SAGAR CEMENT BAYYAVARAM

Welcome to
24th National Award for Excellence in Energy Management 2023

Sagar Cements Limited-Bayyavaram

Energy Team

O. Anji Reddy
Chief. Sustainable Officer

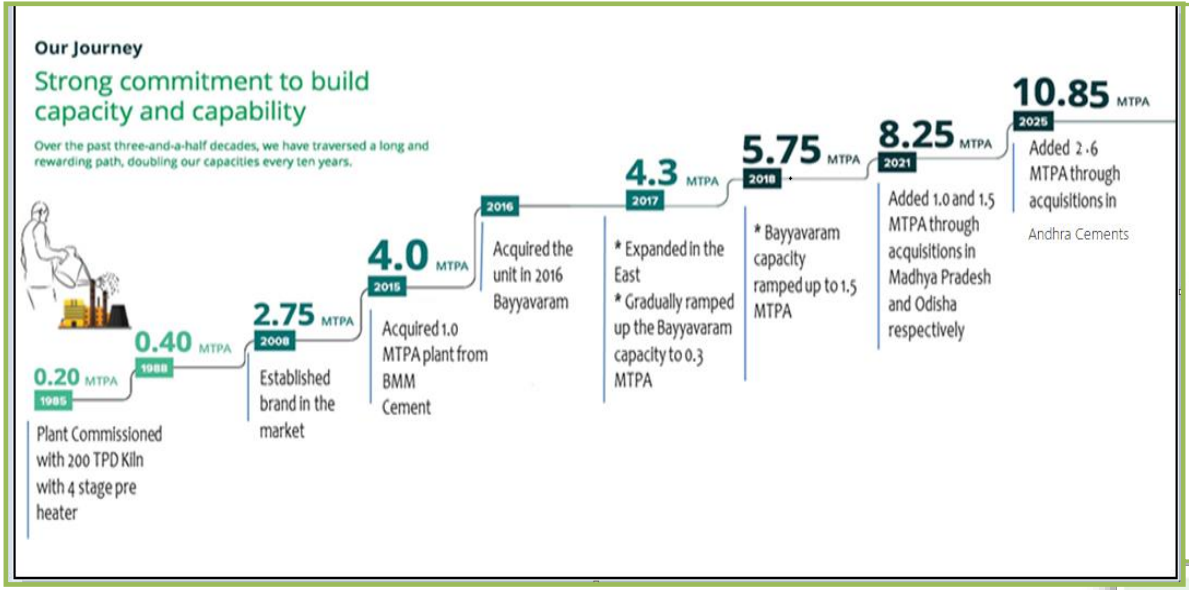
K. Srinivasa Rao
Senior General Manager

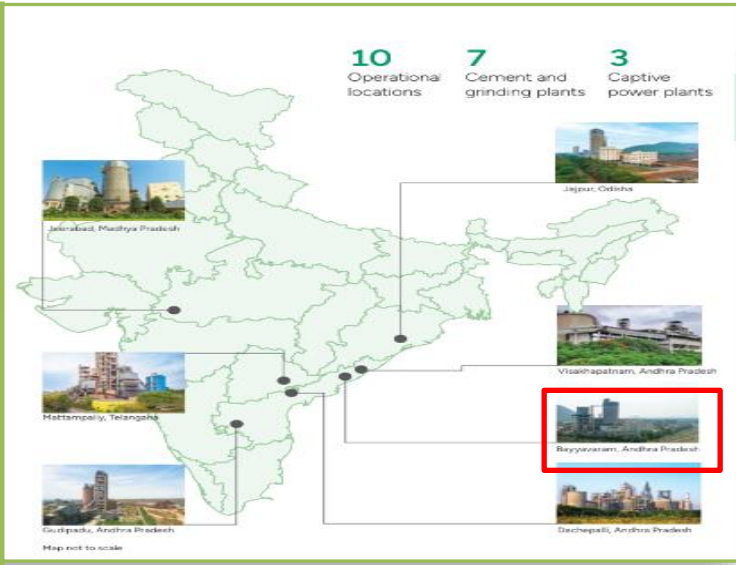
N.Satish
Manager (E&I)

Lead Presenter

Mr. P S V S.Narayana
Production In charge

1.Introduction of the Sagar Group





Our Mission

To be India's most respected and attractive company in our industry – creating value for all our stakeholders**.**

Our Vision

To provide foundations for the society's future.

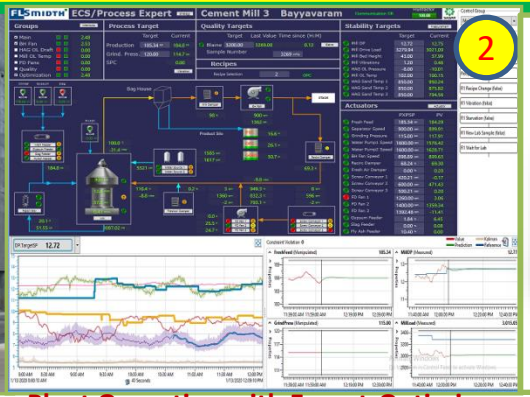
GreenPro
Product certification as a mark of SUSTAINABLE PRODUCT quality

GreenCo
Plant process certification as a mark of ENVIRONMENTAL FRIENDLY manufacturing

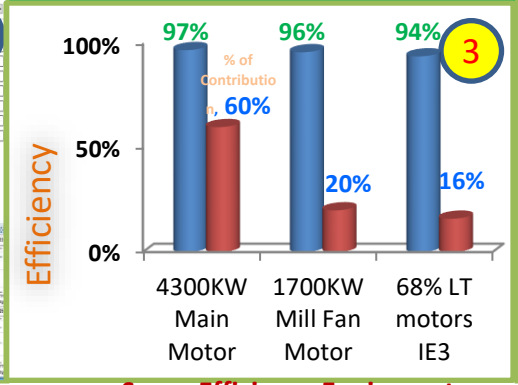
Description of Product	Plant @ Mattampally	Plant @ Gudipadu	Plant @ Bayyavaram
GreenCo Certification	GOLD	GOLD	PLATINUM
GreenPro Certification			
PPC (Portland Pozzolana Cement)	√	√	√
Composite Cement			√
PSC (Portland Slag Cement)		√	√
GGBS (Ground Granulated Blast Furnace Slag)			√

1.Introduction of the Bayyavaram Plant

MVR 5000-C4 PFEIFFER Mill

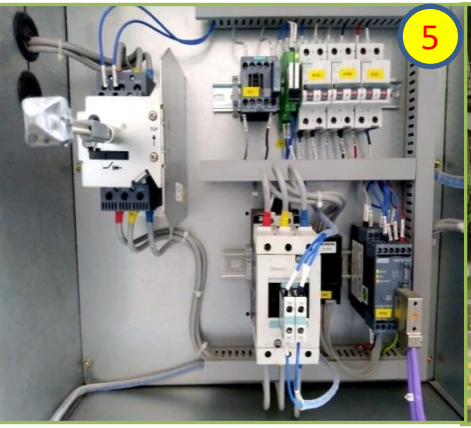


Plant Operation with Expert-Optimiser



Super Efficiency Equipment

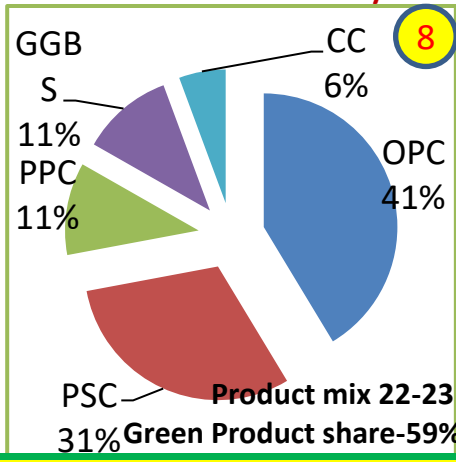
Robotic laboratory.



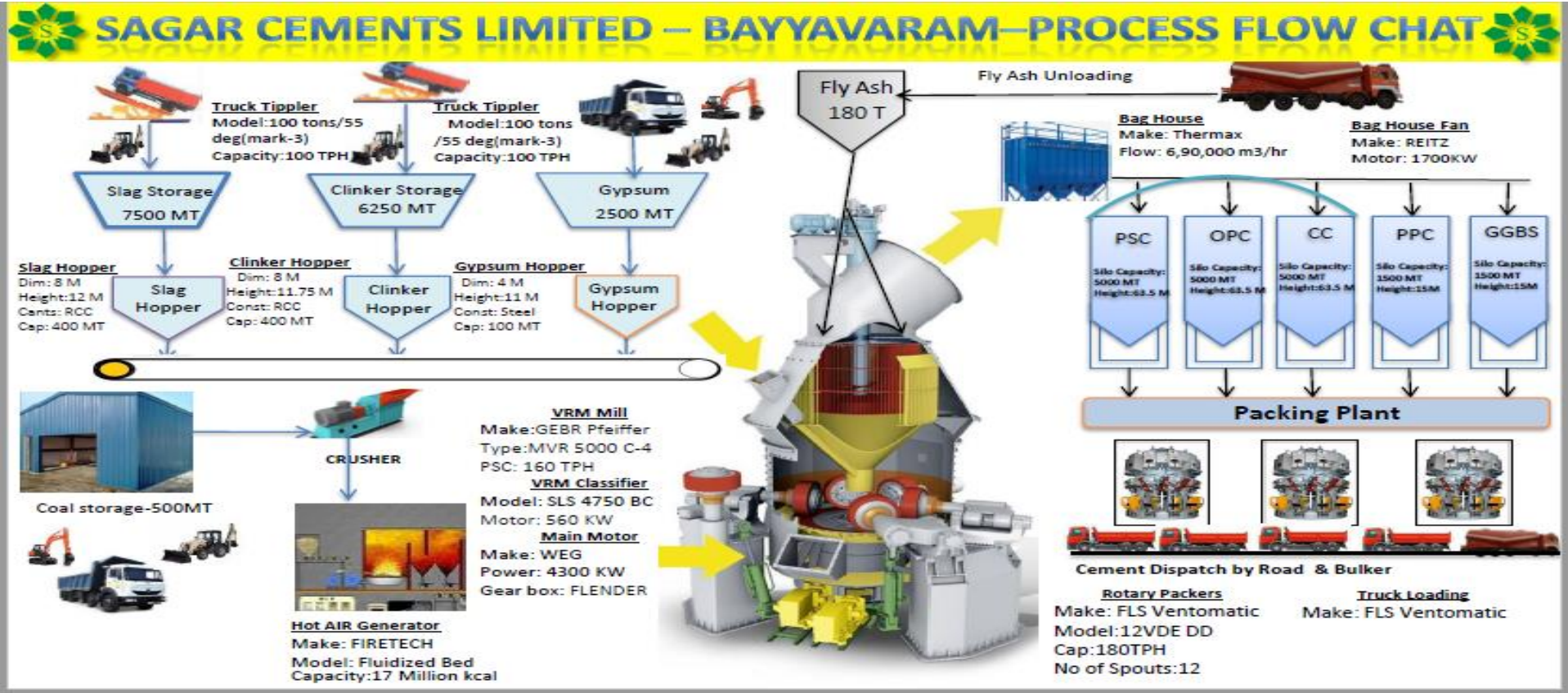
Intelligent MCC - Motor Feeders

EV Vehicles for Material Transport

Roof Top Solar plant

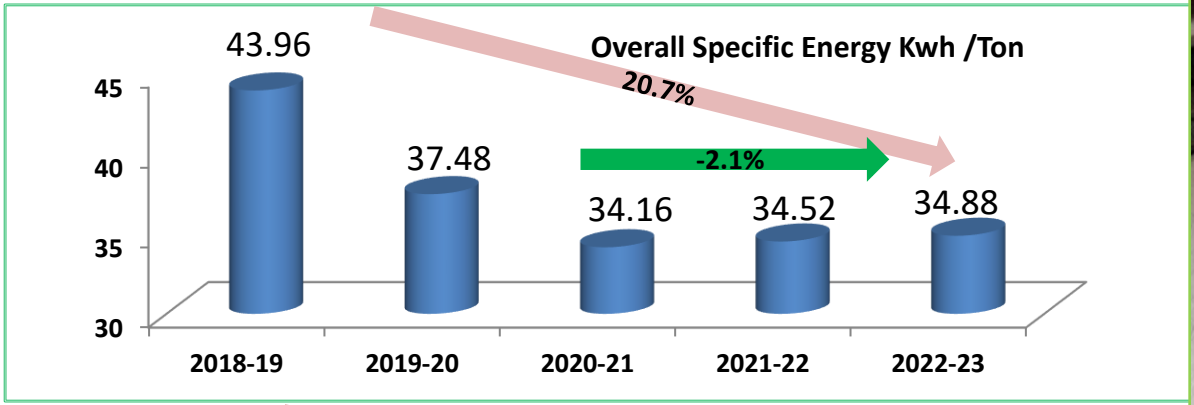


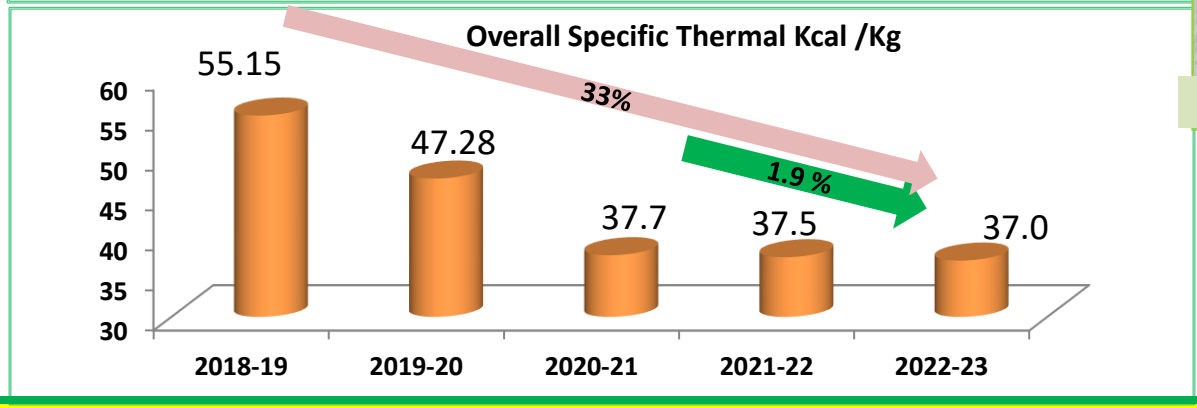
1.Introduction of the Bayyavaram Plant



2. Sp. Energy Consumption in last 3 years (FY 2020-23)

- *Plant Overall Specific Energy Consumption:*



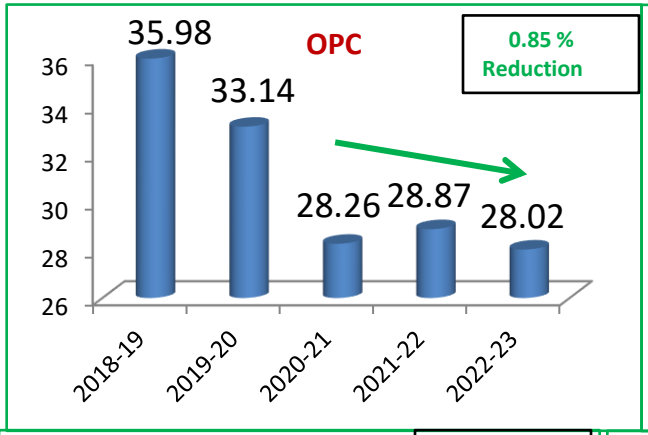


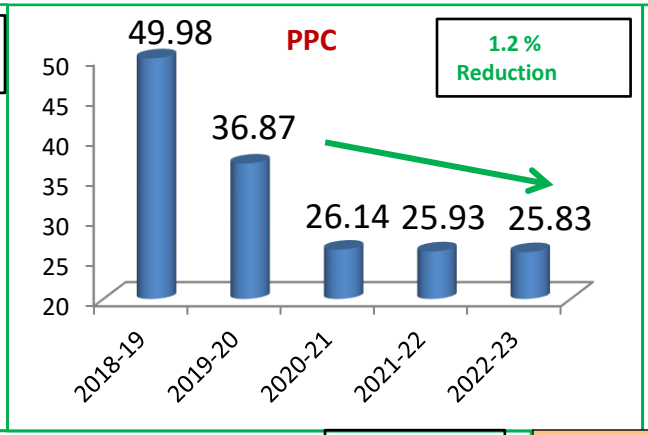
Fresh Slag (<10% Moisture) Dump Slag (>20% Moisture)

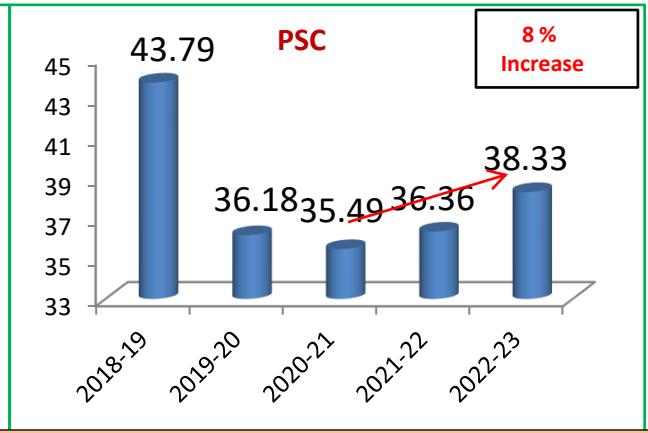
Main reason for High Specific Power

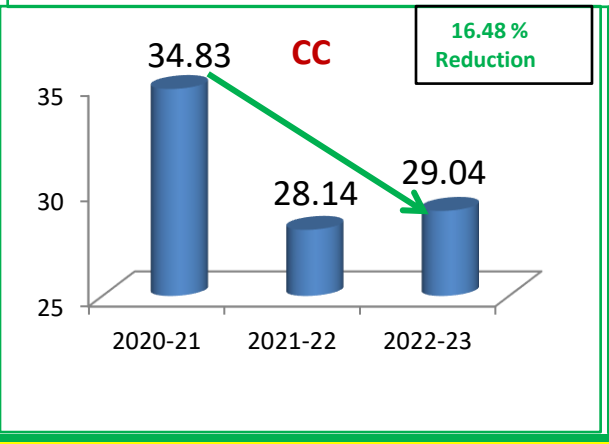
- We are using Slag with more than 20 % Moisture.
- Due to high moisture in the material Load on main drive increased.

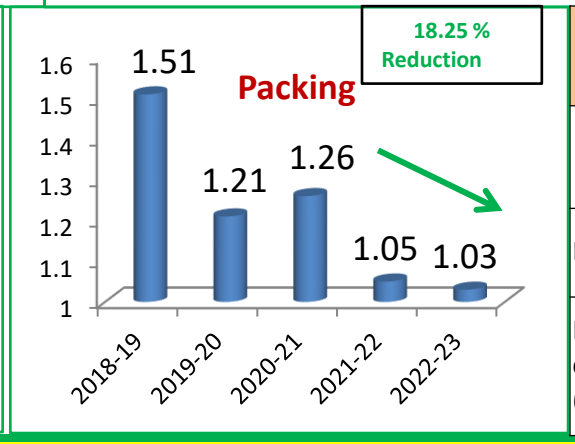
2. Sp. Energy Consumption in last 3 years (FY 2020-23)







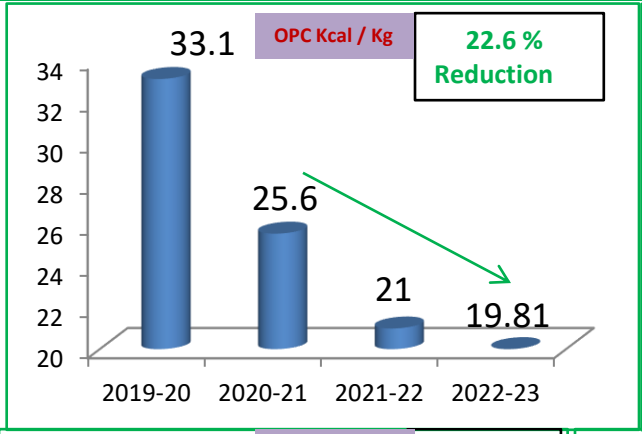


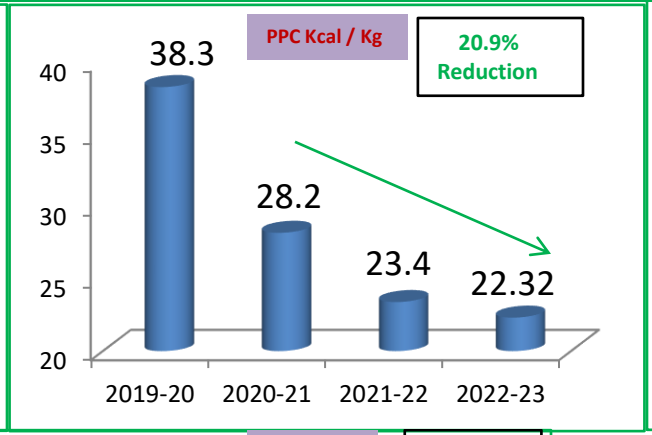


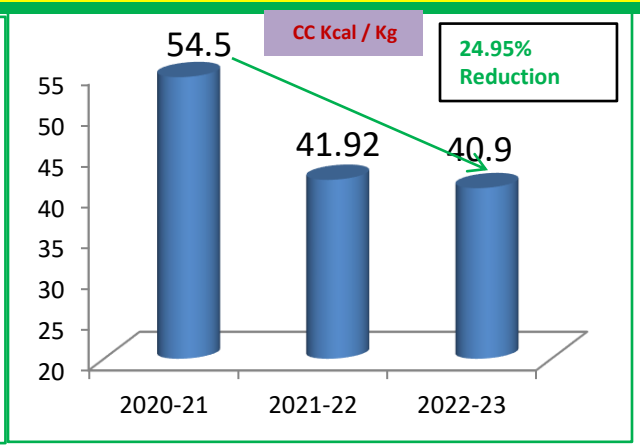
Specific Electrical Energy -Last 3 Years

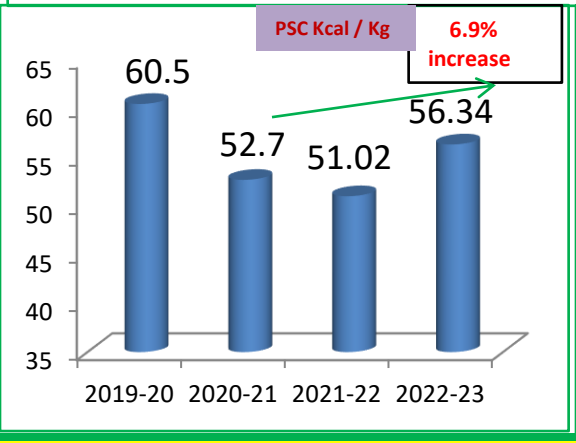
Year	2020-21	2021-22	2022-23
Production(MT)	8,12,873	9,14,859	10,03,298
Energy consumption (Million Kwh)	27.74	31.58	34.89

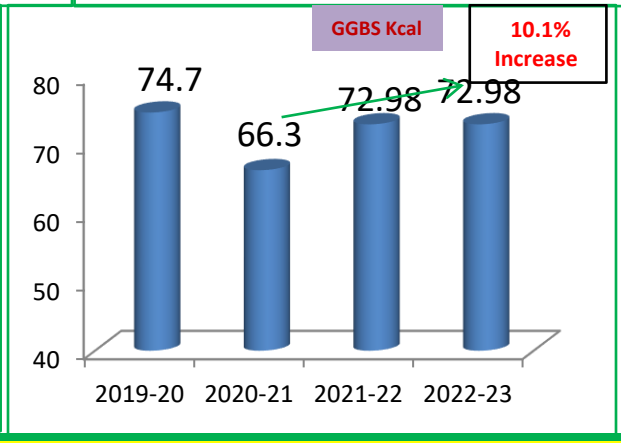
2. Sp. Thermal Energy Consumption in last 3 years (FY 2020-23)











Specific Thermal Energy -Last 3 Years

Year	2020-21	2021-22	2022-23
Total Production(MT)	8,12,873	9,14,859	10,03,298
Energy Consumption (MKcal)	30,645	34,265	37148

3. Information on Competitors, National & Global benchmark

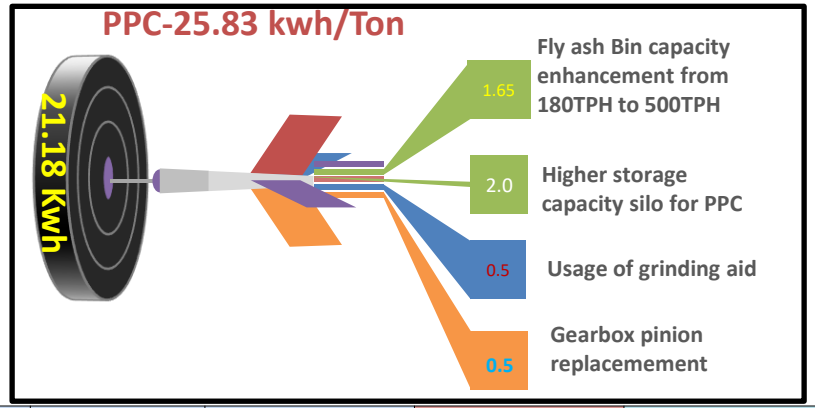
Short term/ Long term Target & National Benchmarking

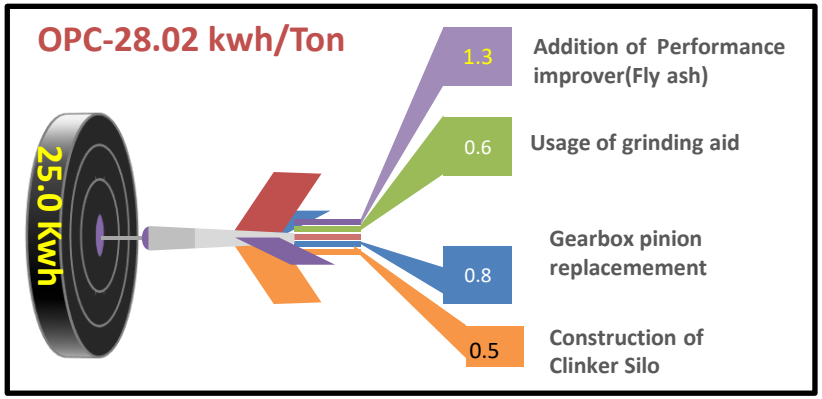
Sl. No.	Description	Specific Electrical Energy (KWH / Ton)				Bench Mark	Short Term Target	Long Term Target	Neighbour Plant
		2019-20	2020-21	2021-22	2022-23	CII *	2023-24	2024-25	2022-23
1	PPC	36.87	26.14	**25.93**	**25.83**	20.2	25.06	24.56	25.95
2	OPC	33.14	28.26	**28.87**	**28.02**	24.5	27.18	26.64	28.43
3	PSC	36.18	35.49	**36.36**	**38.33**	29.8	37.18	36.44	37.24
4	GGBS	38.27	38.53	**38.42**	**41.03**	-	39.80	39.00	39.93
5	CC	-	-	**28.14**	**29.04**	28.5	28.17	27.61	29.8
6	Packing Plant	1.21	1.26	**1.05**	**1.03**	0.7	0.99	0.97	1.21

* **Source : CII -Energy Benchmarking for Cement Industry version 6.0 (Page No-18)**

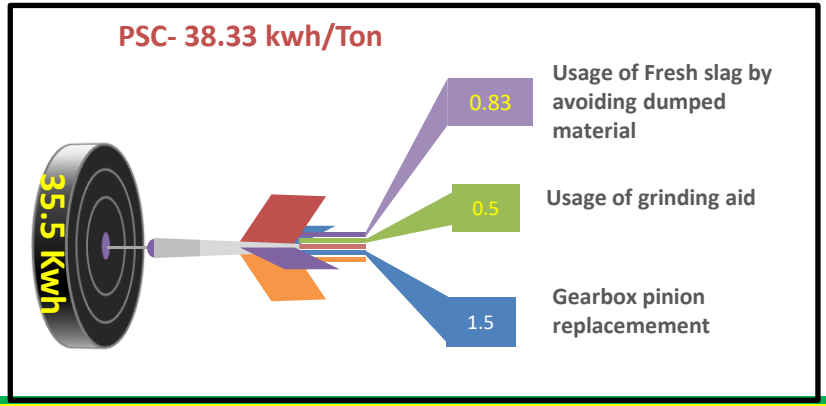
3. Information on Competitors, National & Global benchmark

Road Map to achieve national/global benchmarking





Sl. No.	Description	SE Energy (KWH / Ton)	Bench Mark	How close to CII-National
		2022-23	CII *	Where we
1	PSC	**38.33**	35.5	Plant-7
2	OPC	**28.02**	25.0	Plant-2
3	PPC	**25.83**	21.18	Plant-8
4	GGBS	**41.03**	-	No benchmark
5	CC	**29.04**	28.5	Plant-1(Others)
5	Packing Plant	**1.03**	1.02	Plant-6



* Source : CII -Energy Benchmarking for Cement Industry version 6.0 May-2023(Page No-28)

3. Information on Competitors, National & Global benchmark

Road Map to achieve national/global benchmarking

Road Map: Action Plan with Target & Responsibility to reach National Bench mark

PSC	Project Description	Electrical saving KWH / Ton	Achieved 2022-23(KWH/Ton)	% of Benefit Expected	Target By	Responsibility	Reviewed By	Status
1	Usage of Fresh slag by avoiding dumped material	0.83	38.33	2.17 %	Dec-23	Mr.Gopi Reddy	Plant Head	Project under execution
2	Installation of VFD for Clinker Truck Tippler Bag Filter fan	0.50		1.3 %	Jan-24	Mr.N Satish	Plant Head	Approval Stage
3	Usage of grinding aid	0.50		1.3 %	Nov-23	Mr.Gopi Reddy	Plant Head	Trail has been taken with various grinding aids like criso,super grade 563,Matie.
4	Gearbox pinion replacemement	1.5		3.9 %	Nov-23	Mr.Narendra	Plant Head	Material received at site and waiting for Plant stoppage
5	Construction of Clinker storage silo	0.50		1.3 %	Apr-24	Plant Head	G.P	Civil work under progress
	Total	3.83	34.5	**9.9%**				
PPC	Project Description			%	Target By	Responsibility		Status
1	Gearbox pinion replacemement	0.5	25.83	1.93 %	Nov-23	Mr.Narendra	Plant Head	Material received at site and waiting for Plant stoppage
2	Usage of Grinding aid	0.5		1.93 %	Nov-23	Mr Gopi reddy	Plant Head	Trail has been taken with various grinding aids like criso,super grade 563,Matie
3	Fly ash Bin capacity enhancement from 180TPH to 500TPH	1.65		6.4 %	Mar-24	Mr.Narendra	Plant Head	Drawings approved, Waiting for material.
4	Higher storage capacity silo for PPC	2.0		7.7 %	Dec-23	Mr.Narendra	Plant Head	Under Progress
	Total	4.65	21.18	**17.96 %**				
OPC	Project Description			%	Target By	Responsibility		Status
1	Addition of Performance improver(Fly ash)	1.3	28.02	4.6 %	Dec-23	Mr.Gopi Reddy	Plant Head	Approval Stage
1	Usage of grinding aid	0.6		2.14 %	Nov-23	Mr.Gopi Reddy	Plant Head	Trail has been taken with various grinding aids like criso,super grade 563,Matie
2	Gearbox pinion replacemement	0.8		2.85 %	Nov-23	Mr.Narendra	Plant Head	Material received at site and waiting for Plant stoppage
3	Construction of Clinker Silo	0.5		1.78 %	Apr-24	Plant Head	G.P	Civil work under progress
	Total	3.2	25.0	**11.37 %**				

3. Information on Competitors, National & Global benchmark

Energy Conservation Projects –Planned FY 2023-24

Sl.No.	Year	Title of Project	Annual Electrical savings (Million kwh)	Annual thermal Saving (million Kcals)	Total Annual savings (Rs Lakhs)	Investment (Rs million)
1	2023-24	Mill feed RAL Over load tripping avoided by reverse function enabled in VFD drive.	0.00738	0	0.52	0
2	2023-24	Auxiliary bag filter RAL operation optimization with Bag filter Hopper level sensor	0.011	0	0.78	0.1
3	2023-24	Slag feeding belt feeder replaced with chute	0.11988	0	8.39	0
4	2023-24	Capacity enhancement of Flyash bin from 180 Ton to 500 Tons	0.1035	0	7.25	5
5	2023-24	Bag filter Optimization in Material handling by usage of Dry slag	0.1188	0	8.32	0
6	2023-24	Construction of Clinker silo 15,000 MT to avoid clinker hopper empty.	0.0596	0	4.17	100
7	2023-24	Material Handling section Bag Filter fans operation with VFD-2X37KW	0.0732	0	5.12	0.6
8	2023-24	Arresting of false air entry at Roller sealing area	0.164	0.8	11.5	0.2
9	2023-24	Upgradation of HAG from 2nd generation to 3rd generation by removing Ash hoppers	0.0	30	0.0	0.2
10	2023-24	Installation of Solid flow meter for Performance improver in OPC product	0.6	0.00028	42	0.25

4. Energy Saving projects implemented in last three years

Energy Conservation Projects Completed in last Three years FY 2021-2023

Year	No of Energy Saving Projects	Investments (In Millions)	Electrical Savings (In Million Kwh)	Savings (INR Million)	Impact on SEC (Electrical KWH / MT Cement)
2020-21	10	5.6	2.897	31	4.24
2021-22	11	2.9	0.36	8.18	0.427
2022-23	11	8.8	0.618	5.125	0.664
FY 2020-23	32	17.3	3.875	44.30	5.331

4. Energy Saving projects implemented in last three years

Energy Conservation Projects -Last 3 Years							
Sl No	**Year**	**Energy Management Project details**	**Electrical savings (Million kWh)**	**Thermal savings (Million Kcal)**	**Total Savings (INR Million)**	**Impact on SEC/ SHC**	**Investments (INR Million)**
1	FY 2020-21	Clinker weigh feeder capacity enhancement from 100TPH to 200TPH for OPC specific power reduction.	1.596	0.00	11.172	2.28	1.1
2	FY 2020-21	Plant Electrical system Power Factor Improvement from 0.97 to 0.99 by adding capacitor bank	0.661	0	4.630	0.94	2.5
3	FY 2020-21	37KW ,Packer-1 &2 Bag filter operation with VFD in place of DOL	0.077	0	0.540	0.11	1.2
4	FY 2020-21	Relocation & Duct modification in Electrical Load center Air conditioning system to maintain panel room temperature below 30Deg .	0.170	0.00	1.19	0.24	0.5
5	FY 2020-21	Online mill Change over of Products grinding through PXP	0.157	0	1.102	0.22	0
6	FY 2020-21	Minimization of circulating air entry to HAG by stopping of 2X7.5KW circulating air fans.	0.0567	1.43	0.399	0.08	0
7	FY 2020-21	Minimization of process water consumption in mill for PSC product grinding.	0.000	6.00	0.009	0.09	0
8	FY 2020-21	Consumption of Old Slag (6% Moisture)& Fresh Slag (12% Moisture) together to mill	0.0 00	3	0.004	0.04	0
9	FY 2020-21	Replacement of Conventional 40w tube lights with 24w LED lights for old quarters.	0.070	0	0.0564	0.10	0.2
10	FY 2020-21	Arranging Permanent Magnet on 590BC01 Conveyor	0.103	0	0.826	0.14	0.1
		Sub total	2.897	10.43	31	4.24	5.6

4. Energy Saving projects implemented in last three years

Energy Conservation Projects -Last 3 Years

S.No.	Year	Title of Project	Total Annual savings (Rs Lakhs)	Annual Electrical savings (Million kwh)	Annual thermal Saving (Rs Lakhs)	Impact on SEC/ SHC	Investment (Rs Million)
1	FY 2021-22	Old Packing Plant Packer capacity enhancement from 54tph to 90 tph by increasing elevator buckets volume.	0.32	0.045	0	0.05	0
2	FY 2021-22	Installation of LP Compressor in place of 55 GA Compressor for flay ash unloading from tanker to Bin	0.382	0.054	0	0.06	1.5
3	FY 2021-22	Usage of waste wood for firing in place of disel for HAG restarting.	2.8.	0	28.6		0
4	FY 2021-22	Optimization of bag house fan flow by removing orifice in bag house outlet duct.	1.814	0.025	0	0.03	0
5	FY 2021-22	Packer-1 &2 Bag filter(30KW) operation with VFD in place of DOL	0.52	0.074	0	0.09	0.5
6	FY 2021-22	Increasing of reject vibrating screen height to avoid the refalling of reject material.	0.413	0.005	0	0.007	0
7	FY 2021-22	Provided Insulation of Load Center outside AC duct to avoid condensation	1.210	0.017	0	0.02	0.3
8	FY 2021-22	Installation of IE3 motors in place of IE1 Motors	1.890	0.027	0	0.03	0.5
9	FY 2021-22	Reject RAL drive (3.7KW) stopped by connecting chute to mill feed path.	1.134	0.016	0	0.09	0
10	FY 2021-22	Silo bucket elevator load optimized by changing the bag house purging sequence	0.5	0.071	0	0.02	0
11	FY 2021-22	Installation of Auto MRP and Bag Counting system by integration with ERP	1.97	0.026	0	0.03	0.1
Sub Total			**8.183**	**0.36**	**28.6**	**0.427**	**2.9**

4. Energy Saving projects implemented in last three years

Energy Conservation Projects -Last 3 Years

S.No	Year	Title of Project	Total Annual savings (Rs Miilons)	Annual Electrical savings (Million kwh)	Annual thermal Saving (Rs Million)	Impact on SEC/ SHC	Investment (Rs Million)
1	FY 2022-23	Classifier efficiency improved by providing ring at wear ring	1.28	0.183	0	0.20	0
2	FY 2022-23	Bag house air slide optimization by connecting one air slide blower for 2 air slides	0.34	0.048	0	0.054	0.0
3	FY 2022-23	Additional truck loading machine installation for old packer to maximize packer operation	0.315	0.045	0	0.05	0.50
4	FY 2022-23	Old packer truck loading machine trolley length extension to minimize loading time of truck.	0.42	0.060	0	0.06	0
5	FY 2022-23	Reduce the heat loss through HAG doors by arrest the false air by using transparent glass	0.058	0.000	0.005	0	0.3
6	FY 2022-23	Use of 3KW water pump instead of 7.5KW pump for process water for mill operation.	0.8	0.011	0	0.01	0
7	FY 2022-23	37 KW VFD installed for VRM auxiliary bag filter fan	0.542	0.074	0	0.09	0.5
8	FY 2022-23	Reject bucket elevator inclination changed and vibration level increase for free material increase	0.42	0.060	0	0.06	0
9	FY 2022-23	Compressors optimization by installing IFC at compressor line	0.72	0.104	0	0.11	6.0
10	FY 2022-23	Installation of magnetic separator on clinker and slag unloading conveyor	0.12	0.018	0	0.02	1.5
11	FY 2022-23	Installation of Belt conveyor in place of screw conveyor at Clinker circuit	0.11	0.015	0	0.01	0
Sub Total			5.125	0.618	0.005	0.664	8.8

5.Innovative Projects implemented

Project -1: Product Residue improved by providing flat at static area

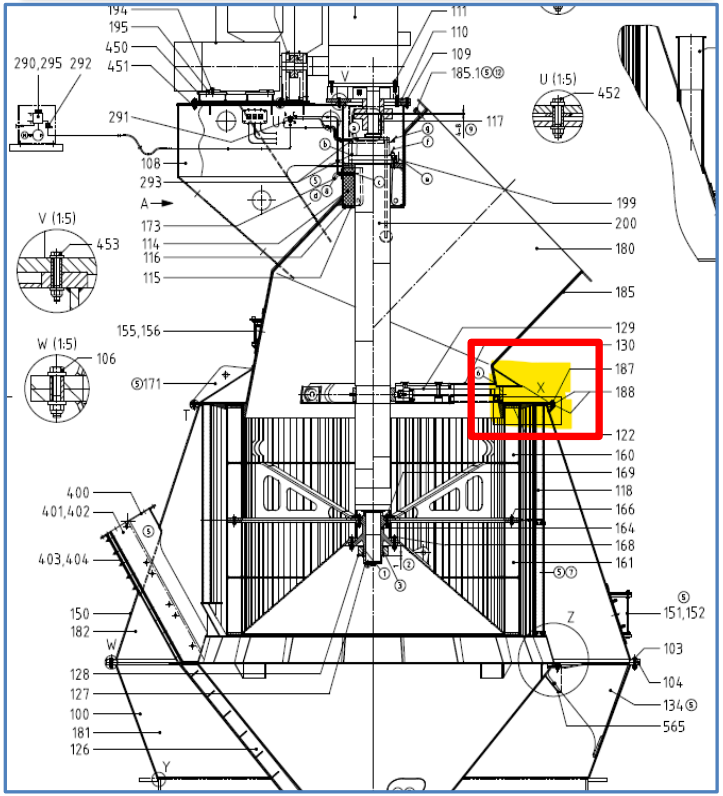
Understanding:

- We are using MVR 5000-C4 VRM for Cement Grinding with 6 variants of OPC,PPC,PSC,CC ,IPC & GGBS.
- Mill was installed with SLS 4750 BC Classifier.

Actual Problem :

- We are not getting desired residues in all products even though Mill is supporting to increase the fresh feed.
- We have done Mill internal inspection like Damring,Nozle ring and Grinding table and rollers.
- We have inspected Classifier seal gap and we have not observed any deviation.
- We suspected from the seal gap area some coarse particles are escaping.

SLS 4750BC



5.Innovative Projects implemented

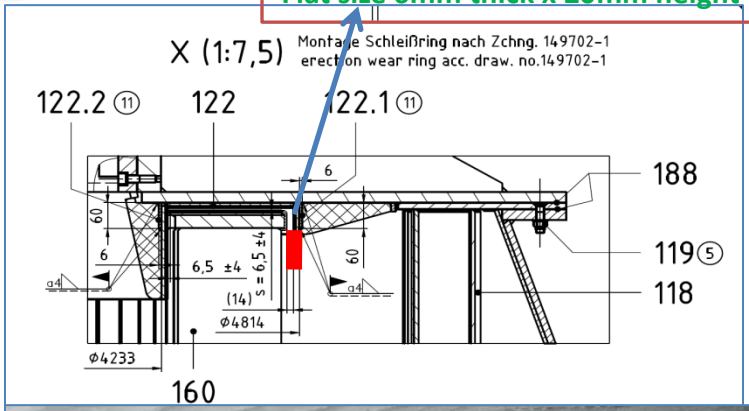
Project -1: Product Residue improved by providing ring at static area

Innovative solution:

Extension of flat ring at wear ring from static vane side around the Rotor.

6mm X 20 mm height flat.

Flat welded around the rotor
Flat size 6mm thick x 20mm height



Results:

- Mill residue achieved at higher TPH.
- Feed increased from 165 to 170 TPH.
- Specific power reduced 0.2 kwh /ton of cement in both products.
- Compressive strength achieved at higher output

Savings:

S.No	Description	Kwh/ Hr	Kwh/Year	Annual Saving(Rs in Lakhs)	SEC impact
1	Power Saving	32	201600	1411200	0.22

5.Innovative Projects implemented

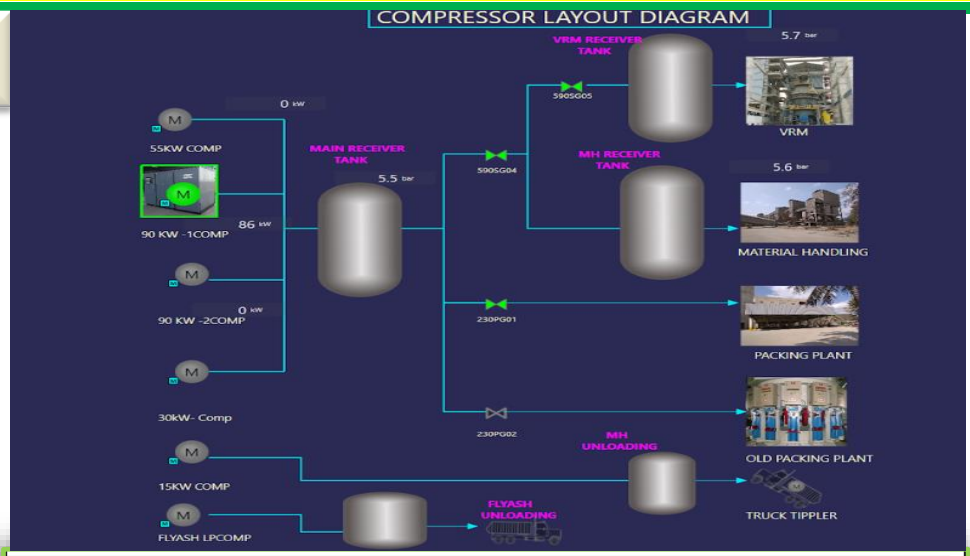
Project -2: Optimization of Compressed air by Intelligent flow controller(IFC)

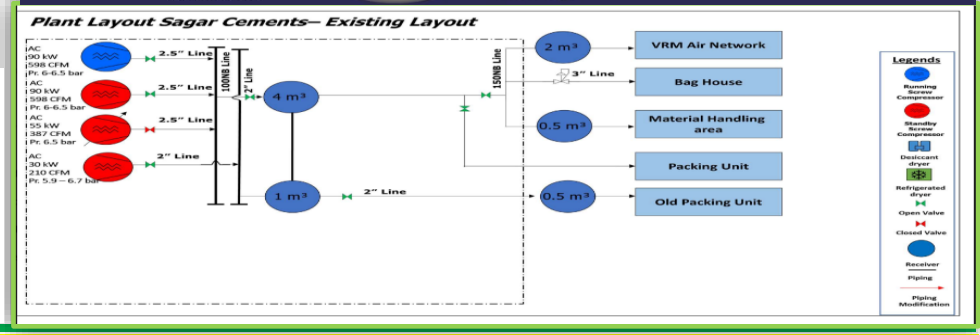
Understanding:

➢In Sagar Cements Bayyavaram Plant : 2 no's. of 90 kW Screw air compressor ,1 no of 30 kW and 55 KW VSD Screw air compressors are installed in Centralized manner.

Issues with Fluctuating Air Pressure

- ➢ Higher Energy Consumption
- ➢ Inconsistent equipment performance
- ➢ Premature equipment failure
- ➢ Higher operating costs



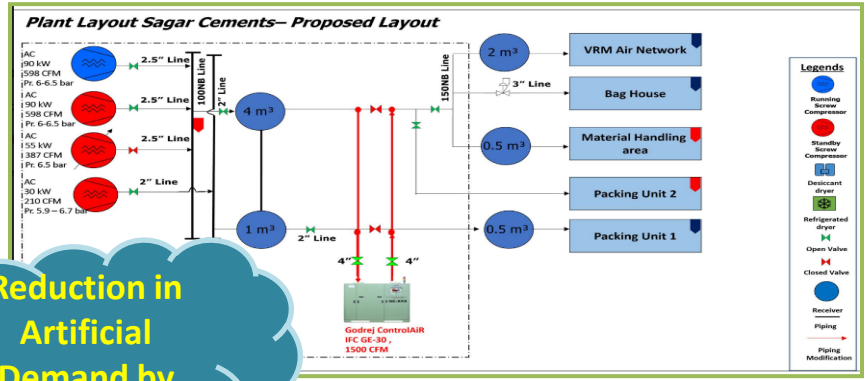


5. Innovative Projects implemented

Project -2: Optimization of Compressed air by Intelligent flow controller(IFC)

Innovative solution:

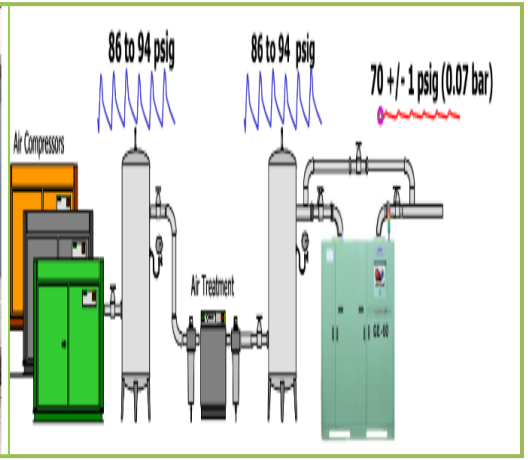
- Installation of Intelligent flow controller to reduce artificial demand and run the compressor at constant pressure.
- Compressors will go to idle mode when demand is low and it will reduce the compressor specific power.



Reduction in Artificial Demand by 4-25 %

Results:

Daily Energy Consumption	:	2500 kWh/day
Daily Energy Savings	:	255 kWh/day
Daily Energy Cost Saving (@Rs.7/kWh)	:	1785
Annual Energy cost saving	:	624750/-
Annual CO2 reduction	:	**71.4 tons CO2 Eq**



5. Innovative Projects implemented

Project -3 : Extension of truck loader trolley to avoid Idle running

Understanding:

- We have trolley type old truck loading machine for PPC and CC products.
- CC and PPC products are dispatching to Odisha market with high capacity trucks

  (14 tyre and trolleys)
- This machine trolley length is suitable for 12 tyre length Lorries.
- Above 12 tyre trucks loading operators have to carry cement bags manually.
- Nearly 100 bags to be loaded manually to complete the truck.

Actual Problem :

- Due to manual handling of bags Packer circuit idle running increased.
- More number of CC and PPC product trucks are waiting for loading.
- Truck TAT is very high.

5. Innovative Projects implemented

Project -3 Extension of truck loader trolley for Energy conservation

Innovative solution:

➢Extension of Trolley length 1.5 meters to avoid idle running of packer circuit.

Benefits :

➢Truck loading time reduced from 45 minutes to 30 minutes.

➢Truck TAT improved .

Savings :

Daily Energy Savings	: 150 Kwh/day
Daily Energy Cost Saving (@Rs.7/kWh)	: 1050/-
Annual Energy cost saving	: 367500/-
Annual CO2 reduction	: 43.05 ton CO2 Eq

6 Utilisation of Renewable Energy sources

On site-Renewable- Roof Top solar on office building and staff quarters top

Year	Technology	Type of Energy	On site / Off site	Installed Capacity (in MW)	Generation (in Million Kwh)	% Over all electrical energy
2019-20	PV Cell	Solar	On-Site	0.130	0.09995	0.34
2020-21	PV Cell	Solar	On-Site	0.130	0.123	0.44
2021-22	PV Cell	Solar	On-Site	0.130	0.121	0.39
2022-23	PV Cell	Solar	On-Site	0.130	0.107	0.36

Off site-Renewable- 4.3 MW in Guntur ,4MW in Kurnool Hydro plants

Year	Technology	Type of Energy	On site / Off site	Installed Capacity (in MW)	Generation (in Million Kwh)	% Over all electrical energy
2019-20	PV Cell	Hydro	Off-Site	8.3	21.283	73.26
2020-21	PV Cell	Hydro	Off-Site	8.3	21.352	76.87
2021-22	PV Cell	Hydro	Off-Site	8.3	27.70	88.34
2022-23	PV Cell	Hydro	Off-Site	8.3	32.24	75.37

Renewable energy is 75.37 %.

6.Utilisation of Renewable Energy sources

SAGAR CEMENTS LIMITED

Renewable Power Allotment

SCL/ /Hyd/2022-23/01

The Sr. Vice President (Works), Mattampally,

The Asst. Vice President (Works), Gudipadu Unit,

The Senior General Manager (Works), Bayyavaram Unit.

Sub: - RE Allocation for FY 2022 – 23 – Reg.

Dear Sir,

During Energy Management review meeting held on 08.06.2022, the allocation of renewable power from our group companies has been decided as noted below.

S.No	Description	Installed Capacity	Generation in MW	Percentage of Allocation		
				Mattampally	BVRM	Gudipadu
1	WHRS	8.80 MW	52248.00	100		
2	Solar Mattampally	1.25 MW	1304.49	100		
3	Solar HO	80 KW	120.27	100		
4	SCL - Hydro Power Plants	8.30 MW	32248.80		100	
5	SPL - Theni	1.65 MW	3116.00			100
6	RVC Wind Firms	2.35 MW	3232.00			100

All are requested to note the same and plan accordingly.

Thanking You.
Yours sincerely.
For Sagar Cements Limited.

SRINIVAS REDDY SAMMIDI
Digitally signed by SRINIVAS REDDY SAMMIDI
Date: 2022.06.08 14:21:16 +05'30'

S Srinivas Reddy
VP – Power Projects

Registered Office: Plot No. 111, Road No: 10, Jubilee Hills, Hyderabad – 500033
Phone No: +91 – 40 – 23351571, 23356573 Fax: +91 – 40 – 23356573 info@sagarcements.in www.sagarcements.in
CIN: L26942TG1985PLC002887

Total Group Green Power- 26.43MW. 100% (8.3MW) Hydro Power allotted to Bayyavaram Plant.

7. GHG Inventorization

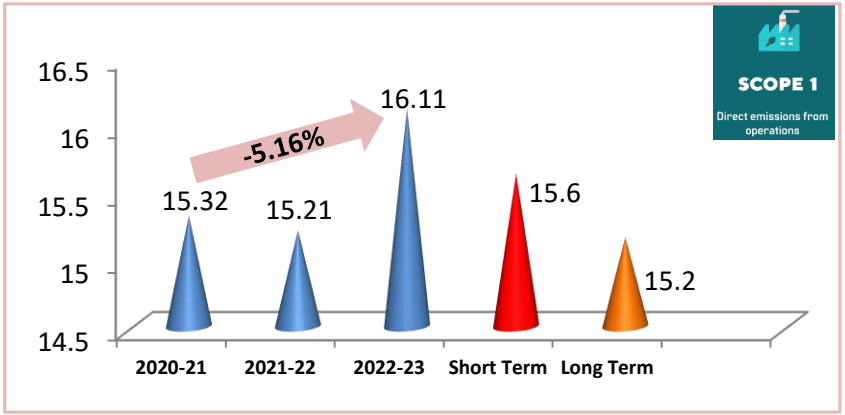
Absolute Emissions and Emissions intensity of last three years

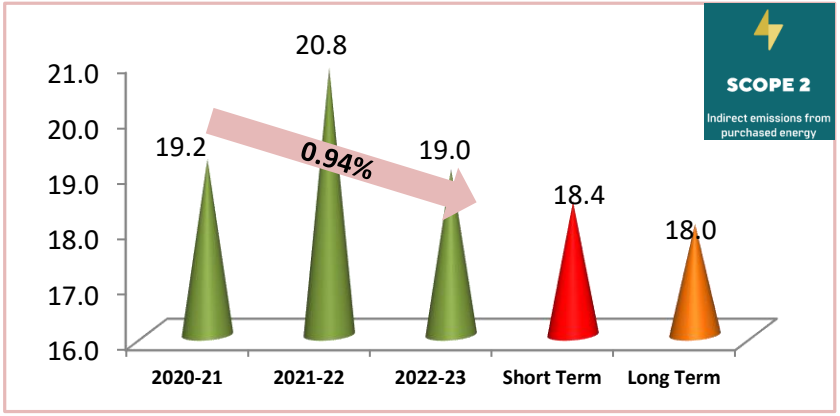
WBCSD Cement Sustainability Initiatives						
	FY-2020-21		FY-2021-22		FY-2022-23	
Description	CO2 (MT)	Kg CO2/Ton of cement	CO2(MT)	Kg CO2/Ton of cement	CO2(MT)	Kg CO2/Ton of cement
Scope-1	12454	15.32	13917	15.21	16162	16.11
Scope-2	15584	19.17	19054	20.82	19057	18.99
Scope-3	10759	6.6	10909	6.0	10992	5.5

Note: Sagar Cements Ltd has committed to achieve **“Net Zero Emission by 2050”**

- Rs. 2.1 Cores investment -2Nos,Supplied M/s BYD Electric Vehicles Q1R model for Raw material and Cement transport

7. GHG Inventorization





- *Target (short term/ long term) for CO2 emission reduction and action plan*

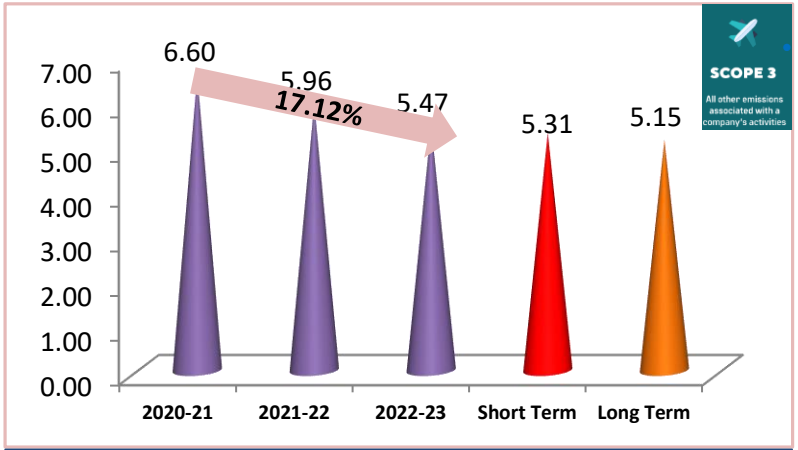
Action Plan:

Scope -1&2

- Increase of slag addition in PSC from 55.85% to 60%.
- Consistently maintain fly ash addition in PPC @ 35%.
- 5% addition of performance improver (fly ash/slag) in OPC.
- Cement to Clinker factor 0.64 to 0.60.
- Implementation of identified energy conservation project
- Switching to 100% Renewal Energy
- Increase of Bio fuels from 3.2% to 20%

Year	% Hydro / Solar	% Grid
FY:2019-20	74.14	25.86
FY:2020-21	77.81	22.19
FY:2021-22	88.34	11.66
FY:2022-23	75.37	24.63

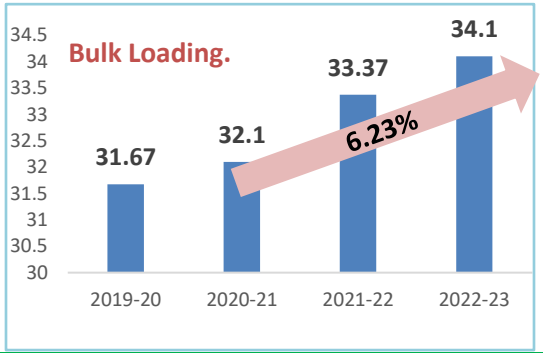
7. GHG Inventorization



Target (short term/ long term) for CO2 emission reduction and action plan

Scope-3

- Logistic management,70% of sales within 200KM range.
- Encouragement of bulk transportation from 34.1 % to 38 %.
- Improving fleet efficiency.
- **EV100 - To switching to 100% Electric Vehicles**
- **Present in beginning stage Procured 2 no's Electrical Trucks for raw material transportation and Cement dispatch.**



70% of product sales below 200KM.

Product Sales Distance in Percentage

Distance (KM)	2022-23
0-50	39.2
51-100	4.6
101-200	25.9
>200	30.2

7. GHG Inventorization

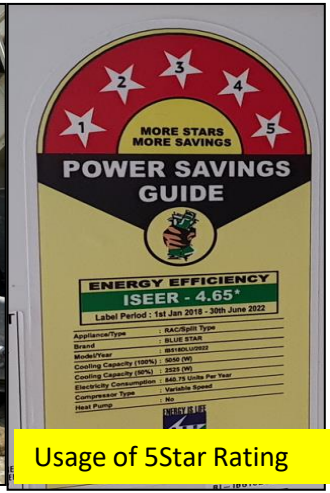
GHG intensity of peers/competitors

	FY-2022-23		Ramco Cement	Chettinad Cement	Maha Cement	Orient Cement
Description	CO2(MT)	Kg CO2/Ton of Cement	Kg CO2/Ton of Cement	Kg CO2/Ton of Cement	Kg CO2/Ton of Cement	Kg CO2/Ton of Cement
Scope-1	16672	16.11	15.7	20.4	18.5	
Scope-2	19057	19.0	21.3	22.6	21.5	19.5
Scope-3	10992	5.47	6.2	7.5	5.2	

7. GHG Inventorization

Name of raw material	UOM	2022-23
Total cement production	MT	10,03,298
Slag consumption	MT	3210431.49
Fly ash	MT	45021.35
Phosphor	MT	17547.21
Total waste material	MT	383609.49
38.365 % raw materials are By-products/waste of other industries	%	**38.36%**

Visit to RINL –Slag Supplier to Plant



Usage of 5Star Rating

S.NO	Initiative	202-23
1	Suppliers meeting at plant & their premises	1
2	Dealers meeting at plant & their premises	2
3	Transporters meeting at plant.	3
4	Drivers' Training on Safe drivingand Fuel Saving	3
5	Equipping the trucks withGPRS for better monitoring	150Nos
6	Percentage of Bulk movement	34.1%

Product Sales Distance in Percentage

Distance (KM)	2022-23
0-50	41.5
51-100	4.9
101-200	24.3
>200	29.3

Awareness to the Transporters:

- Prohibited to use of Transport vehicles older than 15 years.
- Insisting on pollution certificates of the vehicles, practicing random checking of them.
- Not allowing loads higher than the design / permitted capacity.

7. GHG Inventorization

Green Product Certification- PSC,PPC,CC,GGBS By CII

1.Green Procurement
2.Efficient fleet.
3.Local Vendors promotion.
4.Resource Conservation.
5.Vendor audit & Best Practices sharing

By Promoting various blended cements-3.38Lakh MT of other industries By-Products(Slag, Fly ash, Phosphor) for cement production, Around 37% raw materials are By-Products

Green Sourcing

Green Manufacturing

Green Design

Natural Resources Conservation

Green Packing

Green Logistics

Green Supply Chain Management

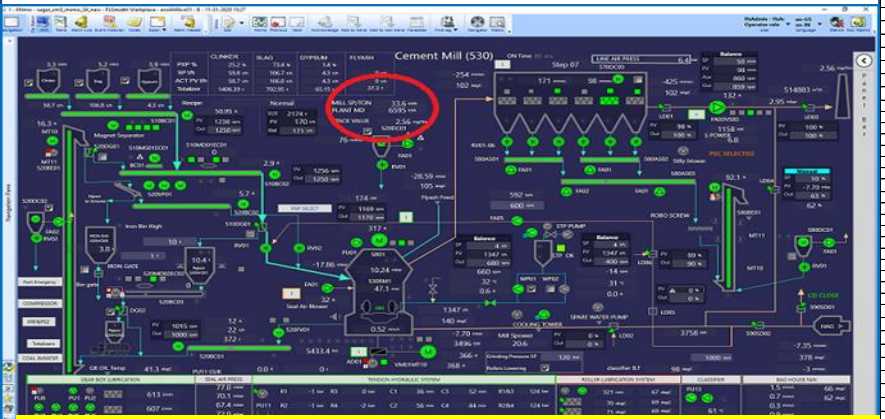
33.3 % of Product Sales through bulk Dispatches

100% Reverse Logistics

8. EMS System and other requirements

Existing Energy parameters monitoring system

Plant is having 61 Nos networked digital energy meters connected to plant DCS. All major and more than 5% energy intesive equipments have meters and connected to DCS .Day wise & Product wise Electrical, Thermal energy report is generated in the system automatically.



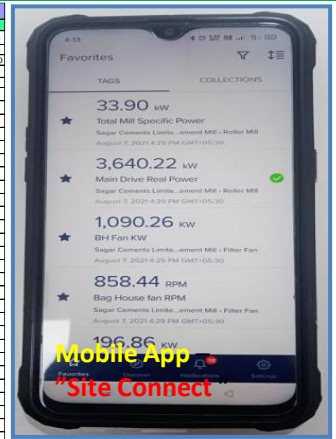
Instant specific power and Plant MD monitoring system displayed in operator screen

SAGAR CEMENTS LTD ,BAYYAVARAM

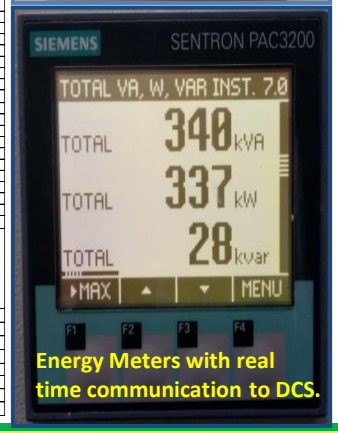
Power Consumption Report on 07-05-22

Sl.No		Consumption	MD		GRD CUM. KVAH	6,97,800
	EPDCL (KVAH)	1,39,800	Day P.F	0.987	GRD CUM. KWH	6,90,200
	EPDCL (KWH)	1,38,000	Solar	436	140KVA DG	0
					Total Cons. (KWH)	**1,38,436**
1	**VRM Section**	**R.Hrs**	**PRO (Dry)**	**Units / Day**	**KW/ Hr**	**(Kwh/Ton)**
	New VRM - PSC Units					
1	Main Drive (4300KW)	8.38	1354	31303	3885	23.13
2	Bag House Fan (1700KW)			9966	1126	7.36
4	Classifier (560KW)			1490	186	1.10
5	VRM Auxiliariers (MCC-2)			1192	149	0.88
6	Fly Ash & Bag House (MCC-3)	TPH-wet	171	969	121	0.72
7	Materail Transportation (MCC-1)	TPH-Dry	162	1050	113	0.78
8	Compressors- PDB	BH Fan rpm	887	630	124	0.47
	Total Units	Classifier RPM	1140	**46600**	**5705**	**34.43**
	New VRM - OPC Units					
1	Main Drive (4300KW)	5.52	1024	18089	2392	17.66
2	Bag House Fan (1700KW)			7128	946	6.96
4	Classifier (560KW)			510	85	0.50
5	VRM Auxiliariers (MCC-2)			921	154	0.90
6	Fly Ash & Bag House (MCC-3)	TPH-wet	186	611	100	0.60
7	Materail Transportation (MCC-1)	TPH-Dry	186	754	103	0.74
8	Compressors- PDB	BH Fan rpm	904	544	135	0.57
	Total Units	Classifier RPM	825	**28600**	**5184**	**27.93**
	New VRM - GGBS Units					
1	Main Drive (4300KW)	7.44	1178	29512	3963	25.06
2	Bag House Fan (1700KW)			8025	972	6.81
4	Classifier (560KW)			1326	173	1.13
5	VRM Auxiliariers (MCC-2)			1065	139	0.90
6	Fly Ash & Bag House (MCC-3)	TPH-wet	172	1153	151	0.98
7	Materail Transportation (MCC-1)	TPH-Dry	158	770	91	0.65
8	Compressors- PDB	BH Fan rpm	850	598	136	0.51
	Total Units	Classifier RPM	1116	**42450**	**5747**	**36.05**
	New VRM - PPC Units					
1	Main Drive (4300KW)	1.27	241.40	3697	2900	15.32
2	Bag House Fan (1700KW)			1585	1170	6.56
4	Classifier (560KW)			110	110	0.46
5	VRM Auxiliariers (MCC-2)			143	143	0.59
6	Fly Ash & Bag House (MCC-3)	TPH-wet	192	166	166	0.69
7	Materail Transportation (MCC-1)	TPH-Dry	190	169	155	0.70
8	Compressors- PDB	BH Fan rpm	890	102	159	0.42
	Total Units	Classifier RPM	959	5973	**4803**	**24.74**
	New VRM - PPC Units					
1	Main Drive (4300KW)	1.39	258	4723	3398	18.31
2	Bag House Fan (1700KW)			1835	1320	7.11
4	Classifier (560KW)			125	90	0.48
5	VRM Auxiliariers (MCC-2)			144	104	0.56
6	Fly Ash & Bag House (MCC-3)	TPH-wet	186	192	138	0.74
7	Materail Transportation (MCC-1)	TPH-Dry	186	65	47	0.25
8	Compressors- PDB	BH Fan rpm	890	149	107	0.58
	Total Units	Classifier RPM	#DIV/0!	7234	**5204**	**28.04**
1	**Packing Plant**	P.R.Hrs	**Dispatch**	Units / Day	**TPH**	**(Kwh / Ton.)**
2	MCC - 4 (Common Ckt)	7.03	342	601		
3	MCC - 5 (Packer - 1-OPC)	8.60	1131	363		
4	MCC – 6 (Packer - 2-PSC)	10.67	785	754		0.85
5	Old Packing Plant		369	476		
6	Compressors			420		
	Total Packing Plant		**3064**	**2614**		
	Total Compressor(Mill+RM)			2064		0.51
1	Staff Colony	PXP	CV	391	CM-3 R.HRS	24.00
2	Distribution Losses	0.6	4600	1267	CLINKER R.HRS	9.43
3	Misc(3,4th FF AC+ wdg works+str+wor	Restarting purpose coal -kg	12000	3307	SLAG R.HRS	11.23
		OPC	**PPC**	**CC**	**PSC**	**GGBS**
4	water consumption-Lt/Ton	**22.2**	**24.6**	**8.6**	**0.0**	**0**
5	coal consumption-kg/Ton	**6.07**	**5.90**	**8.21**	**12.60**	**18.29**
6	90KW1+90KW2+55KW+30KW+15KW	11.41	12.62	3.20	0.00	0.00

Daily Power Consumption Report



Mobile App "Site Connect"



Energy Meters with real time communication to DCS.

8. EMS System and other requirements

DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 10000336309-MSC-RvA-IND | Initial certification date: 02 January 2020 | Valid: 02 January 2023 – 01 January 2026

This is to certify that the management system of
Sagar Cements Limited
Bayyavaram (Village), Kasimkota (Mandal), Anakapalli, Visakhapatnam - 531031, Andhra Pradesh, India

has been found to conform to the Energy Management System standard:
ISO 50001:2018

This certificate is valid for the following scope:
Manufacture of cement

Place and date: Barendrecht, 11 November 2022

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

Eric Koek
Management Representative

ISO 50001:2018 Certification

0.1% **investment of energy saving projects on total turnover of the company**

Sl. No.	Description of meeting	Headed by	Frequency
1	Production & Performance review meeting	Plant Head	Daily
2	High Power committee meeting	Joint Managing Director / Group President	Monthly on 5th
3	Energy Review meetings	Plant Head	Quarterly

First Attempt GreenCo-PLATINUM

- ✓ ISO 9001 :2015 – Quality Management Systems
- ✓ ISO 14001:2015 – Environmental Management Systems
- ✓ ISO 45001:2018 – Occupational Health & Safety Management Systems
- ✓ "Testing Laboratory" got **"NABL accreditation"** in 2019 As per ISO/IEC 17025:2017

Energy Efficiency / awareness training programme

- Energy Awareness week celebrations by conducting various competitions among the employees.
- Suggestion,kaizen scheme.
- Capacity building by internal and external trainings.
- Visiting other units for sharing and gaining good practices.

8. EMS System and other requirements

Learning from CII or any other award programs

The Confederation of Indian Industry (CII) is working to facilitate Industries to Achieve World Class Levels In Energy Efficiency.

In the journey of Excellence we found CII as most enduring companion.

Various Energy saving projects implemented in our plant are replicated from Knowledge sharing programs and events by CII.

Some of these projects are as follows:

- Installation of Intelligent flow controller for Air compressor system for optimization.
- Local start stop push button and indication lamp provided for fly ash compressors at fly ash unloading area.
- Installation of LP Compressor for Flyash unloading sysrtem
- Bag filter optimization by running in D.P. mode

8. EMS System and other requirements

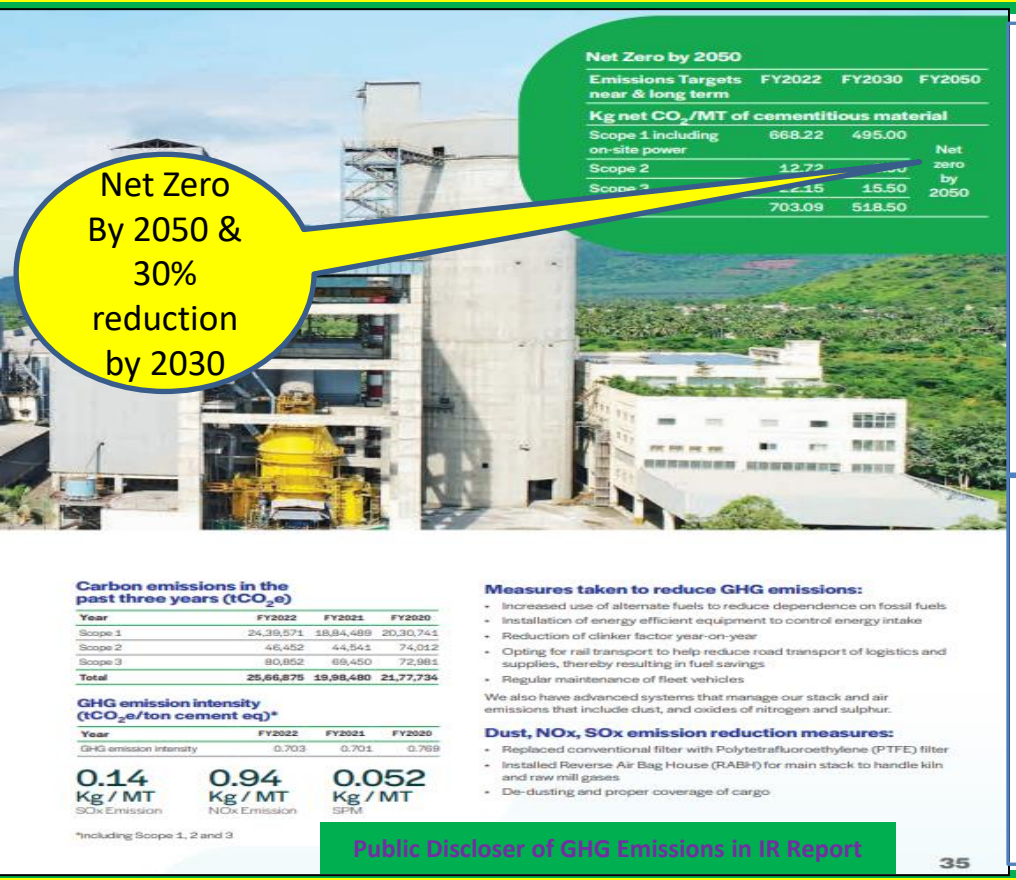
Workshop by Mrs Kusuma Kumari

Sl. No.	Training Programme	persons attend	Total tr. Hrs.
1	External (Energy Conservation in industry)	34	102
2	Internal Training on Energy Conservation	61	97
	Total	**95**	**199**

External Training Programme

Energy Conservation Competition Posters

9.NET Zero commitment



Roadmap for 30% reduction by 2030 and finally becoming Net Zero by year 2050

- Increased use of de-carbonated raw materials.
- Increased thermal efficiency and reduction of specific thermal consumption.
- Increased use of Alternate fuels for pyro process and drying.
- Reduction of clinker ratio in the cement.
- Increased electrical efficiency and reduction in specific electricity consumption.
- Increased ratio of Green Energy.
- Use of EV, Fuel cell, hybrid vehicles for material transport.

ESG Planning Activities

- Documentation for implementing ISO 26000 is completed and ready for deployment.
- Submitted commitment to SBTi to reduce CO2 emissions in line with SBTi targets of 1.5deg C. CDP (Carbon Disclosure Project)
- ESG VISION statement is developed.
- Entered agreement with M/s UNIQUS for ESG Framework development and prepare for the rating system

Any other relevant information

Any other awards, acknowledgement ,Major Achievements from CII

NATIONAL ENERGY LEADER -2022

National Energy Conservation Award conducted by B.E.E

Second Place in Cement Sector-2021

Received From : Shri R.K.Singh,Hon'ble Union Minister of Power & Renewable Energy, Govt.of.India

Star Performance award received from CII on Green Co Summit

Excellent Energy Efficient Unit-2022

Excellent Energy Efficient Unit-2021

Excellent Energy Efficient Unit-2020

Any other relevant information

CCQC-2022 –Vizag chapter

"Sagar Sunrisers"
Quality Circles Team got
"GOLD AWARD"

CCQC-22,Quality Circle Forum of India, for CASE Study, Visakhapatnam Chapter .

Kaizen competition-QCFI –Vizag chapter

Projects Through Kaizen

We have practice of small improvement jobs through Kaizen and FY 2022-23 we have developed 55 Kaizen from the total plant.

SAGAR CEMENTS LIMITED-BAYYAVARAM
Kaizen Sheet

Productivity	Quality	Cost	Delivery	Safety	Morale	Environment	Kaizen Type

Kaizen Title :	Movable type safety platform prepared for Truck Loading Machine maintenance	Basic Kaizen	Problem Solving Kaizen
		Breakthrough Kaizen	Poka Yoke Kaizen
		Result/Benefit:	

Problem/Present Status:	Before Improvement:	a. Qualitative
There is no platform for Truck Loading Machine maintenance purpose		b. Quantitative

Real Root Cause Identification:	After Improvement:	Standardization
There is no platform for Truck Loading Machine maintenance purpose		
Why ↓		
There is no platform for Truck Loading Machine maintenance purpose due to not possible to proved the permant platform		
Why ↓		
Not possible to proved the permant platform due to Trucks to be placed on this area for loading		
Why ↓		
Trucks to be placed on this area for loading due to as per design trucks should be placed at bottom of Truck loading mchine for loading		

Root cause	Trucks to be placed on this area for loading due to as per design trucks should be placed at bottom of Truck loading mchine for loading	Howmany places this kaizen can been deployed horizontally & Total benefits:
Idea to eliminate root cause	Movable type safety platform fabricated for easy maintenance of TLM	
Countermeasure	At the time of TLM maintenace we are using Movable type safety platform other wise it is place at outside	

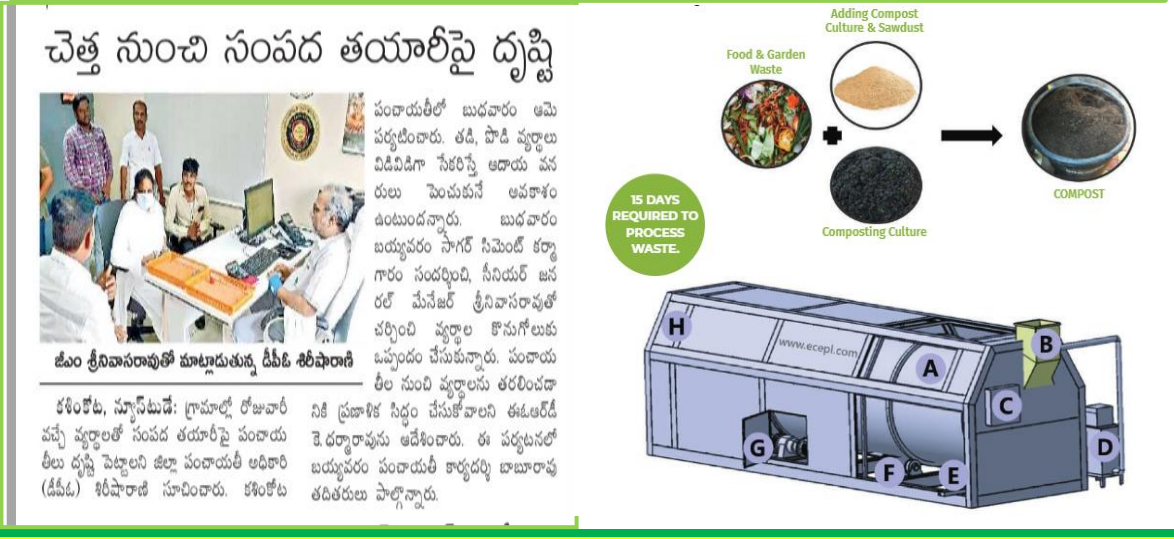
Team details Emp No	Emp Name	Implemented By	Y Ramlingeswara r	Approved by	Name	Approval Status
	L Nagesh	Implemented Area	Packing Plant	Section Head	Y Ramlingeswara rao	Approved
	D Shiva	Implementing Dept	Mechanical	kaizen Champion	M Narendra	Approved
	Sesha rao	Implemented Date	5/6/2023	TQM Champion	K srinivasa rao	Approved
	Raju	Kaizen No	26	Finance head	Y V Lakshmoji rao	Approved

Any other relevant information

Food waste from the canteen and colony is fed to the machine

and getting converted into compost.

➢ Suggestion from Jury members of CII during Green Co award



చెత్త నుంచి సంపద తయారీపై దృష్టి

జీఎం శ్రీనివాసరావుతో మాట్లాడుతున్న డీపీఓ శిరీషారాణి

కళింకోట, న్యూస్‌టుడే: గ్రామాల్లో రోజువారీ వచ్చే వ్యర్థాలతో సంపద తయారీపై పంచాయతీలు దృష్టి పెట్టాలని జిల్లా పంచాయతీ అధికారి (డీపీఓ) శిరీషారాణి సూచించారు. కళింకోట పంచాయతీలో బుధవారం ఆమె పర్యటించారు. తడి, పొడి వ్యర్థాలు విడివిడిగా సేకరిస్తే ఆదాయ మార్గాలు పెంచుకునే అవకాశం ఉంటుందన్నారు. బుధవారం బయ్యవరం సాగర్ సిమెంట్ కర్మాగారం సందర్శించి, సీనియర్ జనరల్ మేనేజర్ శ్రీనివాసరావుతో చర్చించి వ్యర్థాల కొనుగోలుకు ఒప్పందం చేసుకున్నారు. పంచాయతీల నుంచి వ్యర్థాలను తరలించడానికి ప్రణాళిక సిద్ధం చేసుకోవాలని ఈఓఆర్‌డీ కె.దర్మారావును ఆదేశించారు. ఈ పర్యటనలో బయ్యవరం పంచాయతీ కార్యదర్శి బాబూరావు తదితరులు పాల్గొన్నారు.

Any other relevant information

Water Positive Index

S.NO	Location	2022-23(KL)
A	Cement Production in MT	1003298.52
B	Total Water Consumption in Year	30560.61
C	Total Process Consumption in Year	21514
D	Water harvesting potential created in pond	60250
E	Rain Water harvesting through Pond and RWH Pits	25425.53
F	Rain Harvesting through drain pipe	15236
G	Total harvesting created	40661.53
	Water Positive(G/B)	**1.3**

Sewage treated process water for Cement Mill operation(Conservation of 12000 KL/Annum)

❖Treated STP water usage for Plant process, replacing the existing Raw Water Consumption, which is contributing to attain Water Positive.

❖Daily 20 KL of water is consumed from STP for process operation.

❖Before Implementing STP treated water in to mill for cement production, We sent STP outlet water samples to APPCB lab for water quality checking.

75% Process requirement from STP treated water

Green belt is 8% more, than CPCB guidelines (33%)

Thank You

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