24th CII NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT 2023

Presenting Team Members

Mr. Gourav Gupta (DGM Process)

AN INTRODUCTION : MP BIRLA GROUP OF COMPANIES

Birla Corporation Limited is the flagship Company of the **M.P. Birla Group**. Incorporated as Birla Jute Manufacturing Company Limited in 1919, it was Late **Mr. Madhav Prasad Birla** who gave shape to it. As Chairman of the Company, he transformed it from a manufacturer of jute goods to a leading multi-product corporation with widespread activities. Under the leadership **of Mr. Rajendra S. Lodha**, the Company posted its best ever results in the years ended 31.3.2006, 31.3.2007 and 31.3.2008. The Company continued to record impressive growth in 2008-09 and 2009-10.

Mr Harsh V Lodha is now Chairman of the Company.

The Company is **primarily engaged** in the manufacturing of **cement as its core** business activity. The Company has **acquired 100% shares of Reliance Cement Company Private Limited** (Reliance Cement). This acquisition provides Birla Corporation Limited with the ownership of high-quality assets, taking its total capacity from 10 MTPA to 15.6 MTPA. after commissioning of Mukutban plant capacity further increases to ~ 20 MTPA

Birla Corporation currently produces cement at eight locations through its 11 manufacturing units with a combined capacity of almost 20 million tons per annum.

S.No.	UNIT	OPERATIONAL CAPACITY
1	RCCPL Pvt LTD – Maihar, IU	3.74 MTPA
2	RCCPL Pvt LTD- Mukutban IU	3.90MTPA
3	Satna Cement Works, IU	2.70 MTPA
4	Chanderia Cement Works, IU	4.20 MTPA
5	RCCPL Pvt LTD, Butibori, GU	0.50 MTPA
6	RCCPL Pvt LTD, Kundanganj, GU	2.21MTPA
7	Birla Corporation, Raebareli, GU	1.24 MTPA
8	Birla Corporation, Durgapur, GU	2.05 MTPA

VISION, MISSON & VALUES

VISION

To be admired
For our Performance,
Ethics and Culture

MISSION

To be the best- in- class
in every sector we operate

VALUES

- **Integrity**
- **Professionalism**
- **Value Creation**
- **Social Commitment**

GENESIS OF THE MAIHAR CEMENT PLANT

- May 2014 — First Cement Dispatch
- Aug 2016 — Acquisition by Birla Corporation Pvt Ltd
- Aug 2016 — IMS Certification
- Aug 2019 — WHR Commissioning
- Sept 2019 — Solar Commissioning
- Feb 2021 — Water Repellent (Rakshak Cement) Production started
- Aug 2022 — OPC53 Production started
- March 2023 — Highest Clinker Production 3.7 Million MT
- July 2023 — Ever Lowest MTD SHC-672.5 Kcal/kg Clinker

INTRODUCTION OF TECHNOLOGY/SPECIFICATION USED

LIMESTONE CRUSHING → RAW MILL & COAL MLL → KILN & COOLER → CEMENT MILLS → PACKING PLANT

CRUSHER

- Make- ThyssenKrupp Industries india Double shaft hammer impact Crusher
- Capacity- 1600 TPH

STACKER

- Make-NHI, China
- Capacity- 2000 TPH

RECLAIMER

- Make- NHI, China
- Capacity- 1000 TPH

RAW MILL 1 & 2

- Make- ThyssenKrupp Industries, Germany, Roller press (POLYCOM)
- Capacity- 400 TPH

COAL MILL

- Make- FLSmidth Private Limited/ ATOX 32.5
- Capacity- 90 TPH (For Coal)

KILN

- Make-ThyssenKrupp Industries,
- Capacity- 10000 TPD
- Φ6.2/5.8×88m

PREHEATER WITH PRECALCINER

- DOPOL90 with PREPOL-MSC
- 6 stage, double string ILC

COOLER

- Make- Polytrack cooler

AFR

- In-house 5 TPH pneumatic system
- New AFR system of 8 TPH along with 20TPH shredder is under erection stage

CEMENT MILL-1 & 2

- Make-Loesche VRM
- Capacity- 240 TPH PPC & 275 TPH OPC

ROTO PACKER

- TYPE-4 nos FLSmidth rotating vertical semi automatic & 1 nos Beumar
- Capacity- 240 TPH

WHRS & Solar

WHRS

- Make-Thermax India Pvt Limeted
- Capacity- 12.25 MW

SOLAR

- Capacity- 7.7 MW
- Proposal to further increase to 10 MW

Wall Putty & Construction Chemical

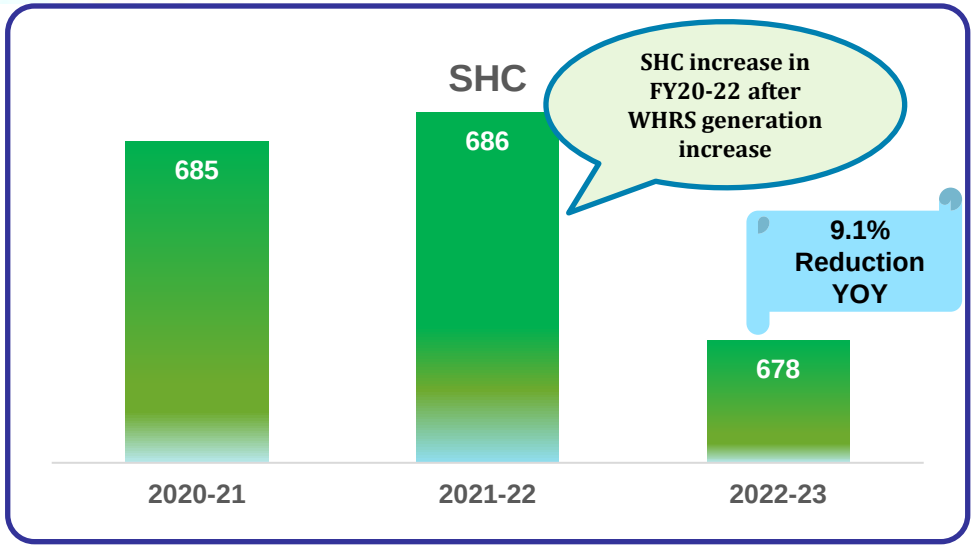
WALL PUTTY

- Capacity-1.5 Lac/Annum

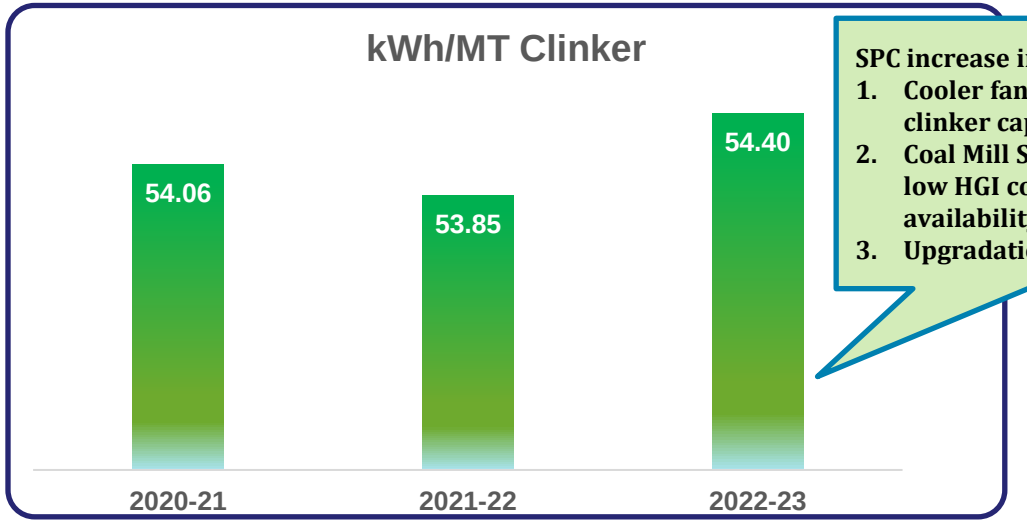
CONSTRUCTION CHEMICAL

- Capacity -45 Lac/Annum

Specific Energy Consumption (Thermal & Electrical) FY21 To FY23

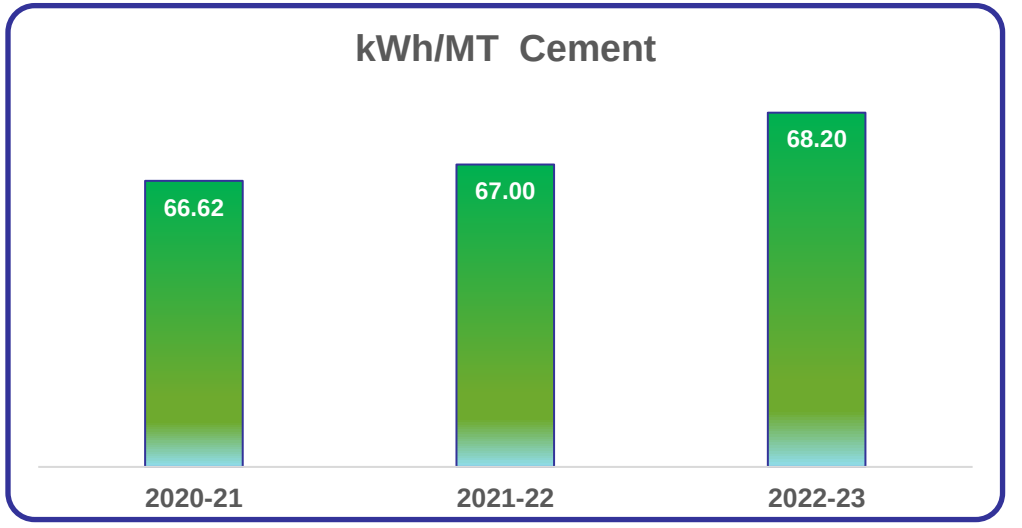


SPECIFIC HEAT CONSUMPTION



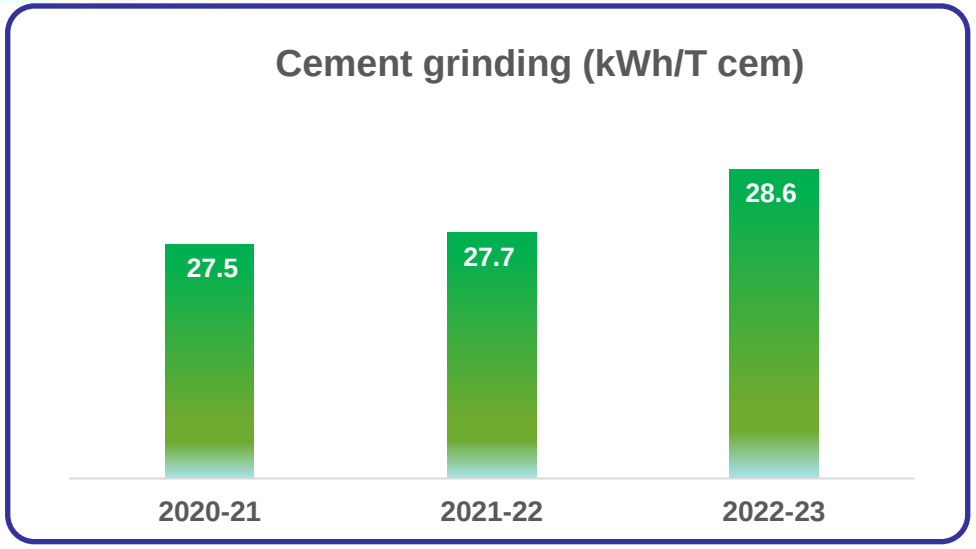
CLINKERISATION SPC

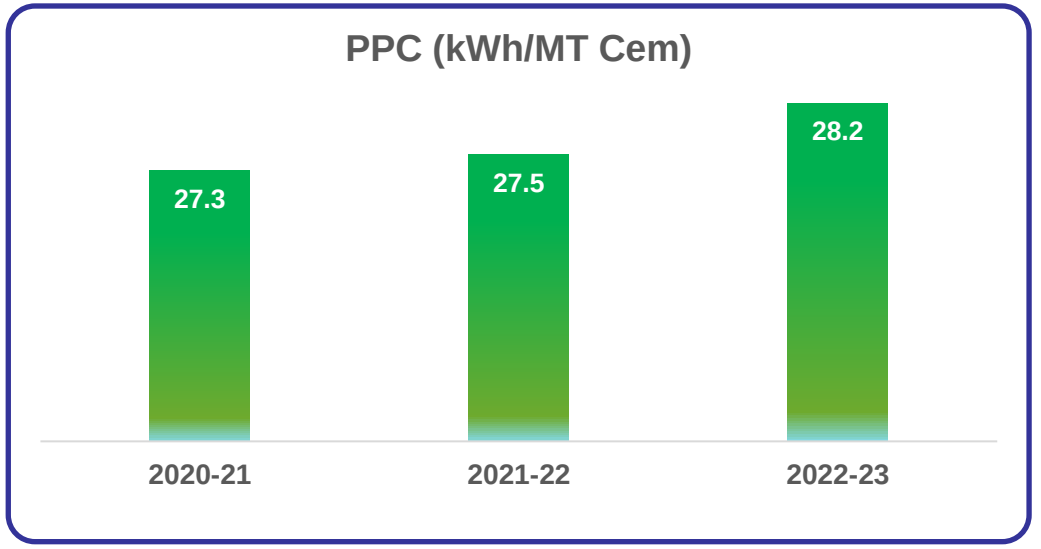
- ❑ Plant has initiated various energy conservation projects and by continuous improvement till Aug'23 FY23-24 achieved-
- ✓ SHC 673.8 Kcal/kg Clinker YTD
- ✓ Clinkerisation SPC - 53.3 Kw/T clinker YTD
- ✓ Overall Cement SPC- 67.6 kwh/T cement YTD



OVERALL PLANT SPC

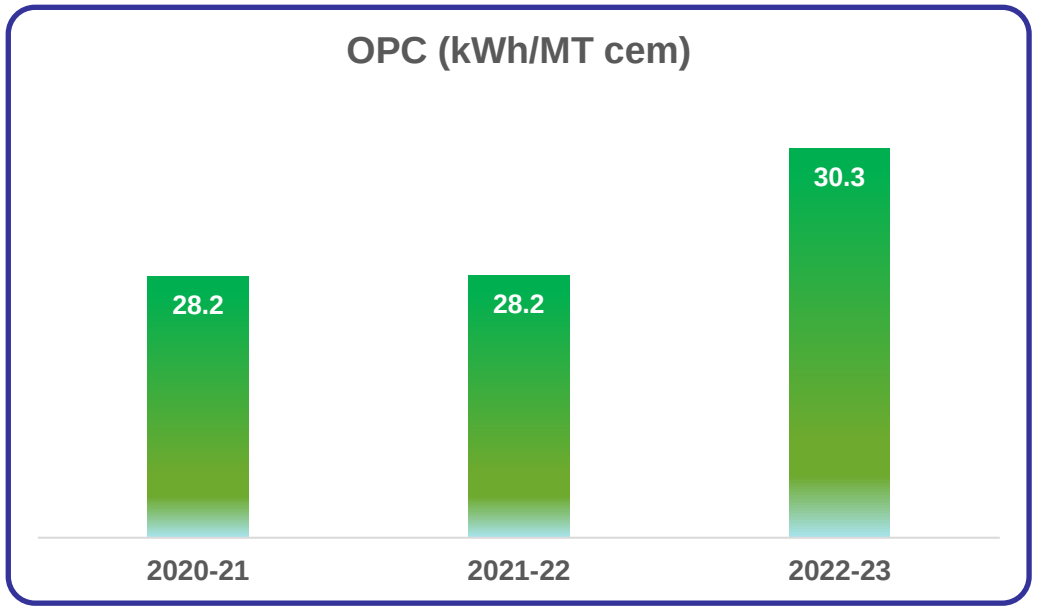
Specific Energy Consumption (Thermal & Electrical) FY21 To FY23



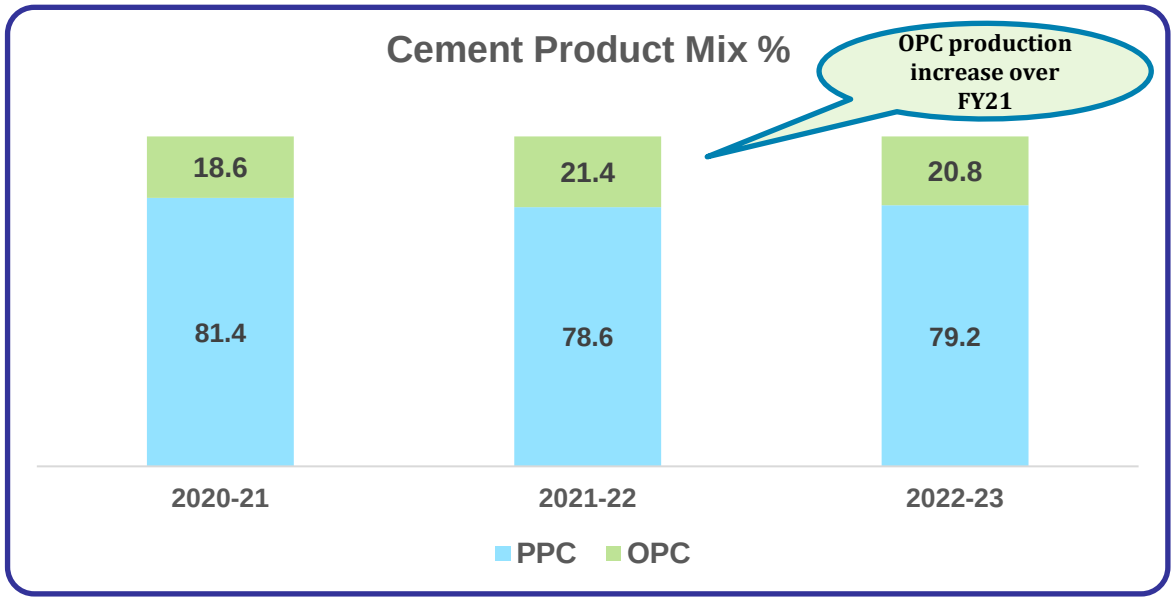


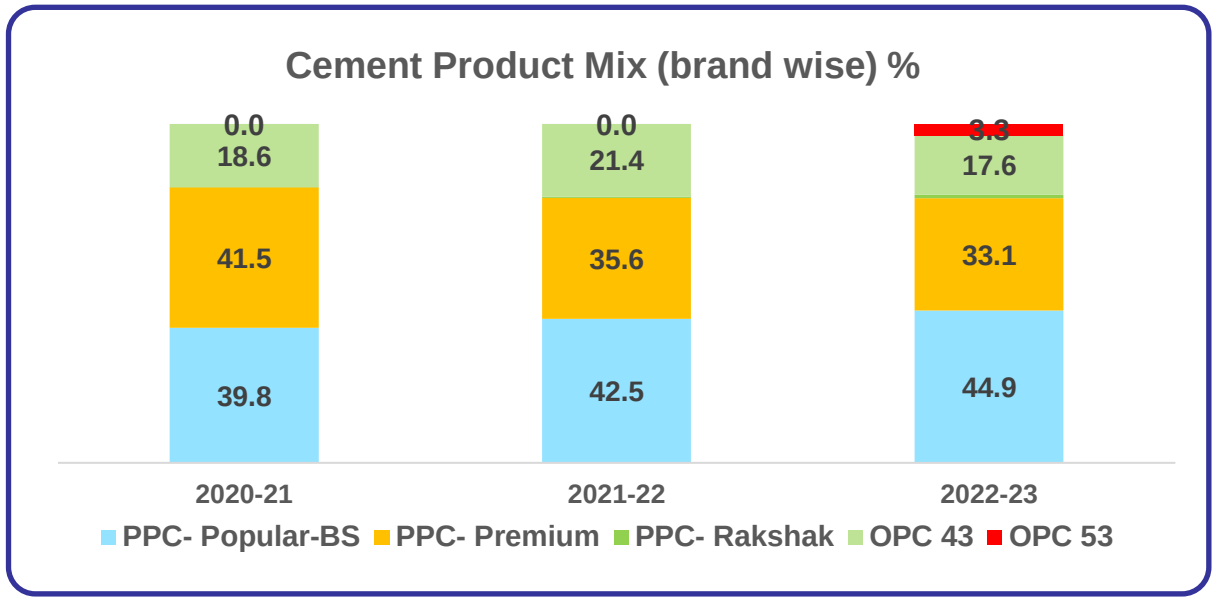
SPC increase in FY23 –

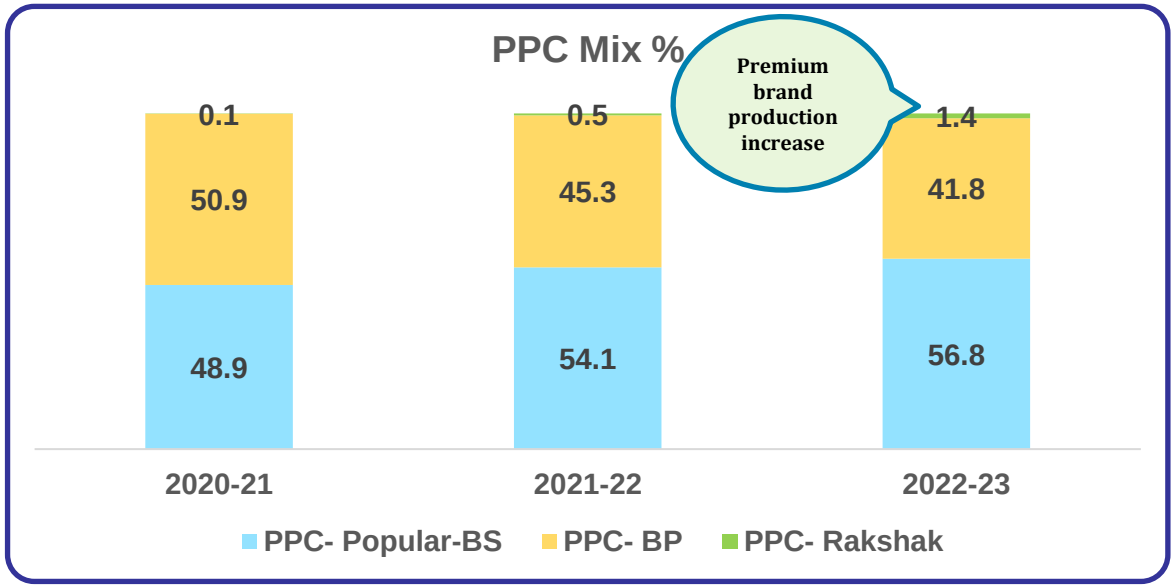
- **OPC % increased in cement Production from FY22**
- **Power increased after installation of BTAP Fly ash unloading system**
- **Conditioned FA consumption % increase in PPC**
- **Rakshak Brand (premium product) production Increased**
- **OPC 53 production started**

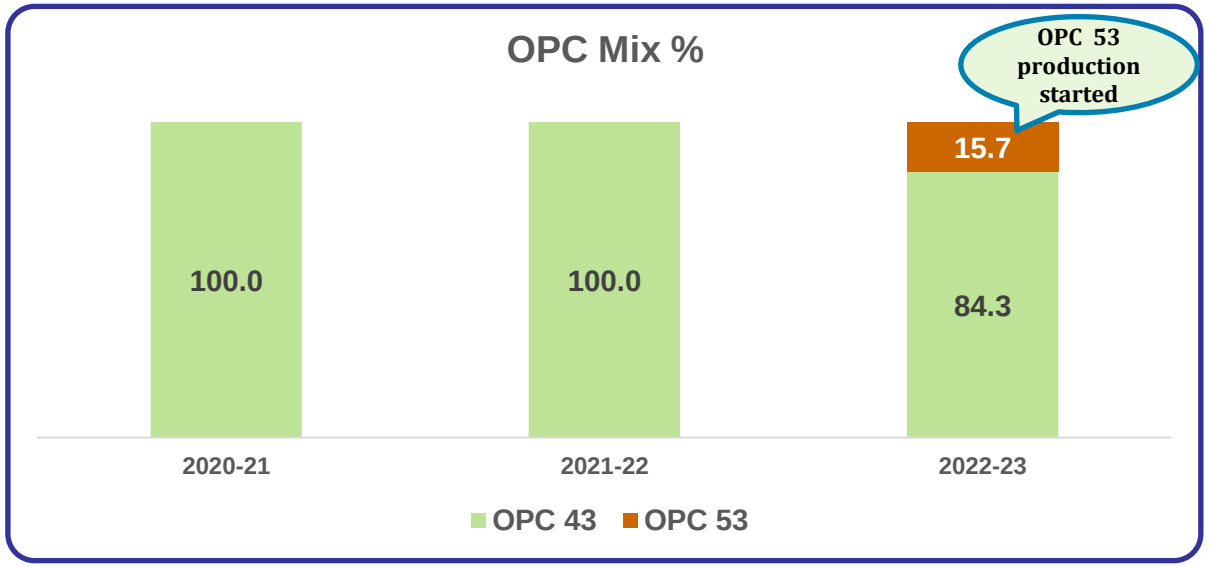


Cement Product Mix FY21 To FY23

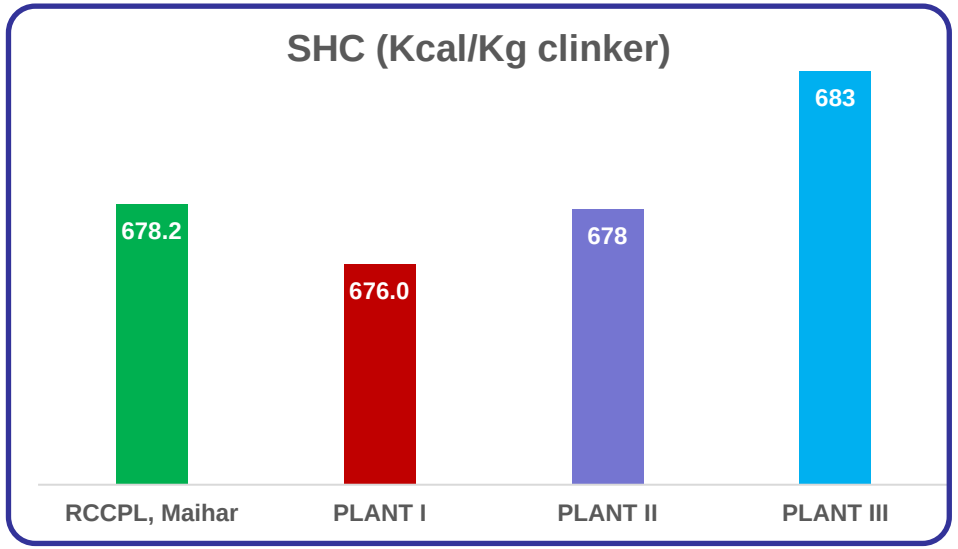




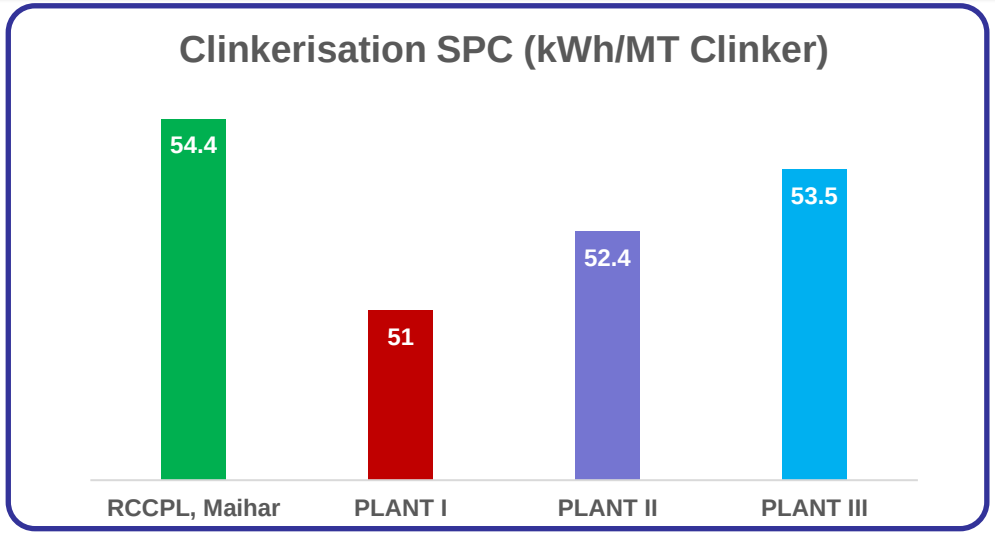




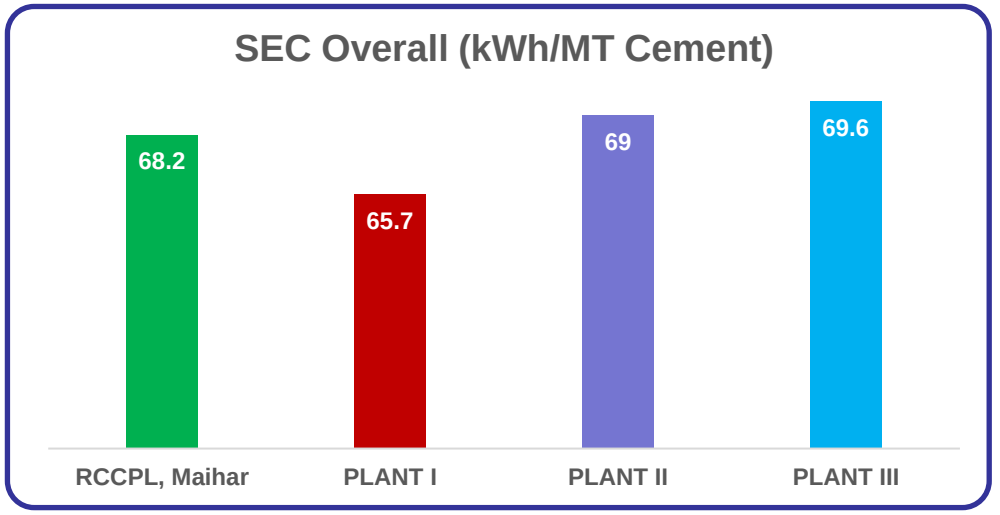
Competitors Benchmarking (Thermal & Electrical)



SPECIFIC HEAT CONSUMPTION



CLINKERISATION SPC



OVERALL PLANT SPC

Strategy framework for Project "SHIKHAR" to achieve Benchmark targets

1 How we are

- Evaluation of existing plant performance KPIs with respect to best achieved values.
- Review the gap and constraint from benchmarking KPI parameters of other cement plants
- Identify the potential to stretch upto maximum / best targets and cost saving initiatives.

2 What Next

Manufacturing Transformation by following objectives:

- Safety – Zero Harm.
- Implementation of CO2 reduction initiatives .
- Improvement of reliability of the equipment.
- Reduction of clinker & cement power
- Reduction of sp. Fuel consumption.
- Higher usage of low cost CFA
- Higher usage of low cost gypsum over imported gyp.
- Improvement of TSR
- Stores & spares inventory reduction
- Fixed cost Optimization.

3 How to achieve

- Implementation of "communities of practices" and "copy with pride" among all the units
- Ideas generations exercise for reduction of cost, efficiency and reliability through small group activities (SGA)
- Evaluations of the best ideas and implementation strategy.
- Implementation of digital initiatives.
- Skill development & Training (Technical / Latest developments)

Vision

To be the best manufacturing plants with respect to safety, cost and efficiency.

Modus Operandi

- The ideas of cost optimization and efficiency improvement shall be inline with our company's Mantra of 4 Vs (Vision, Value, Velocity and Visibility)
- Weekly review of the project status shall be done by respective unit head.
- Monthly review of the project status shall be done along with monthly plant performance review meeting.
- A sharing platform to be created in "One Drive" for regular updates of all the workings and updates
- Rewards & Recognition

UPCOMING PLANNED ENCON PROJECTS IN 2023-24

S. No	PROJECTS	INVESTMENT (Million INR)	Annual Electrical Saving (Million KWH)	Annual Thermal Saving (Million Kcal)	Target of Completion
1	**Reduction in Specific Heat Consumption from 678 to 670 :** ✓ Pre heater False air reduction from 6.5 to 5.5% ✓ PC temperature Optimization by 10 Deg C ✓ PA fan optimization from 2370 to 2100 by 270 rpm reduction ✓ Raw Mill residue optimization from < 4% to 3.6% on 212 micron	(In-house)	0.24	7056	Completed
2	Kiln Capacity Enhancement **11500 TPD**	145.8	0.1	2070	Oct-23
3	Elimination of WHRS AQC Id fan inlet damper	(In-house)	0.04		Oct-23
4	**Kiln and PH cyclone heat resistant paint application in bottom 2 cyclone of both string**	**4.25**		**3696**	**Dec-23**
5	**Modification work in Raw Mill fan inlet box, Y-pieces and transition pieces.**	**4.4**	0.39		**Dec-23**
6	Replacement of 2 nos. of cooling water pump with energy efficient pump	0.76	0.205		March-24

UPCOMING PLANNED ENCON PROJECTS IN 2023-24

S. No	PROJECTS	INVESTMENT (Million INR)	Annual Electrical Saving (Million KWH)	Annual Thermal Saving (Million Kcal)	Target of Completion
7	Compressed air Optimization and Leakages arresting work of Cement and Packing section	1.5	0.09		March-24
8	Idle run reduction of coal mill auxiliary (gearbox lubrication unit, roller lubrication and hydraulic system.)	(In house)	0.03		Dec-23
9	**Cement Mill Aux SPC reduction** ✓ Idle run of heater of cement mill bag house (excluding Rainy season) ✓ Dense phase Drier start stop incorporate with Compressor-04 nos (Post clinkerisation)	(In house)	0.25		Dec-23
10	Optimize of 7 nos transformer output voltage by reduction of tap position-3 to tap position-2	(In house)	0.05		Dec-23

ENERGY SAVING PROJECTS IMPLEMENTD IN LAST THREE YEARS

Year	No of Major Saving Projects	Investment (INR Million)	Electrical Saving (Million KWH)	Thermal Saving (Million Kcal)	Total Saving (INR Million)	Impact on SEC/ SHC (Electrical kWh /MT cement or Kcal/Kg cement)
FY 2020-21	3	8.65	0.07	0	2.24	
FY 2021-22	7	11.2	4.41	2862	33.3	
FY 2022-23	8	39.05	0.6	30377	61.05	SHC Reduced by 7.8 Kcal /kg clinker

ENERGY SAVING PROJECTS IMPLEMENTED: FY 2022-23

Sl.No	PROJECTS	INVESTMENT (Lacs INR)	SAVINGS (Lacs INR/annum)
1	**Reduction in Specific Heat Consumption from 686.4 to 678.2 by:** ✓ Curtain wall installed in cooler Grate 1 to improve recuperation efficiency of cooler. ✓ False Air reduction in Preheater from 8% to 6% ✓ Kiln operation, reliability and productivity improvement ✓ Cooler Upgradation (static grate fan and aeration elements)	**385**	**573.2**
2	Reduced Pyro compressor loading and unloading pressure by 0.2 bar	(In house)	11.88
3	Reduction of Idle running of clinker transport group	(In house)	2.20
4	Reduction of Idle running of Gypsum transport group	(In house)	3.19
5.	Reduction of Idle running of flyash transport group	(In house)	1.15

ENERGY SAVING PROJECTS IMPLEMENTED: FY 2022-23

Sl.No	PROJECTS	INVESTMENT (Lacs INR)	SAVINGS (Lacs INR/annum)
6	Idle run of cement mill transport group and aux circuit.	(In house)	7.32
7	WHRS Power generation improvement and Reduction in Auxiliary consumption through leakage identification in ACC system by ultrasonic leakage detector instrument	4	11.25
8	VFD installed in Coal Mill Water spray pump	1.5	0.26

ENERGY SAVING PROJECTS IMPLEMENTED: FY 2021-22

Sl.No	PROJECTS	INVESTMENT (Lacs INR)	SAVINGS (Lacs INR/annum)
1	Reduction of false Air in PH circuit by 1%	In house	68.5
2	Power saving through replacement of Cement Mill-1 mill fan with new high efficiency fan.	38	15.96
3	Power saving through installation of VFD in cement mill compressor	10	3.98
4	Power saving through installation of VFDs in packing plant bag De Dusting filter fans.	32	13.05
5	Power saving through installation of VFDs in bag filter fans in Cement Mill sections	32	5.8
6	Enhancement of RM-1 & RM-2 capacity by PID operation of Feed with Slide gate of Roller Press	0	167.6
7	**Coal mill Productivity Enhancement by-** ✓ GRR speed from 92% to 100%. ✓ Increasing dam ring height by 10 mm, ✓ grinding pressure increased from 150 bar to 159 bar and separator seal gap adjustment	0	58.5

ENERGY SAVING PROJECTS IMPLEMENTED: FY 2020-21

Sl. No	PROJECTS	INVESTMENT (Lac INR)	SAVINGS (Lac INR/annum)
1	**Refractory design modification- Installation of HASSLE refractory pre cast blocks at kiln inlet slope**	80	15.44
2	Replacement of 37 KW pump used for filling of 5000 liter water tanker with 3.7 KW pump at RO system.	0.4	5.11
3	Removal of Gyro screen system (2.2 KW) & RAL (1.5 KW) in Carbon black feeding system	0.25	1.9

INNOVATIVE PROJECT

Project No 1- Installation of Pre-Cast Block at Kiln outlet

Problem Statement:

- Casting of Kiln Outlet TIP every year
- Cost Impact of Chemical bond castable and application.
- Pre mature Failure of Kiln TIP casting

Modification:

- Installation of Pre-Cast Block at Kiln outlet TIP instead of **traditional practice** of SiC 30 castable application at Kiln outlet TIP plates

Benefits/Impact:

- Enhanced life of Kiln outlet TIP from Annual to Two-year.
- Avoid pre mature failure of TIP casting.
- Casting and curing time of kiln Tip during shutdown is eliminated and KSD duration reduced by ~1 days.
- Clinker Production increase.

Replicable Potential : Yes

INNOVATIVE PROJECT

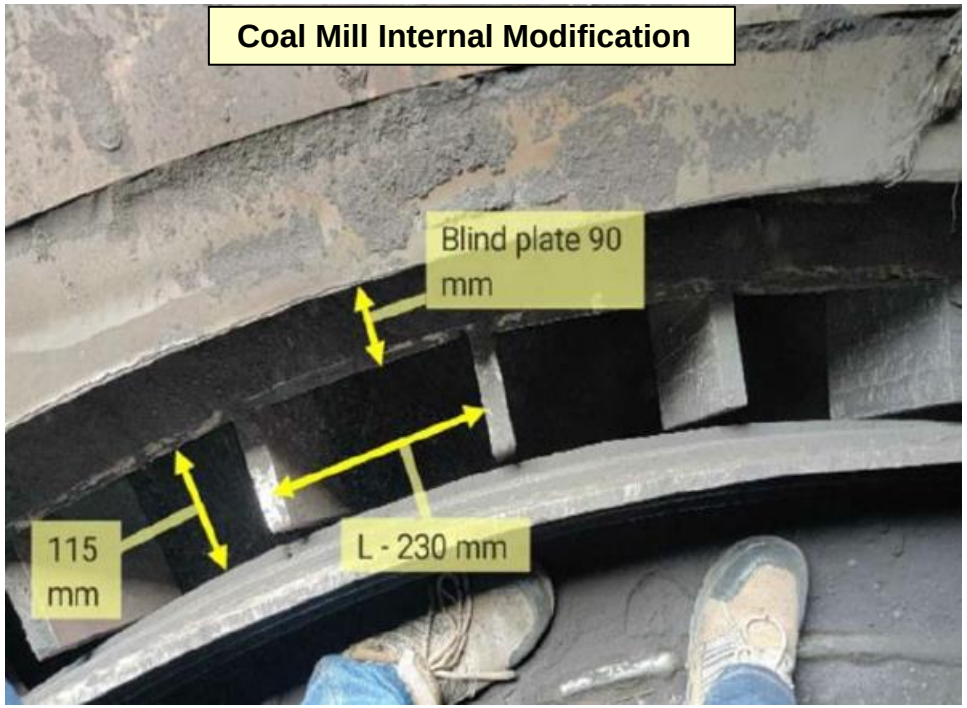
Project No 2- Coal Mill SPC reduction by Nozzle velocity and dam ring optimization

Problem Statement:

- High Mill Fan Power consumption.
- High Nozzle velocity.
- High Wear tear of Mill internals

Modification:

- Reduce the Width of Blind plate in phase manner to lower the velocity <60 m/s
- Reduce the dam ring height gradually from 300 to 250 mm.



Benefits Achieved:

- Power Saving- ₹ 2.5 Lacs/yr
- Reduction in pressure drop across mill.
- Pet coke grinding 40-45 % achieved after this modification
- Optimum Nozzle velocity helped to reduce wear-tear of mill internals

Replicable Potential : Yes

INNOVATIVE PROJECT

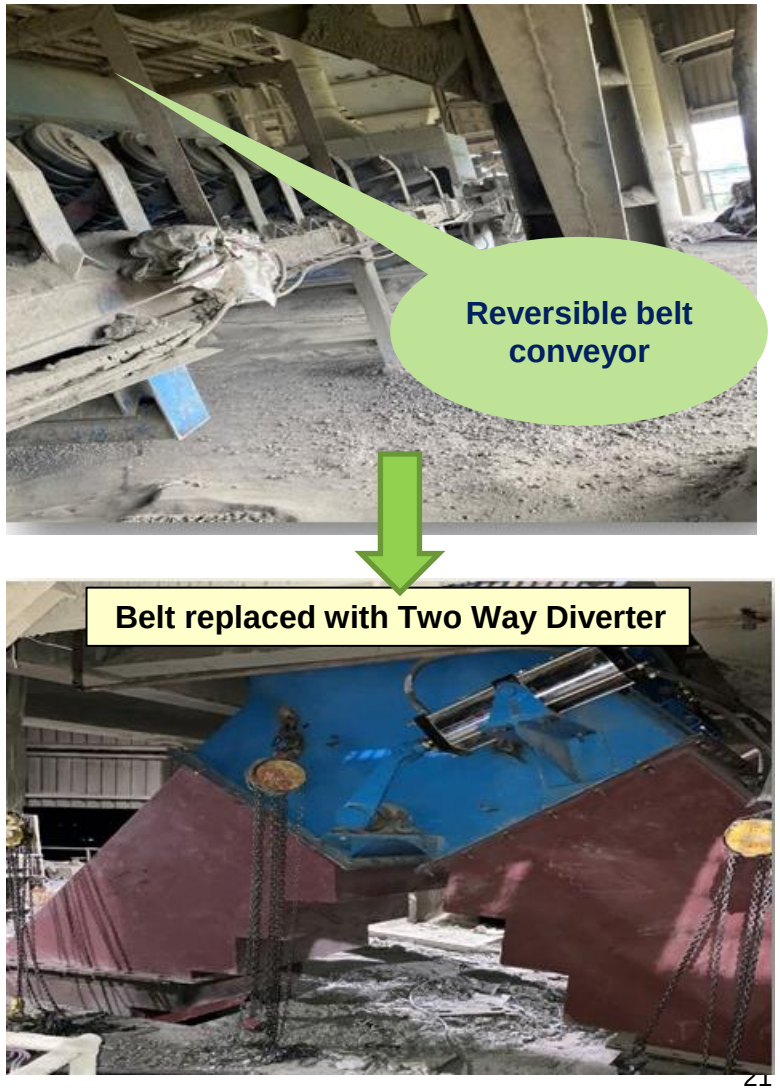
Project No 3- Equipment Elimination by Reversible belt replacement with two way diverter chute

Problem Statement:

- Auxiliary power consumption in Belt conveyor
- Spillage of material from Belt conveyor
- Maintenance cost of Belt conveyor

Modification:

- Reversible belt replacement with two way diverter
- Material surging has reduced dramatically along with longer life of profiling.

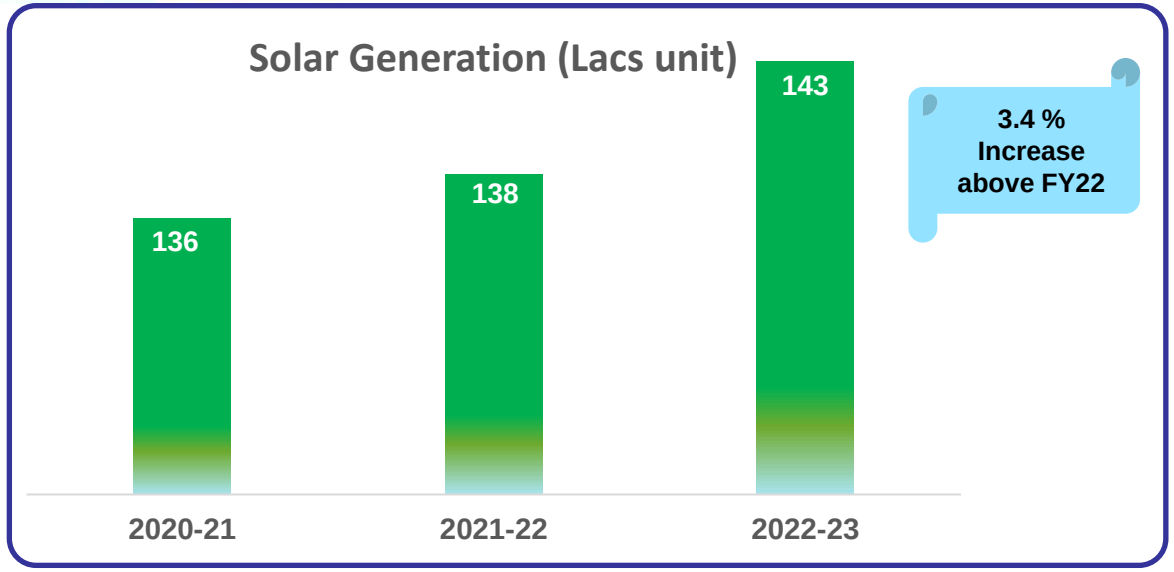


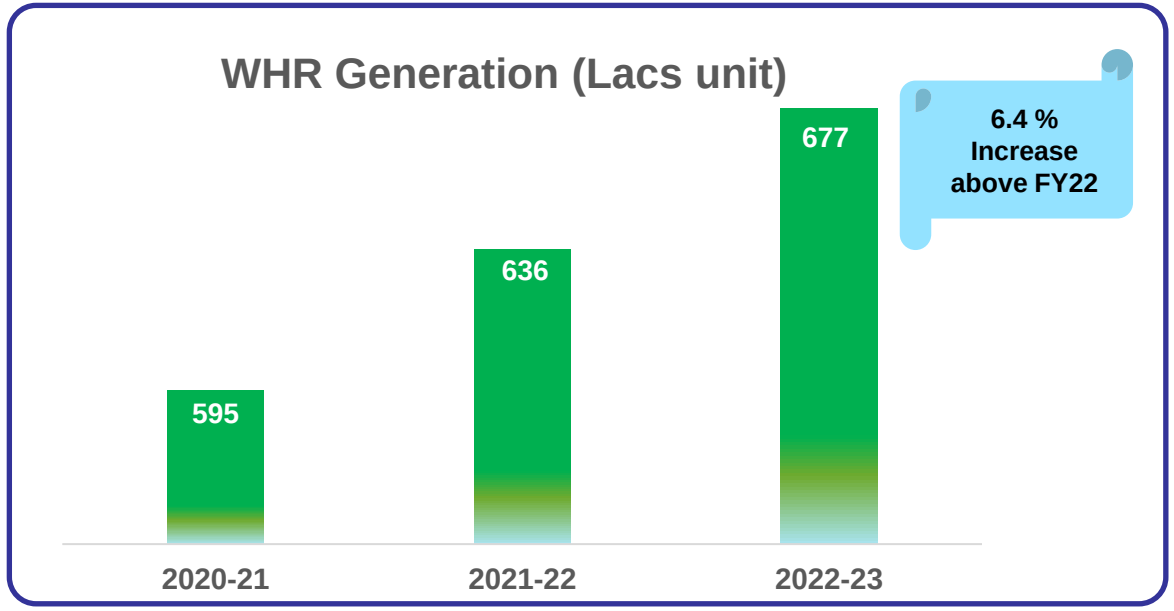
Benefits Achieved:

- Power Saving- ₹ 2.9 Lacs
- Cost of Spares Saved(Belt & Idlers)- ₹ 1.45 Lacs
- Cost of maintenance i.e. replacement of belt, idlers, drive coupling, gearbox
- Spillage of material is eliminated

Replicable Potential : Yes

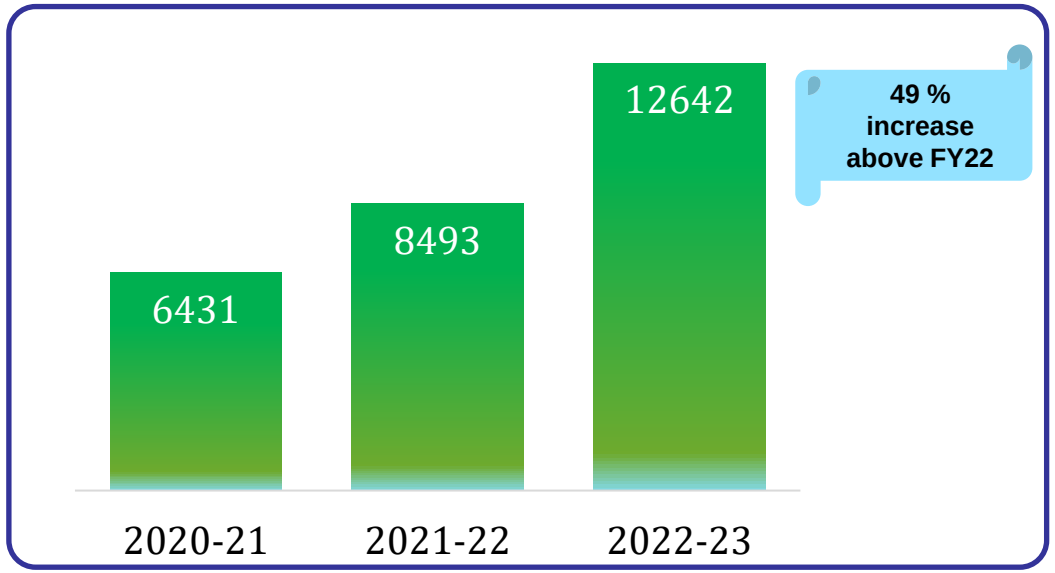
GREEN AND CLEAN ENERGY : SOLAR AND WHRS GENERATION



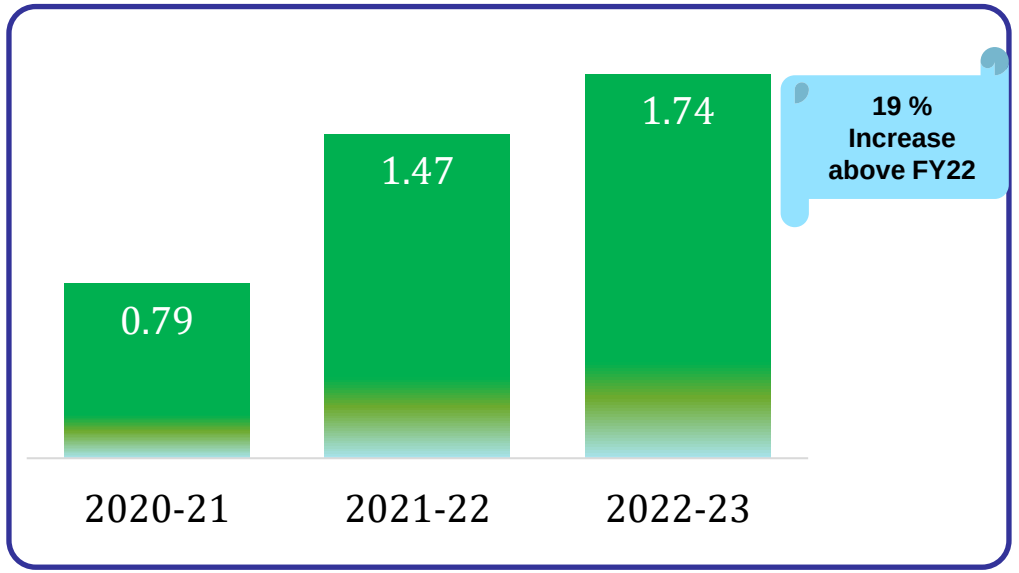


WASTE UTILIZATION AND MANAGEMENT

New AFR System of 8 TPH along with 20 TPH shredder is under Erection which will increase TSR rate upto 7 %

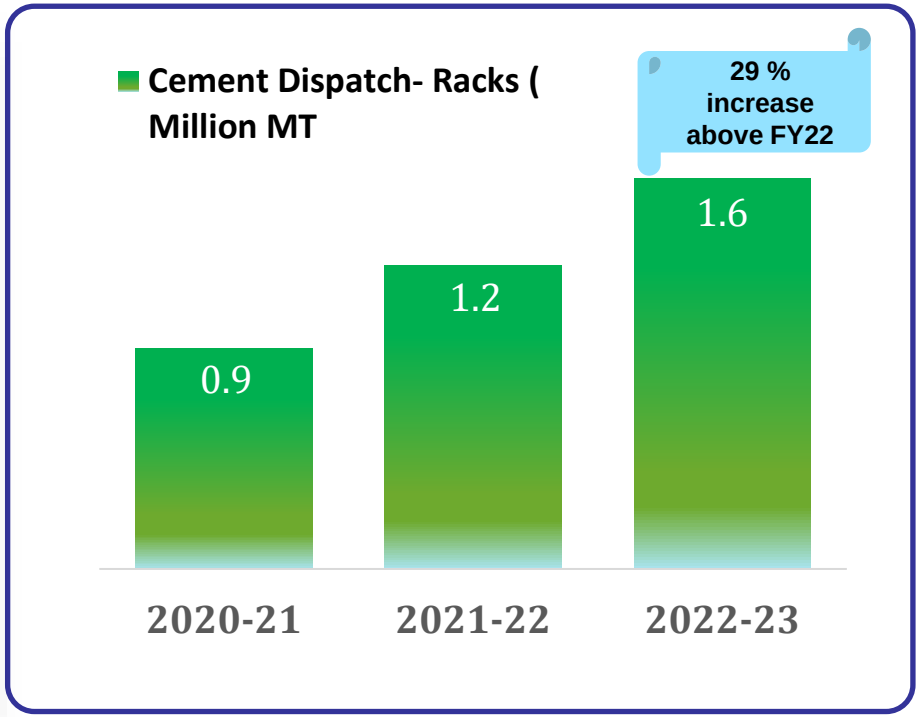


AFR CONSUMPTION (MT)



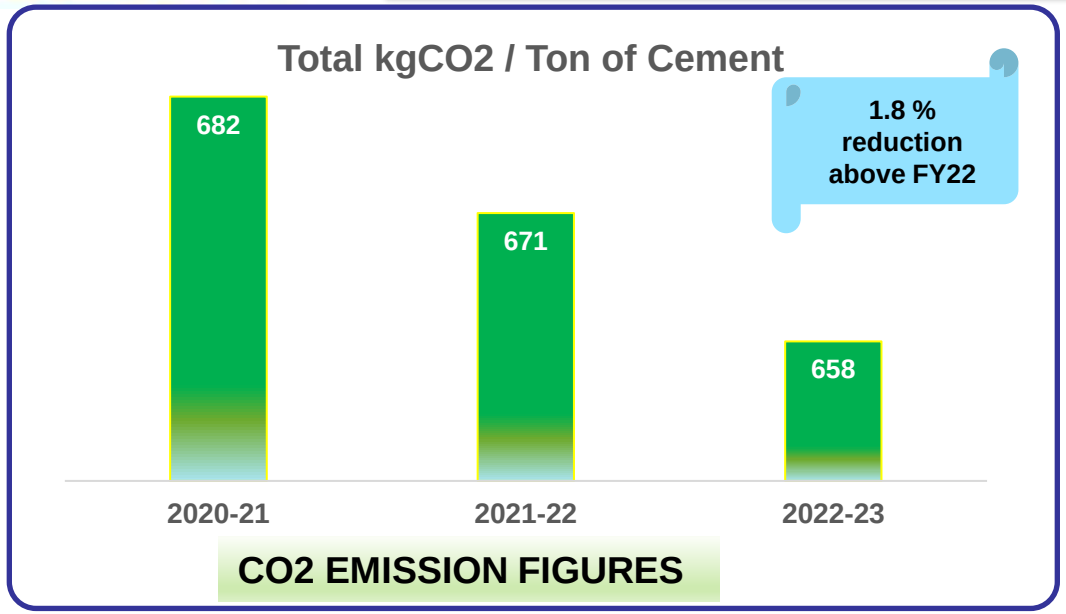
%TSR RATE

GREEN SUPPLY CHAIN MANAGEMENT



- BTAP SYSTEM**:** Fly Ash procured through BTAP rake so as to reduce fly ash bulker freight cost.
- Procurement of coal from through trucks and the same trucks are being used for transporting of cement to near by markets so as to lower freight cost and reduce overall cost of cement.
- Increase in cement dispatch through Rail mode instead of road ways.
- Procurement of CFA through railway racks instead of trucks .

GHG INVENTORISATION



Way Ahead:

- Internal target of Carbon Reduction <500 Kg CO2 per Ton cement by 2030
- Dedicated cross functional Team is working and preparing Road map with action plans for the reduction of Carbon footprints in the company

ENERGY MANAGEMENT SYSTEM

Analysis of Energy performance by Process Head on daily basis

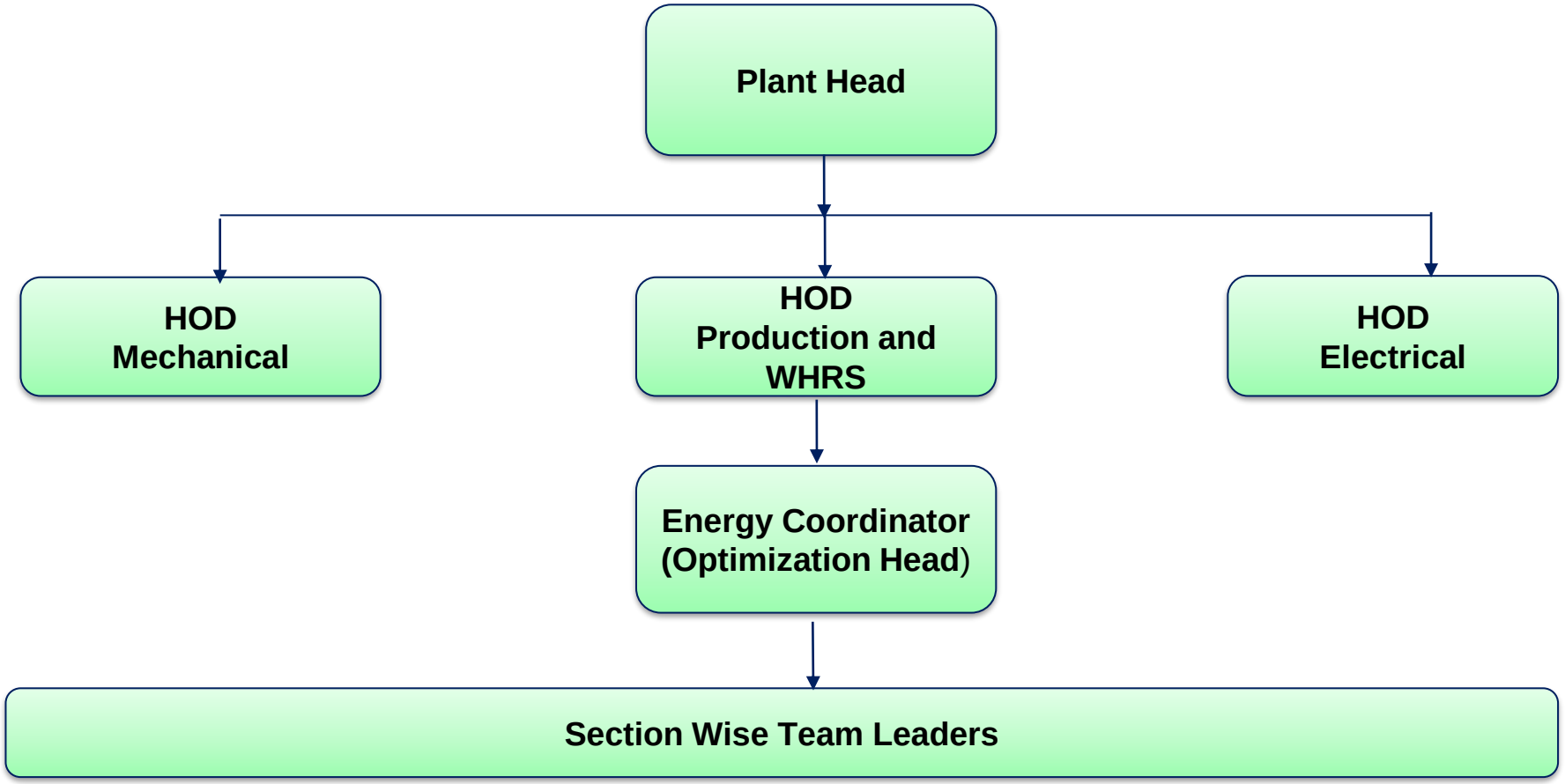
Review of Energy Consumption in coordination meeting on Daily Basis by Plant Head

Project SIKHAR, Copy Community of Practices and Copy with pride (COP) meeting Chaired by Project leaders: Monthly

Fuel and AFR TSR Meeting by CMO on fortnightly basis

Energy and cost performance Review Meeting chaired by CMO : Monthly

ENERGY MANAGEMENT COMMITTEE



- Prod Section Head- RM & RMH
- Mech Section Head- Crusher/ RM & RMH
- E & I Section Head- Crusher/ RM & RMH

- Prod Section Head- Pyro
- Mech Section Head- Pyro
- E & I Section Head- Pyro

- Prod Section Head- Cement Mill
- Mech Section Head- Cement Mill
- E & I Section Head- Cement Mill

- WHR Mech engineer
- WHR E& I engineer
- Packing Plant E& I engineer
- Utility & WTP Mech Engineer
- Lighting and project E& I engineer

IMPLEMENTATION OF INTEGRATED MANAGEMENT SYSTEM

Bureau Veritas Certification

RCCPL PRIVATE LIMITED

MAIN PLANT : VILLAGE- BHARAULI, TEHSIL – MAIHAR, DISTRICT SATNA – 485 773, MADHYA PRADESH, INDIA.

This is a multi-site certificate, additional site(s) are listed on the next page(s)

Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above organization has been audited and found to be in accordance with the requirements of the Management System Standards detailed below.

Standards

ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018

Scope of certification

MANUFACTURING OF CLINKER, PORTLAND POZZOLANA CEMENT AND ORDINARY PORTLAND CEMENT

Original cycle start date:	**01 September 2021**
Expiry date of previous cycle:	**Not Applicable**
Certification Audit date:	**23 June 2021**
Certification cycle start date:	**01 September 2021**

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: **31 August 2024**

Certificate No. **IND.21.2063/IM/U** Version: **1** Revision date: **01 September 2021**

Signed on behalf of BVCH SAS UK Branch
Jagdheesh N. MANIAN
Head – CERTIFICATION, South Axis
Commodities, Industry & Facilities Division

UKAS

Certification body address: *5th Floor, 66 Prescot Street, London, E1 8HG, United Kingdom.*

Local office: *Bureau Veritas (India) Private Limited (Certification Business) 72 Business Park, Marol Industrial Area, MIDC Cross Road "C", Andheri (East), Mumbai – 400 093, India.*

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization. To check this certificate validity please call + 91 22 6274 2000.

Page 1 of 2

ISO 9001:2015

Certificate Issue Date- 01 Sept 2021
Expiry Date- 31 Aug 2024

ISO 14001:2015

Certificate Issue Date- 01 Sept 2021
Expiry Date- 31 Aug 2024

ISO 45001:2018

Certificate Issue Date- 01 Sept 2021
Expiry Date- 31 Aug 2024

Certificate No.- IND21.2063/IM/U

AWARENESS TRAINING and Reward & Reorganization PROGRAM

- **Awareness sessions and Reward & Recognition to workmen for their commendable work**

AWARDS & ACCOLADES

By CII (Confederation of Indian Industry) on 21.09.2022 as Energy Efficient unit in 23rd National Award for Excellence in Energy Management 2022

1

By CII (Confederation of Indian Industry) on 21.09.2022 as Energy Efficient unit in 23rd National Award for Excellence in Energy Management 2022

2

RCCPL has won the Silver Award in the cement category for sustainable energy performance and the best energy efficient unit. Conference and award conclave hosted by SEEM National Energy Management, India (National Energy Management Awards) on 16 September 2022 in New Delhi.Dr. Ashok Sarkar, Senior Energy Specialist (BEE), Dr. MC Jain, President, and Mr. G. Krishnakumar, chairman (SEEM) accredited the prestigious award and received it by awardees Mr Saurabh Singh & Mr. Himanshu Vajapi.

3

Team Maihar receiving NCCBM National Best Award for Energy Excellence in Integrated Cement Plants for 2019-22 during 17th NCCBM International Conference at New Delhi on 09.12.2022

1. Award for energy efficiency unit in **23rd CII National Award** for excellence in energy management in Aug 2022 at New Delhi.

2. Silver Award in cement category for sustainable energy performance and best energy efficient unit by **SEEM national energy management India on Sep'22**

3. Award for energy excellence in integrated cement for **2019-22 during 17th NCB international conference at New Delhi**

AWARDS & ACCOLADES

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1. Platinum Award for Environment Preservation in cement Sector energy management in 2022.

2. Gold Award in Apex Indian Occupation Health & Safety for safety system on Sep'22

3. Achieved Runners Up position under the award category Cement Plant of the Year-Western region by **cem WHR 2022 Energy conference & Award**

Thank You !!