CII National Energy Award for Excellence in Energy Management

2021

AGI glaspac

Presenter:

Mr. Naresh Madaan

Head- Plant Engineering

BEE certified Energy Auditor

Brief Introduction Of Company

HSIL Ltd., Packaging Products Division, AGI glaspac (better known as AGI) established in the year 1972, are engaged in the manufacture of high quality glass containers to meet the stringent and demanding quality standards for the packaging needs of Food, Pharmaceuticals, Soft Drinks, Spirits, Beer, Wine and other industries.

AGI glaspac, Hyderabad is one of the constituents units of the HSIL Limited under Packaging and Products Division. The plant is situated at Borabanda, Hyderabad in 33 acres and established in 1972 and presently employing about 1150 persons. The factory has been set up for the manufacture of container glassware. The plant has the installed capacity to melt about 600 tones per day with its two furnaces

AGI has positioned itself as one of the leading container glass manufacturer in the country with two state of the art manufacturing facilities, one in Hyderabad and the other at Bhongir (Telangana)

HSIL BUSINESS DIVISIONS

HSIL

Building Products Division

Amore

QUEO

ALCHYMI hindware

hindware ITALIAN COLLECTION

hindware Start with the expert

hindware ART

BLUELAVE

VITREOUS SINCE 1960

RAASI

Packaging Products Division

AGI glaspac

GP

AGI CLOZURES

Manufacturing Process of Glass Containers

RAW MATERIAL

BATCHING PROCESS

MELTING PROCESS

FORMING PROCESS

ANNEALING PROCESS

INSPECTION PROCESS

Defective bottles Through Rejection Conveyor

Defective bottles Through Rejection Conveyor

OK

WARE HOUSE PROCESS

OK

Customers

PRINTING PROCESS

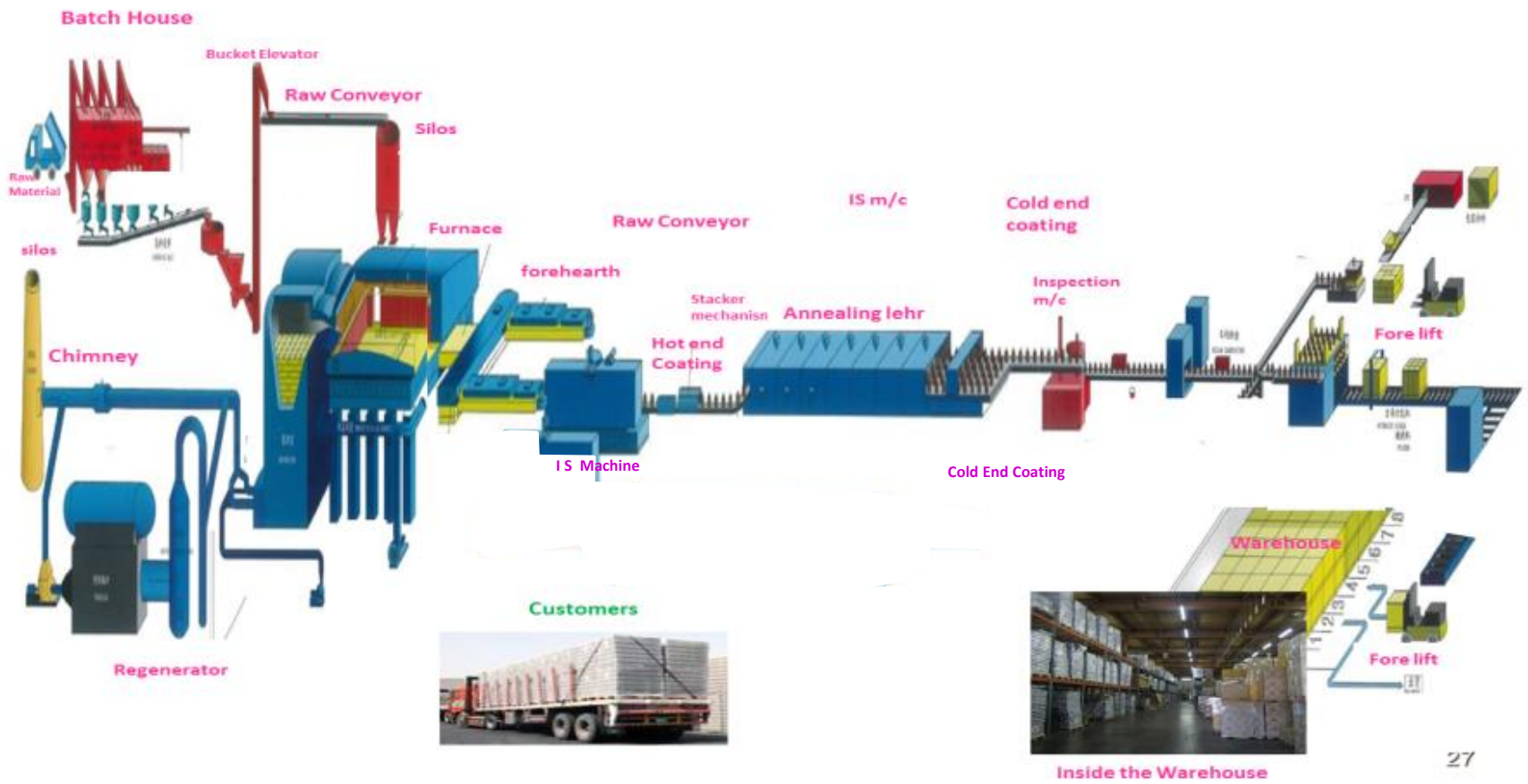
INSPECTION PROCESS

Defective bottles

OK

REJECTION

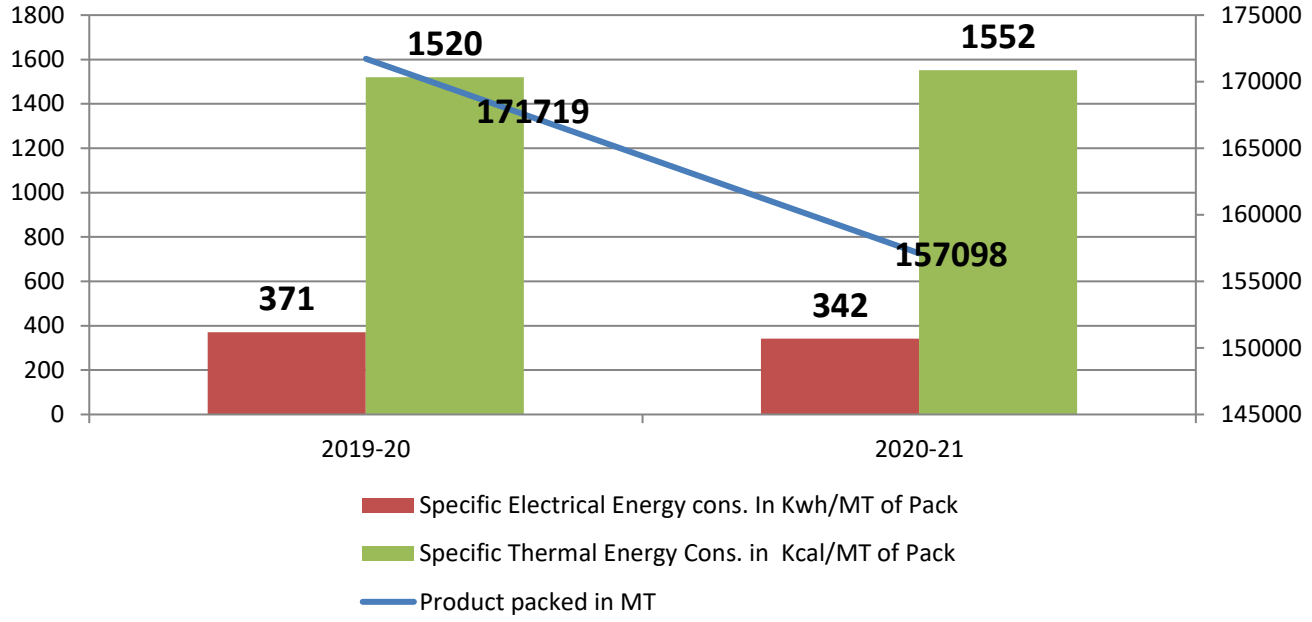
Manufacturing Process of Glass Containers – 3D Lay out



Certificates

FSCC 22000	ISO 9001:2015	ISO 14001:2015	ISO 45001: 2018	ISO 50001: 2018	ISO 15378:2017

Impact Of Covid-19



What changed due to Covid -19 ?

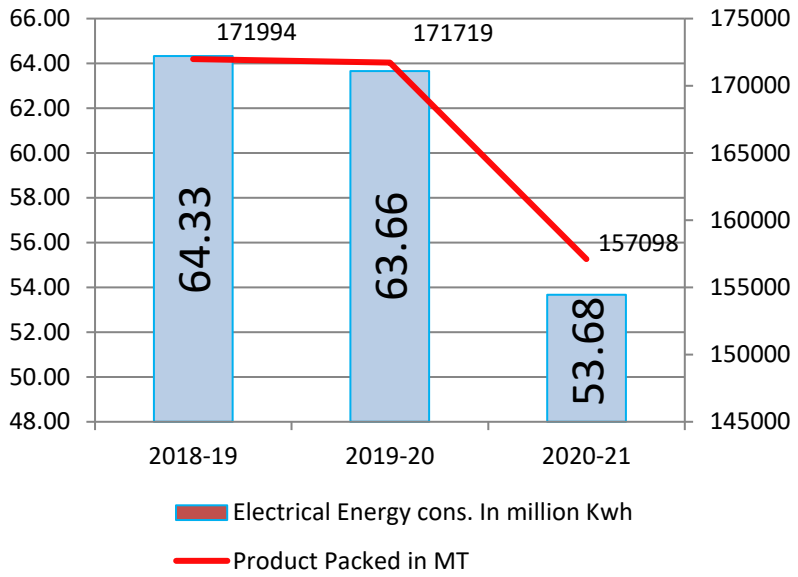
↗ Production decreased **by 8.5 %**

↗ Thermal Energy increased **by 2.5 %**

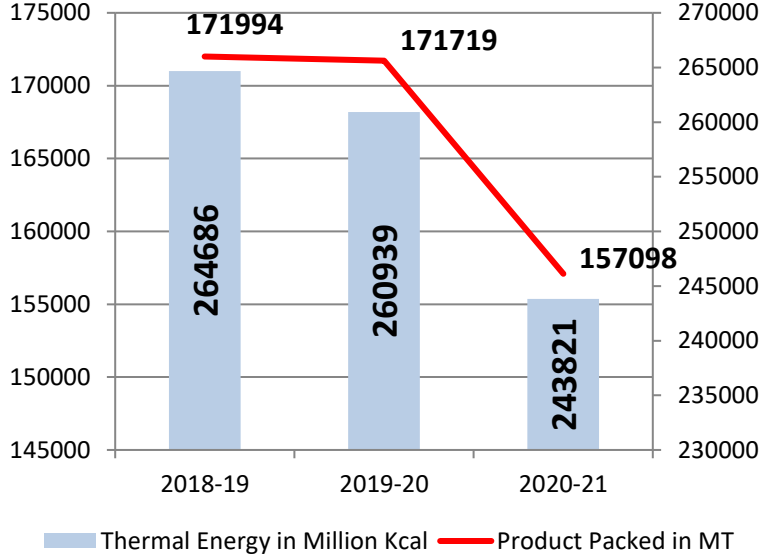
↗ Electricity consumption decreased **by 10.5 %**

Electrical & Thermal Energy consumption

Electrical Energy cons. in million Kwh



Thermal Energy Cons. In million Kcal



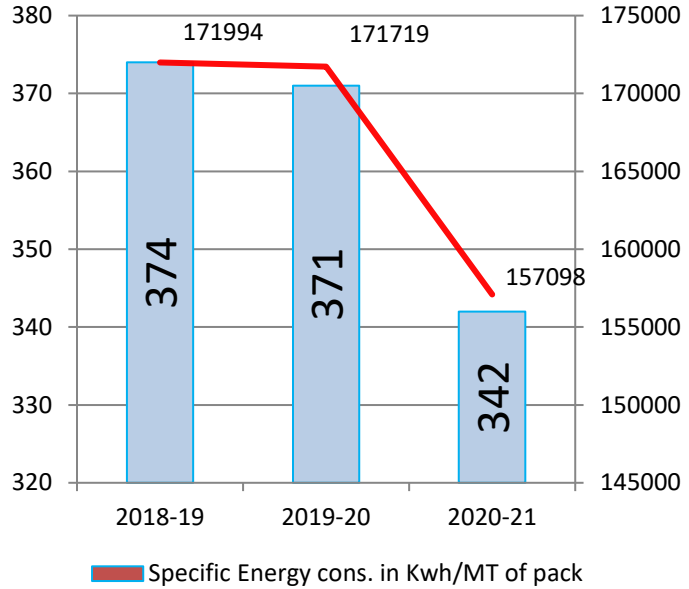
What changed in 3 years ?

↗ Electricity consumption decreased **by 16.55 %**

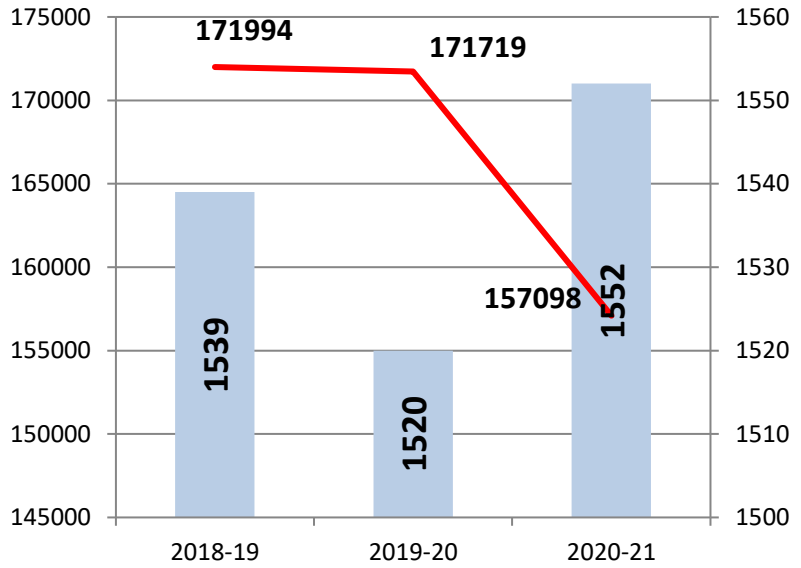
↗ Thermal Energy Consumption decreased **by 7.88 %**

Specific Energy Consumption

Specific Electrical Energy cons. in Kwh /MT of pack



Specific Thermal Energy Cons. In Kcal/Kg of pack



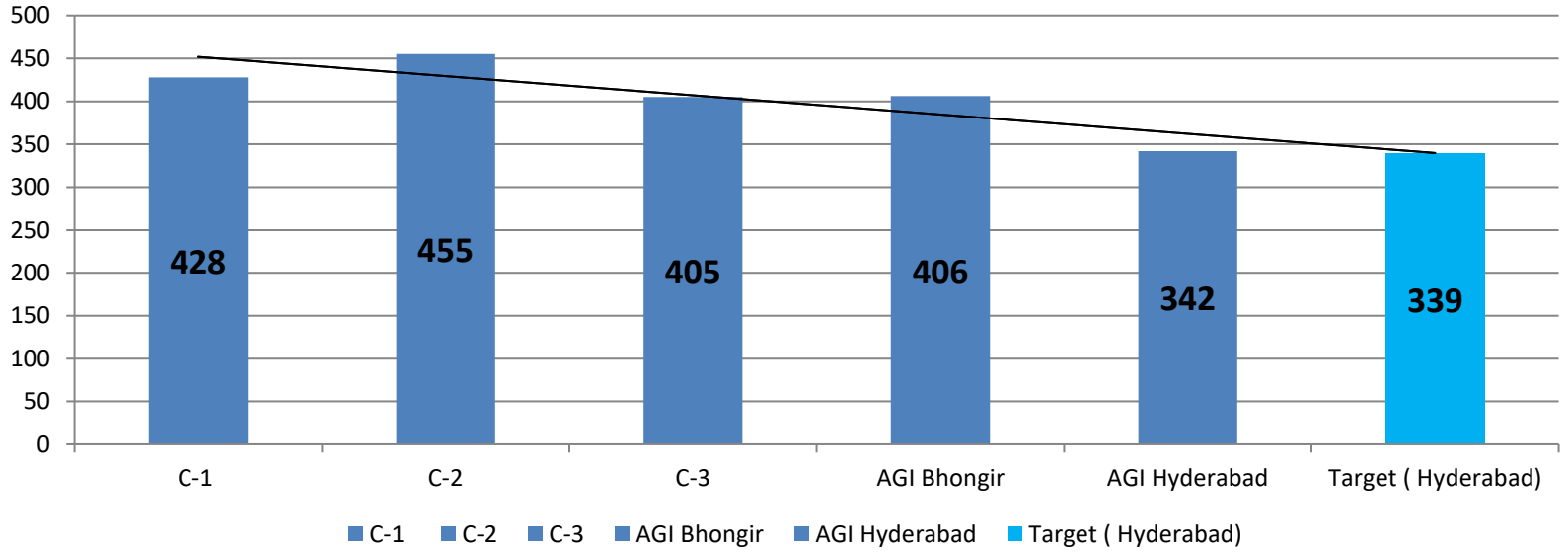
What changed in 3 years ?

↗ Electricity consumption decreased **by 7.81 %**

↗ Thermal Energy Consumption increased **by 0.84 %**

Information On Competitor/ Benchmarking

Specific Electrical Energy consumption benchmarking w.r.t competitors and our other own plant KWH/MT of pack 2020-21



Energy Saving Projects implemented in Last Three Years

Year	No. of energy saving Projects	Investment (INR Million)	Electrical Savings million (kWh)	Thermal Saving Million Kcal	Saving INR Million	Impact on SEC(Electrical)	Impact on SEC (Thermal)
2018-19	**3**	**1.18**	**0.071087**	**482.38**	**2.39**	**0.4**	**2.8**
2019-20	**3**	**66.7538**	**0.314265**	**5606.4**	**22.52**	**1.8**	**32.6**
2020-21	**7**	**8.632**	**3.210285**	**0**	**13.804**	**20.4**	**0.0**

Energy Saving Projects implemented in 2018-19

Title of the Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving in Rs Million	Annual Thermal Saving Million Kcal	Annual Thermal Cost Saving in Rs Million	Total Annual Savings in Rs Million
Lehr height decrease for Lehr 11 & 16 to save energy	NA	NA	482.384	1.94	1.94
Replacement of conventional lights with LED	54750	0.35	NA	NA	0.35
Replacement of oversized conveyor motor with suitable size	16337	0.10	NA	NA	0.10

Energy Saving Projects implemented in2019-20

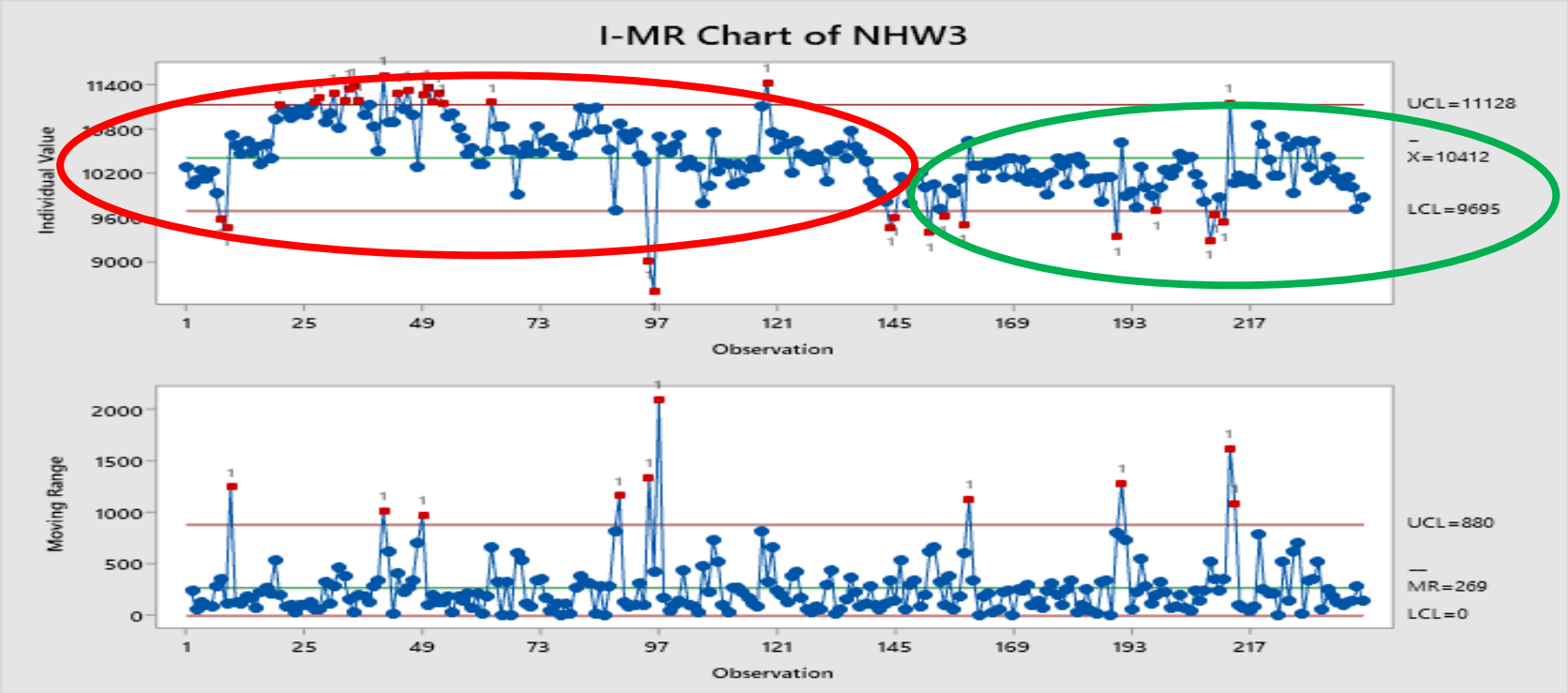
Title of the Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving in Rs Million	Annual Thermal Saving	Annual Thermal Cost Saving in Million Rs	Total Annual Savings in Million Rs
Replacement of Bell mouth of NHWII blowers	249295	1.60	NA	NA	1.60
Replacement of conventional lights with LED	64970	0.42	NA	NA	0.42
Replacement of checkers of NHWIII Furnace regenerator	NA	NA	5606.4	20.50	20.50

NHW3 MCB Suction type changed to Bell Mouth

NHW 3 300HP No.1

Changed to Bell Mouth

NHW 3 300HP No.1

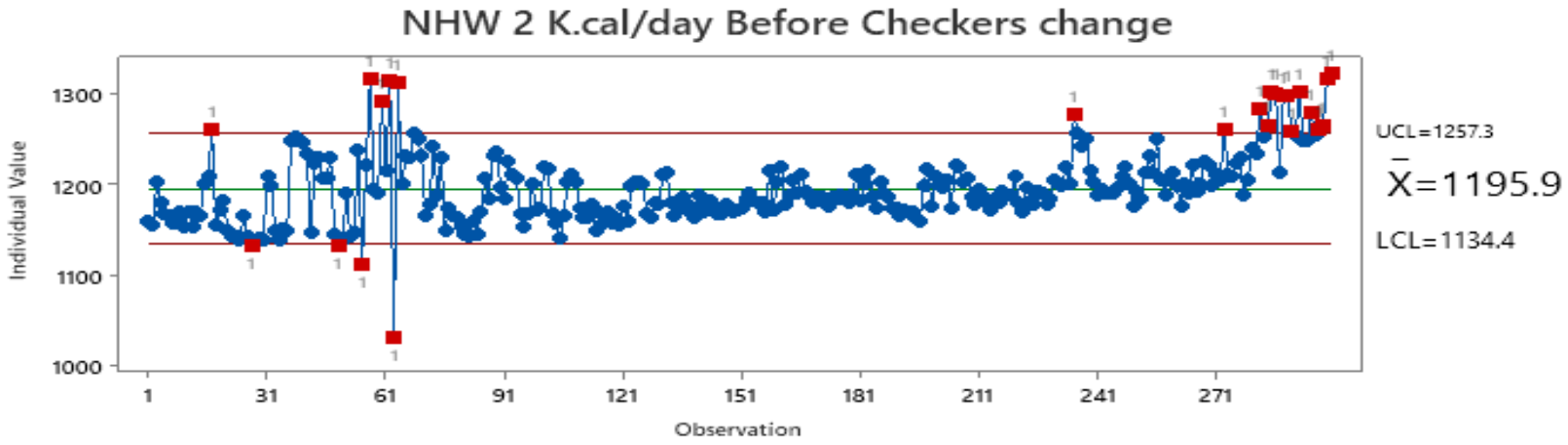


INFERENCE: After replacing Mould cooling blowers suction with bell mouth type the Energy **saved 683 units per day**

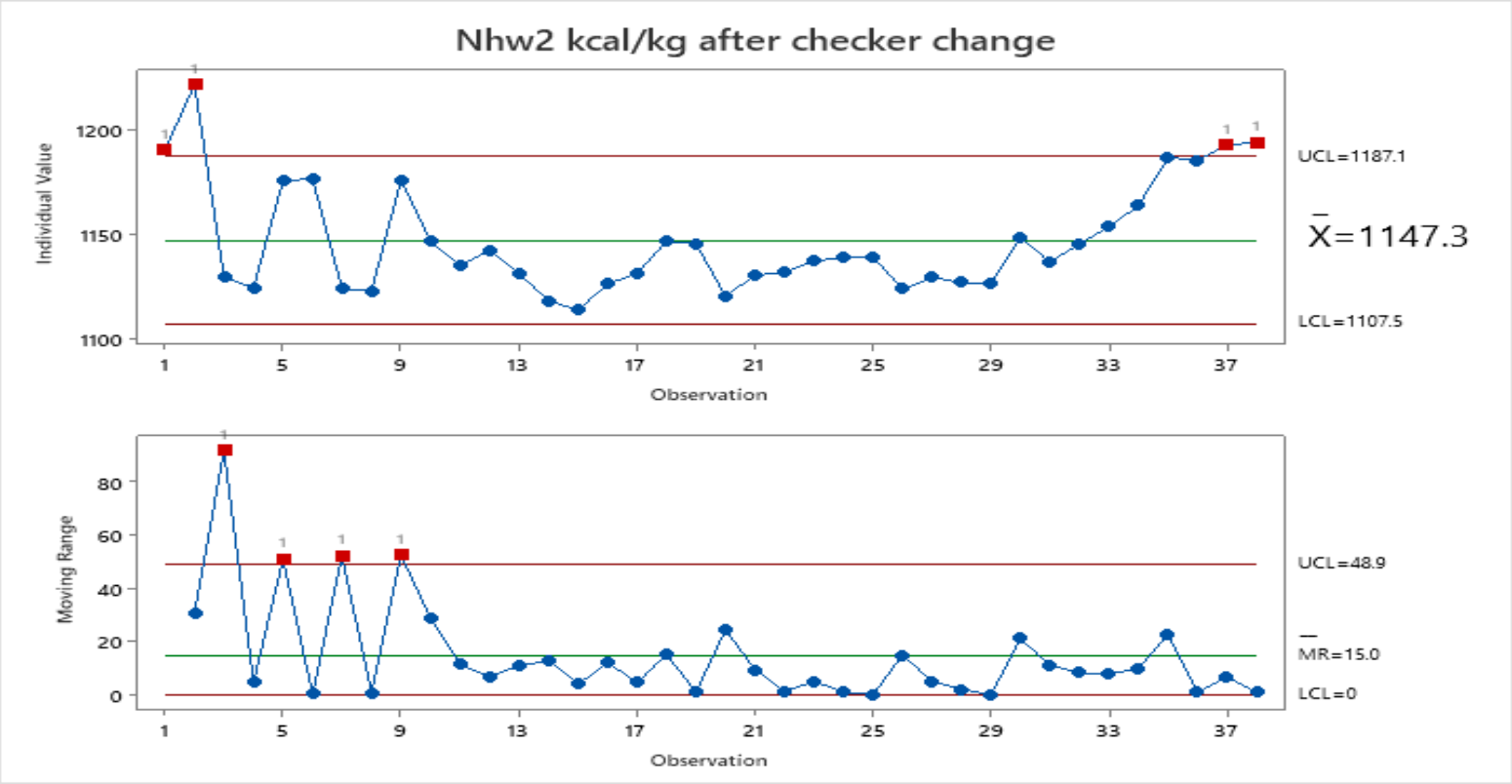
AGI glaspac

Energy Saving Projects implemented in2019-20

Energy Saving Projects implemented in2019-20



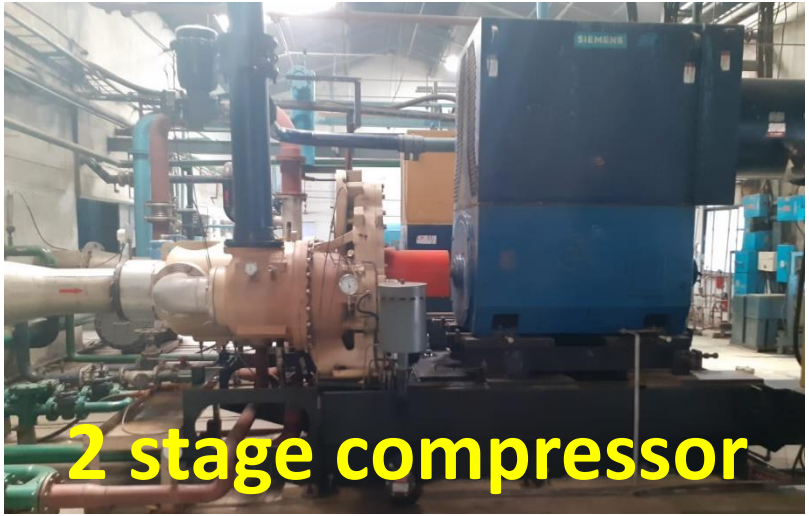
Energy Saving Projects implemented in2019-20



Energy Saving Projects implemented in 2020-21

S.N.	Improvement Projects in Electrical Energy conservation	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving (Rs Lacs)
1	conversion of 3 stage centrifugal compressors to 2 stage compressors	716240	44.48
2	Installed individual energy efficient blower for line no.-11	408070	25.34
3	Wartsila DG internal circuit water heating with Solar	146000	9.07
4	Replaced 3" control valves with 4" control valves at Line 11 & 17 to reduce pressure drop	65700	4.08
5	Modification of inlet line of line no. 11,13,15,16 & 17 to reduce pressure drop	81395	5.05
6	Standby fuel heating reduced from 80 deg C to 45 deg C	320470	19.90
7	Replaced 4 Nos. valves before dryers in compressed air line to run separate LP & HP header	93805	5.83
8	Increased performance of NHWII blowers after modifing the drive cooling system	689850	42.84
9	Increased performance of NHWIII blowers after modifing the drive cooling system	470485	29.22
	Total Saving er Annum in Rs (Lacs)		185.80

Conversion of centrigual compressor from 3 stage to 2stage



Parameter	3 Stage Compressor	2 Stage Compressor
SEC (KW/cfm)	0.113	0.099
Difference (KW/cfm)		0.014
Energy saving MWH/Annum		716.24
CO2 reductions MT/Annum		**573**

DG WATER HEATING THROUGH SOLAR

- Installed Solar heater to heat engine water.
- Saved 146 MWH/Annum electrical energy
- CO_2 reduction 120MT/ annum

Energy Saving Projects through Kaizens

KAIZEN IDEA SHEET

THEME:	PILLAR	JH	KK	PM	QM	IC	SHE	E&T	OTPM
Power saving in LSHS oil Heaters and increased reliability of Temp Measurements at 400KL skid	LOSS								
	P	Q	C	D	S	M			

DEPARTMENT	Electrical
MACHINE	NHW 3 400KL Tank Skid
BENCH MARK	720 KWH /day
TARGET:	400 KWH/day
START DATE:	30-09-2020
FINISH DATE:	01-10-2020

MEMBERS

T.N.Srinivas Raju,Chandrasekar, Kaushal Sirohi

PROBLEM/PRESENT STATUS:

Present heaters control is working with Thermostat which is not accuractely working and causing power loss for heating LSHS oil at 400KL skid

KAIZEN IDEA:

Replacement of Thermostat with Thermocuple and Temperature controller to ON/OFF heaters accurately.

COUNTER MEASURE:

Arangement of thermocuple and temperature controller in place of thermostat.

BEFORE: **AFTER:**

BENEFITS:

) Heaters Controlling will be accurate 2) Processed and setting
alue of temperater visible clearly
)Power Saving of 300 Units/Month

ANALYSIS:

Why-I: *Heaters are controlling with Themostat*

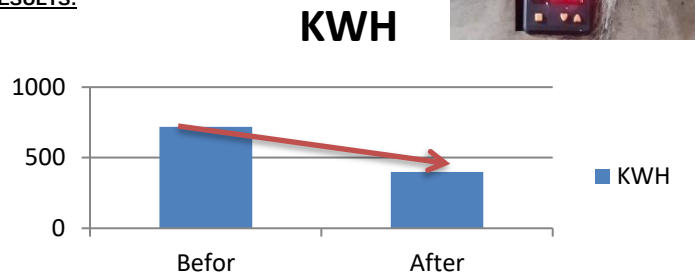
Why-II: *Thermostat installed near the power terminals, gettingheated up and not controlling accurately*

Why-III:

Root Cause:

Thermostat Not controlling accurately

RESULTS:



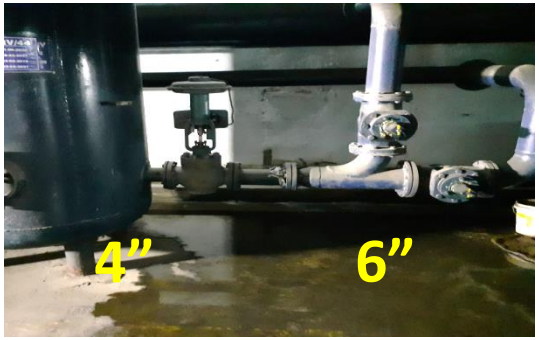
Befor	After
KWH 720	400

H/D PLAN:

M/c No	Resp.	Target Date

Energy Conservation Projects

Before



M/C 13 HP Line

After

M/C 13 HP Line

D.P Before Modified (PSI)	D.P After Modified (PSI)
13 HP	13 HP
1.6	0.5

M/C 11 HP Line

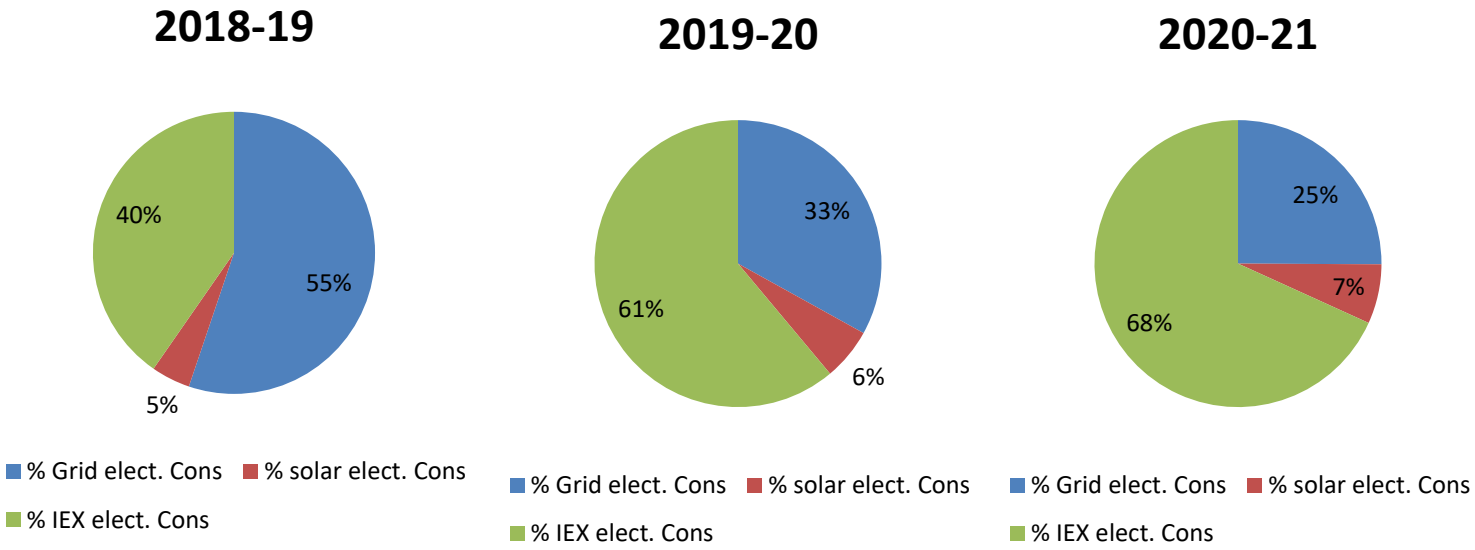
M/c 11 HP Line

D.P Before Modified (PSI)	D.P After Modified (PSI)
11 HP	11 HP
1	0.2

Utilization Of Renewable Energy Sources

Year	Technology (electrical)	Type of energy	Onsite/offsite	Installed capacity in MW	Generation in Million KWH	Impact on SEC(Electrical)	%age of overall electrical energy
2018-19	Electrical	Solar	Offsite	3	2.88	16.7	4.5
2019-20	Electrical	Solar	Offsite	3	3.73	21.7	5.9
2020-21	Electrical	Solar	Offsite	3	3.59	22.9	6.7

Utilization Of Renewable Energy Sources



	2018-19	2019-20	2020-21
RPO Obligation	**6%**	**6.5%**	**7%**

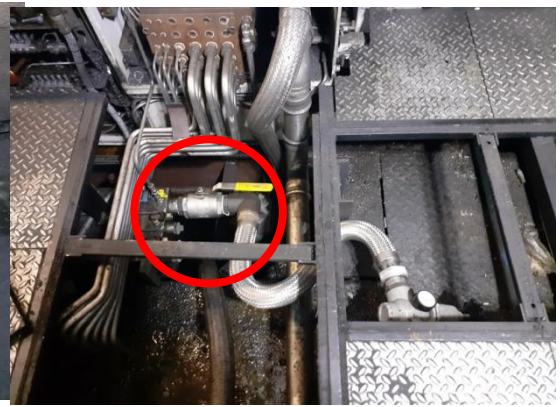
Roof top 996.96KWp solar power plant installed in 2020-21 under OPEX model.
Operation started on 08th May-21

Utilization Of Renewable Energy Sources

Roof Top Solar Installation

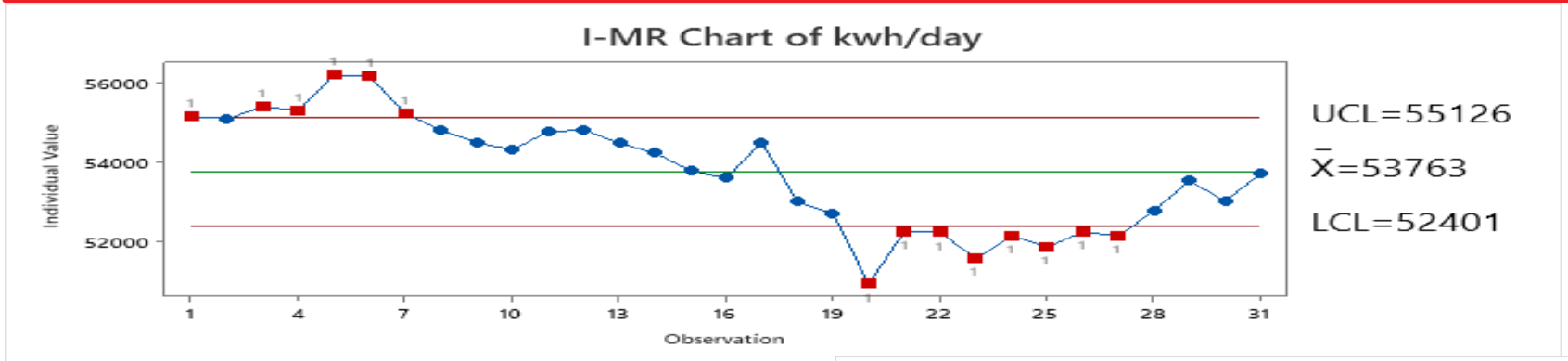
- Grid Connected Solar Installed capacity: 996.96kWp
- Date of Installation : 08.05.2021
- Type of Installation : Roof Top
- Unit Generation per year : 1460Mwh/year

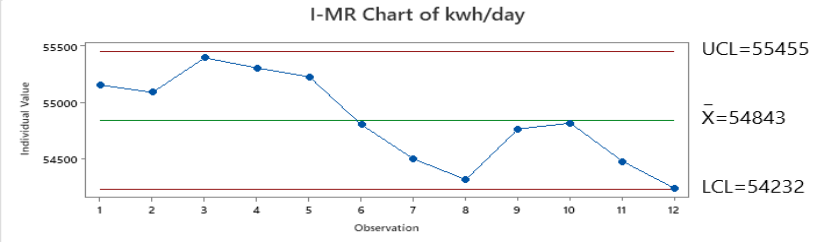
Innovative Project

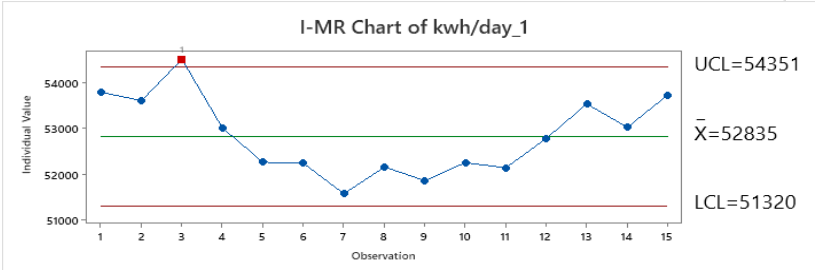


Modification of Blank closing line single operation from HP to VHP to reduce main header pressure
Special line connected to this blank closing operating line

Modification of 17 Blank closing line from HP to VHP







Modification of Blank closing line from HP to VHP
to reduce main header pressure .
Before Modification Total compressed air consumption:54843 Kwh/day
After modification compressed air consumption:52835 Kwh/day
Saved : 2008Kwh/day

Waste Utilization And Management

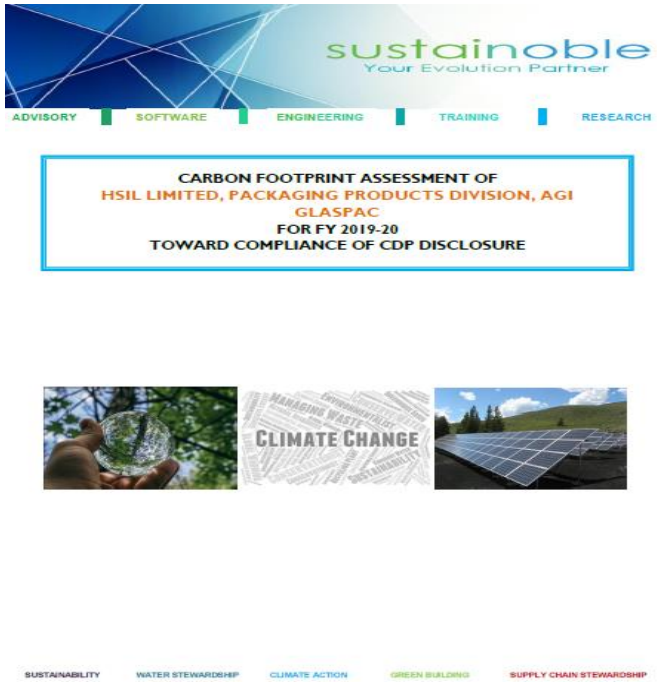
- Recycling of cullet after washing and separation of foreign material by using eddy current. 100% cullet used back in batch.
- ETP sludge, waste oil, cotton waste and hand gloves are given to PCB authorized vendor for recycling.

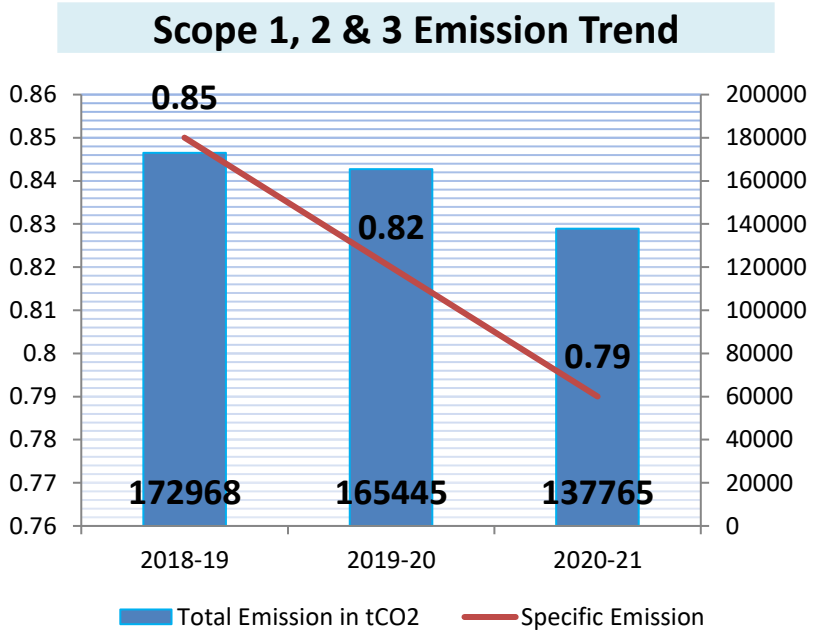
Key Initiatives:

- We are using cartoon wastage as top layer for packing after modification.
- Switching over Furnace oil to Natural gas to avoid any sludge generation of oil.

Eddy Current System for Glass cullet

GHG Emission Data



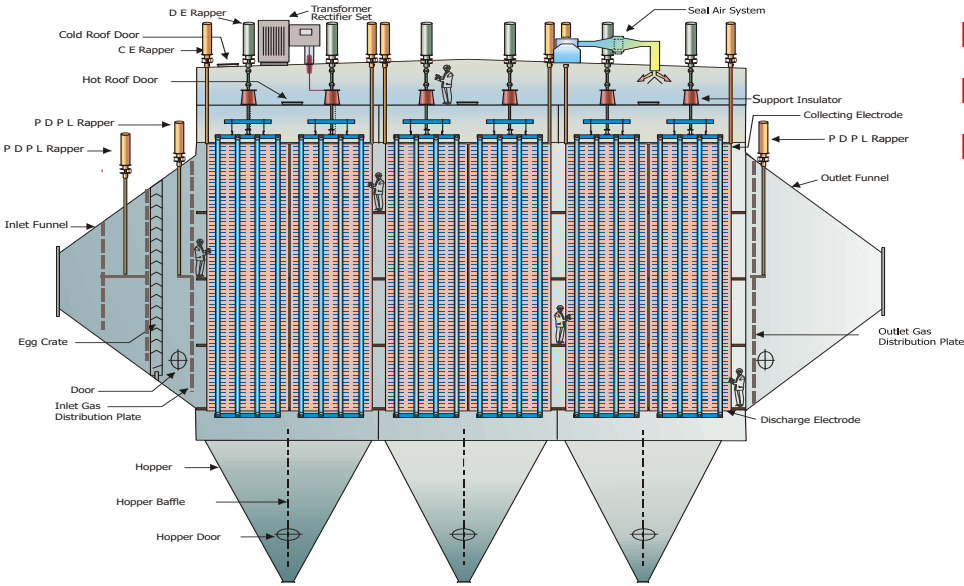


20.35% reduction in absolute GHG emission

7.05% reduction in specific GHG emission

Use of Electrostatic Precipitator

- Reduction of High emissions from Glass furnace outlet flue gas system
- Reduction of Sox and Nox from flue gas system
- To meet statutory requirements
- To protect environment from pollution.



Inlet Parameters :

- Suspended Particulate Matter (SPM) -1040 mg/Nm3
- Sulfur Oxide (SOX) < 3500mg/nm3

Outlet Parameters

- Suspended Particulate Matter (SPM) <50 mg/ nm3
- Sulfur Oxide (SOX) <1300 mg/Nm3

Water Recycling (Effluent Treatment Plant)

- Reuse of waste water from STP,ETP outlets by recycling to meet statuary norms
- Zero liquid discharge

Effluent Treatment Plant

Use of Natural Gas

Total Investment of 29.21 INR Cr made at Hyderabad and Bhongir to laid the Natural Gas Pipeline.

Benefits - >

- **Reduced Carbon Foot Print**
- **Less Emission**

Green Supply Chain Management

HSIL Limited Packaging Products Division AGI glaspac	**Purchase Procedure** QMS/EHS/FSSC/ISO 15378//EnMS	Doc. No :AGI/IMDP/15 Rev. No : 11 Date : 01-04.21 Page No. : 1 of 19

1.0 PURPOSE:

To establish and maintain a procedure for procurement of Raw-material, Fuels, Packing materials, General Stores Items, Indigenous Capital Items, Imported Raw-materials, Consumables and Capital Items, Mould Stores Items, Low Value Material which are below Rs. 5000/- (Rupees Five Thousand Only) and Items / materials required on emergency basis from time to time.

1.1 Issue of Annual Maintenance Contracts, Service Purchase Orders.

1.2 Evaluation and Registration of New Vendors and to review the performance of existing Vendors by Rating them periodically.

1.3 To achieve over effectiveness and efficiency in purchasing process and to ensure the Purchase or materials in Time, Right Quality from Right Source and conform to specified requirements.

2.0 SCOPE:

This procedure shall apply to all the Purchases of Raw-material, Fuels, Packing materials, General Stores Items, Indigenous Capital Items, Imported Raw-materials, Consumables and Capital Items, Mould Stores Items, Low Value Material and various activities of Procurement including Service Purchase Orders and Annual Maintenance Service Contracts.

2.1 All the new Vendors developed from time to time through Vendor Evaluation for 'A' Class items (List of A class items maintained in Purchase department subject to changes from time to time as per the requirement).

2.2 The Purchase procedure covers and applicable to Hyderabad and Bhongir Plants since the purchase department functions were centralized. The process of procurement of materials and services are same for both Plants under the above procedure. The purchase documents/records are being maintained separately for each Plant. The process of vendor evaluation cum registration is same for both Plants but the vendor rating shall be done separately for each Plant. Due consideration for energy efficiency shall be given during procurement of applicable header items (Raw Material, Fuels & Capital Items).

3.0 RESPONSIBILITY: Section In-charge / HOD / A.V.P. (Comml)

4.0 DEFINITIONS & ABBREVIATIONS:

A V P (Comml) — Assistant Vice President (Commercial)

HOD - Head of Department

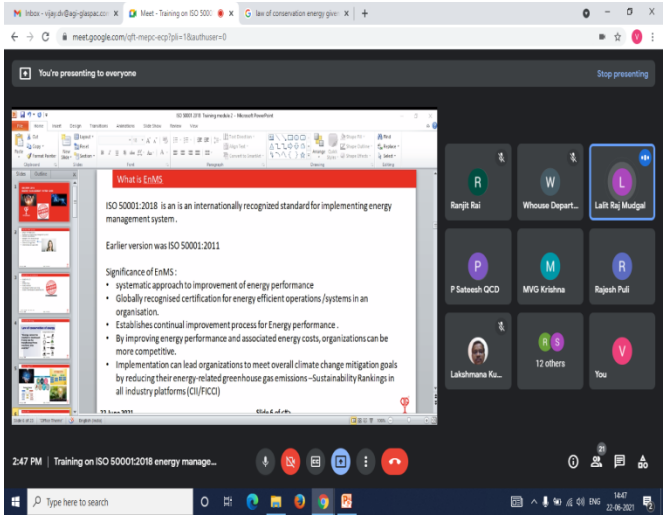
S.I - Section-in-charge

Prepared by:	Approved by:	Issued by:
Date:	Date:	Date:

Trainings imparted on Energy conservation and ISO 50001

Training

- Training on ISO 50001 :2018 Energy Management system
- Training on Energy Efficiency best practices
- Training on Compressed air usage
- Training on Energy Conservation awareness

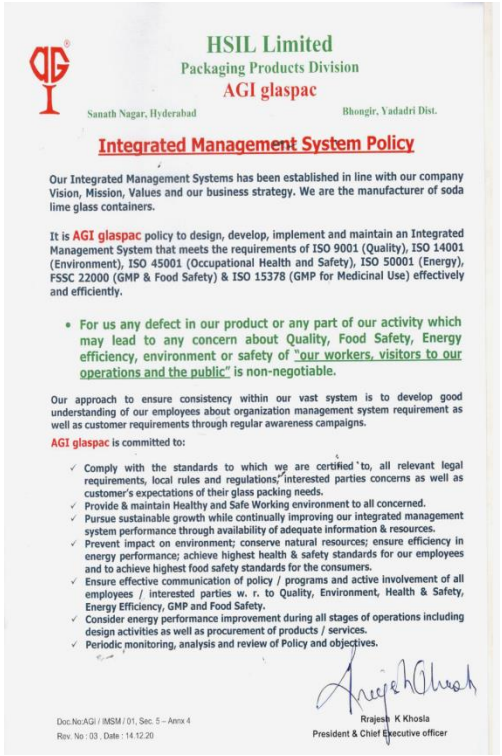


Implementation of ISO 50001:2018

Focus Area

- Energy Policy
- Energy Management Cell
- Energy Targets
- Energy Review, energy performance of equipment and control
- Procurement of Efficient Equipment
- Benchmarking/baseline
- Awareness and technical Training on Energy conservation
- Daily deviation report review
- Audit and Review with TOP Management
- Stakeholder engagement

IMS Policy



HSIL Limited
Packaging Products Division
AGI glaspac
Sanath Nagar, Hyderabad — Bhongir, Yadadri Dist.

Integrated Management System Policy

Our Integrated Management Systems has been established in line with our company Vision, Mission, Values and our business strategy. We are the manufacturer of soda lime glass containers.

It is AGI glaspac policy to design, develop, implement and maintain an Integrated Management System that meets the requirements of ISO 9001 (Quality), ISO 14001 (Environment), ISO 45001 (Occupational Health and Safety), ISO 50001 (Energy), FSSC 22000 (GMP & Food Safety) & ISO 15378 (GMP for Medicinal Use) effectively and efficiently.

- For us any defect in our product or any part of our activity which may lead to any concern about Quality, Food Safety, Energy efficiency, environment or safety of "our workers, visitors to our operations and the public" is non-negotiable.

Our approach to ensure consistency within our vast system is to develop good understanding of our employees about organization management system requirement as well as customer requirements through regular awareness campaigns.

AGI glaspac is committed to:

- ✓ Comply with the standards to which we are certified to, all relevant legal requirements, local rules and regulations, interested parties concerns as well as customer's expectations of their glass packing needs.
- ✓ Provide & maintain Healthy and Safe Working environment to all concerned.
- ✓ Pursue sustainable growth while continually improving our integrated management system performance through availability of adequate information & resources.
- ✓ Prevent impact on environment; conserve natural resources; ensure efficiency in energy performance; achieve highest health & safety standards for our employees and to achieve highest food safety standards for the consumers.
- ✓ Ensure effective communication of policy / programs and active involvement of all employees / interested parties w. r. to Quality, Environment, Health & Safety, Energy Efficiency, GMP and Food Safety.
- ✓ Consider energy performance improvement during all stages of operations including design activities as well as procurement of products / services.
- ✓ Periodic monitoring, analysis and review of Policy and objectives.

Doc.No:AGI / IMSM / 01, Sec. 5 – Annx 4
Rev. No : 03 , Date : 14.12.20

Rajesh K Khosla
President & Chief Executive officer

ENMS Certificate

afaq AFNOR CERTIFICATION

Certificat
Certificate

N° 2021/03-305.1

AFNOR Certification certifies that the management system implemented by:
AFNOR Certification certifie que le système de management mis en place par :

HSIL LIMITED
PACKAGING PRODUCTS DIVISION
AGI glaspac

for the following activities:
pour les activités suivantes :

DESIGN, MANUFACTURE AND SALE OF SODA LIME GLASS CONTAINERS.

has been assessed and found to meet the requirements of:
a été évalué et jugé conforme aux exigences requises par :

ISO 50001:2018

and is developed on the following locations:
et est déployé sur les sites suivants :

GLASS FACTORY ROAD, OFF MOTI NAGAR, P.B. NO. 1930, HYDERABAD, TELANGANA – 500018, INDIA.

GLASS FACTORY ROAD, P.B. NO. 1, DISTRICT YADADRI BHONGIR, TELANGANA – 508116, INDIA

This certificate is valid from (year/month/day) / *Ce certificat est valable à compter du (année/mois/jour)* 2021-05-21 until / *jusqu'au* 2024-05-30

cofrac CERTIFICATION DE SYSTÈMES DE MANAGEMENT

Julien NIZRI
Managing Director of AFNOR Certification
Directeur Général d'AFNOR Certification

11 rue Francis de Pressensé - 93571 La Plaine Saint-Denis Cedex - France - T. +33 (0)1 41 62 80 00 - F. +33 (0)1 49 17 90 00
SAS au capital de 18 167 000 € - 479 076 002 RCS Bobigny - www.afnor.org

afnor CERTIFICATION

Energy Monitoring and Review

Daily Energy Review format with Sr Vice President (Works)

S. N.	DESCRIPTION	UOM	Target	Total	Variance
1	Draw	MT	546	522	-24
2	Total Plant Power Cons. With boost	KWH	170352	162259	-8093
3	Total Plant Power Cons. Without boost	KWH	120120	119191	-929
4	Compressed Air Power Consumption	KWH	51160	49185	-1975
5	Mould Cooling Blowers power cons.	KWH	18291	19638	1347
6	Boosters power cons.	KWH	50232	43068	-7164
7	Specific Total Power Cons. with Boost	KWH/MT	312	311	-1
8	Specific Total Power Cons. without Boost	KWH/MT	220	228	8
9	Specific Compressed air power cons.	KWH/MT	93.7	94	0
10	Specific Blower air power cons.	KWH/MT	33.5	38	4
11	Specific Booster power cons.	KWH/MT	92	82	-10

Cross Functional Team for Various ENCON Projects

S.No	Six sigma projects	Responsible
1	**Compressors inter stage cooling efficiency.**	Mr.Chandrashekar & Mr.Jwala Singh, Mr.Mohan krishna
2	**Pressure drop in compressed air system**	Mr.Jwala Singh & Mr.Srinivas Mr.Sai krishna
3	**Leakages in compressed air system**	Nhw2 Prod.: Mr.Satish, Mr.Raju & Mr.Radha Krishna
		Nhw3 Prod.:Mr.Ganesh, Mr.Mohan & Mr.RadhaKrishna
		Nhw2 &3 CEE : Mr.Someshekar & Mr.Nagaraju
		Compressors , B/H,Petcoke: Mr.Srinivas
4	**Unwanted use of compressed air**	Mr.Nagaraju, Mr.Srinivas raju
5	**Usage of High compressed air pressure against Low pressure requirement**	Mr.Chandra shekar ,Mr.Arpit Pandey
6	**Pump & Cooling tower efficiency suppling water to compressors**	Mr.Mohanrao, Mr.Naga Srinivas, Mr.Mohan Krishna

Other Awards

CII- 5 Star-2020

CII 2020- Sectorial Award 3rd Place

9th FICCI Safety Excellence Gold Award 2020

FICCI National Safety Award 2020

National Safety Council Award 2019

CII- 4 Star-2019

CII- 3 Star-2018

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