








CII National Award for Excellence in Energy Management 2022

Presented by

- | | |
|------------------------|-----------------------------------|
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| 2. Cheruvu Sankar | - Sect. Head - Utility Electrical |
| 3. Sriram Karikkat | - Sect. Head - Environment |



BLUE SKIES FOR
OUR CHILDREN

Contents		Slides	Time
01	Introduction & Energy Management Honda Global and HMSI presence, Honda's Environment journey, Honda's Commitment for Energy Excellence, Honda Motor's 2030 vision, HMSI Policies 	1-3	1 min
02	Energy data Energy Resources, Specific Fuel Consumption, Internal and National Benchmarking 	4-8	1 min
03	Encon Projects Zero Investment Encon Projects and Other Encon Projects 	9-10	1 min
04	Innovative Ideas Auto Booth Air Balancing, Compressed air replacement with Blower and PT Short Process in Paint Shop 	11-20	5 min
05	Renewable & Green Energy Renewable energy usage in Narsapura Plant, Renewable energy projects 	21-28	2 min
06	GHG Emissions, Green Supply Chain and Capacity Building GHG Benchmarking, Supplier EMS Certification, Green Dealer development, Supplier and dealer awareness 	29-37	3 min
07	Major Improvements, Review Mechanism, Employee Engagement Major Improvement themes, Performance review mechanism, employee engagement events 	38-54	3 min
08	Way Forward Positive Spiral, Long terms energy and Environment Improvements 	55	2 min

HONDA MOTOR COMPANY, GLOBAL OPERATIONS



Mr. Soichiro Honda
(1906 – 1992)

**Honda Motor Co Was
Founded In 1948**



**Honda operates in 150 countries
Total 406 group companies globally**



Automobiles



Motorcycles



**Power
Products**



**Marine
Engines**



Robotics



Honda jet



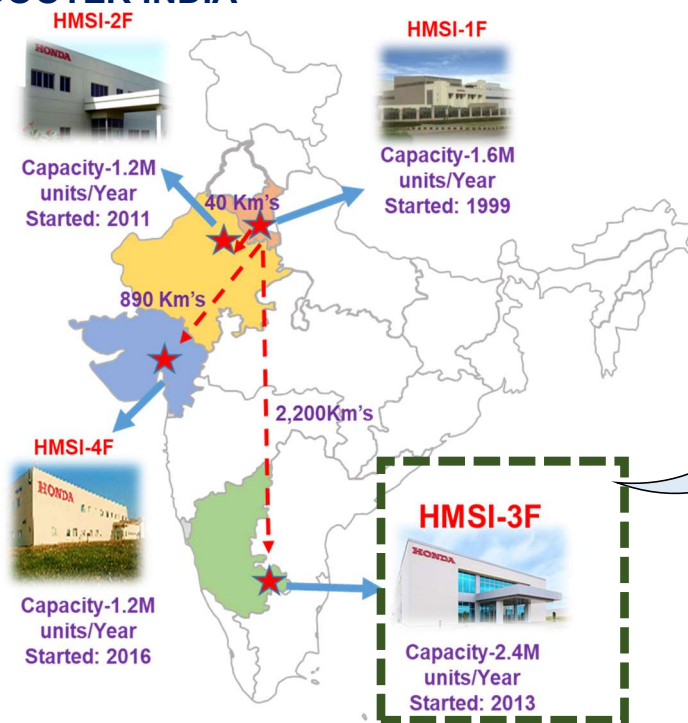
Aero Engine

HONDA MOTORCYCLE AND SCOOTER INDIA

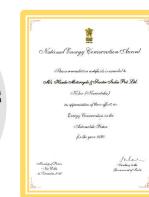
OVERALL HMSI



Total 4 Factories in India
Capacity 5.5 mil units/year
Associates 24,000 people
Activa Sales 1.7 mil Units/year



Land Area : 4,81,757 m²
Built up Area : 2,65,706 m²
Manpower : 7041
Capacity : **2.4 Million**
Models : Activa, SP125, Shine SP, Livo, Dio



- Won BEE National Energy Conservation Award 2020
- Won CII National Energy Leader Award in 2020 and 2021
- Won CII National Award for Excellence in Energy Management in 2018, 2019, 2020 and 2021.

Honda Narsapura is located in Kolar, Karnataka.

It is Honda's largest factory globally with a capacity of 2.4 Million vehicles per year

1948 Honda was founded

1960 Honda actively endeavoured to solve Environment problems

1970 World's 1st Automaker to comply with U.S. Clean Air Act

1992 Released our First Honda Environment Statement

2010 New Honda Environmental Logo Blue Skies for Our Children

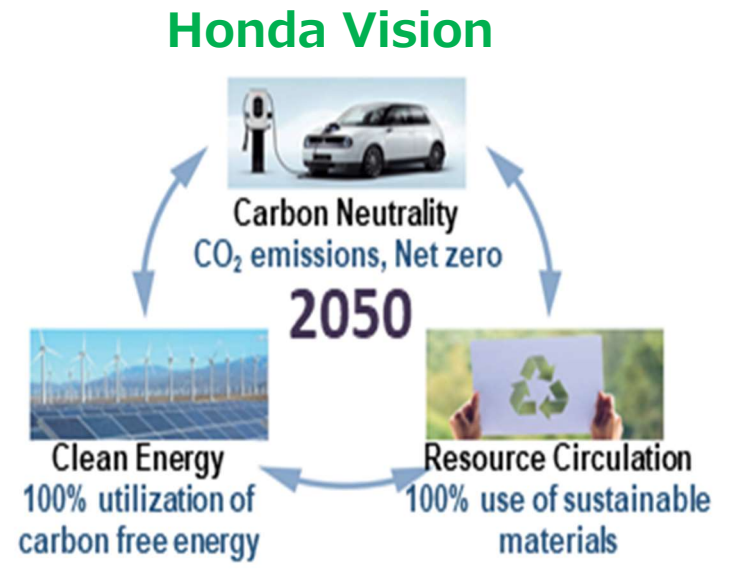
2020 Formulated the Vision as an ideal image of what Honda wants to be

Mr. Soichiro Honda (Founder): Serve people worldwide with the "joy of expanding their life's potential"

Mr. Toshihiro Mibe (President & CEO)

Triple Action to ZERO

- Carbon Neutrality**: CO₂ emissions, net zero
- Clean Energy**: 100% utilization of carbon-free energy
- Resource Circulation**: 100% use of sustainable materials



Water

Rain water harvesting & Reuse

ZLD (Zero Liquid Discharge)

Industrial Process → Waste Water → Concentration → Resource Recovery → Clean Water for Reuse

Energy

Co-processing

Electrical power

Renewable energy sources: Wind, Solar, Biomass

Waste

3R (Reduce, Reuse, Recycle)

Co-processing

HMSI ENVIRONMENT POLICY

HMSI-3F WATER POLICY

HMSI-3F ENERGY POLICY

As responsible members of society we at Honda Motorcycle & Scooter India Pvt. Ltd. -Narasapura plant, will take every possible measure to eliminate wastage & conserve energy. Our plant is committed in each phase of our manufacturing activity to:

- Maximise and promote the utilization of renewable and clean energy.
- Adopt energy efficient technologies, products and services.
- Implement intensive energy monitoring systems, periodical audits & review systems.
- Review periodically & compare our Specific Energy Consumption with National / International level benchmarks to further drive the efforts for energy conservation.
- Continually improve energy efficiency through PDCA cycle & by setting short term & long term targets.
- Ensure sufficient information & resources are available to achieve the targets for energy conservation.
- Abide by and where practicable exceed the applicable legal & other requirements related to energy consumption
- Promote awareness on the Energy Management System & propagate the energy policy among our employees, as well as persons working on our behalf & to the general public.

Place: Narasapura
Date: 12/11/2020

Atsushi Ogata
Plant Head-3F

The Triple Action to Zero propels our Environment initiatives at every stage of lifecycle so as to achieve a liveable & sustainable society

Key policy highlights



Use of renewable energy



PDCA Approach

HONDA
The Power of Dreams

HMSI-3F ENERGY POLICY

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Place: Narsapura
Date : 12/11/2020

Approved
Plant Head-3F



Use of Energy saving equipment's



Use of monitoring systems

PDCA & bench marking is an integral part of our energy policy

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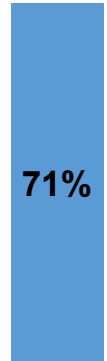
Electrical

Thermal

Total Energy usage pattern

Electrical Energy usage pattern

Thermal Energy Usage pattern



Electrical



Thermal

Utility

38%

PA

24%

MA

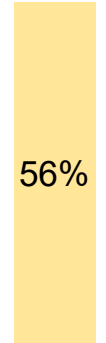
14%

Others

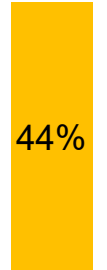
15%

Pr & We

9%

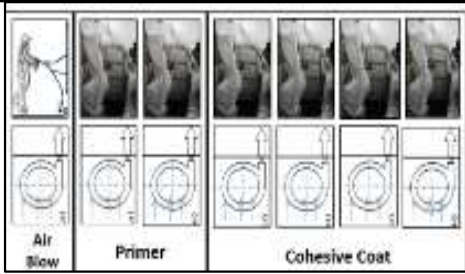


Paint Shop



Boiler + VAM

Electricity and propane gas are the major source of energy for our factory



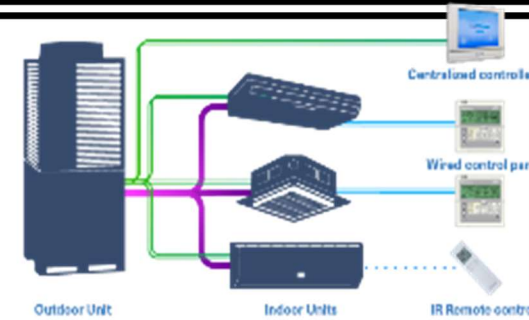
cohesive painting technology



Compressor heat recovery for Vaporizer

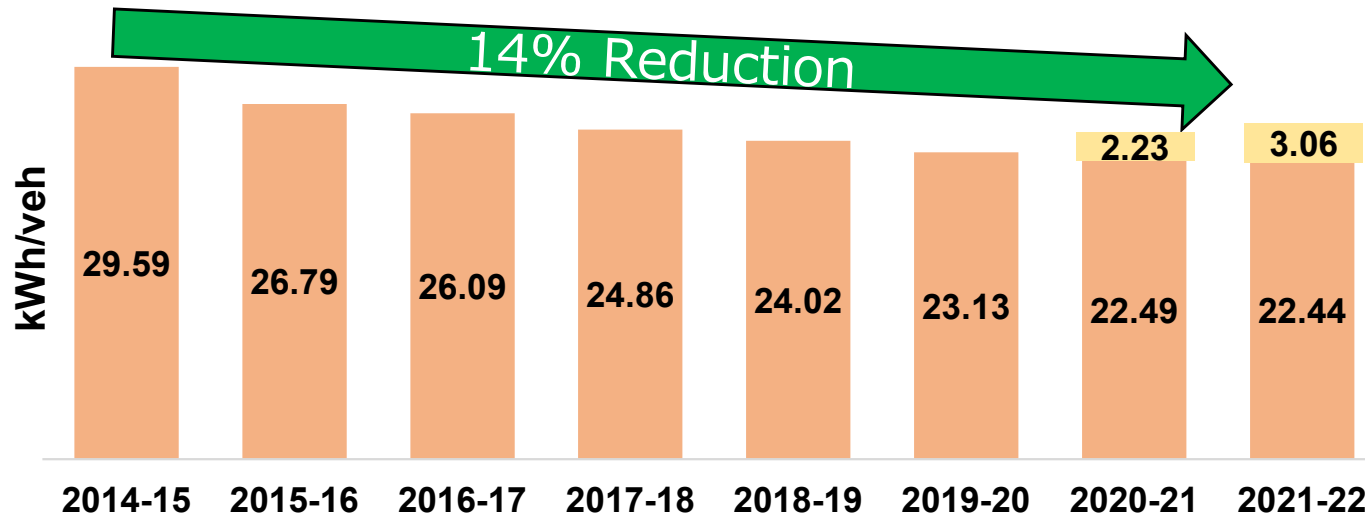


VAM for Paint



AC BMS

Electricity kWh/Veh



COVID impact

Due to COVID impact kWh/Veh has increased



Energy Efficiency projects



VFD for major load



EMS system



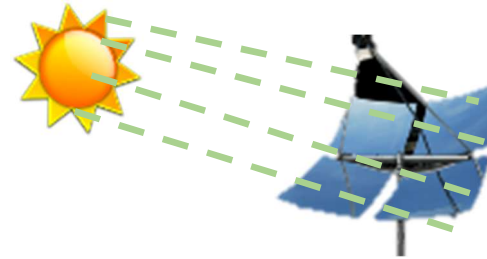
Specific Electrical consumption is in reducing trend.
 Last three year reduction is 6.58% excluding COVID impact



VAM for Paint Shop



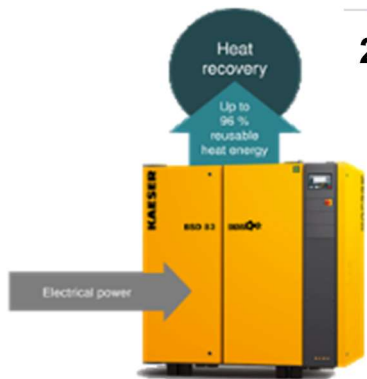
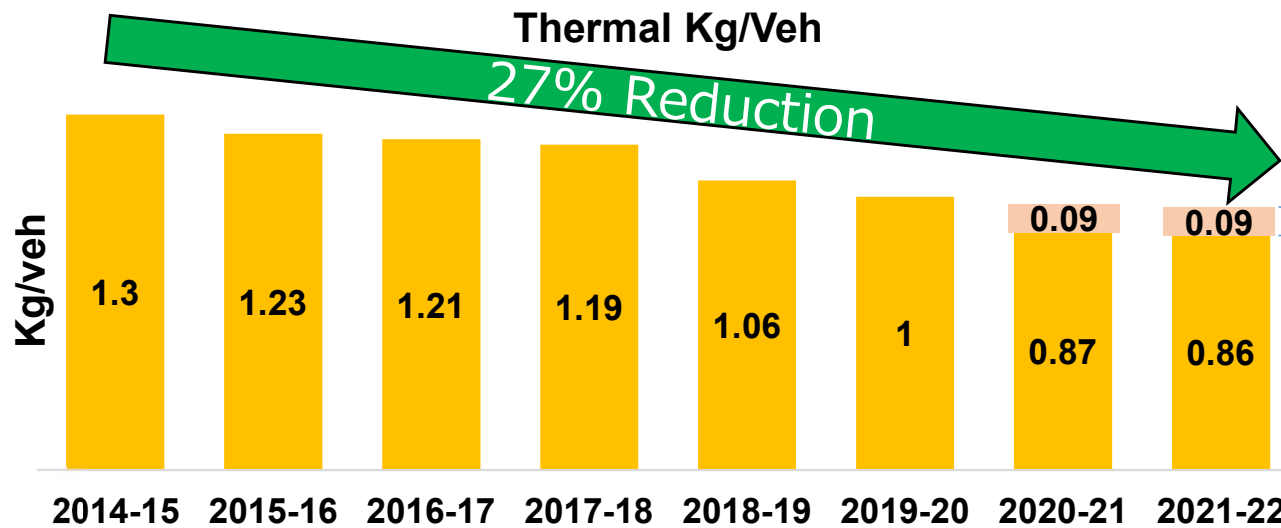
Magnetic Resonator



Solar Dishes



LNG



Compressor heat recovery for hot water generation



WHE



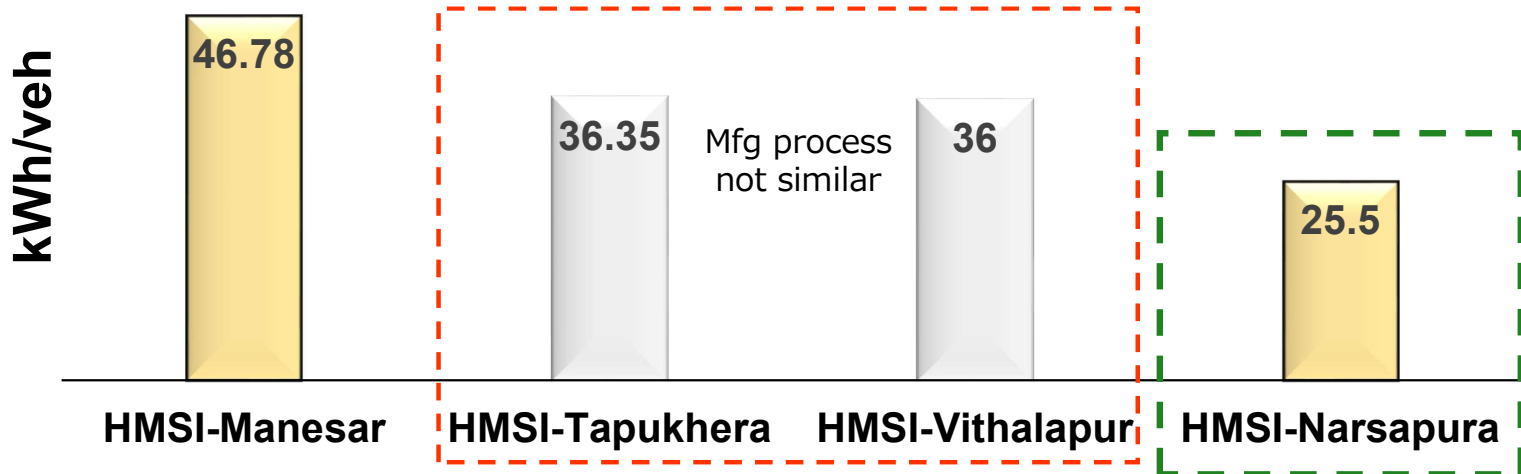
OPTIMIZATION OF MEE & ETP



HWG

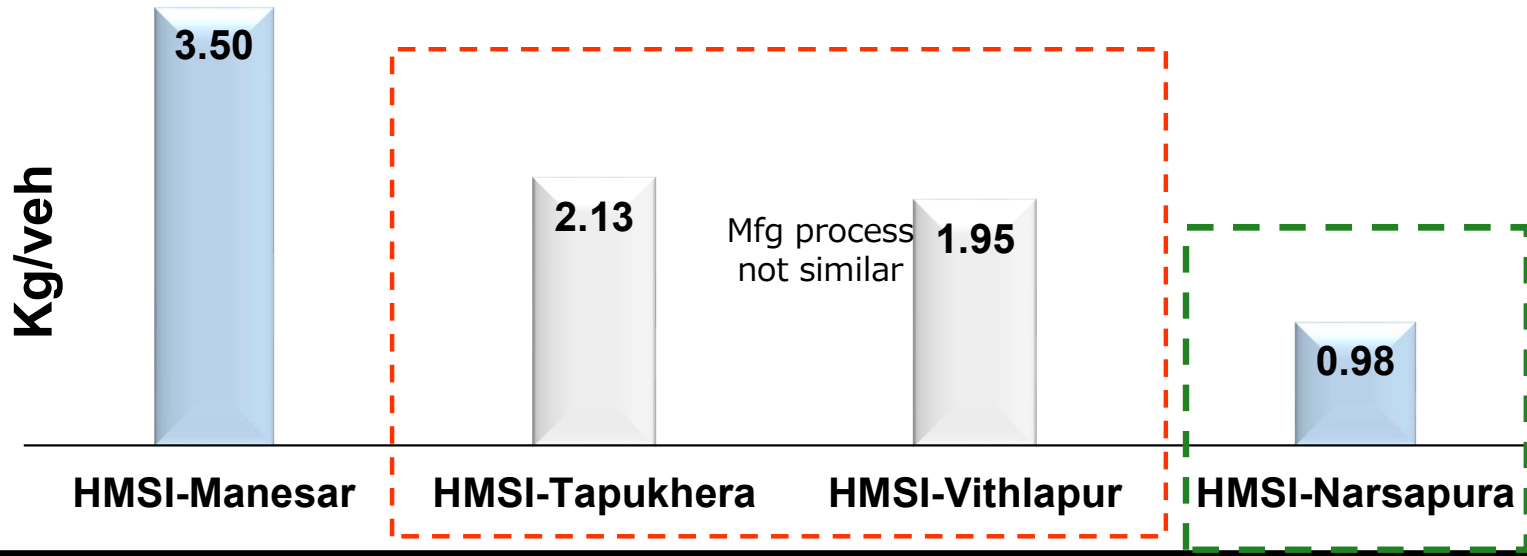
Specific propane consumption is in reducing trend
Last three year reduction is 18.86%

Specific Electrical Energy consumption



**47%
Less**

Specific Thermal fuel consumption

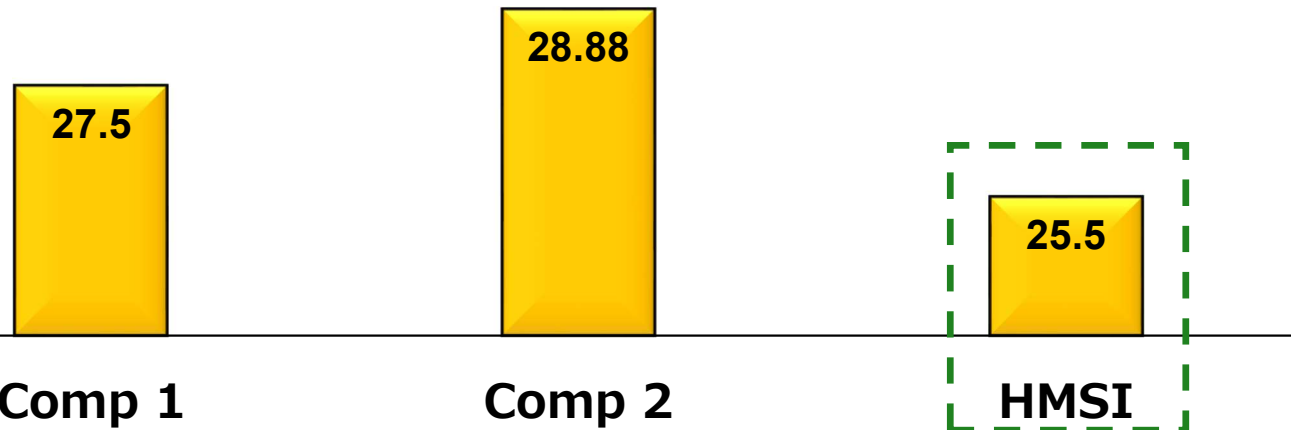


**39%
Less**

We are the benchmark among all the HMSI factories in India

Specific Power consumption

kWh/veh

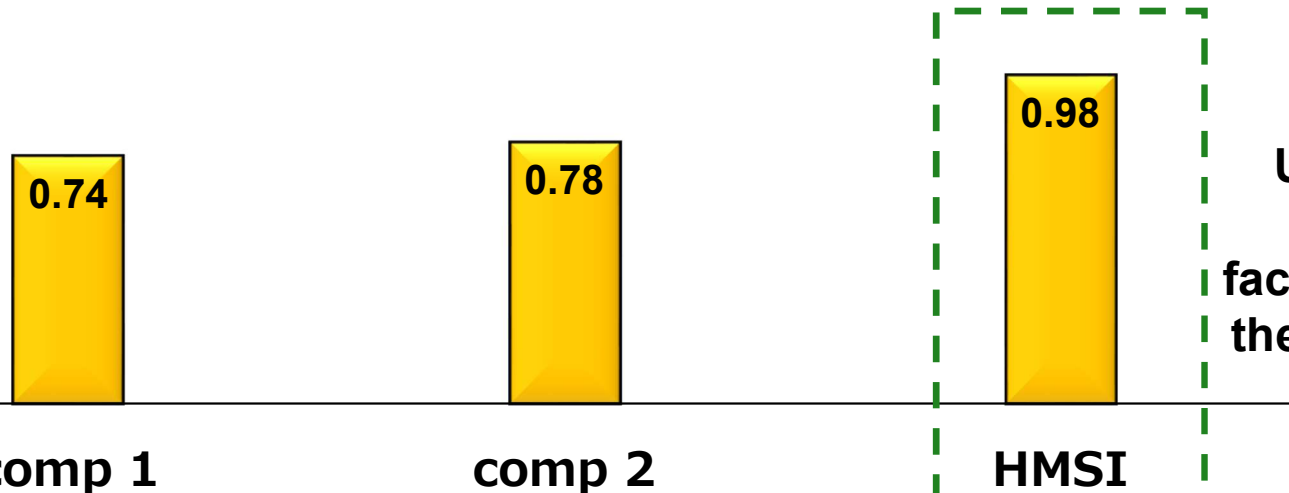


Our target



Specific Propane consumption

Kg/veh



Understand the best practises in other factories and strive to be the national bench mark

➤ No Standard Benchmarks are available for Automobile sector. These are collected from various presentations.

We are striving towards being the national bench mark

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S. No.	Parameter	Projects implemented	Environmental benefits		Total Investment made (Rs. In lakhs)	Monetary Benefits (in lakhs)	Intangible benefits
			Savings in	Quantity			
1	RE	Third party solar power procurement	Renewable energy, kWh	44000000	0	1078	Through third party solar power procurement by wheeling, power requirement is met 24 x 7 irrespective of seasonal variation as state grid back up is always available.
			GHG emission, tons CO2	35772			
2	EE	Propane saving through heat free treatment technology	Thermal energy, Mill Kcal	290	0	144	Reduced water, energy and equipment efficiency losses in heating process. Insulation from market fluctuations in prices of propane
			GHG emission, tons CO2	724			
3	EE	Energy saving through Cohesive painting technology	Electrical energy, kWh	1973000	0	123	Reduction in VOC emission
			GHG emission, tons CO2	1605			
4	EE	Boiler Pressure reduction from 6 bar to 4 bar	Thermal energy, Mill Kcal	645.3	0	24	Safety improvement with regard to handling of highly dangerous steam
			GHG emission, tons CO2	1611			
5	EE	AHU Frequency Optimization	Electrical Energy, kWh	600000	0	40	Reduced wear and tear in motors and reduced Preventive Maintenance
			GHG emission, tons CO2	436			
6	EE	ACED Pumps & Fans Auto Sequence ON/OFF Operation During empty Mode	Electrical Energy, kWh	3225	0	2.3	Reduced wear and tear in motors and reduced Preventive Maintenance
			GHG emission, tons CO2	2.3			
7	EE	Elimination of Induction Hardening process	Electrical Energy, kWh	2376000	0	159	Reduction in downtime and Repair and Maintenance leading to production loss. Safety risk associated with heating machines has been reduced.
			GHG emission, tons CO2	1725			
8	EE	Elimination of Zero B Welding	Electrical Energy, kWh	934615	0	60	Reduction in space and manpower requirements, reduction in quality issues due to welding, hazard reduction
			GHG emission, tons CO2	698			
9	EE	Energy regeneration from Servo motors	Electrical Energy, kWh	72900	0	5	Increase in energy recovery and utilization of regenerated energy
			GHG emission, tons CO2	54.4			
10	RE	Third Party Wind Power Procurement	Renewable Energy, kWh	650000	0	5.42	Third Party wind power procured during the monsoon season to compensate the Solar power loss
			GHG Emissions, tons CO2	485.55			
11	EE	Third Party BEE Certified Energy audit conducted	Electrical Energy, kWh	1339000	0	92.98	Third Party Energy Audit conducted to check all the high energy intensive equipment efficiency and found out all the equipment are above par
			GHG Emissions, ton CO2	966.76			
Total			Electrical Energy, kWh	51948740	0	1734.4	
			GHG Emissions, tons CO2	44080.01			

Without Investment, 51.96 Mill kWh, 44080.01 MT of CO₂ and Monetary Savings of 173.44 Mill /Annum have been achieved.

S. No.	Parameter	Projects implemented	Environmental benefits		Total Investment made (Rs. In lakhs)	Monetary Benefits in lakhs	Intangible benefits
			Savings in	Quantity			
1	RE	Installation of solar roof top panels of capacity 7MW	Renewable energy, kWh	8800000	2870	580	Dependency on external agency for power supply reduced
			GHG emission, tons CO2	8330			
2	RE	Installation of 2.5 MW Solar Roof Top Expansion	Renewable energy, kWh	2940000	1108	269	
			GHG emission, tons CO2	2123			
3	RE	Installation of 2.7 MW Wind turbine	Renewable Energy, kWh	7500000	1920	484	
			GHG emission, tons CO2	5415			
4	RE	Solar solution for sludge drying	Thermal energy, Mill Kcal	55000	30	55	Improvement in safety wrt handling of propane
			GHG emission, tons CO2	317			
5	EE	Interconnection of compressors through integration of three compressor houses	Electrical energy, kWh	1100000	12.39	72	Compressed air requirement for the entire factory has been optimized by reducing the air pressure
			GHG emission, tons CO2	924			
6	EE	VAM for Paint Shop	Electrical energy, kWh	1181250	490	163	VAM can result in reduction of usage of ODS and GHG Potential Refrigerants currently used in chillers. Further, handling of steam has been eliminated thus addressing safety risks
			Thermal energy, Mill Kcal	2936			
			GHG Emissions, tons CO2	1591			
7	EE	Installation of EC Fans	Electrical energy, kWh	222750	75	15	Less Maintenance intensive as the technology is electrically controlled
			GHG Emissions, tons CO2	162			
8	EE	Robotic Washing Machine in Machine Shop	Electrical energy, kWh	1117292	83.1	75	Quality improvement in machine shop process and reduction in market complaints of the product
			GHG Emissions, tons CO2	811			
9	EE	Hot Water Generator for Paint Shop	Thermal Energy, Mill Kcal	923	45.6	25.5	
			GHG Emissions, tons CO2	201			
10	EE	Air Dryer Optimization	Electrical energy, kWh	970000	28	65	
			GHG Emissions, tons CO2	725			
11	EE	PT Short process for ABS Parts	Electrical energy, kWh	200000	28	29.6	With the implementation of PT short process, 720 KL/Annum of Water reduction can also be achieved.
			Thermal Energy, Mill Kcal	184.16			
12	EE	Implementation of Auto Booth air balancing concept for two coat to monocoat	Electrical energy, kWh	870000	181.4	55.9	
			GHG Emissions, tons CO2	632			
Total			Electrical energy, kWh	24901292	6877.15	1981.98	
			GHG Emissions, tons CO2	22010.39			

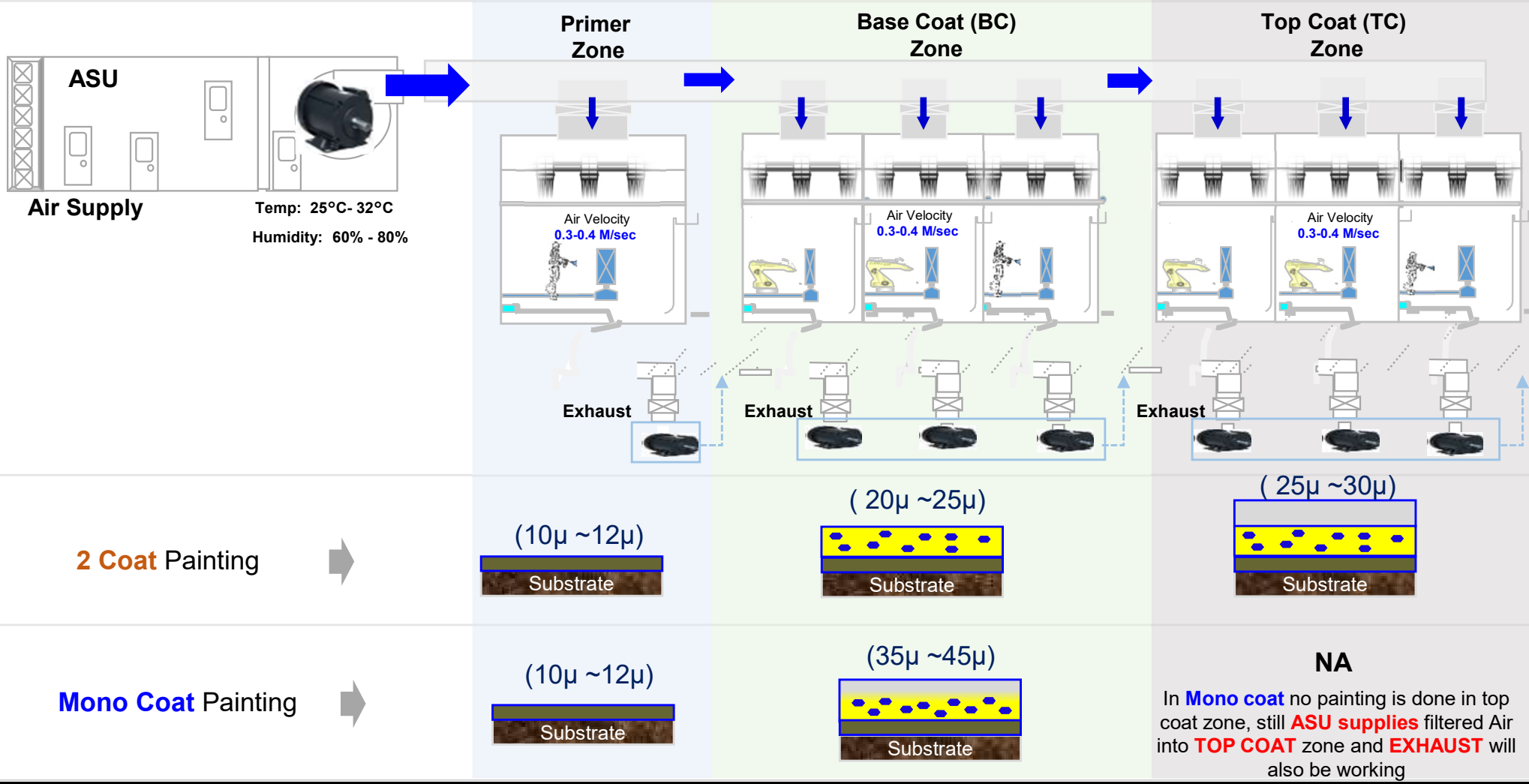
With Investment, 24.90 Mill kWh, 22010.39 MT of CO₂ reduction and annual savings of Rs. 198.2 Mill has been achieved

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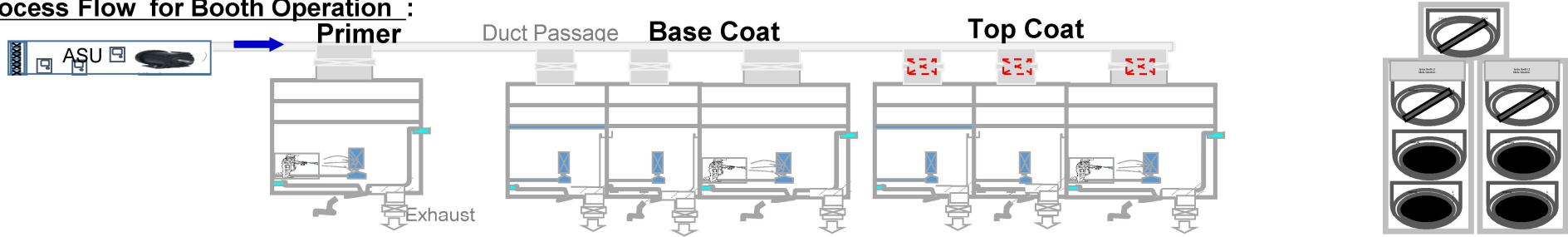
In Paint shop, Paint booths are used for painting application.
 All paint booths in 3F are designed with 3 Zone (Primer + Base Coat + Top Coat)
 In Monocoat painting, only two zones are required (Primer + Base Coat)
 In 3F, 80% of the colour shades are monocoat and remaining 20% are Two coat

Painting Booth Configuration



Due to modification of painting process from two coat to one coat through cohesive painting technology, the ASU and exhaust systems requirement in top coat can now be eliminated.

Process Flow for Booth Operation :



MANUAL CHANGE OVER

Changeover 2 Coat to Monocoat Running Seq.

- Booth gap (Empty of Painted Hanger)
- Auto Start cycle / Change over (Preparation "OFF" ----"ON ")
- Manual Start – Paint Booth
- Sludge Pit Circulation pump Running- ON .
- Topcoat Booth Supply Damper "CLOSE"- Manually
- Top coat Exhaust Fan Manually OFF.
- ASU Fan Running - VFD Frequency setting based upon Booth balancing.-
- Exhaust Fan Running (Air Blow , Primer & Base coat) – VFD Frequency setting based upon booth balancing .
- Setting & Side Exhaust Fan running & setting .
- Check of zone wise Thread condition based upon Exhaust VFD & ASU frequency
- Booth Auto Sequence Complete

Time Taken - Manually

- 40 min
- 10 min
- 20 min
- 10 min
- 10min
- 05 min
- 8 min
- 20 min

Manual Mode

Quality

Fallen Dust of parts during sudden Changeover of Top coat zone.

MP

3 MP

Monocoat Manual mode-

Time – 123 min

Quality - Fallen Dust

3 MP

AUTO CHANGE OVER

2 Coat & Monocoat

- Booth gap (Empty of Painted Hanger)
- Selector switch mode change
- Manual Start – Paint Booth
- Sludge Pit Circulation pump Running- ON .
- Topcoat Booth Supply Damper AUTO--"CLOSE"-
- Topcoat Exhaust Fan AUTO - OFF.
- ASU Fan Running - VFD Frequency setting based upon Booth balancing.- AUTO- ON
- Exhaust Fan Running (Air Blow , Primer & Base coat) – VFD Frequency setting based upon PROGRAM SETTING.
- Setting & Side Exhaust Fan running & setting .AUTO SETTING.
- Check of zone wise Thread condition based upon Exhaust VFD & ASU PRORAM SET FREQUENCY.
- Booth Auto Sequence Complete

Time – Auto (Approx..)

- Time – 10 min

Auto Mode :

Quality

NO Fallen dust- As the sudden stop of Top coat zone is replaced with slow closing process of air.

MP

0 MP

Monocoat Auto mode-

Time –3-4 min

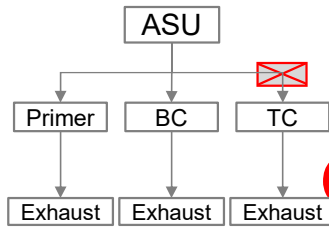
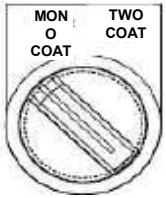
NO Fallen Dust

0 MP

Through implementation of auto damper, the changeover time can be reduced from 123 min to 4 minutes enabling energy conservation in addition to better quality control.

2 Coat → Monocoat Sequence of Operation

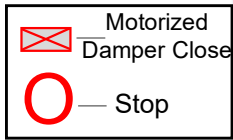
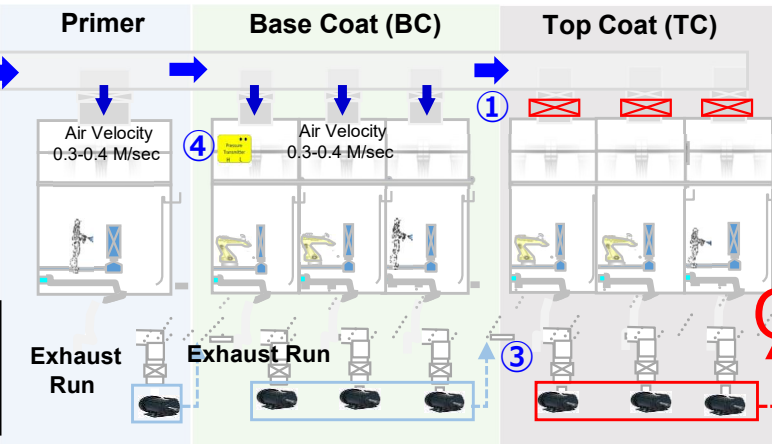
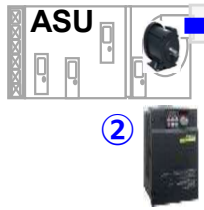
Auto Selector Switch For Booth



2 Coat → Mono-coat

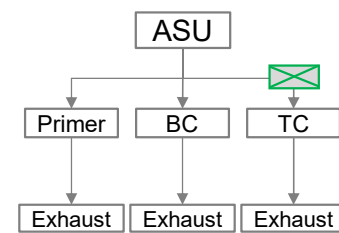
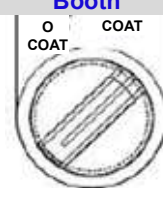
- ① Motorized TC damper **close**
- ② ASU Air supply **reduce**
- ③ Exhaust motor **Stop**
- ④ Air balance **adjust** by pressure switch

Air Supply



Monocoat → 2 Coat Sequence of Operation

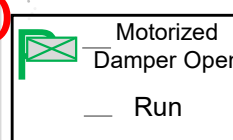
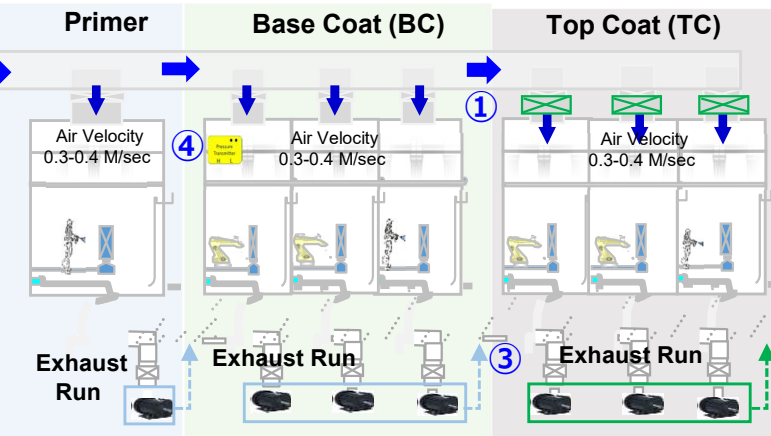
Auto Selector Switch For Booth



Mono Coat → 2 coat

- ① Motorized TC damper **Open**
- ② ASU Air supply **Increase**
- ③ Exhaust motor **Run**
- ④ Air balance **adjust** by pressure switch

Air Supply



Key project highlights



8,70,000 Kwh of electricity



59.3 Lakhs Per Annum



628.14 MT Per Annum



181.4 Lakhs



18 Months

Paint booth air balancing has been converted to auto from manual resulting in Energy reduction. Project has a potential of Horizontal deployment in all the factories where cohesive painting is implemented.

Background

In Paint shop all parts after cleaning are passed through a cleaning Tank to remove the deposition of water particles, Huge quantum of compressed air is used to clean the Parts.

Before (High Pressure Compressed air cleaning)



Process Requirements



Compressor-High Pressure

Desiccant Dryers

❖ Currently high pressure air from centralized compressors after desiccant driers is being supplied to dry the moisture present on the parts.

❖ Moisture needs to remove completely before the parts enter to Paint zone.

❖ Presence of moisture on parts during painting would cause defects in the components which results in production loss.

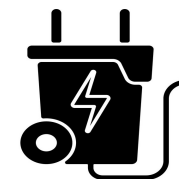
❖ The use of compressed air is emphasized by Honda R&D for ensuring zero moisture and dust on the painted parts



Air Zone area
Paint Pre-treatment



Huge amount of compressed air loss



Energy wastage due to air loss



Zero moisture on parts to ensure paint quality

Currently, high Pressure air from Centralized Compressors are used for cleaning of parts.

Process Quality Parameters defined for Air Quality

S. No	Parameters	Quality Standard	Protocol
1	Oil Mist Content, mg/m ³	Class 2 : ≤0.1	ISO:8573 (P-2):2007
2	Dew Point, °C Td	Class 4 : +3.0	ISO : 8573 (P-3):1999
3	Particulate Matter, mg/m ³	5.0 Max	ISO : 8573 (P-8): 2004
4	Particle Size Analysis, particles per m ³	Class 1	ISO : 8573 (P-4) 2001
4a	0.3µm<d≤0.5µm	≤ 20,000	
4b	0.5µm<d≤1.0µm	≤ 400	
4c	1.0µm<d≤5.0µm	≤ 10	

Feasibility Study-Idea Validation




Idea	Pros	Cons	Judge
Use of Decentralized Compressors	Air Consumption reduction	Drier addition required for maintaining dew point	X
Use of alternate drying methods such as hot air	No air requirement. Substantial energy saving	Droplet mark left on parts affecting quality	X
Physical drying methods such as rinsing	Very less energy requirement	Physical part contact not allowed after pre-treatment until final painting is completed	X
ALTERNATE PROCESS Use of Decentralized Blower	Power consumption reduction High flow and low pressure process No dew point issues as pressure is less		✓

Currently, high Pressure air from Centralized Compressors are used for cleaning of parts.

Situation Analysis

Air Drying is a process that requires high volume and low-pressure air, hence blower can be evaluated as alternative
 Main area of concerns that needs to be addressed are quality issues due to contamination.

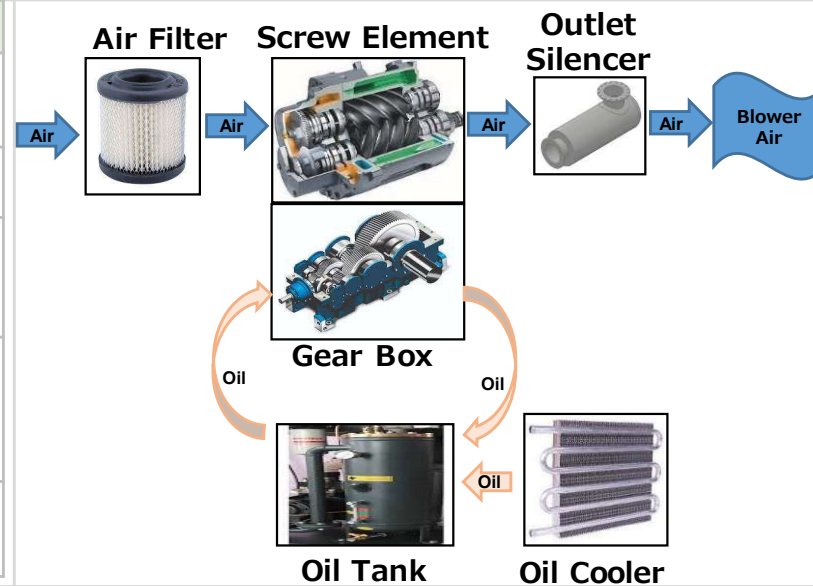
Comparison between types of low-pressure blowers

Type of Blower	Photos	Motor Capacity	Maximum Pressure	Differential pressure	Efficiency	Noise level	MOC of Impeller/screw	KWH/CFM	System installation	Operating cost	Judgement	
Centrifugal		Above 3000 CFM available									Not considered- Required capacity is not available in this type of blowers	✗
Rotary lobe (tri lobe)		55 KW (1000CFM)	1.1 bar	0.8 bar	95%	73 dB	Cast Steel	0.055	Medium (Site installation)	0.3575 Rs/CFM		✗
Screw		45 KW (1000 CFM)	1.1 bar	0.8 bar	95%	72 dB	Cast Steel	0.045	Easy (Packaged type)	0.2678 Rs/CFM		✓

Advantages of Air Blower

Application	Air Compressor	Air Blower
Cleaning & Drying	Can be the best system if intermittent air bursts required.	Concentrated air flow, able to run continuously at low cost and with energy efficiency.
Blow-off	Ineffective at blow-off for certain industries.	Low pressure, high-velocity air flow suitable for blow-off applications.
Contamination	The cooling process needed to maintain compressed air means some fluid (oil and/or water) is ejected in the airstream, affecting drying applications.	Generates clean air - no air or oil needed in the system, meaning expelled air is dry. Able to create "air curtain" protective barriers.
Moisture regulation	High cost to run continuously, difficult to ensure precision needed for moisture regulation.	Air flow able to be easily directed, to create an "air curtain" laminar air flow that adheres to surfaces, meaning it can remove or regulate moisture on a surface as needed.
Large products	The size and energy requirements needed to deliver air over longer lengths are disproportionately large.	Easily supports large product drying/blow-off/moisture and contamination control.

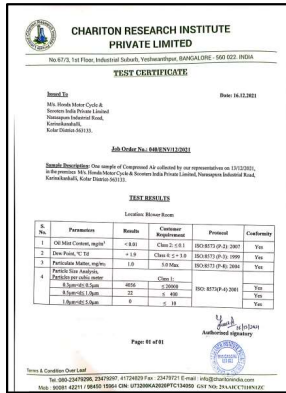
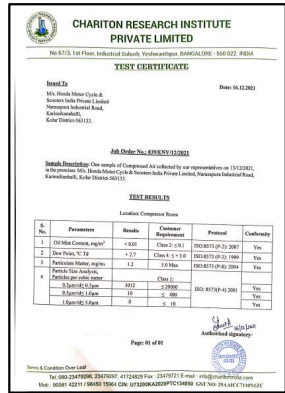
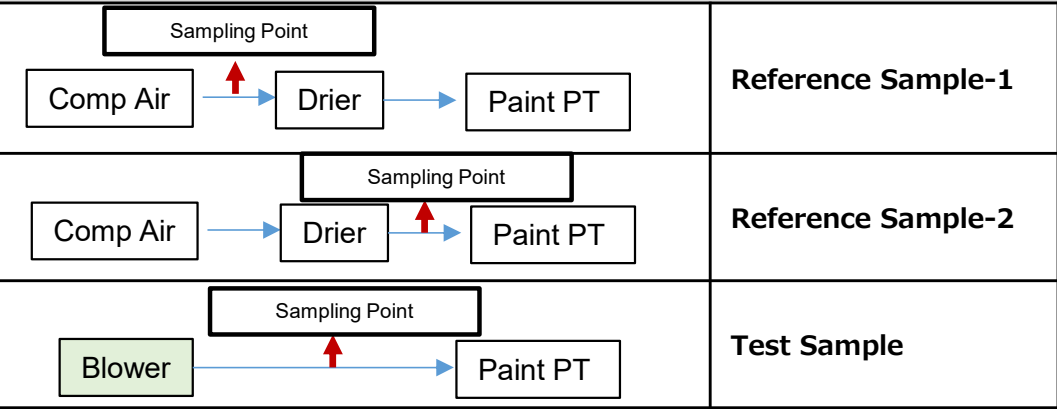
Air flow in Blower



Less Specific Power Consumption for generation of Low-Pressure Air is the key factor for blower selection.

As the product quality was of crucial concern, we obtained permission to conduct trial in one line by installation of one blower.

Trial Set Up



Result

S. No	Parameters	Results	Quality Standard	Protocol
1	Oil Mist Content, mg/m3	<0.01	Class 2 : ≤0.1	ISO:8573 (P-2):2007
2	Dew Point, °C Td	+ 1.9	Class 4 : +3.0	ISO : 8573 (P-3):1999
3	Particulate Matter, mg/m3	1.0	5.0 Max	ISO : 8573 (P-8): 2004
4	Particle Size Analysis, particles per m ³		Class 1	
4a	0.3µm<d≤0.5µm	4056	≤ 20,000	ISO : 8573 (P-4) 2001
4b	0.5µm<d≤1.0µm	22	≤ 400	
4c	1.0µm<d≤5.0µm	0	≤ 10	

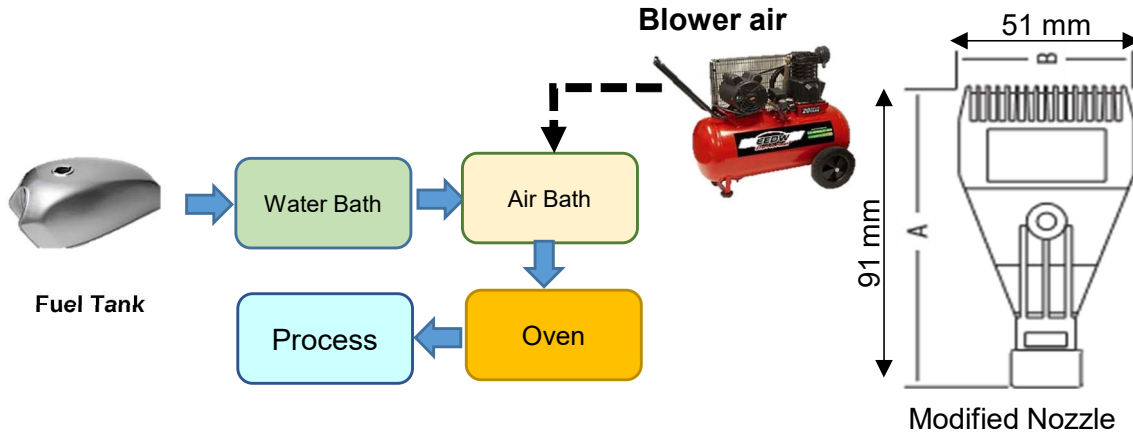


Quality confirmation from QC-HO

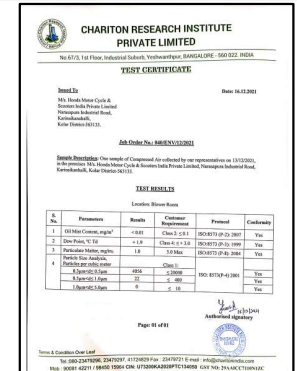


Less Specific Power Consumption for generation of Low-Pressure Air is the key factor for blower selection.

Proposed Idea (Low Pressure Air Blower for cleaning)



Area	Tank-2
No of nozzles	100
Pressure in bar	0.5 – 1
CFM delivered per nozzle	10
Total CFM	1000
Total operating cost in mill	1.40



Quality Check Certificate from Third Party

Current Process



Centralized Compressor- High Pressure



Decentralized Blower- Low Pressure

- ❖ In the current process, High Pressure Centralized Compressor is replaced with Low Pressure Decentralized Blower.
- ❖ Achieved precision moisture regulation.
- ❖ Energy reduction achieved through pressure reduction.

Key Project Highlights



9,60,000 Kwh of electricity



63 Lakhs Per Annum



693.12 MT Per Annum



87 Lakhs

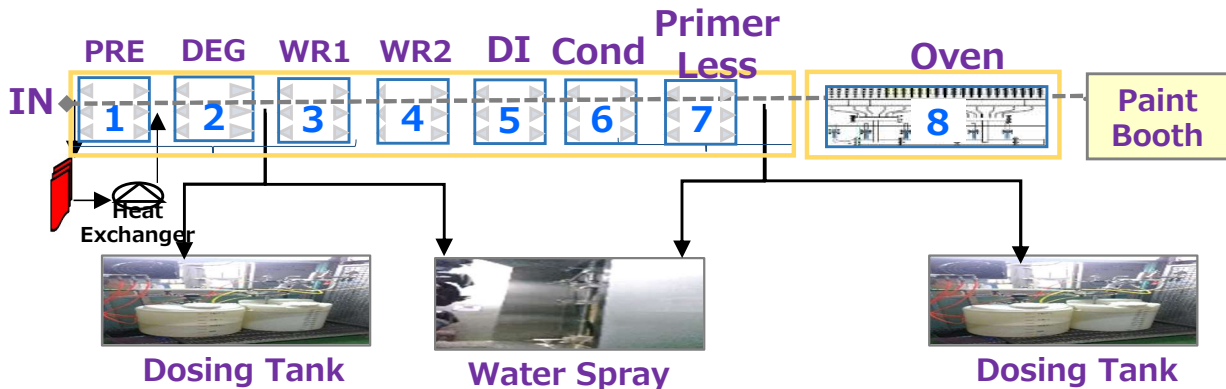


17 Months

Implementation of Decentralized Blower to eliminate the usage of compressed Air to reduce Energy Consumption

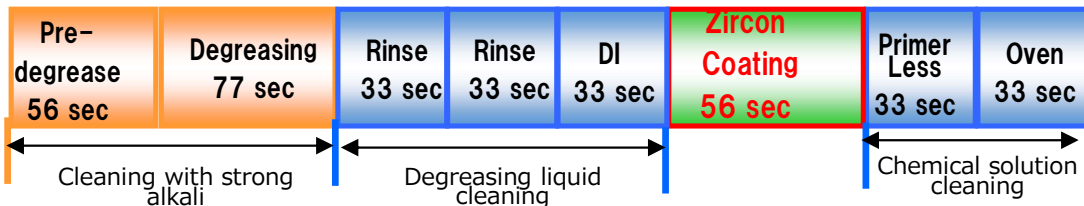
In Paint Shop, for Cleaning & Activating the surface of ABS parts, Pre-treatment process is used before painting followed by dry off oven.

Before condition



- ❖ Present Pre-treatment process at ABS line is an 8-stage process.
- ❖ A dry off oven is provided at the end to dry the parts. Dry Off Oven operates at 75 deg C
- ❖ Present pre-treatment process consumes huge amount of Electricity, LNG and Water.

Process requirements



No of stages : **08 Nos**
 Process Time : **354 Secs**

- ❖ To remove oil, Grease and dust from the surface of component by saponification and Emulsification reactions and make the surface clean.
- ❖ Water sprayers are used to spray water on surface of part to clean. Water spraying increases the water consumption.
- ❖ To prepare the surface for uniform coating. Part roughness also increases to activate the part surface.

Challenge



Huge amount of Electricity consumption



LNG Consumption is more

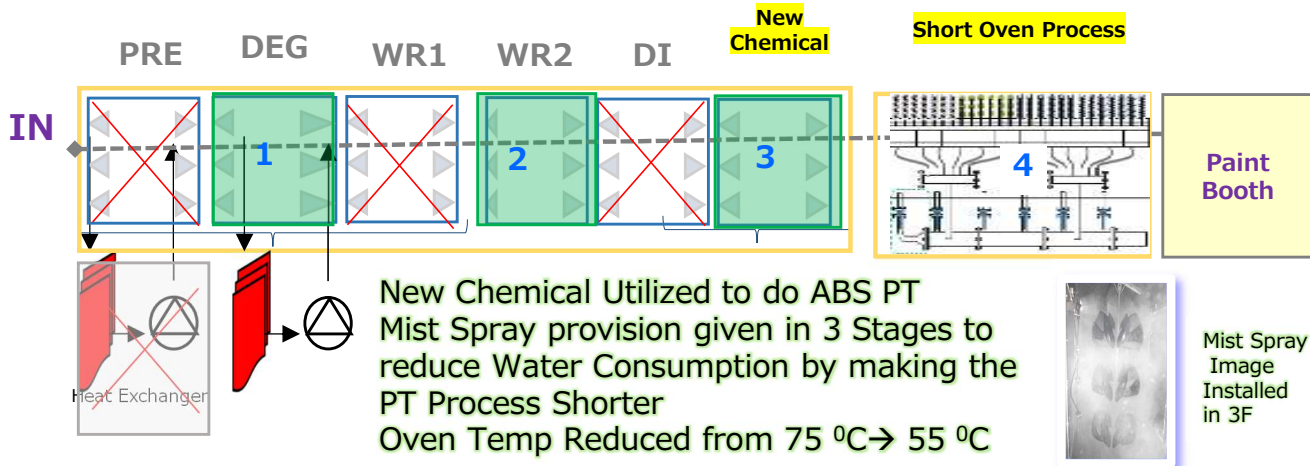


High water consuming process

Current pre-treatment process is high energy consuming due to lengthy process

Proposed idea (PT Short Process)

Resources used



In house expertise

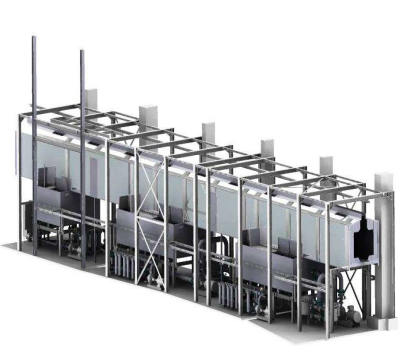


Quality confirmation from QC-HO

Current process

Benefits

By reducing Pre-treatment stages, Energy consumption has reduced



8 Stage pre-treatment process



4 Stage pre-treatment process

- ❖ In the revised process, mist spray provision given in 3 stage.
- ❖ New chemical introduced which will clean the parts effectively with mist spray
- ❖ Energy reduction (Electricity and LNG) by reducing no. of stages and reduced drying temperature at oven.



1,92,537 Kwh of electricity



179 Tons/year



14,166 Kg of LNG



28 Lakhs



29.6 lakhs/ annum



11 Months

Project is implemented in 1 line and will be Horizontally deployed in all the lines and all the factories of HMSI

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01	<p>Introduction & Energy Management</p> <p>Honda Global and HMSI presence, Honda's Environment journey, Honda's Commitment for Energy Excellence, Honda Motor's 2030 vision, HMSI Policies</p> 	1-3	1 min
02	<p>Energy data</p> <p>Energy Resources, Specific Fuel Consumption, Internal and National Benchmarking</p> 	4-8	1 min
03	<p>Encon Projects</p> <p>Zero Investment Encon Projects and Other Encon Projects</p> 	9-10	1 min
04	<p>Innovative Ideas</p> <p>Auto Booth Air Balancing, Compressed air replacement with Blower and PT Short Process in Paint Shop</p> 	11-20	5 min
05	<p>Renewable & Green Energy</p> <p>Renewable energy usage in Narsapura Plant, Renewable energy projects</p> 	21-28	2 min
06	<p>GHG Emissions, Green Supply Chain and Capacity Building</p> <p>GHG Benchmarking, Supplier EMS Certification, Green Dealer development, Supplier and dealer awareness</p>	29-37	2 min
07	<p>Improvements, Review Mechanism Employee Engagement</p> <p>Major Improvement themes, Performance review mechanism, employee engagement events</p>	38-54	3 min
08	<p>Way Forward</p> <p>Positive Spiral, Long terms energy and Environment Improvements</p>	55	2 min

- Third party solar power purchase to meet Plant Power requirement
- The agreement is for a period of 10 years
- Plant located ~200 KM away from factory
- Plant Capacity is around 40 MW

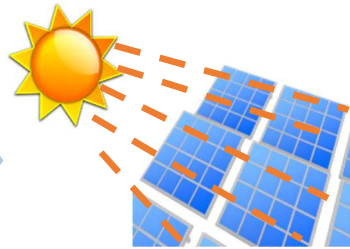
Site Photos



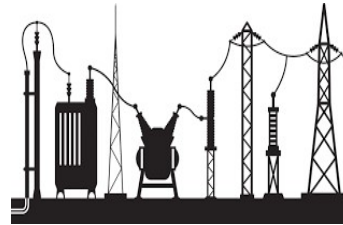
OM Copy



PPA Signing



40 MW Plant

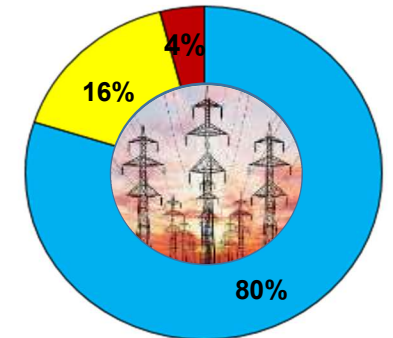


Govt. Network



HMSI 3F

Private Generator Public



440 lakh kWh



1078 Lakh
Rs/year



37,000 ton/
annum

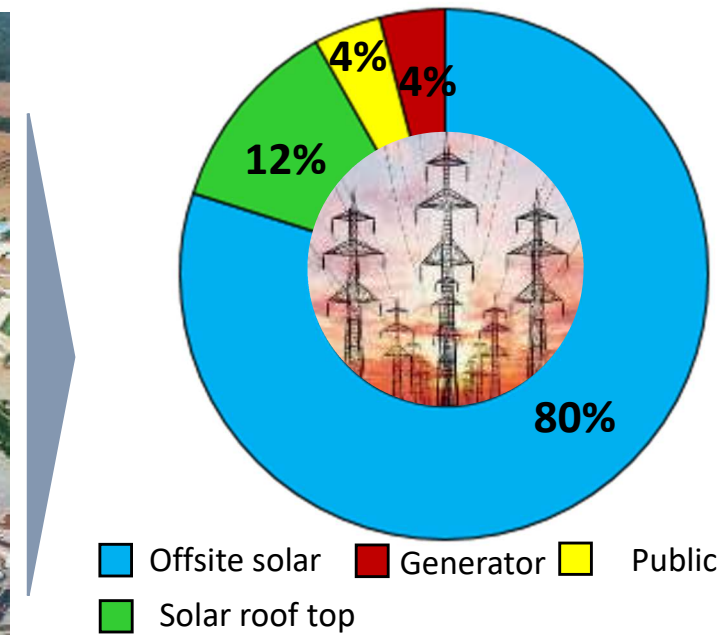


Zero



-NA-

This is Zero Investment project. Overall 44 Mill kWh per year from solar energy to meet 80% power requirement



- 7MW Solar Roof Top Installation done on Factory Roof Top.
- The installation of On site solar power plant was completed in Apr 2019.

Key project highlights



88 lakh kWh



580 lakh Rs/year



8330 ton/ annum



315 Mill Rs

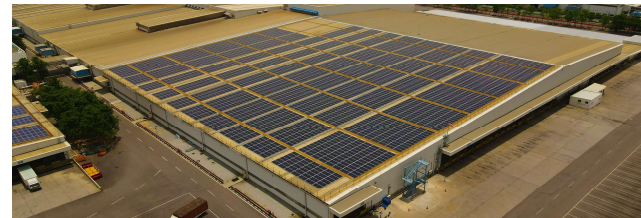


59 Months

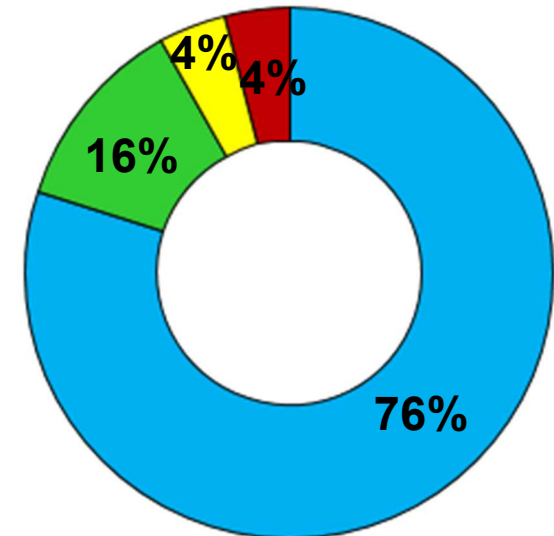
7 MW solar rooftop to meet 12% of total electrical requirement



0.9 MW Solar Rooftop on Logistics Warehouse



1.6 MW Solar Rooftop on MS Roof



■ Private
 ■ Generator
 ■ Public
 Solar roof top

- 2.5 MW Solar Roof Top Installation done on Factory Roof Top.
- The installation of On-site Rooftop solar power plant is completed on Apr 2022

Key project highlights



29.40 lakh KWH



269 lakh
Rs/year



2123 ton/
annum



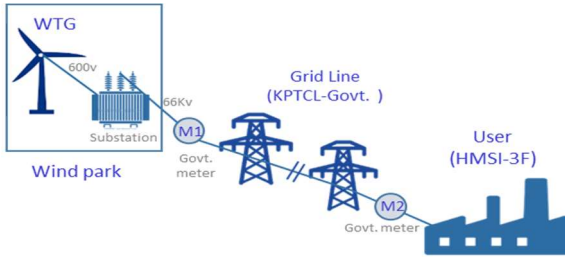
110.8 Mill Rs



50 Months

2.5 MW Solar Roof Top Expansion done to increase the in-house generation capacity to 9.5 MW

Wind Turbine Generator 2.7 MW



Location of Installation



2.7 MW Wind Turbine



Parameter	Unit	Value (2.7MW)	Value (2MW)
Wind Speed	m/s	7.0 - 7.1	
Turbine Output	kW	1050	728
Plant Availability	%	95	95
System Loss	%	5	5
Wind Probability (P50 / P75 / P90)	%	90	90
Generation Days /Yr	Days	365	365
Total Generation / Annum	Mil kWh	7.5	5.2

- Installation has been done Outside the Factory at Jagalur, Davanagere (approx. 300kms). Power is being utilized through Wheeling and Banking arrangement with DISCOM.
- The installation of Wind Turbine Generator is completed in the month of Jul-22

Key project highlights



75 lakh
KWH



48 lakh
Rs/year



1618 ton/
annum

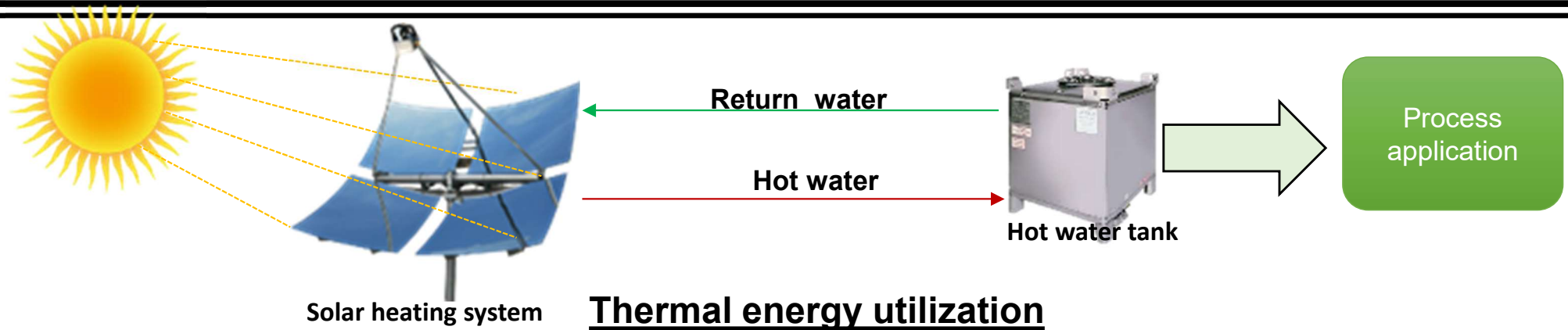


192 Mill Rs



48 Months

2.7 MW Windmill turbine installed to increase Renewable Energy Consumption

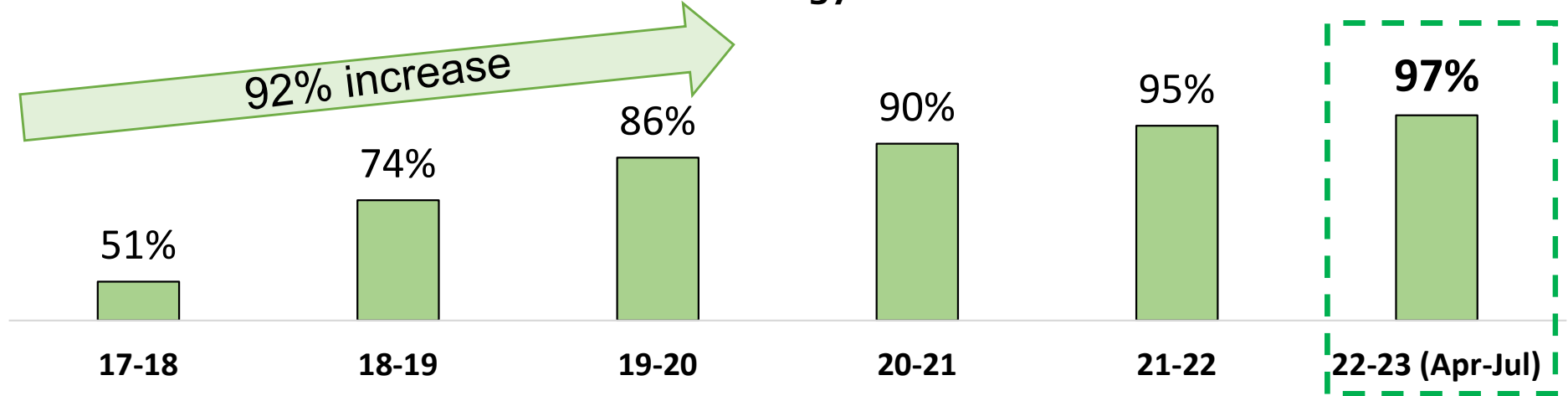


➤ Total 300 numbers of dishes are installed in the factory , which is been distributed in Four Locations .
Key project highlights

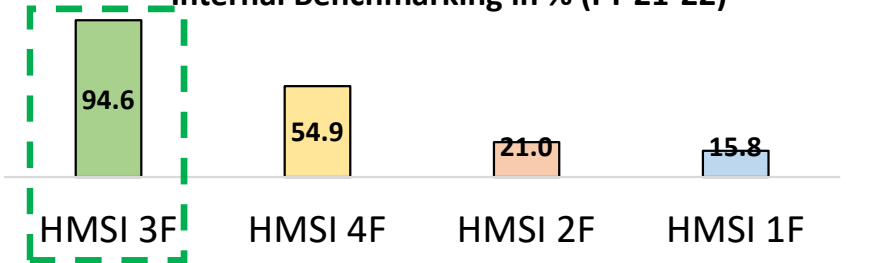
<p>ENERGY SAVING</p>	<p>MONEY SAVING</p>	<p>CO₂ REDUCTION</p>	<p>INVESTMENT</p>	<p>ROI</p>
292,000 kg	134 Lakh Rs/year	681,000 kg/annum	280 Lakh Rs/year	25 months

Fuel cost has been reduced by implementing Solar Dishes in Factory

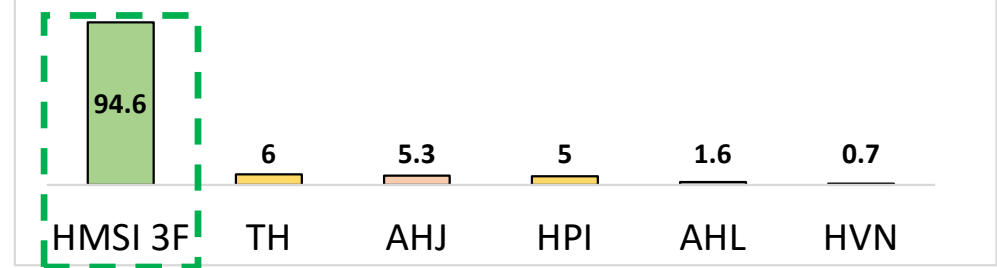
Renewable Energy Utilization in %



Internal Benchmarking in % (FY 21-22)



Benchmarking among Asian Genpo in % (FY 21-22)

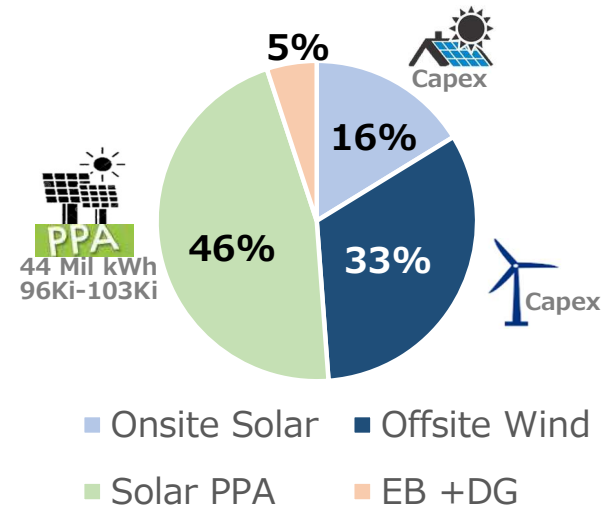


- Total 42 MW of Renewable Energy Capacity
- Total capacity to produce 63 Mill kWh per year of green energy
- Cumulative investment of Rs 645 Mill in Building RE Capacity
- Cumulative reduction of 44,000 tons of CO₂

HMSI-Narsapura is the highest Renewable Energy Utilizing factory in India and Asia region among Honda group companies.



Town : Jagalur
Dist. : Davanagere
Turbine : GE-2.7MW X 2 Nos
kWh/Yr: 7.5 Mill kWh/turbine



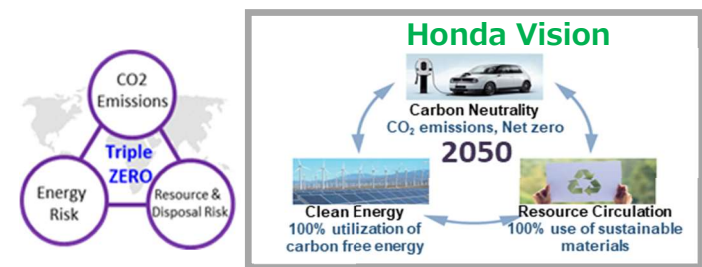
- Installation will be done Outside the Factory
- The installation of Wind Turbine Generator will be completed in the month of Aug-23

Key project highlights

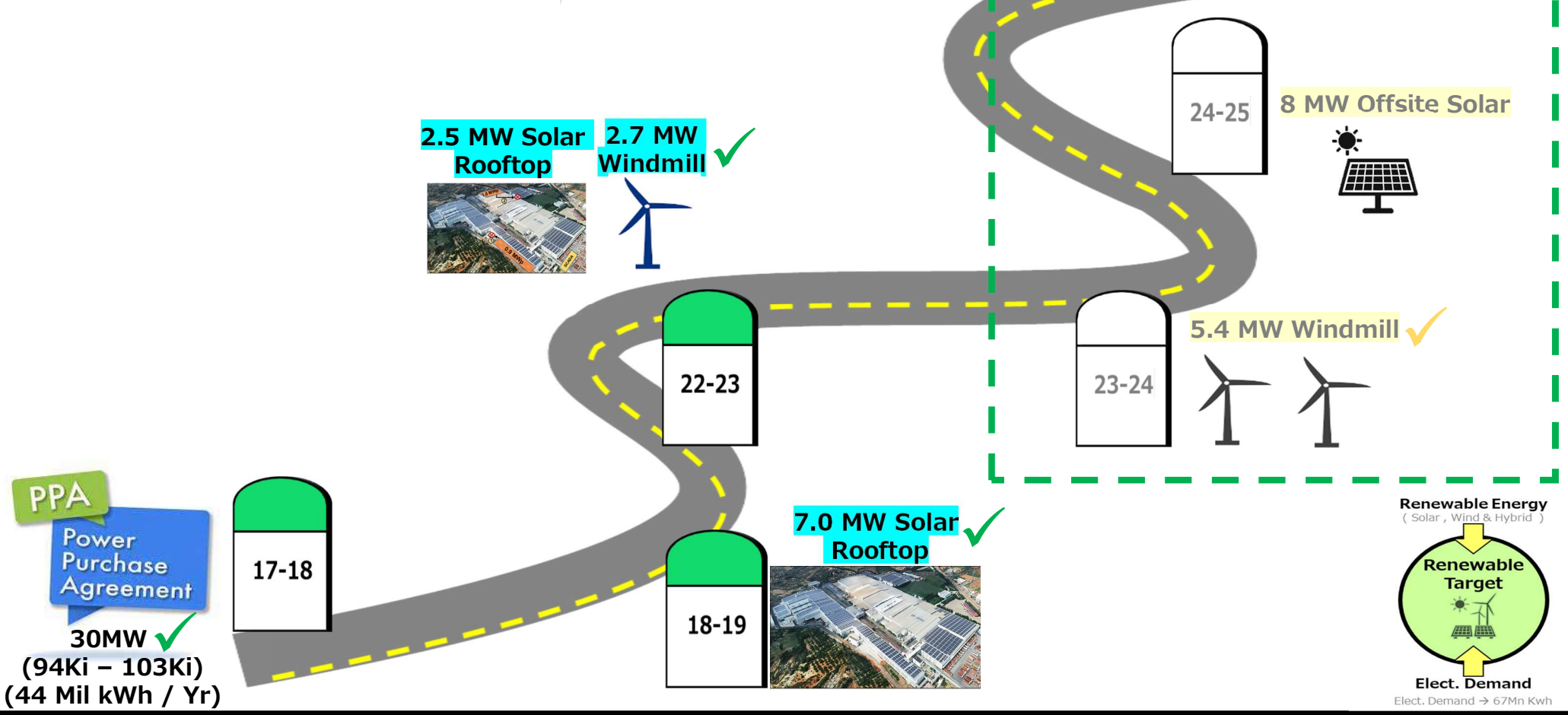
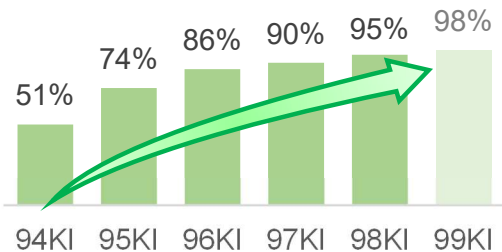
<p>15 Mill KWH</p>	<p>92 Mill Rs/year</p>	<p>3236 ton/ annum</p>	<p>414 Mill Rs</p>	<p>53 Months</p>
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5.4 MW Windmill turbine installation will increase RE generation from Self invested sources

Honda Clean Energy Vision 100% utilization of carbon free energy by 2050



HMSI-3F Renewable Energy Trend



2020 target of substituting 70% energy with RE already achieved

Detailed roadmap is chalked out to achieve the target of 100% RE by 2025

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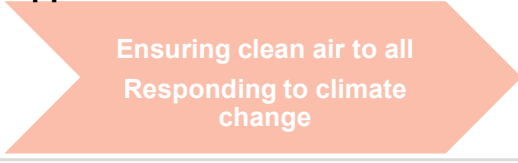
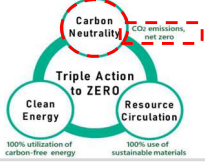
Global Direction:

Honda Global Vision

Applicable Honda Material Issues

Applicable Sustainable Development Goals

Applicable Green factory Requirement



Policy and Target Setting

CO₂ emission reduction through Energy Efficiency

CO₂ emission reduction through RE

HMSI-3F ENERGY POLICY

As responsible members of society we at Honda Motorcycle & Scooter India Pvt. Ltd. -Himnagar plant, will take every possible measure to eliminate wastage & conserve energy. Our plant is committed in each phase of our manufacturing activity to:

- Maximize and promote the utilization of renewable and clean energy.
- Adopt energy efficient technologies, products and services.
- Implement intensive energy monitoring systems, periodical audits & review systems.
- Review periodically & compare our Specific Energy Consumption with National / International level benchmarks to further drive the efforts for energy conservation.
- Continuously improve energy efficiency through PDCA cycle & by setting short term & long term targets.
- Ensure sufficient information & resources are available to achieve the targets for energy conservation.
- Aids by and where practicable exceed the applicable legal & other requirements related to energy consumption.
- Promote awareness on the Energy Management System & propagate the energy policy among our employees, as well as persons working on our behalf & to the general public.

Phone: 9898989898
Date: 12/11/2020

Use of Energy saving equipment's

- Achieve the long-term Carbon Neutrality vision through planned implementation of RE projects.
- Be the benchmark in GHG emissions reduction

1. Air dryer optimization in Paint Shop
2. Installation of EC Fans in AHU.
3. Installation of blower to replace compressed air



Cost Saving	Energy Saving	CO ₂ Reduction
74.48 Mill	11.46 Mill kWh	8560 tons

1. Expansion of 2.5 MW solar roof top panels.
2. Offsite Capex 2.7 MW wind power park installation
3. Installation of Solar Roof top panels of 7MW.
4. Third party wind power procurement.



CO₂ emission reduction through fuel reduction

CO₂ emission reduction through transport

Scope 1 & 2 CO₂ Emissions, Kg/Veh

1. Implementation of hot water in paint shop to eliminate steam consumption.
2. Implementation of VAM for Paint Shop.
3. Conversion of Boiler to Hot water generator

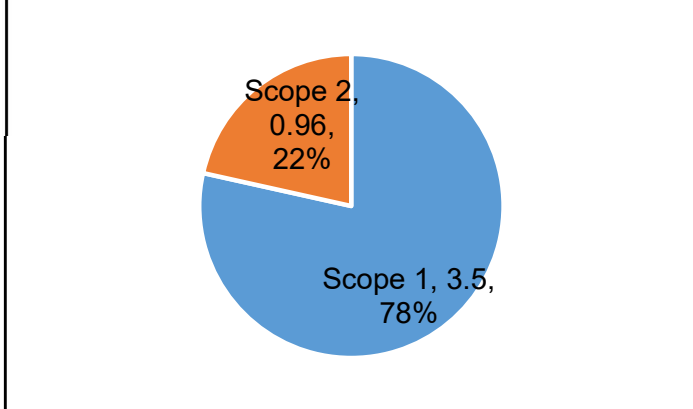


Cost Saving	Energy Saving	CO ₂ Reduction
58.73 Mill	975 MT of fuel	3506 tons

1. Implementation of RORO Service.
2. Implementation of trailer for final product movement.
3. Trucks trips reduction through combining small vehicle consignment to big containers

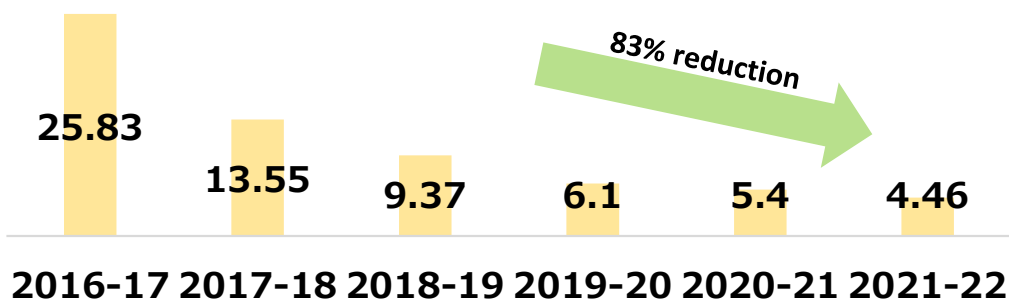


Employee Commutation	Waste Disposal	Downstream Transportation
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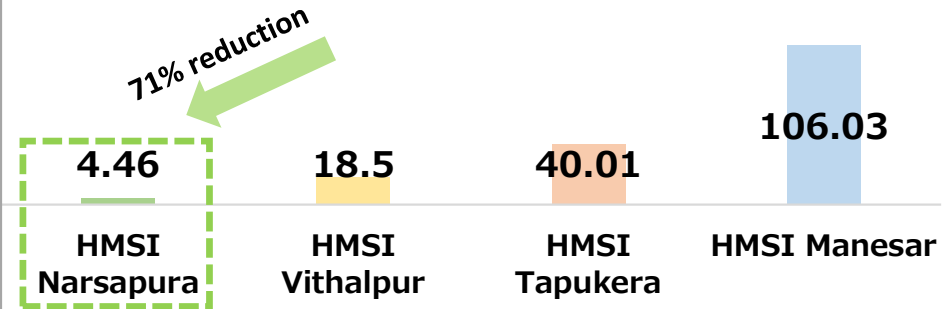


Through High Renewable Energy Utilization and Energy Efficiency we have achieved benchmark levels in CO₂ emissions. Overall, 3 year reduction by 60%.

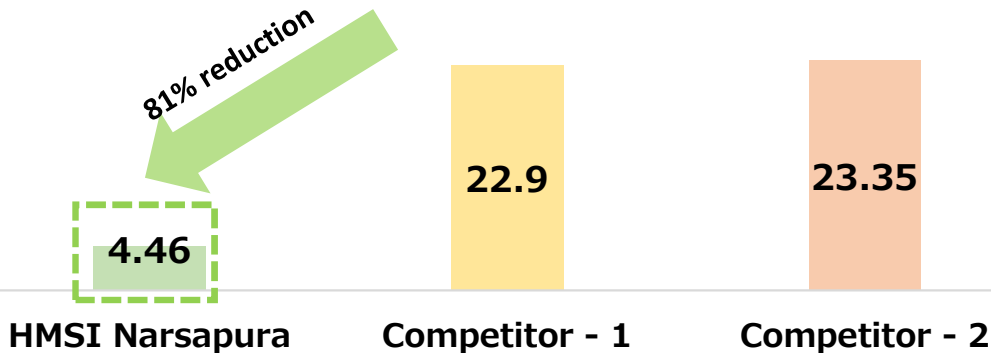
Specific CO₂ Emission reduction Trend YoY



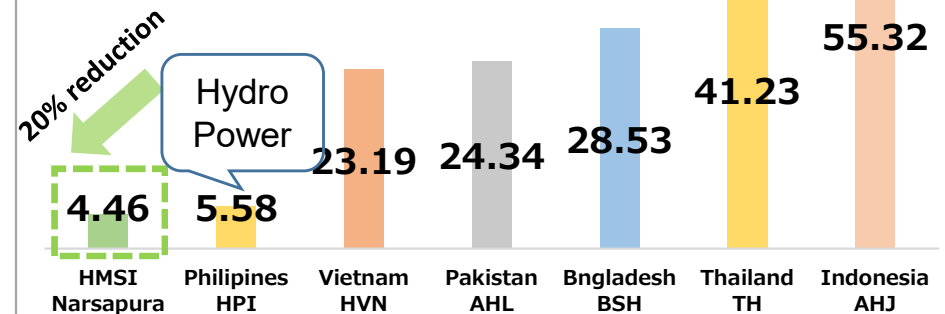
Among HMSI, Kg/Veh



Among Indian Companies, Kg/Veh



Among Asian Group Companies, Kg/Veh



Uniqueness

- One of the first automobile industries in the country which has installed around 300 No's of Solar parabolic dishes.
- Complete elimination of MEE and ATFD Operation through sequential alternatives.
- Implementation of Hot water generator to generate Hot water to eliminate boiler
- Lowest specific propane consumption among group companies with similar configuration.
- One of the lowest specific CO₂ emissions among Asian Group companies.
- Easy to design and maintain and good reliability since last 3years.

**HMSI-Narsapura is the lowest CO₂ emission factory in India and Asia region
Net Zero target will be realized by 2030**

Honda Environment Direction and Approach

Mr. Soichiro Honda (Founder)

2030 Serve People worldwide with the joy of expanding their life's potential
30% CO₂ reduction from baseline year 2000

2020 Selected as member of Dow Jones Sustainability World Index

2010 New Honda Environmental Logo : Blue Skies for Our Children

1992 Released our First Honda Environment Statement

1970 World's 1st Automaker to comply with U.S. Clean Air Act

1960 Honda actively endeavoured to solve Environment problems.

1948 Honda was founded

Triple ZERO (CO₂ Emissions, Energy Risk, Resource & Disposal Risk)

Honda Vision 2050
Carbon Neutrality (CO₂ emissions, Net zero)
Clean Energy (100% utilization of carbon free energy)
Resource Circulation (100% use of sustainable materials)

3F Environment Achievements

GreenCo Platinum Rating

Greenco Star Performer

National Water Award

National Energy Leader

GreenCo Platinum Plus Rating

		CO ₂ Emission – kg/Veh								
		5.0	5.6	18.8	24.3	22.4	28.5	31.9	37.0	50.9
		3F	HPI	HMSI	AHL	HVN	BSH	ATAI	TH	AHJ

		Water Consumption – Ltr / Veh								
		70	120	270	280	290	300	310	540	670
		3F	HMSI	AHJ	ATAI	HVN	BSH	TH	AHL	HPI

Road Map towards Long Term Excellence – 3F

Control Item	98Ki	
	Plan	Actual
CO ₂ , kg/Veh	5.26	5.00
Rainwater use, %	100	100

- Propane to LNG ✓
- VAM for Paint Shop ✓
- Decanter for ETP ✓
- Power Factor Improvement ✓
- EDI for ETP ✓

- GreenCo Platinum Plus ✓
- Third party Wind PPA ✓
- Air Dryer Optimization in PA ✓
- Hot Water Generator ✓
- Compressed air to blower ✓
- Zirconium Coating in PA ✓
- VFD in PA pits ✓
- Zero Waste to Landfill ✓

- 2.5 MW Onsite Solar-Apr '22
- 2.7 MW Offsite Windmill – Jul'22
- 5.4 MW Offsite Wind-Sept '23
- EC Fans for ASU-Dec '22
- Airtron for Air Conditioning-Apr '22
- Temp. based AHU control-Apr '22
- Smart LNG Savers-Mar '23

- External captive wind expansion
- External solar park
- IR Heating Technology for Ovens
- Bio diesel Type DG Sets
- Mission 5 lakh trees
- Rainwater tank capacity up
- Outside factory rainwater collection tank
- Certified Carbon neutral
- Net Zero Industrial Water Intake

Control Item	99 Ki	100 Ki	101 Ki	102 Ki	103 Ki	104 Ki	105 Ki	108 Ki
	Plan	Plan	Plan	Plan	Plan	Plan	Plan	Plan
CO ₂ , kg/Veh	4.8	4.3	3.7	3.3	3.0	2.8	2.6	Net Zero
Rainwater use, %	100	100	100	100	100	100	100	100

97Ki

98Ki

99ki ~ 100ki

101ki ~ 108ki

Approach basis

Driven by Honda Vision, 3F has achieved benchmark CO₂ among A&O Genpos. Highest RE Usage. Net Zero CO₂ is aimed to achieve by 108 Ki

Honda Green Purchasing Guidelines

HONDA

Honda Green Purchasing Guidelines



BLUE SKIES FOR
OUR CHILDREN

December 2001 – First edition
October 2018 – Revised edition

Honda Motor Co., Ltd.

III. Honda Green Purchasing Policy

For Honda, activities to conserve the global environment establish an important pillar in our corporate policies. Our goal is to reduce our environmental footprint through corporate activities

(*1) at every stage in the entire life cycle from resource procurement to design, development, production, transportation, sales, use and disposal stages.

To carry out these activities effectively, we are continuing to take strong measures to reduce our environmental footprint, together with our suppliers. [We are also adding E \(Environment\) to our supplier evaluation categories](#)

(*2) of Q (Quality) , C (Cost), D (Delivery) and D (Development) to allow us to more actively encourage purchasing environmentally friendly parts and materials.

For [Honda's environmental initiatives such as GHG emissions reduction, the overall purchasing activities of sharing policies with suppliers and achieving targets together are called Honda Green Purchasing activities.](#)

<Supplement>

These Guidelines cover [all suppliers for parts, materials, indirect materials, accessories, service parts and logistics.](#)

Products refer to completed products of motorcycles, automobiles and power products produced by Honda.

Parts and materials refer to parts, materials, indirect materials, accessories, service parts and logistics purchased by Honda.

[\(*1\) Corporate activities cover all activities related to Honda products including not only first-tier but also sub-tier suppliers.](#)

[\(*2\) The result of activities at each supplier in response to these guidelines may be evaluated.](#)

Environment is considered in suppliers' evaluation and suppliers are enforced to cover all activities related to Honda products including not only first-tier but also sub-tier suppliers

CO₂ Reduction HM JPN Guidelines

Objective:

Reduce the **Global Warming** through energy saving initiatives

Target Area :



Global Honda CO₂ reduction Target 1% Per Year

Reduction Result (CO₂ Gentani %)

Year	91ki	92ki	93ki	94ki	95ki	96ki	97ki	98ki
No. of Splrs	46	49	52	55	57	60	59	60
Honda tgt.	-	1%	1%	1%	1%	1%	1%	1%
Actual	Base data	-4%	-4%	-6%	-8%	-14%	-9%	Result in 97ki

98ki Approved Yamataka (97ki result)

FY20-21 Supplier's CO₂ Reduction Summary Report (98ki Yamataka)

	FY13-14 Act	FY19-20 Act	FY20-21 Plan	FY20-21 Act	FY21-22 Plan
Prod. Vol. (units)	3.73 Million	5.36 Million	3.47 Million	3.89 Million	3.79 Million
No. of Target Suppliers	46	60	59	60	60
Grasp Ratio of TTL Pur. Amount	71.02	75.97	75.97	78.64	78.64
CO ₂ Amount (CO ₂ Tons)	271,085	381,340	312,965	290,725	302,439
Sales Amount of Target Suppliers (Local currency)	83,884	149,500	126,646	125,265	132,086
IM, JPY	136,730	243,832	206,434	204,182	215,301
CO ₂ Gentani	1.98	1.56	1.52	1.42	1.40

Gentani Result

- Compare with previous year: A0.42 (21.2%)
- Compare with FY13 base year: A0.46 (23.2%)
- Compare FY 2019-20 is 8.97%
- Compare FY 2013-14 is 28.28%

Target: 1.40 (97ki from Base Yr.)

For FY20-21 Actual, Scope1&2 Gentani for reduction control at 1.42
 For FY21-22 Plan, we propose Scope1&2 Gentani at 1.40 (▲29% from FY13-14 base year)

Examples of Splrs major kaizens

Installation of VFD (Varroc)	Replacement of Pump (JNS)	Inst. of central Hopper dryer (SPR)
<p>Before</p> <p>No VFD Installed Earlier</p> <p>After</p> <ul style="list-style-type: none"> 25KW motor taking 37Amp current Reduced initial current & speed control <p>Benefit: Electricity Saving: 1744 KW / Month CO₂ Reduction: 8 Tons / Month</p>	<p>Before</p> <p>5HP vertical pump installed on pre-treatment process</p> <p>After</p> <p>5HP vertical pump replaced with 3HP horizontal pump</p> <p>Benefit: Electricity Saving: 7650 KW / Month CO₂ Reduction: 18 Tons / Month</p>	<p>Before</p> <p>No hopper dryer has been installed earlier</p> <p>After</p> <ul style="list-style-type: none"> Central hopper dryer installed to save time, maint. Cost It is effective & low cost method <p>Benefit: Electricity Saving: 9570 KW / Month CO₂ Reduction: 24Tons / Month</p>
HSD DG change to Gas DG (NMPL)	Replace of Fan with Nozzles (Minda)	Replace DC Motor by AC (Denso)
<p>Before</p> <p>HSD Gen Set</p> <p>After</p> <p>Gas Gen Set</p> <p>Benefit: Electricity Saving: 1379 KW / Month CO₂ Reduction: 13 Tons / Month</p>	<p>Before</p> <p>3.5 KW motor was installed to operate fan which cool process water</p> <p>After</p> <p>Fan replaced with nozzles for cooling to process water</p> <p>Benefit: Electricity Saving: 2359 KW / Month CO₂ Reduction: 17 Tons / Month</p>	<p>Before</p> <p>125HP DC motor used to run for cooling External 3.7 kw blower motor</p> <p>After</p> <ul style="list-style-type: none"> Replaced with 115HP AC motor with self draft fan No need to use external blower <p>Benefit: Elec. Saving: 2664 KW / Month CO₂ Reduction: 15 Tons / Month</p>

98ki Reduction Activities Schedule

S.No	Activity	Status	Remark
1	<p>Target Splr identification & discussion with HCIL & HSPP</p> <ul style="list-style-type: none"> Registration of tgt. Splr in Slim office CO₂ reduction target setting based on last year performance <p>Energy Consumption data collection from 60 Splrs & analysis</p>	Completed	60 target splrs selection done based on last year Pur. Amt
2	<ul style="list-style-type: none"> Collection of Splrs sales amount to Honda -97ki Supplier GHG self assessment Upload data in Slimoffice Portal 	Completed	All the data are uploaded in Slimoffice
3	<p>98ki CO₂ Reduction activities at 60 tgt. Splrs (target Min. 1% with comparison of 97ki)</p> <ul style="list-style-type: none"> Monthly energy data monitoring Horizontal deployment of HMSI mfg. Kaizens <p>Supplier rating for Env. Award during Splr convention</p>	U/progress	Kaizen categorization & Monthly Kaizen receiving record
4	<ul style="list-style-type: none"> Step 1 : Selection of Top 10 suppliers (Tgt. Oct'21) - Done Step 2 : Genba evaluation at the Top 10 splrs & select Best splr 	U/progress	98ki Env. Award

CO₂ Reduction activities are in progress as per ASH / HM Japan Guidelines

Objective:

- To maintain the global expectations for Honda and to fulfill social responsibility as a corporate citizen including the supply chain
- To understand the concerns of each supplier and support for improvement in order to increase the level of activity in ESG category among Honda's supply chain



ESG yrly activity schedule (96ki - 98ki) - HMSI

ki	Major planned activity	Status
96ki Activities	ESG Activity Kick off meeting & ESG guideline distribution	Done
	ESG Survey start at all suppliers	
	Signed acknowledgement & survey sheet received from Splrs	
97ki Activities	ASH Requirement – M/s Goshi Confirmation for ESG, Survey at Goshi	Done
	ESG Survey Support to Supplier (Goshi India)	
	Goshi ESG Survey sheet check	
	Final ESG Survey Report Share with ASH	
98ki Activities	New Suppliers future survey confirmation – As per ASH	Done
	ASH Requirement – Goshi reconfirmation for ESG, Re-Survey at Goshi	
	ESG Survey remote Genba Kick Off confirmation	
	ESG Survey at all newly added suppliers after the 1 st Survey in 96ki	
	Kick off b/w ASH and HMSI - Plan (5th Oct'21)	
	Kick off b/w HMSI & Goshi	Done
	HMSI remote Genba preparation support & check meeting	
	Remote Genba at Goshi (By HMSI, ASH, HM Japan) - 8th & 15th Dec'21	
	ESG self survey at – Mushasi India	
	98ki ESG report share meeting with ASH	

ESG Audit long term plan (MCP PUR – ASH)

ESG Audit 95Ki – 102 Ki

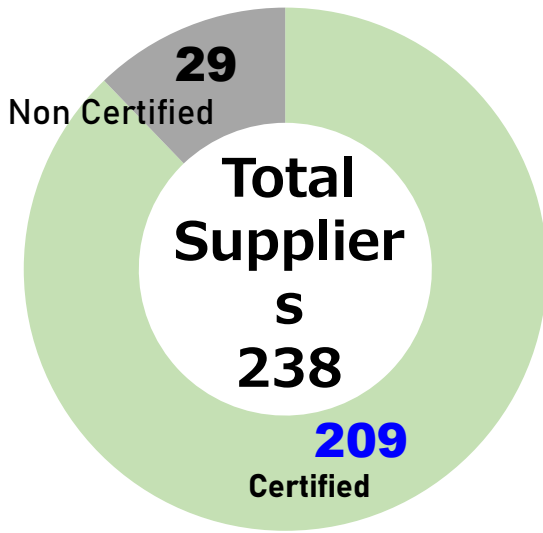
Operation Flow	Child Companies				Affiliate Companies				TTL
	95Ki	96Ki	97Ki	98Ki	99Ki	100Ki	101Ki	102Ki	
	GO Audit		GO+RO	RO Audit		LO Audit			
HVN			GOSHI HONDA LOCK		FCC	SHOWA	KEIHIN MUSASHI	ATSUMITEC NISSIN TANAKA	9
HPI				GOSHI			NISSIN FCC	-	3
HMSI				GOSHI	MUSASHI	KEIHIN	FCC NISSIN	SHOWA TS TECH	7
TH	GOSHI				MUSASHI	KEIHIN FCC	NISSIN SHOWA	ATSUMITEC THAI YANAGAWA YANAGAWA TECH	9
AHM						MUSASHI	KEIHIN SHOWA	FCC NISSIN	5
BSH							KEIHIN		1
TTL	1	-	2	2	3	6	10	10	34

ESG Survey points

Large item	Small item	Large item	Small item	
1 All-CSR	All CSR activity	5 Compliance	Regulation compliance	
2 Safety/Quality	Ensuring Safety of products/services and quality governance		Competition Law	
			Corruption prevention	
3 Human rights /Labor	Discrimination elimination		Confidential info. protection	
	Human rights respect		Export trade control	
	Prohibition of child/forced labor	Intellectual property protection		
	Wage	Conflict of interests		
	Working hour	6 Info. disclosure	Info. disclosure to stakeholder	
	Communication with employee		7 Outside company	Roll-out to Gr. company/supplier
	Safe/Healthy labor environ.			
4 Environ.	Handling of conflict mineral			
	Environmental management			
	GHG emission reduction			
	Environ. Preservation of air/water/soil, etc.			

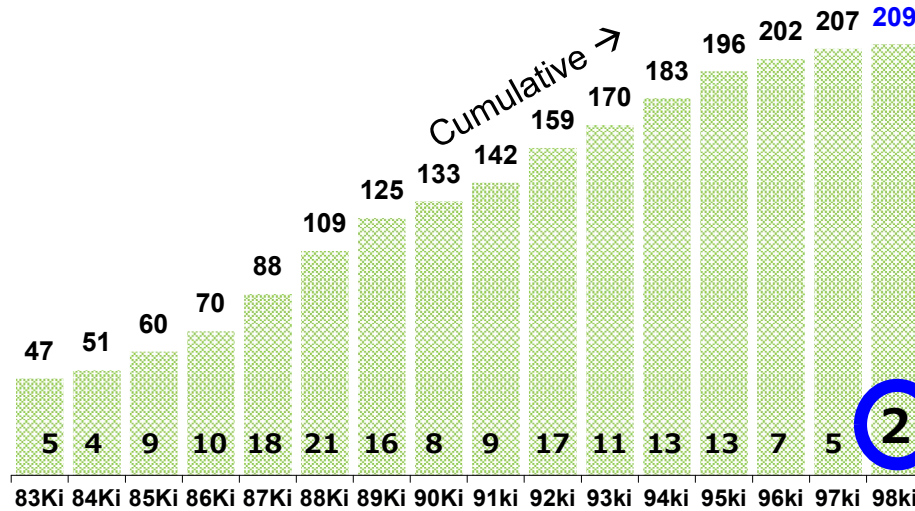
Target Splr - Goshi remote genba by HM JPN, ASH & HMSI is planned in 8th & 15th Dec'21
 FY 2021-22 ESG activity is under progress as per schedule & ASH guidelines

❑ Certification status

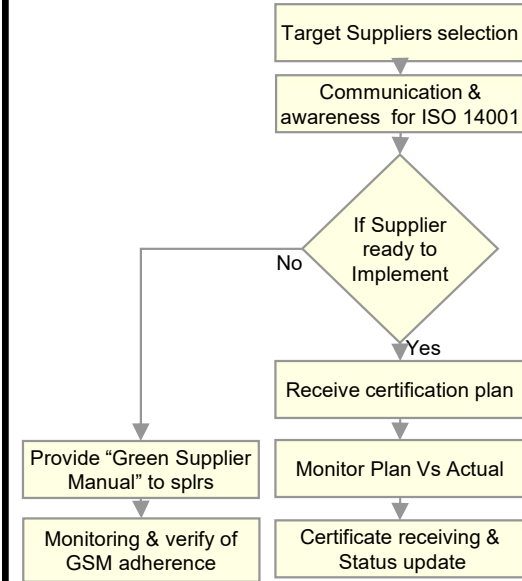


❑ Yrly Certification status

Tgt. : Minimum 7 splrs certification per yr. (98ki tgt. 5 due to Covid effect)



❑ Activity Process



❑ 98ki activities schedule

Activity	98ki											
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb			
Splrs certification plan	▼											
Support to splrs	▼							▽				
Implementation verification	▼							▽				
Follow up for certificates	▼							▽				
Receive splrs certificates	▼							▽				
Report to Top Mgmt.					★ Today						★	

❑ 98ki Certification status

	1 st Half (Actual)	2 nd Half
<ul style="list-style-type: none"> EMS certification request to all remaining Splrs 		<ol style="list-style-type: none"> A K Automatics Modern Steel Amtek Auto
<ul style="list-style-type: none"> 2 Splrs certi. completed 1) New Swan Multitech → O 2) Minda Rinder India → O 		

All the activities are under progress as per plan

World Environment Week

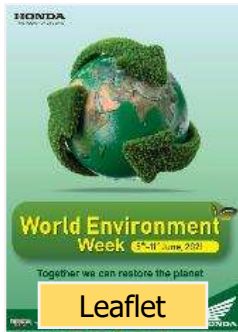
Theme for World environment 2021 is 'Ecosystem Restoration'.

World environment week is celebrated from 5th June- 11th June.

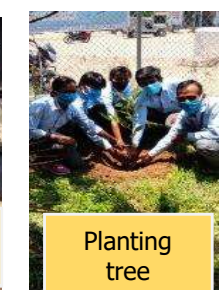
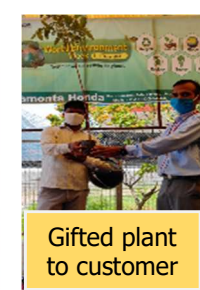
Objective

1. To encourage awareness and action for the protection of environment
2. To utilize world environment week for customer and society connect
3. Brand positioning along with building customer confidence

HMSI actions

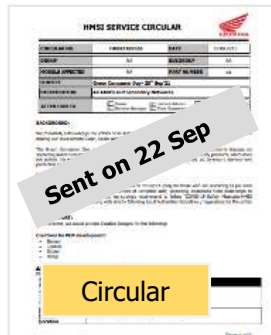


Dealer actions



Environment week 5th-11th Jun'21, celebrated by dealers. 754 No.s of dealers participated in the celebration

Green Consumer Day



Web based awareness organized by HMSI



Green Consumer Day Celebration at Sri Santhosh Honda & Deccan Honda



Green Consumer Day Celebration at Platinum Honda



Green Consumer day Tea Shirt wearing & Sapling Distribution at Meenakshi Honda



Green Consumer day, celebrated by dealers. 622 No.s of Dealers participated in celebration

Table of Contents

Contents		Slides	Time
01	<p>Introduction & Energy Management</p> <p>Honda Global and HMSI presence, Honda's Environment journey, Honda's Commitment for Energy Excellence, Honda Motor's 2030 vision, HMSI Policies</p> 	1-3	1 min
02	<p>Energy data</p> <p>Energy Resources, Specific Fuel Consumption, Internal and National Benchmarking</p> 	4-8	1 min
03	<p>Encon Projects</p> <p>Zero Investment Encon Projects and Other Encon Projects</p> 	9-10	1 min
04	<p>Innovative Ideas</p> <p>Auto Booth Air Balancing, Compressed air replacement with Blower and PT Short Process in Paint Shop</p> 	11-20	5 min
05	<p>Renewable & Green Energy</p> <p>Renewable energy usage in Narsapura Plant, Renewable energy projects</p> 	21-28	2 min
06	<p>GHG Emissions, Green Supply Chain and Capacity Building</p> <p>GHG Benchmarking, Supplier EMS Certification, Green Dealer development, Supplier and dealer awareness</p>	29-37	2 min
07	<p>Major Improvements, Review Mechanism, Employee Engagement</p> <p>Major Improvement themes, Performance review mechanism, employee engagement events</p> 	38-54	3 min
08	<p>Way Forward</p> <p>Positive Spiral, Long terms energy and Environment Improvements</p>	55	2 min

Background

BEE Recognized Third Party Energy Audit conducted at HMSI to ensure all the high energy intensive equipment are working efficiently

Efficiency checking of Air Compressors



- HMSI Narsapura is equipped with 16 No.s of Air Compressors of KAESER make.
- Elaborate measurement carried out to determine performance of equipment.

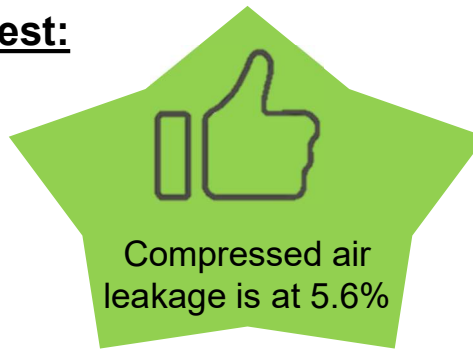
Audit results:

Comp	1	2	3	4	5	6	7	8	9
Std KW/CFM	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Actual KW/CFM	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14
Remark	OK	OK	OK	OK	OK	OK	OK	OK	OK

All the compressor efficiency are calculated and found out all the compressors are most efficient.

Compressed Air Leakage Test:

Compressed air leakage test conducted at shop floor during nonproduction day.



Efficiency checking of Boilers



- HMSI Narsapura is equipped with 5 No.s of Boilers to generate steam to use in process.
- Efficiency of the Boiler carried out by Indirect method by measuring various heat losses.

Audit results:

Boiler	1	2	3	4	Boiler	1	2	3	4
Std Vol Eff %	84	84	84	84	Std CO ppm	<100	<100	<100	<100
Actual Vol Eff %	84.9	84.6	85.2	84.8	Actual Vol Eff %	NIL	NIL	NIL	NIL
Remark	OK	OK	OK	OK	Remark	OK	OK	OK	OK

Efficiency checking of Pumps



- Pumps related to Paint shop, Air Supply Unit and Sludge Pit circulation pumps were checked during audit.

Audit results:



All the pumps are equipped with VFD to save energy



Found out that all the High energy intensive equipment are working efficiently and compressed air leakage is also under control

Background

Modifications in machines are being carried out at production body through utilization of In-house maintenance associates for activities such as M,S,Q,C,D Improvements

EC Fans Installation

L4 Sludge Pit Panel & AB4 Mixing room VFD Installation

Situation Analysis:

ASU EC Fans Installation to Save 320 Units/Day savings at SPC2 & CC

Situation Analysis:

L4 Sludge Pit Panel & AB3 Mixing Room Exhaust fan VFD Installation to save 25 Units/Day Savings

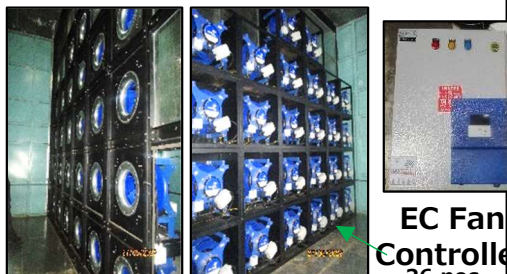
Before



SPC 2 ASU Clear Coat ASU
V Belt Induction Motor

Equip Description /Location	Before					
	KW	Freq (Hz)	Voltage (V)	Current (I)	A: Power (W) - V x I*1.73	KWH
SPC2 ASU MOTOR	160.00	40	411.00	27.00	18835.60	18.84
CC ASU MOTOR	75.00	40	421.00	27.00	18900.14	18.90

After



EC Fans Installation

Equip Description /Location	After					
	Freq (Hz)	Qty Set	Voltage (V)	Current (I)	B: Power (W) - V x I*1.73	KWH
SPC2 ASU MOTOR	37.50	26	416.00	14.87	10071.17	10.07
CC ASU MOTOR	38.50	10	420.00	13.45	9490.55	9.49

EC Fan Controller
26 nos Fan installed

Before

Power Flow

MAIN SUPPLY

MCB

CONTACTOR

FAN MOTOR

L4 Sludge

Pumps Qty	6
Load KWH	224

AB4 Mix room

Fans Qty	1
Load KWH /DAY	62.9

After

Power Flow

MAIN SUPPLY

MCB

CONTACTOR

INVERTER

FAN MOTOR

L4 Sludge VFD Panel

Pumps Qty	6
Load KW	130

AB4 Mix room VFD

Fans Qty	1
Load KWH /DAY	36



86400
kWh/annum



62.39
tons/Annum



15 Mill



454150
kWh/annum



327.889
tons/Annum



1.8 Mill

Continuous energy efficiency are initiatives taken to reduce CO2 Emission

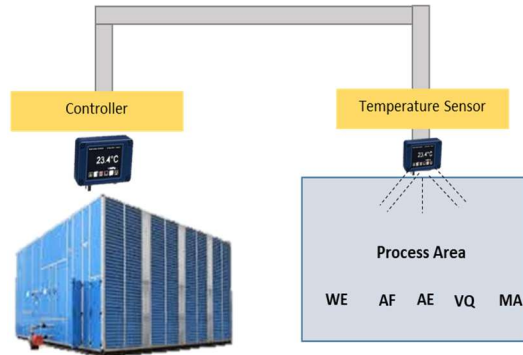
Temperature Sensor for AHU

Before



AHU's run irrespective of temperature inside the shop floor.

After



Temperature sensors installed in shop floor.

Benefits



INVESTMENT
2.5 Mill



170000
kWh/annum

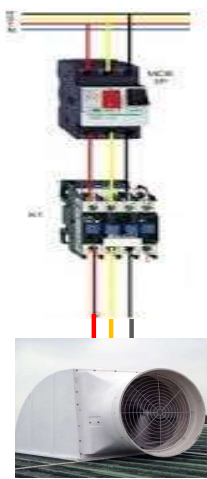


122.74 tons

❖ Temperature sensors are installed inside shop floor which sends signal to the controller at AHU. Controller then optimizes working of AHU.

VFD installation in ABS line Exhaust fan for booth balancing

Before



To maintain air velocity of 0.3 to 0.4 M/sec & down draft, ASU supplies filtered air and same air is exhausted by Exhaust fan. Exhaust fan will be running irrespective of the load in booth.

After



To optimize the running of Exhaust fan when the booth is non operational or on less load, VFD is installed. Which in turn reduce electrical energy consumption.

Benefits



INVESTMENT
0.05 Mill



20000
kWh/annum

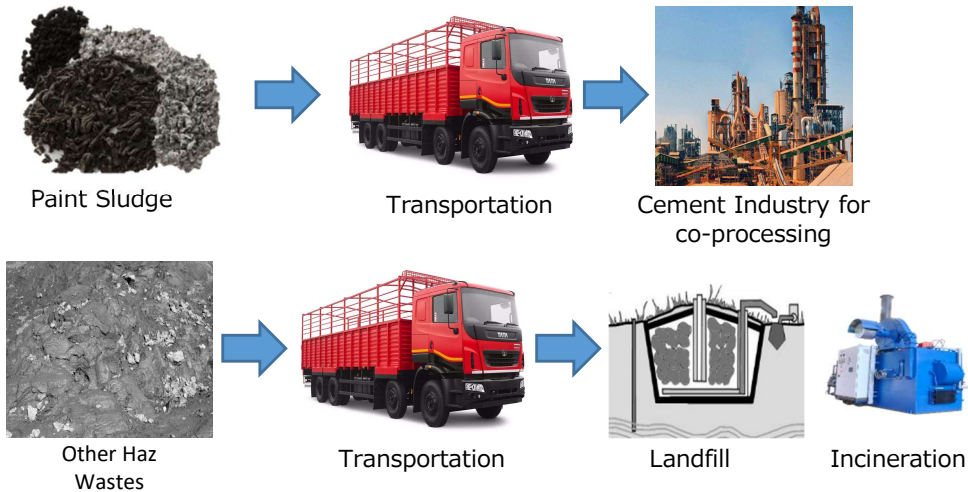


14440
Kg/annum

❖ Exhaust fan is required to maintain booth balancing.
❖ Exhaust fan used to run at full load even though the booth load was less.
❖ VFD is installed to optimize the running of Exhaust fan based on the booth load.

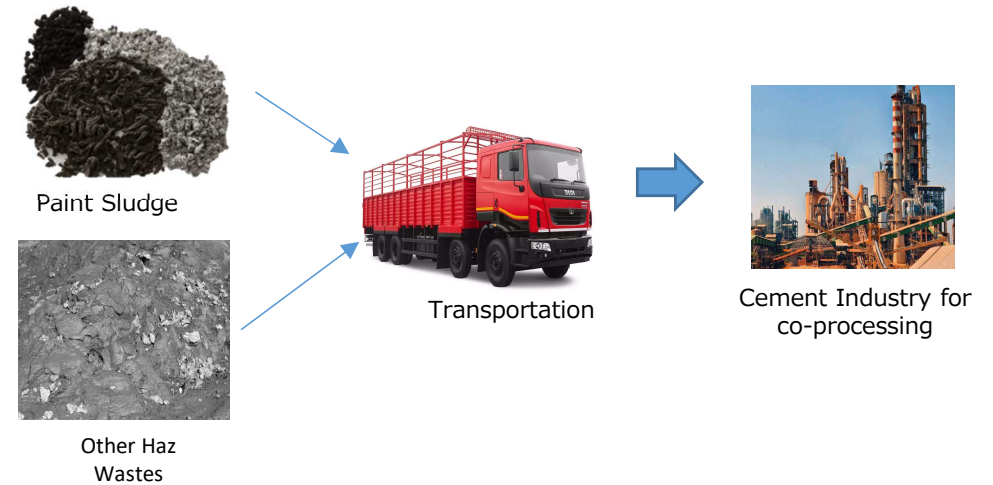
Continuous energy efficiency are initiatives taken to reduce Utility cost

Before:



- Only Paint sludge was being sent to coprocessing and other hazardous waste were sent either to landfill or incineration.
- Due to constraint in authorization, only paint sludge was being sent to co-processing

After:



- Authorization has been amended for coprocessing of all Hazardous waste.
- Contract has been made with cement industry for disposal of all Hazardous waste with effect from 01.12.2021

Benefit:



724.87 MT of Waste Utilized as fuel in cement industry



1972 MT of Co2 Emission reduction



2579 Kcal of energy generated from the waste



0.8 Mill / Annum

Smart AC controller has been installed to ensure energy reduction during AC operation

Decanter for Sludge Drying

Before



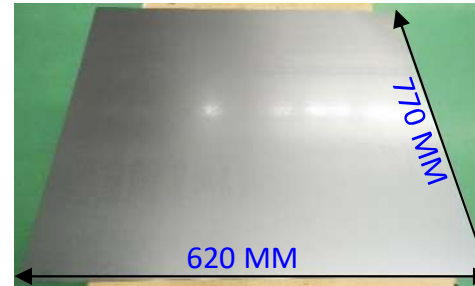
Filter Press for Sludge Handling

After



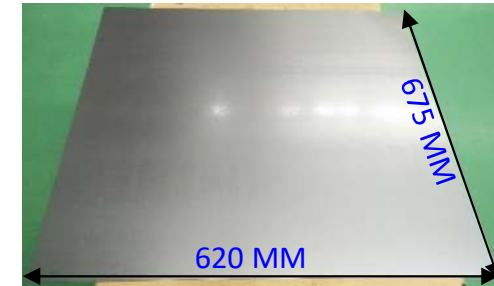
Decanter for Sludge Handling

Before



Size: 0.8 X 620 X 685 MM

After



Size: 0.8 X 620 X 675

Polythene usage elimination in clutch Assy part

Before



Poly cover weight / K1E clutch Assy part – 0.008 Kg

K1E clutch Assy part received with Polythene cover

After

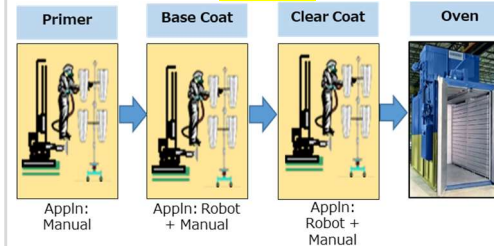


Poly cover for clutch Assy part eliminated.

K1E clutch Assy part Polythene Eliminated

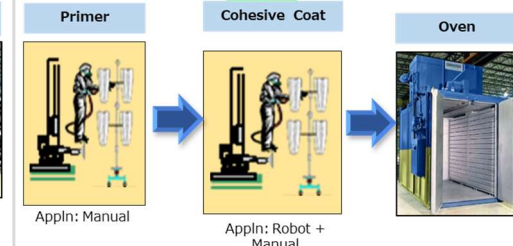
Implementation of Cohesive Painting Technology

Before



2 Coat Painting of components

After



Cohesive Painting technology



4331.32 MT/Annum waste reduced



1524.1 Lakhs/Annum



429.5 Lakhs



3.5 Months

3R principle adopted to reduce Waste generation

Reusable Spacers for tires

Before



To scrap

Spacers from suppliers used to scrap at HMSI

After



Return to Supplier

Spacers now being collected and returned to suppliers

Fr & Rr Cushion Polythene cover reuse

Before



Polythene cover of Cushion used to scrap at HMSI

After



Return to Supplier

Polythene covers of Cushion now being sent to supplier

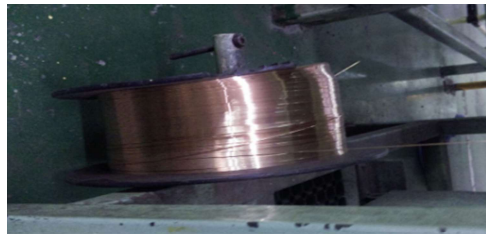
Reuse of 0.8 mm wire spool in manual welding

Before



1.6 mm Brazing rod used on robot welding

After



0.8 mm wire spool from robot welding is reused in manual welding

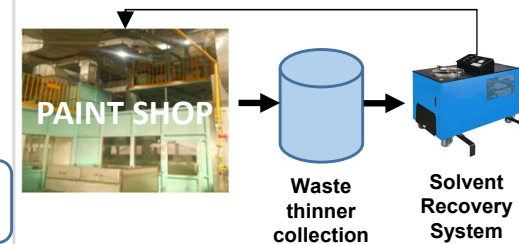
Implementation of Solvent recovery System

Before



Waste thinner from PA used to sent to recycler

After



Waste thinner is being reused in the system



350.6 MT/Annum waste reused



294.16 Lakhs/Annum



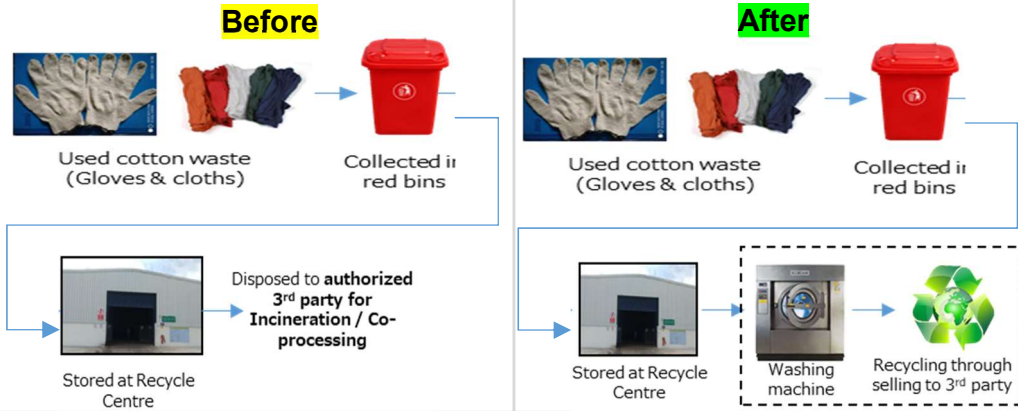
65 Lakhs



NA

3R principle adopted to reuse Waste generation

Recycling of Contaminated cotton waste



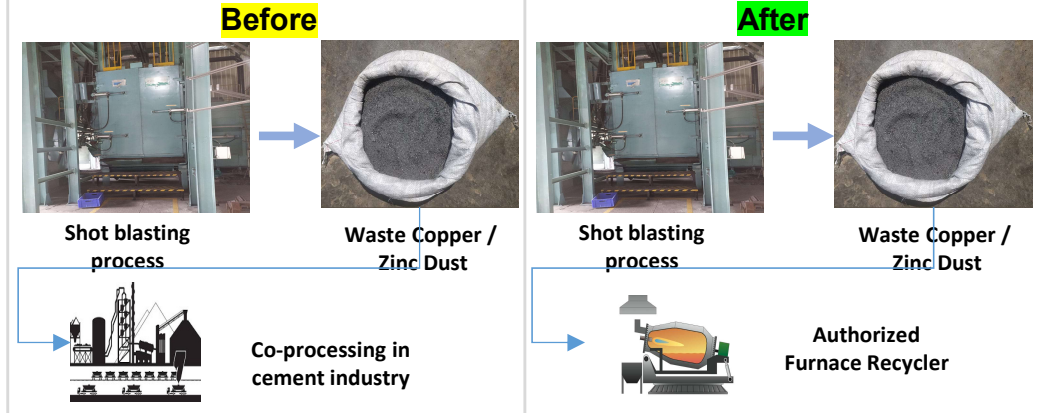
Recycling of Decal liners instead of Incineration



Recycling of Gum covers instead of Incineration



Recycling of Copper / Zinc Dust



10169.99
MT/Annum
waste
recycled



4365.13
Lakhs/
Annum



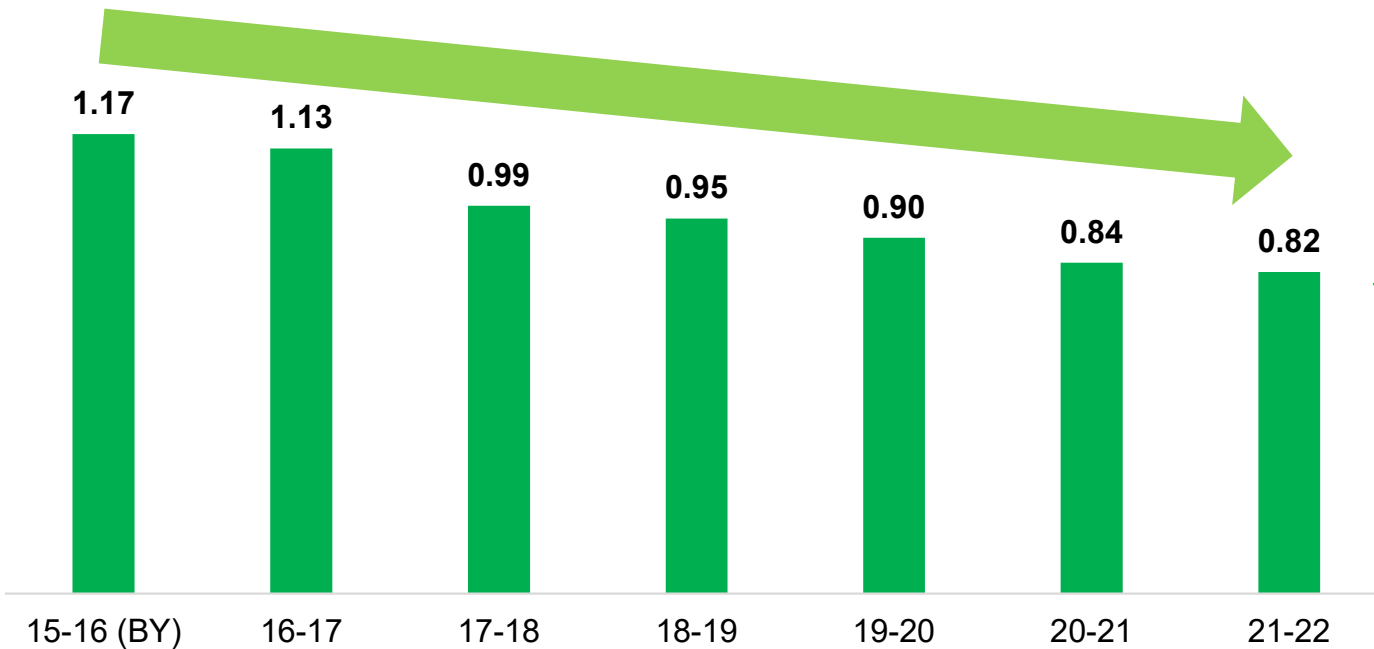
29 Lakhs



NA

3R principle adopted to recycle Waste generation

HAZARDOUS WASTE DISPOSAL TREND (Kg/ Veh)

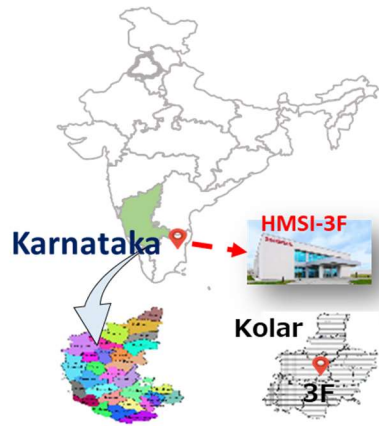


30% reduction in
waste generation
from Base Year

Major initiatives to reduce Waste Generation

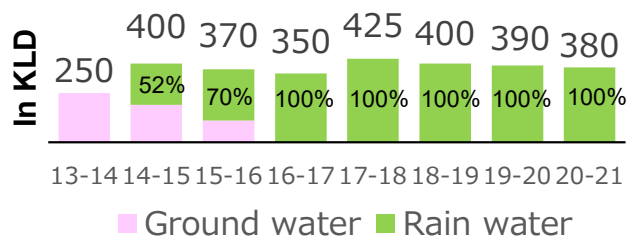
1. Zirconium coating in pre-treatment to reduce Phosphate sludge generation.
2. EDRO in Paint shop to reduce Paint sludge reduction.
3. Recycling of Decal liners instead of incineration.
4. Installation of Solvent Recovery System to recover used thinner.
5. Installation of Decanter to reduce ETP and STP sludge generation.
6. Recycling of Gum covers instead of Incineration.
7. Reduction in size of old dhoti to reduce Oil Soaked cotton Waste.
8. Implementation of Cohesive Painting technology to reduce paint sludge.
9. Implementation of washing machine to reduce Oil Soaked cotton Waste.
10. Co-processing of Hazardous Waste at Cement Industry.

3R principle adopted to recycle Waste generation

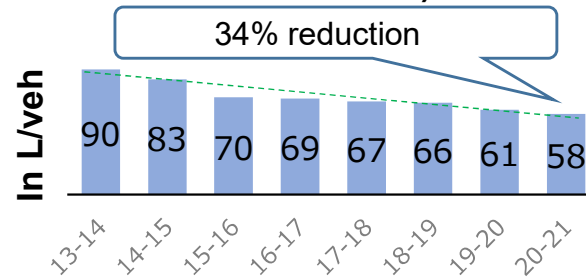


- ❖ Kolar is situated in an area of acute water scarcity
- ❖ 100% factory operation by Rainwater storage and re-utilization
- ❖ Three Rainwater tanks with capacity of 80 Mill. Ltr capable to meet 6 months water requirement
- ❖ Zero Liquid discharge factory

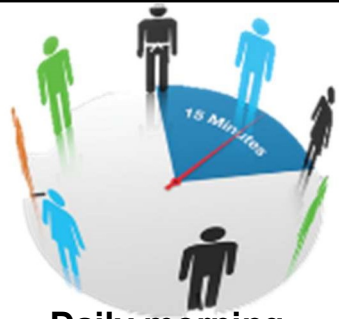
Rainwater usage trend (2013-14 to 2020-21)



Water consumption trend (2013-14 to 2020-21)



Since last five years 100% water requirement for the factory is met only through Rainwater. Model factory for water self sustenance



Daily morning review



Daily variance analysis



Daily shop mailers



Monthly MIS



Monthly MRM

	Plant head	Finance	Energy Manager	Lead/ Advisor cell	Energy coordinator	Core cell member	Facility member
Monthly consumption report	●	●	●	●	●		●
Monthly variance analysis	●	●	●	●	●	●	●
Daily variance analysis	●		●		●		●
Daily shop consumption			●	●	●	●	●
Board review			●		●		●

Comprehensive review mechanism in place for energy consumption

1

Situation Analysis 20-21

- Legal Requirements
- Production Capacity
- Benchmarking

- Corporate ad site level targets
- Best Available Technologies
- Continual Improvement

2

Target Setting by Self & PPC



3

Budget Preparation 21-22

Expense	95 Ki Original Budget												9531 Total
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
Mfg Expenses	Budget												
General Consumables	22,289	17,303	14,782	16,206	15,919	15,301	16,137	17,954	18,190	18,296	18,467	19,813	332,244
Truck Consumption	13,168	17,289	15,802	17,346	16,717	15,514	17,113	18,273	16,238	16,686	16,551	17,290	189,940
Safety	4,222	4,292	4,863	3,236	4,971	4,279	4,453	4,442	4,427	4,766	4,776	5,181	27,990
Repairs & Maintenance	18,105	22,906	20,094	23,999	24,657	25,794	24,137	26,613	27,718	28,421	28,075	28,759	338,207
Utility - Mfg													
- Utility - Normal/Case													
- Utility - Process	11,895	10,375	10,546	10,750	10,532	9,821	9,532	7,732	6,337	6,341	6,354	6,947	114,001
- Utility - Cool/Transe	26,130	26,074	11,613	16,916	16,916	29,613	27,819	27,649	25,945	25,947	25,769	30,319	345,400
- Utility - HSD	1,019	2,844	4,445	4,445	4,445	4,445	4,445	4,445	4,445	4,445	4,445	4,445	48,752
Other Material	71,598	45,247	48,779	77,321	60,300	68,371	71,613	62,827	53,778	47,938	50,751	71,613	641,290
Transportation	3,650	4,274	3,221	3,047	3,178	2,674	2,829	2,432	2,165	2,721	2,652	2,445	34,478
Manufacturing & Other Expenses													
Manufacturing Expense	407	4,127	1,144	1,681	1,315	1,087	1,213	2,543	1,908	2,158	2,158	1,181	16,000
Fixed Asset Work	1,428	1,083	1,984	4,715	4,916	4,172	4,138	3,775	1,088	3,107	3,325	4,320	32,647
Tr. Carriage & Work													
TCC Lab Work - MS	18,349	19,867	19,673	19,907	19,676	16,821	17,422	15,384	13,624	14,574	17,222	16,363	221,287
Other Id. And													
Technical Assistance Fee													
TTC Transportation Charges	26,896	27,227	28,594	27,301	28,432	24,071	25,181	21,780	19,843	21,946	19,653	30,077	381,387
TTC Management Cost	2,933	2,967	3,078	2,985	3,000	2,910	2,791	2,480	2,188	2,578	2,694	2,810	19,667
TTC Parking Cost	1,794	1,807	1,832	1,900	1,810	1,641	1,641	1,317	2,838	1,448	1,688	1,778	9,915
TTC Diesel Cost	290	179	696	696	815	815	815	815	1,082	1,082	1,082	1,082	13,450
TTC Toll Tax													
TTC Air Freight			50	50	50	50	50	50	50	50	50	50	900
TTC Overhaul	15	55	50	50	50	50	50	50	50	50	50	50	870
TOTAL MFG EXPENSES	132,613	240,043	244,394	267,381	267,321	259,279	260,202	230,134	212,558	219,648	210,116	210,116	3,819,876

4

Budget Submission to PPC

Division	Shop Name	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
Production Body	Press	89,819	89,819	86,102	79,052	82,517	71,892	86,223	85,659	89,819	989,498
	Weld	402,771	402,771	386,255	356,636	340,592	299,407	307,299	384,167	402,771	4,656,535
	Paint	1,748,367	1,748,367	1,680,726	1,599,052	1,562,780	1,440,281	1,698,580	1,645,019	1,748,367	19,483,895
	Frame Assembly	106,258	106,258	102,132	97,228	99,129	91,222	103,254	99,928	106,258	1,218,421
Total		2,347,215	2,347,215	2,255,216	2,131,721	2,085,018	1,902,793	2,275,337	2,214,075	2,347,215	26,328,329
Production Power Train	All Machining	442,273	442,273	424,707	398,450	412,556	369,236	427,665	418,791	442,273	5,081,623
	FE Machining	442,273	442,273	424,707	398,450	412,556	369,236	427,665	418,791	442,273	5,081,623
	LPOC										
	HPDC										
Engine Assembly	Engine Assembly	77,497	77,497	74,105	68,309	71,243	62,184	74,434	74,048	77,497	916,498
Total		962,042	962,042	923,720	865,210	896,355	800,655	929,794	911,639	962,042	11,079,744
Production Support	Production Support	1,859,966	1,859,966	1,783,848	1,695,952	1,672,800	1,533,873	1,605,295	1,746,955	1,859,966	21,141,747
Production Control	Production Control	83,677	83,677	80,351	75,338	79,536	69,779	80,898	79,256	83,677	920,408
Quality Control	Quality Control & DST	264,996	264,996	254,565	239,492	221,884	212,205	256,617	199,980	211,055	2,551,128
Van Mfg	Logistics										
Van Mfg	Office Area										
Sub Total		5,517,826	5,517,826	5,299,700	5,008,211	4,965,493	4,519,405	5,347,911	5,052,715	5,463,965	62,025,957

5

Meeting with Opt.Head



6

Budget Approval

PROJECT PROPOSAL FOR IC REVIEW		Approval Indent & IC Design & Mfg	Dispatch & I & C Realization
Title : Vaper absorption machine for process heating & cooling		Apr-May-19 Jun-19 Jul-Aug-19	Nov-19 Dec-19 Feb-20 Apr-20
Department: Facility Operation 3F	Background & Situation Analysis:	Budget (Million INR)	Proposed (Million INR)
<ul style="list-style-type: none"> Steam is used in Paint shop ASU (L1.2.3) and CED process Chilled water is used in paint shop for process cooling L1 & ASU & Other line pre treatments are running on Hot water Converting steam based process into hot water based process fuel can be saved 	50	45	
Import / Local	Import/ Local	Tax Credit Available	Yes / No
50	50	9	8/64
IC Member	Remarks	Sign	
IC Head: Shimokawa (ICFO & Director)		OK	
V. Srihar (ICSP & Director)		OK	
Arupam Mohindroo (Director - Fuel Shop)		OK	
Harbhajan Singh (Director - LCA)			
Hiroyuki Sukegawa (Director)			
Hiroyuki Niita (Director)			
Shashi Mishra (IC - Head - Accounts)	Navneet Kumar (IC - Head - Fuel Shop)	IC Secretary	Date: 02/07/19

Target Setting is done and it is been approved by Board of directors

Purpose of Kaizen Activity



Evaluation Method:

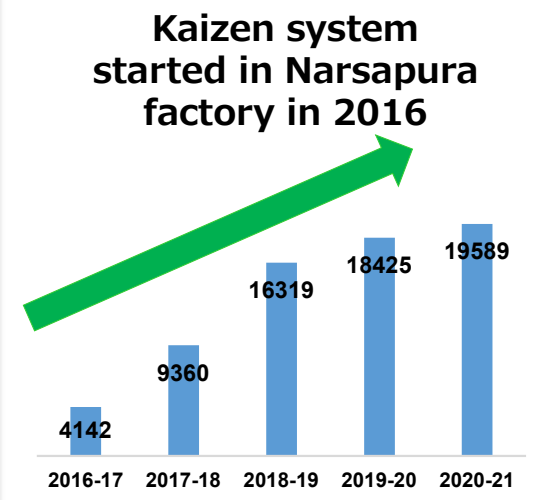


Awards



Recognition

Kaizen participation



Kaizen is a part of our daily work routine

PURPOSE OF ENERGY WEEK

CELEBRATION

1. To create awareness among associates and suppliers about energy conservation.
2. To create awareness about switching to renewable energy from nonrenewable energy.

GLIMPSES OF ENERGY WEEK CELEBRATION



ENERGY WEEK ACTIVITY SCHEDULE - FEBRUARY - 2022						
Sl. No	Activity	21-Feb	22-Feb	23-Feb	24-Feb	25-Feb
1	Energy week banner display at all gates	▽				
2	Poster competition - Associate	▽				▽
3	Poster competition - Family	▽				▽
4	Slogan Competition - Kannada	▽				▽
5	Slogan Competition - English	▽				▽
6	Energy Conservation Model	▽				▽
7	Energy conservation commitment by signing on banner			▽		
8	Quiz competition			▽		
9	Information sharing in canteen on Energy conservation				▽	
10	Associate Commitment towards Energy conservation	▽				▽



RENEWABLE ENERGY WILL BE THE ONLY SOURCE FOR EXISTANCE OF LIFE ON EARTH IN THE FUTURE



Total 1350 Participants in Energy Week celebration

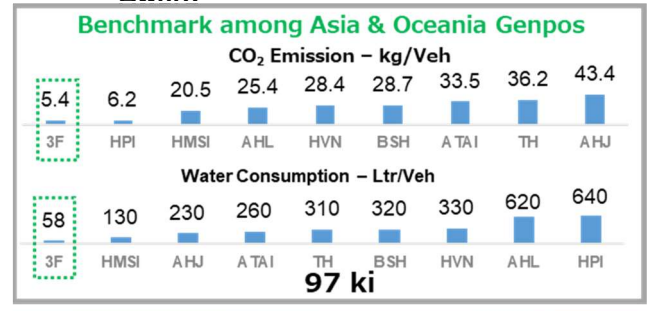
3F has continually endeavored to keep its momentum towards sustainability
 Along this way came many awards & recognitions

Awards and recognitions by State and national level bodies



- ❖ First factory in Honda India Group to achieve "Greenco" rating
- ❖ First Manufacturing facility in Karnataka to achieve Platinum rating
- ❖ National best in Waste management and Innovation

2018-2019



2019-2020

Project details	98KI		99Ki	
	Q 1-2	Q3-4	Q 1-2	Q3-4
Zero land fill facility		▼		
Additional 2.5MW roof top PV		▼		
2.7 MW Windmill installation			▼	
ASU hot water conversion project			▼	▼

2022-2023

3F will continue its journey toward implementing more Environmentally sustainable projects which is having very good financial viability also



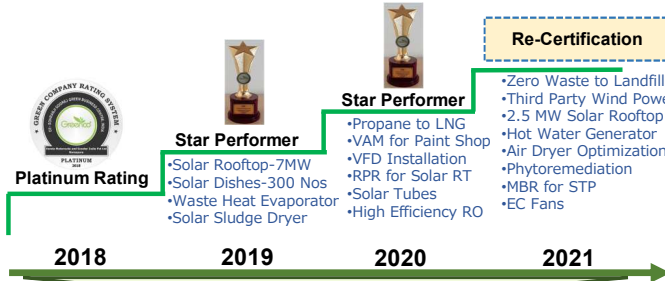
GreenCo is a Green Factory Rating System developed by Confederation of Indian Industry (CII) that critically evaluates all the Environmental Performance Parameters of a factory and provides rating for benchmark performance



HMSI 3F has reflected outstanding performance across 10 Environment Performance Indices & 9 Green Requirements to achieve Top most rating (**Platinum Plus**) establishing itself as the benchmark in Sustainable Environmental Excellence

Energy Efficiency	Renewable Energy	Water Conservation	Green House Gas Emission	Waste Management	Innovation	Life Cycle Assessment	Material Conservation	Product Stewardship	Green Supply Chain

Platinum Plus Journey-3F



Assessment conducted on 30th Nov & 01st Dec, 21



- Site Assessment was done by External Senior Evaluators and Industry experts (Mr. AT Mathew and Mr. Kalyan Dey) from CII.
- Platinum Plus is the highest possible GreenCo rating, and it requires Benchmark performance to be demonstrated across 10 Performance Parameters, 3 mandatory requirements & 6 specific requirements.



- ❖ **First Automobile Company in India to be awarded with Platinum Plus Rating**
- ❖ First company across all sectors in Karnataka to get Platinum Plus rating
- ❖ National Best Scores in Energy Management, Green House Gas Emissions and Innovation
- ❖ Fastest Company in India to transition from Platinum to Platinum Plus

Benefits through GreenCo:

Energy Saving	CO ₂ Reduction	Water Reduction	Waste Reduction
12.65 Lakh kWh/Yr	3418 MT/Yr	6086 KL/Yr	101 MT/Yr

HMSI 3F is the First and Only Automobile Company in India to be awarded with GreenCo Platinum Plus Rating by CII







Background

CII Annually conducts events to showcase industries best practices in Energy Management, Environment, Water Management and Waste Management.

Learnings from CII Events

Project Name	 Solar Dish	 WHE	 Sludge Dryer	 VAM with out cooling tower	 Airtron
CII Event Name	National Energy Excellence Awards summit	Environment Excellence Award summit	Environment Excellence Award summit	Greenco Summit	National Energy Excellence Awards summit
Investments	INR 28 Mill	INR 25 Mill	INR 3 Mill	INR 49 Mill	INR 2.1 Mill
Cost Benefit	INR 13.4 Mill	INR 10 Mill	INR 5.5 Mill	INR 16.3 Mill	INR 1.1 Mill
Energy saving	292 tons of fuel	204 tons of fuel	109 tons of fuel	11 Lakh kWh & 301 tons of fuel	1.65 Lakh kWh
CO2 saving	681 tons of CO2	607 tons of CO2	317 tons of CO2	1690 ton of CO2	123 tons of CO2
Water savings	-	3336 KL/Annum	1100 KL/Annum	1650 KL/Annum	-

Savings achieved from the Learnings

					
12.65 Lakh kWh/Annum	6086 KL / Annum	3418 Tons / Annum	906 Tons / Annum of fuel	46.3 Mill / Annum	107.1 Mill

HMSI has gained Environmental and Economical benefits through the Learnings from CII Annual Events

Contents		Slides	Time
01	<p>Introduction & Energy Management</p> <p>Honda Global and HMSI presence, Honda's Environment journey, Honda's Commitment for Energy Excellence, Honda Motor's 2030 vision, HMSI Policies</p> 	1-3	1 min
02	<p>Energy data</p> <p>Energy Resources, Specific Fuel Consumption, Internal and National Benchmarking</p> 	4-8	1 min
03	<p>Encon Projects</p> <p>Zero Investment Encon Projects and Other Encon Projects</p> 	9-10	1 min
04	<p>Innovative Ideas</p> <p>Auto Booth Air Balancing, Compressed air replacement with Blower and PT Short Process in Paint Shop</p> 	11-20	5 min
05	<p>Renewable & Green Energy</p> <p>Renewable energy usage in Narsapura Plant, Renewable energy projects</p> 	21-28	2 min
06	<p>GHG Emissions, Green Supply Chain and Capacity Building</p> <p>GHG Benchmarking, Supplier EMS Certification, Green Dealer development, Supplier and dealer awareness</p>	29-37	2 min
07	<p>Improvements, Review Mechanism Employee Engagement</p> <p>Major Improvement themes, Performance review mechanism, employee engagement events</p>	38-54	3 min
08	<p>Way Forward</p> <p>Positive Spiral, Long terms energy and Environment Improvements</p> 	55	2 min

Striving to be the Pride of the Region, a Factory Friendly to People and the Earth



Green Factory Initiative

Positive Spiral

Continuous Improvement

Energy Efficiency

- Paint Shop Hot Water conversion -Sep'22
- EC Fans in ASU -Dec'22

Renewable Energy

- 2.7 MW Offsite Captive Wind 2 -Aug'23
- 2.7 MW Offsite Captive Wind 3 -Aug'23

Advanced Treatment technologies

- Short PT for ABS -Aug'22
- Zirconium PT -Jan'22

Reducing toxic chemicals

- Auto Booth control -Feb'23

Supply chain emission reduction

- WMS Implementation for BOPs -Dec'22

Zero-Waste

Reducing Waste

- Washing Machine for Cotton Waste -Dec'22
- Vertical Baler for Compaction -Mar'23

Management Systems & Ratings

- Energy Audit A&O -Oct'22
- ISO 50001 -Nov'23

Activities to contribute to society

Joint-Community Activities

- External solar/wind park -Sep'23
- Drainage strengthening in neighboring villages -Mar'23
- External Greenbelt expansion -Mar'23

Let's make a better tomorrow for our Future Generation.....



THANK YOU

It is in our hand to protect our beautiful earth

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