TATA MOTORS LTD. CVBU PUNE

TEAM:

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Mr. Mandar Pande (Sr. Mgr., Central Maintenance)

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TATA MOTORS
Connecting Aspirations

Our Purpose

We Innovate Mobility Solutions With Passion To Enhance Quality of Life

MHCV

Signa

Prima

BUSES AND VANS

Magic Ambulance

Winger

Starbus

Ultra EV

SCV AND PICKUP

Ace EV

New Intra

Ace

Yodha 2.0

ILCV

Ultra

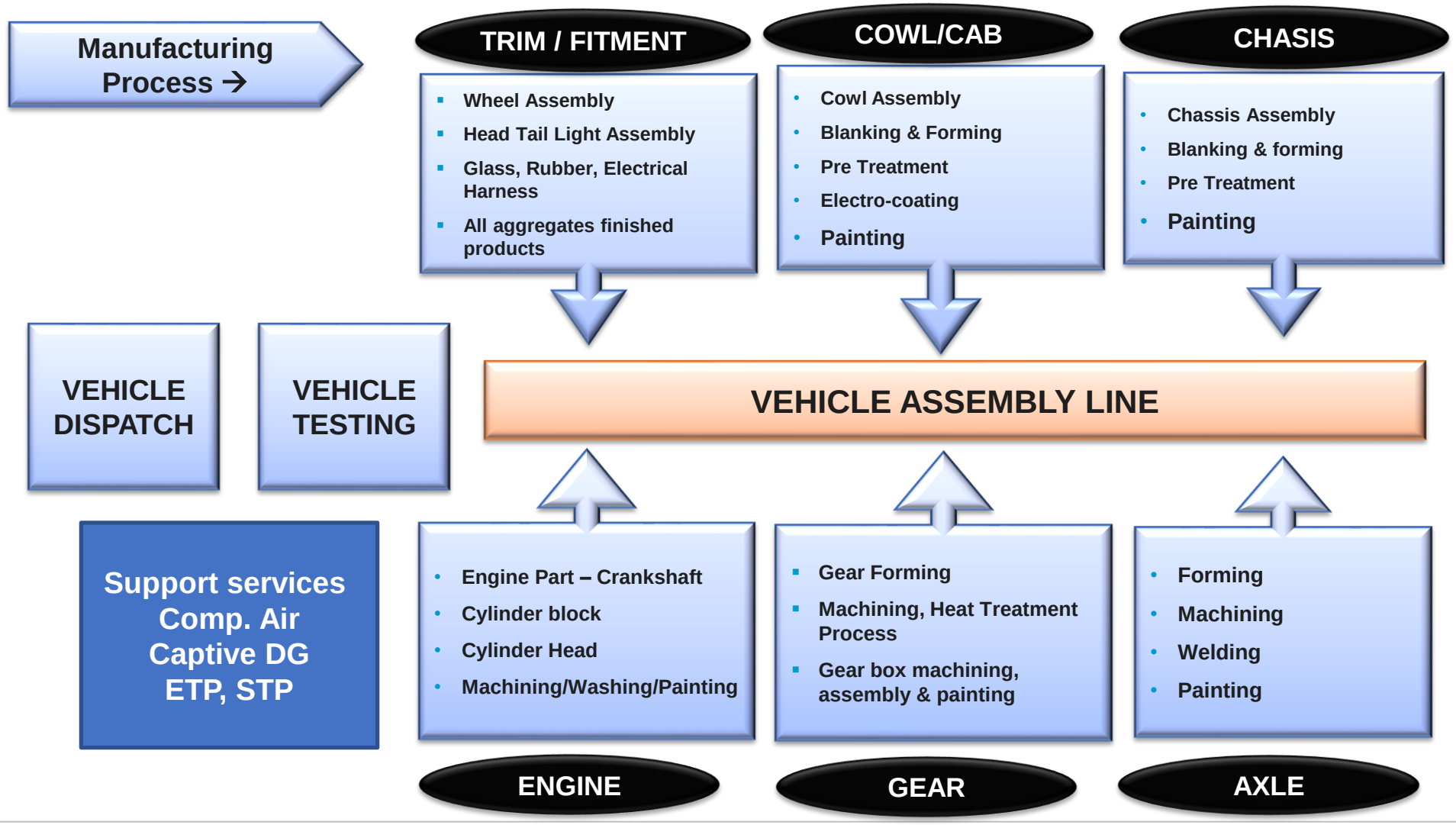
Tata 407

INTERNATIONAL

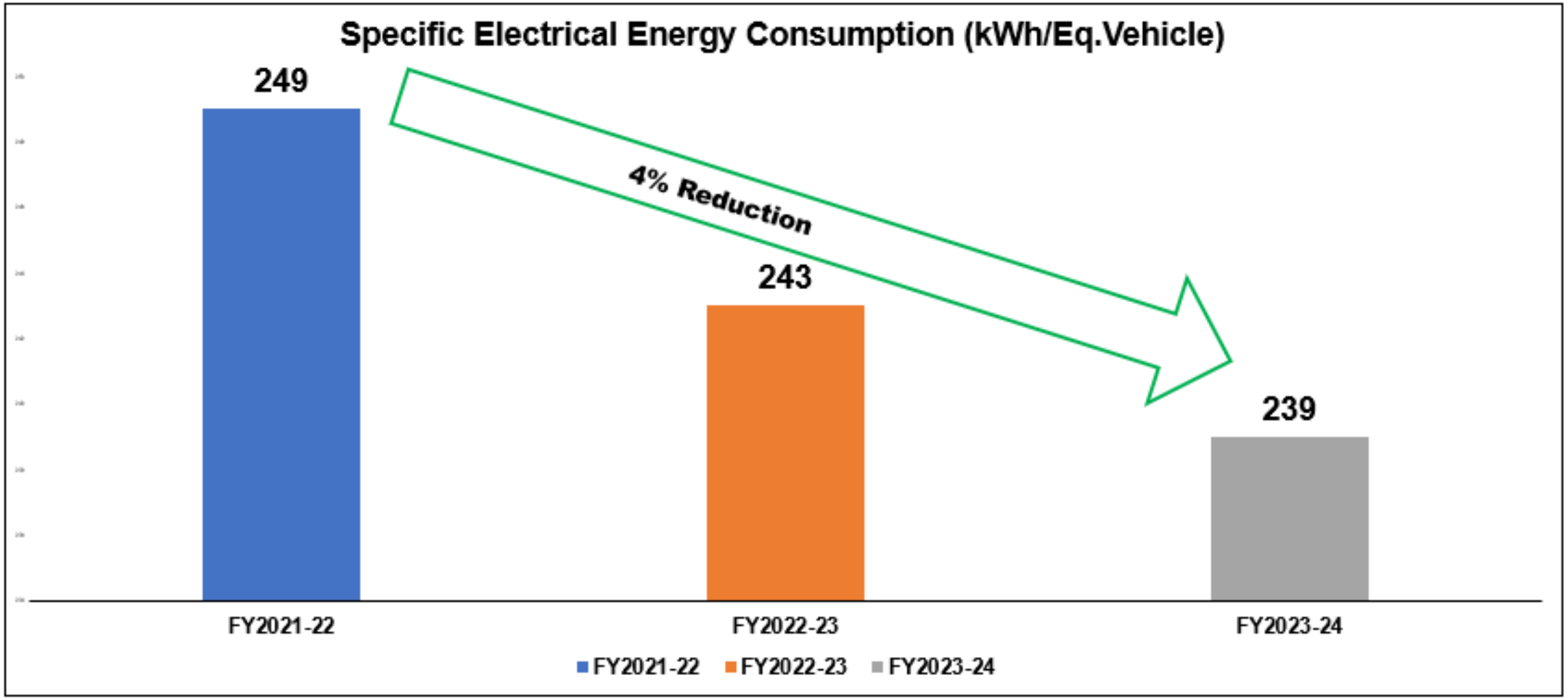
Xenon X2

Prima Euro 5 Range

1. Manufacturing Process

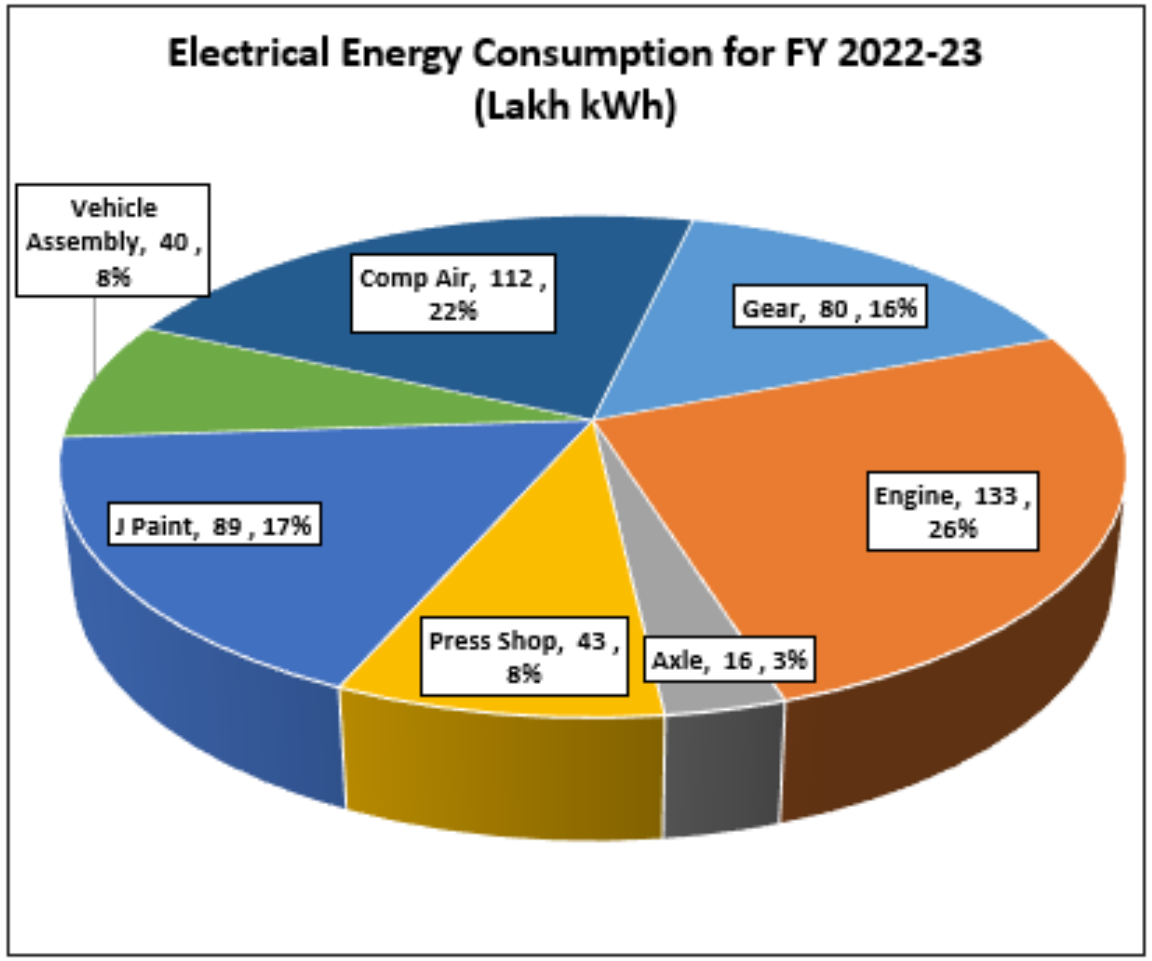


3. Energy Consumption Overview

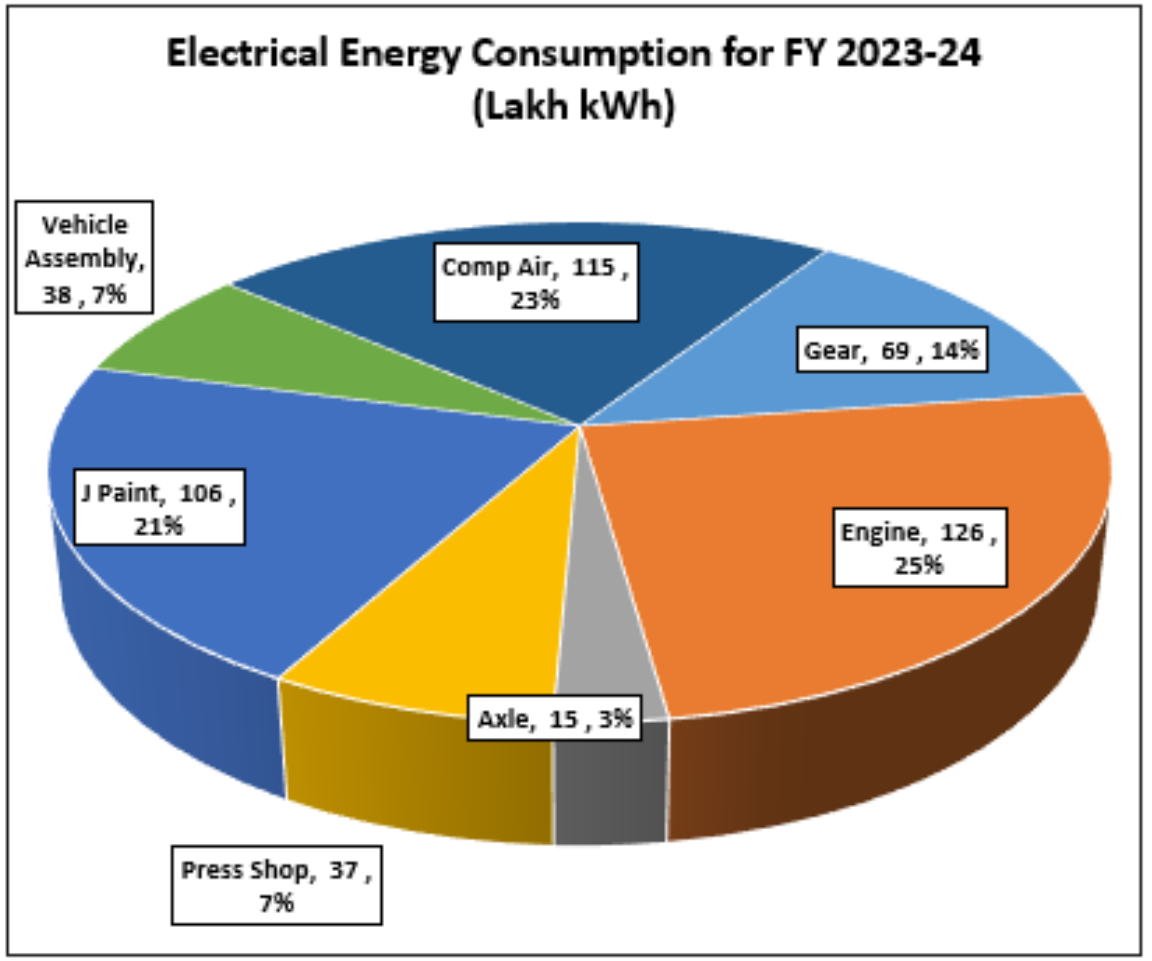


3. Energy Consumption Overview

Process wise Electrical Energy Consumption FY2022 - 23

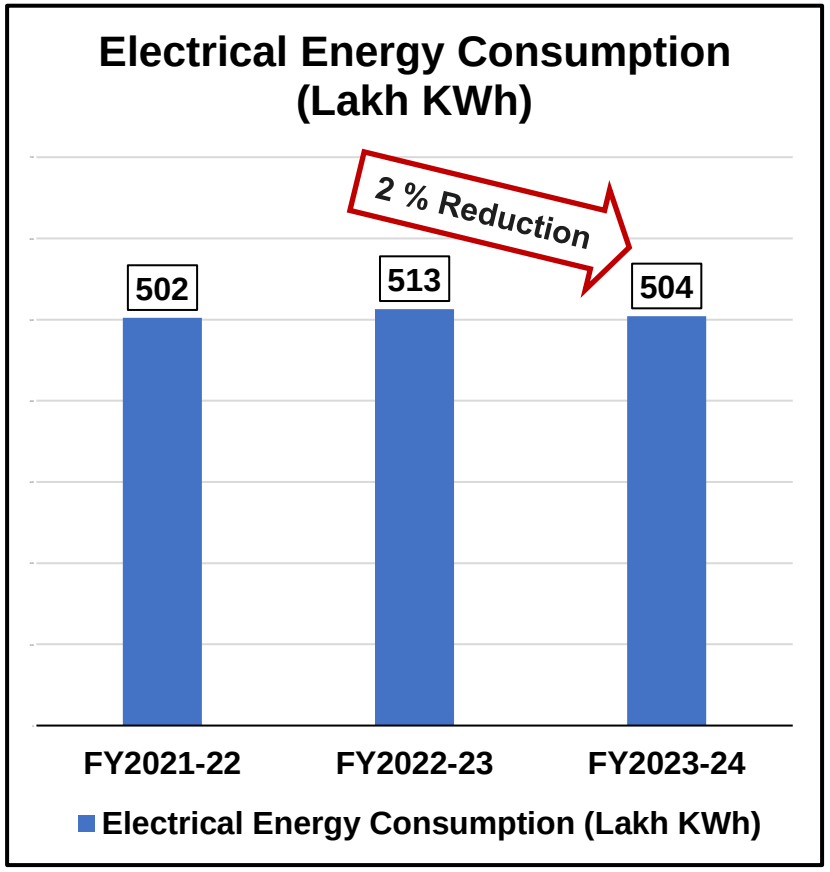


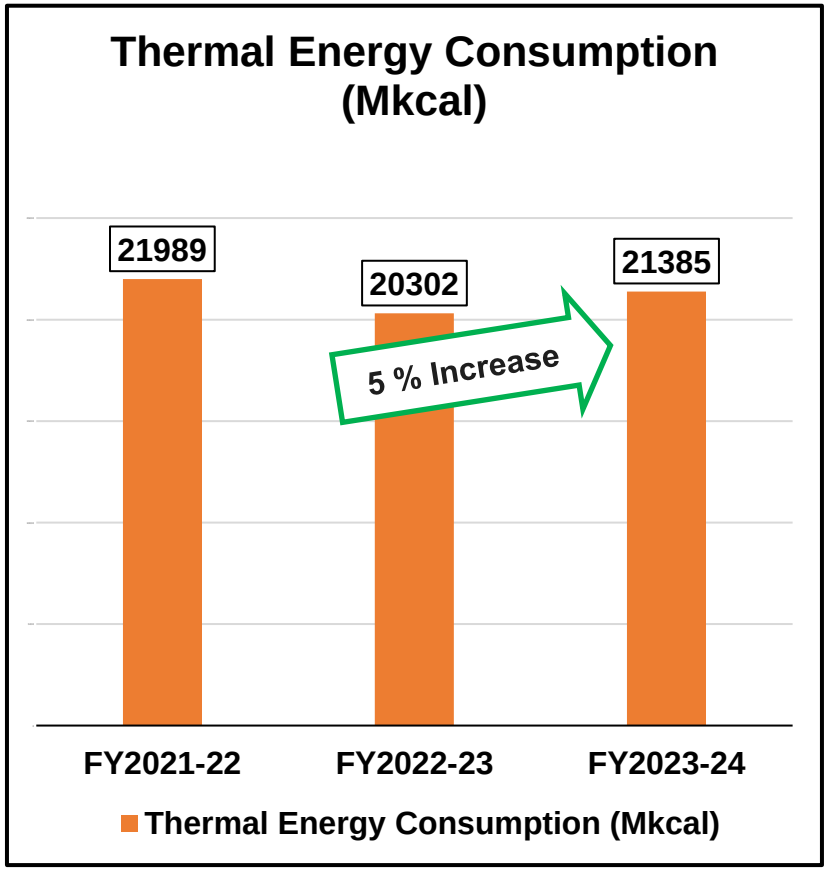
Process wise Electrical Energy Consumption FY2023 - 24

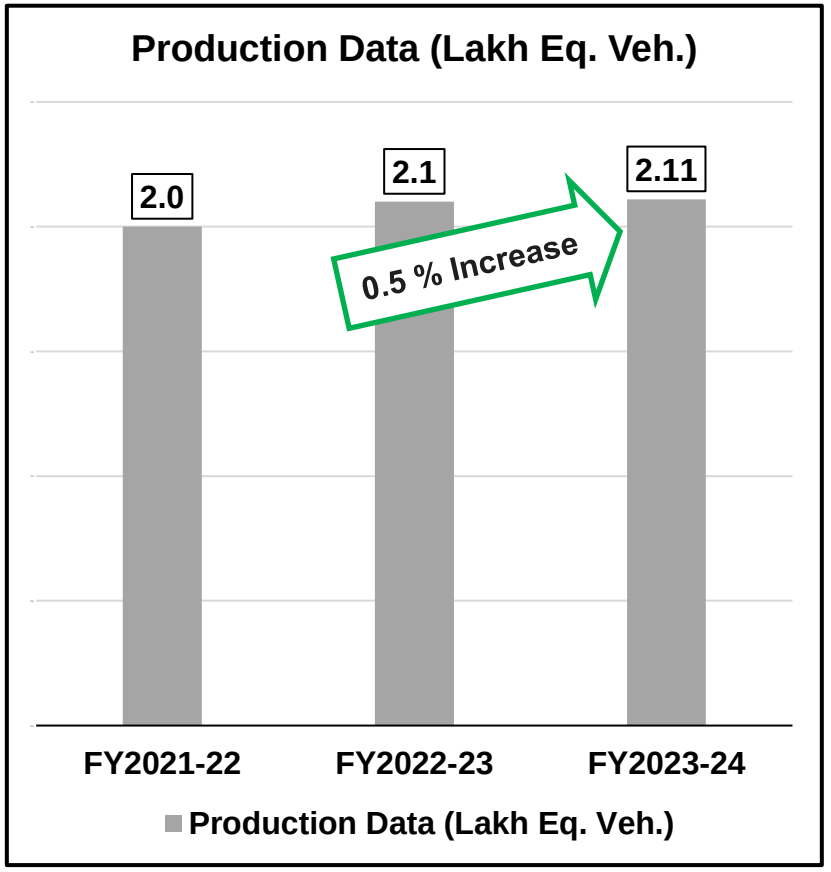


3. Energy Consumption Overview

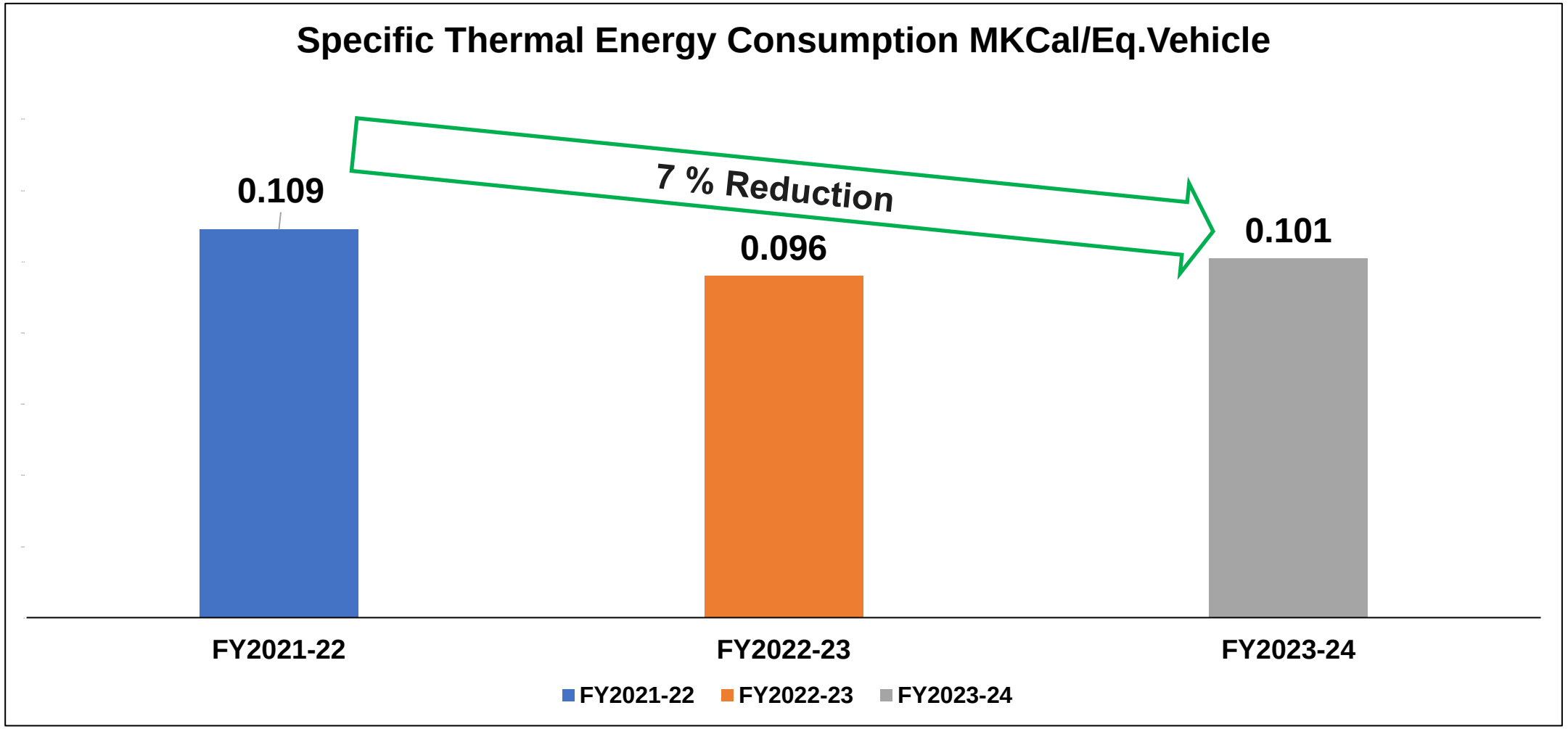
Overall Energy Consumption and Production Data FY2023-2024





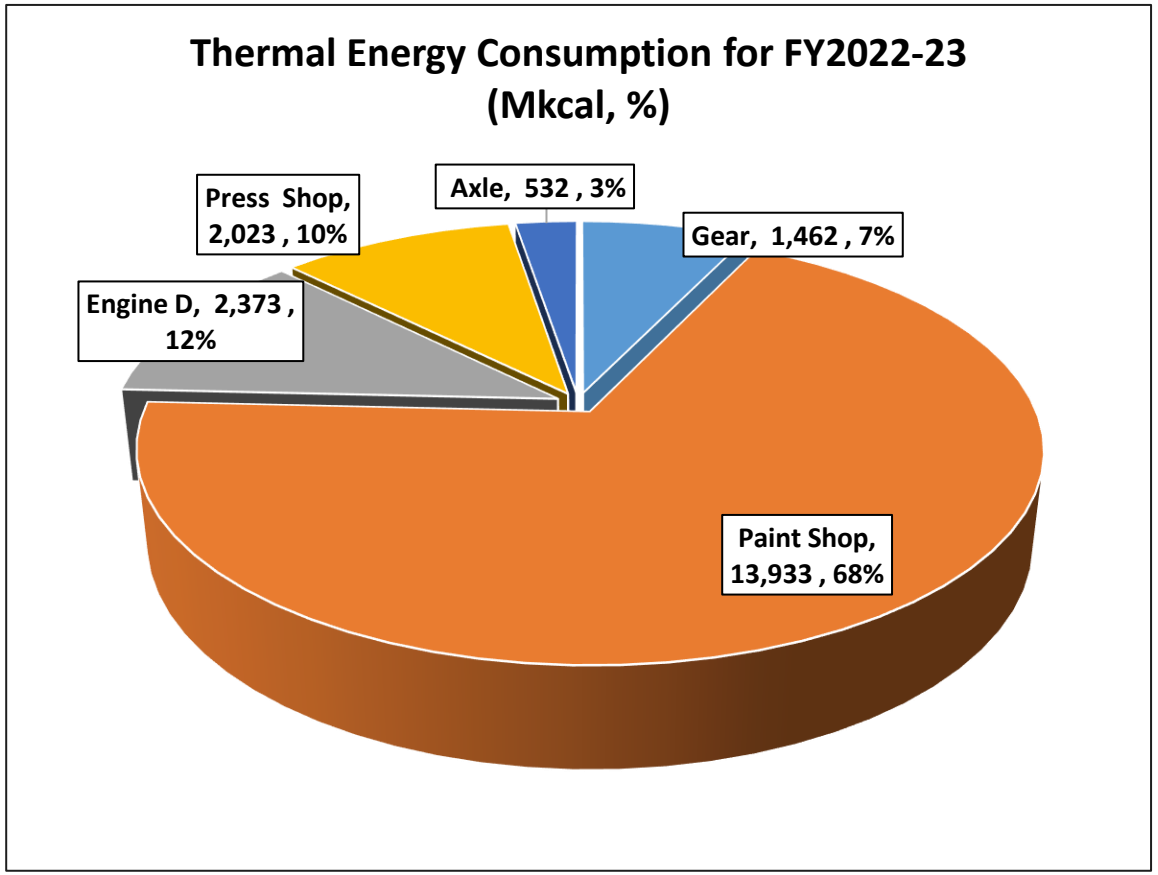


3. Specific Energy Consumption in Last 3 Years - Thermal

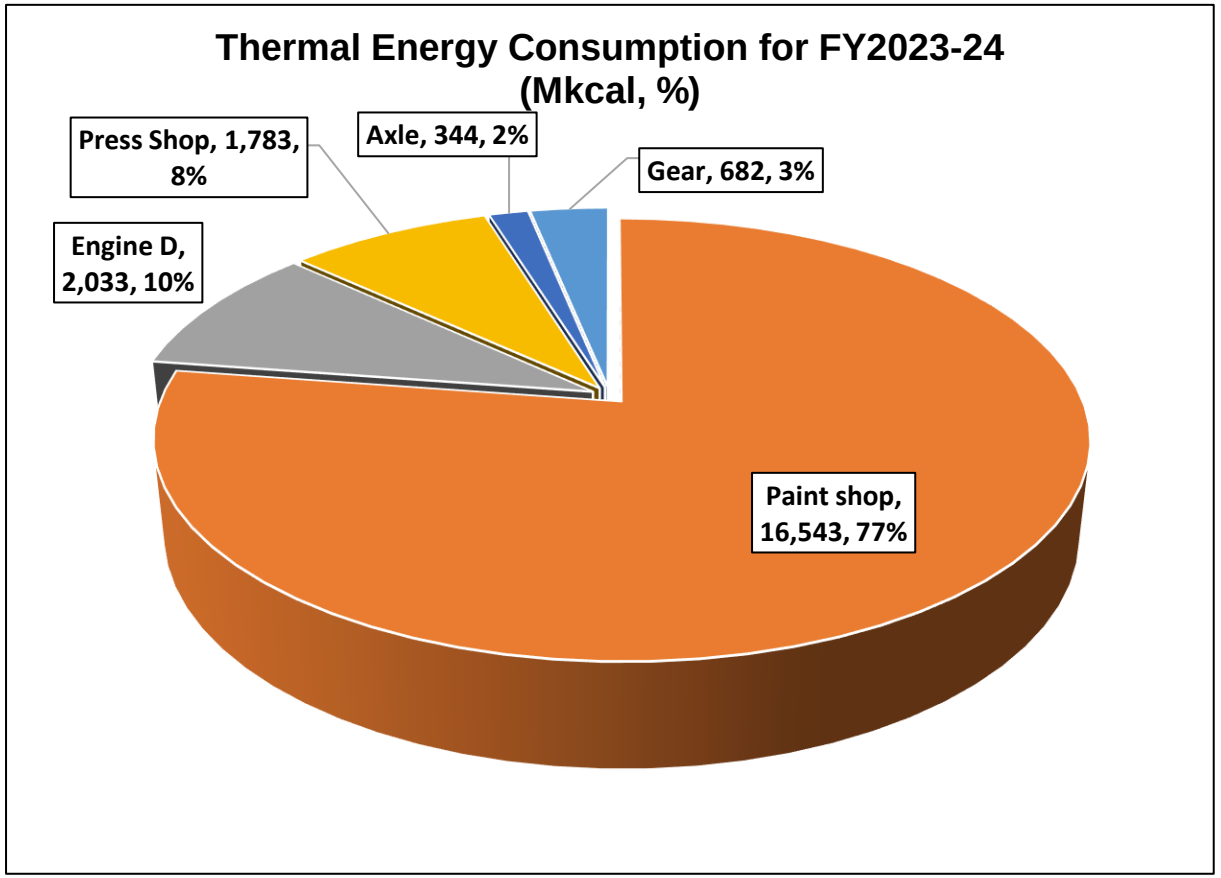


3. Specific Energy Consumption in Last 3 Years - Thermal

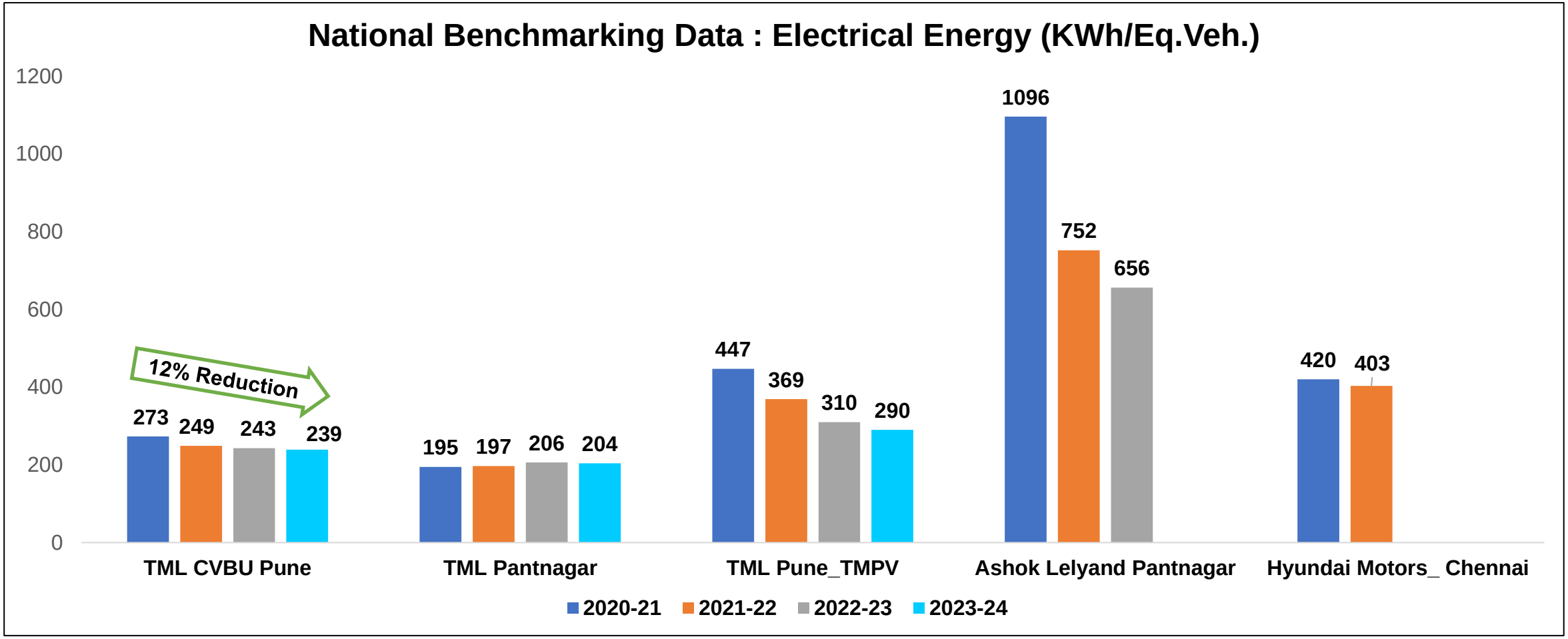
Process wise Thermal Energy Consumption FY2022 - 23



Process wise Thermal Energy Consumption FY2023 - 24

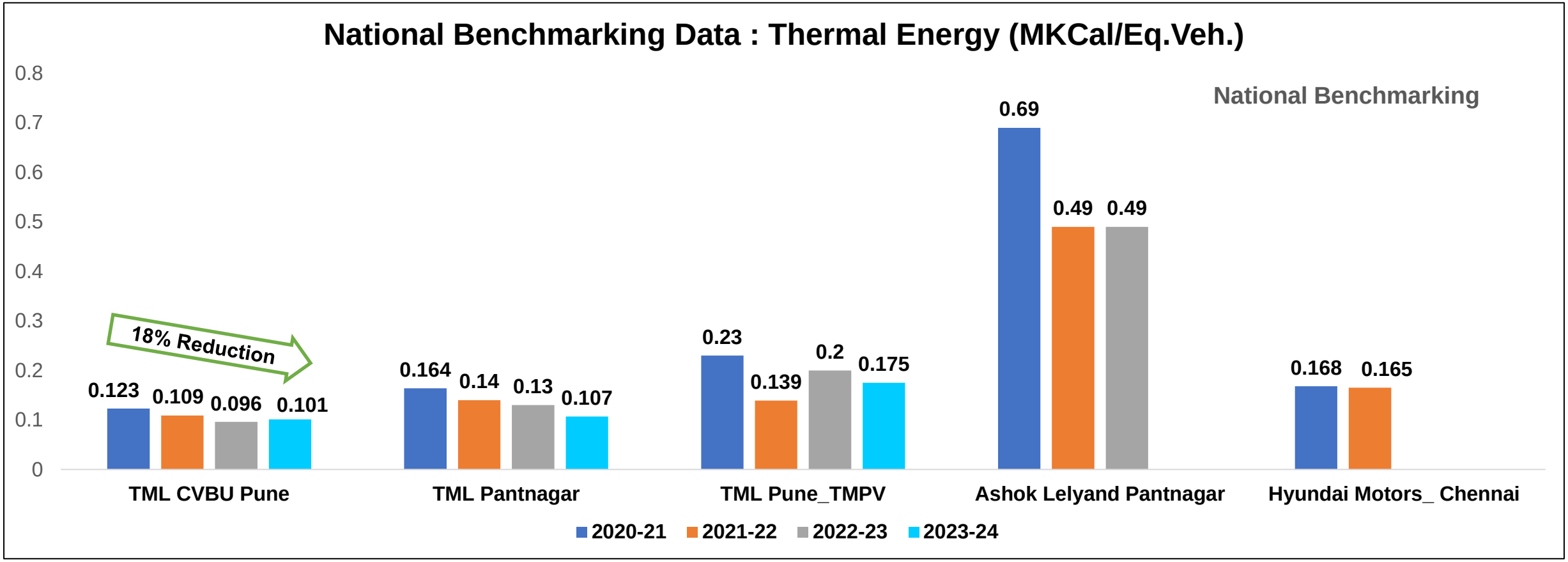


4. Information on Competitors, National & Global Benchmark



Note: Data as per CII Presentation

4. Information on Competitors, National & Global Benchmark



Note: Data as per CII Presentation

4. Information on Competitors, National & Global Benchmark

Global Benchmark

TATA Motors CVBU Pune Energy performance information on national competitors is mentioned above.
Global competitor performance comparison is difficult due to following aspects:

- Apple to apple comparison is very difficult to compare
- Manufacturing models are different, e.g. in CVBU Pune, we are having all manufacturing processes
- Climatic conditions are variable according to geographical locations

Roadmap to achieve Benchmark / Global Best :-

TATA Motors CVBU Pune Plant will continue to refine all process to achieve Benchmark Level.

To Sustain the Best Achieved Level :-

We are following robust process of assessment of performance vis-à-vis comparative information / benchmark from different organisation and standards.

Roadmap :-

- ❑ Intelligent management- **Optimum and effective use of Resources**
- ❑ IOT / Machine management through **Digitization** – KT2 / Adopt Latest Technology
- ❑ Lean manufacturing and Processes Management - **Innovations**
- ❑ Clean resources - **Maximise Renewable Energy**
- ❑ GHG Management - **Reduce Carbon Footprint**
- ❑ **Real-time Monitoring and analysis** at shop floor

4. List of Major EnCon Projects Planned 2024-25

Sr. No	EnCon Projects_FY24-25	Category	Budget in Lac	Saving in Lac
1	Ceramic coating for CCHF Furnace.	New Technology	14.04	19.7
2	Polishing booth draft optimization by reducing frequencies and optimization of supply and Exhaust.	Optimaization	0	11.03
3	KT2 Implementation Heat Treatment Area – Furnace optimization	Optimaization	25	20
4	Optimization of Ventilation ASU no 3 during PTCED Production and recess period by Logic modification-	Optimaization	0	3.7
5	HVLS Installation ICV Factory.	New Technology	2	1.4
6	KT2 implementation Eng. factory	New Technology	12.3	15.1
7	KT2 implementation Press factory	New Technology	12.3	15.1
8	KT2 implementation ICV/LCV/Xenon/Winger factory	New Technology	12.3	15.1
9	KT2 implementation Axle Factory	New Technology	12.3	15.1
10	HVLS Installation LCV /ICV/Winger/Engine Factory	New Technology	8	5.6
11	Quadsun Heat Pump Project implementation - Paint shop PTCED Process tank heating **(Capex Project)** - WIP	New Technology	450	142
12	Paint shop – Pneumatic to electric conversion for Paint kitchen area (**Capex Project)** **2 nos of Pumps Planned .**	New Technology	60	18
13	Complete working on Sunday/Holiday to be stopped – Non Working Day Consumption Reduction. Quick Fix idea	Optimaization	NA	3.6
14	APL CAD room centralized A/c system optimization	Replacement		

5. Energy Saving Projects Implemented in Last Three Years

❑ Summary of Projects Implemented in Last Three Years

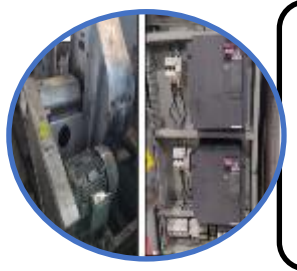
Year	No. of Energy Saving Projects	Investment (Rs. Million)	Total Savings (Rs. Million)	Payback Period (Months)
2021-22	12	10.1	24	4
2022-23	9	6.8	19.4	4
2023-24	15	5.1	21.4	3
Total	**36**	**22**	**64.8**	**4**

5. Energy Saving Projects Implemented in Last Three Years

❑ List of Major Implemented Energy Conservation Projects_**FY2021-22**

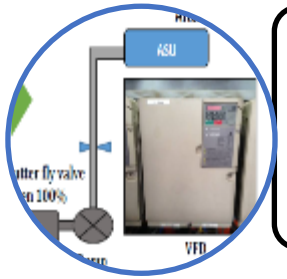
Electrical heating to CNG conversion (Total 5 Machines converted to NG)

- Energy Cost Saving → **Rs. 26.33 Lakh**
- Investment → **Nil**
- Total kwh saving→ **2,82,000 kwh/Year**



REDUCING ENERGY CONSUMPTION OF PERFORMANCE TEST BED BY LOWERING SPEED OF BLOWER SPEED (16 no's VFD installed).

- Energy Cost Saving → **Rs. 27.56 Lakh**
- Investment → **Rs. 8 Lakh**
- Total kwh saving→ **3,32,448 kwh/Year**

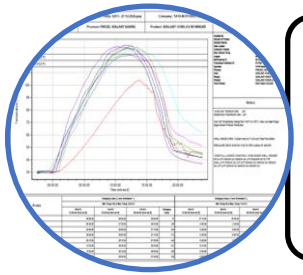


ELIMINATION OF PUMP THROTTLING AT J11/J12 PAINT SHOP(Modulation of pump flow with VFD)

- Energy Cost Saving → **Rs. 19.73 Lakh**
- Investment → **NIL**
- Total kwh saving→ **2,12,585 kwh/Year**

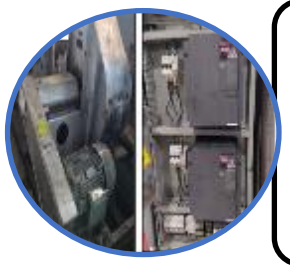
5. Energy Saving Projects Implemented in Last Three Years

❑ List of Major Implemented Energy Conservation Projects_**FY2022-23**



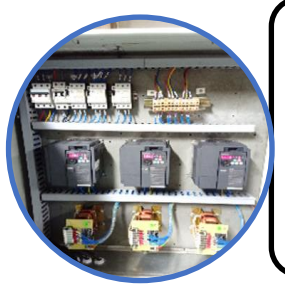
Energy Saving by Development and Implementation of low bake pre-gel seam sealant

- Energy Cost Saving → **Rs. 38.24 Lakh**
- Investment → **Nil**
- Total kwh saving → **61,000 SCM/Year**



Energy Saving by Efficiently Managing Air Supply & Exhaust System of Base coat paint booth

- Energy Cost Saving → **Rs. 27.27 Lakh**
- Investment → **Nil**
- Total kwh saving → **3,20,880 kWh/Year**

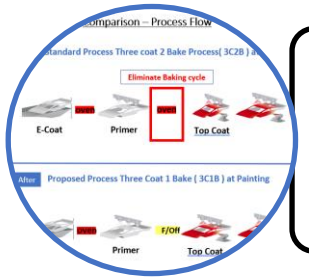


Installation of VFD at Paint shop, Xenon, H Block Engine, Press Shop, Axle (Qty: 111 Nos.)

- Energy Cost Saving → **Rs. 80.72 Lakh**
- Investment → **Rs. 31.52 Lakh**
- Total kwh saving → **9,49,735 kWh/Year**

5. Energy Saving Projects Implemented in Last Three Years

❑ List of Major Implemented Energy Conservation Projects_**FY2023-24**

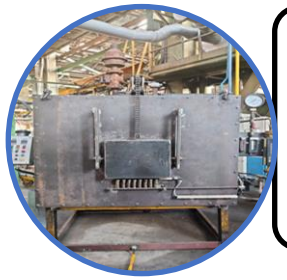


Process Change by Colour Shifting from 3C2B to 3C1B on Various Cabs

- Energy Cost Saving → **Rs. 147.8 Lakh**
- Investment → **NIL**
- Total kwh saving → **6.15 Lakh kwh/Year & NG Fuel saving 2.1 Lakh SCM/Year**

Start-up loss of 2 cycles avoided in PTCED at Paint Shop

- Energy Cost Saving → **Rs. 4.1 Lakh**
- Investment → **NIL**
- Total kwh saving → **24,000 kwh/Year**



Separation of Carburizing and Hardening Process from Main Furnace CCHF4

- Energy Cost Saving → **Rs. 30.76 Lakh**
- Investment → **Rs. 25 Lakhs**
- Total kwh saving → **3.75 Lakh kwh/Year**

5. Major Energy Saving Projects 2023-24

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Connecting Aspirations

Sr. No.	Project Description	Location/Factory	Idea Related to Power/Fuel	Levers for ENCON Projects	Energy Saving (kWh/ Annum)	Annual Power Saving (Rs. Lakhs)	Investment (Rs. Lakhs)	Remarks
1	Installation of VFD at 2000 T Press Shop	Press Shop E Block	Power	Operational Efficiency	67,710	5.6	2.9	
	Installation of VFD at Hitachi Conveyer	Press Shop E Block	Power	Operational Efficiency	24,156	2.0	1.1	
	Installation of VFD at Paint shop blower	Paint shop J block	Power	New technology introduction	11,712	1.0	0.6	
2	Engine Paint booth Elimination	H 8 Engine	Power	Energy cost	20,130	1.7	-	Process change
3	Ventilation ASU Switching off in Recess Period /After production hrs (Paint Shop) –	J11 -12 Paint Shop	Power	Digitalization (KT 02) and process automation (KT 04)	39,650	3.3	-	Implementation based on insights from Ind.4.0 project
4	Process change in heat treatment area for box furnace CCHF04 -	J11 -12 Paint Shop	Power	Digitalization (KT 02) and process automation (KT 04)	3,75,150	30.8	-	use manpower & erial utilized
5	Down sizing of Motor FSB08 Milling machine 10.5 Kw to 5.5.Kw	Axle Factory	Power	Operational Efficiency	13,420	1.1		
	Down sizing of Motor FS011 Motor 5.5. Kw to 3.7 Kw	Axle Factory	Power	Digitalization (KT 02) and process automation (KT 04)	9,150	0.8		used
6	Lighting and Man cooling Fan control During races time – Hardware Modification Done in Winger Factory BIW Line - Done	Winger Line	Power	Energy cost	19,825	1.6		
7	Optimization and Consumption Control for Chassis /Assembly/Aggregate shop in CVBU Pune	All Factories	Power	Measurement & Analysis		-	-	

Approx. 13 Lakh kWh Annual Energy Saving Achieved

5. Major Energy Saving Projects 2023-24

TATA MOTORS
Connecting Aspirations

Sr. No.	Project Description	Location/Factory	Idea Related to Power/Fuel	Levers for ENCON Projects	Energy Saving (kWh/ Annum)	Annual Power Saving (Rs. Lakhs)	Investment (Rs. Lakhs)	Remarks
8	Nexon, Punch, Altroz painting in DTG colour shifting from 3C2B to 3C1B	J11 -12 Paint Shop	Power	Digitalization (KT 02) and process automation (KT 04)	3,88,800	31.9	-	Process optimization
	Nexon, Punch, Altroz painting in PSW colour shifting from 3C2B to 3C1B	J11 -12 Paint Shop	Power	Digitalization (KT 02) and process automation (KT 04)	1,87,200	15.4	-	Process optimization
	Winger painting in PRW colour shifting from 3C2B to 3C1B	J11 -12 Paint Shop	Power	Digitalization (KT 02) and process automation (KT 04)	39,600	3.2	-	Process optimization
9	Start-up loss of 2 cycles avoided in PTCED	J11 -12 Paint Shop	Power	Digitalization (KT 02) and process automation (KT 04)	24,000	2.0	-	Process optimization
10	HVLS Fan installation E8 ICV Factory	ICV Factory	Power	New technology introduction	34,160	2.8	2.0	
	HVLS Fan installation LCV Factory	LCV Factory	Power	New technology introduction	34,160	2.8	2.0	
	HVLS Fan installation Fan Installation H7 Engine Factory	Engine Factory	Power	New technology introduction	34,160	2.8		
	HVLS Fan installation Fan Installation Axle Factory - H4 Area	Axle Factory - Pimpri	Power	New technology introduction	17,080	1.4		
	HVLS Fan installation Fan Installation Axle Factory -DD1 Area	Axle Factory - Chinchwad	Power	New technology introduction	17,080	1.4		
	HVLS Fan installation Fan Installation Axle Factory - RATP Area	Axle Factory - Pimpri	Power	New technology introduction	17,080	1.4	2.0	
Total					**13,74,223**	**112.69**		

Approx. 13 Lakh kWh Annual Energy Saving Achieved

5. Major Energy Saving Projects 2023-24

TATA MOTORS
Connecting Aspirations

Sr. No.	Project Description	Location/Factory	Idea Related to Power/Fuel	Levers for ENCON Projects	Energy Saving (SCM/ Annum)	Fuel Cost Saving (Rs. Lakhs)	Investment (Rs. Lakhs)	Remarks
11	Sealant Oven temperature reduced by 5 Deg (Paint Shop)–	J11 -12 Paint Shop	Fuel	Digitalization (KT 02) and process automation (KT 04)	9,150	4.2	-	Implementation based on insights from Ind.4.0 project
12	Sealant Oven temperature Auto off Deg (Paint Shop)–	J11 -12 Paint Shop	Fuel	Digitalization (KT 02) and process automation (KT 04)	8,235	3.7	-	Implementation based on insights from Ind.4.0 project
13	HBL 209 Machine Fuel Saving Project (Elimination NG)	Engine Factory	Fuel	Energy cost	12,200	5.5	-	Process change
14	Nexon, Punch, Altroz painting in DTG colour shifting from 3C2B to 3C1B	J11 -12 Paint Shop	Fuel	Digitalization (KT 02) and process automation (KT 04)	1,32,840	60.3	-	Implementation based on insi[illegible]s from Ind.4.0 project
	Nexon, Punch, Altroz painting in PSW colour shifting from 3C2B to 3C1B	J11 -12 Paint Shop	Fuel	Digitalization (KT 02) and process automation (KT 04)	63,960	[illegible]		[illegible]ation based on
	Winger painting in PRW colour shifting from 3C2B to 3C1B	J11 -12 Paint Shop	Fuel	Digitalization (KT 02) and process automation (KT 04)	13,530	6.1		[illegible]d on [illegible]ject
15	Start-up loss of 2 cycles avoided in PTCED	J11 -12 Paint Shop	Fuel	Digitalization (KT 02) and process automation (KT 04)	4,932	2.2	-	[illegible] Ind.4.0 project
Total					**2,44,847**	**111.16**		

Approx. 2.4 Lakh SCM Annual Fuel Saving Achieved

6. Innovative Project 1 - Separation of Carburizing and Hardening process from main furnace CCHF4

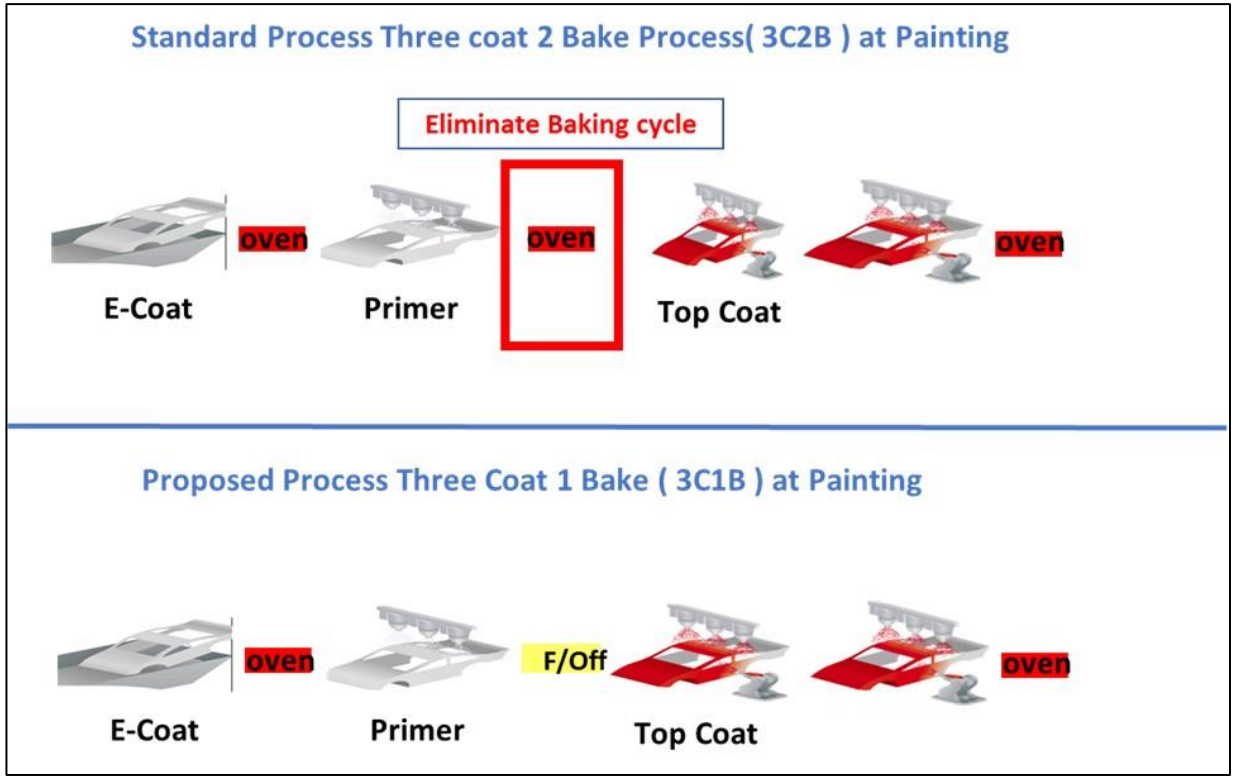
Operation	Problem	Root Cause	Measures Taken	Result
Synchro Components Heat Treatment	The heavy power loss due to delay in material availability of Synchro components at CCHF-4.	The Production plan for GB-40 reduced from 300-400 to only 40-80 per month.	The Carburizing of the components to be done at Seal Quench Furnaces and Hardening to be done at Small Hardening Furnace.	1.Power consumption reduced from 3100 Units to 1870 Units per day (Saving of 1230 Units per day) Rs. 41.84 lacs per year 2. Productivity improved from 140 to 168 per shift 3. LPG consumption reduction up to 40 Kg per day

Before

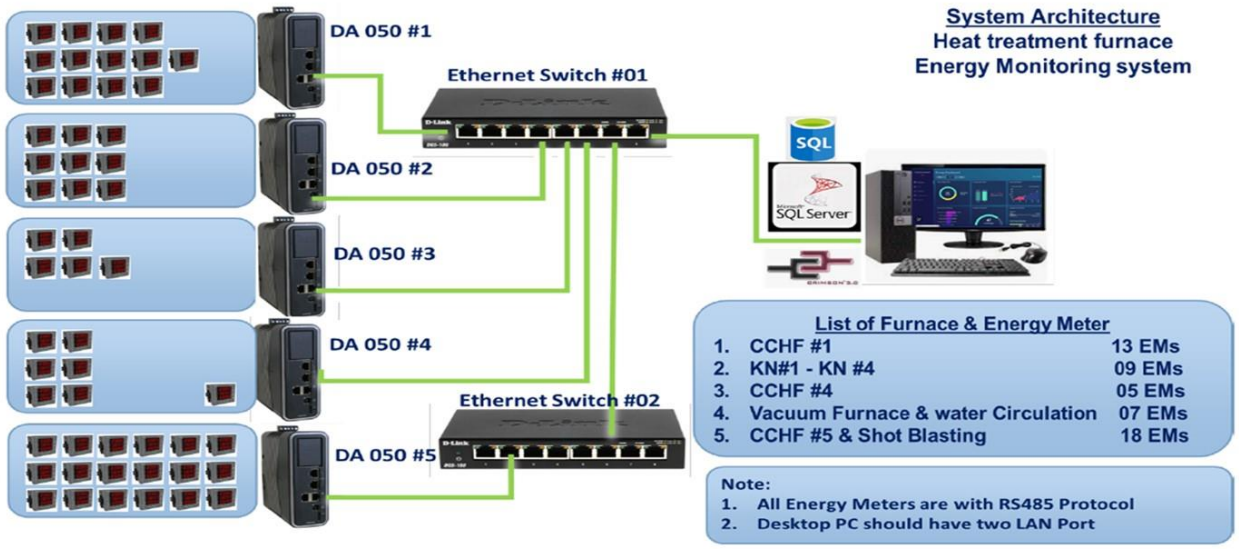
After

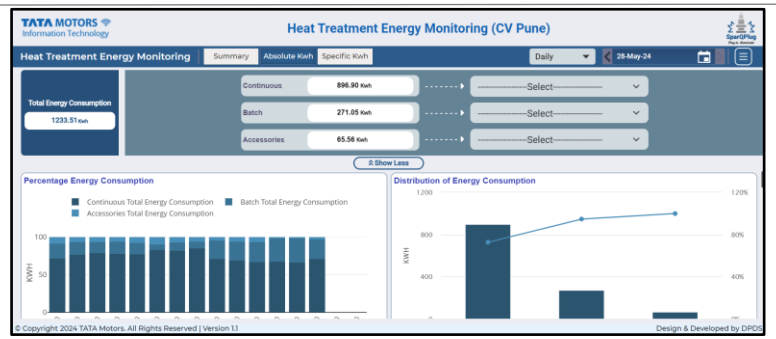
6. Innovation 2: Process Optimization for Porcelain White & others Colours by Shifting from 3C2B to 3C1B on Various Cabs

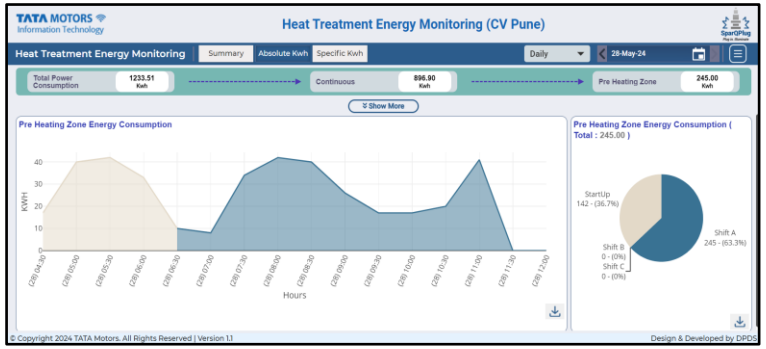
Operation	Problem	Root Cause	Measures Taken	Result
Various cabs required to paint in Dual tone Grey (DTG) / Pristine White (PSW) / Porcelain White (PRW) colors were painted in 3 coat 2 bake (3C2B) process.	Required more time, Fuel, and Power.	1. Excess rework 2. High cost 3. Dirt generation due to sanding	The paint process for DTG / PSW / PRW colors was changed to 3C1B.	1. Moist sanding rework procedure eliminated. 2. Total annual power savings of Rs.53 lakh and fuel savings of Rs.98 lakh aciheved



6. Innovation No 3 – Heat Treatment Digitization Project (Process Innovation)







Deliverables Through The Master KIOSK and Intranet IoT Devices:

1. Online monitoring of the energy consumption of the individual furnaces Group-wise and individual Zone-wise.
2. Data entry from the Furnace data Sheet enables the analysis of the data with respect to the plant variables like KWH/ Kg and KWH / SMH.
3. Calculation of the per Kg consumption, Furnace Utilization (Furnace losses like start Up loss, Shutdown Loss, Set Up change loss)

Benefits:

1. Close monitoring of the furnace parameters.
2. Shutdown and Start Up losses reduced by 4 hours
3. Minor stoppages reduced to zero
4. Furnaces power consumption reduction.

6. Innovation No 3 – Heat Treatment Digitization Project (Process Innovation)

Main Central Kiosk

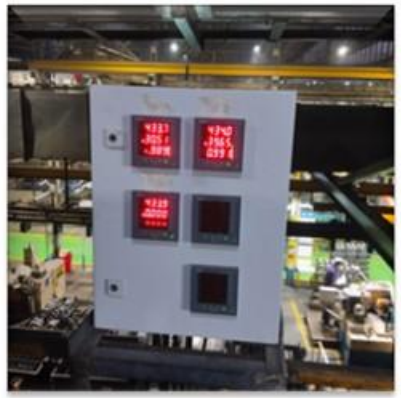
KN Furnaces

HT-302

CCHF-5 GROUP-1

CCHF-5 Q. Press Blower

CCHF-5 HT-73



CCHF-5 GROUP-2

CCHF-1

7. Utilization of Renewable Energy Sources

Renewable energy generation, utilization and % of Overall Energy consumption

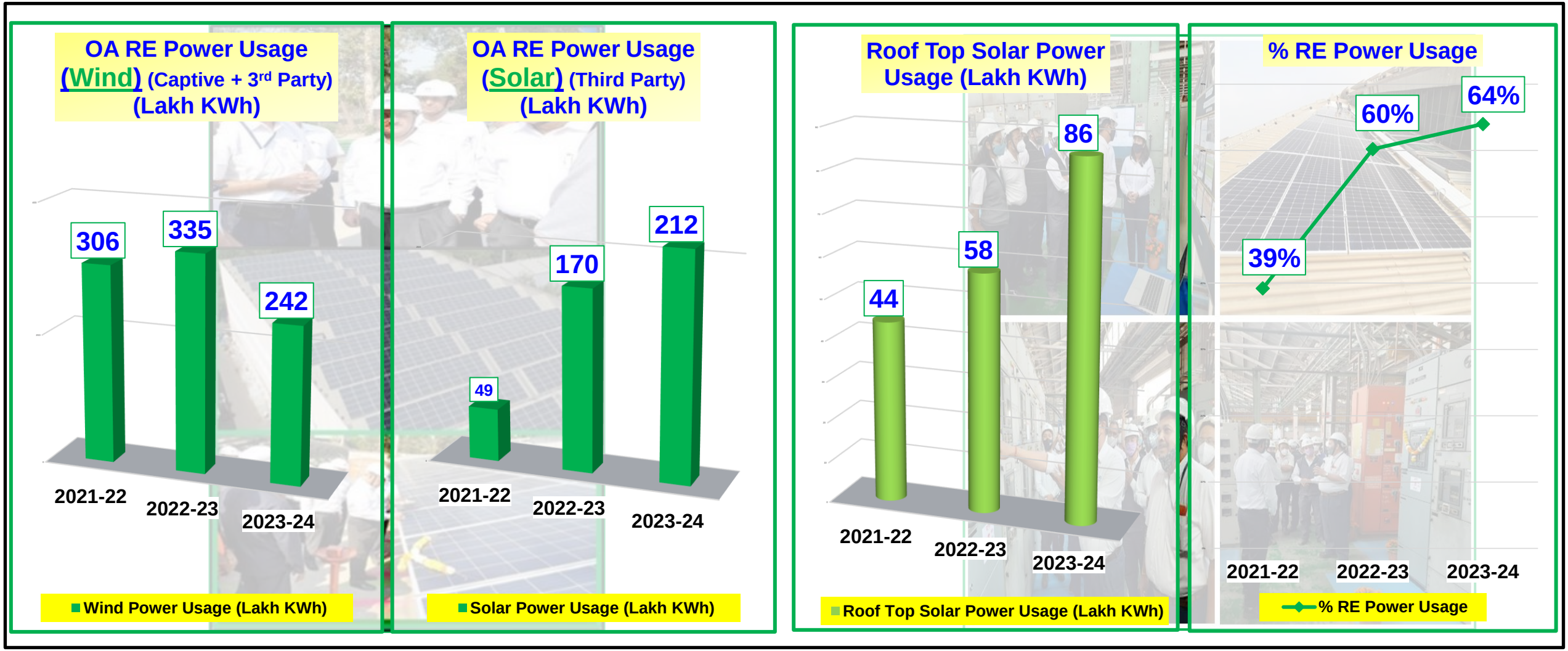
Onsite Generation

Year	Technology (solar/wind/biomass etc)	Installed Capacity (MW)	Consumption (million kWh)	% of overall electrical energy consumption
2021-22	Solar	4.8	4.42	4.33%
2022-23	Solar	4.8	5.78	6.2%
2023-24	Solar	7.8	8.58	9.3%

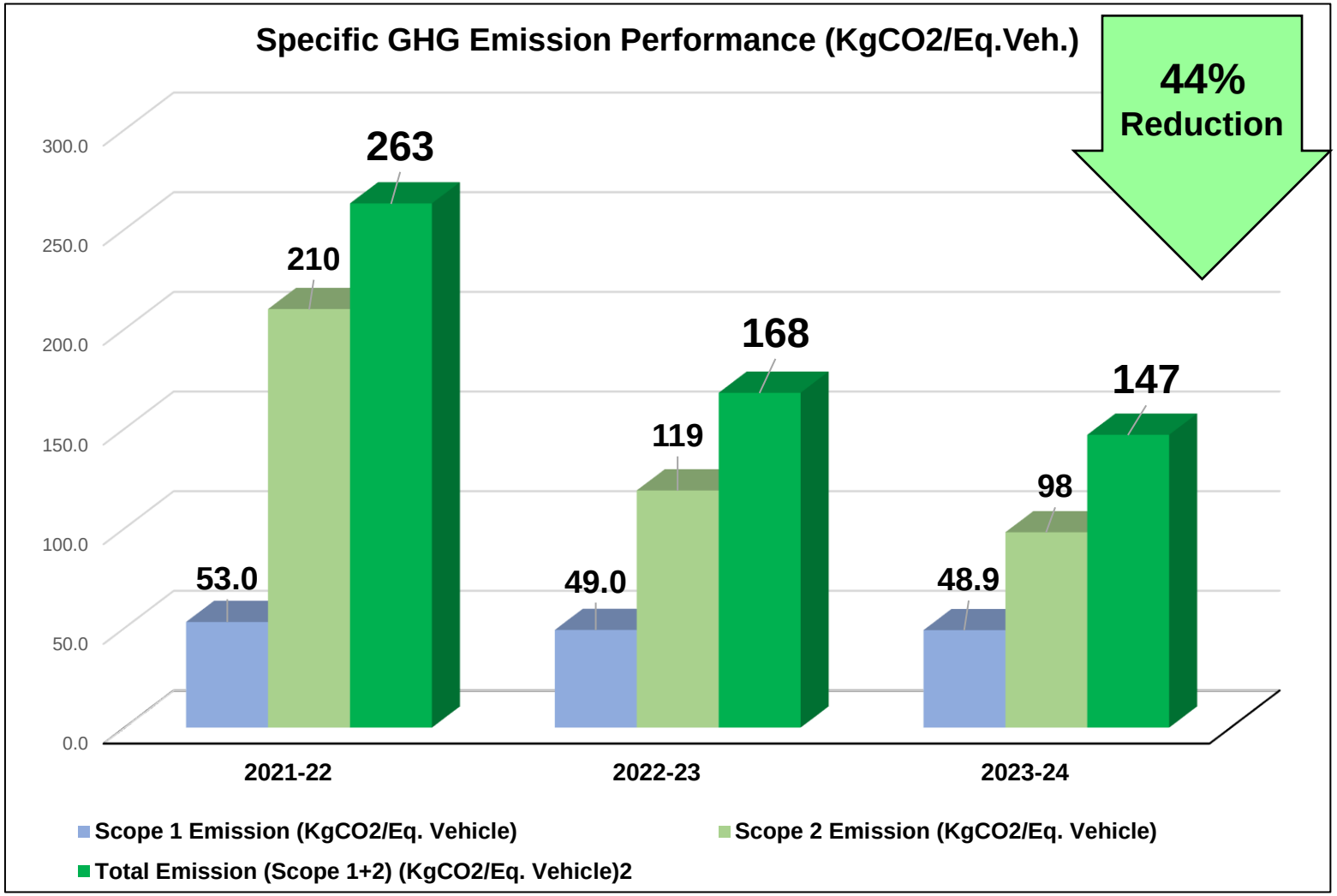
Offsite Generation

Year	Technology (solar/wind/biomass etc)	Installed Capacity (MW)	Consumption (million kWh)	% of overall electrical energy consumption
2021-22	Wind & Solar	21.95 + 18 +17	35.55	34.84%
2022-23	Wind & Solar	21.95 + 42.25 + 25.36	50.5	54%
2023-24	Wind & Solar	21.95 + 15 + 39.36	45.4	54%

7. Utilization of Renewable Energy Sources



8. GHG Inventorisation:



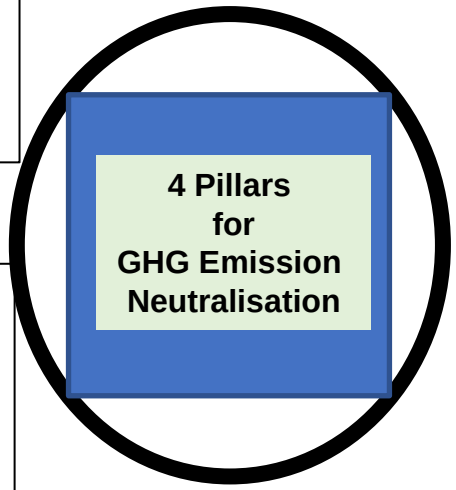
Scope	Emission Sources Considered
Scope 1 Emissions	Fuel consumed for - Process Heat Generation - Process Use - Canteen - Engine Testing - Power Generation - Internal Vehicle movement
Scope 2 Emissions	Purchased Electricity excluding renewable energy
Scope 3 Emissions	It is being reported at Company Level.

8. GHG Inventorisation : Action Plan for CO_2 Emission Reduction:-

4 Pillars of Neutralising GHG emission

❑ **Green Power Purchase**
+ Quick gain
+ Manage Business variability
- Recurring add-on Power Purchase expenses

❑ **Captive RE / RE100** (Wind, Solar)
+ Mid & Long term gain
+ Reduces Power Purchase cost
- Controlled by Regulation
- Capex requirement



❑ **EnCon Projects for Power consumption reduction**
+ Mid & Long term gain
+ Continuous process
+ Reduces Power consumption permanently
+ Improves Operation Efficiency & reduces cost impact
- Controlled by Idea generation & Technology availability /Maturity
- Capex requirement

❑ **EnCOn Projects for Fuel consumption reduction**
+ Mid & Long term gain
+ Continuous process
+ Reduces Fuel consumption permanently
+ Improves Operation Efficiency & reduces cost impact
- Controlled by Idea generation & Technology availability /Maturity
- Capex requirement

Action Plan for CO_2 Emission Reduction:-

Maximise use of Renewable Energy (Wind Power & Solar Power) with in regulatory framework

1) Captive Wind Power through Open Access

2) Third Party Wind Power through Open Access

3) On-site Rooftop Solar Power Plant.

4) Science Base Target for CO_2 Emission Reduction

Short Term Target : As per MERC order and MSEDCL Circular, we are process to procure RE power to achieve the GHG emission target set at Plant Level , Company & Group Level.

Long Term Target : To install Offsite 25MWp Group Captive Solar Power Plant.

9. Waste utilization and management

No	Type of waste generated	2021-2022	2022-2023	2023-2024	Disposal method
		Quantity of waste generated (MT/year)	Quantity of waste generated (MT/year)	Quantity of waste generated (MT/year)	
1	Grinding sludge	109.10	81.36	23.74	Landfill after treatment
2	Phosphating sludge	24.83	41.45	35.26	Landfill after treatment
3	Paint sludge hazardous kachara	265.35	381.62	455.88	Incineration
4	Waste oily Scum	32.08	14.86	49.56	Incineration
5	Spent Resin	0.35	2.04	0.7	Incineration
6	Asbestos	5.52	0.4	2.8	Landfill
7	Glass wool	1.96	2.22	1.15	Landfill
8	Chimney soot	0.00	0.06	0	Incineration
9	FRP Waste	1.26	1.62	12.56	Landfill
10	Shot blasting dust	6.90	12.26	9.4	Landfill after treatment

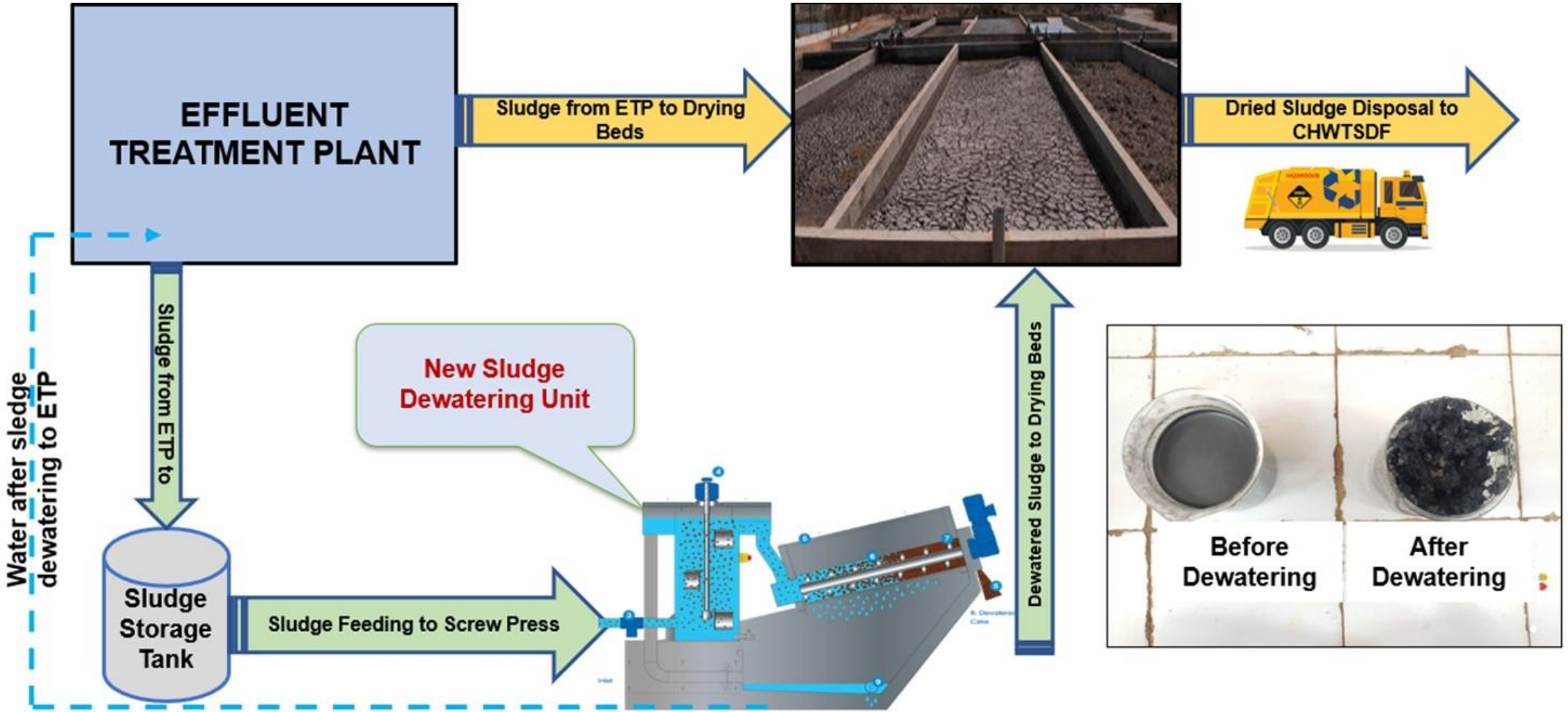
9. Waste utilization and management

No	Type of waste generated	2021-2022	2022-2023	2023-2024	Disposal method
		Quantity of waste generated (MT/year)	Quantity of waste generated (MT/year)	Quantity of waste generated (MT/year)	
11	ETP-Industrial sludge	862.84	348.7	162.96	Landfill after treatment Through Authorised MPCB
12	ETP-Domestic sludge	13.70	0.1	6.18	Landfill after treatment
13	Nickel + Al catalyst	0.9	0.1	0	Landfill
14	ERC pattern waste	10.16	20.48	26.96	Incineration
15	HFO sludge	0	0	0	Incineration
16	Door, Roof liner	3.58	5.4	16.07	Landfill
17	Broken Tube lights	1.12	1.0	0.68	Landfill after treatment
18	Paint sludge - MPCB Regd. Re-cycler	50.06	65.98	28.84	Recycle
19	Paint sludge - MPCB Regd. Re-cycler	119.54	36.74	0	Recycle
20	Paint sludge - MPCB Regd. Re-cycler	0	62.04	21.08	Recycle

9. Waste utilization and management

	Actions/ Initiatives implemented	Expected outcome	Benefits
Waste	Commissioned Static Pile composting at Chinchwad Plant to manage the food waste generated from the canteen.	Disposal as per Zero Waste to Landfill (ZWtL) commitment. Deriving the food waste to Manure.	Generated around 1.80 MT of organic manure. The same was utilized in managing the landscaping area within Chinchwad plant.
	Installation of canteen waste composting for Pimpri Plant using advanced de-hydra and waste composter to handle up to 3 MT of food waste per day.	Disposal as per ZWtL commitment. Deriving the food waste to Manure.	The final compost of around 750 Kg per day of organic manure is expected to be generated from July 2024. The same will be used as manure for managing the landscape at plant and lake house area.
	Sustainable solution for Sludge Drying-Removal of excess moisture from the hazardous waste such as ETP sludge, Paint sludge, Phosphate sludge etc., using enhanced solar sludge drying bed.	Reduced volume of waste and saving in the disposal cost.	Effective July 24, the enhanced solar sludge drying bed will be in operation and it is expected to save around 15 to 20% of overall hazardous waste disposal quantity.
	Diversion of Hazardous Waste such as ETP sludge, Paint sludge, Phosphate sludge, oily rags, used oil etc., to acceptable disposal route such as recycling and or towards co-processing as alternate fuel and alternate raw material.	Disposal as per ZWtL commitment.	To achieve ZWtL target. Saving in Waste Disposal Cost.
Water	Water Conservation- Elimination of underground water leakage. Replacement of old underground water supply pipeline with new above ground pipeline to avoid water leakage at E Block area.	Water conservation measures leading to resource conservation.	Water saving 200 KLD being achieved.
	Installation of digital water meters at CVBU Pimpri Plant.	Industry 4.0 online water monitoring system.	Real time data analysis & monitoring. Saving water consumption
	Existing performance evaluation of ETP/STP and design of New process water pipeline & waste water recycling system (UF/RO)	Water Neutrality project to improve Net water Ratio by end of FY 25.	Achieve water neutrality from existing 0.12 to 0.65 by March 2025. The design and development work have already been initiated.
	Upgradation of the site water and wastewater laboratory	In situ capability of analyzing the key water and wastewater parameters and based on the results immediate corrective actions can be taken.	Daily monitoring of the key wastewater parameters will be carried out to understand the performance of the Effluent and Sewage treatment plant.

9. Waste utilization and management – Sludge Dewatering



9. Waste utilization and management – Sludge Dewatering

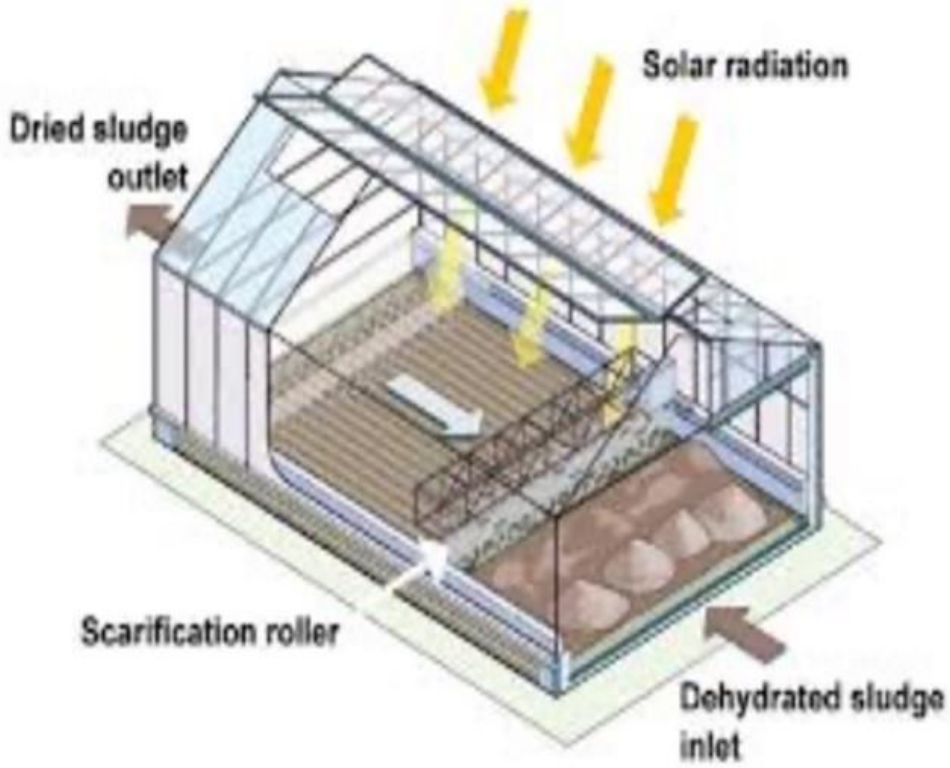
Sustainable Technology for ETP Sludge Dewatering

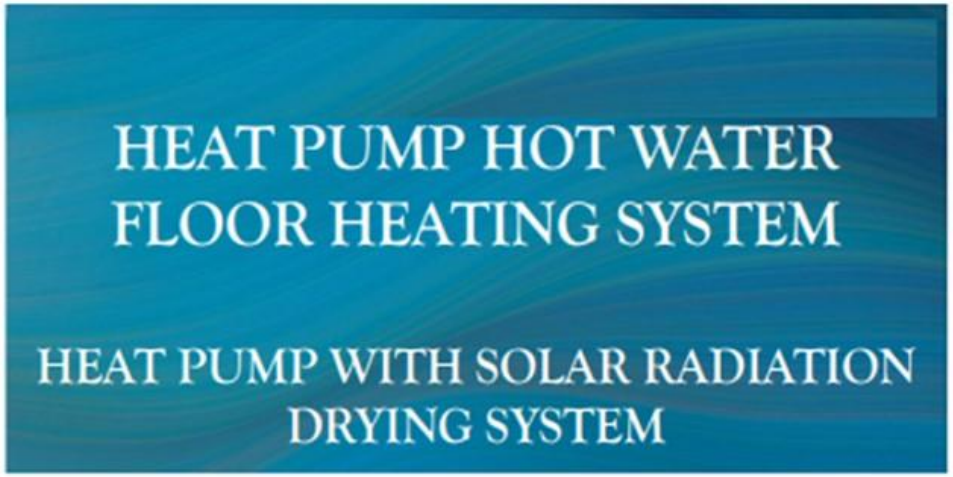
Sr. No.	Benefits of Volute Sludge Dewatering Screw Press
1	Very low power consumption as compared to centrifuge dewatering unit. For Centrifuge 24hr Operation Require 288 Unit/Day For Screw Press 24hr Operation Require 31.2 Unit/Day Saving in energy 256.8 Kw/Day Reduction in CO2 emission
2	Low space require to store dewatered sludge in sludge drying beds. Eliminate ETP sludge draining issue in rainy season permanently.
3	Reduced sludge drying beds maintenance & revamping cost.
4	Minimum time require to dry the ETP/STP dewatered sludge. Moisture contain before dewatering- 95-97% Moisture contain after Dewatering- 65-75%



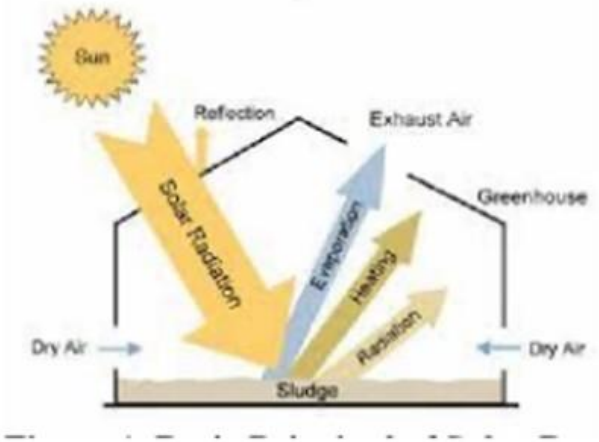



9. Waste utilization and management – Sludge Drying with Solar Concentrators & Heat Pump





installed for colder periods.

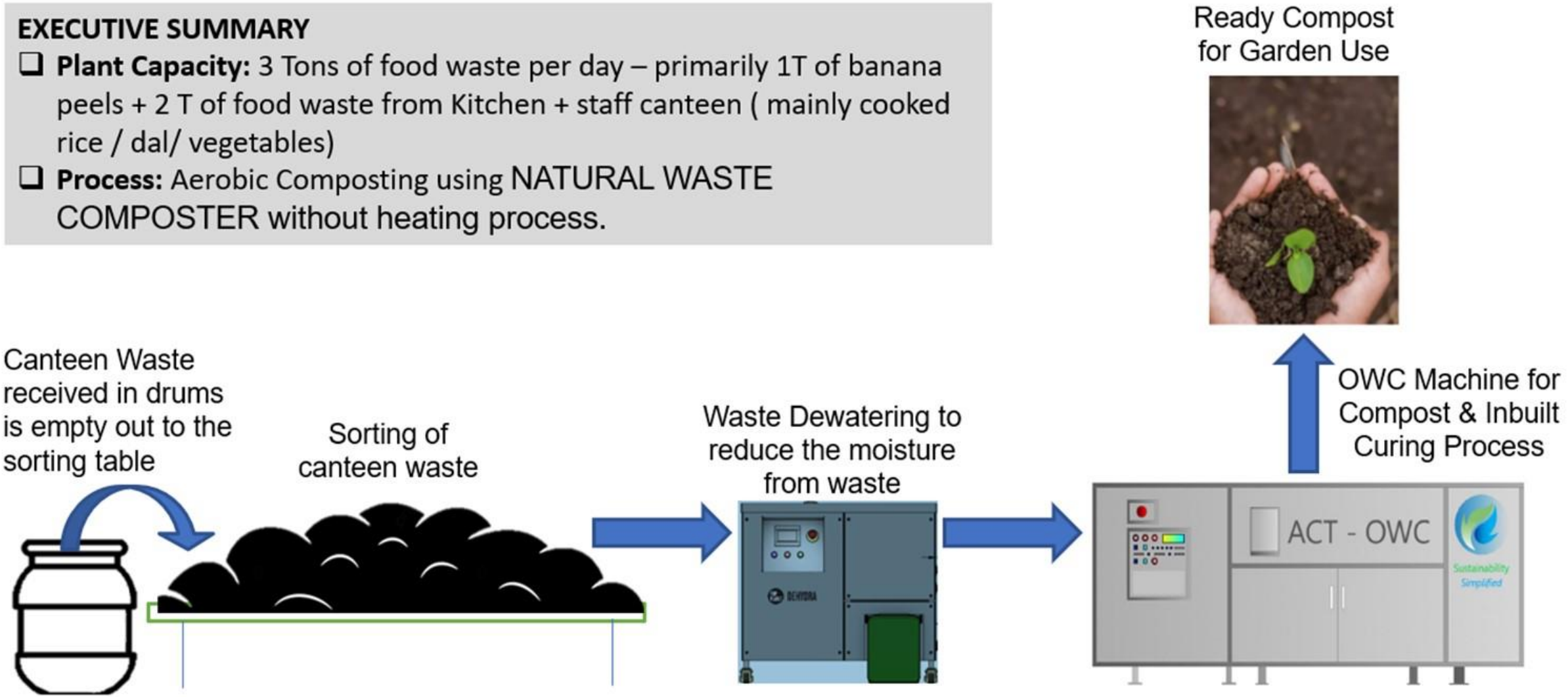


**Images for reference only

9. Waste utilization and management – Canteen Waste Management

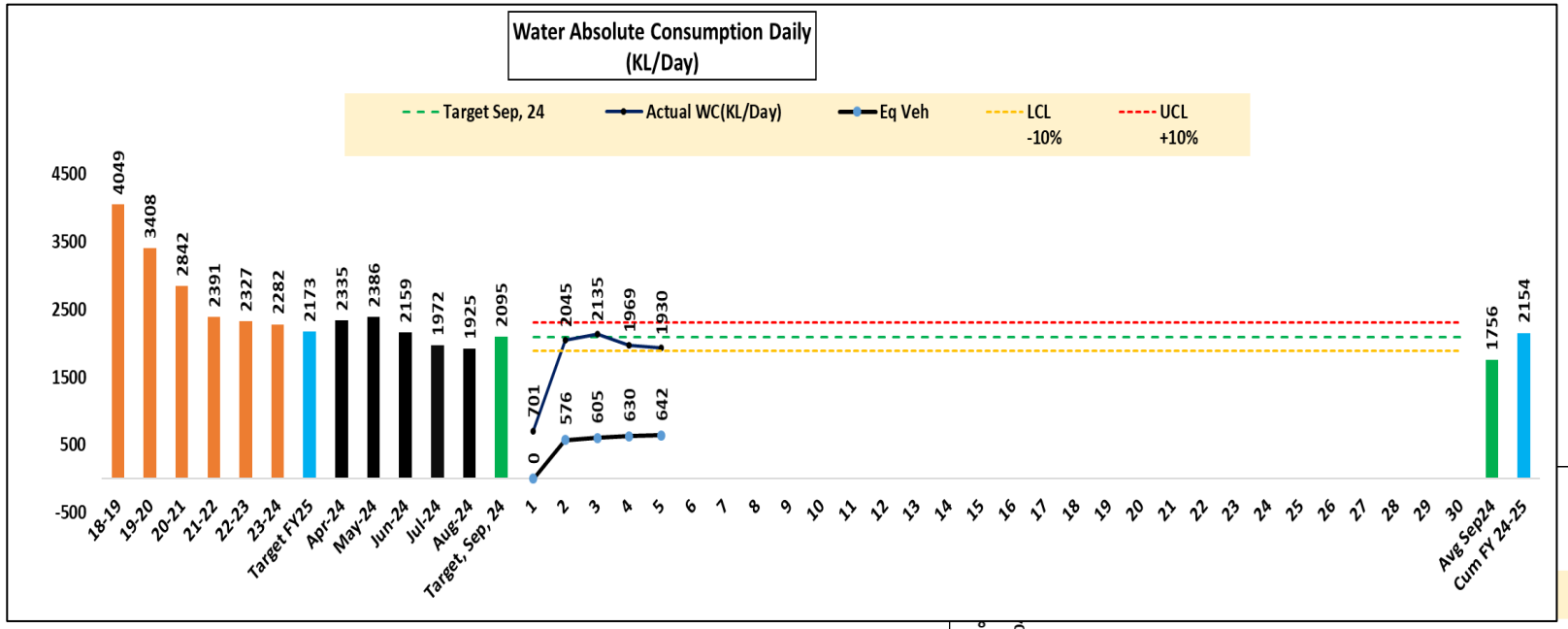
EXECUTIVE SUMMARY

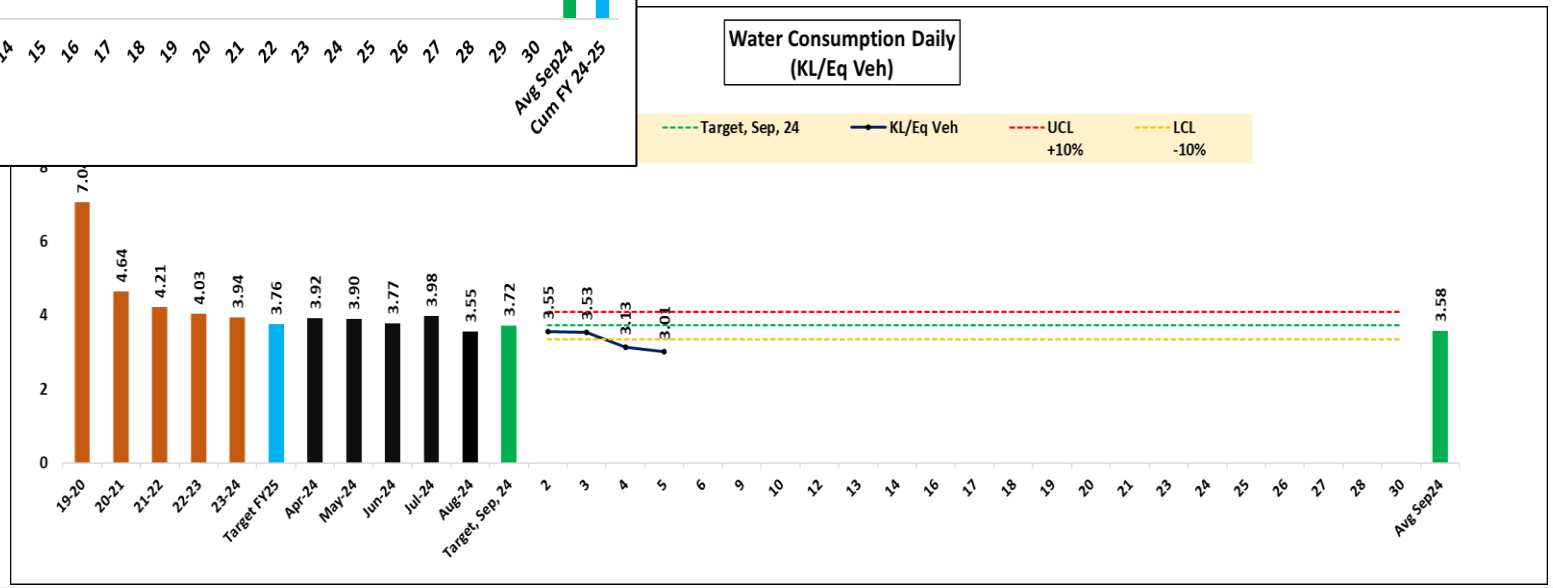
- **Plant Capacity:** 3 Tons of food waste per day – primarily 1T of banana peels + 2 T of food waste from Kitchen + staff canteen (mainly cooked rice / dal/ vegetables)
- **Process:** Aerobic Composting using NATURAL WASTE COMPOSTER without heating process.



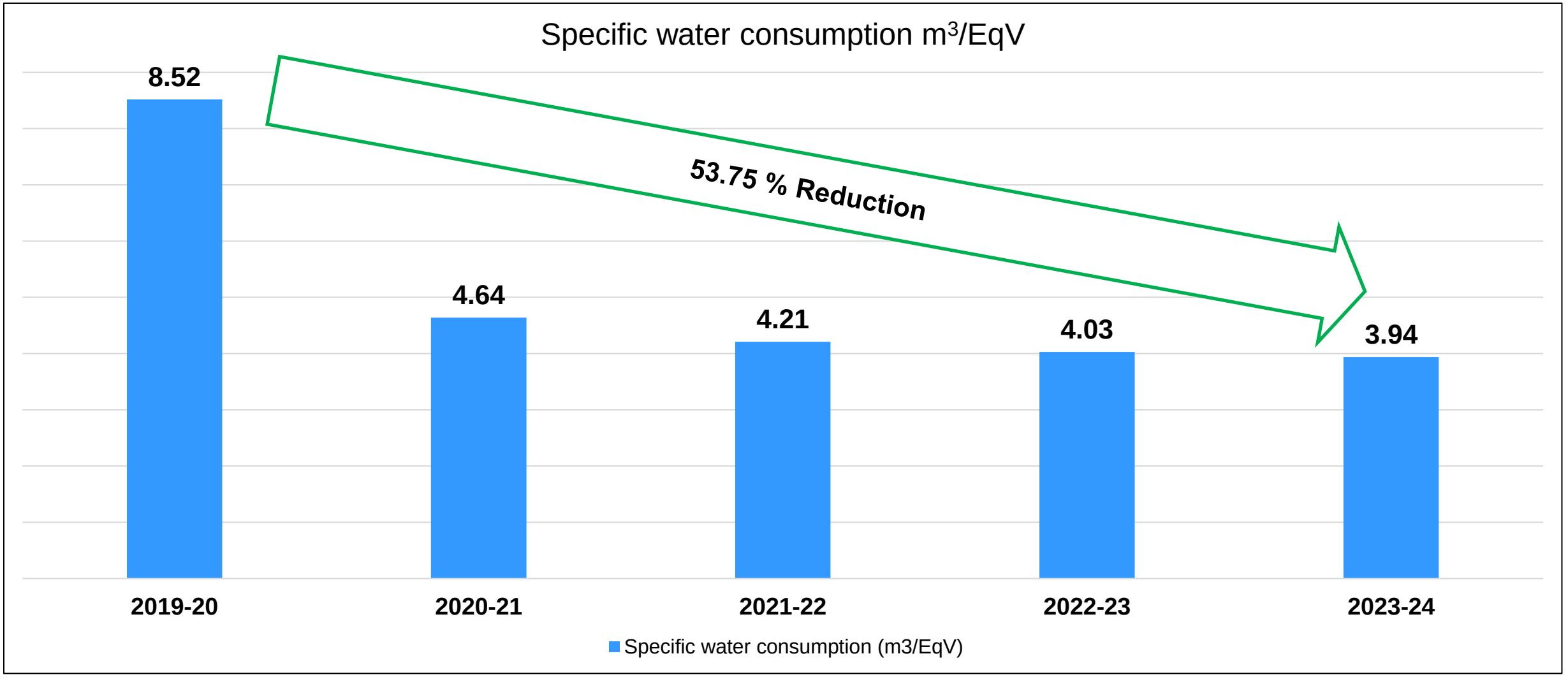

Conserve
WATER

9.1. Water management





9.1. Water management



9.1. Water management

Operation	Problem	Measures Taken	Result
• Utensil washing area	• There is no control for flow of water while washing of utensils.	• Gun having jet formation facility provided for controlling flow of water as per requirement.	• Water saving.

There is no control for flow of water while washing of utensils.

Gun having jet formation facility provided

Operation	Problem	Measures Taken	Result
• Engine Testing	• In bed no 32 water is overflowing continuously due to choke up in the drainage pipe	• Choke up removed of bed no 32 and plate fitted to avoid any waste from going inside the drainage pipe.	• In bed no 32 water is flowing normally through circulation chamber.

In bed no 32 water is overflowing continuously

Choke up removed of bed no 32

9.1. Water management

Operation	Problem	Measures Taken	Result
• Engine Test Bed	• In test bed no 12 water mixing tank 3 water connection is present due to which wastage of water from overflow.	• Extra water connection plugged.	• Water wastage due to overflowing eliminated.

In test bed no 12 water mixing tank 3 water connection is present

Extra water connection plugged

Operation	Problem	Measures Taken	Result
• Hand wash at Toilet	• Water wastage while washing of hands due to excess flow of water at high pressure.	• Flow control washer used before the push taps reducing flow of water.	• Water consumption reduced.

Water wastage due to excess flow of water at high pressure

Flow control washer used before taps reducing flow of water

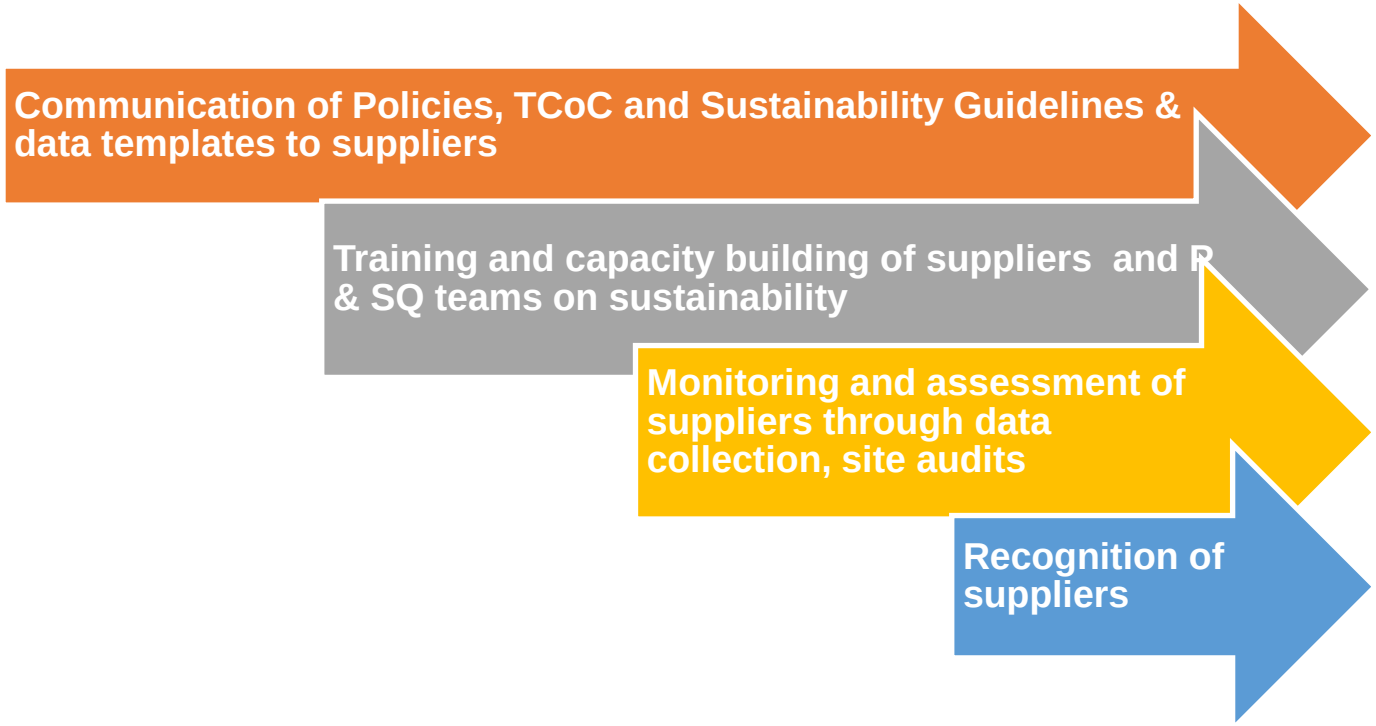
10. Green Supply Chain Management

Our **Environmental Procurement Policy** aims at:

- Awareness of **TML Environmental Policy & Code of Conduct** amongst suppliers;
- Environmental performance evaluation and priority to "Green Suppliers";
- **Encouraging suppliers to improve environmental performance** and implement **EMS;**
- **Reduce carbon footprint** and use of hazardous substances;
- Minimize logistics and packaging material and maximize reuse and recycling packaging materials and use of recycled materials.

10. Green Supply Chain Management

Supplier Evaluation Guidelines

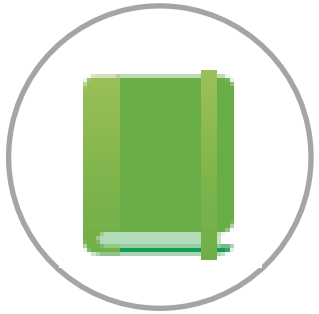


Sustainability Guidelines for Suppliers

cover the following key topics:

- ✓ Governance
- ✓ Legal Compliance
- ✓ Tata Code of Conduct
- ✓ Management System Certifications
- ✓ Environment & Climate Change
- ✓ Health & Safety
- ✓ Labor & Human Rights
- ✓ Transparency & Reporting

10. Green Supply Chain Management



Green Procurement Policy

Education and awareness

Resource Conservation through SCM Systems

Efficiency Improvement Program for Suppliers

Resource Intensity Reduction in Supply Chain

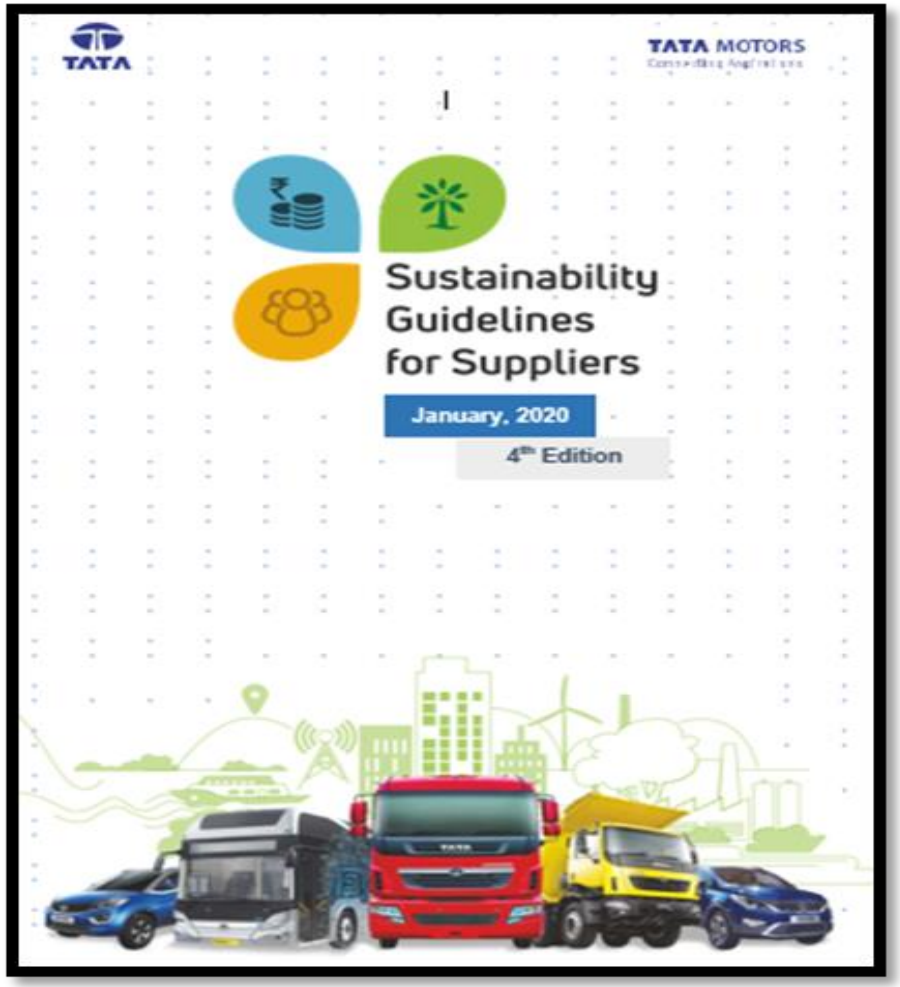
Baseline and target for reduction of Supplier's Resources Consumption

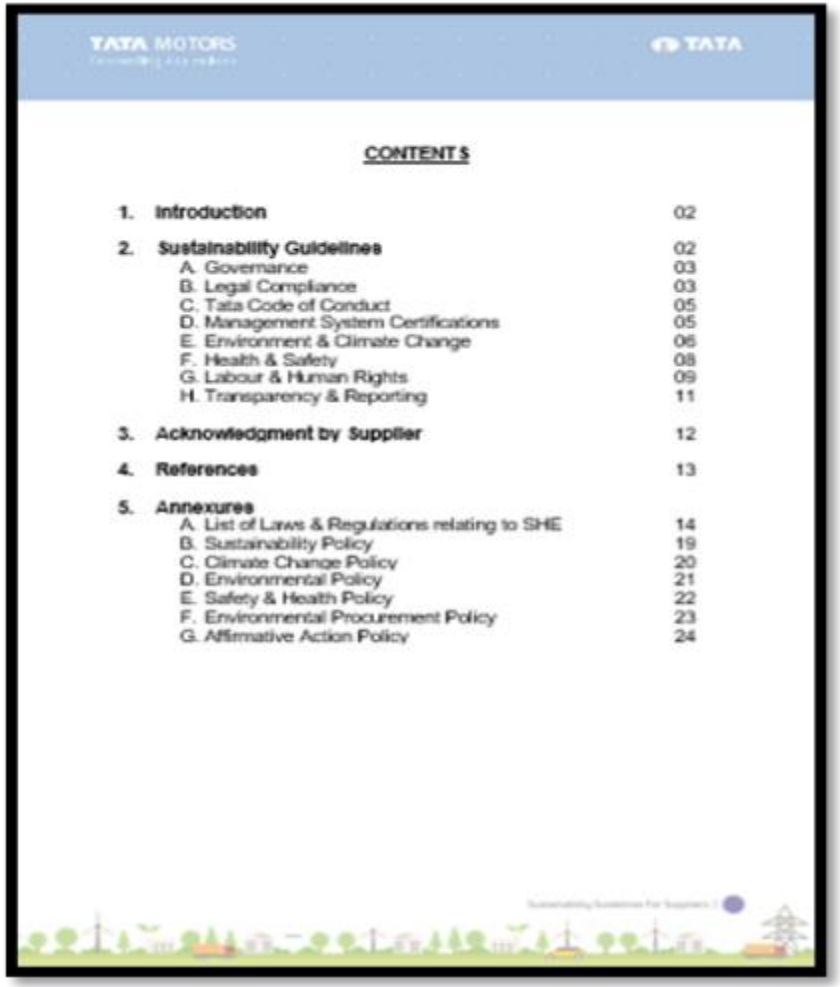
Year on Year Reduction Targets for suppliers :

Parameter	Short Term	Medium Term	Long Term
Energy, Water, Waste	3%	5 %	5-10 %

10. Green Supply Chain Management

Sustainability Guidelines for Suppliers :-



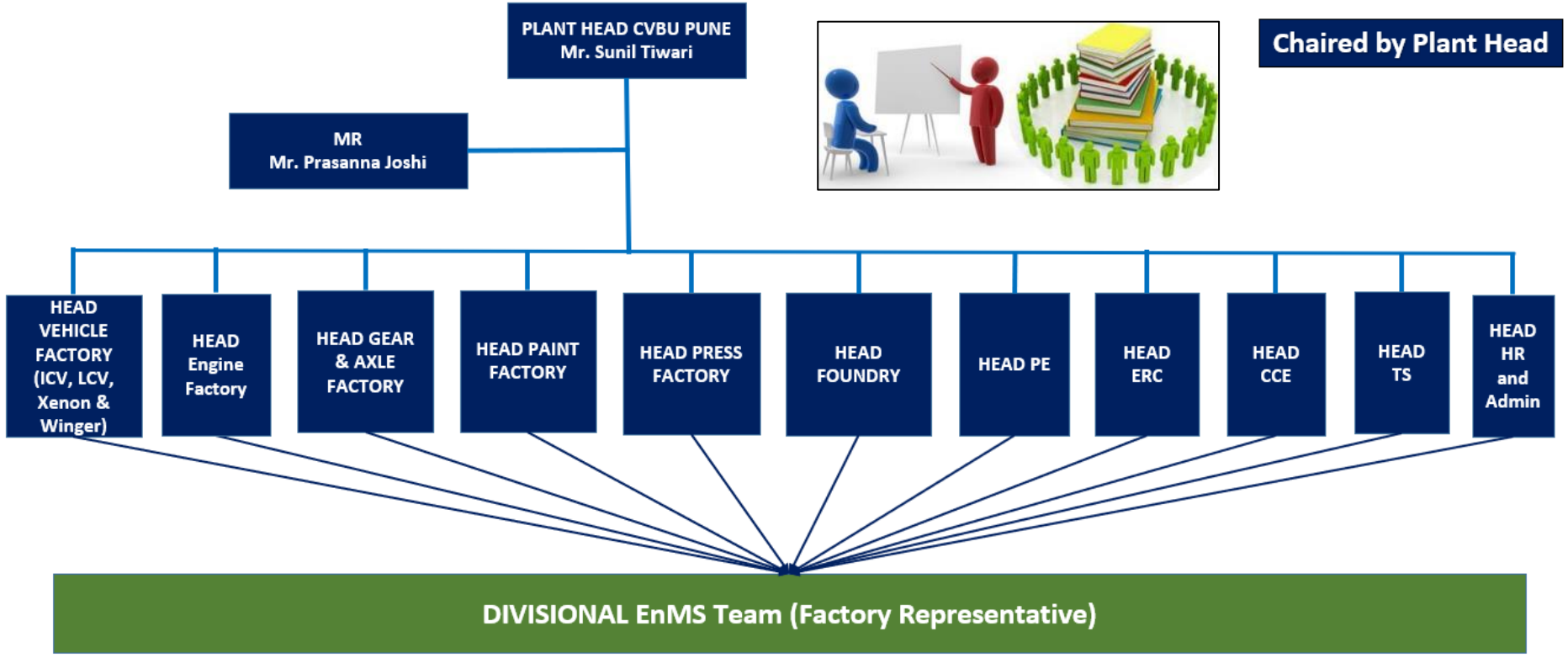


TATA MOTORS TATA

CONTENTS

11. EMS and Other Requirements – EMS Organization

Energy Mgmt. Team – Chaired by Plant Head

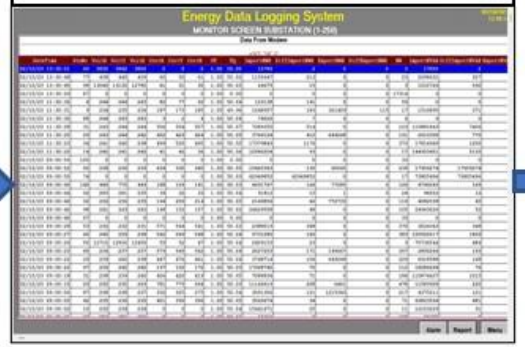


TML CVBU Pune Team		
Sr No	Energy Team Members	Name
1	Champion CVBU Plant	Mr. Prasanna Joshi
2	Axle	Mr Balasaheb Pawar
3	Gear	Mr. Manish Salodkar Mr. Sanjay Dhake Mr. Mahadev Lohar
4	Engine	Mr. Girish Kulkarni. Mr. Sanjay Gaikwad Mr. Rahul Pawar
5	E block	Mr. Pankaj Thaman Mr. Santosh Malpathak
6	Paint Shop	Mr. Nitin Kashid Mr. Sachin Kasture Mr. Anil Pacharne
7	ICV	Mr. .Yogesh Sakhare Mr. Sandeep Nikam Mr. Gyanaranjan Mohanty
8	LCV	Mr. Dhananjay Sahane Mr. Parth Karche
9	Xenon	Mr. Pankaj Joshi Mr. A Harikumar
10	Winger	Mr Vijaykumar Mulay
11	CMS Energy Cell	Mr. Vivek Deshpande Mr. Mandar Pande Mr. Mahesh Raste
12	CC&E Energy Cell	Mr. Hemanta Das Mr. Milind Mench Mr. Naresh Gokhale Mr. Ananda Kale Mr. Mahendra Hingse

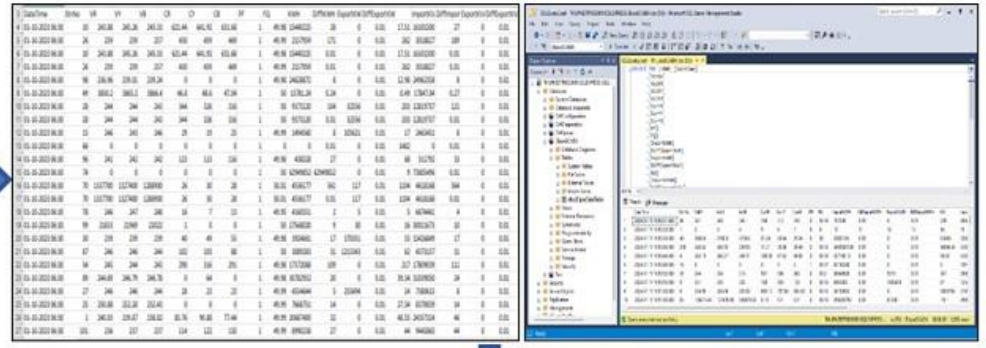
11. EMS and Other Requirements – EMS Data Acquisition Architecture

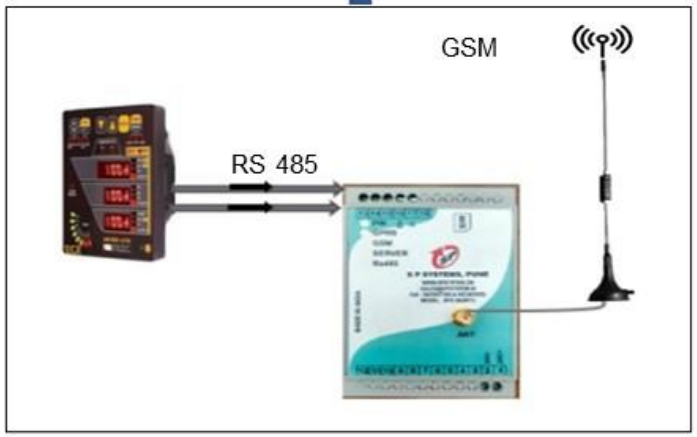
Receiver module connected to Monitoring Station

Data received on Monitoring Station software

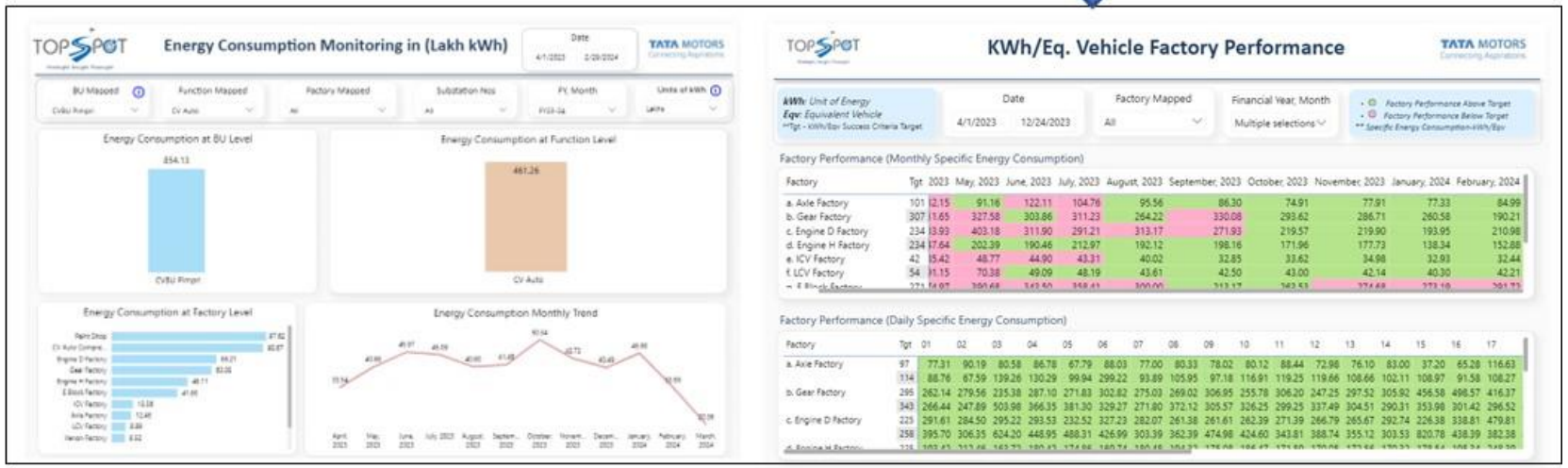


Energy data stored in SQL database as well as excel reports auto-generated





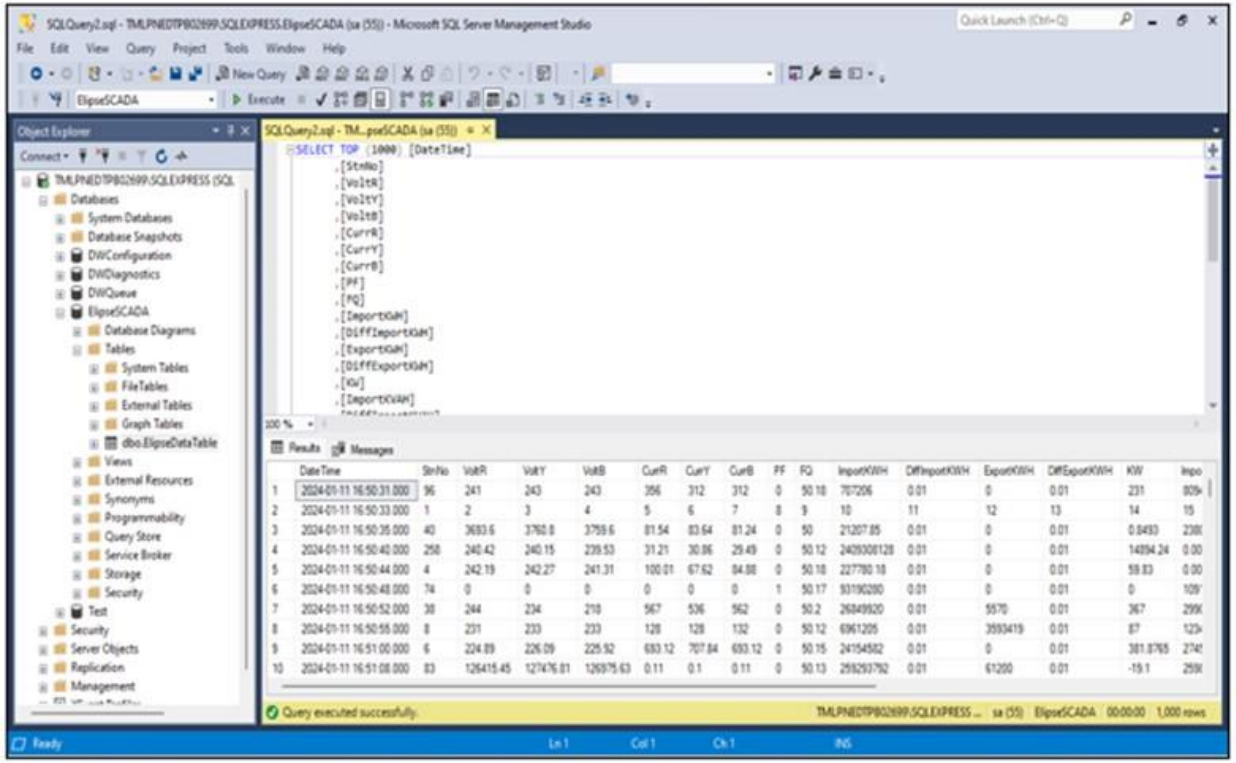
Transmitter module connected to energy meter

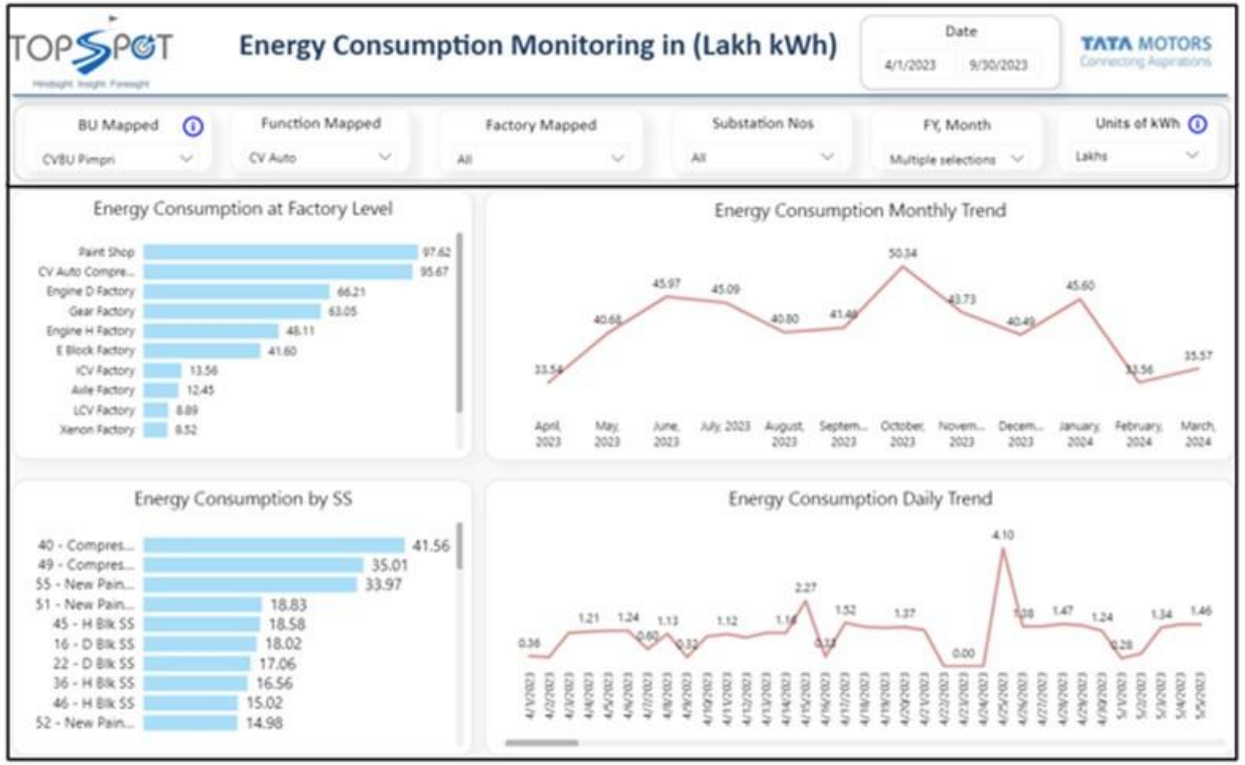


Energy data shared with CA team for display of Energy Dashboard

11. EMS System and Other Requirements – EMS Dashboards

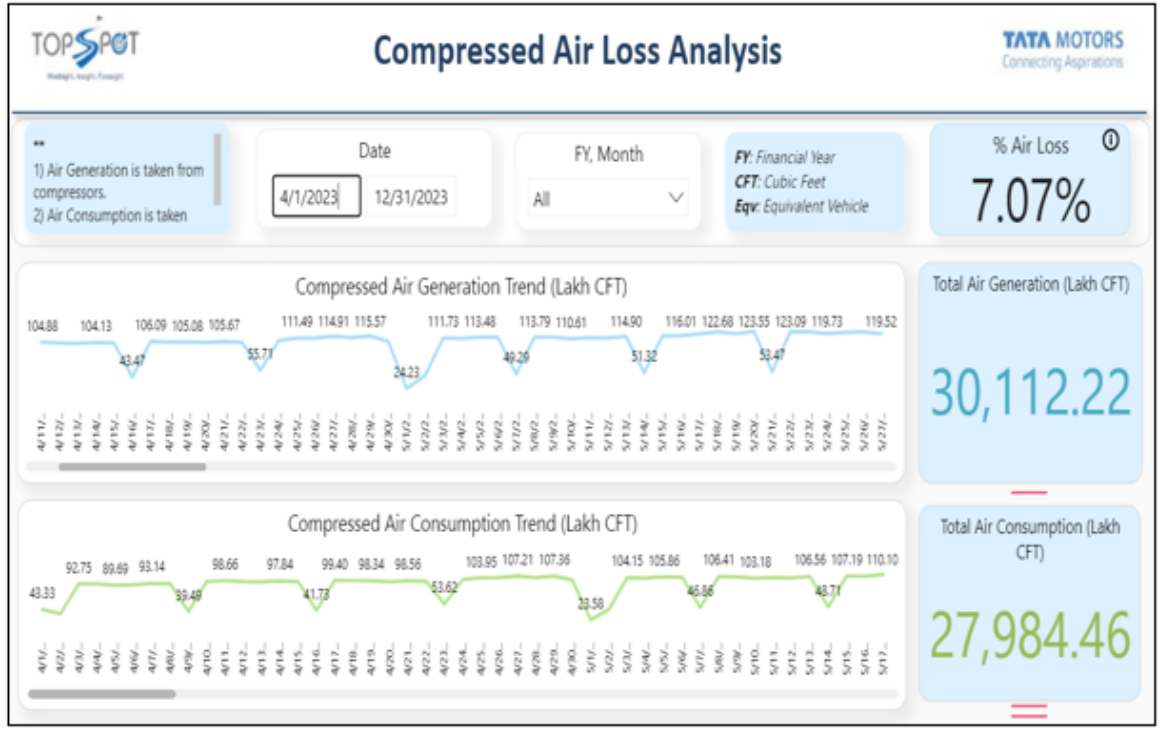
Dashboard for Power Consumption Performance

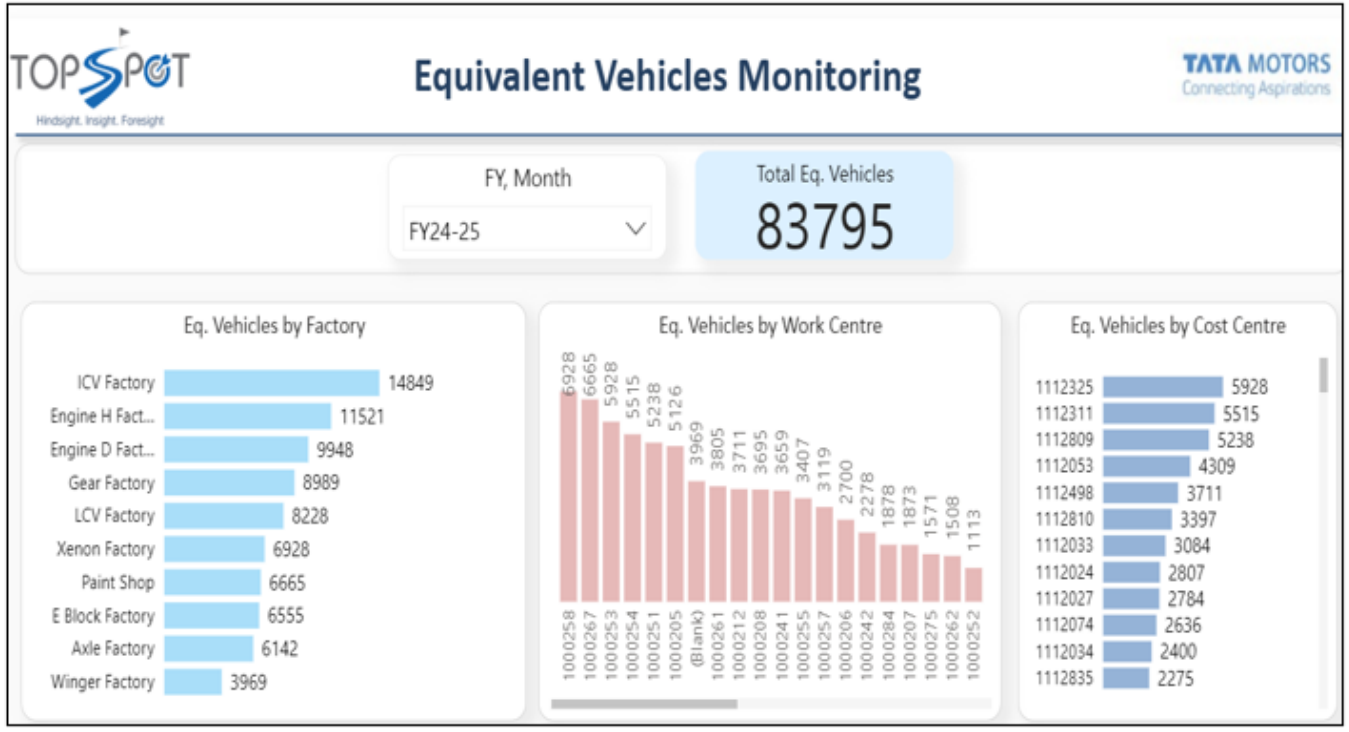




11. EMS System and Other Requirements – Analytics Dashboard

DWM – Compressed Air Loss and Equivalent Vehicles



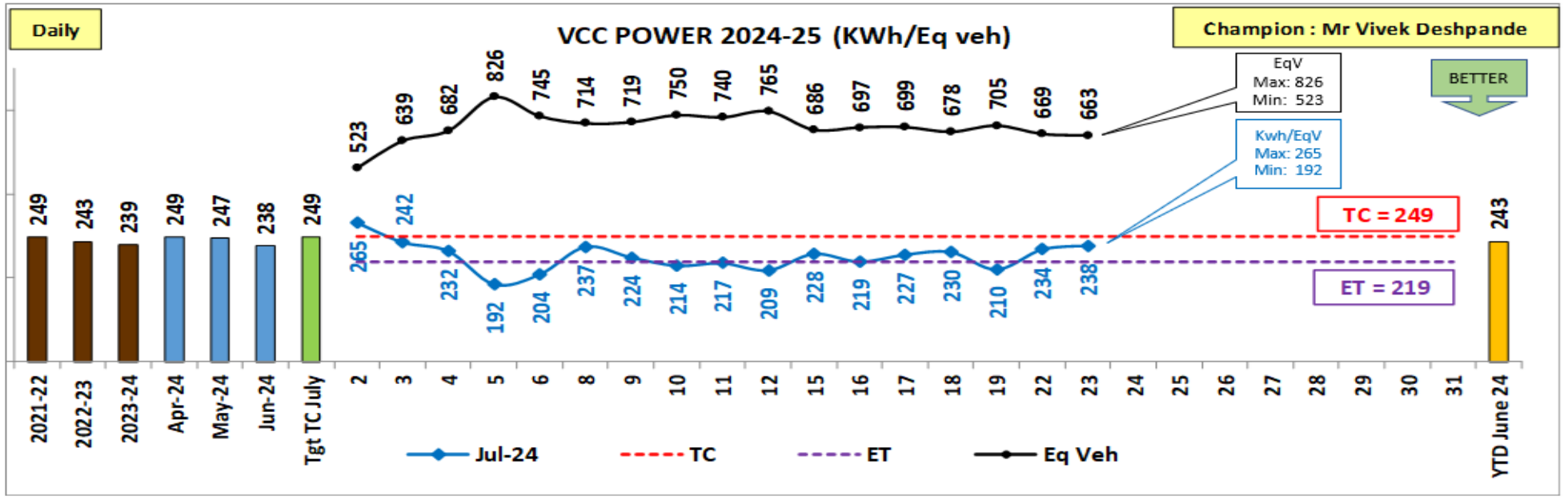


11. EMS System and Other Requirements – EMS Review by Plant Head

DWM – Power & Fuel Daily Trends

DWM - VCC Power (kWh / Eq Veh) Daily

TATA MOTORS
Connecting Aspirations



DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
Eq Veh Jul-23	1	637	699	652	714	690	723	693	-	673	713	702	709	666	673	-	693	641	695	665	654	685	2	12,980
Electrical KWh Jul- 23	43,042	1,63,947	1,70,231	1,73,665	1,69,483	1,69,895	1,69,905	1,65,890	45,621	1,59,819	1,67,187	1,66,978	1,67,392	1,67,953	1,54,917	44,333	1,66,858	1,70,576	1,70,573	1,65,653	1,65,810	1,63,687	42,998	33,46,414
Eq Veh Jul -24	1	523	639	682	826	745	2	714	719	750	740	765	33	1	686	697	699	678	705	13	1	645	639	11,902
Electrical KWh Jul -24	38,765	1,38,721	1,54,739	1,58,012	1,58,831	1,51,941	39,293	1,69,050	1,61,126	1,60,598	1,60,740	1,59,829	37,092	35,999	1,56,728	1,52,630	1,58,786	1,56,279	1,47,853	35,613	34,002	1,57,125	1,55,781	28,79,531

ONE WHEN ONE

11. EMS System and Other Requirements – EMS Review by Plant Head

DWM – Power & Fuel Daily Trends

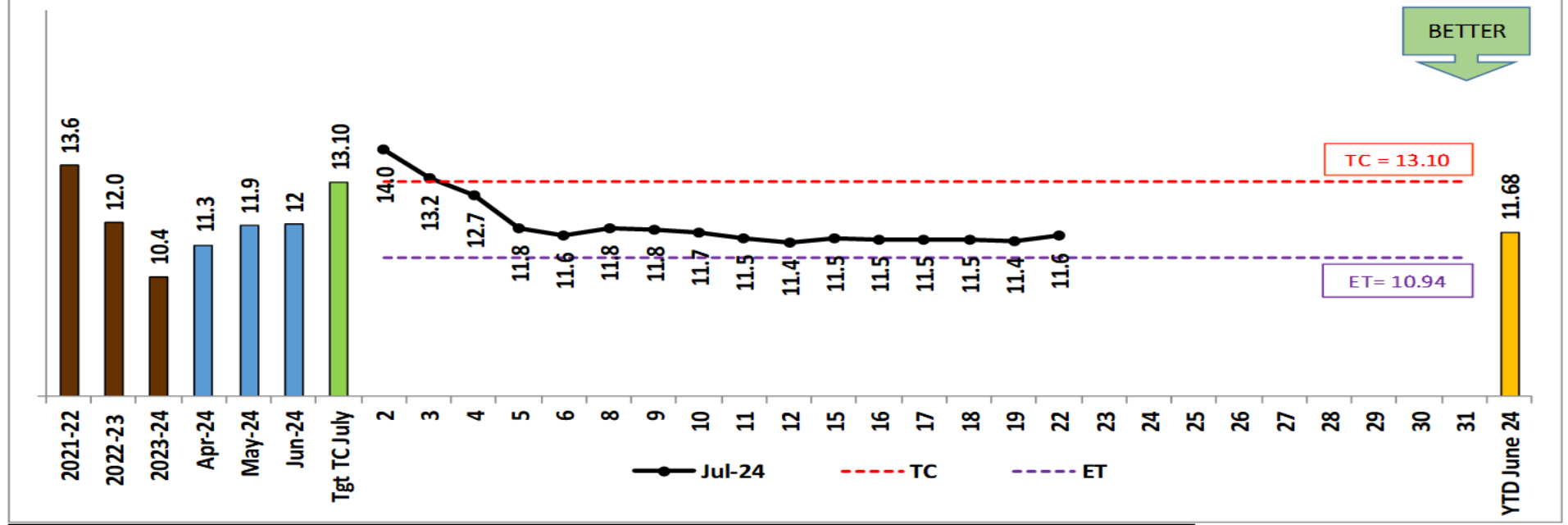
DWM - VCC Fuel (SCM / Eq Veh)

TATA MOTORS
Connecting Aspirations

Cumulative

VCC FUEL 2024-25 (SCM per Eq veh)

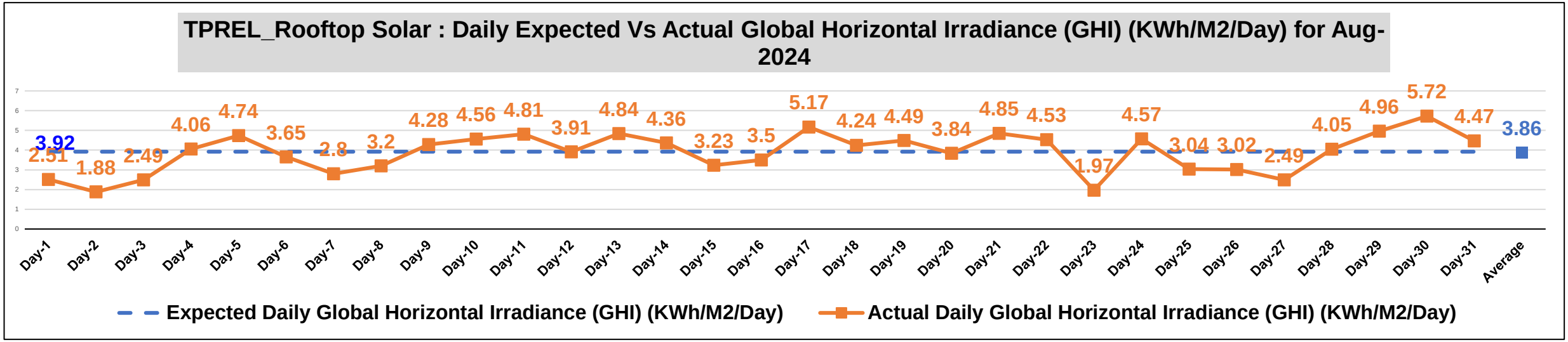
Champion : Mr Nitin Kashid

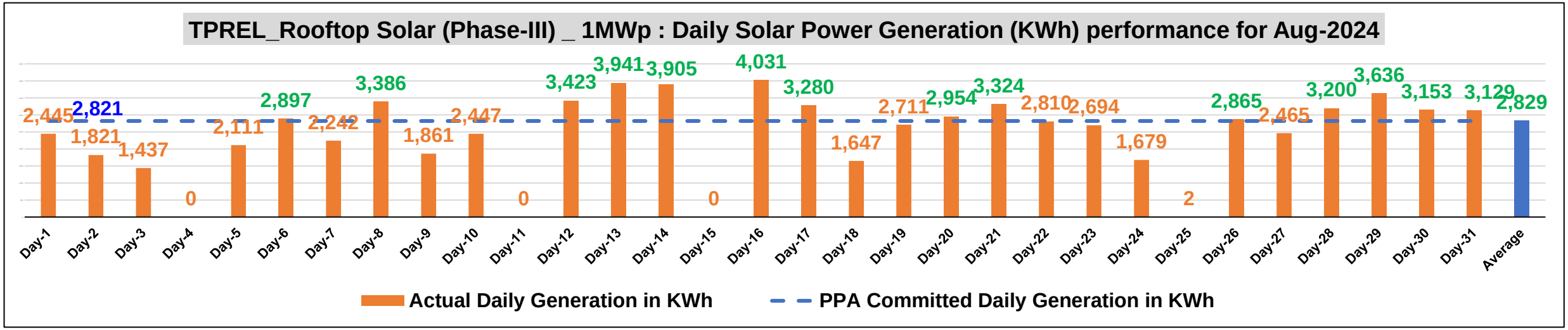


DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
Eq Veh Jul-23	1	637	699	652	714	690	723	693	-	673	713	702	709	666	673	-	693	641	695	665	654	685	12,294
Fuel SCM Jul -23	998	7,310	7,616	7,060	7,335	7,642	7,276	6,751	878	7,346	6,801	7,414	7,308	8,364	6,909	789	8,029	7,719	7,545	7,392	7,859	7,185	1,36,342
Eq Veh Jul-24	1	523	639	682	826	745	2	714	719	750	740	765	33	1	686	697	699	678	705	13	1	644	11,263
Fuel SCM Jul-24	1,887	5,456	8,025	8,131	7,981	8,073	742	8,464	8,313	8,268	7,691	7,809	66	1,233	7,796	7,863	8,028	7,712	7,757	33	1,173	7,831	1,30,330

MOREWHEN ONE

11. EMS System and Other Requirements – Daily Rooftop Solar Generation Review





11. EMS System and Other Requirements – Green Certifications

ISO50001 Certification and Learnings

Bureau Veritas Certification

TATA MOTORS LIMITED

HEAD OFFICE: PIMPRI, PUNE – 411 018, MAHARASHTRA, INDIA.

This is a multi-site certificate, additional site(s) are listed on the next page(s)

Bureau Veritas (India) Pvt. Ltd. (Certification Business) certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the Management System Standard detailed below

Standard

ISO 50001:2018

Scope of certification

DESIGN, DEVELOPMENT AND MANUFACTURE OF LCV, MCV, HCV AND MULTI-UTILITY VEHICLES.

MANUFACTURING OF ALUMINIUM CASTINGS. MANUFACTURING OF AUTO PARTS FOR COMMERCIAL AND MULTI-UTILITY VEHICLES.

Original cycle start date: 07 September 2013

Recertification cycle start date: 05 September 2022

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: 06 September 2025

Certificate No: IND.22.15096/EN/N Version: 1 Issue date: 05 September 2022

Certification Authority
Jagdheesh N. MANIAN
Director – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division

NABCB
EnM003

Local office: Bureau Veritas (India) Private Limited (Certification Business) 72 Business Park, Marol Industrial Area, MIDC Cross Road 'C', Andheri (East), Mumbai – 400 093, India

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization. To check this certificate validity please call: + 91 22 6274 2000

In 2023-24 we have successfully completed the first surveillance audit of ISO50001:2018.
We have transitioned from ISO:50001:2011 version to ISO:50001:2018 version in Dec. 2020..
The ISO 50001-2018 standard helped in emphasizing the need for awareness on below aspects:

- Future energy planning
- Risk Identification and assessment
- Understanding needs and expectations (Internal/External Stakeholder)
- Standardized process of evaluation of legal and other requirement
- External Issues / Internal Issues.

Summary-
One of the most valuable aspects of the energy management system is a structure that allows plant energy managers to share their challenges, successes, and concerns.
Sharing updates and best practices in an open forum provides fertile ground for identifying and leveraging opportunities especially with multiple plants in operation.

GreenCo Certification

CII
Confederation of Indian Industry

GreenCo

CII - Sohrabji Godrej Green Business Centre

hereby certifies that

Tata Motors Limited, CVBU
Pimpri, Pune

has successfully achieved the standards as required for the following level of certification under the GreenCo - Green Company Rating System which is valid for a period of 3 years

GreenCo Gold
June 2017

Jamshyd N Godrej
Chairman
CII-Godrej GBC

Pradeep Bhargava
Chairman
GreenCo Rating System

L S Ganapati
Chairman
GreenCo Assessor Panel

K S Venkatagiri
Executive Director
CII-Godrej GBC

Learning & implementation from CII GreenCo Program:

- Introduction to new technology of ceramic coating of furnace at CII GreenCo Forum
- Ceramic coating is implemented in June 2024 on CCHF05 furnace.

11. EMS System and Other Requirements – Life Cycle Assessments (LCA)

Life Cycle Assessment

- Tata Motors conducts thorough Life Cycle Assessments (LCAs) to evaluate the environmental impacts of our products.
- Adhering to ISO 14040 and ISO 14044 standards, the LCA approach comprehensively evaluates the total environmental impacts or ecological burden arising from the entire lifecycle of our products.
- We have completed Cradle to Gate calculations, commonly referred to as supplier emissions, for our SCV & LMCV range of vehicles.

11. EMS System and Other Requirements – Automatic Power Factor Correction

Installed Panel Summary 2024

Sr. No.	S/S No.	Panel Make	Quantity	KVAR	Working KVAR May	Working KVAR June
1	1	APFC SMASH	1	500	400	400
2	41	APFC ASIAN	1	400	400	400
3	31,27,26,10,16,28, 21,59,61,30,,48,45	APFC MEHER	12	6750	6750	6750
4	7,42,14,29,	APFC MADHAV	4	1600	1600	1600
5	50,13,39,8	TSC ABB	4	1670	1280	1280
6	12,38,20,6	P2P	4	2200	2200	2200
7	23,22,60,51,52,53,54,55	TSC POWERDEAL	8	4250	4080	4080
8	46,36	EPCOS	2	1200	1070	1070
9	19,11,62,64	TAS POWERTEK	4	1970	1960	1960
		TOTAL	**40**	**20540**	**19740**	**19740**

12. NET ZERO commitment

Tata Motors Sustainability Pillars for Planet Resilience

Driving Net Zero

Products driven
- PV by 2040, CV by 2045

Operations driven
- Sourcing 100% renewable electricity by 2030

Following science-based approach for emissions reduction

Pioneering circular economies

Operational circularity
- Zero Waste to Landfill by 2030
- Water Neutral by 2030 and Water Positive by 2040

Product circularity

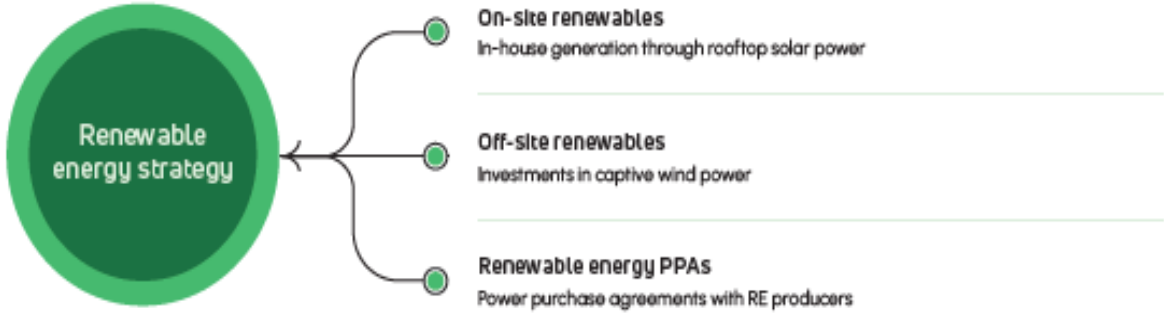
Preserving nature and biodiversity
- Aligning to Global Biodiversity Framework
- Aligning to science to map and set targets across our value chain
- Taking up flagship projects for Nature-based-Solutions

Tata Motors CVBU Pune is working on RE100 project and committed to meet 100% of its power requirement from renewable sources by 2030.

Driving decarbonisation with renewable power

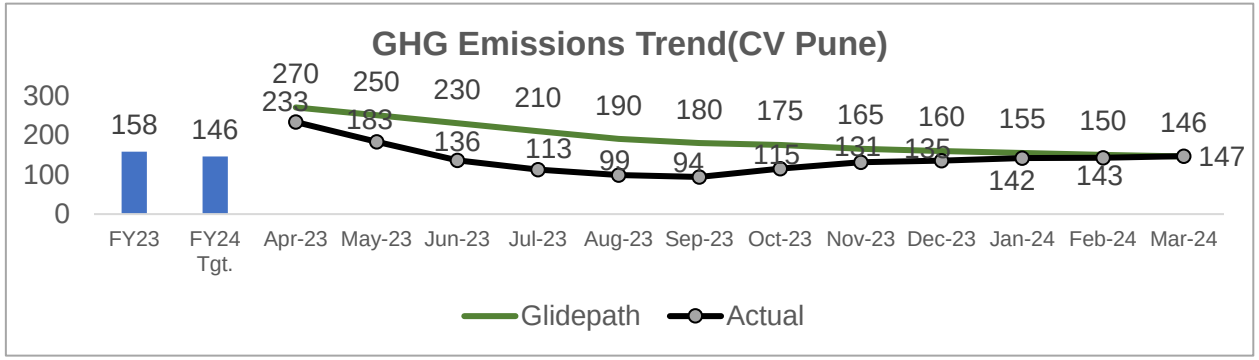
At Tata Motors, decarbonisation in operations will be primarily driven by transitioning to renewable energy sources. We are collaborating with power companies to drive our renewables initiatives forward.

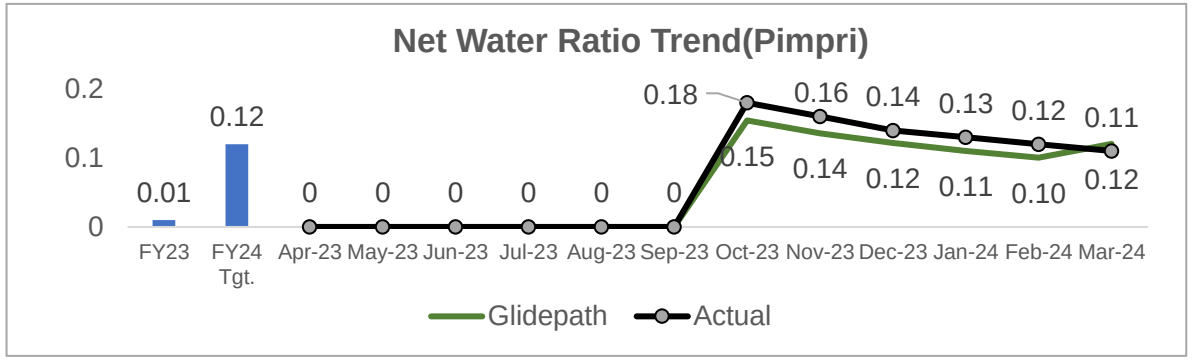
Tata Motors has adopted the Science Based Targets (SBTi) framework for reducing greenhouse has emissions and is committed to achieve net zero emissions by 2045 for CV.

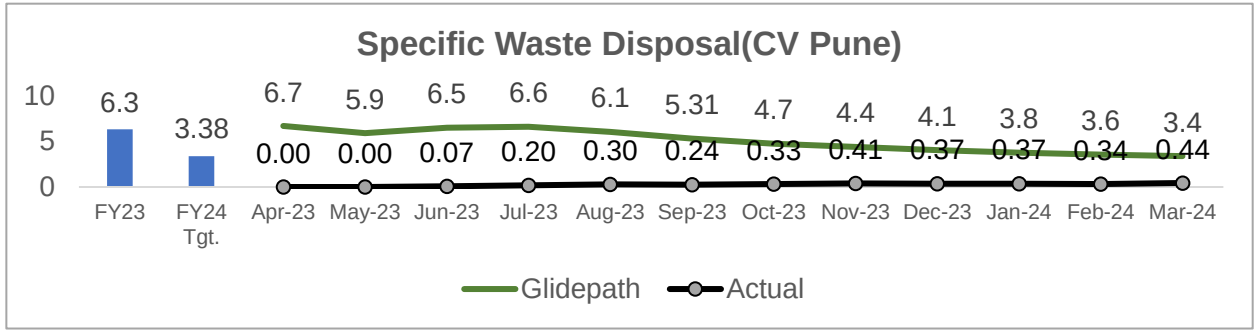


12. NET ZERO commitment – CVBU Pimpri Plant Sustainability

	GHG Emission Reduction (KWh/EU) (CV Pune)				Net Water Ratio #				Specific Waste disposal through non-acceptable routes(CV Pune)			
	FY23 Act	FY24 Tgt	YTD Tgt	YTD Act	FY23 Act	FY24 Tgt	YTD Tgt	YTD Act	FY23 Act	FY24 Tgt	YTD Tgt	YTD Act
Plant - Pimpri	158	146	146	147	0.01	0.12	0.12	0.12	6.3	3.38	3.38	0.44
Plant –Ch'wd					0	0.53	0.00	0.00				
Plant - Maval					0	1.18	0.00	0.00				





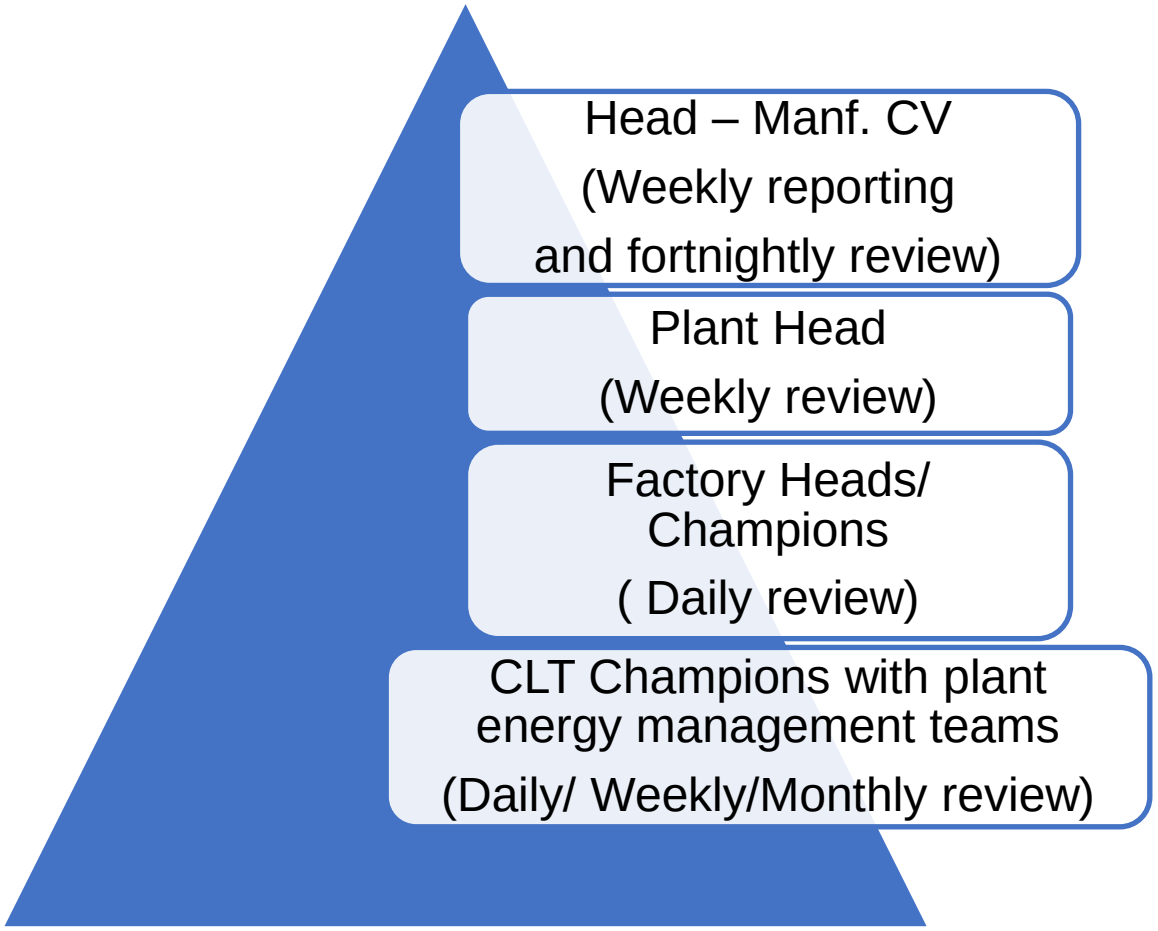


Cost leadership team CLT

CLT Utilities (Cost leadership team)	Utilities: **Power & Fuel**
	Started: 2018
	Current scope : Jamshedpur plant – Manufacturing, Pune – CV , Lucknow, Pantnagar and Dharwad , Foundry JSR & Pune,
	Lead Plant : TML Pantnagar, CLT Chairman – Plant Head – TML Pantnagar

13. Employee Involvement Knowledge Sharing, Award and Recognition

Cost Leadership Team Review Mechanism



- Plant Energy performance at CV level
- EnCOn projects progress review
- Energy dash board review of each plant

- Respective plant energy performance review
- Manuf. & Non- Manf. Energy review
- Projects review

- Factory energy performance review
- Operational controls
- Daily monitoring, analyses & action

- Plant coordination for implementation of EnCon projects
- Data management and performance tracking
- Coordination among other CLT members for cross learnings and projects implementation
- Benchmarking

13. Employee Involvement Knowledge Sharing, Award and Recognition

CLT : Levers for idea generation

Measurement & Analysis & KT2	> DWM – Allocation of MP & CP at each level ➢ Leveraging real time data (Energy digitization) and Energy analytics ➢ Implementation of KT2
Operational Efficiency	> Energy audit and significant load/ process selection for power and fuel > Process Automation & process modification to achieve higher efficiency
New technology introduction	> Heat pump, BLDC motors, High efficiency Fans etc
Renewable energy	> Roadmap for RE & Energy saving
Benchmarking	> Benchmarking and leveraging inputs from different national forums like CII, Golden Peacock, BEE etc.
Energy cost	> Open Access > Load management based on ToD (Time of day) tariff
Knowledge & Capability building	> Sharing of best practices and processes

13. Employee Involvement Knowledge Sharing, Award and Recognition

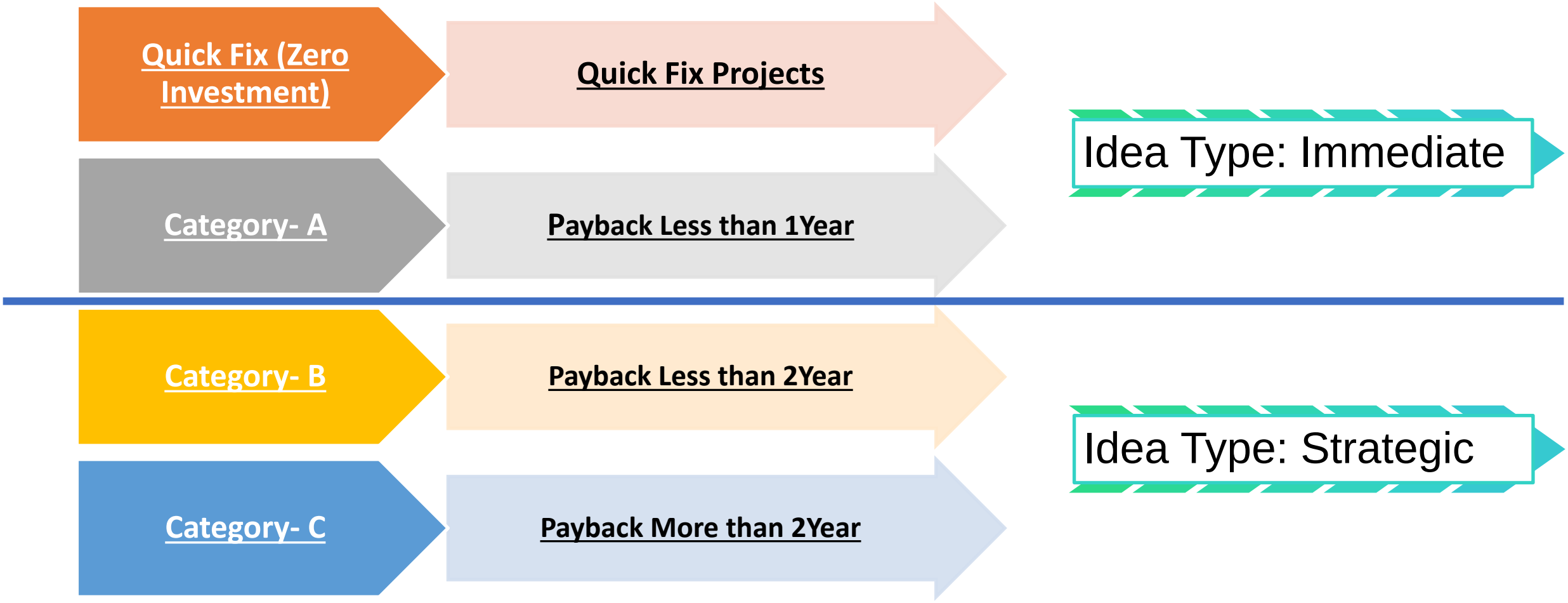
Idea recording sheet on flip chart / Excel sheet

Team No:

Sl No	Idea Description	Cat	Applicability Plant/Shop/area	Impact Rs/units	Long Term/ Short Term	Investment Yes/NO
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

	Category / Lever	Code
1	*Measurement & Analyses*	*M&A*
2	*Operational Efficiency*	*OE*
3	*Renewable energy*	*RE*
4	*New Technology/ Innovation*	*Newtech*
5	*Benchmarking & Adoption of Best Practices*	*BM*
6	*Commercial energy cost saving*	*COST*
7	*Knowledge and capability building*	*K&CB*
	Any other Points Team want to put forward.	*OTHER*

13. Employee Involvement Knowledge Sharing, Award and Recognition



13. Award and Recognition, Employee Involvement & Knowledge Sharing

Awards and Recognitions:

Tata Motors CVBU Pune
WINS
NATIONAL ENERGY LEADER AWARD

- Tata Motors CVBU Pune participated in the competition for the 24th National Award for Excellence in Energy Management, 2023 conducted by Confederation of Indian Industry (CII).

It won TWO awards:

- NATIONAL ENERGY LEADER AWARD
- EXCELLENT ENERGY EFFICIENT UNIT AWARD.

TATA MOTORS CVBU Pune has won the National Energy Leader Award for the 6th Consecutive year

13. Award and Recognition, Employee Involvement & Knowledge Sharing

Godrej & Boyce Mfg. Co. visit to CV Pune Plant for Knowledge Sharing during EnCon Week 2023

Godrej & Boyce Mfg Co.

It was great to interact with such a dynamic team to pursue the learning.
I also want to extend the invitation to Visit our manufacturing facilities any time with your team.

Mukesh Suthar
AGM & Head – Energy Management & Sustainability

13. Award and Recognition, Employee Involvement & Knowledge Sharing

Energy Week Celebration Dec. 2023

NATIONAL ENERGY CONSERVATION WEEK PLEDGE

TODAY, ON THE OCCASION OF 'NATIONAL ENERGY CONSERVATION WEEK', I SOLEMNLY PLEDGE, TO CONSERVE ALL FORMS OF ENERGY USED BY ME, AT MY WORKPLACE, IN MY NEIGHBORHOOD, AND AT HOME.

I RE-AFFIRM MY COMMITMENT TO-

1. AVOID WASTAGE OF ENERGY, BY FOLLOWING DISCIPLINE IN SWITCHING OFF MACHINES/EQUIPMENTS, WHEN NOT IN USE.
2. IDENTIFY COMPRESSED AIR LEAKAGES AND WORK TO RECTIFY THEM
3. SWITCH OFF LIGHTS, FANS, A/C'S, COMPUTERS ETC WHEN I AM THE LAST PERSON TO LEAVE THE WORKPLACE
4. MAXIMIZE USE OF RENEWABLE ENERGY WHEREVER FEASIBLE
5. CREATE AWARENESS ON ENERGY CONSERVATION AMONG FAMILY, FRIENDS AND NEIGHBORS

I ALSO PLEDGE, TO WORK CONTINUALLY TO IMPROVE OUR SPECIFIC ENERGY CONSUMPTION, WHICH WILL REDUCE OUR GREENHOUSE GAS EMISSIONS AND ENERGY COST.

SUGGESTION SCHEME - CVBU PUNE

USS (Unique Suggestion Scheme) – 205 on Energy Conservation is Launched !

All

PNCV_USS@205_23-24_09	December 14, 2023
Subject	USS (Unique Suggestion Scheme) : 205
Scope	Pune CVBU Plant (including Maval)
Applicable to	Permanent / Probationers / Fix Term / Temp / Trainee Employees on TML Pay Roll
Period of USS	December 14, 2023 to December 31, 2023
USS Focus Areas	Topics on which the Fresh/ Implemented suggestions can be submitted : • Reduction in energy consumption by change in process, • Introducing New Technology & utilizing Industry 4.0 for Optimization of Energy Consumption. • Arresting Energy Wastage in Machine Operation Cycles • Capacity Downsizing of Energy Pumps /Motors • Optimization of Air conditioning plant • Optimization of Compressed Air Consumption • Office Lighting and Air Conditioning

Suggestion on our Suggestion Portal.

While submitting the **suggestion, please select appropriate Scheme** *(Special or Special Implemented)* from the drop down menu and **select Suggestion Scheme Office** as Reciever.

Exciting Prizes are available to be Won, to the Participaiting Divisions and Enganged in Energy Conservation! However, Minimum 40 Suggestions registration by the Beneficiary Division would be eligibility criteria. Please contact Suggestion Office for more details.

Energy Conseration teams from respective divisions may seek leverage of the same.

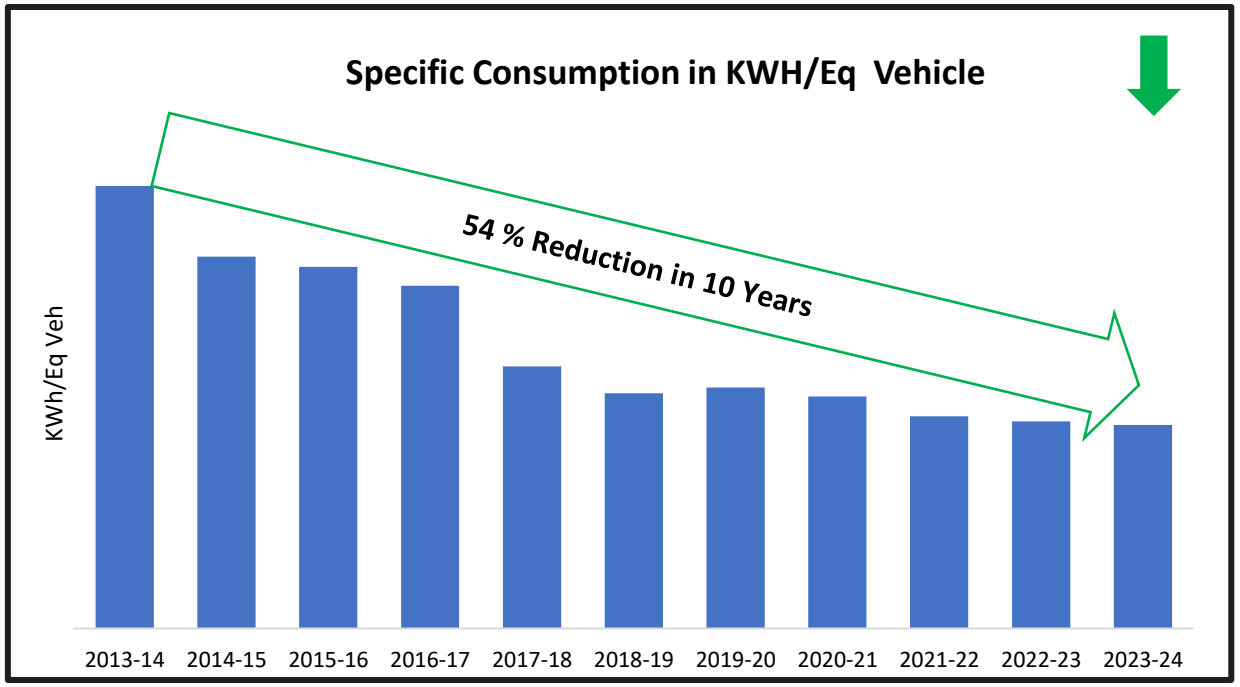
We look forward to your **enthusiastic involvement and participation** in this **Unique Suggestion Scheme** to make it a grand success.

There is always Scope For Improvement.

One need to have an ey... It, Improvise and Win It !

Avinash More	Adil Bala	Prasad Phuljhele
Secretary- Suggestion Scheme CVBU Pune	GM - Central Maintenance CVBU Pune	Chairman-Suggestion Scheme CVBU PUNE

THANK YOU



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