CII
National Award for Excellence in Energy Management 2023

Presented By

V. Pajanivelou – General Manager

C. Kumar – Asst. Manager

Company at a Glance

One of only two global full line automotive thermal solution suppliers in the world

Headquartered in Korea; listed on the Korea Exchange

Global 2022 sales of ₩7.4T

51 manufacturing sites
3 innovation centers

Presence in 21 countries across Asia, Europe, North America and South America

More than 21,000 employees

Hanon Chennai Plant

Profile

Established : 1997
Location : Maraimalai Nagar, Chennai
Shop Floor Area : 50,000 Sq. m
Employees : 1600

Product line


C/MODULE


FLUID TRANSPORT


COMPRESSOR


HVAC

Customers / Certification

IATF 16949

3

Key Product Lines
– Innovative Solutions for Automakers

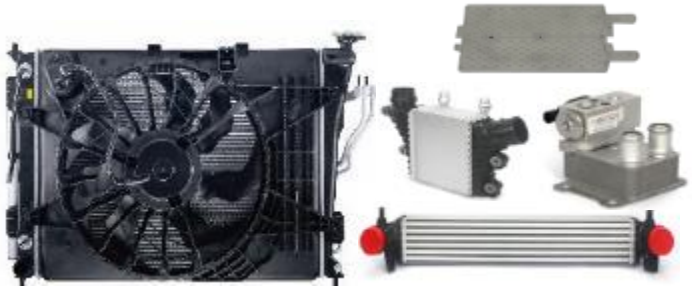
xEV & ICE Full Thermal Systems

- HVAC & Powertrain Cooling Systems
- Heat Pump Systems
- R134a, R1234yf & R744 Refrigerants
- Battery Thermal Management

Heating, Ventilation and Air Conditioning (HVAC)

Electronics and Fluid Pressure

Compressor



Powertrain Cooling / Heat Exchangers

Fluid Transport

Complete xEV and ICE Thermal Management Solutions Provider

Major Sources of Energy Loss

Design

Setting

Efficiency (OEE)

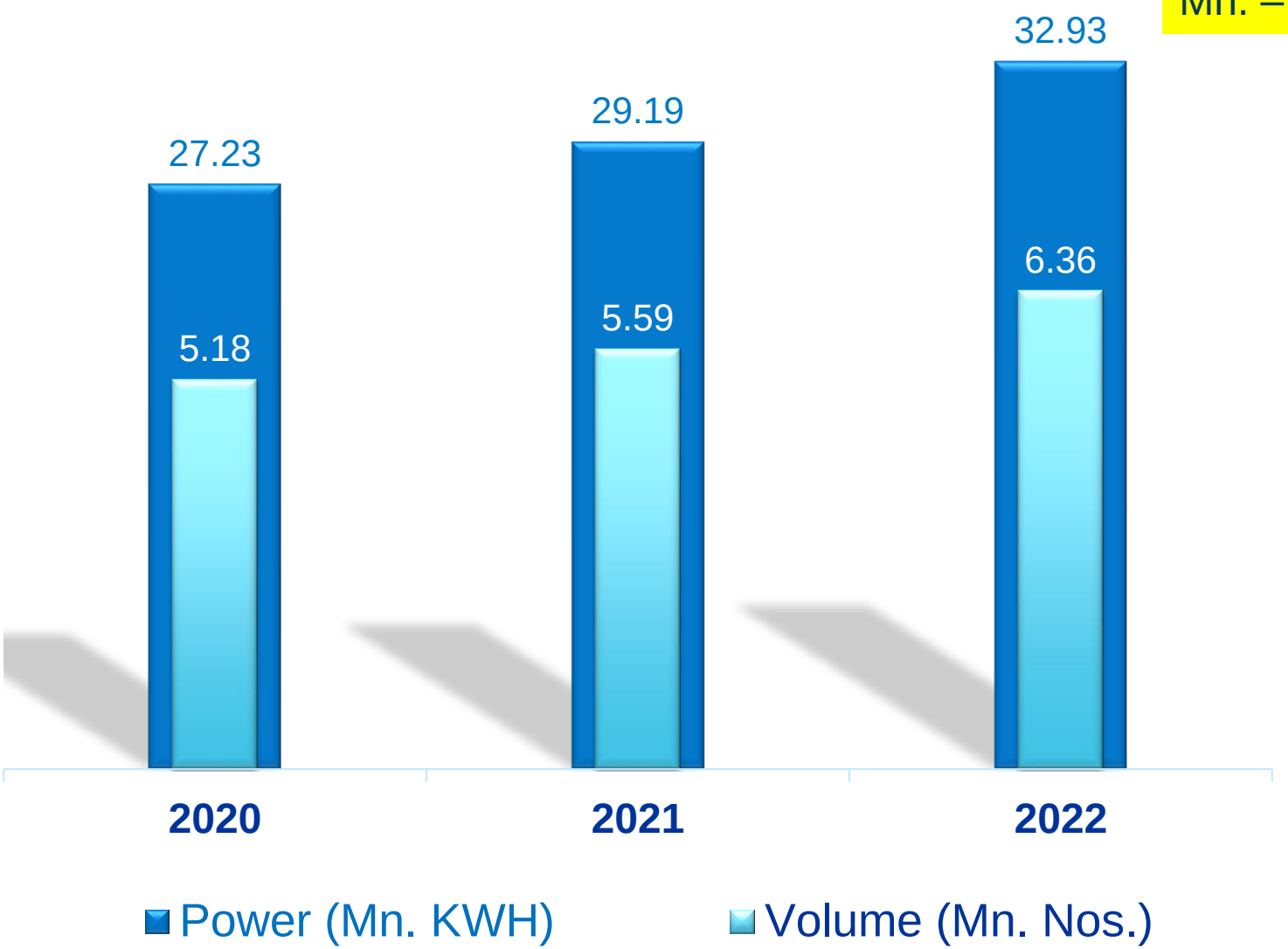
Maintenance

Technology

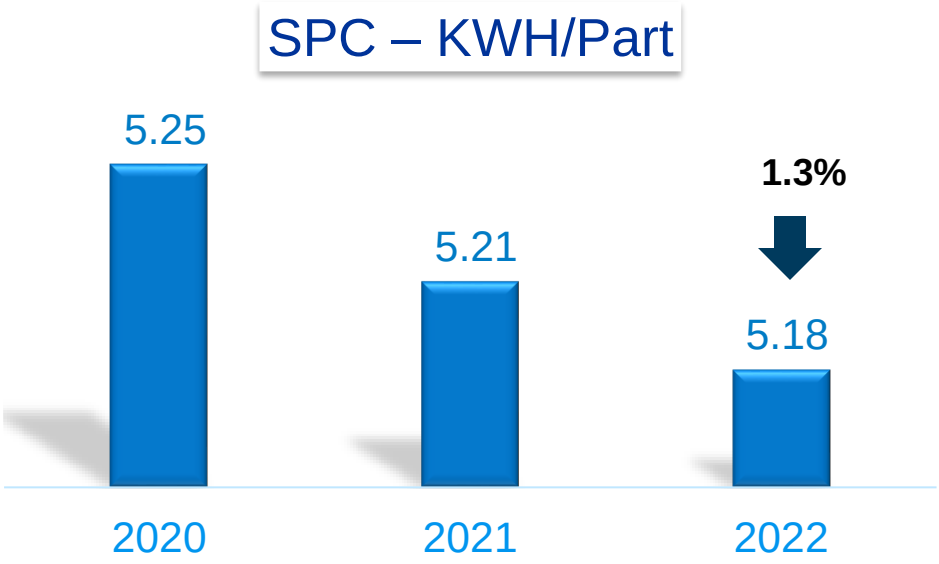
Knowledge

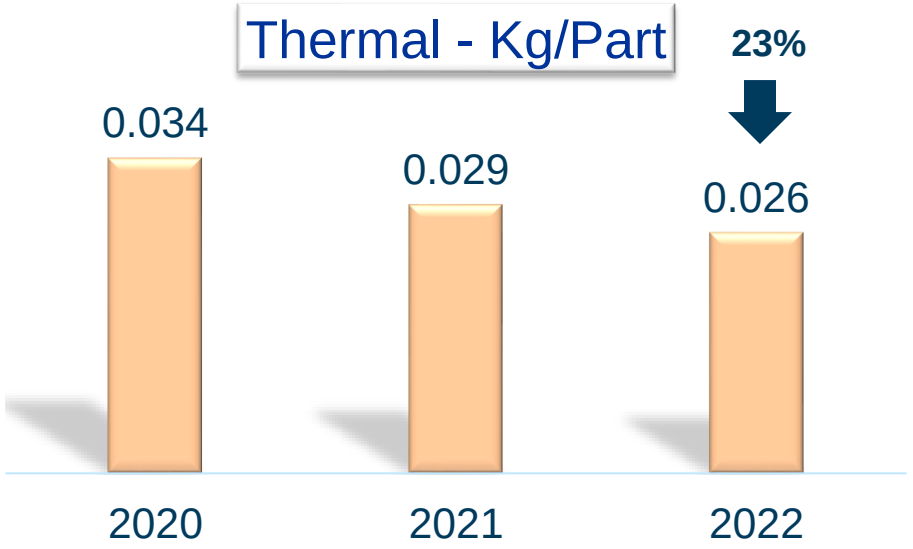
Energy Vs Volume

Mn. – Million



Specific Power & Fuel Consumption Trend (Plant)





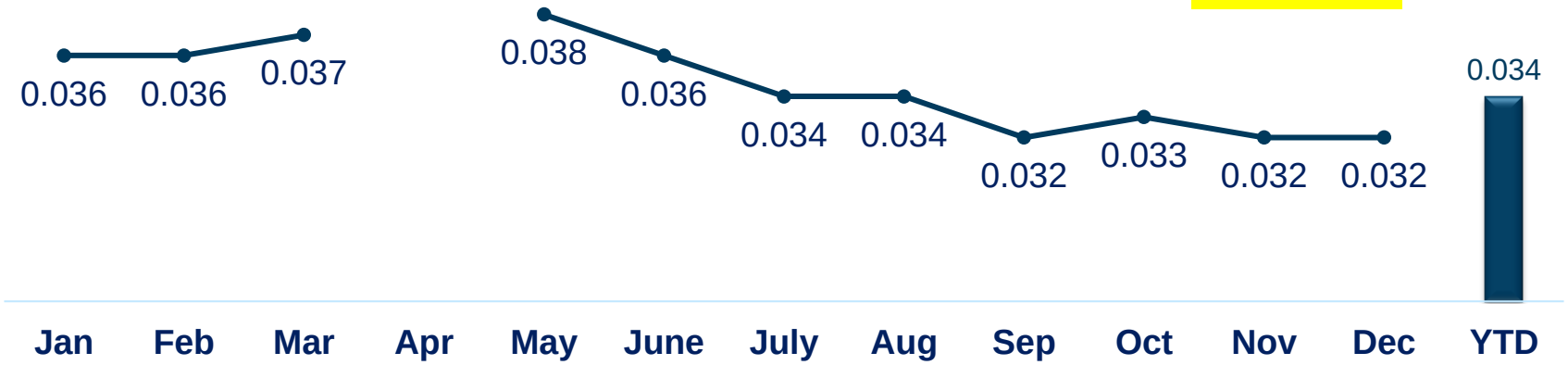
Specific Energy consumption Electrical & Thermal

KWH / Part

2020 Electrical

2020 Thermal

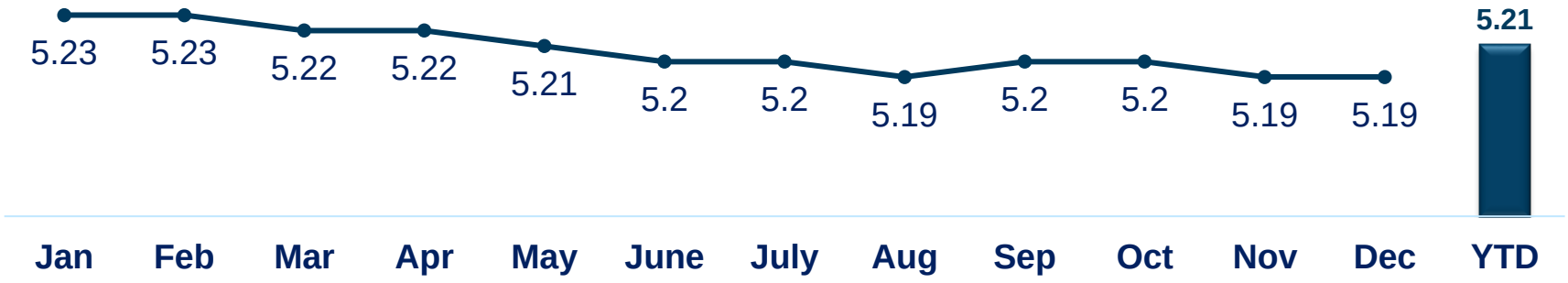
Kg / Part



Specific Energy consumption Electrical & Thermal

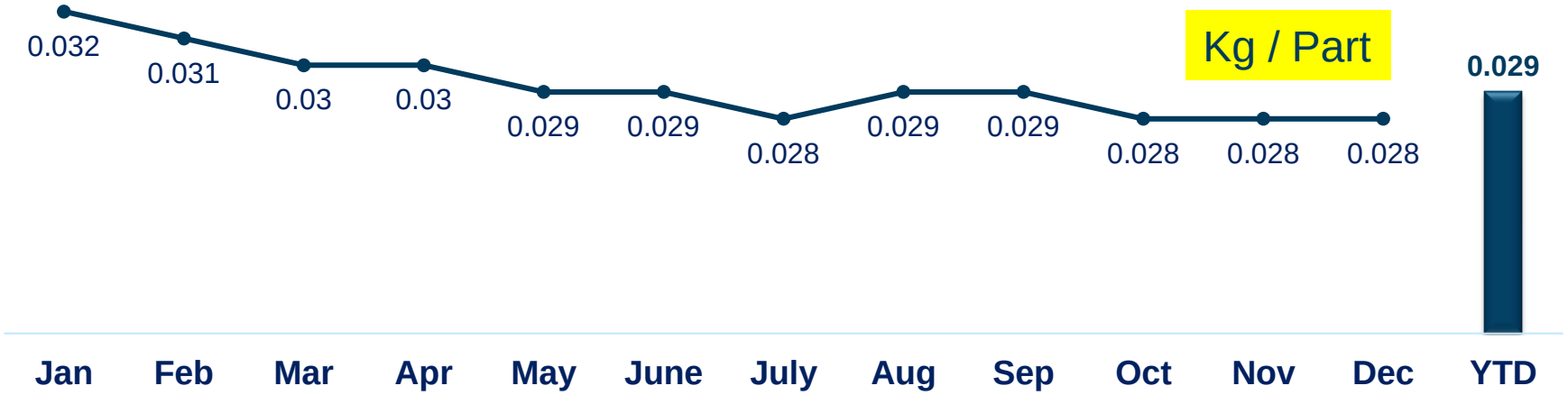
2021 Electrical

KWH / Part



2021 Thermal

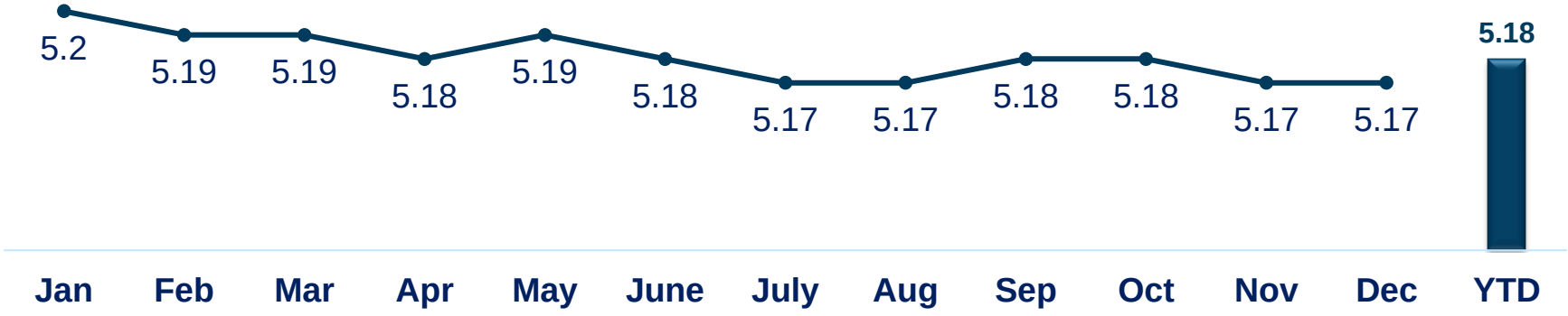
Kg / Part



Specific Energy consumption Electrical & Thermal

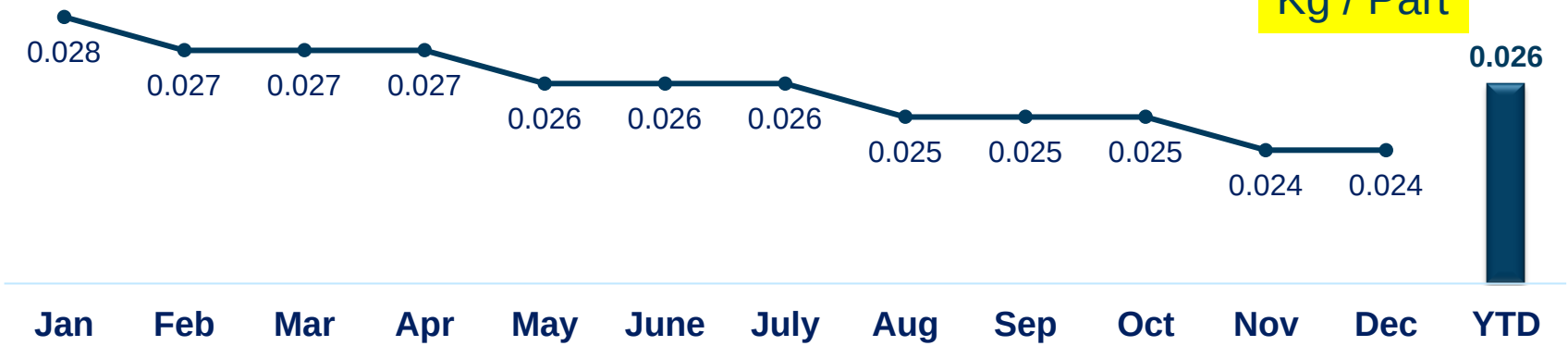
2022 Electrical

KWH / Part



2022 Thermal

Kg / Part



Reason for Variation (SPC & SFC)

Environmental factors

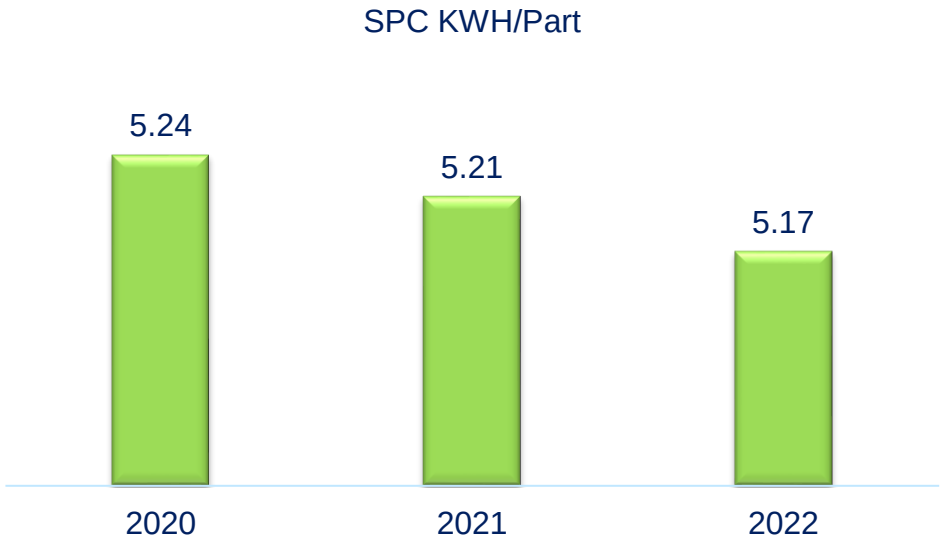
Volume fluctuation

Equipment performance

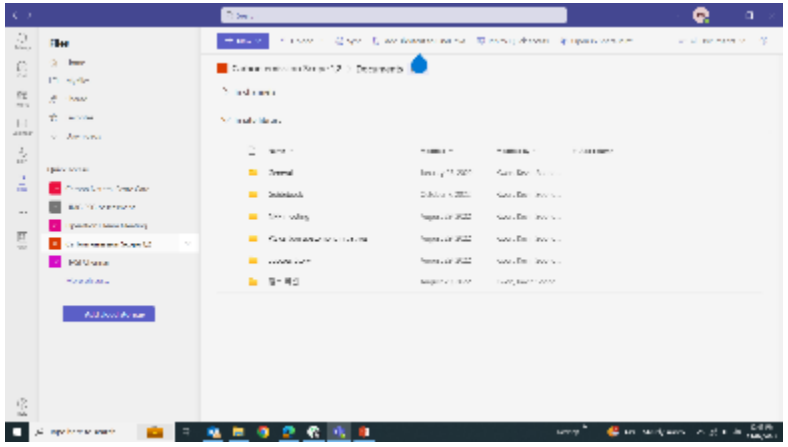
Product mix

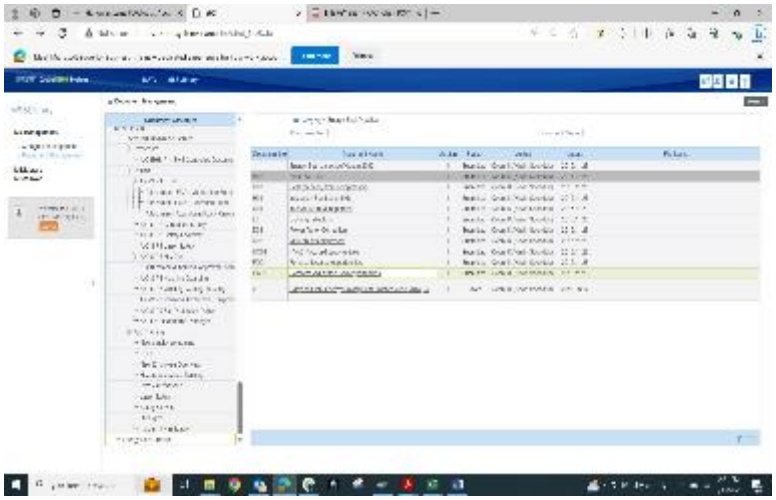
Load variations
(Part loading pattern)

Internal bench marking

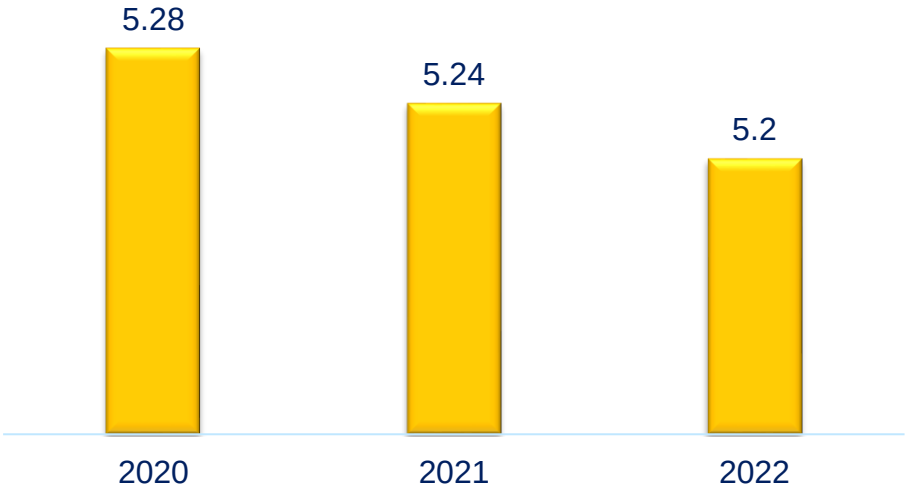


Daejeon S.Korea
(Global)





SPC KWH/Part



Bhiwadi India
(National)

Plan

Short term

Periodic Review

Continuous Improvement

Optimize Equipment usage

Energy Audit & Action

Long term

#1

- Continue Energy Conservation.
- Upgradation of machines.

#2

- Adopt Latest Technology
- Energy Efficient Equipment Selection

#3

- Overall Equipment Effectiveness.
- Automation

Major Econ projects 2023~24

Populate more BLDC Fans

Climate based Temperature in Chillers

Tube Forming Automation

Compressed Air auto Shut Off in machines

Demand based Compressed Air Pressure optimization

Solar Street Lights in inner Roads & Pathways

Summary - ECON Projects

Year	No. of Energy saving projects	Investment (Mn. INR)	Electrical savings (Mn. KWH)	Thermal Savings (Mn. Kcal)	Total savings (Mn. INR)	Payback period (In months)
2020	11	2.1	0.18	0	1.52	17.7
2021	14	1.9	0.25	154	1.41	15.6
2022	15	3.9	0.45	187	3.32	11
Total	38	10.7	0.82	341	6.2	14.7

Energy Saving projects 2020

Hydro pumping system

Savings

KWH : 11,000
₹ 0.85 Lacs.

Inv. & ROI

₹ 1.5 Lacs.
19 Months

HVLS fan

Savings

KWH : 37,000
₹ 2.83 Lacs.

Inv. & ROI

₹ 2 Lacs.
16 Months

Venturi type duct for Air compressor

Savings

KWH : 36,000
₹ 2.8 Lacs.

Inv. & ROI

₹ 0.15 Lacs.
2 Months

Air cooling jacket in furnace

Savings

KWH : 27,000
₹ 2.1 Lacs.

Inv. & ROI

₹ 4 Lacs.
23 Months

Temperature optimization

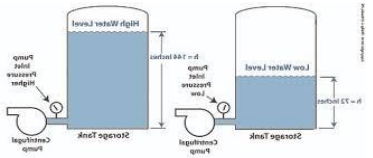
Savings

KWH : 37,000
₹ 2.86 Lacs.

Inv. & ROI

Zero
Immediate

Water column reduction



Savings

KWH : 8,000
₹ 0.61 Lacs.

Inv. & ROI

Zero
Immediate

LED street lights

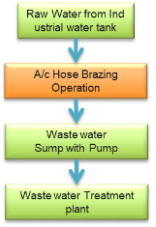
Savings

KWH : 12,000
₹ 1 Lac.

Inv. & ROI

₹ 1.8 Lacs.
22 Months

Water Reuse



Savings

KWH : 6,200
₹ 0.47,000/-

Inv. & ROI

₹ 1 Lac.
24 Months

Reservoir for pump suction line

Savings

KWH : 1500
₹ 0.1 Lac-

Inv. & ROI

₹ 0.15 Lac.
18 Months

Energy Saving projects 2021

Fin Mill Upgradation

Savings	Inv. & ROI
KWH : 38,000 ₹ 2.8 Lacs.	₹ 3.5 Lacs. 14 Months

Design change in Hydraulic power pack

Savings	Inv. & ROI
KWH : 16,000 ₹ 1.2 Lacs.	₹ 2 Lacs. 18 Months

Seven Days timer for fans

Savings	Inv. & ROI
KWH : 6,000 ₹ 0.45 Lacs.	₹ 0.05 Lac. 12 Months

BLDC Fans

10 Fans

Savings	Inv. & ROI
KWH : 7,480 ₹ 0.56 Lacs.	₹ 1.1 Lacs, 23 Months

Local Preheating system

Savings	Inv. & ROI
KWH : 20,000 ₹ 1.5 Lacs.	₹ 1.2 Lacs. 8 Months

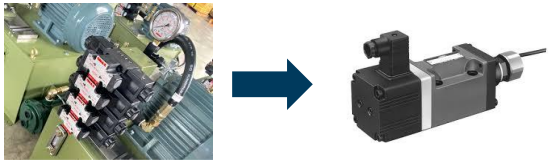
LPG Ionizer

Savings	Inv. & ROI
MKcl : 99 ₹ 1.1 Lacs.	₹ 2.2 Lacs. 24 Months

Header Forming Machine Upgradation

Savings	Inv. & ROI
KWH : 37,000 ₹ 2.8 Lacs.	₹ 5 Lacs. 19 Months

Hydraulic to servo



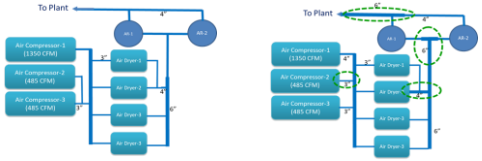
Savings	Inv. & ROI
KWH : 47,000 ₹ 3.5 Lacs.	₹ 2.5 Lacs. 7 Months

Condensation water use

Savings	Inv. & ROI
KWH : 1,700 ₹ 0.13 Lacs.	Zero Immediate

Energy Saving projects 2022

Header modification in air compressor



Savings	Inv. & ROI
KWH : 37,000 ₹ 2.8 Lacs.	₹ 0.45 Lacs. 2 Months

Cab furnace on sleep mode

Savings	Inv. & ROI
KWH : 72,000 ₹ 5.4 Lacs.	Zero Immediate

Exhaust fan automation

Savings	Inv. & ROI
KWH : 5,400 ₹ 0.41 Lacs.	Zero Immediate

Solar street light

Savings	Inv. & ROI
KWH : 12,000 ₹ 0.91 Lacs.	₹ 2 Lacs. 26 Months

Heat Resistance paint

Savings	Inv. & ROI
KWH : 11,000 ₹ 0.87 Lacs.	₹ 1.8 Lacs. 24 Months

Energy Efficient LPG torch & PID Controller

Savings	Inv. & ROI
MKcl : 126.5 ₹ 2 Lacs.	₹ 2.7 Lacs. 24 Months

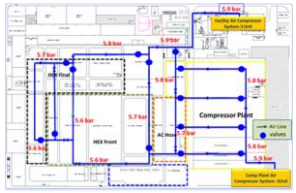
Hydro pumping system for Industrial water pump

Savings	Inv. & ROI
KWH : 23,000 ₹ 1.7 Lacs.	₹ 2.1 Lacs. 13 Months

Air compressor with VFD

Savings	Inv. & ROI
KWH : 140,000 ₹ 10.06 Lacs.	₹ 6 Lacs. 6 Months

PG wise compressed air isolation



Savings	Inv. & ROI
KWH : 120,000 ₹ 9.1 Lacs.	₹ 4 Lacs. 5 Months

Venturi System in Air Compressor (Innovative #1)

IMPROVEMENT

Was

Now

EFFECT

- Suction of Ambient air
- Inlet air Temperature >3° C
- Low density, less efficient.

- Suction of open atmospheric air thru' Venturi nozzles.
- Inlet air Temperature < 3° C of ambient air.
- Comparatively high efficient.

Benefits

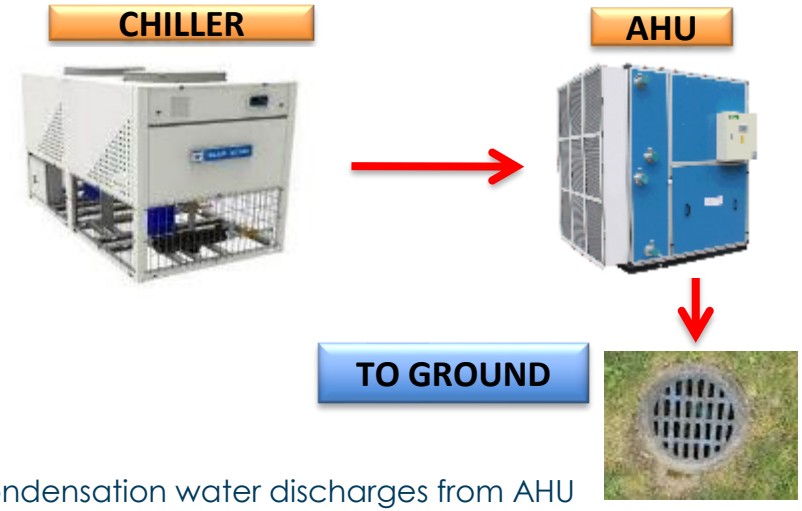
✓ **Energy Saved : 36,988 KWH / Annum**

Reduce Water consumption (Innovative #2)

Need of the Project:

Conserve water

Was:



- Condensation water discharges from AHU
- Water drained directly to ground
- Daily Condensation water generation 0.7 to 0.9 KL/day

Aim:

- Use condensation water for dish washer
- Eliminate RO water consumption for dish washer.
- Utilize the same water for chiller top-up

Now:

Result:

- **Water Conserved – 270KL /Annum**
- **Energy saved – 13,000 KWH / Annum**

Auto Loader for Tube Forming Machine (Innovative #3)

Need of the Project:

Monotones

Optimize Energy

Productivity

Was:

- Manual Loading / Unloading.
- One HC / Machine/Shift.
- Cycle time 12 Secs / Comp.
- Output 280 Nos. / Hour.
- KWH / Part high

Aim:

- Automate the tube Loading / Unloading .
- Optimize Energy Consumption & Cycle time.
- Optimize KWH / Part
- Increase hourly Output. (300 Nos. ⇧)

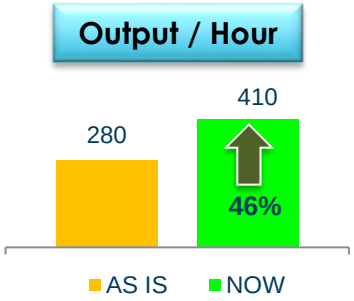
Action Taken:

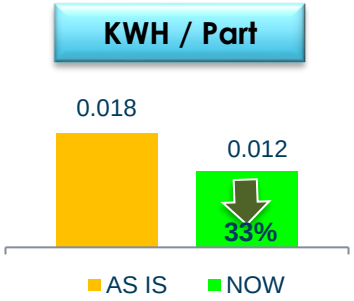
- Low Cost Design & concept by Hanon
- Auto Tube Loading / unloading system with hopper.
- Loader system interfaced with machine PLC.
- Complete machine operation Automized.

Now:

- Auto Loading / Unloading.
- .Optimized KWH / Part.
- Cycle time 8.5 Secs. / Comp.
- Output 410 Nos. / Hour.
- 0.2 Head Count / Shift for loading

Result:





H.D: Concept can be deployed to another 8 machines.

Renewable Energy sources

0.672 Mn KWH | 2% of Overall

2020

1.46 Mn KWH | 5% of Overall

2021

1.6 Mn KWH | 5% of Overall

2022

Capacity – 5 MWp each		
Wind	0.5 Mn KWH	2.0%
Solar	0.4 Mn KWH	1.5%

Capacity – 10 MWp each			
0.7 Mn KWH	2.5%	7.7 Mn KWH	24%
1.2 Mn KWH	4.6%	17 Mn KWH	52%

Waste utilization

Sl. No4	Year	Type of waste	Quantity (TON)	GCV	Waste as percentage of total fuel
1	2021 & 22	Used Oil	72.24	2383.9	100%
2	2021 & 22	Chemical waste	135.6	1627	100%
3	2021 & 22	Residues	1.2	18	100%

Sl. No	Type of Waste Generated	2021 (TON)	2022 (TON)	Disposal Method
1	Used Oil	28.98	43.26	Recycle
2	Residues	0.332	0.875	Co-Process
3	Phosphate sludge	45.84	35.21	Land filling
4	Chemical waste	74.3	61.3	Co-Process
5	Empty Bin	10.16	13.47	Recycle
6	Wood	51.9	58.2	Recycle

Emission intensity

Year	NO_2 (MT)	SO_2 (MT)	CO_2 (MT)
2020	0.967	0.005	0.029
2021	0.975	0.004	0.026
2022	0.935	0.009	0.018

Short term plan

- Optimize the Specific fuel consumption
- Emission control device for Diesel Generators - Installed

Long term plan

- Populate more Electronic control device
- Eliminate fossil fuels
- Adopting to latest technology

Energy Policy

HANON SYSTEMS	ENERGY MANAGEMENT SYSTEM MANUAL	REF	ANNEXURE 1
		REV	03
	ENERGY POLICY	DATE	21.12.2020
		PAGE	1 of 1

HASI – CHENNAI is committed to ensure in achieving continuous improvement in Energy Management in order to minimize the consumption and increase the energy efficiency of the plant, which will improve the environment and the organizational competitiveness.

Achieving excellence in Energy Management System is a plant wide responsibility and it ensures all the activities at HASI – Chennai, involved in the manufacture of automotive thermal management solutions (HVAC, Power Train Cooling, Fluid transportation and Compressors).

HASI – CHENNAI have developed an Energy Management System by promoting the efficient use of energy and other natural resources. This includes developing initiatives with customers, contractors and suppliers from Local, National and Global to maximize and promote the efficient use of energy.

As a part HASI – CHENNAI is committed to promote and initiate continuous improvement in Energy Performance is implicated to:

- Ensuring on improving the Energy efficiency through various aspects.
- Setting Energy objectives and targets for reduction of Energy Consumption through various formal and innovative Projects and reviewing at appropriate interval on the Development.
- Complying with all relevant legislation and other requirements
- Ensure the availability information on Energy Management System to all Employees and educate them in the Energy Savings, Latest technology and Environment impact. Involving them in Projects which motivates them and creates ownership.
- Supporting the purchase of energy efficient products and services, and design for Energy performance improvement.
- Ensuring the usage of Natural resources and green energy in process .

HASI – CHENNAI is committed in implementing Energy Management Systems in accordance with the ISO 50001 – 2018 Energy Management Standard.

HASI – CHENNAI will ensure the best practices related to Energy Management Systems will be shared with other Global Plants to minimize the Energy usage at Corporate Level target.

HASI – CHENNAI ensures the involvement of Top management for effective internal communication on Energy Management System and the definition of Objectives & energy indicators, the resulting obligations are complied. Also ensures the company's Long –term planning takes energy performance into account.

PREPARED BY	REVIEWED BY	APPROVED BY

Ensuring the usage of Natural resources and green energy in process

Hanon Energy policy Encouraging Green energy usage

Energy audit with supplier and out come

Hanon supplier Energy Audit Report -2022

Supplier : National Auto Plast

Plant Location : Oragadam-Kancheepuram

Date of Audit : 08/12/2022

Hanon supplier Energy Audit Report -2022

Supplier : Sundaram Auto Component LTD

Plant Location : Oragadam-Kancheepuram

Date of Audit : 08/12/2022

Energy Initiatives:

- Cooling tower cut off
- Machine ideal stop hyd. motor
- LED lighting.
- Individual controls of fans & lights.
- VFD installations & Blowers.
- Day light sheet at roof top of machining area
- Day light sheets at stores area.
- Roof top solar

Area to Improve:

- Day lighting can be improve through Roof top sheet replacement in office area
- Low cost Energy initiations can be introduced
- Energy monitoring can be improved cell wise
- Air leak can be audited
- VFD for pumps.
- Star rated air conditional recommended.
- Awareness to be created for bottom level employees
- Encouragement through Energy competitions among the employees.
- Introduce BLDC man coolers HVLS fans in shop floor.
- Increase roof top solar more areas.

Assessors : C.Kumar, P.Sakthivel

Participants : RajKumar,Karthik

Energy Initiations:

- Cooling tower VFD installation
- Smart sensor for air compressors utilization
- IMM hydraulic ideal stop
- Paint shop auto cut off lighting & VFD for blower
- Water temperature controller cut off for cooling tower with VFD
- Hyd. motor VFD
- Air leak audit
- LED lighting
- Kitchen exhaust auto cutoff
- 7 days timer for lighting systems
- Solar panel
- Shop floor Day light system implemented.
- HVLS fan
- BLDC fans

Area to Improve:

- Day lighting can be improve in gang ways, path ways & office area
- Motion sensor path way lighting at office area.
- Utility building day light system can be improved.
- Auto climate control device for Chiller plant

Assessors : V.Dinakarraja, A.Shanmugam

Participants : Karthick,Bhaskaran.

Initiatives in supply chain – 2021 ~ 2023

Vendor	Year	Name of Energy saving projects	Investments (INR Million)	Electrical savings (Million KWH)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Payback Period (Months)
National Auto Plast.	2021	Cooling Tower fan motor Cut off during ideal time	0.015	0.00679	0	0.0514	12
National Auto Plast	2021	VFD installation for Aeration blower	0.02	0.02	0	0.15	1.3
Sundaram Auto Comp	2021	Idle stop for Brazing exhaust system	0.04	0.015	0	0.11	4
Wonjin	2022	Day light roof sheet (Polycarbonate) in shop floor lighting	0.25	0.018	0	0.13	20
Sundaram Clayton	2022	Machine hydraulic idle stop programming	0	0.03	0	0.22	Immediate
Woory	2022	Down sizing the pump industrial water supply	0.074	0.019	0	0.14	5
Sundaram auto comp	2023	Temperature based Cooling tower fan motor operation	0.012	0.004	0	0.03	4
Sundaram Clayton	2023	Solar street light Installation	0.16	0.007	0	0.05	38
Wonjin	2023	Timer base chiller operation in assembly	0.01	0.029	0	0.22	1
Total			0.581	0.148	0	1.10	11

Energy conservation Awareness

Creating awareness to the School childre n's

Drawing competition fo r school childr en's

Elocution competition fo r school childr en's

Out come fro m drawing competition

Students participation

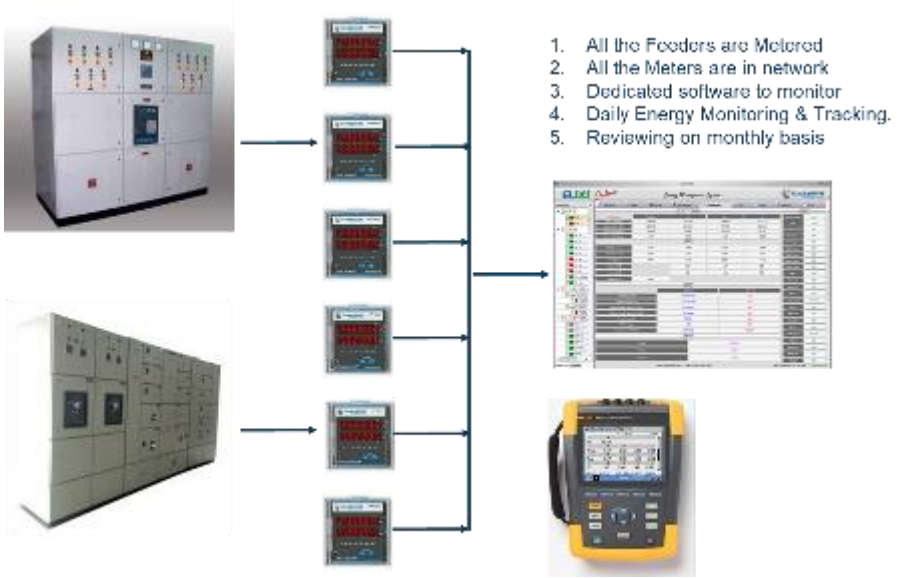
Price distribut ed for winners

Awareness session conducted in Thirukkachur Govt. High School

Awareness to Employees

EMS system & other requirements

Energy Monitoring system



1. All the Feeders are Metered
2. All the Meters are in network
3. Dedicated software to monitor
4. Daily Energy Monitoring & Tracking.
5. Reviewing on monthly basis

Learnings:

- Light pipe: CII
- HVLS fan: CII
- BLDC fan: SEEM

DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 282601-2019-AE-IND-RvA | Initial certification date: 03 April 2019 | Valid: 03 April 2022 – 02 April 2025

This is to certify that the management system of

Hanon Automotive Systems India Pvt. Ltd.

Keelakaranai Village, Malrosapuram Post, Malrosapuram, Chengalpattu - 603204, Tamil Nadu, India

has been found to conform to the Energy Management System standard:

ISO 50001:2018

This certificate is valid for the following scope:

Design, development & manufacture of automotive thermal management solutions, (heating ventilation & air conditioning, power train cooling, fluid transport & compressors)

Place and date: **Barendrecht, 28 March 2022**

For the issuing office: **DNV - Business Assurance, Zwolseweg 1, 2994 LB Barendrecht, Netherlands**

MGMT. SYS. RvA C 024

Erie Koek, Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV Business Assurance B.V., Zwolseweg 1, 2994 LB, Barendrecht, Netherlands - TEL: +31(0)102922689. www.dnv.com/assurance

Net Zero commitment

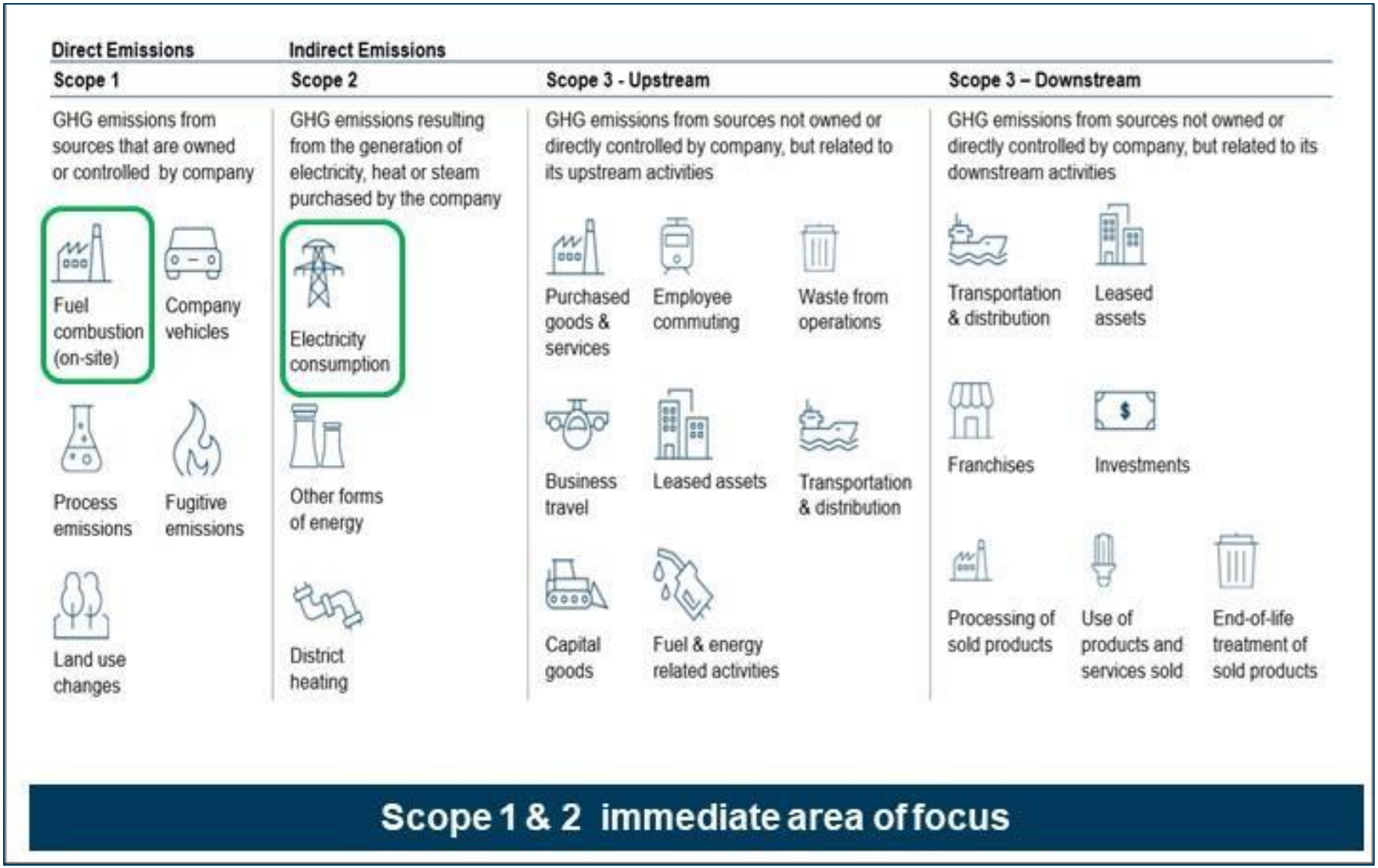
Overview of individual plant targets with respect to renewable electricity switch

<50% green | min. 50% green | 100% green

	To 2025			To 2030			To 2035		
Europe	Alba	Gebze	Palmela	Alba	Gebze	Palmela	Alba	Gebze	Palmela
	Bad Homburg	Hluk	Pecs	Bad Homburg	Hluk	Pecs	Bad Homburg	Hluk	Pecs
	Benevento	Ilava	Plovdiv	Benevento	Ilava	Plovdiv	Benevento	Ilava	Plovdiv
	Campiglione	Kladno	Retsag	Campiglione	Kladno	Retsag	Campiglione	Kladno	Retsag
	Charleville	Novy Jicin		Charleville	Novy Jicin		Charleville	Novy Jicin	
Americas	Alabama	El Paso DC	Queretaro	Alabama	El Paso DC	Queretaro	Alabama	El Paso DC	Queretaro
	Atibaia	Monterrey	Rivereno	Atibaia	Monterrey	Rivereno	Atibaia	Monterrey	Rivereno
	Belleville	Monterrey EFP	San Lorenzo	Belleville	Monterrey EFP	San Lorenzo	Belleville	Monterrey EFP	San Lorenzo
	Carey	Novi (AIC)	San Lorenzo 2	Carey	Novi (AIC)	San Lorenzo 2	Carey	Novi (AIC)	San Lorenzo 2
	Concord	Paso del Norte	Santa Fe	Concord	Paso del Norte	Santa Fe	Concord	Paso del Norte	Santa Fe
Korea	Asan	Daejeon	Ulsan	Asan	Daejeon	Ulsan	Asan	Daejeon	Ulsan
	Cheonan	Pyeongtaek		Cheonan	Pyeongtaek		Cheonan	Pyeongtaek	
China	Beijing	Chongqing	Nanjing	Beijing	Chongqing	Nanjing	Beijing	Changchun	Changzhou
	Changchun	Dalian	Shanghai	Changchun	Dalian	Shanghai	Chongqing	Dalian	Nanchang
	Changzhou	Nanchang	Yancheng	Changzhou	Nanchang	Yancheng	Nanjing	Yancheng	Shanghai
Rest of Asia	Bhiwadi	Gujarat	Thailand	Bhiwadi	Gujarat	Thailand	Bhiwadi	Gujarat	Thailand
	Chennai	Pune		Chennai	Pune		Chennai	Pune	

Group locations (e.g., Novi): Scope 2 to be decarbonized by 2030 in two steps

Net Zero commitment

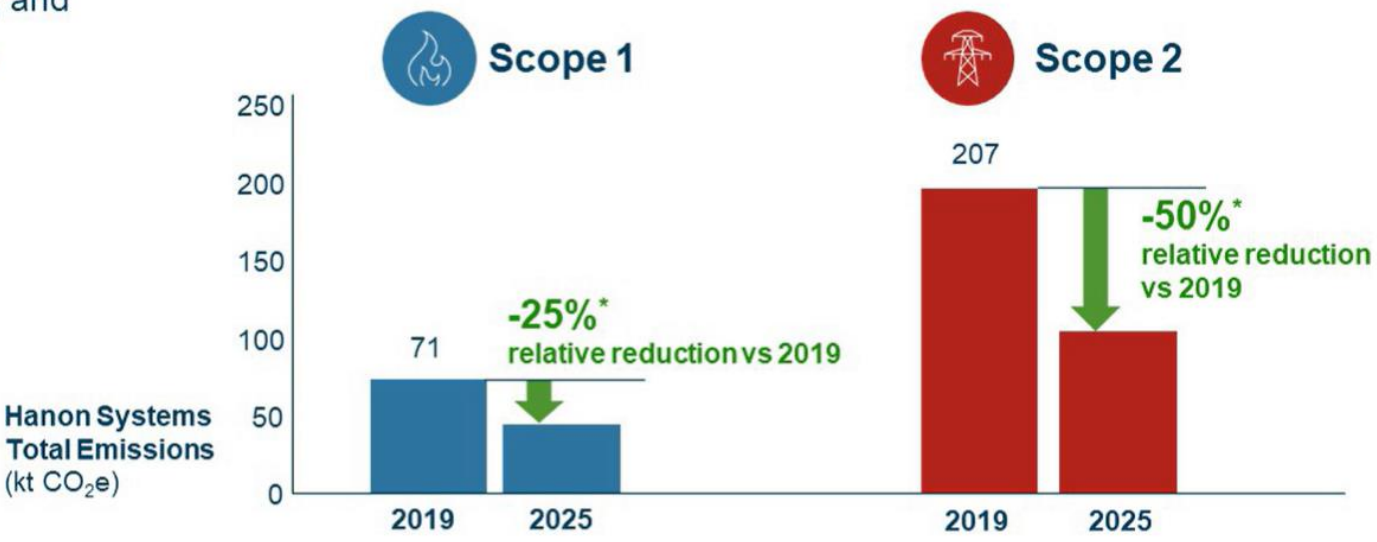


Emission Reduction - Target

Take Action

Understand the site's Scope 1 and 2 greenhouse gas emissions (in tCO_2e)

- 2019 baseline
- current state; and
- 2025 targets



*Target dependent on site

GHG Initiatives & Road Map - Consolidated

2019 ~ 2020 — *Scope #1 to #2*

- LPG Burners into Electric Heaters.
- Miyawaki - Urban Dense Forestation.
- Upgrade machines – Energy Efficient.

2021 — *GO Green Ph. #1*

- 540 KWp In-house Solar plant.
- Solar Power from 3rd Party. (PPA)
- Zero Water Discharge.

2022 — *GO Green Ph. #2*

- 750 KWp In-house S olar plant.
- Wind & Solar Power for Day & night use.
- Miyawaki Urban Forestation.

2023 Plan — *GO Green Ph.#3*

- 1.9 MWp In-house Solar plant.
- LPG Brazing to Induction Brazing
- LPG heating to Electric heating.

2024 & Way — *GO Green Cont. d*

- Zero-in the Direct Emissions (Scope#1).
- Extend Induction bra zing tech. to all PG's
- 100% Green Power.

Scope 1 to 2	Go Green Phase 1	Go Green Phase 2	Go Green Phase 3	Go Green Continued
 LPG to Electric	  540KWp Solar/ Zero Discha rge	  750 KWp & Miyawaki	  1.9 MWp Solar & FT Inducti on Brazing	 HEX Induction Brazing

Consumed 80% Renewable Power (26 Mn. Units) & Carbon⬇ – 17000 MT (Y2022)

Awards & Credentials

2021 SEEM

2020 SEEM

2019 SEEM

2018 SEEM

2017 SEEM

2016 CII

2014 CII

2010 CII

Excellence in Energy Management

THANK YOU