Welcomes to Juries And Participants

CII National Energy Award
For
Excellence in Energy Management - 2024

M.Anbhazhagan
Manager - Maintenance

R.Karthick
Asst.Manager - Maintenance

D.Sankar Prasath
Senior Engineer - SHE

Rane
Expanding Horizons

RANE BRAKE LINING LTD – Trichy

10th - 12th Sep 2024

www.rane.co.in

Company Profile

RBL Vision

"To establish global presence and enhance domestic leadership by providing eco-friendly friction solutions"

RBL Milestones

2024 – GreenCo Kick Start

2023 – ACMA- Health, Safety and Sustainability

2022 – ACMA-Manufacturing Excellence

2020 – CII-Energy excellence award

2019 – Plant capacity enhancement

2016 – CII-Energy excellence award

2015 – CII-Energy efficient award

2013 – Deming Grand Prize

2008 – Trichy plant (P4) commenced

2003 – Deming Award

1985 – Collaboration with Nisshinbo(NISB), Japan

1964 – RBL Commenced operations – Technical collaborations with Small & Parkes-UK ; Chennai plant started (P1)

Plant Profile

Trichy plant facility

Certifications

IATF 16949:2016 | ISO 9001:2015 COMPANY | ISO 14001:2015 | ISO 45001:2018 COMPANY

Product segments & Customers

Plant Started at June 2006
Plant Spread Area – 20 acres
Plant Build up area – 6 acres
40% of land Area covered by Green belt

Passenger Car Disc Pad – 14.5 lacs/Month
Commercial Vehicle Brake Lining – 1.50 lacs/Month
Passenger Car Brake Lining – 4.50 lacs/Month

IATF 16949:2016, ISO 9001:2015
ISO14001:2015, ISO 45001:2018

- Manufacturing 100% asbestos free Disc pads & Brake lining
- 72% - Renewable energy utilized plant
- 1330 Saplings Planted Conventional & Miyawaki Method, which observes 20MT of CO2/Year

Passenger Car Disc brakes

"State of Art Manufacturing Facility for Frictional Material"

2.Technology strength comparing with Competitors

Process Technology

Wet blasting Process

- Make : MACOHO - Japan
- Wet blasting is the use of an abrasive media and compressed air to achieve a desired finish on a chosen surface
- Only friction material company in India using wet blasting technology
- System operating in 80% energy efficiency

Powder Coating Process

- Make : PARKER - Japan
- Powder coating is a dry powder applied to a charged surface, creating a thicker coating in one application
- Energy Efficient : IR heater system with natural cooling Process

Product Technology

1D Barcode

- Make : COGNEX - India
- RBL is the 1st first Indian company to implement 1D barcode printing in friction Material
- Scanned 100% in RBL & Tier 1 & OEM
- Avoid Wrong pad fitment of in Caliper at Tier 1

Robots & Kobots

6 Axis Robot

- Make : ABB - India
- Man to No-Man Technology
- We are the Benchmarking plant for implementing Robot technology in our group companies

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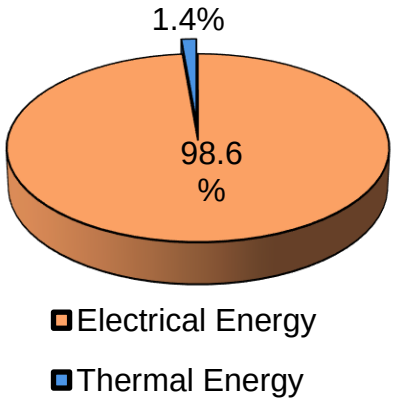
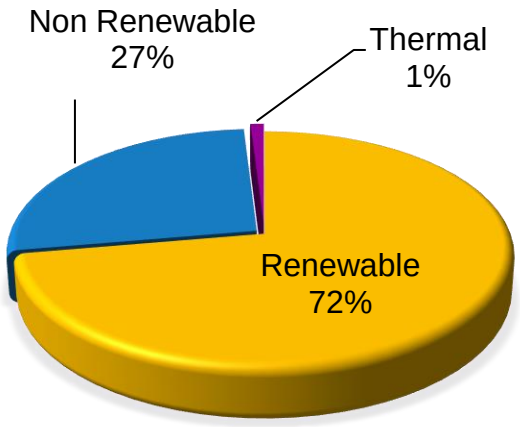
3.Energy Consumption Overview

- ✓ In our factory premises ,we are using 98.6 % **Electrical Energy** and 1.4% **Thermal energy**
- ✓ Total Renewable energy is 72% and Non Renewable is 27 %
- ✓ We are using 51 % Solar energy and 21% wind energy plant equipment's

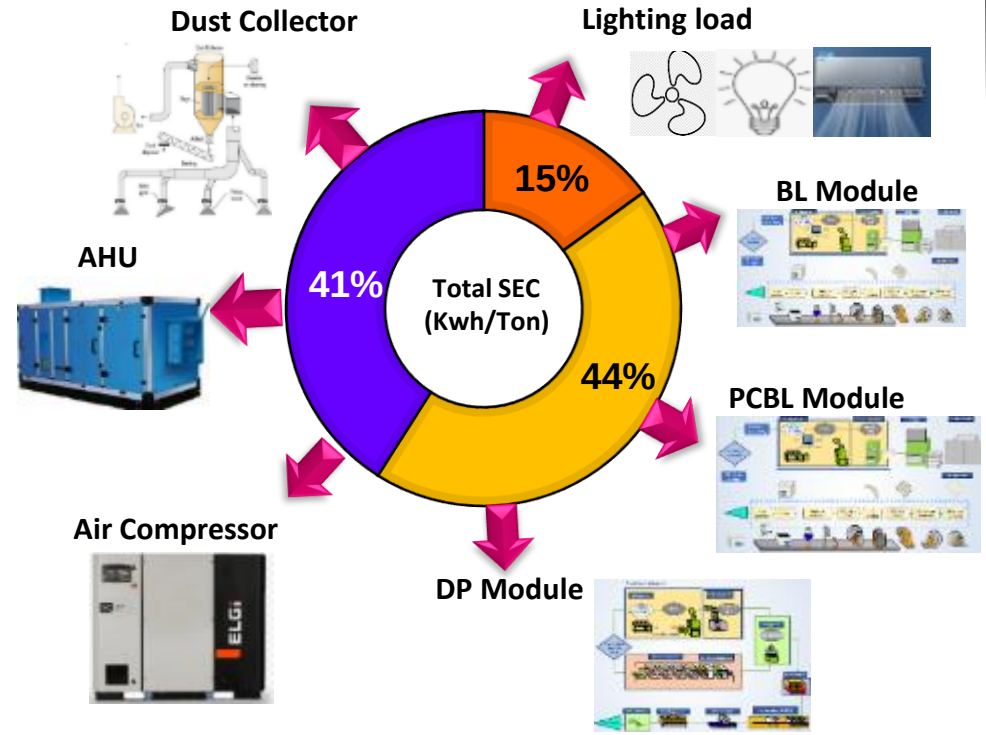
Source of Energy



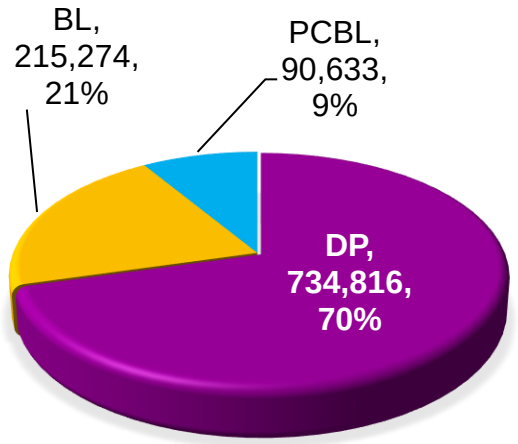
Plant Energy Mix in %



Energy Consumers



Module Wise Energy Consumption



Understanding the energy consumers helped in framing the strategies of High Energy equipment

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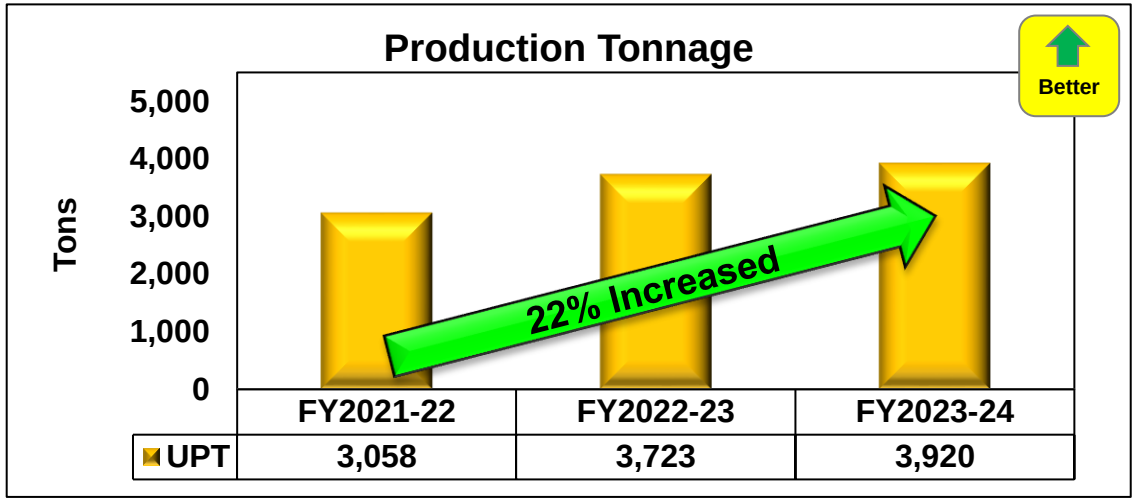
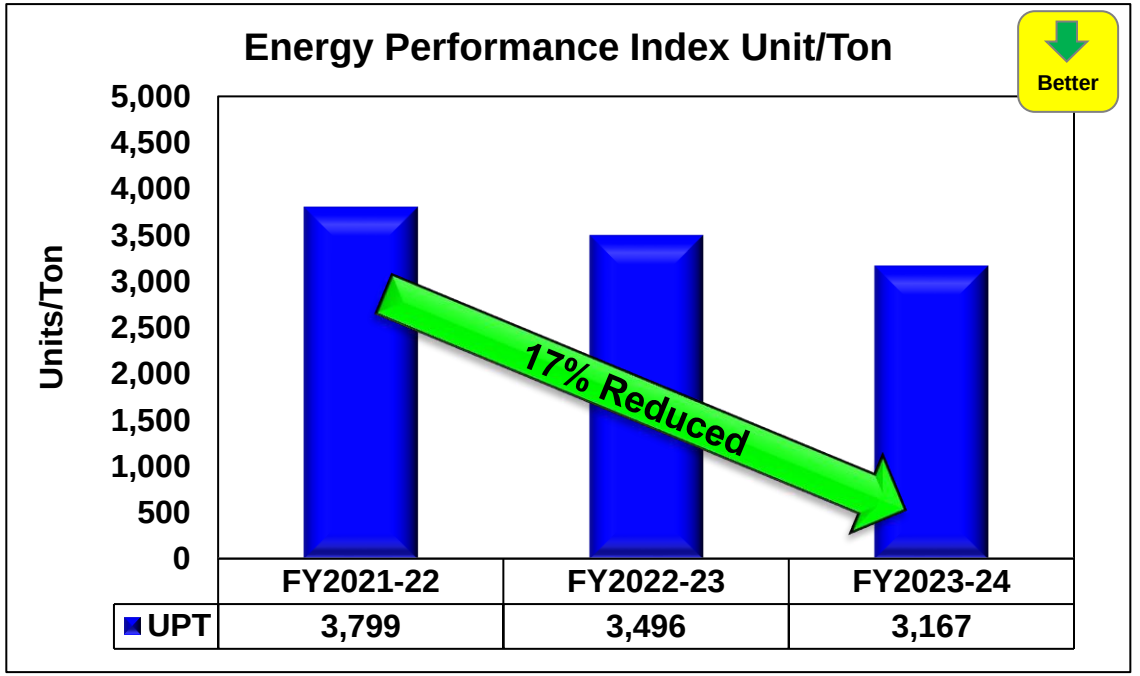
3.2.Specific Energy Consumption in last 3 years

Year	Energy consumption(kWh)	Production Tonnage	Energy Performance index
			Unit/Ton
FY 2021-22	1,07,01,258	3,058	3,799
FY 2022-23	1,22,54,903	3,723	3,496
FY 2023-24	1,26,09,535	3,920	3,167



Process wise SEC

Segments	Specific Energy Consumption	2020-21	2021-22	2022-23	2024-25 Short term	2026-27 Mid-term	2030 Long term	% of reduction
Utility	Compressor -DP	1,162	1,104	1,049	996	916	762	27
	Compressor - BL	1,045	993	944	896	825	812	14
	AHU	2,793	2,654	2,521	2,395	2,203	2,194	13
	Dust Collector	31,934	30,337	28,821	27,379	25,189	24,567	15
	Cooling tower	17,418	16,547	15,720	14,934	13,739	12,687	19
Production	Wet blasting	32,648	31,016	29,465	27,992	25,752	23,519	20
	Curing	216,728	205,892	195,597	185,817	170,952	159,914	18
	Baking	84,990	80,740	76,703	72,868	67,039	63,687	17
	Scorching	25,160	23,902	22,707	21,572	19,846	18,054	20
Total -KWH Reduction		413,879	393,185	373,526	354,849	326,461	306,196	18



Production tonnage increased 22% and Energy consumption reduced 17%

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3.3.Specific Energy Consumption in last 3 years

- *Energy conservation group level CFT formed with select team members across all Plant. Team created "Technique matrix" based on best practices implemented over the years*
- *Based on the approach for both production and utility equipment's to identified high impact projects which gives quick payback*

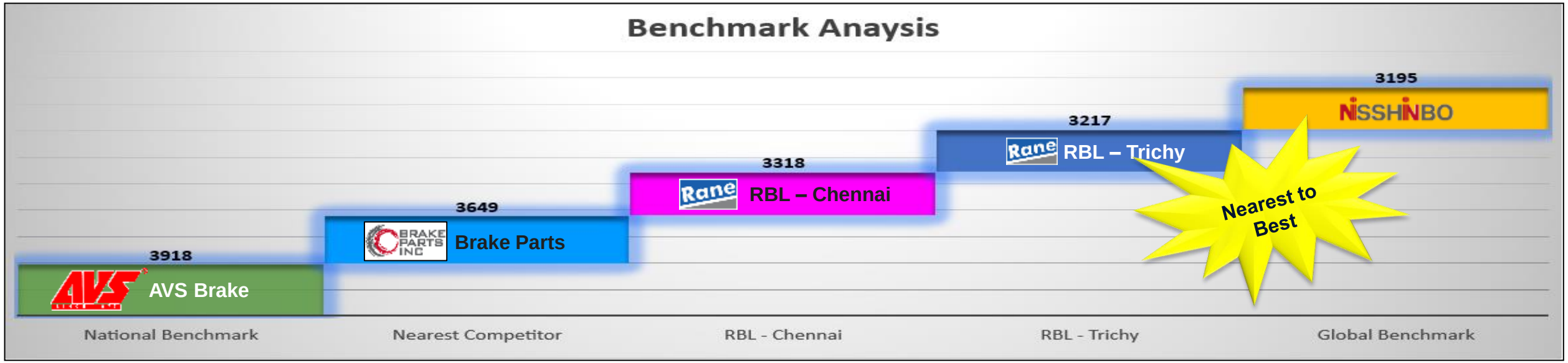
Energy Conservation Technical Matrix

Process	VFD	Servo Motor	Motor Class conversation to IE3 or IE4	IR Heater	Process Optimization 1.on/off control 2. Efficient devices	Efficiency improvement	Idle time trip	Delta to star conversation	Motor size optimization	PID control/Thyrister controller and Ceramic insulation
Mixing	X		X	X	X	X	√	X	X	X
Wet blasting	X	X	X	X	X	√	√	X	X	X
Adhesive coating	√	X	X	√	X	√	√	X	X	X
Preform Press	√	X	X	X	X	X	√	X	X	X
Cure press	√	X	X	X	√	√	√	X	X	√
ID Grinding	√	X	√	X	X	√	√	X	√	X
OD Grinding	√	X	√	X	X	√	√	√	X	X
Chamfering	X	X	X	X	X	√	√	X	X	X
Wear mark	X	X	X	X	X	√	√	X	X	X
MSDM	X	X	X	X	X	√	√	X	X	X
Baking	√	X	√	X	X	√		X	√	√
Auto Painting	√	X	X	X	X	X	√	X	X	X
Powder coating	√	X	X	√	√	X		X	X	X
Grinding m/c	√	X	X	X	X	√	√	X	X	X
Scorching	X	X	X	X	√	X		X	X	√
Shim bonding	X	X	X	X	X	X	√	X	X	X

Process	VFD	Inverter	Motor Class conversation to IE3 or IE4	Process Optimization 1.on/off control 2. Efficient devices	LED	Efficiency improvement	Power Factor Improvement	Solar System
DG	X	X	X	X	X	X	√	X
Compressor	√	X	X	X	X	√	X	X
Dust collector	√	X	√	X	X	√	X	X
AHU	X	X	X	√	X	X	X	X
STP & ETP	X	X	X	√	X	X	X	X
Cooling tower	X	X	X	√	X	√	X	X
Air Conditioners	X	√	X	X	X	X	X	X
Lighting	X	X	X	√	√	X	√	√

4.1.Information on Competitors, National & Global benchmark

- It's one of our regular practice that enable our team to increase the competitiveness
- Benefits of Benchmarking – Identifies the best practices to set goals and targets and for our continuous improvement



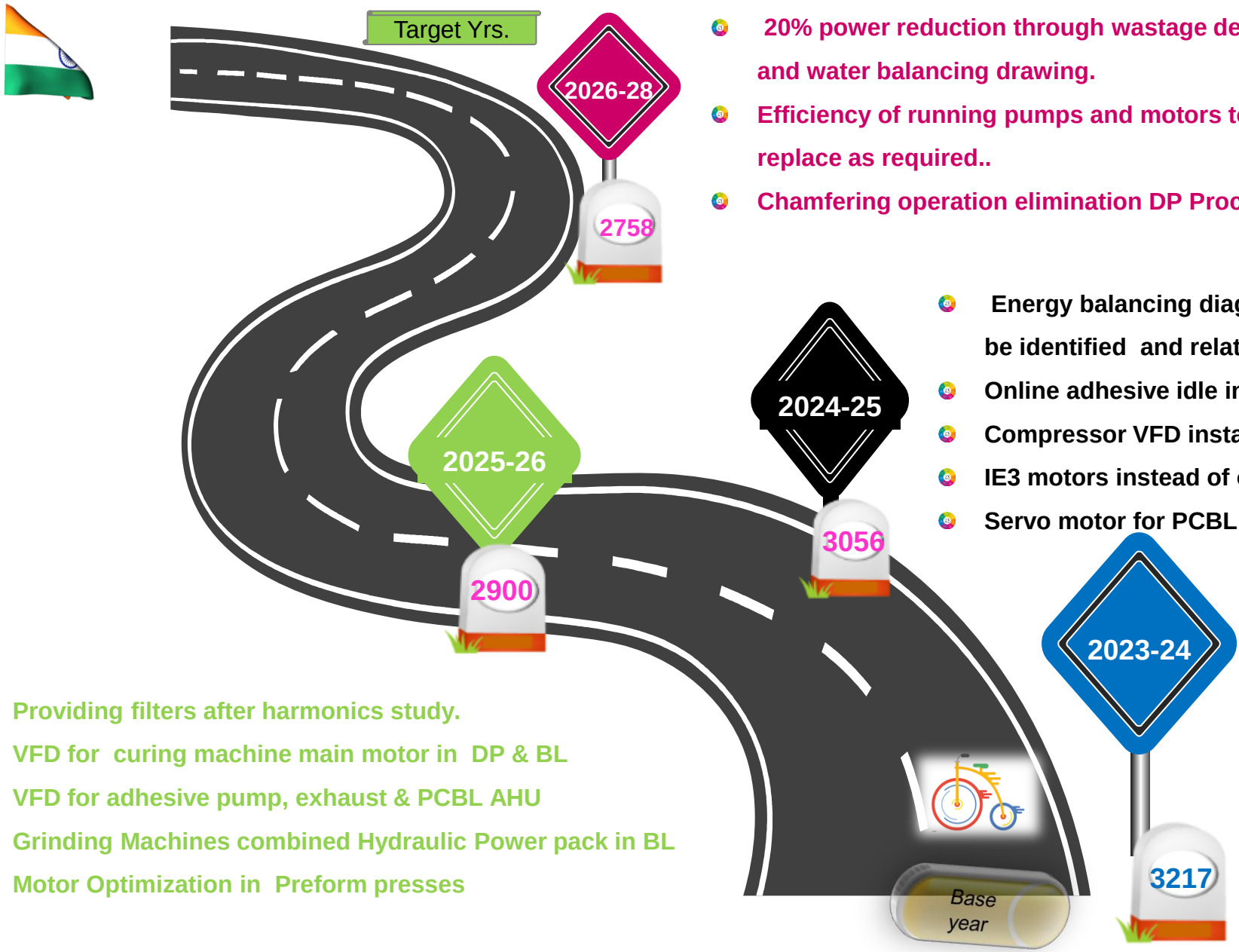
Sustainable benchmark Success Story

- Vision on Energy management system to Continuously improve and efficient use of energy and commitment to environment
- Energy cost focus on conserve energy, waste reduction, alternate technology, Fixed cost reduction & renewable energy usage
- YOY target setting done based on best of best in previous year
- Energy Sustenance Tracking done using IOT based Energy Management system

RBL Trichy is Second best industry benchmark focusing on reducing SEC year on year better than its competitors, however, accurate benchmarking can't be done due to different processes & size of product .

4.2 Road map to achieve benchmark

SEC in KWh / Tonnage



- 20% power reduction through wastage derived from Material and water balancing drawing.
- Efficiency of running pumps and motors to be checked and replace as required..
- Chamfering operation elimination DP Process

- Energy balancing diagram to be derived and energy wastage area to be identified and related action to be taken.
- Online adhesive idle interlock (Heater off) with conveyor
- Compressor VFD installation
- IE3 motors instead of old / inefficient motors .
- Servo motor for PCBL Cure press.

- 7 Projects completed
- Heat loss reduction in oven through thermography method
- No. of power saving projects identified 12 (Thyristor control for heaters in curing presses)
- Blower for MSDM instead of compressed air

- Providing filters after harmonics study.
- VFD for curing machine main motor in DP & BL
- VFD for adhesive pump, exhaust & PCBL AHU
- Grinding Machines combined Hydraulic Power pack in BL
- Motor Optimization in Preform presses

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4.3 List of Major Encon project planned in FY 2024-25

S.No	Name of energy saving projects	Electrical savings (Million kWh)	Total Savings (Million INR)
1	VFD introduction for Finishing Machines	0.04	0.31
2	IE3 motor for Baking and dust collector	0.02	0.19
3	Thyristor for Heater in Baking process	0.02	0.15
4	Automatic power factor correction system	0.04	0.34
5	Cure press hydraulic motor ON time optimization	0.02	0.19
6	Lower HP motors for hydraulic press	0.07	0.53
7	Concept of Common power pack in finishing	0.09	0.77
8	Wet blasting heater On/off Optimization	0.05	0.43
9	Duct line modification in BL Module	0.04	0.36
10	AC Energy saver in office area .	0.01	0.12
11	LED Light in PCBL Mixing zone	0.04	0.30
12	BLDC Fans in Shop floor	0.03	0.22
13	Energy efficient Air Compresser -3 nos	0.23	1.84
14	Idle off in Shop floor cure machines	0.02	0.13
15	Pressure optimization in pneumatic circuit	0.02	0.19
16	Joint elimination in pneumatic circuit	0.03	0.26
17	Elimination of Hydraulic motors - Finishing machines	0.05	0.44
18	Servo motor for PCBL Cure press	0.05	0.37

657 Tco2 reduction

Idea given by Operator | **Idea given by Supervisor** | **No of Projects :27nos** | **Zero Investment ideas :13**

2024-25 : Energy saving projects identified and potential cost saving of ₹ 7.13 Million

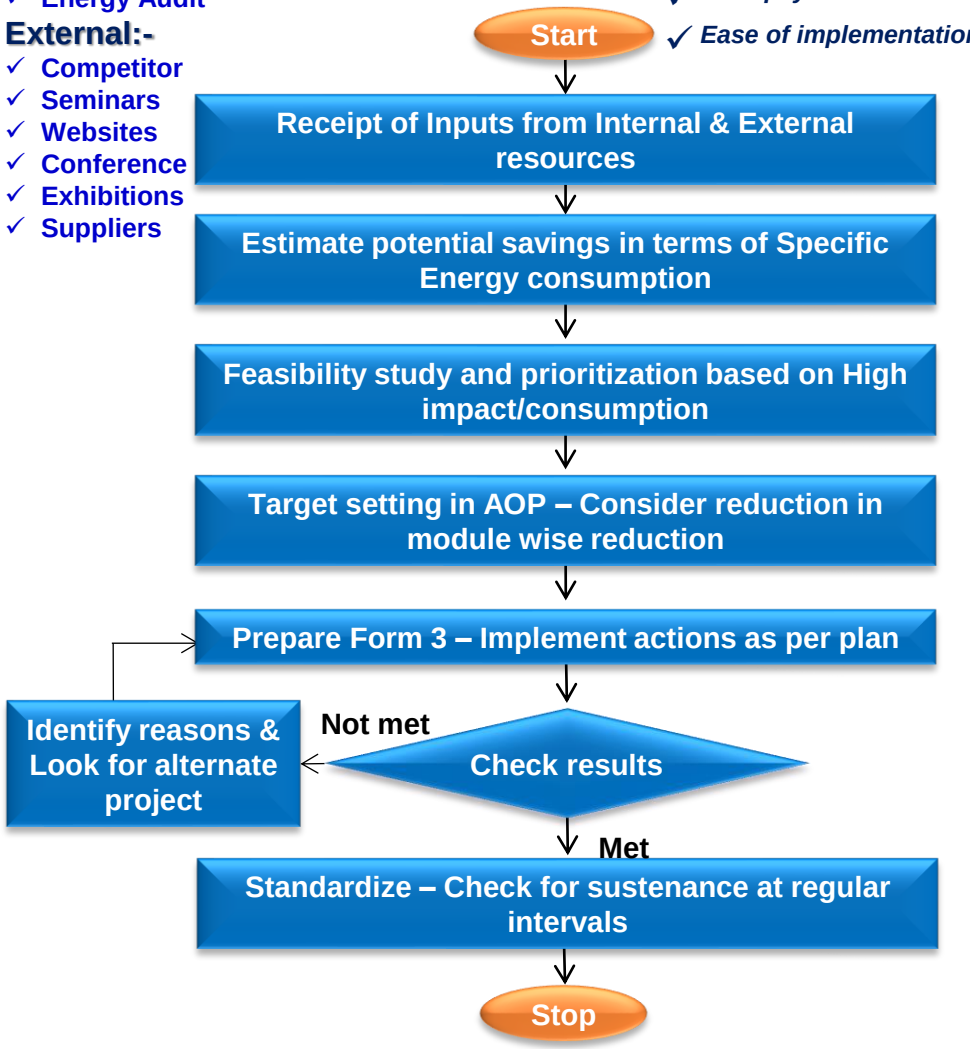
5.Approach on Energy saving initiatives

Energy Conservation measures – Approach

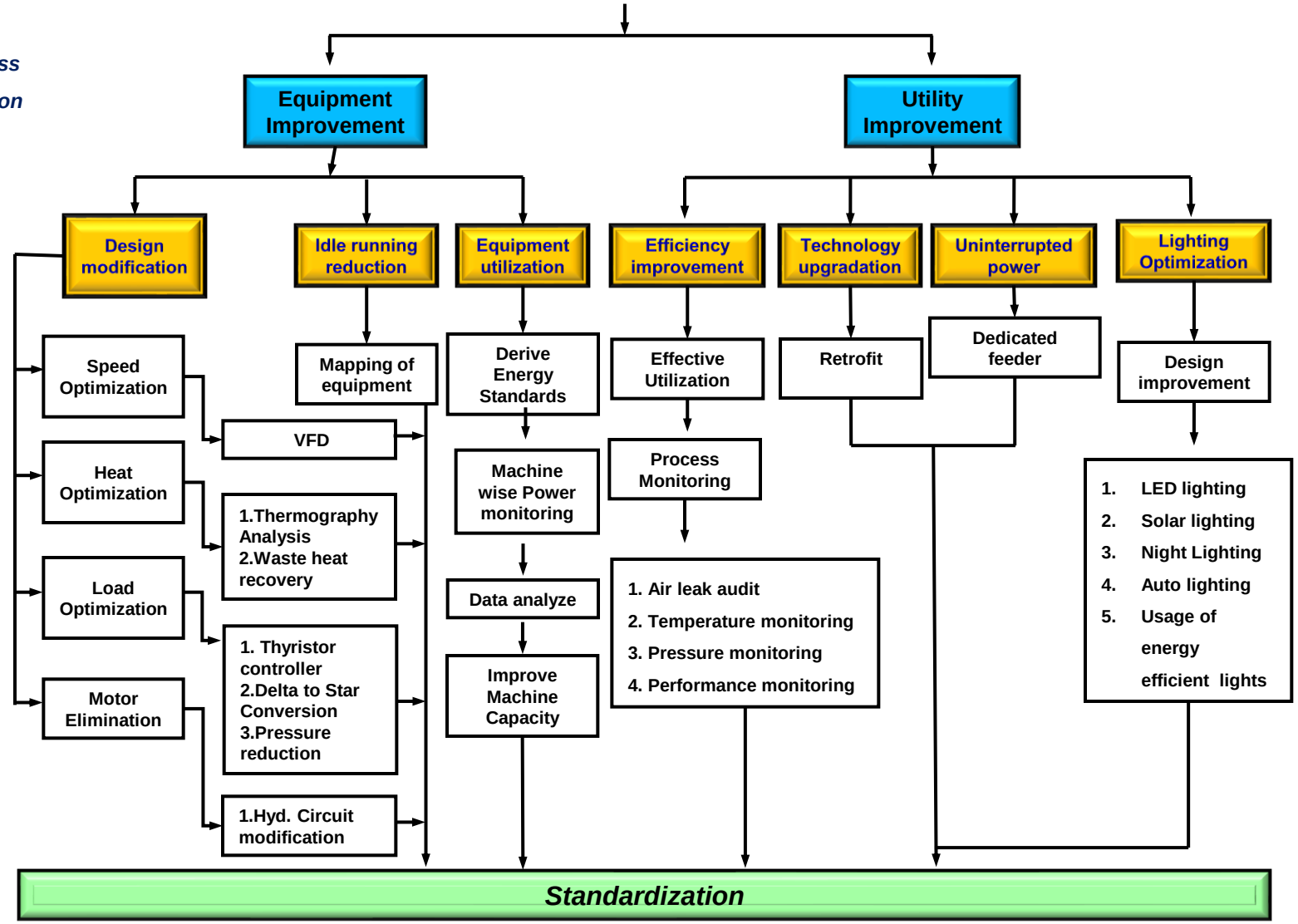
Internal:-
- ✓ Engineers
- ✓ Operator voice
- ✓ Last years pending
- ✓ Energy saving mapping
- ✓ Energy Audit

External:-
- ✓ Competitor
- ✓ Seminars
- ✓ Websites
- ✓ Conference
- ✓ Exhibitions
- ✓ Suppliers

#Criteria:
- ✓ *High consumption process*
- ✓ *Module with 60% utilization*
- ✓ *Less payback*
- ✓ *Ease of implementation*



Energy saving Mapping Chart



Energy Saving Projects identified based on the above mapping

5.Energy Saving projects implemented in last three years

Year	No.of Energy saving projects	Saving Potential in Million kWh	Investment (₹ Million)	Total Savings (₹ Million)	Payback period (in months	TCo2e Reduction
2021-22	32	0.86	2.03	5.80	4.2	610
2022-23	24	1.02	2.89	6.14	5.6	724
2023-24	37	1.96	4.49	13.67	3.9	1391

Consistent increase in investment towards energy efficiency and greener technologies showcases our commitment towards a greener tomorrow

2021-24 : 93 Energy saving projects implemented and cost saving of ₹26 Million achieved in the last 3 years

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5.1 List of Major Encon project implemented in FY 2021-22

S.No	Name of energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Payback period (in months)
1	Elimination of electrical conveyors in BL cure press	-	0.01	-	0.07	0.00
2	Axial fan AHU(Innovative concept of converting centrifugal fan with Axial flow fan concept implemented for AHU)	0.15	0.02	-	0.02	10.30
3	Riveting machine motor idle run switched off by providing timer	0.00	0.01	-	0.07	0.20
4	Thyristor for Baking ovens	0.10	0.04	-	0.26	4.50
5	Adhesive -2 Oven preheating and post heating chamber height reduction by 400mm	-	0.07	-	0.49	0.00
6	18 W LED tube lights in Preform and Mixing zone	0.16	0.04	-	0.32	6.10
7	Switching off cooling tower fan using temperature controller	0.02	0.00	-	0.01	14.40
8	Motor running hours modification through PLC in Preform press	-	0.07	-	0.54	0.00
9	Interlock between lodgie main motor with dust collector	-	0.00	-	0.02	0.00
10	Switching off panel AC by interlocking with HPP motor for GG04& GG05	-	0.00	-	0.02	0.00
11	VFD for Preform press	1.44	0.15	-	1.08	15.90
12	Temperature Optimization in AHU system	-	0.07	-	0.53	1.60
13	Preform press Cycle time optimization	-	0.03	-	0.19	0.00
	Sum of Total	1.86	0.50	0.00	3.61	53.00

2021-22 : 32 Energy saving projects implemented and cost saved ₹ 5.8 million with investment of ₹1.9millon

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5.2 List of Major Encon project implemented in FY 2022-23

S.No	Name of energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Payback period (in months)
1	Provide new air line for preforming and reduce air Pressure from 6 bar to 2 bar in cure press line 01 paranol line	0.00	0.01	-	0.10	0.00
2	Idel Timer for ejection system - DP Cure press	0.00	0.04	-	0.30	0.00
3	Combining IDG and IAL machine power pack.	0.08	0.01	-	0.11	8.20
4	DP Curing conveyor integration	0.13	0.01	-	0.10	14.80
5	VFD For preform machine- 13 no's	0.61	0.17	-	1.38	5.30
6	Duct line modification in BL mixing process	0.09	0.06	-	0.45	2.40
7	Baking Oven trolley Conversion	0.08	0.09	-	0.69	1.30
8	VFD for baking Oven - 15 no's	0.98	0.07	-	0.56	21.00
9	LED High bay light replacement	0.13	0.03	-	0.21	7.20
10	Idel Timer for Panel cooler AC	0.00	0.02	-	0.16	0.00
11	Drive & Driven Pulley ratio modification in baking oven	0.01	0.03	-	0.22	0.70
12	Reduce energy consumption by providing Solenoid valves on main headers of Compressed air line & switching off during non production time.	0.03	0.02	-	0.18	2.10
	Sum of Total	2.12	0.56	0.00	4.45	5.71

2022-23 : 24 Energy saving projects implemented and cost saved ₹ 4.45 million with investment of ₹2.1millon

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5.3 List of Major Encon project implemented in FY 2023-24

S.No	Name of energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Payback period (in months)
1	Compressed air usage optimization by switching off 125 cfm compressor	0.13	0.06	-	0.51	2.92
2	Temperature optimization in DP Preform Zone	0.00	0.02	-	0.18	0.00
3	Switching on Air line in od finishing -1, msdm 1 & 2 only when motor is on by providing solenoid valve	0.02	0.02	-	0.13	2.11
4	VFD installed in 16000 Cfm dust collector	0.04	0.03	-	0.23	1.84
5	Auto batching 2 Remote control switch fixed for 8000 Cfm dust collector motor switch off idle run	0.00	0.02	-	0.13	0.14
6	LED light replacement in DP Mixing	0.12	0.05	-	0.37	3.89
7	Idle time reduction in Preform Press -Motor running hour optimization through PLC program	0.00	0.01	-	0.08	0.00
8	Conveyor idle off in scorching machine	0.00	0.04	-	0.33	0.00
9	Duct line modification in BL Line -01 finishing process	0.10	0.08	-	0.62	1.90
10	Wet blasting heater switch off during non production time	0.00	0.03	-	0.28	0.00
11	IE3 motor for Baking and Dust collector	0.17	0.02	-	0.14	13.85
12	Capacity improvement in Powder coating process from three/product/ row to four/product/row	0.00	0.08	-	0.55	0.00
13	Continuous grinding and grooving system instead of manual type	2.00	0.35	-	2.80	9.20
14	Energy loss reduction through thermography study	0.02	0.02	-	0.17	1.24
15	2 degree offset in AHU System	0.00	0.08	-	0.62	0.00
16	Cartridge heater length optimization in BL Module	0.00	0.03	-	0.27	0.00
17	Motor HP reduction in BL dust collector	0.13	0.04	-	0.30	4.92
18	Baking Oven energy optimization	1.00	0.26	-	2.08	5.80
	Sum of Total	3.73	1.24	0.00	9.79	47.81

2023-24 : 37 Energy saving projects implemented and cost saved ₹ 4.54 million with investment of ₹2.78millon

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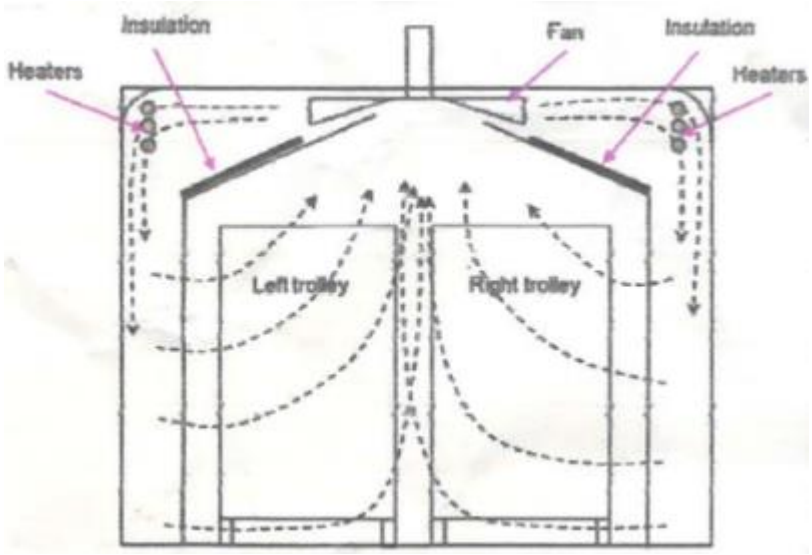
5.4. Baking Oven Motor Energy Optimization

Process — Baking Process

Purpose — For reducing glazing and eliminating impurities, such as bonding materials in brake pads

Background of the Problem



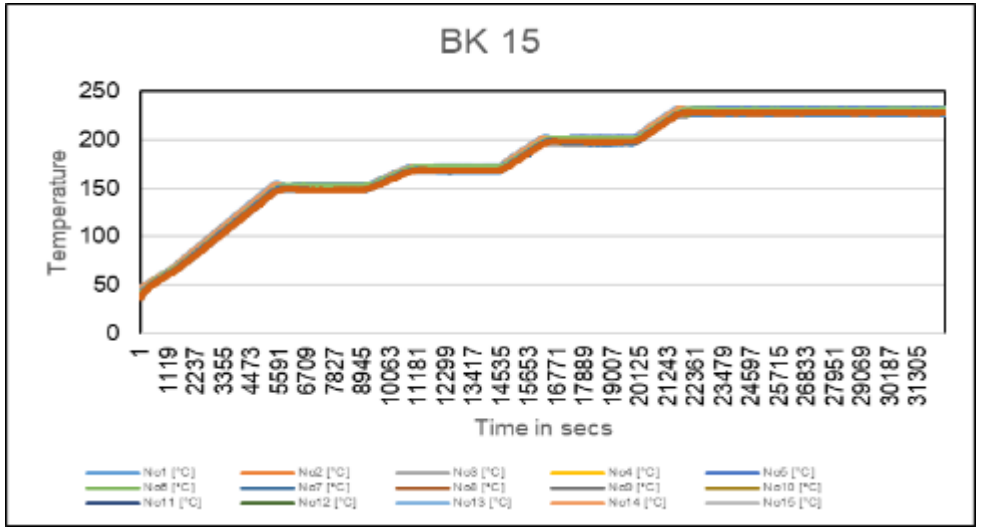
- Oven process contributes to 32 % of plant energy consumption
- Baking comprises of Heating load and a circulation fan (inductive load)
- Nearly 16 ovens available for baking process with an average consumption of 1.45Lac Kwh per month

Observation

- Temperature is maintaining as per the specification
- Blower motor 15Hp is continuously running to maintain the uniform temperature
- Heating load 36 kw

Process Condition:

Cycle	Type	Temp / Time
Cycle -1	Ramp	150 ° C @ 90 mins
Cycle -2	Soak	150 ° C @ 60 mins
Cycle -3	Ramp	170 ° C for 30 mins
Cycle -4	Soak	170 ° C @ 60 mins
Cycle – 5	Ramp	200 ° C @ 30 mins
Cycle - 6	Soak	200 ° C @ 60 mins
Cycle - 7	Ramp	230 ° C @ 30 mins
Cycle -8	Soak	230 ° C @ 180 mins



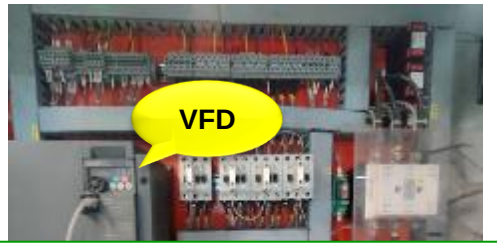
5.4. Baking Oven Motor Energy Optimization

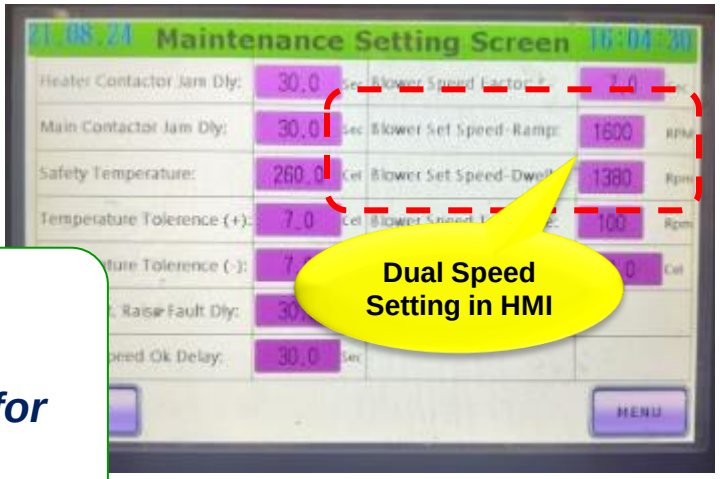
Action

- Initial trial planned
- BK 15 oven taken for trial since it has PLC
- VFD Connected to vary the blower RPM instead of Star-delta Starter
- Program done in PLC for Dual s

50Hz, 1600 RPM) & Low speed (4

- Blower CFM 10,000 during ram





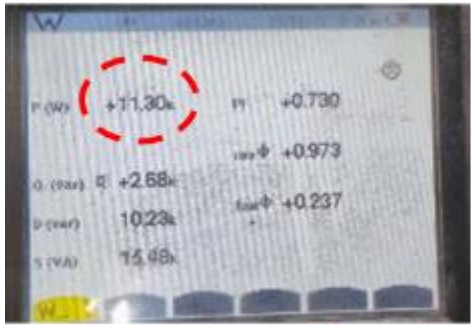
Benefits:

Implementation and Horizontal deployment of the project for 16 baking ovens resulted in

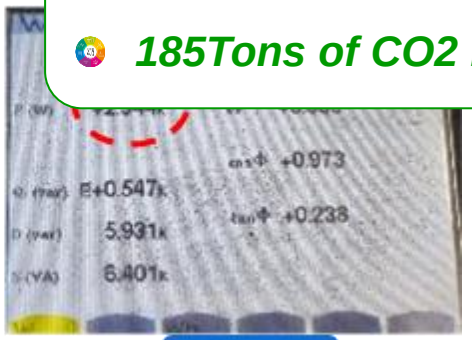
- ***Energy saving of 2.6lacs Kwh per annum***
- ***₹20.8lacs per annum cost Saved.***
- ***185Tons of CO2 Emission reduced***

Results

Motor Power @ 50 HZ



11.3 Kw



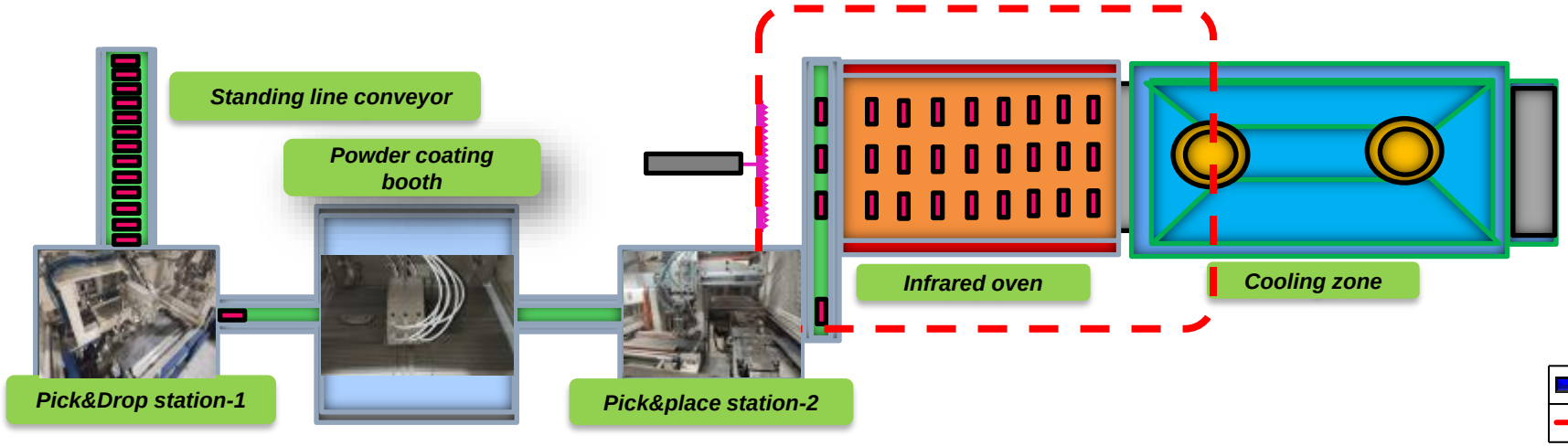
2.34 Kw

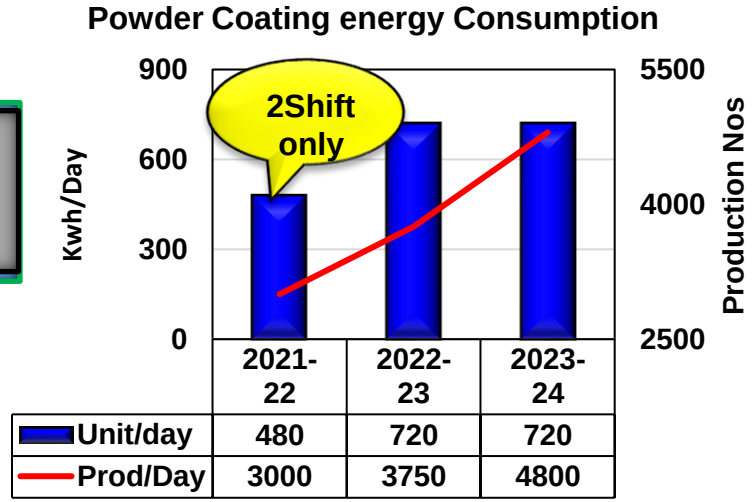
		Saving (Kwh)
(Blower @ full speed during ramping & Soaking)	120.2 Kwh	29.7 Kwh / cycle
Dual Speed (Blower @ full speed during ramping & low speed in Soaking)	**90.5 Kwh**	

6.Innovative Projects implemented

6.1. Efficiency Improvement in Powder Coating Process

Process	**Powder Coating**
Problem	**High Power Consumption in Oven - 80%**





Observation

- Machine Capacity - 6300nos/day,
- Customer demand - 4800nos/day,
- Production planned - 1600nos/Shift
- So machine runs in all the 3 shifts

Root cause

- Machine Under Utilization
- 1600nos runs against the capacity of 2100nos/Shift

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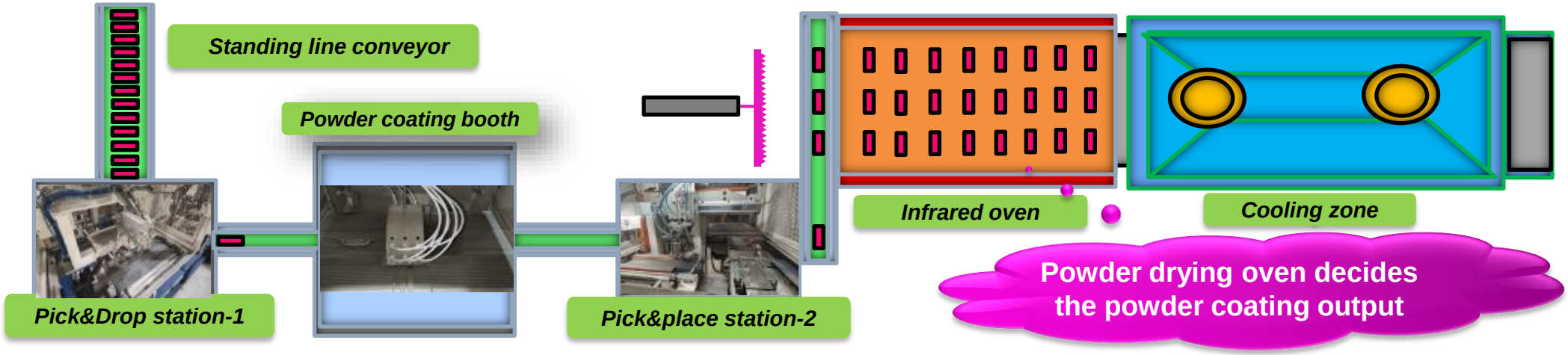
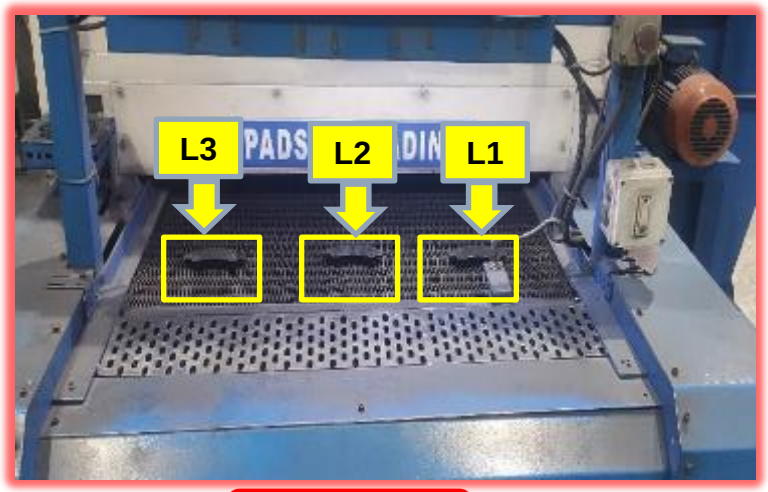
6.1. Efficiency Improvement in Powder Coating Process

Action

Increase the Machine Capacity by increasing the No. of cavities from 3 to 4



Result



Before

After

Benefits

- Capacity Improved from 6300 to 8400nos/day
- Machine runs 2shift only per day
- Energy saved 0.74 lacs kWh/Year
- 53Ton CO_2 Emission reduction per Year
- 2 manpower Eliminated
- Energy Cost saved 5.5lacs/Year

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6.2. Continuous Grinding Machine

Machine ***:- Grinding Process***

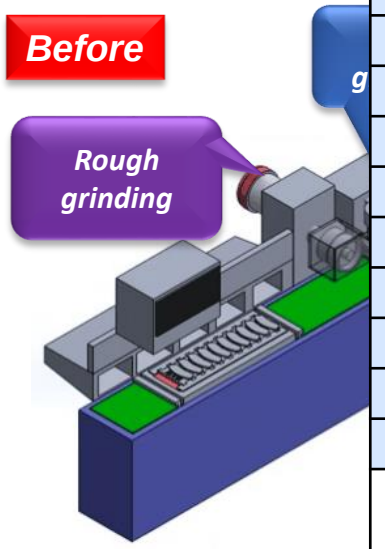
Problem ***:- Grinding Machine & Dust Collector Idle time High***

Observed ***:- Return stroke comes idle***

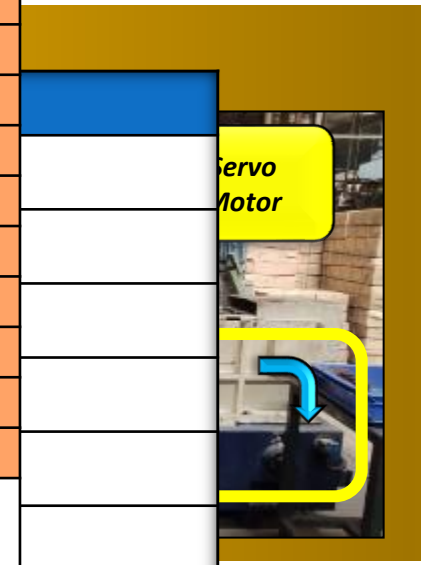
Root cause ***:- Ball Screw Drive used for Grinding Bed Movement***

Action

Before



Energy Consumption Study		
Description	**Existing Grinding Machine**	**Continuous Grinding Machine**
Dust Collector Motor	15kW	15kW
Hydraulic motor	7.5kW	0.5kW (Servo motor)
Final & Rough Wheel	7.5kW	7.5Kw
Bed Drive Motor	12.5kW	3.3Kw
Total power Consumption/ Day	1026kWh/Day	749kWh/Day
Cycle time	92 Sec@ 18 Cavity	4.0Sec @ 2 cavity
Plan / Shift	3,200 no's / shift	6,750 no's / Shift
Capacity	2,60,000 no's / month	5,26,500nos / Month
Units Per Pad	0.11units / pad	0.04units / pad



Benefits:

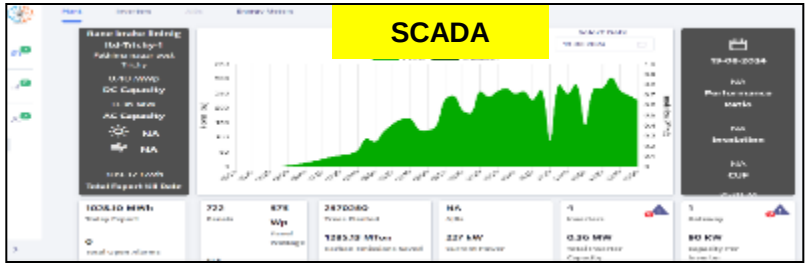
- ❑ **Specific Energy Saved 3.5 lacs Kwh per Annum**
- ❑ **Energy Cost saved 28 Lacs per Annum**
- ❑ **250 tons of CO2 Emission reduction per Annum**

- ➢ **Hydraulic Cylind**
  down movement
- ➢ **Bed returns idle**

7a.Utilisation of Renewable Energy sources

Renewable energy generation, utilization and % of Overall Energy consumption – Onsite

Year	Source (Solar Wind,etc.,)	Installed Capacity in MW	Capacity addition after FY 2021	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
FY 2021-22	-	-	-	-	-
FY 2022-23	-	-	-	-	-
FY 2023-24	Solar (New Plant),Trichy factory premises	1.05	1.05	1.43	13.9



Area	Type	Number of panels	Capacity
Ground Floor	Ground Mount	1160 no's	600KW
PCP (Disc pad)	Roof top	590 no's	260KW
PC Brake Lining	Roof top	234 no's	120KW
CV Brake Lining	Roof top	132 no's	70KW
Total		2116 no's	1050KW

This 1.05MW solar plant produces 1.60Million units per annum

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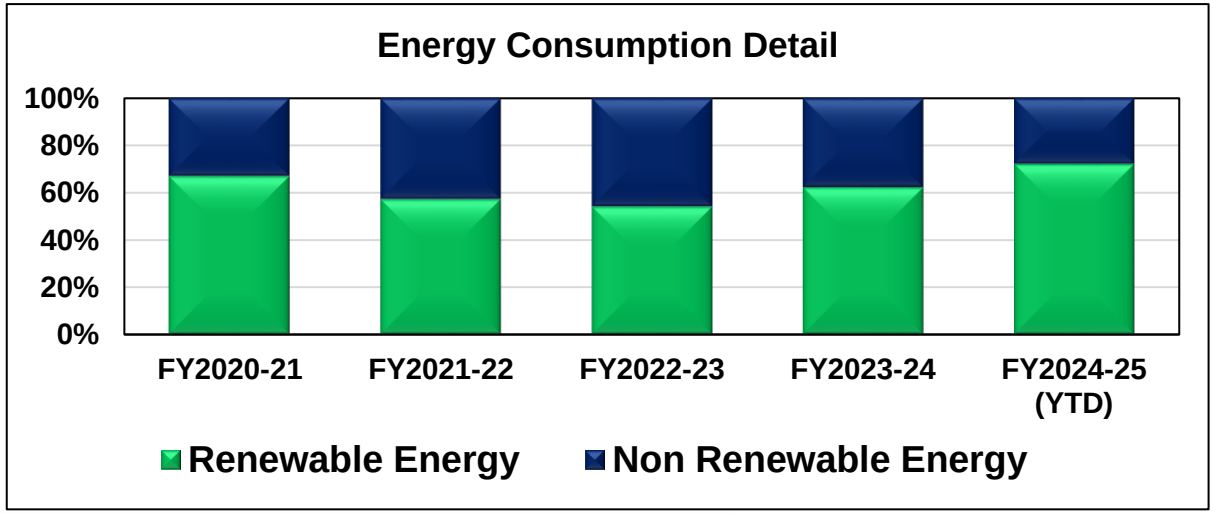
7b.Utilisation of Renewable Energy sources

Renewable energy generation, utilization and % of Overall Energy consumption – Offsite

Year	Source (Solar Wind,etc.,)	Total offsite Installed capacity (MW)	Capacity addition (MW)	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
FY 2021-22	RBL own solar ,Solar and Wind Group captive	3.56	-	4.74	45.93
FY 2022-23	RBL own solar ,Solar and Wind Group captive	3.91	0.35	5.2	50.45
FY 2023-24	RBL own solar ,Solar and Wind Group captive	4.56	0.65	6.1	58.8

72% of(Onsite + Offsite) energy requirement of RBL,Trichy is met through Renewable Energy sources

- ***Solar generation saving for the year 2021-24 2.05cr Kwh (INR 8.05 Cr saving)***
- ***This has resulted in reduction of 13,971 MT of Eq. Co2 saving compared to power from traditional sources - which is equivalent to planting 6.93lacs trees***



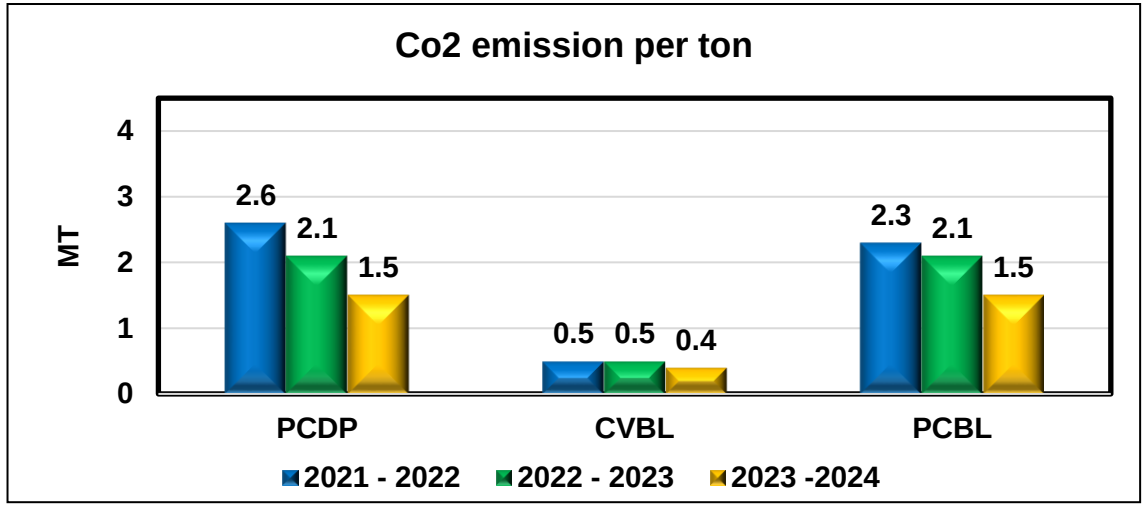
Year on year renewable energy increased from 62.22 % to 72.2%

8.GHG Inventorisation

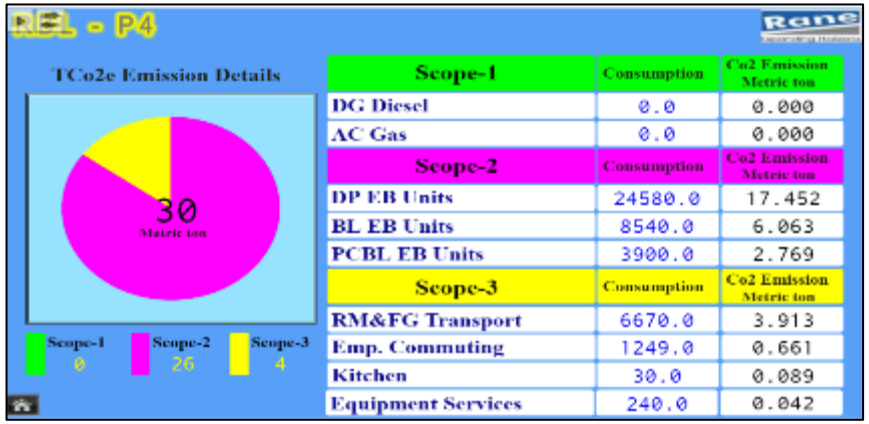
Information on GHG Inventorisation and public disclosure

S.no	Scope	Emission Source	Type of Fuel
1	Scope – 1	Diesel Generator -	Diesel
2		AC	R410 A, R 407 C, R 22, R 32
3		Fire Extinguisher	Co2
4	Scope – 2	Grid	Electricity
5	Scope – 3	Up stream	
6		Transport and Distribution – Raw material and Consumable transportation	Diesel
7		Capital Goods- Purchase of New machinery	Diesel
8		Fuel Energy – Kitchen	LPG
9		Business Travel – Employee travel	Diesel
10		Purchased goods and Services – Equipment services	Diesel
11		Employee Commuting – Employee transportation	Diesel
12		Down Stream	
13		Transportation – FG Distribution	Diesel
14		Leased Facility	Electricity
15		Waste Disposal	Diesel

Emissions intensity of last three years (2021-24)



62% of intensity emission was reduced in past three years



Real time monitoring of GHG emission in shop floor through Customized Digital Software

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8.GHG Inventorisation

Target (short term/ long term) for GHG emission reduction and action plan to be mentioned

Target

Carbon Neutral : 2028 through utilization of Renewable energy ,Carbon Sequestration & Energy saving projects

Net Zero : 2038 through Converting all Diesel equipment's to electric or CNG

Short Term 2024 - 2025

Project	Emission Reduction(Mt)
1. Install 1 MW solar plant	1402
2. . Increase Green belt coverage from 40 % to 65 %	4
3. Reduction in SEC 10 %	150
4.Engaging supplier for Milk Run concept to supply raw materials	350

Mid Term 2026 - 2028

Project	Emission Reduction(Mt)
1.Green initiatives through 65% contribution suppliers	100
2. Installation of Group captive of 1 MW solar plant	1400
3. Increase employee commuting from 71 % to 97 %	275
4. Achieve Carbon Neutrality	Zero emission in Scope -1 & 2

Long Term 2038

Project	Emission Reduction(Mt)
1. Conversion of diesel to bio diesel for Diesel generator	5
2. Reduction in SEC by 25 %	300
3.Net Zero	Zero emission in Scope -1 ,2 & 3

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9.Waste utilization and management in last three years(2021-24)

Sl no	Type of waste	Nature	Mode of Disposal
1	Solid	Hazardous	Recycling and co processing in cement industry
2		Non Hazardous	Recycling and reuse as replace of virgin material
3	Liquid	Process	Recycling and Reuse in process
4		Domestic	Recycling and Reuse in Garden

Liquid waste Management

Solid waste Management

Hazardous & Non Hazardous Waste Generation & Disposal						
S. No.	Waste Details	UoM	2021 - 2022	2022 - 2023	2023 - 2024	Disposal method
1	33.1 - Empty barrels /containers/liners contaminated with hazardous chemical/wastes	MT	3.62	3.8	2.7	Recycling
2	5.1 - Used or spent oil		1.2	0.6	1.4	
3	35.1 - Exhaust Air or Gas Cleaning residue	MT	524.77	650.67	658.13	Co – processed in cement industry as an alternate fuel
4	12.5 - Phosphate sludge		4	8	8.98	
5	21.1 - Process waste, residues and sludge's		29.71	30.19	59.13	
6	Non hazardous waste (Plastic, wood & metal)	MT	149	140	136	Recycling

Waste Utilization as Fuel							
S. No.	Type of waste	UoM	Quantity			GCV MJ/Kg	Waste as percentage of total fuel
			2021 - 2022	2022 - 2023	2023 - 2024		
3	35.1 - Exhaust Air or Gas Cleaning residue	MT	524.77	650.67	658.13	62	86% fuel & 14 % Ash
4	12.5 - Phosphate sludge		4	8	8.98	20000	93 % Fuel % 7 % Ash
5	21.1 - Process waste, residues and sludge's		29.71	30.19	59.13		

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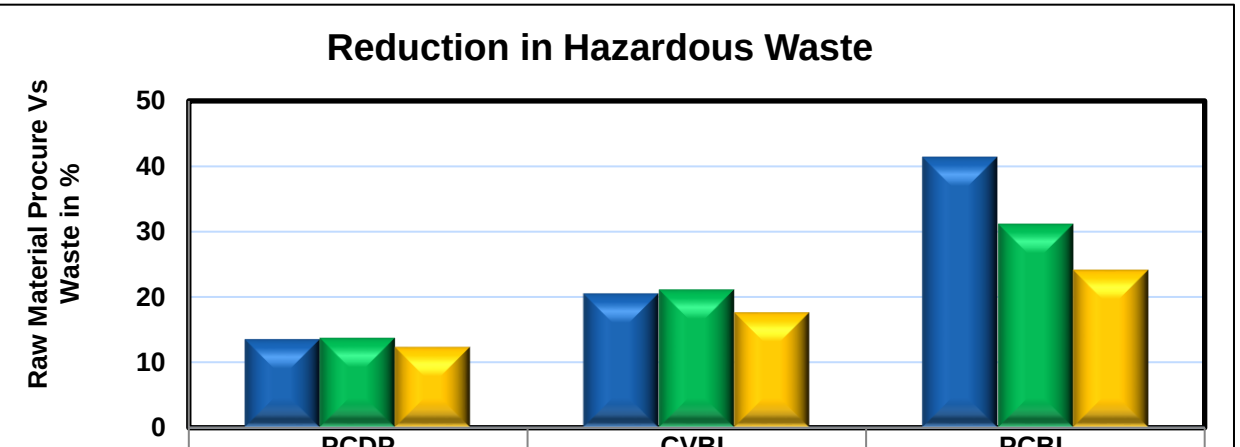
9.Waste utilization and management in last three years(2021-24)

*Our waste management was mainly through the incorporation of **3R technologies***

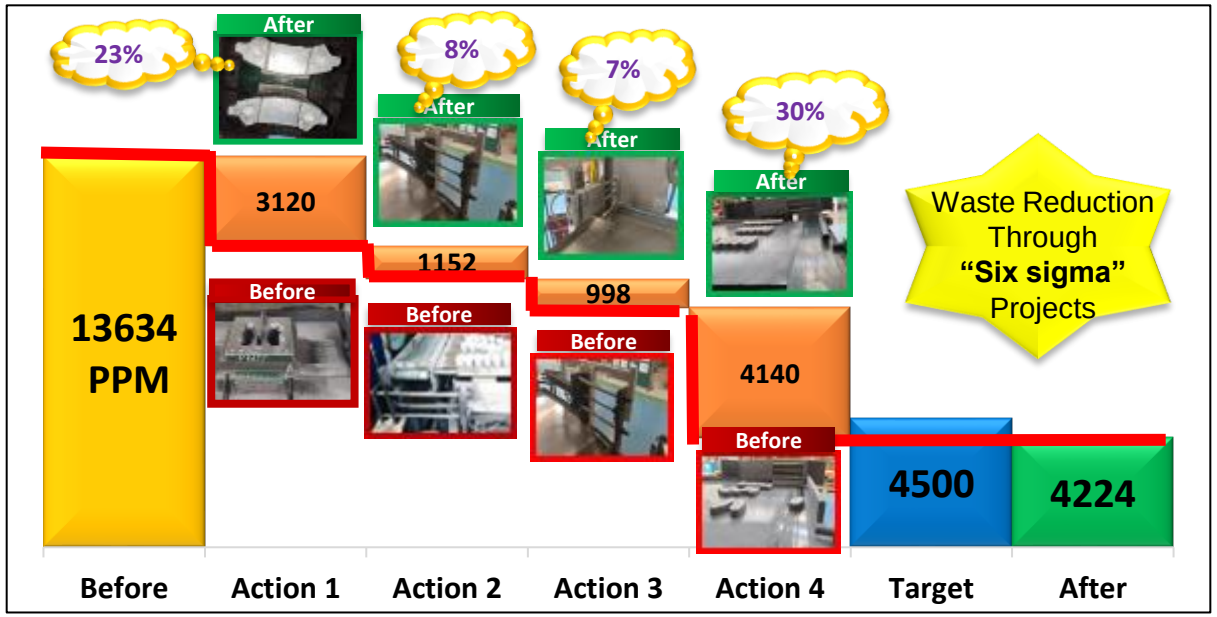
- ✓ *Reduce :Waste generation was reduced through QC story concept.*
- ✓ ***Reuse :** 12 – 15 % of the grinding waste was reused by replacing of virgin material in our process and 88 % of waste are reused as an alternate fuel in cement industry.*
- ✓ ***Recycle**: 22 % of the waste was recycled and reused for various industries.*

Achieved Results



	PCDP	CVBL	PCBL
2021 - 2022	13.5	20.5	41.4
2022 - 2023	13.7	21.1	31.1
2023 - 2024	12.3	17.6	24.1

Case study on preform rejection



Summary Projects

Sl no	Project	Actions	Reduced /Year	
			From (Mt)	To (Mt)
1	Reduce Preform weight	2	13	0
2	Reduction in preform rejection	4	18	5
3	Reduction of blister issues	5	45	30
4	Reduction in block sticking issues	1	12	7
5	Reduction in paint sludge	4	1.2	0.6

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10. Green Supply Chain Management

Environment Sustainable Policy

RANE BRAKE LINING LIMITED – P4

ENVIRONMENT SUSTAINABILITY POLICY

Sustainability Policy

We at Rane Brake Lining Limited believes that adopting sustainable practices in all our operations is not only a business imperative for us but provides us with a competitive advantage in long run. We integrate the economic growth, social responsibility and climate changes with the objective of business values and operations to meet the expectations of our customers, employees, partners, investors and society.

The principles we follow are;

- Integrating sustainability practices to mitigate climate change risk to our business. Ensuring that relevant environmental and social aspects are embedded in our business decisions and goals
- Adopt 3R (Reduce, Reuse and Recycle) for all types of wastes towards reduction of impact on consumption of materials and environmental friendly disposal inline with regulatory requirements or industry best practice
- Strive to achieve carbon neutral by focusing on energy efficiency projects and use of renewable energy
- Focus on water conservation, rain water harvesting to become water positive through continuous improvements in process
- Provide and maintain a clean, healthy and safe work environment for employees, customers and the community
- Making sustainability personnel to encourage employees and society at large to adopt sustainable practices
- Building sustainable value chain by encouraging and supporting our suppliers and dealer partners to adopt sustainable practices
- Continual improvement in process, product and peoples

We endeavor to be a model location by imbibing green features in our operations

Plant Head

Rane Brake Lining Limited

Trichy Plant

Date:- 12th June 2024

Procurement

RM recycling to avoid the consumption & Green initiatives

Production

Waste Management
Water Management
Energy Management

Packing

Returnable packing to increase the usage cycle and reduce decompose

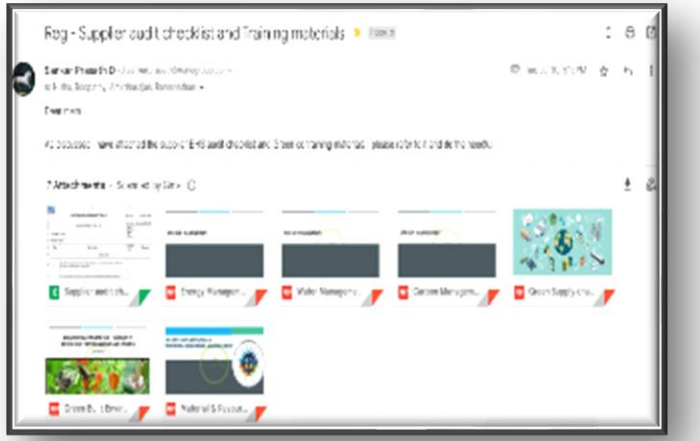
Logistics

Avoid multiple usage (Fuel)
Pollution control
Green energy

Objectives	Action plan	Benefits
Identification of the supplier	5 of 56 key suppliers identified to work environmental contribution	Awareness and understanding of the supplier
Training and awareness program	Educate and engage the suppliers for green production by 2027	Improve the greener production by supplier
Vendor Green procurement	**100% restriction** of Hazardous materials by 2027	Avoid Land and air pollution
	Procurement of **100% eco friendly materials**	
	100% recycling of raw materials	
Vendor Green production	**30 % Reduction** of wastes by 2027-28	Avoid the pollution control Energy consumption reduction Cost saving
	30% Reduction of energy consumption 2028-29	
	Reduction of CO_2 emission to control the usage of transport and electricity 2028-29	
Vendor's Green packaging	**75% usage of returnable** packing (Plastic tray or PP box)	Reduction of wastages
Vendor's Green transportation	Reduce the consumption of diesel in the transport by the usage of EV	By optimizing the vehicle utilization to benefit the cost saving & air pollution
Audit selection / Evaluation criteria	Green supply chain requirements include in the audit check sheet	Improve Green environment

10. Green Supply Chain Management

Knowledge Sharing for suppliers through mails on green business



Green business Training for suppliers by RBL through external trainers

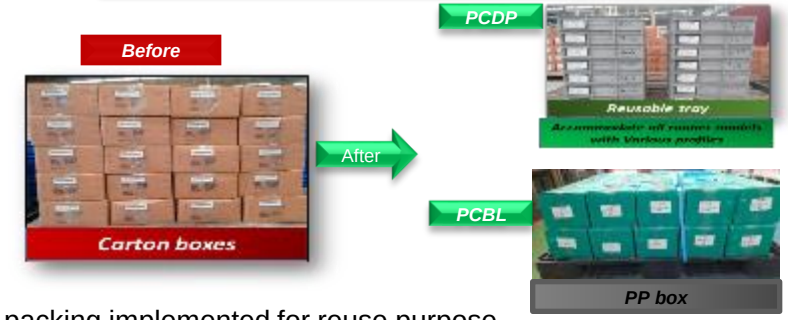
Appreciation given to suppliers for implementing energy kaizens in their industry by RBL

S.No	Supplier Name	Name of energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million kWh)	Total Savings (INR Million)	Payback period (in months)
1	premier engineering works	Conventional light to LED	0.06	0.01	0.0	0.06	12.00
2	Esterkote pvt limited	Motor HP reduction in Forming press	0.03	0.01	0.0	0.06	6.00
3	Kumarasamy industries	Individual Solenoid valve in air line	0.08	0.01	0.0	0.06	16.00
4		Real time clock for dust collector on/off during break time and Automatic power factor controller	0.05	0.01	0.0	0.06	10.00
5		IE3 energy efficient replace to energy efficient motor	0.2	0.00	0.0	1.2	2.00
6	sun industries	VFD for hydraulic Pressing every cycle completion and Heater modification	0.2	0.05	0.0	0.3	8.00
7	Sarda industrial enterprises	Cutting-edge Mc Motor Sequence modification	0.24	0.00	0.0	0.72	4.00

Case study :
Projects implemented in Supply chain for Eliminating Wooden & Cartons packaging

Action :- **Transition from Carton boxes to Reusable packages**

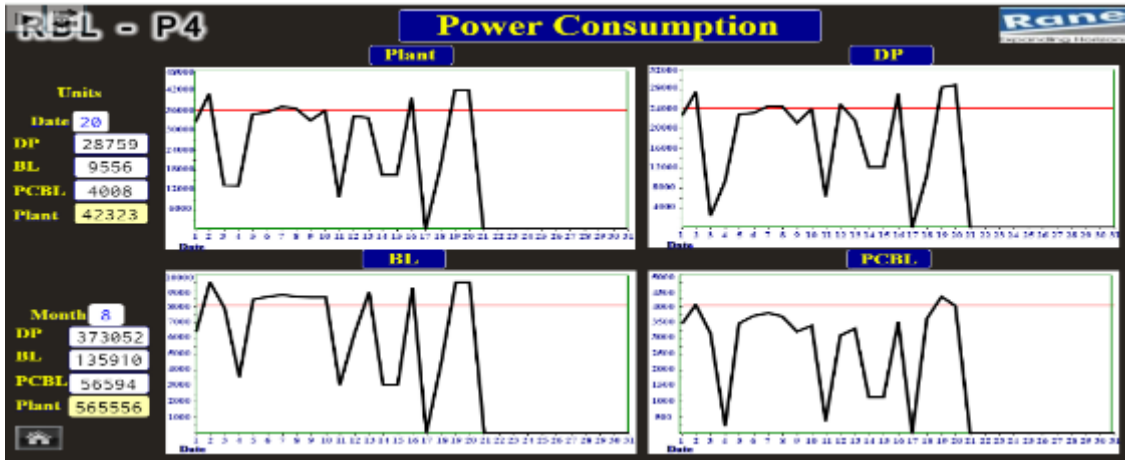
Kaizen: Implementation of recyclable trays



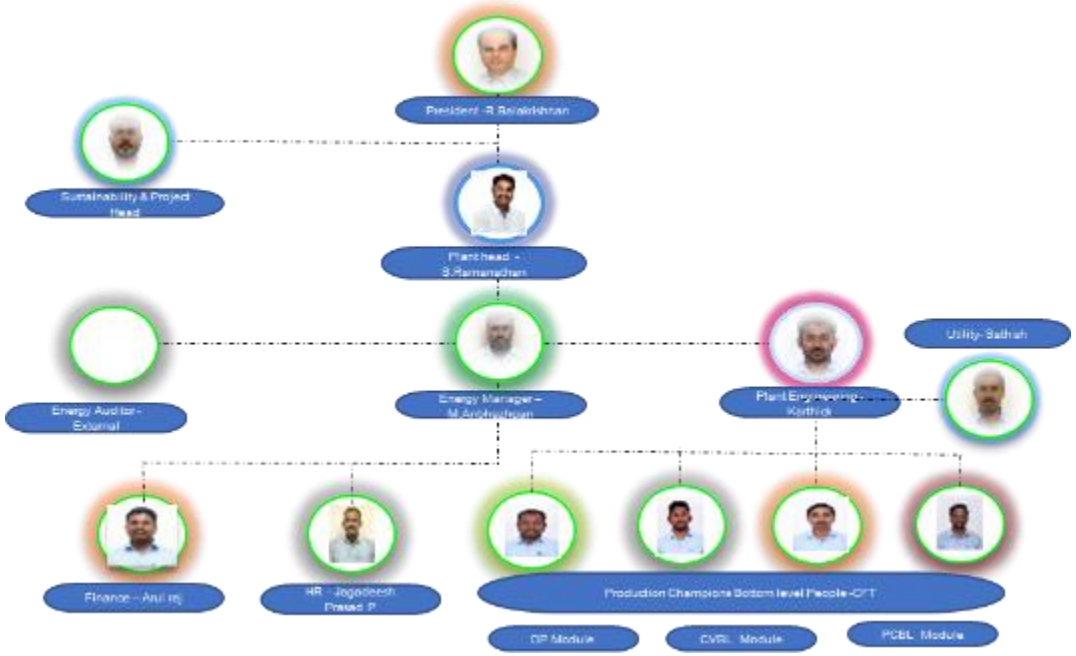
- ✓ Returnable packing implemented for reuse purpose
- ✓ Due to returnable packing environmental sustainability improved by avoid using carton boxes

11. EMS system and other requirements

Sustenance Tracking through Energy monitoring system



Energy management Cell



Review System

Management cell	Roles & Responsibility	Review mechanism
President	Overall review and Approval	Monthly , Quarterly & Annual
Sustainability & Project Head	Project confirmation & Project cost approval	Monthly
Plant - Head	Cost review and Project discussion	Daily
Energy manager	KWH - Tracking	Daily
Energy Advisor	External audit team	Qtr.
Maintenance Champions	Review the Production team	Daily
Production champions	Utilize the power without loss	Daily
Plant Finance	Cost review and Estimate approval	Daily
Plant HR	Training to employees	Daily
Utility Team	Daily monitoring and Energy saving projects	Daily

Learnings from CII Energy Award or Any Other Award Program

1. •Learned beast from other automobiles sectors
2. •Increased the % dependence on RE sources (such as Solar and wind)
3. •Interacted with may suppliers from energy sector
4. •Learned about way forward for RE 100 and Net Zero action plan

Implementation of Green Co / ISO 50001 / IGBC rating

S.no	Description	Certification	Planned on	Investment
1	Green co	Nil	2024-25	Work in progress

Green Co Current Assignment Status

Online Registration by the Unit	Launch & Advanced training program by CII	Implementing & Preliminary data submission by the Unit	GreenCo Hand Holding & Pre-Assessment by CII	Final Assessment by external experts	Announcement of the rating level and communication to the unit	Feedback report by CII	Annual sustenance review by CII
Stage -1	Stage -2	Stage -3	Stage -4	Stage -5	Stage -6	Stage -7	Stage -8

Scheduled during end of Sep'24

2	ISO 50001		025-26	To be decided on 2025-26 AOP (AOP - Annual Operating Plan)
3	IGBC rating	Nil	2025-26	To be decided on 2025-26 AOP(AOP - Annual Operating Plan)

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12.NET ZERO commitments

ROAD MAP FOR “NET ZERO”

2023 - 2024

1. Assessment and Baseline Measurement
2. Through GHG inventorization

2024 - 2025

Target Setting

1. Short term – Energy efficiency
2. Mid term – Carbon Neutral
3. Long term – Net Zero
4. Awareness & Training for stake holders

2025 - 2028

Develop Strategies and Implementation of Scope 1&2 (“Carbon Neutral”)

1. Energy Efficiency – 45 %
2. Renewable Energy – 100 % RE 100
3. Carbon Capture – 68 %
4. Electrification in DG
5. Initiate Green supply chain for all suppliers

2029 - 2031

Develop Strategies and Implementation of Scope 3

1. Electrification in employee commuting
2. Electrification in Kitchen
3. Conduct audit and evaluate the green supply chain of implemented green technologies and infrastructure
4. Monitoring and Reporting

2038

Electrification of sup[ply vehicles

Climate Resilience

Review and Revision

“ NET ZERO”

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13. Awards & acknowledgement

Won the GOLD Award for Excellence in Health, Safety, Sustainability on 2023

Second Prize for Environment Protection and Management, from The Government of Tamil Nadu

QCC 3rd Position : ACMA Southern Region

Won the GOLD Award for Excellence in Manufacturing Large category on 2023

RANE BRAKE LINING LTD – Plant 4 Trichy

THANK YOU

M.Anbhazhagan, ***Manager - Maintenance***

m.anbhazhagan@ra**neg**roup.com

9944432305

R. Karthick, ***Asst.Manager - Maintenance***

r.karthick@ra**neg**roup.com

9952949609

D.Sankar Prasath, ***Senior Engineer-HSE***

d.sankarprasath@ranegroup.com

9952949609

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