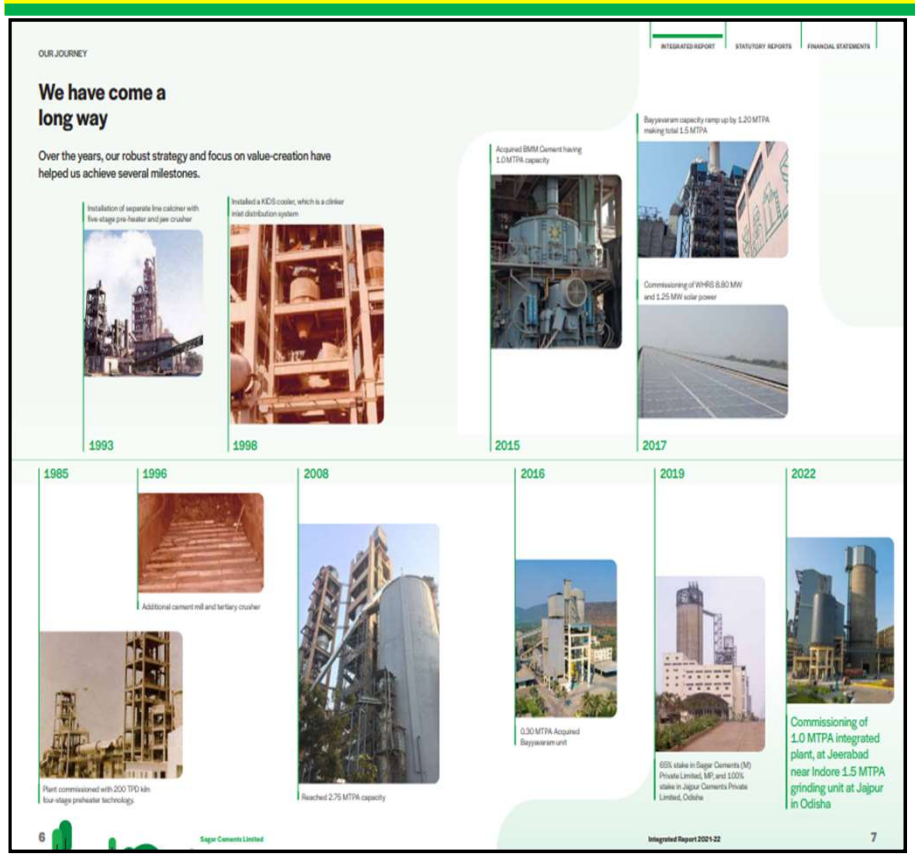
Welcome to
23rd National Award for Excellence in Energy Management 2022

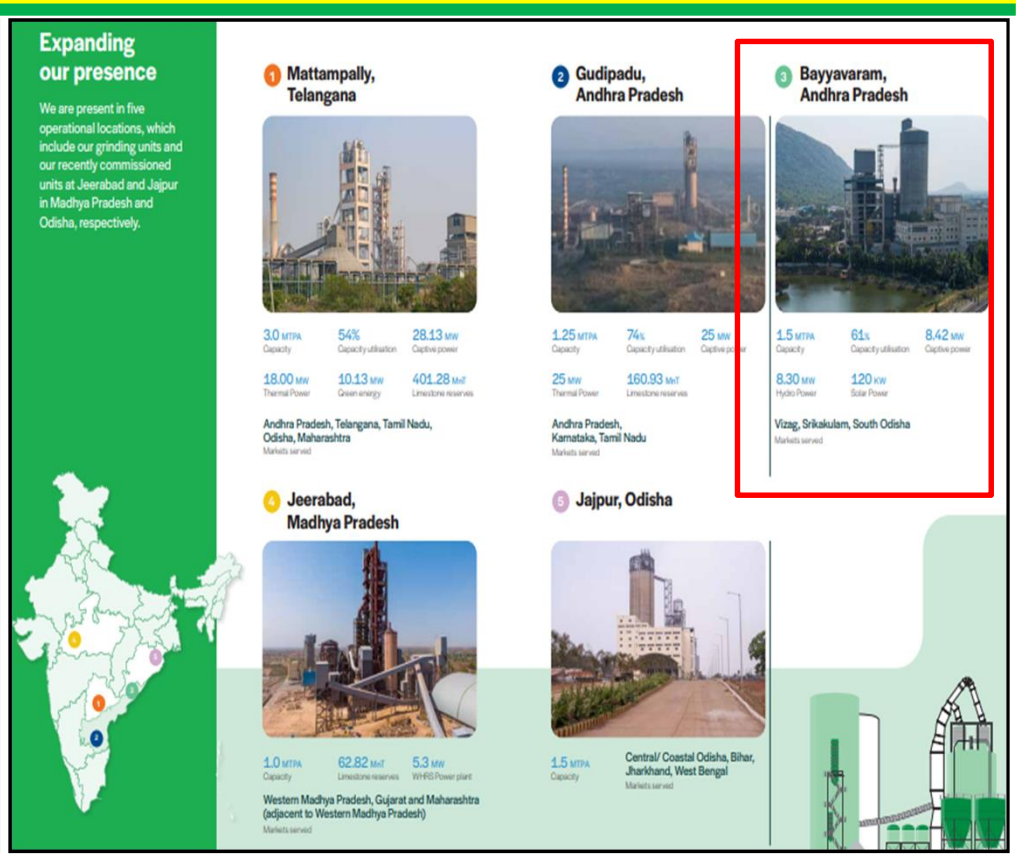
Sagar Cements Limited-Bayyavaram

Team Members:

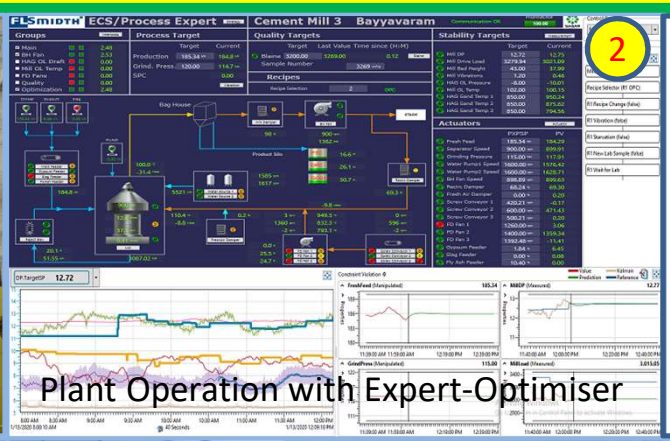
1. Mr Srinivasa Rao - Sr. General Manager
2. Mr Prasad Babu -Asst.General Manager
3. **Mr Ganesh - Energy Manager**

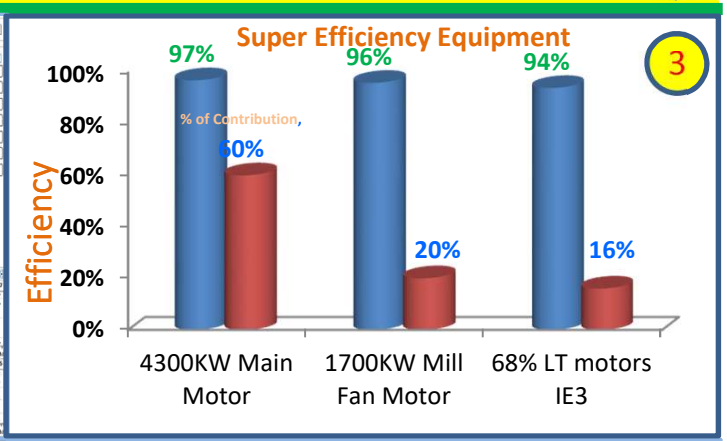
1.Introduction of the Sagar Group

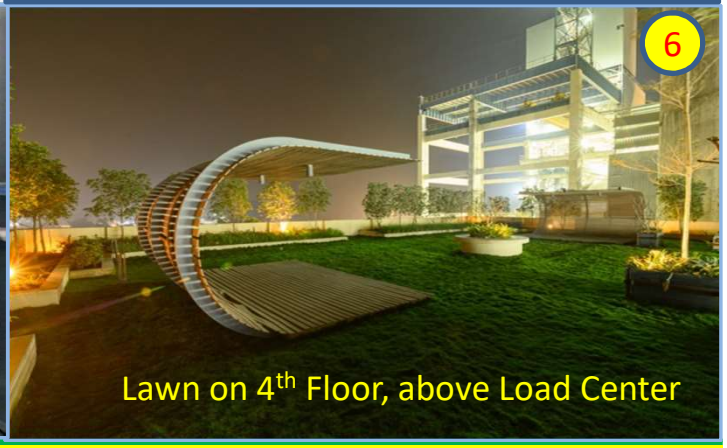




1.Introduction of the Bayyavaram Plant



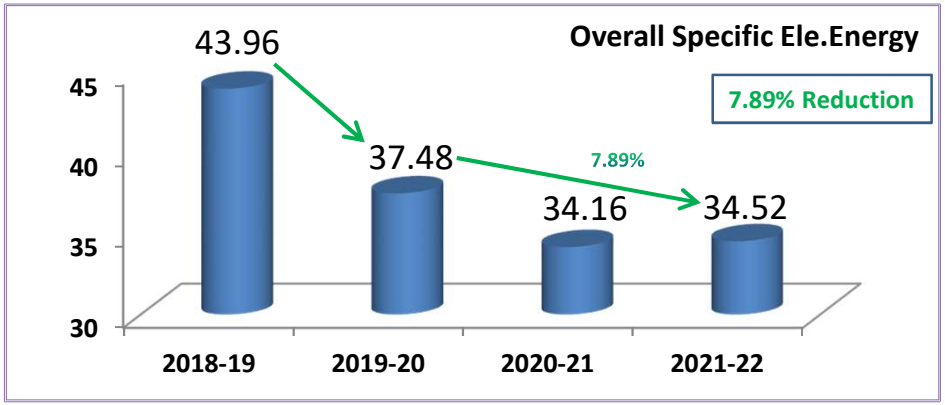




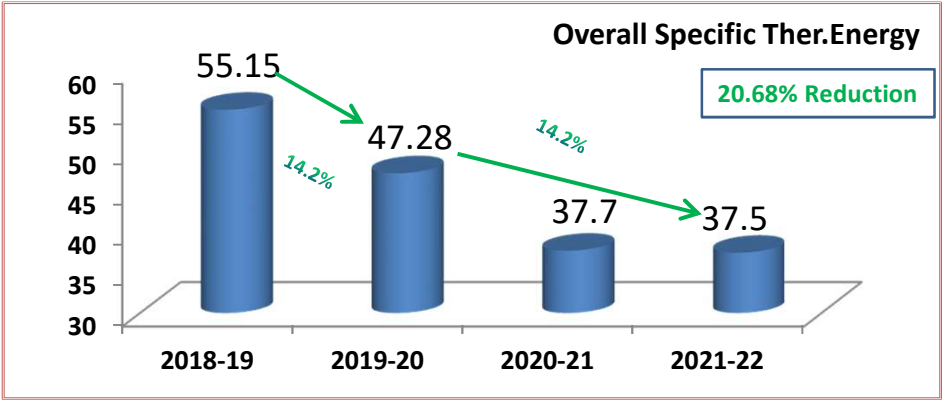
2. Sp. Energy Consumption in last 3 years (FY 2018-22)

- ***Plant Overall Specific Energy Consumption:***

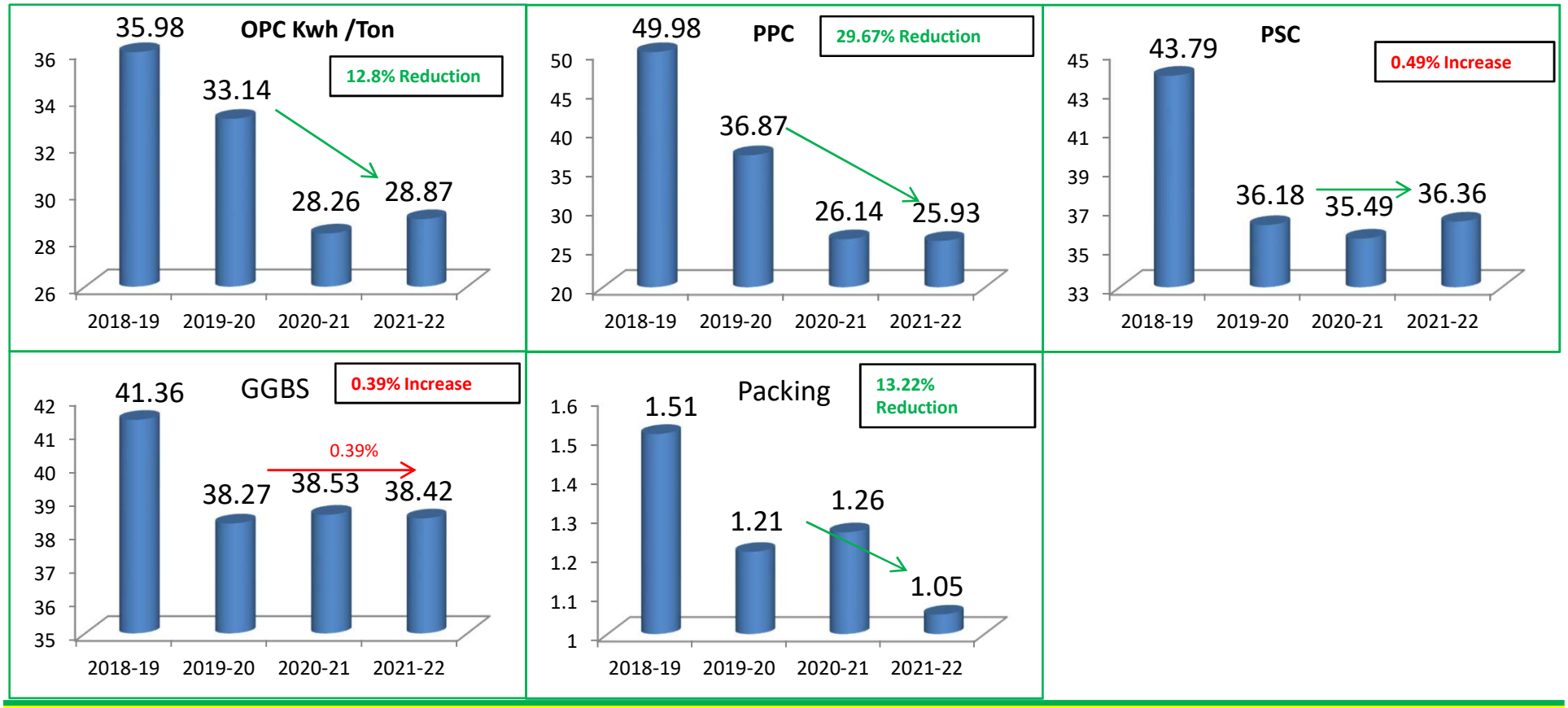
Specific Electrical Energy -Last 3 Years				
Year	2018-19	2019-20	2020-21	2021-22
Total production(MT)	6,05,952	7,74,941	8,12,873	9,14,859
Energy consumption (Kwh)	2,66,36,302	2,90,47,521	2,77,44,22	3,15,88,796
Specific Energy (Kwh /Ton)	**43.96**	**37.48**	**34.16**	**34.52**
% Reduction	7.89%			



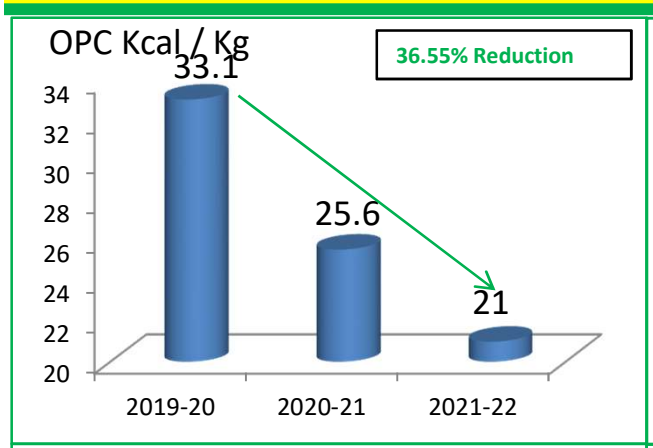
Specific Thermal Energy -Last 3 Years				
Year	2018-19	2019-20	2020-21	2021-22
Total Production(MT)	6,05,952	7,74,942	8,12,873	9,14,859
Energy Consumption (MKcal)	33,418	36,642	30,645	34,265
Specific Energy (Kcal /kg)	**55.15**	**47.28**	**37.70**	**37.45**
% Reduction	14.2%			

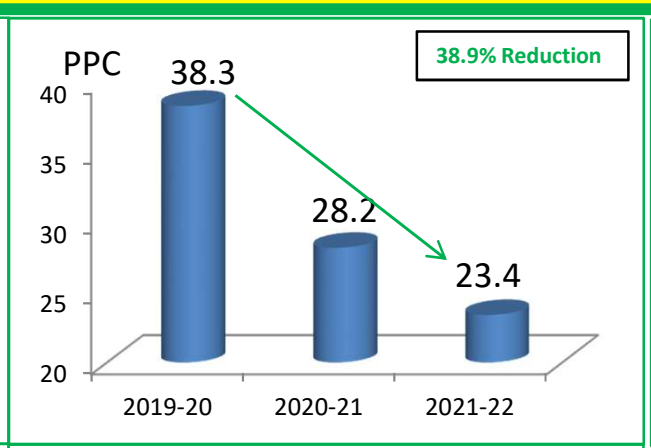


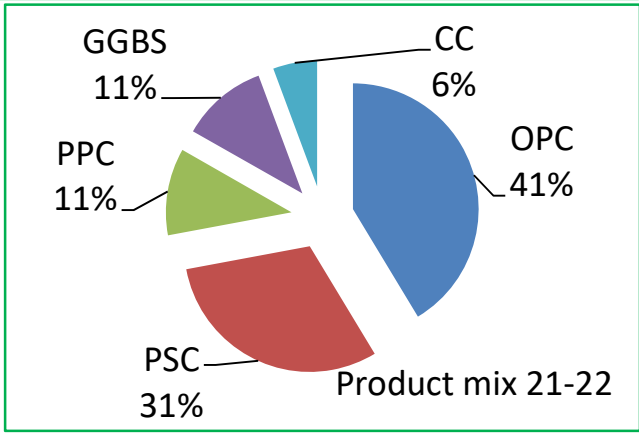
2. Sp. Energy Consumption in last 3 years (FY 2018-21)

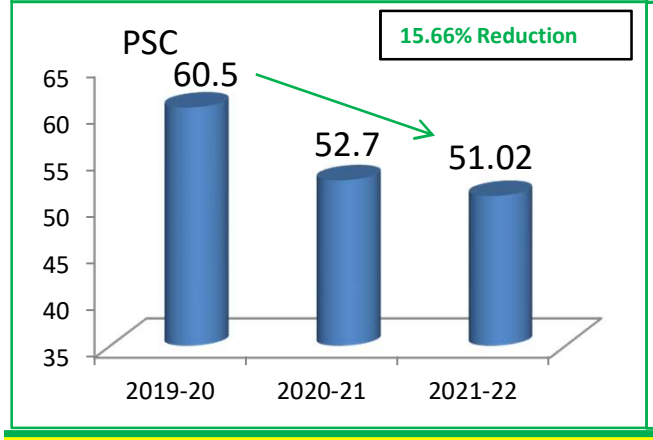


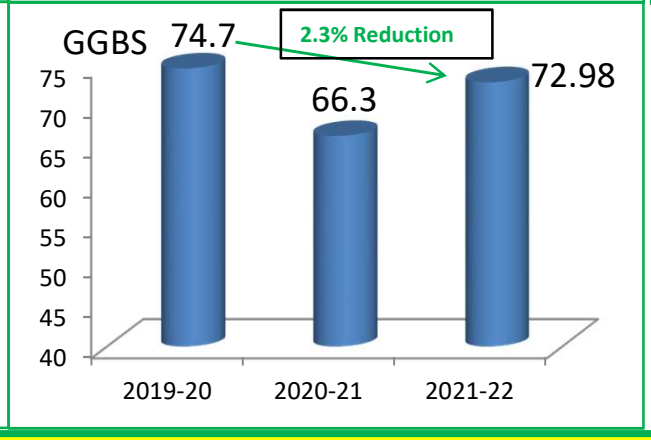
2. Sp. Energy Consumption in last 3 years (FY 2018-21)











3. Information on Competitors, National & Global benchmark

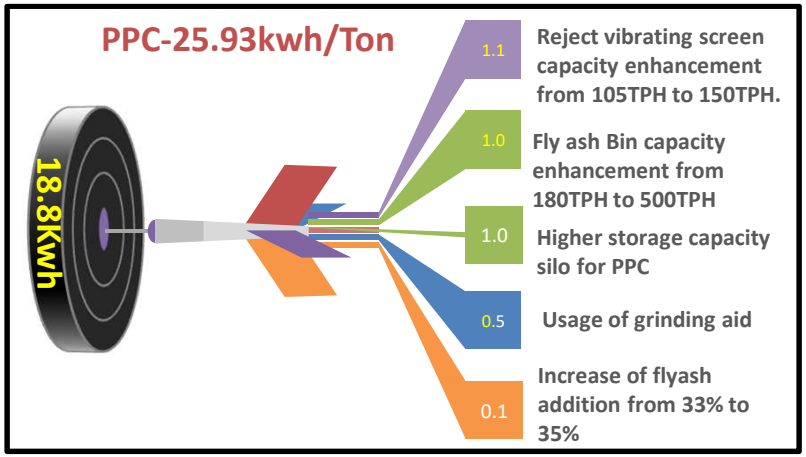
Short term/ Long term Target & National Benchmarking

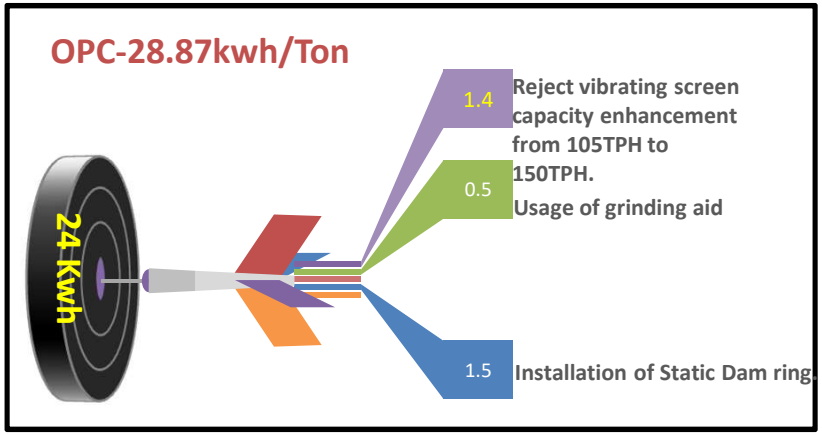
Sl. No.	Description	Specific Electrical Energy (KWH / Ton)				Bench Mark	Short Term Target	Long Term Target	Neighbour Plant
		2018-19	2019-20	2020-21	2021-22	CII *	2022-23	2023-24	2021-22
1	PPC	49.98	36.87	**26.14**	**25.93**	18.80	25.15	24.63	26
2	OPC	35.98	33.14	**28.26**	**28.87**	24	28.00	27.43	32
3	PSC	43.79	36.18	**35.49**	**36.36**	31.90	35.26	34.54	36
4	GGBS	41.36	38.27	**38.53**	**38.42**	-	37.27	36.50	-
5	CC	-	-	**-**	**28.14**	-	27.30	26.73	-
6	Packing Plant	1.51	1.21	**1.26**	**1.05**	0.81	1.02	1	-

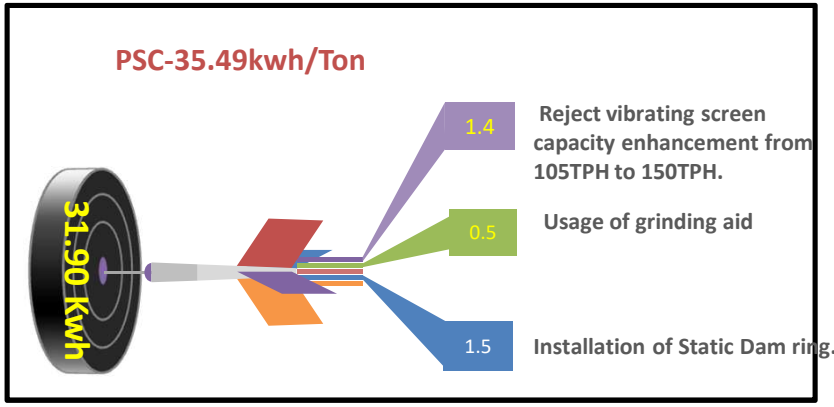
* **Source : CII -Energy Benchmarking for Cement Industry May-2021 version 5.0**

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
		2021-22	CII *	Where we
1	PSC	**36.36**	31.90	Plant-5
3	OPC	**28.87**	24	Plant-3
4	PPC	**25.93**	18.80	-
2	GGBS	**38.42**	-	No benchmark
5	Packing Plant	**1.05**	0.81	Plant-5

3. Information on Competitors, National & Global benchmark

Energy Conservation Projects –Planned FY 2022-23

Sl.No.	Title of Project	Year	Annual Electrical savings (Million kwh)	Annual thermal Saving (million Kcals)	Total Annual savings (Rs million)	Investment (Rs million)
1	Reduce the heat loss through HAG doors by arrest the false air by using transparent glass	2022-23	0	420.603	0.757	0.03
2	Installation of magnetic separator on clinker and slag unloading conveyor	2022-23	0.060	0.000	0.420	0.8
3	Compressors optimization by installing smart sensor for operation of compressor based on CFM.	2022-23	0.018	0	0.126	0.5
4	Capacity enhancement of Flyash bin from 180Ton to 380 Tons	2022-23	0.104	0	0.725	5.0
5	Reject bucket elevator inclination to be changed and vibration level to be increase for free material increase	2022-23	0.024	0	0.167	0.0
6	Construction of Clinker silo 15,000MT to avoid clinker hopper empty.	2022-23	0.060	0	0.417	100
7	Material Handling section Bag Filter fans operation with VFD-2X37KW	2022-23	0.073	0	0.512	0.6
8	Use of 3KW water pump instead of 7.5KW pump for process water for mill operation.	2022-23	0.01134	0	0.079	0
9	Old packer truck loading machine trolley length extension to minimize loading time of truck.	2022-23	0.06		0.000	0
10	Additional truck loading machine installation for old packer to maximize packer operation by avoiding idle running of packer and auxiliaries.	2022-23	0.045	0	0.315	0.5
11	Bag house air slide optimization by connecting one airside blower for 2 airsides by this 2 nos of 5.5KW motors became stab	2022-23	0.048	0	0.336	0

4. Energy Saving projects implemented in last three years

Year	No of Energy Saving Projects	Investments (In Millions)	Electrical Savings (In Million Kwh)	Savings (INR Million)	Impact on SEC (Electrical KWH / MT Cement)
2019-20	10	7.34	5.621	39.35	7.25
2020-21	10	3.14	1.664	11.65	2.05
2021-22	11	3.64	0.364	5.26	0.37
2019-22	31	14.12	7.649	56.26	9.67

4. Energy Saving projects implemented in last three years

Energy Conservation Projects -Last 3 Years								
Sl No	Year	Energy Management Project details	Actual savings achieved					
			Electrical savings		Thermal Savings		investment	pay back period
			Reduction in Power kWh/hr	Rs in Lakhs per annum	kcal / kg Cement	Rs in Lakhs per annum	Rs. Lakhs	months
1	FY 2019-20	Stopping of 5 Nos of drives in recirculation group during OPC running	6.90	0.99	0.00	0.00	0.00	0.00
2	FY 2019-20	Replacement of 15KW Process Water Pump with 7.5 KW	8.50	2.28	0.00	0.00	0.65	3.41
3	FY 2019-20	Stopping of Ball Mill by connecting Mill-3 TO mILL-2 by air slides so that PPC Power will reduce from 48 to 28 KWH /Ton	4200.	379.85	0.00	0.00	70.00	2.21
4	FY 2019-20	Stopping of HAG section during mill OPC cement Operation.	25.70	3.67	25.00	106.93	0.00	0.00
5	FY 2019-20	Installation of Complete LED lights in place of Conventional light system in staff quarters	6.22	0.78	0.00	0.00	0.81	12.47
6	FY 2019-20	Installation of 5 Star ceiling Fans in place of Conventional ceiling fans in staff quarters	3.15	0.53	0.00	0.00	1.92	43.43
7	FY 2019-20	Optimization of 520BC03 Belt with reject bin level as control input	1.50	0.38	0.00	0.00	0.00	0.00
8	FY 2019-20	Automatic Bag House fan Speed Reduction during mill tripping (instead of Fan speed manual Reduction from 900RPM to 600RPM)	500.00	1.47	0.00	0.00	0.00	0.00
9	FY 2019-20	Classifier Speed Reduction during mill tripping (instead of Classifier speed manual Reduction from 900RPM to 600RPM)	100.00	0.11	0.00	0.00	0.00	0.00
10	FY 2019-20	Stopping of Bag Filter drives for Packer 1 & Packer 2	8.47	0.28	0.00	0.00	0.00	0.00
		Sub total		**390.34**		**106.93**	**73.38**	

4. Energy Saving projects implemented in last three years

Energy Conservation Projects -Last 3 Years								
Sl No	Year	Energy Management Project details	Actual savings achieved					
			Electrical savings		Thermal Savings		Investment	Pay back period
			Reduction in Power kWh/hr	Rs in Lakhs per annum	kcal / kg Cement	Rs in Lakhs per annum	Rs. Lakhs	months
1	FY 2020-21	Clinker weigh feeder capacity enhancement from 100TPH to 200TPH for OPC specific power reduction.	380	64	0.00	0	8.5	1.60
2	FY 2020-21	Plant Electrical system Power Factor Improvement from 0.97 to 0.99 by adding capacitor bank	105	35	0	0	13	4.43
3	FY 2020-21	37KW ,Packer-1 &2 Bag filter operation with VFD in place of DOL	18.4	5.6	0	0	5	10.78
4	FY 2020-21	Relocation & Duct modification in Electrical Load center Air conditioning system to maintain panel room temperature below 30Deg .	27	12.2	0.00	0	4	3.92
5	FY 2020-21	Online mill Change over of Products grinding through PXP	25	2.9	0	0	0	0.00
6	FY 2020-21	Minimization of circulating air entry to HAG by stopping of 2X7.5KW circulating air fans.	9	4.6	1.43	15	0	0.00
7	FY 2020-21	Minimization of process water consumption in mill for PSC product grinding.	0	0.0	6.00	35	0	0.00
8	FY 2020-21	Consumption of Old Slag (6% Moisture)& Fresh Slag (12% Moisture) together to mill . so that average moisture will Approximate - 8% . so that thermal value consrvation	0.0	0	3	5.76	0	0.00
9	FY 2020-21	Replacement of Conventional 40w tube lights with 24w LED lights for old quarters.	1.68	0.4	0	0	0.42	13.23
10	FY 2020-21	Arranging Permanent Magnet on 590BC01 Conveyor	49.2	0.52	0	0	0.5	11.61
		Sub total	615	125	10	55	31	

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 (kwh)	Annual thermal Saving (Rs million)	Investment (Rs Lakhs)
1	FY 2021-22	Old Packing Plant Packer capacity enhaencement from 54tph to 90 tph by increasing bucket elevator buckets volume.	3.205	45792	0	0
2	FY 2021-22	Installation of LP Compressor inplace of 55 GA Compressor for flayash unloading from tanker to Bin	3.820	54568	0	15.4
3	FY 2021-22	Usage of waste wood for firing in place of disel for HAG restarting.	28.656	0	2.86	0
4	FY 2021-22	Optimization of bag house fan flow by removing orifice in bag house outlet duct.	1.814	25920	0	0
5	FY 2021-22	Packer-1 &2 Bag filter(30KW) operation with VFD in place of DOL	5.242	74880	0	5
6	FY 2021-22	Increasing of reject vibrating screen height to avoid the refalling of reject material to avoid jamming from bucket elevator	0.413	5904	0	0
7	FY 2021-22	Provided Insulation of Load Center outside AC duct to avoid condensation	1.210	17280	0	0.3
8	FY 2021-22	Installation of IE3 motors in place of IE1 Motors	1.890	27000	0	5.5
9	FY 2021-22	Reject RAL drive (3.7KW) stopped by connecting chute to mill feed path.	1.134	16200	0	0
10	FY 2021-22	Silo bucket elevator load optimized by change the bag house purging sequence	5.000	71424	0	0
11	2021-22	Installation of Auto MRP and Bag Counting system by integration with ERP	1.73	0.026	0	10.00
Sub Total			**52.384**	**338968**	**2.86**	**36.2**

5. Innovative Projects implemented

Project -1: Implementation of Bag counting system in Packing Plant

Understanding:

Bag counting system is installed in Packing plant to maintain bag counting accuracy and to maintain weighing accuracy at Weigh bridge

Regular Operation:

Bags will be loaded in to truck by truck loader and loading operator will count bags manually and there will be a probability of excess or less bags in to the truck.

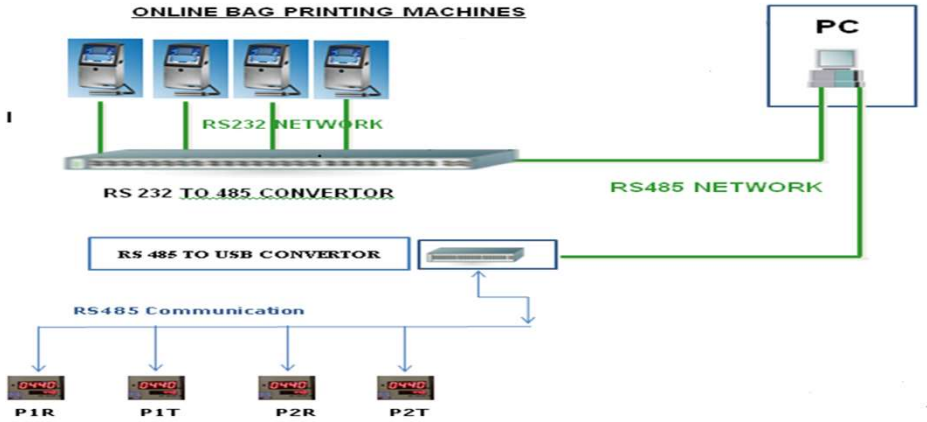
Problems faced :

- Trucks coming back from Weigh bridge due to Extra/Less bags loading in truck .
- Extra/Less bags loading due to miss communication between loader and supervisor.
- Wrong MRP's due to telephonic communication.
- RS232 Communication problem due to hand held terminal operation.

Hand held terminal used to enter MRP of bag printing system

5. Innovative Projects implemented

- Accurate quantity of bags loading in Truck / wagon.
- ERP integration done through Bag counter software to fetch MRP and number of bags
- Eliminated manual counting system.
- Elimination of error due to manual counting system.
- Reduction of time during MRP/Grade change over.
- Better reconciliation of bags .
- Elimination of error in while feeding MRP through keypad unit.



		Electrical Saving			Bag Cost Saving			
S.No.	Description	kwh saving/day	kwh saving/Annum	Cost saving/Annum	No of Bags	Bag Cost	Total cost saving/day	Coal Saving Tons /Annum)
1	Electrical Saving -kwh/day due to bag saving	35	10500	73500	-	-	-	-
2	Electrical Saving -Kwh/day due to idle running for MRP entering	50	15000	105000	-	-	-	-
	No of Bags savings/ Day (Approximate)	-	-	-	20	300	6000	1800000
Total Saving				173500	Total Saving			1800000

Total saving (In Rs) Ele + Bag saving (In Rs) - 173500 +1800000 = **1978500**

5. Innovative Projects implemented

Project – 2

Elimination of silo BE Overload Tripping

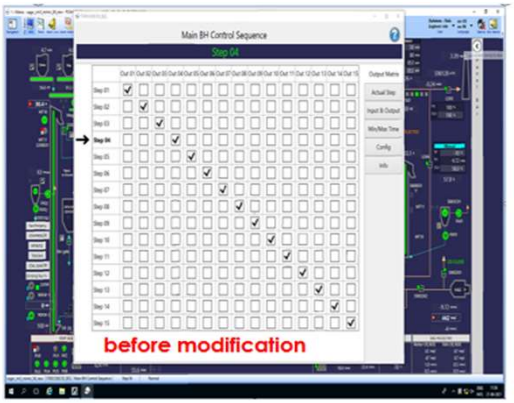
Silo feed bucket elevator current is varying from 80 -115 Amps and due to this variation it was tripping with overload / Boot level problem and that time heavy material accumulated bottom of the elevator sensor

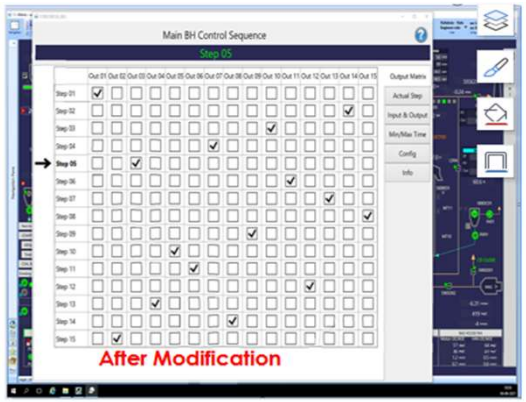
The No. of silo bucket elevator Tripping were 10 to 12 Nos. per Month and the Plant Operation Reliability were affected. Hence, Resulting into Higher down Time of cement mill, power and production loss.
This was taken as case study for improvement and analyzed deeply. We observed purging sequence. In Bag house purging system have total 15 steps and each step have 10 No's Solenoid valves and each valves in each step. On time was 80 milli seconds and off time was 30 sec .

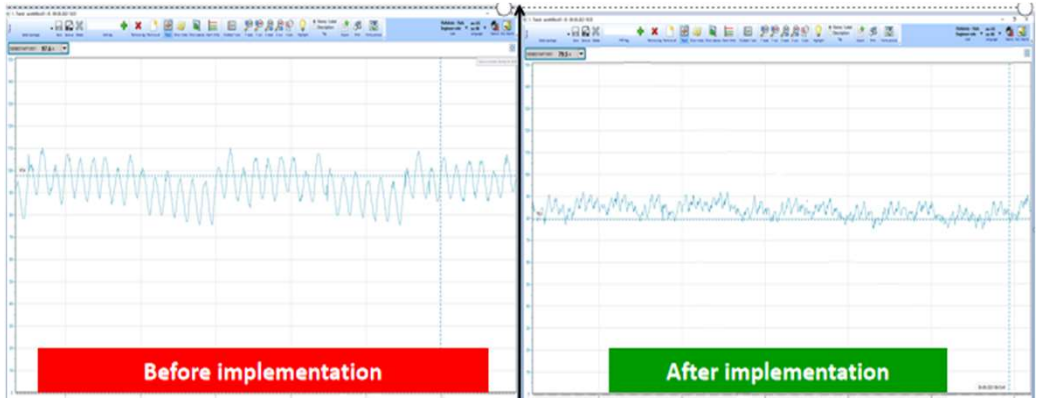
The Following Actions were taken:

- Bag house **off time** reduced from 30 sec to 25 sec and next **on time** also changed. But no of tripping not reduced.
- Bag house purging sequence changed in trail error method. In particular sequence silo bucket elevator load was optimized and no peaks in elevator current.

5. Innovative Projects implemented







No of breakdown reduced from 12/month to zero
Mill feed TPH increased from 205 TPH to 215 TPH.
Mill Specific power reduced by 0.16 KWH/T
Idle running of equipment reduced

Result:

Power Saving : 72000 Units / Annum
Cost Saving : Rs. 5.04 Lakhs / Annum

Innovative Projects implemented

Project -3: Installation of static dam ring in VRM mill

Understanding:

Satic dam ring was installed in between rollers in VRM to reduce reject in OPC and PSC product.

Regular Operation:

Reject was coming 80tph to 100 tph in OPC and PSC product. Due to this Feed has to reduced and stoppage happened due to reject elevator overload.

Problems faced :

- Mill was run with low TPH because of over reject .
- Mill tripped due to reject over load
- Reject ekevator buckets derailed and buckets damaged .
- Reject material refall from elevator top and wornout the elevator body.

Observation: After insttaled static dam ring in between rollers, Reject come down max 60-65 tph. Bucket elevator is taking normal load and material is not falling from top of the reject elevator. Feed incresed from 200 tp to 210 tph. Specific power reduced 0.5 kwh/ton of cement in both products

S.No.	Description	kwh/Hr	kwh/Day	kwh/Annum
1	Electrical Saving - kwh/Hr	100	1000	365000
2	Cost Saving -Rs/Annum	**₹25,55,000**		

6a. Utilisation of Renewable Energy sources

On site-Renewable

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

Off site-Renewable

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	19.648	62.2

Renewable energy is 62.2 %.

6b. Utilisation of Renewable Energy sources

SAGAR CEMENTS LIMITED

SCL/ /Hyd/2021-22/01 Dt: 04.04.2022

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 2021 – 22 – Reg.

Dear Sir,

During Energy Management review meeting held on 04.04.2022, the allocation of renewable power from our group companies has been decided as noted below.

S.No	Description	Installed Capacity	Expected Generation in MW	Percentage of Allocation		
				Mattampally	[illegible]VRM	Gudipadu
1	WHRS	8.80 MW	42863	100		
2	Solar Mattampally	1.25 MW	1353	100		
3	Solar HO	80 KW	119	100		
4	Kallam Textiles Limited	4.00 MW	688	100		
5	SCL - Hydro Power Plants	8.30 MW	27692		100	
6	SPL - Theni	1.65 MW	3116			100
7	RVC Wind Firms	2.35 MW	3232			100

All are requested to note the same and plan accordingly.

Thanking You.

Yours sincerely.
For Sagar Cements Limited.

S Srinivas Reddy
VP – Power Projects

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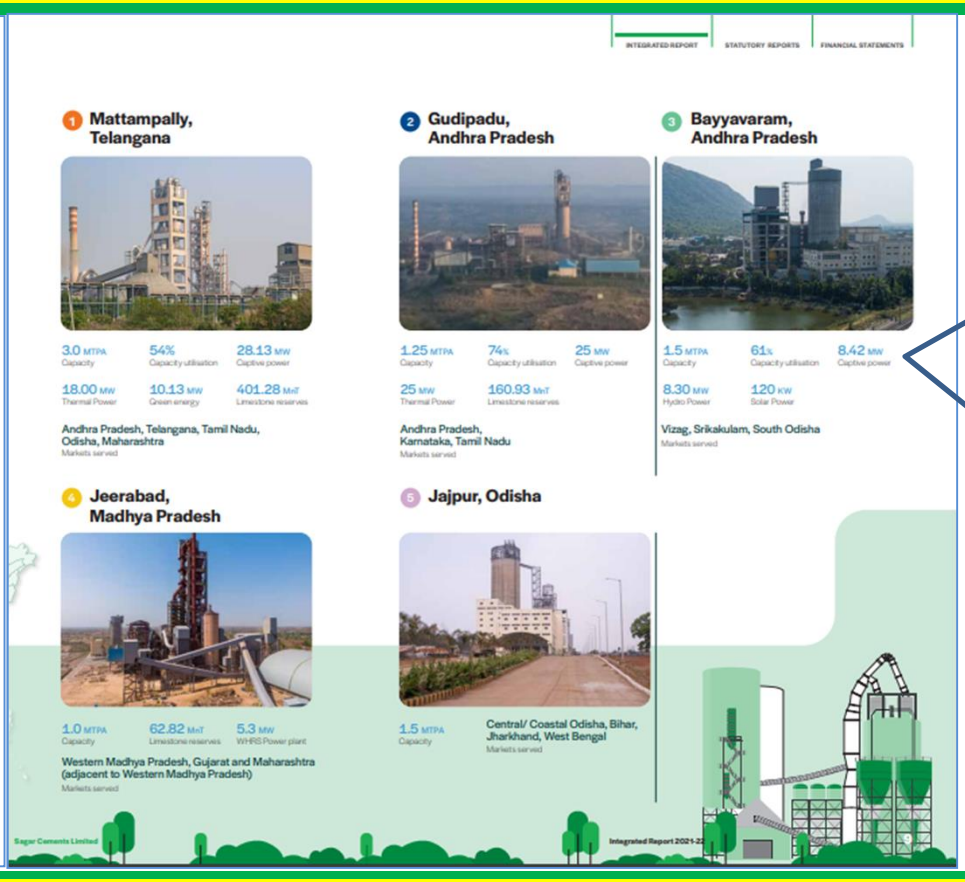
Phone : +91-40-23351571, 23356572 Fax : +91-40-23356573 E-mail : info@sagarcements.in Website : www.sagarcements.in
CIN : L26942TG1981PLC002887 GSTIN : 36AACCS8680H1ZY
Factories : Mattampally, Via Huzurnagar, Suryapet-District, Telangana - 508204. Phone : 08683 - 247039 GSTIN : 36AACCS8680H1ZZ
Bayyavaram Village, Kasimkota Mandal, Visakhapatnam District, Andhra Pradesh - 531031. Phone : 08924-244550 Fax : 08924-244570 GSTIN : 37AACCS8680H1ZX
Gudipadu Village and Post, Yadiki Mandal, Ananthapur District, Andhra Pradesh - 515408. Phone: 08558-200272 GSTIN : 37AACCS8680H1ZX



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				
Description	UNIT	FY-2019-20	FY-2020-21	FY-2021-22
Scope-1 Emissions	Unit			
Absolute CO2 emission	t CO2	14857	12,454	13,917
Emission Intensitity	kg CO2/t cementitious	52	48	41
Scope-2 Emissions				
Absolute CO2 emission	t CO2	12516	15584	19054
Emission Intensitity	kg CO2/t cementitious	44	60	56
Scope-3 Emissions				
Absolute CO2 emission	t CO2	11296	11771	10909
Emission Intensitity	kg CO2/t cementitious	40	45	32

7. GHG Inventorization

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

S.No.	Description	2019-20	2020-21	2021-22	Short term (2022-23)	Long term (2023-24)
1	Scope-1 kg CO2/t cementitious	52	48	41	39.77	38.95
2	Scope-2 kg CO2/t cementitious	44	60	56	54.71	53.2
3	Scope-3 Kg CO2/T cementitious	40	65	32	31.04	30.4

Action Plan:

Scope -1&2

- Increase of slag addition in PSC from 57% to 65%.
- Increase of fly ash addition in PPC from 32% to 35%.
- 5% addition of performance improver (fly ash/slag) in OPC.
- Cement to Clinker factor 0.63 to 0.60.
- Implementation of identified energy conservation project

Scope-3

- Logistic management.
- Encouragement of bulk transportation from 32% to 40%.
- Improving fleet efficiency.

8. Green Supply Chain Management

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

32 % of Product Sales through bulk Dispatches

100% Reverse Logistics

8. Green Supply Chain Management

green procurement guidelines

The following are the general guidelines to be adapted for each of the focus areas for sourcing of materials, products and services;

1. Reducing the usage of hazardous (toxic) Products / Chemicals:

Hazardous products are those which can pose health risks to employees/public and also cause significant environmental impacts.
Attempt shall be made to avoid use of Hazardous materials and materials producing hazardous waste by finding suitable alternatives. These materials shall be phased out in definite time and during this period, safe handling shall be ensured.

2. Purchasing Energy Efficient Products:

In the present scenario, utilization of energy efficient products has gained greater importance as it reduces the specific energy consumption, consequently cost of production & also minimizes the emission of CO_2 in the atmosphere.
Efficiency of the equipment / products shall be one of critical criteria for selection. In case of variation in efficiency of various suppliers, capitalization shall be made and after capitalization, efficient products shall be allowed a premium of 5% compared to the others. Final decision shall be made based on techno commercial merits after applying premium for efficient products.

The following equipment are to be considered for inclusion under green purchase procurement:

- Electric Motors
- Transformers
- Variable Frequency drives
- LED Lamps & Star Rating electrical appliances
- Air compressors
- Centrifugal Fans & Blowers
- Solar Panels for Electricity on Roof Top in Plant and Colony Buildings.

3. Purchasing Water Efficient Fixtures/Products

Water being a scarce resource, effective utilization & conservation of water has gained a greater importance. The water saving devices are playing a key role towards conserving water usage.
To adapt latest technologies that use less specific water consumption. Foam taps, push taps, E Taps, E Flush Urinals, Low Flush Cisterns, etc. are some of the products that consume less water. And also planned for water less flush toilets.
And we are using STP water in our Process further reduce ground water consumption.

SAGAR CEMEMNTS LIMITED – GREEN SOURCING GUIDE LINES

4. Increasing the utilization of products with recycled content or products that can be recycled:

The utilization of recycled material and waste/by products like BF Slag, Fly ash, Gypsum and Spent Carbon as alternate fuel or the materials that can be recycled can significantly reduce the consumption of raw material & other environmental impacts associated in its processing & use.
To identify the process areas where re-cycled material or the materials that can be recycled can be used while meeting the product specification.
To set year wise targets for use of these environmental friendly materials and make concerted efforts to achieve the targets.

5. Adopting Environmental Friendly Green Building Practices

A green building is defined as a building which uses less ener… resources, creates less waste and is healthier for the peo… to a conventional building.

A green building product/material usually ha… wing characteristics:

- Contains less embodied energy
- Manufactured with renew…
- Manufactured with …
- Uses less am… al resources in its manufacture
- Relea… astes during its use
- Easy t…
- Saves e… ater and other natural resources

The suggested lists of green building materials are:

- Fly ash based bricks
- Fly ash and Slag based cement
- High performance glass
- Glass with high recycled content
- Low Volatile Organic content (VOC) paints and carpets
- Doors & windows with high recycled content
- Eco-friendly furniture
- Water less urinals
- Water efficient fixtures

6. Encouraging suppliers to adapt green initiatives:

SAGAR CEMEMNTS LIMITED – GREEN SOURCING GUIDE LINES

In order to manufacture environment friendly products, we need to work with our suppliers / vendors of raw materials and components. We will set up environmental criteria for the suppliers upstream in supply chain.

In addition to setting up the requirements, to provide assistance to the major suppliers for meeting these requirements.

The steps to be practiced in order to encourage suppliers for producing eco friendly products are as below,

- Circulate an Environmental Performance Evaluation questionnaire to the suppliers / vendors
- Evaluate Supplier's environmental performance based on the replies of questionnaire. Prepare Environmental Performance Score Card.
- Identify areas where the supplier has to concentrate to reduce their environmental impacts by identifying aspects and impacts of their activities
- Encourage the suppliers to improve their environmental performances in the identified areas and work on significant aspects
- Define a timeline for suppliers to improve their environmental performance
- Periodically monitor & review the supplier performance.

7. Office Consumables & Green Office Practices

In our company, several products are purchased under office consumables. Though the purchase volume and value are less compared to other materials, there are several opportunities exist to use environment friendly products and demonstration of eco-friendly practices.

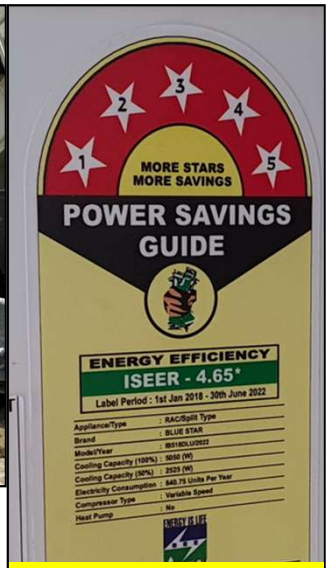
- Purchase energy efficient (energy star rated) equipments for office purchases like photocopiers, lightings, refrigerators, printers etc.,
- Preferably, purchase duplex (double-sided) printers
- Adopt, purchasing 100% recycled & chlorine-free papers
- Consider purchasing products made from recycled contents
- Consider purchasing printing inks which is biodegradable
- Limit computer printouts & use electronic mail wherever possible
- Use two-way envelopes for inter office correspondence
- Minimize the usage of colored, glossy & special papers

Green Procurement Guideline

8. Green Supply Chain Management

Name of raw material	UOM	2021-22
Total cement production	MT	915065
Slag consumption	MT	277366
Fly ash	MT	45021
Phosphor	MT	16084
Total waste material	MT	338471
36.98% raw materials are By-products/waste of other industries	%	**36.98%**

Visit to RINL –Slag Supplier to Plant



Usage of 5Star Rating

S.NO	Initiative	2021-22
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	32%

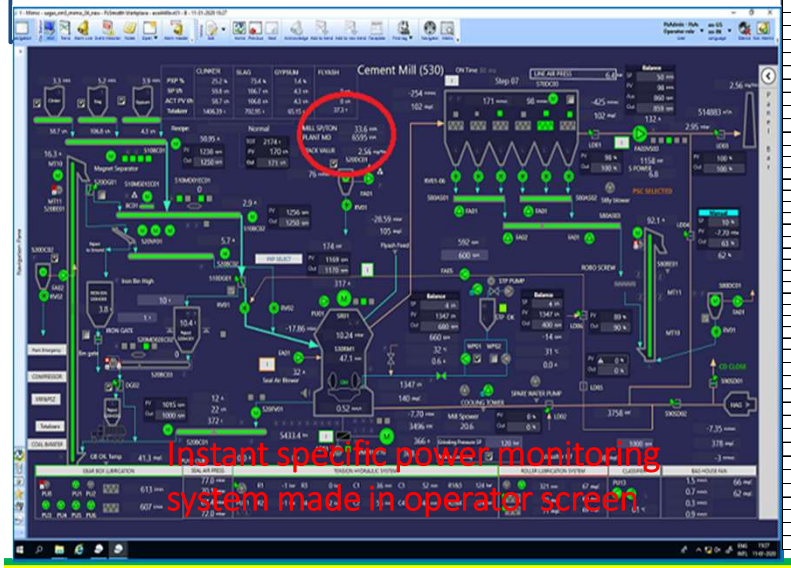
Product Sales Distance in Percentage

Distance (KM)	2021-22
0-50	39.2
51-100	4.6
101-200	25.9
>200	30.2

9. Teamwork, Employee Involvement & Monitoring

1.Daily monitoring system & use of iOT

- Plant is having 47 Nos networked digital energy meters connected to plant DCS. All major and more than 5% energy intesive equipments have meters and connected to DCS and Day wise & Product wise Electrical, Thermal energy report is generated in the system automatically.

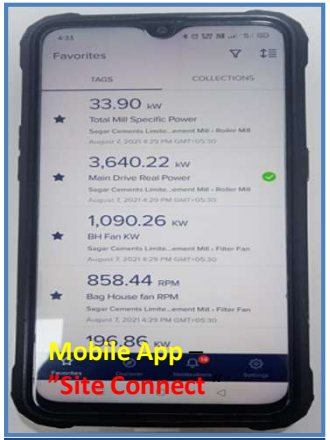


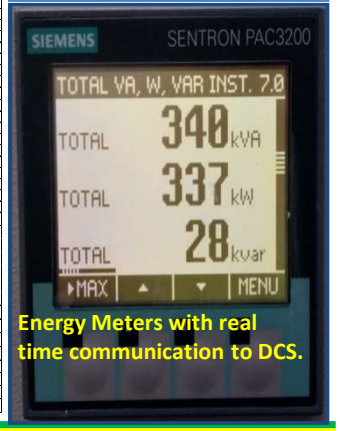
SAGAR CEMENTS LTD ,BAYYAVARAM

Power Consumption Report on **07-05-22**

SLNo		Consumption	M.D		GRID CUM KVAH	6,97,800
	EPDCL(KVAH)	1,39,800	Day P.F	0.987	GRID 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 Auxiliaries (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	3392	17.66
2	Bag House Fan (1700KW)			7128	1216	6.96
4	Classifier (560KW)			510	85	0.50
5	VRM Auxiliaries (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	757	103	0.74
8	Compressors- PDB	BH Fan rpm	904	584	135	0.57
	Total Units	Classifier RPM	825	**28600**	**5184**	**27.93**
	New VRM - GGBS Units					
1	Main Drive (4300KW)	7.44	1178	23512	3963	25.06
2	Bag House Fan (1700KW)			6025	972	6.81
4	Classifier (560KW)			1326	173	1.13
5	VRM Auxiliaries (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	830	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 Auxiliaries (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 - PCC 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 Auxiliaries (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 Flr AC+ wdg works+str+wo	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+15KV	11.41	12.62	3.20	0.00	0.00

Daily Power Consumption Report





9. Teamwork, Employee Involvement & Monitoring

2.Review meeting chaired by

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

Top Mangement -Monthly Meeting

*All review meeting are being done remotely to avoid travel emissions

4. Energy Efficiency / awareness training programme

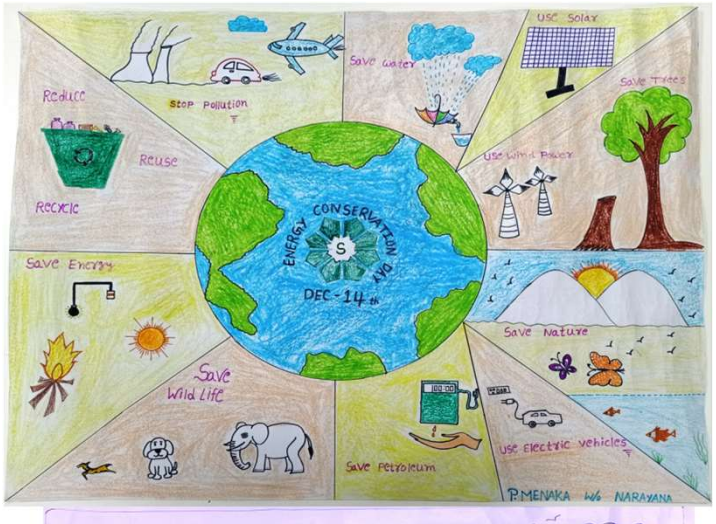
- Energy Awareness week celebrations by conducting various competitions among the employees.
- Suggestion,kaizen scheme.
- Capacity building by internal and external trainings.
- Visiting other units for sharing and gaining good practices.

3. Separate budget for Energy Conservation

- ✓ Funds are allocated at the beginning of the financial year for the projects identified. Priority will be given those projects whose simple pay back period is maximum 3 years (Automatic Approval).
- ✓ Funds are also provided to projects whose payback period is more than 3 years provided there is multi dimensional benefits like reduction in specific energy consumption, reduction in environment impact, improved productivity etc.

Year	Budget Allottment Requirement	Amount spent in Rupees(Lakhs)	Benefits (Lakhs)
2019-20	Budget is planned and deployed as required based on identified Energy efficiency projects and their payback period – In general projects with simple payback period of less than 3 Years is preferred.	141.2	562
2020-21			
2021-22			
2022-23		35	58

9. Teamwork, Employee Involvement & Monitoring



Energy Conservation Competition Posters

9. Teamwork, Employee Involvement & Monitoring

Energy Conservation Competitions-2021 winners

10. Implementation of ISO 50001/Green Co/IGBC rating

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No: 10000336309-MSC-RvA-IND | Initial certification date: 02 January 2020 | Valid: 02 January 2020 - 01 January 2023

This is to certify that the management system of

Sagar Cements Limited
Bayyavaram (Village), Kasimkota (Mandal), Anakapalli, Visakhapatnam - 531031, Andhrapradesh, 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

ISO 50001:2018 Certification

Place and date: **Barendrecht, 02 January 2020**

MGMT. SYS. RvA C 024

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

Erie Koek
Management Representative

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

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

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

11. Learning from CII Energy Award

Installed LP compressor for fly-ash unloading for reduction of power consumption

Before:

To Unload the Dry Flyash from Bulk Tanker, Compressed Air is used to pump the Flyash from Tanker to the Silo.

Pressure of Compressed Air	:	6 Bar
Power Consumption / Ton of Flyash	:	2.48 Units / Ton

After:

Proposed and Installed the Low Pressure Compressor to Unload the Flyash and to Fill at the Silo.

Trails Taken

Trial taken with Blower, But the Trial was Failure

Trial Taken with Pressure Reducer up to 2.50 Bar. Flyash Unloading was Success, But Power not Reduced as Expected.

Study Conducted through KAISHAN (USA) and Installed LP Compressor

Operating Pressure of Compressed Air	:	2.00 to 2.50 Bar
Power Consumption / Ton of Flyash	:	1.28 Units / Ton of Flyash
Total Flyash Handling / Month	:	3800 Tons / Mon

Result:

Power Saving	:	**54,500 Units / Annum**
Cost Saving	:	Rs. 3.8 Lakhs / Annum

Any other relevant information

Any other awards, acknowledgement ,Major Achievements from CII

Excellent Energy Efficient Unit-2020

Excellent Energy Efficient Unit-2021

National Energy Conservation Award conducted by B.E.E

Second Place in Cement Sector-2021

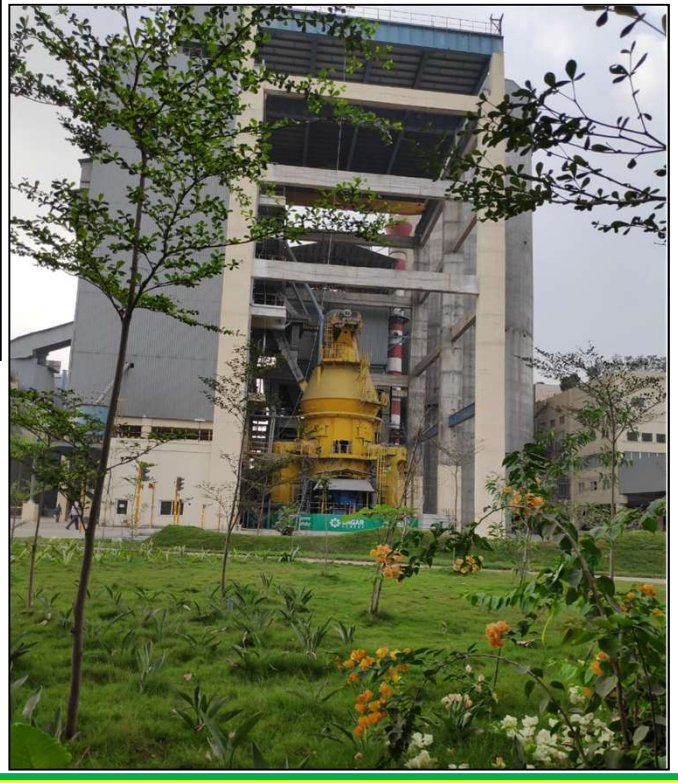
Award received by Shri R.K.Singh,Hon'ble Union Minister of Power & Renewable Energy, Govt.of.India

Any other relevant information

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

CCQC-20,Quality Circle Forum of India, for CASE Study, Visakhapatnam Chapter .

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



Thank You

Mr. K Srinivasarao
Sr. G.M (Works)-Plant Head
Email: Srinivasaraok@sagarcements.in
Ph : 7997990901