

24th
National Award for
Excellence in Energy Management **2023**
13 – 15 September 2023 || HICC, Hyderabad

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To
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Certified
APR 2023 – APR 2024
INDIA

Orient Cement Limited

**Clinker Grinding Unit
Jalgaon-Maharashtra**

Mentor : Mr. Bala Giridhar (Unit Head)

**Presentation By:
Mr. Chandan Parasar (HOD-Production)**

➤ **Company Name : Orient Cement Limited**

➤ **Group : CK Birla Group**

➤ **Year of Establishment : 1979 AD**

➤ **No of Units : 3**

Integrated Units : 2

(Located at Devapur, Telangana & Chitapur, Karnataka)

Grinding Unts : 1

(Located at Jalgaon, Maharashtra)

➤ **Overall Capacity : 8.0 MTPA**

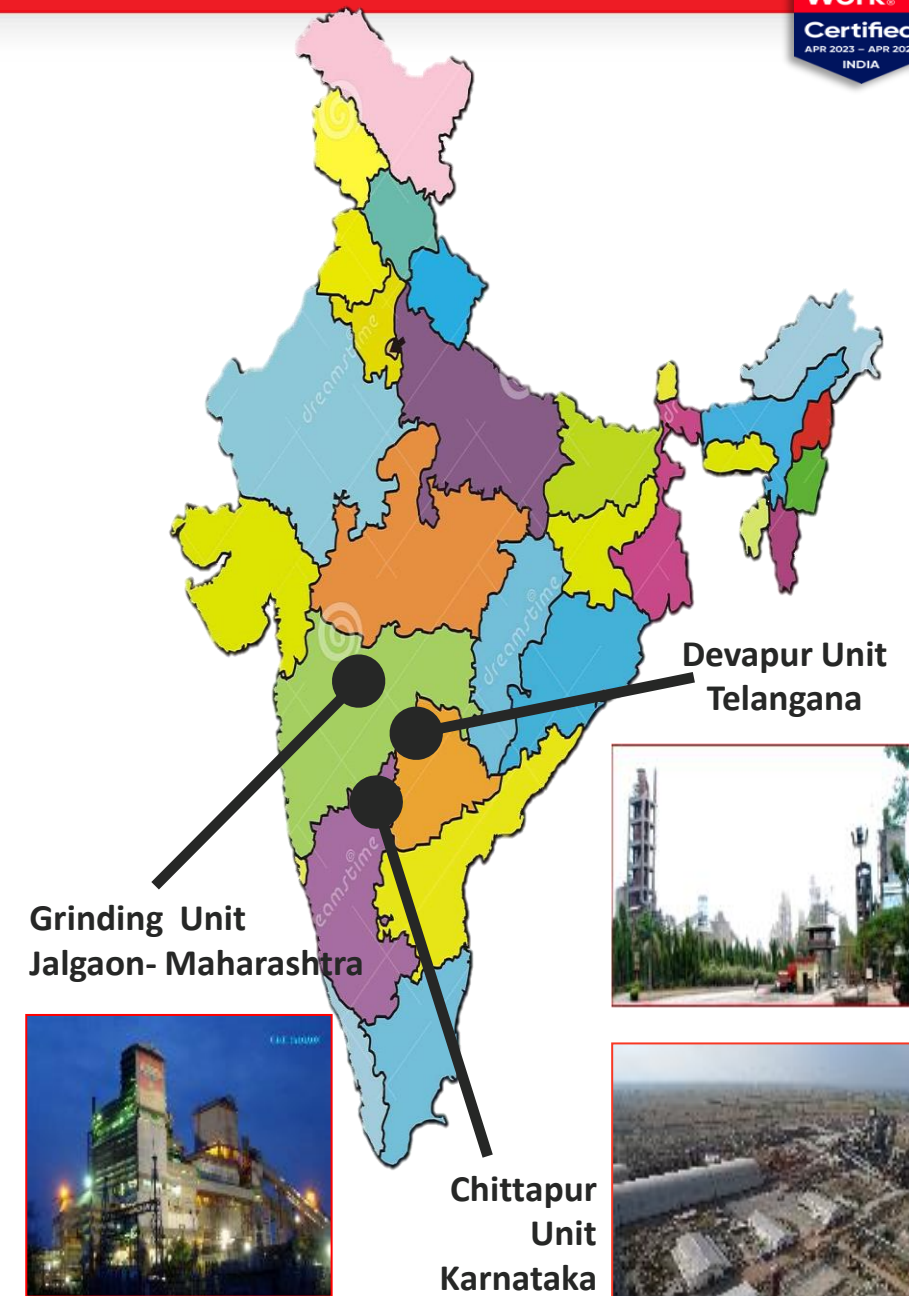
➤ **Unit Name : Clinker Grinding Unit, Jalgaon, Maharashtra**

➤ **Unit Establishment : 2000 AD**

➤ **Unit Capacity : 2.28 MTPA**

➤ **Major OEM :**

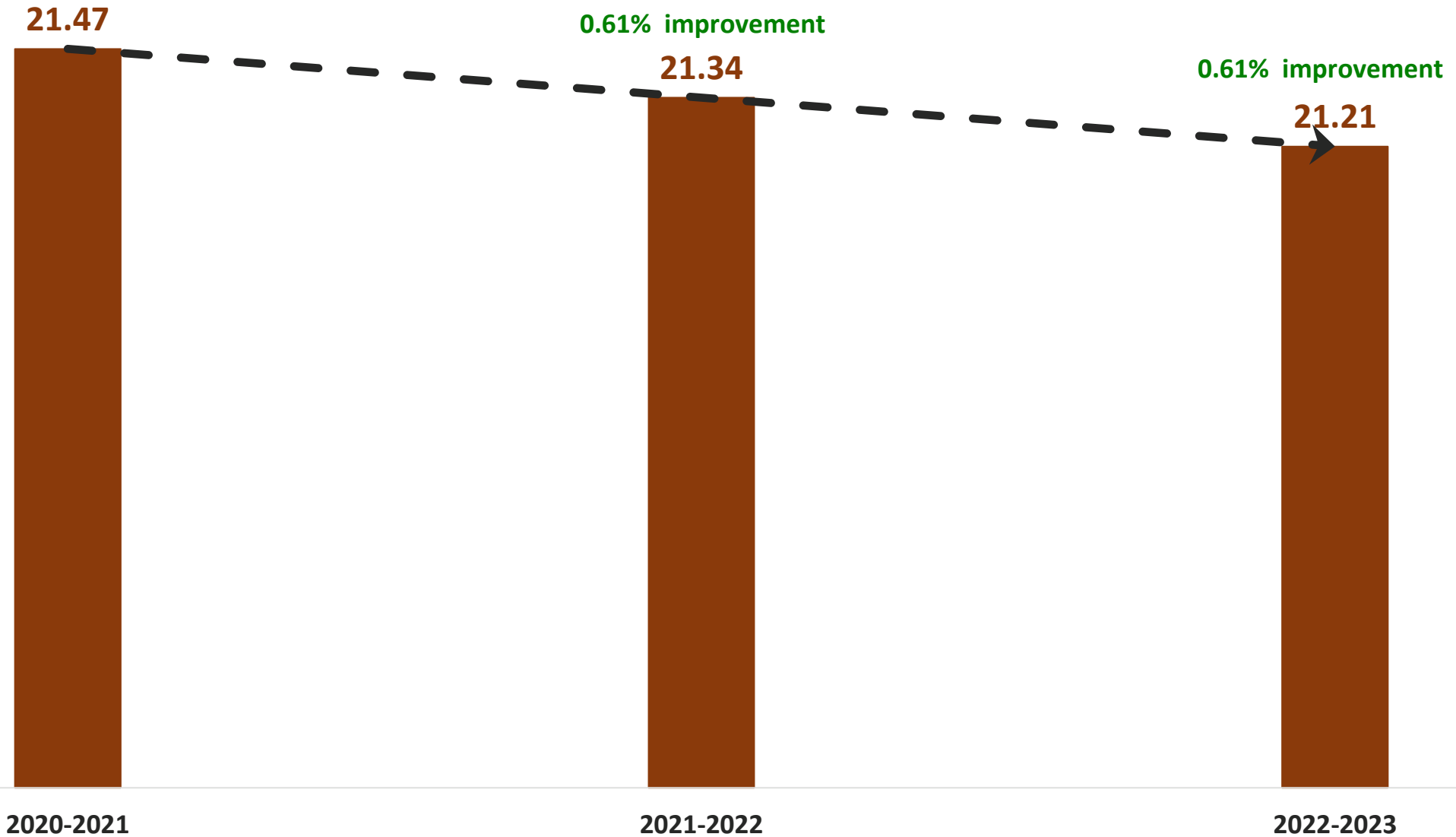
- 1. Line-1 (Roller Press + Ball Mill circuit supplied by M/s Thyssenkrupp)**
- 2. Line-2 (Roller Press + Ball Mill circuit supplied by M/s KHD)**

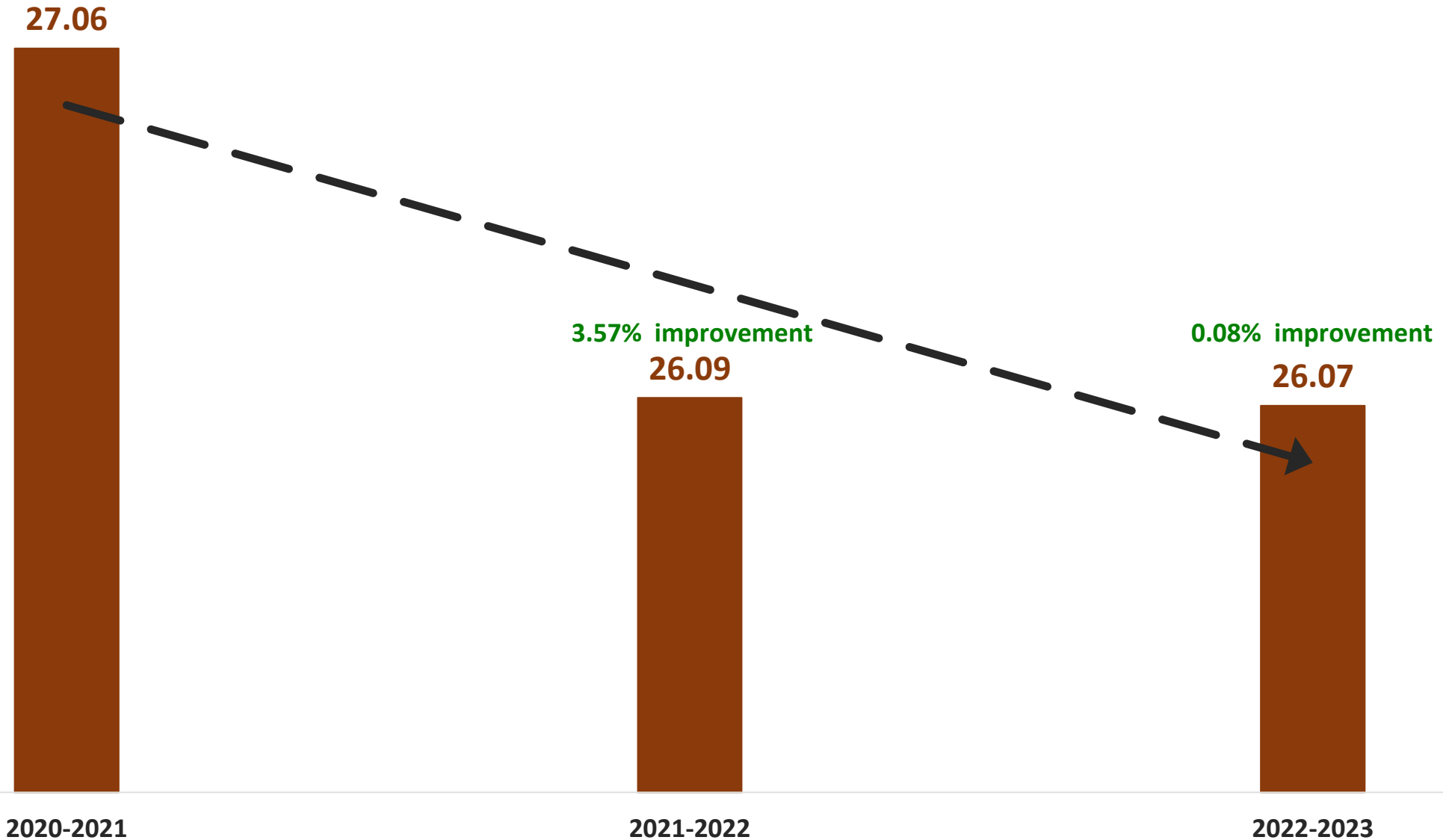


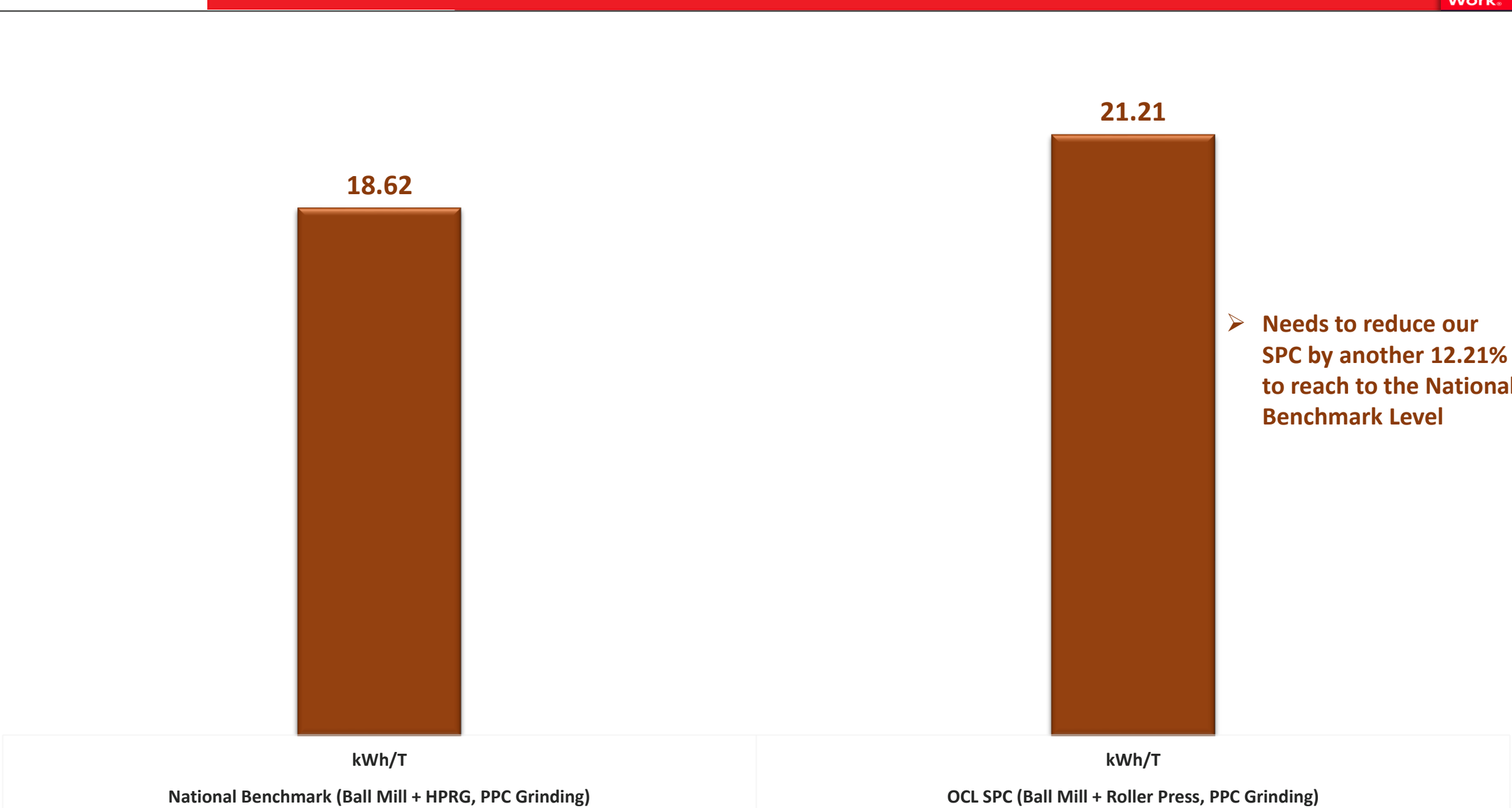
PPC

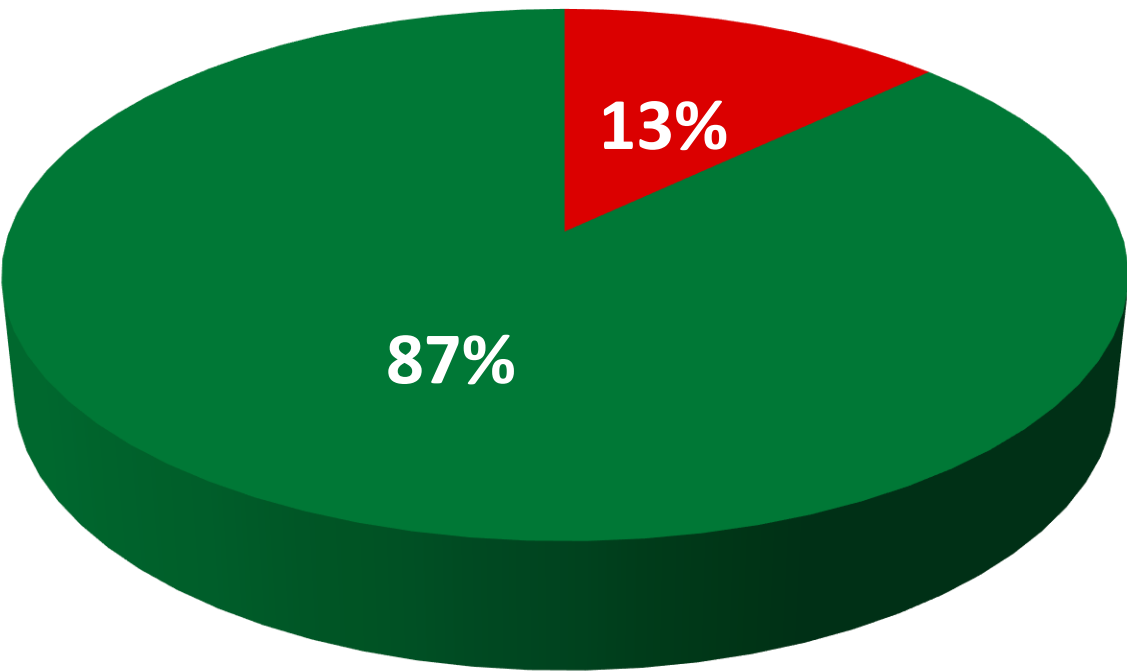
OPC











■ OPC ■ PPC

Our Target : 90% of **PPC** Production

Sr. No.	Title of Project	Annual Electrical Saving Potential (Million kWh)
1	Outlet Hood Modification of the Both Ball Mills	0.93
2	Line-2 Cyclone Bottom RAL installation in place of Double Flaps	0.86
3	Low Pressure Compressor for Flyash unloading	0.30
4	Wagon Tippler Bag Filter Optimization	0.10
5	Compress Air Optimization	0.79
	Total	2.98

Parameters	UoM	2020-2021	2021-2022	2022-2023
Installed Cement Capacity	MTPA	2.28	2.28	2.28
Cement Production	MTPA	1.06 (CU : 53%)	1.24 (CU : 62%)	1.15 (CU : 50%)
Product Contribution of PPC	%	88.38%	88.49%	87.02%
Product Contribution of OPC	%	11.62%	11.51%	12.98%
Clinker Factor for PPC	#	0.62	0.62	0.62
Clinker Factor for OPC	#	0.91	0.91	0.91

Year	No. of Saving Project (Major)	Investment (₹ Million)	Annual Electrical Saving (Million kWh)	Annual Cost Saving (₹ million)
2020-21	3	0.24	0.087	0.75
2021-22	5	0.50	0.84	6.82
2022-23	5	0.015	0.64	10.06

Sr. No.	Title of Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving (Rs. million)	Investment Made (Rs. million)
1	Replacement of Line-1 Ball Mill separator Coarse return air slide from 280 TPH to 400 TPH to avoid jamming.	46200	0.41	0.2
2	Replacement of Fly Ash Bin Blower from 15 KW to 11 KW (available old drive)	19307	0.17	0.02
3	Diversion of line 2 BF3 Dust collector material from mill inlet to mill outlet.	21396	0.17	0.02
	Total	86903	0.75	0.24

Sr. No.	Title of Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving (Rs. million)	Investment Made (Rs. million)	Payback (Months)
1	Grinding Media Optimization	700403	5.72	0.200	0.42
2	Interconnection of compressed air line for unloading multiple Flyash bulker at a time	97912	0.80	0.025	0.38
3	Shortening of Clinker Silo tunnel (B) conveyor length by 40%.	5000	0.041	0.010	2.93
4	Installation of New Oil lubrication system for SKS separator	10000	0.082	0.065	9.51
5	Replacement of Flyash bin extraction root blower from 15 KW to 5.5 KW blower	22000	0.18	0.200	13.33
	Total	835315	6.823	0.500	

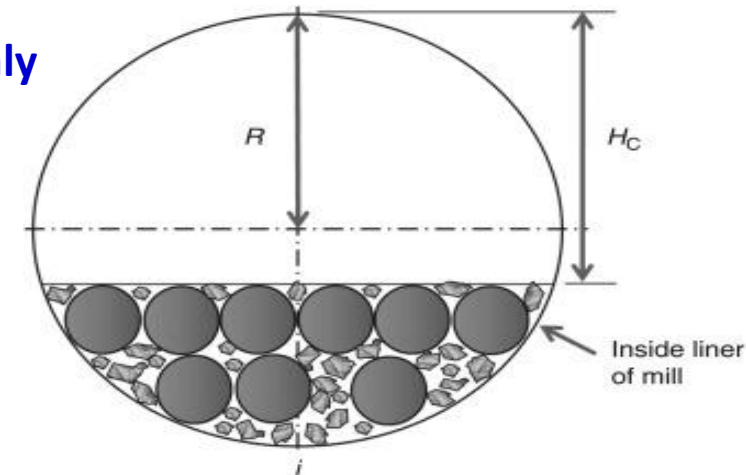
Sr. No.	Title of Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving (Rs. million)	Investment Made (Rs. million)	Payback (Months)
1	Grinding Media optimization	293767	6.73	0.00	0
2	Line-2 Process Optimization	341917	2.75	0.00	0
3	Optimization of Nusense Bag Filter operation at Clinker Silo Top	1159	0.093	0.00	0
4	Removal of Wagon Tippler Bag Filter Fan inlet Damper	2800	0.23	0.005	0.15
5	Replacement of Reciprocating compressor with Screw Compressor at Wagon Tippler area	3218	0.26	0.01	1.82
	Total	642861	10.063	0.015	

Project Title : Grinding Media Optimization

Goal : To run the plant with optimized Filling level of Grinding Media without affecting Productivity & Quality.

Background :

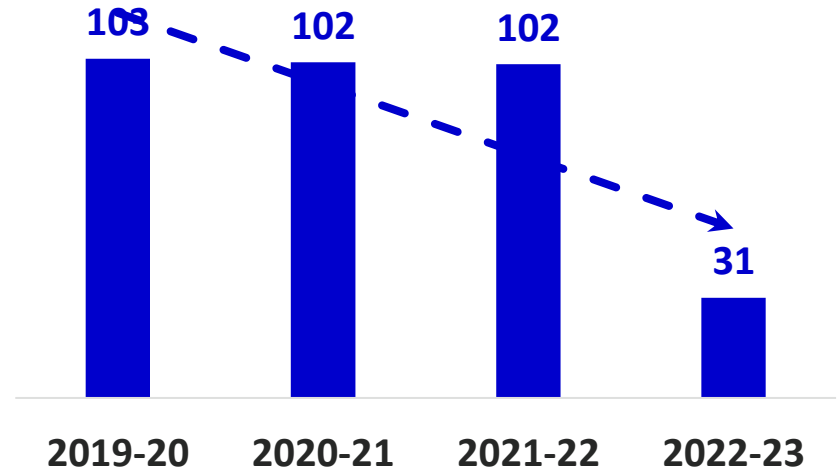
- The Ball Mill is equipped in series with a Roller Press as pre-grinder and the Ball Mill is running as finish grinding part.
- To reduce the work done in the Ball Mill, we have taken a task to optimize the filling level upto the minimum possible value to get the optimum Specific power consumption.
- We have analysed the detail performance & optimized the whole Circuit of RP+Ball Mill by carrying out following exercises...
 - a) Repeated Granulometry test
 - b) Optimization of Gas-Material Balance across the Ball Mill, SKS Separator etc
 - c) Top up/degrading of Grinding Media based on the Granulometry performance only
 - d) Optimization of Material distribution to the Roller Press & Ball Mill
 - e) Optimum usage of Grinding Media
 - f) Maximize the utilization of Pre-grinding Mill of Roller Press
 - g) Minimize the Fine Dust Recirculation into the System



➤ Result :

Parameters	UoM	Line-1		Line-2	
		Before	After	Before	After
Filling Level of Grinding Media	%	25%	19%	27%	22%
Mill Load	KW	1310	1250	965	910
Reduction in Mill Load	KW	60		55	
Reduction in Specific Power Consumption	kWh/T	0.50		0.31	

Grinding Media Consumption (gm/T)



➤ Benefit :

- ❑ Overall Reduction in Specific Power Consumption : 0.36 kWh/T (Equivalent to ₹ 23.60 Lacs of Cost Saving)
- ❑ Overall Reduction in Grinding Media Consumption : 71 gm/T (Equivalent to ₹ 43.70 Lacs of Cost Saving)
- ❑ Grand Total Cost Saving : ₹ 67.30 Lacs

Project Title : Line-2 Process Optimization

Goal : Stable & Efficient Operation without affecting Quality.

Background :

- The Gypsum feeding was in Ball Mill, where it was giving disturbance in operation by
 - a) Chocking of Mill outlet diaphragm
 - b) Jamming of the Mill inlet chute
 - c) Nuisance in Mill outlet Bag Filter operation
 - d) Fluctuation in Mill outlet Material Temp
 - e) Mill outlet Elevator overloading during jam clearance due Material surgeas it has moisture content of >25% on average & ≈40% in rainy season.

With all above disturbance, the Total Productivity of the Line-2 Production Line was getting disturbed. The fluctuation in overall daily Productivity was maintaining in the range of ± 30 -40 tph.

- We have analysed the problem with Cause & Effect Tool and found that the Gypsum can easily be diverted to the Inlet of Pre-grinder Roller Press.

Gypsum Feeding to Ball Mill



Before

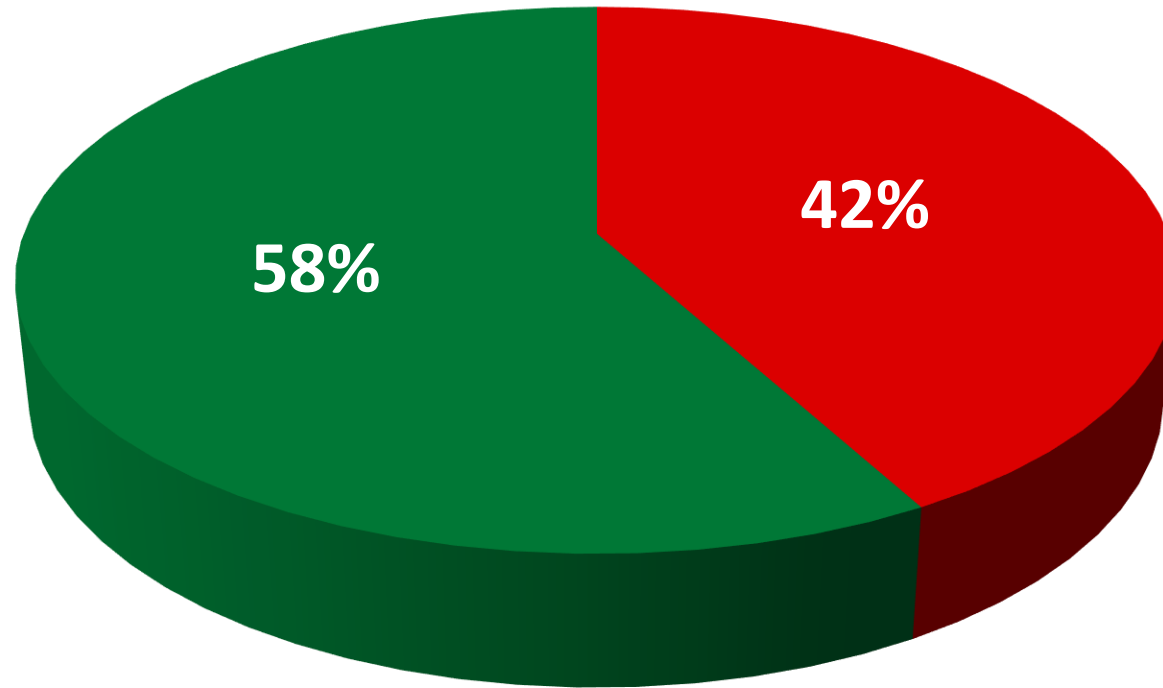
Gypsum Feeding to Roller Press



After

- Additionally, the Material-Gas Balance also optimized in the Roller Press Circuit to pull out maximum quantity of Fine Dust from the system.
- After the diversion of the Gypsum Feeding & Material-Gas Ratio Optimization, the said problem was solved and following additional Benefits were achieved :
 - a) Gypsum now could be dried up before feeding to the Grinding Mills as it has to pass through the V-Separator located at the Roller Press Inlet.
 - b) Less circulation of Fine Dust into the system. Thus, the regrinding work of both Roller Press and Ball Mill was minimized.
- **Benefit :**
 - ❑ Overall Enhancement in Productivity : 10 tph
 - ❑ Overall Reduction in Specific Power Consumption : 1.19 kWh/T
 - ❑ Grand Total Cost Saving : ₹ 27.50 Lacs

- 13.5 MW (DC) Solar Power Generation Capacity
- Present Power Consumption Scenario for the Year 2022-23



■ Grid Power (MSEDCL) ■ Green Power (Solar Power_AMP Power_PPA)

Our Target : 75% of Green Power

Reduction in GHG emission :

- Optimization of Fly ash utilization in PPC upto 35%
- Optimization of Chemical gypsum utilization upto 4.0%
- >50% of Plant area covered by green belt
- Reverse logistic to reduce GHG emission during transportation
- Maximizing the Railway logistics to reduce GHG emission of road transportation

Emission Details				
Year	Scope-1 Emission	Scope-2 Emission	Scope-3 Emission	Total Emission
2021-22	583	5	8.5	596.5
2022-23	595	6	9.4	610.4

CK BIRLA GROUP

ORIENT
CEMENT

ORIENT CEMENT LIMITED

INTEGRATED MANAGEMENT SYSTEM POLICY

ISO 9001:2015, ISO 14001:2015,
(ISO 45001:2018 & ISO 50001:2018)

Orient Cement Limited aims to be a leading company by providing consistent quality products and customer satisfaction through capabilities building, use of best practices, reliable relationships with all stakeholders and innovative cement products with a commitment to maintain environment friendly, safe, healthy and sustainability working condition in all its operations.

We are committed to:

- Operating the plant energy efficiently and increase the usage of alternative fuels & minimizing the energy losses
- Complying applicable legal & other requirements
- Protection of environment includes prevention of pollution by optimizing the consumption, responsible sourcing, reuse and recycle
- Eliminating hazards, reducing risks and exploring opportunities by continual improvement of all processes to enhance the IMS performance, professional development and knowledge sharing
- Developing safety culture, safeguarding employees, workers, and their representatives from injury & ill health through their consultation and participation in safety assessment and adherence to PPE
- Available information is utilized for enhancing objectives & targets with optimal resources.


SATYABRATA SHARMA
PRESIDENT MANUFACTURING

Date: 01.04.2023

ORIENT CEMENT	DOC. TITLE: PURCHASING	DOC TYPE: INTEGRATED MANAGEMENT SYSTEM PROCEDURE - LEVEL 2	
	DOC. NO: 06-06	Issue No: 00	Issue Date: 01.07.2017

1.0 PURPOSE:

- 1.1 The purpose of this procedure is to establish correct procurement of material as per the requirement of in-house customer.

2.0 SCOPE:

- 2.1 This procedure is applicable to all Purchase requisitions/ procurement plan of raw material at CGU, Jalgaon Plant.

3.0 RESPONSIBILITY:

- 3.1 HOD (Procurement) is overall responsible for the operation of this procedure.
- 3.2 HOD (Procurement) & HOD (Stores & Purchase) are responsible for the approval of Purchase Orders depending upon the values as per the Circulars DOA issued by the management from time to time.
- 3.3 HOD (Stores & Purchase) is responsible for review of purchase orders related to Oils, Lubricants and Industrial Gases.
- 3.4 HOD (Procurement) in consultation with Central Procurement Cell (CPC) is responsible for review of purchase orders related to all raw materials procured by the company.
- 3.5 HOD (Stores & Purchase) is responsible for co-ordinating all purchases affected by Purchase Department. HOD (Stores & Purchase) is also responsible for maintaining Approved Vendors' list.

S.No	ACTIVITY	Responsibility	Reference
5.2.2.5	The quotations from respective approved vendors are received by HOD (Stores & Purchase) and comparative statement is prepared by HOD (Stores & Purchase).	-do-	F-04(06-06)
5.2.2.6	HOD (Stores & Purchase) gets clarification, if any, on technical points from the concerned indenting department, if required.	-do-	F-04(06-06)
5.2.2.7 a	If required, negotiations are done by HOD (Stores & Purchase) with the vendor on price, delivery schedule, packing requirements and other terms and conditions and record the same on the comparative statement.	-do-	F-04(06-06)
5.2.2.7 b	When procuring energy services, products and equipment that have, or can have an impact on significant energy use, the organisation shall inform suppliers that procurement is partly evaluated on the basis of energy performance.	-do-	F-04(06-06)
5.2.2.8	HOD (Stores & Purchase) decides for the vendor on whom the purchase order is to be placed as per Delegation of Authority (DOA).	-do-	
5.2.2.9	HOD (Stores & Purchase) prepares the computerised purchase orders which includes - Name of approved vendor - Stores Purchase Requisition No. & material code - Material description including specification/ drawing / Grade as applicable. - Quantity - Rate - Delivery schedule - Other terms & conditions	-do-	F-05(06-06)
5.2.2.10	Where applicable HOD (Stores & Purchase) stipulates inspection of manufactured goods at vendor's site / works, by company's representative in the purchase order.	HOD (Stores & Purchase)	F-05(06-06)
5.2.2.11	The purchase order contains the requirements for furnishing the test certificates indicating the conformity to the	-do-	F-05(06-06)

RESOURCE OPTIMIZATION

- Optimization of Fly ash Utilization upto 35% resulted in clinker consumption reduction.
- Contract with Power plants to ensure regular dry fly ash supply for high blending ratio.
- Mineral conservation with optimum usage of fly ash
- Utilization of Chemical Gypsum 4.00% which is a waste of other industry

REVERSE LOGISTICS

- Transportation of Cement in truck carrying gypsum to our plant

MACHINERY & SPARE PROCUREMENT

- Vendor meets
- Encouraging local vendors to reduce carbon footprint & inventory
- Vendor Stocking to have just in time concept ie. Lubricants , PP Bags, etc
- ARC contract for fast moving spares
- LED lights installation



Energy Budget

Sr. No	Year	Budget (Rs. Million)
1	FY20	8.10
2	FY21	8.82
3	FY22	9.10
4	FY23	9.50



ORIENT CEMENT : JALGAON																
CLINKER GRINDING UNIT																
DAILY POWER REPORT																
DATE: 10-08-2022																
ON DATE										MONTH TO DATE						
EQPM./SECTION	UNITS	PRODn	R.HRS IN HRS.	PRODn. RATE	LOAD	SP.ENERGY IN KWH/T					UNITS	PRODn	R.HRS IN HRS.	PRODn. RATE	LOAD	SP.ENG
NAME	KWH	TONS	Hrs	TPH	KW	%	ACT.	ACT+CS +LOSS	TARG ET	VAR.	KWH	TONS	Hrs	TPH	KW	ACT+ CS+L OSS
WAGON TIPPILER + LIGHTING	1625	4062.62	0.00				0.40	0.41	0.45	0.04	10775	24103.89	0.00			0.45 0.46
FLY ASH	3015	1104.60	0.00				2.73	2.81	2.50	-0.31	24360	9664.08	0.00			2.52 2.61
LINE -I																
CEMENT MILL	0				0	0%	0.00	0.00		0.00	129550				1191	9.56 9.89
POLY-FIX	0				0	0%	0.00	0.00		0.00	45482				418	3.36 3.47
POLY-MOV	0				0	0%	0.00	0.00		0.00	46250				425	3.41 3.53
SEPOL FAN	0				0	0%	0.00	0.00		0.00	21533				198	1.59 1.64
POLYCOM SEPARATOR-160KW	11				0	0%	0.00	0.00		0.00	1123				10	0.08 0.09
CC SEPARATOR - 250KW	12				0	0%	0.00	0.00		0.00	5102				47	0.38 0.39
CC SEPOL FAN 70282 315 KW	9				0	0%	0.00	0.00		0.00	25122				231	1.85 1.92
OTHER AUX + LIGHTING	623				0		0.00	0.00		0.00	53985				496	3.98 4.12
TOTAL GRINDING - LINE-I	655	0.00	0.00	0	0		0.00	0.00	22.67	22.67	328147	13548.00	108.75	124.58	3017	24.22 25.06
LINE -II																
CEMENT MILL	20834				868	72%	4.93	5.07		-5.07	116566				898	5.98 6.19
RP-FIX	20260				844	84%	4.79	4.93		-4.93	105795				815	5.43 5.62
RP-MOV	19355				806	81%	4.58	4.71		-4.71	102300				788	5.25 5.43
SKS FAN	10668				445	81%	2.52	2.59		-2.59	58680				452	3.01 3.12
SKS SEPARATOR - 250KW	1140				48	24%	0.27	0.28			6580				51	0.34 0.35
RP BE 2X132KW	4496				187	71%	1.06	1.09			25098				193	1.29 1.33
OTHER AUX + LIGHTING	13327				555		3.15	3.24		-3.24	79198				610	4.07 4.21
TOTAL GRINDING-LINE-II	90080	4227.00	24.00	176	3753		21.31	21.91	22.67	0.76	494217	19479.00	129.75	150.13	3809	25.37 26.25

Automatic EnMS software for daily power report generation

Energy Management Cell Details :

- Brief : Cross Functional Team of 15 members
- EnCon Competition Frequency : Quarterly Once

Energy Review Details :

- Plant level : Meeting is being conducted on Daily Basis and Chaired by Plant Head. Additionally, Monthly Once Energy Review Meeting is also being conducted among the Energy Management Cell Team
- MD Level : Overall performance review meeting is on Weekly, Monthly & Quarterly Basis and Chaired by Managing Director.



MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 160112-2014-AE-IND-RvA Initial certification date: 10 April 1999 Valid: 24 August 2023 – 23 August 2026

This is to certify that the management system of
Orient Cement Limited
P.O. Devapur Cement Works, Mancherial - 504218, Telangana, India
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

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

Place and date:
Barendrecht, 09 August 2023

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



[Signature]
Erie Koek
Management Representative

Lack of fulfillment of conditions as set out in the Certification Agreement may render the Certificate invalid.
ACCREDITED UNIT: DNV Business Assurance B.V., Zwolleweg 1, 2994 LB, Barendrecht, Netherlands - TEL: +31(0) 1029 22899 - www.dnv.com/assurance



MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 10000322562-MSC-RvA-IND Initial certification date: 24 August 2009 (based on OHSAS 18001) Valid: 24 August 2023 – 23 August 2026

This is to certify that the management system of
Orient Cement Limited
P.O. Devapur Cement Works, Mancherial - 504218, Telangana, India
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Occupational Health and Safety Management System standard:
ISO 45001:2018

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

Place and date:
Barendrecht, 09 August 2023

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



[Signature]
Erie Koek
Management Representative

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MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 210226-2016-AE-IND-RvA Initial certification date: 09 February 2017 Valid: 04 September 2023 – 23 August 2026
Expiry date of last certification cycle: 23 August 2023
Date of last re-certification:

This is to certify that the management system of
Orient Cement Limited
P.O. Devapur Cement Works, Mancherial - 504218, Telangana, India
and the sites as mentioned in the appendix accompanying this certificate

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

This certificate is valid for the following scope:
Manufacturing of Cement

Place and date:
Barendrecht, 04 September 2023

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



[Signature]
Erie Koek
Management Representative

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MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 160095-2014-AQ-IND-RvA Initial certification date: 09 April 1997 Valid: 24 August 2023 – 23 August 2026

This is to certify that the management system of
Orient Cement Limited
P.O. Devapur Cement Works, Mancherial - 504218, Telangana, India
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Quality Management System standard:
ISO 9001:2015

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

Place and date:
Barendrecht, 09 August 2023

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



[Signature]
Erie Koek
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We have imbibed our Sustainable Development Goals (SDGs) as a business objective and working towards reducing our energy consumption and carbon emissions.



Net Zero Road Map for 2030

Estimated CO2 footprint reduction @ 40%
345 – Kg CO2/T of Cement



23.4%

**Increase in
usage of AFR**



59 %

**Increase in
Blended Cement**



14.4%

**Renewable & WHR
Energy**



2.7 %

**Reduction of Energy
consumption through - ENCON
Idea's**



0.5%

Process Optimization

External training programs attended		
S.No.	Topic	Man Hrs.
1	CII - Online Certified Professional in Energy Efficiency (Cement Sector)	54
2	Power system study and relay coordination	20
Internal training programs conducted		
1	PAT awareness program	80
2	Calculation factors under PAT Scheme	80
3	Fan efficiency calculation	40
4	Bag filter Optimization	24
5	RP Maintenance	60
6	EnMS ISO - 50001	480
7	Utilities Performance Improvement	24
8	Training Programme on -L T Motor Maintenance	30
9	Optimization packing plant operation	42
10	Energy benchmark & Efficiency in Cement Industry	60

- **Active Participation in Energy Conservation Activities by getting exposure to other plant activities through such training Programs**
- **Every Year we are nominating min 2 participants for CII - Online Certified Professional in Energy Efficiency (Cement Sector) to get well trained for Energy Conservation activities**
- **Implementation of innovative projects/Ideas which may be applicable to us by observing the other Units presentations e.g. Bag Filter Optimization.**
- **Energy Conservation activities became a habit of everyone at our plant**
- **More Competitive nature builds up with such programs in Energy Conservations**

Green belt at plant premises



Providing natural habitat to Birds & Animals





Thank You...

Chandan Parasar
chandan.p@orientcement.com
Contact : +91-9518386733