National Award for Excellence in Energy Management -2021

Hero MotoCorp Ltd. - Haridwar

1. Brief introduction on HMCH - Journey

1984 – Journey Started

Hero Honda Motors Ltd. Incorporated – Dharuhera Plant (1st)

1985 – First motorcycle "CD 100" rolled out

1997 – Gurgaon plant inaugurated (2nd)

2001 – HHML-World No.1 2W Manufacturer

2008 – Haridwar plant inaugurated (3rd)

2011 – New Identity - Hero MotoCorp Ltd.

2013 – Most Effective Brand Transition Award by CNBC

2014 – 4th plant & GPC operational at Neemrana, Rajasthan

2015 – 1st overseas plant Operational at Colombia

2016 – CIT Started at Jaipur, Rajasthan

2016 – 5th plant was Made Operational at

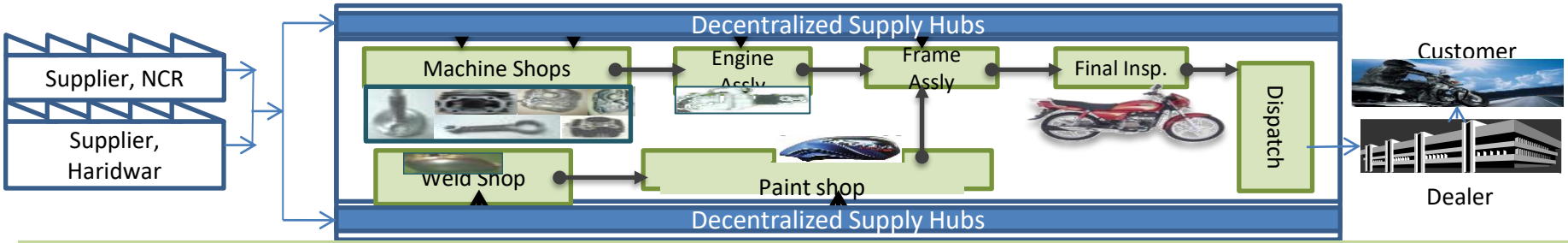
2017 – 2nd overseas Plant started manufacturing at Bangladesh

2018 – Foundation Stone of Chittoor Plant (6th - Andhra Pradesh)

2019 – Start of Hero Tech Centre Germany GmBH

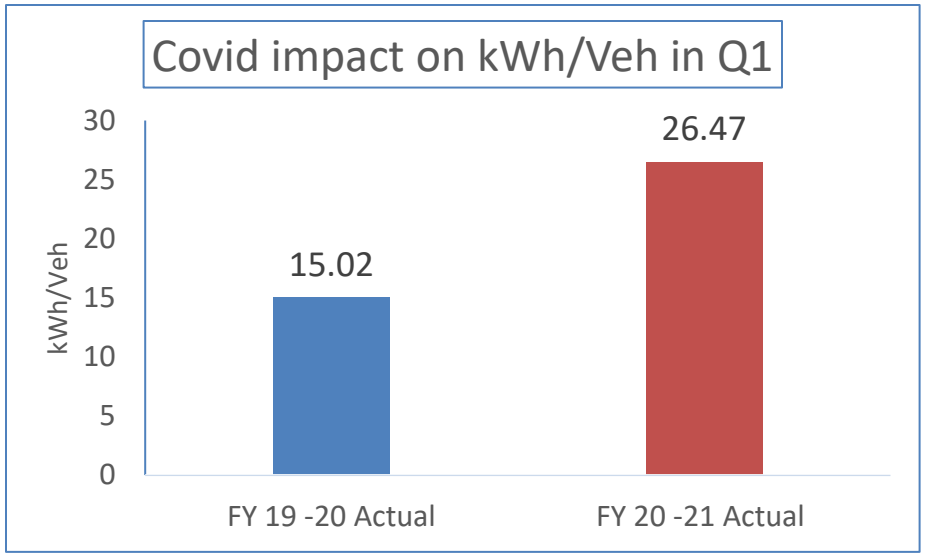
2021 – Milestone of 100 million cumulative Production

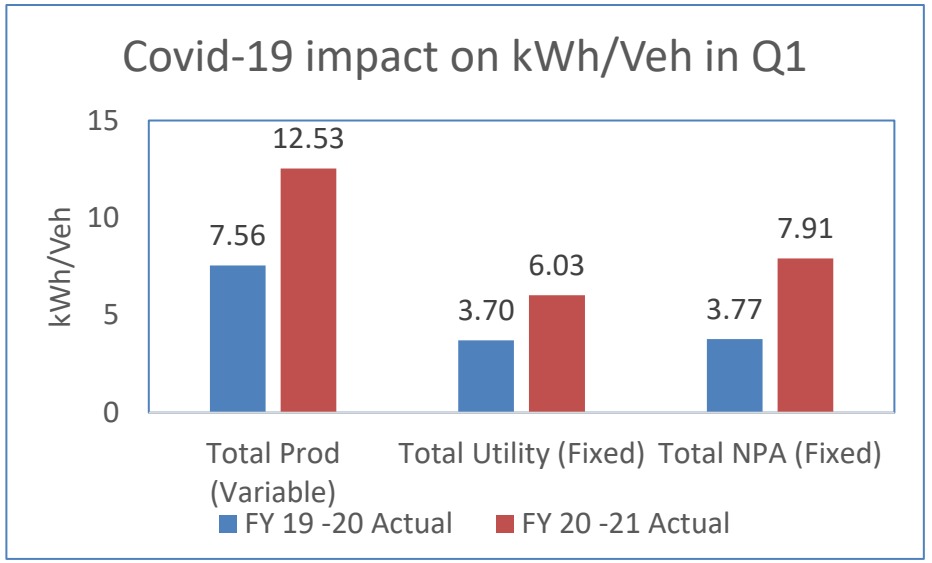
Processes & Major Equipments:

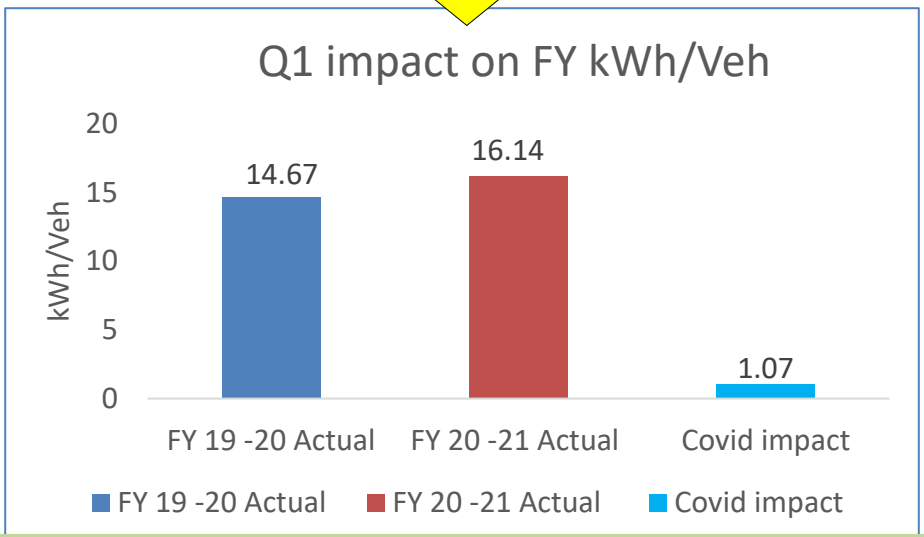


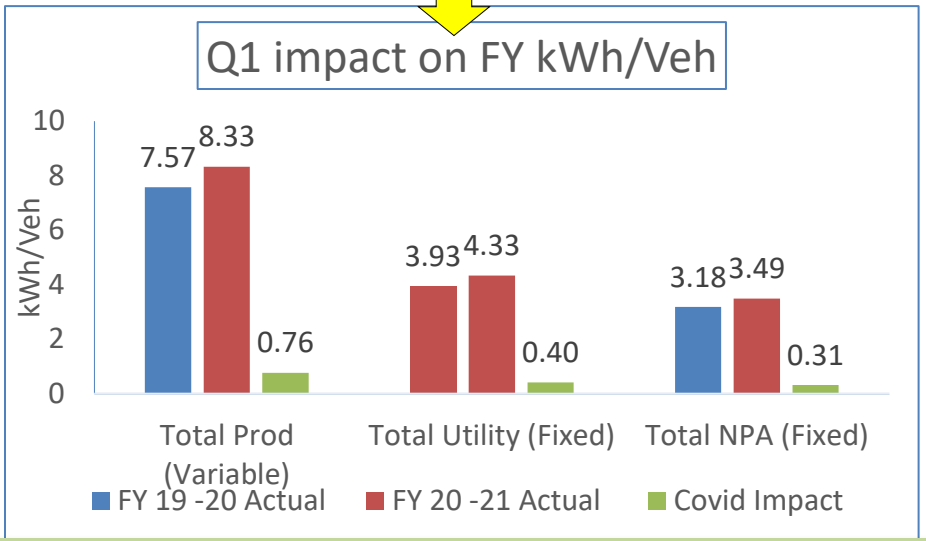
Major equipments are in Paint & utilities of electrical and thermal nature.

2. Impact of Covid-19



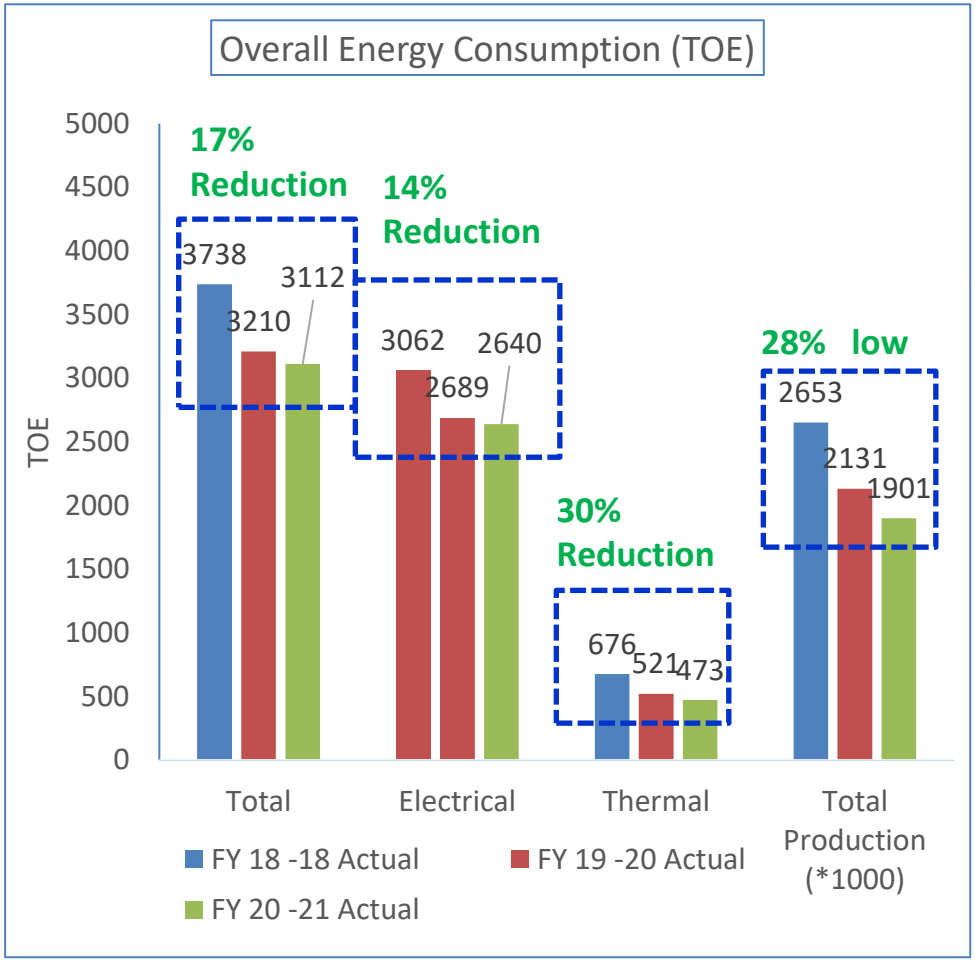


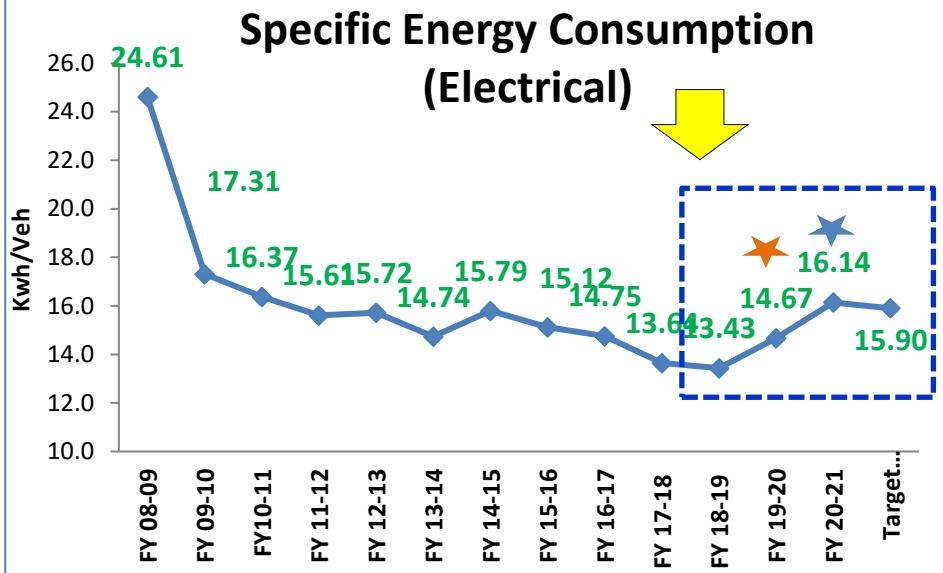




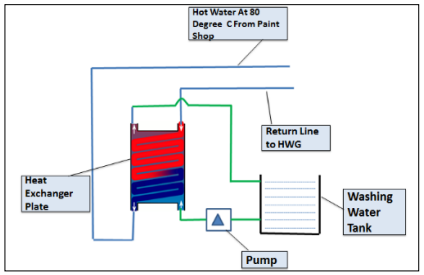
There is no major impact on fuel SFC

3. Plant Specific Energy Consumption 3.1 Historical Trend -Electrical





Key Projects contributing to reduction



Washing heating System using NG

Machine Cycle time reduction

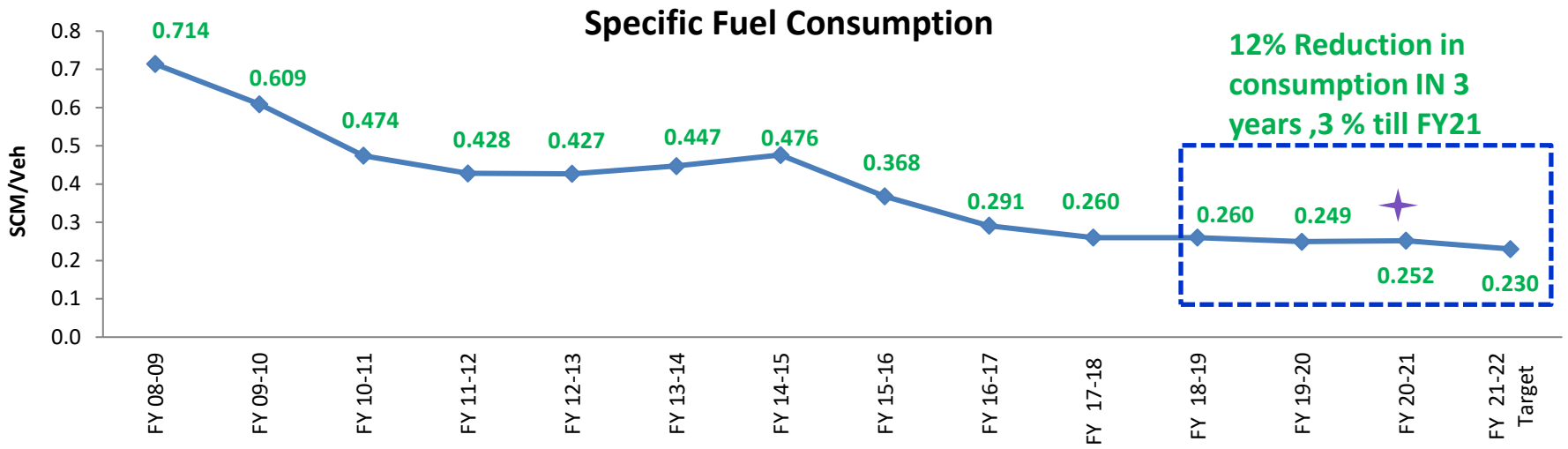
Legend

★ installation of new machines and trail for BS6,higher cc production

★ Covid-19 impact and higher CC production

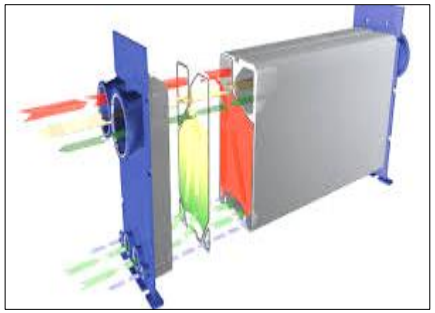
Controlled the overshoot due to covid-19 by Continual improvement in resource conservation

3. Plant Specific Energy Consumption 2.3 Historical Trend -Thermal

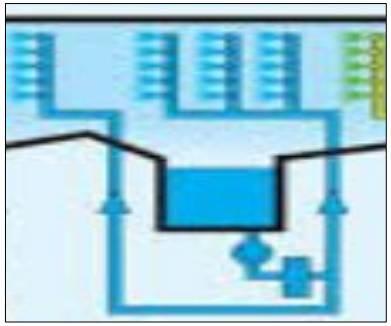


Key Projects contributing to reduction

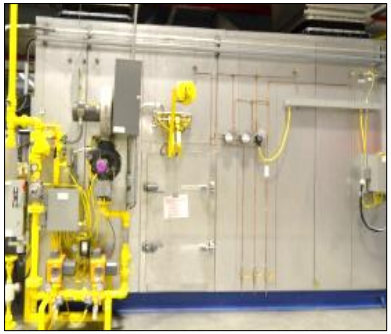
Heat pump in Hot water generator



Temperature optimization through plate increase



Phosphate bath temp. reduction



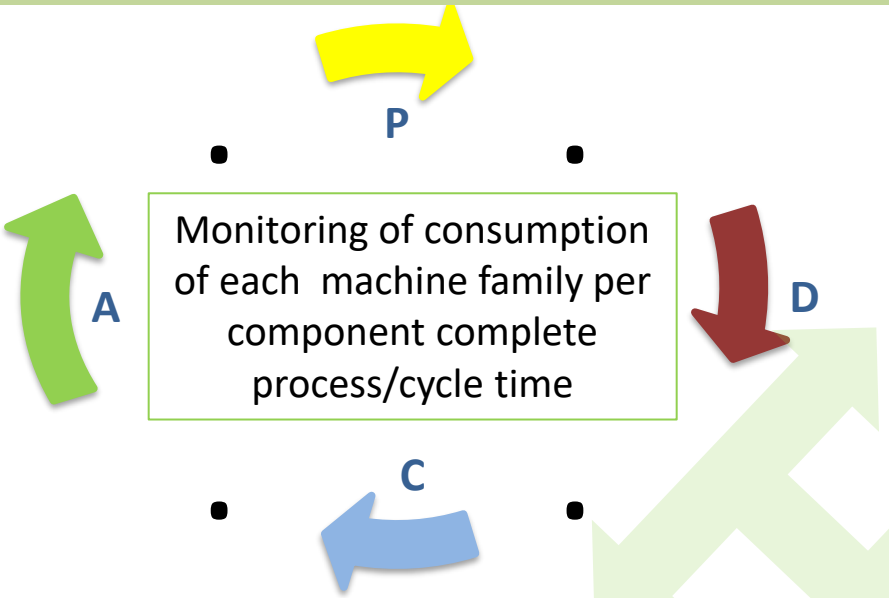
Oven temp. reduction

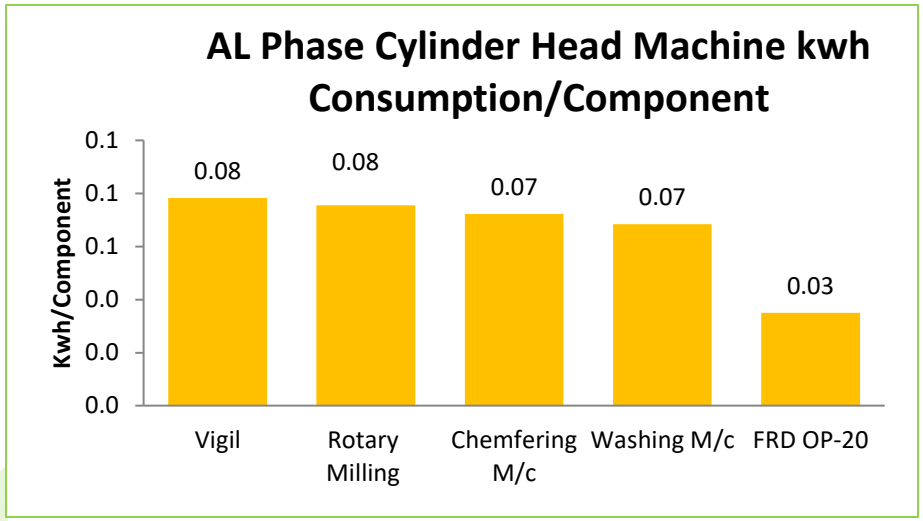
Legend

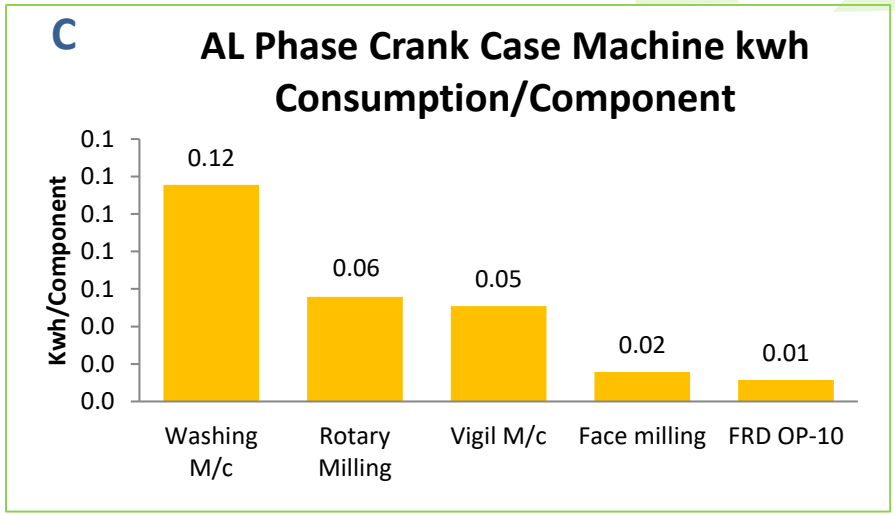
✦ Extensive efforts made in FY 20-21 to bring down SFC under control as new machine addition post BSVI

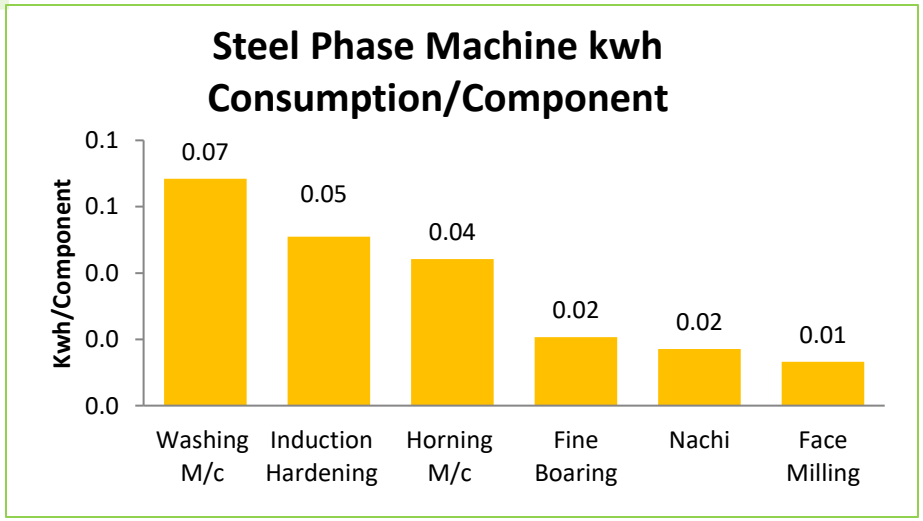
12% thermal consumption reduction in last three year

3. External & Internal Benchmarking



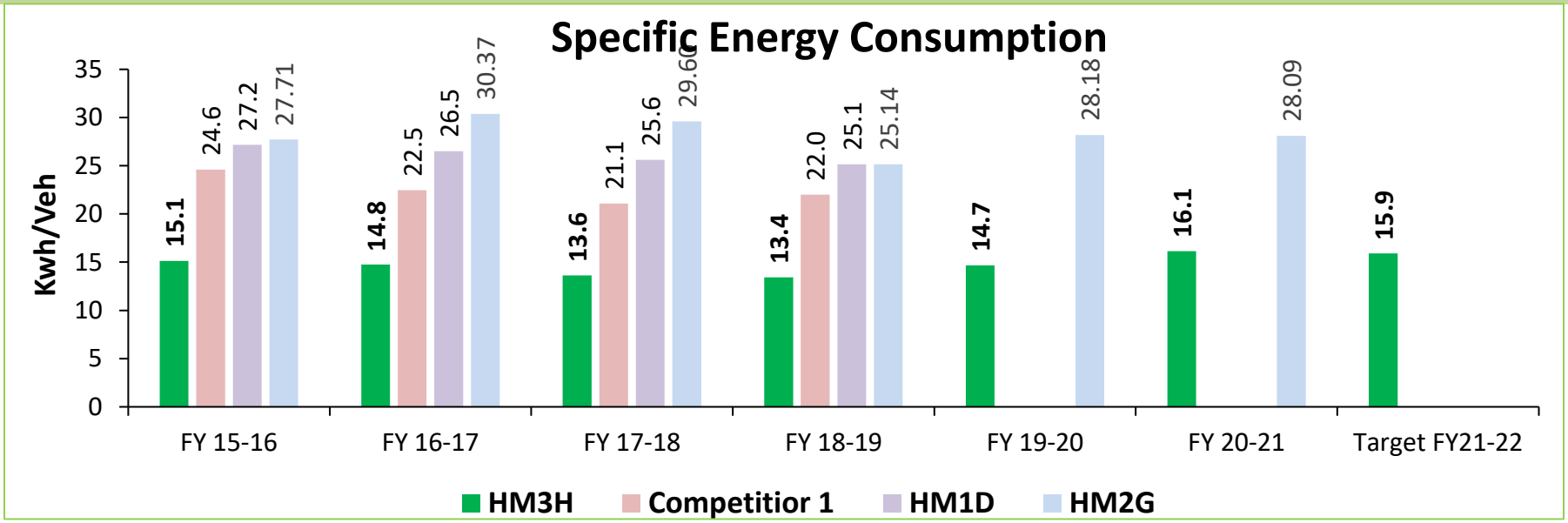




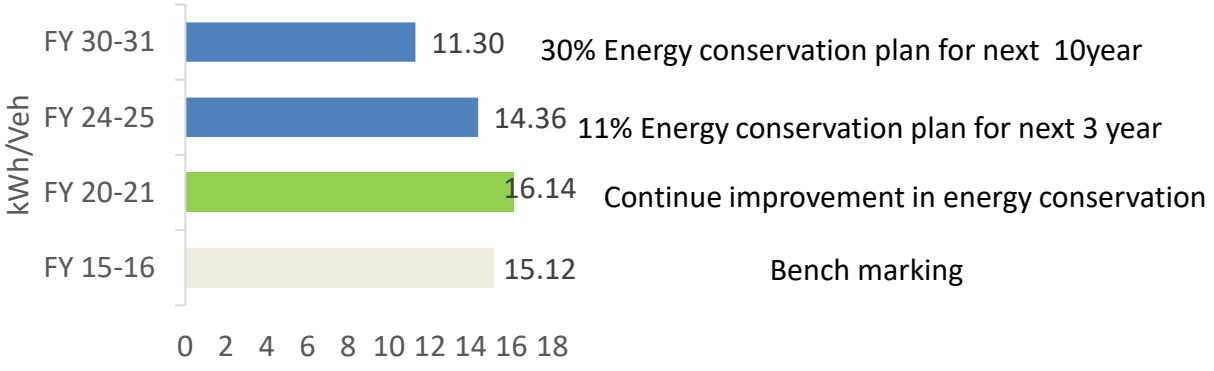


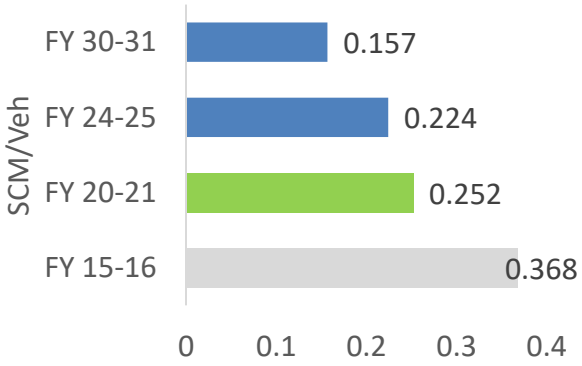
Bench Marking done for energy consumption of each machine family

4.1 External & Internal Benchmarking



Short term and long term Target:-





Benchmarking done w.r.t. Competitors and Internal, though we are consuming lesser than them , still we are striving for continual improvement

4.2 Road Map to achieve Target

- Renewable energy Source identify and usage
- Reused of waste as a fuel and adopting new methodology to reuse waste Energy
- Identify and adopt other efficient technologies
- Digital Innovation to conserve energy
- Continue and accelerate implantation of Energy conservation project

Major Encon Projects Planned for FY 21-22

Major Energy Conservation projects	Saving Proj. (MWh/ Year)	Investment (in Million)
Heat pump is Machine shop washing machine	212	1.5
Automatic Cleaning system (ATC) in EA chiller -Line 2,3,4	192	0.5
High efficient chiller installation in engine Assly	137	1.35
Compressor auto load sharing through centac panel to utilize compressor running	111	1.2
1 MW New Ground Solar Plant	1,095	30
High Efficient Pump & Motor Installation For Energy Saving	56	0.8

Hot water temperature reduction from 75 to 70 Degree	0.04 SCM/Veh	0.01

5. Energy Saving projects implemented

5.1 Project summary

FISCAL YEAR	TOTAL No. PROJECTS	TOTAL INVESTMENTS (In Rs. Million)	Electrical Saving (MWh/Yr)	Thermal Savings (Million Kcal)	Thermal Saving (In Rs. Million)	SAVINGS (Elec, Ther) (In Rs. Million	Impact on SEC (Electrical, thermal)	Impact on SEC (Electrical, thermal)
FY 18-19	22	21	1471	895	3.5	12.7	0.55	0.34
FY 19-20	17	7	1338	0	0.0	8.7	0.63	0.00
FY 19-21	19	6	1433	901	2.9	11.2	0.75	0.47
TOTAL	**58**	**34**	**4242**	**1796**	**6.4**	**32.7**	**1.94**	**0.81**

Total 58 No's projects Implemented and cost saving of Rs 32.7 Million achieved

5. Energy Saving projects implemented

5.1 Zero investment (Electrical)

Sr. No.	Top 10 Energy Saving Projects – Zero Investment/low cost	Annual Savings	
		MWH	Rs in Million
1	Capacity Enhancement of machine shop to 1. Cycle time reduction (Saving power consumption)	333	2.1
2	Elimination of 2 washing machines by increasing the capacity of washing machine with layout improvement	147	0.95
3	Power Factor improvement from 0.991 to 0.995 Through Relay control	130	0.8
4	Elimination of Low Suction Pressure & Air Cylinder malfunctioning phenomenon through modification of Exhaust hood by providing swing exhaust collection system.	108	0.70
5	FA DOL FDV use optimization by stopping extra blowers.	91	0.6
6	Oil heating removal in EA1234 in oil dispenser (pneumatic pump and heater elimination)	87	0.56
7	KWH Saving thru optimization of solvent temperature from 45-60 to 45-50	89	0.56
8	Recurring energy saving in Fanuc Robo drill machines by optimizing consumption of compressed air with Zero investment of capital	79	0.50
9	Chiller energy consumption Optimization in L34	72	0.47
10	Re-layouting of AARCO and Fume suction Drop of Weld Shop	65	0.42
	Total Saving (Top 10 Projects)	1201	7.7
	Total Projects Saving (37 Nos.)	1720	10.6

Total 37 No's Zero investment projects Implemented and conserved 1720 MWh and cost saving of Rs 10.6 Rs Million/year

5. Energy Saving projects implemented

5.2 With investment (Electrical)

Sr. No.	Top 10 Energy Saving Projects- With Investment	Annual Savings	
		MWH	Rs in Million
1	Heat pump installation in washing machine of cylinder head to save the energy cost	110	0.7
2	Conventional task lights replacement with LED Lights (8592 (Exc. Street light) Nos) PH-1: 5280, PH-2: 3312	673	4.23
3	Plant light conversion to LED	316	2.05
4	Heat exchanger installation in Engine Assy Washing machine and elimination of Heater	271	1.7
5	FDV Upgradation with new technology- EC+ Fans - 3 FDV nos.	196	1.2
6	5 nos washing machines (Machine No 1,2, 5,6,7) - convert to Ng from electrical type. (5 Machines @ Avg 2 .1 Lacs/Machine/Year)	190	1.23
7	10 Nos VFD installation through out the plant to save the power cost	160	1.01
8	Base Coat and Top Coat ASU blowers to be replaced with EC fans	117	0.76
9	EC fans installation in Plant (Phase 1 - Laq ASU-MB1, AB, SM PC Phase -2 - SM BC, TC)	99	0.63
10	IGBT based transformer to be installed in place of servo stabilizers (11nos + 18nos)	74	0.47
	Total Saving (Top 10 Projects)	2206	14
	Total Projects Saving (20 Nos.)	2522	15.7

Total 20 No's Investment Projects Implemented and conserved 2522 MWh and cost saving of Rs 15.7 Million/year

5. Energy Saving projects implemented

5.3 Thermal Energy

Sr. No.	Top Energy Saving Projects – Thermal	Annual Savings	
		SCM in Tons	Rs in Lakhs
1	Hot water temperature Reduction from 80°C to 75°C through Digitalization.	75	28.6
2	Installation of AHP to reduce energy consumption	120	35.8
	Total Saving (Top 2 Projects)	**195**	**64.4**

2 Projects implemented & Conserved 195 Ton SCM Natural Gas resulting in cost saving of Rs. 64.4 Lakh /year

6.1. Innovative Projects implemented

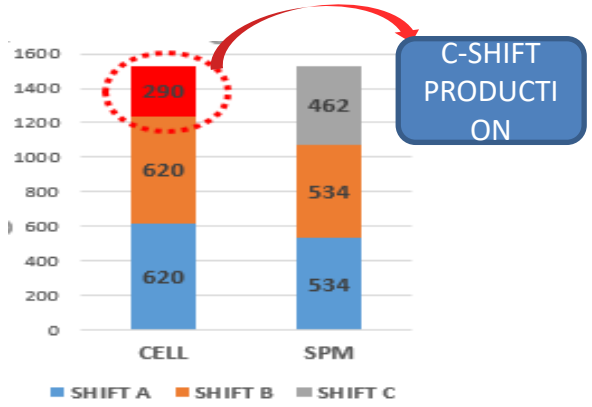
S. No.	Section	Improvement Project	Resource Saved/ Annum	Cost Saving
1	Utility -HWG	Hot water temperature Reduction from 80°C to 75°C through Digitalization.	96 KSCM	INR 28.6 Lakh
2	Machine Shop	Energy Saving through heat pump installation in washing machine	110 MWH	INR 6.9 Lakh
3	Machine shop	Capacity Enhancement of machine shop to- 1. Cycle time reduction (Saving power consumption)	333 MWH	INR 21.0 Lakh
Total Saving Per Annum				**INR 56.5 Lakh**

Cost saving of Rs. 56.5 Lakh/Annum above top 3 Innovative Projects

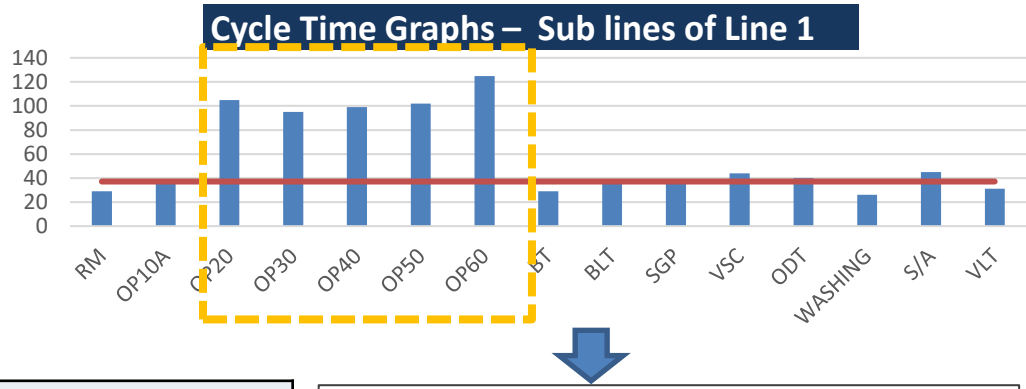
6.2. Innovative Projects implemented

Theme : Capacity Enhancement of machine shop by reducing cycle time

Current Scenario :.Machine shop running for complete 3 shifts 24 hours

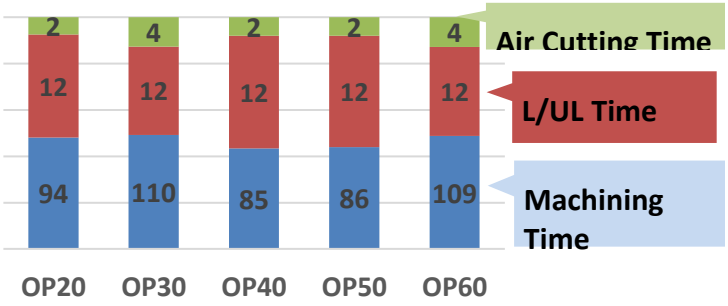


➢ Step1. Study done on Subline wise cycle time.



Phase	M/C	Cycle time		Proposed Trial details
		Before	after	
Phase-1	OP30	126	105	# Inlet face milling In Double cut in OP30 # Oil bolt dia 5.0 drill processing in G01 up to 20 mm (NVA) in OP30
	OP60	125	104	# Dia 14 end mill processing in G01 up to 10 mm(NVA) : Air Cutting Time reduced
	OP20	108	105	Dia 14 end mill processing in G01 up to 10 mm(NVA) in OP30
Phase-2	OP20	104	95	# Face milling to be done with Dia 32 milling cutter & re-programmed it to reduce no. of cutting touch points for CT reduction with feed of 3600mm/min & 7500 rpm
	OP30	96	95	# NVA removal activity
	OP40	95	92	# Tool Sequence Corrected # Turret & Table movement to be synchronized after cycle completion #Air cutting time reduction in Dia 13.1 drill & deburring brush
	OP50	100	95	# Air cutting time reduction for NVA removal on Rough seat tool for Inlet & Exhaust Dia
	OP60	105	94	# Combination tool of Dia 9.2 & Dia 10.5 # NVA removal activity

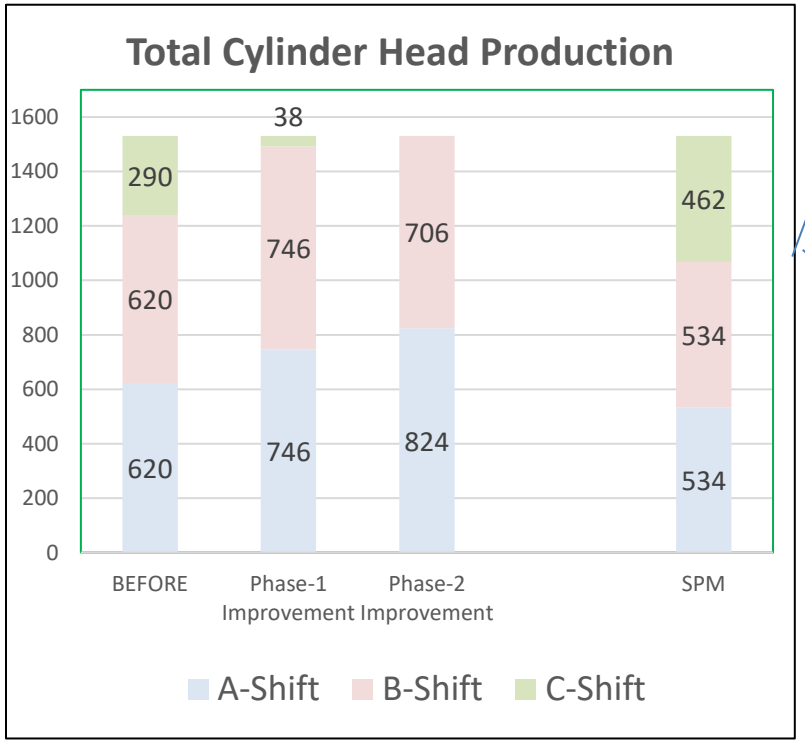
➢ Step2. Cycle time breakup captured of cycle time lines

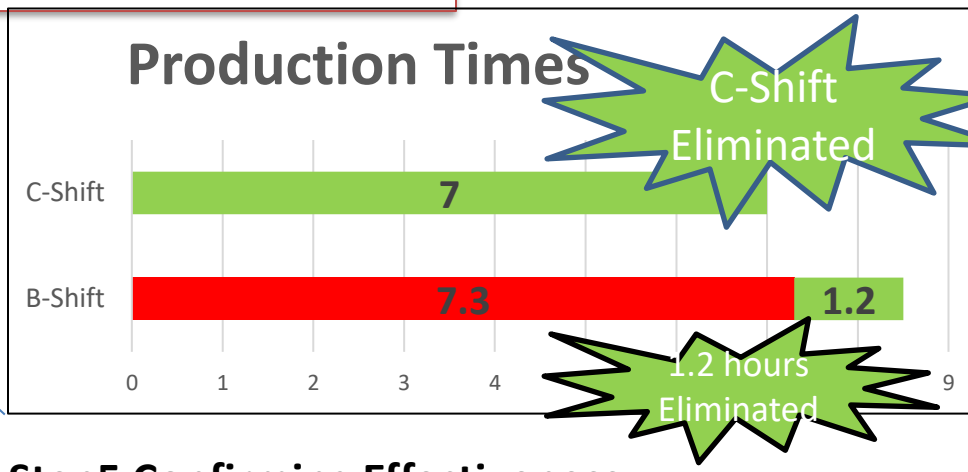


Step 3: Multiple projects identified to reduce the machining time and Air cutting time, action plan to execute

6.2. Innovative Projects implemented

Step4 Confirming Effectiveness





Step5 Confirming Effectiveness

Power Saving Justification		
Cost of 1 KWH(Rs.)	6.5	
Power Consumption OF 1 m/c (KW)	8	
Power Consumption OF 1 ROBOTS (KW)	4.8	
No. of Machines	15	
No. of Robots	6	
Total load (KW)	148.8	
	Before	After
Time Consumed(min)	1410	920
Power Consumed/day	3497	2282
Power saving kWh/day	1215	
Power Saving kWh /year	332965	
Cost Saving Rs in lac/year	22	

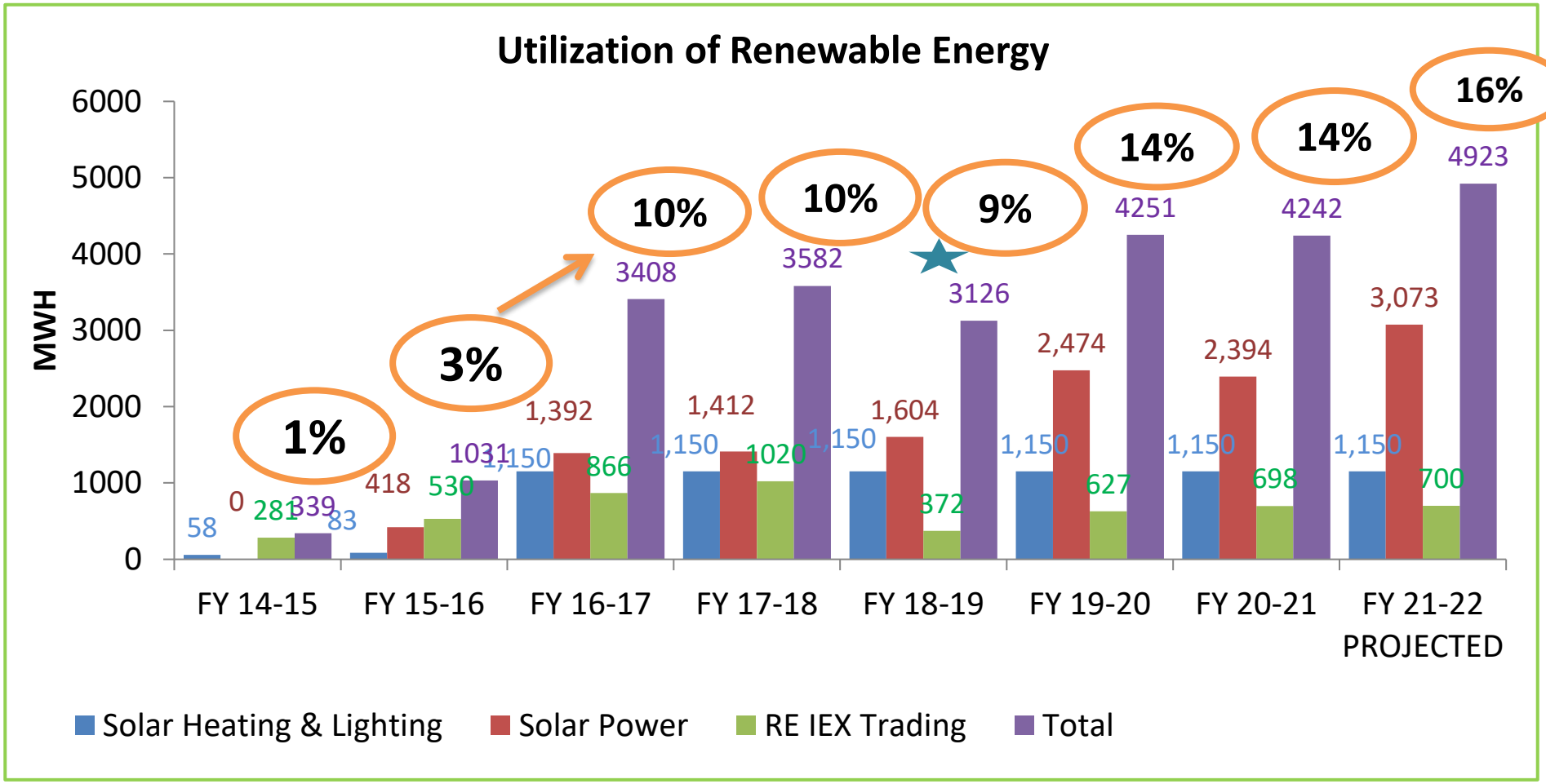
Cycle time improved from 126 Secs to 95 Secs (25 % reduction)

7. Renewable Energy Source

S.No.	Technology	Type of Energy	Onsite/ Offsite	Installed capacity	Generation(million kwh)	% of overall electrical energy
1	Solar	Electrical	Onsite	2MW	2.4	7.8%
2	Solar	Thermal	Onsite	5KL	0.7	2%
3	Solar (sky Light/Translucent sheet	Light	Onsite	252	0.3	1%
Total renewable energy generation					**3.03M KWH**	

3.03 M kWh per year generation from renewable energy sources

5.2 Renewable Energy Utilization



Legend

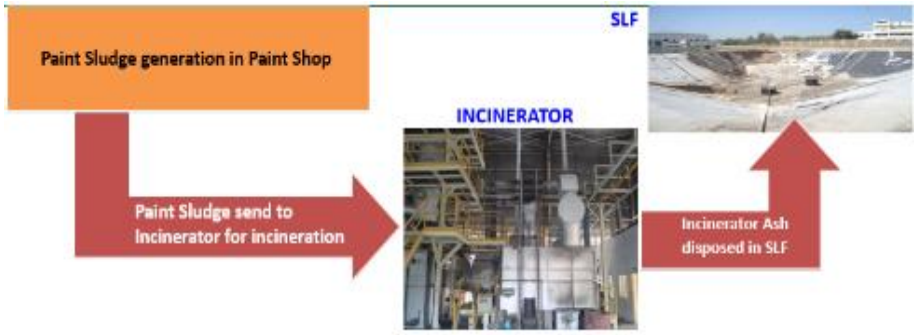
★ RE iex trading less because of higher market rate

Current Utilization of Renewable Energy - 14% , we are in process of installation of 1MW Solar plant

8. Utilization of waste material as fuel

1. Co-processing for Disposal of Paint Sludge

- After incineration paint sludge convert into ash which disposed in SLF.
- Approx.. 23000 kg paint sludge generate monthly, which is being incinerated in the one incinerator
- Approx. cost of Paint sludge incineration = Rs 27/kg



Co-processing (Rs/Kg)	9.00
Per kg Paint Sludge Incineration Cost	27.00
Saving per kg paint sludge	18.00
Monthly average Paint Sludge generation ((kg)	23230
Monthly Saving by Co-processing (Rs. Lakh)	4.18
Yearly Saving by Co-processing (Rs. Lakh)	50.18

2. Rain water harvesting in plant

Rain lake

Rain water Pit

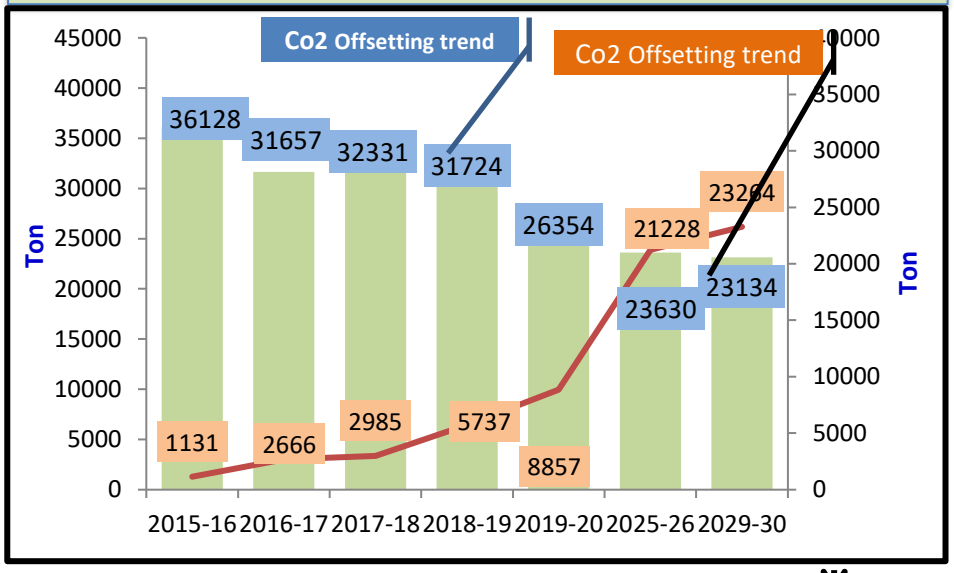
Layout of rain water harvesting pits

S No	areas	Actual Rain Water Harvested (cubic mts/yr)Ha =Aa*C*R
1	Run off area	129465
2	Roof top area	81644
Grand Total (M3/YR)		211109

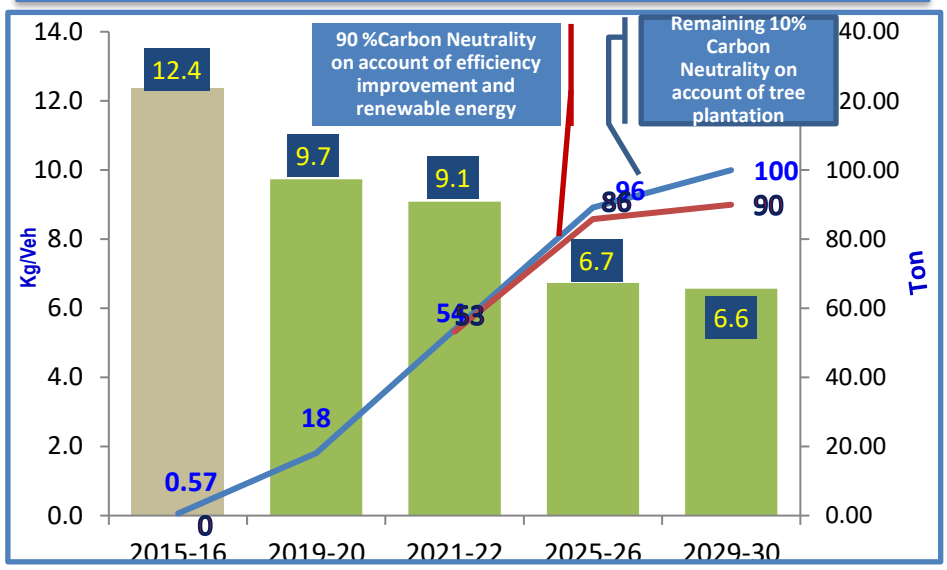
2.1 lakh M3/year Rain water harvesting in plant

9. GHG Inventorization

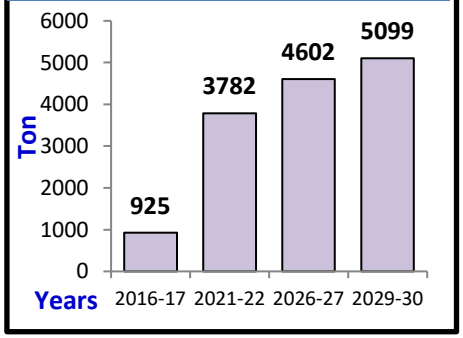
CO2 Reduction in Tons Vs CO2 Offsetting Trend till 2030



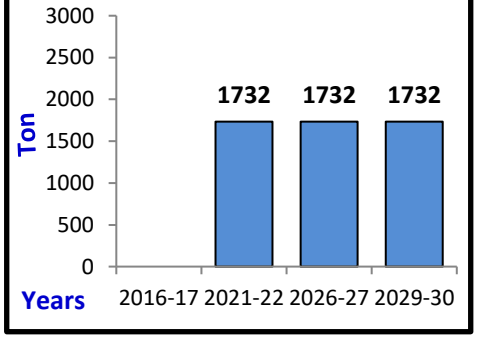
CO2 Reduction – Kg/Veh Vs CO2 Offsetting Trend %age



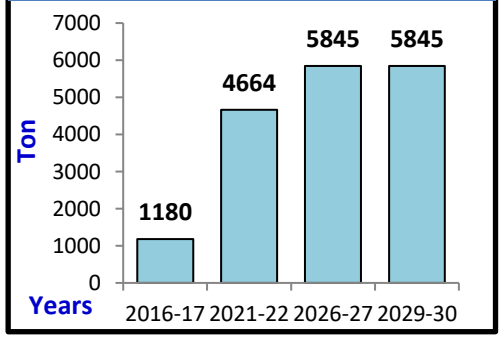
CO2 Offsetting – Energy Conservation



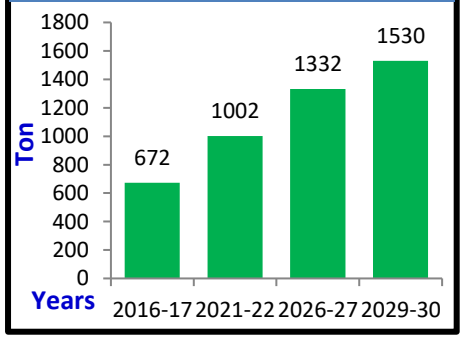
CO2 Offsetting - Fossil Fuel Reduction



CO2 Offsetting - Renewal Energy



Co2 Offsetting - Tree Plantation



Carbon Neutral Strategy – Targeting 100% Carbon Neutral by 2030 at HM3H

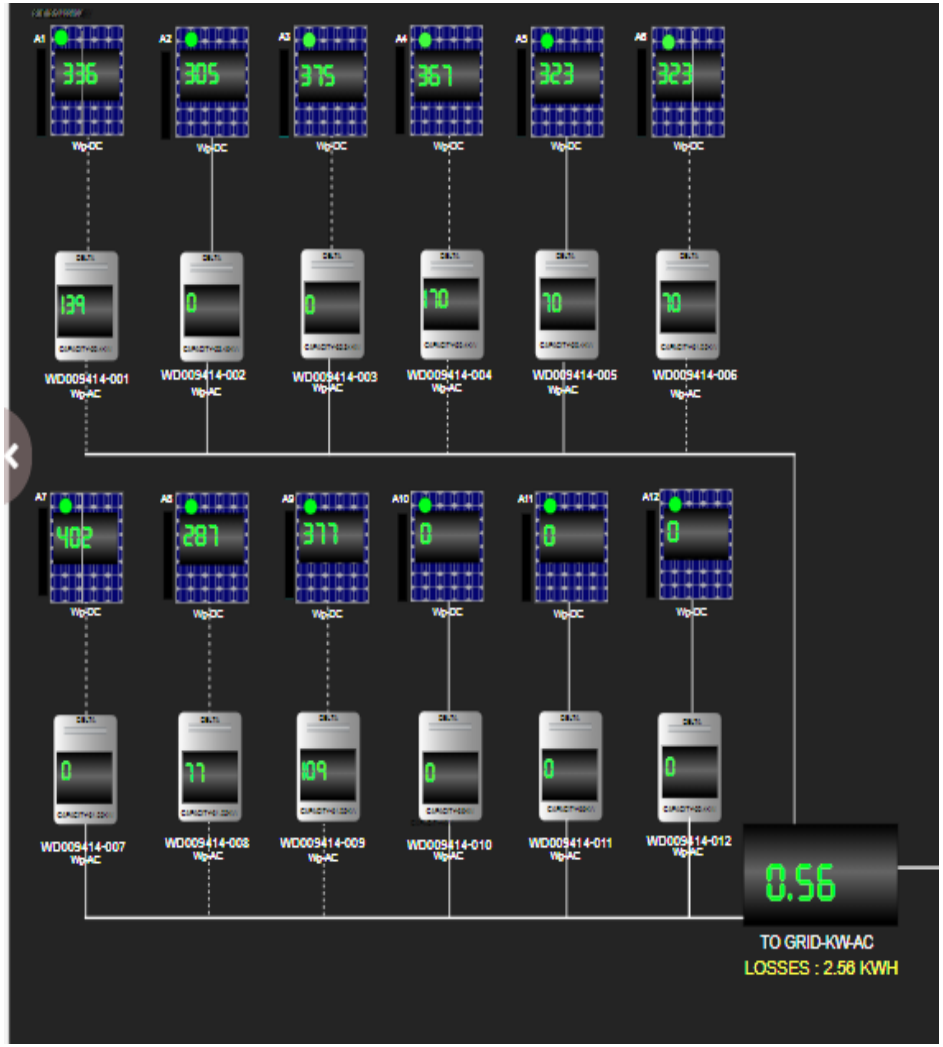
10. Green Supply Chain

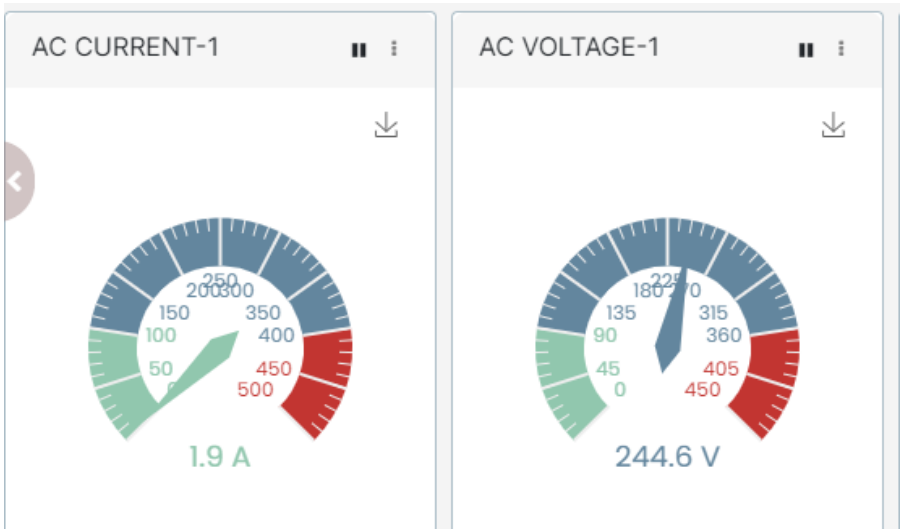
10 En Con Projects Saving

Sr. No.	Top Energy Saving Projects	Name of the Associate / Vendor	Annual Savings KWH
1	Installed roof top solar plant 350 KVA CAPACITY	Classic Stripes Pvt Ltd	911,019
2	Submersible pump install in cooling tower instead of monoblock/openwell pump	Sandhar Automotive, Haridwar	44,928
3	To Reduce Energy Consumption through air compressor. (Compressor Dryer Install After Air receiver Tank & Two compressor pressure setting is 6.0 bar to 6.5 bar & Another Compressor pressure setting is 5.8 bar to 6.3 Bar.)	Sandhar Automotive, Haridwar	45,778
4	4) Modification in Chiller Plant	M/S - Bhagwan Precision	23,712
5	To save electricity during Compressor	Napino Auto	90,000
6	Changing High wattage Conventional light with LED - Machine sop & HPDC	Lifelong India Pvt. Ltd. Haridwar	19,445
7	Replacement of CFL Tube Lights with Energy Saving LED Tube light	Lumax Industries	10,585
8	To Reduce Energy Consumption through air compressor (Reduce 5 % air leakage in all plant)	Sandhar Automotive, Haridwar	20,592
9	4) Modification in Chiller Plant	M/S - Bhagwan Precision	23,712
10	Provided Transparent Sheet on shop floor roof to get natural light in day time	Lifelong India Pvt. Ltd. Haridwar	15,382

Various project implemented at vendor end & Conserved 19 Lac kwh resulted

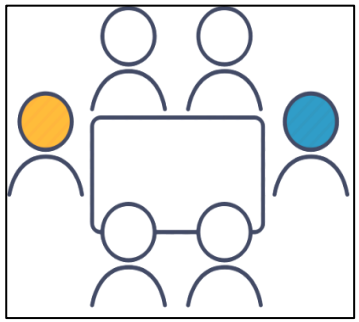
Solar Plant monitoring using web



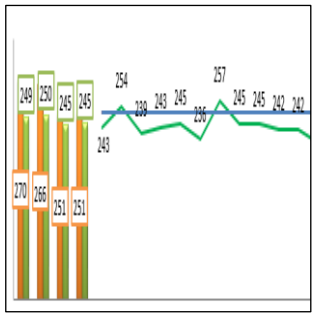


Report Generates and sent to mail, live monitoring also become easy.

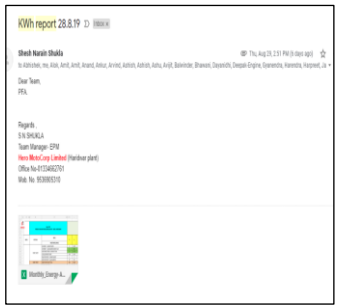
11. Team work, Employee Involvement & Monitoring



Daily morning review



Daily variance analysis



Daily shop mailers

Monthly MIS

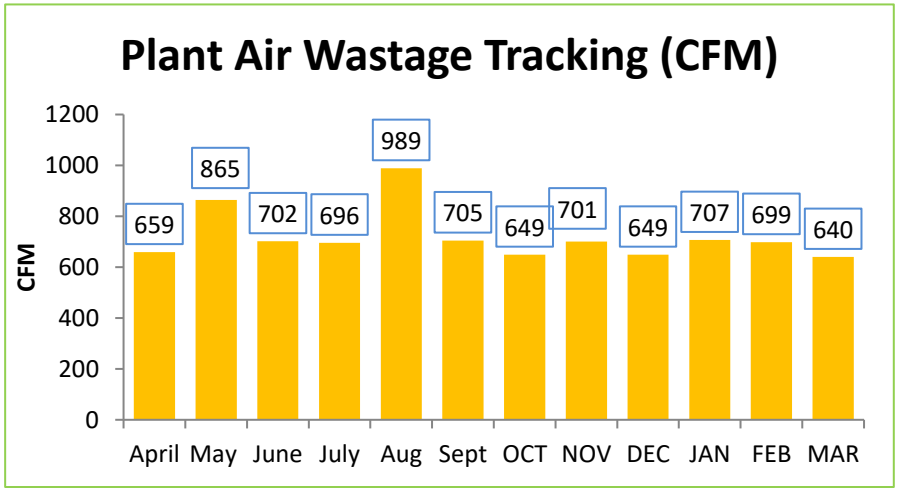
Monthly MRM

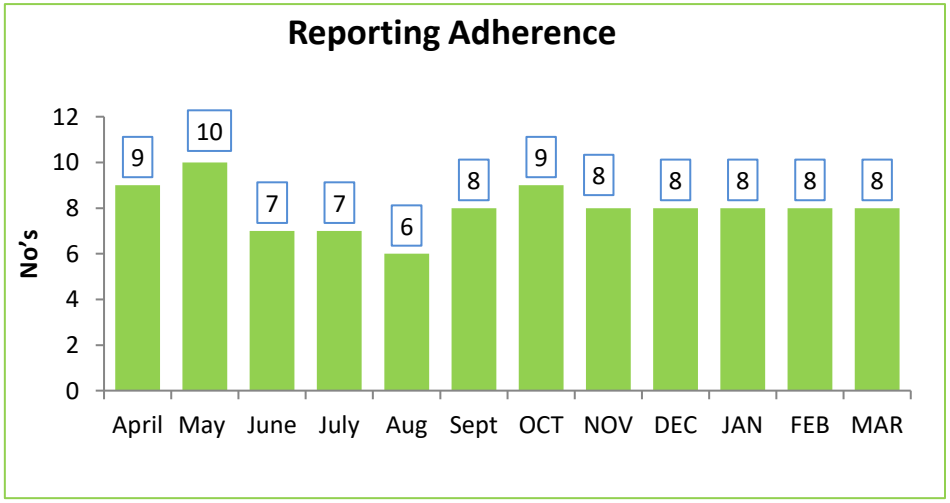
Review Frequency	Plant head	Head of Department	Energy Manager	Section Head - Area	Energy coordinator
Monthly	√	√	√	√	√
Fortnightly		√	√	√	√
Weekly		√	√	√	√
Daily			√	√	√
Board review			√	√	√

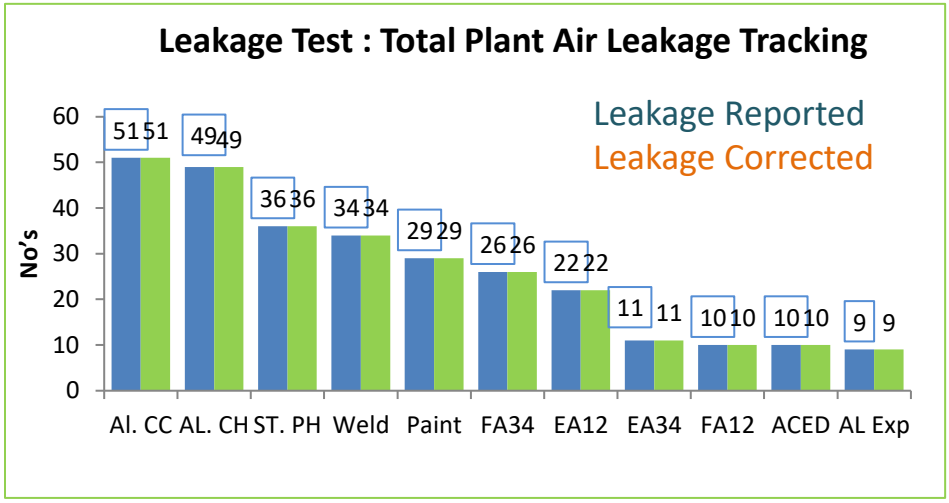
Energy Conservation Cell driven from top with involvement of all employees

Air Compressor Efficiency and Air leakages

FAD TEST : Measurement of Efficiency at Source							
S. NO	Compressor	Rated Capacity at 8Kg/Cm2 (CFM)	Rated Input Power (KW)	Avg. pressure (KG/cm2 Bar)	Avg. Actual Capacity as per report (CFM)	Avg Input Power (KW)	Specific Power (KW/ CFM)
1	Centac (NO6-1389)	6018	930	5.7	5569	861	0.15
2	Centac (NO6-1388)	4132	660	5.3	3948	617	0.16
3	Centac (09/555)	2281	400	5.6	2244	342	0.15
4	SL-250WC	1597	250	5.7	1530	257	0.17



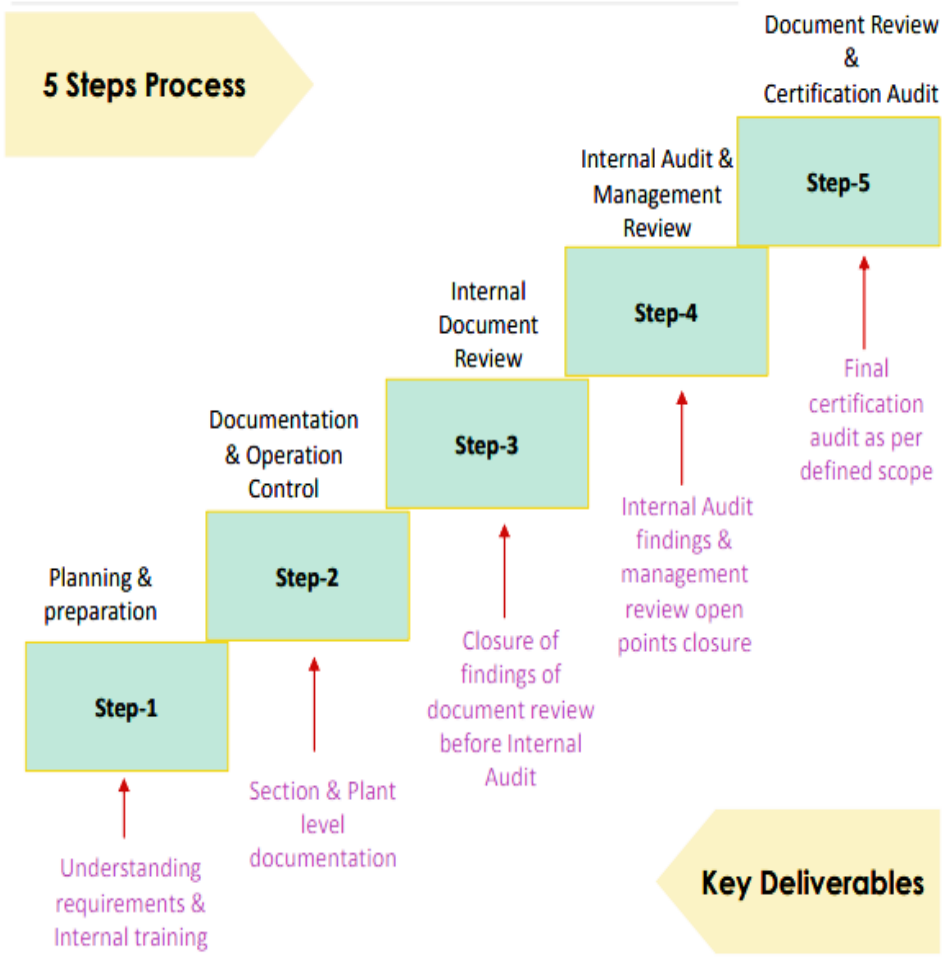




Cross Functional projects taken to improve Air transfer efficiency

12 Implementation of ISO 50001

ISO Certification Strategy



DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Hero MotoCorp Ltd.
Plot No. 3, Sector 10, IIE, SIDCUL, Haridwar - 249403, Uttarakhand, India

has been found to conform to the Energy Management System standard:
ISO 50001:2011

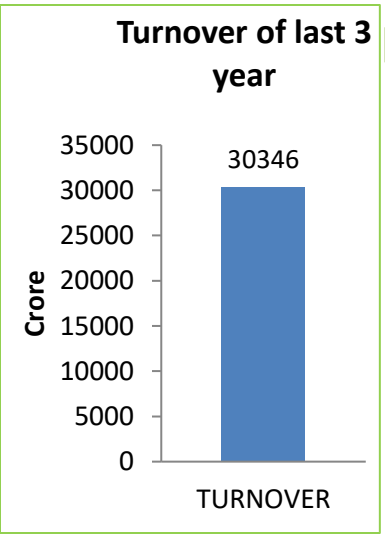
This certificate is valid for the following scope:
Manufacture of Four Stroke Motorcycles.

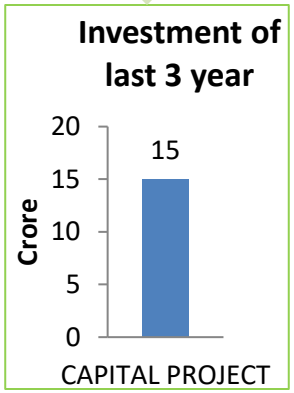
Total Internal Auditors developed – 32 Nos.

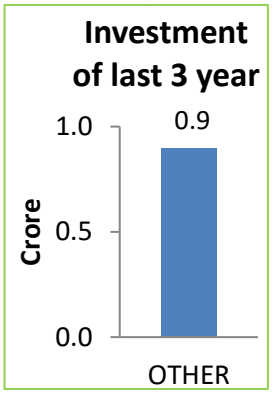
We are certified company for ISO 50001

12.Implementation of ISO 50001/Green Co/IGBC rating

HM3H won "Green Co Gold Rating- Green Company Rating System"







Project Detail	Investment in Crores
AHP in HWG	1.2
0.95 MW Solar power plant	4.50
EC fan for Chiller and SM ASU	0.32
Washing machine upgrade on NG	0.25

We are certified for CII Green Company Gold Rating

13. Learning from CII Energy Award 2020 or any other award program

Title of the Project	Brief Description of the project	Reason To Choose
To reduce gas consumption and energy consumption by reducing ACED run hrs by shift elimination by increasing loading of hangers by design modification.	Hanger loading from 2 frame body per hanger to 3 frame body per hanger will result in required cycle time reduction - which gave a whopping 50% increase in capacity and thus reducing operation hours.	To increase productivity & save power & Energy
Elimination of Shift from Crank Case by Reducing cycle time of Robotic cell from 76.5 Sec/Line to 72 Sec/Line to reduce energy consumption and improve productivity	Synchronization of Machine shop Cycle time to Engine Assembly to – Improve Productivity and Save Resources including Power by 1 shift elimination 1.Speed shifted on Higher speed and controlled by VFD Air Cutting time reduced 2.Combination Drill implemented for Dia 8.8/11.6 mm	Resource conservation by elimination of 1 shift.
Pretreatment (PT) chemical change in Sheet Metal (SM) & ACED paint shops to reduce Natural Gas consumption in Hot Water Generator (HWG)	Temperature lowering - 1. Upgraded chemical usage to assist low temperature cleaning PT line in SM (Sheet Metal) 2. Upgraded chemical usage to assist low temperature cleaning PT line in ACED	To reduce energy consumption by reducing demand of Hot water requirement in paint shop.
To replace conventional blowers with High Efficiency DC Fans in Lacquer Paint shop ASU to save energy	Centrifugal blowers used for conditioned air supply in ASU of Paint Shop which involves high Kwh consumption and also no backup if came in breakdown.	To reduce energy consumption
To replace Electrical energy heating with existing hot water supply system through PHE which run on Gas to save electricity in washing machines	Elimination of usage of electrical heaters by Utilizing hot water usage in washing machines so as to eliminate energy usage.	To increase productivity & Energy
IGBT based transformer to be installed in place of servo stabilizers	Elimination of usage of electrical conventional transformer which have low efficiency and installed higher efficiency transformer	To increase productivity & save power
AHP for Hot water Generator	AHP uses comp Cooling Tower water temperature reduction to heat the Hot Water	To increase productivity & save Thermal Power

14. Any other relevant information (Awards won)

Zero Landfill Certification

VERIFIED ZERO WASTE TO LANDFILL

Intertek does hereby certify that an independent assessment has been conducted on behalf of

HERO MOTOCORP LTD (HARIDWAR)

Certificate Number: ZWL-2021-02
Certificate Issued: 18 February 2021

Initial Verification Date: 16 February 2021
Certificate Valid Until: 15 February 2024

Applicant Address: Plot No. 3, Sector-10, IIE, SIDCUL
Haridwar – 249403
Uttarakhand, India

Product Industry/Category: Transportation, Automotive

Conformance Criteria: Zero Waste to Landfill diversion rate exceeding 99%* is applicable to the manufacture of Four Stroke Motorcycles.
*Includes 10.32% Waste-to-Energy.

Issuing Office Name & Address: Intertek Testing Services NA, Inc.
4700 Broadmoor Ave SE, Suite 200
Kentwood, MI 49512 USA
Phone +1-616-656-7401

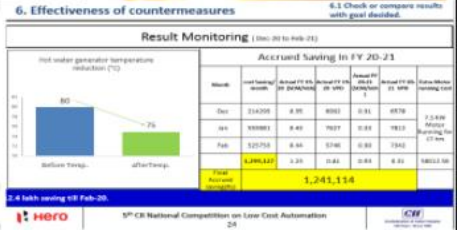
Jesse Ordersma
Certification Officer

5th CII National competition on Low cost Automation (LCA)

SILVER RECONGNITION –Hero motocorp Ltd, Haridwar Plant

Project :-Hot water temperature Reduction from 80°C to 75°C through Digitalization.

Facilitator	Team Leader	Team Member	Team Member
Haridwar Singh	Harendra Singh	Manpreet Singh	Ram Mohan



CII National Maintenance Circle Competition 2021

Higher productivity & profitability by adopting World Class Maintenance Practices :
Compete, Learn & Share

Competition Category : Best Case Study on MTBF & MTTR

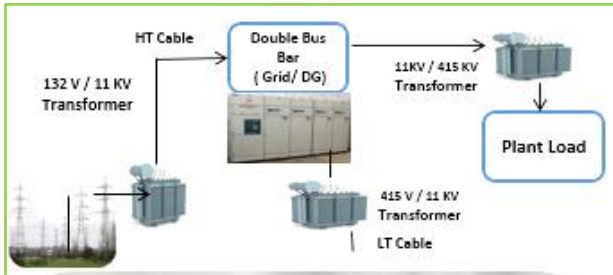
Theme : Establishment of Zero breakdown In Assembly Lines through TPM Methodology.

Facilitator
Haridwar Singh

Winner –Best Case Study on MTBF & MTTR

Leader	Member	Member	Member	Member	Member
Harendra Singh	Manpreet Singh	Brijveer Singh	Shiv Kumar	Anmol Aneja	Manish Tyagi
Frame Plant Maintenance				Production	

14. Any other relevant information



2MW Solar Power Utilization Reduction
2301 Tons of Co2 in Environment

Flat plate based Solar water Heaters Installed at Roof Top , Saving of 0.80 Lac Kwh/Year

HPMV lights replaced with Sky light/Light pipe Saving of Rs 0.15 Lac /year through New Technology

Natural Air ventilators installed 38 no.

Translucent Sheet in plant roof

Green roof coverage 45000 Sqm

Natural Ventilator, Translucent sheet, Plant green roof initiative saved 1200 kwh/Day

Utilization of Renewable Energy by using Solar Plant, Solar heater, sky light, Natural ventilator, Translucent sheet and green roof

14. Any other relevant information

Waste Food Energy Utilization

Food Compositing Machine Manure usages in horticulture

Hygienic Disposal of waste: 500 Kg./Day
Manure Generation : 200 Kg./Day

Thinner (Waste) Recovery System

Thinner Recovery unit & its reuse in bell & Gun cleaning Advantage :- Saving of 180 Litres of cleaning thinner per day

Recycling & Reuse of Waste resources based on 3R approach