Proud to be part of planet earth.

25th National Award for Excellence in Energy Management

Marelli Motherson Automotive lighting India Pvt. Ltd. Sanand

TEAM MEMBERS :-

Sahebrao Bhosale (Central Energy Support) – sahebraobhosale@marelli.motherson.com
Vinod Rawat (Head Maintenance) – vinod.rawat@marelli.motherson.com

About Marelli Motherson Automotive Lighting

50 : 50 JV
Marelli & Motherson

In house Process Molding/Coating/ Metallization/ Assembly

In house Local Design Center

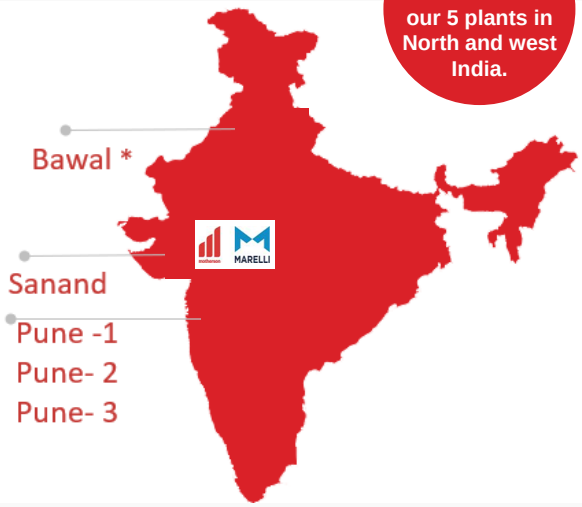
Marelli Motherson

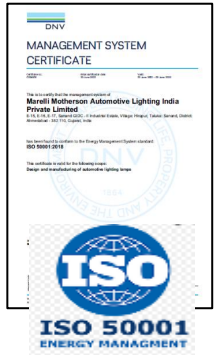
In house Product Testing

New Technology

From Idea to Serial Product

Always Next to Customer with our 5 plants in North and west India.





Employees

TOTAL 1,600

Design 72

Production Capacity

SETS/YEAR

Front lighting	1.7 m
Rear lighting	1.7 m
Small Lamps	1.2 m
Intake Manifold	1.2 m

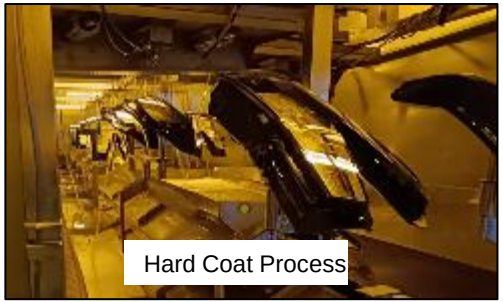
Annual turnover

12800*

MN INR

Plant Manufacturing Process


Injection Molding Process


Hard Coat Process


Robotic Glue pasting

S No	List of Processes	No of Equipment
1	Injection Moulding Process	24
2	Metallizing Process	5
3	Hard Coat Process	2
4	Base Coat Process	1
5	Antifog Coating Process	2
6	Robotic Glue Pasting	7
7	Assembly Process	10


Metallizing Process


Anti-fog Coating Process


Assembly Process

Unique Technology HL

2K Outer lens
2K Bezel
2K Molding

ANTIFOG Coating

Multi Reflection System

Localized Projector Module (LED+ Halogen)

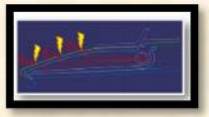
BI/Mono LED Module

BI/Mono LED Module

HID

Halo gen

Laser D- Metallization



Different Type of Metalizing

Satin Chrome

Chrome

MODULE DETAILS

H7 – Halogen Projector Module

Honda CITY

Tata Nexon

Suzuki Brezza

Localized Assembly- Halogen Projector Module-2015
Annual Volumes: 500K pieces

25W HID – Projector Module

Jeep Compass

TATA Harrier

TATA Safari

Imported HID Projector Module
Annual Volumes 80K pieces

BI /MONO LED Projector Module

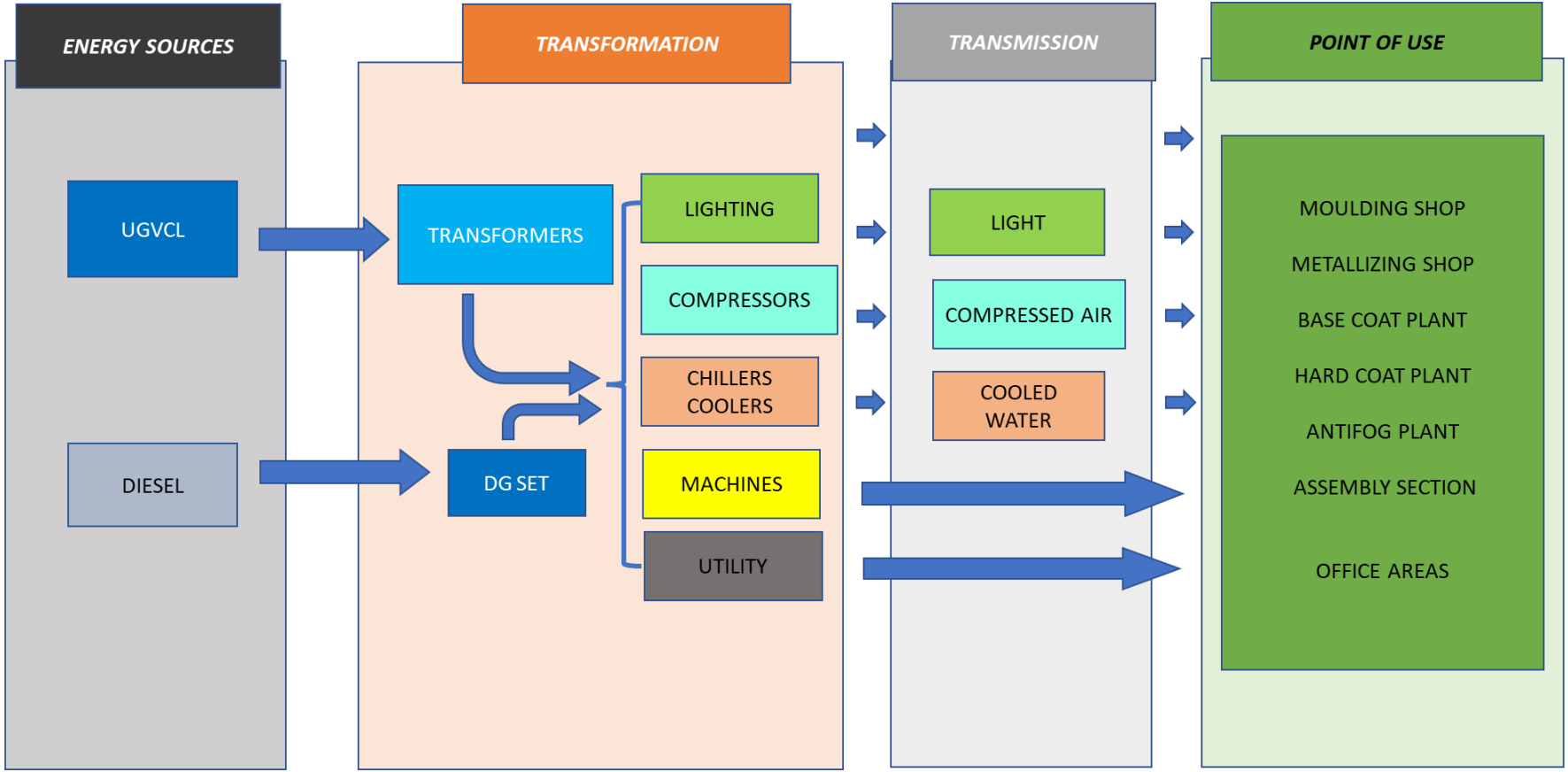
SUZUKI- Baleno

SUZUKI- Brezza

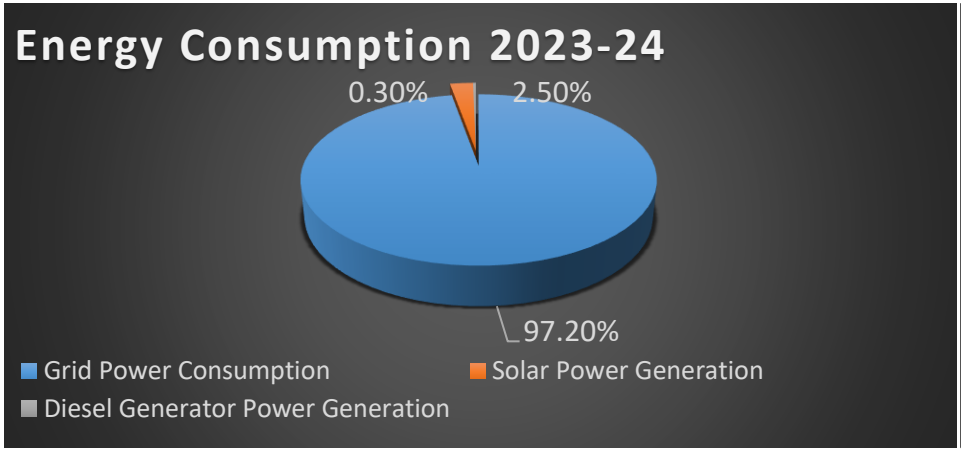
Jeep Compass -2021

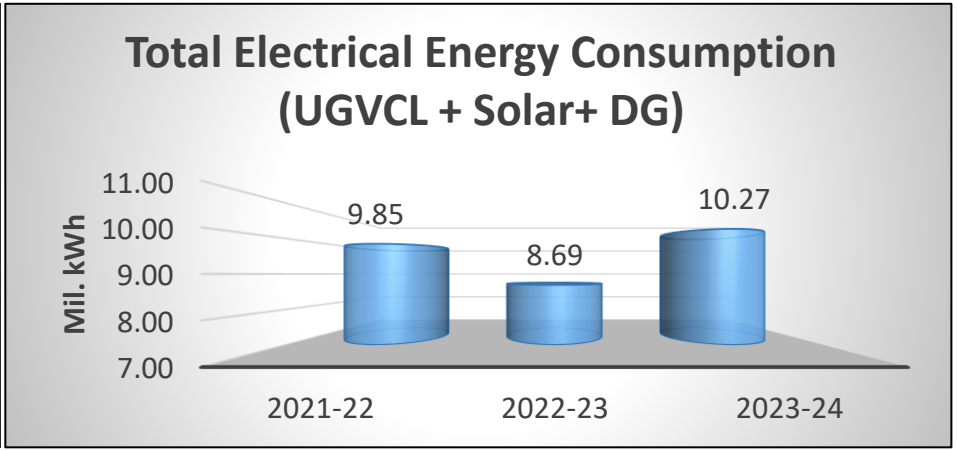
Localized Assembly LED Projector Module
Annual Volumes 800K pieces

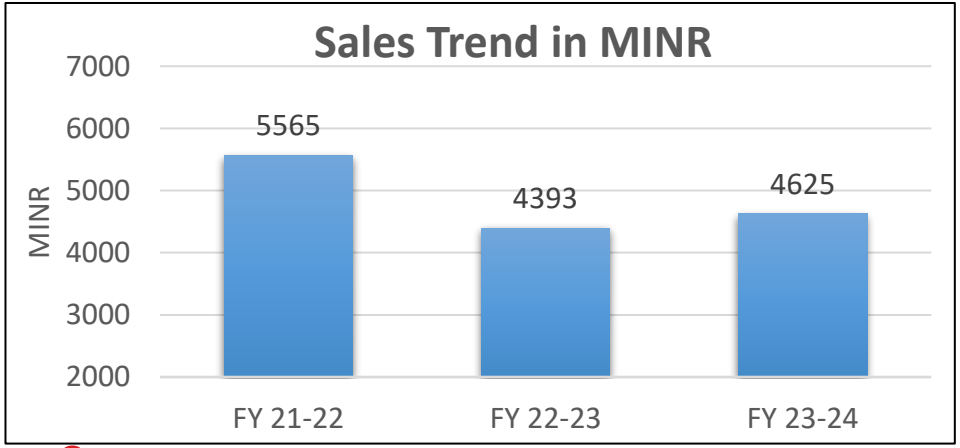
ENERGY MAPPING

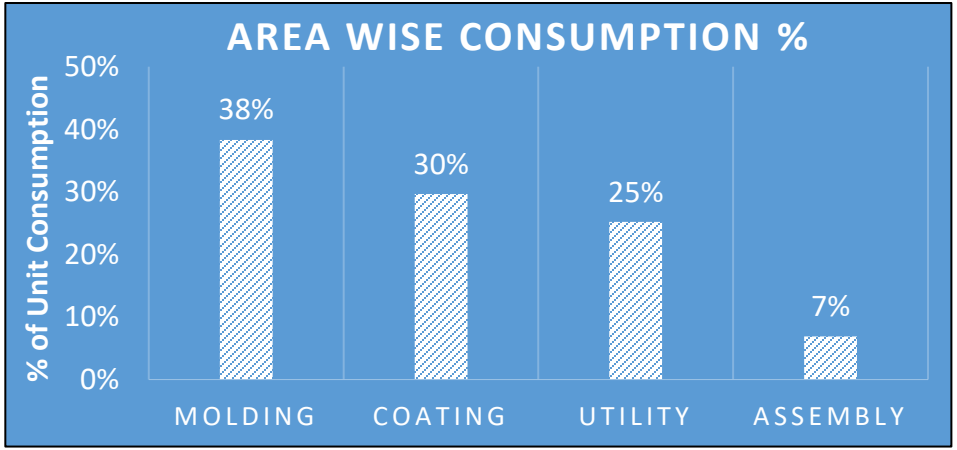


ENERGY MAPPING

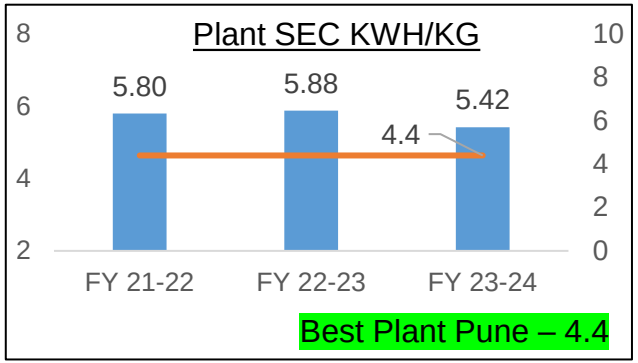




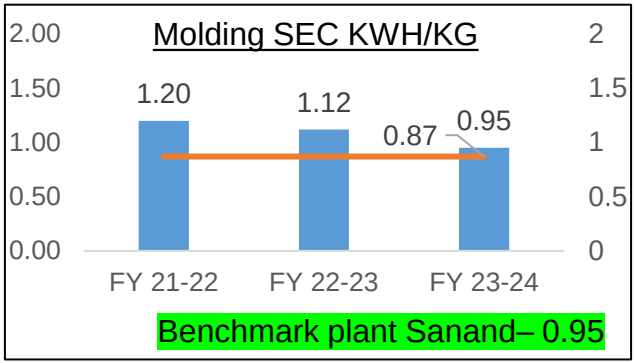




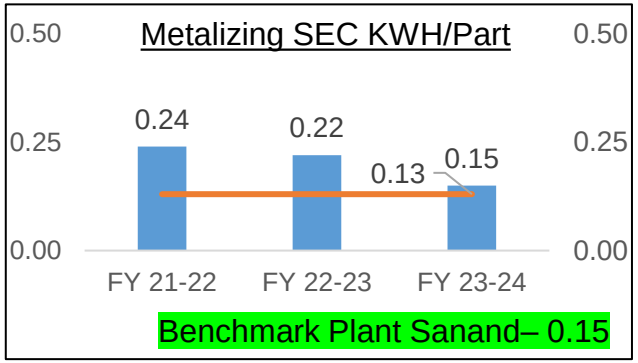
SPECIFIC ENERGY CONSUMPTION TREND WITH BENCHMARKING



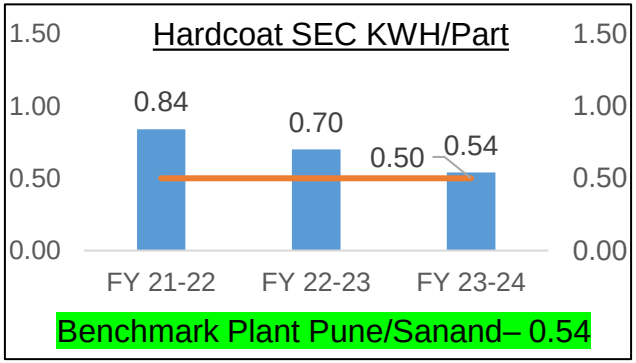
8% reduction as compared to last year



15% reduction as compared to last year

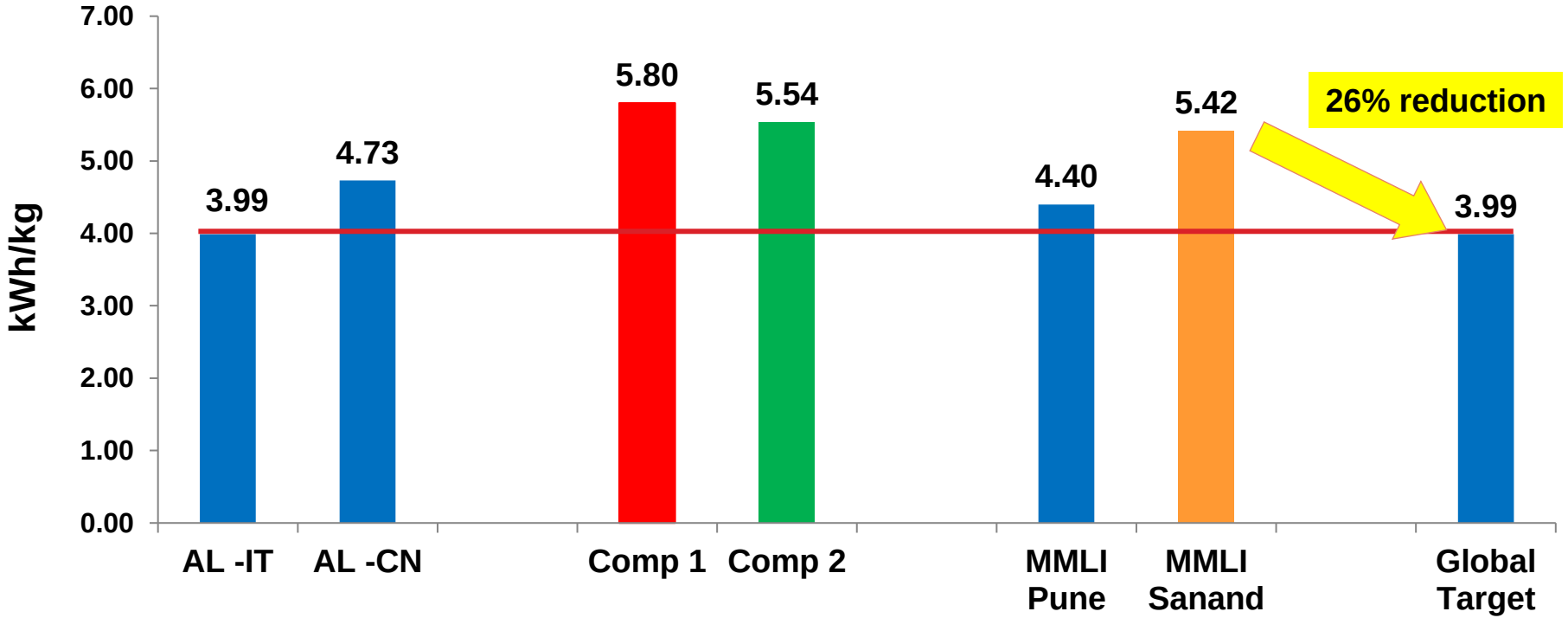


32% reduction as compared to last year

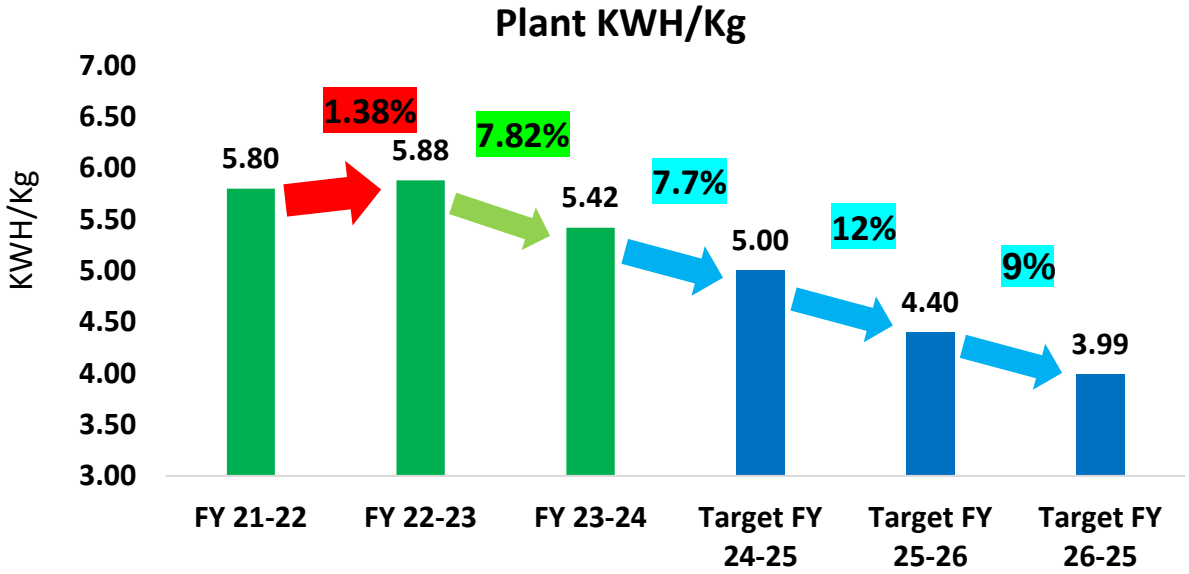


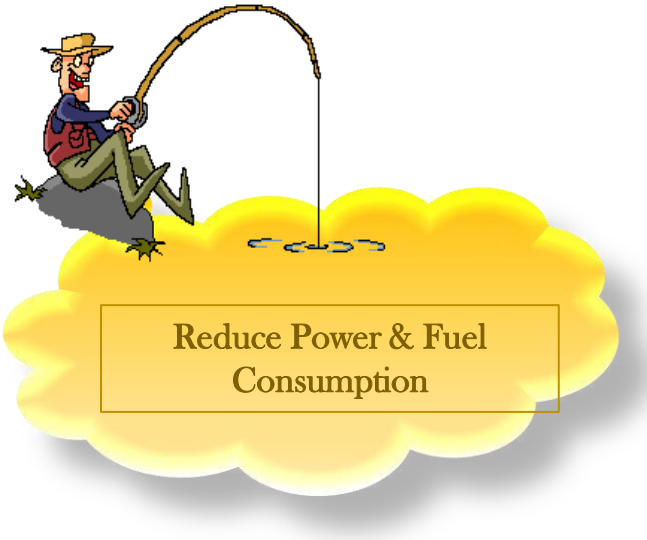
23% reduction as compared to last year

Information on Competitors, National & Global benchmark



TARGET SETTING





NOTE :- National Benchmark MMLI Pune – 4.40 KWH/Kg SEC at Plant Level
Global Benchmark Automotive Lighting – 3.99 KWH/Kg SEC at Plant Level

Motherson Mantra for Energy Conservation

Need of Turn Off-Turn Down

Waste of Resources is an additional waste for the seven wastes (MUDA). It is the non efficient use of your Equipment includes wastage of Light, Heat and Power.

Seven Wastes of MUDA

Mantra - Turn Off. Turn Down.

Let us reduce consumption and minimise the waste of resources across all processes in our business. Our resources are precious and should be used effectively and efficiently. Commit to turning off, or if you can't turn off, then turn down wherever possible. By making a conscious effort to reduce consumption in our work areas, we will contribute to saving costs and creating a more sustainable future for our planet.

ROAD MAP TO ACHIEVE TARGET

Low-cost automation

Load Management

Optimization of Process Parameter

Reduction in Heat Loss

Maintain Power factor close to unity

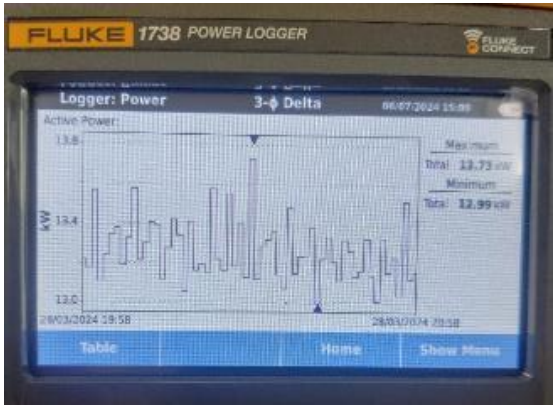
Introduction of new technology

Power & Fuel Cost Reduction

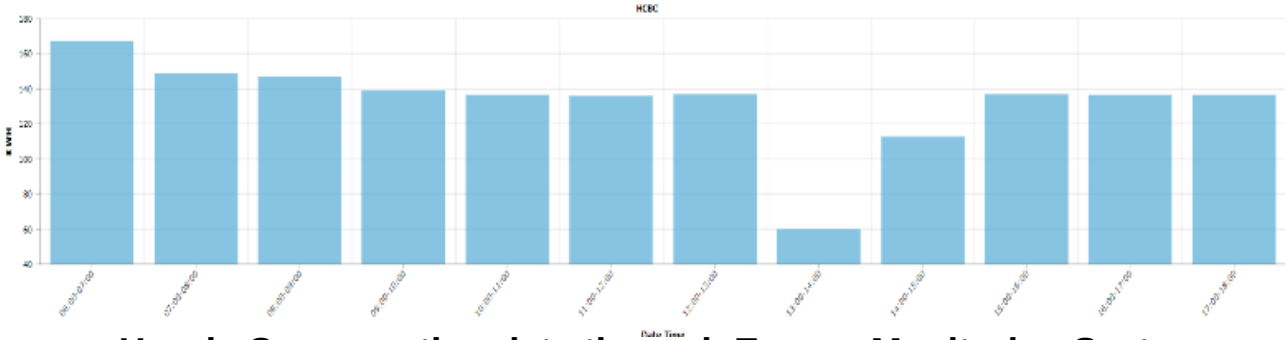
Utilisation of Compressed Air

Use energy-efficient motors

ROAD MAP TO ACHIEVE TARGET



Data Logger / Power Analyser



Hourly Consumption data through Energy Monitoring System

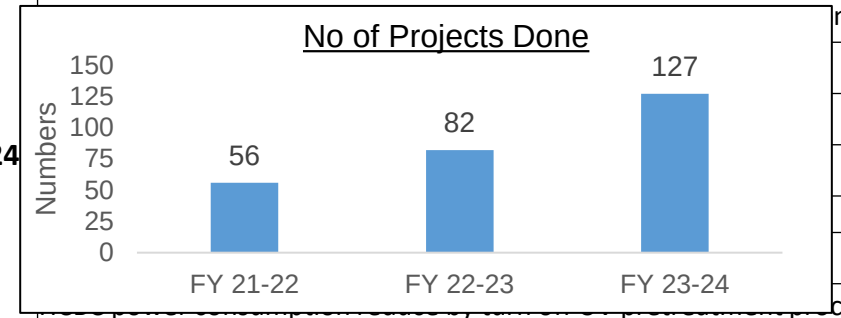
LIST OF MAJOR ENCON PROJECTS PLANNED (2024-2025)

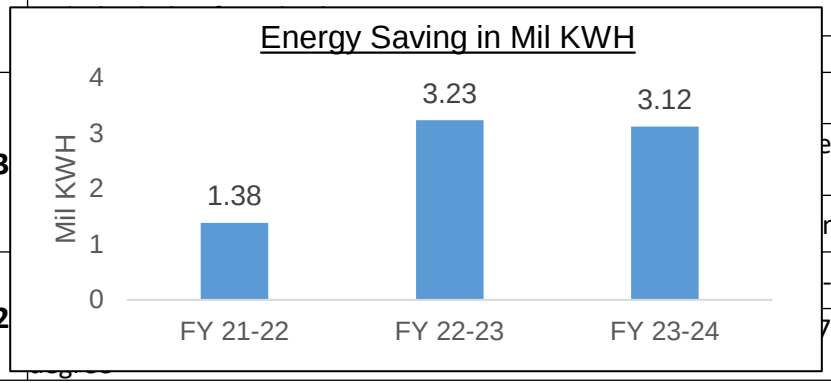
Title of Project	Annual Electrical Saving (Mil kWh)	Annual Thermal Saving (Mil Kcal)	Annual Energy Saving (ToE)	Investment (MINR)	Estimated Payback Period (months)	Comment
Improved PF by installation of SVG place of APFC bank		0	6.01	0.6	11.4	150 kVAR Static Var Generator installation by replacing APFC panel for improving power factor
To reduced energy ele retrofitting of 900T IM						ing of 900T machine
To reduced Air compre by providing IE4 motor						fficient IE 4 motor to be provided to Air compressor
Solar power procurem captive capacity up to						m plan for group captive- we are going to d solar power up to 4.5 MW
Thermal coating to be vided to all annealing oven	0.03					coting provided to TL-6 annealing oven and ater bank consumption to be reduced
To reduced air loss by providing solenoid to main Air line of IMM of Idle off	0.006			1	22	solenoid valve to be provided to individual machine main incoming
To reduced electricity cost by installation of induction heater to Arzuffi	0.015			2	17	10 KW induction heater in place of 12 KW triangular heater to metallizing machine of DP
To reduced electricity cost by replacing Conventional blower of AHU to EC Fan	0.0354			3	8.66	EC FAN
To reduced electricity cost by replacing IE1 motors with IE-5 motors	0.053			5	19	Energy Efficient Motors
Reduce electricity by providing close loop system for regeneration heaters of DH	0.044			2	15.75	Waste Heat recovery
To reduced electricity y providing energy efficient lights to Store Area	0.015	0	1.28	0.08	7	LED lights

Total Number of Projects planned :- 135 Nos
Total Estimated KWH Saving Annually Based :- 0.55 Mil KWH
Total Estimated Cost Saving Annually Based :- 4.9 MINR

SUMMARY OF ENCON PROJECTS in Last THREE YEARS

Year	No of ENCON projects	Investment (MINR)	Electrical savings (Mil kWh)	Thermal savings (Mil Kcal)	Total Savings (MINR)	Payback period (in months)
FY 2021-22	56	6,50,000	1,38,211	0	11,05,000	7
FY 2022-23	82	12,96,000	3,22,852	0	27,44,242	6
FY 2023-24	127	9,54,000	3,11,590	0	26,48,515	4





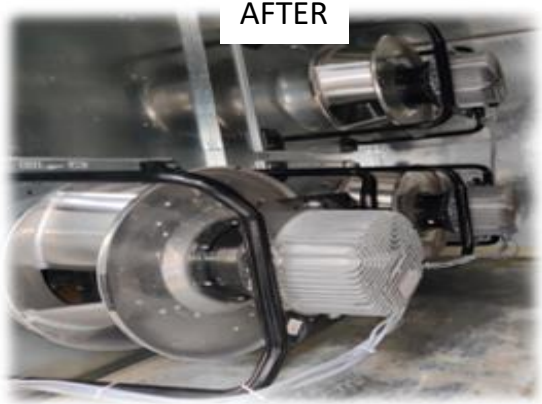
545 Tons of CO2 reduced in last 3 years

MAJOR ENCON PROJECTS DONE From (2021-2024)

BEFORE

Conventional Blower having Induction Motor with pulley and belt system is used to circulate air inside clean room. Capacity of Conventional blower with induction motor is 12 KW, 12000 CFM

AFTER

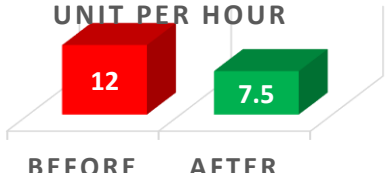


Energy Efficient blower i.e. EC blower fixed , Motor Rated Capacity 2.5*3 = 7.5 KW, CFM=12000

Horizontal Deployment :-

1. All AHUs

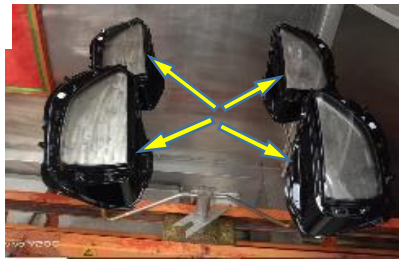
Benefit :-
1. Cost :- 8.91 lac INR
2. Energy :- 98930 KWH per annum
3. CO2 Emission reduce :- 69.7 Tons



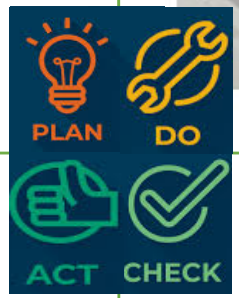
Benefit :- 3.03 lac INR
Cost :- 3.20 lac INR
ROI :- 13 month

MAJOR ENCON PROJECTS DONE From (2021-2024)

BEFORE



Only 4 HL Lens are hard coated at a time



AFTER

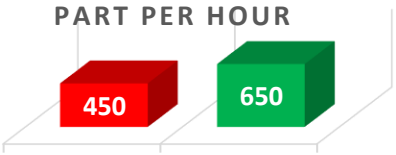
After analysis found due to small length size, we can adjust 6 Lens in single Jig

Horizontal Deployment :-

1. All Coating fixture capacity increase
2. Till date 3 Model fixtures capacity increases

Benefit :-

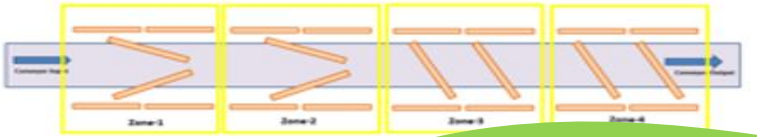
1. Cost :- 8.91 lac INR
2. Energy :- 88130 KWH per annum
3. CO2 Emission reduce :- 62.1 Tons

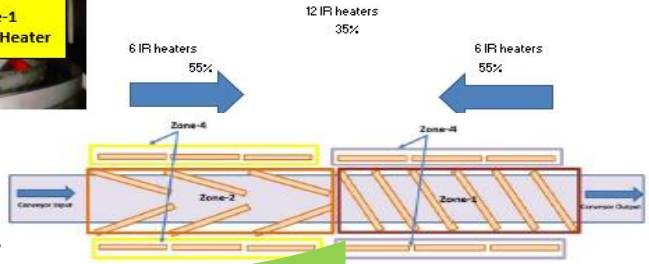


Benefit :- 3.16 lac INR
Cost :- 0.35 lac INR
ROI :- 13 month

INNOVATIVE PROJECT IMPLEMENTED

BEFORE





Innovative idea is to redefine Zones of IR heating to facilitate different setting of Top and Side wise rather than just defining Zone 1,2,3,4 continuously

Horizontal Deployment :-

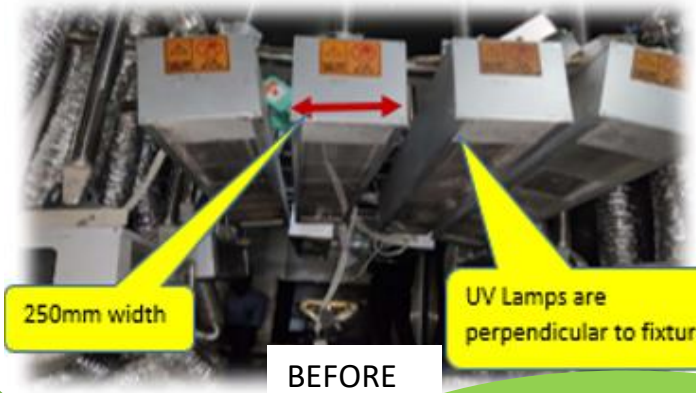
1. HCBC IR lamp Zone a
2. We can do anywhere
   from top as well as side wise

Benefit :-

1. Cost :- 0.91 lac INR
2. Energy :- 10320 KWH per annum
3. CO2 Emission Reduce :- 21 Tons

Benefit :- 1.56 lac INR
Cost :- 67,000 INR
ROI :- 5 month

INNOVATIVE PROJECT IMPLEMENTED



BEFORE

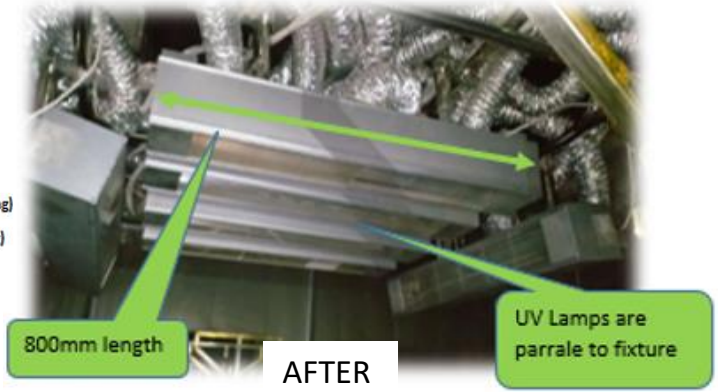
Jig Dimension :- Length - 900mm, Width - 600mm

UV Lamp Housing Dimension :-L - 800mm, W - 250mm

Part curing area is require 600-700 mm width wise

Before UV Lamp = 4 nos x 250= 1000mm (Width Covering)

After UV Lamp = 2 nos x 800= 800mm (Width Covering)



AFTER

Innovative idea is to rearrange orientation of UV Lamps housing to reduce number of UV Lamps for Curing of Lacquer

Horizontal Deployment :-

1. HCBC UV lamp alignme
2. We can do anywhere v
   top as well as side wise

Benefit :-

1. Cost :- 2.34 lac INR
2. Energy :- 25890 KWH per annum
3. CO2 Emission Reduce :- 53 Tons

Benefit :- 4.53 lac INR
Cost :- 4500 INR
ROI :- 0.1 month

Utilisation of Renewable Energy sources (Onsite)

Year	Source (Solar, wind, etc.,)	Installed capacity (in MW)	Capacity addition (MW) after FY 2021	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
FY 2021-22	Solar	0.192	0	0.22	2.21%
FY 2022-23	Solar	0.192	0	0.25	2.85%
FY 2023-24	Solar	0.192	0	0.23	2.20%

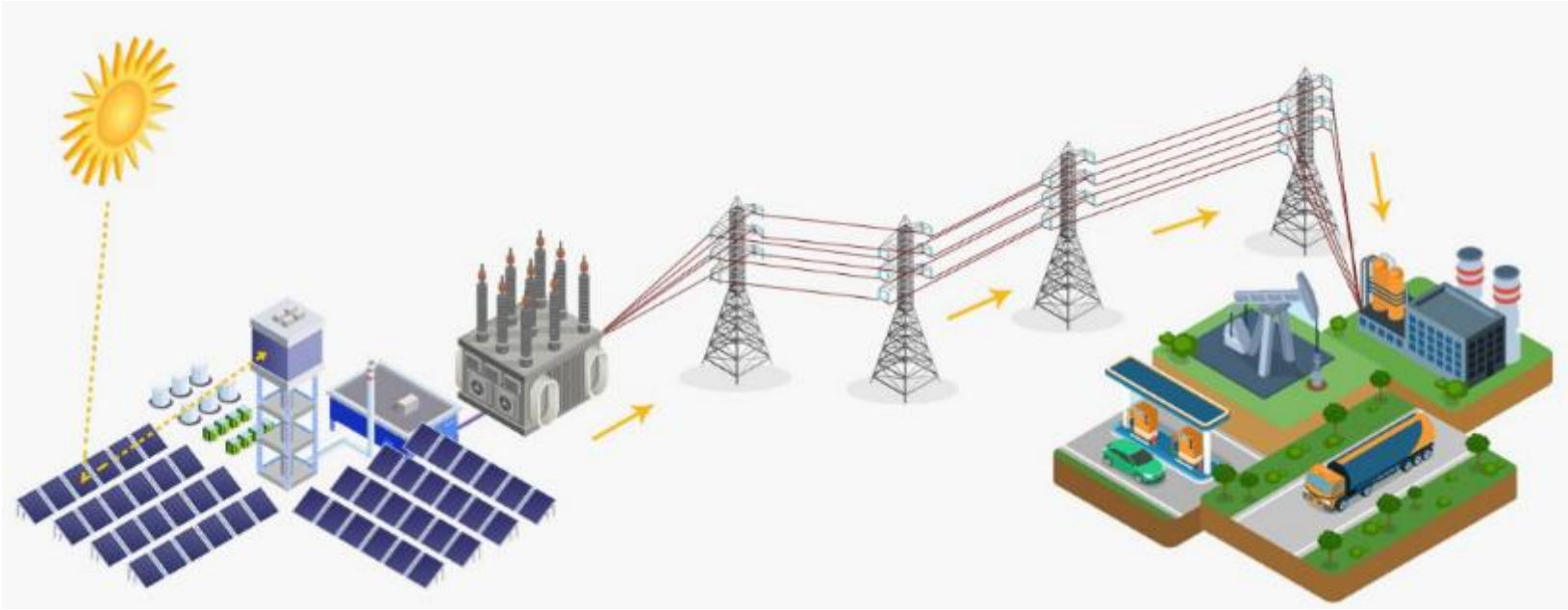
Rooftop Solar of
Capacity of 192 KWp

Future Renewable Energy Project (Onsite)

Year	Source	Installed capacity (in MW)	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
FY 2024-25	Solar	1.10	1.6	15%

Rooftop Solar of Capacity of 1100 KWp will be planned to installed in FY 24-25

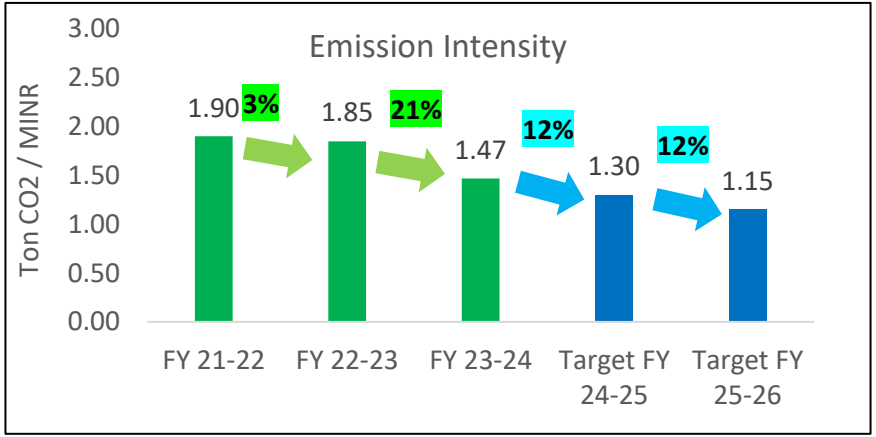
Future Renewable Energy Project (Group Captive) FY 25-26



Generation KWh	Investment (MINR)	Plant Capacity	CO2 Offset
7200000	30	4 MW	5040

GHG Inventorisation

Parameter	Unit of Measurement	FY 2021-2022	FY 2022-23	FY 2023-24
SCOPE 1 Emission (Direct Emission from Fuels used)	Kg CO2 / Equivalent Product	0.052	0.021	0.022
SCOPE 2 Emission (Indirect Emission from Grid Electricity)	Kg CO2 / Equivalent Product	5.05	4.64	3.27



GHG Emission Intensity (Kg CO2 / Ton of Product) of peers/competitors :- 1.15 Kg CO2/Ton of Product

Short Term -

1) Energy conservation projects to reduce energy consumption
2) Replace AC refrigerants with low GWP refrigerants.

Long Term -

1) Agreement with GRID suppliers for green energy at premium price
2) Initiate and finalize green power purchase agreement with state Grid supplier – 2038-39
3) DG conversion to green fuel
4) Reduce Scope 1 + Scope 2 emissions by- 25% by 2025
   50% by 2030
   75% by 2035
5) Carbon neutral (Scope 1+ Scope 2) by 2040
6) ISO certifications:-
   ISO 50001 - Energy Management System - Certified in 22-23
   ISO 14064 - GHG reporting- by 2025-26
7) SAQ 5.0 - > 95 % by 2025
8) Water Neutral :- 2025-26

TARGET for GHG EMISSION REDUCTION

Key Partners : *Who will help to deliver ?*

- *Identify the key external partners / suppliers ?*
- *Identify the key internal Motherson divisions and OP-COs that will assist in this Net Zero transition plan delivery.*

Give details below :

1. Solar plant installers and providers onsite and offsite with CAPEX and OPEX models
2. WTG providers offsite
3. State Grid suppliers
4. DG green fuel conversion retro fitting suppliers
5. Green/low carbon fuel suppliers.
6. Professional energy auditors

Key activities : *How do we propose to do it ?*

1. Install roof top solar in CAPEX/OPEX model.
2. PPA for renewable power in CAPEX/OPEX mode
3. Agreement with GRID suppliers for green energy at premium price.
4. DG conversion to green fuel
5. Energy conservation projects to reduce energy consumption
6. Replace AC refrigerants with low GWP refrigerants.

Key resources : *What is needed to succeed ?*

1. Legal team
2. Purchase team
3. Finance team
4. Facility management
5. Specialist with good understanding of state policies on green power procurement
6. Energy managers and auditors
7. Energy measurement devices and Online EMS

Value proposition : *What do we need to do ?*

- *Which Scopes does the proposal apply*
- *What is your Co2e baseline ?*
- *What needs / pain points does the ideation satisfy ?*
- *Does the idea / product / service offer any key USP's ?*

Give details below :

1. Replace Fossil fuel energy by green energy.
2. Reduce Scope 1 and Scope 2 emissions of the plant
3. 2020-21 Baseline of 6930 T of CO2 eq.

Target timing : *What are the key milestones ?*

1. Rooftop solar to cover whole roof – **2024-25**
2. Open access renewable power purchase quotes to be taken and ROI to be validated – **2025-26**
3. Check the feasibility of running DG set on green fuel or in hybrid mode.
4. Initiate and finalize green power purchase agreement with state Grid supplier – **2038-39**
5. Carry out energy audits, identify and quantify the losses, work out the ROI of proposed solutions – **alternate year**

Benchmarking : *Who are our competitors ?*

- *Are established players active in the field ?*
- *What are their key product and performance attributes ?*
- *What are the competitors price points ?*

Give details below :

1. CAPEX and OPEX solar installations – M+, Clean max, Sun-source are capable players- Most of them use standard installations.
2. No installer use dual sided panels yet.
3. For WTG used asset is preferred over new asset.

Budget activities : *How much do Motherson need to invest ?*

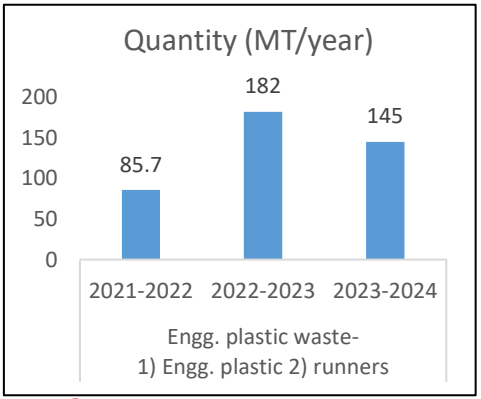
1. WSH power purchase – in Capex in 25-26 at 6 MWh annually
2. Encon activities budget to be covered in CAPEX and OPEX in 2024-25 – Approx 2 MINR
3. 9.3 MWh green Units purchase from State grid

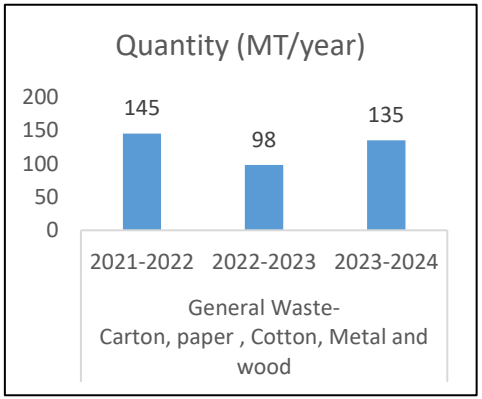
Revenue stream : *How much return can Motherson expect ?*

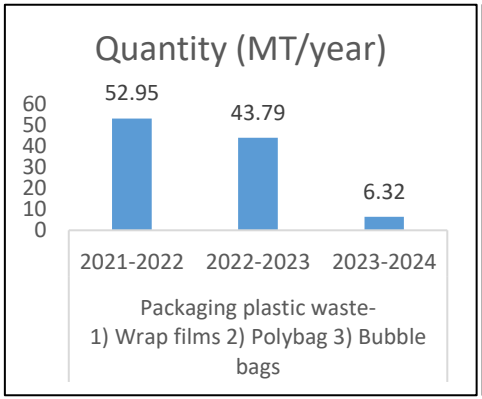
1. WTG capex model – approx 41 months
2. Open access renewable OPEX model – additional cost
3. ENCON projects – ROI within max 18-24 months

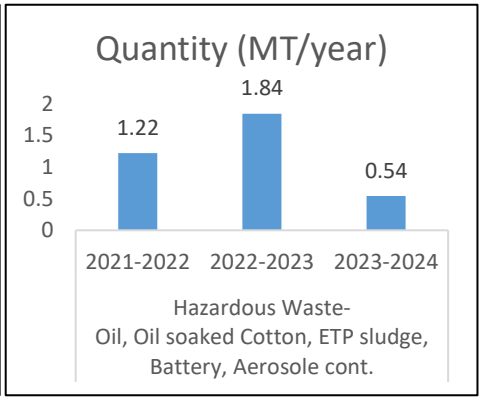
WASTE UTILIZATION AND MANAGEMENT

Sl No	Type of waste generated	Year	Quantity (MT/year)	Recycle	Disposal method
1	Engg. plastic waste- 1) Engg. plastic 2) Runners	2021-2022	85.7	100%	Send to authorized recycler
		2022-2023	182	100%	Send to authorized recycler
		2023-2024	145	100%	Send to authorized recycler
2	General Waste- Carton, paper , Cotton, Metal and wood	2021-2022	145	50%	Send to authorized recycler
		2022-2023	98	50%	Send to authorized recycler
		2023-2024	135	50%	Send to authorized recycler
3	Packaging plastic waste- 1) Wrap films 2) Polybag 3) Bubble bags	2021-2022	52.95	100%	Elimination and reused
		2022-2023	43.79	100%	Elimination and reused
		2023-2024	6.32	100%	Elimination and reused
4	Hazardous Waste- Oil, Oil-soaked Cotton, ETP sludge, Battery, Aerosol cont.	2021-2022	1.22	75%	Disposal through Incinerator to authorized Agencies
		2022-2023	1.84	75%	Disposal through Incinerator to authorized Agencies
		2023-2024	0.54	75%	Disposal through Incinerator to authorized Agencies





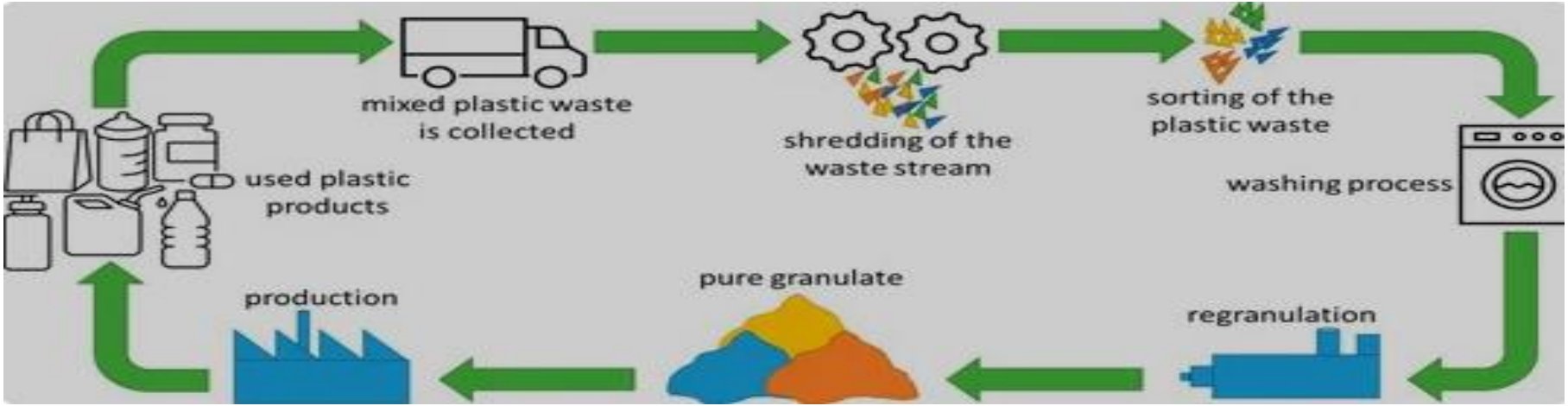




WASTE UTILIZATION AND MANAGEMENT

Supplier Name	Licence No	Material List
Naaz Trading Company	AWH-22490	Corrugated box Scrap
		Plastic Scrap
		Wooden Scrap
		M.S DRUM

Supplier Name	Licence No	Material List
Gauri Polymers	0000143889	Plastics Waste



WASTE UTILIZATION AND MANAGEMENT

Sustainability initiative :- Reduction in consumption of Packaging Material

Before

Weight :8.61 Mg

After

Weight :1.92 Mg

Before

Average Monthly PCB receive Qty :- 15000 nos
Per month poly bag receive :- 15000 nos
Weight of polybag :- 8.61 mg
:- 129.15 gms per month
:- 1551.8 gms per year

After

Average Monthly PCB receive Qty :- 15000 nos
Per month poly bag receive :- 15000 nos
Weight of polybag :- 1.92 mg
:- 28.8 gms per month
:- 346.05 gms per year

Before
No. of PCB in Corrugated Box :- 30 nos

After replacing packaging
No. of PCB in Corrugated Box :- 60 nos

Before Corrugated Box required :- 500 nos
After Corrugated Box required :- 250 nos

Weight of one Box :- 739.6 gms
Total weight reduce :- 250 X 739.6
= 184.9 kgs per year

Yearly Benefit :-					
	Plastic Packaging	**1.205**	**Kgs**	**CO2 Emission reduction :-**	**3.62 kgs of CO2**
	Corrugated Box	**184.9**	**Kgs**	**CO2 Emission reduction :-**	**60.3 kgs of CO2**

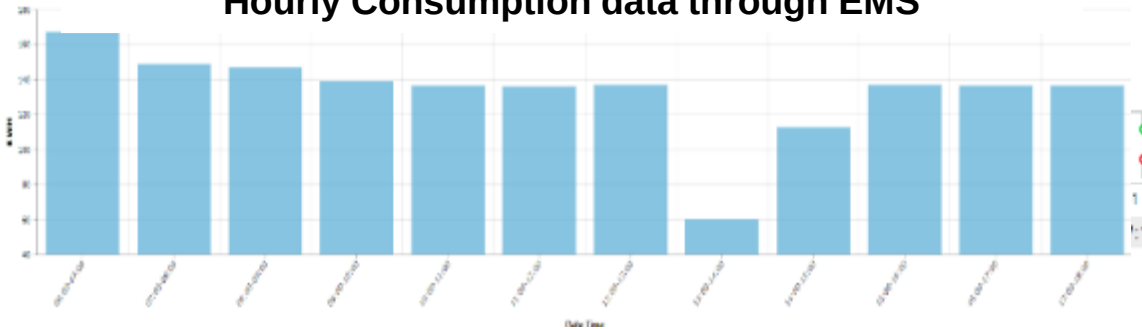
GREEN SUPPLY CHAIN MANAGEMENT

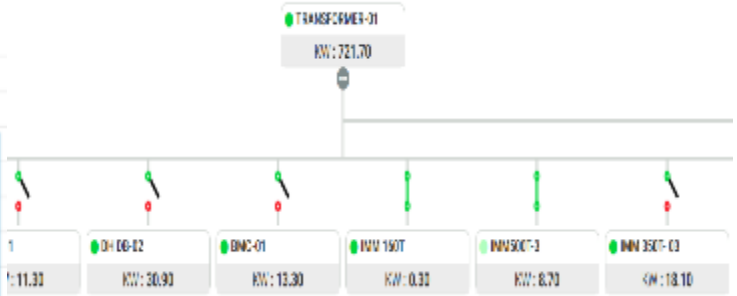
- Total suppliers – Direct material, Indirect Material, Equipment Suppliers, Service providers
- SAQ 4.0 status of suppliers, current average score, and target.

S. No.		2023-24	Actual Achievement 2023-24	Target 2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
1	Adhere to Motherson Supplier Code of Conduct	100%	78%	85%					
2	Supplier coverage with SAQ 4.0/5.0	60%	48%	100%					
3	SAQ 4.0 Score - Direct material suppliers	60%	48%	70%	80%	90%			
4	ISO certifications - Direct material suppliers								
	ISO 14001	75%	65%	100%					
	ISO 45001	40%	34%	50%	75%	100%			
	ISO 50001		4%	25%	50%	75%	100%		
	Product carbon footprint - ISO 14067			20% suppliers contributing 80% of purchase value	25%	50%	75%	100%	
	Life cycle assessment - ISO 14040					25%	50%	75%	100%
	Scope 3 Emission calculation			10 suppliers					
5	Establish Scope 1 and 2 emissions data - Direct material suppliers	25%	20%	50%	100%				
6	Green energy - Direct material suppliers nos.	20%	20%	40%	60%	80%	100%		
7	Green energy content of suppliers using the green energy	20%	20%		>40%		>50%	=100%	
8	Water neutral - Direct material suppliers				50%	75%	100%		
9	Non hazardous waste recycling %	50%	60%	75%	80%	100%			
10	Carbon neutrality (Scope 1+2) - Direct material suppliers								100%
11	Zero discharge			10%		50%			100%
12	Bio diversity								50%
13	Rain Water Harvesting			10%	20%	50%	60%	75%	100%
14	Eco vadis rating (Silver rating)		17%	41%	41%	50%			100%
15	Plastic packaging elimination							100%	

EMS AND CERTIFICATIONS

Hourly Consumption data through EMS





SLD IN EMS

Site transition plan 2023-2040 inclusive.

Site Name:	MMLI Sanand
Sustainbility Champion	Vasant Malunjkar
Date	01-02-2023

Site Reduction Rate	5.00%

Please enter your reduction rate in this tab.

Please note: < 1.5 alignment degree pathway (scope 1 and 2) anticipate 10% net level by 2040

Reduction Rate	
Scope 1	1%
Scope 2	99%

Calculated Glide Path (fix % rate)

Phase	Near Term (5-10 years)										Long term								
MMLI Sanand	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
S1+S2 Total (t)	6930	6584	6237	5891	5544	5198	4851	4505	4158	3812	3465	3119	2772	2426	2079	1733	1386	1040	693
Scope 1 (t)	92	87	83	78	74	69	64	60	55	51	46	41	37	32	28	23	18	14	9
Scope 2 (t)	6838	6496	6154	5812	5471	5129	4787	4445	4103	3761	3419	3077	2735	2393	2051	1710	1368	1026	684
Combine (t)	6930	6584	6237	5891	5544	5198	4851	4505	4158	3812	3465	3119	2772	2426	2079	1733	1386	1040	693
% reduction overall from base line	100%	-5%	-10%	-15%	-20%	-25%	-30%	-35%	-40%	-45%	-50%	-55%	-60%	-65%	-70%	-75%	-80%	-85%	-90%
Reduction cumalation (t)	0	-347	-693	-1040	-1386	-1733	-2079	-2426	-2772	-3119	-3465	-3812	-4158	-4505	-4851	-5198	-5544	-5891	-6237
Value Proposition Canvas actionable comments			Rooftop solar RESCO Model 1.1 MW 1,20,000 kWh/month	OPEN ACCESS or RESCO Model 4 MW 6,00,000 kWh/month	OPEN ACCESS or RESCO Model 2 MW 3,00,000 kWh/month	OPEN ACCESS or RESCO Model 1 MW 1,00,000 kWh/month		OPEN ACCESS or RESCO Model 1 MW 1,00,000 kWh/month	OPEN ACCESS or RESCO Model 1 MW 1,00,000 kWh/month				OPEN ACCESS or RESCO Model 1.5 MW 1,50,000 kWh/month				OPEN ACCESS or RESCO Model 1 MW 1,00,000 kWh/month	7,13,597 KWh green units purchase from State GRID	7,22,244 KWh green units purchase from State GRID

NET ZERO ACTION PLAN

MMLI – Sanand Transition Plan for Scope 1 & 2 - To Achieve Science Based Targets

Near-term actions (5-10 years)

Long-term actions

- Capex provision for replacing the old solar panels after 25 years.
- Capex provision for replacing the WTG assets every 10 years.
- Opex provision in respective budgets for premium cost of green energy.

2021

95%
Minimum coverage for Scope 1 & 2 - Done

Scope 3 emissions calculation - Done

2022

ISO 50001
Operation sites 100% ISO 50001 verified - Done

Suppliers Engagement
Start with SAQ 4.0 and Motherson Code of conduct with the suppliers – In progress

2023

10% green energy

2024

20% green energy

2025

70% green energy

Water neutrality

ISO 14064-1 Certified emissions report

Suppliers Engagement
Start with SAQ 4.0 and Motherson Code of conduct with the suppliers –95%

2030

100% green energy

Suppliers Engagement
Complete alignment of suppliers

2040

CO_2 NET ZERO

Thanks For Your Attention