

CII National Award for Excellence in Energy Management- PCP1

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Mentor Name- Rakesh Bhosale

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Nayak, Tushar Chavare,

Aug -24

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02. Manufacturing Process

3. Energy Consumption in Last 3 yrs (FY 21-22 tot 23-24)

4. Information on Competitors, National & global Benchmark

5. Energy Saving Projects Implements in the last Three Years

6. Innovative Projects Implemented

7 (a) Utilization of Renewable Energy Sources (Onsite)

7 (b) Utilization of Renewable Energy Sources (Off site)

8: GHG Inventorization

9: Waste Utilization & Management

10 : Green Supply Chain Management

11. EMS system & Other Requirements

12. NET ZERO Commitment

Other relevant Information (optional))

Global Footprint



Company Info :

Plant Area: 39004 (sq. Meter)
 Plant Headcount : Close to 500
 Plant Established : 1st March 2017

Connected Load: 5823 KW
 Grid Contract Demand: 1501 KVA
 Renewable Capacity: 1.6 MW

Technology Initiator



13 Cobot top at India Cummins

Heat Pump
 Water cooled chiller
 EC plus fans
 Solar
 BMS

ISO8 standard Clean room for high precision assemblies



Product Portrayal



700+ Accident Free Days

<150 Customer PPM

100 % Customer delivery

50% Renewable Energy Usage

Non- Exempt Female Representation
46%

Exempt Female Representation
18%

Training %
PCP1- 2% (YTD) of Total Man hrs

Attrition
4% (YTD)

IR Index
95%



Plant View



Awarded by CII for innovative & sustainable HSE initiatives



Marsha K Allamanno award for EEEEC Engagement.



Best Plant Cleanliness Governance Award.



IATF:16949 certification



ISO : 14001 certification



ISO : 45001 certification

Facility Highlights



Achieved Platinum Rating in first attempt



Environmental Standard



Health & Safety Standard



SGS

Third Party certification body



Got HSE Excellence & Innovation Award by CII



Winner of WIN1 for BMS Implementation Project



Received Business Impact Award for Solar Plant Installation



Won Gold & Silver Awards in CII Quality Circle Competition for Environmental Best Practices



- Elimination of PIV & Pedestrian interaction by **90%**
- Reduced PIV Operations footprint by **70%**



First Plant across Cummins Global Sites to adopt Heat Recovery for Clean Room HVAC systems



- **1.9 MW Solar Plant**
- **45% Green Energy Contribution in Plant Power Consumption**



- **Water Neutral Site through CSR**
- **100% Reuse of Treated Water**
- **Water Balance Error is within 5%**



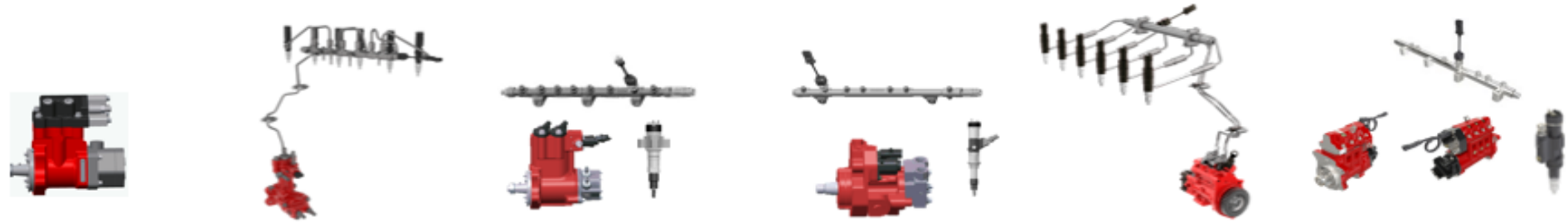
Access Control & Floor Marking in Warehouse



- **Zero Waste Disposal Site (100% Waste Recycling)**
- **Urea Elimination from DU Line**
- **Calib Oil & Hand Gloves Recycling**

2. Manufacturing Process

Portfolio Summary



Characteristic	CCR	Common Rail - MD			Common Rail - HD		Common Rail-HHP
Max Pressure (bar)	1600	2200	1800	1800	2600	1800	1600-2600
Horsepower Range	250-400	250-400	250-400	160-230	280-1200	300-520	400-2500
Engines	C8.3, L8.9	C8.3, L8.9	China C8.3, L9.5	B5.9	9 & 13 Liter (2007) 16 Liter (~2010) Cummins X12, X15, Z13 (~2010)	G11, G12, X12	K19, K38, K50
Applications	Auto, IND, Marine	Auto, IND	Auto, IND	Auto, Mining	Auto, IND, PG, Marine	Auto, IND, PG	Off-Highway-Mining, Oil and Gas, PG, Construction and Marine
Emission Levels ~	EPA'04, NS IV, Euro IV, TIER 3	EPA'07+, T4i+, Euro VI	NS IV+	BS IV+	Euro V+, EPA'10+, Tier 4i+	NS IV+	Stage V, Tier 4i+
SOP	2003	2006	2012	2017	2007	2014	2021

*Cummins fuel system used widely for engines larger than 8L since 2003
3 Million+ units sold over last 10 years*

Fuel Systems India Mfg Overview

Started : 2017

Span Over : 7 Acres

Employee Strength : 350+
People

>40% Gender Diversity

>1% PWD Representation

50% Six sigma Certified



700+ Accident Free Days



**<150 Customer
PPM**



100 %

Customer delivery



**50% Renewable
Energy Usage**



IATF:16949 certification

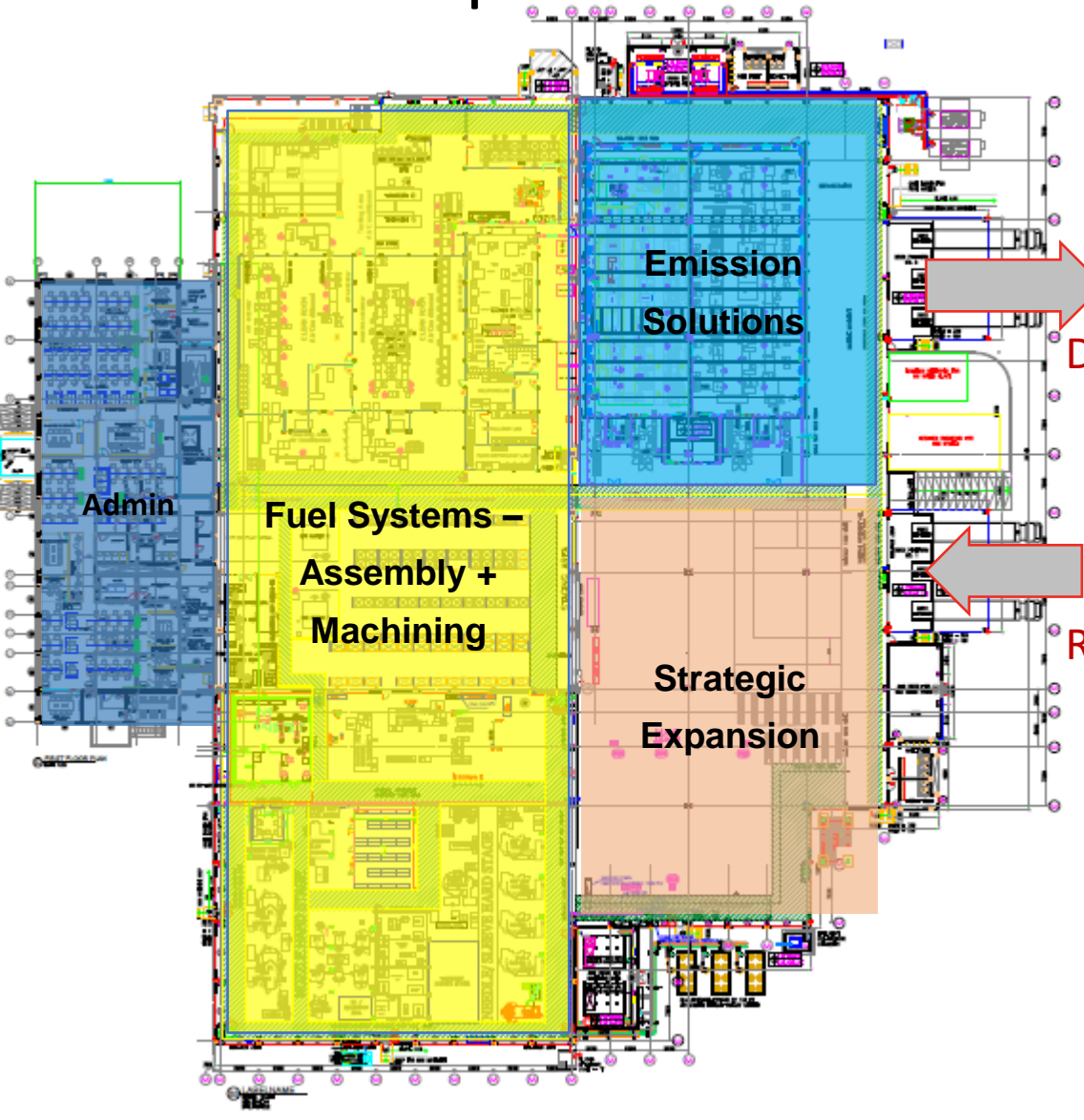


ISO : 14001 certification



ISO : 45001 certification

Fuel Systems India - Plant Footprint



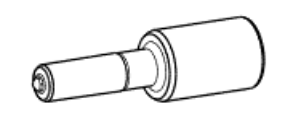
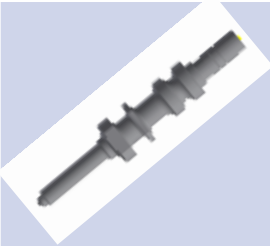
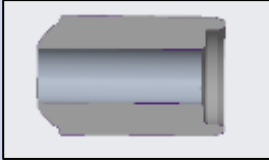
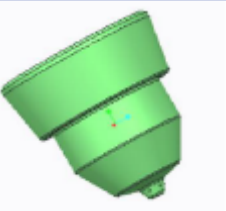


Dispatch Dock

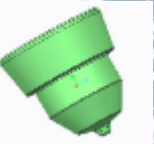
Receiving Dock

Manufacturing Capabilities

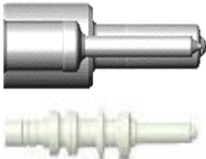
- FSI currently Manufacturing Pump, Injector and 3 MIW (Nozzle, Needle & Sleeve) + PT Cup

Product	OLP Pump	CRFI Injector	MR Nozzle	MR Needle	Sleeve	PT Cup
Picture						
Design Capacity (6 Days)	140K/ Year	140K/ Year	100K/ Year	100K / Year	100K/ Year	25K/Year
Capability	OLP18.1, Fuel Lubricated Pump	Patented Press to stroke Design	Upto 10Ltr	Upto 15Ltr	Upto 15Ltr	Upto 60Ltr

Winning Exports Globally



Plant : FSC
Parts : PT Cup
Location : Columbus

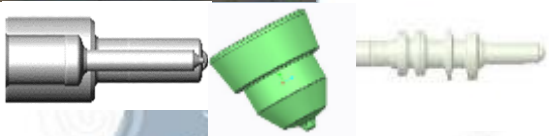


Plant : FSW
Parts : Nozzle and Needle
Location : Wuhan, China

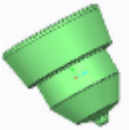
Plant : FSJ
Parts : PT Cup, MR Needle
Location : Juarez, Mexico



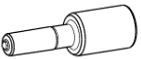
Plant : Cummins-Scania JV
Parts : Nozzle and Needle
Location : Juarez, Mexico



Plant : KEP
Parts : PT Cup
Location : Pune, India



PT Cup



Nozzle



Needle

Injector Assembly Manufacturing

Features

- ISO Class 8 Clean room for Assembly
- Hydrocarbon washing machine to meet class A requirement (**Eco Clean Make**)
- **Loccioni Make** Test machine for testing Injectors EOL capable to test **2100 Bar** pressure with **0.4% Shot to Shot accuracy (High ON Time)**.
- Indigenous made machines for Injector Stroke setting with stroke **stroke accuracy of +/-1 Micron**
- High end Assembly process with Fail safe. (**Titan Make**)
 - Tox Make Servo Press
 - Atlas Copco Nut Runner
 - Ateq Leak testing Machine

Data Traceability :

- Child Part traceability with 2D Matrix of all critical Components.
- Cummins MES systems for all product and Process parameter storage



Nozzle and Needle Manufacturing

Features

- High Precision ID grinding Machine for Bore and Seat Grinding. (**Make : UVA**)
- EDM (V7) for the Spray hole generation with 100% flow testing (**Make : Posalux and Sonplas**).
- 100% Abrasive grinding for Nozzle . (**Make Extrude Hone**)
- OD Bulbous and OD Grinding (**Make : Curtis**)
- OD grinding for Needle (**Make : Shiglyya**)
- Spray hole inspection capability using Fiber Probe. (**Make : Werth**)
- Marposs Gauges for all Line Inspection
- Zeiss gauges for all parameter Inspection.
- Temperature and Humidity controlled for complete Machine shop.

Data Traceability :

- End to End traceability with 2D Matrix of all critical Components.
- Online SPC Monitoring.



Pump Assembly Manufacturing

Features

- ISO Class 8 Clean room for Assembly
- Aqueous Washing process to meet Class A requirement.(**Eco clean Make**)
- High end Assembly process with Fail safe. (**Titan Make**)
 - Tox Make Servo Press
 - Atlas Copco Nut Runner
 - Ateq Leak testing Machine
- Pump EOL Testing machine capable to test 2100 Bar capability with RPM of 4300 RPM. (**Cummins Make**)
- Single Piece flow with Pallet and Powerised conveyor

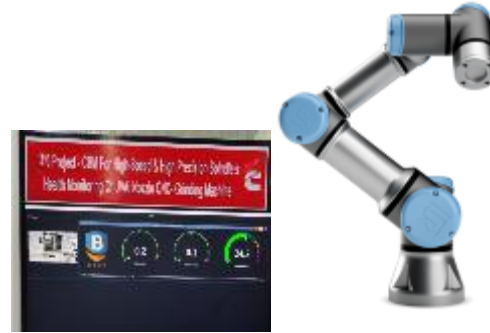
Setting up new Manufacturing Lines for **Fuel Lubricated Pumps**

Data Traceability :

- Child Part traceability with 2D Matrix of all critical Components.
- Cummins MES systems for all product and Process parameter storage



Automation Roadmap



10 Cobots
Extensive RFID Application
Building Management System

4 COBOTS
Energy Management System
Building Management System
Pack ship application for Needle

Condition Based Monitoring
Real time Process Monitoring
3 COBOTS
Pack ship application for Nozzle

IMR / AGV for direct material
3D Scanning / 3D Printing

2021

2022

2023

2024

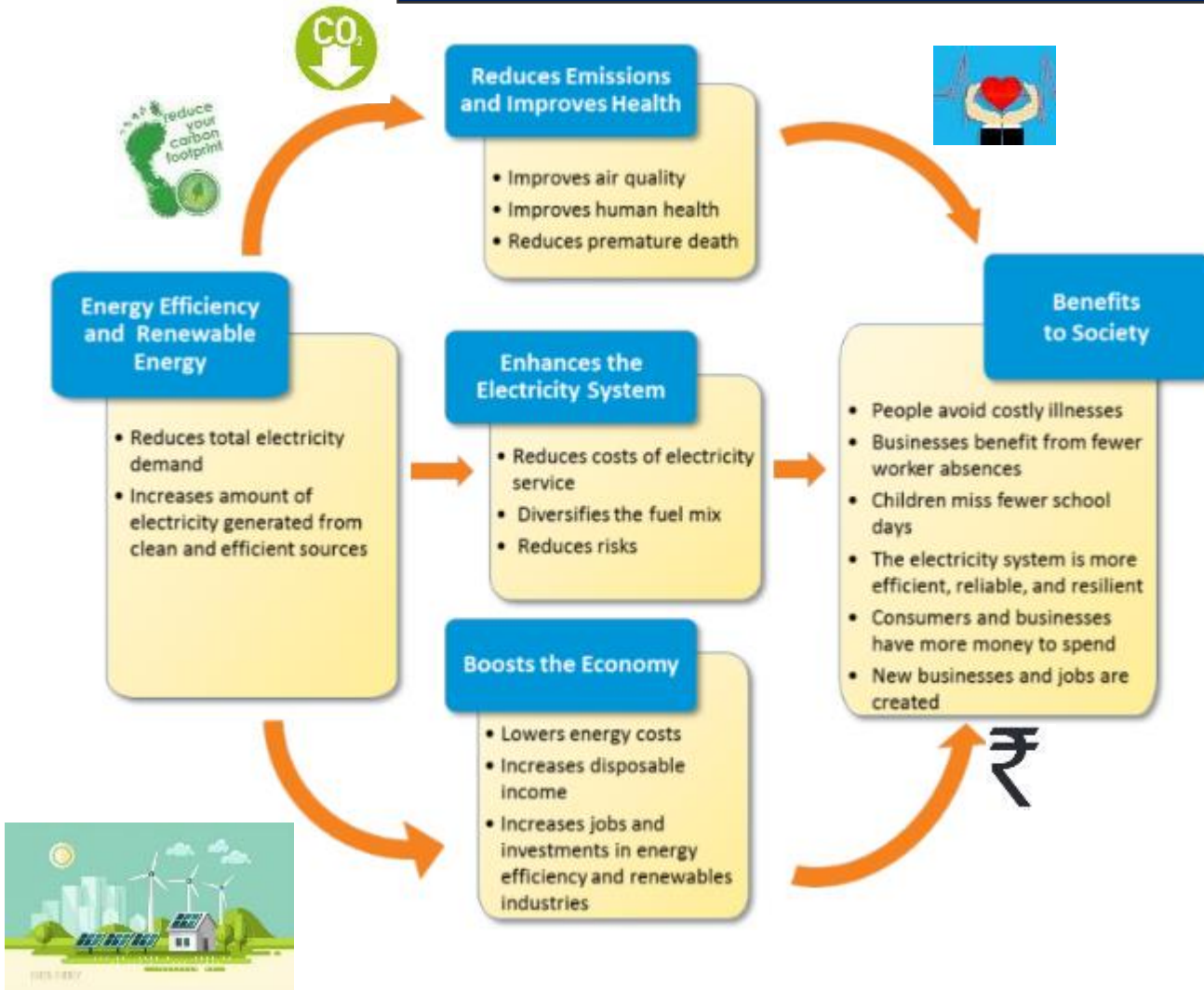
Completed

Current

Future

3. Energy Consumption in Last 3 yrs (FY 21-22 tot 23-24)

Strategy Adopted to optimize on Energy Efficiency




1. Energy Efficiency Improvement Program
2. Energy Theme to drive savings
3. Enablon Energy Score Card

Benefits of Energy Management



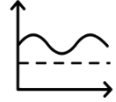
1

- Improved awareness about Green Manufacturing



2

- Knowledge of calculating Environmental benefits of Green Initiatives




3

- Able to establish baseline data for GreenCo initiatives




4

- Understanding of various categories of Environment Impact (Product, processes, People & overall Supply Chain)



5

- Organizational engagement in improving Environment impact & benefits



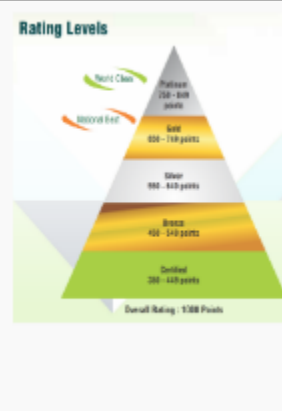
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- Sustainable focused approach towards Environmental improvements


GreenCo
GreenCo – A CII Initiative for Green Companies



S No	GreenCo Parameter	Maximal Points
1	Energy Efficiency	100
2	Water Conservation	100
3	Renewable Energy	100
4	Green House Gas mitigation	100
5	Waste management	100
6	Material Conservation, Recycling and Recyclability	100
7	Green Supply Chain	100
8	Product Stewardship & Life Cycle Aspects	100
9	Innovation for Environment	50
10	Green Infrastructure and Ecology	75
Total Points		1000



- GreenCo Assessment is done on 10 GreenCo Parameters
- Assessment includes physical condition as well as system data
- Score cards are available for each GreenCo Parameters
- Scores are being awarded based on two full days assessment by CII




12

- More value proposition to Customers to attract new business opportunities



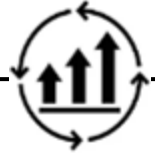
7

- Constant eye on Green Manufacturing initiatives



8

- Able to measure the performance / contribution on Green Manufacturing




9

- Continuous improvement has become a way of life.



10

- Tangential benefits started reflecting in business performance



11

- Sense of contribution towards Environment

Energy Mix & Energy Flow Diagram

Instruction: Energy Mix and Energy Flow Diagram

Electrical Power Sources

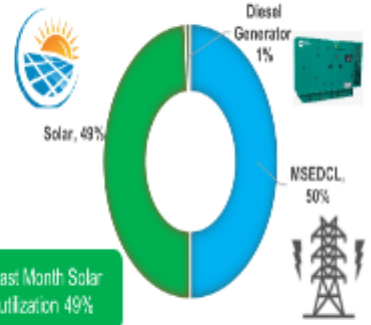
Purchase Electricity
 Connecting Load 5823 KW
 Contract Demand 1501 KVA
 Max Billing Demand 987 KVA

Solar
 Capacity- 1.6 MW

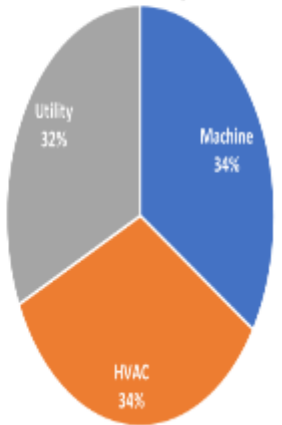
Diesel Generator
 Capacity=1500 (2nos)+500 (2 nos.)+25+50
Total =4075 KVA

Year	Purchase Electricity Unit Rate (Rs./KWH)	Solar Unit Rate (Rs./KWH)	Diesel Generator Unit Rate (Rs./KWH)
2019-20	8.9	6.4	26.57
2020-21	9.04	6.54	26.89
2021-22	10.20	7.7	27.24
2022-24	10.20	7.7	26.67

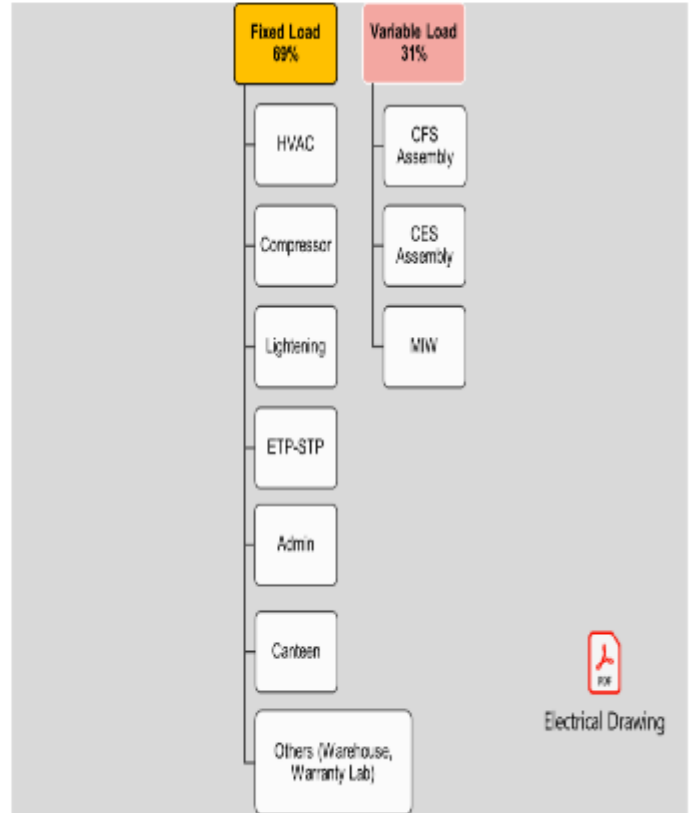
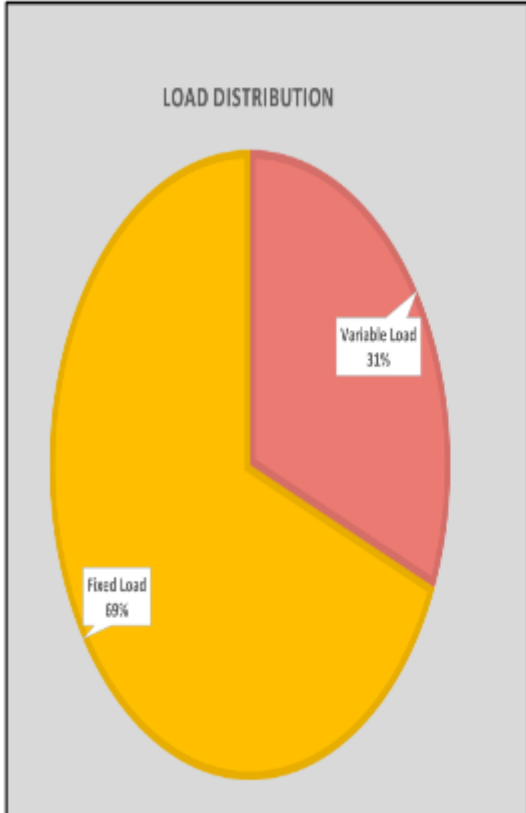
SOLAR UTILIZATION % IN OVERALL ENERGY CONSUMPTION



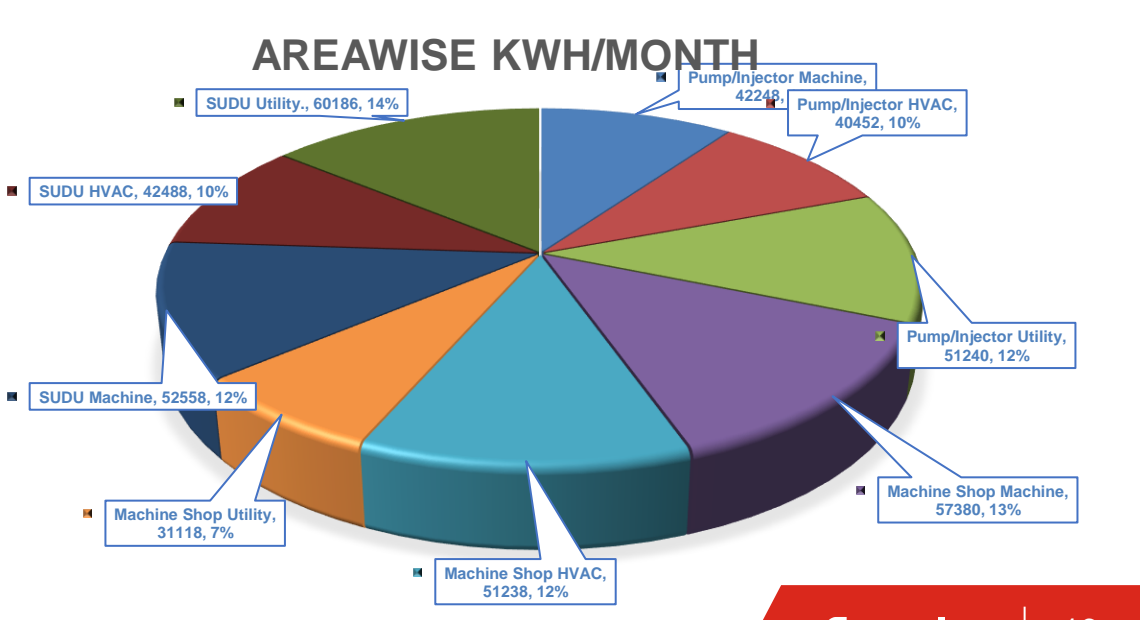
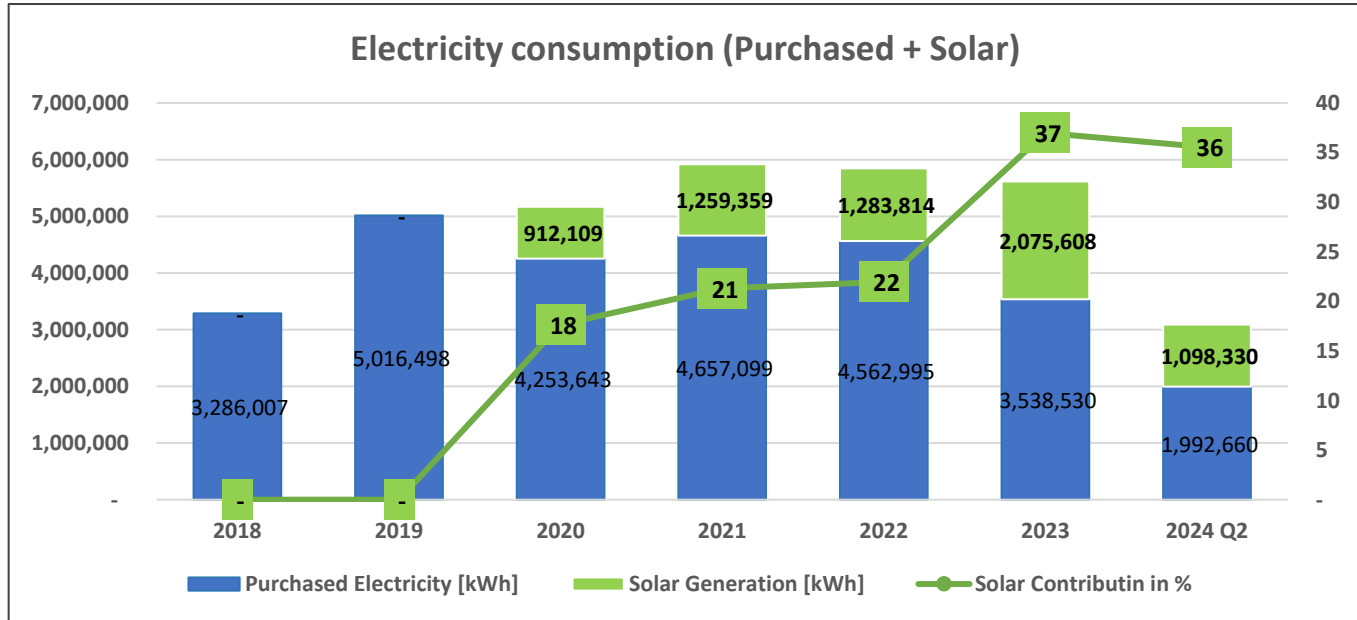
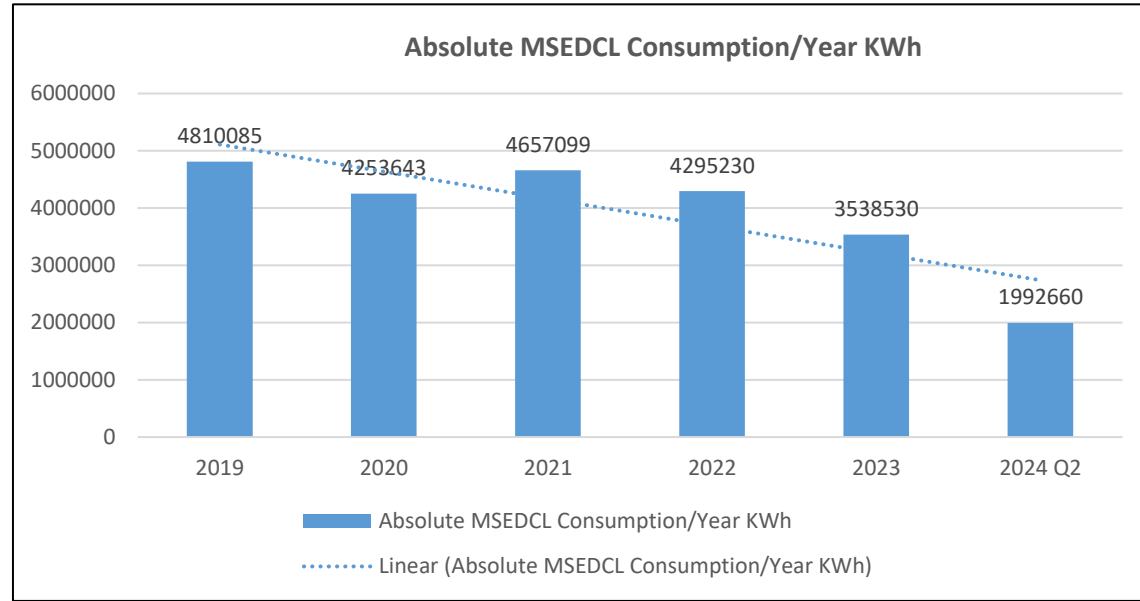
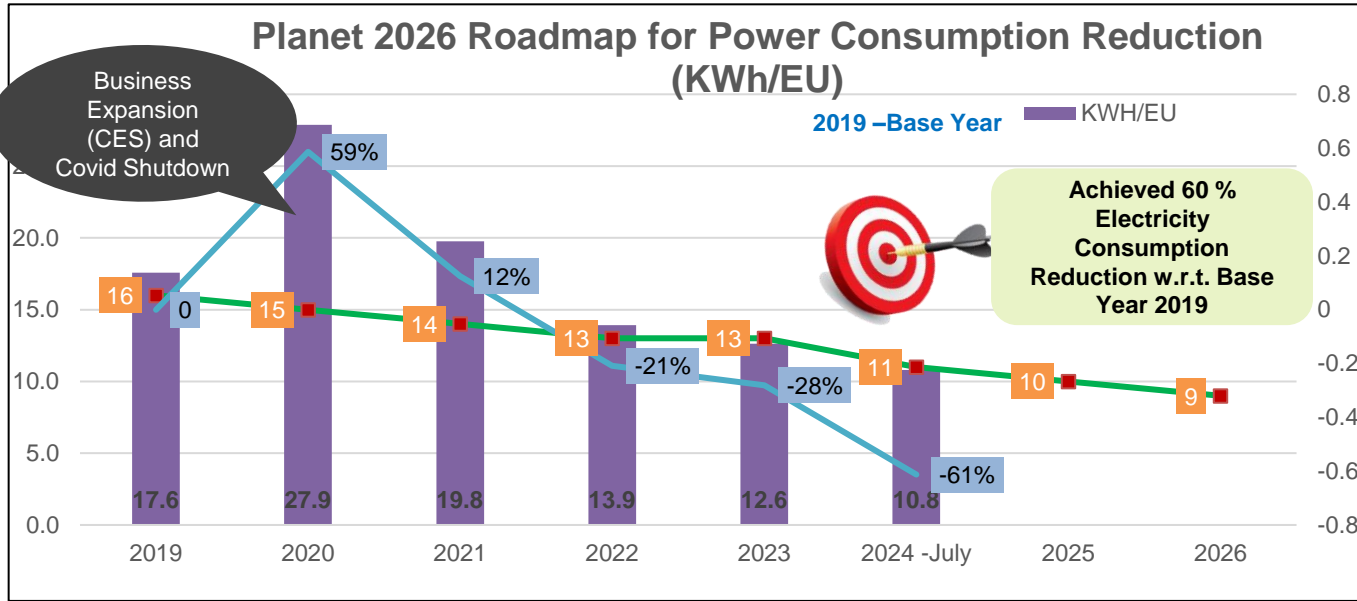
Area wise Monthly KWh



Process wise Energy Distribution

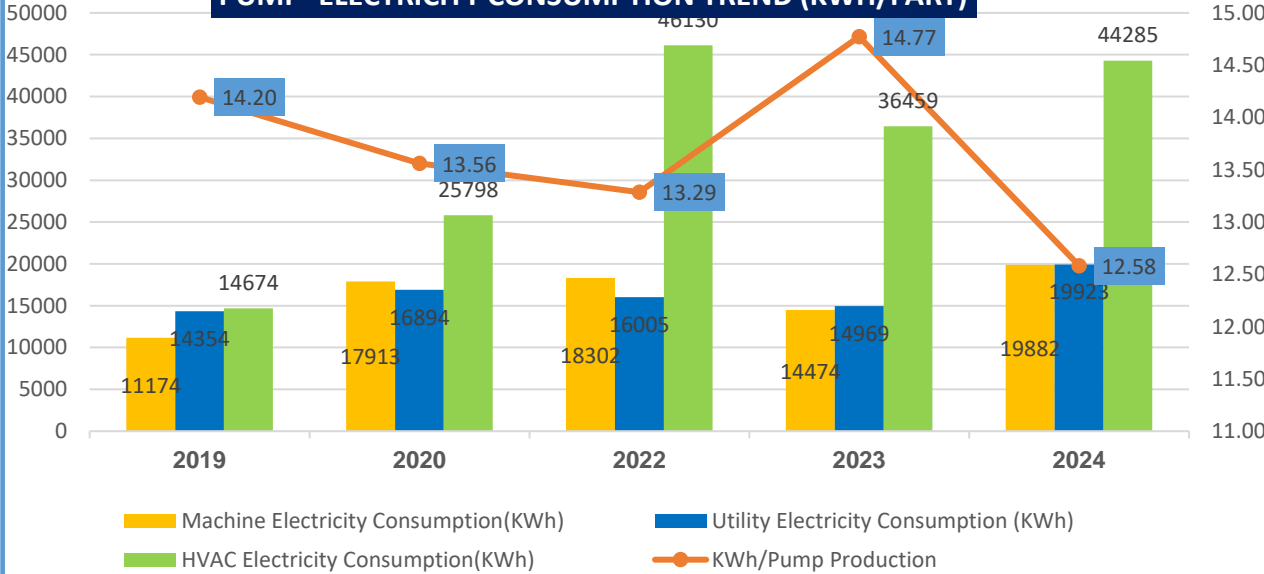


Reduction in SEC in the past 3 Years(Total Plant Power)

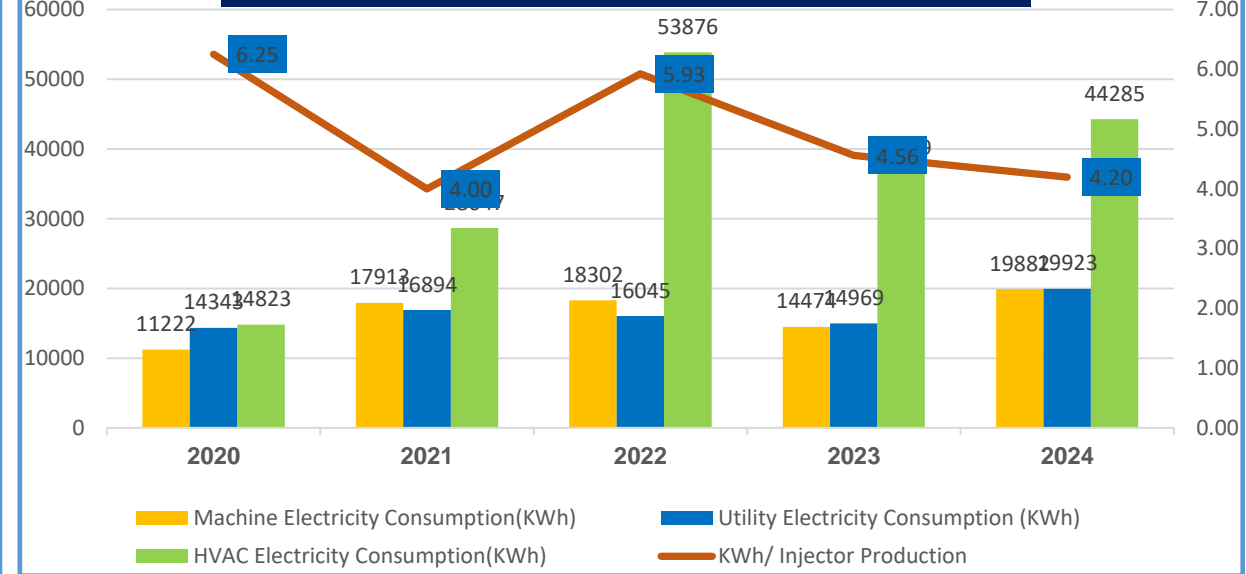


Electricity Consumption Line Wise-

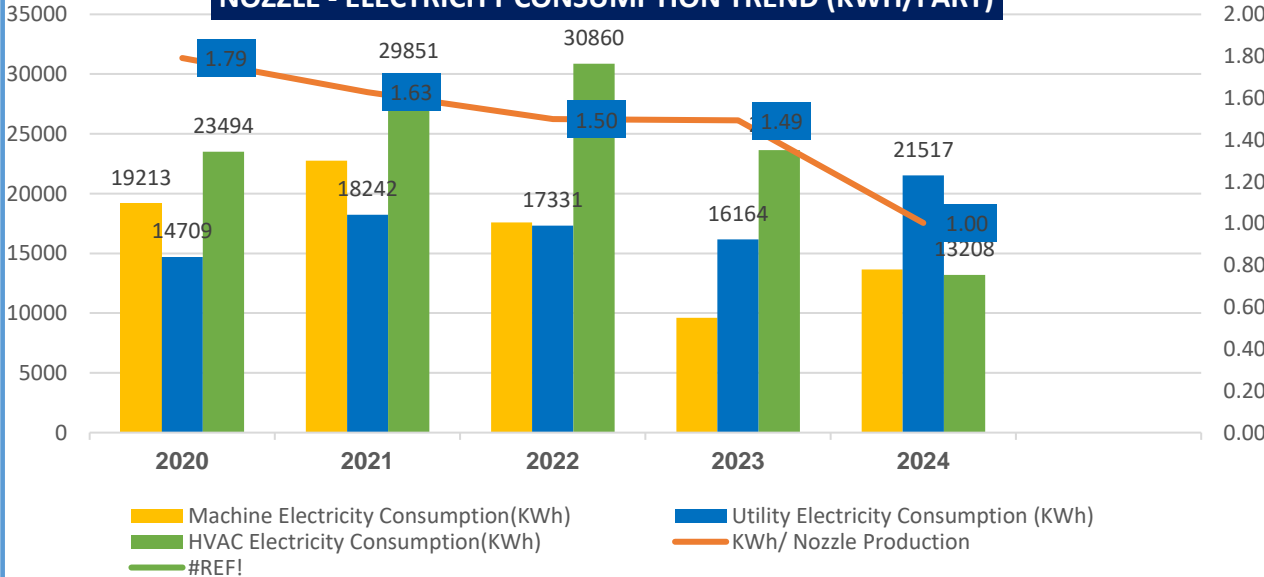
PUMP- ELECTRICITY CONSUMPTION TREND (KWH/PART)



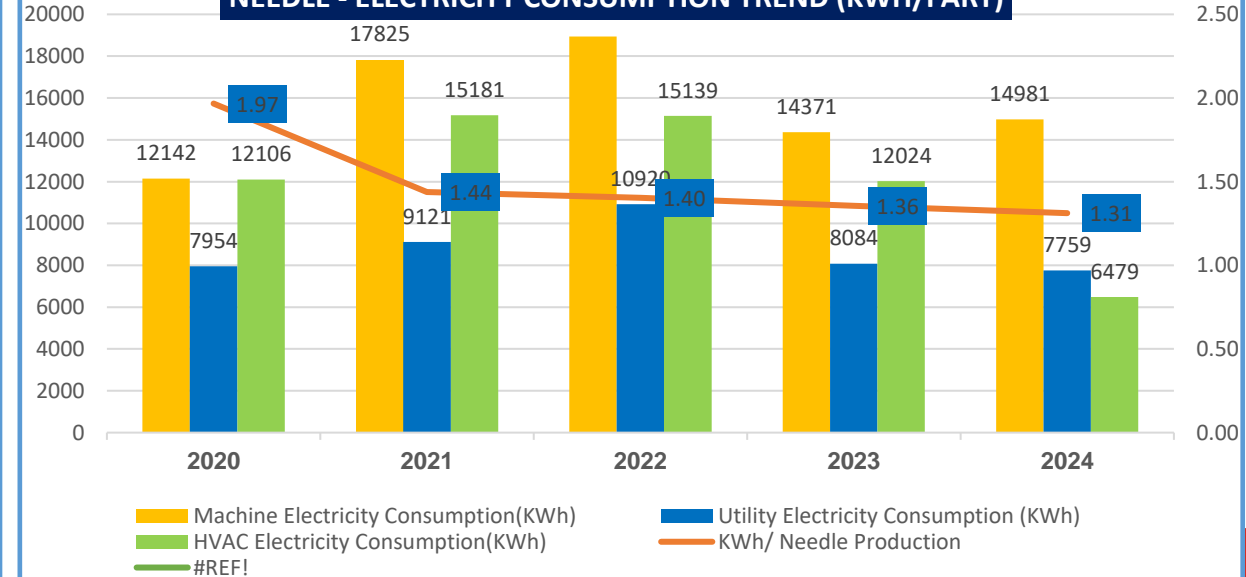
INJECTOR- ELECTRICITY CONSUMPTION TREND (KWH/PART)



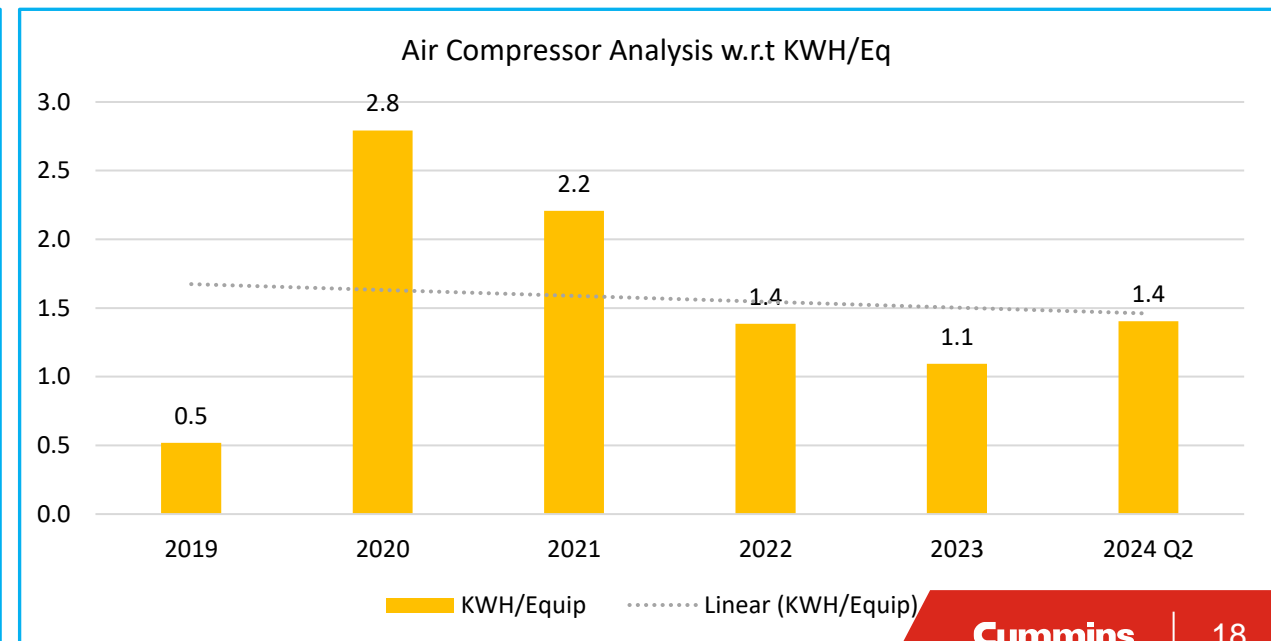
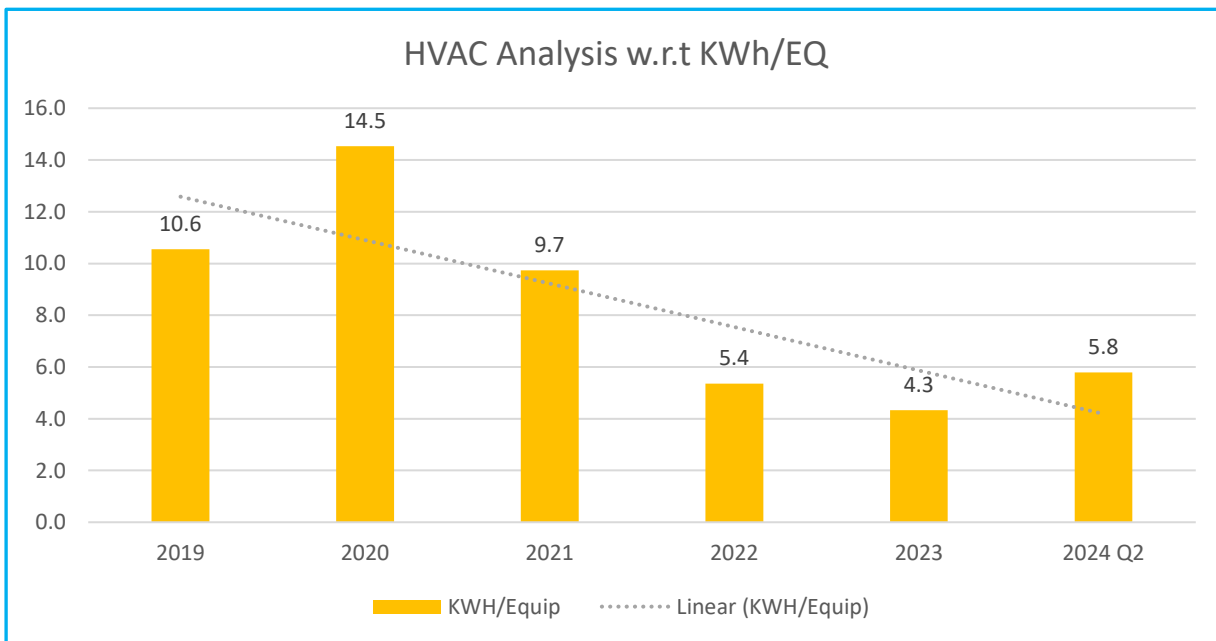
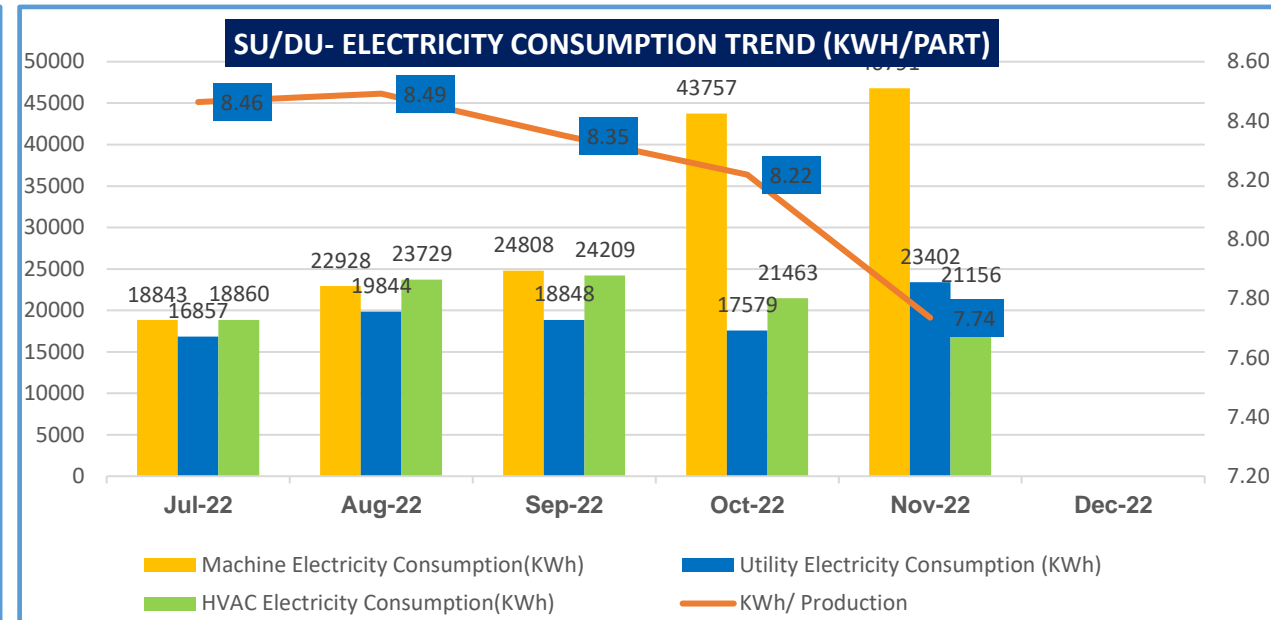
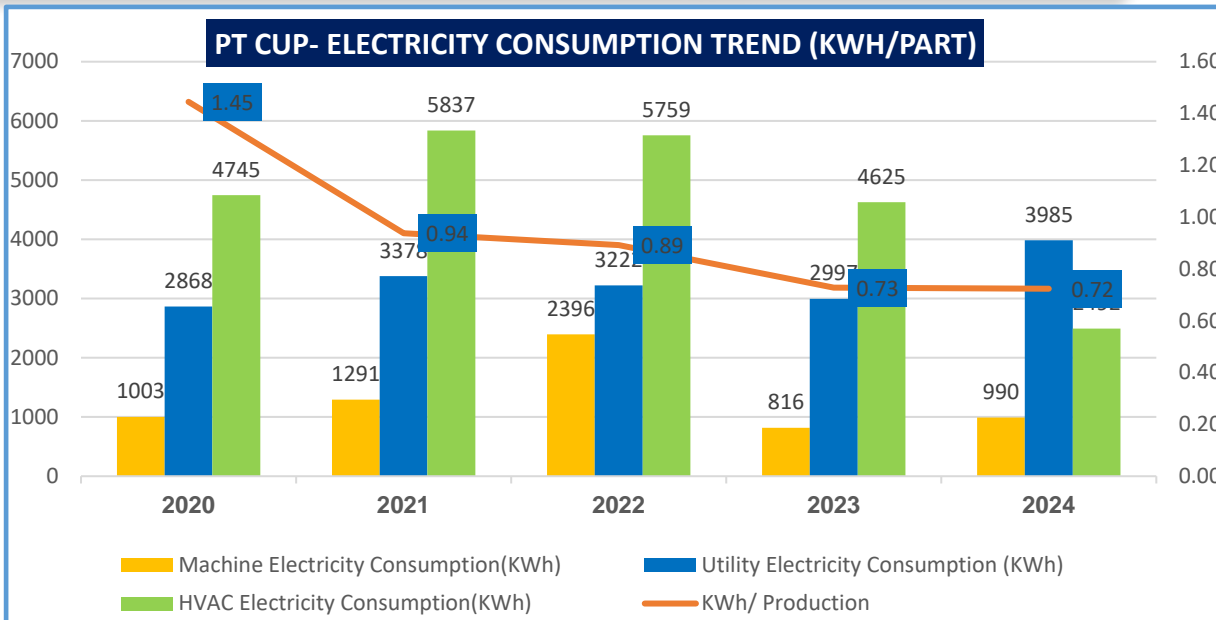
NOZZLE - ELECTRICITY CONSUMPTION TREND (KWH/PART)



NEEDLE - ELECTRICITY CONSUMPTION TREND (KWH/PART)

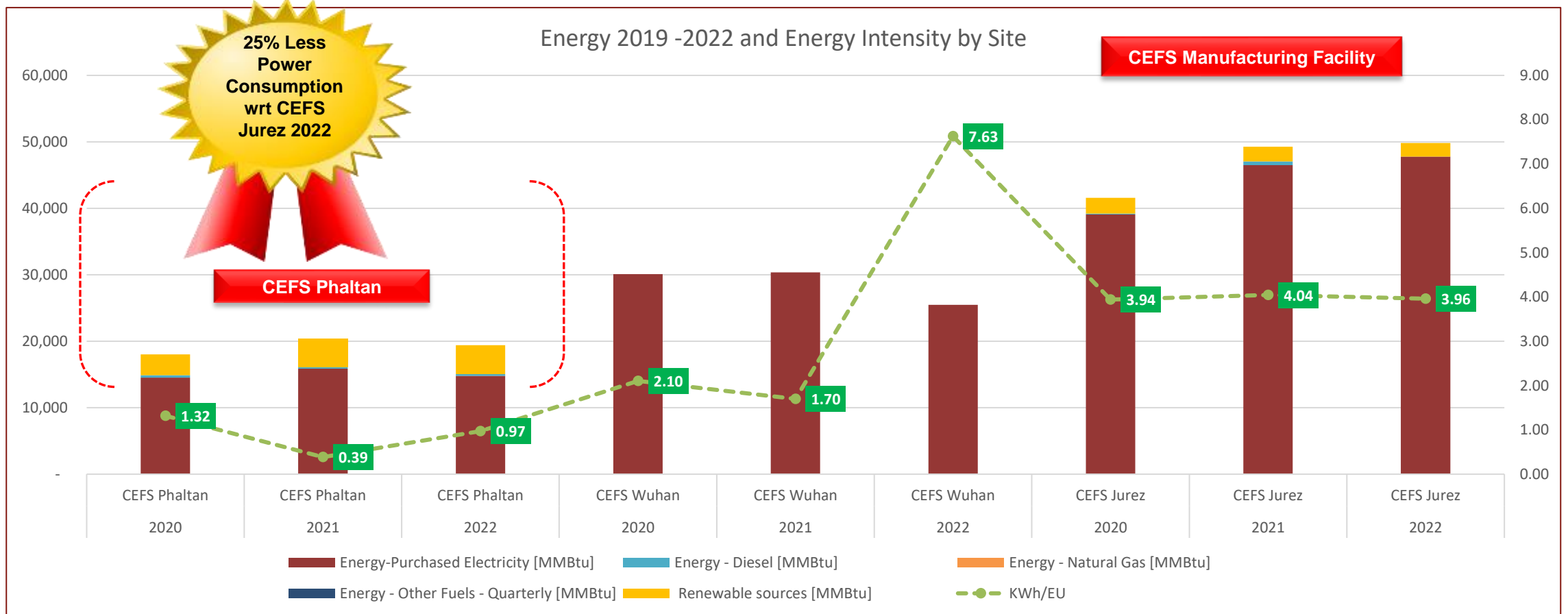


Electricity Consumption Line Wise-



4. Information on Competitors, National & global Benchmark

Target Setting : National and International Benchmark



CEFS Phaltan Specific power consumption is best across all CEFS plant Worldwide
In recent rolling year 2022 data CEFS Phaltan is at 0.97 KW/EU.

PCP-1 Policy & Target Setting

Health, Safety and Environment Policy

Health, Safety and Environment Policy is a commitment to protect the safety and well-being of our employees and the environment. We are committed to the highest standards of safety and environmental performance.

- Ensure a safe and healthy working environment for all employees.
- Promote environmental stewardship and responsible use of resources.
- Comply with applicable laws and other requirements related to Occupational Health and Safety risks and Environmental impacts of our facilities, products and services.
- Continuously improve energy efficiency, water conservation, waste management and other sustainable practices for existing and new facilities, products and services.
- Adopt "Greenhouse Gas" and "Climate Change" Objectives:
 - Develop innovative technology solutions to reduce greenhouse gas emissions.
 - Reduce overall CO2 emissions, water consumption in our facilities and products.
 - Design sustainable products and processes.
 - Reduce the carbon footprint of our products and services.
- Develop and enforce environmental policies to ensure that our products and services are environmentally sound.
- Assign responsibilities to different levels including employees, contractors, transportation and other agencies regarding the policies.
- Establish an environmental management system (EMS) by providing appropriate resources, training, information and performance measures.
- Measure and monitor HSE performance of individual and overall performance considering their respective responsibilities.
- Set individual and measurable HSE Objectives and Targets and commit to continually improve our HSE performance.
- Adopt HSE objectives based on product design, plant design, plant operations and other activities as well as reaction and prevention activities.
- Identify and pursue opportunities to use our talents and capabilities to improve the HSE and quality of life in the communities where we operate.
- Establish and enforce policies to ensure that our products and services are environmentally sound.
- Report findings, management actions and other information in a timely and transparent manner.
- Encourage and support participation of all employees in safety and environmental improvement.
- Publish our HSE performance to ensure transparency and to be made available to all employees and interested parties as appropriate.
- Make the HSE policy visible to all employees and interested parties. We will ensure HSE policy is often an important part of our business communication.
- Monitor and improve HSE performance of our products and services.

Explore new technologies and innovative ideas for continual improvement in HSE performance.

Identify and pursue opportunities to use our talents and capabilities to improve the HSE and quality of life in the communities where we operate.

Phallan Components Plant 1 - India Goal Tree 2023

Key Projects:

- Targeted expense reduction by 20% across all facilities. Anand
- Achieving 85% OEE at sea grade capacity on each line. Nandkumar
- Improve supplier and inbound DOPG by 30%. Anand
- Average MC less than 26 lakhs across the year. Anand
- Improve Direct Inventory Turns from 6 Turns to 8 Turns. Pratik
- OPM level at least 100 for CTO and CTS through 2023. Anand
- Establishing Grinding Process and Create Capacity of 60k gears @ Raichyga including Sample Kutch Substrate. Energy reduction to improve baseline productivity rate for DOPG class 80 Gear by using from Cummins Business. Pratik
- 100 On revenue RFD. Nandkumar
- Develop Capability and Capacity of 40k for Assembly of Legend Gears. Nandkumar
- Supply based Demand GM in PCP-1. Pratik
- Develop Supply Chain for Upcoming NP- Legend Asia Silver (Ravari). Pratik
- Improve green energy contribution by 25%. Rohan
- Reduce total CO2 emissions by 10%. Pratik
- Drive end to end traceability for all steel parts. Anand
- Drive M.D for business critical areas (SMA, SMS, CVES, Cobalt, Igniter, Quality). Nandkumar
- Strengthen process for change management, process planning documents, LOTD, IP and finalizations. Pratik
- Global Functional expertise (M4, MTR, MTR, Global production control, 20% rotation, JSM development, PVP, BSC, DTCU). Nandkumar + Pratik
- Global talent excellence (Coastal manufacturing, Control). Nandkumar + Pratik
- Develop robust Supplier Planning across SPS, APAC, Europe and India. Pratik
- Talent. Pratik and Shashi
- Drive 50% initiatives / 2020 USM from Equipment's - O&M from Equipment's. Pratik
- Organismic risk reduction by 15%. Nandkumar
- Reduce hand carry risk score by 50% across plant. Pratik
- Drive health and safety. Energy W&P engagement, RMV, Renewal, etc. Pratik
- Supporting participation across Malaysia through model village initiative. Shashi

HSE Policy is signed by Occupier (CBU Leader). Awareness of Policy is given through -

- HSE Induction program
- Yearly Refresher training
- Displays at strategic locations
- Management Review Meetings

Vision Planet 2050 is our key driver in our policy Installation.

Improve green energy contribution by 25% Rohan

PCP-1 Goals to meet our global target in alignment with our Policy.

- PCP-1 Long Term Goals (2027 - 2030)**
Long term target: **7.0 KWH / EU by Yr. 2030 (50% Energy Reduction)**
- PCP-1 Short Term Goals (2023 - 2026)**
Short term target: **9.0 KWH / EU by Yr. 2026 (40% Energy Reduction)**

PCP-1 HSE Policy
मराठी
हिंदी

Target Setting

2030 GOAL UPDATE

More than 3,000 businesses and financial institutions, including Cummins, are working with the Science Based Target initiative (SBTi) to reduce their emissions in line with climate science.

Following the Paris Climate Agreement in 2015, organizations including the United Nations Global Compact, the COP (formerly the Carbon Disclosure Project), the World Wildlife Fund and the World Resources Institute continue to develop the SBTi to set science-based emissions reduction targets.

In 2021, Cummins agreed to develop targets under the SBTi framework. In 2023, the company announced long-term goals for the business - 70 to nearly 80% reduction in the other for facilities and operations. The facilities and operations goal is specifically to keep global warming to a 1.5°C temperature increase over pre-industrial levels while the other goal and production goal is aligned to a 1.5°C target.

Cummins also set seven other 2030 goals to be part of **PLANET2030**, the company's environmental sustainability strategy. This is Cummins' first progression on these.

CUMMINS 2030 ASPIRATIONAL TARGETS

- DOING OUR PART TO ADDRESS CLIMATE CHANGE AND AIR EMISSIONS**
 - 2030 TARGETS:
 - Customer success powered by carbon neutral technologies that address its needs.
 - Carbon neutral (net-zero) emissions for Cummins' facilities and operations.
- COMMUNITIES ARE BETTER BECAUSE WE ARE THERE**
 - 2030 TARGETS:
 - Not possible impact every community where Cummins operates.
 - Not yet back into environmental impact.
- USING NATURAL RESOURCES IN THE MOST SUSTAINABLE WAY**
 - 2030 TARGETS:
 - Design out water products lifecycle processes.
 - Use water wisely for our facilities.
 - Reduce water consumption across the company.

NINE 2030 GOALS

- Reduce direct greenhouse gas (GHG) emissions from facilities operations by 50%.
- Reduce Scope 1 emissions from GHG emissions energy with production by 25%.
- Reduce water consumption from 2020 Cummins base product in facilities by 10 million m3.
- Reduce emissions of GHG refrigerants from plant and supply operation by 50%.
- Reduce water usage per unit of output by 10%.
- Reduce CO2 emissions from plant and supply operation by 10%.
- Reduce water consumption across the company by 10%.
- Reduce water consumption across the company by 10%.
- Reduce water consumption across the company by 10%.

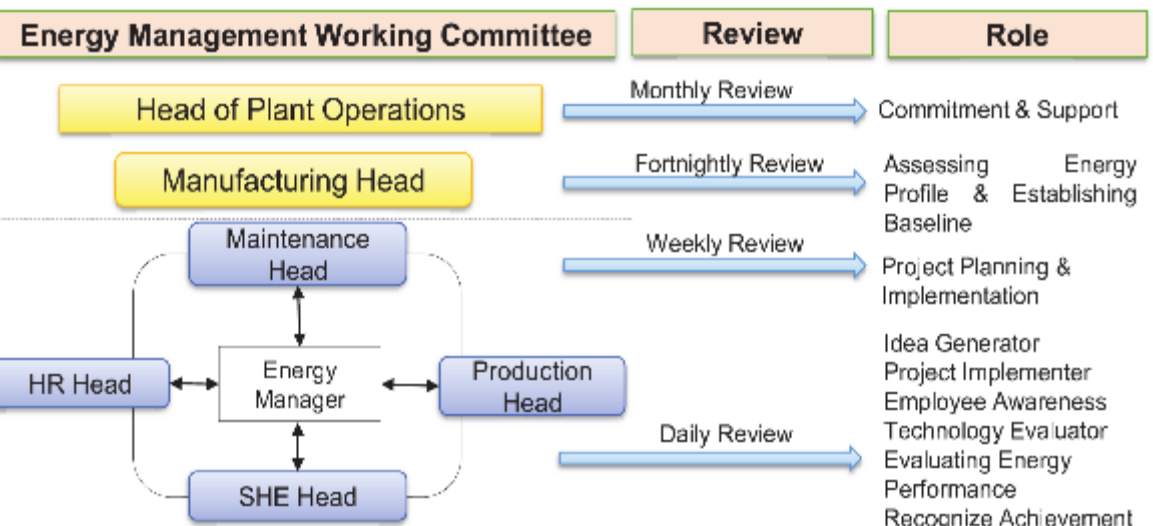
Reduce Electrical Consumption up to 7.0 KWH / EU by Yr. 2030

Reduction of Electrical Energy Consumption by

- 1: Optimization of KWH/Eq unit at plant level
- 1.1: Energy efficiency project through site / Global Eco hopper projects.
- 2: Introduction of Green energy (Solar PVs) in phase manner.
- 3: Plan to Implement open access. (Wind energy).

Our Background is based on International Benchmarking and goals

Energy Management Cell



Awareness creation and Employee involvement- Training

Energy ?

- Direct:
 - Electricity
 - Oil/Gas
 - CHNG
- Indirect:
 - Compressed Air
 - Water
- In GMS (ISO/TS 18848) : Focus on Quality Improvement
- In EMS (ISO 14001) : Focus on Environmental Improvement (Related to Air , Water , Noise Pollution, Waste reduction, energy saving etc)
- OHSAS 18001 : Focus on Safety Improvement
- ISO 80001 : Energy related Improvement

Energy Planning Process

The Cummins 7 Energy Themes

- Power Management
- Lighting
- Compressed Air
- Water
- Waste & Recycling
- Energy Recovery
- Equipment & Maintenance
- Fuel Usage

EE_Question Paper

Sustainable GHG Innovation with 30% energy efficient systems

Rain-Water Harvesting Lake @ PCP1 (1000 KL)



Cooling Tower



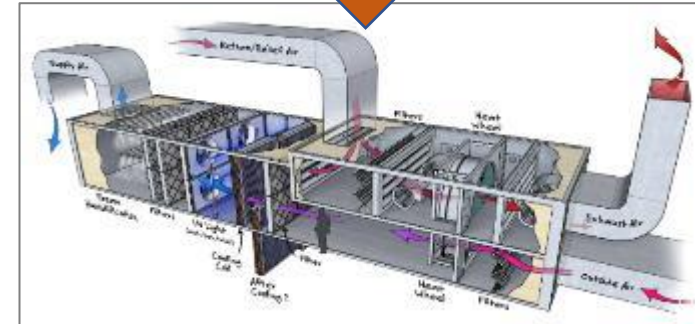
Water-cooled Chiller



Air-cooled Chiller



30% less energy efficient
Transferred to Plants with high water imbalance



Air Handling Unit for Clean Rooms

Rain-Water overflow

Refill from Reservoir



Megasite Common Water Tank

- Total GHG Impact: 680 MtCo2
- Expected Savings: \$ 100K /Annual
- Investment: \$0.3Mn
- ROI: ~ 3 yrs.



2024-25 Environmental Strategic Funded Project Hopper



SUB BU	Environmental Theme	Project Description	Project Status	Funding Source	Capital Cost (\$k)	Cost Savings (\$k)
CFS	Water	ETP-STP Upgradation (Water Filtration) for achieving Zero Liquid Discharge at site2. Planning		Strategic Environment	133	
CFS	Water	Water Conservation through implementation of water sprinkler for solar cleaning.	0. Not Started - Funding Requested	Strategic Environment	10.67	
CFS	Machinery and Equipment	Optimization of Cooling system in plant to avoid running of main chiller of 135 TR during off days/Shift.	Project Identified	Strategic Environment	10	8
CFS	Power Management	Power quality improvement by Harmonic filter	Project Identified	Strategic Environment		
CFS	Power Management	Admin AC pulled cord for Conference room	Project Identified	Strategic Environment	2	2
CFS	Machinery and Equipment	Kardex Conventional blower replacement with EC plus fan	Project Identified	Strategic Environment	18	4
CFS	Power Management	Solar Street Light	Project Identified	Strategic Environment		3
CFS	Power Management	Light optimization on shop floor	Project Identified	Strategic Environment		2
CFS	Machinery and Equipment	Replacement of conventional motor with Energy Efficient motor	Project Identified	Strategic Environment	18	4
CFS	Water	Xeriscapping Garden Phase 2	Project Identified	Strategic Environment	8	
CFS	Water	Waterless urinal installation	Project Identified	Strategic Environment	6	
CFS	Machinery and Equipment	Energy optimization through Compressed air leakage reduction.	Project Identified	Strategic Environment	1	3
CFS	Machinery and Equipment	Heat pump introduction in durr machine.	Project Identified	Strategic Environment		

Sr.no	Improvement Projects
1	UPS procurement for CES and CFS
2	Inhouse Fabrication .
3	Water bottle dispensor to avoid the Ergo hazards
4	AHU filter Cleaning automation
5	Water Management- Auto filling of Water into the tank .

2024-25 Environmental Strategic Funded Project Hopper



Year	Category	Project Name	Capital Cost	Status
2024	Heating and Cooling	Portable chiller for Nozzle UVA machine.	4,92,360	Quote Received, ROI TBD
2024	Water	ETP-STP Upgradation (Water Filtration) for achieving Zero Liquid Discharge at site	1,09,13,980	RFA Approval is in process
2024	Water	Water Conservation through implementation of water sprinkler for solar cleaning	8,75,580	
2024	Wastewater Management & Reuse	Waterless urinal installation at PCP1 plant washroom	4,92,360	0
2024	Wastewater Management & Reuse	Xeriscapping Garden Phase 2 at PCP 1 plant.	7,38,540	0
2024	Energy - Utilities	Replacement of conventional motor with Energy Efficient motor	6,56,480	RFA Need to raise
2024	Energy - Utilities	Kardex Conventional blower replacement with EC plus fan at PCP1	14,77,080	RFA Approved, PR is in Process
2024	Energy - Utilities	Optimization of Cooling system in plant to avoid running of main chiller of 135 TR during off days/Shift.	7,38,540	RFA Approved, PR is in Process
2024	Fire	Fire Supression system for the Kardex	3,28,240	RFA Approval is in Process
2024	Power Quality	Harmonic filter in Ltside	15,59,140	

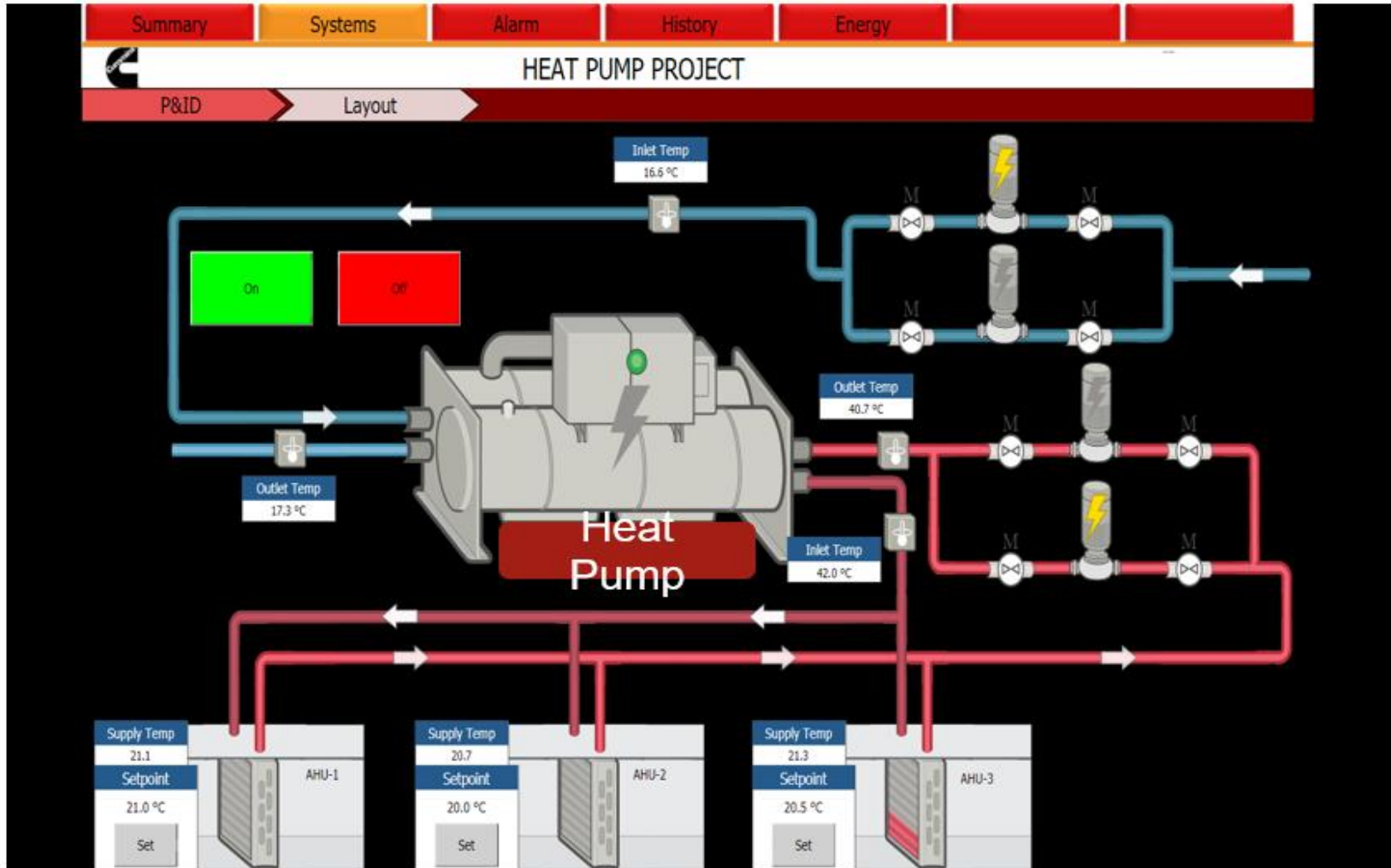
5. Energy Saving Projects Implements in the last Three Years

Energy Saving & GHG Reduction Plan -2023								
SR.no	PROJECT TITLE	Proposed Start Date	Estimated End Date.	INVESTEMENT (INR)	ESTIMATED ANNUAL SAVING	KWH saving	GHG(Mtco2)	Status
1	Replacement of Conventional Blowers of AHU by EC +fans(7 AHUS)	Jun-23	Aug-23	₹ 58,00,000	₹ 23,00,000	2,30,000	195.50	RFA in approval flow
2	Chiller Centralization by replacing Air cooled by Water Cooled Chiller	Jul-23	Aug-23	₹ 3,10,00,000	₹ 80,00,000	8,69,565	739	RFA approved. PR is in approval flow
3	Industrial 4.U-Area wise isolation of Compressed air system and integration with FMS system.	Aug-23	Nov-23	₹ 3,00,000	₹ 70,000	7,609	6	Awaiting for Quotation.
4	Improving the Power Factor quality	Jun-23	Aug-23	₹ 1,50,000	₹ 45,000	4,891	4	Completed -3% reduction
5	Lighting System Modification to reduce Utility Cost .	Apr-22	May-22	₹ 5,00,000	₹ 2,00,000	21,739	18	Completed
Energy Saving & GHG Reduction Plan -2022								
1	Replacement of Conventional Blowers of AHU by EC +fans(3 AHUS)	Oct-22	Nov-22	₹ 42,90,000	₹ 14,30,000	1,55,435	132	Completed
2	700 KW Solar project	Aug-22	Dec-22	₹ 4,57,00,000	₹ 96,00,000	9,60,000	748.80	Completed
Energy Saving & GHG Reduction Plan -2021								
1	Heat Recovery project	Sep-21	Nov-21	₹ 1,30,00,000	₹ 50,00,000	5,43,478	462	Completed.
2	BMS implementation to reduce HVAC consumption.	Mar-21	Apr-21	₹ 22,00,000	₹ 20,00,000	2,17,391	185	Completed.
3	Introdution of IFC controlled in compressed air system to reduce artifical plant air demand.	Oct-21	Nov-21	₹ 7,50,000	₹ 3,39,000	36,848	31	Completed.
4	CD Reduction	Feb-21	Feb-21		₹ 1,00,000	10,870	9	Completed.
Energy Saving & GHG Reduction Plan -2020								
1	991KW Solar project.	Dec-19	Feb-20	₹ 4,51,00,000	₹ 96,00,000	9,08,875	887	Completed.
2	HVAC optimization in clean room	Jun-20	Jun-20	₹ 20,000	₹ 1,50,000	16,304	14	Completed.
Energy Saving & GHG Reduction Plan -2019								
1	Chiller Optimization in Machine shop using Portable chillers in Machining	Apr-19	May-19	₹ 6,59,190	₹ 1,09,685	11,922	10	Completed.
2	Conventional light replacement with LED in Assy shop floor	Oct-19	Dec-19	₹ 9,23,504	₹ 10,99,410	1,01,020	79	Completed.



Eco hopper projects YOY-2023

❖ Heat Recovery System - Operational Schematic Overview



* System has been fully integrated with '**BMS**' platform, to get online Real Data & Operating pattern's Trend Monitoring.

Helping in controlling & Optimization of HVAC's setting Parameters, resulting, reduction in Energy loss.

PROJECT

Reduction in electrical consumption by 42% in AHU by replacement of conventional blower with EC plus fan

PROJECT BACKGROUND

- We have installed 3 Nos EC Plus Blower Fan instead of Conventional Blower at the PCP1 plant.
- Reduce carbon footprint of operations
- Implement Advanced Energy Efficient Technology.
- Reduce per part Consumption.

KEY IMPACT

- Total Green impact in GHG: 113 MtCo2
- Expected Savings: 10.45Lakhs/Annual
- Expected KWH saving-104500/Annual
- Saving (Til Date) – 1.35 Lakhs
- Saving KWh (Til Date)- 13250

PROJECT TEAM

Rohan Dangle, Babu Shinde, Tushar Mulik, Sagar Jagtap, Ram Pradhan, Mrunal Magare, Prashant Waghmare, Tushar Chavare

Innovative Project



PROJECT

Energy Saving through HVAC Optimization

PROJECT BACKGROUND

The PCP-1 plant has more scope for energy saving in CIS Assembly, CIS Assembly and MIW Area, Office & utility Areas. So, our project scope is to review & optimize cost saving in Non-Production Days (NPD) by ensuring existing requirement without affecting the production, quality & safety using energy efficient devices & control system. So that we can make cost effective usage of utility system.

The High-Power Consumption areas identified in PCP-1 Plant in Non-Production Days (NPD) are:

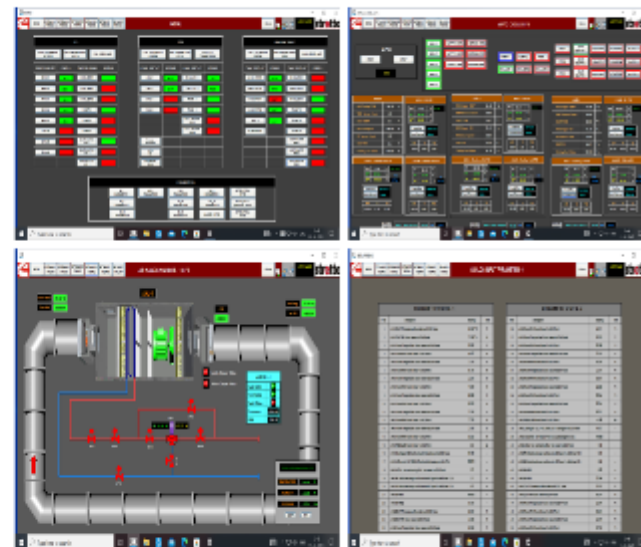
- CFS Assembly-Clean Rooms
- CES Assembly
- MIW Area
- Shop Lighting & Utility

KEY IMPACT

- Total Green impact in GHG: 139 MtCo2
- Savings: 11.03 Lakhs/Annual
- Saving KWh (Til Date)- 1,08,203

PROJECT TEAM

Rohan Dangle, Babu Shinde, Tushar Mulik, Sagar Jagtap, Ram Pradhan, Mrunal Magare, Prashant Waghmare, Tushar Chavare



PROJECT

Compressed air Consumption Reduction through Leakage Reduction

PROJECT BACKGROUND

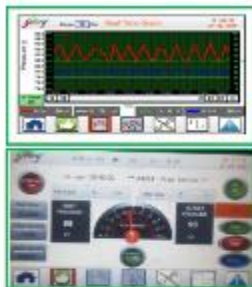
Identifying and addressing air leaks promptly can save industrial setups from wasting air and escalating energy costs. It also optimizes the system's efficiency, ensures the longevity of equipment, and reduces the carbon footprint of the plant.

KEY IMPACT

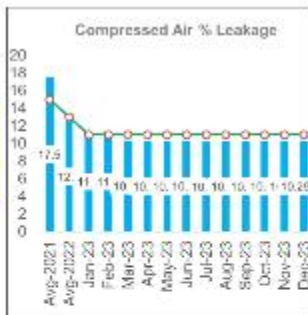
- Total Green Impact in GHG: 81 MtCo2
- Savings: 6.85 Lakhs/Annual
- Saving KWh (Til Date)-57,000

PROJECT TEAM

Rohan Dangle, Babu Shinde, Tushar Mulik, Sagar Jagtap, Ram Pradhan, Mrunal Magare, Prashant Waghmare, Tushar Chavare



100% Non Controller installed to reduce compressed air pressure at machine shop



Estimating Leak with Load/Unload Controls



Compressed Air Leakage Test



DESCRIPTION

CONTINUAL IMPROVEMENT PROJECT 1: Reduced Electrical Power Consumption by installing motion Sensors.

Innovation Type		Environmental benefit				
Process	Design	Energy	Carbon	Water	Toxicity	Material
Project Background	1. As per our 2030 goal we required reduce Energy and GHG Consumption. 2. Electricity consumption is high at CES Washroom and AHU room area, LED lights found ON condition by 24 Hrs. 3. So we installed Motion sensors at below location and save electricity . (SUDU washroom, CES & MIW AHU room).					
Project Timeline	Project Timeline: Plan (June - 2023) to Execution (June - 2021)	Sustainability: Highly Sustainable ✓	Replicability: Highly Replicable! Can be replicated in CES washroom ✓	The Benefits!		
				1. Annual Electricity Savings! : 40692 INR		
				Annual GHG TCO2e Savings! : 3114		
				Team-Tushar, Sagar, Babu, Ram, Mrunal		

Project Background

- As per our 2030 goal we required reduce Energy and GHG Consumption.
- Electricity consumption is high at CES Washroom and AHU room area, LED lights found ON condition by 24 Hrs.
- So we installed Motion sensors at below location and save electricity .
(SUDU washroom, CES & MIW AHU room).

Project Timeline

Project Timeline	Ideation (Start)	Execution (End)
Plan	June - 2023	June - 2021

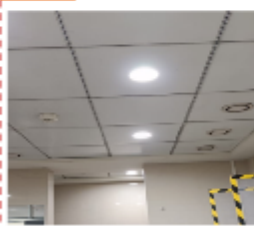
Sustainability

Highly Sustainable ✓

Replicability

Highly Replicable! Can be replicated in CES washroom ✓

Before



Total 12 LED is ON 24 hrs in this area , Total Kw-17

After



So we installed Motion sensors to this area , so LED ON only 8 Hrs mostly .

Total 12 LED at this room.
Total watt-691 & On 24 hrs.
Total daily Cons.-691 X 24.
Total KWH /Day-16.58.
Monthly cost /KWH-5074 INR

Total 12 LED at this room.
Total watt-691 & On 8 hrs.
Total daily Cons.-691 X 8.
Total KWH /Day-5.5.
Monthly cost /KWH-1683 INR.

Monthly Saving-3391 INR

Team-Tushar, Sagar, Babu, Ram, Mrunal

6. Innovative Projects Implemented

CONTINUAL IMPROVEMENT PROJECT 4: HVAC Energy Saving with BMS without quality compromise IE Credit 2

Innovation Type		Environmental benefit				
Process	Design	Energy	Carbon	Water	Toxicity	Material

Project Background

- Design stable BMS system to monitor & track the HVAC properly to reduce production down time.
- Build a communicable eco-system with SCADA for HVAC optimization & Energy Savings.
- Areas Implemented - MIW Area • CES Assembly Area • CFS Assembly Area
- Provision of Alarm Indicators for showing abnormal & highest priority situations – Increase in operator awareness

Project Timeline

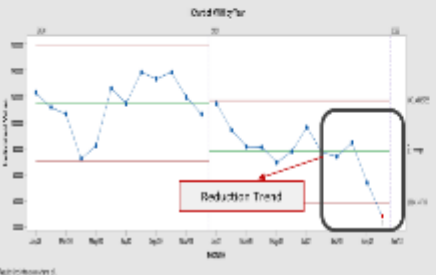

Project Timeline	Ideation (Start)	Execution (End)
Plan	Oct - 2021	Jan - 2022

Sustainability ✓
Highly sustainable system. Helps in the optimization of HVAC.

Replicability ✓
It can be replicated where ETP / STP / OS water tanks.

The Benefits!

- Annual Cost Savings: **₹ 20,00,000**
- Annual Energy Savings: **2,17,391 kWh**
- Annual GHG Reduction: **185 CO2 Mt/yr**
- Increased production Efficiency.
- Simplified Operator Experience.

CONTINUAL IMPROVEMENT PROJECT 7: Installation of LEDs – Replacing all T5 lights in PCP-1 IE Credit 2

Innovation Type		Environmental benefit				
Process	Design	Energy	Carbon	Water	Toxicity	Material

Project Background

- Replacement of conventional T5 lights with the LED gives us tremendous electricity consumption saving
- Provides better illumination.
- Greater Aging more than 5+ years for its lasting.
- Low cost in maintenance

Project Timeline

Project Timeline	Ideation (Start)	Execution (End)
Plan	Oct - 2019	Dec - 2019

Sustainability ✓
Light/Sustainable

Replicability ✓
Highly Replicable Any plant in the world


The Benefits!

- Annual Energy Savings: **1,01,020 kWh**
- Annual CO2 Reduction: **79 Mt**
- Annual Cost Savings: **₹ 10,99,410**

ROI - 10months!

The REASONS:

- 84 Shop provided for employees
- Provision of 244 Personal lockers for safe savings of shoes



Innovative Project

PROJECT 16 : Replacement of Conventional Blowers with EC Plus Fan IE Credit 2

Innovation Type		Environmental benefit				
Process	Design	Energy	Carbon	Water	Toxicity	Material

Project Background

- PCP-1 uses AHU system – heavy energy consumption demand (25% plant energy requirements).
- AHU System (Clean Room Plant) implemented solar power plant of 1MW in 2019. Harnessing solar power is only limited to daytime, site HVAC's (50% electricity) demand is 24x7 Irrespective of plant operation.
- Highly deployable at any size Cummins & Non-Cummins with AHU facility.

Project Timeline

Project Timeline	Ideation (Start)	Execution (End)
Plan	Mar - 2022	Jan - 2023

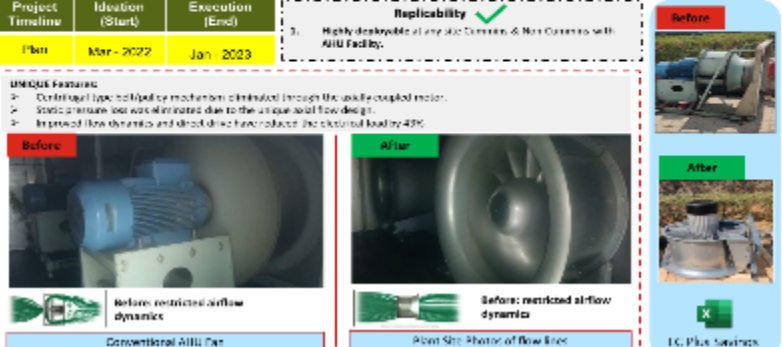
Replicability ✓
Highly deployable at any size Cummins & Non-Cummins with AHU facility.

The Benefits!

- Annual Energy Savings: **3,85,435 KWH!**
- Annual CO2 Reduction: **113 mt/annum**
- Annual Cost Savings: **₹ 37,30,000**

UNIQUE FEATURES:

- Combinatorial type of flow mechanism eliminated through the axially coupled motor.
- Static pressure loss was eliminated due to the unique axial flow design.
- Improved flow dynamics and broad flow characteristics. The internal loss by 40%.



CONTINUAL IMPROVEMENT PROJECT 8 : Savings through introduction of CES Reuse Guidelines IE Credit 2

Innovation Type		Environmental benefit				
Process	Design	Energy	Carbon	Water	Toxicity	Material

Project Background

- As CES line(SU & DU Line) is introduced for Production due to some RFT loss and these parts are rejected & parts are directly to be scrapped.
- To avoid the Environment getting effected due to the scrap of the parts, this project was taken to introduce the Reuse Guidelines/Strategy which helped in reducing the Scrap Exposure & brought savings to the organization as parts are being reused as a fresh parts.

Project Timeline

Project Timeline	Ideation (Start)	Execution (End)
Plan	Jan - 2021	Aug - 2021

Replicability ✓
Similar process being developed for the other Models in the line U.2.0 Customer


The Benefits!

- Total Energy Savings: **55156.11 Kwh**
- Total CO2 Reduction: **21203.5 Kgs**
- Total Water Savings: **7422.71**
- Annual Cost Savings: **₹ 8,32,33,446**

UNIQUE FEATURES:

- High Scrap is reduced
- Overall Carbon content is reduced to scrap produced
- Improved process of those the parts after demanding the line required components

NO Process



CONTINUAL IMPROVEMENT PROJECT 6: Reduce Fresh Water – Replace with AHU Condensate Water IE Credit 2

Innovation Type			Environmental benefit				
Process	Design		Energy	Carbon	Water	Toxicity	Material

Project Background

- Fresh water was earlier used for Floor Cleaning, AHU Filter Cleaning and Chiller Cleaning
- Replaced with AHU Condensate water.
- The pipeline was modified, and storage tank provided to reuse condensate water in AHU to the process pipelines.
- 3 process of freshwater reduction: • Floor Cleaning • AHU Filter Cleaning • Chiller Cleaning

Project Timeline


Project Timeline	Location (Start)	Execution (End)
Plan	Jan – 2023	Feb – 2023

Sustainability
✔
 Highly Sustainable

Replicability
✔
 Highly Replicable Can be replicated in all sites with AHU.

The Benefits!

- Annual Water Savings! :
168KL
- Reduction of Fresh Water Usage in 3 Areas!
 - Floor Cleaning
 - AHU Filter Cleaning
 - Chiller Cleaning



Commins | 33

CONTINUAL IMPROVEMENT PROJECT 1: Reduced Electrical Power Consumption by blower Automation through Motion sensor.

Innovation Type			Environmental benefit				
Process	Design		Energy	Carbon	Water	Toxicity	Material

Project Background

- As per our 2030 goal we required reduce Energy and GHG Consumption.
- Electricity consumption is high at Washroom area due to Air Blower is Running 24 Hrs due to fresh air circulation.
- So we interlocking this blower operation to the motion sensor, when motion sensor is activated then Blower will be ON and we save electricity consumption.

Project Timeline

Project Timeline	Location (Start)	Execution (End)
Plan	Sep – 2023	Sep – 2023

Sustainability
✔
 Highly Sustainable



Replicability
✔
 Highly Replicable Can be replicated in CES Washroom.

The Benefits!

- Annual Electricity Savings! :
128000 INR
- Annual GHG TCO_{2e} Savings!
96.59

Before Implementation

After Implementation

Before Implementation

2 Blower is ON at this room 24 hrs.
 Total -3.44Kwatt- On 24 hrs.
 Total daily Cons.- 3.44X 24.
 Total KWH /Day-82.56.
 Monthly cost /KWH-21465 INR

After Implementation

2 Blower is ON at this room 12 hrs.
 Total -3.44Kwatt- On 12 hrs.
 Total daily Cons.- 3.44X 12.
 Total KWH /Day-41.28.
 Monthly cost /KWH-10732 INR

Monthly Saving-10732 INR

Team-Tushar, Sagar, Bapu,Mrunal

IMPROVEMENT PROJECT 3 : Installation of IFC (Intelligence Flow Controller) System

Innovation Type			Environmental benefit				
Process	Design		Energy	Carbon	Water	Toxicity	Material

Project Background

- The IFC controls the airflow & pressure being delivered. Thus, it reduces artificial demand in the Plant.
- During heavy or light operation in the plant, the IFC helps to regulate the airflow & pressure according to the requirement.
- It saves energy by 4 to 25% in the existing compressed air network through a reduction in the artificial plant air demand.
- It improves pneumatic equipment performance with constant air pressure.

Project Timeline

Project Timeline	Location (Start)	Execution (End)
Plan	Oct- 2021	Nov- 2021


Replicability
✔
 Highly Deployable Can be replicated in any plant with Air Compressor.

The Benefits!

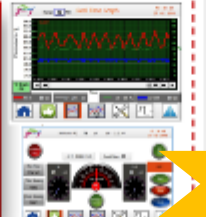
- Annual Energy Savings:
36,848 KWH
- Annual CO₂ Reduction:
31 mt/annum
- Annual Cost Savings:
₹ 3,39,000

ROI
2.5
Years

Innovative Project



Plant site display of IFC implementation



Digital Display of IFC

UNIQUE Features:

- Displays the real time pressure outlet of inlet and outlet, % opening of flow control modes.
- Displays the run hours and service due hours.

CONTINUAL IMPROVEMENT PROJECT 1: Reduce Electricity consumption by fixing duct insulation of Compressor.

Innovation Type			Environmental benefit				
Process	Design		Energy	Carbon	Water	Toxicity	Material

Project Background

- Initially there is no insulation for compressors ducting system so to reduce the air leakage we have provided Insulation to existing Ducts.
- For Working condition room temperature is not within limit so we minimize the temperature at compressor room.

Project Timeline

Project Timeline	Location (Start)	Execution (End)
Plan	Aug – 2023	Aug – 2023

Sustainability
✔
 Highly Sustainable



Replicability
 NA

The Benefits!

- Reduced Electrical Consumption as well as minimize the air leakage trend.
- Minimize the room temperature for working condition

Before

After

Team Member- Ram Pradhan, Bapu shinde, Mrunal Magare, Sagar JAGATAP, Tushar Mulik.

CONTINUAL IMPROVEMENT PROJECT 1: HVAC Operational cost reduction by UV Filming at PCP-1.

Innovation Type		Environmental benefit				
Process	Design	Energy	Carbon	Water	Toxicity	Material

Project Background

1. Increasing monitoring/optimization to Reduce extra loading of HVAC system. & Window UV Filming to reduce Heat load. Plant HVAC optimization with load balancing & improving standard parameter set.
2. HVAC leakages arrested.
3. CHiller set point set to higher.
4. Windows UV Filming

Project Timeline

Project Timeline	Ideation (Start)	Execution (End)
Plan	Sep - 2021	Sep - 2023



Before Implementation



After Implementation

The Benefits!

1. Annual Electricity Savings! :

3,23,000 INR

Vikey Ghorpade

CONTINUAL IMPROVEMENT PROJECT 1: Cost saving on power consumption reducing by using Sub- Zero controller to indoor AC units

Innovation Type		Environmental benefit				
Process	Design	Energy	Carbon	Water	Toxicity	Material

Project Background

1. AC's continuously on at lowest temperature set points, so power consumption was high.
2. AC compressor continuously on load, so consumption was increases and compressor life decreases.

Using Sub- zero controllers set point fixed at suitable temperature and get compressor at loading and un-loading conditions. So, power saving done and decreases break-downs and increases life of compressor.

Project Timeline

Project Timeline	Ideation (Start)	Execution (End)
Plan	OCT - 2021	NOV - 2021



Before Implementation



After Implementation

The Benefits!

- Annual Electricity Savings in kwh

24794.08 kwh

- Annual Electricity Saving in INR

297528.94 INR

Team-Mrunal ,Sagar.

CONTINUAL IMPROVEMENT PROJECT 1: Right First Time (RFT) Improvement - Pump line 65% to 90% and above

Innovation Type		Environmental benefit				
Process	Design	Energy	Carbon	Water	Toxicity	Material

Project Background

1. PCP-1 pump line RFT was 64% in 2021 due to low Right First Time (RFT) we are ran extra shifts in outside cleanroom and Both EO's are in same states, issue is in Rated RPM test pumps required to run 2 to 3 time to pass.
2. We have conducted multiples actions with DOEs and identified, No issue in parts design
3. Then we have decided to improve machine performance and efficiency through 6sigma project.

Project Timeline

Project Timeline	Ideation (Start)	Execution (End)
Plan	Mar - 2022	Oct - 2023

Sustainability

In 2023 - RFT in pump line above 95% & per 4 months we have sustained more than 95%.

Replicability

It is a unique solution to the specific problem statement.

The Benefits!

1. Annual Energy Savings:
68230.8KWH!

2. Annual Oil (Calibol & Lube oil) Reduction:

1575 ltrs

3. Annual Materials Savings:

600 kgs

4. Annual Cost Savings:

Approx. 12 to 15 lacs

Cummins | 2

IMPROVEMENT PROJECT 14: Elimination of Argon Gas for DU Laser Welding

Innovation Type		Environmental benefit					
Process	Design	Energy	Carbon	Water	Toxicity	Waste	Material

Project Background

1. Argon Gas is being used for shielding on Laser welding
2. Argon Gas has been installed in PCP1 plant in Dec-2019 for B5VI Laser welding application
3. This is used in both lines DU1 & DU2 lines for 10 nos of weld joints

Project Timeline

Project Timeline	Ideation (Start)	Execution (End)
Plan	Sep - 2019	Dec-2019

Replicability

Depends on Welding Quality requirement

Details:

- > Welding trial taken without Argon Gas and it is not having any impact on weld Quality
- > Approx. Argon Gas Saving per Doser :- 3 L
- > This elimination of Argon Gas reduced maintenance of Argon Gas system, transportation & material handling of Gas bank/cylinders
- > Argon Gas saving per annum :- 360,000 L (360 Cubic meter)
- > Cost saving per annum :- 360 * 125 = INR 45,000

The Benefits!

1. Annual Argon Gas Reduction

360KL

2. Annual Cost Savings:

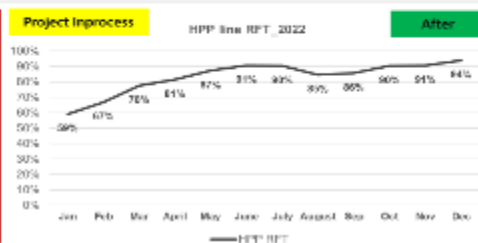
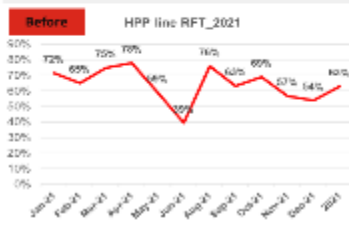
₹45,000



The Welding Machine which used Argon Gas

Cummins | 3

1. we have saved extra shifts run in outside clean room.
2. Saving of oil consumption (calibol and lube oil)
3. Machine parts and fixture tools damages are reduced (Pallet damages).



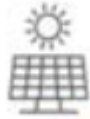
7 (a) Utilization of Renewable Energy Sources (Onsite)

❖ Renewable Energy-Phased Adaptation (Solar Systems)

Phase III (Future Plan)
PCP-1 to Megasite Main Gate Pathway

Phase I
991 kWp
Main Plant-Roof Top, Admin Terrace, Scrap Yard, Parking Area
In Operation from Dec-19

Phase II
700 kWp
Parking Area, Megasite Material Gate Pathway, Utility Roof Top, Compressor Backside
In Operation from Jan-23



Renewable Energy Sources (Onsite)- Budget Plan and Spent



❖ Solar Panel Installation on Pedestrian Walkway Area :



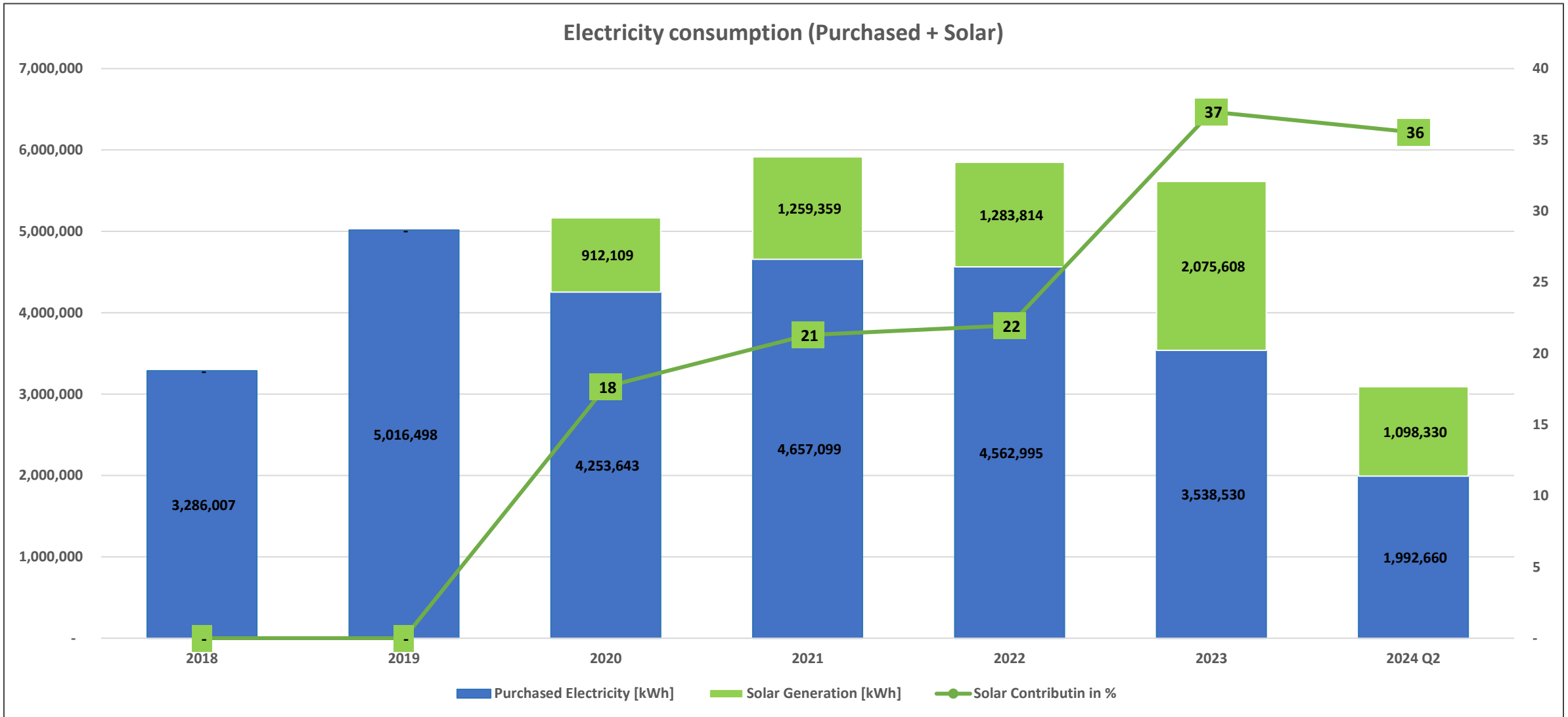
❖ Solar Panel Installation on Carport Roof :



Year	Sum of Investment approved Capital Cost (INR).	Energy Saving in KWh	Cost Reduction in (INR) ₹	MTCO2 Reduction
2020	5,71,28,260	46,45,381	3,48,40,357	78%
2022	4,71,00,000	8,30,838	62,31,285	97%
Grand Total	10,42,28,260	54,76,219	4,10,71,642	88%

On-site Renewable Energy Generation

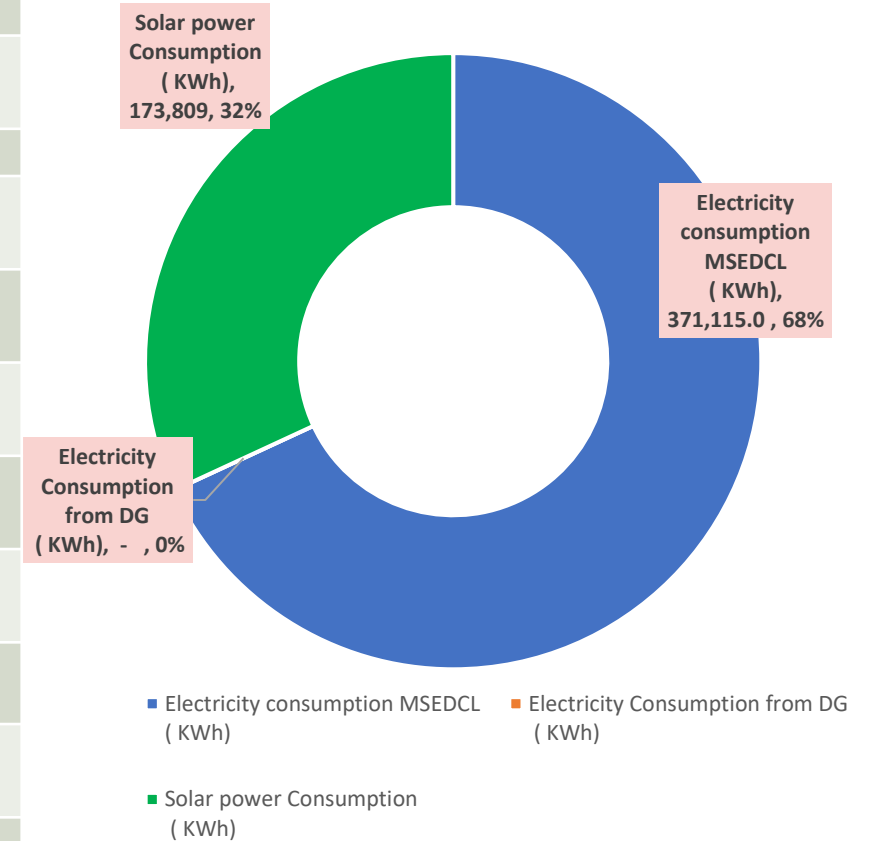
Electricity consumption (Purchased + Solar)



Solar Green Power Generation Highlights-

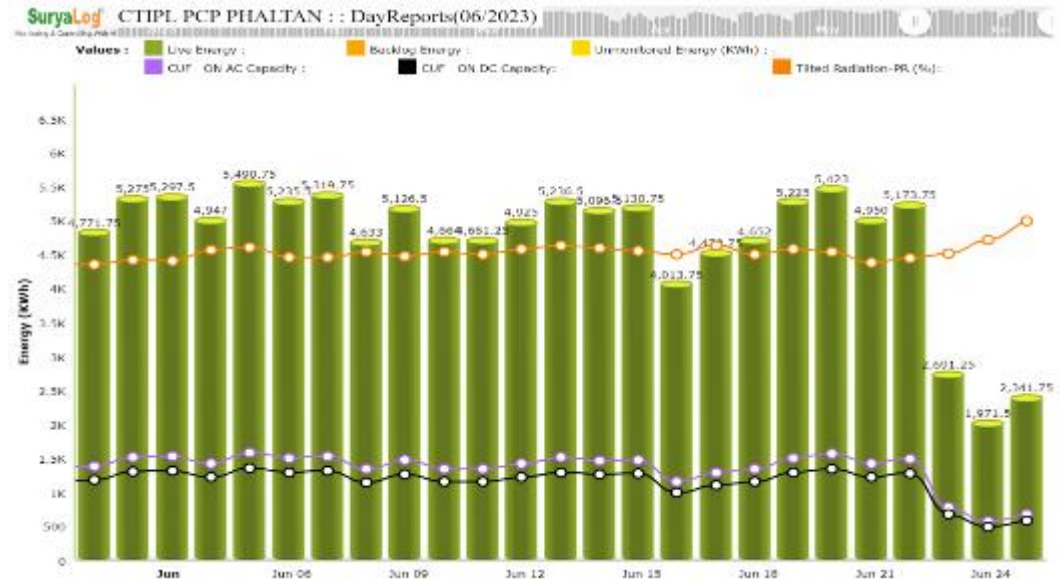
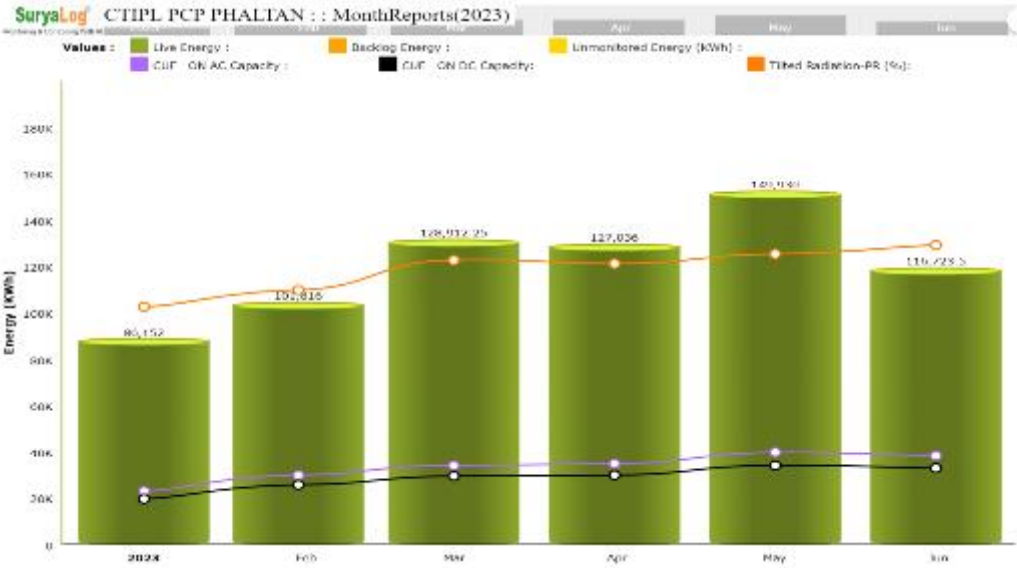
	Description	Phase I	Phase II	Total
Basics	Capacity (kWp)	991	708	1699
	Commissioned In	Jun-20	Jan-23	
	Expected Break-even (Payback)	May-25	Dec-28	
KPI's	Generation for the month (kWh)	1,02,091	71,718	1,73,810
	Performance Ratio %	52%	49%	50.5%
	Entitlement Vs Actual %	82%	89%	85%
	Specific Power Generation kWh/kWp	103	102	102.5
	Plant Up Time % (Availability)	100	100	100
Performance	2024 Generation (kWh)	4,60,730	2,88,091	7,48,820
	2024 cost saving INR Lakhs	34.60	21.60	56.16
	2024 GHG Reduction (MTCO2e)	64.20	41.76	106
	Capital Investment in (INR)	4,51,00,000	4,57,26,474	
	Total Generation (KWh)	49,54,135	10,26,845	
	ROI (INR)	3,71,56,009	76,98,637	
	ROI (%)	82.3	16.8	

Monthly Electricity Balance



Note : As per Finance guidelines unit rate considered by deducting Rs. 2.5/kWh on account of depreciation, AMC & insurance cost in monthly landed MSEDCL per unit cost.

Monitoring System



Cummins PCP Plant

Cummins PCP Plant

Monthly overall consumption

Category	Percentage
PCP Phase B Total Energy (No In Load 370V)	31.7%
PCP Phase B Total Energy (In Load 370V)	33.4%
PCP Phase B Total Energy (No In Load 370V)	34.9%

CFS Assembly shop

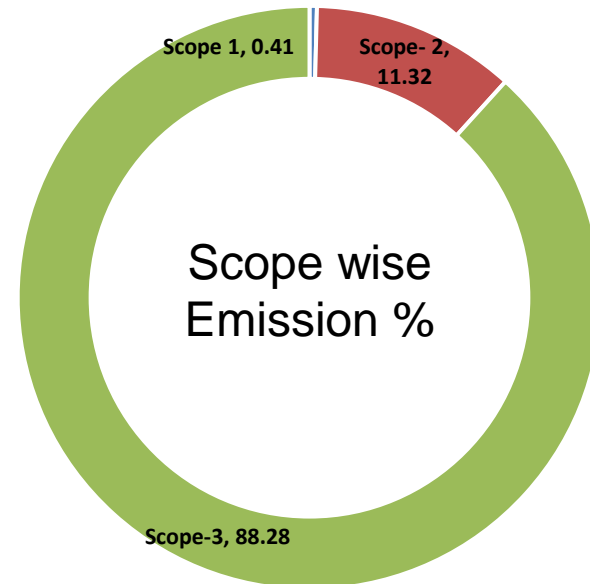
Category	Percentage
ASSEMBLY SHOP (NO IN LOAD 370V)	18.0%
ASSEMBLY SHOP (IN LOAD 370V)	12.0%
ASSEMBLY SHOP (NO IN LOAD 370V)	12.0%
ASSEMBLY SHOP (IN LOAD 370V)	12.0%
ASSEMBLY SHOP (NO IN LOAD 370V)	12.0%
ASSEMBLY SHOP (IN LOAD 370V)	12.0%
ASSEMBLY SHOP (NO IN LOAD 370V)	12.0%
ASSEMBLY SHOP (IN LOAD 370V)	12.0%

7 (b) Utilization of Renewable Energy Sources (Off site)

Regional Facility Team Working on off Site Renewable accessibility and sources.

8: GHG Inventorization

	Scope -01				Scope-02		Scope-03				
	Diesel Fuel Oil Emissions [T CO2e]	Refrigerant Emission [T CO2e]	Fire Extinguisher Emissions [T CO2e]	Total	Purchased Electricity Emission [T CO2e]	Total Gross Emissions [T CO2e]	Direct/ Core Material GHG Emission CO2e	Bus	Business Travel	Hazardous waste	Total GHG Emission TCO2e
2019	33.71	419	0.018	452.728	3632.59	4538	32141	336	7	0.0	32484
2020	28.62	0.07	0.0225	28.7125	3197.77	3255	18017	439	8	0.0	18464
2021	15.61	0.55	0.0225	16.1825	3380.94	3413	35835	679	19	0.0	36533
2022	18.2	21.45	0.027	39.677	3004.37	3084	28517	398	0	0.0	28915
2023Q 1	1	0.97	0	1.97	625.71	630	0	0	0	0	0





GHG Management system.

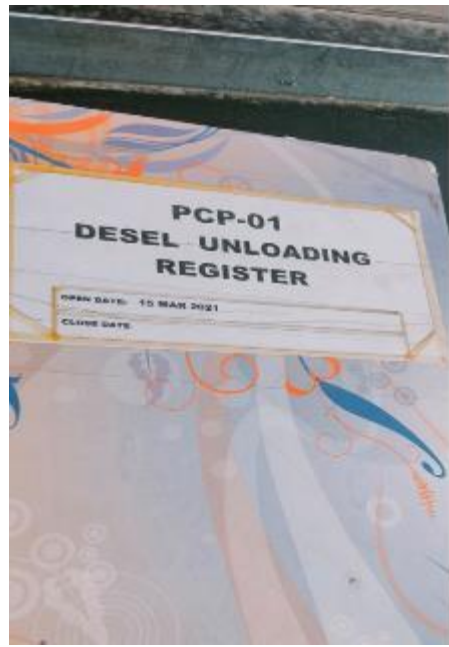
Scope -01 Monitoring system

1

Sl No	Date	Start time	Stop time	Total Run Hrs	Sl. No	Serial No	Initial Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)
1	20/01/21	12:30 PM	01:25 PM	1.05 hours	000001	850 km	8848.07	650	8854.57	850	8854.57	850	8854.57	850	8854.57
2	18/01/21	1:28 PM	2:10	43 min	000001	960 km	3024.45	900 km	3054.95	900 km	3054.95	900 km	3054.95	900 km	3054.95
3	21/01/21	5:44 AM	7:10 AM	1:26 min	000001	830 km	3356.98	800 km	3370.78	800 km	3370.78	800 km	3370.78	800 km	3370.78
4	21/01/21	6:15 PM	8:34 PM	2:22 min	000001	800 km	3470.78	800 km	3470.78	800 km	3470.78	800 km	3470.78	800 km	3470.78
5	20/01/21	05:00	05:45	45 min	000001	850 km	4160.78	800 km	4160.78	800 km	4160.78	800 km	4160.78	800 km	4160.78

2

Sl No	Date	Start time	Stop time	Total Run Hrs	Sl. No	Serial No	Initial Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)	Final Reading (km)
1	20/01/21	12:30 PM	01:25 PM	1.05 hours	000001	850 km	8848.07	650	8854.57	850	8854.57	850	8854.57	850	8854.57



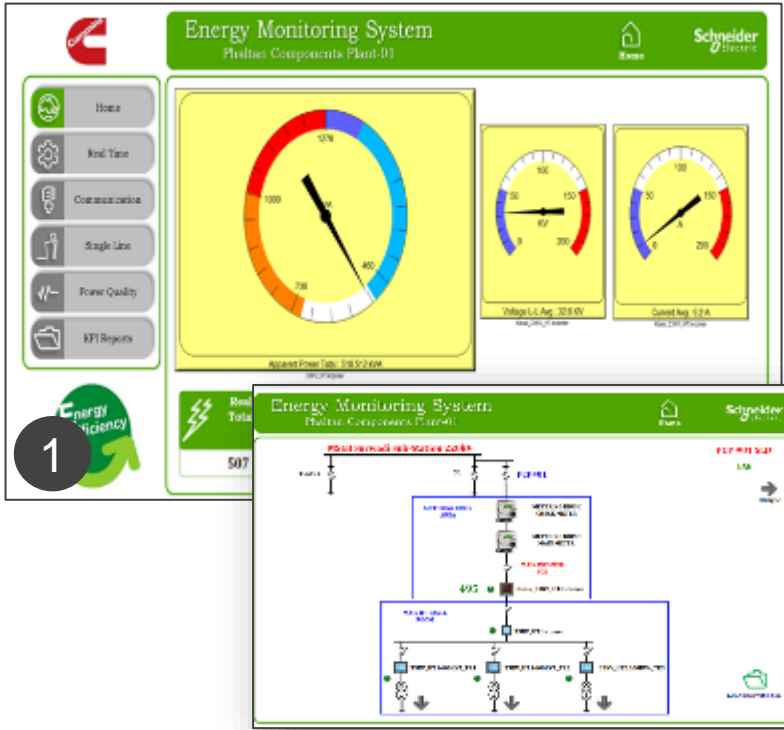
Register followed by tracking DG Consumption .

Security Team maintain register for tracking Diesel unloading.

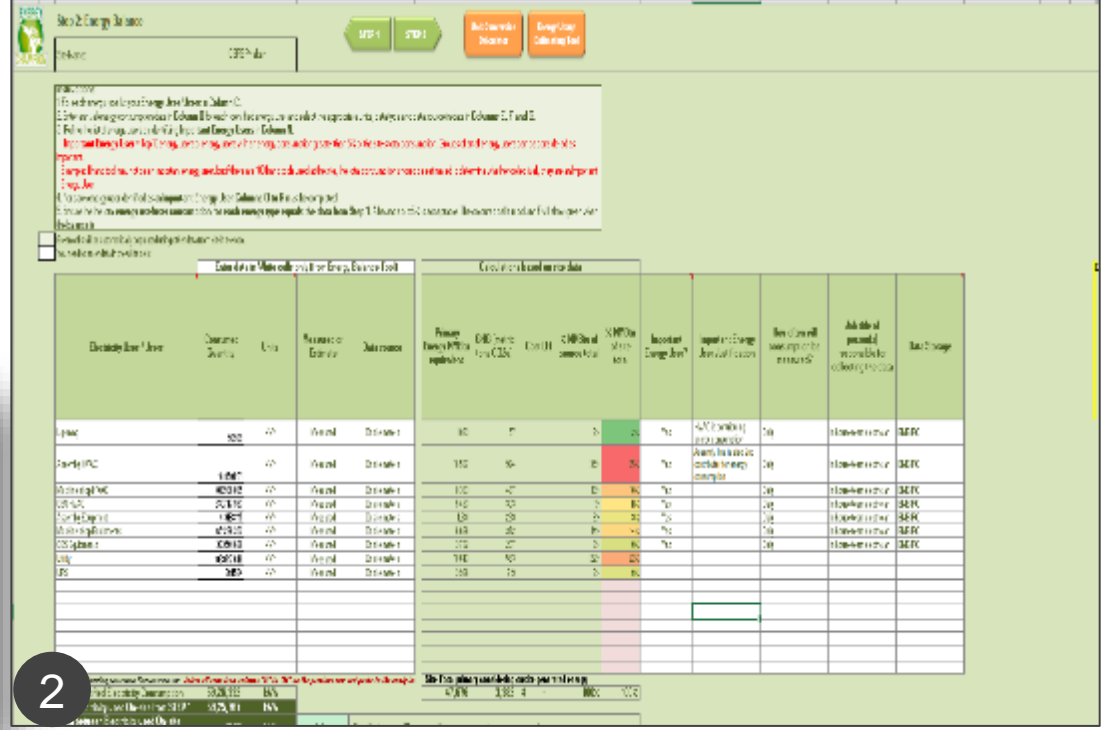


GHG Management system.

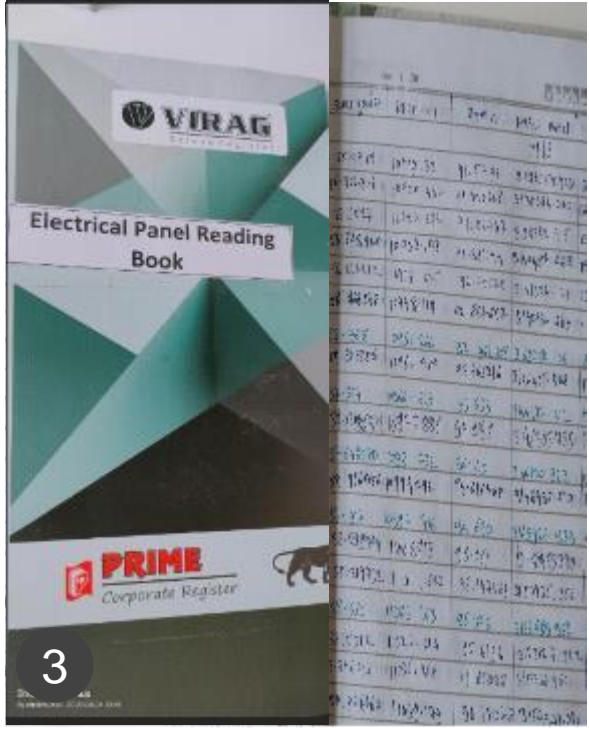
Scope -02 Monitoring system



PCP-01 Site have EMS system to Monitoring Electrical consumption .

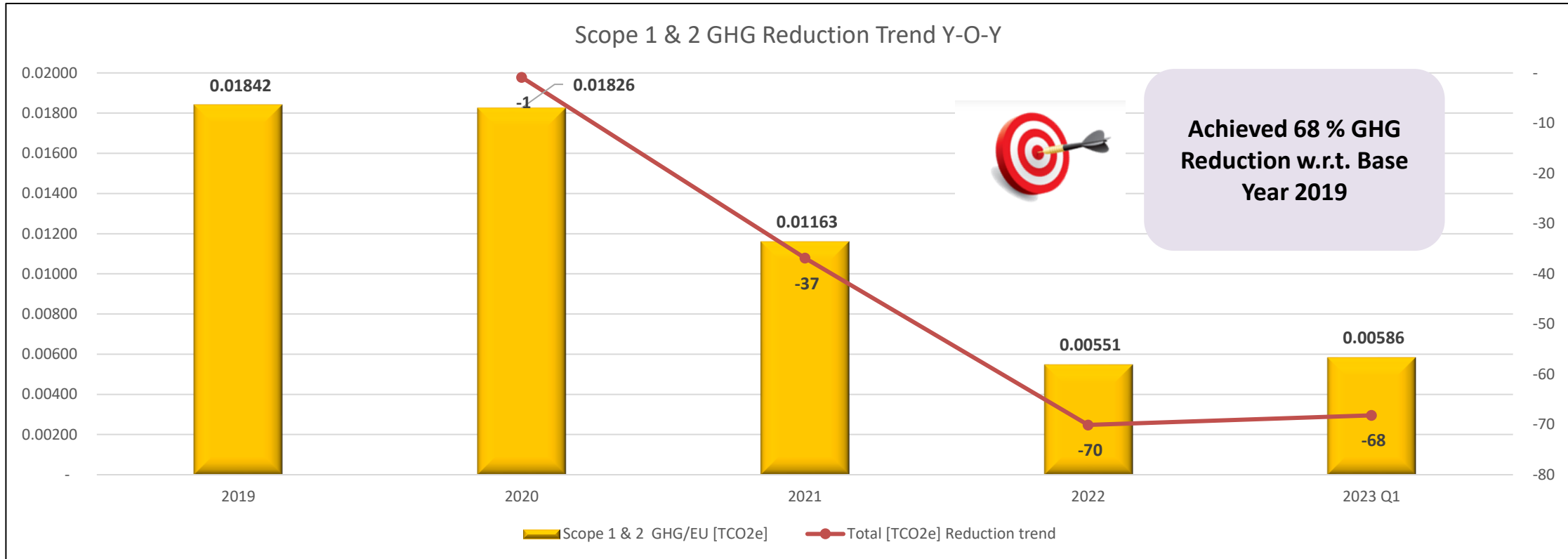


Corporate Energy Review tool : Data Analysis (Integrated Approach)



Register Followed for monitoring electrical reding on daily basis.

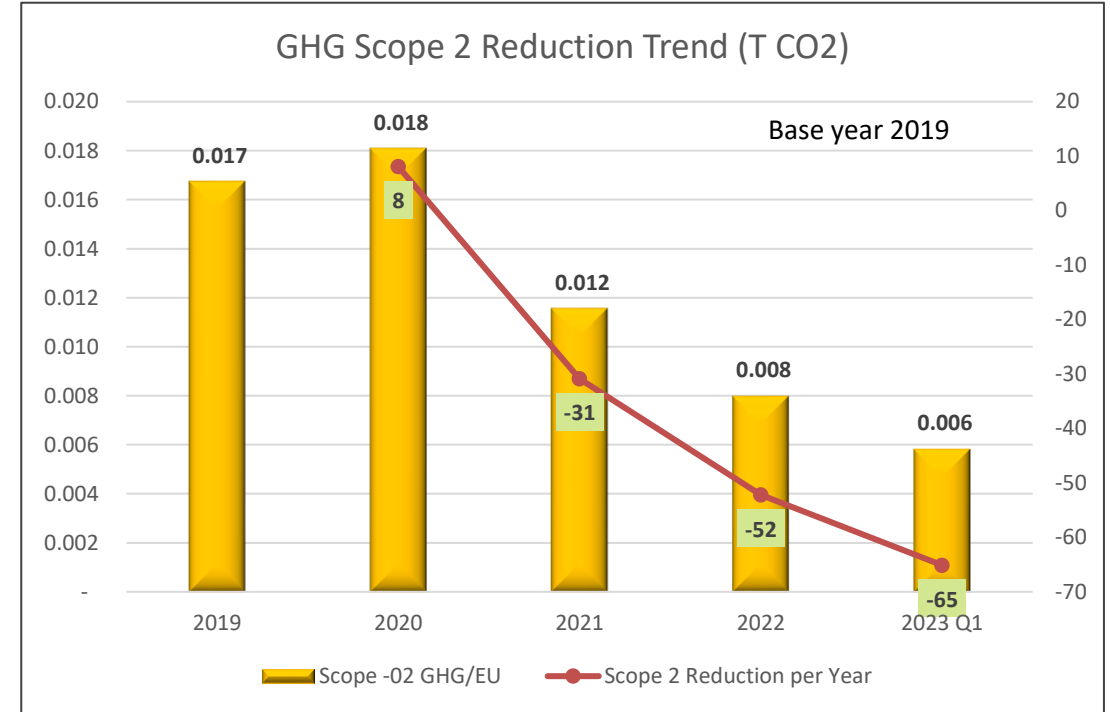
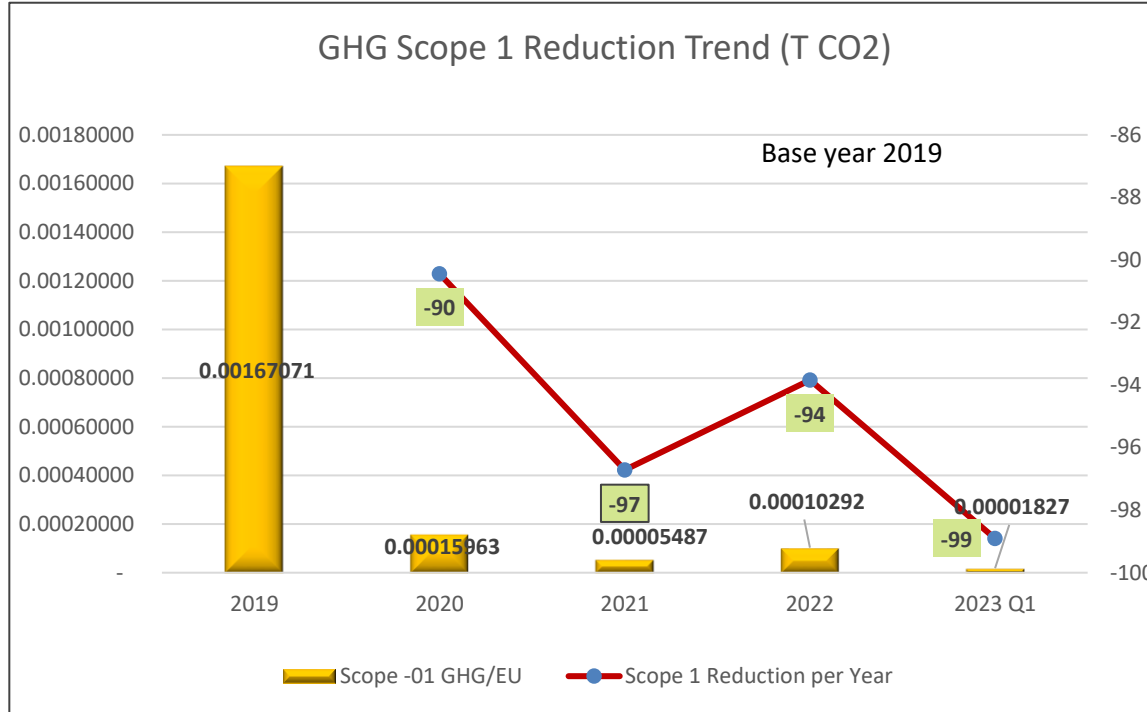
GHG Emission Intensity Reduction



PCP-01 Site have total 68 % Reduction on GHG Scope 1 & 2 with considering baseline 2019.

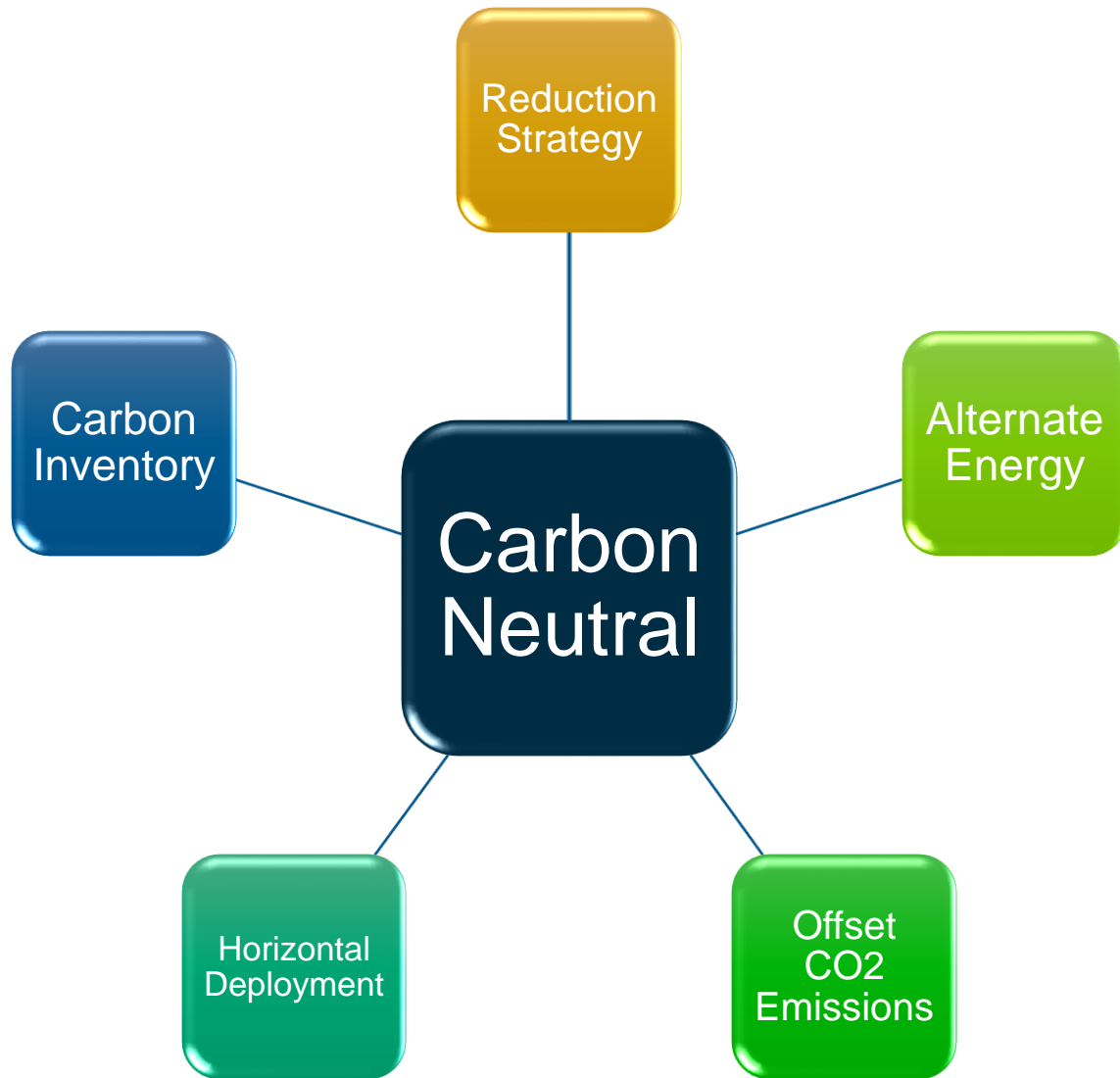


GHG Emission Intensity Reduction



Year	Scope 1 (DG & Refrigeration)[T CO2e]	EU	Scope -01 GHG/EU	Scope 1 Reduction per Year
2019	452.728	270,974	0.00167071	
2020	28.71	179,856	0.00015963	-90
2021	16.11	294,886	0.00005487	-97
2022	39.67	385,463	0.00010292	-94
2023 Q1	1.97	107,818	0.00001827	-99

Year	Scope2 Electricity [T CO2e]	EU	GHG/EU	Reduction per Year
2019	3632.59	270,974	0.017	
2020	3197.77	179,856	0.018	8
2021	3380.94	294,886	0.012	-31
2022	3004.37	385,463	0.008	-52
2023 Q1	625.71	107,818	0.006	-65



- 1** Where does our organization's consumption of energy take place?
- 2** How to reduce the use of energy within our organization?
- 3** How can we generate renewable energy?
- 4** Offset those CO2 emissions which cannot be eliminated yet.
- 5** Communicate taken steps with stakeholders.

Carbon Inventory

- 1) Inventories Scope 1, scope 2 and scope 3 GHG emissions : 2019
- 2) Calculation carbon sinks created through afforestation : 2019

Reduction Strategy

- 1) Partner with supplier for scope 3 emission reduction by 10% : 2019
- 2) Identify opportunities for in-house GHG source reduction by 5% : 2019
- 3) Increase green cover by 10% : 2019

Alternate Energy

- 1) Additional solar power generation of 1.6 MW to reduce GHG emission : 2020





Carbon Neutral Approach

Carbon Sequestration/Neutral Approach (Calculation with Cumulative no. of trees)

	2019 TCO2e	2020 TCO2e	2021 TCO2e	2022 TCO2e	2023 Q2 TCO2e
Absolute GHG Emissions from scope-01 Sources	452.72	28.71	16.18	39.67	1.97
Absolute GHG Emissions from scope-02 Sources	4538	3255	3413	3084	630
Net Emission (A).	4991	3284	3429	3124	2528
Through Renewable Energy Sources	0	718	995	1035	776
Through Plantation Activity	9.56	20.98	30.54	39.98	47.78
Emission Avoided (E).	10	739	1025	1075	824
Total	4981	2545	2404	2049	1704
% Carbon Sequestration .(E/A).	0%	23%	30%	34%	33%

Carbon Sequestration/Neutral Approach (Calculation with actual no. of trees)

	2019 TCO2e	2020 TCO2e	2021 TCO2e	2022 TCO2e	2023 Q2 TCO2e
Absolute GHG Emissions from scope-01 Sources	452.72	28.71	16.18	39.67	1.97
Absolute GHG Emissions from scope-02 Sources	4538	3255	3413	3084	630
Net Emission (A).	4991	3284	3429	3124	2528
Through Renewable Energy Sources	0	718	995	1035	776
Through Plantation Activity	5.66	7.53	5.66	5.54	3.9
Emission Avoided (E).	6	726	1001	1041	780
Total	4985	2558	2429	2083	1748
% Carbon Sequestration .(E/A).	0%	22%	29%	33%	31%

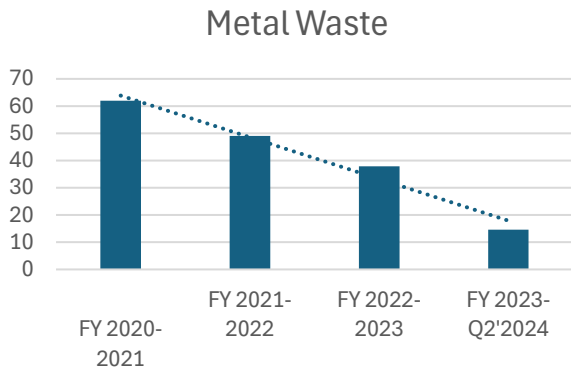


9:Waste Utilization & Management

Waste Generation in PCP-1						
Sr.No	Type of Waste Generated	FY 2020-2021	FY 2021-2022	FY 2022-2023	FY 2023-Q2'2024	Disposal Method
1	Metal Waste	61.98	49.066	37.865	14.64	Recycle to Authorized Vendor
2	Paper Waste	0.12949	0.19751	0.32724	0.1449	Recycled to Authorized Vendor
3	Plastic Waste	17.76	17.385	34.78	23.4	Recycle to Authorized Vendor
4	Wooden Scrap	48.835	44.57	50.27	14.96	Recycle to Authorized Vendor
5	Corrugated Waste	49.525	52.925	53.37	26.01	Recycle to Authorized Vendor
6	Other Recycled waste	25.85	34.595	19.24	4.44	Recycle to Authorized Vendor
7	Recycled Hazardous waste	0	1.2145	1.583	0.935	Recycled to Authorized Vendor

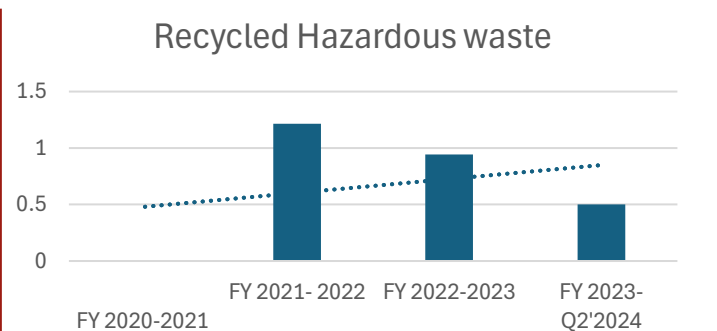


Waste Storage Area



61% ↓

Decrease in Metal Scrap generation



77% ↑

Increase in recycling of waste

10 : Green Supply Chain Management

The Suppliers portal for detailed communication in Expectations

Supplier Portal

Supplier Portal | English (United States) | Pages | default

Welcome to Supplier Portal

My Business Applications

News & Announcements

Supplier Recognition

Procurement Organization

Supplier Webcasts

Corporate Responsibility

Environmental Stewardship

Business Resilience

Supplier Diversity

Supplier Payments

Standards & Processes

Shipping

Mexico

Recent

Company News

Expectations for Suppliers on Proactive Communication to Cummins

Cummins relies on our direct material suppliers in order to achieve our Brand Promise of **INNOVATION AND DEPENDABILITY**. Dependability means we strive for perfection, but respond swiftly and appropriately to resolve issues when they arise. The material from the information sessions can be found here.

URGENT NOTICES:

(01May2023 - ALL) Effective 01 May 2023, the CBS Accounts Payable US team's call center hours will be from 6:00AM to 1:00PM CST. See this page.

(12Apr2023 - ALL) The Cummins Small Business Self-Certification form is now available on this page.

(21Feb2023 - ALL) The Cummins Supplier Handbook (English translation) has been updated. Please find it on this page.

(01Apr2022 - UK suppliers) The purchase order Terms and Conditions have been updated and can be found on this page.

Quick Links

- Cummins Supplier Portal Overview
- About Cummins and Our Products
- Procurement Organization
- New Registration Request Information
- Contact Us
- iSCM- EBU Suppliers
- iSupplier Portal India
- Become a Cummins Supplier
- Sourcing Oracle Cloud (SFD) Training Guide and Login
- iSupplier Portal (For CKV Suppliers)
- iSupplier Portal - Cummins Filtration
- Supplier Diversity
- Supplier Code of Conduct
- iSupplier Portal - CEFS**

Online portal for suppliers

Projects in Returnable Packaging

SCL → PCP : Pump Body Housing Returnable Packaging



Priority-
Cost
Cleanliness
Part Presentation
Logistics Optimization

Benefit on Costs and Waste

Savings Per Pump
PCP : Rs.15.69
(\$0.19)

23T
Total Waste
6PCP

SKF → PCP : Returnable Packaging Bearing



Priority-
Cleanliness
Part Presentation
Storage Criteria

Benefit on Waste

4.2T
Total Waste
6PCP

Project Title: Logistics Cost Optimization in 2022 - CEFS

Project Leader: Hemant Mane	Project Sponsor: Sunil Funde	Project Number: PRJ202202879	Project Pillar: Transformational Project	Status:
--------------------------------	---------------------------------	---------------------------------	---	---------

Team Members: Suraj H, Namrata Patil, Ravindra E, Shivani Singh, Deepali Jadhav, Swati Patil, Gouri D	Project Start Date: 01/01/2022	Project Completion Date: 31-12-2022	GHG CO2 saving: 19.31 MTCO2
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Background & Deliverables:

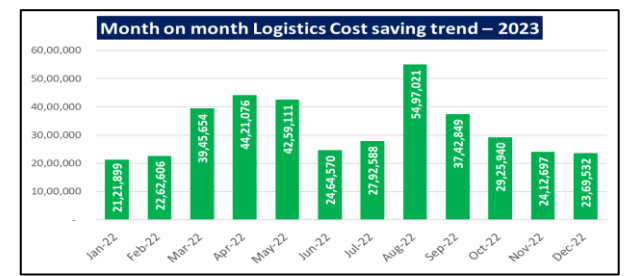
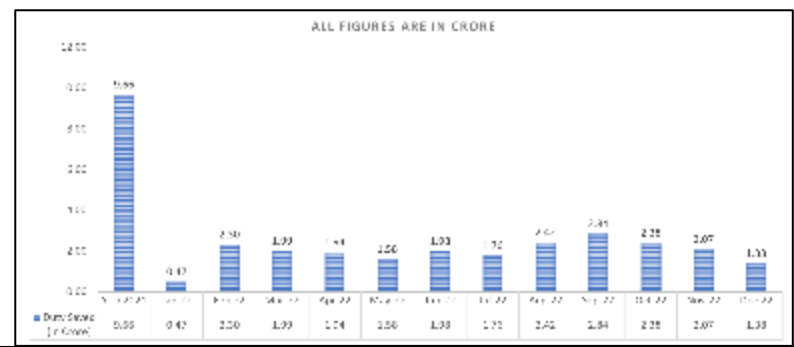
- According to AOP target & cost data study, our report mentions the higher cost consumption in Freight cost bucket.
- We have identified different area for Import & domestic direct & indirect material end to end logistic cost saving. Cost saved by
 - Import Shipment Clubbing
 - Multiple port using for Air/Ocean freight optimization
 - 100% space utilization of Import Container
 - Multiple containers clubbing into one
 - Milk run for Domestic suppliers
 - 20 feet/40 feet FCL Container with Double stacking of pallet at Origin Freight Forwarder warehouse.

Tangible & Intangible Benefits for the Organization:-

- Minimum no. of vehicle required which is helping to reduce air pollution, noise pollution & fuel consumption
- Impact on logistics cost savings to be increase in company profit.
- No major impact on delivery time
- Annual logistics cost saving in 2022 : 3.92 Cr
- FTA duty benefit incurred in 2022 : 23.10 Cr
- 100% FTA duty benefit. No any missed opportunity.

Logistic cost saved as per below Ideas :-

Category	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Grand Total
CE- Import air shipment clubbing	54,000	17,000		34,000	17,000			36,400	36,400	54,600	18,200	36,400	3,21,700
CFS-Import ocean shipment clubbing	2,19,000	1,68,000	1,84,000		3,26,000	58,000	58,000		42,000		1,16,000	74,000	12,45,000
CE-CFS-Air/JNPT port Import shipment Clubbing	49,800	74,100	1,17,400	1,80,000	98,600	1,65,400	1,19,000	97,700	75,000		45,800	1,24,000	13,00,800
CFS-Domestics-Two shipper shipment club under one vehicle. (Chennai to Phaltan)	25,427	1,01,708	25,427			50,854	25,427			50,854		24,000	3,03,697
CFS-Import air shipment clubbing	51,000	85,000	34,000	1,19,000	1,36,000	78,100	1,06,200	1,45,600	72,800	1,27,400	1,09,200	1,45,600	12,09,900
CEFS- Air port to CEFS Phaltan import shipment picked through PTL mode option	45,000	1,05,000	1,20,000	80,000	66,000	66,000	93,500	49,500	99,000	88,000	44,000	60,500	9,16,500
CFS-FTL shipment convert to PTL- TCL Jamshedpur	89,939	59,227	64,168	54,194	1,17,443	53,131	35,732	59,111	82,918	55,254		75,325	7,46,442
CE-Import ocean shipment clubbing- through 20 feet/40 feet FCL Container with Double stacking at Origin Freight Forwarder warehouse	12,55,303	76,000	33,000	8,50,000	8,50,000	12,75,000	17,92,893	44,66,571	28,44,863	22,07,580	16,44,965	15,84,921	1,88,81,096
CFS- Small import shipment picked through DHL Courier instead of freight forwarder	1,85,789	3,17,308	3,26,595	1,99,270	2,86,263	2,57,690	1,49,055	52,665	1,40,506	64,521	1,75,765	1,55,402	23,10,829
CE- Small import shipment picked through DHL instead of freight forwarder	18,415												18,415
CE-Savings due to change of port from Kolkatta to Delhi for Singapore & China shipments	47,636	9,61,800	28,15,443	27,41,420	22,22,770	4,06,600	3,58,340	5,57,740	3,07,705	1,92,812	1,44,877	47,401	1,08,04,544
CE-Detention & demurrage saving		45,000	1,98,000	1,44,000	90,000								4,77,000
CE- Kolkata port to TCL Jamshedpur shipment Clubbing		2,15,823											2,15,823
CFS- PCP1 to CTCI Kothrud shipment Clubbing				6,000			7,000			7,000			20,000
CE- Delhi Port to TCL Jamshedpur- FTL shipment convert to PTL via Safexpress	80,590	36,640	27,621	13,192	49,035	36,095	47,441	31,734	41,657	32,119	35,690	11,983	4,43,797
Grand Total	21,21,899	22,62,606	39,45,654	44,21,076	42,59,111	24,64,570	27,92,588	54,97,021	37,42,849	29,25,940	24,12,697	23,69,532	3,92,15,542

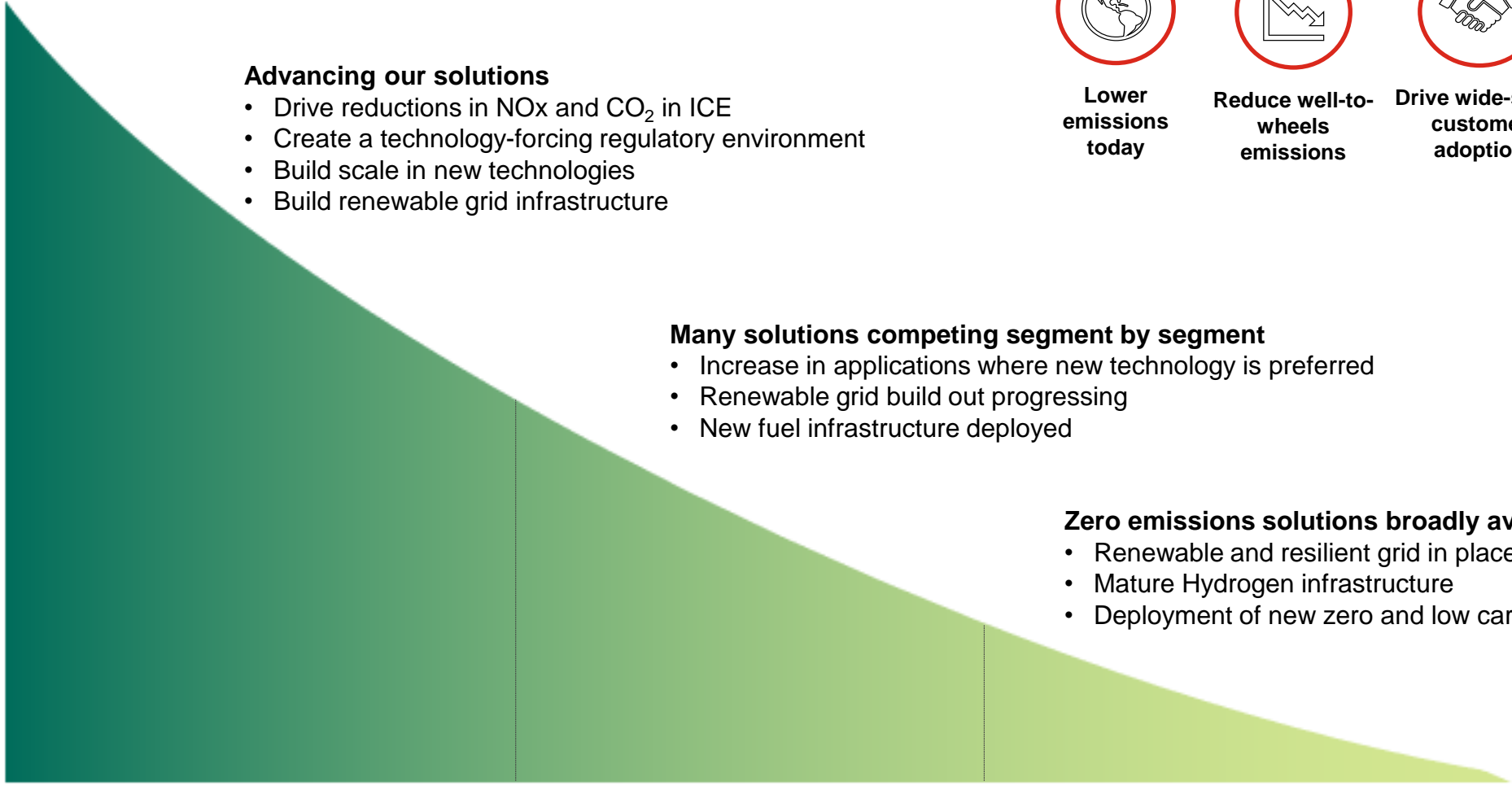


Cummins DESTINATION ZERO

Towards NET Zero Emissions

CO₂ emissions

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%



Advancing our solutions

- Drive reductions in NO_x and CO₂ in ICE
- Create a technology-forcing regulatory environment
- Build scale in new technologies
- Build renewable grid infrastructure

Many solutions competing segment by segment

- Increase in applications where new technology is preferred
- Renewable grid build out progressing
- New fuel infrastructure deployed

Zero emissions solutions broadly available

- Renewable and resilient grid in place
- Mature Hydrogen infrastructure
- Deployment of new zero and low carbon technologies



Lower emissions today



Reduce well-to-wheels emissions



Drive wide-scale customer adoption



Achieve zero emissions by 2050

Driving factors: energy source decarbonization and infrastructure investment, regulatory advancements, and customer pull

11. EMS system & Other Requirements



SR No	Date	Name	Function	Training Programm
1	13.01.2021	Ganesh Khumkar	Operation	Internal auditor training(ISO14001:2015 & ISO 45001:2018)-Three days training
2	13.01.2021	Revan Kalshetti	Operation	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
3	13.01.2021	Rohan Dangle	Facility	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
4	13.01.2021	Swati Patil	SCM	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
5	13.01.2021	Sachin Atole	HSE	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
6	13.01.2021	Ishant Bhoskar	Engineering	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
7	13.01.2021	Strikant Subramanian	Quality	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
8	13.01.2021	Sumit Trivedi	ME	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
9	13.01.2021	Shreshtha Dey	Operation	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
10	13.01.2021	Ravindra Ekashinge	SCM	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
11	13.01.2021	Prabha Pradhan	HR	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
12	13.01.2021	Pravin Bhangre	ME	Internal auditor training(ISO14001:2015 & ISO 45001:2018)
13	13.01.2021	Sachin Desai	Maintainance	Internal auditor training(ISO14001:2015 & ISO 45001:2018)

Final Assessment Result

CII GreenCo Final Assessment Rating: Cummins Technologies India Private Limited, PCP 1, Phaltan

GreenCo GBC <greenco.gbc@cii.in>
 To: Pradhum Waghmare
 Cc: greencoteam2021; Sohail Khan Pathan; Muthusezhyan N; rump19b; Ishwath K (Ishwath); Neha Pendse; Ushar Chavare; Lejaswini Nayak; Rohan Dangle; Ashwani Kumar Sharma; Sunil M Funde; Seema Pisal; Akshay Medhkar; Amol T Pawar; merchantip@gmail.com
 Retention Policy: New Default (1 year (1 years)) Expires: 09-07-2026
 You forwarded this message on 21-08-2023 09:54.
 If there are problems with how this message is displayed, click here to view it in a web browser.

GreenCo Rating System Scoreband_Cummins - PCP 1.pdf 260 KB
 Plaque and Certificate PCP 1.pdf 411 KB



PCP1 have achieved Platinum Rating!!

GREENCO 2023 This award is a national solution of Cummins. Do not take it as a challenge unless you really like to and you can win it.

Dear Mr. Pradhum Waghmare,

Greetings from CII-GreenCo!

At the moment, CII GreenCo Assessment Panel is proud to announce Cummins Technologies India Private Limited, PCP 1 Phaltan, Maharashtra for their best hospitality and excellent services provided by CII GreenCo Assessment team led by Mr. Ravi Prasad & Mr. Kishor Mendhe, during their visit at Cummins Technologies India Private Limited, PCP 1 Phaltan, Maharashtra on 07th & 08th July 2023.

We are happy to inform you that based on the findings from the assessment, it has been found that Cummins Technologies India Private Limited, PCP 1 Phaltan, Maharashtra has met all the requirements in accordance with Green Company Rating System (Version-3) guidelines and is being rated "PLATINUM".

This is a notable accomplishment and CII-GreenCo would like to congratulate the entire team for this achievement. Committed leadership from the top, involvement of the team and the efforts put in throughout the process of GreenCo rating implementation across all the parameters are appreciated.

The score band, placard & certificate is attached for your kind perusal.

We are confident that the great work done by Cummins Technologies India Private Limited, PCP 1 Phaltan, Maharashtra will pave way for establishing itself as a benchmark for other companies in going "Green", thereby bringing an example for others to emulate.

Once again, hearty congratulations to the entire team on achieving "PLATINUM", and wish you all the success in the "GreenCo" journey.

Warm regards,
 CII - GreenCo Assessment Panel
 CII - Sohrabji Godrej Green Business Centre

GreenCo Scoreband - Cummins Technologies India Private Limited, PCP 1															
PARAMETERS	POINTS AWARDED														
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150
Energy Efficiency														X	
Water Conservation										X					
Renewable Energy										X					
GHG Emission										X					
Waste Management										X					
Material Conservation, Recycling & Recyclability										X					
Green Supply Chain										X					
Product Stewardship & Life Cycle Aspects															X
Innovation for Environment					X										
Green Infrastructure & Ecology								X							

Legends: Points scored by Cummins PCP 1 Maximum points scored by another GreenCo company

0-100	101-201	201-300	301-400	401-500	501-600	601-649	650-699	700-749	750-799	800-899	900-1000
Total Score											

LEVELS	POINTS AWARDED				
	350-449	450-549	550-649	650-749	≥ 750
Certified					
Bronze					
Silver					
Gold					
Platinum					

First site of Cummins in India to achieve "Platinum Rating in first assessment"

Energy Tracking

- **Metering**
- **Recording** -Measuring and recording energy consumption
- **Analyzing** -Correlating energy consumption to a measured output, such as production quantity
- **Comparing** -Comparing energy consumption to an appropriate standard or benchmark
- **Setting Targets** -Setting targets to reduce or control energy consumption
- **Monitoring** -Comparing energy consumption to the set target on a regular basis
- **Reporting** -Reporting the results including any variances from the targets which have been set
- **Controlling** -Implementing management measures to correct any variances, which may have occurred.



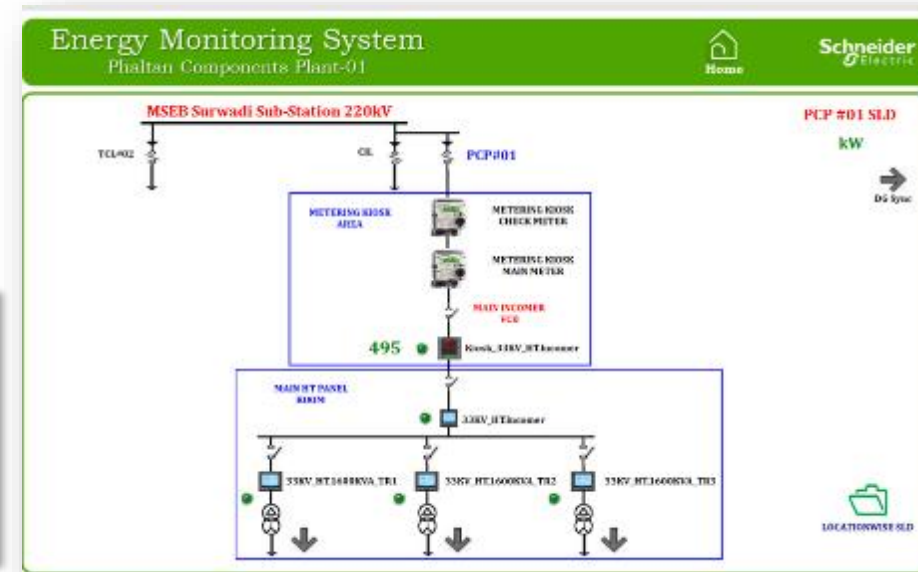
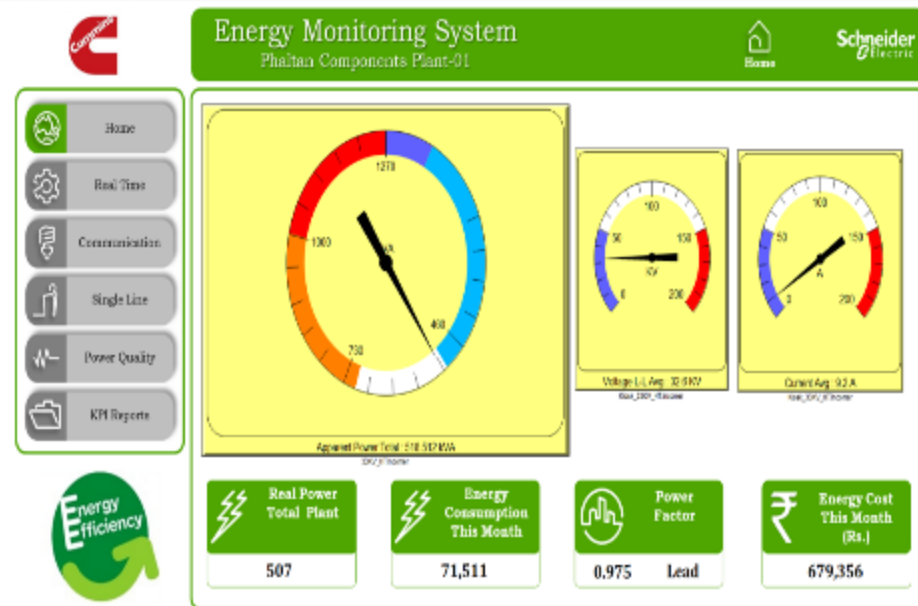
**You can't manage what you don't measure.
If you don't measure it, you can't improve it.'**

Energy Monitoring System

Install energy monitoring system and monitor electrical consumption at the supply and user ends



**PCP-01 Has Schneider Energy monitoring system up to level 2 monitoring + 14 machines (Level 3)
Total number of energy meters – 200+
Daily, weekly and monthly report are generated from EMS the system**



Q+A

