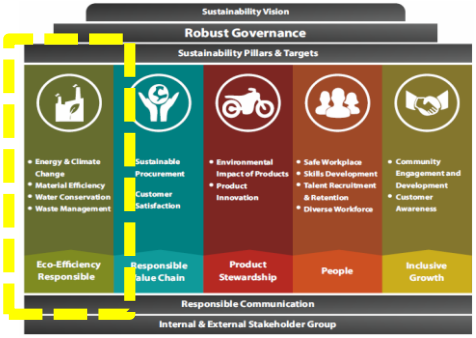


Hero MotoCorp Ltd, Neemrana

Zero Waste to Landfill-Waste Management & Recycling

Date of commencement	July'2018
Date of completion of project	March'2019

Presenter:
Sushil Kumar Pandey
DGM-Safety & Env.

29th Jul 2020

External-Confidential

Agenda

Project title-Zero Waste to Landfill-Waste Management & Recycling

- ❑ Trigger of the project
- ❑ Uniqueness of the project
- ❑ Zero Waste to Landfill journey at Neemrana Plant
- ❑ Major milestones of project accomplishment
- ❑ List all tangible benefits
- ❑ List all intangible benefits
- ❑ Replication potential and progress of project assimilation cross functional / within group companies
- ❑ Replication potential of project within sector
- ❑ List Challenges faced and brief on countering
- ❑ Achieving national benchmarks/Standards
- ❑ Priority Plans for Next Two years
- ❑ Top ten best practices which will form the core of approach for +1 and +2 year
- ❑ Major learnings from the project implementation

Trigger of the project

"We must give back to the society from whose resources We generate wealth"

It is a reflection of us - our value system, work culture and thought process. It is our constant endeavor to align our vision and business strategy with the welfare of all stakeholders.

Dr. Brijmohan Lall Munjal

(Chairman Emeritus)

Top management commitment towards sustainability & green manufacturing

Continuous focus on resource conservation

Sustainable Development Goals -**SDG12** (*Responsible Consumption & Production)*

CII-GreenCo Platinum rated plant & IGBC Platinum rated green

Strengthening of system & procedures w.r.t waste management & resource conservation.

ZERO WASTE TO LANDFILL

Sustainability report-2018-19

As a leader in the automotive industry, we realized our responsibility to the fast changing industrial environment and our role in Sustainable Development of the nation right at the beginning. Hero introduced a four stroke motorcycle when two stroke scooters were popular. It not only changed the Indian two wheeler scenario from scooter to motorcycle but also gave birth to one of the highly fuel efficient and environment friendly product to the customer at that point of the time.

Neemrana plant was setup in year 2014 at Neemrana and named as ***"The Garden Factory"***: Platinum rating from the Indian Green Building Council and **GreenCo Platinum Rated from CII**. Hero MotoCorp built a new kind of factory; one which goes beyond its central mission, the making of two-wheeled vehicles. The Garden Factory, consisting of the Manufacturing Plant at Neemrana, demonstrates how an industrial workplace can be beneficial, healthful, and even life-affirming

Uniqueness of the project

- CII-GreenCo Platinum rated plant in first attempt and first one in the automobile industry. It pulls us to go beyond the boundaries in the waste management system like Zero Waste to landfill.
- Green Partner Development Programs- Initiative brought down to the our dealers, vendors & suppliers after practicing it at our plant.
- Waste converted into energy by co-processing at cement industries like paint sludge, chemical sludge etc.
- It is a path towards Zero Waste to landfill to reduce land pollution and convert waste in to resources for others.
- Introduction of returnable, reusable and recyclable packaging which resulted in reduction of waste. Banned Single used plastic in our premises.
- It helps us in greenhouse gas reduction, building stronger brand identity and also reduced legal exposure.
- Initiated Material flow cost accounting concept through sustainable thinking.
- Improvement in waste collection system and identification of various cost saving improvements.

12 Steps-Zero Waste to Landfill journey at Neemrana Plant

S.No.		Activity	Resp.		Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
1	ZWL Preparation Plan	Identification and tracking of all types of waste.	Section Heads / HOD's	Plan									
				Actual									
2		Defining of ZWL policy, system, strategies, improvements and ZWL book preparation	Plant Head	Plan									
				Actual									
3		Developing department specific manuals and preparation of improvement projects plans	Section Heads / HOD's	Plan									
				Actual									
4		Employee Engagement drive and Enhancing visual controls.	Head-Safety & Environment	Plan									
				Actual									
5	ZWL Projects Implementation	Strengthening of recyclers	Section Heads / HOD's	Plan									
				Actual									
6		Input Waste Segregations	Section Heads / HOD's	Plan									
				Actual									
7		Resolving of legal issues	Head-Safety & Environment	Plan									
				Actual									
8		Implementation of Improvement Projects	Head-Engineering & Concerned	Plan									
				Actual									
9		Achieve Zero Waste to Landfill	Section Heads / HOD's	Plan									
				Actual									
10	ZWL Certification Plan & Horizontal Deployment	Certification by Third party	Head-Safety & Environment	Plan									
				Actual									
11		Horizontal deployment in HMCL	Corporate Head-Safety & Environment	Plan									
				Actual									
12		Sharing of best practices	Head-Safety & Environment	Plan									
				Actual									

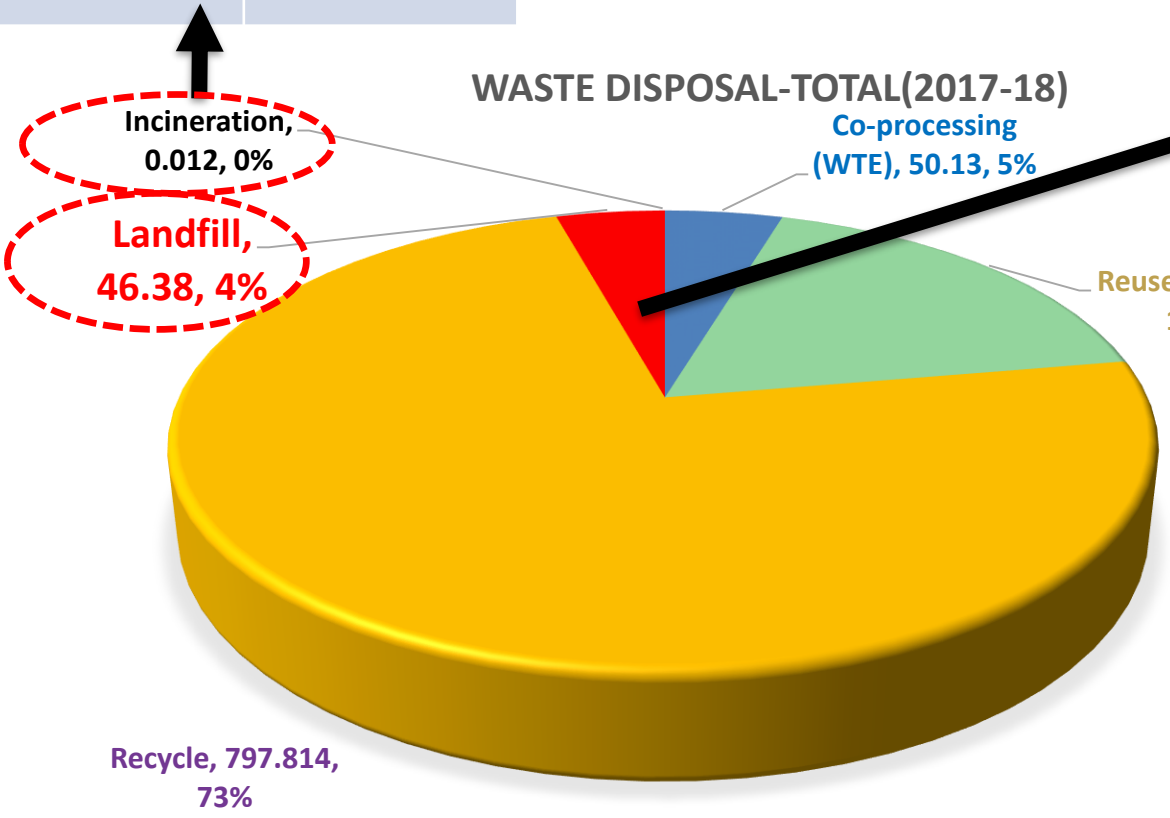
Horizontal deployment in HMCL's other plants stared in year 2018-19 with trainings and continued in 2019-20 for implementation. It will be shown in subsequent slide no.-24

Sharing of best practice continued in the year 2019-20 as the case study has been presented at many forums. It will be shown in subsequent slide no.-26 & 27

Identification and tracking of all types of waste

Incineration Waste	Qty.
Bio Medical Waste	12 KG

Landfill Waste	Qty.
ETP Sludge	23.656 MT
Grinding Sludge	22.72 MT



Total Major category of wastes covered – 19 nos.

Waste Diversion (2017-18)

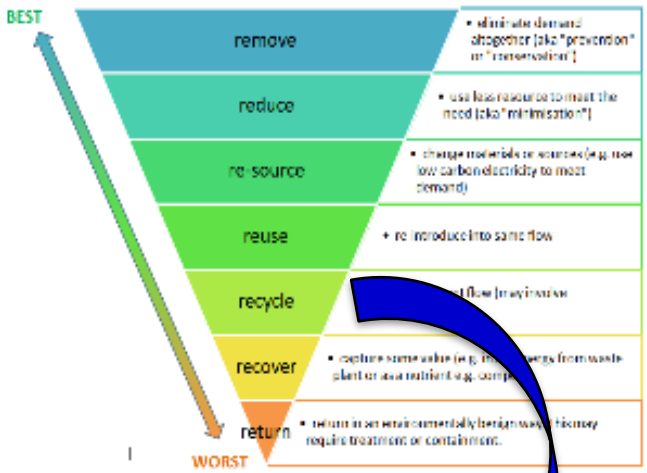
Method of disposal	Qty in kg	%age
Co-processing (WTE)	50.13	5%
Reuse	192.36	18%
Recycle	797.814	73%
Landfill	46.38	4%
Incineration	0.012	0.0011%
Total diversion waste in percentage %	**95.731%**	

ZWL Policy, System, Strategies, Improvements and handbook

Environment Policy

ZWL Policy

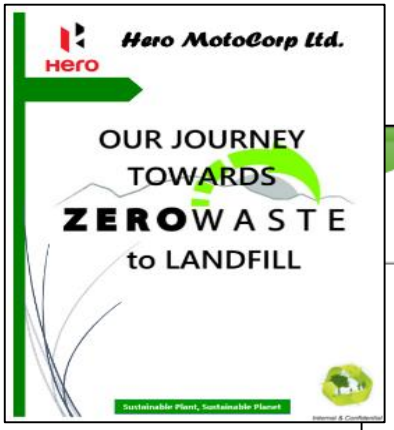
Approach



Strategy

- Zero Waste to Landfill
- Reduction in generation of Waste
- Optimization of process & materials
- Green IT & Offices
- Green Supply Chain
- Zero Liquid Discharge

Defining of ZWL policy, system, strategies, improvements and ZWL book preparation



Hero

Hero MotoCorp Limited

Zero Waste to Landfill (ZWL)

Cradle to Cradle

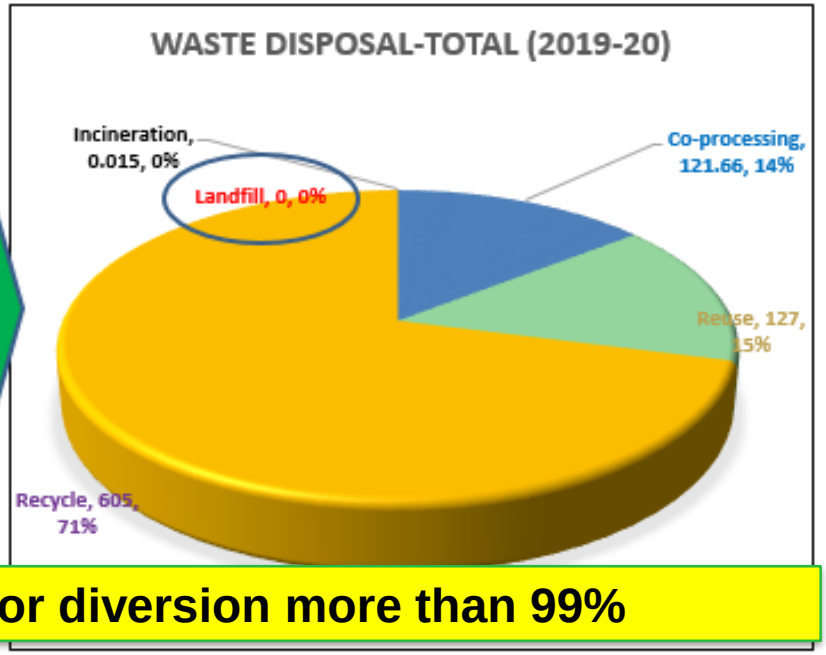
Table of Contents

Launching of Zero Waste to landfill booklet and project by EDO-HMCL

Major Improvement Projects implemented

S.No	Type of waste	Activity	Method	Status
1	Grinding Sludge. Phosphate Sludge & Chemical sludge (ETP Sludge)	Co-processing of waste in cement industry (Waste to Energy)	Co-processing	Completed
2	Packaging waste	Reusable/Returnable/Recyclable packaging	Reuse	Completed
3	Aluminum machining scrap	Chips compacting machine.	Recycle	Completed
4	Paper	Shredding of paper & reused for packaging in glass industry.	Recycle	Completed
5	Release Paper	Release paper converted into tissue paper	Recycle & Reuse	Completed
6	Used Edible Oil	Used edible oil can be reused in soap industry	Recycle & Reuse	Completed
7	Paint	Paint Consumption Reduction	Reduce	Completed
8	Grass, Leaves, plants etc	Grass Pallet making machine & sale to farms of cows, buffalos etc.	Recycle & Reuse	Completed
9	Paper Cups	Paper Cups can be replaced with steel cups or other types of utensils	Remove	Completed
10	Plastic	Elimination of polythene in waste collection bins	Remove	Completed
11	Paper	Reusable check sheets	Remove & Reuse	Completed
12	Paper	Paperless organization efforts-Phase-1	Remove	Completed

Achieve Zero Waste to Landfill



Achieved Zero Waste to Landfill for diversion more than 99%

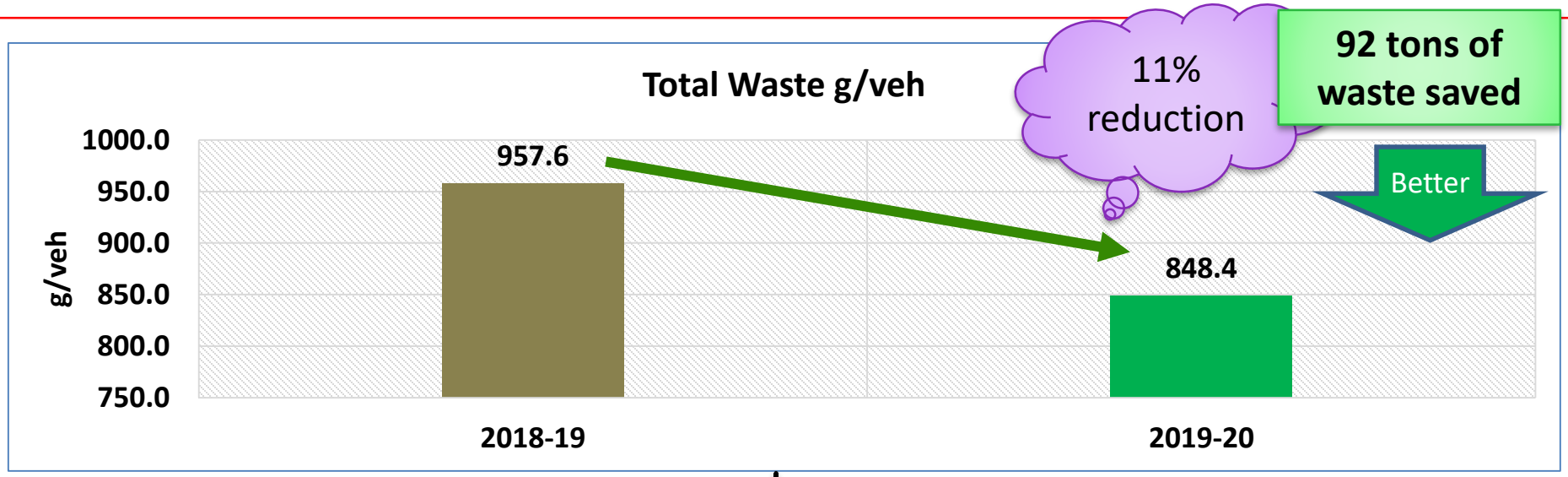
Diversion Table (2018-19)

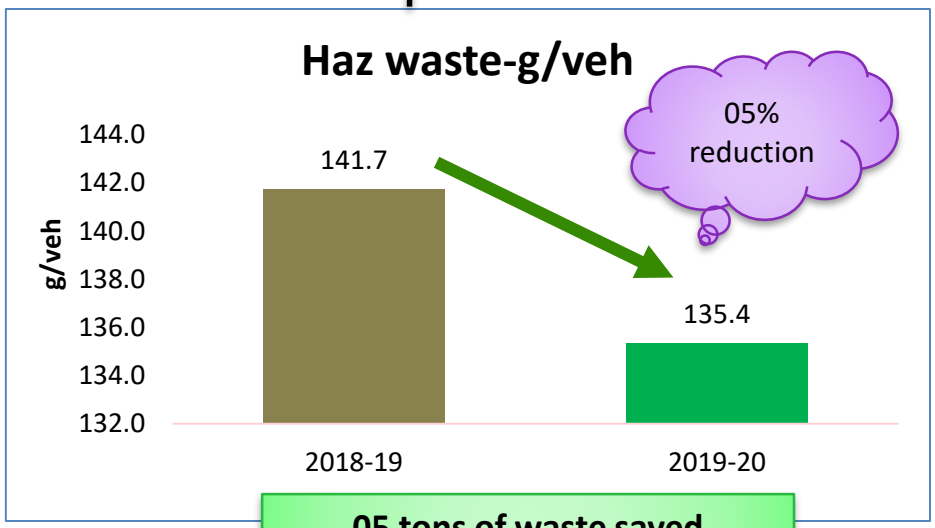
Method of disposal	Qty in kg	%age
Recycle	841061	77.34%
Reuse	132900	12.22%
Co-processing(WTE)	113540	10.44%
Incinerate	11.8	0.001%
Landfill	0	0%
Total diversion waste in percentage %	**99.965%**	

Diversion Table (2019-20)

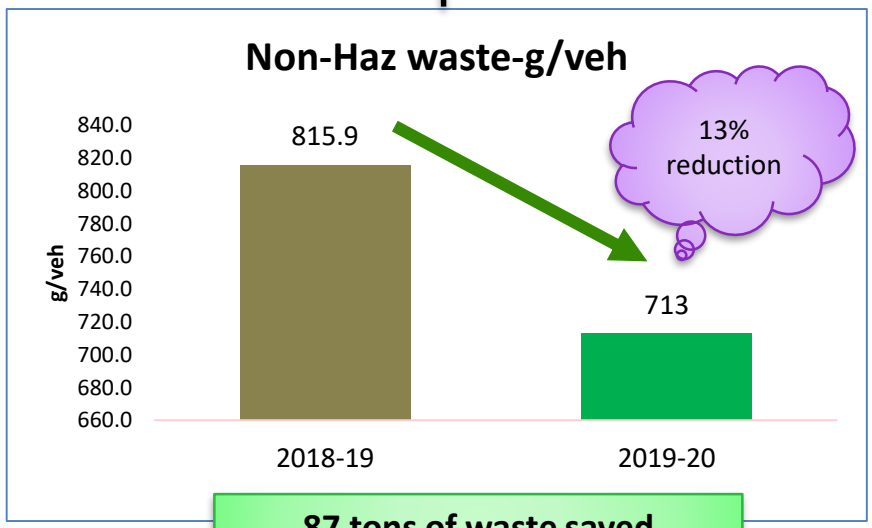
Method of disposal	Qty in kg	%age
Recycle	605378	70.90%
Reuse	126842	14.85%
Co-processing(WTE)	121660	14.25%
Incinerate	15.3	0.002%
Landfill	0	0%
Total diversion waste in percentage %	**99.998%**	

Reduction of Waste at Source





05 tons of waste saved



87 tons of waste saved

Major milestones of project accomplishment

Achieved

Future Plan

Sustainable Plant, Sustainable Planet

Through Circular Economy

2017-18

95.731% waste diverted from landfill

GreenCo Platinum Rating

2018-19

99.965% waste diverted from landfill resulted no land pollution

TPM Excellence Award

Single use Plastic Ban

2019-20

99.998% waste diverted from landfill resulted no land pollution)

Water positive plant assurance

Energy management System

Single use Plastic Ban

2020-21

Carbon Neutrality

2021-22

Sustainable packaging

Carbon Neutrality


VERIFIED ZERO WASTE TO LANDFILL

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

HERO MOTOCORP LIMITED, NEEMRANA

Certificate Number: ZWL-2019-04
Certificate Issued: 13 March 2019
Initial Verification Date: 27 February 2019
Certificate valid until: 12 March 2022

Applicant Address: Plot no. 101-103 & 108-109, RIICO Industrial Area, Delhi-Jaipur Highway Neemrana, Distt. Alwar (Rajasthan)- 301705 India

Product Category: Automotive

Conformance Criteria: Zero Waste to Landfill diversion rate exceeding 99% is applicable to the Manufacturing of Vehicles (Bikes & Scooters)

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

Brian Kimbel
Certification Manager

List all tangible benefits (2019-20)

- ✓ **99.998%** waste diverted from landfill resulted no land pollution.
- ✓ Total waste reduction by **11%** from **957.6g/vehicle** to **848.4 g/vehicle** (92MT/year)
- ✓ Hazardous waste reduction by **05%** from **141.7 g/vehicle** to **135.4 g/vehicle** (05MT/year)
- ✓ Non-hazardous waste reduction by **13%** from **815.9g/vehicle** to **713g/vehicle** (87MT/year)
- ✓ **100%** recyclable & reusable packaging (**15%** reduction in packaging waste from **116.77 g/vehicle** to **99.15 g/vehicle)-**15MT/year
- ✓ Single use plastic ban (**42%** reduction in plastic waste from **20.58 g/vehicle** to **11.99 g/vehicle**) -07 MT/year
- ✓ CO2 emission reduction **10 ton/annually** by waste reduction, distance reduction and capacity utilization.
- ✓ Total savings/annum due to above projects **is Rs. 98 lacs/annum** approx.
- ✓ Reduction in waste collection bins by **50% approx.**

List Intangible Benefits

- Establishment and strengthening of Input waste segregation System.
- Motivation and awareness amongst team which helps for reduction in consumable and raw material cost.
- Diversion from landfill waste resulted in no land pollution.
- Resource conservation and waste reduction resulted in savings of resources for the people, society.
- Skill level up of the team w.r.t. to waste as perception changed from
  - ✓ - **"Waste"** to **"Misplaced Resource"**
  - ✓ - **"Dust Bin"** to **"Value Bin"**
  - ✓ - **"Scrap Yard"** to **"Waste Management Yard"**
  - ✓ - **"Kachra" to specific waste**
- Input waste segregation system resulted in motivation level up of waste collectors.
- Inherent cost consciousness amongst the team.
- Strengthening of the vendor's audit system (waste recycler/co-processor/reusers).
- Saving of Human energy by defining the frequency for emptying of bins.

Horizontal deployment in HMCL-Replication potential and progress of project assimilation cross functional / within group plants.

Sno	Plant	Year of Implementation / Start	Status	Diversion Rate in %age
1	Hero MotoCorp Ltd-(Global Parts Center), Neemrana	2019-20	**Completed (Dec'2019)**	99.939
2	Hero MotoCorp Ltd, Dharuhera	2019-20	**Completed (Feb'2020)**	99.996
3	Hero MotoCorp Ltd, Gurgaon	2019-20	**Completed (Mar'2020)**	99.998
4	Hero MotoCorp Ltd, Haridwar	2020-21	Under progress	
5	Hero MotoCorp Ltd, Halol	2020-21	Under progress	
6	Hero MotoCorp Ltd, Chittoor	2020-21	Under progress	

Global Parts Center, Neemrana

Hero MotoCorp Ltd, Dharuhera

Hero MotoCorp Ltd, Gurgaon

Replication potential and progress of project assimilation cross functional / within group companies

Global Parts Center, Neemrana

Packaging Waste Reduction Achieved FY 2018-19

S. No	Waste Details	Type	Waste Reduction / Annum	Status
1	Corrugation Waste	Reduce	16 Tonne	Completed
2	Corrugation Waste	Remove/Reduce	48 Tonne	Completed
3	Release Liner	Remove	1.5 Tonne	Completed
4	Plastics (BOPP)	Remove	18 Tonne	Completed
5	Plastics (Laminated Pouch)	Remove	16 Tonne	Completed
6	Plastics (PVC to LDPE)	Recycle	36 Tonne	Completed

Corrugation Packaging from Vendor end used in Line (KIT1,KIT 2,KIT 3) Total Parts–49 SKU's having secondary packaging as Corrugation Box .Proposal for Corrugation Packaging Elimination accumulating to 100 T per annum FY 2018-19.

Type of waste	Category	State of waste
Corrugation	Non-Hazardous	Solid
Generation Area	**Generation Qty.(HP3N)**	**Current Disposal Frequency**
Production	100 Ton	Once in a week

Current Receiving Method (2017-18)	Proposed Receiving Method (2018-19)
	
Corrugation Packaging Used in Total Parts for Line Kit 1,Kit 2 & Kit 3– 49 SKU's having secondary packaging as Corrugation box FY 2018-19	Proposal for Corrugation packaging Elimination from 49 SKU's accumulating to 100 MT Corrugation waste per annum .

Parts are coming from Plant having secondary packaging as Corrugation Box .Proposal for Corrugation Packaging Elimination approx. 5 T per annum FY 2018-19.

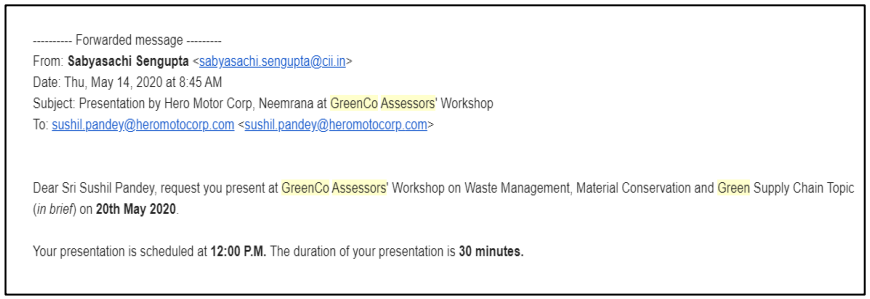
Type of waste	Category	State of waste
Corrugation	Non-Hazardous	Solid
Generation Area	**Generation Qty.(HP3N)**	**Current Disposal Frequency**
Production	5 Ton	Once in a week

Current Receiving Method (2017-18)	Proposed Receiving Method (2018-19)
	
Corrugation Packaging Used for Parts for Dharuhera Plant and Gurgaon Plant having secondary packaging as Corrugation box FY 2018-19 having secondary MOQ zero.	Bin Implementation for In-plant parts having secondary MOQ zero.

135 tones of waste reduction in Global Parts Center, Neemrana

Sharing of best practices- Replication potential of project within sector

- CII-GreenCo Assessor training programme on 20.05.20
- Sharing of case study during ITC sustainability audit by CII. Date 10.10.2019
- Sharing of case study at IMTMA (Indian Machine Tool Manufacturer's Association) awards June'20
- Inclusion of Zero waste to landfill in HMCL sustainability report FY'19 which has been published in public domain.
- Sharing of case study with vendors, supplier & dealers on 5th June'2019.



---------- Forwarded message ---------
From: **Sabyasachi Sengupta** <sabyasachi.sengupta@cii.in>
Date: Thu, May 14, 2020 at 8:45 AM
Subject: Presentation by Hero Motor Corp, Neemrana at GreenCo Assessors' Workshop
To: sushil.pandey@heromotocorp.com <sushil.pandey@heromotocorp.com>

Dear Sri Sushil Pandey, request you present at GreenCo Assessors' Workshop on Waste Management, Material Conservation and Green Supply Chain Topic (*in brief*) on **20th May 2020**.

Your presentation is scheduled at **12:00 P.M.** The duration of your presentation is **30 minutes.**

Sharing of best practices- Replication potential of project within sector

- Sharing of best practices with industries like Shri Ram Piston, Godrej, Dabur India, HCCB(Coca Cola), JCB etc. visited our plant for the year 2019-20
- Sharing of best practices with CII delegation visited to our plant.
- Sharing of case study on conference on Future of Manufacturing at Uttarakhand CII chapter on 27.09.22019 in Haridwar.
- Sharing case study on GreenCo Summit held 3rd, 4th and 5th July'19
- Presented paper in Circular Economy & SDG's: Strategy 2020-30, A decade of actions on 24th & 25th July'20.
- **Sharing of best practices with Prominent management and Engineering students during plant visit.**

List Challenges faced and brief on countering

Category	Challenges	Methods to Overcome
People	• Less awareness amongst team for waste management • Less awareness about recyclability (LCA) • Perception change of people from scrap to misplace resources. • Skill development of the people for identification and mapping of the wastes.	• ESPEED Manual developed for identifying and determination of the trainings needs. • Waste training Corners developed. Sharing of best practices. • External Trainings organized for LCA. • Departmental waste management manual prepared by involving shop floor teams.
Administrative	• Good system for hazardous waste but further strengthening of system for non hazardous waste. • Procurement guidelines are not enough to control the inward of material carrying landfill waste • No operational control procedures for all category of non-hazardous wastes • Waste and recycle data tracking and reporting • Monitoring & measurement of all types of non-hazardous solid waste	• Zero Waste to landfill Booklet made for better understanding of the waste management system. • Departmental Waste management manuals developed for deep study at process level which includes Material flow diagram of the process, Input waste segregation system, transfer system to Waste Management Yard, Treatment of waste at source, End party disposal, Operational control procedures, roles & resp. matrix etc.
Maintenance	• Inconsistencies across installations • Further reduction in generation of wastes • Reduction in food waste • Maintenance of the procured machine for better utilization of the waste.	• Waste reduction targets linked with KPI's of shop floor team. Central Dash Board • Identification of waste collection bins and responsibility matrix made for adequate usage and adherence of Input waste segregation system. • Food waste monitoring started in canteen on daily basis and it has been displayed at used plate keeping area of awareness amongst the team.
Technical	• Limited technology • Disposal of horticulture waste • Achieving Zero VOC at paint shop • Efforts towards paperless organization • Disposal of used paper cups • Handling, storage & disposal of spent edible oils	• Study organised for technical feasibility of the concepts for better utilization wastes across the industry. • Manure making machine and Pallet making machine introduced for horticulture waste. • Various initiatives taken for paperless organization like e-learning modules, online portal, online audit system, IMS portal etc. • Paper cups eliminated from the plant by use of reusable cups & glasses. • Used edible oil collected and sent to soap industry for recycle and reuse.

We have made Zero Waste to landfill book to understand the waste management system and to counter the challenges with various types of systems, procedures and projects. Detailed planning done and executed to achieve the goal by overcoming the challenges & barriers.

Achieving National benchmarks / Standards

Studied following approach:

- Unilever achieved Zero **Non Hazardous Waste** to Landfill in 600 sites and 70 countries. (09.02.2016)
- Honda North America also achieved Zero Waste to Landfill in their sites**. Landfill waste 0.06 %**
- General Motors has 142 landfill free facilities as on 28.02.2018.
- Skoda has also stopped using landfill sites for its commercial waste since the beginning of 2020.
- Toyota Recycled based society.
- **Japan Waste Management system. Our Plant Head Visited the Waste Management site at Japan**.

Achieved Zero Waste to landfill in first attempt in India.

- **Selected International Certification body M/S Intertek for certification of Zero Waste to Landfill.**
- **Studied and followed U.S. Zero Waste Business Council Manual.**
- **Followed ISO 14051 Material Flow Cost Accounting standard.**
- **HMCL Neemrana plant achieved Diversion rate more than 99 % . 2018-19 – 99.965%**
- **Sustained in 2019 -20 also and achieved diversion rate 99.998% (Landfill waste-0.002%)**

In India Mahindra Group and Sterlite Group achieved Zero waste to Landfill and Near Zero waste to Landfill status.

Now this is primary requirement of Green Manufacturing.

- Unilever
- General Motors
- Honda
- Hero MotoCorp Ltd.
- Mahindra
- Sterlite

Priority Plans for Next Two years

SN	Themes	Action Plan	
		2020-21	2021-22
1	Zero waste to Landfill	Sustenance of ZWL and Further reduction of waste at source. Achieve ZWL for all plants by'22.. Expand ZWL efforts Globally in our partners & facilities.	
2	Water Positive Plant	Sustenance of Water positivity and further reduction of specific water consumption in Neemrana Plant. Achieve 500 % water positivity for all plants by 2025	
3	Energy	Implementation of Energy Management system in all plants by March' 2021.	Innovation in ENERGY Conservation
4	Carbon Neutrality	100 % Carbon Neutrality by March' 2025	
5	Green Packaging	100 % sustainable Packaging of parts by March21.	
6	Green Innovation and Technology	Use of advanced technology and Digitalization of process. (Industry 4.0)	
7	Paper wastage	Paperless organization by March'21	
8	Plastic Waste	Sustenance of single use plastic ban and 100% recyclable packaging.	
9	GreenCo Platinum Plus	Preparation started. Will approach CII in Next FY.	

Top ten best practices which will form the core of approach for +1 and +2 year

Sn	Type of Waste	Project	Approach	Resource Reqd.	Time line
1	Grinding Sludge	Briquetting machine	Recycling & Reuse	Infrastructure and technology	2020-22
2	Steel Scrap	Utilization of waste in our product	Recycling & Reuse	Collaboration with part supplier & Feasibility study by expert.	2020-22
3	Plastic waste	Sustainable packaging assurance by 3rd Party.	Good Plastic, Less Plastic & No Plastic.	Collaboration with suppliers and competent body for verification & evaluation.	2021-22
4	Stationary Waste	Reuse for making dustbins, collections tanks	Reuse	Collection system and reusable materials	2020-21
5	Food Waste	Bio-mass energy conversion	Recycling & Reuse	Infrastructure and technology	2021-22
6	Carbon Neutrality	Carbon Pricing Approach	Reduction & Offsetting	Identification of resources after complete study.	2020-24
7	Hazardous Waste	Sludge Dryer at Hazardous waste storage area – Trial on	Disposal cost reduction	Infrastructure and technology	2020-21
8	Canteen waste	Automatic waste segregation system	Recycling & Reuse	Study started by our PE team	2021-22
9	Paint Conservation	Further reduction in Paint consumption	Innovation in Paint Technology	Feasibility study by expert	2020-22
10	Pollution Load	25 % reduction in pollution load	Innovative Technology	Infrastructure and technology & Feasibility study by expert	2020-21

Major learnings from the project implementation

1. Deep understanding of waste management system of the plant and conversion into resources.
2. Strengthening of Input waste segregation system
3. Better utilization of waste collection system and resources.
4. Better utilization of the housekeeping team to save their time and increase their productivity.
5. Non-value added activities elimination
6. Process flow of wastes a micro level.
7. Identification of new wastes which has less quantity but accountable for diversion.
8. Better utilization of the waste through various projects such as conversion of aluminum chips into briquettes which resulted in better utilization of vehicle capacity and waste handling etc.
9. Enhance Cost consciousness among team.
10. Strengthen Green Purchasing guidelines
11. Enhanced Competency of team resulted more sustainability initiatives water positivity, carbon neutrality etc.
12. Separate Packaging cell set up for packaging improvements and support to our vendors at corporate level. (Good Plastic. Less Plastic & No Plastic).
13. Sharing of ZWL efforts Globally in all facilities and supply chain.


Thanks