CII National Award for Excellence in Energy Management-2021

Hero MotoCorp Ltd.
Gurgaon Haryana

Presenter : Pankaj Kaushik
Virender Taneja
Vivek Pandey

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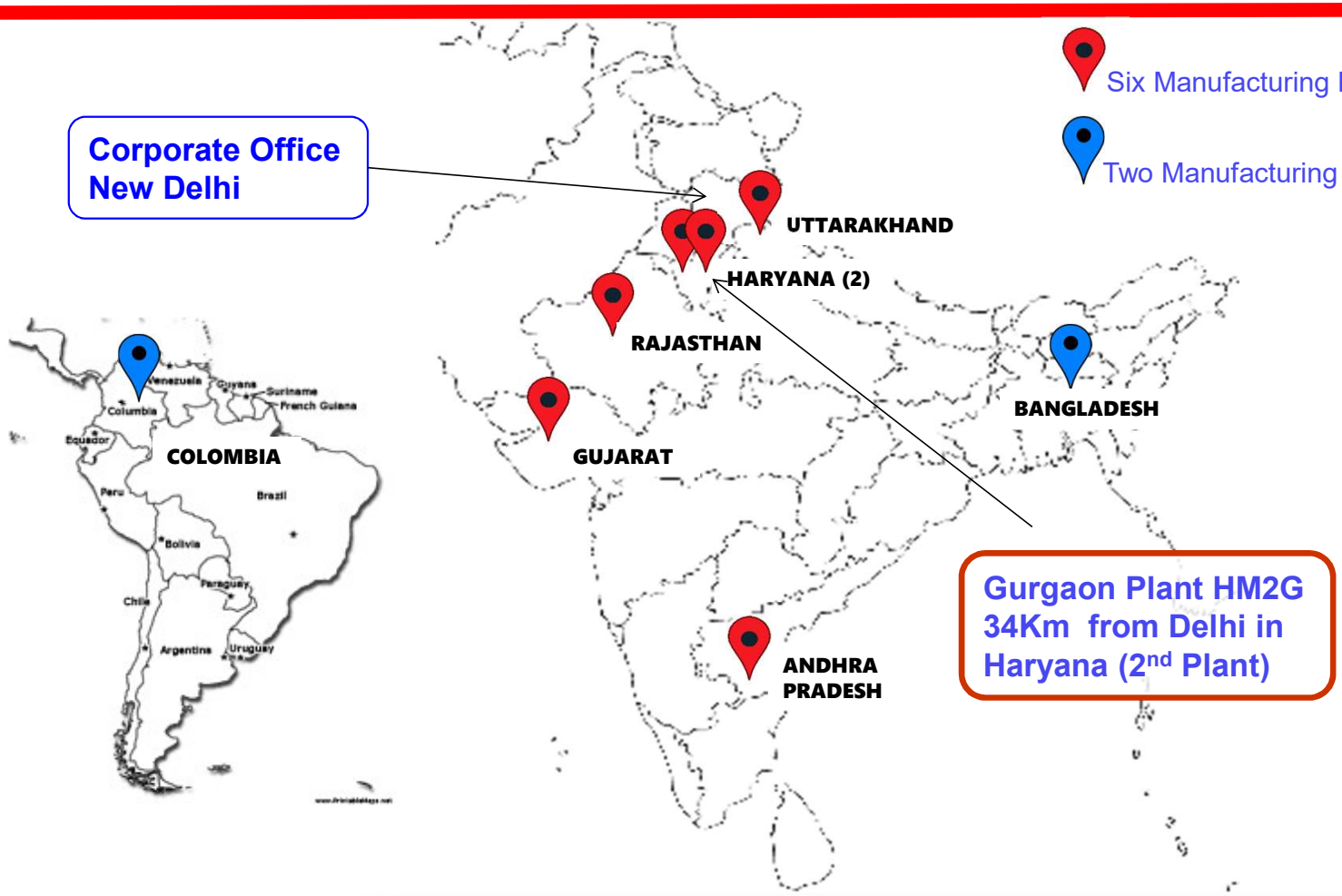
Hero MotoCorp – Manufacturing Locations



Gurgaon Plant Overview

- Inauguration Year - 1997
- Area – 70 Acres
- Employees – 5000+

- Production Shops – Steel Phase, Gear Section, Al Phase, Heat Treatment, Engine Assy, Frame Assy, Paint Shop, Weld Shop
- Assembly Lines – 3 Nos. of Flexible Assembly Lines for Engine & Vehicle Assembly
- Cycle Time – 18 Sec.

- Zero Liquid Discharge Plant
- All effluent is treated in-plant & reused

- Energy Management System
- Advanced Energy Dashboards for Real Time Data of shops

Modern Machine Tools used:

- CNC Machines, Robotic Lines for component Machining, Robotic Welding, Robotic Painting, Cobot in Engine Assy, AGV for material movement, Conveyor System

Introduction- Path of Leadership

50 Million

Aug-2013

75 Million

Sep-2017

Celebrating 75 million customers

100 Million

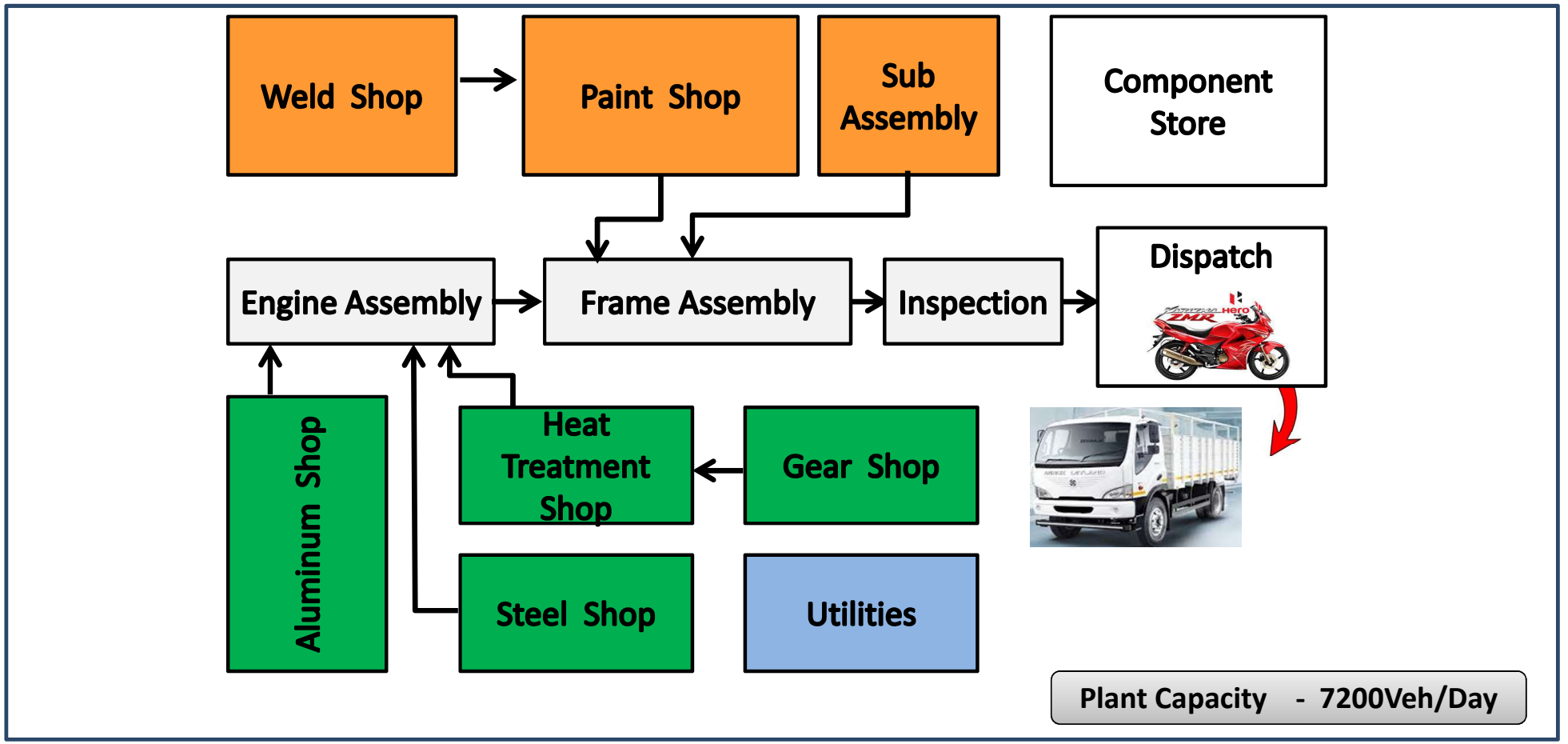
By-2020

Electric Vehicle By- 2022

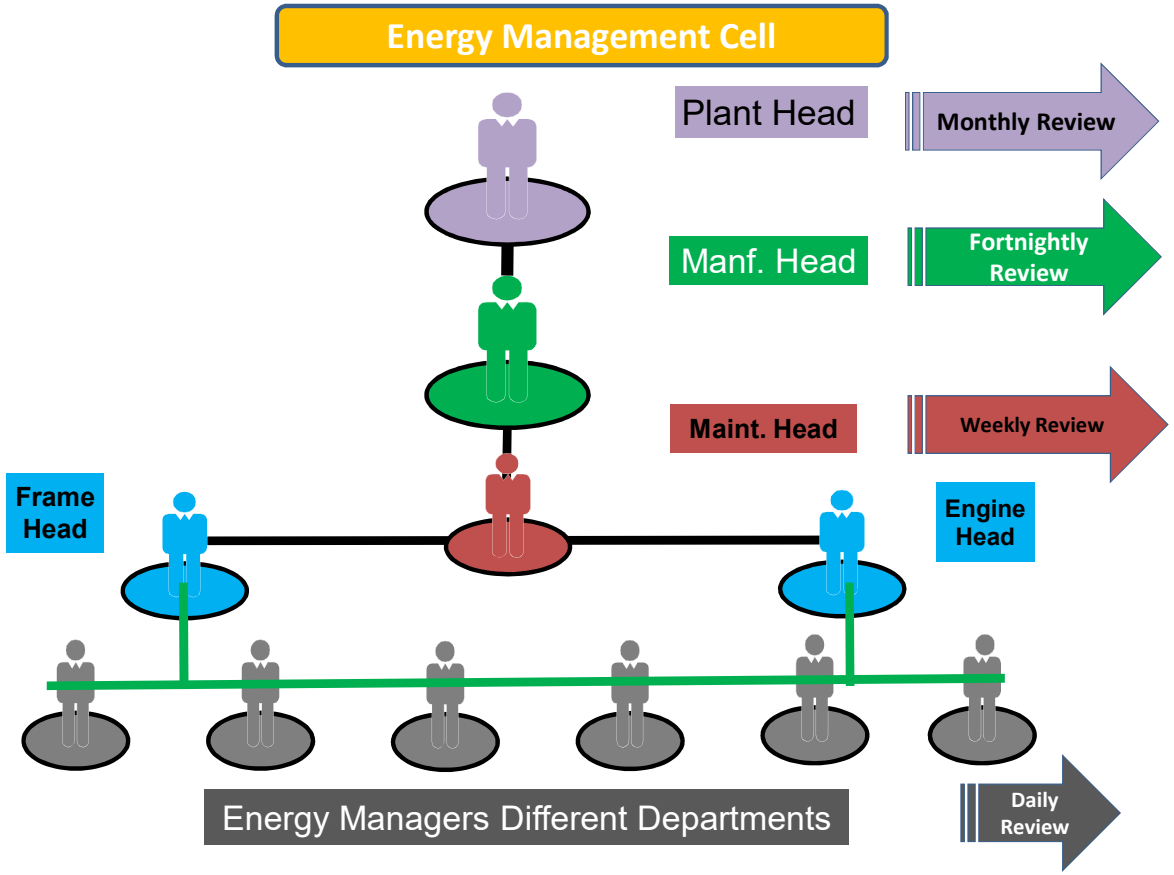
100 Million Crossed on 21 Jan2021

Very few companies attain such glory. Hero's core strengths are - *Manufacturing Excellence, Great Mileage, Extensive Network, Trained Technicians, Great Service, Genuine Parts, 5 year warranty.*

Introduction- Plant manufacturing Process



Introduction- Energy Management cell & roles



Roles

- Projects and Budget approver
- Projects and SEC Evaluator
- Bench Marking , Risk Management
- Projects Progress Reviewer
- Resource Allocation
- Idea Generators
- Projects implementers
- Technology Evaluators
- Budget Allocators

Dedicated Energy Management Cell and defined their roles & responsibilities.

Introduction- Environment & Energy conservation Policy

Environment Policy

We at Hero MotoCorp are committed to demonstrate excellence in our environmental performance on a continual basis, as an intrinsic element of our Corporate philosophy .

To achieve this we commit ourselves to:

- Integrate environmental attributes and cleaner production in all our business processes and practices with specific consideration to substitution of hazardous chemicals, where viable and strengthen the greening of supply chain.
- Continue product innovations to improve environmental compatibility.
- Comply with all applicable environmental legislation and also controlling our environmental discharges through the principles of "ALARA" (As Low As Reasonably Achievable).
- Institutionalize resource conservation in the areas of oil, water, electrical energy, paints and chemicals.
- Enhance environmental awareness of our employees and dealers and Vendors, while promoting their involvement in ensuring sound environmental management.
- We shall communicate this policy to all our employees and would make it available to the interested party.

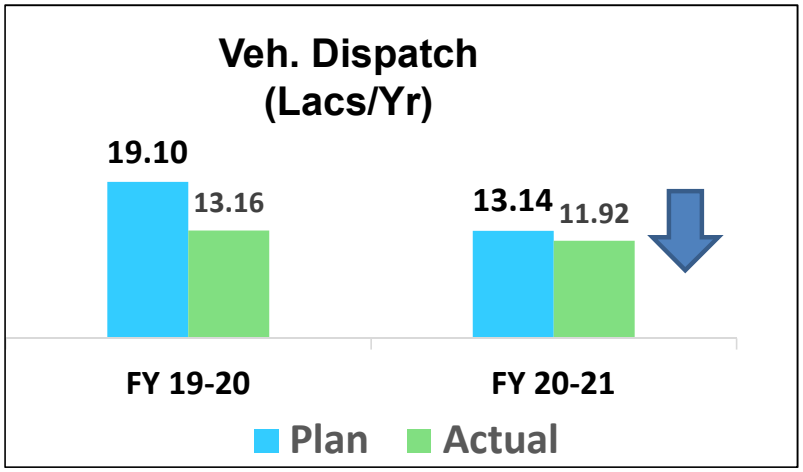
Energy Conservation Policy

We at Hero MotoCorp Ltd are committed to demonstrate in our energy performance on continual basis as an intrinsic element of our corporate philosophy

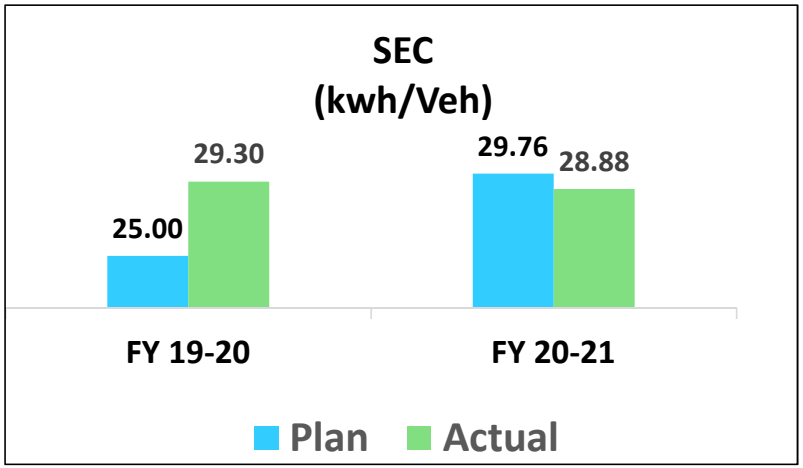
- We work towards "Conserving energy both thermal and electrical" in all processes within our operations.
- We will adopt latest technology solutions to further reduce our consumption in energy.
- ON short term we will reach our target of "Modern Energy Operations factory in Hero MotoCorp Group companies"
- On Long term we target to set new benchmarks for being a "Industry leader in energy conservation"
- Integrate energy considerations and cleaner production in all our business processes and practices.
- Continue product innovations to improve energy efficiency.
- Comply with all applicable energy legislation and also controlling our conventional energy usage through the principles of ALARA (As low as reasonably achievable)
- Institutionalize energy conservation
- Enhance energy awareness of our employees and dealers / vendors, while promoting their involvement in ensuring sound energy management;
- We shall communicate this policy to all our employees and would make it available to interested parties.

Framed Plant Energy conservation Policy from the environment policy.

Impact of Covid 19



- **Less Production by 5 % than Planned**
  - 15 % Less Planned due to Covid-19 impact



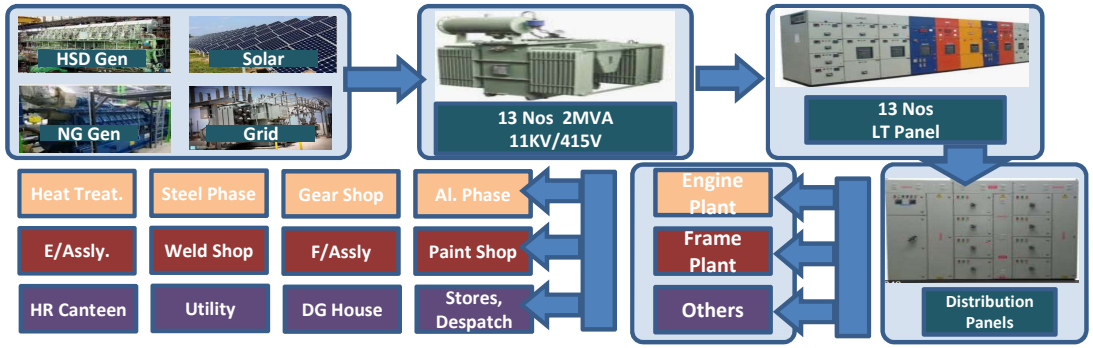
- **Reduced SEC by 3% than Planned despite of less production**
  - Plant operation Efficiency improvement at low demand in production
  - Stopping idle running of Assembly lines & machines

Energy Usage - Electrical & Thermal

Electrical Energy Generation

HSD | Natural Gas | Solar | Grid

Electrical Energy Distribution



Thermal Energy Distribution

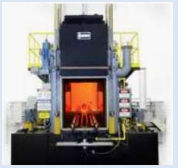
Natural Gas | HSD | Propane

Hot Water Generator

Canteen Chapatti M/C

Forklift

SQF Furnace

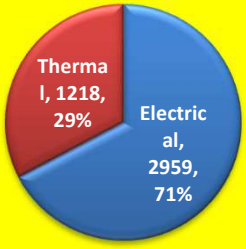


Burner Paint Shop

Fluidized Bed

Steam Boiler

Energy (MToE) 2020-21

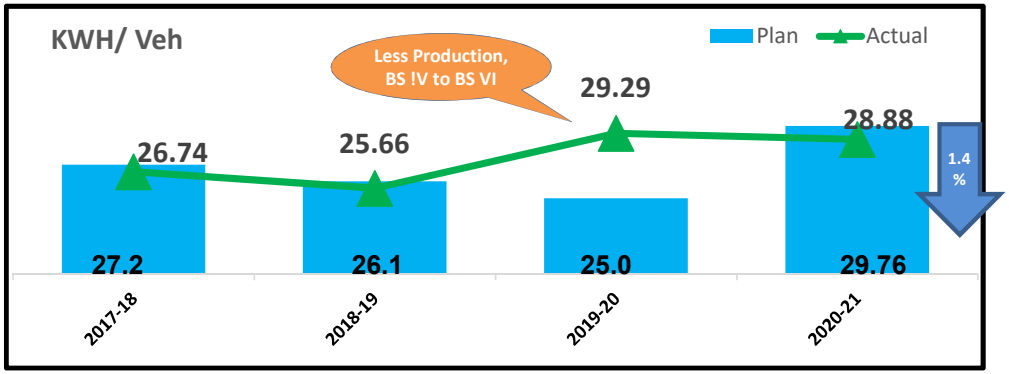


Mainly HSD, LNG, GRID & SOLAR are the sources of power generation.

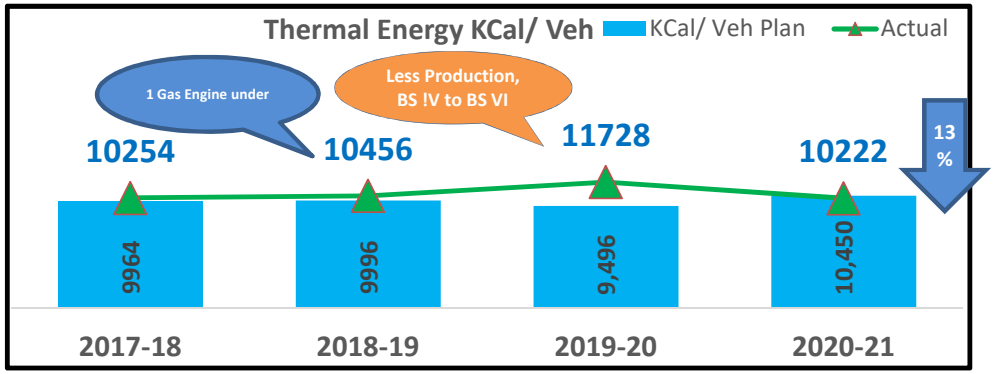
NATURAL GAS, HSD & PROPANE are the sources of Thermal energy

Year wise Plant Energy consumption Trend

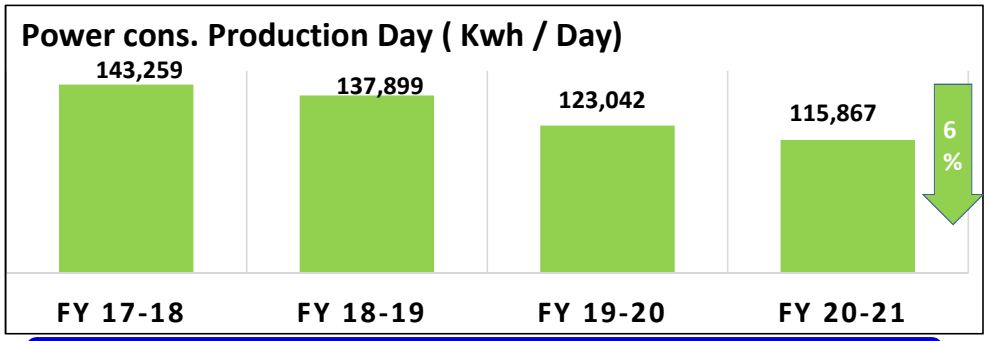
Electrical SEC



Thermal SEC

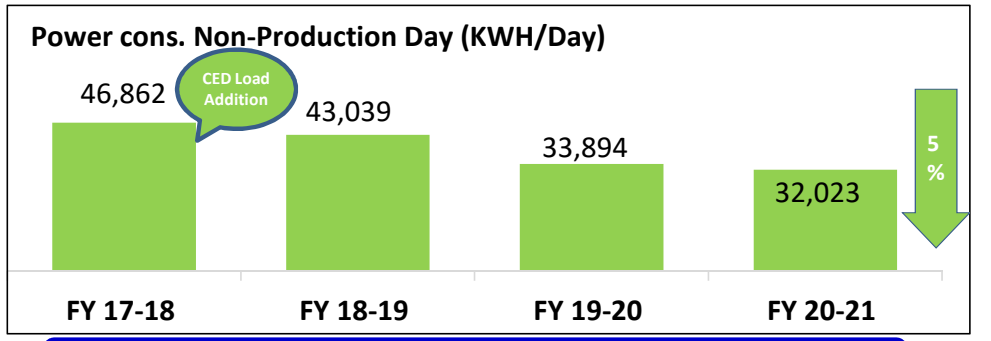


Energy consumption trend in Production Days



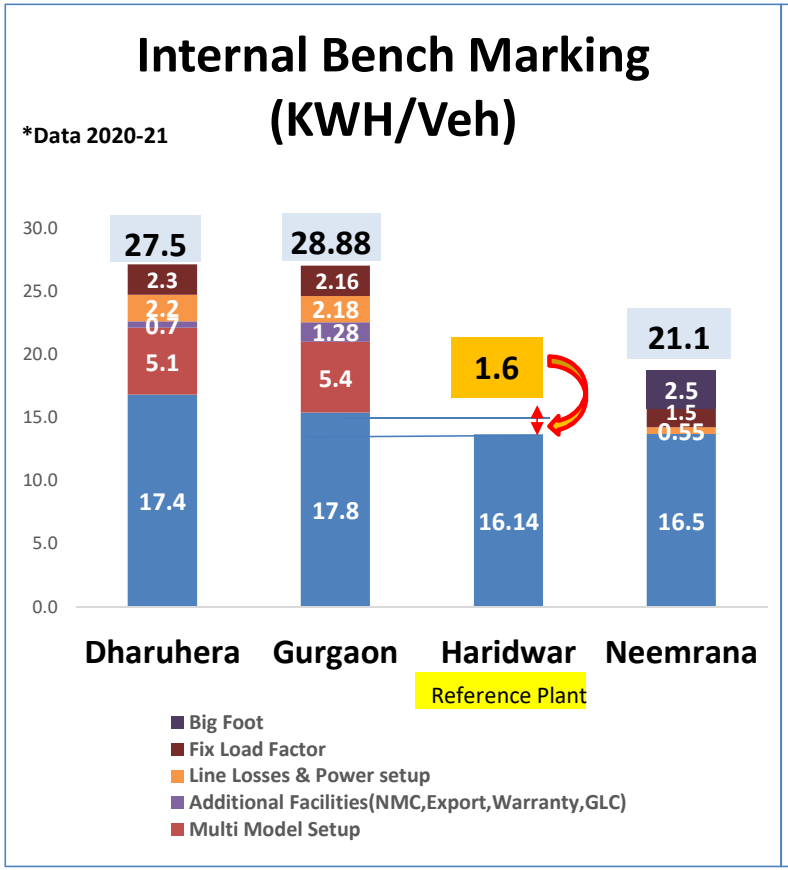
6 % reduction in kwh per Production Day in Last Year

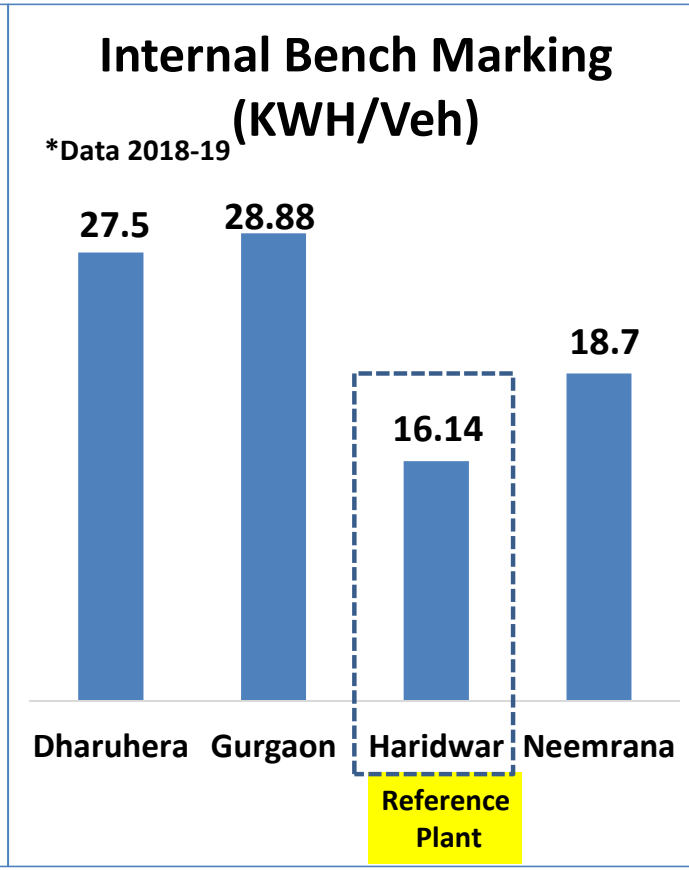
Energy consumption trend in Non production Days

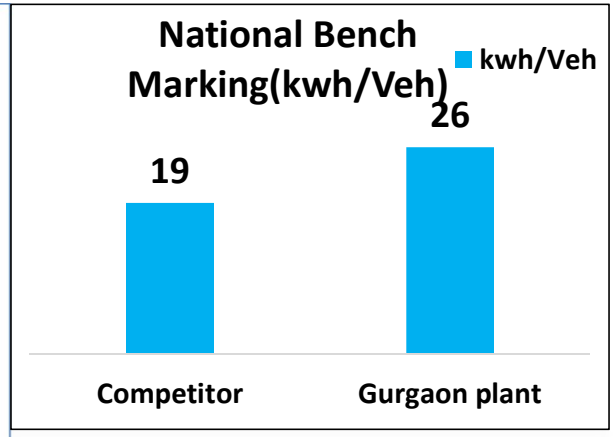


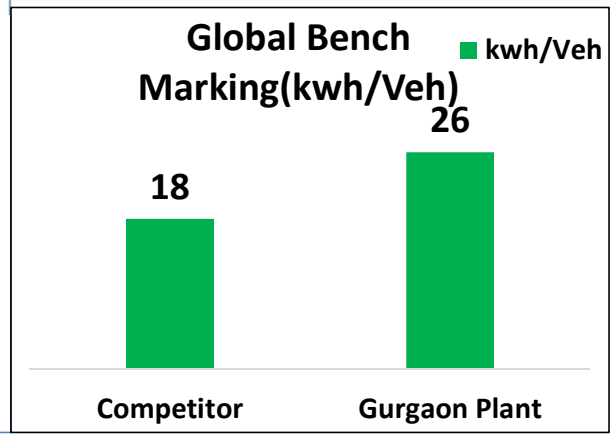
5% reduction in kwh per Non Production Day in Years

Bench Marking – Internal / National/ Global





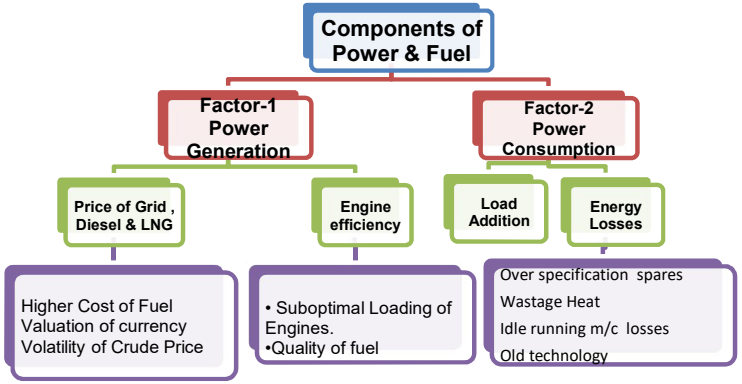




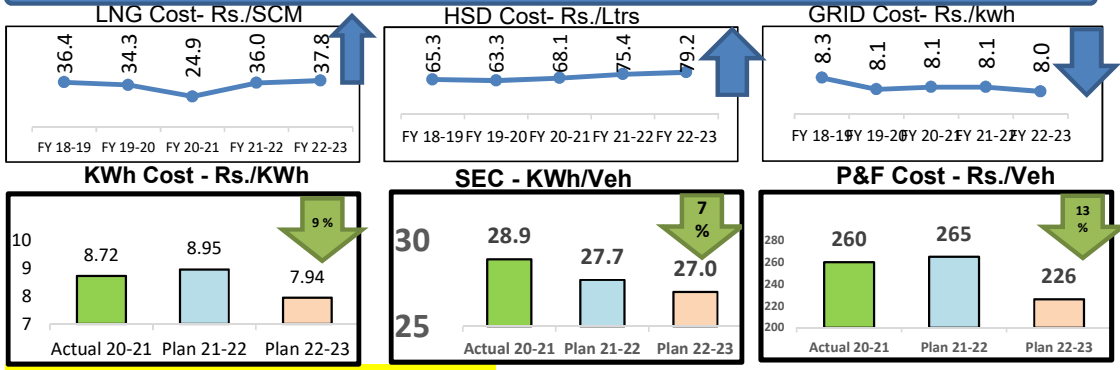
Bench marking Done & found 1.6 kwh/Veh. is the gap w.r.t to Reference Plant.

Haridwar Plant is taken as reference Plant for Internal Bench Marking

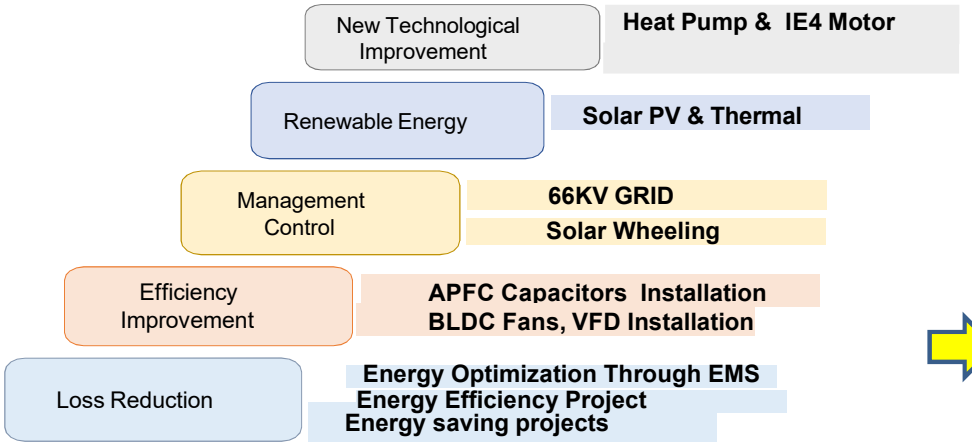
Strategic Approach @ Gurgaon Plant :



Inflation Factors- Fuel Prices



Methodology For Power and Fuel Consumption Reduction

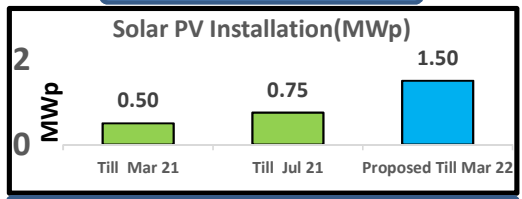


GRID utilization will reduce Rs/KWh to 7.94

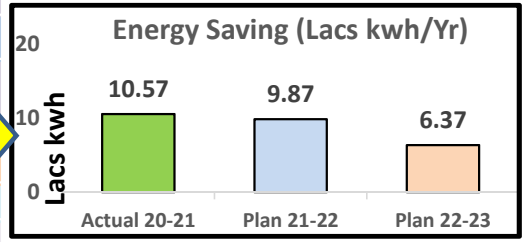
Power & Fuel Cost Reduction Projects

Sr No	Methodology	Cumulative No of Projects(FY 22-24)	Cumulative Saving KWH/day
1	Technological Improvement	5	2166
2	Renewable Energy	1	833
3	Management Control	2	267
4	Efficiency improvement	3	1410
5	Loss Reduction	3	1100
	Total	14	5776

Proposed Solar Installation



Proposed kwh Saving/Yr



Power and fuel cost strategy to control power and Fuel Cost

Energy Conservation projects 2018-19

Major Project	Energy Saving (Lacs Kwh)	Cost Saving (Rs. In Lacs)	Remark
1-Air Cooled Energy Efficient Compressors in Utility	1.07	12.2	
2- Separation of Air Headers & added New air headers	1.82	20.7	
3-Connecting F/Assay Lines with Static Transfer Switch(STS)	0.89	90	Manpower Saving
4-Change Over Panel Plan at Utility	1.82	100	Economical Source use
5-Power factor Improvement by Installing Hybrid Capacitor bank	6.82	45.1	
6-Heat Pump installation in washing machine	1.87	21.3	
7- Heat Pipe at Gas Generator-Waste Heat Recovery	3360	50	M kcal/Yr
8-Solar Thermal Dish for Canteen	81	5.6	M Kcal/Yr
9-Advance Energy Management System-EMS	4.03	45.9	
Total Saving From Major Projects-9	18.32	390.8	
Other Misc. Project-12	6.79	65	
Total Saving	25	456	3441 M kcal Thermal Saving Additional

25 Lacs Kwh Saved by Implementing 10 Major Energy Conservation Projects

Energy Conservation projects 2019-20

Sr No	Major Project	Energy Saving (Lacs Kwh)	Cost Saving (Rs. In Lacs)	Thermal Saving (in Kcal/Hr)	Remarks
1	Installation of 150KWp Rooftop Solar PV system in Employee Bike parking shed	2.18	26.16		
2	Replacement of 2 Nos. Old Compressor with Energy efficient IE4 Keaser Compressor	4.25	51.00		
3	Centralized FDV Online Monitoring & Control System for plant	7.20	86.40		Innovative Project-1
4	Replacement of 11 Nos. Conventional IE2 motors with IE4 motors in Utility area	0.47	5.66		
5	Replacement of conventional AC with Energy efficient Inverter type ACs (14 Nos.)	0.72	8.60		
6	Replacement Of Solar Day Lighting system in the Plant main gangway (20Nos.)	0.47	5.61		
7	Solar All-In-One Standlone LED Street lights (35 Nos.) from Visitor Gate to NMC area	0.14	1.72		Renewable Project
8	Bio Methane Plant for Canteen Application, LPG Cap: 20 Kg/Day	0.00	3.80	9,583	Renewable / Thermal Project (7300 Kg/yr of LPG equ. saving)
9	Replacement of HRU with Heat Pipe system for efficient transfer of heat in DG house	0.00	9.00	244,000	
10	CED Oven Heat Recovery, Cap: 1 Lkcal/hr	0.00	1.50	100,000	
11	Sludge Drying system for converting the wet sludge in to Powder form in ETP	0.00	8.80		Innovative Project-2
12	Replacement of Filter Press with Sludge Dewatering machine to reduce the moisture content from 80% to 30% in ETP	0.00	4.40		
13	Installation of STS for Engine Assamblies	0.00	6.10		
13	Interlocking of Lights of Assembly Line with conveyor Panels and Other Shops with Operation Timings	0.83	9.98		
14	Idle tripping Ckt for Engine Plant machines-50 Nos	0.60	7.21		
15	Installation of Motion Sensors for Lights & Fan-100 Nos	0.18	6.10		
Grand Total:		**17.04**	**242.04**	**353,583**	

17 Lacs Kwh Saved by Implementing 15 Major Energy Conservation Projects

Energy Conservation projects 2020-21

Sr No	Major Project	Energy Saving (Lacs Kwh)	Cost Saving (Rs. In Lacs)	Thermal Saving (in KCal/day)	Remarks
1	Centralized Heat Pump System for Engine Assembly NGCT Washing Machines (3 Nos.) by Offsetting Electrical Heaters	0.75	7.50		Innovative Project
2	IE4 motor based Energy Efficient Air Compressor in the Utility Area	2.55	25.50		
3	Reduction of carbon footprint through Solar Thermal Collector system for Al Phase Washing M/Cs	0.9	9.00	300,000	Renewable Project
4	Conventional Motors replacement into Premium Efficiency IE4 Motors in Weld Shop & DG House (16 Nos)	0.35	3.50		
5	Electrical Agitator in Paint Shop for Paint mixing application instead of Pneumatic type	1.1	11.00		Innovative Project
6	Replacemnt of 55 KW Compressor Cooling Tower Pump with 32 KW Motor-pump.	0.9728	9.73		
7	Compressor Cooling close ckt Pump replacement from 55 KW to 45 KW Motor-pump.	0.4864	4.86		
8	Installed Air Cooled Compressors-1080 cfm. Stopping 1 Nos. Cooling Tower 200 TR-2 Nos	2.432	24.32		
9	Stopping HRU Compressor by utilizing Compressed air 5 bar from UTL Header.	0.2128	2.13		
10	HSD Fork Lift Conversion to Battery Operated-1Nos	0	0.65	60,000	
11	Occupancy sensor for Lights-25 Nos	0.09125	0.91		
12	Replacement of Old conventional split AC with 5 star rating AC-25 Nos	0.468	4.68		
13	Energy Efficient FDV Blower(Direct Coupled)-4 Nos	0.16	1.60		
14	80 W BLDC Fans in Place of 100 W Conventional Fans-100 Nos	0.09728	0.97		
Grand Total:		**10.57053**	**106.36**	**300,000**	

10.6 Lacs Kwh Saved by Implementing 14 Major Energy Conservation Projects

Energy Conservation projects 2021-23 Plan

Proposed Projects Plan for next Two Years									
Financial Year	Methodology	Project Description	UOM	Qty	Proposed Saving			Target Date	Responsibility
					KWH/ Day	KWH/Yr	₹ Lacs/Yr		
FY: 21-22	Renewable Energy	Solar Rooftop PV Expansion in New OBL Shed	KWp	250	833	2,50,000	**22.4**	Jun21	Pankaj Kaushik
	Management Control	66KV Electrical Grid (6 Months uasge)	Lot	1	0	0	**200.0**	Dec-21	Amit Rathore
	Efficiency improvement	Centralized Utility Cockpit System	Lot	1	1,000	3,00,000	**26.9**	Mar-21	Pankaj Kaushik
	New Technology	Centralized Heat Pump System for NEP Washing M/Cs	Lot	1	500	1,50,000	**13.4**	Nov-21	Ashish Meher
	New Technology	Online Monitoring & Control of Exhaust System	Nos	35	583	1,75,000	**15.7**	Oct-21	Virender Taneja
	Loss Reduction	Energy Saving through EMS Monitoring & Control	Lot	1	450	68,000	**6.1**	Mar-22	RG Mandan
	Efficiency improvement	Replacement of DOL starters with VFD Control Panels	Nos	7	210	44,100	**3.9**	Aug-21	Virender Taneja
	Total Saving				**3576**	**9,87,100**	**288.3**		
FY: 22-23	Efficiency improvement	AHUs Online Monitoring System	Nos	5	267	80,000	**6.8**	Jul-22	Mukesh Sharma
	Loss Reduction	Energy Saving through EMS Monitoring & Control	Lot	1	450	1,35,000	**11.5**	Aug-22	RG Mandan
	New Technology	Direct coupled Motors in FDV Units	Nos	20	250	80,000	**6.8**	Oct-22	Hemant Gautam
	Efficiency improvement	66KV Electrical Grid Optimum Utilization (reduce Fuel consp.)	Lot	1	200	32000	**2.5**	Dec-22	RG Mandan
	New Technology	Centralized Heat Pump System for Weld Shop Washing M/Cs	Lot	1	500	1,50,000	**12.8**	Dec-22	Ashish Meher
	New Technology	SMART ESS (Load Management System)	Nos	7	333	1,00,000	**8.5**	Mar-23	RG Mandan
	Loss Reduction	Smart control system for Lights & Fans	Lot	1	200	60,000	**5.1**	Mar-23	Virender Taneja
	Total Saving				**2200**	**637000**	**54.0**		

Major Energy Saving Projects Implemented - 2019-20

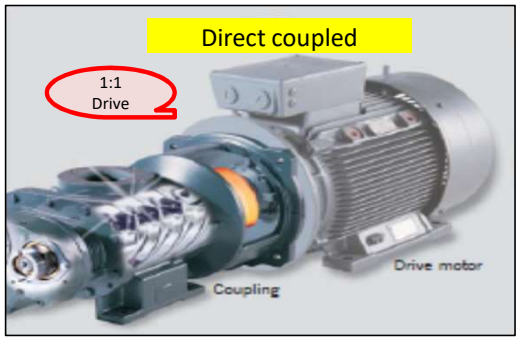
1-Replaced water cooled to Air Cooled Energy Efficient Compressors

Before

Rotor lube and flute Ratio - 4:6

Kwh Cons./Day-19015

After



Rotor lube and flute Ratio - 5:6

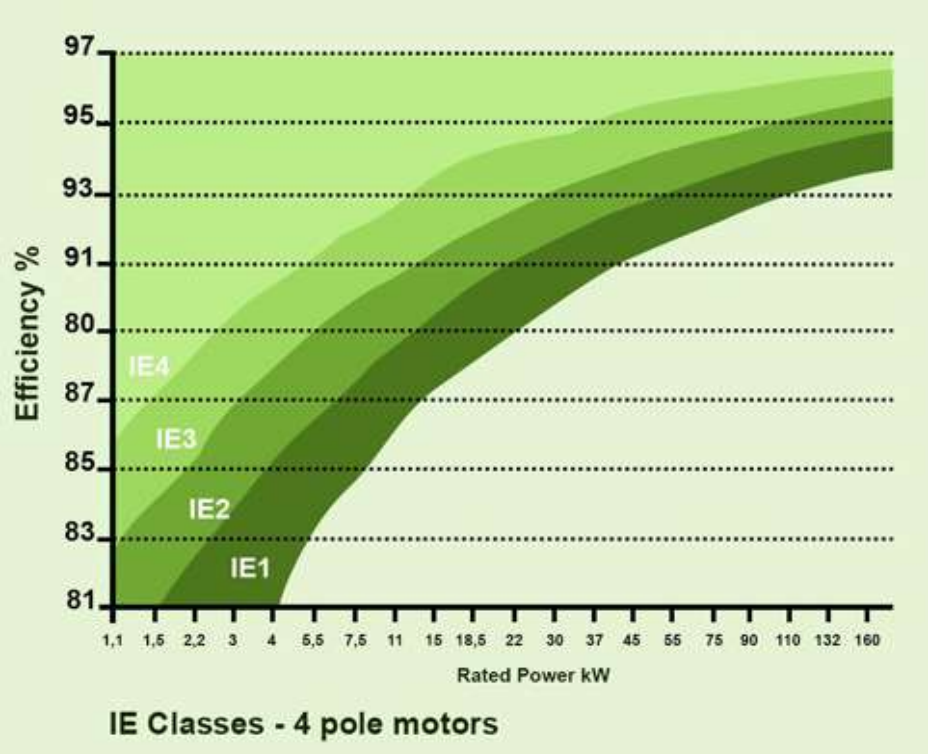
Kwh Cons./Day-18243

Description	Uom	Atlas copco (Water Cooled)	Kaeser (Air Cooled)
Motor efficiency	%	95%	97.0%
Motor efficiency class	IE	IE2	IE4
Free Air Delivery @ 5.5 bar	FAD	980	1080
Package power in put at 5.5 bar	kw	155.3	152.2
Specific Power Consumption/CFM @ 5.5bar	KW/CFM	0.16	0.14

After installation of Air Cooled compressors achieved Saving –2.43 Lacs kwh/Year

Major Energy Saving Projects Implemented - 2019-20

2- Energy Saving IE4 Motors of Higher rating



Efficiency improvement by replacing conventional motors by Premium Eff. motors(>=18kw-160kw)

- **10 Nos of Premium Efficiency IE4 Motors (> = 18 KW) in Steel Phase, Gear Section & ABS PT Line**

Energy saved 2.55 Lacs Kwh /year

Major Energy Saving Projects Implemented - 2019-20

3.Reduction of carbon footprint through Solar Thermal Collector for Al Phase Washing M/Cs

- Solar Thermal discs (25 Nos) follows the Sun path to generate the required Heat energy.
- Rated capacity : 3.0 Lkcal/day
- Heat utilization in the Aluminum phase Washing machines (4 Nos)
- Real time monitoring of Solar Heating system

After installation of Solar thermal system achieved Saving –0.9 Lacs kwh/Year

Innovation Project-1:

4.Replacing pneumatic driven agitator with electric operated agitator by controlling the motor according to paint level.

Background :

Air Agitator uses 12 cfm for mixing the paint. Power required to produce air 12cfm (8.5M³/hr) @ 100 psi (6.0 bar) at the compressor requires 2.4kW of Energy (1cfm 0.2kW).

Analysis / Issues :

Present system cost consumption is very high, optimisation of energy source is important

Proposed:

By installing electric agitators we can save Rs.10 Lac per year as the running cost of pneumatic equipment is high and annual energy cost of 1 electric pump is Rs.7300, in addition to this there are some more benefits like R&M (Manpower spares) saving and clean environment.

Advantages-

- Elimination of Paint Fumes
- Cost Saving of Rs.10 Lac by replacing pneumatic agitator with electric agitator

ENCON projects already Implemented-1

Solar Outdoor Street Light System

VAM for Plant Air Conditioning

Voltage regulators for lights

Real time capacitors

VFD for paint shop blowers

Advanced Solar Day Lighting System

Waste heat Recovery unit (HRU)

Trans vector Nozzle cleaning guns

Usage of 5 ★ rated ACs

Hybrid Filters

Glimpses of various ENCON projects implemented till FY 2020.

ENCON projects already Implemented-2

VFD in air washers

Natural Cooling Towers

Regulated air supply to plant

Hollow FRPs blades for cooling tower

Replaced Ex fans with natural vents

EC Fan for AHU

LED lights Exterior

VSD Compressors

Solar Light pipes

Replacement of IE1/IE2 motors with IE 3 & IE4

Glimpses of various ENCON projects implemented till FY 2020.

Innovation Strategies of HMCL:

Corporate Initiatives:
(Hero Hatch – A Start-up Programme)

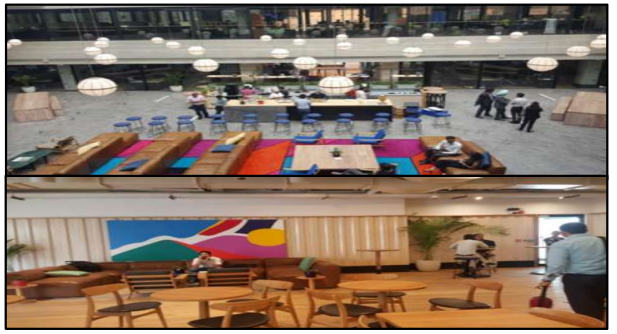
Description

HeroHatch has been formed with the aim to foster innovation within the organisation. This unit will work with the spirit of a startup, while utilising existing people strengths. As a part of HeroHatch, we will keep experimenting new business models, services and revenue streams, celebrating both successes and failures.

Snapshot:

First Batch is already working on
- Electric Mobility
- Pre-Owned 2 Wheelers

The next batches are lined-up to work on
- 2 Wheeler Sharing and Rental
- Battery Charging
- **Energy Conservation & Co2 Reduction**

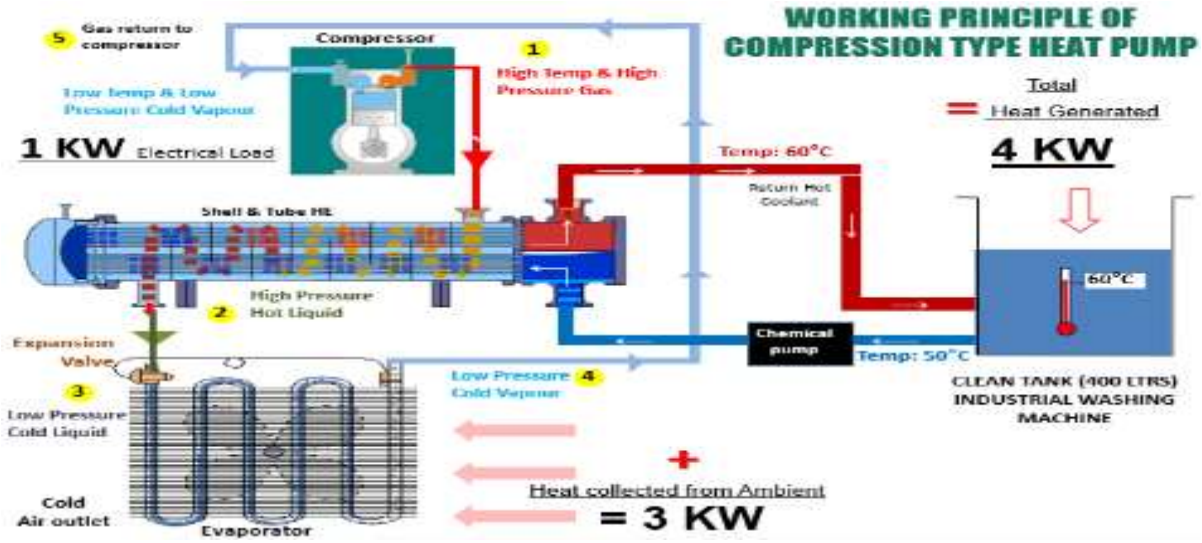


Every Year Hero Idea Contest was held for different themes in which Environment and Sustainability having one pillar.

Innovation Project-1:

1.Centralized Heat Pump System in Eng. Assy. Washing Machines

Energy efficient compression type Centralized Heat Pump system for Eng. Assy Washing m/cs having approx. 0.75 LKWH/Annum (7.5 Lakh/Annum Approx.) of energy saving, which Offsets the existing Electrical Heaters



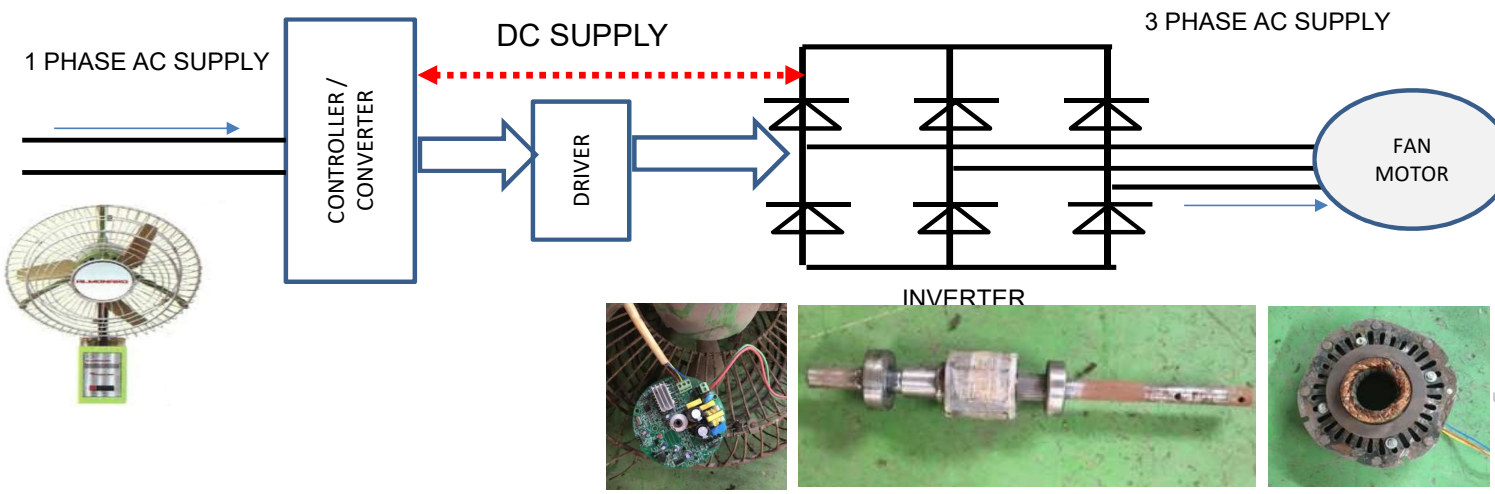
Energy saved 0.75 Lacs Kwh /Yr

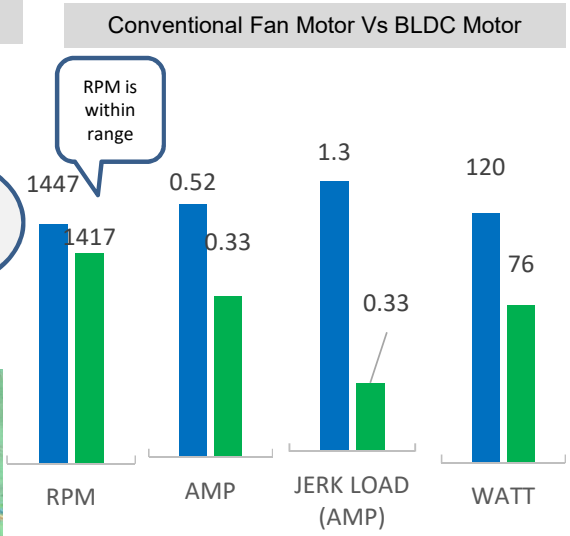
Innovation Project-2:

2.Conversion of 100 W Induction Motor Fan by BLDC Fan-80 W

Brushless DC motor also known as electronically commutated motor (EC motor) that are powered by AC electric power supply.

Typical Circuit diagram BLPMDC Fan Motor





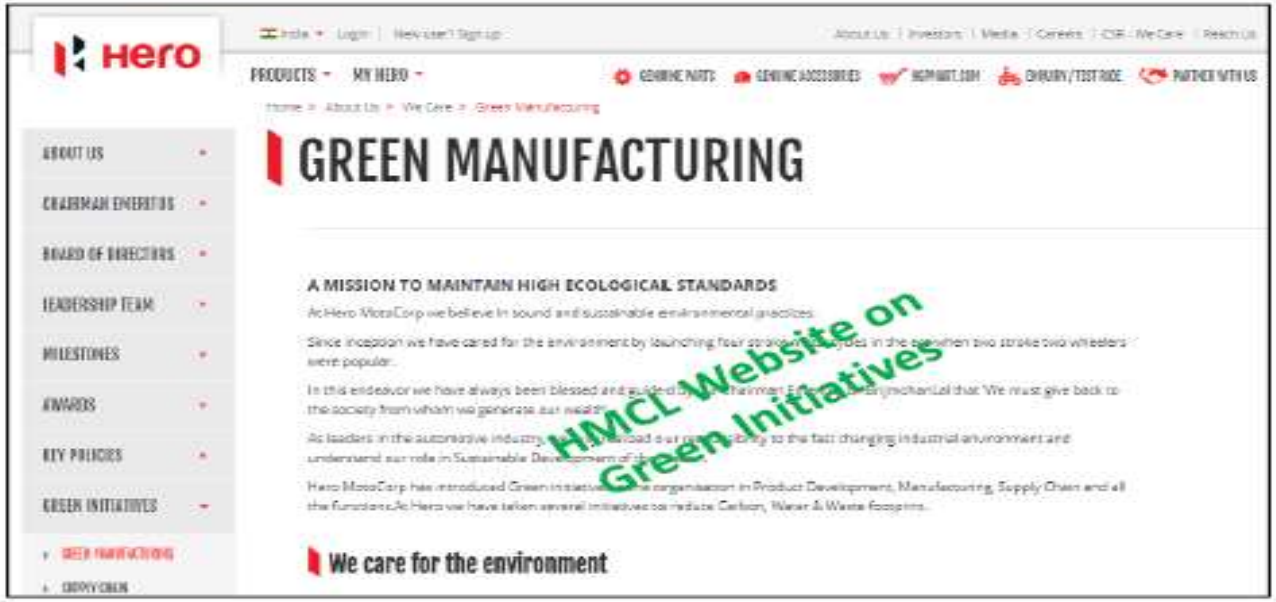
- **100 Nos for DG House & Canteen (Ph#1)**
- **63% Energy Saving than the Conventional Fans**
- **This motor is enabled with "Permanent Magnet" it does away the mechanical commutator replacing with electronic device.**

Energy saved 0.1 Lacs Kwh /year(in Phase#1),has a potential of Saving - 4.0 Lacs kwh/Year in Plant

Renewable & Green Energy

"We must do something for the community from whose land we generate our wealth "

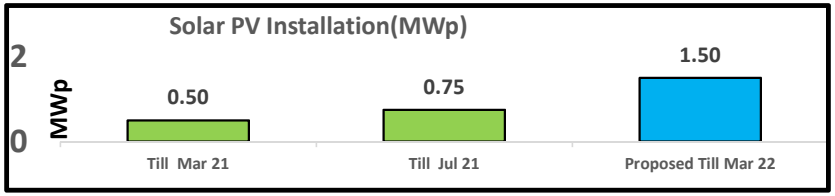
Dr. Brijmohan Lall Munjal
(Chairman Emeritus)

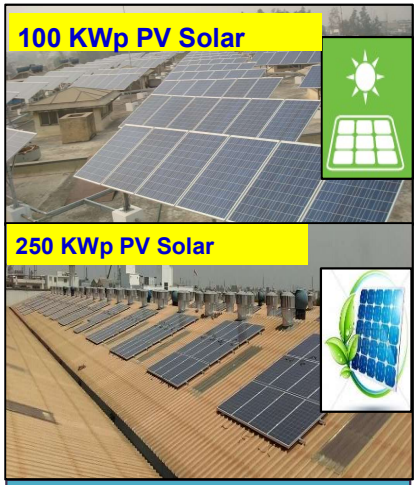


On-site Renewable Energy Generation

- We have an installation capacity of **350KWp** of Solar plant with an average annual power generation of **4.25 L KWh**.
- An additional **150KWp** of Rooftop Solar plant was Installed in Yr 2019 above Employee Bike parking shed with having an annual power generation of nearly **2.4 L KWh**.

Years	RE Projects	On-Site	Off-Site	Total RE Capacity	Remarks
FY:17-18 & Earlier	100KWp of RCC mounted PV Solar	350 KWp	0	350 KWp	On-Site Only
	250KWp of Rooftop PV Solar				
FY:18-19 Completed	Introduction of Solar SmarTree	6.5 KWp	0	6.5 KWp + 1.76LKCal/day	
	Concentrated Solar Thermal Dishes (16 Nos.)	1,76,000 KCal/day	0		
FY:19-20 Completed	Expansion of 150KWp Solar PV	150 KWp	0	150 KWp	
FY:20-21 Completed	Solar thermal Dish	300000 Kcal/day		300000 Kcal/day	On-Site
FY:21-23 Plan	Expansion of Solar PV plant with Capacity of 750KWp	750 KWp	0	4.32 MWp	On-Site & Off-Site Both
	Solar Power Wheeling through State GRID (3.57 MWp)	0	3.57 MWp		
GRAND TOTAL:		1.56 MWp	3.57 MWp		





- 100KWp Solar at Alu. Phase RCC Roof
- 250KWp Solar Plant at Despatch & NEP Roof

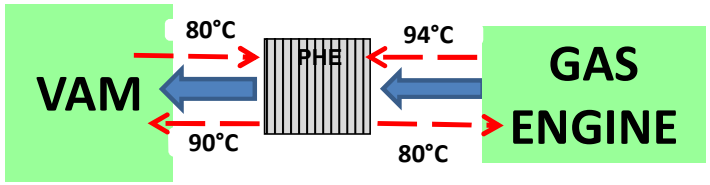
- 150KWp Solar at Employee Bike Parking Shed

On site 500 KWp Roof top Solar PV plant for in-house use

Waste as Fuel

1.Gas generator's Jacket Water Waste Heat Recovery

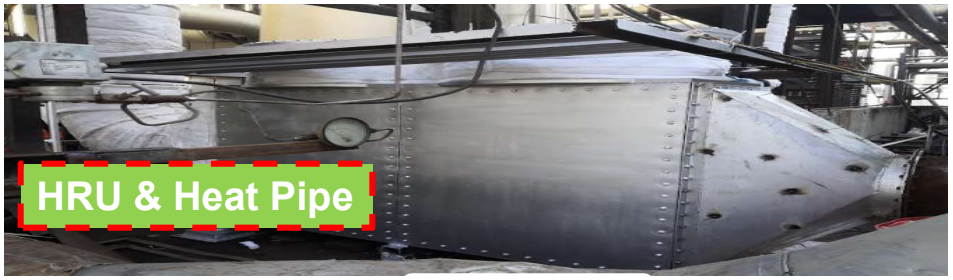
M/C	Flow Rate(m3)	Δt	Running HR/Day	Days in Year	mkcal/Yr
VAM	180	10	16	180	5184



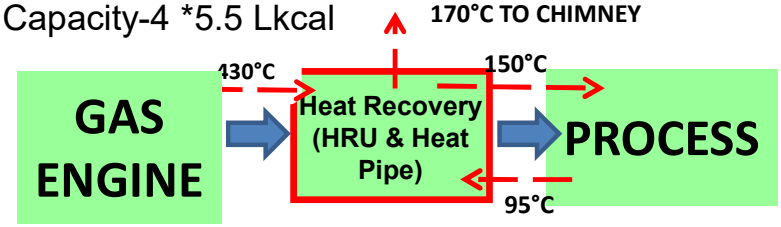
Saving : 5184 M kcal/yr

2.Gas generator's Exhaust Gas Waste Heat Recovery

M/C	Flow Rate(m3)	Δt	Running HR/Day	Days in Year	mkcal/Yr
HRU	25	55	16	300	6600



Capacity-4 *5.5 Lkcal



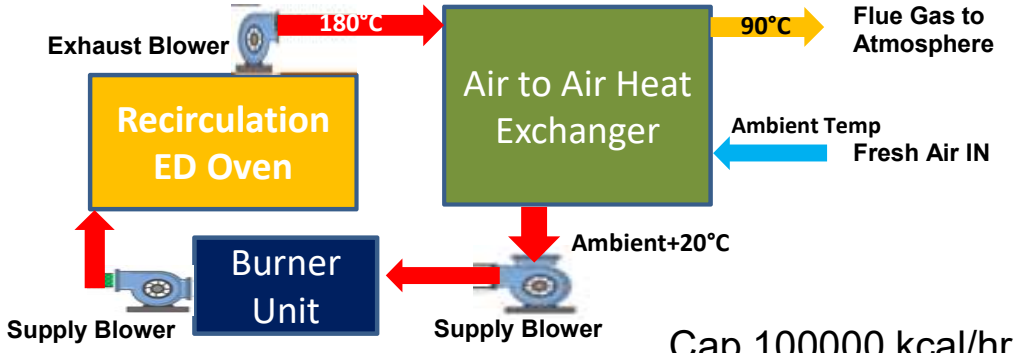
Saving :6600 M kcal/yr

Gas Engine Waste Heat Recovered & used as Fuel resulting in Saving 11784 M Kcal/Yr

Waste as Fuel

3.CED Paint shop Oven Exhaust Waste Heat Recovery

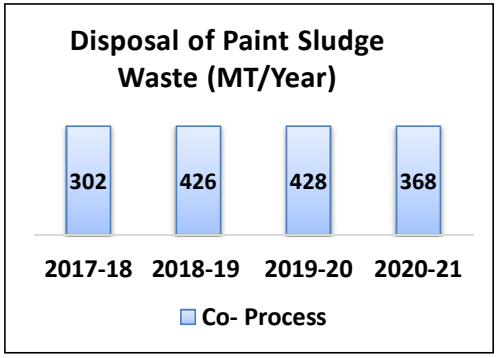
An air-to-air Heat Exchanger is used to pre-heat fresh air (on atmospheric temperature) for ED oven in CED Paint shop.
(Targeted ∆t = 20 Deg. Celsius)



Cap 100000 kcal/hr

4.Paint Waste Sending to Cement Industries

Paint Sludge is generated in Paint shop from Painting Process.100% Sludge is sent to Cement industries to be used as fuel



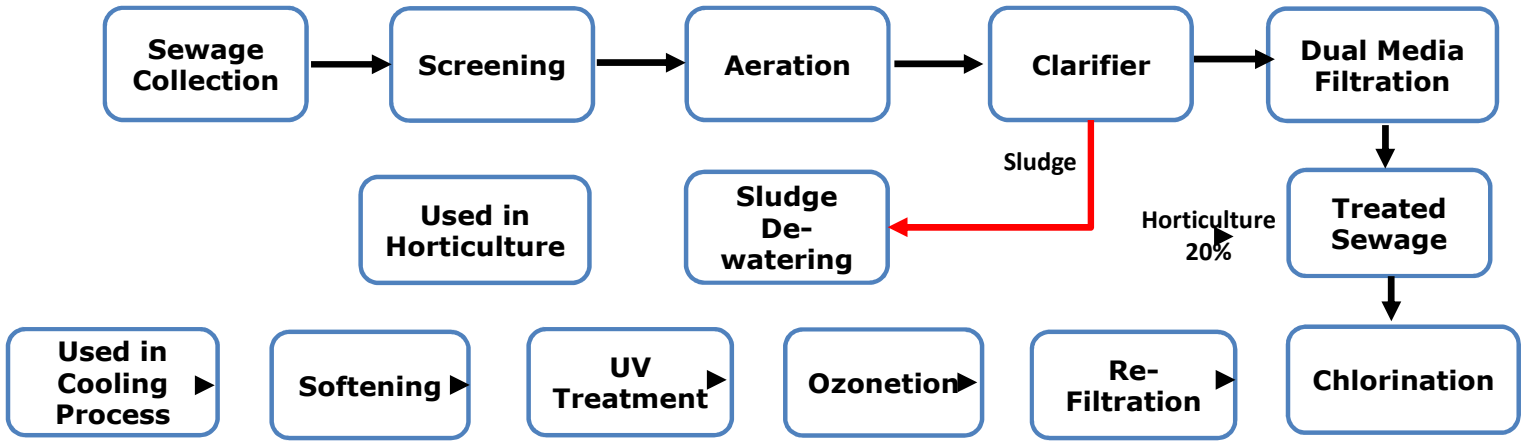
100% Hazardous waste used as alternate fuel/raw material in Cement plants from July 2018

CED Waste Heat is recoverd,Saving:480 M kcal/Yr

Sewage Effluent Management

Capacity-600 Ltr/Hr

Process Flow chart – Sewage Recycling




STP Plant

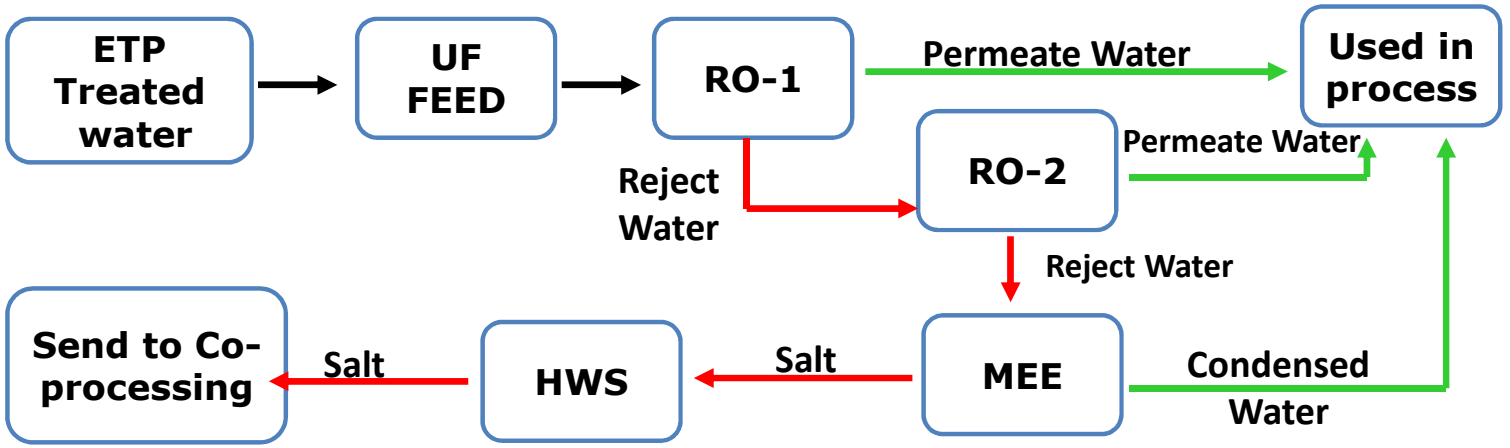

Outlet


Soft Water

Process Effluent Management

Capacity-600 Ltr/Hr

Process Flow chart - ZLD




ETP Plant


ETP Recycling

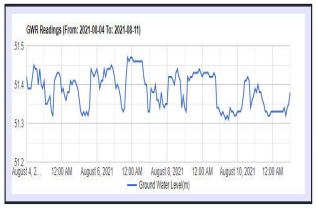
MEE

Rain water harvesting

Rain Water Harvesting

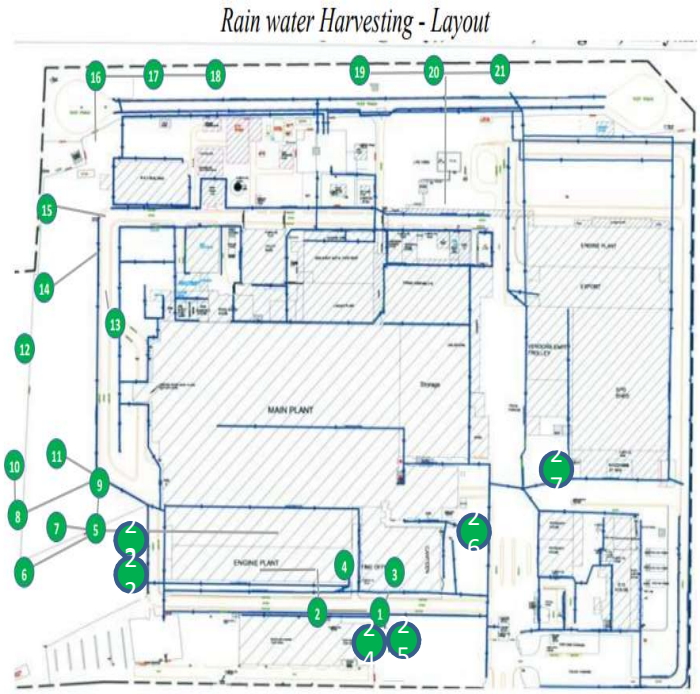
HHML Rain Water Harvesting System	
Catchment's	Existing
Buildings Area (m^2)	57421
Roads Area (m^2)	5725
Average Annual Rainfall (mm)	726
Water Harvesting (m^3)(Runoff coefficient for Buildings = 0.85, Roads = 0.7)	28128
Total Water Harvesting (m^3)	38344

Ground Water Monitoring



HM2G plant has Online real time monitoring system for ground water table monitoring

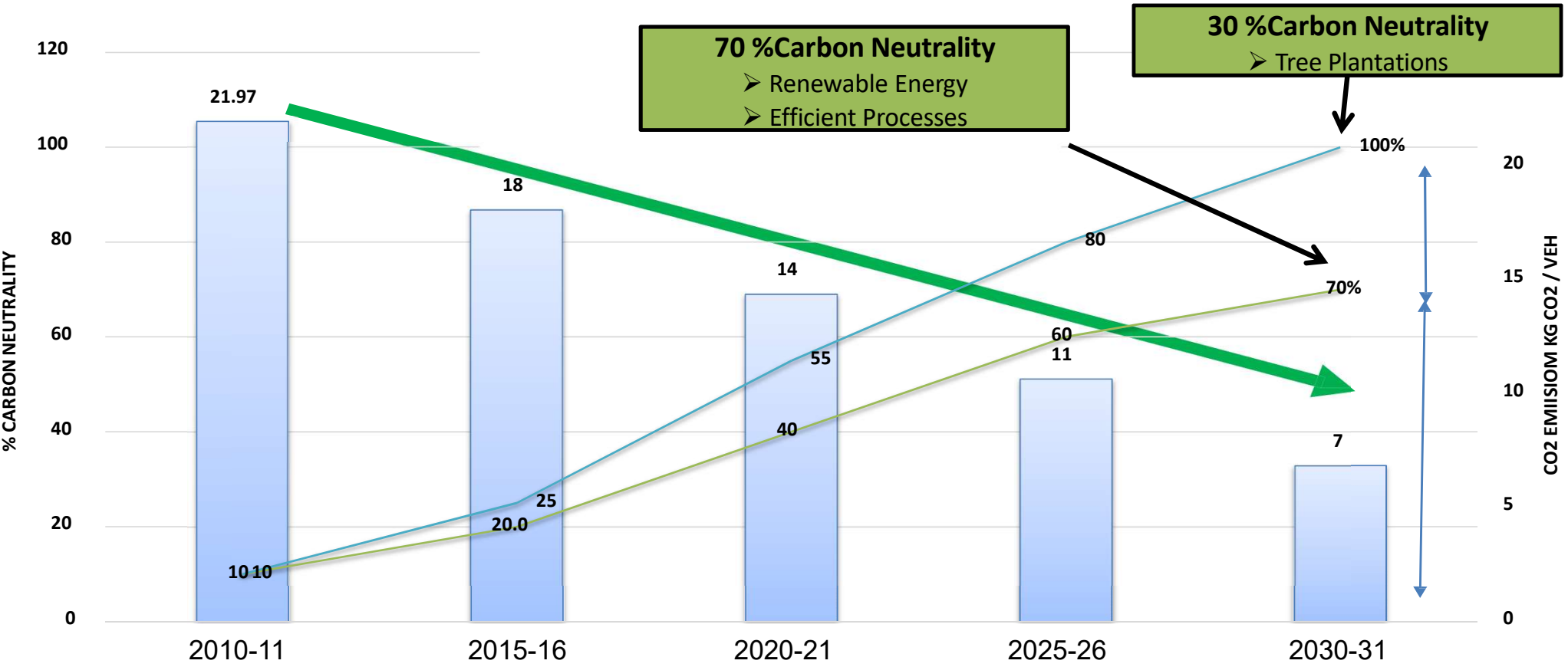
Rain Water Harvesting Well Site Photograph



No. of recharge shafts=27 nos.

27 Shaft of Rain Water harvesting systems Achieving 250 % of Recharging

GHG Emission: Targets for HMCL:



To become a Carbon Neutral Company by FY:2030

Green Supply Chain Commitment

GVDP: An Initiative by Hero for protecting and preservation of Environment

Green Vendor Development Programme

Hero's initiative for Green Vendor development program.

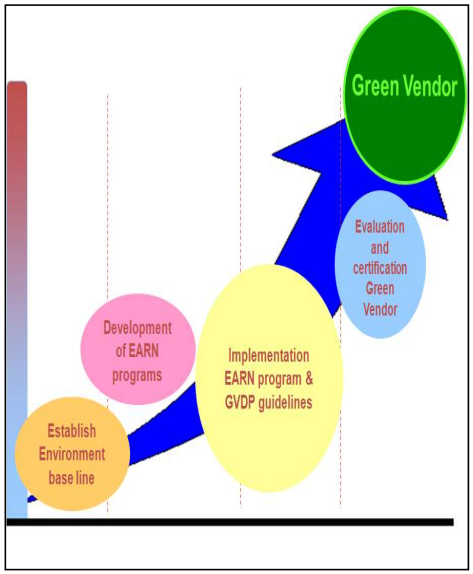
We at Hero MotoCorp are continuously striving for synergy between technology, system and human resources, to provide products and services, to meet the aspiration of our valued customers that too, demonstrating our "WE CARE" philosophy. We believe that our vendors and dealers are key stakeholders and partners to work towards the goal of sustainable development.

Green Vendor Development Programme (GVDP) encourages a effort between Hero MotoCorp and its suppliers to achieve Hero MotoCorp's overall corporate environmental goal. GVDP calls for partner companies to demonstrate their commitment towards improved environmental performance and striving for continual improvement.

Buyers Gain	Sellers Gain	Mutual Gains
Multiplier effect of supplier gains	Reduced production cost-resource optimization	Market competitiveness
Reduced purchase costs	Assured client commitment/ potential for more clients	Public image
Improved image	Reduced liability	Improved relations-secured ties
Improved market reach	Improved relations with regulatory agencies	Reduced production costs greater margins
Reduced liability	Competitive advantage over others	
Greater assurance of consistent & reliable supply	Improved management systems at marginal costs	

METHODOLOGY

Green Supply Chain Cell/Team Approach



APPROACH

1ST YEAR	2ND YEAR	3RD YEAR
Enrollment under GVDP Education & Training for GVDP Techniques One to One Monitoring Base line Establishment Identification of areas for improvement Draw up earn programs for binding the gaps. Evaluation of Earn program at Gemba	Continuous improvement in Earn Program Management Enhanced business efficiency through Earn Programs Improved resource planning and compliance Management Inculcate GVDP approach in over all work culture Measuring & Monitoring results	Extending GVDP techniques to their other manufacturing units and Supply Partners Demonstrate continual improvement in their Environmental performance Generate MIS & Submit to HMCL

HAND HOLDING & MENTORING BY HMCL

JOURNEY CONTINUES FOR NEXT GENERATION

Program Approach had Been Knocked Down Into Year Wise Activities

Awareness Creation for Suppliers, vendors, Associates, etc.

Safety & Green Initiative: Training and awareness Module for Drivers

AN HM2G-OBL DRIVER ENGAGEMENT INITIATIVE

Education and Awareness program created for driver for saving fuel by optimizing routes And periodic vehicle maintenance.

Supplier Evaluation & Certification

Recognition Criteria -

- Top Management involvement and commitment .
- Understanding & aligning with GVDP approach .
- Process mapping as per GVDP methodology
- Adequacy & uniqueness of EARN Projects

On the basis of Adequacy & uniqueness of their EARN PROGRAM ,SCP's are certified every year in the Recognition Program .

Green Supply Chain Efficiency Improvement Programs for Suppliers

Elimination of Single Use Plastic / Non reusable plastic

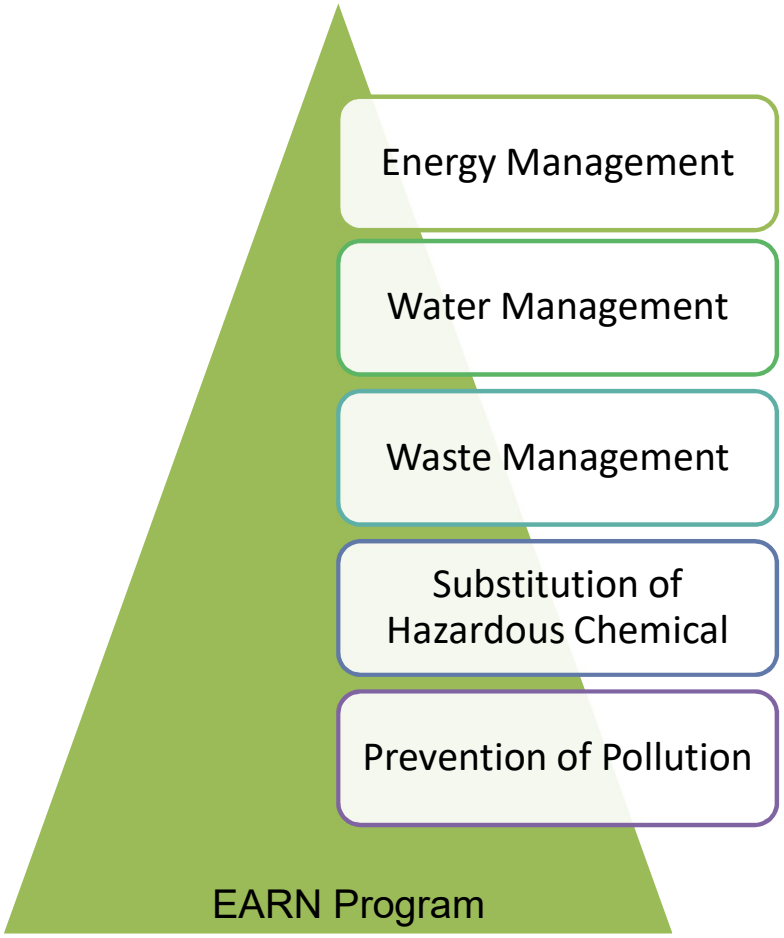
Application of Polybag in Packaging

Use	Over each part	On a group of parts	Over each bin	Tie parts in groups	Over entire trolley	Packing
						
Occurrence	High. Also used exclusively in Export Variant parts.	High in C class & Engine parts	High in Greasy & Oily parts.	Cable	Very Low	Low
Purpose	-Scratch, Rust & Dust protection.	- Clustering	- Rust & Dust protection	- Clustering	-Rust & Dust protection	-Temporary packaging
Possible Solution	- Rust & Dust: Double sided flap with Velcro over bin - Scratch: Foam / PVC cover on walls	-Non-woven bags -Jute Bags	- Double sided flap cover with Velcro - Non Wooven covers.	- Plastic Twine / Develop Trolley	Flap cover with Velcro over a side of trolley	Develop permanent packaging
						

Alternative of Polybag

	Image	Applicability	Advantages	Disadvantages
Jute Bags		- C Class components & Heavy parts	- Reusable - Recyclable - Eco-friendly	- Higher cost - Opaque - Dust attractive
Bio-Degradable Polybag		- Light weight parts	- Bio degradable - Eco friendly - Recyclable - Transparent	- Higher cost - Low weight carrying capacity
Cloth bag		-Light to Heavy components	- Reusable - Recyclable - Eco-friendly - Washable	- Higher cost - Opaque
Non Woven Bag		-Light to Heavy components	- Reusable - Recyclable - Eco-friendly - Washable	- Higher cost - Opaque
PP Sack Bag		-Heavy components	-100% reusable, recyclable, eco-friendly	-Higher cost -Non Biodegradable
Custom Bins		- Dedicated packaging for parts	-Dedicated packaging	-All packaging need to be replaced with new one

Green Vender Development Program 2020-21(EARN Program)



Vendor-Micro Turner,Haridwar

AM DONE DURING FY 20~21 - MICRO TURNERS-VII,HARIDWAR

S.No.	GPDP Pillar	EARN Program Description	Annual Saving of Units	Annual Cost Saving of Rupees (In Lac)
1	Energy Management	To save energy on hobbing machine by reducing motor rating of Hydraulic motor.	25834 KWH	1.8
2	Energy Management	To control rejection by implement bottom clamping on hobbing machine along with top clamping (earlier).	5558 KWH	0.38
3	Energy Management	Reuse waste heat for post washing water heating purpose	840 KWH	0.06
4	Ene...	To exclude Hydraulic motor from thread rolling	...KWH	...
5		...on		

Vendor-Shivam Auto , Rohtak

GPDP (2020-21) Earn Program Summery

		Gpdp Pillar	Annual Saving in Units (KWH/Annum)
1	C2 AABM vmc productivity improvement	Energy Management	1425
2	On VMC NG parts produced due to broken tool	Energy Management /Waste Mgmt/Prevention Of Pollut	14688
3	To arrest continue air from APG Gauge	Energy Management	7390
4	To reduce run out on component by cleaning centre through air blast due to shots/dust present in centre	Energy Management /Waste Mgmt/Sobstitution of Haza	3080
5	Energy saving in DISHA Shot Blasting Blower motor	Energy Management	43200
6	Compressor Loading/Unloading Pressure Reduced to 1 Bar.	Energy Management /Prevention Of Pollution	62208
7	To reduce energy consumption in shot peening & To Increase Productivity	Energy Management /Waste Mgmt/Prevention Of Pollut	3856
8	VFD Provision in d...	Energy Management /Prevention Of	
9	DM Water Pump ...		
10	Induction Heater		
11	Thermal Losses in		
12	Dome Light Repla		
13	Shaft Balancer AA		
14	Multistacking co		
15	Shaft drive Maru... drive train		

Vendor-Varroc ,Halol

S.No	Pillar Name	Title & Description of Project	Saving per Year (Kg/Liiter/ No)	Status
1	Sibstitution of Hazardous Chemical	To Reduce Consumption of Cotton Waste	120 Kg	Completed
2		To Reduce PPE s(Gloves & Mask)	1260 Nos	Completed
3		To Reduce Consumption of Laquera and sludge(B/c)	840 kg	Completed
4		To Reduce Consumption of Black Paint	NA	In process
5		To Reduce Paint sludge	NA	In process
S.No	Pillar Name	Title & Description of Project	Yearly savings In (Nos/g CO2/(km* pax)	Status
1	Prevention of Pollution	Reduce the Paper and painting use	55596 Nos	Completed
2		Employee transporting vehicle reduction for Prevent to Pollution	48360 CO2/(km* pax)	Completed
3		Delivery vehicle size increase for Prevent to Pollution	154752 CO2/(km* pax)	Completed

Employee Involvement & Capacity Building

Strategies adopted for Awareness creation & employee involvement

- On-joining program
- Refresher training
- Class Room Courses
- Training on wheels at shop floor
- Hands on Training
- Safety Corners at Shop floor
- On the Job Training
- One point lesson sheets
- Safety Solutions Team
- Beyond the wheels training for truck drivers
- External Auditor Training
- Internal Auditor Training
- EMS Training
- Environment Promotional Activities


DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Hero MotoCorp Ltd.

ISO 14001:2015

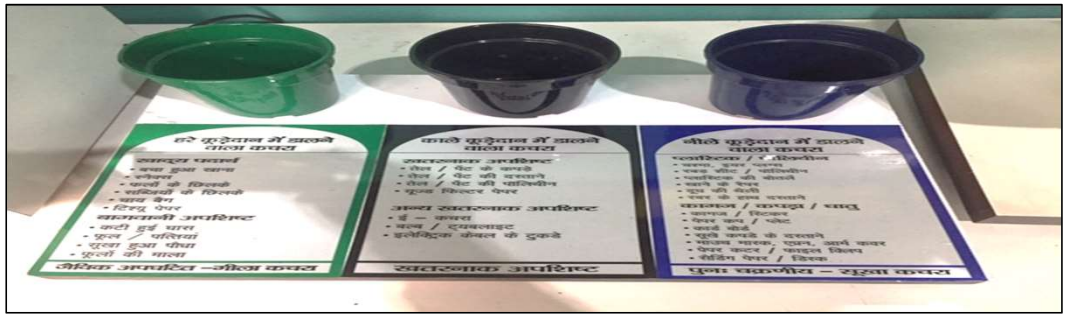
Employee Involvement & Capacity Building

Training programs on energy conservation are organized .

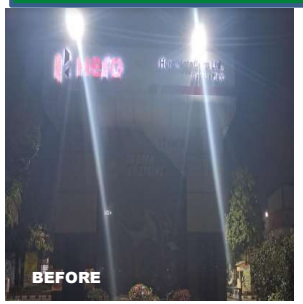
Employee Involvement & Capacity Building

Awareness creation and employee involvement

Waste Segregation Training



Environment Promotional Activity:- Earth Hour Celebration (30th March 2021)



All the employees of each area were participated during this Earth Hour celebration.

World Environment Day & Tree Plantation

Tree plantation & Quiz Competition was planned every year on World Environment Day (5th June)

Green Idea Contest

Poster Competition"

Employee Involvement & Capacity Building

Environment Saving Initiatives

Rain water Harvesting

water Conservation Boards

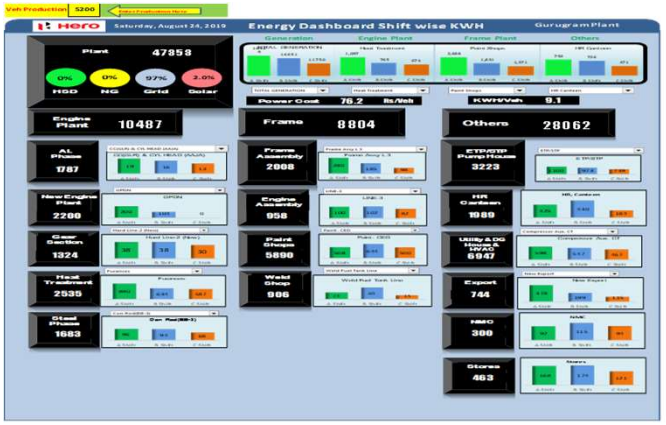
Ban on Plastics

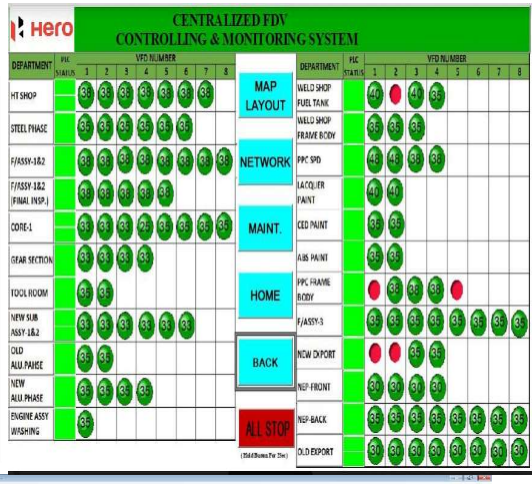
Initiatives to Ban use of Plastic in HMCL

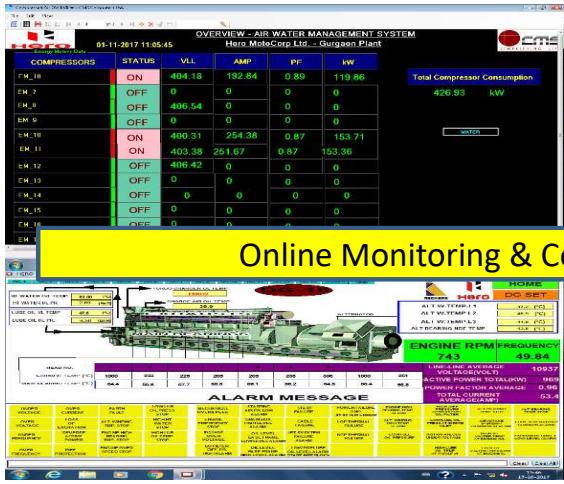
Carpooling

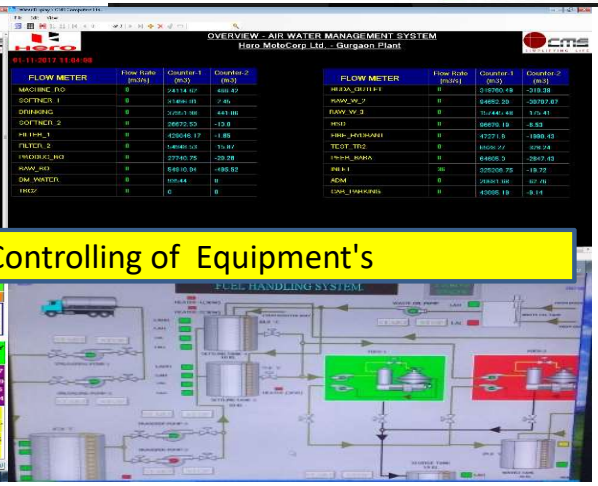
Initiatives to promote Carpooling

Energy Management System-EMS









Online Monitoring & Controlling of Equipment's

Initiative taken During Covid-19 Lockdown

Bike Ambulance

Food Distribution

Learning from CII Energy Awards

Guidance from Honorable CII Judges

- Methodology for deciding scope of Energy Conservation at section/line/machines
- Various Projects-EMS , Digitization
- Solar Thermal for Hot Water
- Benchmarking with National/Global Standards on Energy Consumption

How Green Co has supported us---

- Increased Share of Renewable Energy
- Methodology for Calculating SEC
- Approach for Carbon neutrality
- Mentoring Vendors for Green Co Certification

Awarded with Gold

Encon Initiative during Covid-19 Pandemic

- Reduction Aux. Power Consumption by shifting all plant load on GRID
- Power made off for all non essential equipment, Separate Supply arrangements for critical Equipment's
- Only Critical Lightings were made functional

ENCON Sharing with others --

Senior Officials from Railways visited to see Encon Initiatives

Thank You