLUOROPOLYMERS

- PTFE
- PFA
- FEP
- FKM
- PVDF
- ADDITIVES

FLUOROSPECIALITY

- HF BASED
- TFE BASED
- KF BASED
- CHLOROFORM

REFRIGERANTS

- R22
- R125

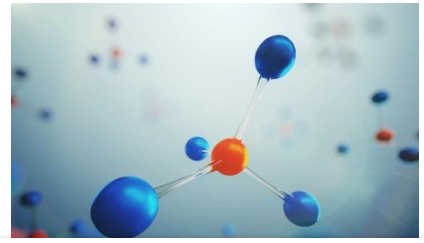
CHEMICALS

- CAUSTIC SODA
- CARBON TETRACHLORIDE
- CHLORINE
- METHYLENE DI CHLORIDE
- HYDROCHLORIC ACID
- HYDROGEN GAS

FLUOROPOLYMERS

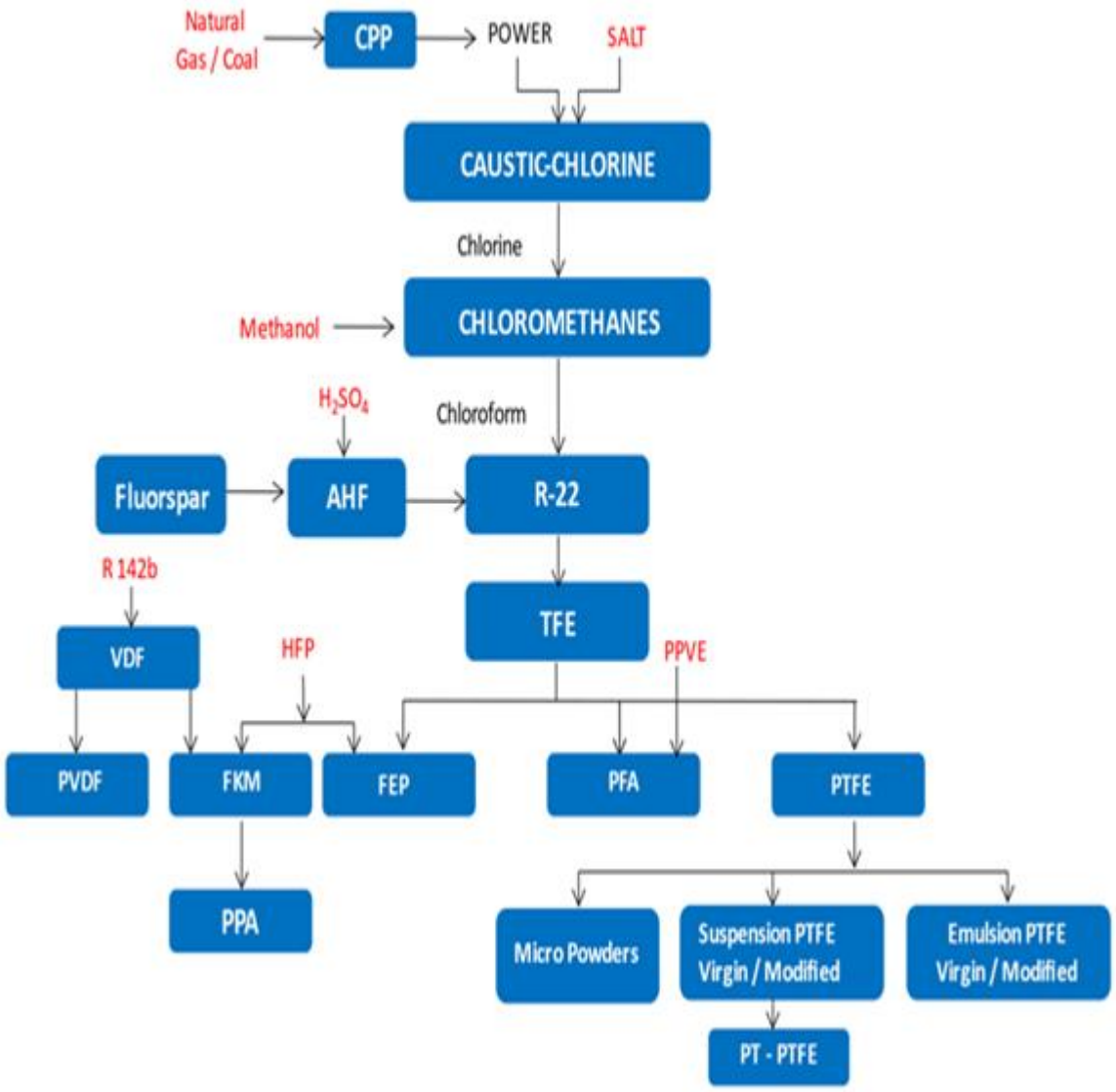
FLUOROSPECIALITIES

REFRIGERANTS



CHEMICALS

Manufacturing Process



GFL is a major manufacturer of PTFE and other TFE and VDF based polymers (namely PVDF, FKM, FEP, PFA, PVDF etc)

The process starts with manufacturing of Chlorine in Chloroalkali plant, which reacts with Methanol in Chloromethane plant to generate Chloroform.

In AHF plant, Fluorspar is reacted with Sulphuric Acid and Oleum to generate Hydrogen Fluoride.

Hydrogen Fluoride reacts with Chloroform to generate R-22.

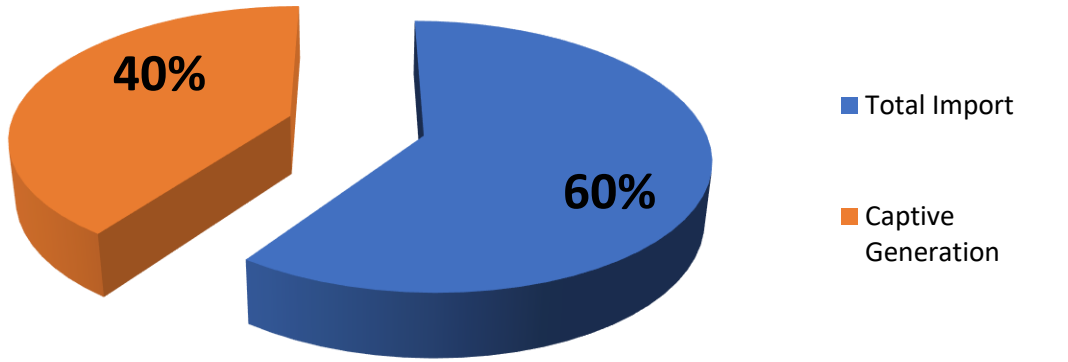
R-22 is cracked under high temperature to form TFE, which is the base monomer for further Polymerization processes.

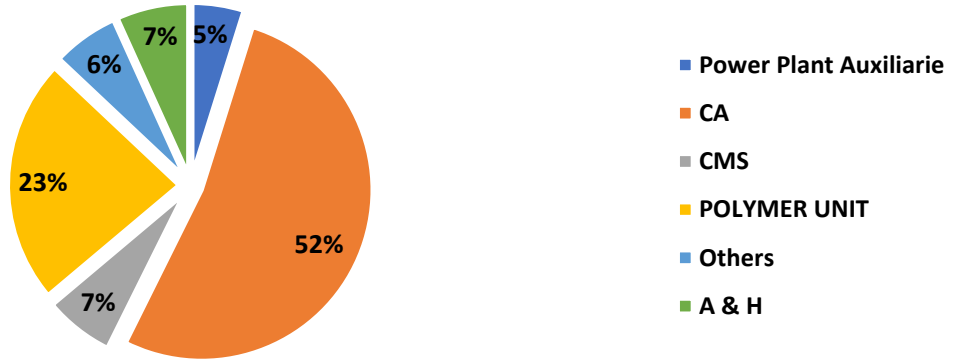
Also, R-142b is cracked under high temperature to form VDF, which is also a monomer for our Polymerization processes.

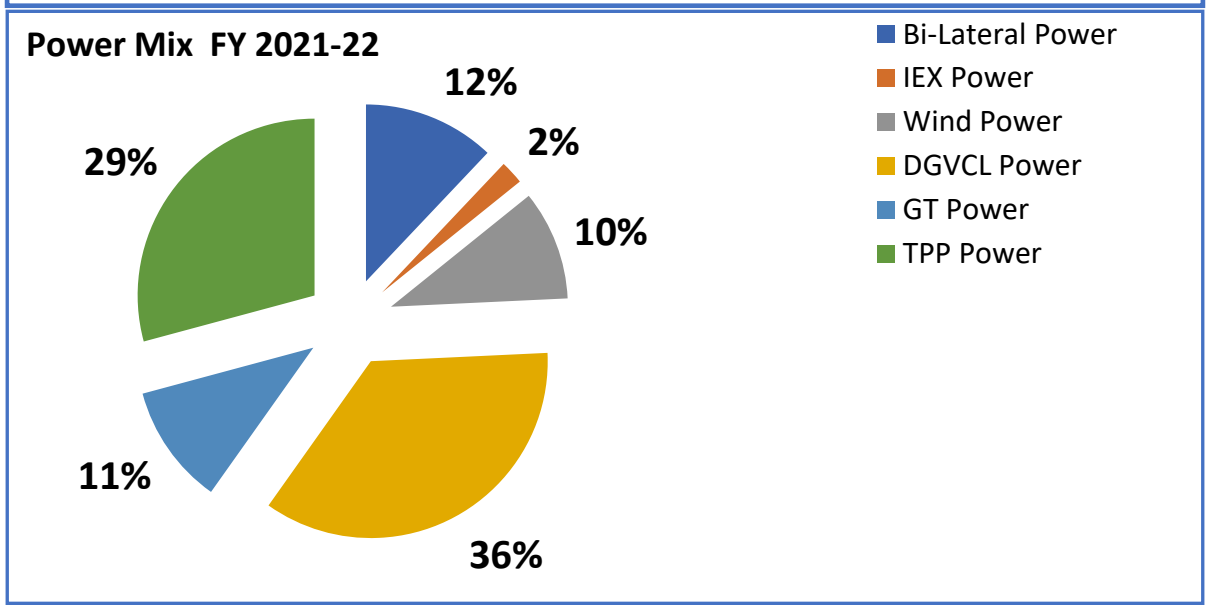
Monomers at different compositions reacts in the Polymerization Reactors to generate different grades of Polymers

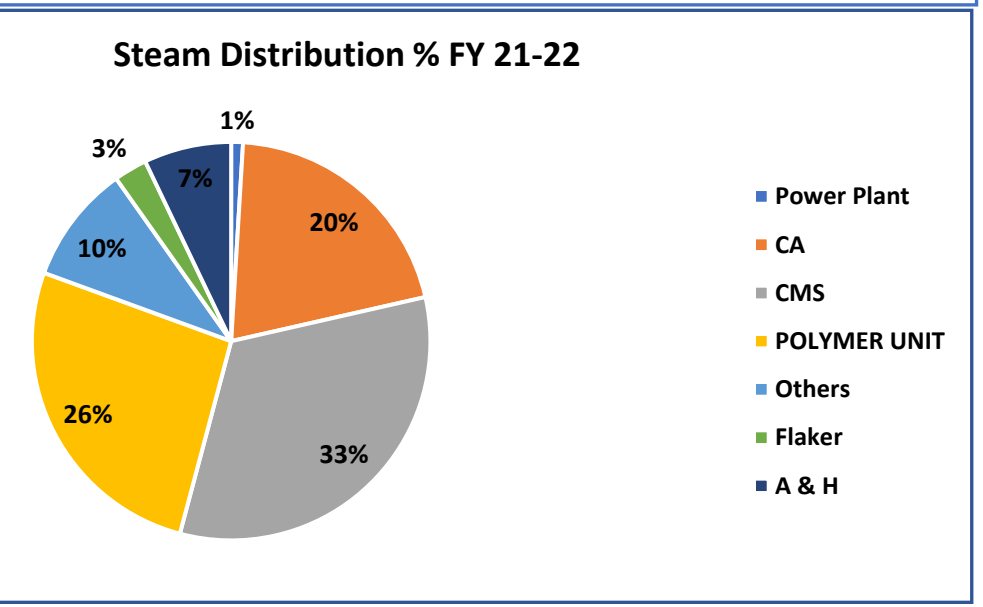
Our one of the product PVDF, is being used for renewable energy through solar panel film as well as in Lithium battery for EV segment.

Power Mix & Power and Steam Distribution Across the Complex









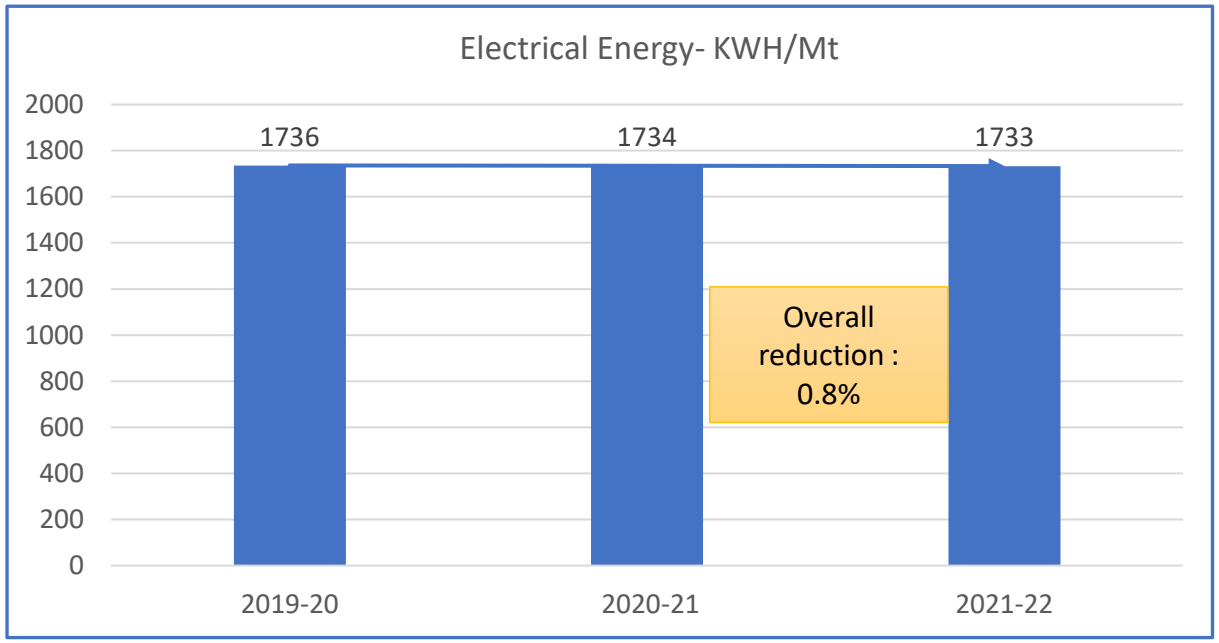
3. Sp. Energy Consumption in last 3 years (FY 19-20 to FY 21-22)

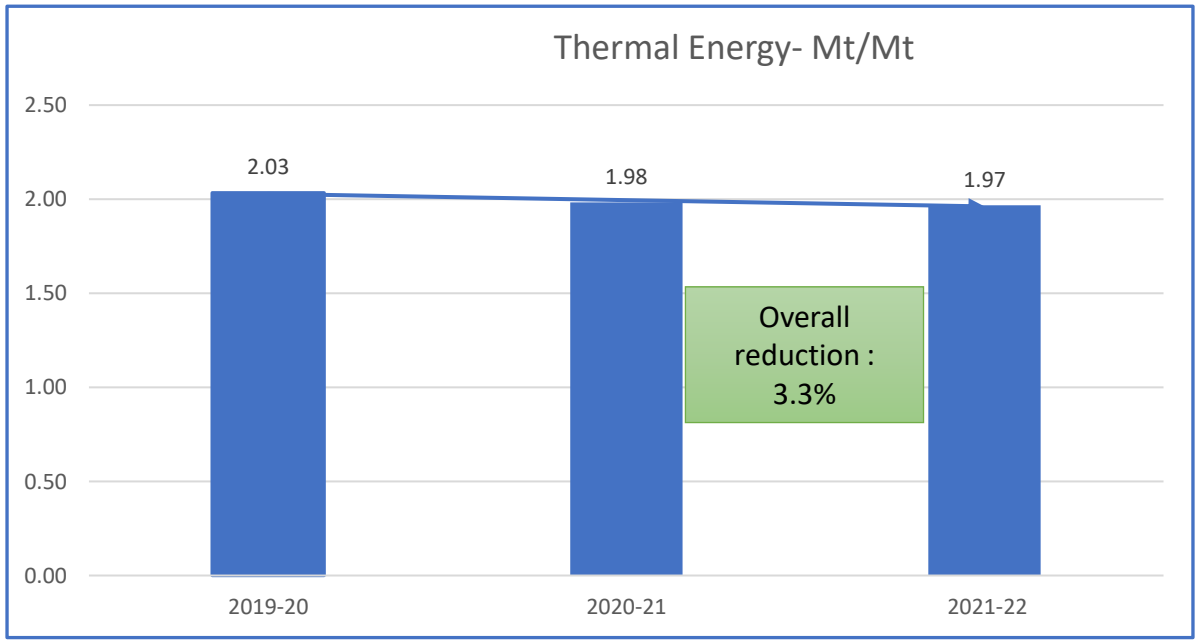
Electrical Energy

Items	FY 2019-20	FY 2020-21	FY 2021-22
Overall Energy Cons (Kwh)	649925610	616175781	664181317
Total Prod (Mt)	374480	355298	383325
Kwh/Mt	1736	1734	1733

Thermal Energy

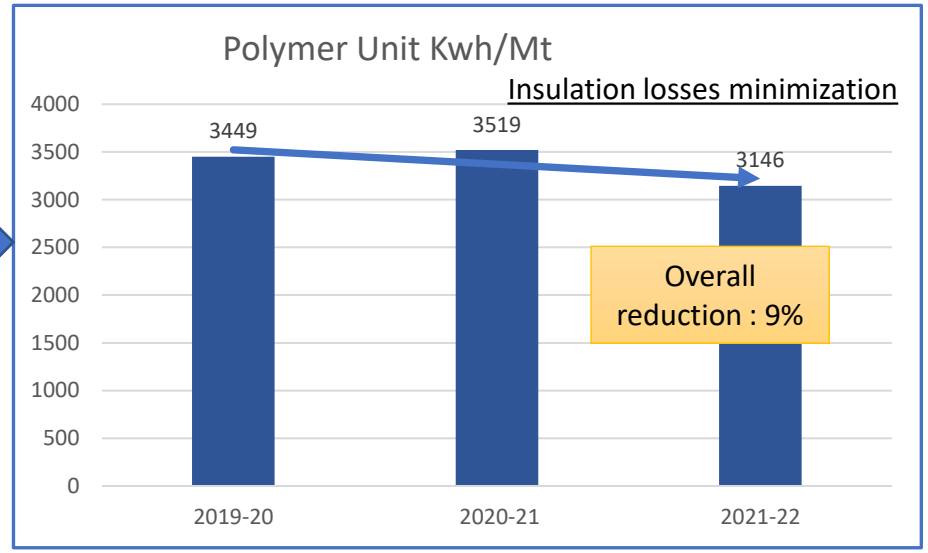
Items	FY 2019-20	FY 2020-21	FY 2021-22
Overall Energy Cons (Mt)	761821	704704	754101
Total Prod (Mt)	374480	355298	383325
Mt/Mt	2.03	1.98	1.97

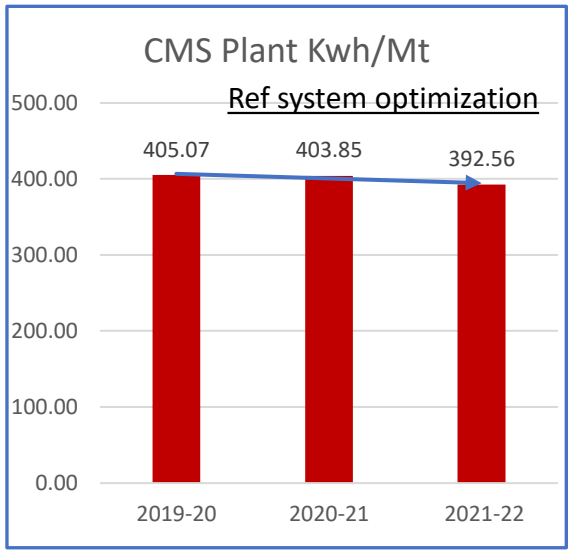


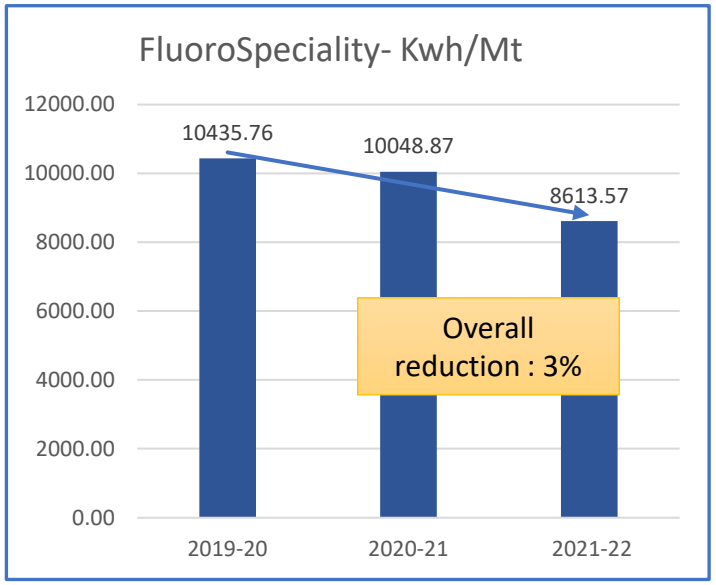


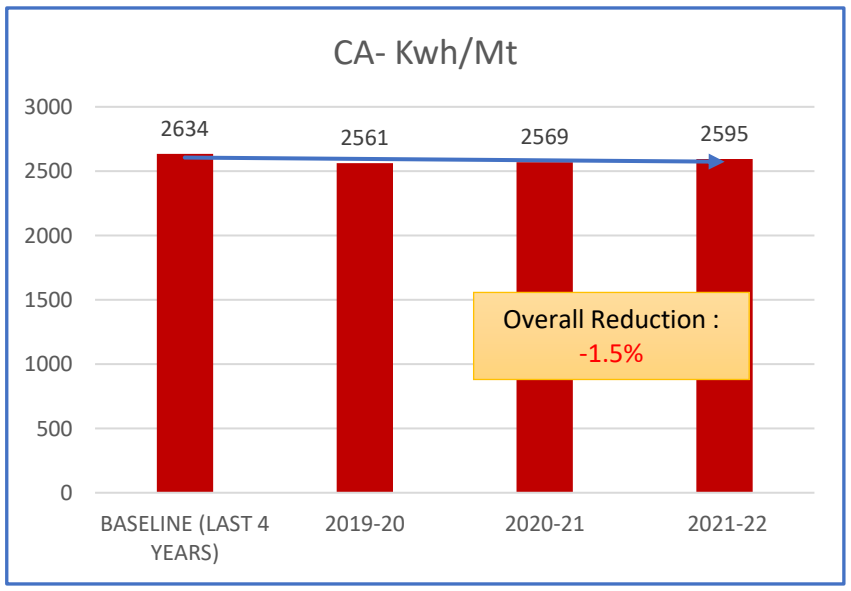
Sp. Electrical Energy Consumption -Product Specific

Through various ENCON projects

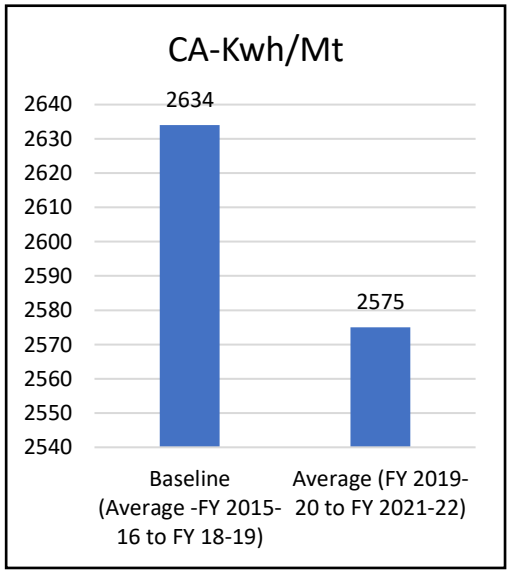








Reason for Variances :
GFL's CA plant is running @ 6 CD –Highest .
Why at 6 CD- To meet chloromethanes's chlorine demand



Sp. Thermal Energy Consumption -Product Specific

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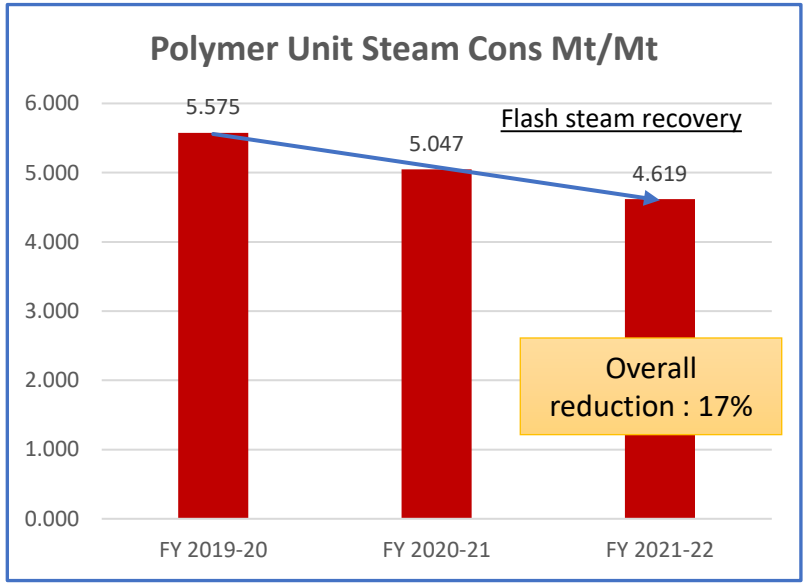
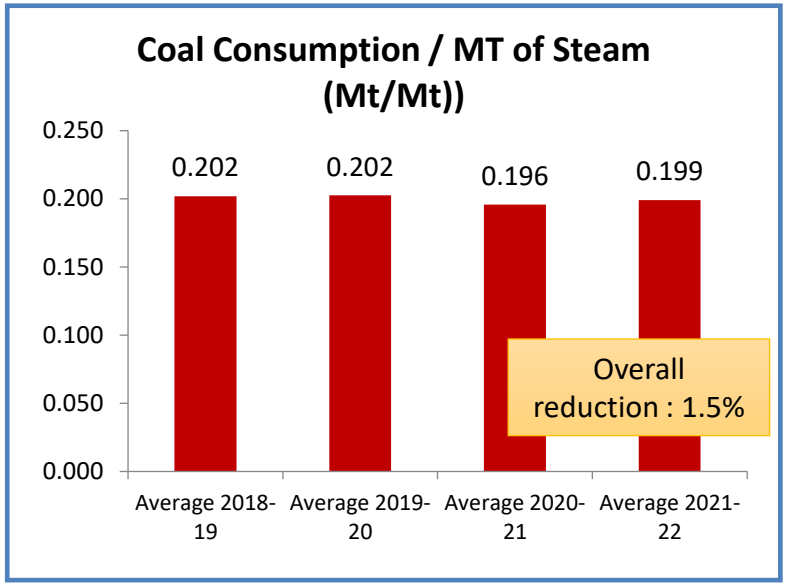
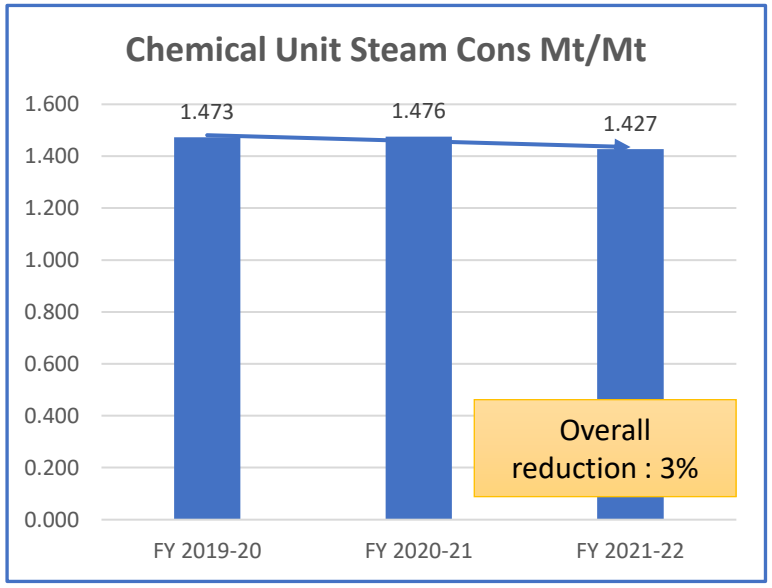
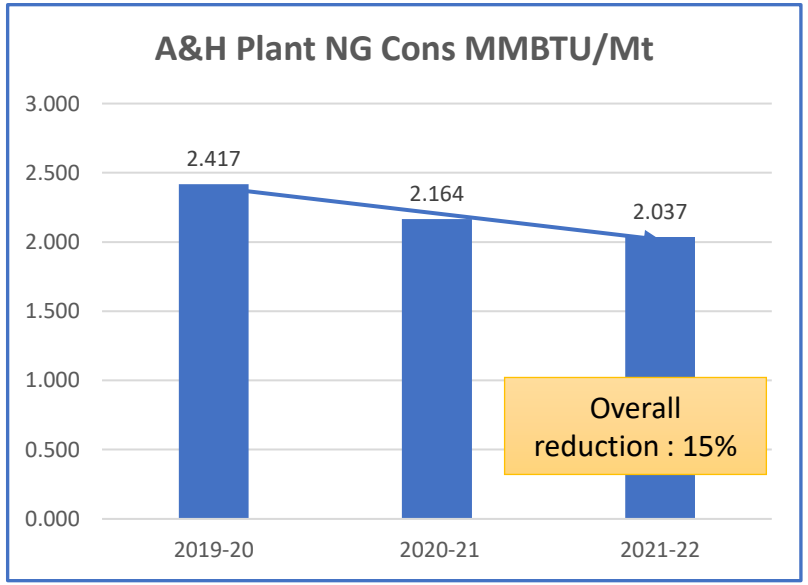
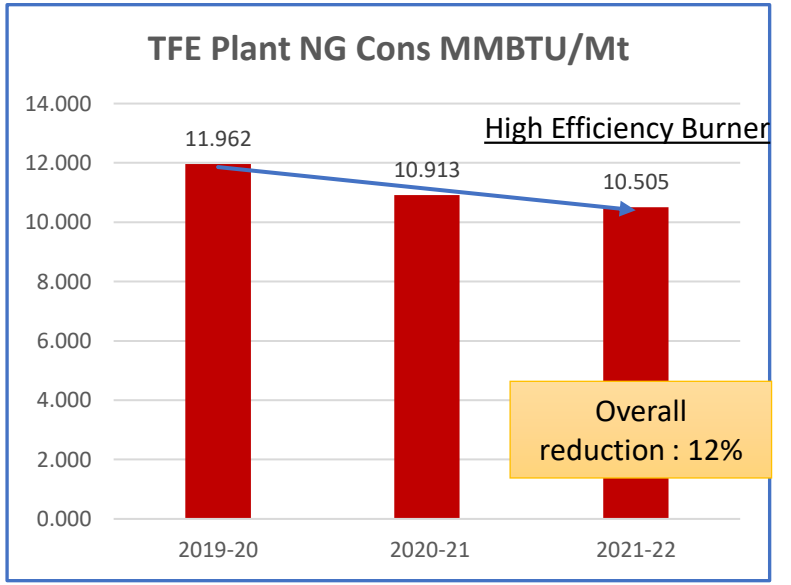
Through various ENCON projects











Initiatives Taken For Energy Conservation

Condensate Polishing Unit with High Temp Resin

- Steam consumption reduction by 0.5% in turbines
- Conservation of natural resources, Water & Coal
- Makeup water saving reduction by 1250 KLD
- Reduction in carbon footprints
- Investment :50 Lakh
- Benefit : 291 Lakh/An

Energy Efficient FRP Blades in all Cooling Towers

- Reduction in Power Consumption
- Investment :50 Lakh
- Benefit : 55 Lakh/Annum

Insulation Thickness Survey Across Complex of Refrigerant Lines

- Reduction in power consumption across polymer complex by 0.4%
- Reduction in carbon footprint
- Investment : 120 Lakh
- Benefit : 150 Lakh/Annum

Utilisation of Generated Flash Steam

- Reduction in steam consumption by 17% in DPTFE plant
- Reduction in carbon footprint
- Investment : 144 Lakh
- Benefit : 156 Lakh/Annum

Reduction in Coal Consumption in Boilers

- Conservation of natural resources
- Reduction in coal consumption by 0.5%
- Reduction in carbon footprint
- Benefit : 51 Lakh/Annum

Conversion of Electrolyser to Zero Gap at Chlor-Alkali Plant

- Power saving by approx 6.7 MW

There are many other energy conservation recommendations , identified during audit, are under regular review for timely implementation.

4. Information on Competitors , National & Global Benchmark

- Being an unique player in POLYMER & FLUOROPOLYMER , It’s difficult to do the benchmarking
- From raw materials to fluoropolymers –Completely forward & backward integrated complex.
- Unique player in the World having so much variety of product mix with complete integration .
- YES, Internal benchmarking we are doing.

Roadmap – To Achieve Target –ENCON Projects Planned in FY 22-23

Installation of Micro Turbine
Power Saving : 2.1 MKwh
Investment : 2 Cr ,Saving : 1.2 Cr

Installation of VFD enables instrument compressor
Investment : 0.35 Cr, Saving : 0.16 Cr

1733 Kwh/Mt

1725 Kwh/Mt

FY 21-22

FY 22-23

FY 23-24

1710 Kwh/Mt

1730 Kwh/Mt

1.5 % Reduction

Installation of Zero Gap Membranes in Electrolyser
Power Saving :7.8 MKwh
Investment : 3 Cr , Saving : 2 Cr

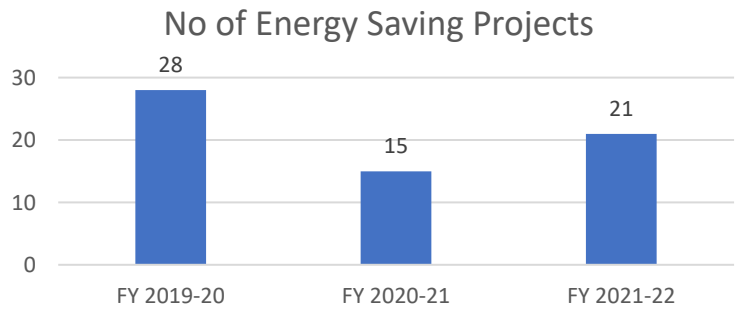
Installation 20 MVAR HT capacitor bank to improve overall Power Factor from 0.91 to 0.98 on 66kV grid .
Investment : 8 Cr , Saving : 3.2 Cr

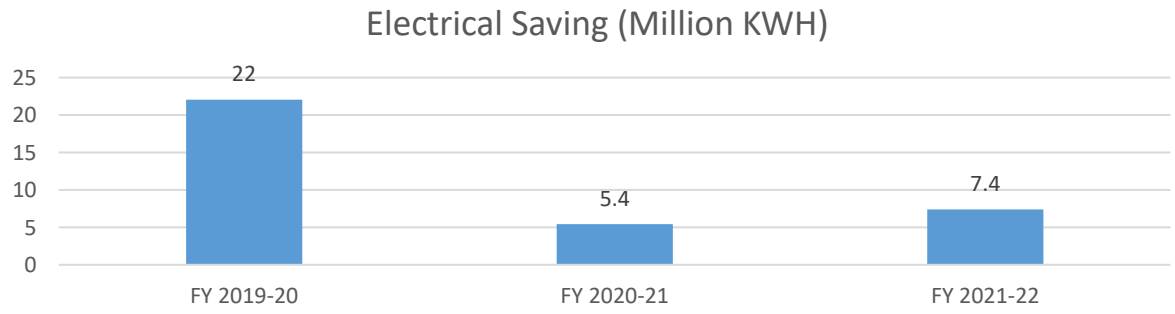
De-staging of Boilers Feed Pumps
Investment : 0.13 Cr, Saving : 0.25 Cr

Ref System Losses Optimization
Power Saving : 6.5 MKwh
Investment : 0.6 Cr, Saving : 0.5 Cr

5. Energy Saving Projects Implemented in Last 3 Years

Year	No of Energy Saving Projects	Investment (INR-Million)	Electrical Saving (Million KWH)	Thermal Saving (Million Kcal/MTOE)	Savings (INR-Million)	Impact on SEC (Thermal,Electrical)
FY 2019-20	28	80	22	2582	83	0.2%, 2%
FY 2020-21	15	60	5.4	44941	165	0.1%, 5%
FY 2021-22	21	40	7.4	-	59	0.2%, 2%





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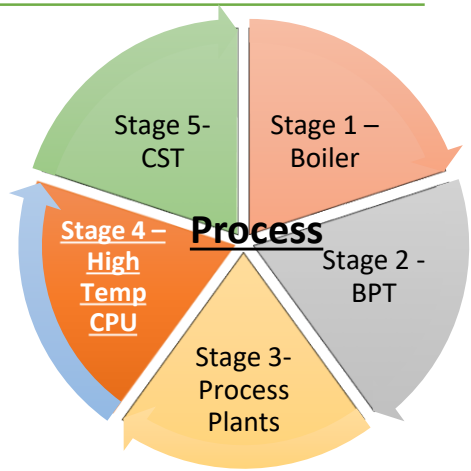
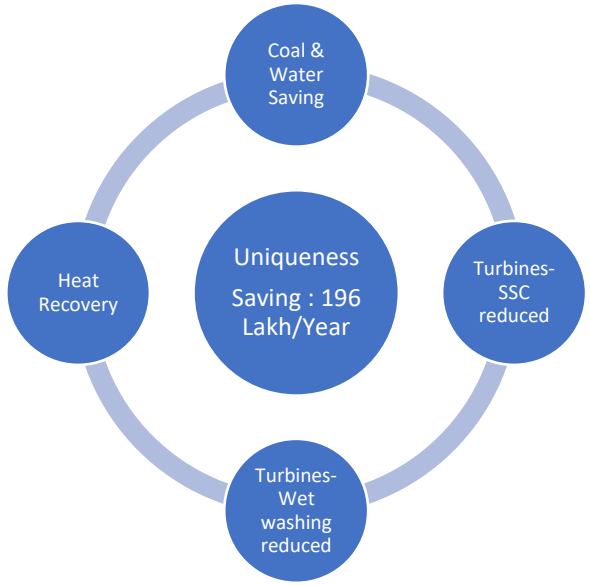
6.1 Condensate Recovery Through High Temperature Condensate Polishing Unit (CPU)

Conservation of Natural Resources

Problem :--

Fresh DM water cons high & Heat loss → Process return condensate collection → Return condensate quality monitoring → Silica controlling → High temp compatibility RESINS





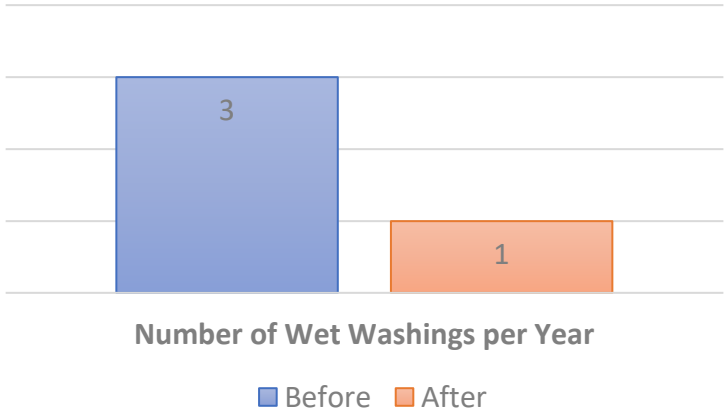
Payback : 02 month

Adopted as a Best Practice

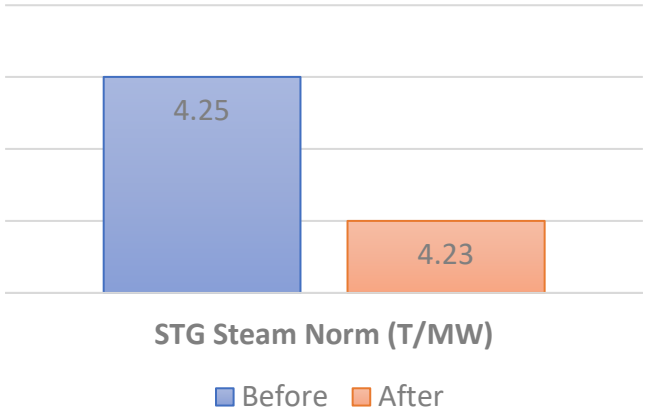
Steam to Process : 100 TPH
Condensate Recovery @ 70% = 70 TPH

Equivalent Heat Gain from Condensate
50°C Temperature Gain = 2600000 Kcal/

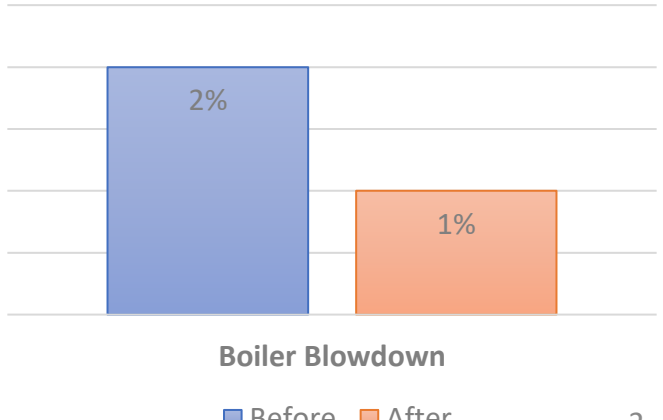
Equivalent Coal Savings = 4900 MT/Yr
Annualized Savings = Rs 196 Lacs/Yr



Savings for reducing wet washings= Rs 40 Lacs/ Yr



Savings for improving Steam Norm = Rs 41 Lacs/ Yr



Make up water quantity reduced by 50 M3/Day
Savings = Rs 14 Lacs / Yr

6.2 Back Pressure Turbine

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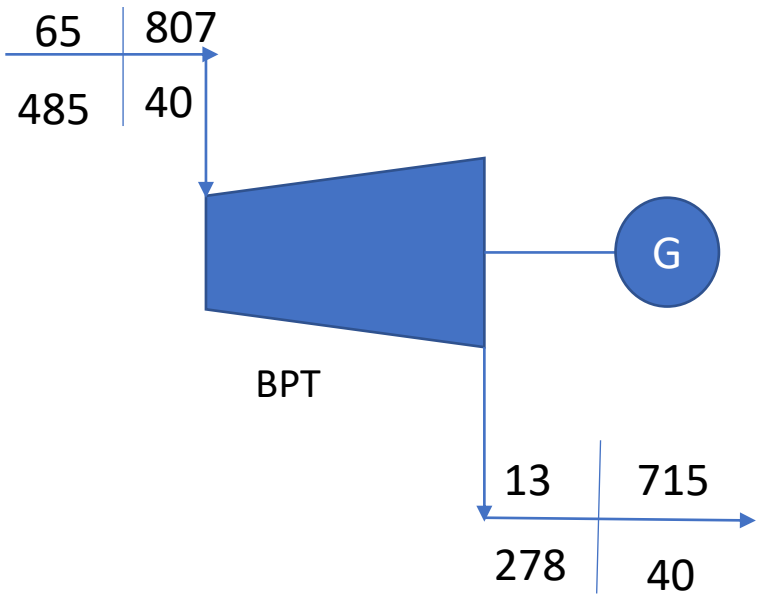
Purpose: In view of meet out process plant steam demand ,4 Mw back pressure turbine is required to utilize the steam energy for power generation before supplying to the process

Back pressure turbine: High pressure steam let down in BPT, Generate the power and low pressure & temp steam supply to the process



INVESTMENT: 799.5 LACS

POWER GENEARATION @ SSC 12 MT/MW= 3.33 MW

NET POWER GENERATION AFETR AUX.=3.15 MW

POWER GENEARTION PER DAY = 75600 KW

POWER GENERATION PER YEAR= 26838000 kW

SAVING PER YEAR @ 5.90 Rs/kwh= 158344200 Rs.
(COST OF PURCHASED POWER =5.90 Rs./kwh)

PAYBACK= 6 MONTHS

6.3 Flash Steam Recovery

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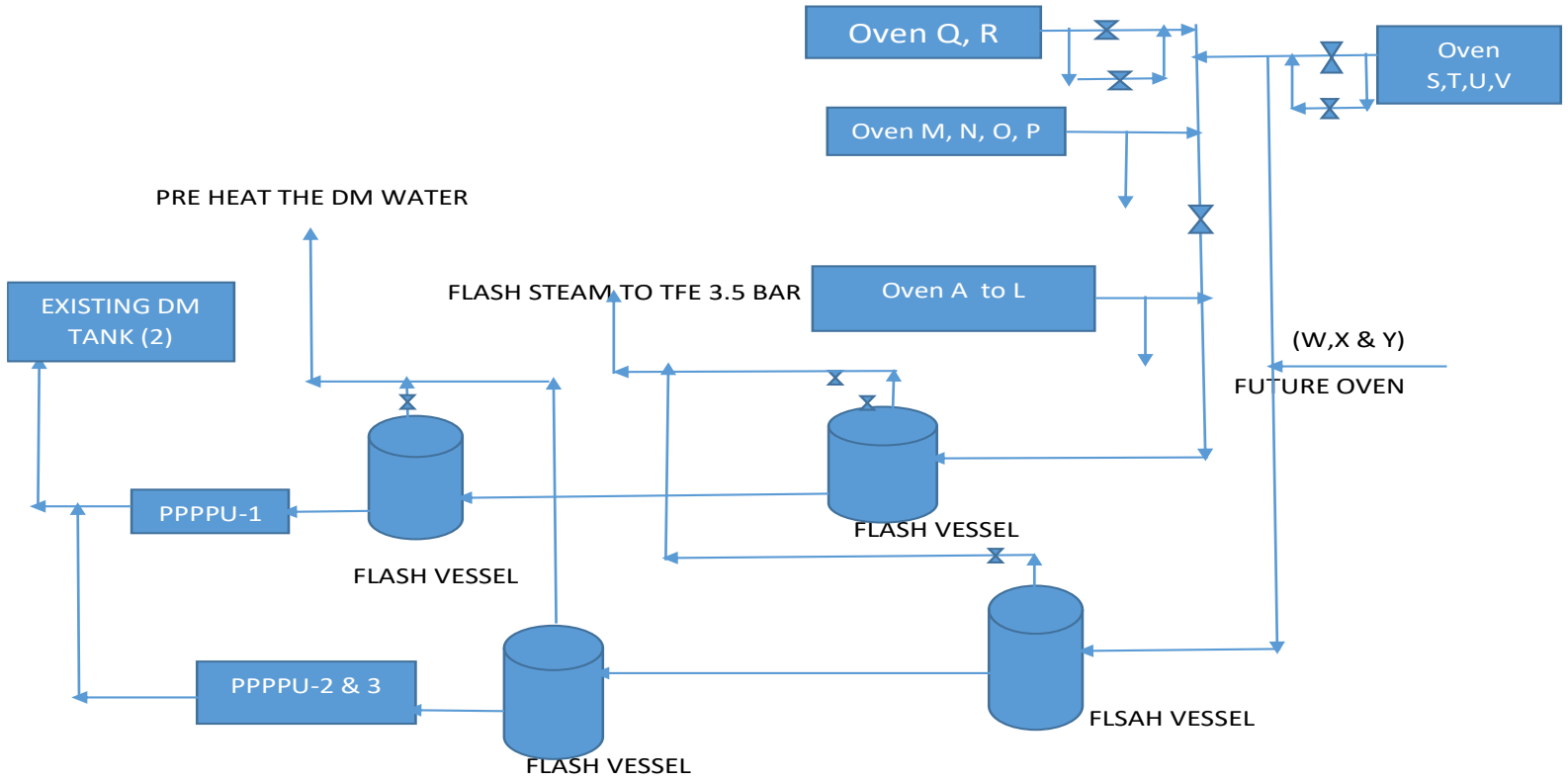
Purpose: To minimize steam venting & save 40-45 TPD steam, along with monetary saving of power & water.

Recovered flash steam will be utilized in TFE plant and condensate recovery will also get improved from 54% to 90%.

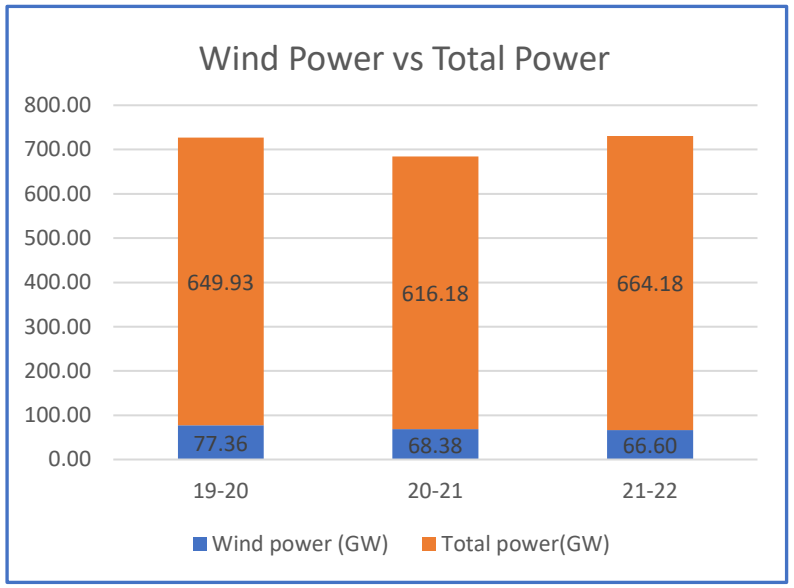


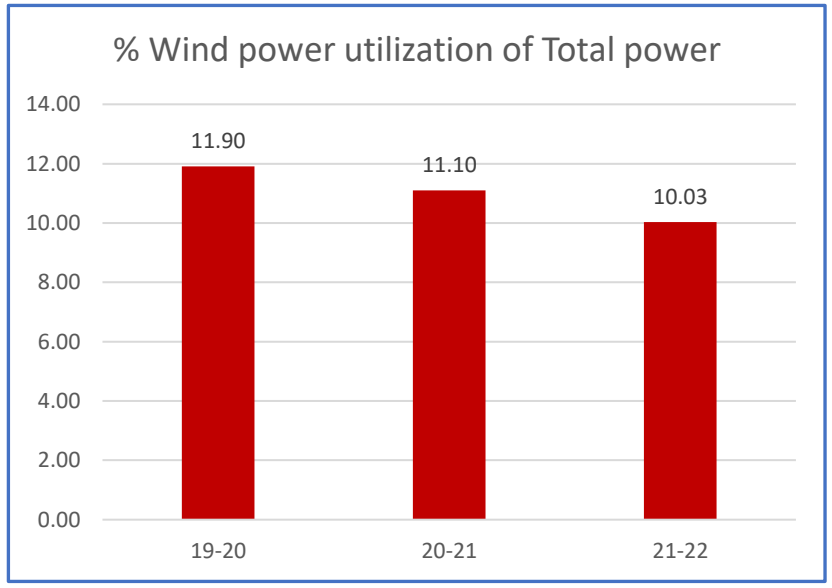
INVESTMENT: 160 Lakh

SAVING PER YEAR : 145 Lakh/annum

PAYBACK= 11 MONTHS

7. Utilization of Renewable Energy Sources





Year	Technology (Electrical)	Type of Energy	Onsite/Offsite	Installed Capacity (MW)	Generation (Million KWH)	% Overall Energy
2019-20	ELECTRICAL	WIND POWER	OFFSITE	50 MW	77.36	11.9
2020-21	ELECTRICAL	WIND POWER	OFFSITE	50 MW	68.38	11.1
2021-22	ELECTRICAL	WIND POWER	OFFSITE	50 MW	66.60	10.03

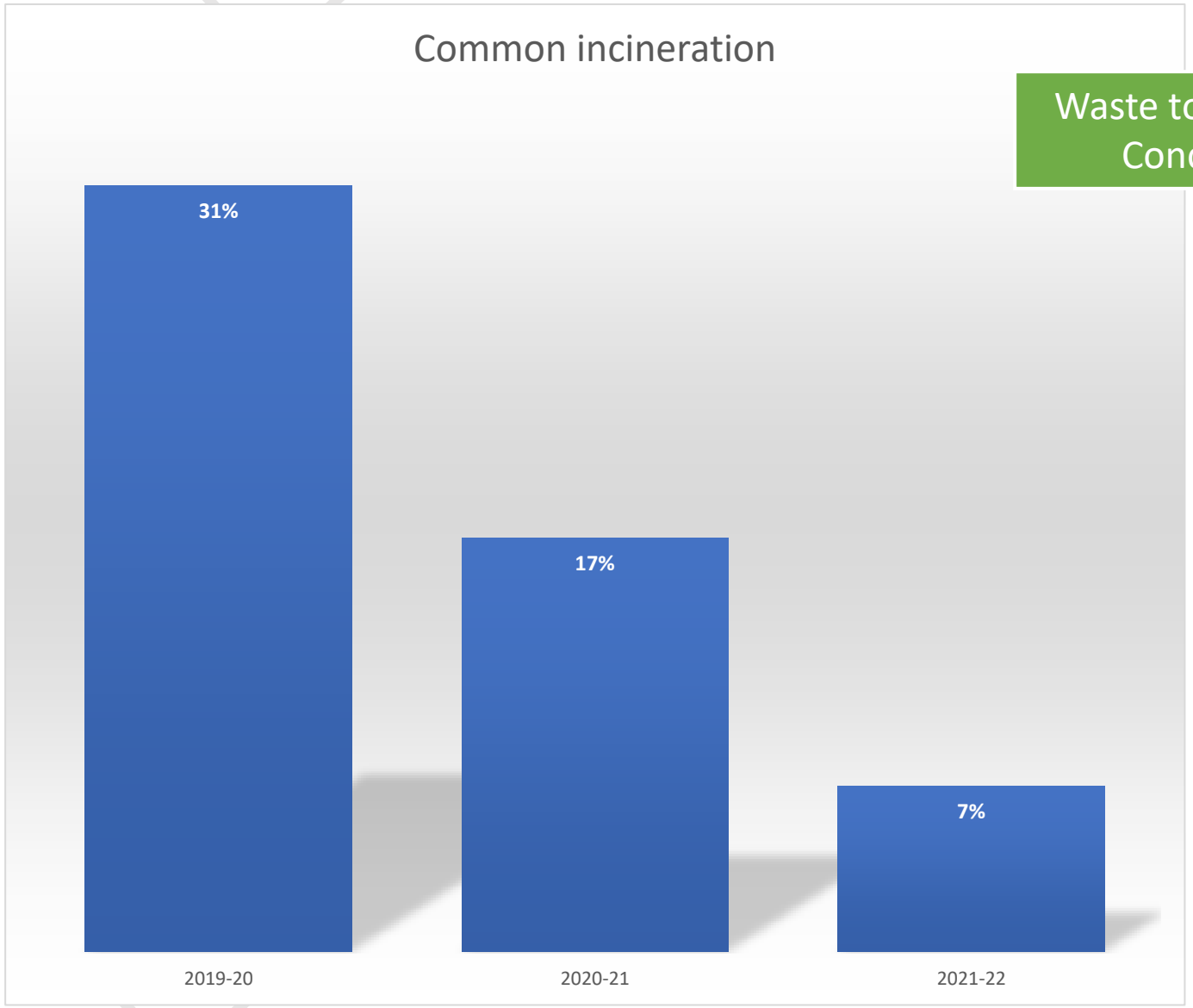
8. Waste Utilization & Management

SN	Year	Type of waste generated	Quantity of waste generated (MT/year)	Disposal method
1	2019-2020	Process waste and Distillation residue	912.14	Coprocessing & Incineration
		Landfill waste	391.79	GPCB Approved TSDF Site
2	2020-2021	Process waste and Distillation residue	1924.41	Coprocessing & Incineration
		Landfill waste	663.71	GPCB Approved TSDF Site
3	2021-2022	Process waste and Distillation residue	3169.839	Coprocessing & Incineration Rule-9
		Landfill waste	581	roved TSDF Site

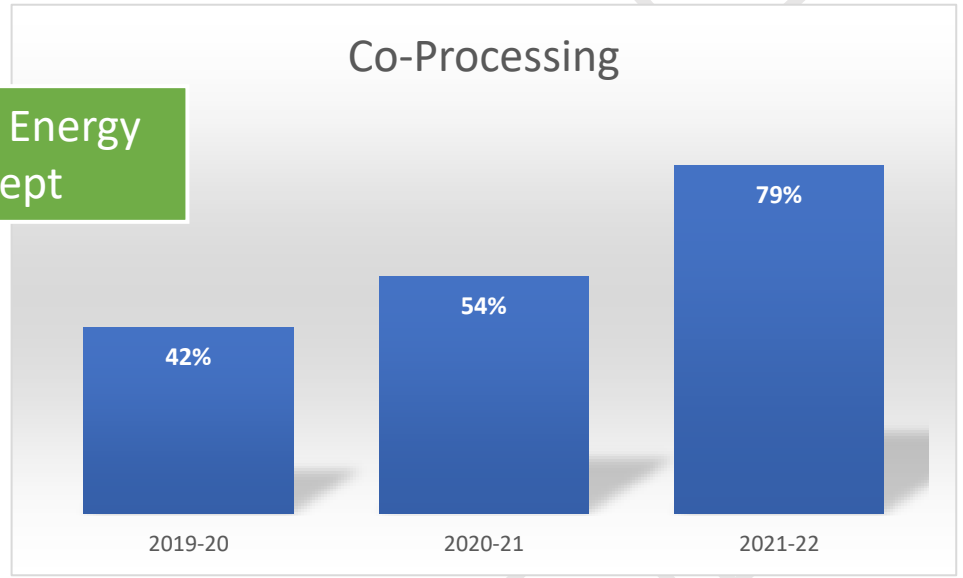
Not applicable for GFL-Fuel

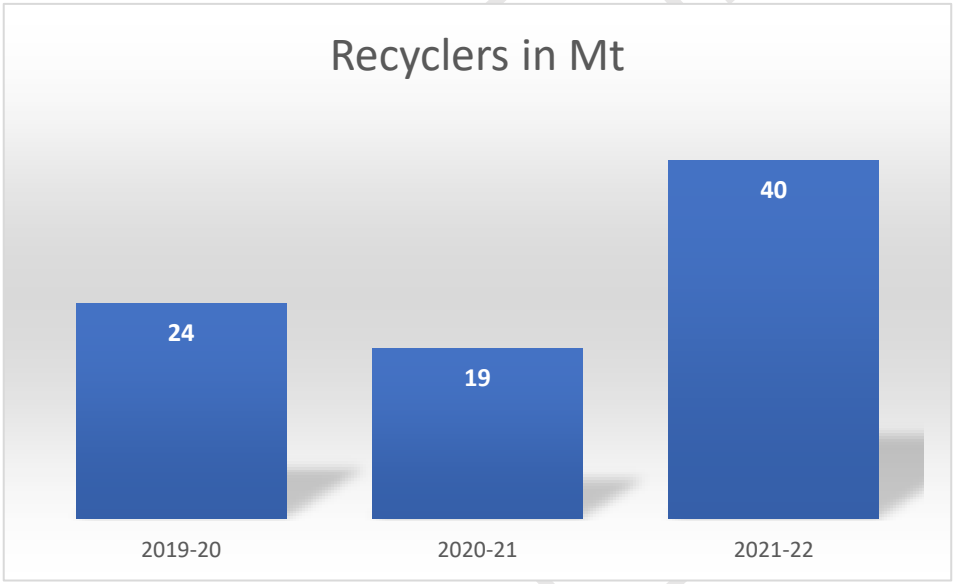
SN	Year	Type of waste	Quantity (Mt)	GCV	Waste as percentage of total fuel
1	2019-2020	Process waste and Distillation residue	912.14	2000(KCal/Kg)	-
2	2020-2021		1924.41	2575(KCal/Kg)	-
3	2021-2022		3169.839	2101(KCal/Kg)	-

Waste Management



Waste to Energy Concept





9. GHG Inventorisation

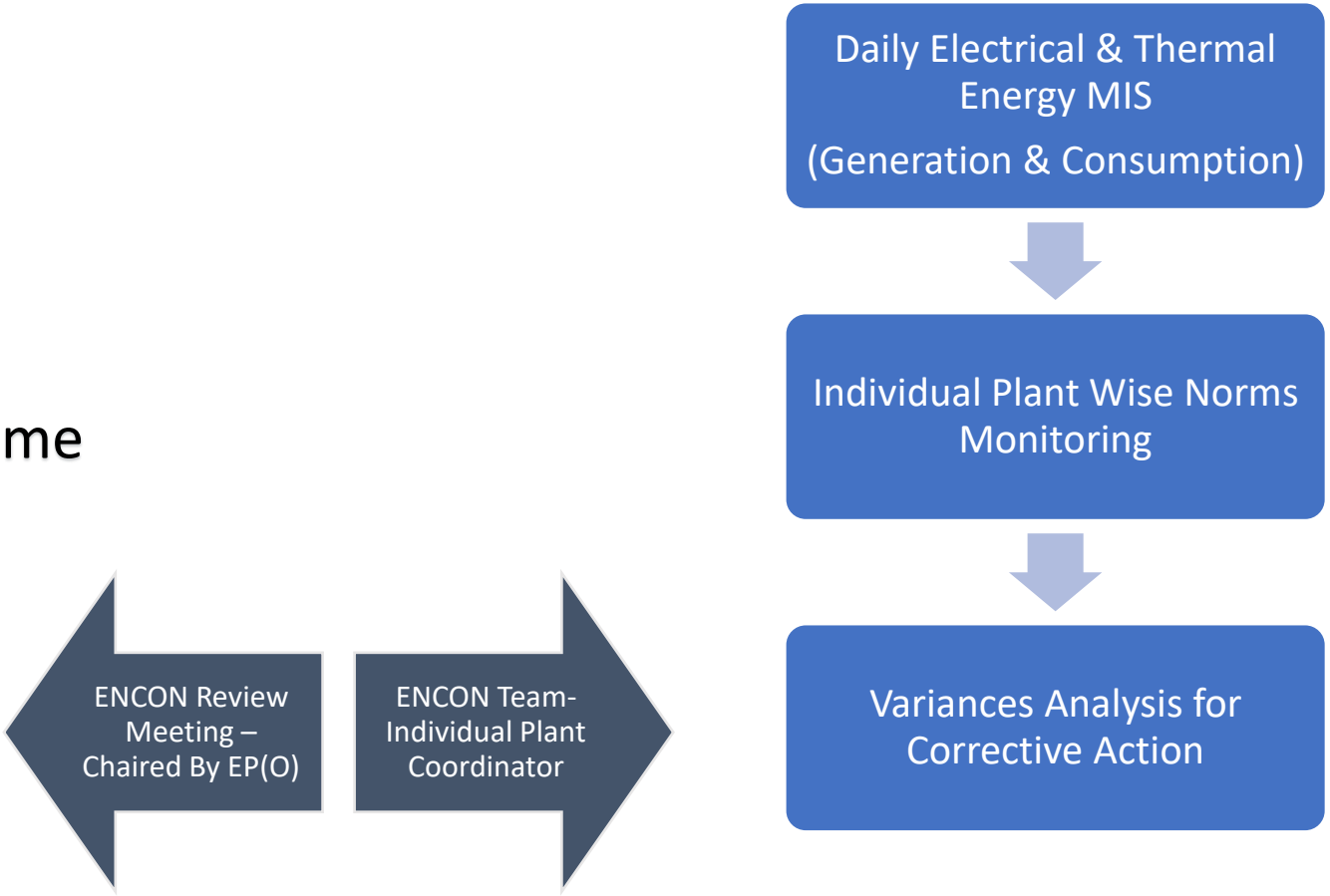
Information of GHG Inventorisation and Public Disclosure.	We have required mechanisms for monitoring and measurement & for calculating GHG emissions of the Company. 2019 was of our first year for GHG emissions reporting and we have used The GHG Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) for calculating our emissions. We are disclosing our ESG performance through various public disclosure platforms like; CDP (Climate Change and Water Security), UNGC COP, and Integrated Annual Report.
Scope of emissions	The base year for us was 2019, Measuring and disclosing greenhouse gas (GHG) emissions transparently is an important step towards reducing our carbon footprint. While our absolute Scope 1 and Scope 2 emissions declined during the year 2020, our target is to reduce our combined Scope 1 and 2 emissions further. For Scope 3 emissions we were able to calculate a few categories so far and we are further exploring possibilities to report our emissions in the remaining categories.
Absolute emissions and Emissions intensity of the last three years	Absolute emissions: FY 2019 – 20 : (in tCo2e) Scope – 1 : 635,054.32 Scope – 2 : 289,821.30 Scope – 3: Waste generated in operations: 7154.00 tCo2e Business travel : 104.00 tCo2e Downstream leased assets : 281.00 tCo2e FY 2020 – 21 : (in tCo2e) –PROVISIONAL Scope – 1 : 625,770.00 Scope – 2 : 165,707.00 Scope 3 Upstream T&D : 132,167.17 tCo2e Scope 3 Use of Sold Products : 2,307.12 tCo2e Reduction of Scope 1 emission by 8,437 tCO2 in FY 21, in comparison to FY 20. Scope 1 emission reduction by 1.33% and Scope 2 emission reduction by 42.3%.
target for CO2 emission reductions	Under Review
Initiatives on carbon capture	In our efforts to fight climate change, we have adopted several initiatives to increase our energy efficiency and thereby reduce GHG emissions by carbon capture: Switching to energy-efficient machineries and processes such as replacement of motors, reduced throughput, flash steam recovery systems, etc.; Installed close loop sampling system to avoid emissions; Minimizing fuel consumption through ENCON measures and maximizing the use of cleaner fuel. Our sustainability efforts have helped to considerably reduce the amount of carbon emissions. To manage our carbon footprint and achieve our emission reduction goals, we have strategized many interventions to reduce transportation needs and fuel consumption. We continuously monitor and manage emissions from logistics, to implement customized interventions for reducing the carbon footprint.

10. Green Supply Chain Management

- Buying major Raw Material like Sulphuric Acid & Salt from nearby location Dahej and thereby have been saving on diesel cost used in transportation
- Similarly we have been buying coal from Adani which is getting landed in nearby Dahej port thereby have been saving on diesel cost used in transportation
- We have stopped using Asbestos Cement Sheet, all our new projects are done with metal sheets
- For bulky packaging material like HM HDPE Drums we have developed nearby Dahej based sources and hence started saving on diesel cost used in transportation
- Forward Path : To monitor CO_2 emission of RMs suppliers & Transporters -Giving the priority , those having lowest norms

11. Teamwork, Employee Involvement & Monitoring

a. Process Monitoring with Historian
b. Energy – Electrical & Thermal
c. Variance Report & Analysis
d. Separate Budget for ENCON
e. Fast Track Approval
f. Energy Efficiency & Training Programme
g. Employee Engagement -PRAYAS



12. Implementation of ISO 50001/Green Co/IGBC rating

a. Under Implementation

13. Learning from CII Energy Award or any other award program

a. An opportunity to participate on such a big platform

b. Showcasing best practices for the benefit of all

c. Witnessing other companies best practices

d. An opportunity to learn from other industries practices

Achievement

- IMC RBNQA Award for Conservation of Natural Resources—
- Year 2019 : TFE Vent Gas Recovery System
- Year 2020 : Effluent Recovery System
- Year 2021 : Condensate Polishing unit


IMC
Chamber of Commerce and Industry
IMC RAMKRISHNA BAJAJ NATIONAL QUALITY AWARD TRUST

SECOND RUNNER-UP CERTIFICATE

AWARDED TO

Gujarat Fluorochemicals Ltd
Bharuch

IN THE MANUFACTURING CATEGORY

at the

MQH Best Practices Competition

6 - 9 July 2021

NIRAJ BAJAJ
CHAIRMAN


Won the 'IMC RBNQA Performance Excellence Trophy & 'MQH Best Practice Competition' under Manufacturing Category (14th & 15th March,2019)


IMC
Chamber of Commerce and Industry
IMC RAMKRISHNA BAJAJ NATIONAL QUALITY AWARD TRUST

FIRST RUNNER-UP CERTIFICATE

AWARDED TO

Gujarat Fluorochemicals Ltd
Bharuch

IN THE MANUFACTURING CATEGORY

at the

MQH Best Practices Competition 2.0

23 & 26 June 2020

NIRAJ BAJAJ
CHAIRMAN

Awards & Certificates

Energy Saving Certificates :
FY 2018-19 : PAT Cycle 2 : 336 ECerts
FY 2014-14 : PAT Cycle 1 : 437 ECerts

Year 2018-19

IMC RBNQA MQH Best Practice Award for **TFE Vent Gas Recovery System**

Year 2019-20

IMC RBNQA MQH Best Practice Award for **Effluent Recovery System**

Year 2020-21

IMC RBNQA MQH Best Practice Award for **Condensate Polishing Unit**

Nov 2021

Par Excellence Award in the International Convention on Quality Control Circle 2021

Dec 2021

CII-15th National Water Excellence Award 2021

Sustainability Awards & Certification

OVERALL SCORE(2021)

Gujarat Fluorochemicals Ltd (Group) is in the top 7% of companies rated by EcoVadis in the Manufacture of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms industry.

CERTIFICATIONS

Health – Safety - Environment	ISO 14001 : 2015 ISO 9001 : 2015 ISO 4501 : 2018
Ethics	ISO 37001 : 2016 ISO / IEC 27001 : 2013
Social Responsibility	We have aligned all our Internal & Supply chain processes as per the following standards ISO 26000 : 2010 ISO 20400 : 2017

Way Forward to Sustainability

Cleaner Production –Greener Production

Solar Panel Films	Electric Vehicle Segment	Conservation of Natural Resources	Awareness

Thank you