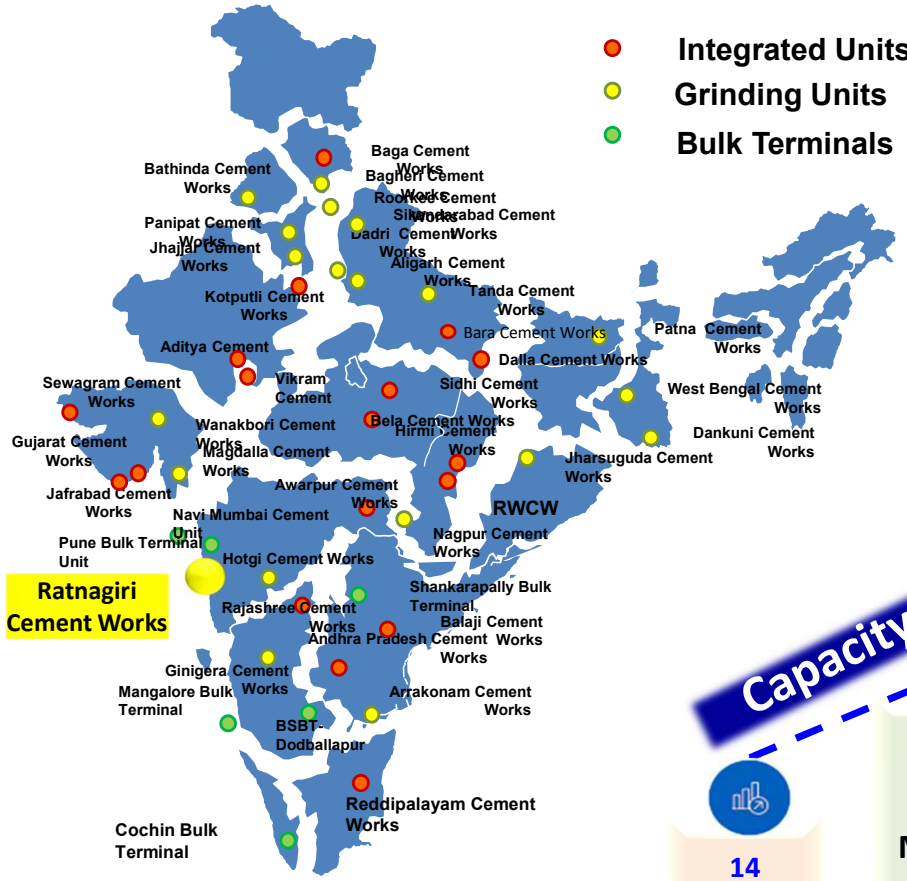
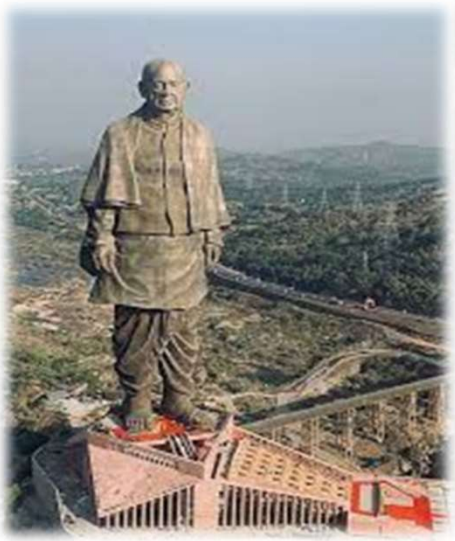
UltraTech Cement Limited – Ratnagiri Cement Works

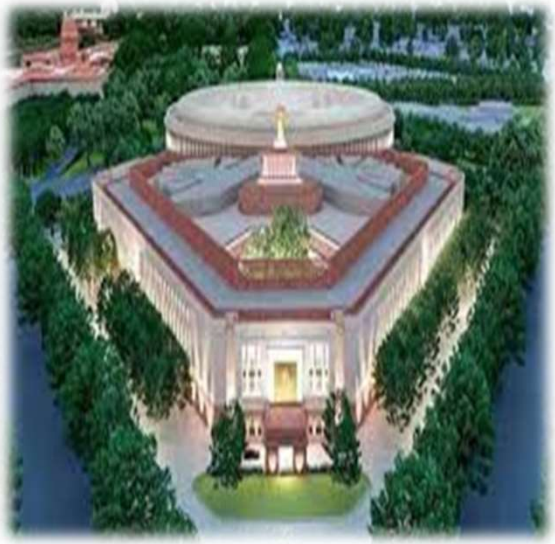
1) Mr. Dhananjay B. Kulkarni (Manager)
2) Mr. Mahendra Kr. Jagtap (Deputy Manager)
3) Mr. Subhankar Khara (Assistant Manager)

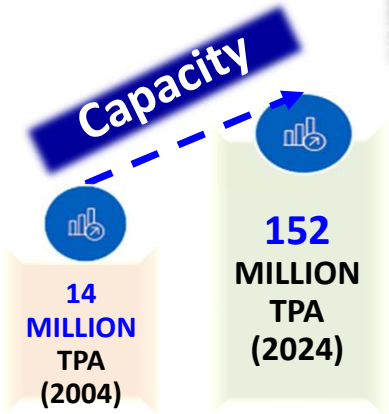
Business Overview



India's Largest Cement Producer – Lead by Miles







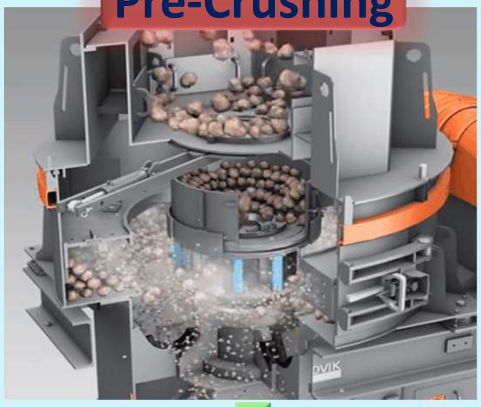
Units	Symbol	Number of Units
Integrated Plants		24
Grinding Units		34
Bulk Terminals		8

Process Overview

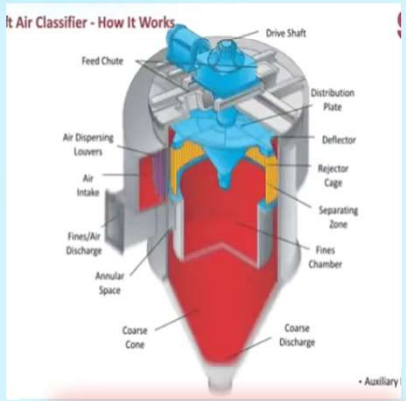
Jetty

Clinker Storage

Pre-Crushing



Cement Grinding



Separator

Silo

Packing

PPC

OPC

Major Equipment

Equipment	Type	Make	Capacity	Age
Ship Unloader	Grab Bucket Type	Mukand	300 TPH	42 Years
EOT Crane	Grab Bucket Type	Mukand	200 TPH	42 Years
VSI Crusher	B8000 (Vertical Shaft Impactor)	Svedala / Metso	230 TPH (throughput)	27 Years
Cement Mill	2 Chamber / Single drive	Walchandnagar Industries	50 TPH - OPC 72 TPH - PPC	42 Years
Separator	Side Draft, High Efficiency	Strutvent SD80	142 TPH (throughput)	27 Years
Electronic Packer	6 Spout Rotopacker	Enexco Technologies	90 TPH	25 Years

Policy and Certificates


DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

UltraTech Cement Limited
Unit Narmada Cement, Ratnagiri Works
Plot No. 1, 3, 4 & 7, MIDC, Zadgaon Block, Ratnagiri - 415 639, Maharashtra, India

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

This certificate is valid for the following scope:
Handling, storage and grinding raw materials

Storage, packing and loading cement


DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

UltraTech Cement Limited, Unit Narmada Cement, Ratnagiri Works
Plot No. 1,2, 3, 4 & 7, MIDC, Zadgaon Block, Ratnagiri - 415 639, Maharashtra, India

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:
Handling, storage and grinding raw materials

Storage, packing and loading cement


DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

UltraTech Cement Limited
Unit Narmada Cement, Ratnagiri Works
Plot No. 1, 3, 4 & 7, MIDC, Zadgaon Block, Ratnagiri - 415 639, Maharashtra, India

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

This certificate is valid for the following scope:
Handling, storage and grinding raw materials

Storage, packing and loading cement


DNV·GL

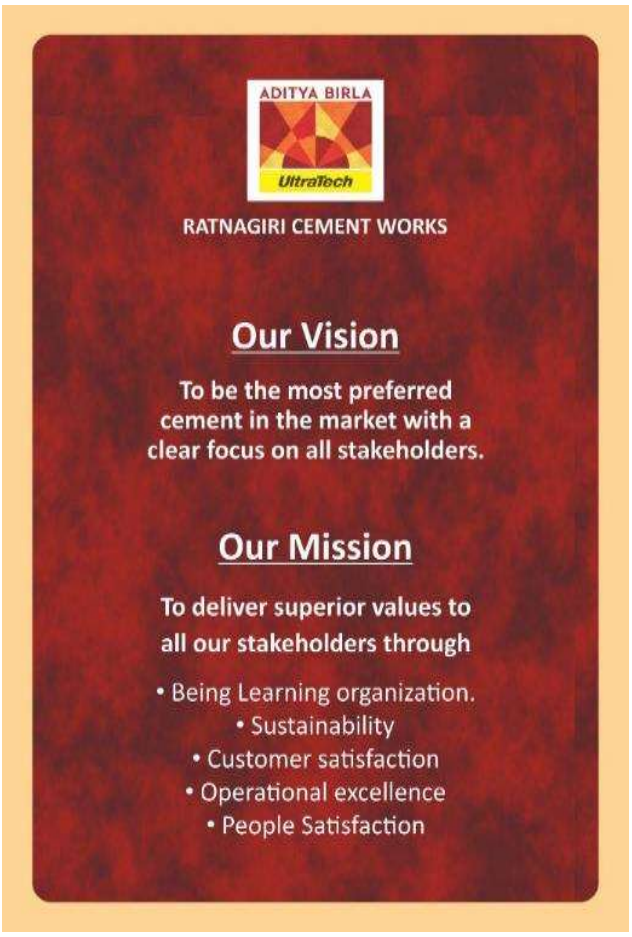
MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Ultratech Cement Limited
Unit: Ratnagiri Cement Works
MIDC Industrial Area, Zadgaon Block, Ratnagiri – 415 639, Maharashtra, India

has been found to conform to the Information Security Management System standard:
ISO/IEC 27001:2013

This certificate is valid for the following scope:
Management of information security pertaining to IT services provided by information technology department in accordance with the statement of applicability version 4.0 dated 5-Feb-2019


ADITYA BIRLA

UltraTech

RATNAGIRI CEMENT WORKS

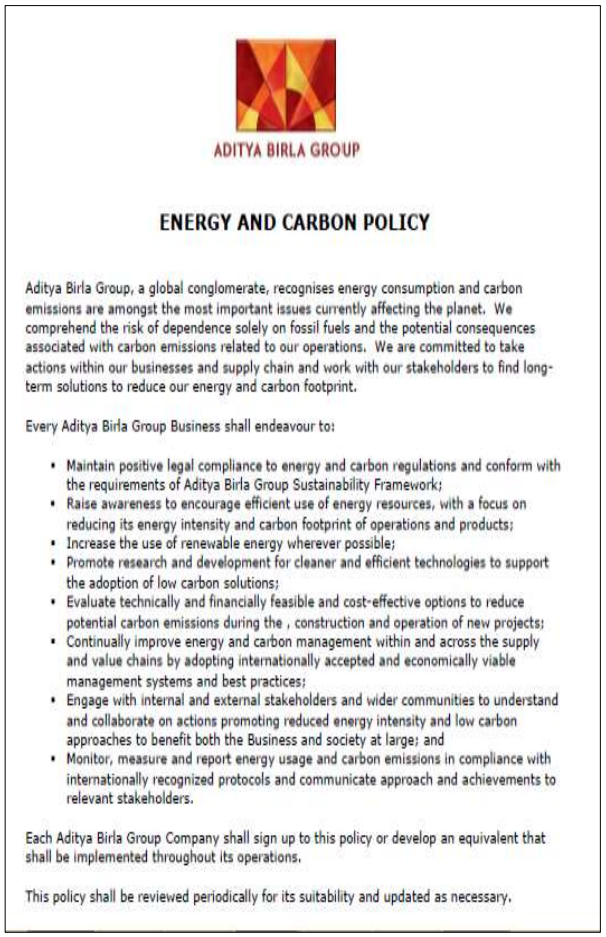
Our Vision

To be the most preferred cement in the market with a clear focus on all stakeholders.

Our Mission

To deliver superior values to all our stakeholders through

- Being Learning organization.
- Sustainability
- Customer satisfaction
- Operational excellence
- People Satisfaction


ADITYA BIRLA GROUP

ENERGY AND CARBON POLICY

Aditya Birla Group, a global conglomerate, recognises energy consumption and carbon emissions are amongst the most important issues currently affecting the planet. We comprehend the risk of dependence solely on fossil fuels and the potential consequences associated with carbon emissions related to our operations. We are committed to take actions within our businesses and supply chain and work with our stakeholders to find long-term solutions to reduce our energy and carbon footprint.

Every Aditya Birla Group Business shall endeavour to:

- Maintain positive legal compliance to energy and carbon regulations and conform with the requirements of Aditya Birla Group Sustainability Framework;
- Raise awareness to encourage efficient use of energy resources, with a focus on reducing its energy intensity and carbon footprint of operations and products;
- Increase the use of renewable energy wherever possible;
- Promote research and development for cleaner and efficient technologies to support the adoption of low carbon solutions;
- Evaluate technically and financially feasible and cost-effective options to reduce potential carbon emissions during the , construction and operation of new projects;
- Continually improve energy and carbon management within and across the supply and value chains by adopting internationally accepted and economically viable management systems and best practices;
- Engage with internal and external stakeholders and wider communities to understand and collaborate on actions promoting reduced energy intensity and low carbon approaches to benefit both the Business and society at large; and
- Monitor, measure and report energy usage and carbon emissions in compliance with internationally recognized protocols and communicate approach and achievements to relevant stakeholders.

Each Aditya Birla Group Company shall sign up to this policy or develop an equivalent that shall be implemented throughout its operations.

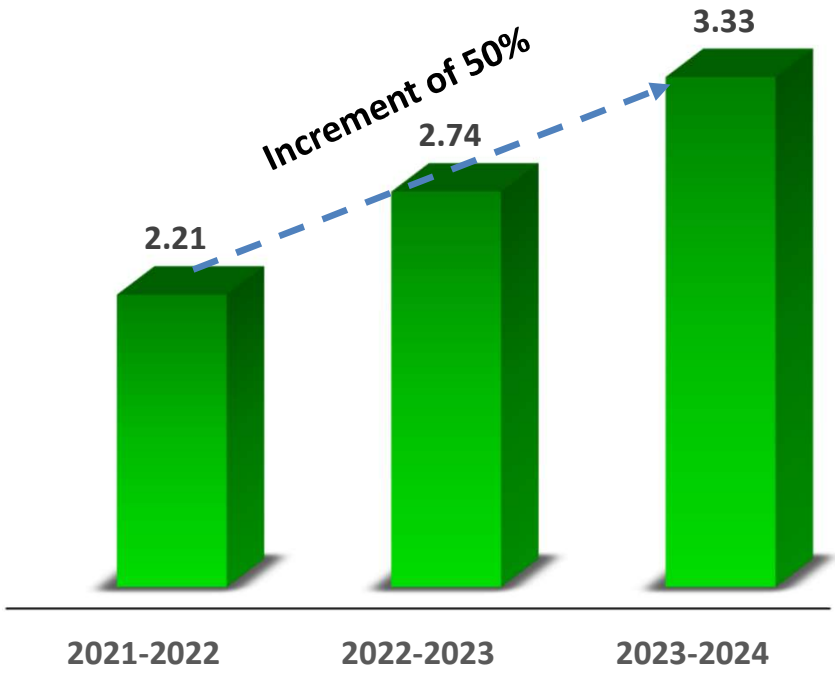
This policy shall be reviewed periodically for its suitability and updated as necessary.

Policies

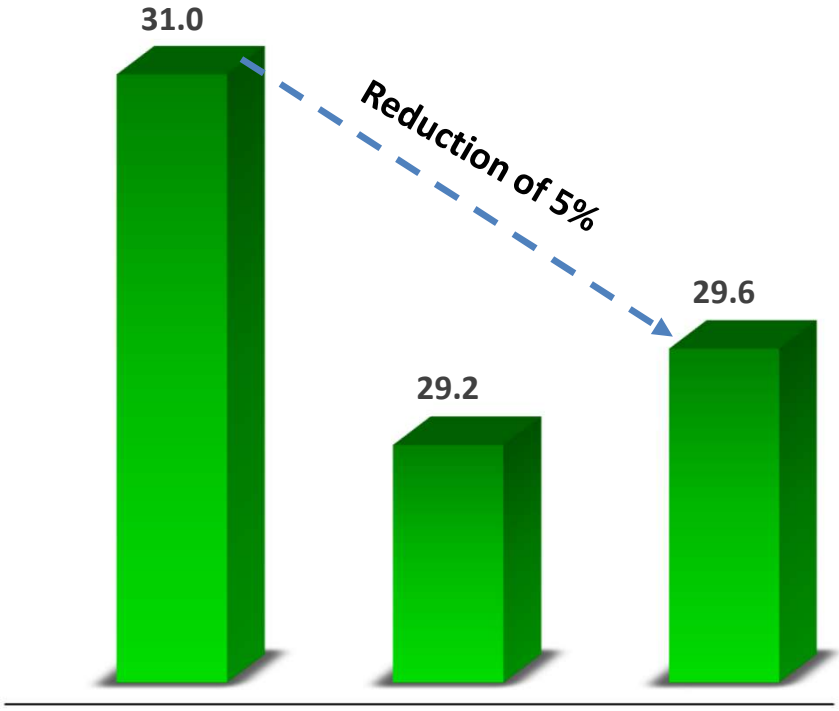
IMS certificates

Overall Specific Power Consumption Kwh/MT

Production (in LMT)

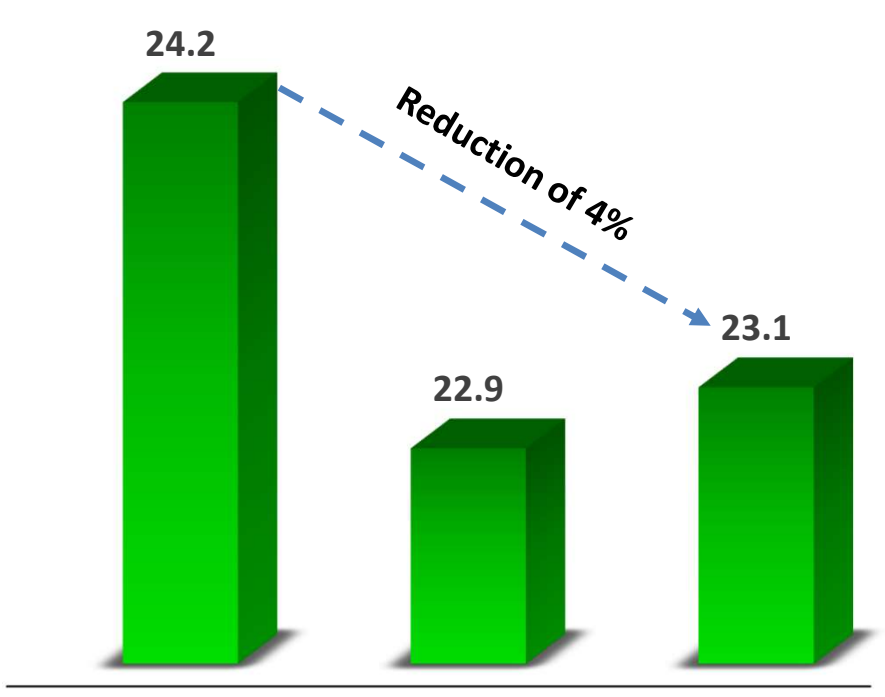


SPC Cement (kWh/MT)

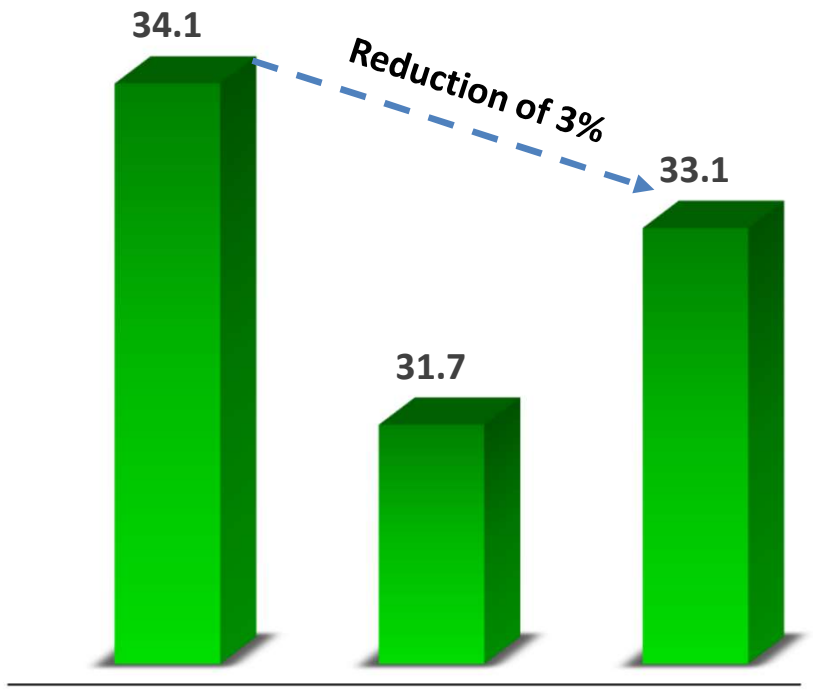


Product Specific Power Consumption kWh/MT

SPC PPC (kWh/MT)

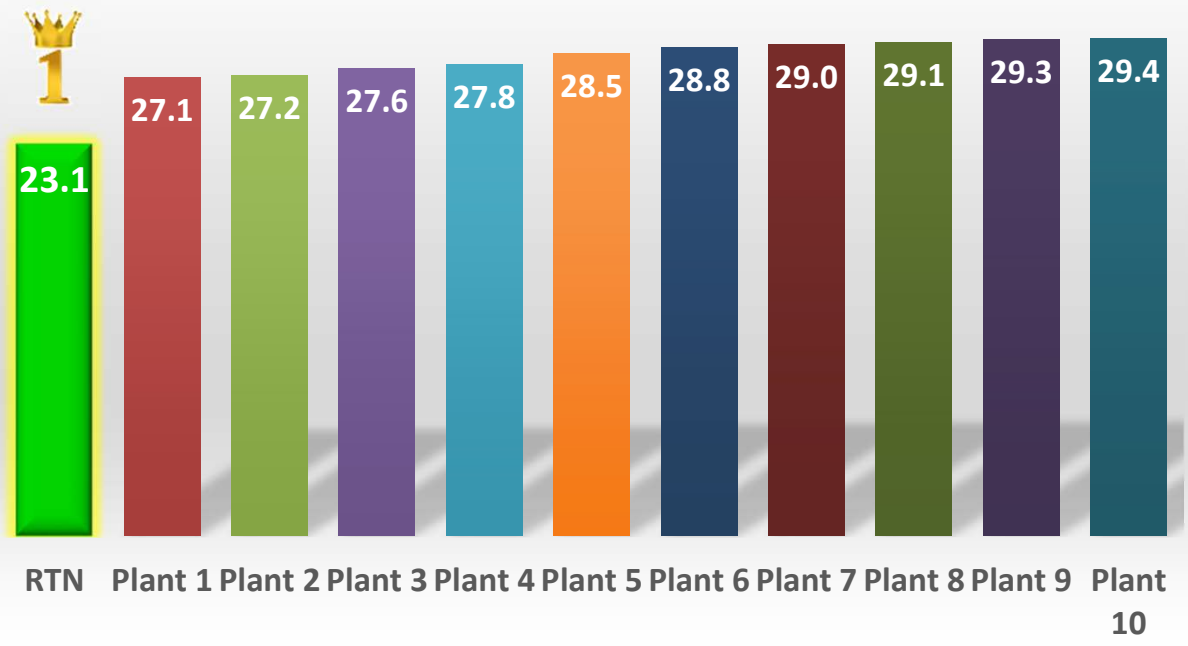


SPC OPC (kWh/MT)

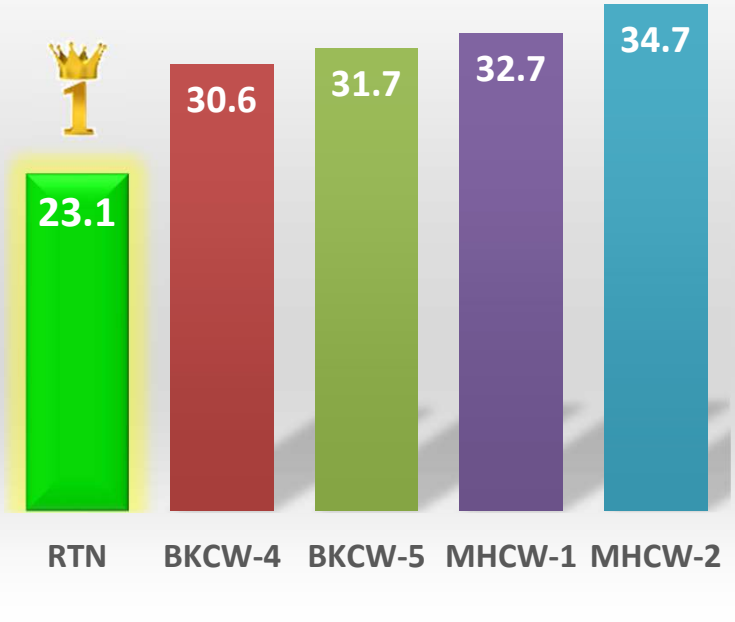


Benchmarking - SPC PPC (kWh/MT)

External Benchmarking



Internal Benchmarking



* Source: CII Energy Benchmarking for Indian Cement Industry V.6.0

Roadmap to Achieve SPC Target

Achieved a SPC of **29.6 kWh/MT** in ball mill grinding, setting a benchmark in the cement industry for this category

Process Optimization:

Fine-tuning mill operations and leveraging automation for real-time adjustments

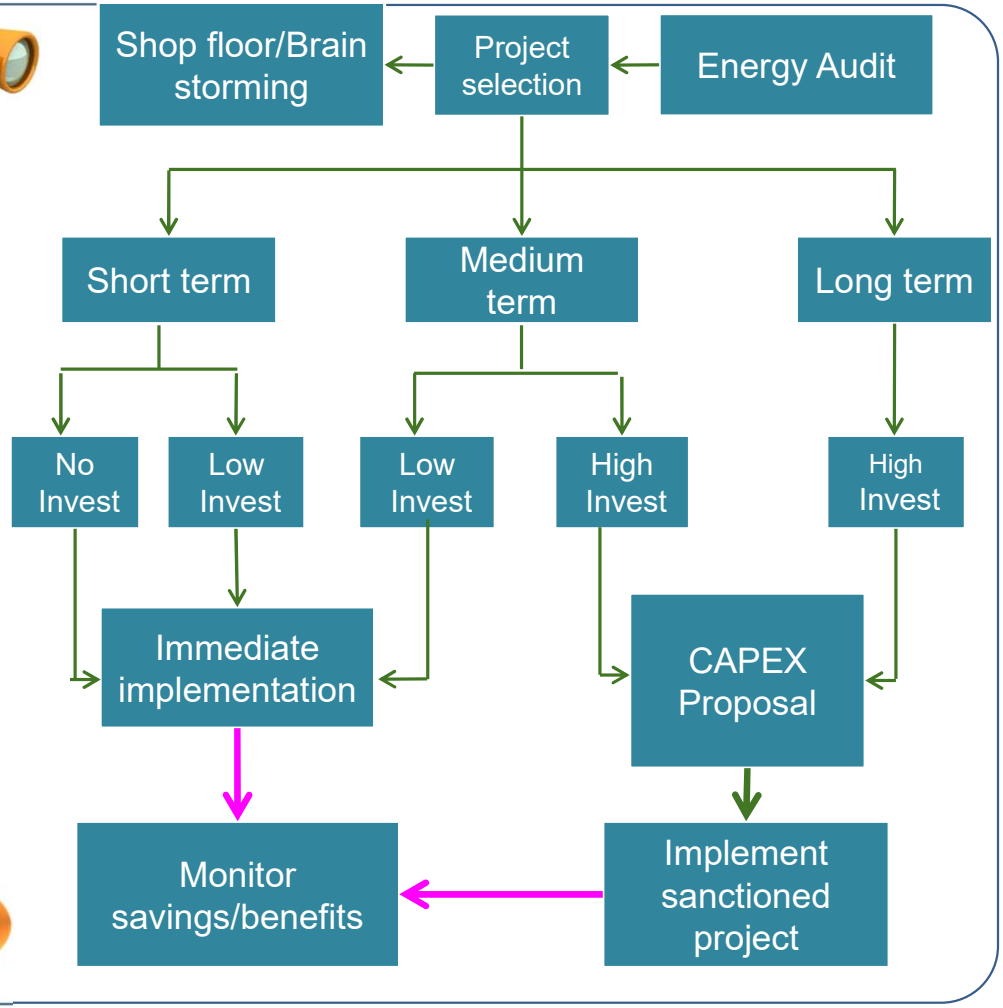
Equipment Upgrades: Variable Frequency Drives (VFDs).

Renewable power 5 MW

Maintenance Practices: Emphasizing predictive maintenance and regular inspections to sustain efficiency

Employee Training: Enhancing operator skills and promoting energy-saving initiatives.

long-term goal of 28. kWh/MT

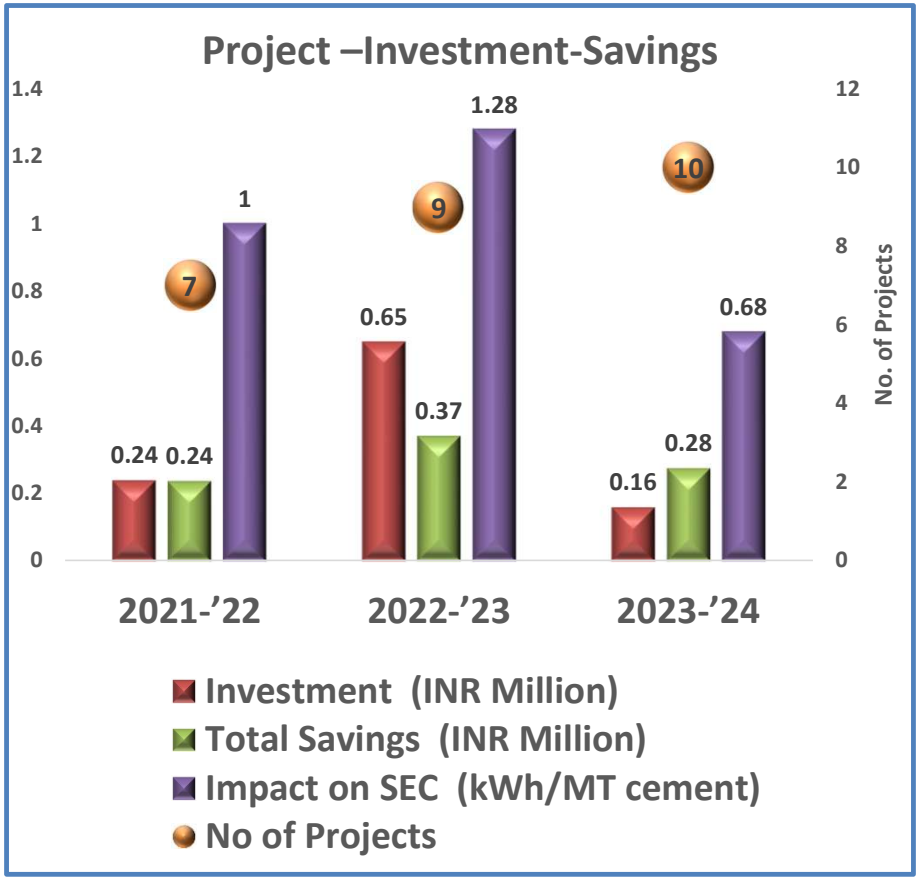


I List of Major Encon Project Planned in FY 2024-25

Sl No	Project Details	Annual Electrical Saving (Lakh kWh)	Investment (Rs in Million)	Payback (Yrs)
1	Mill shell liner replacement	1.67	3.4	2
4	FA silo revamping	0.67	1.5	2.5
3	Energy efficient blowers for Cement Silo aeration system	0.23	0.45	2
2	Jetty Compressor Installation	0.17	0.6	4
5	Zero air loss level sensor Auto drain valve	0.17	0.6	1
6	Lighting consumption optimization/Auto start stop and sensor based lighting control to be installed	0.03	0	0
	Total	**2.94**	**6.55**	

Energy Saving Projects Implemented in Last Three Years

Year	No of Projects	Investment (₹ Million)	Electrical saving (Million kWh)	Total Saving (₹ Million)	Impact on SEC (kWh/MT Cement)
FY'22	7	0.24	0.0223	0.237	1.00
FY'23	9	0.65	0.0355	0.371	1.28
FY'24	10	0.16	0.0258	0.275	0.68



List of Major Encon Projects in last Three Years

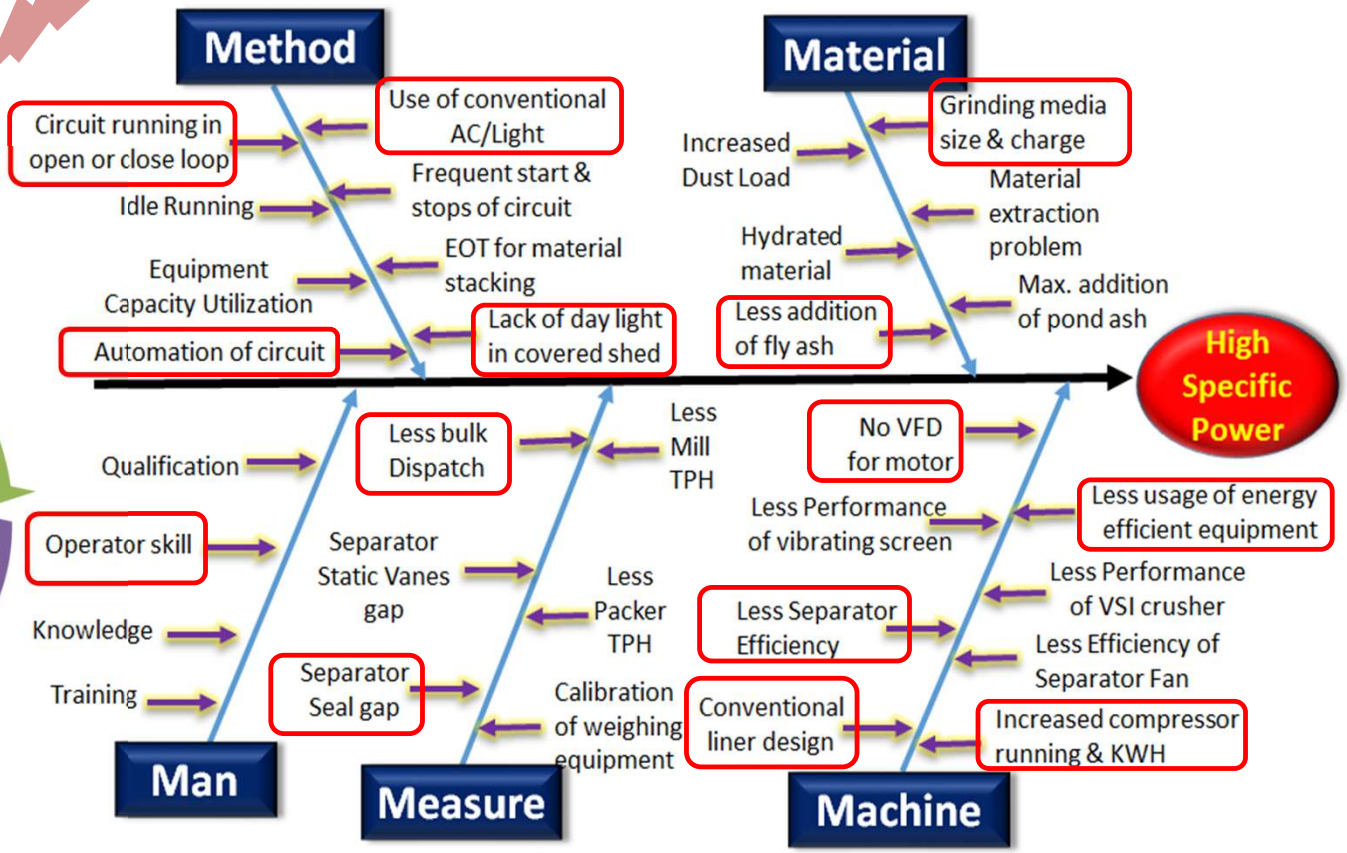
Sl. No.	Project Details	Year	Investment (₹ Lacs)	Saving (₹ Lacs)	Payback (Yrs)
1	Optimization of Grinding media charge based on dispatch plan	FY'22	0.00	5.80	Immediate
2	Reduction in compressed air consumption	FY'22	0.00	2.34	Immediate
3	Provide transparent sheets to utilize day lights	FY'22	1.15	0.90	1.28
4	Increase usage of pond ash to 5%	FY'22	1.50	8.00	0.19
5	LED lights in place of conventional lighting	FY'22	1.75	1.19	1.90
6	Right sizing of Packing Plant JPF fan	FY'22	5.00	1.55	3.25
7	Latest design JPF for Cement Mill Vent	FY'22	15.00	4.00	3.75
8	Increased VSI Bin Cap.	FY'23	0	4.03	Immediate
9	Optimization of the compressors	FY'23	0	7.30	Immediate
10	Increase Flyash % by optimize the Roto feeder –PID loop	FY'23	0.00	0.45	Immediate
11	Use of Exhaust Gas energy by using turbine	FY'23	4.5	1.5	3.0
12	Upgradation of the separator Rotor	FY'23	25.00	7.2	3.5
13	Replacement of mill liner with Low Lift	FY'23	23 .00	5.8	4.0

List of Major Encon Projects in last 3 Years

Sl. No.	Project Details	Year	Investment (Rs.Lacs)	Saving (Rs.Lacs)	Payback (Yrs)
14	Conventional Blowers replacement with energy efficient blower (5 KW to 3.7 KW)	FY'23	2.8	3.18	0.8
15	Installed VFD for Pneumatic Blowers	FY'23	3.5	4.65	0.9
16	Implementation of the BLDC fans (60 No.s @0.17 Lacs)	FY'23	6.5	3.0	2.1
17	Optimization of Grinding media charge based on dispatch plan	FY'24	0.00	5.80	Immediate
18	Reduction in compressed air consumption	FY'24	0.00	2.34	Immediate
19	Provide transparent sheets to utilize day lights	FY'24	1.15	0.90	1.28
20	Increase usage of pond ash to 5%	FY'24	1.50	8.00	0.19
21	LED lights in place of conventional lighting	FY'24	1.75	1.19	1.90
22	Reduction in VSI Crusher Power by replacing with Energy efficient motors IE3.	FY'24	7.50	5.16	1.45
23	8026 Clinker bin capacity increases from 100 MT to 150 MT.	FY'24	3.50	3.40	1.00
24	False air ingress in to the system to be identified and arrested.	FY'24	0.10	0.52	4.00
25	Air Driers Remote Start Stops along with Compressors	FY'24	0.10	0.50	4.00
26	Saving through bulk dispatch 20 % of total dispatch instead of bags.	FY'24	0.40	0.45	1.00

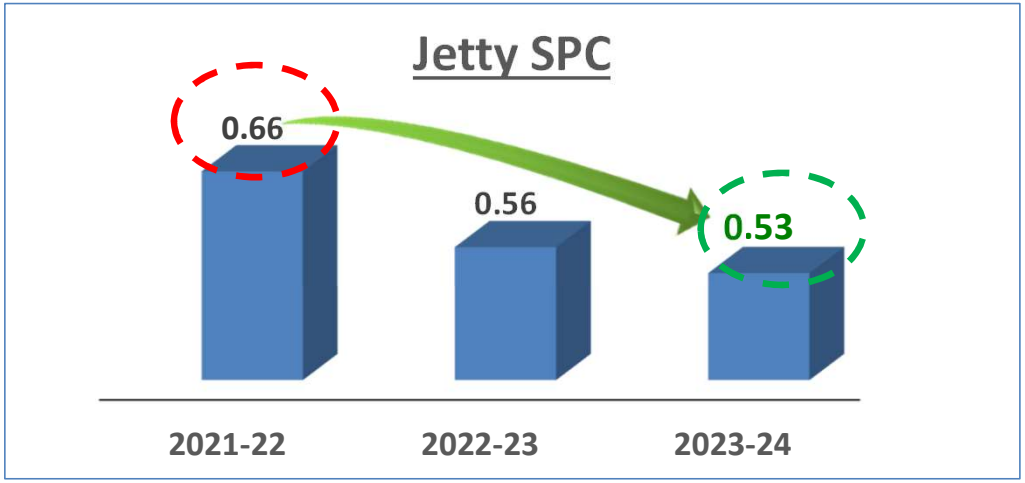
Explored Solution through Cause & Effect Diagram

Use of Analytical Tools & Techniques



Optimization of Ship Unloading Time at Jetty

S. N.	Improvement
1	Taken Unloader fan in bucket circuit
2	Avoided frequent start/Stop during silo full
3	Unloader fans control taken in cabin
4	Optimised belt operation
5	Dumper loading operation optimised
6	Trained attendants to improve TPH



- Unloader TPH increased from 380 to 400 TPH, TAT of clinker ships reduced from 12.5hrs. to 10 Hrs.
- Ever lowest power achieved in Jetty

Benefit : Reduction in specific power consumption - 0.13 kWH/MT.

Converting Problem into Opportunity

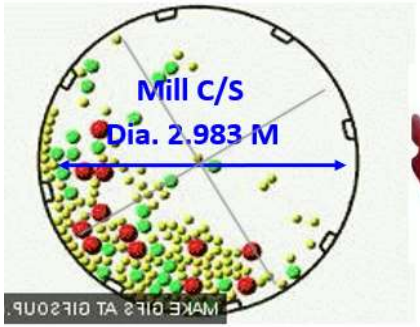
Critically worn out Mill 1st Chamber Shell liner replaced

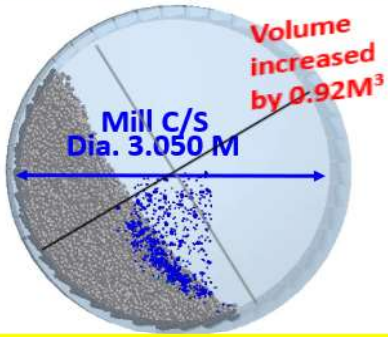
- Mill shell exposed in some places due to liners worn out. Lifting efficiency of liners reduced
- Cyclones caused severe damage to our jetty and plant raw material shed.

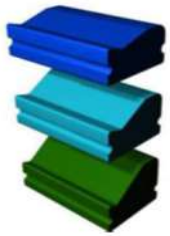
Traditional screw fitted sheet replaced with Tata BlueScope Klip Lock, press fit screw less sheets (Zn-Al coated)

Adoption of Latest design Liner

BEFORE	AFTER







Existing liner less effective for -4mm clinker feed
Blocked useful mill volume. (114mm thk. Liner)
Bulky – Unwanted rotating mass & difficult to handle.

- Latest Design Low lift (UVL – ABAB) liners highly effective for -4mm feed.
- Volume increased by 0.92 Cub. M.(101mm thk Liner)
- Light weight & easy to handle.

Benefit - Reduction in 0.5 kWh/MT

I Innovation : Dilute Phase Conveying System

ADITYA BIRLA UltraTech

Final product conveying pneumatic conveyor with speed variation as per product

Saving Data and details

Product	TPH	Load (kW)	VFD speed (RPM)
OPC	52	55	90%
PPC	75	63	100%
Total kWH saving		15.2	
Mill Run Hrs./Annum	300	109440	
Total Saving in RS @10.50		**11.49 Lacs**	

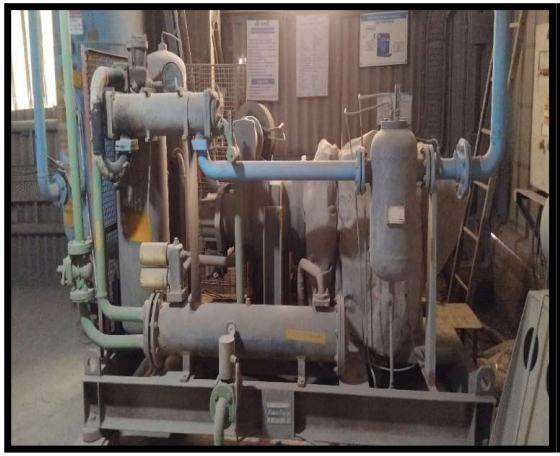
Benefit - Reduction in 0.3 kWh/MT

I Innovation : Utility Area

Innovation : 132 KW compressor replaced by two 45 KW compressor.

High Pressure compressor running combination.

Before

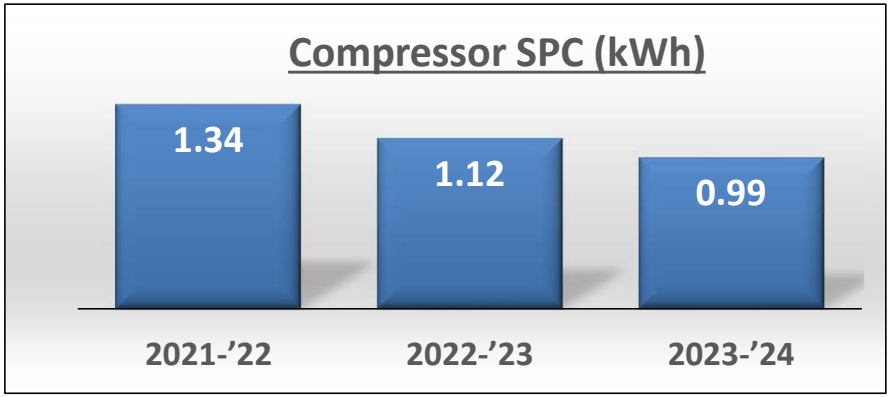


After

132 KW compressor used for plant operation

Replaced with 2 nos. GA 45 (45 KW) compressor

Location	CP-1 22 KW	CP-2 45 KW	CP-3 45 KW
Packing (A)	🟢	🔴	🔴
Grinding (B)	🔴	🟢	🔴
Clinker feeding (C)	🔴	🟢	🔴
A + B	🔴	🟢	🔴
A + C	🔴	🟢	🔴
B + C	🔴	🟢	🟢
A + B + C	🔴	🟢	🟢



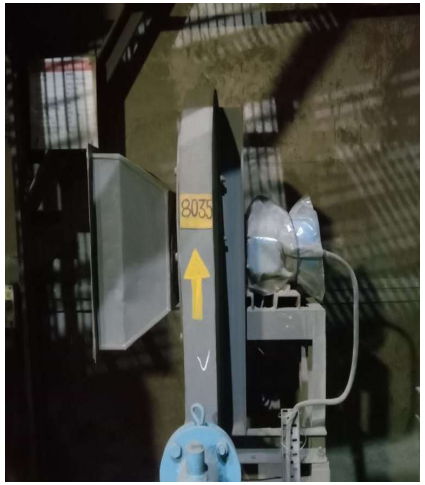
Benefit- Reduction in power consumption by 0.15 kWh/MT

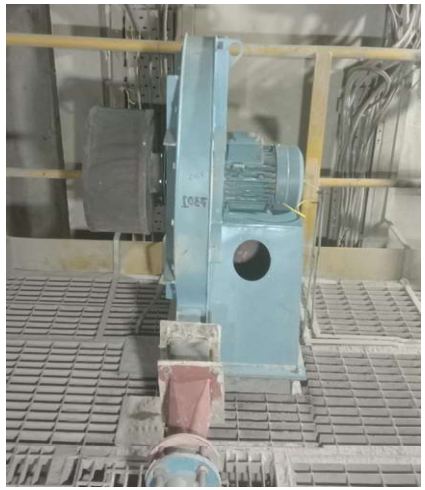
I Improvement: VSI Crusher and Air-slide Blower

200 KW VSI Crusher motor replaced with energy efficient 160 KW IE3 motor

Parameters	UOM	Amt
VSI previous kWH	kWH	68
After VFD installation	kWH	59
Saving in KWH	kWH	9
Annual Saving @Rs. 10.50	Rs.	544320

6 Aeration blower replaced with energy efficient blowers





Parameters	UOM	Amt
Airside blower rating	kWH	3.7
Previous load	kWH	3.4
Energy efficient blower load	kWH	2.9
Annual Saving @Rs. 10.50	Rs.	219240

Benefit- Reduction in 0.21 kWh/MT

I

Innovative Project

ADITYA BIRLA
UltraTech

Installation of Exhaust Air Wind Turbine for Green Energy regeneration

<u>Benefit</u>- 6 kWh Electrical energy generation through Wind energy

I Innovation: Revamping fly ash silo–Reliability improvement

ADITYA BIRLA UltraTech

Before

After

Capacity: 900 MT

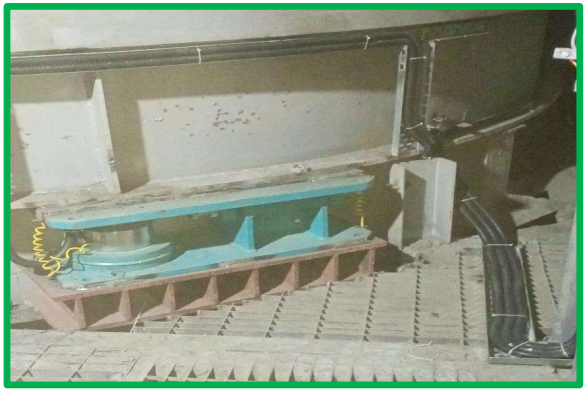
(Originally this silo is meant for Ground Slag)

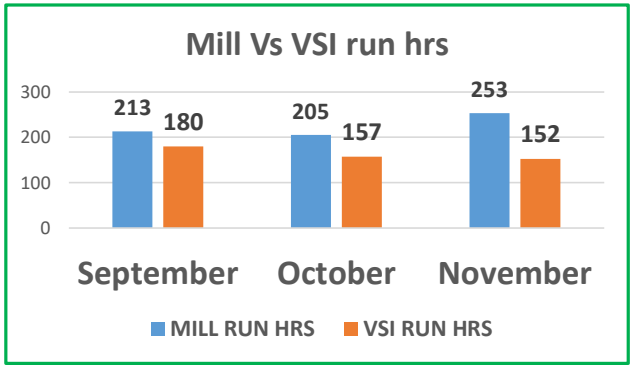
- Converted to store Flyash in the year 2011
- Out of 16 aeration pipes (25 mm) 14 pipes got damaged. Shielded with additional C class pipe to prevent wear and tear.
- Inside of airslide air chamber there was no provision for air distribution, modified by providing C-box to protect airslide cloth
- Aeration valve replaced with feedback indication at DCS and auto cycle timer

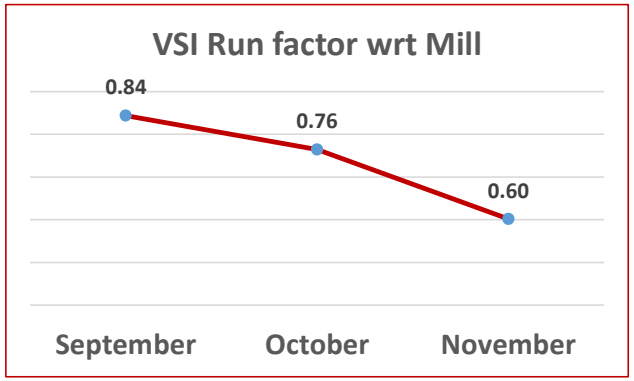
Benefit – Free flow of flyash, Blower Power reduced, Elimination of extra compressed air requirement.

Innovation : Reduction in VSI Run hrs

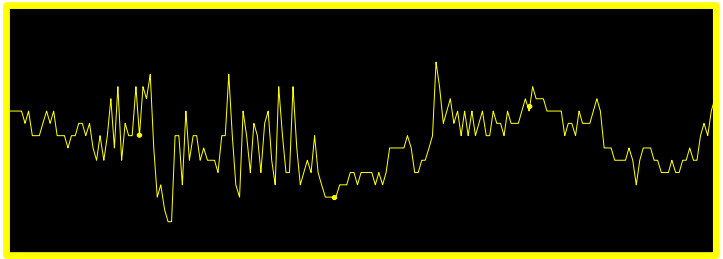
Installation Load cell in 8026 Clinker Bin

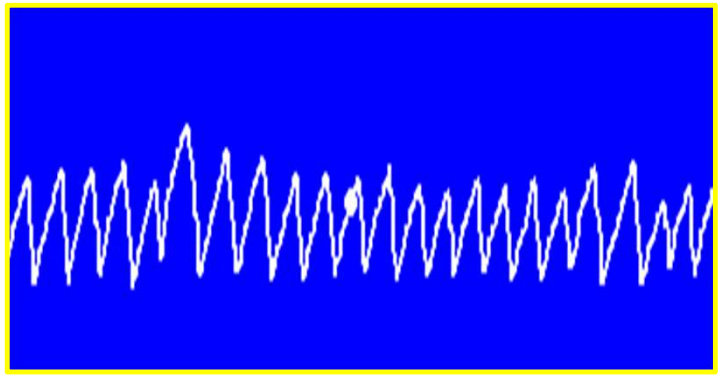






PID loop for VSI bin filling with bucket elevator

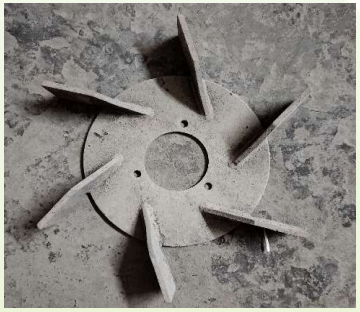




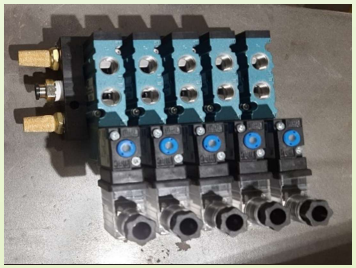
<u>Benefit</u>- Reduction in VSI Run hrs (Savings: 0.3kWh/MT SPC)

Improvement Job – Packing Plant

Installed new centralized aeration control system with pressure gauge and flow control valves



Replacement of Impeller Blade from 6 blade to 9 blade



Installation of air breather

MAC solenoid valve

❑ Action Taken

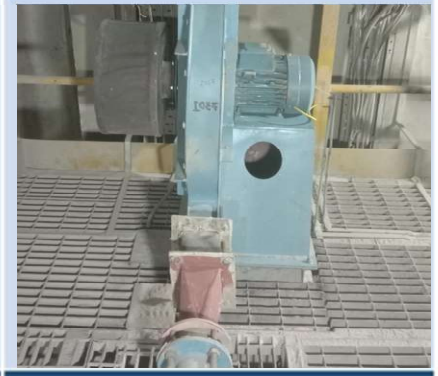
- ✓ Installed new aeration system
- ✓ Replacement of Festo solenoid with MAC solenoid valve for packer spout operation
- ✓ Installation of air breather/silencer in casing system
- ✓ Replacement of impeller blade from 6 blade to 9 blade

✓ Benefit

- ✓ Free flow of cement
- ✓ Reliability improvement, fast action
- ✓ Reduction moisture in air, hence no jamming
- ✓ Increased from 72tph to 86tph

Benefit - Reduction in 0.1 kWh/MT

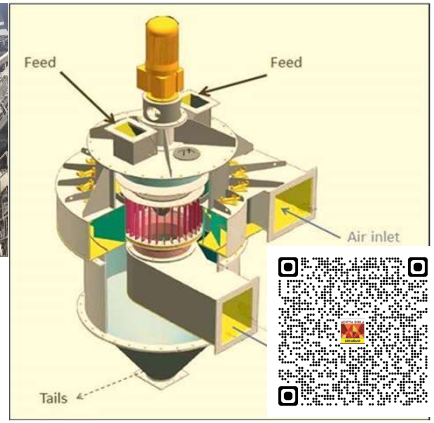
Cement Mill Area

KAIZEN 1	KAIZEN 2	KAIZEN 3	KAIZEN 4	KAIZEN 5
Smart Operation philosophy: Different separator fan speed for OPC (<810 RPM) Material to air ratio has been increased from 1.2 to 1.5 kg/m3.	Reducing nos. of operational air slide blowers in dry season – Winter & Summer.	Replacement of old motors with energy efficient motors 	Logic for intermittent operation of mill HT motor space heater. 	Single command to start all groups mill. 
Saving – 0.08 KWH/MT	Saving – 0.02 KWH/MT	Saving – 0.05 KWH/MT	Saving – 0.03 KWH/MT	Saving – 0.02 KWH/MT

Advancing Plant Operations Through Digital Transformation

ADITYA BIRLA
UltraTech

Details through QR Code scan



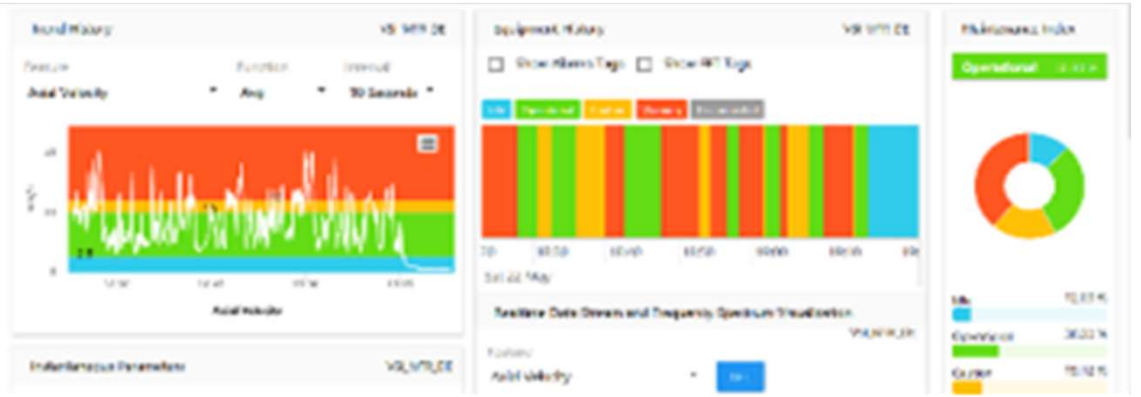
1.Mill Overview

Type of Mill	Cement Mill
OEM	WIL
Mill Size	Dia. 3.2 m X Length 12.07 m
Number of Chamber	Two
Direction of Rotation (From Inlet)	Clock Wise
Mill Rotation Speed	17.86 RPM
Critical Speed	23.64 RPM
% Critical Speed	75.52 %
Current Productivity Rate	OPC : 24 % / PPC – 76 % (one year avg) OPC : 50 – 51 TPH at 2870 – 2900 cm^2/gm PPC : 71 – 72 TPH at 3200 -3300 cm^2/gm (Dry flyah – 32 - 35 % , Pond ash – 2 % and gypsum – 3 – 4 % , clinker - 62 – 65%)
Main Motor Installed Power	1680 KW
Main Motor Absorbed Power during study	1130 to 1155 KW
Mill Circuit	Close

Separator Guidevance Cleaning Record

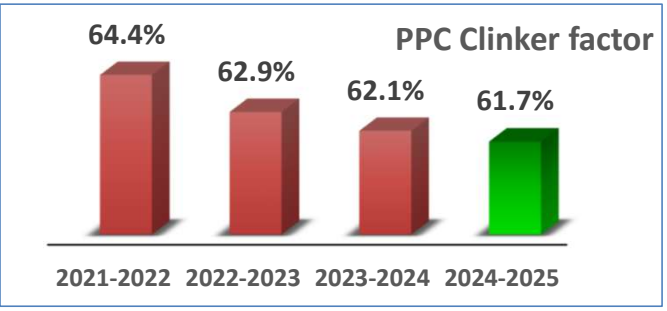
Date	Permit No	Cleaning Area	Description
29-08-2023	RTN-GWP-28049	100	Tromeel screen(8041) and nibs reject screen cleaned.
30-08-2023	RTN-GWP-28050	100	Tromeel screen(8041) and nibs reject screen cleaned.
11-09-2023	RTN-GWP-28117	100	Tromeel screen(8041) and nibs reject screen cleaned.
05-10-2023	RTN-GWP-28288	100	Tromeel screen(8041) and nibs reject screen cleaned.
09-10-2023	RTN-GWP-28316	100	Tromeel screen(8041) and nibs reject screen cleaned.
16-10-2023	RTN-GWP-28387	100	Tromeel screen(8041) and nibs reject screen cleaned.
30-10-2023	RTN-GWP-28470	100	Tromeel screen(8041) and nibs reject screen cleaned.
06-11-2023	RTN-GWP-28516	100	Tromeel screen(8041) and nibs reject screen cleaned.
26-11-2023	RTN-GWP-28288	100	Tromeel screen(8041) and nibs reject screen cleaned.
16-12-2023	RTN-GWP-28316	100	Tromeel screen(8041) and nibs reject screen cleaned.
05-01-2024	RTN-GWP-28387	100	Tromeel screen(8041) and nibs reject screen cleaned.
25-01-2024	RTN-GWP-28470	100	Tromeel screen(8041) and nibs reject screen cleaned.
14-02-2024	RTN-GWP-28516	100	Tromeel screen(8041) and nibs reject screen cleaned.
05-03-2024	RTN-GWP-28288	100	Tromeel screen(8041) and nibs reject screen cleaned.
25-03-2024	RTN-GWP-28316	100	Tromeel screen(8041) and nibs reject screen cleaned.
14-04-2024	RTN-GWP-28387	100	Tromeel screen(8041) and nibs reject screen cleaned.
04-05-2024	RTN-GWP-28470	100	Tromeel screen(8041) and nibs reject screen cleaned.
24-05-2024	RTN-GWP-28516	100	Tromeel screen(8041) and nibs reject screen cleaned.
13-06-2024	RTN-GWP-28288	100	Tromeel screen(8041) and nibs reject screen cleaned.
03-07-2024	RTN-GWP-28316	100	Tromeel screen(8041) and nibs reject screen cleaned.
23-07-2024	RTN-GWP-28387	100	Tromeel screen(8041) and nibs reject screen cleaned.
12-08-2024	RTN-GWP-28470	100	Tromeel screen(8041) and nibs reject screen cleaned.
01-09-2024	RTN-GWP-28516	100	Tromeel screen(8041) and nibs reject screen cleaned.

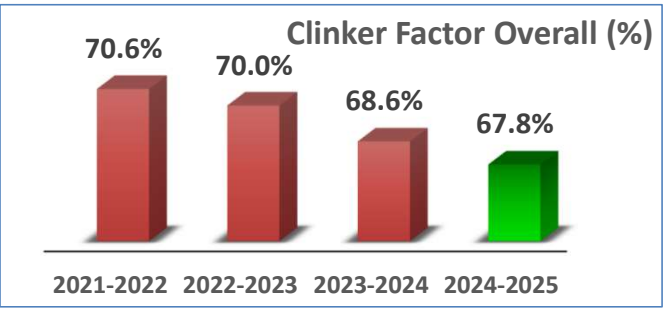
Online vibration analysis of all critical equipments



Benefit – Saving 0f 37 Hrs. Breakdown.
Preventive measure before breakdown

GHG Inventorisation





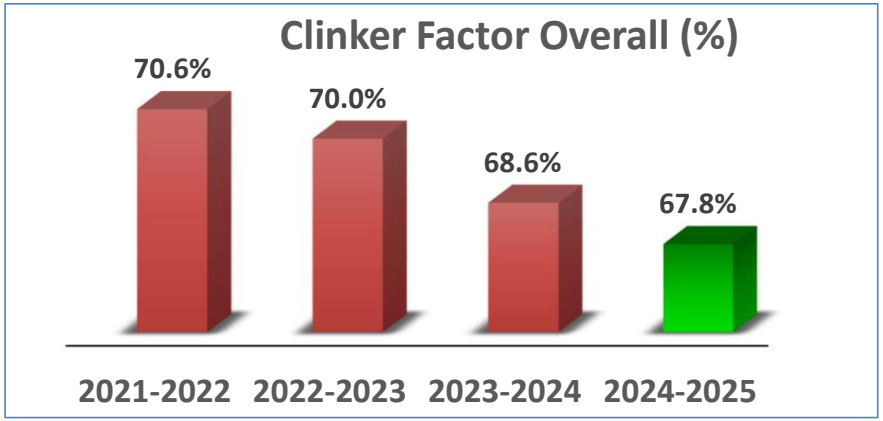
Rain Water harvesting at Jetty & Plant

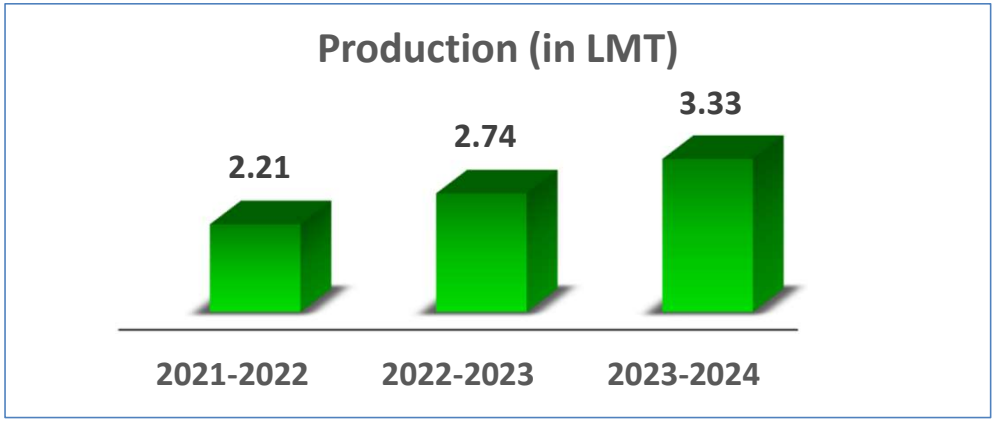
Reverse Logistic support

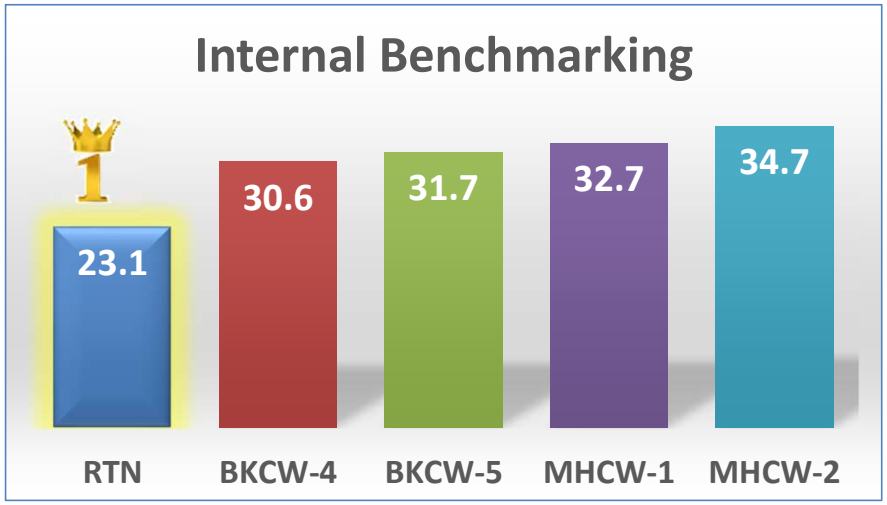
Flyash to cement

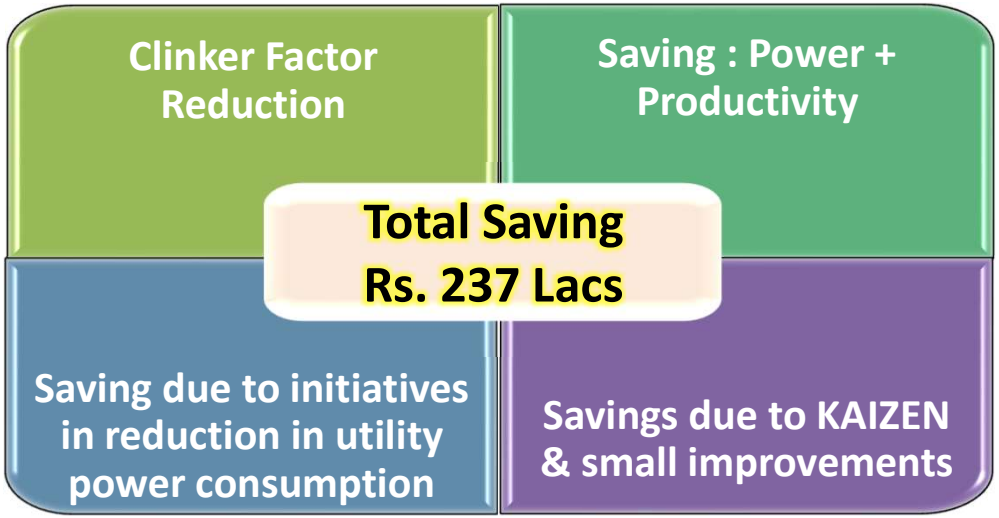
UltraTech, India's No. 1 cement company and No. 3 globally, is committed to sustainability. We've secured a 5 MW solar power agreement with Aditya Birla Solar Energy, starting February 2025, to reduce our carbon footprint and support a sustainable future.

Impact in cost & productivity









Strategies Adopted for Employee Involvement & Team Work

Brainstorming Meeting on Energy Conservation

- ✓ Brain Storming Sessions
- ✓ KIP Visits / Participation in Seminars
- ✓ External / Internal trainings
- ✓ Team competition
- ✓ Energy conservation Week
- ✓ Awareness creating to all Employee Families
- ✓ Rewarding & Recognition

Best Encon Award

Energy Saving Award

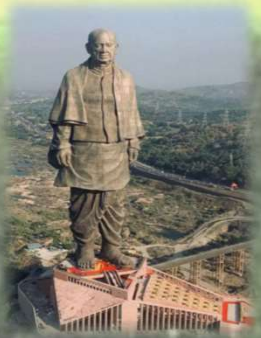
Energy Conservation Day Celebration

Rewarding Best EnCon Suggestion

Excellence Through Systems

CII ENERGY EXCELLENCE AWARD

- CII AWARD 2023
- CII AWARD 2021
- CII AWARD 2020
- REPRISM 2019
- WCM Silver 2017
- WCM Bronze 2011
- ISO 27001 2010
- OHSAS18001 2004
- ISO 14001 2002
- ISO 9001 2000



Sustainability

Sustainability is the ability to satisfy needs of the present without adversely affecting the ability to satisfy the needs of future.

7000

Accident Free Days

Journey Continue ...