CII ENERGY MANAGEMENT AWARD-2021
AMBERNATH PLANT

Lead Presenter: Aslam Sorathiya: Executive Production
Team:
QH Bhatia: Head- Engineering Services
Anjali Bherwani : Senior Executive- Sustainability

MANUFACTURING FACILITIES- GIL Chemicals

- Pioneer in manufacturing of Oleochemicals in India.
- State of Art facility in Valia and Ambernath

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.

Manufacturing Plant in Maharashtra

GOOD AND GREEN- 2025 VISION

1. Achieve scope 1+2 neutrality and calculate scope 3 emissions
2. Achieve 50% reduction in energy intensity against FY12
3. Achieve 70% renewables in our energy mix
4. Reduce specific water consumption by 70%
5. Achieve Zero waste to landfill status

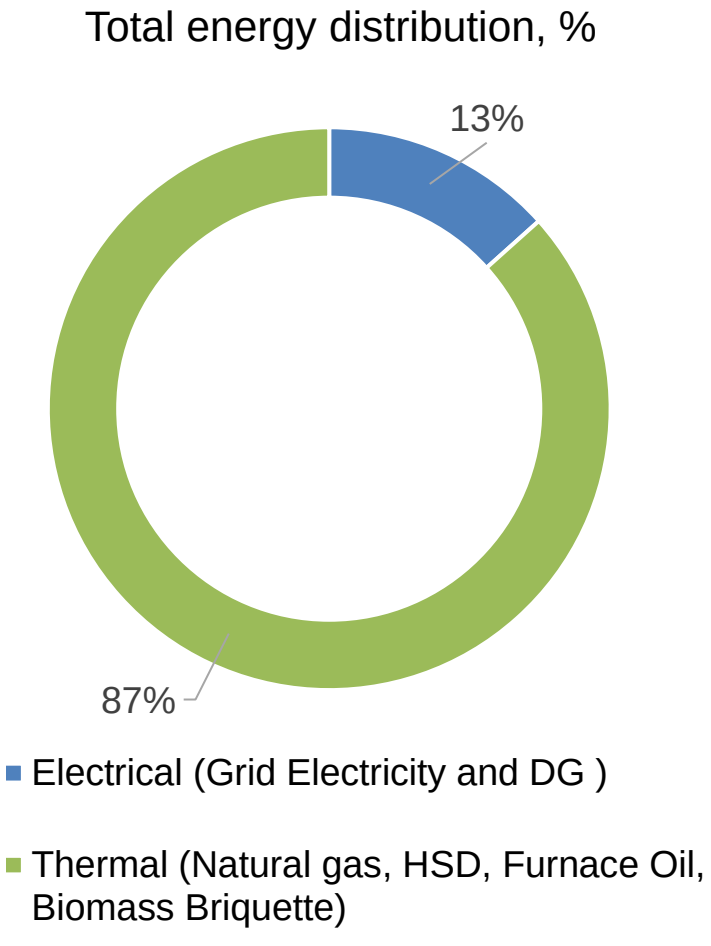
1. Generate a third of our portfolio revenues from 'good' and/or 'green' products
2. Partner with suppliers to adopt our sustainable supply chain policy and improve their ESG performance
3. Focus on sustainable packaging by reducing plastic packaging, increasing use of post-consumer recycled materials.

IMPACT OF COVID 19

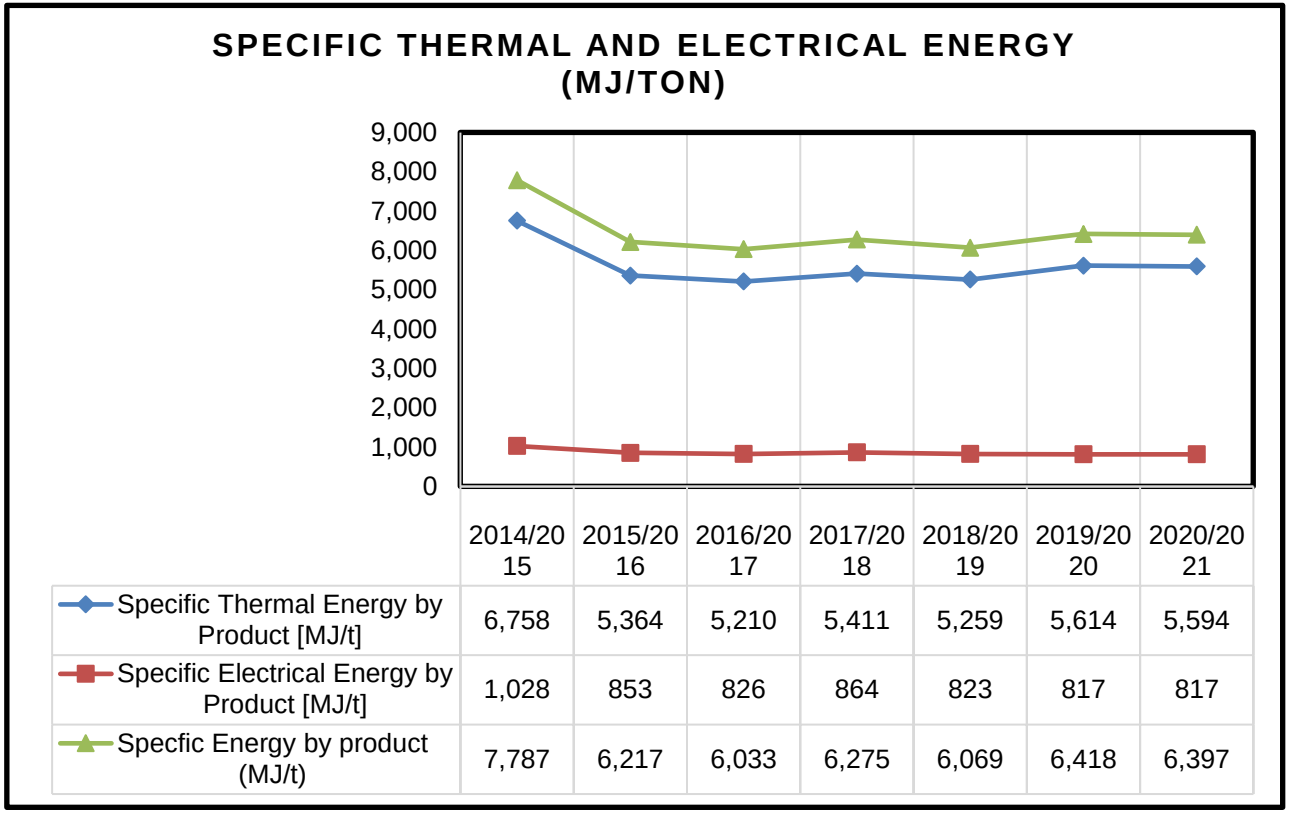
1. Production Loss: 71 % less production in April and May month compared to previous year
2. Sales Volume: 66% less sales volume revenue in these two months
3. Briquette unavailability due to disruption in supply chain resulted in increased use of fossil fuel for energy consumption. Renewable portfolio of plant down by 10% despite starting wheeling of wind energy in that year.
4. Multiple Startup and Shutdown resulting in higher energy consumption.

Total Energy Distribution

YEAR	Total Energy [KWH]	Total Electrical Energy (KWH)	Total Thermal Energy (KWH)	Production (MT)
2018/2019	1.07E+08	1.46E+07	9.26E+07	63,782
2019/2020	1.13E+08	1.45E+07	9.90E+07	63,831
2020/2021	9.67E+07	1.23E+07	8.44E+07	54,171



Specific energy consumption trend



	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Specific Thermal Energy by Product [MJ/t]	6,758	5,364	5,210	5,411	5,259	5,614	5,594
Specific Electrical Energy by Product [MJ/t]	1,028	853	826	864	823	817	817
Specfic Energy by product (MJ/t)	7,787	6,217	6,033	6,275	6,069	6,418	6,397

- 17 % reduction in specific thermal energy from FY 15

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- 20.5% reduction in specific electrical consumption from FY 15.

- 21.7% reduction in overall specific energy consumption by production from FY 15

Encon Projects Planned- FY 21/22

Project	Energy Reduction	Investment (Lakhs)	Savings (Million Kcal)	Project Detail
Evaluation of Product Vs Feed Heat Exchanger	Thermal	15	420	Use of existing head in product to preheat feed. Saving of 150 sm3/day of NG.
Heat Recovery by Novel Heat Exchanger in Sulfonation Plant	Thermal	450	756	Use of Novel heat exchanger to recover heat from hot SO3 gas at 250 degree and use hot air in another plant . Currently, Cascade cooler is used to reduce the temperature of SO3.
Hybrid Vacuum System (Water Jet Vacuum system+ Steam booster) in fatty acid distillation plant	Thermal	11	157	Current Scenario: Vacuum is generated using Steam Boosters, Steam Ejector along with Vacuum Pump. we are planning for Hybrid Jet Vacuum System in place of them to generate vacuum and save energy.

Major Encon Projects in last three years

Title of Project	FY	Annual Electrical Saving (MWh)	Annual Thermal Savings (MT of steam)	Savings (million INR)	Investment Made (million INR)	Payback (Months)
Installation of Evaporative condenser in AOS plant	21	231	-	2.1	3.5	20
Installation of 4th effect in sweet water evaporation plant	21	-	1200	2.4	1	5
Installation of Mechanical Vapor recompression	21	-	1500	3	6	24
Optimization of CCT pump power consumption	20	539	-	5	1	3

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Installation of Intelligent Pumping solution in MP Boiler feed water	20	135	-	1.26	0.05	Low cost investment project
Turbo Blower Installation in Sulfonation plant	20	568	-	4.8	4.6	
Optimization of Nitrogen compressor operations & activity	20	208	-	1.91	1.5	Low cost investment project

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Desuperheater in MP Boiler	19	-	663	1.4	3	

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Fatty acid distillation plant 7-Steam drum	19	-	83.3	0.19	0.25	7
Sonic Soot Blower in Boiler	19	-	1.16	5.42	0.3	System was installed to aid cleaning the boiler and to have better heat transfer by not having deposits on the wall.

Innovation Project-Evaporative Condenser

Plant: Alpha Olefin Sulfate

Current Scenario: Using Water cooled condenser in Brine & water chilled water system

Aim: Maximize the efficiency of overall chiller system

Action plan: Replace existing water cooled condenser with evaporative condenser (EC)

About EC:

- Integrates intermediate heat exchanger, secondary pump piping & cooling tower into a single unit
- Heat transfer coefficient for evaporative cooling is very high

Benefit Achieved:

- Reduction of discharge pressure from 125 psi to 105 psi
- Condensing temperature from 38^0C earlier to 33^0C
- Improvement of cooling capacity by 15 kW & reduction in power consumption by 12 kWh

Innovation Project-Evaporative Condenser

Annual Impact:

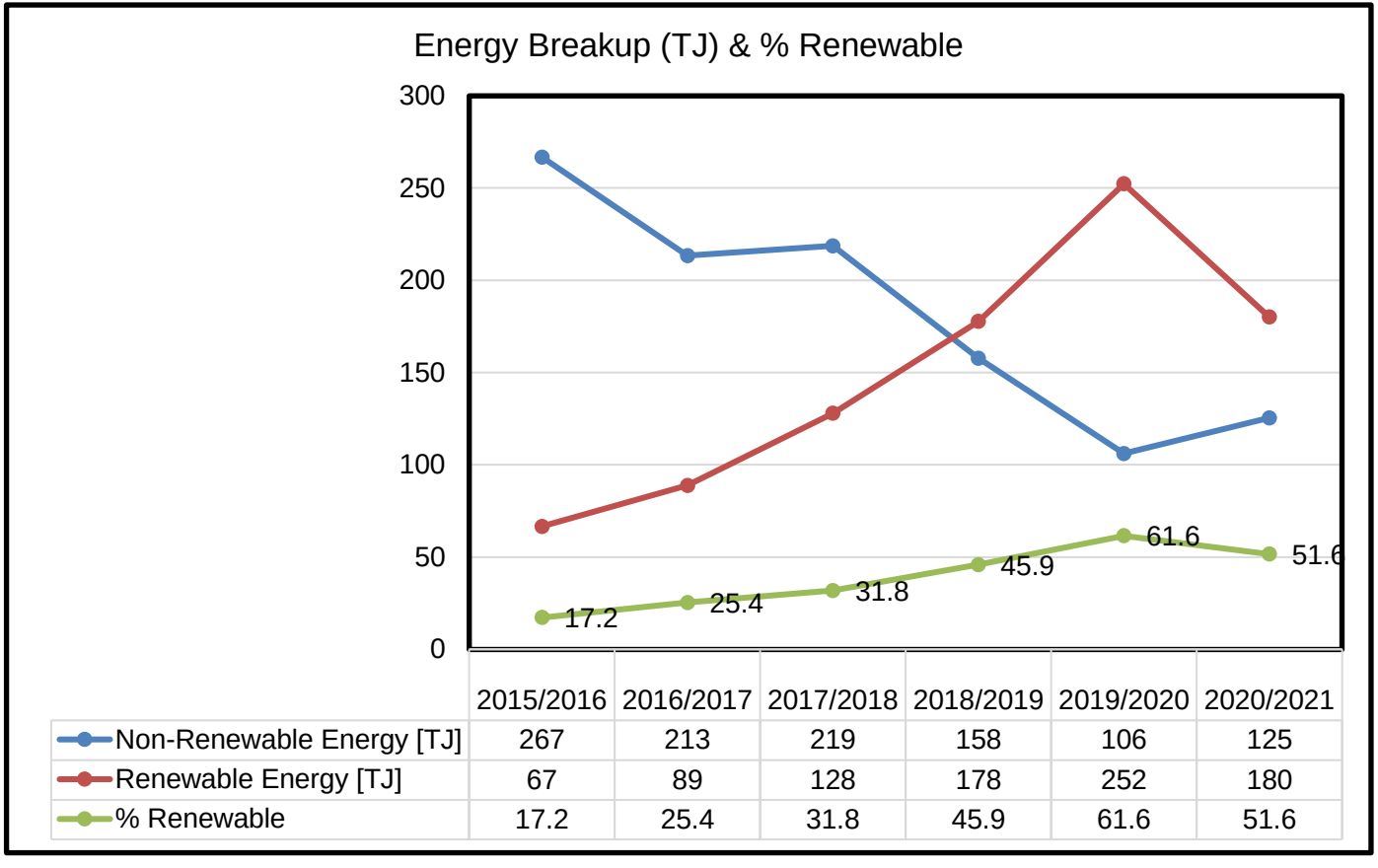
- Energy Saving :- 2,31,000 KWH
- Monetary Benefit :- INR 21 lakhs
- Investment :- INR 35 lakhs
- Payback :- 20 months

Other Intangible Benefit:

- Lower Footprint compared to conventional water cooled or air cooled system

Replicability:
Yes

Renewable energy portfolio



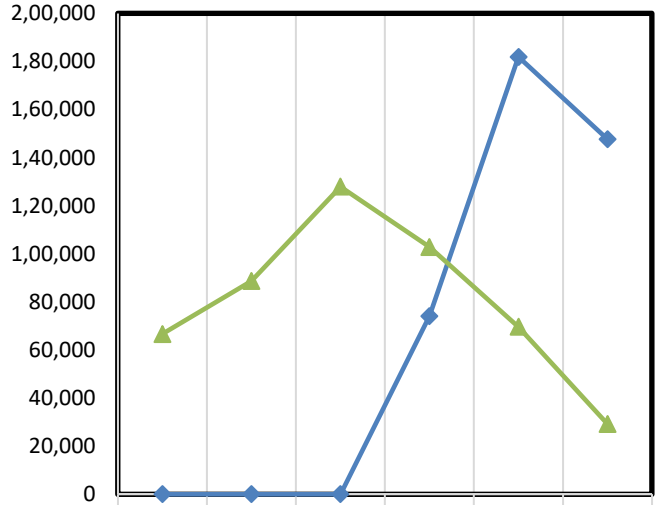
	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Non-Renewable Energy [TJ]	267	213	219	158	106	125
Renewable Energy [TJ]	67	89	128	178	252	180
% Renewable	17.2	25.4	31.8	45.9	61.6	51.6

Major Changes in last 3 years

- Shifting to biomass for steam generation and thermic fluid heating
- Wind Energy Wheeling from Oct 20
- Solar rooftops (small capacity)
- Utilization of waste as fuel
- Investment in briquette in last three years: 190 lakhs

Renewable energy portfolio

RENEWABLE ENERGY- THERMAL

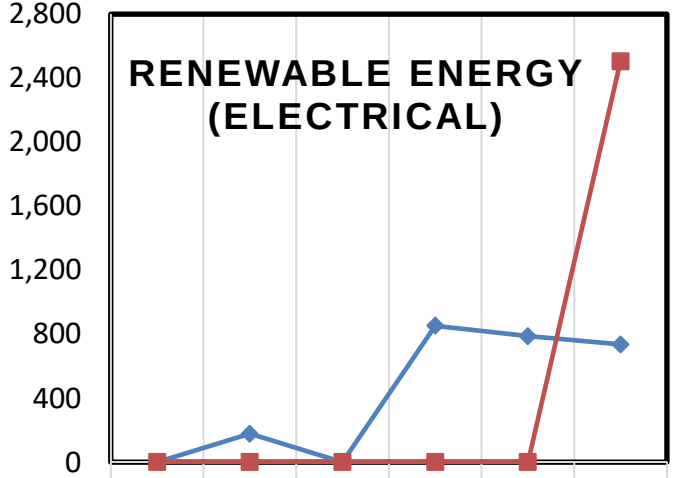


	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021
Briquette Energy [GJ]	0	0	0	74,046	1,81,859	1,47,635
Pitch [GJ]	66,597	88,618	1,27,905	1,02,779	69,623	29,218

- Unavailability of Briquette in month of April and May resulted in reduction of overall renewable energy

- Started Wheeling from Wind Energy in October 2020.
- Wind Energy will be replacing around 35% of our grid electricity per annum.

RENEWABLE ENERGY (ELECTRICAL)



	2015 /201 6	2016 /201 7	2017 /201 8	2018 /201 9	2019 /202 0	2020 /202 1
Solar Energy (GJ)	0	177	0	852	787	735
Wind Energy (GJ)	0	0	0	0	0	2,505

GHG Emissions Reduction

Ambernath	Total Energy		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
2019/20	6,121	11,754	0.096	0.184	0.280
2020/21	7252.0	10032.7	0.133	0.183	0.316

Achievement till date: 33.5 % reduction in specific GHG emissions in last 5 years.

Short Term Target:

- Reduction of specific GHG emissions by 3% compared to previous year
- Maintain goals for scope 3 emissions reduction

Long Term:

- Scope 1+ 2: To be carbon neutral by 2025

Public Disclosers:

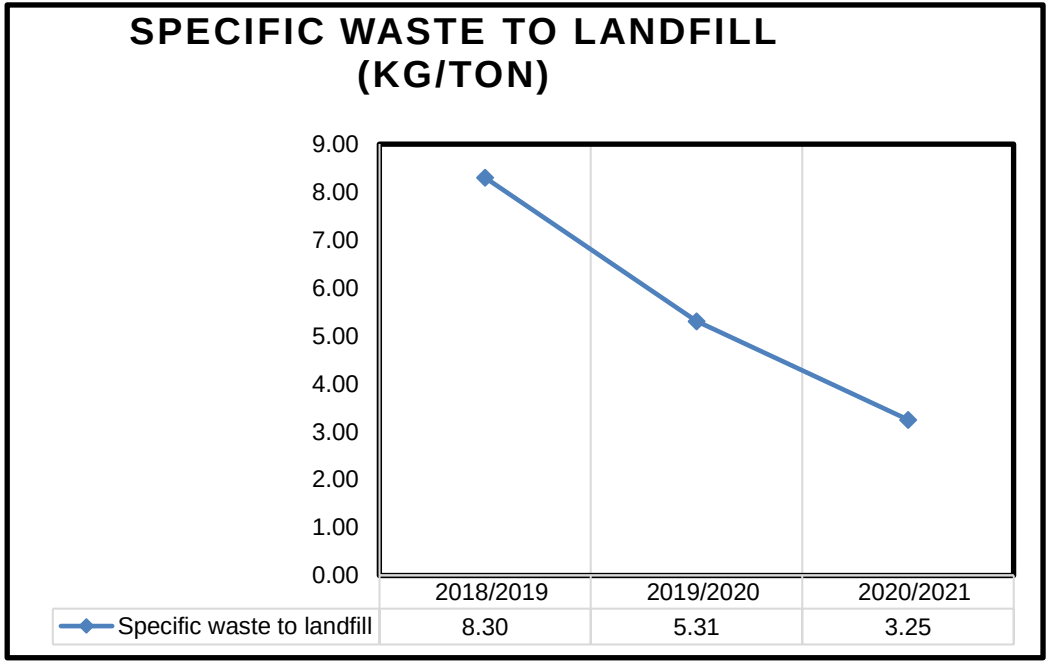
- Carbon Discloser Project – GIL: B rated last year
- Third Party GHG Emission Verification
- Sustainability and Annual Report

FY 20/21

Scope 3: GIL Chemicals

- Outbound transportation- 10227 CO_2 eq
- Business commute (Air Travel)- 0.58 CO_2 eq
- Employee Commute-728 CO_2 eq
- Waste Emissions -9813 CO_2 eq
- Fuel manufacturing and transport (NG, HSD, Briquette, FO, Solar, Wind, Pitch) – 29524 CO_2 eq only.

Specific Waste to Landfill



Name of Fuel / Year	Pitch (MT)	Calorific Value (kcal/kg)	Heating Value (Mkcal/year)
2018-19	2855	9800	27979
2019-20	1934	9800	18953.2
2020-21	812	9800	7957.6

MT/year	Non Hazardous Waste	Other Hazardous Waste	Hazardous Waste: ETP Sludge + MEE
2018-19	76.5	123	395
2019-20	77.44	173	529
2020-21	90	108	338

- Paddle Dryer project helped us to reduce waste to landfill.

Supply Chain- Sustainable Procurement and Sustainable Palm Oil

Systems and procedures implemented for green procurement

Policies & Compliance

- ❖ Sustainable Procurement Policy
- ❖ Sustainable Palm Oil Policy
- ❖ Sustainable Palm Oil Policy : Action Plan
- ❖ Formulation of Supplier Audit

Source :http://www.godrejindustries.com/chemicals/policies-compliance.aspx

Sustainable Procurement Policy
- Self Assessment Questionnaire
- Site Visits
- Supplier Meet
- Email for sharing best practices

Supply Chain- Sustainable Palm Oil Policy

Sustainable Palm Oil Goals and Action Plan:

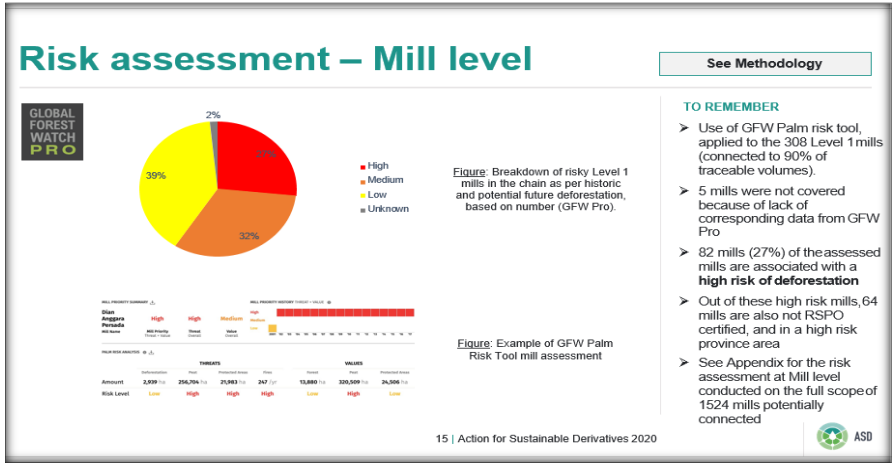
1. 100% Sustainable PO/PKO & Derivatives by 2025
2. 100% transparency upto mill and refineries level
3. Commitment to Zero Deforestation in supply chain

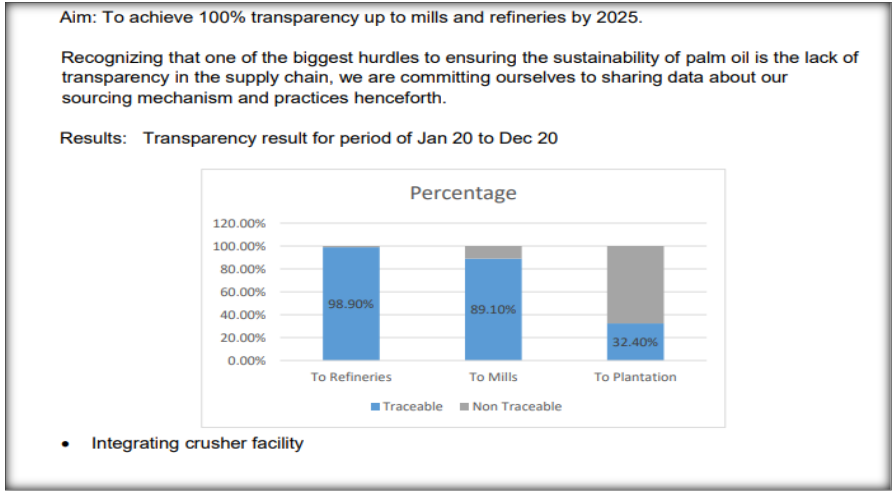
Strategies to achieve:

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

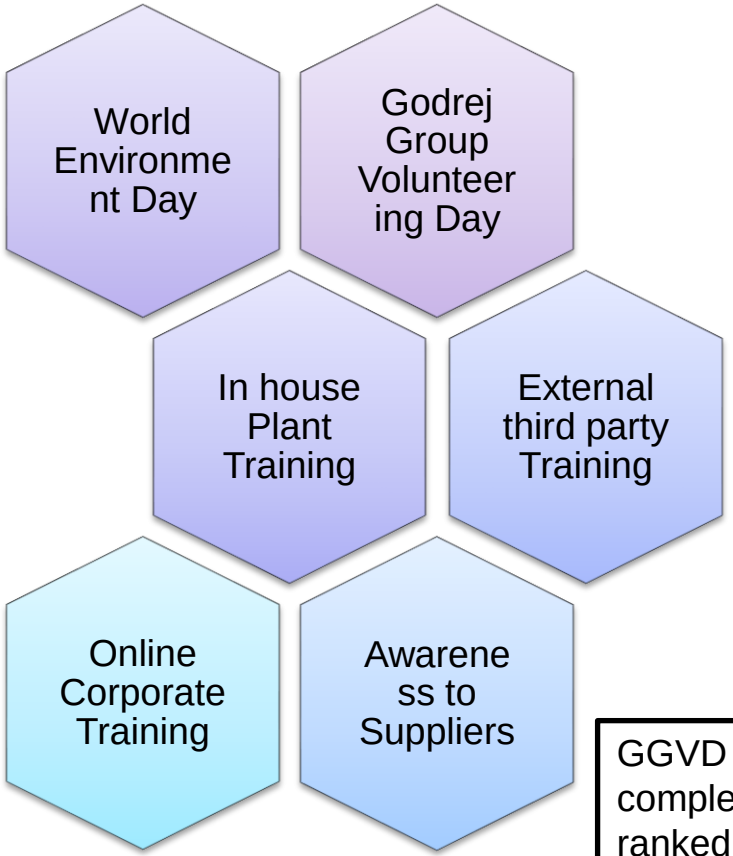
Disclosers:

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





Teamwork, Employee Involvement & Monitoring



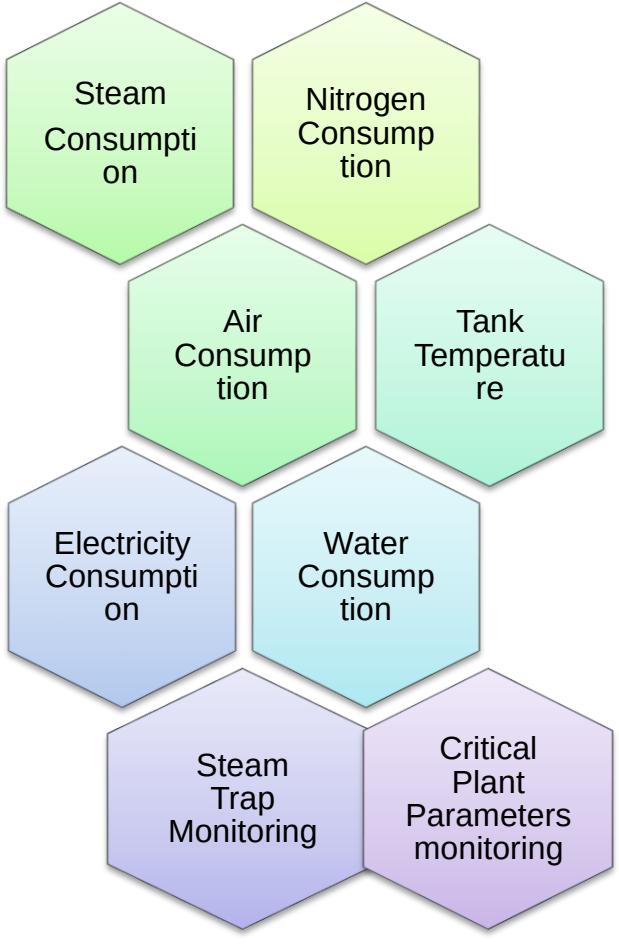
Teams	Energy Management Cell
	Cross Functional Team at Plant Level
	Corporate Sustainability
	EHS & Procurement team for supplier sustainability

Budget	Annual Operating Plan
	Encon Projects based on project viability & potential
	Sustainable Supply Chain: Pre approved budget

GGVD 2021: Gamified our volunteering to rank the teams who had completed the most volunteering activities. Our Ambernath team was ranked first.

Across the Group, of the 56 tasks we hosted on the app, each volunteer on average completed 28 tasks. In this week, we helped save 67,560 litres of water, 13,658 kWh of electricity, and 2,735 kg of waste

Automation- Monitoring and reporting



Remote Monitoring of Scada System:

Technology Used: FactoryTalk ViewPoint Software

Make: Rockwell Automation

- Software loaded server installed and connected to PLC & SCADA fibre optic ring network.
- Access given to plant HODs. Remote monitoring started for all process plants.

Benefits:

- Provides quick, easy access to critical information from the process plants using the simplicity of a web browser.
- Supports multiple browsers and client devices for increased flexibility.
- Allows easily web enabled without requiring application changes.
- Major benefit in COVID situation with limited manpower

Investment: 3.25 lacs

- Specific Plant Head & Factory Head can access any process plant from any where.

Kaizens

Projects Suggested by Supervisor level	Status	
Condensate recovery to be improved by 20-30KL/day-	50% implemented	FY 19
Separate switches to be provided to avoid unwanted light in FG godown	Completed	FY 19
Self cleaning system to be installed on the chiller condenser	Under Evaluation	FY 19
Water collection from canteen building, HO & time office by 100-130KL/day	Under Evaluation	FY 19
Instead of major repairing of AC's, workmen at ground level to ahead with 5star inverter AC	Completed	FY 20
Filter Changing frequency determination on amount of material passed rather than fixed days	Completed : 75%filter usage reduced	FY 20
Heat Exchanger cleaning frequency was set by plant team based on overall heat transfer coefficient	Montoring done based on this-completed.	FY 20

Learnings from other Awards:

Project	Background	Status
Harmonics filters	Improve power quality	Implemented
Grundfos Motor mount VFD pumps	Energy Conservation	Implemented
High Pressure Nozzle for cleaning	Energy conservation	Evaluating

Awards and recognition

Year	Award Category	Description
2020	5S Certification	Valia Factory is certified in 5S Workplace Management System by QCFI
2020	16th FGI Awards	Valia site conferred award for Excellence in Pollution Management & Sustainable Practices
2020	Platinum Award (45th ICQCC 2020)	Bagged the international award for effective implementation of 5S Concept at Valia factory
2020	National Award for Excellence in Energy Management	Ambernath Factory was rated as Energy Efficient Unit by Confederation of Indian Industry
2020	CII Green Co Star Performer Award	Valia site bagged the award for sustainable practices
2020	CII Occupational Health & Safety Award	Conferred for our best safety practice at manufacturing site
2019	Golden Peacock Award	Won prestigious industry level award, instituted by Institute of Directors for our holistic HR practices
2019	Excellence in Human Resource Management	Our efforts & practices in Chemicals Industry were recognized by Indian Chemical Council
2019	India Sustainability Summit & Awards	Appreciation for efforts in reduction of Green House Gas Emissions in Chemicals Industry
2019	National Convention of Quality Concepts	Valia factory bagged Par Excellence Award for the 5S efforts at site
2017	FICCI Award	Valia site won Most Environment-Friendly Company award for sustainable practices
2016	Excellence in Energy Conservation & Management	This ICC award is a testament to the efforts of achieving Godrej Good & Green goals at Ambernath site

Way forward


Innovations and Technologies
Clean Technologies
Value Chain Sustainability
Suppliers Assessment
Process Reengineering and Process Innovation
Life Cycle Assessment
Green Chemistry

THANK YOU FOR YOUR TIME AND CONSIDERATION