

# NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT AND EFFICIENCY



August, 2021

## **PRESENTERS:**

- 1) Ms. Sweta Zode – Executive Production GIL, Valia
- 2) Mr. Rajesh Agrawal – General Manager of GIL, Valia
- 3) Mr. Mayank Naik – Manager Electrical, Valia.

# 1) Plant Profile

- Pioneered in manufacturing of Oleochemicals in India.
- State of Art facility in Valia and Ambernath
- Exports to more than 80 countries

Product	Market Segment/Application
Fatty Acids	Cosmetics, Tyre Industry, PVC Processing
Fatty Alcohols	Cosmetics, Personal Care, Specialty applications, industrial applications
Glycerin	Pharmaceuticals, Humectants, Cosmetics
Surfactants	Detergents, Oil Drilling, Cosmetics, Toot paste, shampoo
Speciality Products and Oleo Derivatives	Cosmetics(Creams, lotions, conditioners), Compliment to our fatty acids and alcohols.

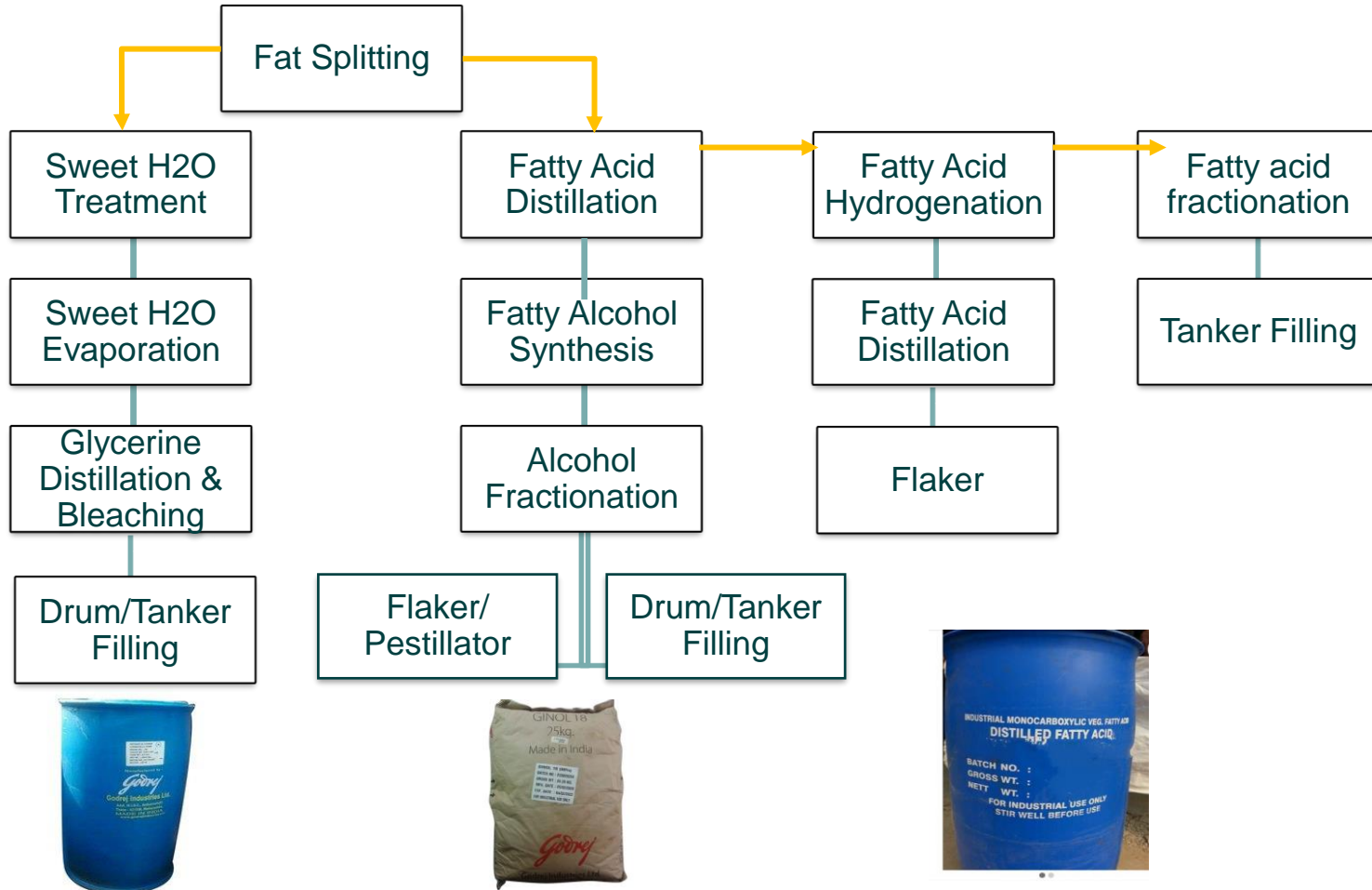
Valia Plant – Spread across 140 Acres



- Fatty Alcohol 40,000 MT/year
- Stearic Acid 20,000 MT/year
- Ref. Glycerine 13,200 MT/year
- Sulfonation 23,000 MT/year
- Erucic acid (new) 14,500 MT/year
- Lubolic Acid 16,500 MT/year
- Palmitic Acid 20,000 MT/year
- Puroleic 6,500 MT/year
- Specialty products 8000 MT/year

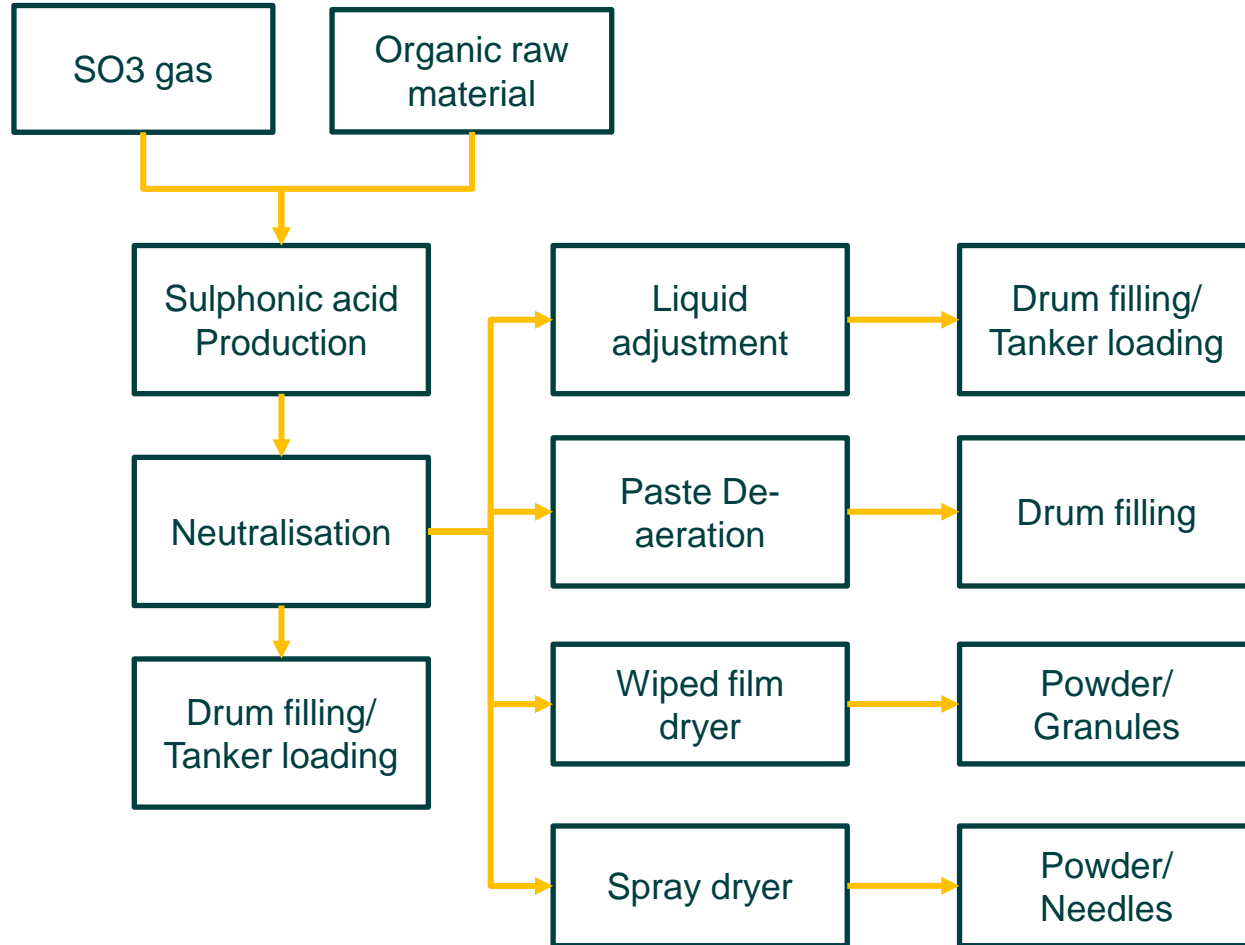
## 2) Manufacturing process

### Processes in Factory



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### Processes in Factory



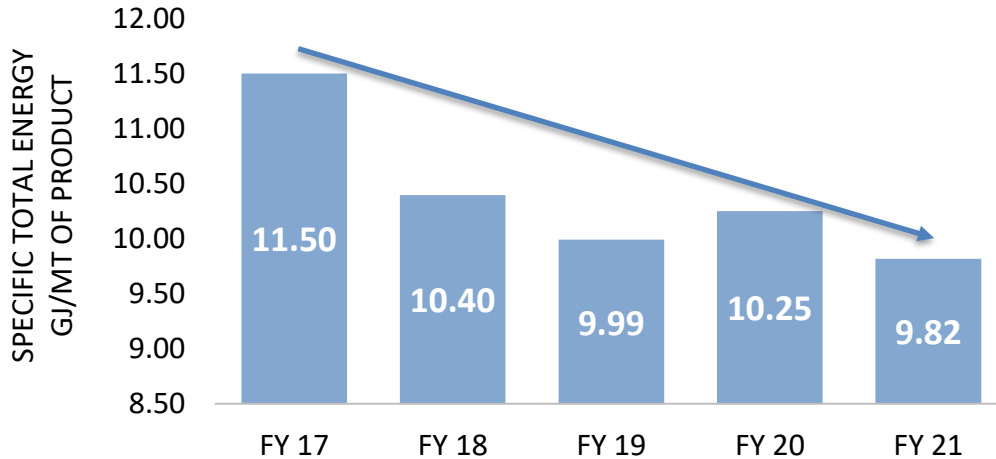
### *3) Impact of Covid*

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- 1) Production Loss: 56% less production in April & May 2020 as compared to previous year
- 2) Sales Volume: Less sales volume revenue in these two months
- 3) Briquette unavailability due to disruption in supply chain resulted in increase use of fossil fuel for energy consumption.
- 4) Multiple start-up & shutdown resulting in higher energy consumption

## 4) Specific energy consumption in last 5 years

### SPECIFIC ENERGY GJ/MT OF PRODUCT



**25.64%**

Reduction from FY 10-11

**17.16%**

Reduction in FY 21 from  
FY 17

**2.61%**

Increase in FY 19-20 from  
FY 18-19

### KEY ACHIEVE- MENTS

1

Energy Efficiency Projects like Water Jet Vacuum systems, use of cooling water instead of using chiller, resizing of pumps.

2

ISO 50001 Energy Management System.

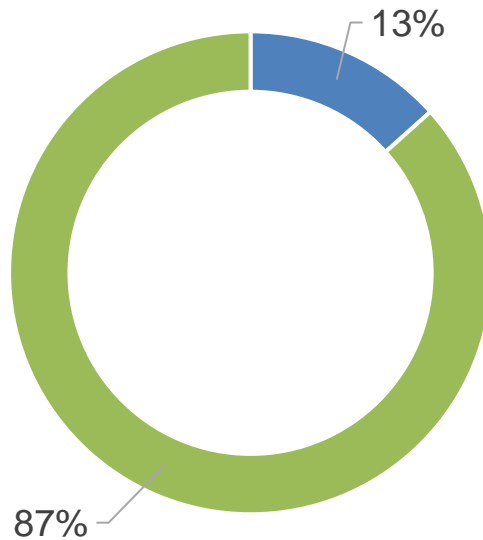
3

Awards: 5S certified by QCFI, India; Kaizen awards in State, National & International levels.

## 4) Energy Distribution in Valia

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Total energy distribution, %



- Electrical (Grid Electricity and DG )
- Thermal (Natural gas, HSD, Furnace Oil, Biomass Briquette)

### Major Changes/Projects in last 3 years

- New Air compressor with VFD and heat recovery unit, Automation in Nitrogen plant for reduction in energy consumption.

## 5) TARGETS

### GIL TARGETS 2021 & 2025

#### FUNCTIONAL PRIORITY

#### LONG TERM TARGETS – 2025

#### SHORT TERM TARGETS – 2021

#### GREEN TARGETS

Achieve 50% reduction in energy intensity against FY12

3% reduction in SEC

Achieve 70% renewable energy portfolio

5% reduction in Specific Emissions

Achieve carbon neutrality (Scope 1&2)

60% renewable energy

Reduce specific water consumption by 70%

5% reduction in Specific Water

Zero liquid discharge – India

10% reduction in Specific waste to landfill

Achieve Zero Waste to landfill status



## 5) *Projects planned in FY 2021-22*

<b>PROJECT</b>	<b>Energy Reduction</b>	<b>Investment (Lakhs)</b>	<b>Savings (Lakhs)</b>	<b>Payback (Months)</b>	<b>CO<sub>2</sub> Reduction (tons of co<sub>2</sub>)</b>	<b>Month of Installment</b>
Briquette based thermic fluid heater of capacity 1.5M Kcal/HR for Alcohol Fractionation (Sec 18,19)	Thermal	600	290	25	1841	Apr-21
Screw blower for sec - 112	Electrical	28	12.10	28	143	2021-22
Sec: 4 Water Jet Vacuum System	Thermal	41.6	41	12	179	2021-22
High pressure NG for Hydrogen generation	Electrical	290	85.68	41	1015	May-21

## 6) Summary of projects implemented in last three years

Year	No. of Energy Saving projects	Investment (INR million)	Electrical Savings (Million Kwh)	Savings (INR Million)	(Total Electrical, Thermal Energy)
FY 2018-19	5	14.72	1.35	10.08	3.28% total reduction in electrical energy KW
FY 2019-20	6	9.95	1.31	14.30	3.13% reduction in electrical KW & 0.99% reduction in thermal energy GJ
FY 2020-21	4	4.17	0.31	2.20	0.8% reduction in electrical KW & 0.25% reduction in thermal energy GJ

## *Energy conservation/efficiency projects; FY20-21*

<b>Project</b>	<b>Energy Reduction</b>	<b>Investment (Lakhs)</b>	<b>Savings (Lakhs)</b>	<b>Payback (months)</b>	<b>CO<sub>2</sub> Reduction (tons of CO<sub>2</sub>)</b>	<b>Month of Installment</b>
Use of Vacuum Pump 4G9B instead of 3G3B	Electrical	NIL	4.01	-	51.53	Oct-20
Sec-12 Chiller Saving during SLS Liquid & Paste Run	Electrical	0.10	13.85	-	178.03	Oct-20
Sec-128 Water Jet Vacuum System	Thermal	41.6	16.73	29.84	135.31	Oct-20
Resizing of 105P10A	Electrical	-	4.1	-	52.08	Apr-21

## *Energy conservation/efficiency projects; FY19-20*

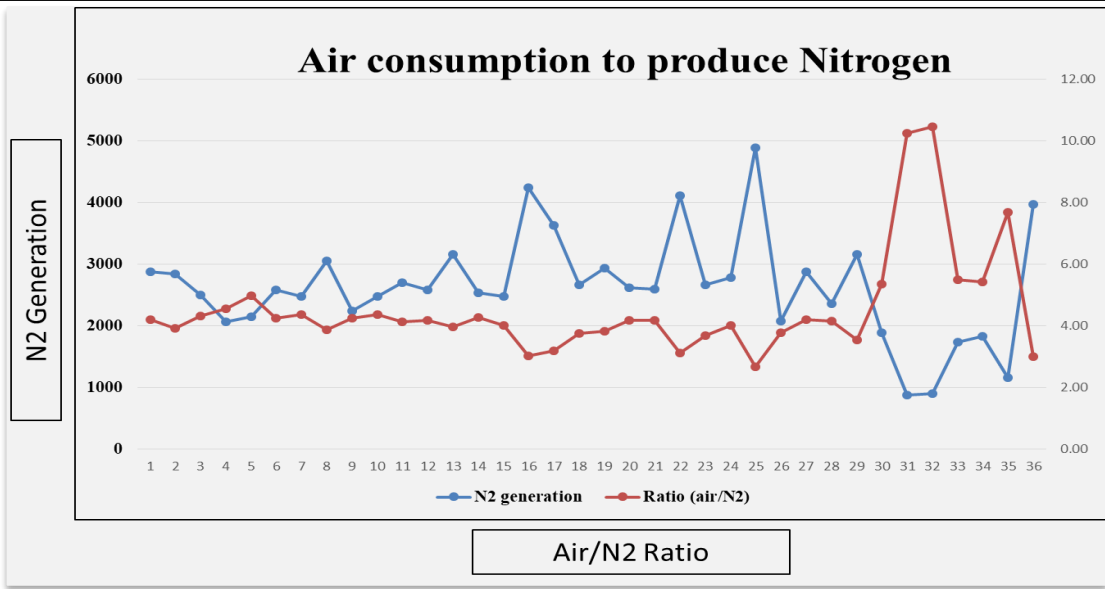
<b>Project</b>	<b>Energy Reduction</b>	<b>Investment (Lakhs)</b>	<b>Savings (Lakhs)</b>	<b>Payback (months)</b>	<b>CO<sub>2</sub> Reduction (tons of CO<sub>2</sub>)</b>
Heat Recovery system in Air Compressor (11G03)	Electrical	17	12.6	12	869.01
Automation in Nitrogen plant for reduction in energy consumption	Electrical	5	12.31	5	132.80
Resizing of 104P07A	Electrical	1.5	7.31	2	86.71
Sec-105 Water Jet Vacuum System	Thermal	9.3	9.72	11	78.50
Instrument Modular Burner in spray dryer burner	Thermal	6.66	6.24	13	44.65
Heat Recovery system in Sulphonation Plant (Sec-12)	Thermal	63	26.31	29	1820.11

## *Energy conservation/efficiency projects; FY18-19*

<b>Project</b>	<b>Energy Reduction</b>	<b>Investment (Lakhs)</b>	<b>Savings (Lakhs)</b>	<b>Payback (months)</b>	<b>CO<sub>2</sub> Reduction (tons of CO<sub>2</sub>)</b>
New Air compressor with VFD and heat recovery unit from Atlas Copco	Electrical	124	66	24	729.94
Zero Investment Projects	Electrical	0.35	14.1	0.30	156.88
AC Saver	Electrical	1.87	2.3	9.76	25.47
Intelligent Pumping Solutions for DM water Network	Electrical	13	4.83	32.30	53.44
6 G01 compressor Valve replaced new generation valves	Electrical	8	13.6	7.06	150.64

# 7) Energy Conservation – Innovation

## AUTOMATION IN NITROGEN GENERATION PLANT



Type of Innovation	Energy Saving
Uniqueness	Low Investment Project
Tangible Benefits	12.31 Lacs Saving
Intangible Benefits	Automation thought process evolved
Replicability of Project	Yes

In FC N2 plant, Air to N2 ratio was on the higher side which led to higher consumption of compressed air.

In order to produce 1 Nm<sup>3</sup> of Nitrogen 6.1 Sm<sup>3</sup> of air was required.

High cost of N2 Generation.

# 7) Energy Conservation – Innovation

## Problem Statement

- In FC N2 plant the PSA cycle was continuous throughout the day.
- Once pressure is developed in surge vessel air is vented out from the PSA unit without producing N2, leading higher air consumption

## Thought Process

Instead of running N2 plant continuously why not stop it when pressure is built up in surge vessel and starting it again when pressure gets reduced

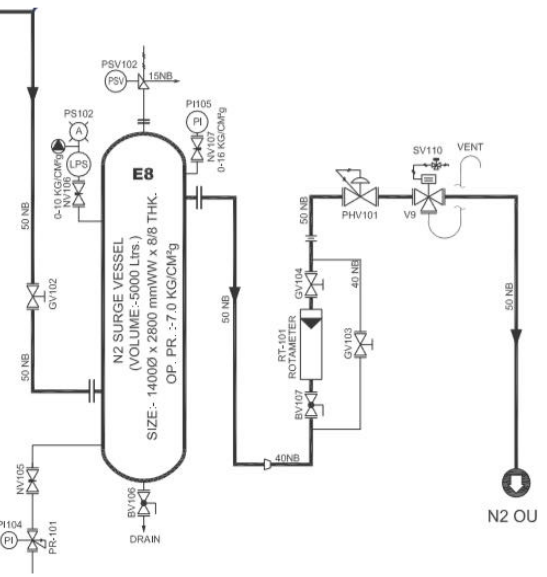


## Control Philosophy

**Control philosophy :**  
 When N2 pressure is equal to or greater than 3.5 bar: PSA will stop and after delay of 30sec air receiver inlet ON-OFF will close  
 When N2 pressure is equal to or less than 2.5 bar:  
 Air receiver inlet ON-OFF will open and after delay of 60sec PSA will start

## Benefits

The average ratio was reduced from 6.11 to 2.98  
 Compressed air saved per day : 3800 sm3  
 Annual Saving : 12.31 Lac.

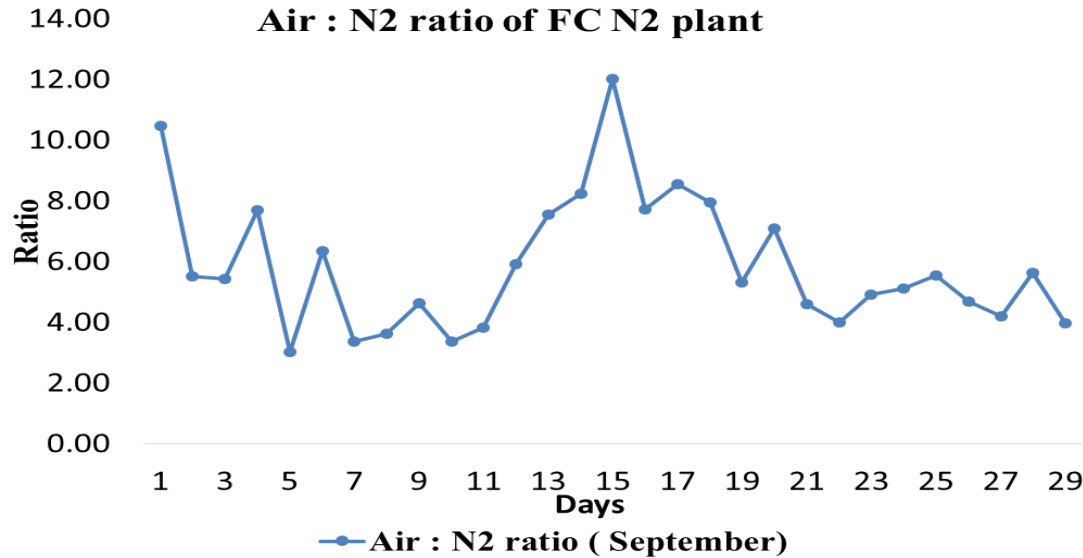


### Contribution of Plant Team

On 5<sup>th</sup> ,7<sup>th</sup>,8<sup>th</sup> and 10<sup>th</sup> they carried out an experiment by operating N2 plant in manual mode. ON-OFF valve installed at air receiver inlet. PSA start stop taken on auto from manual with control philosophy

### Replication Potential

- 1) Tank LT & pump to avoid overflow/excess filling
- 2) Timers for agitators in tanks.
- 3) Heating on/off in sweet water treatment plant to save steam.

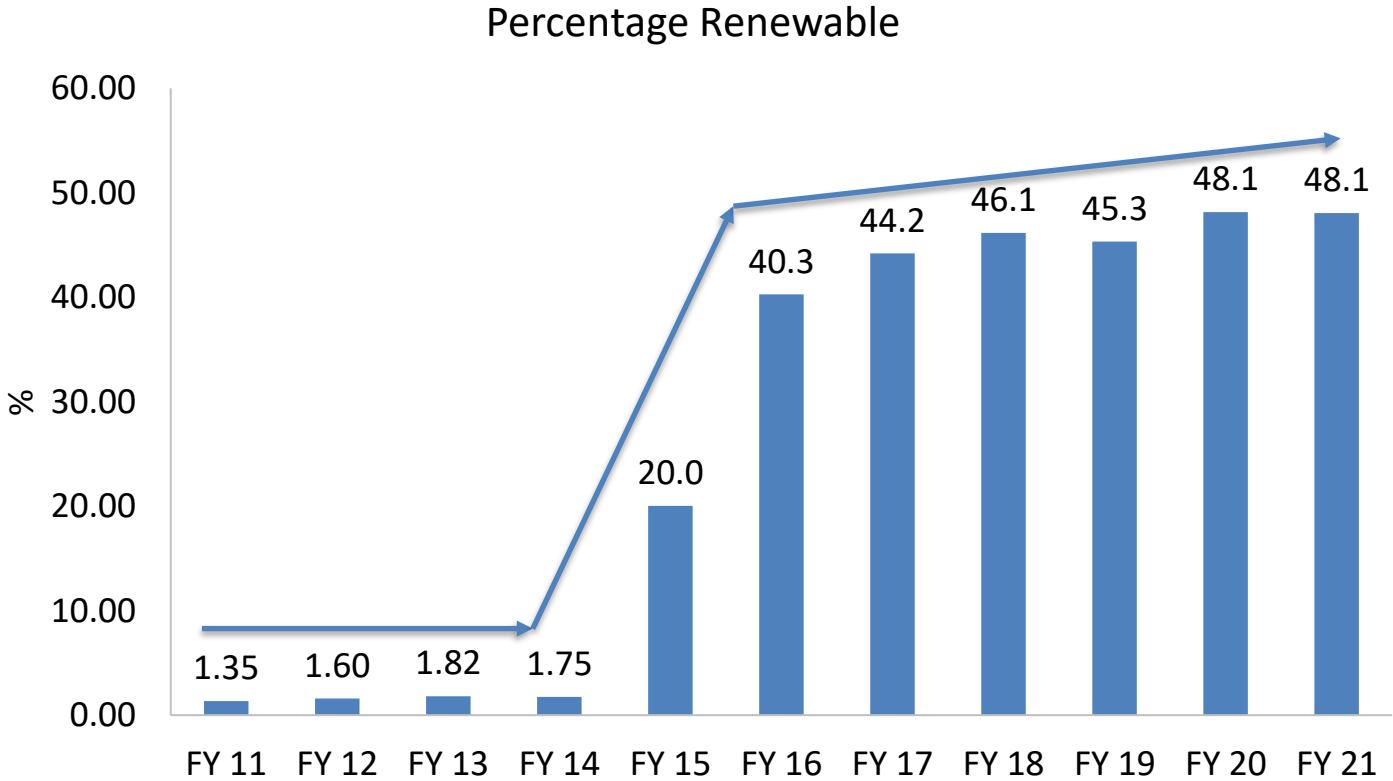




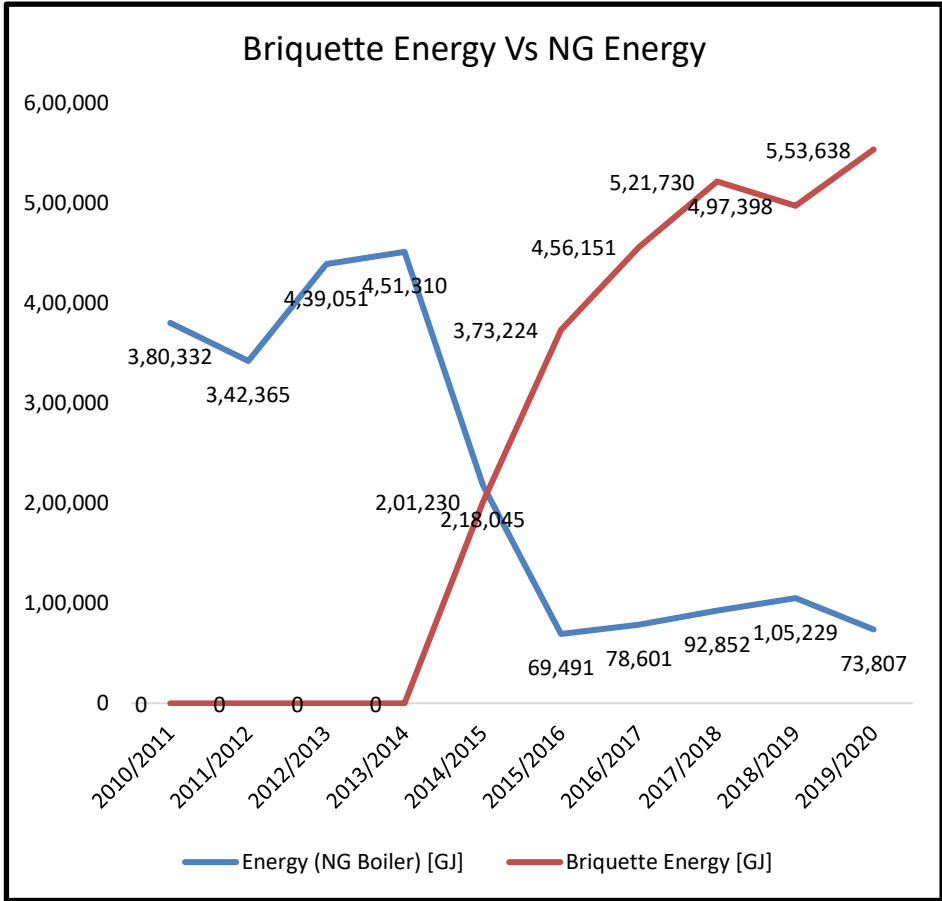
# 8) Utilization of Renewable Energy Sources

**46.7%**  
Increase from FY10-11

**04%**  
Increase from FY17



# 8) Utilization of Renewable Energy Sources



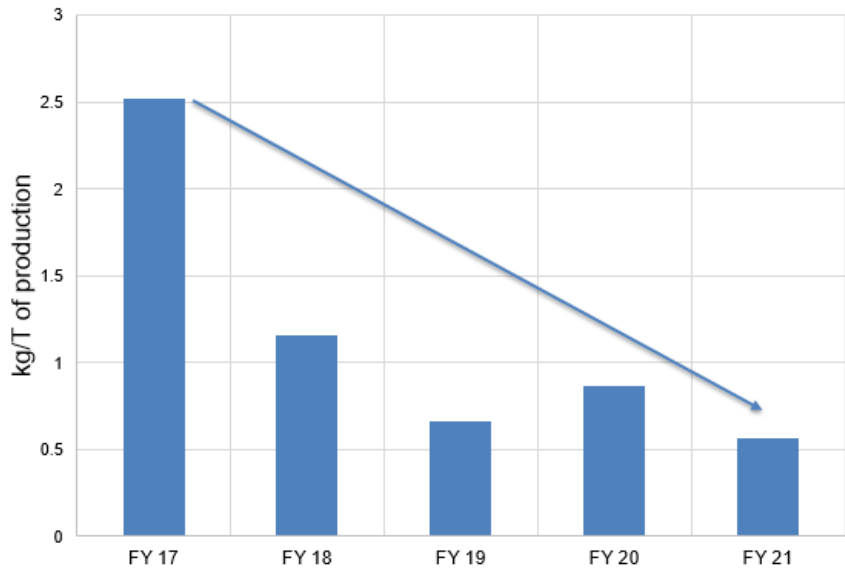
**14.3%**  
Increase in briquette energy in FY21  
Baseline FY17



Total 5 Briquette Boiler at site & running instead of NG based boilers.

# 9) Waste Utilization and Management

Specific Waste to Landfill by Product [kg/t]

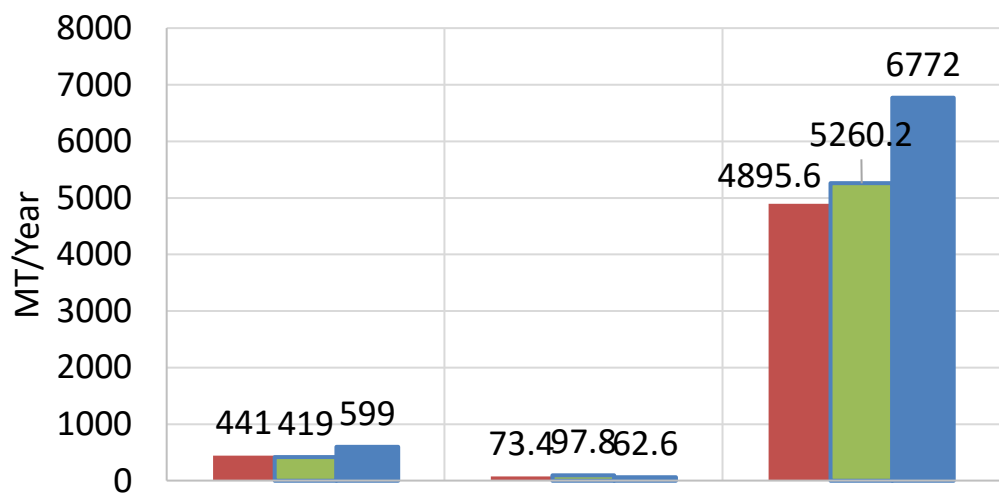


# 77.5%

Reduction in FY21  
Baseline FY17

## Waste to Landfill

### Waste Management



Non Hazardous Waste:      ETP Sludge      Hazardous Waste

Wooden, M.S.  
Aluminium, Plastic and  
Paper Scrap Empty  
drums and Carboys

FY 18-19    19-20    20-21

# 10. GHG Inventorisation

Valia	Total Energy		t CO2e, Godrej Scope 3	Specific GHG Emissions per Ton Production		
	t CO2, Godrej, Scope 1	t CO2, Godrej, Scope 2		t CO2, Godrej, Scope 1	t CO2, Godrej, Scope 2	t CO2, Godrej, All
2018/2019	26,057	31,744	7,374 (only Outbound transportation, Employee Commute)	0.235	0.287	0.523
2019/2020	26,191	32,608	6,673 (Outbound transportation, Employee Commute, Business commute)	0.23	0.28	0.059
2020/2021	24,136	31,841	9,399.19 (Outbound transportation, Business commute, Employee Commute, Waste Emissions, fuel manufacturing and transport)	0.22	0.29	0.08

**SCOPE 3** is studied and in 2018-19, scope 3 reporting was for Outbound transportation only. From 2020-21, Scope 3 reporting for Outbound transportation, Business commute , Employee Commute, Waste Emissions, fuel manufacturing and transport (NG, HSD, Briquette, FO, Solar, Wind, Pitch) has started.

**TARGET OF REDUCING SCOPE 2 EMISSIONS:**

Now we have installed Cogeneration plant at Valia site. This will allow us to generate Electricity through turbine at site. Scope 2 will be zero. Commissioning is in mid Sept-21

# 11) Green Supply Chain Management

<p>Sustainable Procurement Policy Implementation</p>	<p>18 Lac Investment</p>	<p>FY 19-20: We had completed onsite audit of 66% of our critical suppliers.</p> <p>FY 20-21: We completed the process of establishing the baseline for our suppliers applicable to both packaging and raw materials and covered 100% of our selected critical suppliers.</p> <p>The questionnaire covers Ethics, Social, Good and Green as three major pillars apart from quality.</p>
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FY 19: We have achieved 94% of refineries,74% of mills and 14% tree plantation.

FY 20: We have improved our transparency results : 98.9% refineries, 89.1 % mills and 32.4 % plantations by dedicatedly working with our consultants, suppliers and by being a part of Action of Sustainable Derivative consortium.

# 11) Supply Chain – Sustainable Palm Oil Policy

## Sustainable Palm Oil Goals and Action Plan:

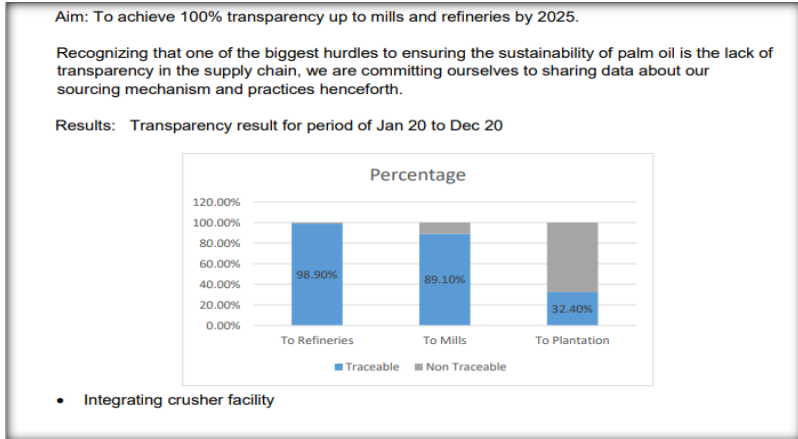
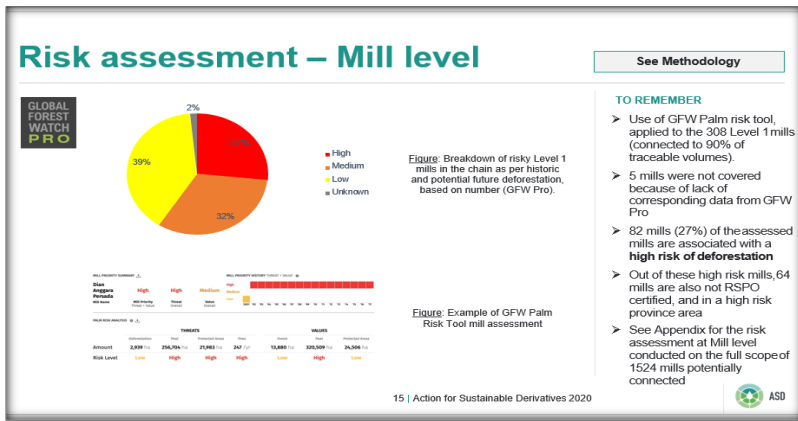
1. 100% Sustainable PO/PKO & Derivatives by 2025
2. 100% transparency up to mill and refineries level
3. Commitment to Zero Deforestation in supply chain

## Strategies to achieve:


1. Doing risk assessment in supply chain and acting on same
2. Being part of collaborations like Action of Sustainable Development (ASD) and RSPO.

## Disclosers:

1. Sustainability Report
2. Annual Communication of Progress on RSPO
3. Sustainable Palm Oil Policy action plan report
4. CDP- Forest Discloser
5. WWF Forest score card



# 12) Teamwork, Employee Involvement & Monitoring

 Godrej Industries Ltd.	DATE FROM:	05-08-2021 07:00		SEC-5 DAILY REPORT				
	DATE TO:	06-08-2021 06:30						
	Site Location:- Valia							
Minimum	709.45	0.01	35.09	36.20	518.20	29.50	100.78	0.00
Maximum	1378.47	0.01	38.39	40.20	518.20	32.30	103.42	0.00
Average	1146.98	0.01	36.68	38.05	518.20	30.81	102.01	0.00
Parameters	05FC110	05FC182	05TC210	05TI255	05PI250	05TC105	05LC206	5B3 Steam Pressure
Unit	kg/hr	T/HR	Deg C	Deg C	Mbar	Deg C	%	bar
Description	Feed Flow	Product Flow	Column Top Temp.	Column Bottom Temp.	Column Top Vacuum	Drier Temp.	Steam Generator Level	Burner
05-08-2021 07:00	1330.41	0.01	38.39	40.20	518.20	29.60	100.78	0.00
05-08-2021 07:30	1354.26	0.01	38.30	40.20	518.20	29.60	101.95	0.00
05-08-2021 08:00	1360.45	0.01	38.20	40.00	518.20	29.60	102.72	0.00
05-08-2021 08:30	1331.65	0.01	38.09	39.90	518.20	29.50	102.73	0.00
05-08-2021 09:00	1336.60	0.01	37.98	39.80	518.20	29.60	102.29	0.00
05-08-2021 09:30	1321.23	0.01	37.92	39.70	518.20	29.70	102.77	0.00
05-08-2021 10:00	1302.68	0.01	37.83	39.60	518.20	29.80	101.24	0.00
05-08-2021 10:30	1253.74	0.01	37.77	39.50	518.20	30.00	101.67	0.00
05-08-2021 11:00	1222.30	0.01	37.71	39.40	518.20	30.10	101.65	0.00
05-08-2021 11:30	1142.62	0.01	37.62	39.30	518.20	30.30	102.49	0.00

We have developed a centralized energy monitoring system through which we monitor the following:  
 NG, Power consumption, Steam, All critical parameters of plant process.

**Review Meetings** for monitoring and reporting system to review specific energy consumption of the plant: Daily, monthly, quarterly & annually are carried out.

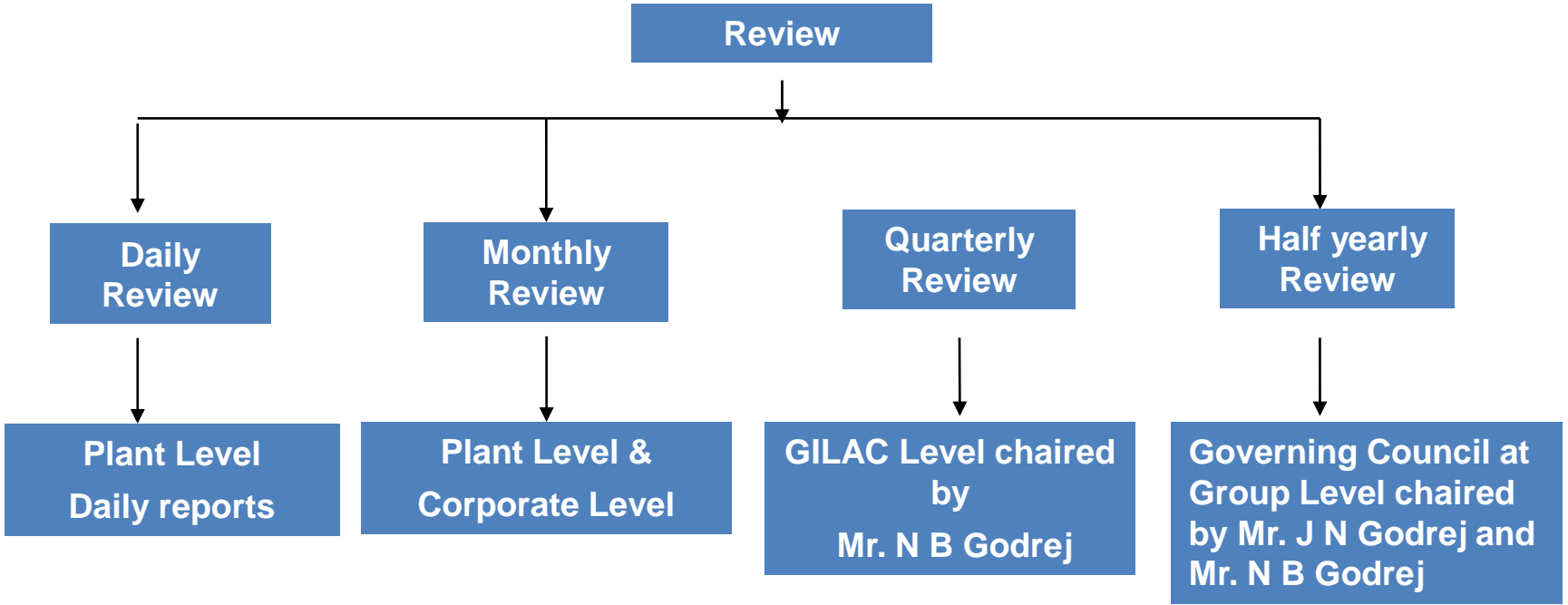
**Awareness:**

- Energy week
- Environmental day
- Skill matrix of employees
- Annual training calendar for monthly trainings to all employees.
- EP100 project trainings

**Kaizens:**

Our unit is 5S certified. This platform gives an opportunity down the line to explore for energy, time, material, etc. projects. Through implementation of 5S we are able to save 360mins/day and 36Lac/annum.

# 12) Energy monitoring and review



**SoFi** Enterprise Sustainability Performance Software for Sustainability Management and Data analysis and reporting



# 13) Implementation of ISO 50001/Greenco/IGBC Rating

# 0.0365%

## FY 2020-21:

## % Investment of total turnover of the company



GreenCo rating System:  
 GIL, Valia is GreenCo GOLD  
 rated in 2018.  
 We are also audited in 2021  
 for GOLD Sustenance.



## ISO 50001:2018

## *14) Learning from CII Energy Award 2020 or any other award program*

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- ❖ CII, EP-100 sessions, new projects are explored and ideas generate thought provoking sessions in plant
- ❖ Energy award forums helps to understand the philosophy and concept behind a project from other plant presentations.

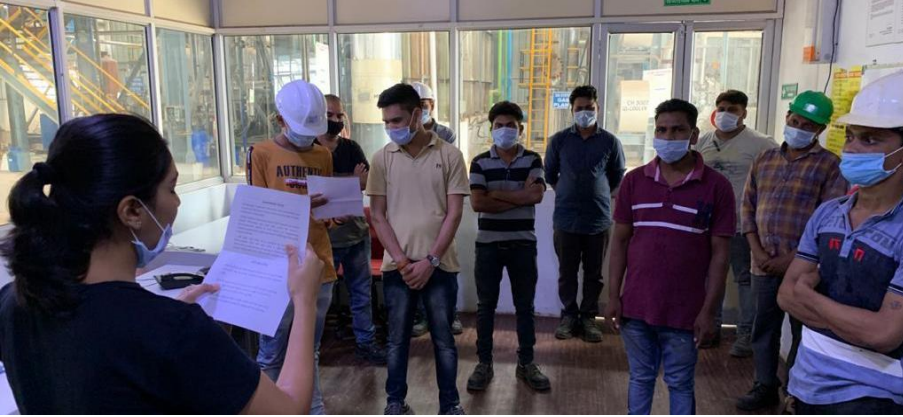
# Awards and recognition

- ❖ 5S Certified Company by Quality Circle Forum of India – 2021
- ❖ CII Best Practice in Health and Safety – 2020
- ❖ Godrej Industries has ranked B on the CDP Climate Change Disclosure and Water Security Disclosure – 2020
- ❖ Award for Excellence in the Category of Pollution Management & Sustainable Practices by FGI – 2020 in 16th FGI Awards (Federation of Gujarat Industries)
- ❖ GreenCo star performer of the year – 2020
- ❖ Golden Peacock award for Environmental management – 2019
- ❖ India Sustainability Award on Efforts for GHG Reduction 2019 – by Transformance
- ❖ CII National Award for Excellence in Energy Management – 2018, 4th consecutive time
- ❖ GIL, Valia plant received the CII Green-Co GOLD rating in 2018



# Environment day and Energy conservation week

## Energy Pledge



## World Environment Day



## Training & Awareness Programs



## Tree Plantation



# *Kaizens, Suggestions, Process improvement*

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40

suggestions

32

Implemented

## *CONTACT US*

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[www.godrejgoodandgreen.com](http://www.godrejgoodandgreen.com)



**THANK YOU FOR YOUR TIME AND CONSIDERATION**