HARMAN
A SAMSUNG COMPANY

HARMAN PUNE

23rd ENERGY EXCELLENCE PROGRAM 23rd – 26th August 2022

K. Balasubramanian – Director, Plant Operations, Manufacturing

We Presenters : -

T. Kalaivanan - Sr. Manager Plant Engg.

Chandradhar Shukla - Manufacturing Manager

Rakesh Krishna Bhagat – Plant Engg , Dy Manager

GLOBAL PRESENCE

WHERE WE ARE

USA
BELLEVUE
EL PASO
MOUNTAIN VIEW
NEW YORK
NORTHRIDGE
NOVI
RICHARDSON, TX
STAMFORD, CT

MEXICO
JUAREZ
MEXICO CITY
QUERETARO
TIJUANA

BRAZIL
MANAUS
NOVA SANTA RITA
PORTO ALLEGRE
SÃO PAOLO

UNITED KINGDOM
BASINGSTOKE
CAMBRIDGE
LONDON
LOUTH

NETHERLANDS
AMSTERDAM

GERMANY
BOCHUM
GARCHING
KARLSBAD
BOEBLINGEN
ULM

BELGIUM
BRUSSELS

FRANCE
PARIS
MONTIGNY
LEBRETONNEUX

NORWAY
KRISTIANSAND

FINLAND
TAMPERE

DENMARK
AARHUS
KVISTGÅRD
STRUER

ESTONIA
TALLINN

POLAND
ŁÓDŹ

HUNGARY
BUDAPEST
PÉCS
SZÉKESFEHÉRVÁR

ROMANIA
BUCHAREST

RUSSIA
MOSCOW
ST. PETERSBURG
NIZHNY NOVGOROD

UKRAINE
KIEV

ISRAEL
TEL AVIV

INDIA
BENGALURU
CHENNAI
COIMBATORE
GURGAON
MUMBAI
PUNE

THAILAND
KLONGTON NUA
WATTANA

SINGAPORE
SINGAPORE

CHINA
BEIJING
CHENGDU
DANDONG
HONG KONG
SHENZHEN
SUZHOU

SOUTH KOREA
SEOUL

HARMAN INDIA MILESTONE

Phase-2 Inaugurated by CM of Maharashtra

Jun '19

Feb '20

MSIL-MIC Production Started

Mar '21

Dec '21

MSIL-Best Supplier for Localization

May '22

Aug '22

Tata- Zero PPM Supplier

HERMES 2.1 Production Started

HERMES 3.0 Production Started

Golden Peacock Award for Environment Management (GPEMA)

Golden Peacock Awards
A Strategic Tool to Lead the Competition

ANSI ESD S20.20

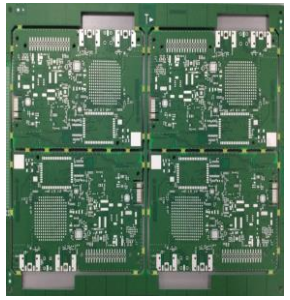
IATF 16949

ISO 9001
ISO 14001
ISO 45001

ISO 8
Class 100000

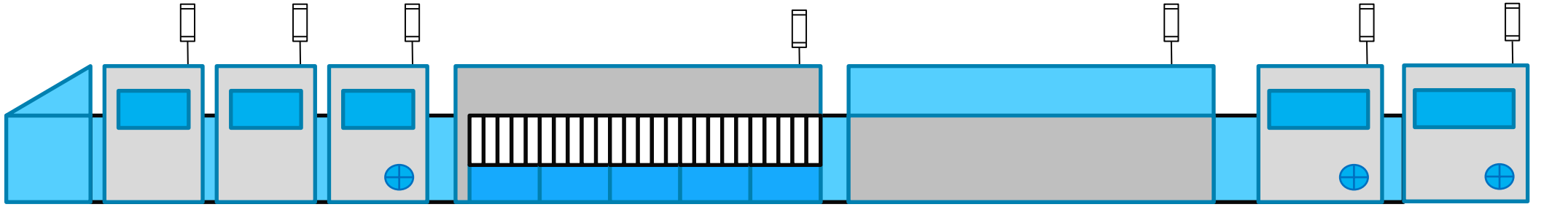
HARMAN INDIA MANUFACTURING

INFOTAINMENT MANUFACTURING PROCESS



PCB

SURFACE MOUNTING TECHNOLOGY (SMT)

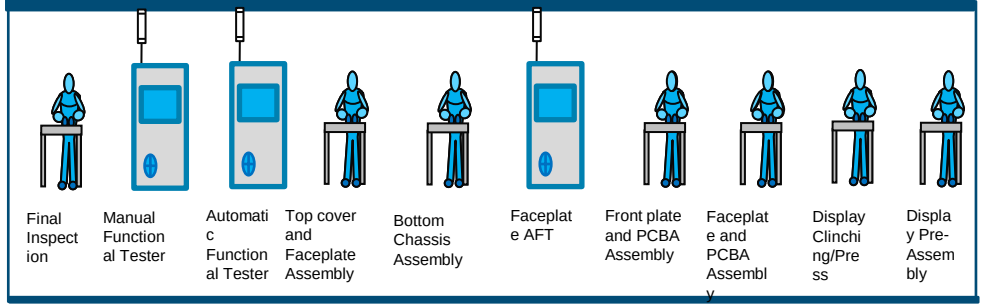


START

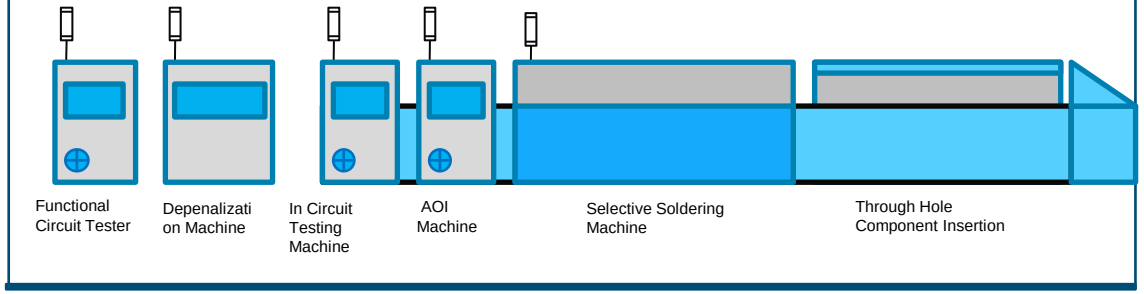
END

AUDIO HEAD UNITS

INFOTAINMENT ASSEMBLY

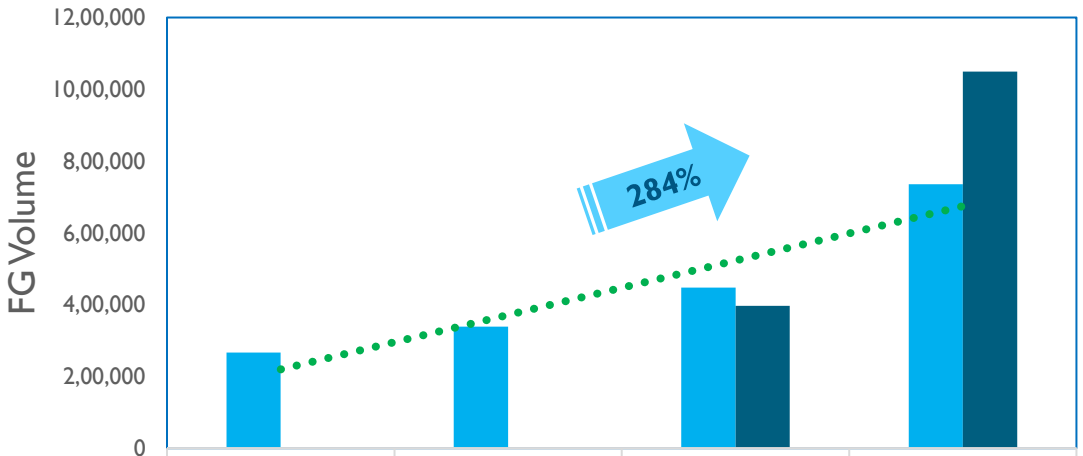


THROUGH HOLE TECHNOLOGY (THT)



ENERGY CONSUMPTION AND PRODUCTION DETAILS

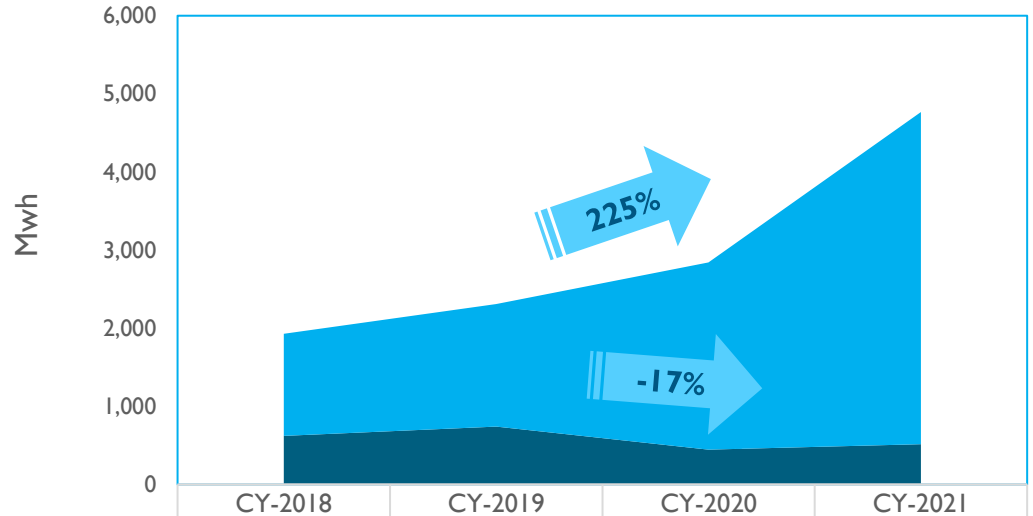
Volume - Audio Head Unit and Telematics control unit



	CY-2018	CY-2019	CY-2020	CY-2021
HU	2,66,466	3,38,852	4,47,705	7,35,364
TCU	0	0	3,96,416	10,49,141

TCU started in year 2020. Production volume increased and respectively consumption increased.

Electricity consumption in Mwh



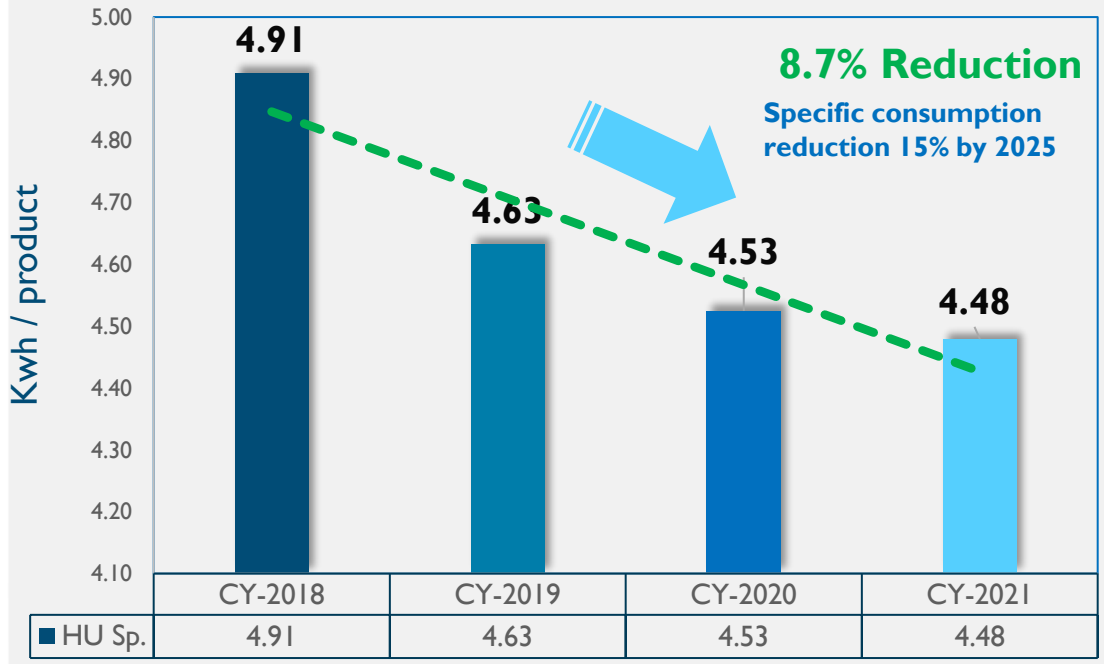
	CY-2018	CY-2019	CY-2020	CY-2021
Mfg Mwh	1,308.28	1,570.10	2,396.54	4,249.44
Facility Mwh	621.65	740.95	446.61	516.00

17% Reduction in facilities consumption. Through Energy saving projects &

20% Reduction in Mfg. consumption through productivity improvement

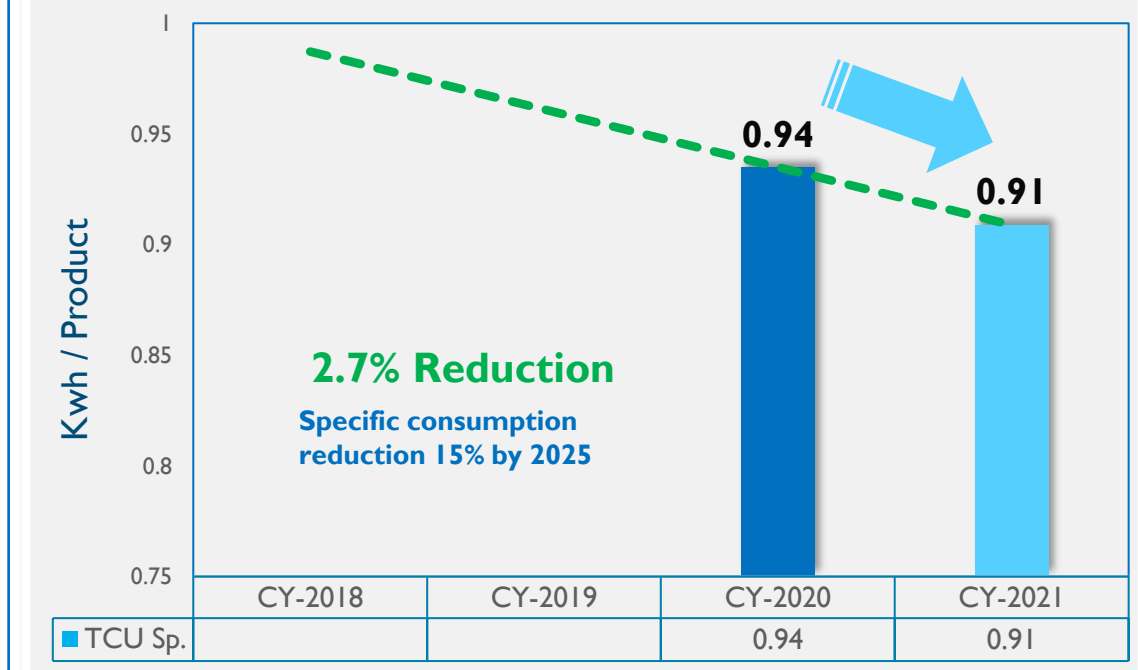
SPECIFIC POWER CONSUMPTION FOR HU & TCU

Specific Power Consumption / Audio Head Unit



Customer's

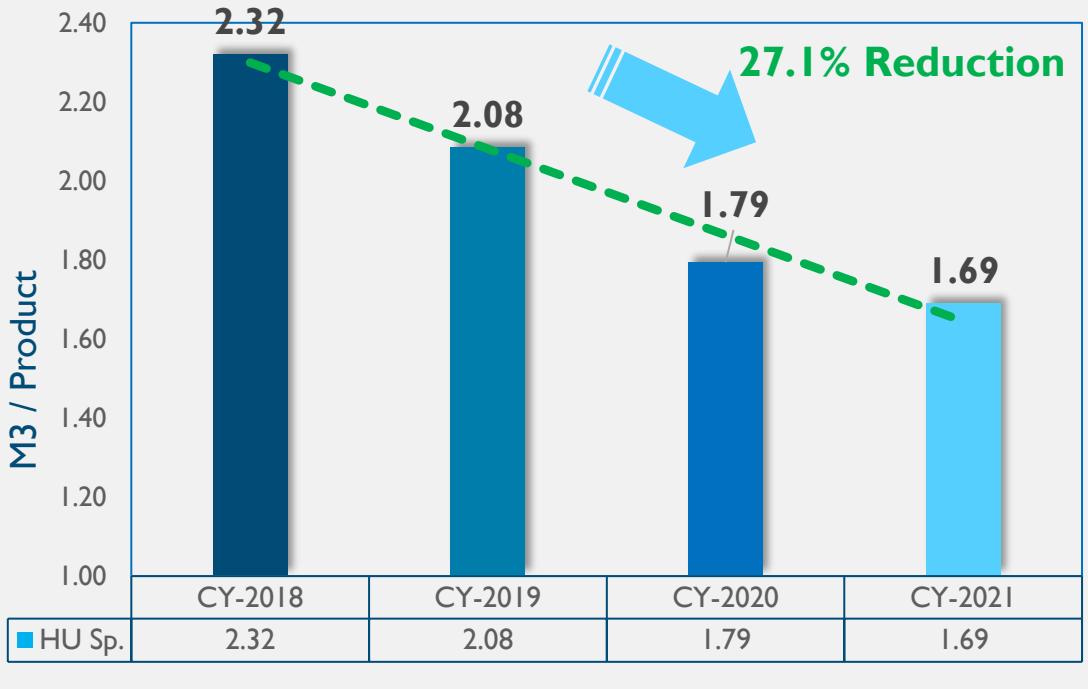
Specific Power Consumption / Telematics Control Unit



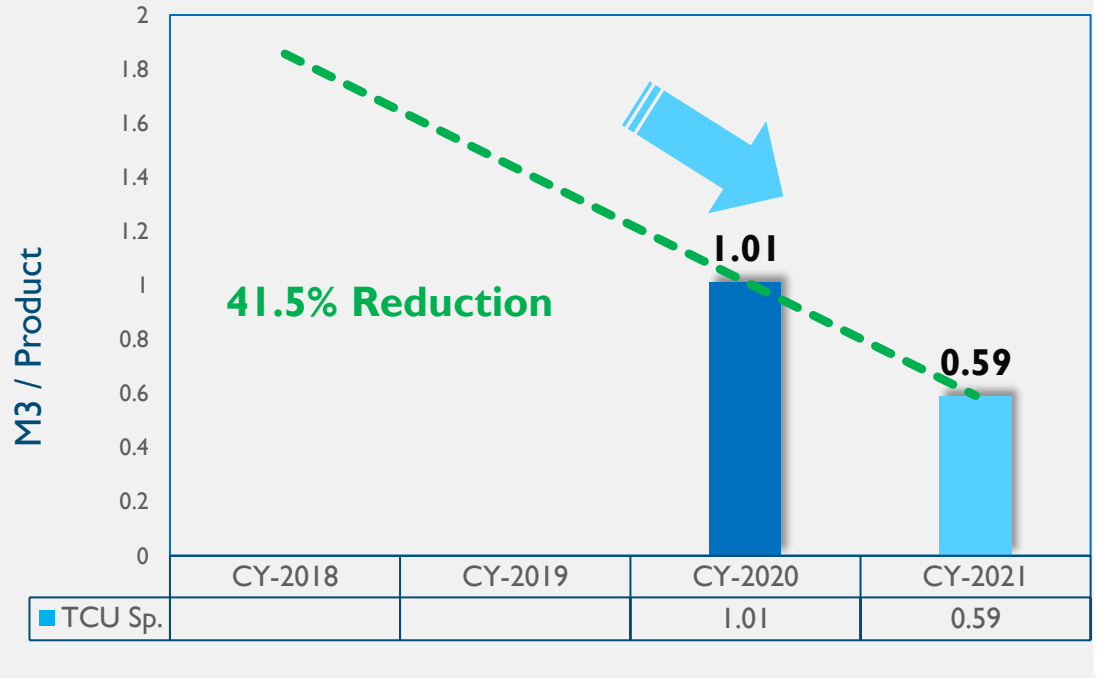
Customer's

NITROGEN SPECIFIC CONSUMPTION FOR HU & TCU

Nitrogen -Specific Consumption / Audio Head Unit



Nitrogen Specific Consumption / Telematics Control Unit



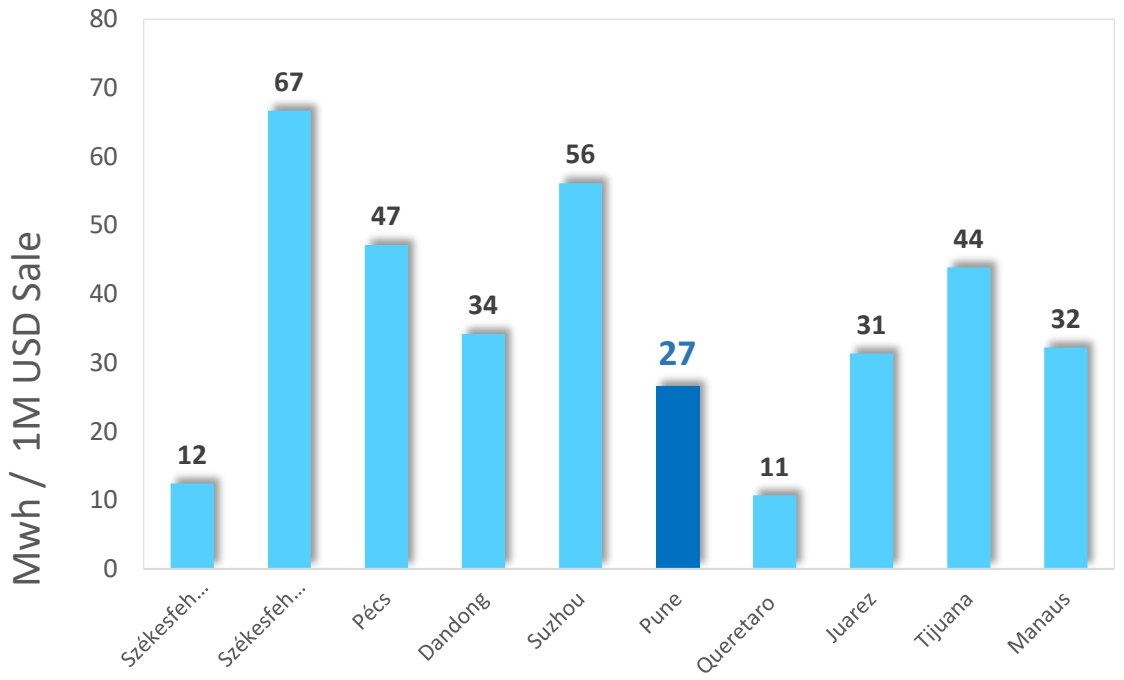
Customer's

Customer's

HARMAN INDIA MANUFACTURING

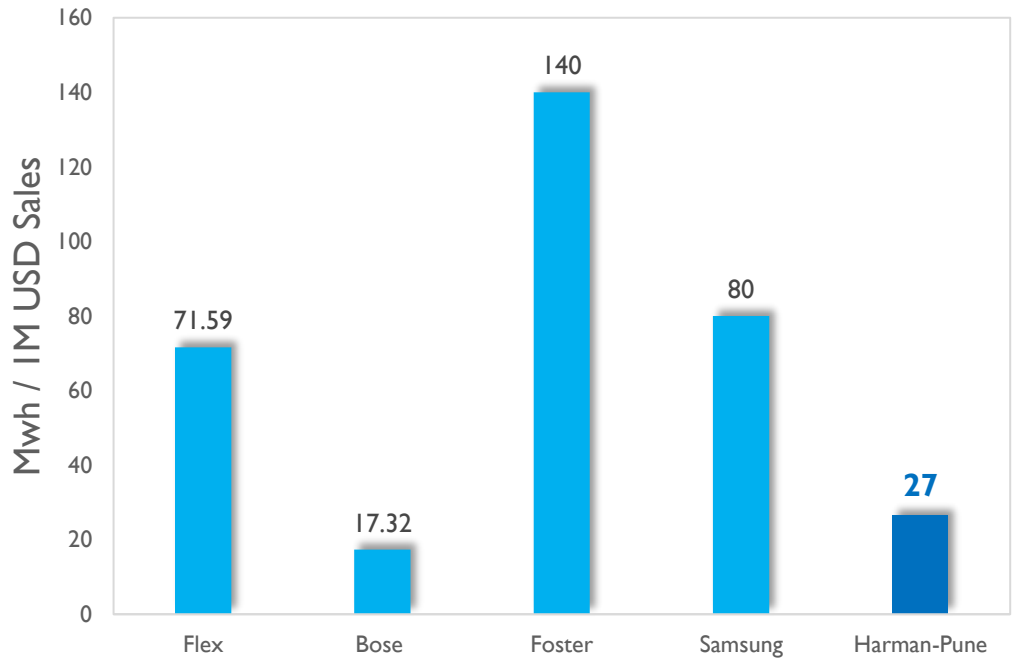
INFORMATION ON BENCHMARK

Electricity Intensity Mwh / 1M USD Revenue



HARMAN PUNE PLANT is at 3rd within Group

Electricity Intensity Mwh / 1M USD Revenue

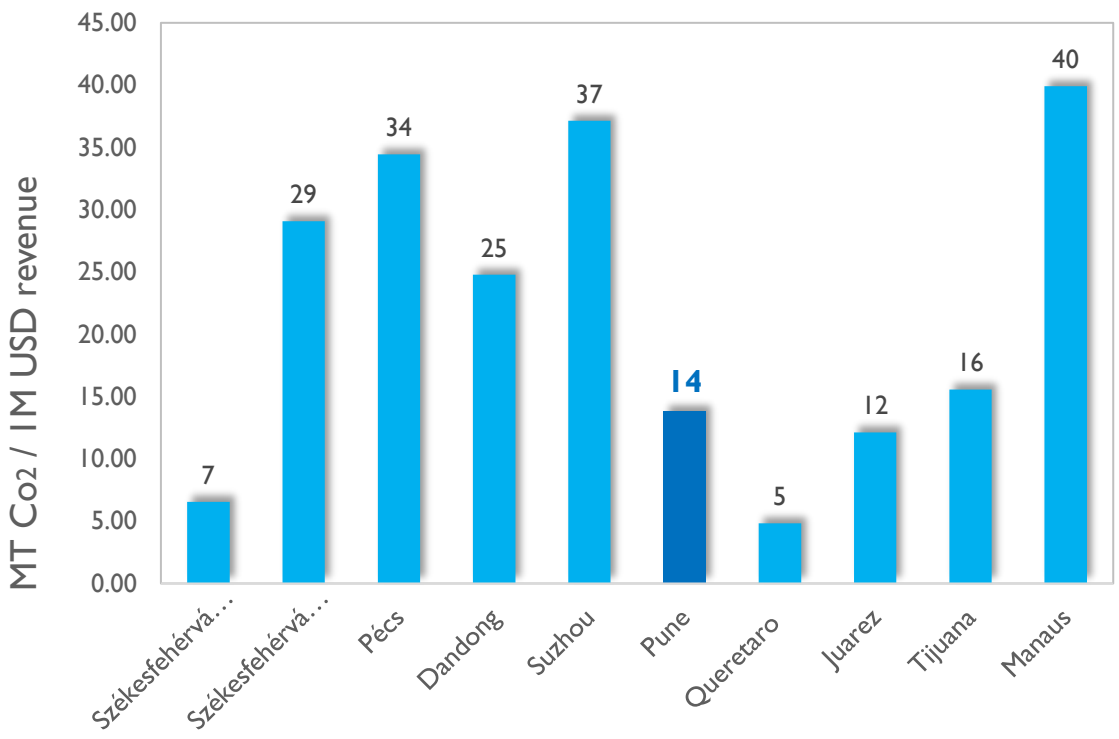


Benchmark Data With Competitors

Source - Benchmark data published in sustainability reports..

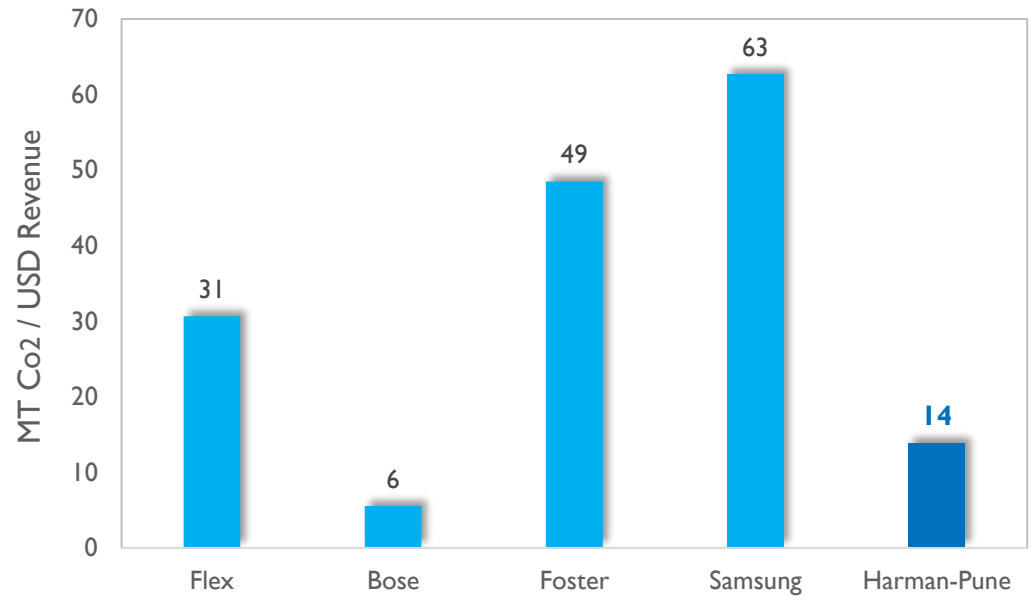
INFORMATION ON BENCHMARK

GHG emission intensity MT Co2 / 1 M USD Revenue



HARMAN PUNE PLANT is at 4th within Group

GHG emission intensity MT Co2 / 1 M USD Revenue



Benchmark Data With Competitors

Source - Benchmark data published in sustainability reports..

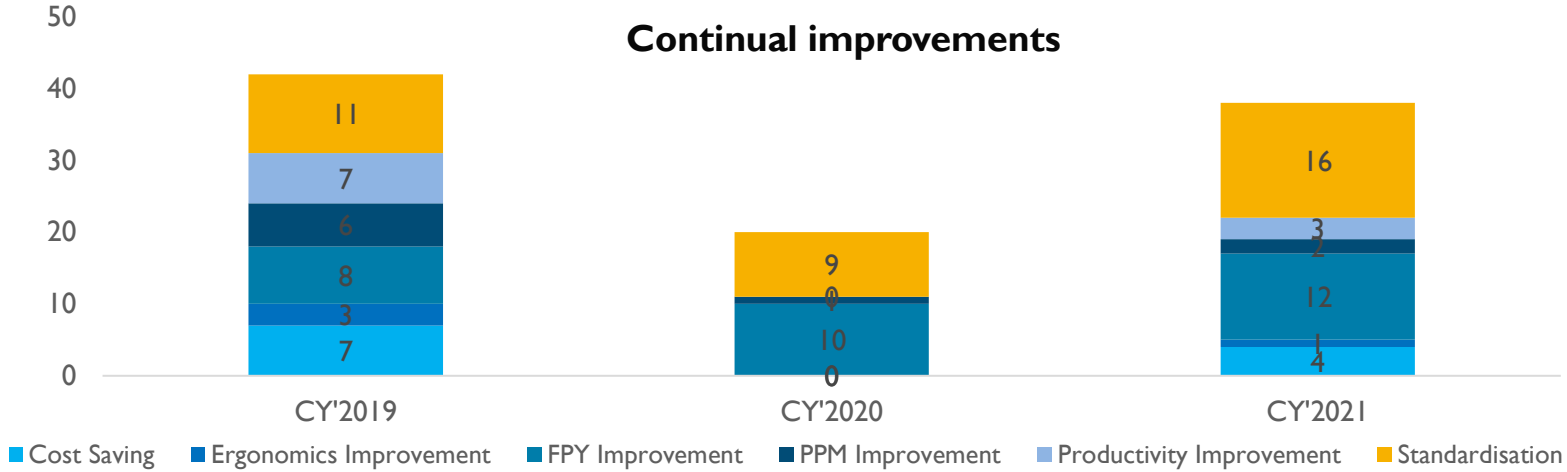
HARMAN INDIA MANUFACTURING

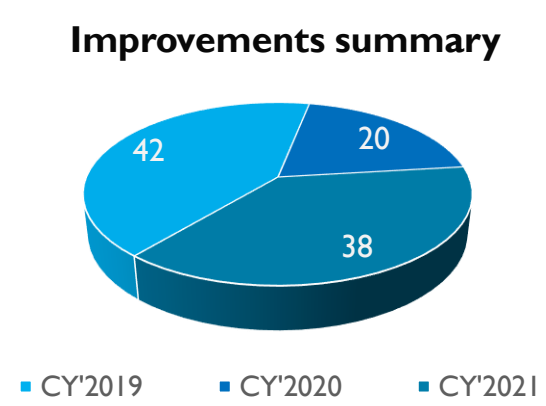
2022-23 PROJECT'S IN PIPELINE

Sr.No.	Project's	Details	Target	Projected Saving / Generation
1	AHU Speed reduction pulley	Phase II AHU 20% air flow reduction by changing the pulley	Q4-2022	251596 kwh / Annum
2	Roof Top solar	Roof top solar power plant to be installed with capacity 310 Kwp	Q4-2022	361584 kwh / Annum
3	Adiabatic cooling for chillers	Misting (Precooling) system will reduce approx. 2°C Ambient. Temp before to condensor coil and help to improve chiller efficiency	Q4-2022	212756 kwh / Annum
4	Additives for HVAC system	Minerals will added in refrigerant circuit to improve the chiller efficiency	Q2-2023	36900 Kwh / Annum
5	Roof Top solar	Roof top solar power plant to be installed with capacity 178 Kwp	Q4-2023	207619 kwh / Annum
6	Chiller replacement	Old Chiller replacement with energy efficient chiller	Q3-2023	219024 kwh / Annum
7	Dual fuel kit for DG	Diesel + PNG fuel kit for DG set	Q4-2023	Co_2 Reduction
8	Electrical vehicle	Electrical vehicle for local transportation	Q4-2023	Green Energy Initiatives
9	Continual improvement - value engineering	Continual improvement / value engineering	Ongoing	Energy / Waste reduction / Co_2 Reduction

EnCON PROJECT DETAILS & VALUE ENGINEERING

Year	No's of Energy saving project	Investment (INR Million)	Energy Saving (Million kwh)	Saving in (INR Million)	Impact on SEC Reduction (Energy) Base Line 2018
2019	10	0.77	0.12	1.42	2.03%
2020	10	0.77	0.04	0.53	1.02%
2021	7	1.21	0.27	3.29	2.80%



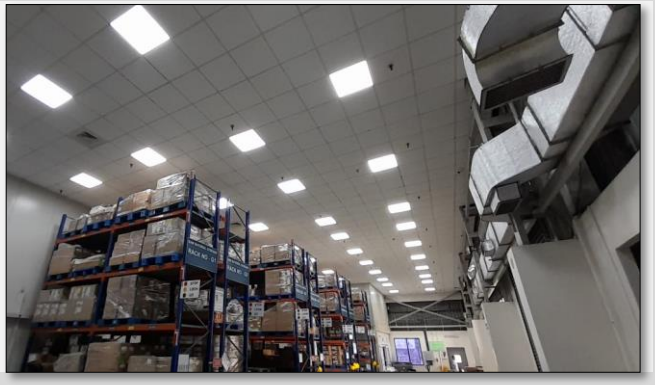


ENCON PROJECTS IMPLEMENTED

1 Shop Floor Lights

2 Street Light

3 Warehouse

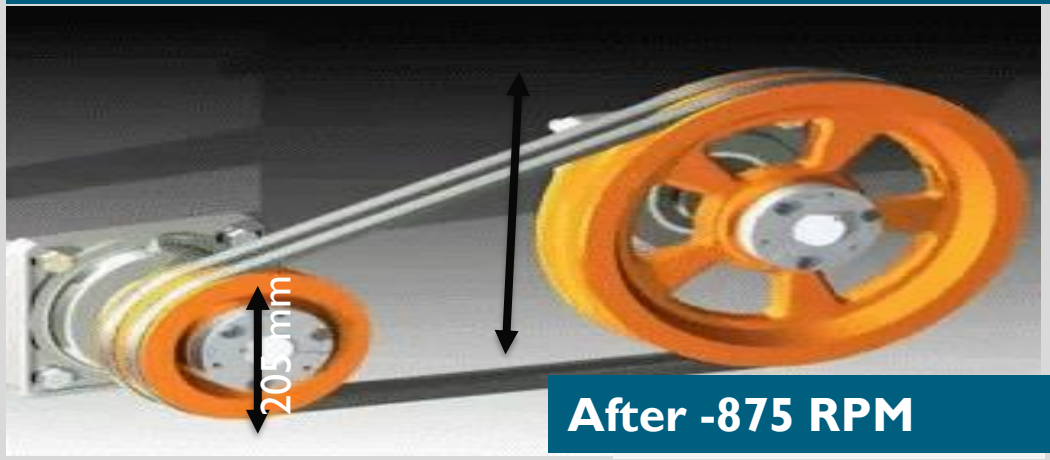


Entire Factory 100% LED conversion done

Phase II area Heat load assessment done.

Reduced CFM with using reduction pulley

After- Air Flow- 16000 CFM



Parameter		Before 205 /255 AHU-12	After 205 / 315 AHU-12
Current	R	29.76	19.7
	Y	31.26	20.23
	B	31.05	20.06
	Avg	**30.69**	**20.00**
Vtg	RY	408.3	410
	YB	411	413
	BR	409	412
	Avg	**409.43**	**411.67**
KW	R	5.9	3.1
	Y	6.2	3.3
	B	6	3.3
	Total	18.10	9.70
Energy Saving in Kwh / hr			**8.40**
Energy saving in %			46%
Energy Saving in Kwh / day			**201.60**
Energy Saving in Kwh / Month			5241.6

HARMAN INDIA MANUFACTURING

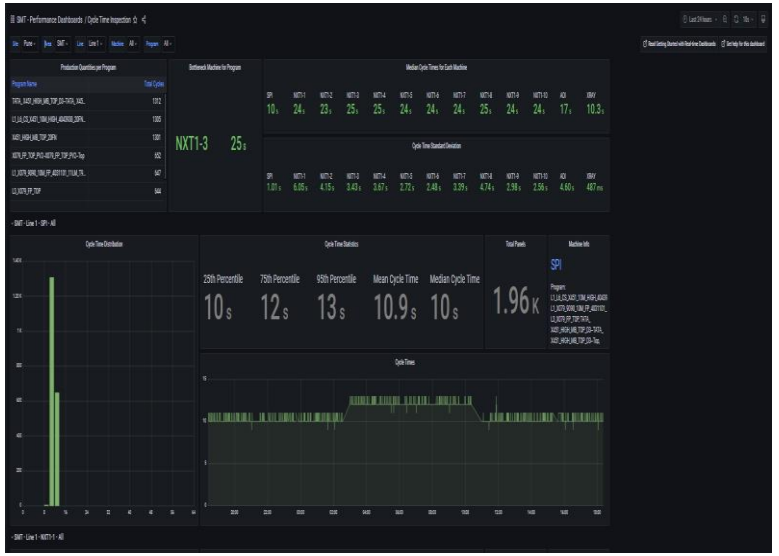
INOVATIVE PROJECTS IMPLEMENTED

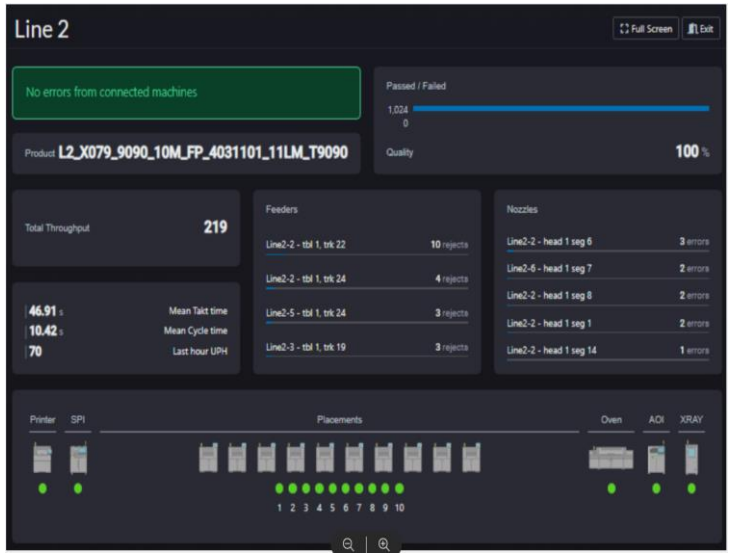
Project ID	Project Details	Saving	Contribution of plant Team
3-2022	Innovation Project-IOT project for SMT line	Performance monitoring	Design and Implementation
2P-2022	IoT Project –DG efficiency Monitoring	DG efficiency Monitoring	Knowledge sharing and support to OEM
1P-2022	Adiabatic / Precooling for chiller	Energy - 4605 kwh / Annum / chiller (44 TR)	Design and Implementation
1-2022	Barcode Label application replaced with Laser Barcode Etching on PCBA	Waste Reduction- ▪ 36000 sq.mtr (Ribbon) ▪ 75 sq.mtr (Labels)	Design and Implementation
1-2021	Common corridor created between 2 SMT lines and layout is made in U shape	Energy - 135862 Kwh / Annum	Lean MFG drive and Implementation
2-2021	Line balancing and Process Optimization to reduce Cycle Time	Energy - 152678 Kwh / Annum	Design and Implementation
2-2022	Cycle time improvement by implementing parallel operation of 2 PCBA at a time	Energy - 181149 Kwh / Annum	Design and Implementation

HARMAN INDIA

INNOVATION PROJECT- IoT PROJECT

INDUSTRY 4.0 IMPLEMENTATION





Real time Data monitoring system implemented though IoT device in All Harman Manufacturing Plant's

Benefits :

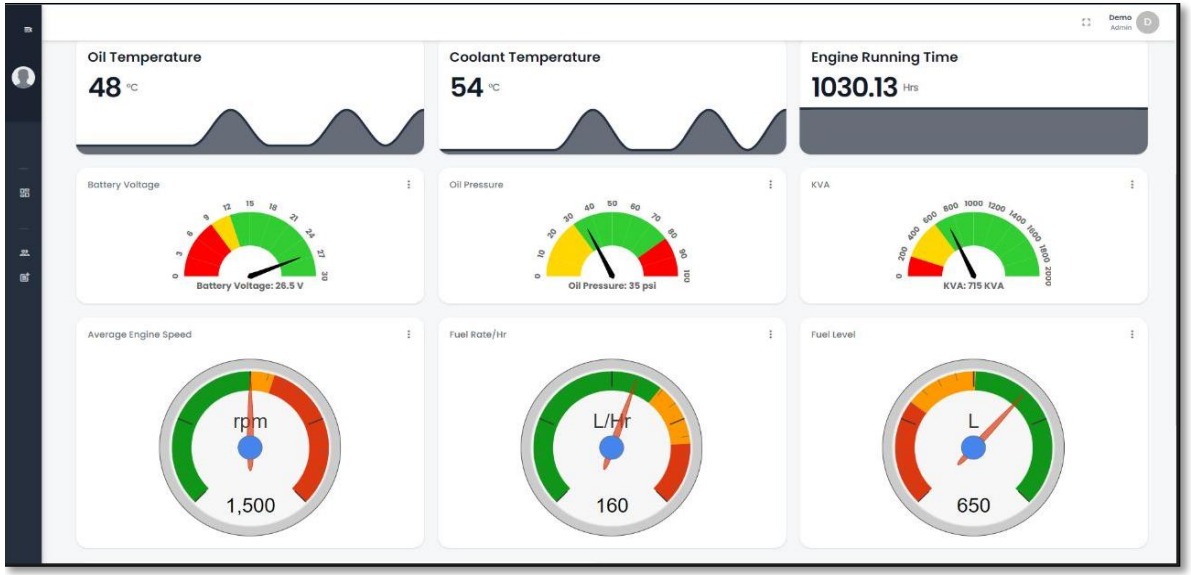
- Online monitoring of KPI to take corrective action
  - ✓ OEE
  - ✓ Waste Reduction
  - ✓ Line Efficiency
  - ✓ Line Utilization
  - ✓ Product Quality ratio
  - ✓ Individual Machine Performance
  - ✓ Idle Line Cycle time adherence
  - ✓ Machine Wise Yield ratio
  - ✓ Child Component attrition ratio
- Auto Alert E-mails to Expert for any deviation from target to Address Issue on priority
- All Machines are Accessible from remote to address issue anytime anywhere

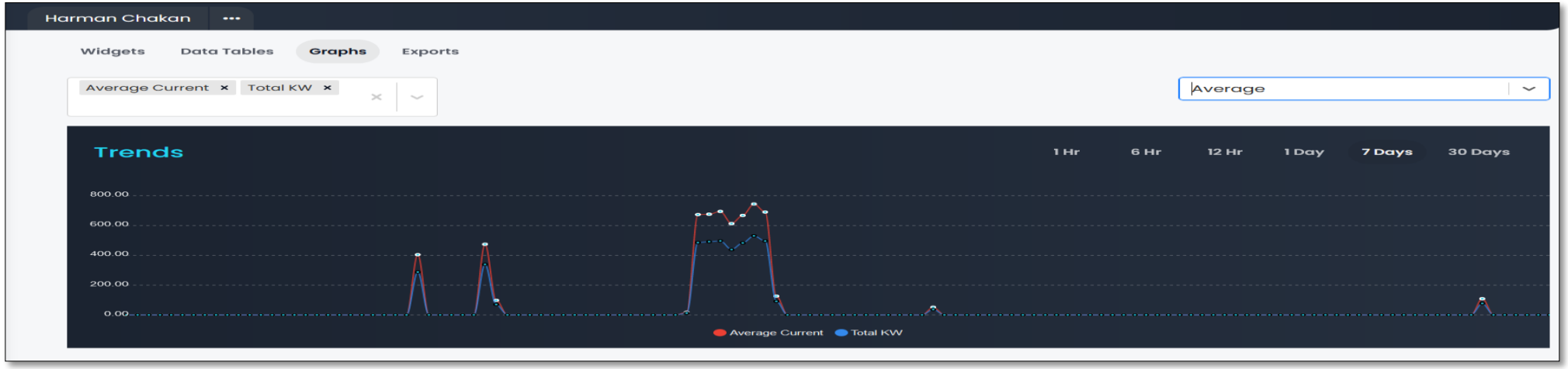
Additional Projects completed related to Standardization of Plants,

LMPC	MODI System
Auto Backflush	Packaging BOM
SAP PM	GTN

HARMAN INDIA MANUFACTURING

INOVATIVE PROJECT (IoT) –DG EFFICIENCY MONITORING





- DG parameter will monitor from control room or Personal computer
- Fuel efficiency and fuel level monitor to help fuel inventory
- Trend monitoring possible
- Three phase current monitoring and help to identify the unbalancing, also help to Min /Max /Avg demand.

INOVATIVE PROJECT –ADIABATIC COOLING FOR CHILLER

1 Conceptual of initial Design

Misting / Precooling will improve chiller efficiency

2 Improved Implementation from initial design

Work completed for two chillers

3 Savings / chiller (44TR)

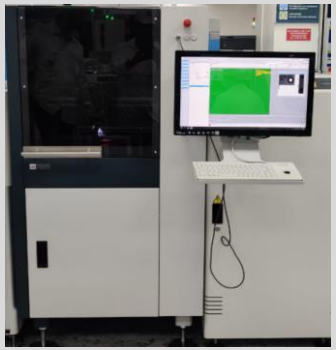
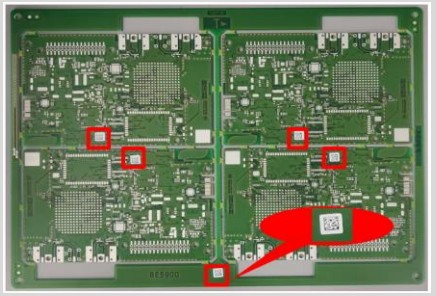
Chiller Consumption / Day	1080
With Adiabatic cooling consumption / Day	1036
Saving in kwh / Day	44
Saving in kwh / month (26 days)	1151
Saving in kwh / Year (4 Month)	4605
Saving in INR / Year	35459
Saving in %	4%
Water consumption in M^3 / Day	0.3
Cost of water in INR / Day	18
Cost of water in INR / Month	468
Cost of water in INR / Year	1872

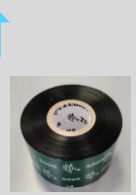
4,605 kwh saving per annum per chiller.

INNOVATION - TECHNOLOGY UPGRADATION

ELIMINATION OF LABEL USAGE ON PCBA(PRINTED CIRCUIT BOARD)

BEFORE

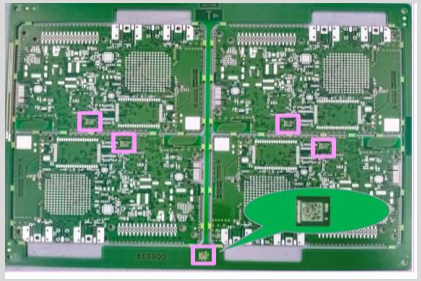







LABEL ON PCBA

1. Printing of Barcode label through Printer and Ribbon
2. Application of Barcode label on each PCBA through label applicator machine
3. Annual Consumption of 4 Million Barcode Label's and 200 Ribbon rolls.

AFTER


ETCHING ON PCBA

1. Barcode label printing eliminated through introduction of Laser Etching operation
2. Consumable cost saving of ₹ 3 Million/Annum.

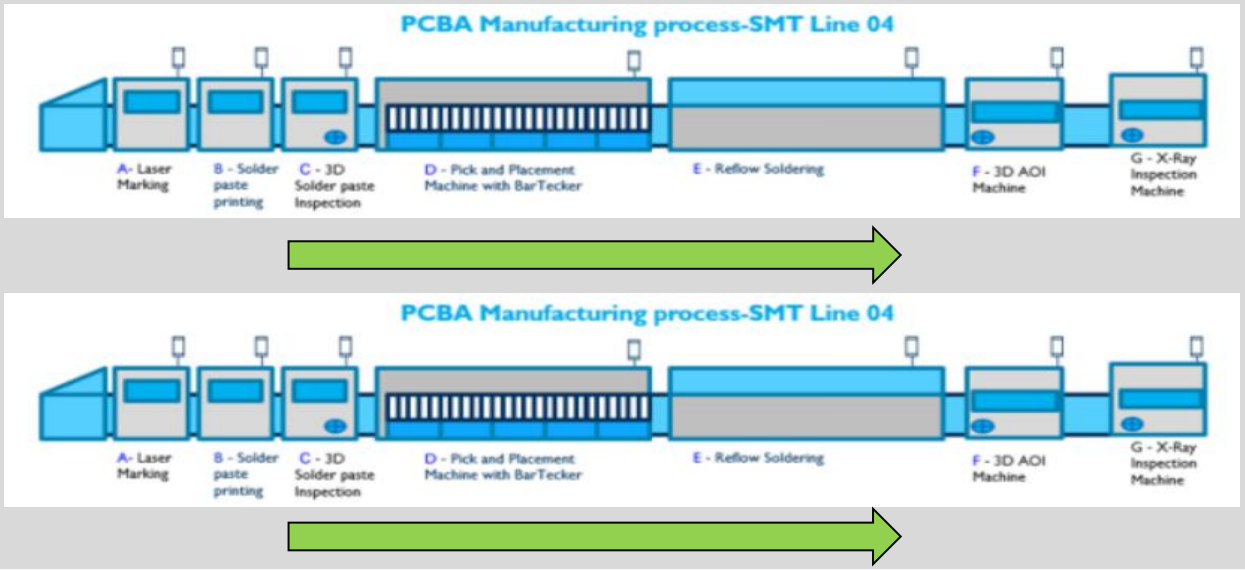
Project ID	Project Description	Status-Before	Status-After	Waste Reduction
1-2022	Barcode Label application replaced with Laser Barcode Etching on PCBA	Consumable Cost- INR 3 Million/Annum	Zero Consumable Cost	1) 36000 sq.mtr (Ribbon) 2) 75 sq.mtr (Labels)

HARMAN INDIA MANUFACTURING

MACHINE UTILIZATION IMPROVEMENT ON SMT

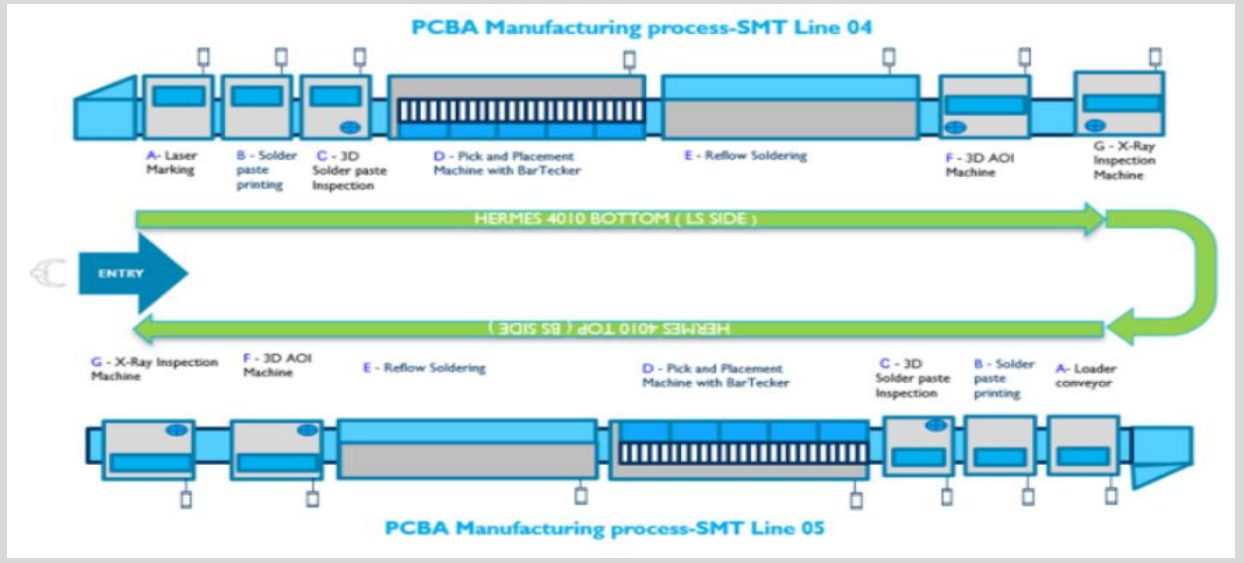
PRODUCTIVITY IMPROVEMENT-COMMON CORRIDOR

BEFORE



1. SMT line layout is not optimized
2. WIP Stock is 1.5 days as both line are running in batch production
3. Additional one DL required due to different corridor

AFTER



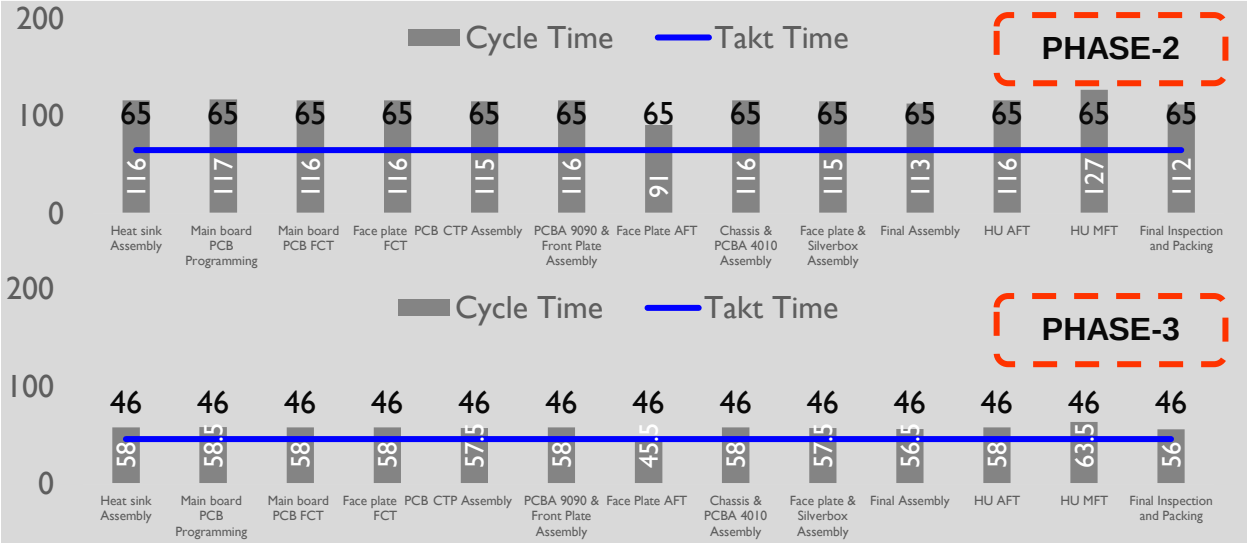
1. SMT line layout changed in U shape to utilize common corridor
2. WIP reduction from 1.5 days stock to 0.3 days stock (7200 no's to 1440 no's of TCU)
3. Through put time reduced by 12 hrs.
4. One DL Reduced due to common corridor

Project ID	Project Description	Status-Before	Status-After	Saving in Kwh
1-2021	Common corridor created between 2 SMT lines and layout is made in U shape	Capacity- 143364/Month	Capacity- 156000/Month) (Productivity increased in 9%)	• 11321 Kwh saving per month • Nitrogen consumption reduced 2527 m3/month

VALUE ENGINEERING ON ASSEMBLY LINE'S

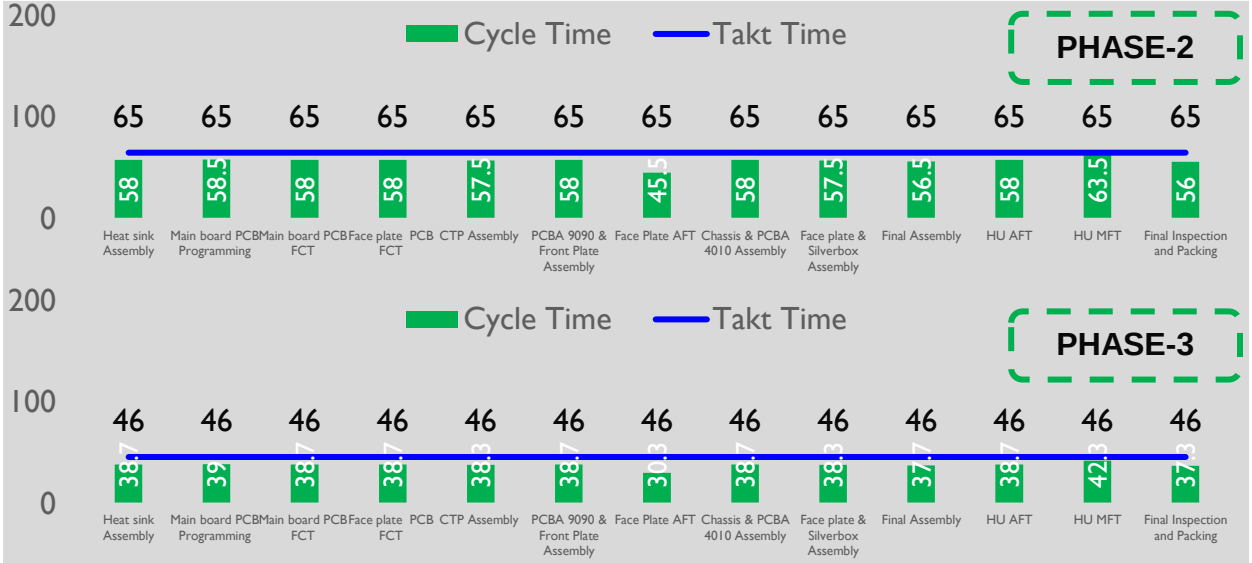
PRODUCTIVITY IMPROVEMENT-LINE BALANCING

BEFORE



1. Assembly line Capacity 15900/Month with Bottleneck Cycle time of 127(P-2) and 63.5(P-3) Second.
2. Customer requirement of 31800(P-2) and 44300(P-3) per Month with Takt time of 65(P-2) and 46(P-3) Second.
3. All workstation having Cycle time more than Takt time.

AFTER



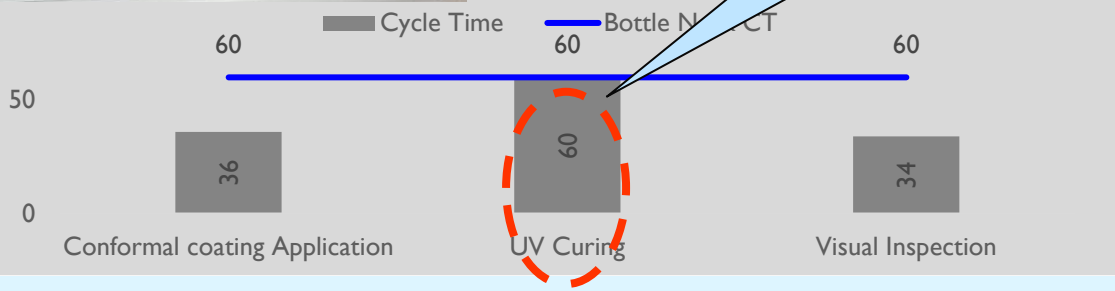
1. Assembly line Capacity 31800(P-2) and 44300(P-3) per Month with Bottleneck Cycle time of 63.5(P-2) and 42.3(P-3) Second.
2. Assembly Line-2 added in Phase-2 to meet customer demand on 04.09.2019.
3. Assembly Line-3 added in Phase-3 to meet customer demand on 02.01.2020.

Project ID	Project Description	Status-Before	Status-After	Saving in KWh
2-2021	Line balancing and Process Optimization to reduce Cycle Time	Capacity-15900/Month	Capacity- 44300/Month Productivity increased in 179%	12723 Kwh saving per month

VALUE ENGINEERING ON CONFORMAL COATING LINE

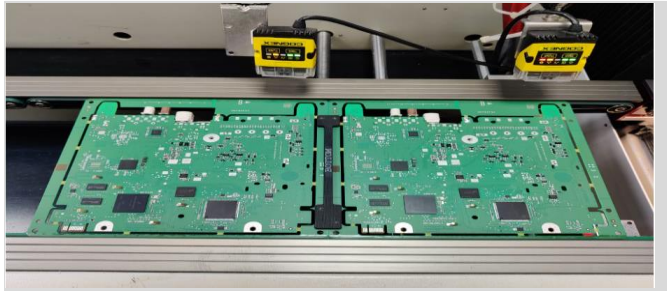
PRODUCTIVITY IMPROVEMENT-PARALLEL OPERATION

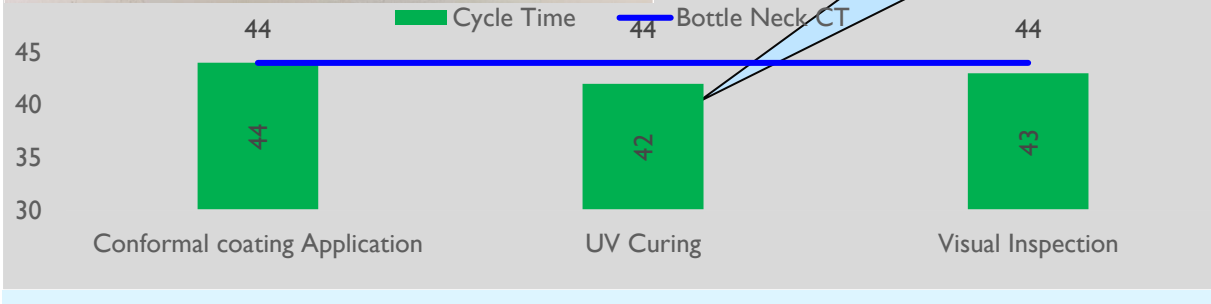
BEFORE



1. As per PCBA Design able to run Single PCBA on conformal coating
2. Machine Configuration Setting defined for Single PCBA.
3. Conformal coating Capacity constrain with loading of 4.3 Line against 4 available Line

AFTER



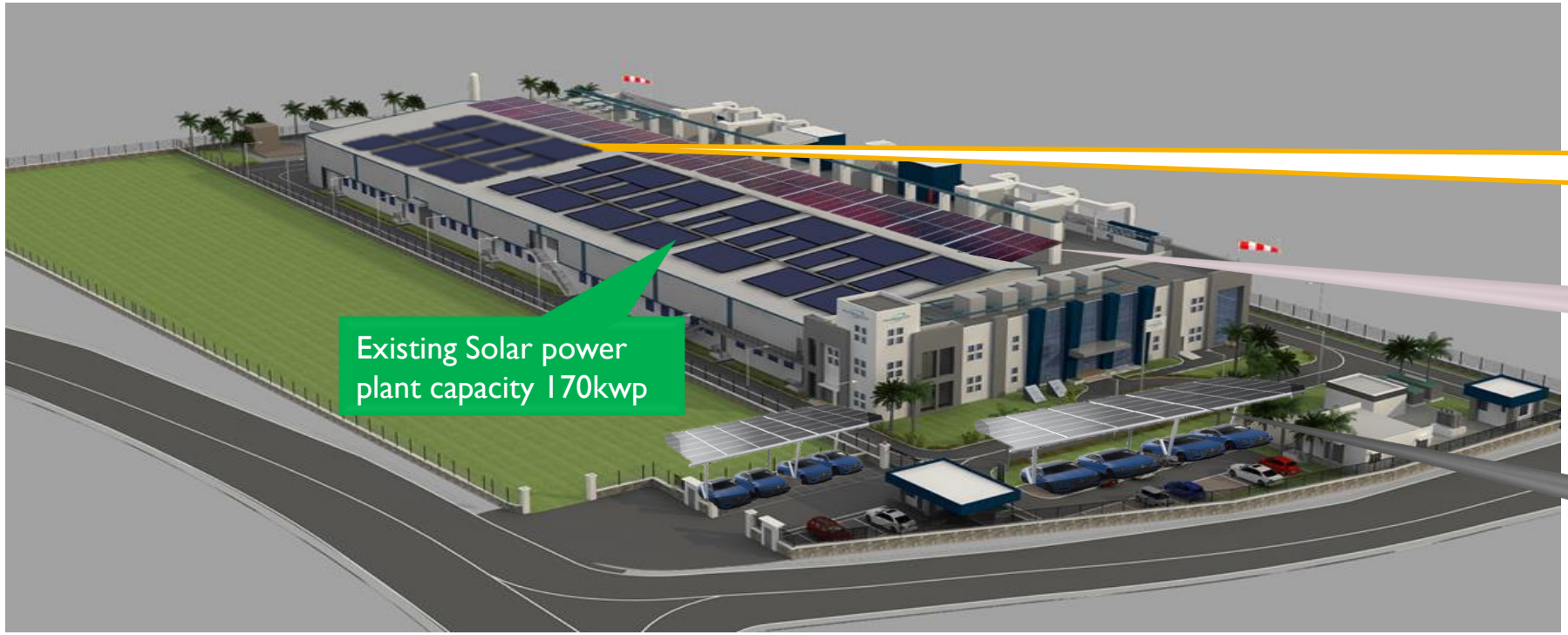


1. Conformal coating Process modified to run 2 PCBA of HSBX.
2. Machine configuration setting Modified & updated to run 2 PCBA.
3. Cycle time reduced by 36 % for HSBX PCBA
4. Conformal coating Capacity Improved by 0.4 line with loading of 3.9 Line against 4 available Line

Project ID	Project Description	Status-Before	Status-After	Saving in KWh
2-2022	Cycle time improvement by implementing parallel operation of 2 PCBA at a time	Capacity- 34320/Month	Capacity- 5168/Month Productivity increased in 49%	15095 kwh saving per month

HARMAN INDIA MANUFACTURING

RENEWABLE ENERGY DRIVE



Ph2 - Additional 310 Kwp on Existing roof

Ph3 - Additional 103 Kwp on existing roof

Ph4 - Additional 75 Kwp possible at car parking

Ph1-170 KWP installed

Ph-2- 310 KWP

Ph-3 & 4- 178 KWP

100% Through PPA / REC/ SREC

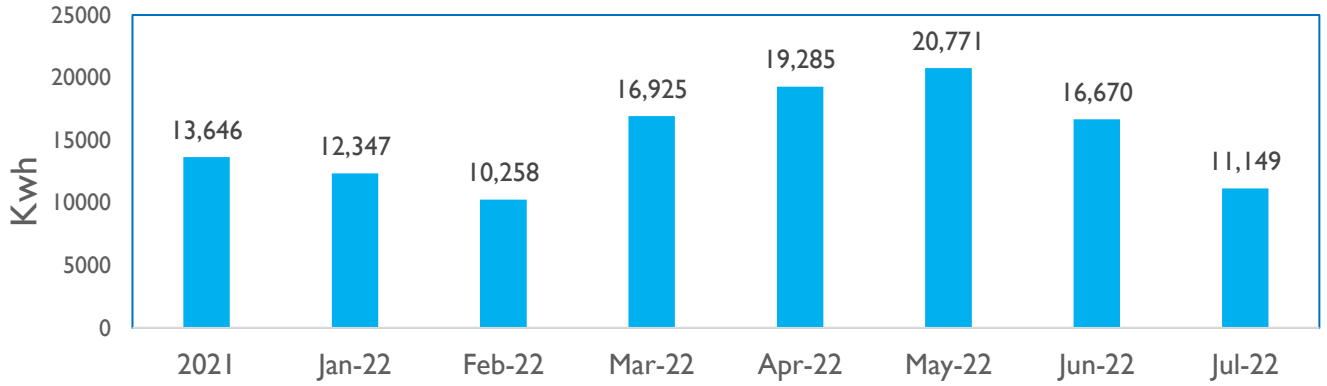
2021 2022 2023 2024 2025

- Roof Top solar 658 Kwp in 2023 (Total installed capacity)with in the facility
- 100 % in 2025 Through PPA / REC / SREC

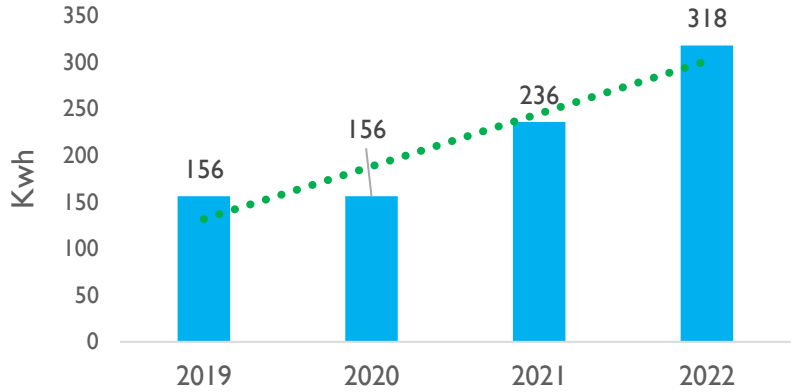
HARMAN INDIA MANUFACTURING

RENEWABLE ENERGY GENERATION

Roof top solar power plant (170kwp) Generation in Kwhr



Solar lamp & wind generation in Kwhr



Year	Type of Energy	Onsite / Offsite	Installed Capacity Kw	Generation in (Kwh)/Year	% of overall electrical energy	Status
2019	Solar	Onsite	0.144	318	0.01%	
2021	Solar	Onsite	170	1,76,256	3.26%	
2022	Solar	Onsite	310	3,61,584	6.70%	
2023	Solar	Onsite	178	2,07,619	3.84%	
Total			658	7,45,777	14 %	

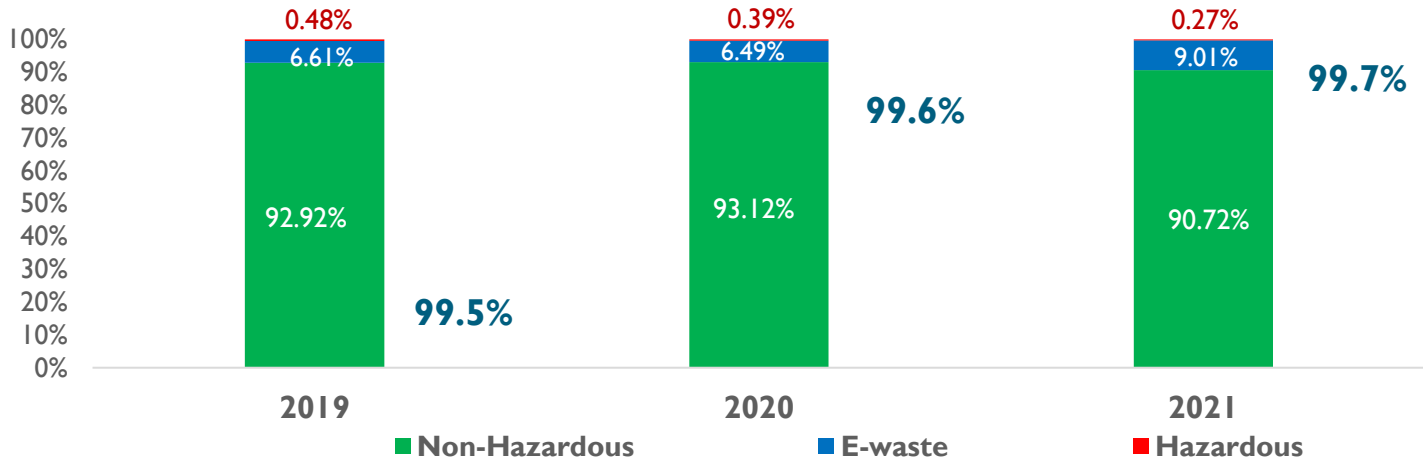
170 Kwp in operation,488 Kwp will be operational in 2023

Yearly consumption considered – 54,00,000 kwh

HARMAN INDIA MANUFACTURING

WASTE UTILIZATION & MANAGEMENT

% of waste Recycle

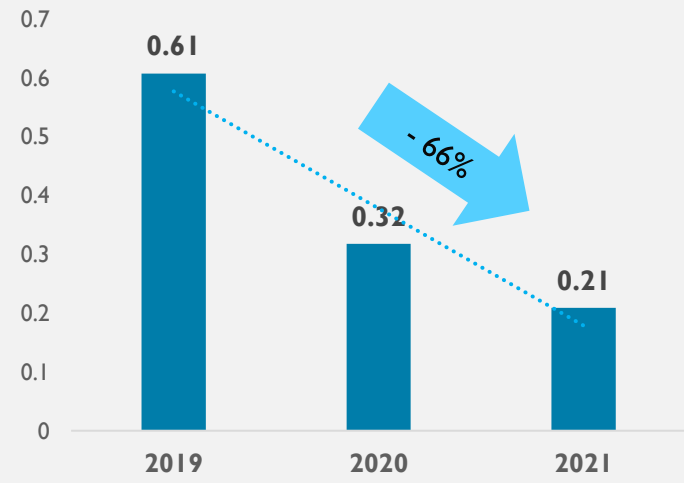


Waste Management %:

Harman International Chakan Pune plant recycles more than 99% of total waste generated

Waste reduction number of projects- 15 no's

Sr. No.	Bin Colour	Waste category	Example	Handed Over to	Method of disposal	Generated Waste (M Tons)		
						2019	2020	2021
01	Green	Non-hazardous waste	cloth, paper, Plastic etc.	MPCB Authorized Recycler	Recycling	191.3	249.7	338.2
02	Blue	Electronic waste	Scrap PCBs, Leftovers etc.	MPCB Authorized Recycler	Recycling	13.6	17.4	33.6
03	Red	Hazardous waste	Solder paste, waste oil	MPCB Authorized disposer	Secured landfilling	0.985	1.045	0.996



HARMAN INDIA

RETURNABLE PACKAGING-I

ELIMINATION OF CORRUGATED BOXES

BEFORE

1. Packaging is used as one way packaging.
2. Boxes are received in loose condition.
3. Individual boxes to be unloaded from vehicle

AFTER

1. Child part receiving, FG shipments in palletized condition
2. Palletized material easy to handle and stack in warehouse
3. Corrugated boxes elimination

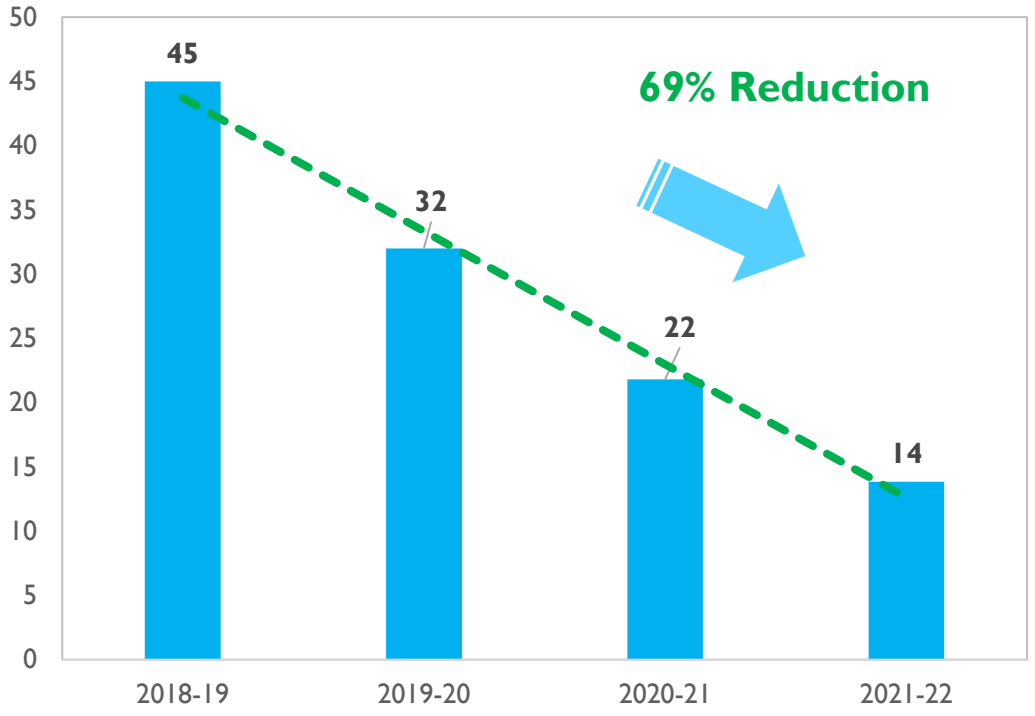
REDUCTION IN WASTE GENERATION

Wastage	Unit	Weight/ Box	Boxes/Month	Wastage/ Month	Reduction in Wastage/ Year
Carton board sheet	Kgs	1	3,000	3,000	36,000 kg's

HARMAN INDIA MANUFACTURING

GHG INVENTORISATION

GHG emission intensity MTco2 \ 1M USD Revenue



69% Reduction achieved through energy saving projects, productivity improvement

Sustainability report :-

Sustainability Report

GHG Emission Projects in Pipeline – Target to implement upto 2024

Scope	Associated with	Emission Reduction Drives
Scope 1	Fuel for DG set	✓ Fuel Reduction- Dual fuel kit (PNG+Diesel) ✓ Dedicated power source- to reduce the DG run hours
Scope 2	MSEDCL – Electricity	✓ Increase the Renewable Energy uses ✓ Productivity improvement ✓ Energy saving project
Scope 3	Transport	✓ Large carrier used instead of small carrier ✓ Diesel fuel vehicle to CNG vehicle for material transportation ✓ Transportation to all employees- to avoid individual transports ✓ Electric vehicle for local transport

LOOKING TOWARD THE FUTURE

SUSTAINABILITY AT HARMAN

OUR PLATFORM IS CALLED SOUND PURPOSE

SOUND PURPOSE

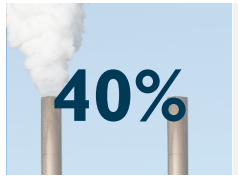
Our stated mission

To be a best-in-class employer and provider of technology solutions that are beneficial to the long-term well-being of the people and communities we serve.

CARBON NEUTRAL BY 2040 – SHORT TERM GOALS FOR 2025:

Renewable electricity across all HARMAN factories

HARMAN suppliers use renewable electricity in production



Emissions reduction

Electricity reduction

OUR FOUR FOCUS AREAS:

Environment & Emissions

Employee Diversity & Safety

Products & Innovation

Corporate Purpose

HARMAN INDIA MANUFACTURING

ENERGY & GREEN SUPPLY POLICY- MANAGEMENT PROGRAM

EHS & Energy Policy

OCCUPATIONAL HEALTH, SAFETY, ENVIRONMENTAL & ENERGY POLICY

As designer, manufacturer, and supplier of connected products and solutions for automakers, consumers, and enterprises worldwide, HARMAN understands world-class performance not only as the achievement of complete customer satisfaction but also energy and environmental consciousness and safe design of products and production processes, considering its contribution to climate protection as part of its business activities.

EMPLOYEE PROTECTION & WELL-BEING

HARMAN is committed to implementing programs and policies for improving our employees' Health and Well-being, by promoting a workplace free of known hazards, to prevent injuries and deterioration of health.

COMPLIANCE

HARMAN is committed to implementing processes to ensure compliance with all applicable country, state, and local laws, and conformity to other requirements to which we subscribe, regarding occupational health, safety, environmental, and energy management.

COMMUNICATION

HARMAN communicates our Occupational Health, Safety, Environmental, and Energy commitments to our employees, clients, suppliers, and other interested parties, considering their input, needs, and expectations. Our policy is made available to the public upon request.

CONTINUAL IMPROVEMENT

HARMAN is committed to establishing and reviewing objectives and targets regarding Occupational Health, Safety, Environmental, and Energy, which lead to continual improvement, eliminate hazards, and reduce OH&S risks, providing mechanisms for the consultation and participation of employees and other interested parties.

PREVENTION OF POLLUTION

HARMAN is committed to the protection of the environment and has developed management systems and processes designed to prevent activities and/or conditions that are detrimental to the environment.

REDUCTION OF ENERGY CONSUMPTION

HARMAN is committed to implementing a systematic process to achieve continual improvement of energy performance, considering energy consumption in the specification, planning, and installation of new or modified operations, facilities, or systems, procuring the use of energy-efficient devices, products, and services.

John Stacey
EVP, CHRO

Michael Mauser
President & CEO

Revision A – November 10, 2021

Supply Chain Policy

AMPLIFY PROGRESS

April 19, 2022

Dear Valued Supplier,

Sustainability is a critically important focus area for HARMAN. A key initiative of HARMAN's sustainability program centers around our ambition to be Carbon Neutral by 2040 (CNx2040). We are proud to share that HARMAN has joined RE100 and The Climate Pledge, and is in the process of setting a Science-Based Target aligned with the Science-Based Targets Initiative (SBTi).

We recognize that the road to success must include our value chain as well, and we have created "Amplify Progress" as our supplier sustainability engagement program. Over 98% of our carbon footprint comes from Scope 3 emissions, of which goods and services from our suppliers account for about 90%. Through our "Amplify Progress" program, we are asking our suppliers to support our CNx2040 goal by increasing their energy efficiency and transitioning to renewable electricity. These efforts help reduce product-related carbon emissions, create a more resilient supply chain, and contribute to healthier communities – while also paving the way for others to follow.

The key component of HARMAN's Supplier Renewable Electricity Program is asking our suppliers to commit to using 100% renewable electricity by 2025 (Supplier Renewable Electricity Commitment). Other components of our program include data collection through CDP Supply Chain, incorporating renewable electricity use into supplier scorecards, and providing suppliers with educational resources and opportunities for collaboration.

We are aligned with our customers and downstream value chain partners in these commitments and are now extending our expectation of renewable electricity transition to our supply chain. We ask that you cascade these goals and objectives to your suppliers as well. We appreciate your cooperation and engagement in this important initiative.

Best Regards,

Troy Zerbe
Senior Vice President
SVP Procurement & Auto Sourcing

Tom Mooney
Senior Director
Government Affairs and Sustainability

Wolfgang Heitmann
Vice President
Supply Chain and Operations, Professional Solutions

Lily Guo
Vice President
Global Operations, Consumer Audio

Management Program

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www.harman.com
CIN: U72200KA2009PTC048794

ENVIRONMENT & OCCUPATIONAL HEALTH-SAFETY (EHS) OBJECTIVE, TARGETS & PROGRAMS CY-2022

COMMITMENTS	EHS OBJECTIVES	EHS TARGETS	UOM	EMP NAME	EMP NO.
Compliance	Compliance to all legal and other requirements	100% compliance to all applicable legal and other requirements	%	Tracking system for Legal and Other requirements	HPU/D/EHS/006O
Prevention of Pollution & Natural resource conservation	Reduce Energy Consumption	Reduce overall energy consumption by 6% (KWH/KUSD)	%	Additive for HVAC system	HPU/D/EHS/006AE-01
				AHU Pulley modification	HPU/D/EHS/006AE-02
	Use of Renewable energy	Achieve 5% of renewable energy consumption of total energy consumption	%	Utilization of solar energy	HPU/D/EHS/006X
Employee Protection and Well being	Identification of High risks and reduction in risk level to avoid workplace injuries & health issues	"0" Loss Time Incident	No.	Identification of EHS issues & closure	HPU/D/EHS/006W
				Railing to head room	HPU/D/EHS/006AF-01
				Exhaust system for battery room	HPU/D/EHS/006AF-02
Communication	Create EHS awareness & develop Trained and well aware workforce	ESH training to each employee @ 0.6 Hr./Month	Hrs.	EHS Training Plan & execution	HPU/D/EHS/006V

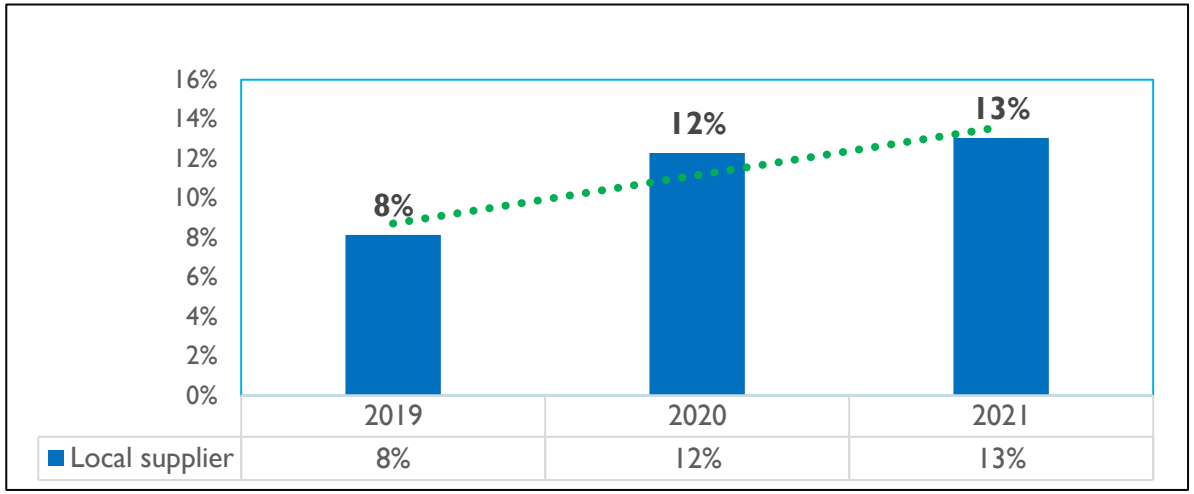
K. Balasubramaninan
Director: Plant Operation

GREEN SUPPLY CHAIN MANAGEMENT

LARGE CARRIER USED INSTEAD OF SMALL CARRIER

Location	Distance in Km	Volume / Year	Earlier Vehicle Capacity	Yearly Trips Earlier	Current Vehicle Capacity	Yearly Trips Now	Saving in Vehicle Trips	Co2 reduction in MT / year
Gujarat	751	1,20,000	480	252	1200	96	156	6 MT

SUPPLIER LOCALIZATION



- All Mechanical parts are localized, Currently E comp depends on Overseas suppliers
- Transportation / fuel saving through localization

TEAMWORK, EMPLOYEE INVOLVEMENT & MONITORING

Reduce / Reuse / Recycle

- E-waste recycling
- Recycle / treated water uses

Employee communication & Motivational

- Encourage employee with rewards
- Training to employees

Thermography

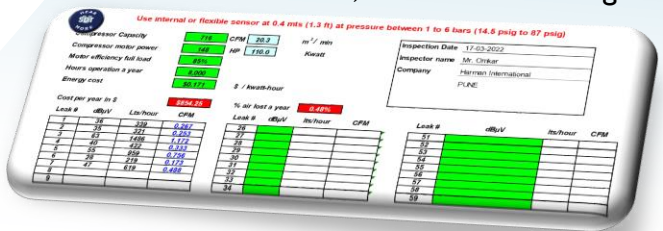
- Internal Quarterly
- External Yearly

Project

- Energy saving initiatives
- Cost saving, PPM Improvement project
- Ergonomics improvement,
- Productivity Improvement
- Standardization

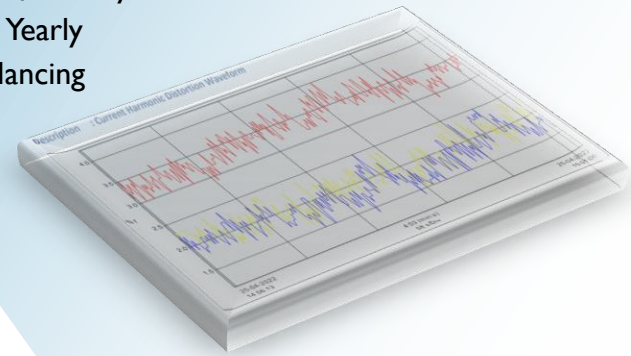
Maintenance

- Life cycle replacement as per OEM recommendation
- Efficiency measurement
- Air leak study
- 100% PM, PDM & overhauling



Power Analyzing

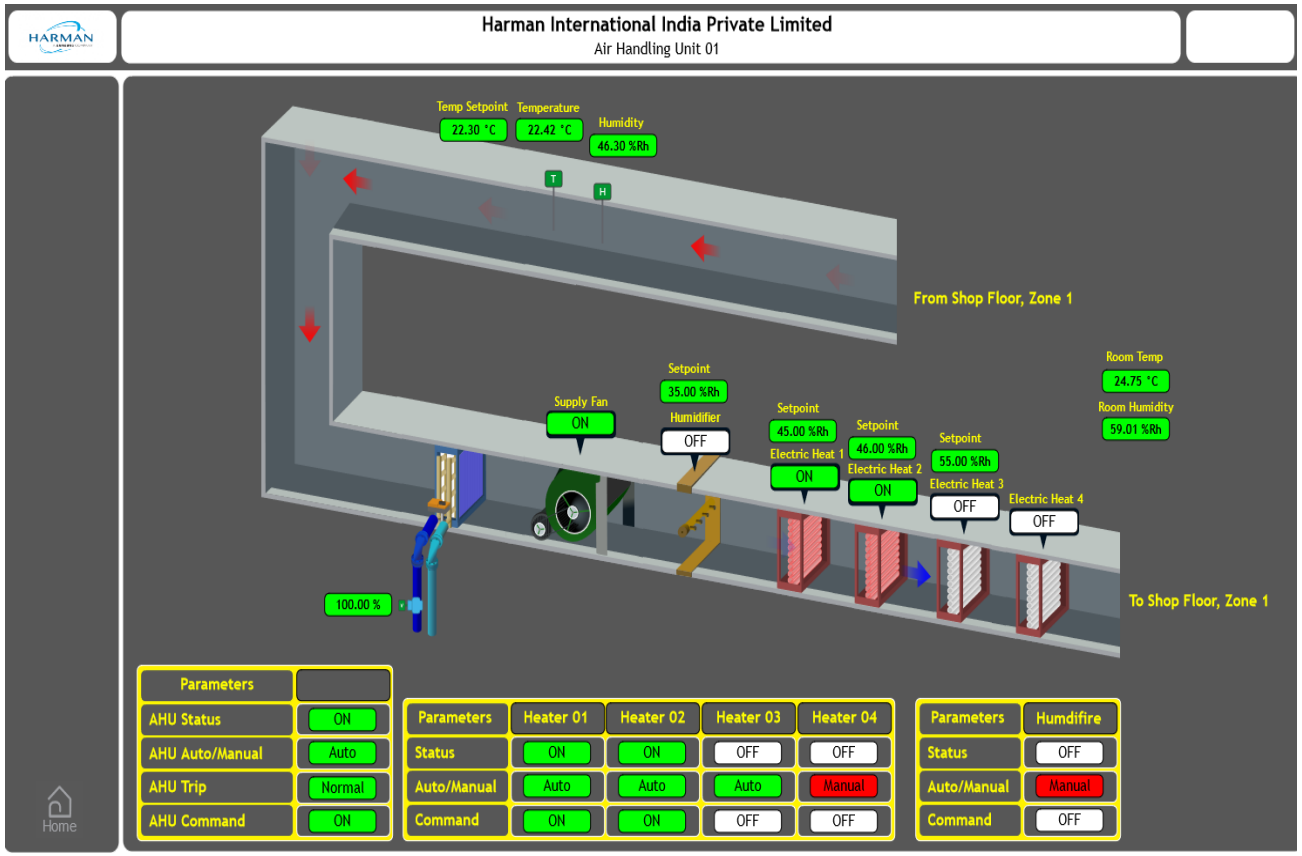
- Internal Quarterly
- External Yearly
- Load Balancing

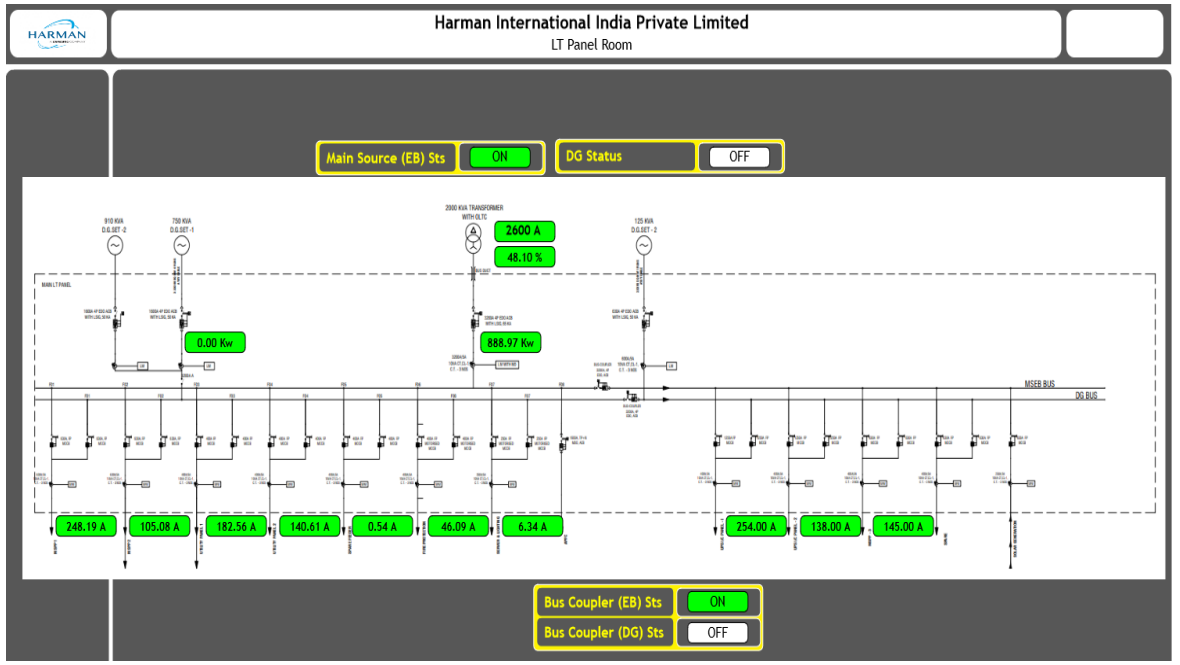


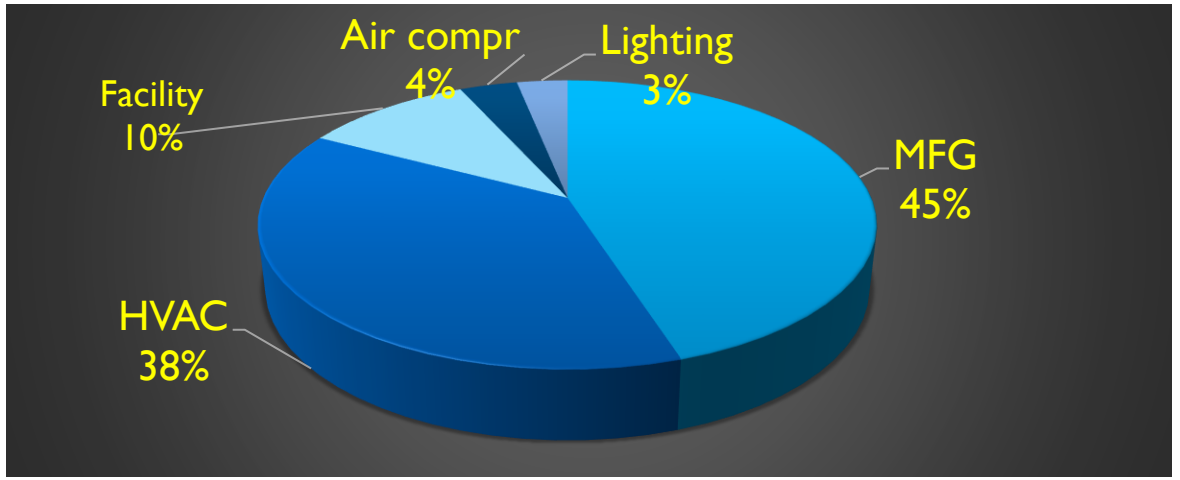
X = additional headcount

HARMAN INDIA MANUFACTURING

TEAMWORK, EMPLOYEE INVOLVEMENT & MONITORING







- Old Controller replaced with PLC
- Auto ON / OFF operation instead of manual operation.
- Set point will be change / modified as per requirement.

HARMAN INDIA MANUFACTURING

ROAD MAP FOR ISO 50001 : 2018

Year	2022	2023	2023	2023	2023
Quarter	Q4	Q1	Q2	Q3	Q4
Stage	Project Kick off	Training & Documentation	Internal Audit	Stage I (Documentation Audit)	Stage II (Certification Audit)
Activities	Initial Planning	Awareness Training	Energy Assessment	Stage I Audit by (Certification body)	**Stage II (Certification) Audit by certification Body**
	Team Formation	Internal Auditor Training	Management Project	Analysis of findings	
		Documentation	Internal audit and Gap assessment	Closure of observations	
		Implementation	Closure of Gap		

THANK YOU

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