CII National Award for Excellence in Energy Management - 2022

AGI Glaspac – Bhongir (HSIL Ltd)



Presented By : Sunil Kumar Verma AGM - Electrical



AGI glaspac-Snapshot





Our Mission Innovative and Eco-friendly Glass Packaging Solutions

Our Vision

To Be The Most Preferred Glass Company Creating Value For The Customers And Stakeholders



Our Journey....



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Manufacturing Process of Glass Containers – 3D Lay Out







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Inside the Warehouse

AGI glaspac Bhongir Manufacturing



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Electrical & Thermal Energy



Electrical Energy Cons. Million Kwh

Thermal Energy Cons. Million Kcal



Production affected by COVID in 20-21 & 21-22 by 7.2 %

Electrical Energy Consumption decreased by 11.1% & Thermal Energy Consumption decreased by 10.3%



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Specific Energy Consumption

Sp. Electrical Energy Cons. Kwh/Ton



Sp. Thermal Energy Cons. Kcal/Kg



Commitment of doing the Excellence

Sp. Electrical Energy decreased by 4.2 % & Sp. Thermal Energy Decreased by 3.4 % Even WHEN Production decreased by 7.2 % due to COVID



Benchmarking with Competitors

Specific Electrical Energy Consumption Benchmarking with competitors



Source : Data Collected from the plants websites



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Energy Saving Projects Implemented in last Three years

Year	No of Energy Saving Projects	Investment (INR Million)	Electrical Saving Million Kwh	Thermal Energy Million Kcal	Saving INR Million	Impact on SEC (Electrical)	Impact on SEC (Thermal)
2019-20	11	15.02	2.97	0	16.629	9.05	0
2020-21	06	4.31	1.329	0	7.508	4.82	0
2021-22	06	67.5	1.049	9142	16.4	3.44	30.0
Total	23	86.83	5.348	9142	40.53	17.31	30.0
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Implemented Energy Saving Projects 2019-20

Sr. No	Implemented Project	Annual Electrical Energy Saving Kwh	Annual cost of Saving Rs Million	Investment Rs Million	Payback Period Months
1	Installation of External inter cooler for IR compressors	420000	2.4	4.0	20.3
2	Installation of Energy Efficient Vacuum System	594000	3.4	10.0	35.7
3	Recover wasted condensed chilled water from air driers and use if for cooling water	43800	0.2	0.0	Immediate
4	Reduce air consumption by replacing defective valves & pneumatic fittings	220752	1.2	0.0	Immediate
5	Optimize the voltage of Auxiliaries distribution transformer in Furnace -5 Load center	87600	0.5	0.0	Immediate
6	Set dew point of all driers to 6-8Deg C	112128	0.6	0.0	Immediate
7	Reduce air consumption by arresting all indentified air leaks	236520	1.3	0.0	Immediate
8	Install enthalphy based automation for cooling tower fans	70080	0.4	0.9	27.0
9	Modify piping from compressor to header to reduce pressure drop	131400	0.7	0.0	Immediate
10	Installed bell mouth in Mould cooling fans	300468	1.7	0.1	0.8
11	Removing IGV and replacing the Bird screen in mould cooling blowers	761025	4.3	0.0	Immediate
	Total	29,77,773	16.6	15.0	10.8



Implemented Energy Saving Projects 2020-21

Sr.No	Implemented Projects	Annual Electrical Energy Saving Kwh	Annual cost of Saving Rs Million	Investment Rs Million	Payback Period Months
1	Arresting compressed air leakages from IS machines	577000	3.26	0	Immediate
2	Reducing pressure drop in compressed air line by modifying the same	30000	0.17	0	Immediate
3	External coolers for IR compressor no 2	300000	1.695	4	28.3
4	Reducing Voltage drop in F4 barrier booster transformer system	343000	1.935	0.17	1.1
5	Installation of timers for F5 Rejection conveyors	25000	0.1	0.0	Immediate
6	Providing level sensors for water tanks to avoid pump running	54000	0.3	0.1	3.9
	Total	13,29,000	8	4	6.9



Implemented Energy Saving Projects 2021-22

Sr.N o	Implemented Project	Annual Electrical Energy Saving Kwh	Annual Thermal Energy Saving Million Kcal	Annual cost of Saving Rs Million	Investme nt Rs Million	Payback Period Months
1	Modification in furnace height to reduce thermal energy consumption	0	9142	16.4	60.0	43.9
2	Installation of BLDC Fans	9100	0	0	0.1	23.5
3	Energy Efficient cooler for IR3	300000	0	1.7	3.6	25.5
4	Reduction in voltage drop in F5 melting booster transformer	452000	0	2.6	0.0	Immediate
5	Modifying compressed air header of F5 to reduce pressure drop	173000	0	1.0	3.0	36.9
6	Instllation of FRP cooling tower fan	115000	0	0.8	12.2	187.3
	Total	10,49,100	9,142	22	79	42.2

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Installation of online leakage monitoring system for compressed Air

Problem identified:

- 15 Nos IS machine with more than 1800 Nos air operated solenoid valves
- Not possible to check leakages by simple method due to heavy noise area.
- Frequent chances of valve leakages due to speedy operation and heat

During machine operation very difficult to distinguish between actual leakage or valve exhaust.



Implementation :

Installed SCADA system with online flow meters for real time monitoring and analysis

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IS MACHINE 57 LP PV-01	IS MACHINE 57 LP PV -01	592	m3/h	🥥 10.0	۹	DATE	TIME	IS MACHINE ST LP PM.01	IS MACHINE STEP 12.01	IS MACHINE ST LP PV.01	15 MACHINE SELP 17.07	13 MACHINE 52 LP 194-01 607-05	15 MACHINE 52 LP 12-02 1020001-00 1020002-00	1944 00 1918 00	11792295.00	466.00 476.00 472.00
IS MACHINE 57 LP TZ-01	IS MACHINE 57 LP TZ-02	3786641	m3/h	10.0	9	29/05/2022 29/05/2022	01.00	452.00	3767429.00	1839.00 1839.00	1200(403.00) 1207041.00	695.00 695.00	1828903.00 1829040.00	1827.00	11782924.00	494.00 514.00
IS MACHINE 51 LP PV-01	IS MACHINE 51 LP PV-01	1839	m3/h	(a) 10.0	<u></u>	29/05/2022 29/05/2022	01:10	430.00	3767512.00 3767549.00	1839.00 1839.05	1287260.00	697 00 664 00	1829103.00 1829162.00	1007 00	11793096.00	568.00 494.00
IS MACHINE 51 LP TZ-02	IS MACHINE 51 LP TZ-02	1358811	m3/h	🥥 10.0		2905/2022 2905/2022	0125	493.00 480.00	3767631.00	1829.00	1287647.00 1287811.00	701.00 704.00	1829(201.00 1829(201.00 1829(201.00	1965-00	11790428.00 11790578.00	474 00
IS MACHINE 52 LP PV-01	IS MACHINE 52 LP PV-01	(650	m3/h	6 10.0	9	29/05/2022	01.35	492.00 483.00	3767673.00	1839.00	1267968.00 1288131.00	679.00	1829454 00	1980 00 1971 00	11793929.00	485.00 493.00
IS MACHINE 52 LP TZ-02	IS MACHINE 52 LP TZ-02	1855165	m3/h	🥏 10.0		29405/2022 29405/2022	01.45	481.00 487.00 4//2.00	3767792.00	1839.00	1283423.00	400.00 Y03.00	1829513.00	1975.40	11794229-00 11794402-00	425.00 459.00 491.00
IS MACHINE 52 HP PV-01	IS MACHINE 52 HP PV-01	1898	m3/h	🥥 10.0		29/05/2022 29/05/2022	0135	480.00	3767868.00	1839.00	1258/42 09 1268068.00	606.00 700.00	1829647.00 1829746.00	1979.05	11794572.00	449.00 442.00
IS MACHINE 52 HP TZ-02	IS MACHINE 52 HP TZ-02	11868140	m3/h	🥥 10.0		29405/2022 29405/2022 29405/2022	02.10 02.15	405.00	376/962.00	1839.00	1289192.00	635.00 636.00 699.00	1829857.00	1985-00	11795/258 00	45/0 00 444 00 457 00
IS MACHINE 53 LP PV-01	IS MACHINE 53 LP PV-01	431	m3/h	10.0		2%05/2022	02:29 02:25	469.00	3768074.00 3768116.00	1839.00	12/10/08 00	701-00 696.00	1829917.00	1977.00	11795462.00	444 00 447 00
IS MACHINE 53 LP TZ-02	IS MACHINE 53 LP TZ-02	3750054	m3/h	10.0		23/05/2022 23/05/2022	02:35	482.00	3768188.00	00 9051	1289402.00 1289963.00	697.00 63/3.00	1830006.00	1966.00	11795854.00	446.00
IS MACHINE 53 HP PV-01	IS MACHINE 53 HP PV-01	1666	m3/h	10.0		29/05/2022 29/05/2022	02.45 02.50	475.00 483.00	3768230.00	1839.00	1290126.00	696.50 701.00	1830212.00 1830271.00	1960.00	11796184.00	440.00
	IS MACHINE 53 HP TZ-02	10737251	m3/h	0 10.0		29/05/2022	02.55	478.00 470.00	3766356 00	1639.00	1290571.00 1290732.60	70140 764.00	1830327 00 1830388.00	1965 00	11796529002	445.00
IS MACHINE 541 B BV.01	IS MACHINE 54 LP PV-01	0	m3/h	🥥 10.0		29405/2022	03.05	455.00	3768438.00 3768477.00	1839.00	1290876.00	705.05	1830492.00	19/3 00	11797010.00	455.00
	IS MACHINE 54 LP 12-02	2997705	m3/h	10.0		29/05/2022 29/05/2022	03.15 03.20	485.00	3768511.00 3768552.00	18.19.00	1291173.00 1291333.00	703.00	1830613.00 1830673.00	1967.00	11797350.00	439.00
IS MACHINE 54 LP 12-02	IS MACHINE 54 HP PV-01	1313	m3/h	6 10.0		29401-/2022 29401-/2022	03:30	406.00 487.00	3768599 09 3768637.00	1039.00	1291652.00	701.00	1830734.00	1985.00	11797847.00	454 00
IS MACHINE 54 HP PV-01	IS MACHINE 54 HP PV-01	9194141	m3/h	🥚 10.0		29/05/2022 29/05/2022	03.40	486.00 454.90	3768716.00	1839.00	1791957.00 1292090.00	702.00 703.00	1830911 00	1964.00	11750159.00	455.02
IS MACHINE 54 HP TZ-02	IS MACHINE SEL P PV-01	840	m3/h	ID.0		0 29/05/2022 1 29/05/2022	03.59	485.00	3766/035.00	1839.00	1292249.00 1292411.00	701.00	1831027.00 1831028.00	1973.00 1962.00	11790403.00	442,00
IS MACHINE 55 LP PV-01	IS MACHINE IS LO TT-02	4146524	m3/h	10.0		2 29/05/2022 29/05/2022 29/05/2022	04.00	479.00 484.00	3768877.00 3768919.00	1839.00	1292571-00 1292728-00	702.00	1831145.00 1831206.00	19(5.00	11796829.00	458.00
IS MACHINE 55 LP TZ-02	IS MACHINE SS LP 12-02	2006	m3/h	(i) 10.0		29/05/2022 29/05/2022	04.15	485.00	3768960.00 3769902.00	1839.00 1839.00	1293005.00	710.00	1831264.00	1940.00	11799142.00	451.00
IS MACHINE 55 HP PV-01	IS MACHINE 35 HP F9-01	4402480	m3/h	🧼 10.0		7 29N05/2022 29N05/2022	04:20	472.00	3769077.00	1839.00	1293327.00	713.00	1831426.00	1944.00	11799536.00	442.00
IS MACHINE 55 HP TZ-02	IS MACHINE 55 HP 12-02	431	m3/h	🥥 10.0		29/05/2022	04.35	487.00	3769161.00 3769203.00	1839.00	1293645.00 1293799.00	677.00	1831546.00 1831604.00	1903.00	11799946.00 117908122.00	473.00
IS MACHINE 56 LP PV-01	IS MACHINE 50 LP PV-01	740439	m3/h	10.0		29/05/2022	04:45	495.00	3769239.50 3769281.50	00.8031	1293918.09 1294081.00	00.765 60.66a	1031007.00	1974.00	11800433.00	492.00
IS MACHINE 56 LP TZ-02	IS MACHINE 56 LP 12-02	1289	m3/h	10.0		29/05/2022 29/05/2022 29/05/2022	04.55	495.00	3769323.00	00 9081 00 9081	1294482.00	704.00	1031847.00 1831903.00	1968-00 (971.99	11800175-00	449.00
IS MACHINE 56 HP PV-01	IS MACHINE 56 HP PV-01	10100964	m3/h	(i) 10.0		29/05/2022	05.05 05:10	457.00	3769447.00	1839.00	1294(//2.00	105.00	1831963.00	1953.00		
IS MACHINE 56 HP TZ-02	IS MACHINE 56 HP TZ-02	10500000				29/05/2022	05.20	456.00	3769525.00	1004081						~
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Online real time monitoring and report generation of compressed air consumption



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Benefits :

By online monitoring and further identified the leaks using ultrasonic leak detectors and By checking and valves we arrested the leakages.



Total Benefits observed : 350 CFM of compressed air Energy Saving achieved : 3.5 Lakh unit per year Energy Cost Saving : Rs 23.7 Lakh per year Investment : Rs 35.0 Lakhs (in phases) SEC Reduction : 1.176 kwh/t



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Innovative Project - 2

LP air controller to separate the generation of HP/LP air for IS machines

Problem identified:

- Generating compressed air at 3.2 bar but using at 3.0 bar and 2.0 bar in the IS machines
- Throttling of air from 3 bar to 2 bar for LP usage in machine, causing loss of energy.
- Earlier tried to use separate compressor for LP&HP but failed due to machine breakdowns because of demand fluctuation and tripping of LP compressors. Cost of machine breakdown is very high compared to savings.
- It is costly to buy standby LP compressors and to start it immediately if any one fails. Hence not tried again since installation.





11 APRV @pens only when the pressure in LP header drops below the set point

Innovative Project - 2

Implemented Idea :



We installed one PRV in between LP & HP line with set point of LP pressure. Now if there is air fluctuation or extra demand of LP air then it is maked-up by HP air, also in case of LP Compressor tripping, we are able to make up LP air from HP air header.

Annual Saving	6,68,136	Kwh
Saving in INR	37,74,966	INR
Investment	10,00,000	INR
Payback	3.18	Months
SEC Reduction	1.83	Kwh/t

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Innovative Project – 3 (Reduction of voltage drop in furnace electrical boosting)

Problem identified:

During systematic measurement we observed significant voltage drop in the system

	F4 Bar	rier Boos	ster 1.2MVA	Transf	ormer		
	Т	ap position:	12(Delta), Tap Vol	tage:142\	/		
Near Tra	Near Transformer bushing		ner bushing Near electrode		Voltage	Electro	de Current
Ph-Ph	Voltage (V)	EI-EI	Voltage (\	√)	drop	Phase	Amp
U-V	139.9	E1-E5	117.7		22.2	R	4028
V-W	141.8	E5-E6	133.9		7.9	Y	4587
W-U	140.7	E1-E6	113.8		26.9	В	4484
Average	140.8		121.8		19	Average	4366.3
Total Boost	ing Power =	921.1	KW				
Voltage c	Irop is directly asso	ciated to	o the power l	oss, for	the san	ne power	' to
electrode	es we have to give i	more inp	ut power due	e to los	ses.		



Innovative Project – 3 (Reduction of voltage drop in furnace electrical boosting)

Reason Identified : It was observed that the size of bus bar is not adequate as per the Increased current of electrodes. Electrode current increased after enhancement of furnace draw.

Solution : We shifted the boosting transformer very close to furnace, avoiding lengthy busbar







After (Bus bar length is only 06 mtr)



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Innovative Project – 3 (Reduction of voltage drop in furnace electrical boosting)

F4 Barrier Booster 1.2MVA Transformer a							ting	
		1	Tap position:	:12(Delta), Tap	Voltage:142V			
Near Trai	nsformer	bushing	Near electrode		Voltage	Electrode Current		
Ph-Ph	Volta	age (V)	EI-EI	Volta	ge (V)	urop	Phase	Amp
U-V	14	40.1	E1-E5	12	8.4	11.7	R	4577
V-W	14	41.9	E5-E6	13	7.8	4.1	Y	4411
W-U	1	40.8	E1-E6	12	6.5	14.3	В	4140
Average	1	40.9		13	0.9	10.0	Average	4376.0
Total Boostin	g Power =		992.1	KW				
Earlier pow	<mark>er on sa</mark>	me tap =	921.1	кw				
Difference	=	71.0	KW					
Per year Savir	ng				6	5,21,960	Kwl	า
Impact on SE	С					1.84	KW	h/t
Per year Savir	ng in INR				3	5,14,074	Rs	
Investment						2,50,000	Rs	
Payback						0.85	mo	nths



Utilization of Renewable Energy

Year	Technology (Electrical)	Type of Energy	On site/Off site	Installed Capacity, MWp	Generation Million Kwh	% of over all electrical energy
2019-20	Electrical	Solar	On Site	8.6	12.051	10.26
2020-21	Electrical	Solar	On Site	11.6	13.117	13.06
2021-22	Electrical	Solar	On Site	13.7	17.252	16.52
		Reduct	tion of 16217 T Emission per	ons of Carbo year		

Target to increase renewable energy consumption by more than 25% in next two years

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Waste Fuel Utilization:

Sr No	Year	Type of waste Fuel	Quantity, MT	GCV, Kcal/kg	% of total fuel
1	2019-20	Petcoke	20111	8000	42.6
2	2020-21	Petcoke	13801	8000	33.14
3	2021-22	Petcoke	10880	8000	25.7

Solid Waste Management :

Sr No	Year	Waste Glass, MT	Metal Waste, MT	Used Paper Cartons, MT	Disposal Method
1	2019-20	2076.86	474.04	553.5	Disposal through
2	2020-21	1724.24	157.78	301.84	Third party vendor
3	2021-22	2950.84	353.8	620.4	for Recycling

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Waste Utilization & Management

Waste Water Management :



100 % Recycling of process waste water, making plant as Zero water discharge Saving of 350 KL fresh water per day



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GHG Inventories & Green Supply Chain



매 HSIL Limited Packaging Products Division	Purchase Procedure	Doc. No Rev. No	:AGI/IMDP/15 : 11	
AGI glaspac	QMS/EHS/FSSC/ISO 15378//EnMS	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:	



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ISO Certifications: ISO 50001: 2018 Certified

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FSCC 22000	ISO 9001:2015	ISO 14001:2015	ISO 45001: 2018	ISO 15378:2011	ISO50001-2018
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Online monitoring of Electrical Energy (EMS) and Compressed air consumption



Daily team review of all energy parameters with set targets and deviations



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Training and Team engagement

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



IMS Policy HSIL Limited **Packaging Products Division** AGI glaspac Rissogie, Stadadol Dire andh Namer, Hyderschuld Integrated Management System Policy Our Integrated Management Systems has been established in line with our company Vision, Hission, Values and our husiness strategy. We are the manufacturer of soda **Give plass** containers. It is AGE glaspac policy to design, develop, implement and maintain an Integrated Management System that mosts the requirements of ISO 9001 (Quality), 250 14001 (Environment), 190 45001 (Decupational Health and Safety), 190 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 officiency, environment or safety of "our workers, visitors to our operations and the public," is non-negotiable. Our approach to ensure consistency within our wat system is to develop good understanding of our employees about organization management system requirement as requirements, local rules and regulations," interested parties concerns as well as Parsae sestainable growth while continually improving our integrated management. system performance through availability of adequate information & resources. · Prevent impact on anvironment; conserve natural resources; ensure efficiency in

- well as customer requirements through regular averences comparigns. All glasses is committed to:
 - · Comply with the standards to which up are cartified to, all minuted logal customer's expectations of their glass packing needs.
 - Provide & maintain Healthy and Safe Warking environment to all concerned.

 - everyy performance; achieve highest health & safety standards for our employees and to achieve highest food safety standards for the consumers
 - Ensure effective communication of acility / programs and active involvement of all employees / interested parties vs. r. to Quality, Environment, Health & Sefety, Everyy Efficiency, GMP and Foot Safety.
 - Consider every performance improvement during all stages of operations including. dusign activities as well as procurement of products / services.
 - · Periodic rearritoring, analysis and review of Policy and objectives

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firmers K threads President & Chief Electrics officer



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Our Testimonials



GPEMA-2021



CII - 2018 11 August 2022

FICCI -2021

EHS

"3 Star" Rating

AGI Glaspac

Bhongir, Nalgonda

for Approciation

in EHS Practices

CII

CII - 2015



CII – 2020



CII – 2019



AGI glaspac

Future Roadmap

01

05

To Reduce the Carbon emission per MT of glass from 713 CO2 kg to 540 CO2 kg in Next 5 years, equivalent to 6.4 Mn Trees per annum.

To Increase the Usage of Cullet through improvement in Cullet quality and increase in cullet collection.

All the Future New Infrastructure & Installation with respect to IGBP (Indian Green Building Rating System) Rating System 02

Planned Installation of Waste Heat Recovery System.

04

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Additional 5 MWp solar power installation is under discussion

06

Usage of Plastic Pallets in place of Wooden Pallets in association with Garden Polymers which is a Group company of AGI

Carbon Reduction to 540 CO2/ kg in Next 5 years equivalent to 6.4 Mn trees per annum

Installation of 1.5 MW WHR plant for furnace flue gases

11 August 2022



Thank





11 August 2022

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