ORIENT CEMENT LIMITED, DEVAPUR UNIT

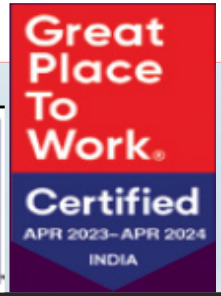
CK BIRLA GROUP

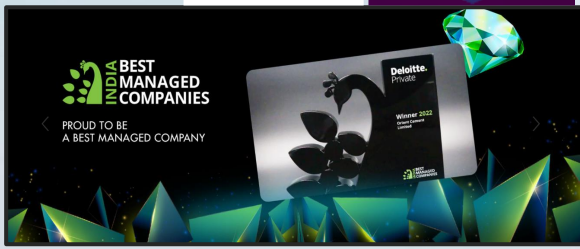
ORIENT CEMENT

CII National Award for Excellence in Energy Management 2023

Mr. Satyabrata Sharma
President – Manufacturing

Mr. Mahendra Pratap Joshi
Sr. VP-Works & Factory Manager





Presentation Team:

Mr. Deveshraaj Panjiray, DGM-Process

Mr. B. Pavan kumar, GM -Mechanical

ORIENT CEMENT LIMITED - PLANT PROFILE

OUR VISION & VALUES

Vision

Build Sustainably to Be a Valued Partner in Progress.

Values

- Collaboration
- Humility to Learn
- Walk the Talk
- Respect for All
- Agility with Speed
- Passion to Excel
- Celebrate Diversity

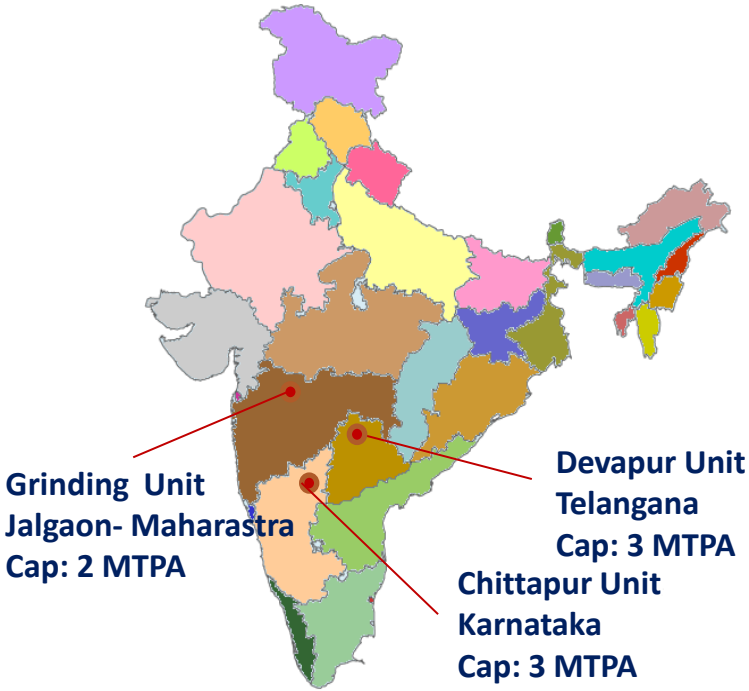
Plant is certified with IMS:

- ISO 9001:2015
- ISO 14001:2015
- ISO 45001:2018
- ISO 50001:2018
- TPM-Phase I & II (Excellence and Excellence in consistent)
- NABL Accredited Quality Control Laboratory
- **Member of CSI (WBCSD)**
- **Green Pro certified by CII**
- **Great Place to Work Certified consecutive four Year**

Overall Capacity of Orient Cement is 8.0 MTPA.

Orient Cement operating 3 Cement Plants in India:

- Integrated Plant (incl:CPP) - Devapur, Telangana
- Cement Grinding Unit - Jalgaon, Maharashtra
- Integrated Plant (incl:CPP) - Chittapur, Karnataka



CAPACITY ENHANCEMENT – DEVAPUR UNIT

1982	1990	1997	1999	2009	
Plant Cap.: 0.45 MTPA	Plant Cap.: 0.90 MTPA	Plant Cap.: 1.18 MTPA	Plant Cap.: 1.75 MTPA	Plant Cap.: 3.0 MTPA	
					
Line-I Plant Commissioned	Line-II Plant Commissioned	Line - I ,Internal modification	Line I, Up gradation with PC	Line - III Commissioned	CPP-50 MW Installation

Section	Line-1		Line-2	Line-3
Raw Mill	Ball Mill with Polycom as Pre Grinder Capacity - 240 TPH Make : Polycom -Krupp Polysius & Ball Mill-FLS		Central discharge Ball Mill with HIC as pregrinder Capacity - 160 TPH Make : Ball Mill - KHD & HIC -Barmac	Finished mode Roller press Capacity -300 TPH Make : KHD
Coal Mill	Ball Mill (Kiln Firing) Capacity - 16 TPH Make : FLS	VRM (PC Firing) Capacity - 16 TPH Make : Pfeiffer	Ball Mill Capacity - 20 TPH Make : KHD	VRM Capacity - 40 TPH Make : Pfeiffer
Pyro Process	K- String 4 stage Suspension Pre heater & PC -String 5 stage Suspension Pre heater with Separate Line Calciner. Rotary Kiln with Grate Cooler (Folex Cooler) Capacity -3600 TPD Make: FLS . Plant Commissioned in 1982 and upgraded in 1999		Five Stage Suspension Pre heater with In Line Calciner. Rotary Kiln with Grate Cooler Capacity -2800 TPD Make: KHD. Plant Commissioned in 1990 and upgraded	Six Stage Suspension Pre heater with In Line Calciner. Rotary Kiln with SF Cross Bar Cooler Capacity -4200 TPD Make: FLS Plant Commissioned in 2009
Cement Mill	Ball Mill with Roller Press as Pre Grinder Capacity - 260TPH Make : Roller Press : KHD & Ball Mill: FLS		Ball Mill with Roller Press as Pre Grinder Capacity - 230TPH Make : Roller Press & Ball Mill : KHD	-

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LAST FIVE YEARS ENERGY PERFORMANCE

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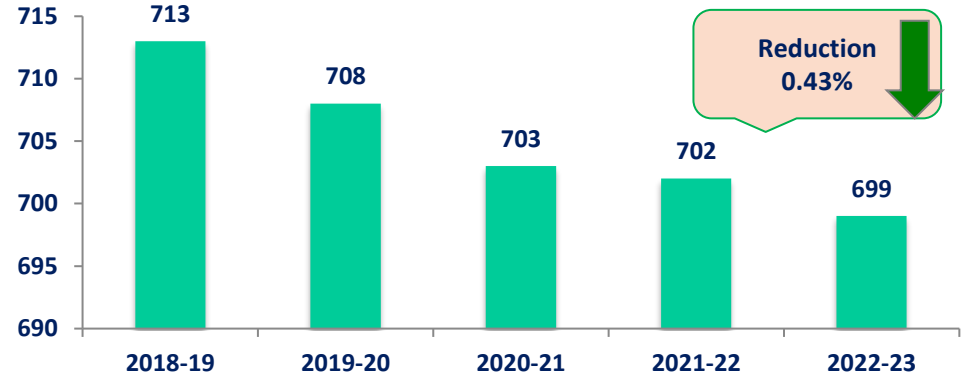
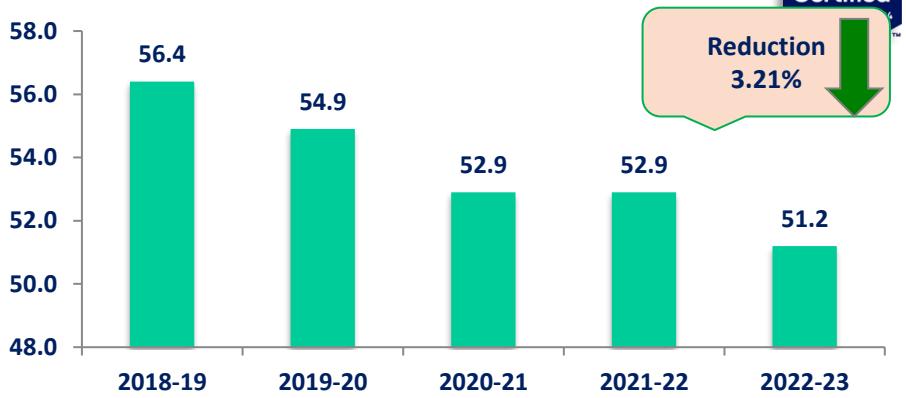
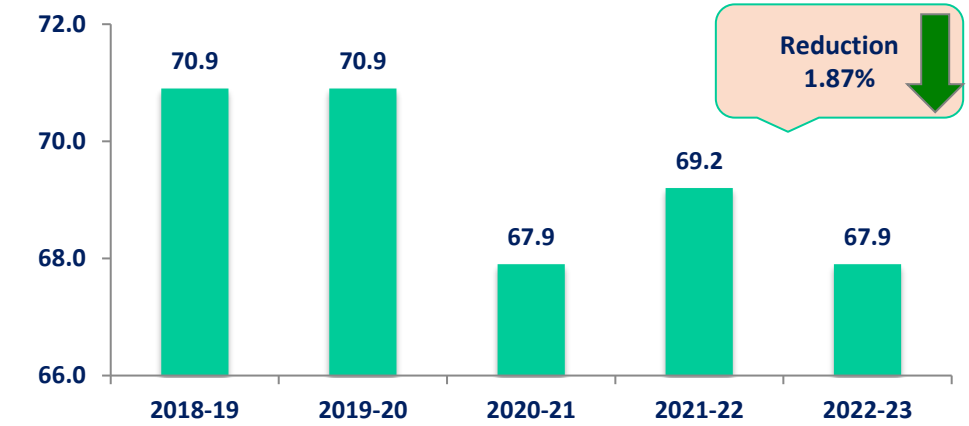
Specific Heat Consumption Common – Kcal/ Kg Clk



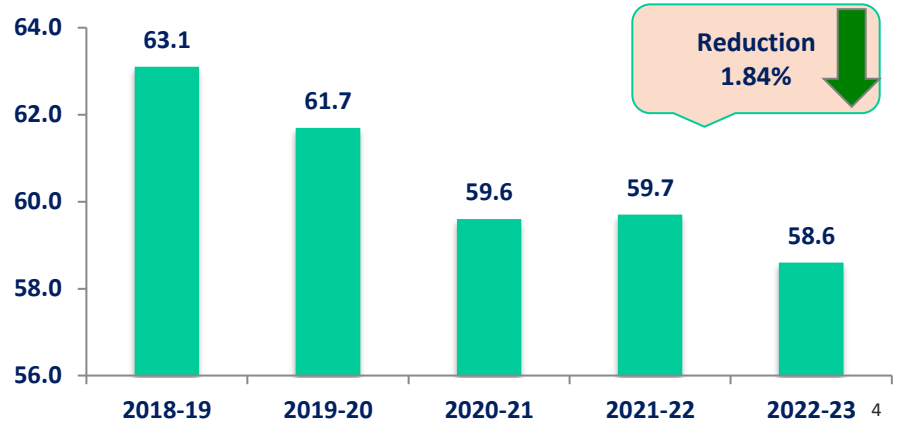
Sp. Power up to Clinker Common (Kwh/ MT)



Sp. Power up to cement Common (Kwh/ MT)

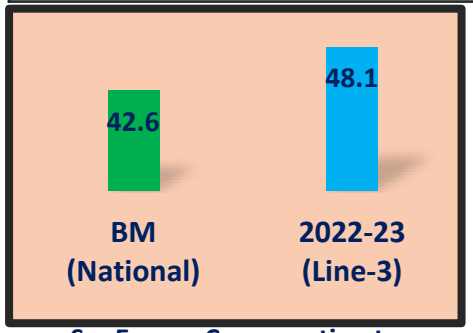


Sp. Power up to PPC (Kwh/ MT of Cement)

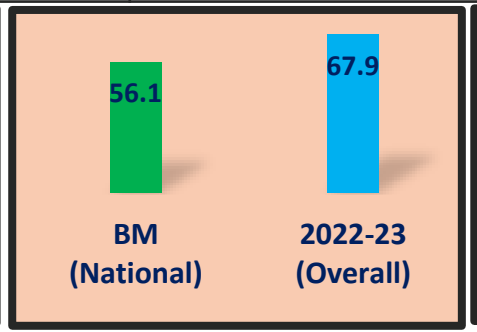


INFORMATION ON COMPETITORS, NATIONAL & GLOBAL BENCHMARK

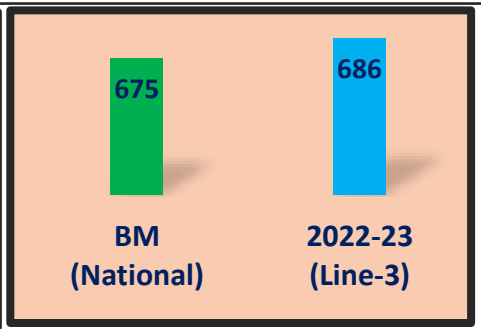
Parameters	Electrical SEC	Thermal SEC
SEC (Specific Energy Consumption) of the Unit	67.9	699
Unit of Measurement	kWh/MT Cement	Kcal /Kg Clinker
Name of Competitor I	Chettinad – Karikkali	Chettinad – Karikkali
SEC Values for Competitor I	74.0	718
Name of Competitor II	Dalmia Cement (Bharat) Limited,Ariyalur	Dalmia Cement (Bharat) Limited,Ariyalur
SEC Values for Competitor II	68.59	728
Name of Competitor III	M/s DALMIA CEMENT (BHARAT) LTD, DALMIAPURAM	M/s DALMIA CEMENT (BHARAT) LTD, DALMIAPURAM
SEC Values for Competitor III	65.05	782
NATIONAL BENCHMARK		
Name of the Company	Plant-1	Plant-1
SEC Value	56.14	675
Unit of Measurement	kWh/MT Cement	Kcal /Kg Clinker
Difference with National Benchmark Company	11.76	24
Reference:-	ENERGY BENCHMARKING for the Indian Cement Industry (CII) V 6.0 and year 21-22 CII Award Presentation	



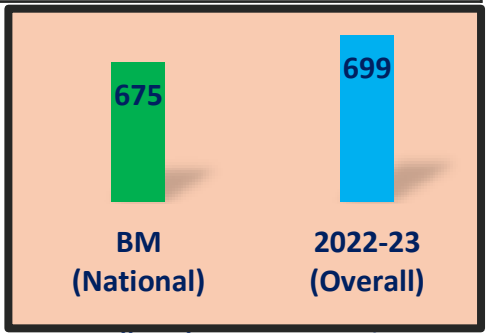
Sp. Energy Consumption to Clinker – KWh/MT



Sp. Energy Consumption Up to Cement – KWh/MT



L-3, Sp. heat Consumption – KCal/ Kg of Clinker



Overall Sp. heat Consumption – KCal/ Kg of Clinker

ROAD MAP FOR REDUCTION OF ENERGY CONSUMPTION

1. Installation of energy saving device in split of packaged AC units.
2. Installation of energy efficient pump sets/VFD to pumps.
3. Install roof top solar PV for buildings.
4. Reduce pressure drop in the preheater downcomer duct by conducting CFD study.
5. Install waste heat recovery system.
6. Installation of BLDC fans to replace conventional ceiling fans.
7. Replace IE1 motors with energy efficient IE3 motors (energy efficient motors replacement for selected motors).
8. Replacement of existing cooler with latest generation cooler in line-1 & 2.

PLANNED ENERGY CONSERVATION PROJECTS–2023-24

S. No	Energy Saving Proposals	Electrical energy saving per annum (Units in Lakhs)
1	Optimisation of cooler fans in kiln-2	2.37
2	Replace IE1 motors with energy efficient IE3 motors (energy efficient motors replacement for selected motors)	1.66
3	Installation of energy efficient pump sets/VFD to pumps	2.47
4	reduce pressure drop in the preheater downcomer duct by conducting CFD study	3.96

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ENERGY SAVING PROJECTS IMPLEMANTEDIN LAST THREE YEAR

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Year	No of Energy saving projects	Investments (INR Million)	Electrical Savings (Million kWh)	Savings (INR Million)	Impact on SEC/ SHC (Electrical kWh /MT cement or Kcal/Kg cement)
FY 2019-20	11	2.71	1.845	7.39	0.7670
FY 2020-21	19	1.02	3.645	14.6	1.8630
FY 2021-22	07	1.83	1.415	5.66	0.6618
FY 2022-23	09	0.39	1.409	8.45	0.6887

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ENERGY SAVING PROJECTSIMPLEMENTED IN FY 2022-23

Year	No of Energy saving projects	Investments (INR Million)	Electrical Savings (Million kWh)	Savings (INR Million)	Impact on SE (Electrical kW cement or Kcal/Kg cement)
FY 2022-23	VFD installation in Kiln-3 Coal Conveying blower	0.10	0.032	0.19	0.015
FY 2022-23	Kiln-1 PC firing Coal conveying blower Discharge Line Modification	0.02	0.032	0.19	0.015
FY 2022-23	RM-2 Silo Top Air Slide Blower Air Pipeline Modification	0.02	0.029	0.18	0.014
FY 2022-23	VFD Installation in Packer-3 Old Dust collector.	0.18	0.040	0.24	0.019
FY 2022-23	Optimization of Raw Mill 3 SKS fan during the High clinker stock management	0.00	0.288	1.73	0.141
FY 2022-23	Raw mill 1 Vent Fan Motor changed from 250kW to 200kW and System optimized.	0.02	0.079	0.48	0.039
FY 2022-23	K-string, Kiln Feed Air Slide Blower discharge line modification in Line 1	0.03	0.011	0.07	0.005
FY 2022-23	Idle running of Separator gear box oil cooling water pump avoided in CementMill-1	0.00	0.010	0.06	0.005
FY 2022-23	Grinding media optimization in Cement Mill-1	0.00	0.889	5.34	0.434

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VFD installation in Kiln-3 Coal Conveying blower

Great Place To Work

Problem & Observation:

- Phase Density Estimation: a. Kiln Firing: 1.73 kg of fuel /kg air.
- Kiln coal firing phase density low Indicates air being used for coal conveying is higher than standard norms.
- Kiln firing transport pipeline Velocity: 34m/s.

Action Taken:

- Installed VFD and reduced Blower RPM 1480 to1420 and Increased phase density 1.90 Kg of fuel /kg air and reduced Transport Pipe line Velocity 30m/s .

Benefits:

- Total power savings: 4.0 KW.

Before VFD Installation		
PARAMETERS	**UNIT**	**TECHNICAL DATA (Operating)**
Velocity	m/s	1.65
Filter (Length*Width)	m	0.4*0.4
Area	m2	0.640
Flow	m3/sec	1.054
Flow	m3 /hr	3794
Flow	Kg/hr	4173
C/S Area of pipe line	m2	0.031
Velocity of air in the pipe line	m/sec	34
Blower Pressure	Kg/cm^2	0.35
Kiln side Coal conveying Air flow	m3 /hr	3794
	Kg/hr	4173
Kiln Coal	Kg Coal/hr	7200
Phase density	Kg coal/kg air	1.73
Operating		
Blower capacity (@ 0.35 kg/cm2)	m3 /hr	3794
Motor Speed	RPM	1470
Motor KW	KW	48
Design		
Blower capacity (@ 0.9 kg/cm2)	m3 /hr	3350
Motor Speed	RPM	1450
Motor KW	KW	160

After VFD Installation		
PARAMETERS	**UNIT**	**TECHNICAL DATA (Operating)**
Velocity	m/s	1.50
Filter (Length*Width)	m	0.4*0.4
Area	m2	0.640
Flow	m3/sec	0.958
Flow	m3 /hr	3447
Flow	Kg/hr	3792
C/S Area of pipe line	m2	0.031
Velocity of air in the pipe line	m/sec	30
Blower Pressure	Kg/cm^2	0.35
Kiln side Coal conveying Air flow	m3 /hr	3447
	Kg/hr	3792
Kiln Coal	Kg Coal/hr	7200
Phase density	Kg coal/kg air	1.90
Operating		
Blower capacity (@ 0.33 kg/cm2)	m3 /hr	3447
Motor Speed	RPM	1420
Motor KW	KW	44
Design		
Blower capacity (@ 0.9 kg/cm2)	m3 /hr	3350
Motor Speed	RPM	1450
Motor KW	KW	160

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Kiln-1 PC firing Coal conveying blower Discharge Line Modification

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Problem & Observation:

- Earlier Kiln-1 PC firing Coal conveying blower discharge Line numbers of bends higher side.

Action Taken:

- Modified the discharge line and reduced numbers of bends.

Benefits :

- Total power savings: 4.0 KW.

Before		
PC firing blower Volumetric flow rate (4366)		
Design Details		
Blower capacity @ 0.8 Kg/Cm2	m3 /hr	2220
Blower speed	RPM	1480
Motor Speed	RPM	1480
Motor KW	KW	75
PARAMETERS	**UNIT**	**TECHNICAL DATA (Operating)**
Velocity	m/s	2.93
Length*Width	m	0.51*0.51
Area	m2	0.265
Flow	m3/sec	0.778
Flow	m3 /hr	2801
C/S Area of pipe line	m2	0.017
Velocity of air in the pipe line	m/sec	47
Blower O/L Pressure	Kg/cm2	0.30
Blower RPM	RPM	1480
Operating Power	KW	36
PC side Coal conveying Air flow	m3 /hr	2801
	Kg/hr	3622
PC Coal	Kg Coal/hr	11000
Phase density	Kg coal/kg air	3.04

After		
PC firing blower Volumetric flow rate (4366)		
Design Details		
Blower capacity @ 0.8 Kg/Cm2	m3 /hr	2220
Blower speed	RPM	1480
Motor Speed	RPM	1480
Motor KW	KW	75
PARAMETERS	**UNIT**	**TECHNICAL DATA (Operating)**
Velocity	m/s	2.84
Length*Width	m	0.51*0.51
Area	m2	0.265
Flow	m3/sec	0.753
Flow	m3 /hr	2710
C/S Area of pipe line	m2	0.017
Velocity of air in the pipe line	m/sec	46
Blower O/L Pressure	Kg/cm2	0.35
Blower RPM	RPM	1480
Operating Power	KW	32
PC side Coal conveying Air flow	m3 /hr	2710
	Kg/hr	3504
PC Coal	Kg Coal/hr	12000
Phase density	Kg coal/kg air	3.42

RM-2 Silo Top Air Slide Blower Air Pipeline Modification

Problem & Observation:

- RM-2 Silo BE Discharge air slide pipeline was connected with three air-slide blowers with 18 bends.
  - 32111 = 5.5KW,
  - 32111A= 5.5KW
  - 32103 = 3.7KW
- By modification of Air pipeline & minimising bends we can/may stop one blower and achieve power saving approx. 3.5 kW.

Action Taken:

- Modified air Pipeline & minimized numbers of Bends.

RM - 2 Silo top Air slide Blowers									
Sr. No.	Tag No.	Location	Before Modification		After Modification		Design		
			Flow Rate (m3/hr)	Operating Amps	Flow Rate (m3/hr)	Operating Amps	Flow Rate (m3/hr)	Pressure mmWg	Motor kW
1	32-111	Raw Mill Silo Top	840	5.1	970	5.3	**720**	**642**	**5.5**
2	32-111A	Raw Mill Silo Top Std by	657	4.9	658	5.1	**720**	**642**	**5.5**
3	32-103	Raw Mill Silo Top	483	3.0	**Stopped**		**480**	**642**	**3.7**

Benefits :

- One Blower completely stopped now Running two blowers instead of three blowers,.
- One blower kept be standby for another two blowers.
- Total power savings: 3.7 KW

VFD Installation in Packer-3 Old DC

Problem & Observation:

- Packer -3 old dust collector fan stater changed from DOL to VFD to avoid the frequent failure of motor winding at the number of start and stop interval.

Action Taken:

- Installed VDF in Cost collector fan and reduced fan RPM 1480 to 1230 RPM

Before				After			
Parameters	**UOM**	**Operating**	**Design**	**Parameters**	**UOM**	**Operating**	**Design**
Flow	m3 /hr	14201	19800	Flow	m3 /hr	13539	19800
Motor input power	KW	13		Motor input power	KW	8.0	
Installed motor power	KW	45	45	Installed motor power	KW	45	
Motor efficiency	%	90		Motor efficiency	%	90	
Fan speed	RPM	1480	1480	Fan speed	RPM	1232	1480
Fan inlet damper opening	%	70		Fan inlet damper opening	%	100	

Benefits :

- Total power savings: 5.0 kWh

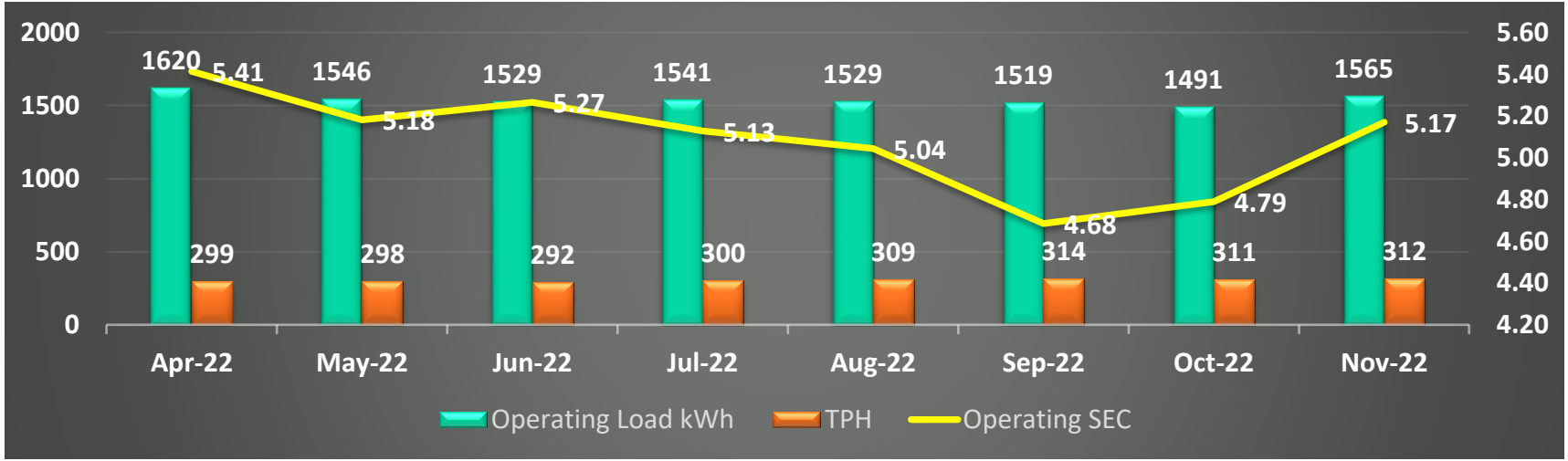
Raw mill-3 SKS fan optimisation

Problem & Observation:

- During Monsoon as the dispatches were low and Clinker stocks were building up, in order to avoid start- stop Kiln 3, Due to which Kiln 3 Feed was restricted to continuous Operation, Similar condition reflected in Raw Mill 3, So to avoid Start-stop and Power Management We have reduced the SKS Fan Speed to 90%, and The Production Level did not reduce to the expected level and instead reduced the Specific Power.

Action Taken:

- Reduced fan speed upto 90% as per Raw mill feed.



Benefits :

- We achieved saved up to 100kWh.

Raw Mill 1 Vent fan Motor changed

Problem & Observation:

❖ Observed raw mill 1 vent fan efficiency lower side.

Action Taken:

❖ Raw Mill 1 Vent fan and motor changed from 250 KW to 200 KW, initially we could not got any power savings but after optimised operation and system we got power savings.

Raw Mill-1 Vent fan before after comparison (Fan motor changed 250kW to 200 kW)

Before				After			
RM-1 Vent Fan Inlet	Feed:245 TPH			RM-1 Vent Fan Inlet	Feed:255 TPH		
PARAMETERS	UNIT	TECHNICAL DATA		PARAMETERS	UNIT	TECHNICAL DATA	
		Operating	Design			Operating	Design
Gas temp.	ºC	80	90	Gas temp.	ºC	74	90
Static pressure (fan inlet)	mmWg	-358		Static pressure (fan inlet)	mmWg	-360	
Static pressure (fan outlet)	mmWg	-34		Static pressure (fan outlet)	mmWg	-35	
Total pressure	mmWg	324	400	Total pressure	mmWg	325	400
Flow	m3 /hr	72051	108000	Flow	m3 /hr	72468	108000
Flow	Nm3 /hr	52116		Flow	Nm3 /hr	53307	
Flow	m3 /sec.	20.01		Flow	m3 /sec.	20.13	
Motor input power	KW	105		Motor input power	KW	95	
Installed motor power	KW		250	Installed motor power	KW		200
Fan speed	RPM	670	740	Fan speed	RPM	670	740
Fan outlet damper opening	%	100		Fan outlet damper opening	%	100	
Fan Efficiency	%	67.27		Fan Efficiency	%	71.07	

Benefits :

❖ Total power savings: 10 kWh

K-string, Kiln Feed Air Slide Blower discharge line modification

Problem & Observation:

❖ Kiln 1 K-string kiln feed air slide blower have more numbers of bends.

Action Taken:

❖ Eliminated all bends and Blower shifted to near air slide.

Drive No.	3431 A		
Location	K-string,Kiln Feed Air Slide Blower		
Description	UOM	Before	After
Design Details			
Rated Motor	Kw	5.5	5.5
Design Flow	m3/hr	1200	1200
Pressure	mmWg	642	642
Motor RPM	RPM	2860	2860
Actual Details			
Actual motor Running	KW	3.9	2.4
Area (m2)	m2	0.21	0.21
Actual Flow	m3/hr	982	1157
Filter shape	Square	yes	yes
Damper position	(%)	100	100
Numbers of bend	Nos	4	0
Numbers of damper in line	Nos	2	1
Modification	Eliminated all bends and Blower shifted to near air slide		
Savings	**1.5 kW**		

Benefits :

❖ Total power savings: 1.5 kWh

Grinding media optimization in Cement Mill-1

Problem & Observation:

❖ Higher Grinding media loading in Cement mill 1 as per FLS norms after Cement mill upgradation.

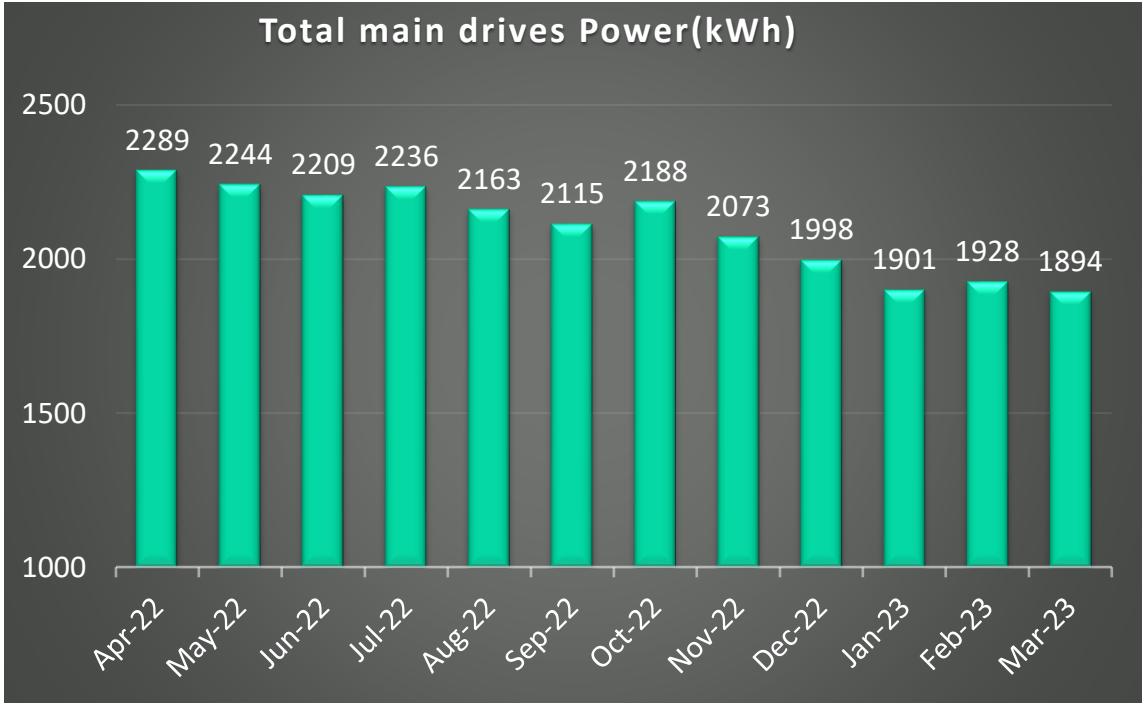
Action Taken:

❖ Gradually decreased grinding media in mill as per feed rate increased from Nov -2022

FLS grinding media Pattern			Existing grinding media Pattern		
Size (mm)	MT	%	Size (mm)	MT	%
25	50	30.12	25	23	16.42
20	50	30.12	20	38	27.14
17	33	19.88	17	38	27.14
15	33	19.88	15	41	29.28
Total	166	100.00	Total	140	100.00
Grinding Media Volumetric Loading		29.2%	Grinding Media Volumetric Loading		24.5%

Benefits :

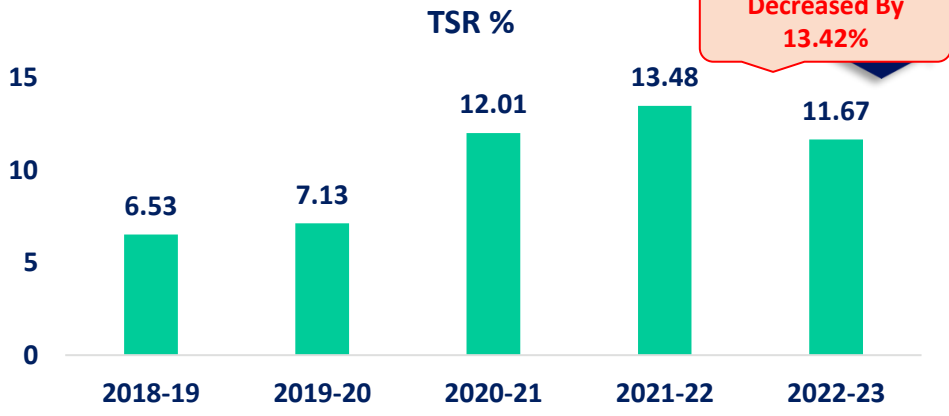
- Total power savings: 247 kWh



Month	CM-1 MM (East)	CM-1 MM (west)	Total Power	Avg (kWh)	Savings Per Month	Avg Savings kWh
Apr-22	1185	1105	2289	2206		
May-22	1161	1083	2244			
Jun-22	1151	1058	2209			
Jul-22	1169	1067	2236			
Aug-22	1133	1030	2163			
Sep-22	1107	1008	2115			
Oct-22	1144	1044	2188			
Nov-22	1086	987	2073	1959	133	
Dec-22	1050	948	1998		208	
Jan-23	980	921	1901		305	
Feb-23	980	948	1928		278	247
Mar-23	968	927	1894		312	

USAGE OF ALTERNATIVE FUELS

- **Rice Husk** direct feed to preheater through Rice husk feeding system.
- **Carbon Black** direct feed in coal mill through carbon black dense phase system.
- **Recovered waste** mixed with rice husk.
- **Hazardous Waste** mixed with raw coal.
- **Cotton stalk, Coconut fiber, Wood chips** direct feed in to the preheater system.
- **Municipal Waste** mixed with rice husk.



Sl No	FY (2021-23)	Waste as fuel	Quantity	GCV	Waste as percentage of total fuel	TSR %
1	FY 2020-21	Biomass (MT/year)	33240	3290	6.90 %	12.01
2		Solid waste (MT/year)	12314	6191	5.11 %	
3	FY 2021-22	Biomass (MT/year)	44703	3312	7.72 %	13.48
4		Solid waste (MT/year)	16654	5777	5.37 %	
5		Liquid Waste (MT/year)	2642	2820	0.39 %	
6	FY 2022-23	Biomass (MT/year)	22196	3310	4.34 %	11.67
7		Solid waste (MT/year)	19019	5718	6.13 %	
8		Liquid Waste (MT/year)	5494	3646	1.19 %	

WASTE UTILIZATION AND MANEGMENT

LAFR System in Line-3

Line -3's 5 TPH Rice husk feeding system installed in Line-2

Old carbon black system

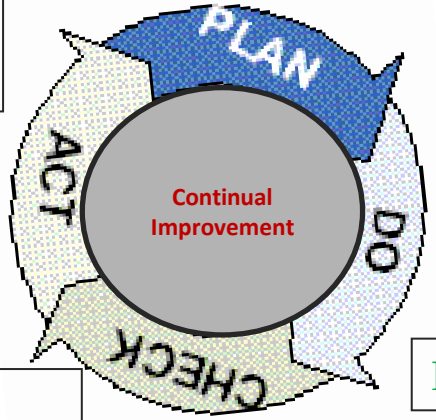
New carbon black system

Enhance capacity of Line-3 Rice Husk system (5 TPH to 15 TPH)

IMPLEMENTATION & REVIEW PLAN

- Capturing of Energy consumptions
- Discuss and Compare
- Identify the Problem
- Identify Causes along with Actions/ solutions

Analyse and Act on results



Implement solutions

Check for Results

A special team has been designated for monitoring of Energy consumptions. Electrical as well as Thermal consumption is been monitored on daily basis and highlighted to down the level. The daily Energy consumptions of concerned departments are discussed during daily review meeting. Actions and brain storming are done based on actual vs targets.

List of active members of Energy Management Cell within the organisation and their role Do you have a designated energy manag (need not be exclusive for energy) at your unit.

1. Mr. Atul Kumar Agrawal (EA-11170)
2. Mr. Devesh Raaj Panjiray
3. Mr. Sameer Gandhi
4. Mr. Vijayapal Ratna
5. Mr. Goutham
6. Mr. P. Ramakrishna (EA-34984)
7. Mr. Shailesha Rajawat (EM-300528)
8. Mr. B. Kasieswarudu

Responsibilities of Energy Manger:-

a) Planning and Conducting Energy review meetings
b) Energy monitoring activities.
c) EnMS – ISO 50001, Documentation and compliance to standard.
d) Energy conservation projects
e) Conducting periodical Energy Audits
f) Create Awareness & training to employees on Energy conservation activities.
g) Compliance to PAT schemes etc.

Energy Management Activities:-Activities are monitoring of section wise and main motors electrical consumption, Monitoring Thermal energy consumptions, Heat balance, Leakage monitoring, Suggesting new energy efficient equipments and modifications, Explore usage of alternative fuels, Conduct energy audits, awareness & training etc.

ENERGY MANAGEMENT SYSTEM

Energy Management system installed for online capturing of all Energy consumption details of Major fans ,HT drives and above 75kW drives different departments and specific energy usages

ORIENT CEMENT : DEVAPUR

DAILY POWER REPORT — Date: 17-Mar-23

CK BIRLA GROUP

EQPT./SEC. NAME	ON DATE UNITS KWH	PROD TONS	R.Hrs.	RATE TPH	LOAD KW	LOAD %	* SP.ENERGY ACT.	target	KWH/T Var.	MONTH TO DATE UNITS KWH	OUTPUT TONS	Run. Hrs	RATE TPH	LOAD KW	SP. ENGY
MINES AUXILARY	3690						0.30	0.23	-0.07						
LS CRUSHER TOTAL	16835						1.43	1.4	-0.03						
LSC-3	**20425**	**11794**	**11.8**	**997**	**1727**		**1.73**	**1.63**	**-0.10**	**369380**	**252439**	**256**	**985**	**1441**	**1.46**
RM-1 M.M (S)	3493.2				1456	76.6	5.82	5.67	-0.15	564664				1446	6.17
RM-1 M.M (N)	3334.0				1389	73.1	5.56	5.75	0.19	544130				1393	5.95
SEPOL FAN	962.0				401	77.1	1.60	1.45	-0.15	156266				400	1.71
VENT FAN	189.0				79	39.4	0.32	0.44	0.13	32385				83	0.35
POL (E)	1034.0				431	82.9	1.72	1.90	0.18	170316				436	1.86
POL (W)	1093.2				456	87.6	1.82	1.69	-0.13	178297				457	1.95
B/E	298.1				124	67.1	0.50	0.46	-0.04	46060				118	0.50
Other Aux with B/E & Sep Fan	862.9				346		1.38	1.44	0.06	134718				345	1.47
RM-1 Total	**11233.4**	**6000**	**24.0**	**250**	**4681**		**18.72**	**18.80**	**0.08**	**1826836**	**91482**	**390**	**234**	**4678**	**19.97**
ESP-1	113.4				47	23.6	0.31	0.55	0.24	20026				49	0.33
PH-1	744.2				310	62	2.03	2.25	0.22	126276				311	2.07
CLM-1M.M	486.9	204	14.3	14	342	80.4	1.33	1.50	0.17	83588	3241	220	15	379	1.37
CLM -1 Aux. (M-11)	90.6				64		0.25	0.30	0.05	15885				72	0.26
CESP-1	110.4				46	23	0.30	0.25	-0.05	15882				39	0.26
CLR FANS-1	143.24				597		3.91	3.78	-0.21	240394				593	3.94
PC FAN	1599.0				666	83.3	4.36	4.50	0.14	270410				667	4.43
VRM-MM	434.1	315	22.3	14	195	97.3	1.18	1.10	-0.08	76452	5523	379	15	202	1.25
VRM-D/CM.	329.6				148	73.9	0.90	1.00	0.10	54280				143	0.89
VRM Aux.(MCC)	369.0				165		1.01	1.13	0.12	63636				168	1.04
Oth. Aux.	3072.1				1280		8.38	8.22	-0.16	505532				1246	8.28
KILN-1 Total	**8781.7**	**3665**	**24.0**	**153**	**3659**		**23.96**	**24.50**	**0.54**	**1472361**	**61036**	**406**	**150**	**3630**	**24.12**
CM-1 MM (East)	1668.4				953	63.6	3.97	4.52	0.55	278884				963	4.22
CM-1 MM (west)	1599.0				914	60.9	3.81	4.21	0.40	269400				930	4.07
CM-1 AUX.(M-14)	98.4				56		0.23	0.22	-0.01	17216				59	0.26
CM-1 SEP MCC	125.6				72		0.30	0.18	-0.12	18275				63	0.28
CM-1 R. PRESS (East)	1007.0				575	57.5	2.40	2.80	0.40	178790				617	2.70
CM-1 R. PRESS (West)	1147.5				656	65.6	2.73	2.78	0.05	198268				685	3.00
CM-1 R. PRESS SKS FAN	1911.8		18.20		1050	100	4.55	4.23	-0.32	311096		301		1034	4.71
CM-1 R. PRESS Aux.MCC	1299.0				742		3.09	3.02	-0.07	202747				700	3.07
Other aux with comp.	142.62				815		3.40	2.38	-1.02	166745				576	2.52
CM-1 Total	**10239.9**	**4200**	**17.5**	**240**	**5875**		**24.49**	**24.35**	**-0.13**	**1641425**	**66118**	**290**	**228**	**5668**	**24.83**
RM-2 M.M.(S)	3359.5				1400	73.7	8.23	8.36	0.13	476165				1326	8.93
RM-2 M.M.(N)	3492.0				1455	76.6	8.56	8.76	0.20	501910				1398	9.41
RM-2 VENT FAN	1037.5				432	59.6	2.54	2.56	0.02	145090				404	2.72
RM-2 AUX.(M-18)	460.8				192		1.13	1.36	0.23	69176				193	1.30
other aux with sep & HIC	432.8				180		1.06	1.46	0.40	48108				134	0.90
RM-2 Total	**8782.6**	**4080**	**24.0**	**170**	**3659**		**21.53**	**22.50**	**0.97**	**1240449**	**53347**	**359**	**149**	**3455**	**23.25**
ESP-2	63.58				265	88.3	2.42	2.50	0.08	105620				266	2.51
PH-2	252.25				1051	76.7	9.61	10.01	0.40	410405				1035	9.75
CLM-2	1044.6	380	24.0	16	435	87.1	3.98	3.35	-0.63	165657	6148	381	16	435	3.93
CLM -2 Aux. (M-25)	39.56				165		1.51	0.75	-0.76	62468				164	1.48
CESP-2	16.30				68	31.6	0.62	1.00	0.38	26978				68	0.64
CLR-2	103.78				432		3.95	4.10	0.15	171389				432	4.07
Oth. Aux.2	155.79				649		5.93	8.00	2.07	255776				645	6.07
KILN-2 Total	**735.72**	**262.5**	**24.0**	**109**	**3066**		**28.03**	**29.70**	**1.67**	**1190293**	**42185**	**397**	**106**	**3222**	**28.46**
CM-2 MM (East)	303.10				1263	70.2	6.64	6.63	-0.01	476870				1271	6.93
CM-2 MM (west)	295.10				1230	68.3	6.47	6.33	-0.14	466630				1243	6.78
CM-2A(M-28)	26.90				112		0.59	0.68	0.09	48569				129	0.71
CM-2 R. PRESS (North)	159.70				665	66.5	3.50	3.33	-0.17	241202				643	3.51
CM-2 R. PRESS (South)	152.80				637	63.7	3.35	3.68	0.33	242124				645	3.52
CM-2 R. PRESS SKS FAN	148.30				618	72.7	3.25	3.05	-0.20	234490		380		618	3.41
CM-2 R. PRESS SKS SEP.	20.02				83	26.5	0.44	0.43	-0.01	33975				85	0.46
Oth aux with fly ash	75.94				316		1.66	3.25	1.59	218671				583	3.18
CM-2 R. PRESS (Total)	0	0	0.0				#DIV/0!	0.00	#####	0	0	0			#DIV/0!
CM-2 Total	**1181.86**	**456.4**	**24.0**	**190**	**4924**		**25.90**	**27.35**	**1.45**	**1960531**	**68784**	**375**	**183**	**5223**	**28.50**
PACKING PLANT	**1099.8**	**743.6**					**1.49**	**1.55**	**0.07**	**176892**	**127997**	**0**			**1.38**
RM-3 RP MOVABLE	329.07				1334	74.1	4.37	4.46	0.09	519685				1296.8	4.43
RM-3 RP FIXED	322.29				1343	74.6	4.40	4.33	-0.07	522056				1302.7	4.45
RM-3 SKS FAN	379.95				1583	88	5.19	5.18	-0.01	637480		402		1586.6	5.43
RM-3 RP DSG B/E-NORTH	40.83				170	68.1	0.56	0.52	-0.04	67200				167.69	0.57
RM-3 RP DSG B/E-SOUTH	39.67				165	66.1	0.54	0.56	0.02	64209				160.22	0.55
OTHER AUXILARY	155.74				649		2.13	1.95	-0.18	249446				622	2.12
RM-3 Total	**1258.55**	**732.0**	**24.0**	**305**	**5244**		**17.19**	**17.00**	**-0.19**	**2060076**	**117391**	**401**	**293**	**5141**	**17.55**
BAGHOUSE FAN	74.88				312	32.8	1.60	1.68	0.08	128610				315	1.63
PREHEATER FAN	235.67				982	59.5	5.04	5.13	0.09	397160				973	5.03
KILN MAINDRIVE	82.15				342	48.6	1.76	1.67	-0.09	135930				333	1.72
COOLER FANS	165.80				691	36.6	3.55	3.81	0.26	280388				687	3.55
VRM MAIN DRIVE	895.0	616	17.3	36	516	80.6	1.91	1.9	-0.01	161322	10309	280.5	37	575	2.04
VRM FAN	42.87				247	45	0.92	0.95	0.03	78731				280.72	1.00
VRM-3 AUX	10.37				60	19	0.22	0.25	0.03	18716				66.733	0.24
OTHER AUXILARY	277.20				1155		5.93	5.71	-0.22	467673				1146	5.93
KILN-3 Total	**978.44**	**467.5**	**24.0**	**195**	**4077**		**20.93**	**21.10**	**0.17**	**1668530**	**78931**	**408**	**193**	**4090**	**21.14**
COMSER.	516.2									89111					
MAINTENANCE L1,L2&L3	0									2953					
LOSSES	-2981									-20794					
COLONY	622.2									105040					
TOTAL POWER	846.080									13789990					
UP TO CLINKER (average)							**53.80**								**54.82**
UP TO CEMENT (average)							**77.41**								**79.74**
UP TO CEM. PPC (average)							**61.52**								**61.92**
UP TO CEM. HS PPC (average)							**0**								**80.31**
CPP Aux. From MRSS	0									0					
POCHAMMA SAGAR PUMPS	25.94									42262					
POWER EXPORT	10.0									5800					

ENERGY MANAGEMENT SYSTEM

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

Future aspects for Green Supply Chain Management :

- Usage of Hazardous waste.
- Usage of agro based waste.
- Ideas towards reduction of Carbon emissions.
- Adoption of automation technologies.
- Safety standards and reliability
- Ban of single use plastic in Colony/Plant.
- Maximizing reverse logistics.

CK BIRLA GROUP

ORIENT CEMENT

ORIENT CEMENT LIMITED

CORPORATE GREEN PROCUREMENT POLICY

Orient Cement Limited ensures & practices potential environment and associated impacts while purchasing Products & Services in the supply chain.

We committed to:

- Continuous creation of awareness on Environment and its impacts.
- Measures towards reduction of foot print by Energy efficiency appliances and water conserving equipment.
- Procurement and sourcing of Raw materials from nearby sources to reduce vehicle movement/diesel consumption and encourage local stake holders.
- Measures towards increase the Rail mode for incoming and out going material transportation.
- Create awareness among the suppliers to use of biodegradable material for packing.
- Explore and Increase the procurement of AFR/Hazardous waste materials for cement manufacturing process.
- Green supply chain with increase in bulk transportation.
- Purchase & replacement of equipment that have higher energy efficiency.

SANDEEP KOTHARI

1st Apr'21

Learning from CII Energy Award or any other award program

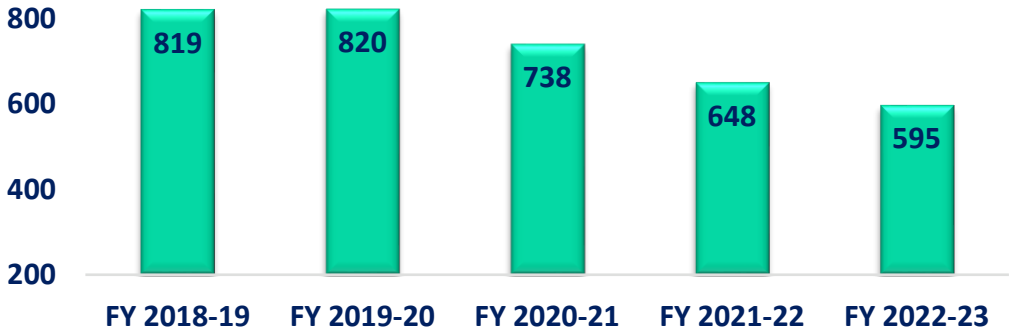
- We would like to thanks CII Team to their efforts towards Energy initiatives.
- We learnt Lot of things from CII award functions such as New Initiatives, New technology and new ideas which we had implemented in our Plant and got huge benefits in the area of energy savings.
- CII Provided us Knowledge exchange platform, we shared our ideas and we inspired from other competitors.
- We applied Bell mouth idea in our Line-1 and Line-3 Cooler fans and we got very good results and reduced 1kwh/MT Electrical energy in Both Units.
- We installed many VFDs and removed damper in different location in our Plant.

CO2 reduction at Glance by 2030

24.7 %	62.3 %	9.7 %	2.8 %	0.45 %
Increase usage % of AFR	Increase PPC, SC+PSC/ PCC mix proportion	Renewable & WHR Energy	Reduction of Energy consmn through - ENCON Idea's	Process optimization

2030

CO_2 Kg/MT of Cement



CK BIRLA GROUP

ORIENT CEMENT

ORIENT CEMENT LIMITED

CORPORATE POLICY ON CARBON FOOTPRINT REDUCTION

Orient Cement Limited committed towards climate change, explore, adoption of technologies and input processing materials which reduce carbon footprint,

- ✓ Identify and implement Low carbon technology and processes across all the Plants.
- ✓ Measure and Monitor Carbon footprint numbers and new plans identify, plan and to reduce future Carbon footprint numbers.
- ✓ Adopt aggressive abatement actions to reduce life cycle footprint and drive growth through best practices and innovation.
- ✓ Identify and implement on continuous sustainability projects.
- ✓ Awareness, knowledge sharing of best practices towards reduction of impact of climate change and adherence to Global warming temperature below 2°C.

SATYABRATA SHARMA

PRESIDENT - MANUFACTURING

1st Nov'22

WAYFORWARD:

INSTALL ROOF TOP SOLAR PV FOR BUILDINGS

Present Status:

Office Buildings in the plant have a potential for installation of Solar Panels on the rooftop in order to generate extra power that can feed the offices and buildings. The roof areas can be utilized in order to make the buildings self sufficient

Savings Calculation:

	Units	Technical Office	Admin Office
Total approximate area available	m2	940	567
Recommended solar PV plant	KWp	105	65
Annual energy generated from SPV	MWH/year	211	128
		339 MWH	
Annual Monetary cost Benefit	Rs/years	15.25 Lakhs	
Cost of SPV system	Rs	60.3 Lakhs	
Simple payback period	months	48	

Benefits:

The estimated annual Energy offset potential is INR 15.25 Lakh. The investment required for this is INR 60.3 Lakhs which will have a payback period of 48 months.

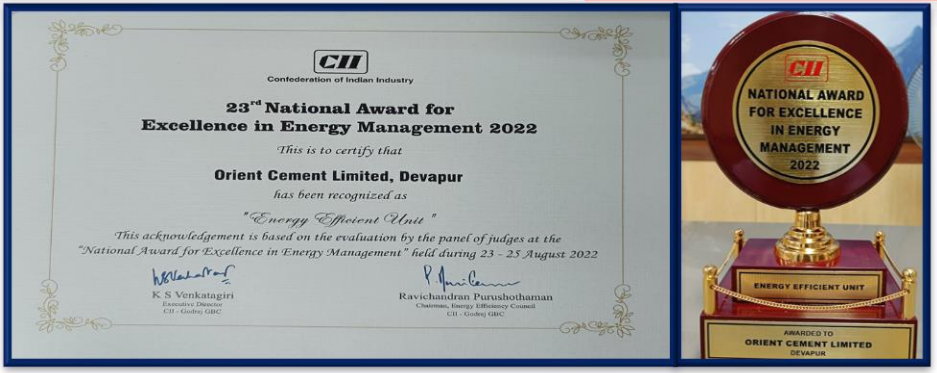

LEADERSHIP IS THE ABILITY TO TRANSLATE VISION INTO REALITY.
CONGRATULATIONS ON BEING NAMED ONE OF INDIA'S MOST TRUSTED LEADERS BY THE GREAT PLACE TO WORK® INSTITUTE (INDIA).
Great Place To Work.
India's Most Trusted Leaders 2023
MR. DEEPAK KHETRAPAL
MD & CEO -ORIENT CEMENT


OUR RESOLVE TO EXCEL HAS BEEN CEMENTED FURTHER
ORIENT CEMENT
Proud winner of the Best Workplace in Manufacturing Award of excellence.
Best Workplaces™ in Manufacturing
Great Place To Work.
INDIA 2023


INDIA BEST MANAGED COMPANIES
PROUD TO BE A BEST MANAGED COMPANY
Deloitte. Private
Winner 2022
Orient Cement Limited


Consistency reinforces excellence.
We are certified a great workplace yet again by
Great Place to Work® Institute, India
Great Place To Work.
Certified
APR 2023-APR 2024
INDIA

AWARDS & ACCOLADES



"Energy Excellence Award 2022" received from "CII"

"Energy Excellence Award 2021" received from "CII"

APEX INDIA EXCELLENCE AWARD 2021 in the Category of "Platinum" for Energy Efficiency.

"GreenTech Energy Award 2021".

"Telangana State Energy Conservation Award-2021" received on 19th Dec 2021

ORIENT CEMENT LIMITED: DEVAPUR

CII

Confederation of Indian Industry
125 Years - Since 1895

21st National Award for Excellence in Energy Management 2020

This is to certify that

Orient Cement Limited, Devapur

has been recognized as

"Energy Efficient Unit"

This acknowledgement is based on the evaluation by panel of judges at the "National Award for Excellence in Energy Management" held during 25 - 28 August 2020.

K S Venkatagiri
Executive Director
CII - Godrej GBC

Ravichandran Purushothaman
Chairman, Energy Efficiency Council
CII - Godrej GBC

"Excellence in Energy Management 2020" award as Energy Efficiency Unit by CII.
21st National Award (Virtual) Event held on 25 - 28 Aug 2020.

AWARDS & ACCOLADES

APEX INDIA EXCELLENCE AWARD 2019 in the Category of "Platinum" for Environment**,**
"Gold" for Safety and Energy Efficiency received on 24th September 2019 at New Delhi.

ORIENT CEMENT LIMITED: DEVAPUR

CII
Confederation of Indian Industry

20th National Award for Excellence in Energy Management 2019

This is to certify that

Orient Cement Limited
Devapur

has been recognized as

"Energy Efficient Unit"

This acknowledgement is based on the evaluation by panel of judges at the "National Award for Excellence in Energy Management" held during 16 - 18 September, 2019 at Hyderabad.

S Raghupathy
Deputy Director General
Confederation of Indian Industry

Meher Pudumjee
Chairperson, Energy Efficiency Council
CII - Godrej GBC

"Energy Excellence Award 2019" received from "CII" at Hyderabad on 18th Sep 2019

ORIENT CEMENT LIMITED DEVAPUR

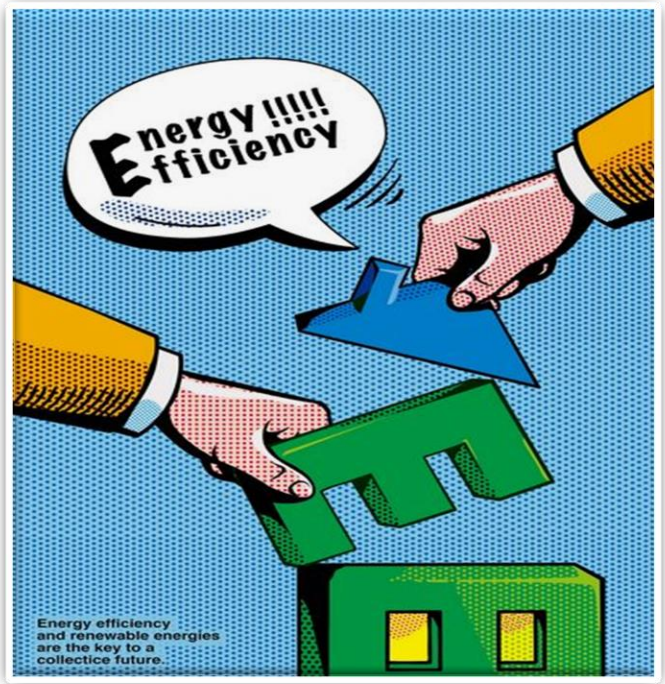
SEEM NATIONAL ENERGY MANAGEMENT PLATINUM AWARD 2019

From SEEM received at Delhi on 27th September 2019

AWARDS & ACCOLADES

ORIENT CEMENT LIMITED: DEVAPUR

"Telangana State Energy Conservation Award" received on 20th Dec 2019



Thank You