22nd National Award for Excellence in Energy Management 2021

25 - 27 August 2021

Best Implementation of ISO 50001

Galaxy Surfactants Limited

Mr. Amit Kakkar & Sr. Manager & amit.kakkar@galaxysurfactants.com

& Mr. Ashish Chaudhari, Ms. Shweta Bande

& Mrs. Sreeja Mala

About The Organization

- Based in India, Galaxy is one of the leading manufacturers of surfactants and specialty care products with an advanced portfolio of innovative products and solutions
- Preferred supplier to leading Multinational, Regional and Local FMCG brands
- Established track record of providing a wide range of innovative and high-quality ingredients
- One of India's leading manufacturers with global presence
- Strategically located plants in India, Egypt and US


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Certificate of Registration

ENERGY MANAGEMENT SYSTEM - ISO 50001:2018

This is to certify that:

Galaxy Surfactants Ltd
V-23, MIDC taloja
Taluka Panvel
Dist. Raigad 410 208
Maharashtra
India

Holds Certificate No: **ENMS 723570**

and operates an Energy Management System which complies with the requirements of ISO 50001:2018 for the following scope:

Manufacturing of performance surfactants and specialty care ingredients with the application of electricity from state electricity board, Captive Power Plant, Renewable energy from solar plant, DG Power, steam generation for coal & FO boilers, keeping in view the internal and external issues and needs & expectations of interested parties.

For and on behalf of BSI:

Chris Cheung, Head of Compliance & Risk - Asia Pacific

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Latest Revision Date: 2020-02-24
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ISO STANDARDS
ISO 9001
ISO 14001
ISO 14064
ISO 50001:2018
ISO 45001

Taloja Plant :- An Overview

- Established in 1997
- Manufacturing Sections :- 8
- Working Shifts :- 3
- **Continuous Process Plants**
  - Sulphonation (Ballestra falling Film)
  - Drying (Ballestra Thin film)
- **Batch Process Plants**
  - F2 (Amides and betaines), Ethoxylation and Syndet Soap Noodles
- **Production Quantity**
  - Production of Surfactants and Specialty Chemicals like SLES, SLS, CAPB, Syndent, etc was 143506 Metric Tonnes

Impact of COVID 19

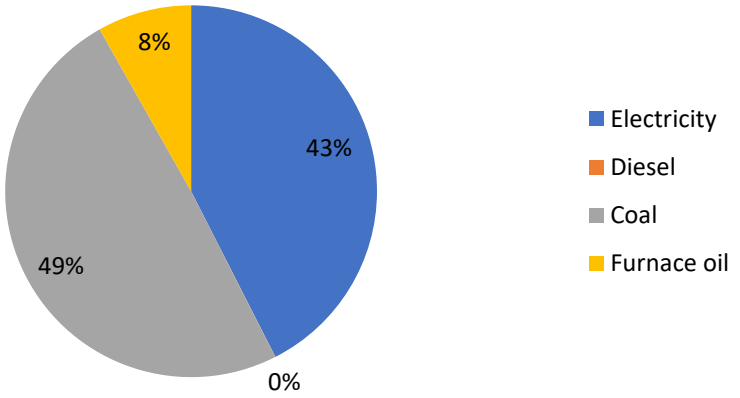
Being an Essential Goods supplier, Plant operations were exempted from Lockdown restrictions but due to unavailability of Manpower (especially in first wave), energy performance got affected on following :

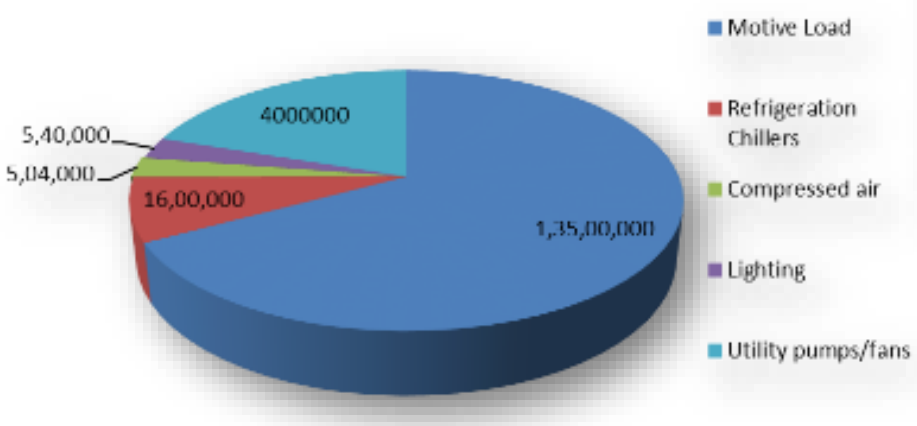
- Q1 Specific consumption was higher by almost 5 %

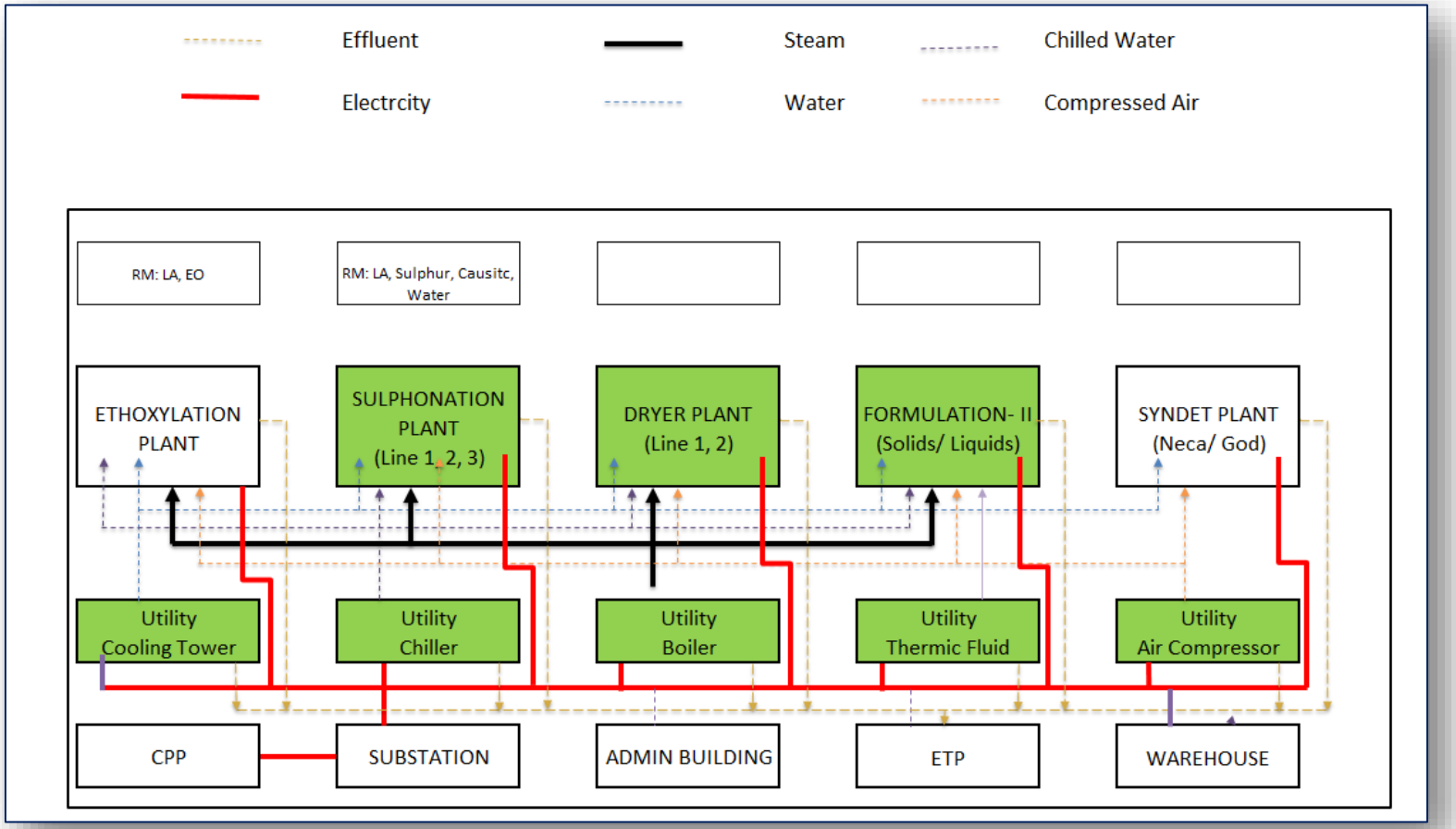
  (complete stoppage for 2 weeks)
- Delays in implementation of identified Energy conservation themes
- No Energy related training in Q1 & Q2
- Energy metering scheduled calibration got delayed.

Energy Mapping

Apr20-Mar21



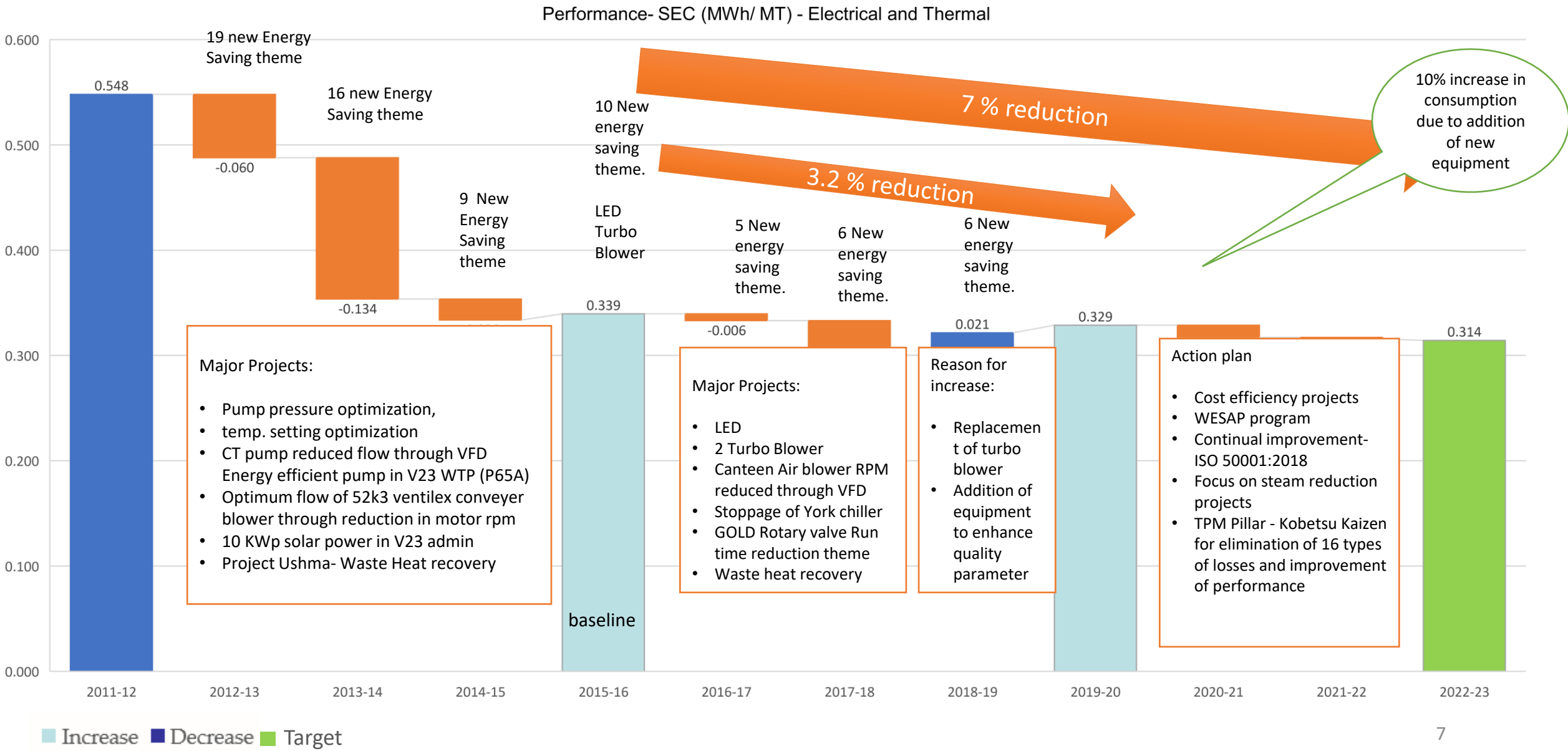




Transformers : 2 x 2500 KVA, 1 X 1600 KVA
Coal boiler : 5 TPH
Utility Chillers : 1 x 250 TR , 1 x 210 TR
Air Compressor : 2 x 293 cfm
Thermopac boiler : 600000 Kcal

Other Information:
Max Demand : 3500 KVA
Load factor : 60-64 %
Power factor : >0.995 (APFC + Harmonic filters installed)

Energy Performance



Sp. Energy Performance (Past 3 yrs)

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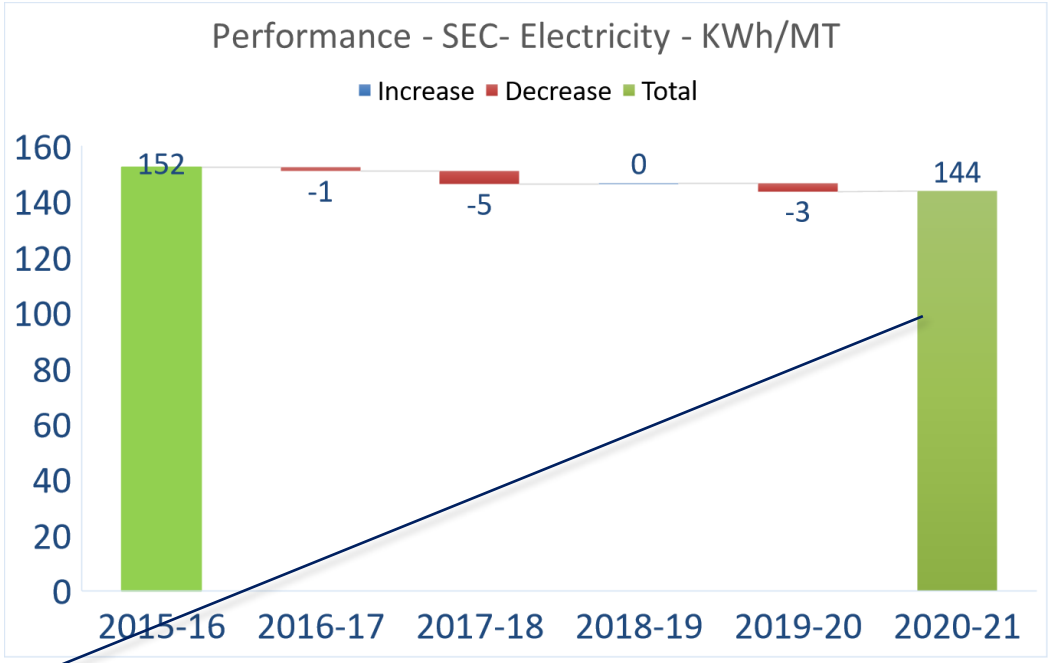

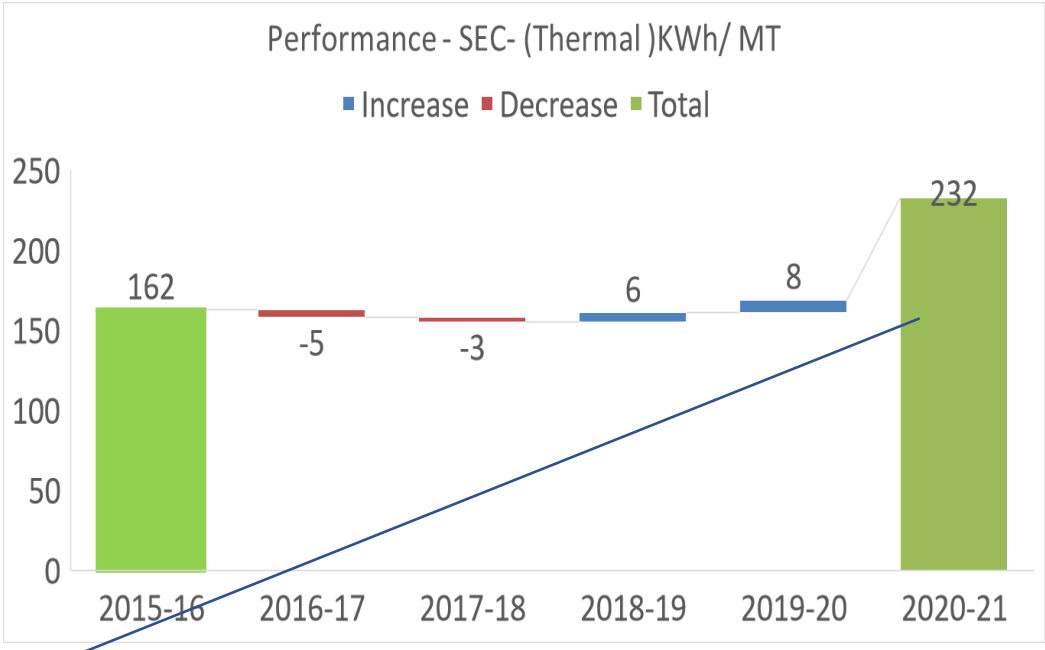

- Load additions in Energy intensive plants for improvement in Quality , safety and Yield.
- Additions gets negated by increase in yield and implementation of energy reduction themes

- For steam , measurement improved
- Consumption increased due to load additions and intentional reduction in production rates (especially in Dryers) primarily for product quality

Information on Competitors, National & Global benchmark

- Not much information is available on sulphonation plants bench marking
- Production rates were maintained as per OEM specifications.
- Internal Benchmarking was carried out among different factories of Galaxy:

Location	Year of Commissioning	Sp. Consumption (KWH/MT)
Taloja (L1)	1997	X
Taloja (L2)	2004	0.85 X
Taloja (L3)	2010	0.94 X
Jhagadia (Gujarat)	2018	0.79 X
Egypt	2011	0.78 X

Major Encon project planned in FY 2021-22	*Expected Reduction*
Conversion from Coal based boiler to NG Boiler	
Optimization of process blower loading by PID controlled Variable frequency drive	54 kw/hr
L.E.D Phase VIII	200 kwh/day
Enhanced waste Heat Recovery by replacement of process heat exchangers	10 % steam reduction
Chiller synchronization and load segregation	750 kwh/day

Energy Saving projects implemented in last three years

Year	No. of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal/MTOE)	Savings (INR Million)
FY 2018-19	3	1.451	0.169	-	1.515
FY 2019-20	17	26.9	0.714	159.574	8.662
FY 2020-21	4	0.175	0.093	85.391	1.74

Major Projects Implemented

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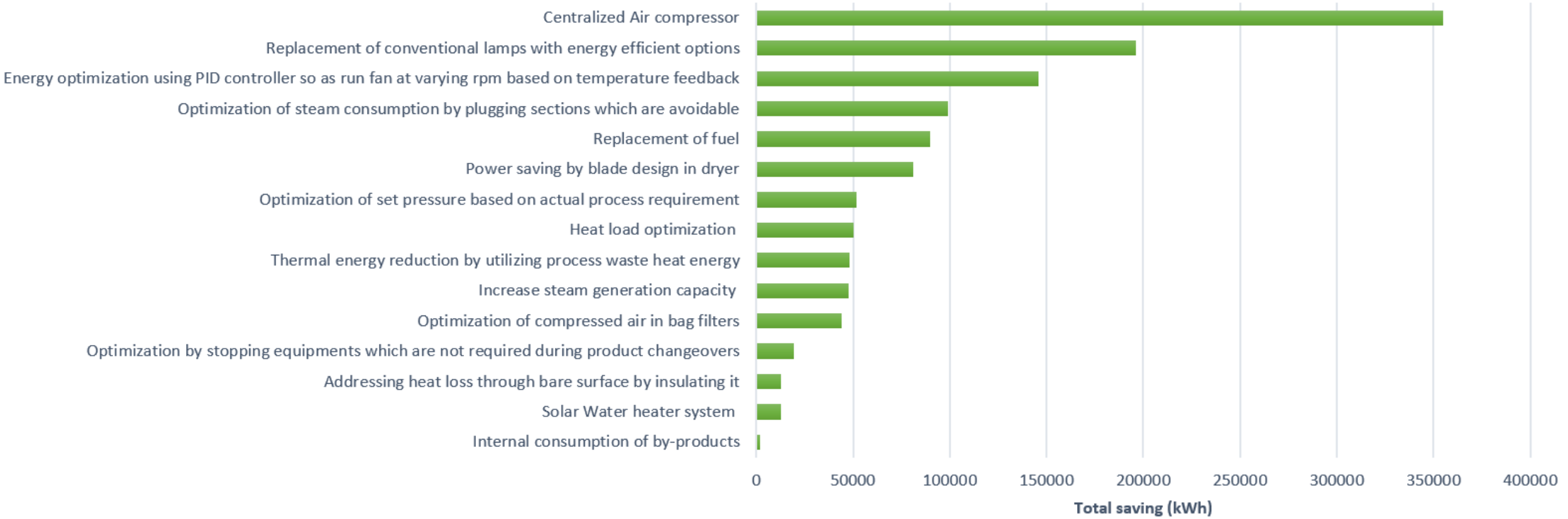
Top 15 Major Projects Implemented (2018-21)



Innovative projects implementation

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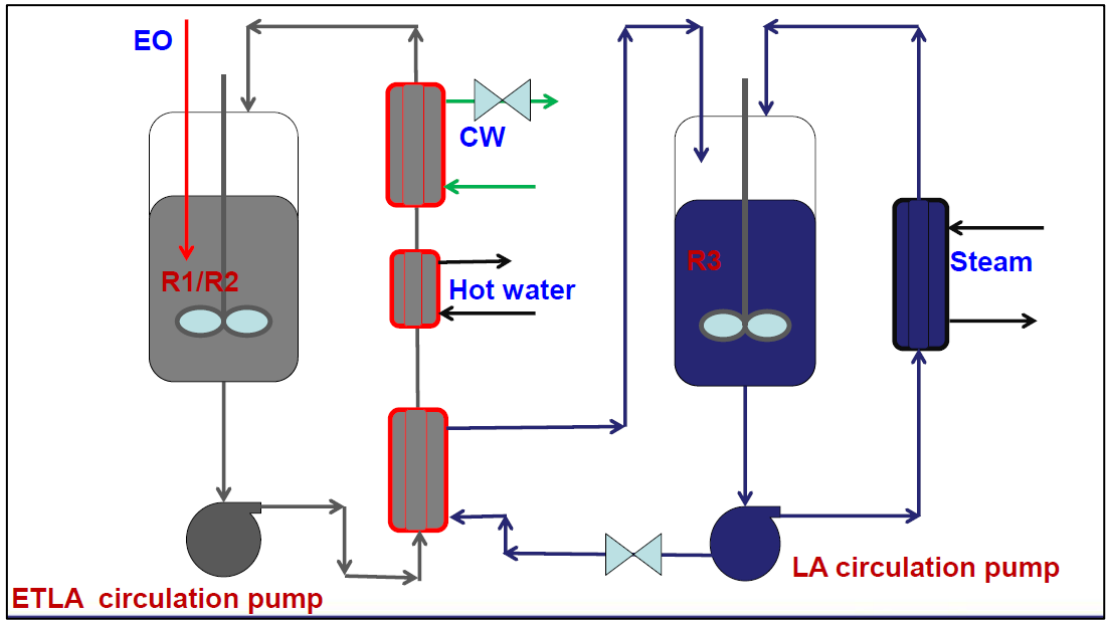
Project USHMA:

Utilization of process exothermic heat from reactor as a replacement for steam used for heating another raw material to bring it to desired temperature.



Heat availability	Heating of LA from 30 -145 °C	Exothermic heat of reaction	Cooling of ETLA from 165 -55 °C	Units
Before Implementing heat recovery				
Energy	18628	48866	23100	Lakh Kcal / Annum
FO required	192.04	503.77	238.15	MT
Cost of FO	111.38	292.19	138.12	Rs (In Lakhs)
After Implementing heat recovery				
Energy	97	4854	23100	Lakh Kcal / Annum
FO required	0.99	50.04	238.15	MT
Cost of FO	0.58	29.02	138.12	Rs (In Lakhs)
Net Savings	373.97 *			Rs (In Lakhs)
Net loss	167.72			Rs (In Lakhs)

- Saving of 5000 TPA of steam.
- Overall Thermal Specific consumption (kg/MT) dropped by 40 %
- Boiler capacity was a constraint and in order to optimize its output , some reduction in demand was required which was sufficed through project USHMA in ethoxylation plant

Utilisation of Renewable Energy sources

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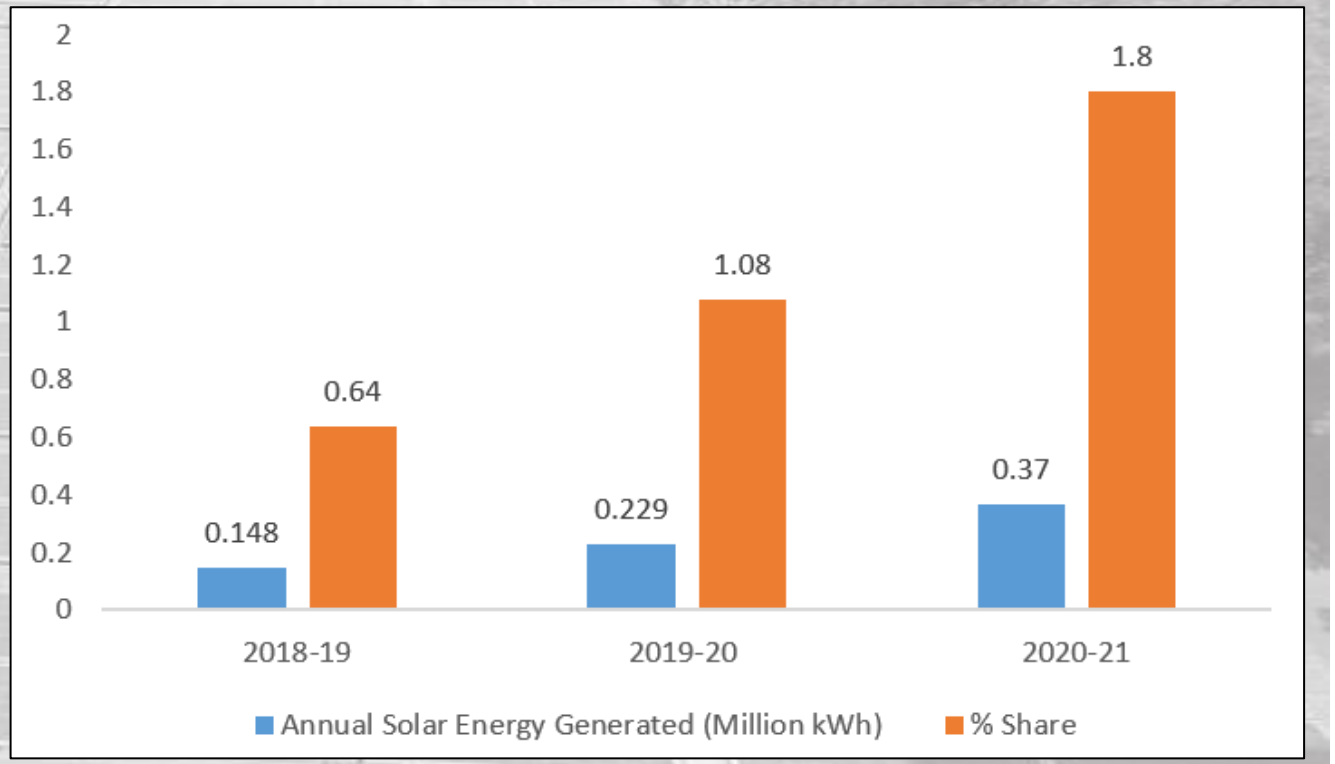
Inhouse Generation

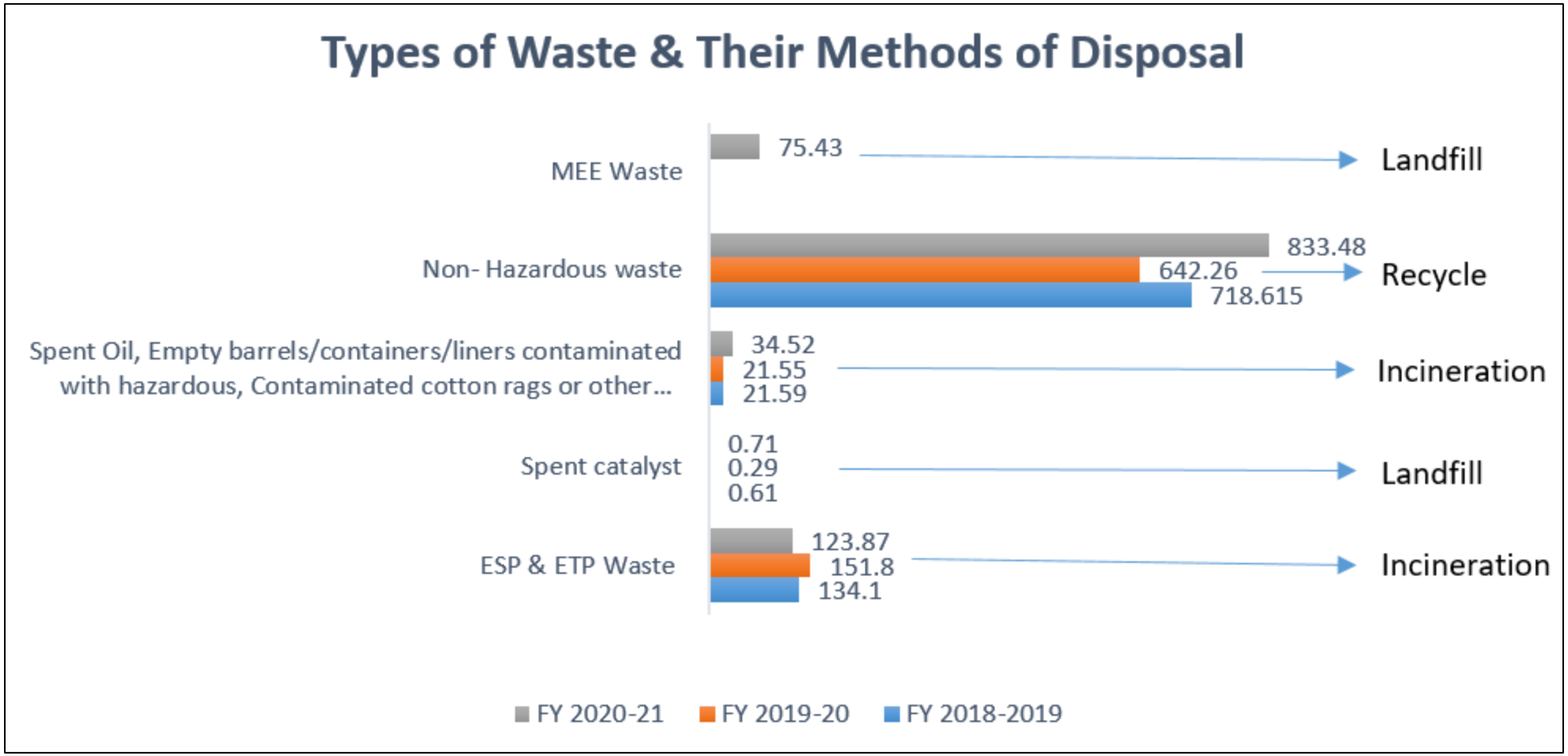
- Total installed capacity
  - Taloja: 504 KWp
  - Jhagadia: 250 KWp
  - TTC: 49 KWp
  - TOTAL : 803 KWp (2.0-2.25 % of requirement)



Procurement

- PPA Signed for 40 % power through Group captive mechanism (5.64 MWp plant commissioned in Beed)

Waste utilization and management



Waste utilization and management

- 2 waste heat recovery boilers of 1000 Kg/hr capacity of steam output are running on waste heat released from manufacturing process in sulphonation.
- Condensate recovery (60 %) as condensate sent to boiler feed tank
- Nearly, 90% effluent is recycled back and for 10% MEE has been installed and commissioned in Feb 2020. Various process effluent reduction themes implemented resulting 5.1% reduction effluent generation and also 5.2% reduction in domestic waste generation

	Total Quantity of waste Generated (MT/Year)	Name of Fuel	Quantity of waste Fuel used (MT/year)	GCV of fuel (kCal/kg)
FY 2018-19	874.915	Waste Hot Air	265600	16.74
FY 2019-20	815.9	Waste Hot Air	265600	16.74
FY 2020-21	1068.01	Waste Hot Air	138816	46.65

Zero Liquid Discharge Unit since May 2017

GHG Inventorization & target

Emissions of last three years

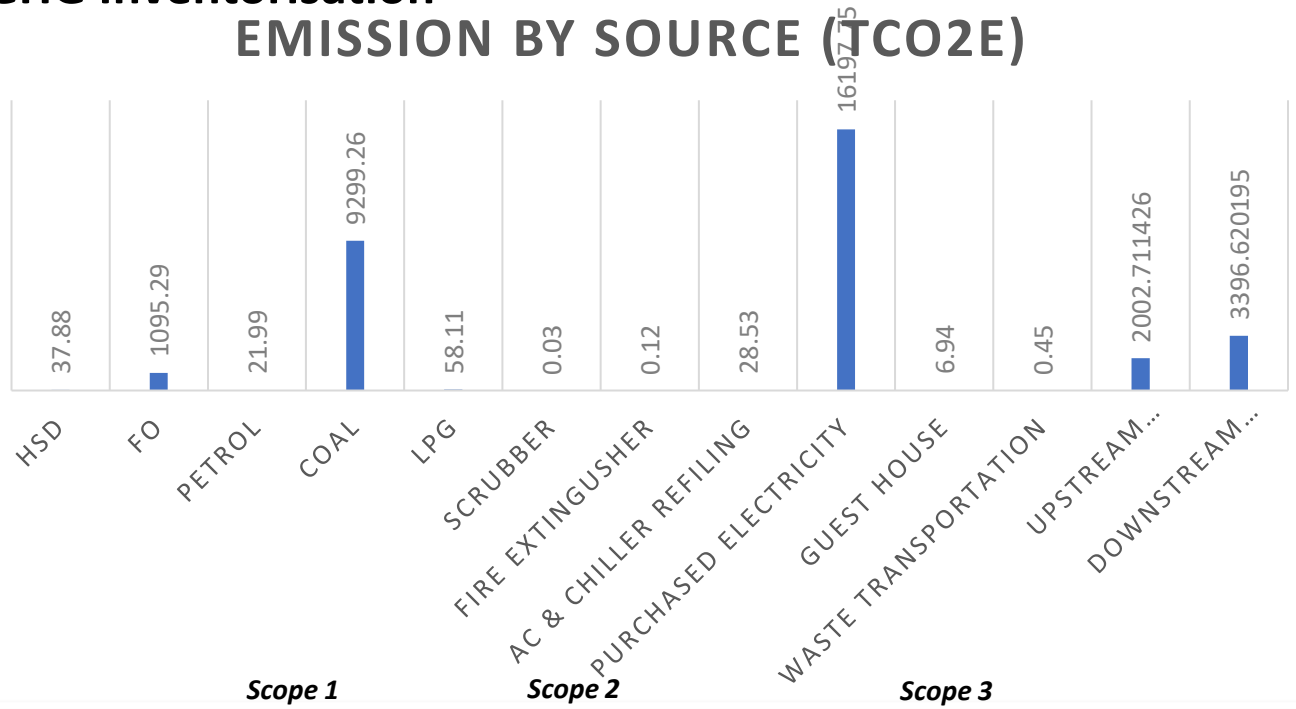
	Scope 1+2(tCO2e)	Scope 1+2 (tCO2e)/ MT
2018-19	28887	0.184
2019-20	27130	0.184
2020-21	26734	0.186

Climate Change- B
Water- B-, SER- A-

GHG Reduction (Intensity India)

- ❑ Target: 35%
- ❑ Achieved: 33.9%
- ❑ Base Year: 2012-13

GHG Inventorisation



Target

- Signed Commitment to Science Based Target.
- Long term: 42% absolute Scope 1+2 emission reduction (in line with 1.5 degree scenario)
- Short Term Target- 40% RE; Eliminate use of Coal & FO in operation by 2023; 2% SEC reduction by FY 2021-22
- Medium Term Target- Zero Waste to Incineration (Waste to energy); Supplier engagement plan to encourage suppliers to adopt low carbon economy
- Long Term Target- 100% Waste Circularity by 2030;

Green Supply Chain Management

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Reduction in raw material packaging material:

- Used to handle Sulphur in 20 kg HDPE bags earlier
- Consumption of ~1400 bags/month
- Converted this to Jumbo handling= 28 bags
- Tie up with Supplier to use these jumbo bags at least 3-4 times

Close to 4500 fresh HDPE drums saved

- Taloja RM drums being used for packing waste @ Tarapur units
- Alignment with suppler for reuse of RM carboys

~40000 bags saved (~12 lacs)

- Formulation product property of direct material storage in Jumbo 20Kg HDPE bags are used for initial packing
- Everytime fresh bags considered earlier
- Now same bags used again

~1.15 lac paper bags saved with saving of ~49 lacs

- Initially for all material movement at job processor new bags being used for movement
- Thought process by team to use same bags till the quality deteriorates
- Started themes implementation from April 2018

Supplier Code of Conduct

EnMS Requirement –

- Evaluation- on basis of energy performance. Evaluation criteria has been communicated to supplier/ vendor
- Criterion established and implemented for assessing energy use, consumption and efficiency over the operating lifetime when procuring energy using products, equipment and services

Teamwork, Employee Involvement & Monitoring

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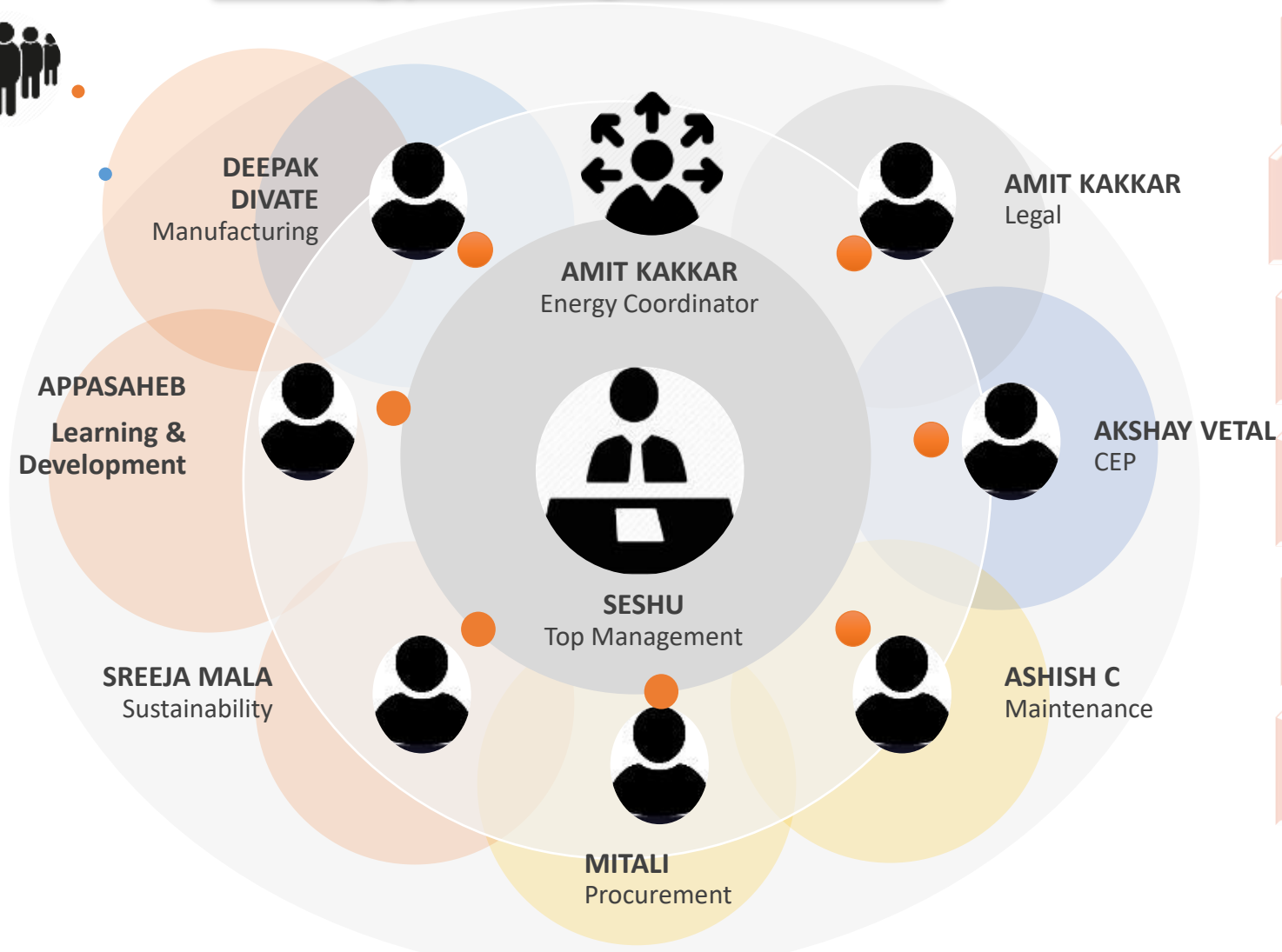
Energy Management Cell



1. MRM – Status of Energy Saving Project
2. Energy performance review- included in MIS and DPR's
3. Plant Monthly meeting
4. Sustainability Cell Meeting
5. Annual Performance Report, Sustainability Report & BRR
6. Corporate -Management Review & Quarterly meeting

Strategy Adopted for Awareness creation and employee involvement

- Team of 22 Internal auditors available
- 3 BEE certified Manager and 2 BEE certified Auditor. 1 BEE Manager & 1 BEE Auditor applied in FY 2020-21
- E-Module on energy conservation and requirements of EnMS ISO 50001
- Celebration of Energy week
- WESAP – training
- 16 Major loss- training
- Energy Policy & Requirements EnMS ISO 50001:2018 Video
- Reward and Recoginition

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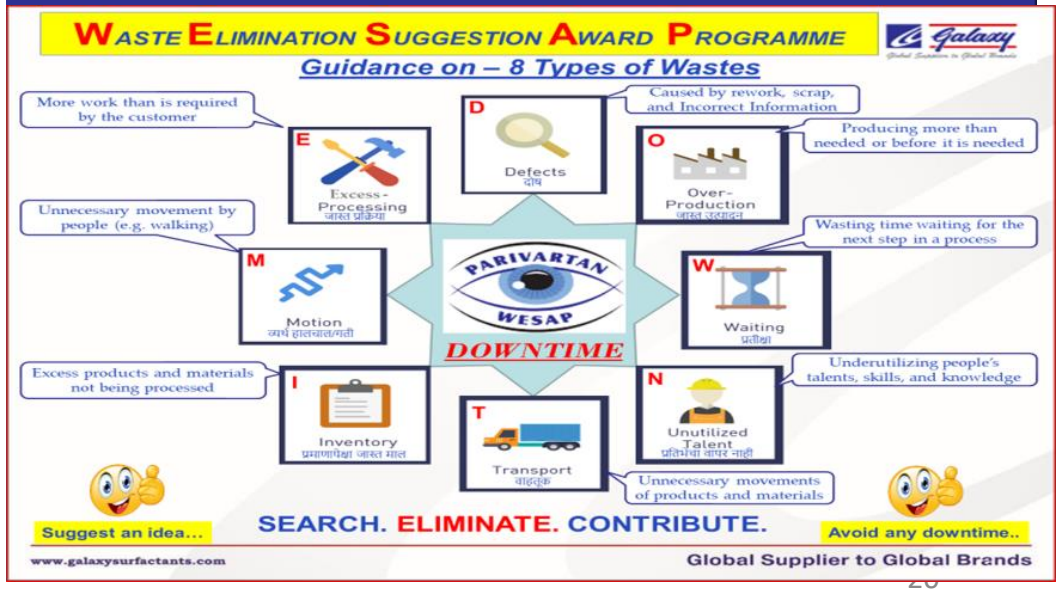
WESAP (Waste Elimination suggestion award program)

- Initiated suggestion mechanism to address losses by involving plant operators
- Conducting awareness sessions on 16 types of losses
- resulted in 1270 suggestions in 2020-21

No. of Suggestions Received (YTD)							2464
No. of Feasible suggestions							1405
No. of Non Feasible / Invalid /Rejected suggestions (Fuguais/Repeated)							763
No. of Suggestion Confirm for feasibility(Need to discuss with senior)							156
No. of suggestions To be Check Category							141
Categorizations of Feasible suggestions (YTD)							
Category	C	E	P	S	Q	M	
Total	217	76	81	719	194	118	1405
Implemented	79	31	29	258	78	39	514
Pending	138	45	52	461	116	79	891
No. of suggestions which resulted in cost savings (C,E,P)							373
Pending cost Calculation of implemented Suggestions							78
Potential Cost savings (Rs. in CR.)							6.40
Actual savings Calculated of implemented 55 Nos. Suggestions only (Rs. in CR.)							



Training program, at least once in a year

Communication from Top Management and Energy Coordinator

Classroom Training

Poster & Slogan Competition- Energy Week

Celebration of Energy week

Reward and Recognition – Events of Energy Week

Quiz competition on Energy week

Awareness Creation and Employee Involvement

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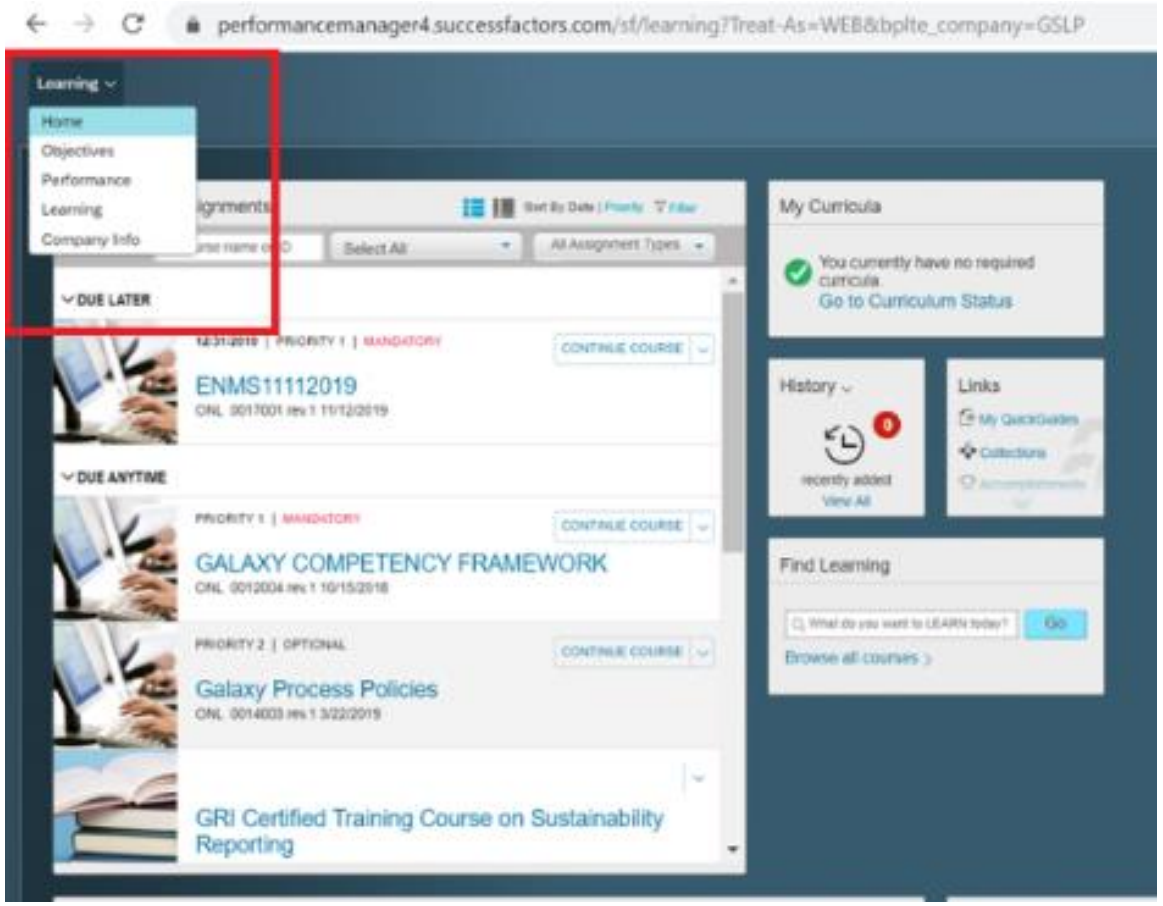
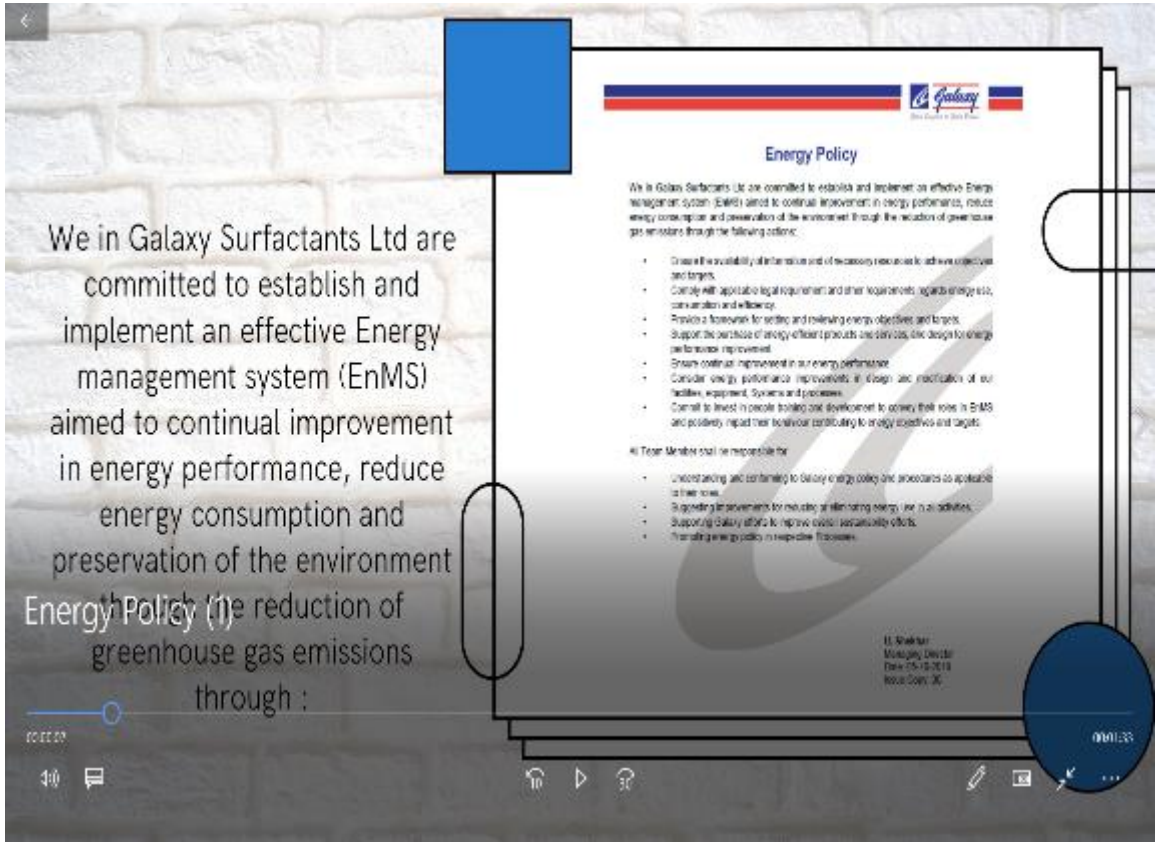


E-Learning on EnMS



Video on Energy Policy

Daily monitoring system,use of iOT

An energy management software generates section wise daily consumption reports with a clear status on deviations from planned figures. Energy details are part of daily production reports also which is reviewed by plant seniors

For Electrical and thermal energy, software are installed to record and monitor power and steam related information. Even for power quality , ispl meters are installed which have online monitoring

Separate budget for Energy Conservation

There is no fixed budget . Approvals are granted based on saving potential and priorities . We have examples of themes worth 2 Crores getting approved unbudgeted.

Energy efficiency/awareness training program

Awareness sessions conducted, E-Module created for staff members- Trained staff members on energy conservation and requirements of EnMS ISO 50001:2018, Celebration of Energy week

WESAP – training, 16 Major loss- training , Energy Policy Video

Many such sessions were conducted in 2020-21.

Galaxy
Global Supplier to Global Brands

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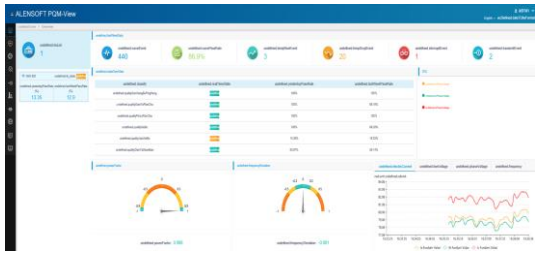
Power - Quality Software

Installed a POWER QUALITY METER for power quality measurement.

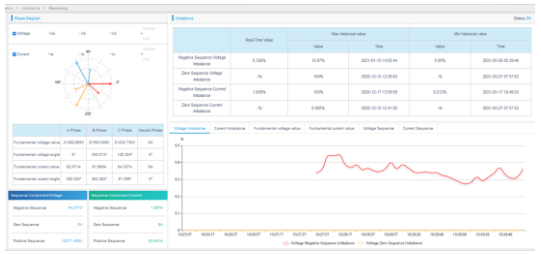
OVERVIEW



BASIC PARAMETERS

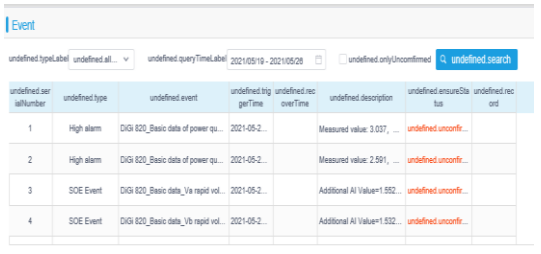
FLUCTUATIONS

UNBALANCE



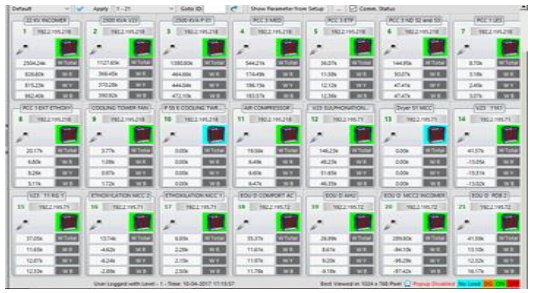
FLICKERING

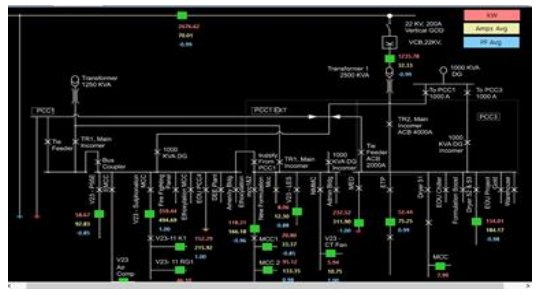
EVENT MEASUREMENT

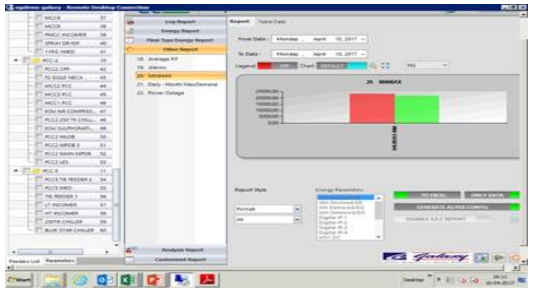


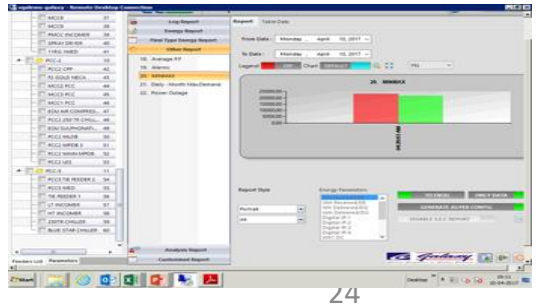
Energy Management System

Developed the ENERGY MANAGEMENT SYSTEM (EnMS) for Taloja site for online power measurement, analysis & also for report generation.









Implementation of ISO 50001/Green Co/IGBC rating

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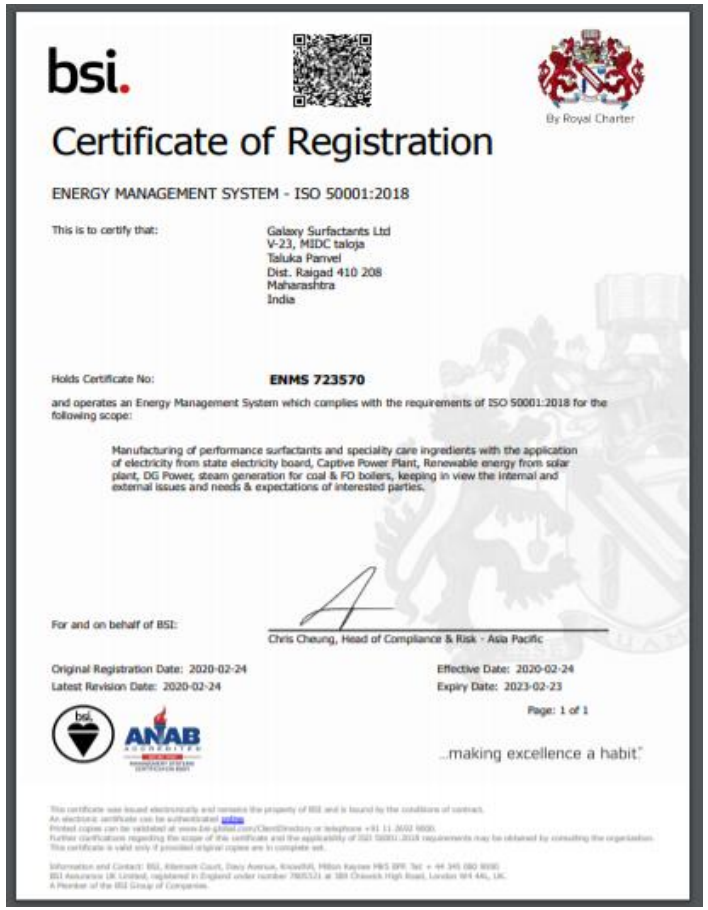

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For and on behalf of BSI:

Chris Cheung, Head of Compliance & Risk - Asia Pacific

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Energy Management System(EnMS)

Galaxy has adopted structured way of energy monitoring and control through EnMS 50001:2018. The certification was awarded to Taloja plant, India after successful audit conducted by BSI, a certification body.

CII Green Co

It is the “first of its kind in the world” holistic framework that evaluates companies on the environmental friendliness of their activities using the life cycle approach.

Galaxy has adopted the GreenCo rating system at its Taloja plant, India to assess its operations’ environmental performance adopting a procedure-based approach.

Awards & Achievements!

Galaxy Surfactants, Taloja plant was conferred with the CII Green Company rating (GreenCo - Silver level). The plant thus became only the 2nd Surfactant unit in the country to achieve this feat.

We are a signatory to the Responsible Care Global Charter since March 2015. Galaxy Surfactants Ltd. (India) has been granted permission to use Responsible Care Logo for a period of Three Years i.e., from February 2021 to January 2024 based on the virtual Responsible Care Recertification audit conducted in December 2020.

Learnings from Award programs

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Learning from implementation of ISO 50001:208

Hidden losses got exposed, Awareness brought consciousness about energy at shop floor level, Manufacturing team talks the language of specific consumption and not production volumes, Internal bench marking, Best practices shared across location

Learning from other companies from past energy award events

1) New products which can reduce energy consumption
2) Best practices
   - Eg: Integrate GHG Accounting with ERP systems; a. Use of Accounting software for reporting or Sustainability modules of existing ERP providers; b. Use of additional fields in existing systems for encoding GHG component;
   - Eg: Explore the possibility of 'at source' carbon sequestration project; a. Conversion to usable/saleable chemicals; b. Conversion to inks/pigments based on carbon black
3) Awareness initiatives
   - Measure effectiveness of capability building programs conducted is suggested to understand the cost benefit ratio, and to further improve on the same

Thank you !

Amit kakkar- Sr.Manager-Electrical

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