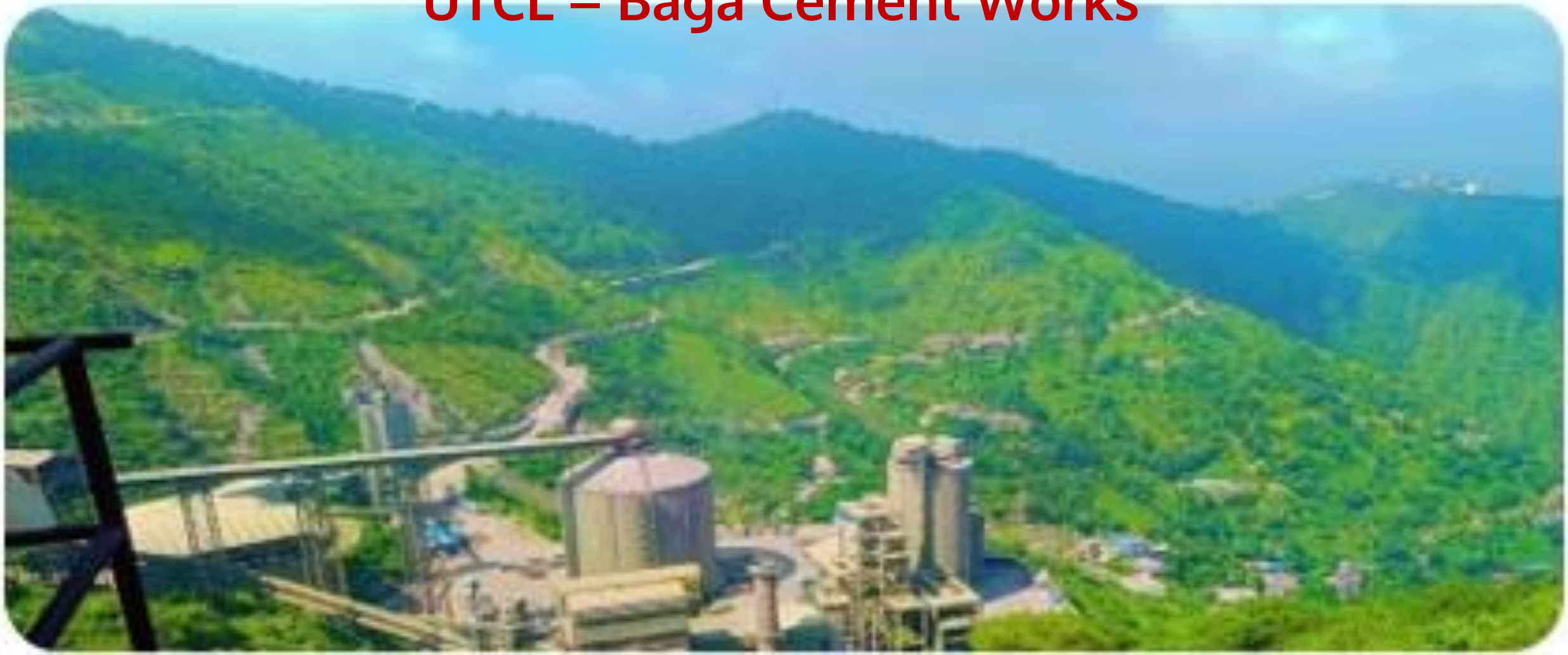
CII 25th National Award for Excellence in Energy Management 2024

UTCL – Baga Cement Works



Integrity | Commitment | Passion | Seamlessness | Speed

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7. GHG Inventorisation

8. EMS & Green Pro certification
9. Net Zero Commitment

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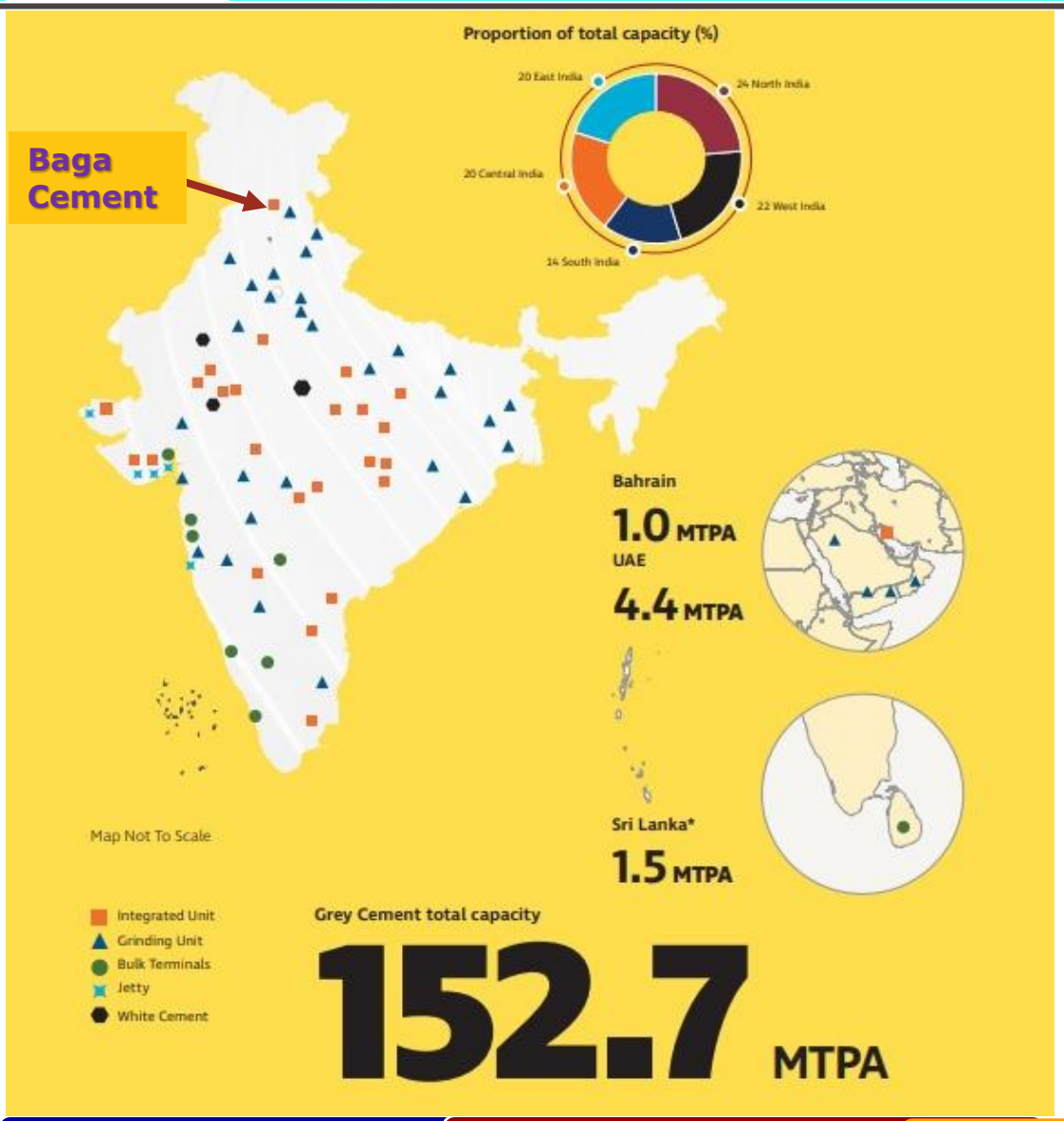
11. EMS Monitoring
12. Best Practices in Green Supply Chain and Journey toward excellence

UltraTech Baga Cement Works -Profile



Production Capacity Installed
Clinker : 3.5 MTPA; Cement : 2.5 MTPA
Product Mix:
PPC - 42%; OPC 43 - 37%; OPC 53 - 21%

Major Equipment's

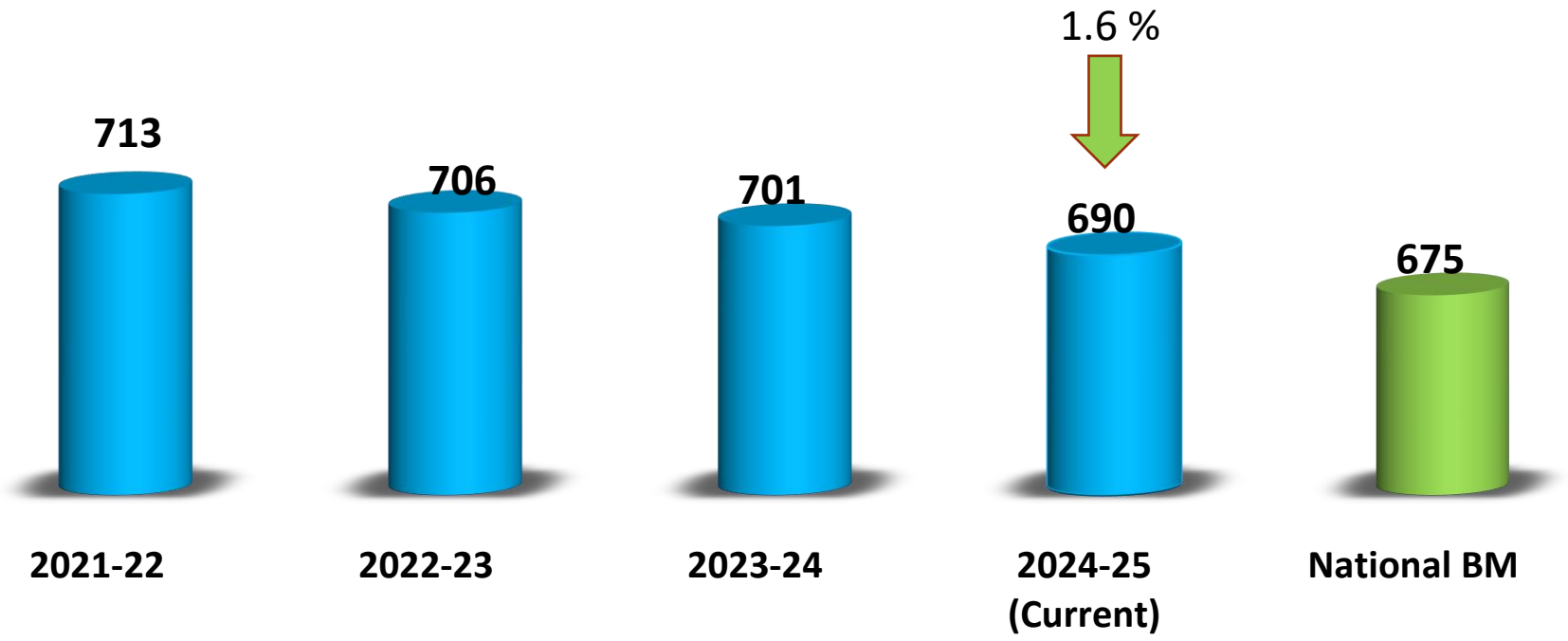
CRUSHER	• Make: L&T, Model : APPM 1822, Capacity: 900 TPH
RAW MILL	• Make: Geber Pfeiffer, Model: VRM MPS 5000B, Capacity: 400 TPH (2 Nos)
COAL MILL	• Make: Geber Pfeiffer, Model: VRM MPS 3550BK,Capacity: 80 TPH (Lignite Coal)
KILN	• Make: KHD (4 Strings ILC / 6 stage), Capacity:10000 TPD
CEMENT MILL	• Make: Loesche, Model: VRM LM 56.3+3, Capacity: PPC-300 TPH
PACKING PLANT	• Type: ROTO Packer, Cap.: Packer 1 - 180TPH, Packer 2 - 240 TPH

Product Range

PPC	OPC 43	OPC 53
		

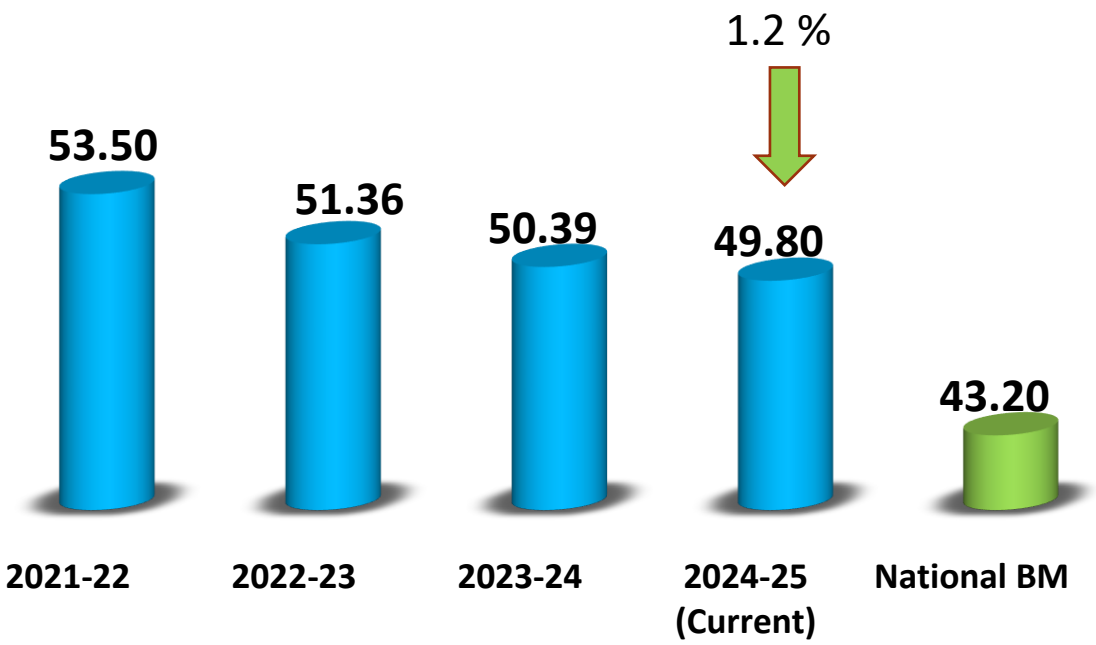
Thermal Energy Performance

Sp. Heat (Kcal/Kg of Clinker)

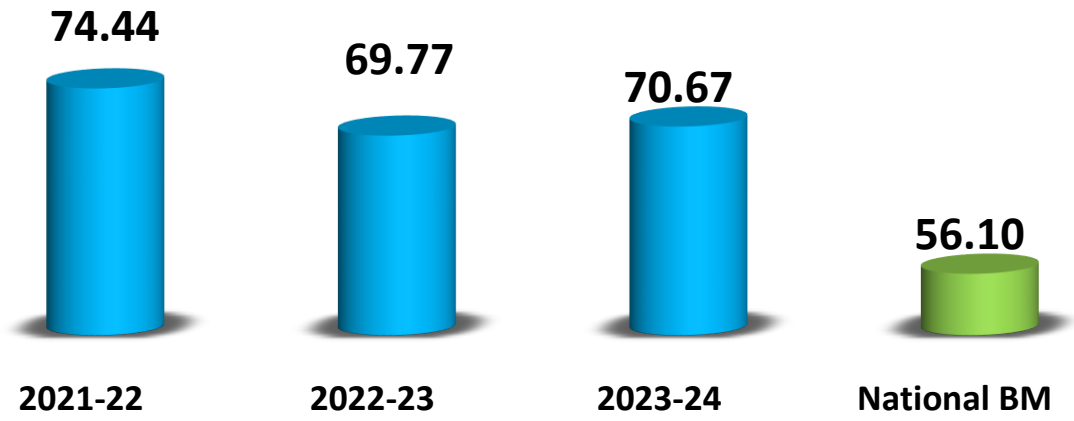


Electrical Energy Performance

Sp. Power kWh/MT of Clinker



Total Sp. Power kWh/MT of Cement

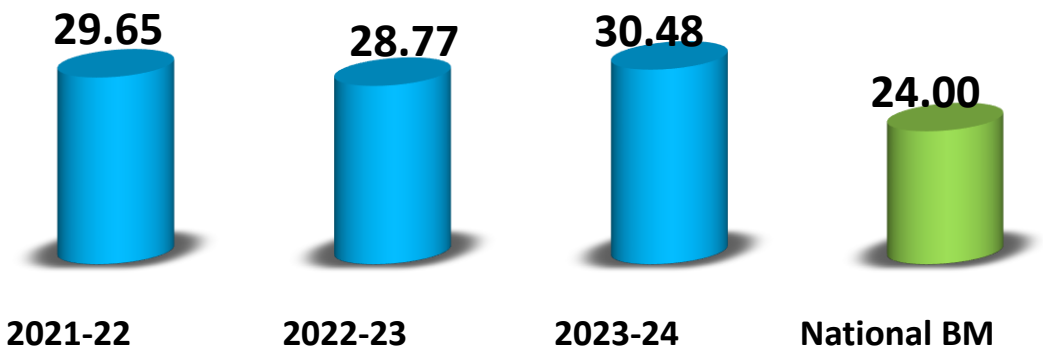


Overall Power increased due to

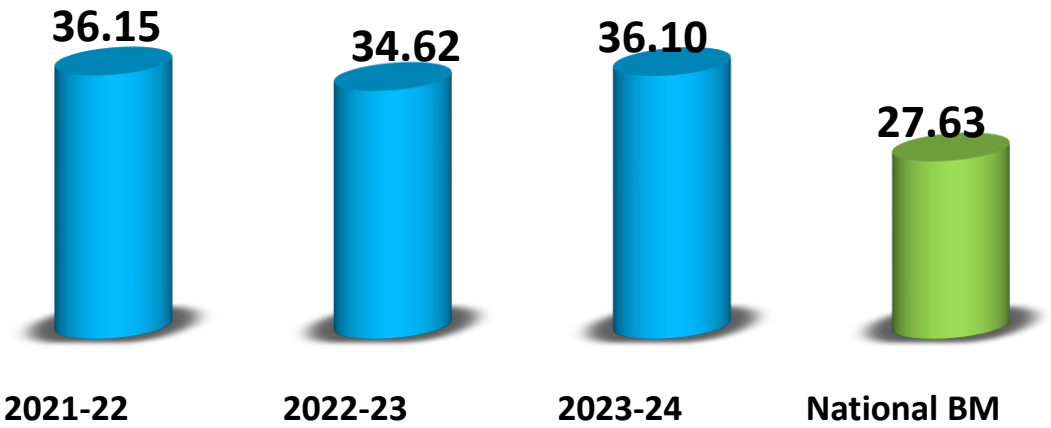
- Blended cement ratio reduced 52% (FY24) to 42% (FY25).
- Pet coke % uses increased 80 to 100%.
- Cement mill under optimization after Roller & Table liner replacement. As discussed with OEM, sinter exposure and profile formation will take some more time.

Electrical Energy Performance OPC 43 & 53

OPC 43 : Sp. Power kWh/MT of Cement

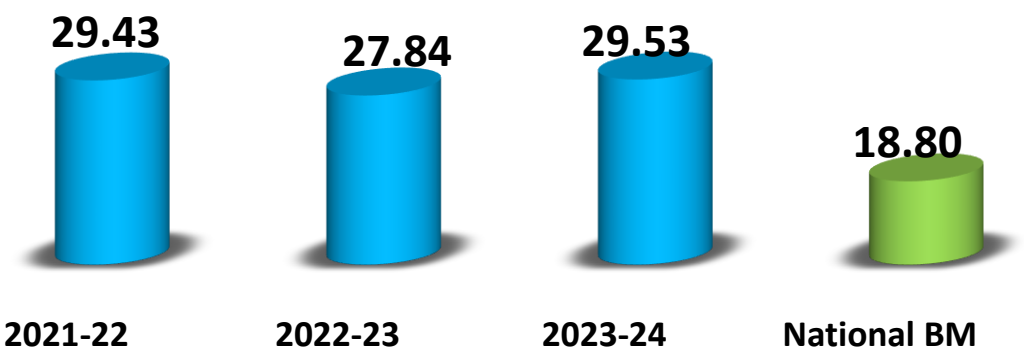


OPC 53 : Sp. Power kWh/MT of Cement

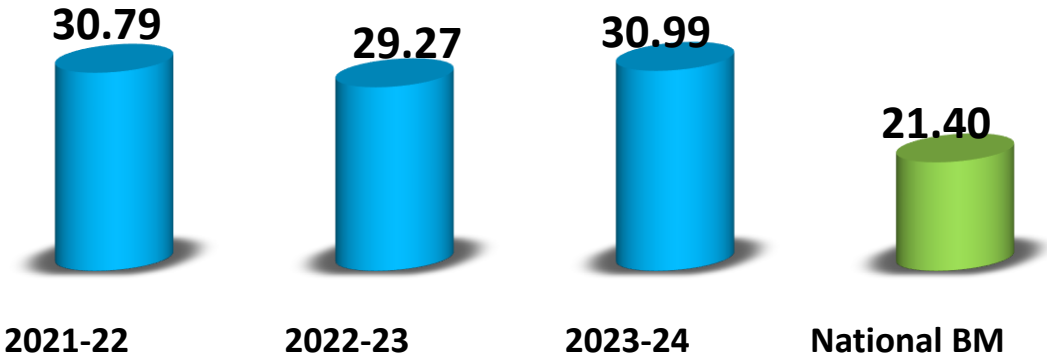


Electrical Energy Performance
PPC & Total Cement

PPC : Sp. Power kWh/MT of Cement



Combined : Sp. Power kWh/MT of Cement



Power increased due to

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- Cement mill under optimization after Roller & Table liner replacement. As discussed with OEM, sinter exposure and profile formation will take some more time.

Road Map to achieve Benchmarks

Sr. No.	Ongoing Encon Projects 2024-25	Annual Energy Savings		Capex Required (Rs. Lacs)	Target
		Electrical (kWh)	Thermal (MTOE)		
1	WHRS installation	67200000	-	40000	11 MW Capacity Preliminary study completed
2	Solar power usage 6MW from ISTS to be increased to 8MW	20288000.0	-	-	In-process
3	Replacement of TFG with RAL in Raw Mill-2.	943392.00	-	78.0	Dec - 24
4	Raw mix optimization by consistent quality additive	-	600.78	-	In-process
5	Digitization for monitoring of burner flame.	--	450.58	10.0	Completed
6	2 reciprocating compressor to be replaced with energy efficient screw compressor.	282130	-	58.0	Oct - 24
7	Implementation of AI based Machine Vision System for Oversized stone detection at Limestone crusher and conveyor.	450584.4	-	15.5	Completed
8	8 nos. of VFD installation in Bag-filter.	253600	-	20.0	6 no's installed

Road Map to achieve Benchmarks

Sr. No.	Ongoing Encon Projects 2024-25	Energy Savings		Capex Required (Rs. Lacs)	Target
		Electrical (kWh)	Thermal (MTOE)		
9	Reduction of Preheater area radiation	-	150.19	-	Phase manner refractory work in process
10	Dip tube installation in bottom cyclone.	-	300.39	84.0	In-process
11	Increase TSR % above 5% AFR feeding System including shredder (after supply v/s demand study in HP along with cost economics)	-	8.34	200	Under planning
12	Raw mill 2 optimization through MCX controller.	300389.6	-	5.0	Under planning
13	Use of Grinding Aid in cement mill for Productivity and Power	248542.8	-	-	Sep - 24
14	Classifier modification	-		60	Under study

Summery of Projects Last 3 Year

Year	No of energy saving projects	Investment (INR Million)	Energy Savings (Million kWh)	Thermal Savings (Million Kcal)	Total Savings (INR Million)	Impact on SEC/ SHC(Electrical kWh/MT cement or Kcal/Kg cement)
FY 2021 - 22	14	125.86	4.75	29254	117.09	Overall 4.2 kWh/Mt Cement power saving. 12.2 Kcal/Kg Clinker thermal saving
FY 2022 - 23	24	1.67	7.63	-	38.25	Overall 3.7 kWh/Mt Cement power saving
FY 2023 - 24	18	28.75	4.08	8930	61.72	3.7 Kcal/Kg Clinker thermal saving

Energy Conservation Projects 2023-24

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Lacs/Annum)
		Electrical (kWh)	Thermal (MTOE)	
1	Raw mill 1 TFG replacement with gravel gate for power saving	840000	-	77.0
2	Energy Efficient Screw Blower in place of existing Tri-Lobe Blower for Jet air Blower	440000	-	51.0
3	Inhouse Modification Raw mill 2 fan impeller tipping by 20 mm.	380400	-	22.10
4	Raw mix optimized to reduce sp. heat consumption	-	-	353.9
5	Cooler ESP fan impeller tipping 50 mm and eliminate stoppages due to resonance at 270 - 310 RPM.	342360	-	19.9
6	3 reciprocating compressor to be replaced with energy efficient screw compressor.	323657	-	18.8
7	Coal mill duct filled with set material ~ 40% area reduced. Impact high pressure resistance across system.	243456	-	14.1

Energy Conservation Projects 2023-24

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Lacs/Annum)
		Electrical (kWh)	Thermal (MTOE)	
8	Inhouse Modification Raw mill 1 fan impeller tipping by 15 mm.	152160	-	8.80
9	Coal mill water spray pattern change from 2 point to linear	129336	-	7.50
10	Inhouse Modification - Optimizing compressed air consumption between 1370 & Baga crusher.	91296	-	5.30
11	Eliminate idle running of air slide blowers in packers by modification in pipeline .	45648	-	2.60
12	Inhouse Modification-Steel Impeller replaced with FRP impeller for 421BL1 & L41MD1 GRR cooling fan.	26945	-	1.60
13	10 No's VFD installation in Nuisance Bag Filter Fans	22190	-	1.30
14	Inhouse Modification - Optimizing compressed air consumption between cement mill & packing plant.	19020	-	1.10

Energy Conservation Projects 2022-23

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Lacs/Annum)
		Electrical (kWh)	Thermal (MTOE)	
1	Cooler fan operation in PID along with cascade mode	1742576	-	87.13
2	Optimized the Bag house DP purging cycle from 90mmwg - 60mmwg. Raw mill fan damper logic modified	1000762	-	50.04
3	Raw Mill : Optimized gap between nozzle and table by fixing 30 mm round bar	644933	-	32.25
4	Cement Mill : Optimized gas velocity 41 m/s from 36 m/s, by reducing nozzle area with additional nozzle blanking	567979	-	28.40
5	Cement Mill false air reduction - Rocker Arm Sealing by flexible cloth and RAL blades gap reduced from 30 mm to 4 mm	425985	-	21.30
6	Cement Mill : Elimination of idle running equipment	391280	-	19.56
7	Modified the bag filter fan suction pipes of packer-2 and isolated 30kWh bag filter from operation	290035	-	14.50

Energy Conservation Projects 2022-23

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Lacs/Annum)
		Electrical (kWh)	Thermal (MTOE)	
8	Cement Mill : Optimized gas velocity from 41 to 46 m/s by implementing scatter ring (65 + 25 mm)	283990	-	14.20
9	Cement Mill : Classifier seal gap reduced by fixing felt through out ring	283990	-	14.20
10	Optimized kiln hood draft from -5 mmwg to -3 mmwg	250190	-	12.51
11	Installed DP transmitter in 4 no's nuisance bag filter i.e. 331BF2, 332BF1, 391BF1, 391BF3, & purging kept on DP mode	205872	-	10.29
12	Raw Mill : Reduction in Input LS Size <50mm by 6% to reduce power consumption	189686	-	9.48
13	2 no's of VFD installation in kiln feed Bag filter (431FNJ & 431FNK)	174258	-	8.71
14	Optimized reverse air fan along with RAL operation in RABH circuit	124470	-	6.22
15	Optimization of nuisance bag filters (321BF1, 321BF2, 331BF2) RPM by optimizing suction pressure at each point	102936	-	5.15
16	Modified venting line and stopped one bag filter i.e. 561BF2 in cement mill circuit	85860	-	4.29

Energy Conservation Projects 2021-22

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Lacs/Annum)
		Electrical (kWh)	Thermal (MTOE)	
1	Partial Cooler upgradation for thermal energy saving. 12 Kcal/Kg Clinker saving established	1440000	0.002880	878.4
2	PID optimisation for minimizing manual operating losses. 0.2 Kcal/Kg clinker saving	528	0.000454	127.0
3	Raw Mill 2 roller and table liner replaced. Mill productivity improved by 10 TPH	241500	-	12.08
4	Coal Mill roller and table liner replacement. 5 TPH gain in output	210000	-	10.5
5	HT motor cooling blower interlock with motor winding temperature	201600	-	10.8
6	Installation of new high efficiency impeller for Raw mill fan 1. 0.4 kWh/MT power saving	800000	-	40.0
7	Installation of new high efficiency impeller for Raw mill fan 2. 0.4 kWh/MT power saving	800000	-	40.0
8	Reduction of false air in cement mill. 0.01 kWh/MT power saving	297900	-	14.9

Energy Conservation Projects 2021-22

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Lacs/Annum)
		Electrical (kWh)	Thermal (MTOE)	
9	Installation of energy efficient blower for Kiln coal firing blowers	377200	-	18.86
10	Automation of VFD/MV drive/SPRS panel room AC automation with room temperature	115200	-	5.76
11	Installation of LED lights in place of existing conventional lights	115200	-	5.76
12	Reduction of suction loss in identified cooler fans by modifying the inlet area	80800	-	4.04
13	Reduction of false air across Coal Mill. 0.01 kWh/MT power saving	45000	-	2.25
14	Installation of BLDC fan with conventional ceiling fans	25200	-	1.26
15	Installation of efficient lighting controls	590	-	0.03

Innovative Project – 1

Raw mill power reduction journey

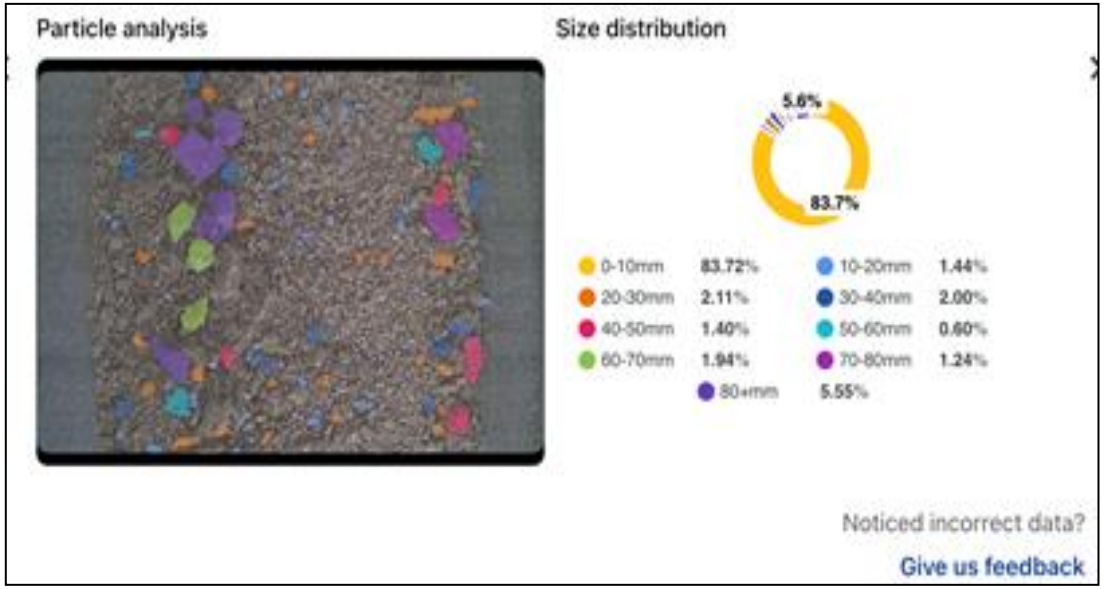
Objective: Reduction of power consumption.

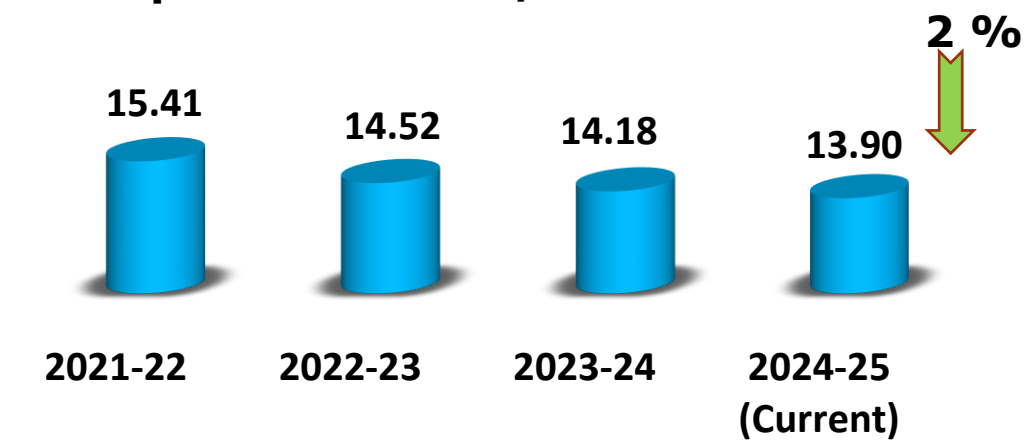
- MCX VRM model – AKXA Controlling to smooth operation. Gain of 0.17 kWh/MT.
- Online Monitoring of limestone size. Gain of 0.12 kWh/MT.
- Installed rotary air lock in place of triple feed gate. Reduction of 6% of false air across mill 1. Gain of 0.27 kWh/MT.
- Optimized mill velocity profile based on feed size and modification in water spray nozzle height. Gain of 0.5 kWh/MT.
- Optimized nuisance bag filter / bag house purging cycle operation. VFD installed. Gain of 0.2 kWh/MT.

Benefits:

- Reduction in Specific Power Consumption by 2.42 kWh/MT material.

Investment: Rs. 91 Lacs.





Integrity | Commitment | Passion | Seamlessness | Speed

Innovative Project – 2

Compressed air power reduction

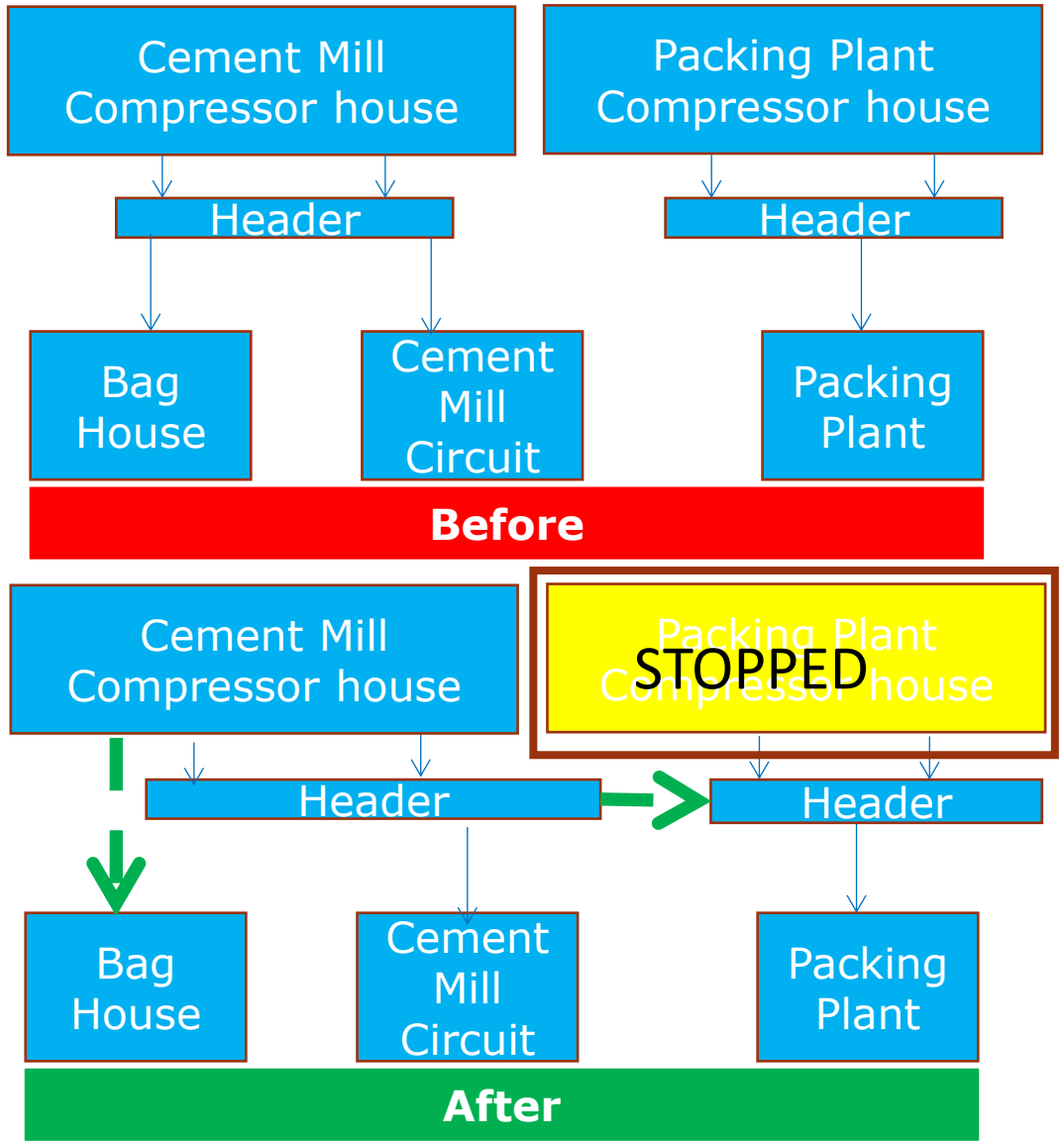
Objective: Reduction of Compressed air consumption

- Utilizing cement mill compressor CP2 for both cement mill as well packing plant.
- Air line made separate & provided valve for common line provision.
- Unloading time reduced by 3 Hrs. Stopped 110 kW compressor while keeping 30 kW compressor as stand by.
- CP1 as dedicated compressor for cement mill bag house and reduce unloading running by 5 hrs.

Benefits:

- Sp. 0.1 kWh/Mt cement power reduction

Investment: In-house



Innovative Project – 3

Kiln Sp. Heat Consumption Reduction

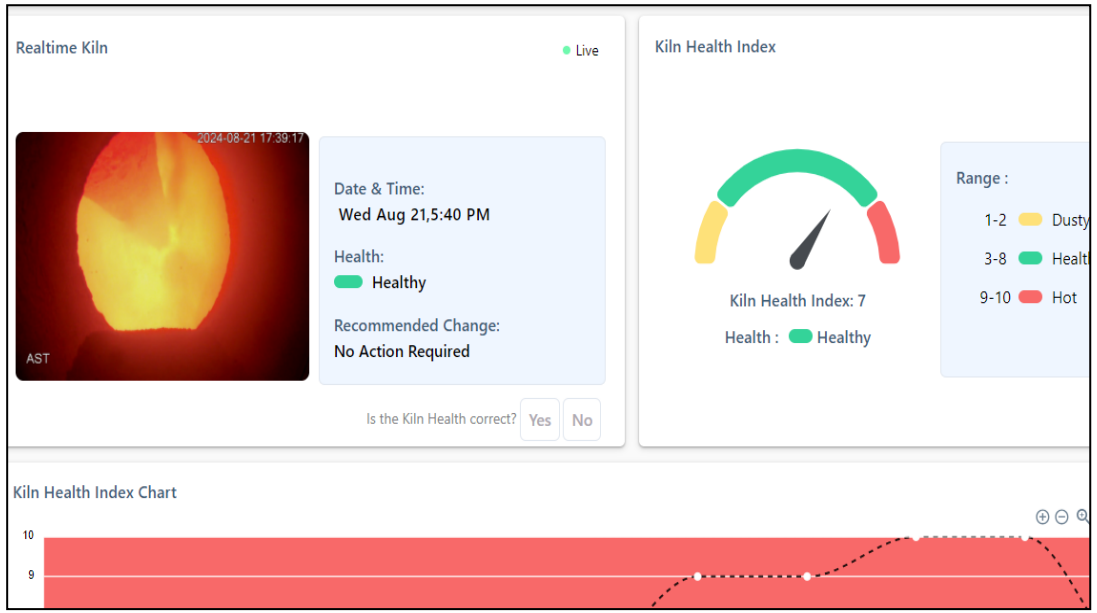
Objective: Reduction of SHC consumption through

- ❑ Installation of flame monitoring IO module to monitor high heat condition and optimize coal. Saving of 1.19 Kcal/Kg Clinker
- ❑ Uses of 100% petcoke by balancing Sulphur through Redmud
- ❑ Cooler grate plate MOC upgrade to improve cooler reliability
- ❑ Optimize cooler stroke from 15 to 12 Stroke / Min.

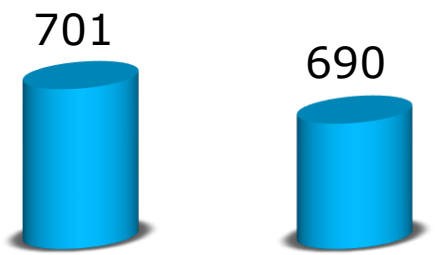
Benefits:

- ❑ Reduction in Specific Heat Consumption by 1.2 Kcal/Kg Clinker.

Investment: Rs. 10 Lacs.

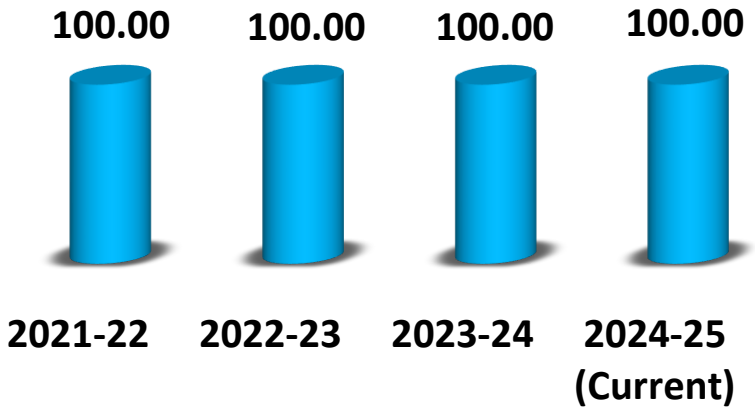


Sp. Heat Kcal/Kg Clk

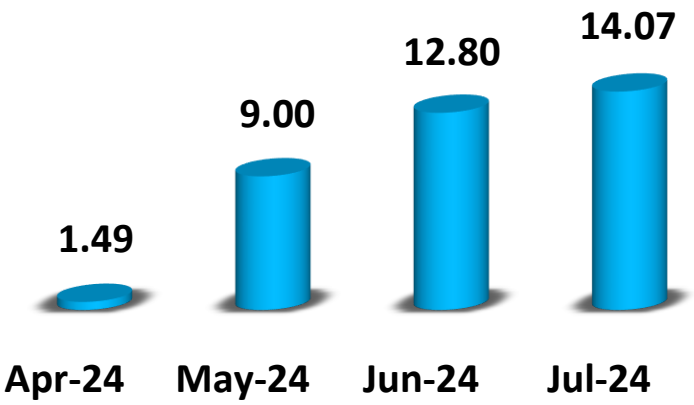


Renewable Energy utilization

Renewable %



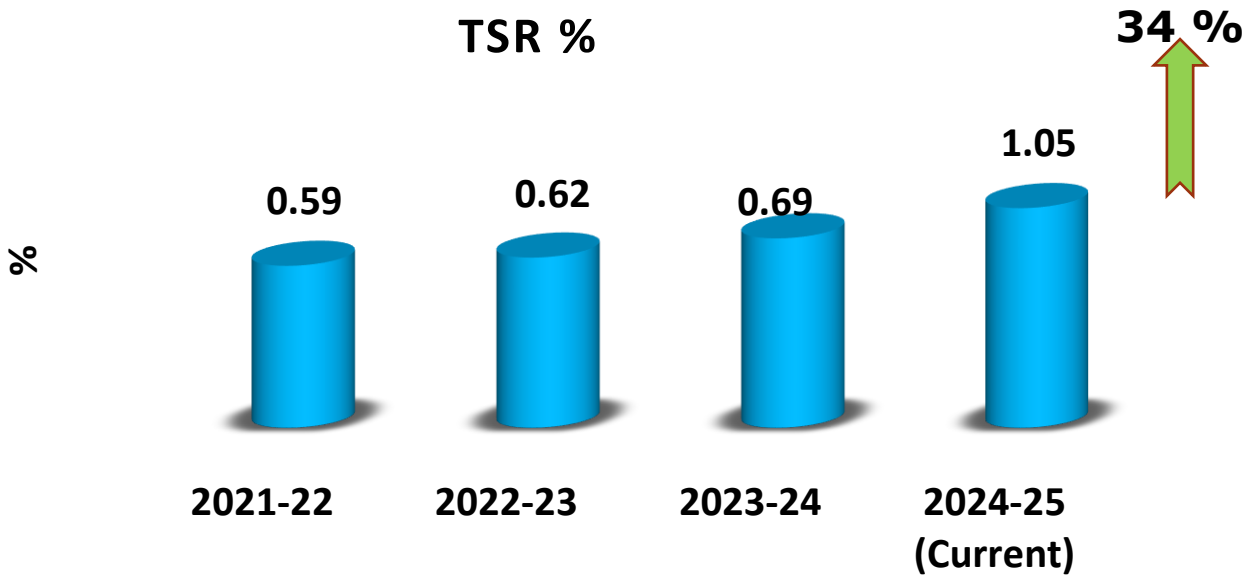
Solar Energy %

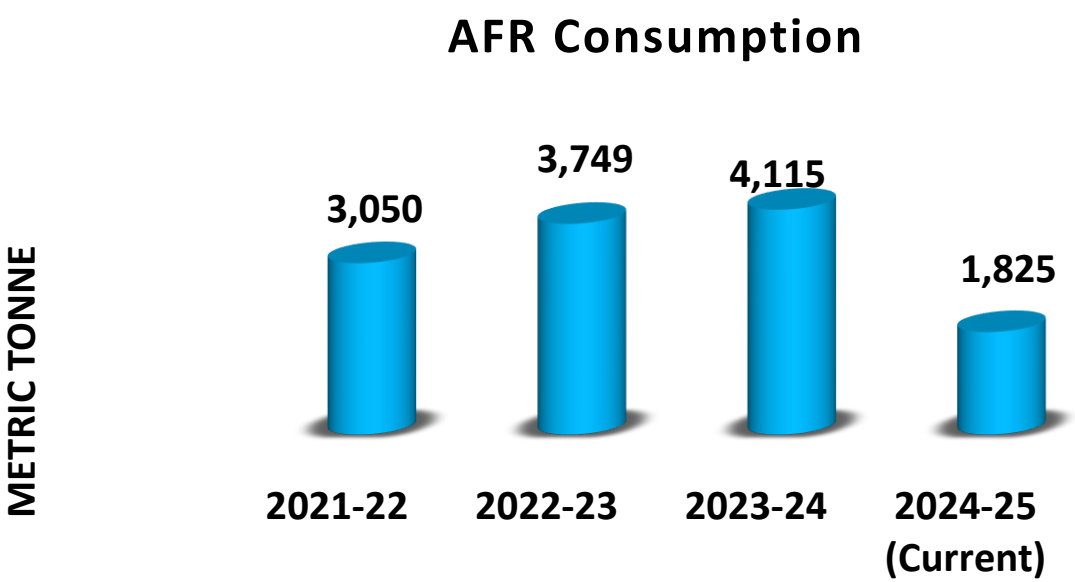


Green Power through WHRS -under pipeline

Utilizing 100 % Renewal Power from State Hydro Electric Projects

Utilization of Waste Material



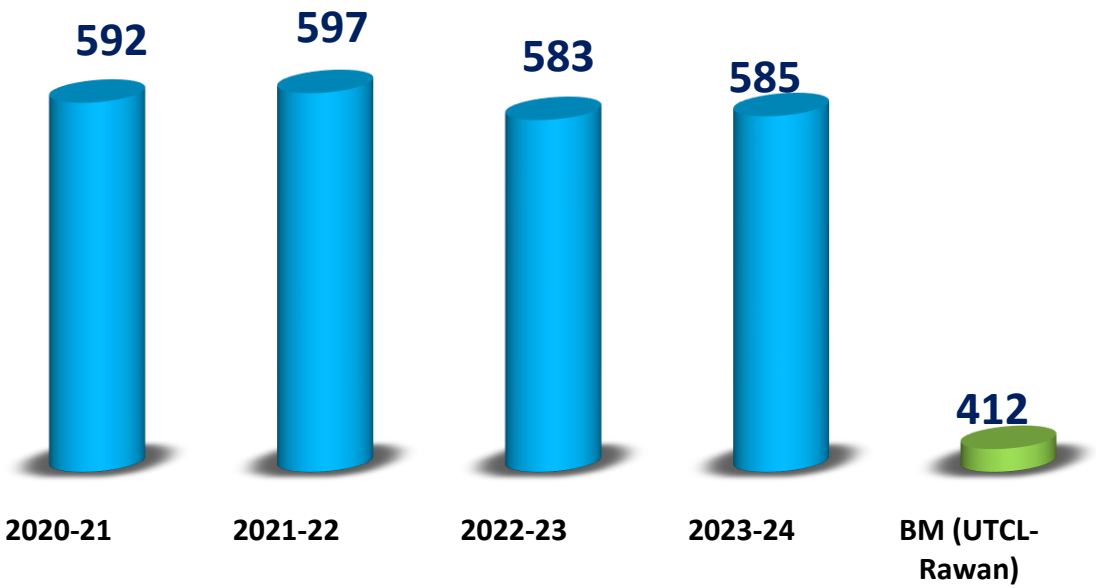


- PLASTIC WASTE
- MSWRDF WASTE
- FMCG WASTE

GHG Inventorisation

Public disclosure in integrated sustainability report 2023-24

Sp. CO_2 Emission Kg CO2/MT Cement



Reduction of net specific Scope 1 emissions by 12% and targeting 27% 2032, from 2017 as base year.

890 MW of Green Energy(Solar + WHRS)
Substitution of 22% of electricity
Targeting 85% by 2030

technology Roto Dynamic HeaterTM (MoU signed with Coolbrook)

EP 100 Commitment achieved ahead of target of year 2035, i.e. doubling of energy productivity from base year 2010

EMS and GreenPro Certification


TÜV NORD

CERTIFICATE

Management system as per

ISO 9001 : 2015

UltraTech Cement Ltd.
(Unit: Baga Cement Works)
Baga Cement Works, Village: Baga,
PO: Kandhar, Tehsil, Arki, Dist. Solan -171 102,
Himachal Pradesh,
India

Manufacture and Dispatch of Clinker and Cement.

ISO 9001


TÜV NORD

CERTIFICATE

Management system as per

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Manufacture and Dispatch of Clinker and Cement.

ISO 14001


TÜV NORD

CERTIFICATE

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ISO 45001


TÜV NORD

CERTIFICATE

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Himachal Pradesh,
India

Manufacture and Dispatch of Clinker and Cement.

ISO 50001


DNV

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the centrally implemented management system for

UltraTech Cement Limited

Baga Cement Works Village Baga, P.O - Kandhar, Tehsil: Arki, District: Solan - Himachal Pradesh - 171102, India

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

This certificate is valid for the following site scope:
Management of information security pertaining to IT services provided by information technology department in accordance with the statement of applicability version 5.0 dated 15-Feb-2022

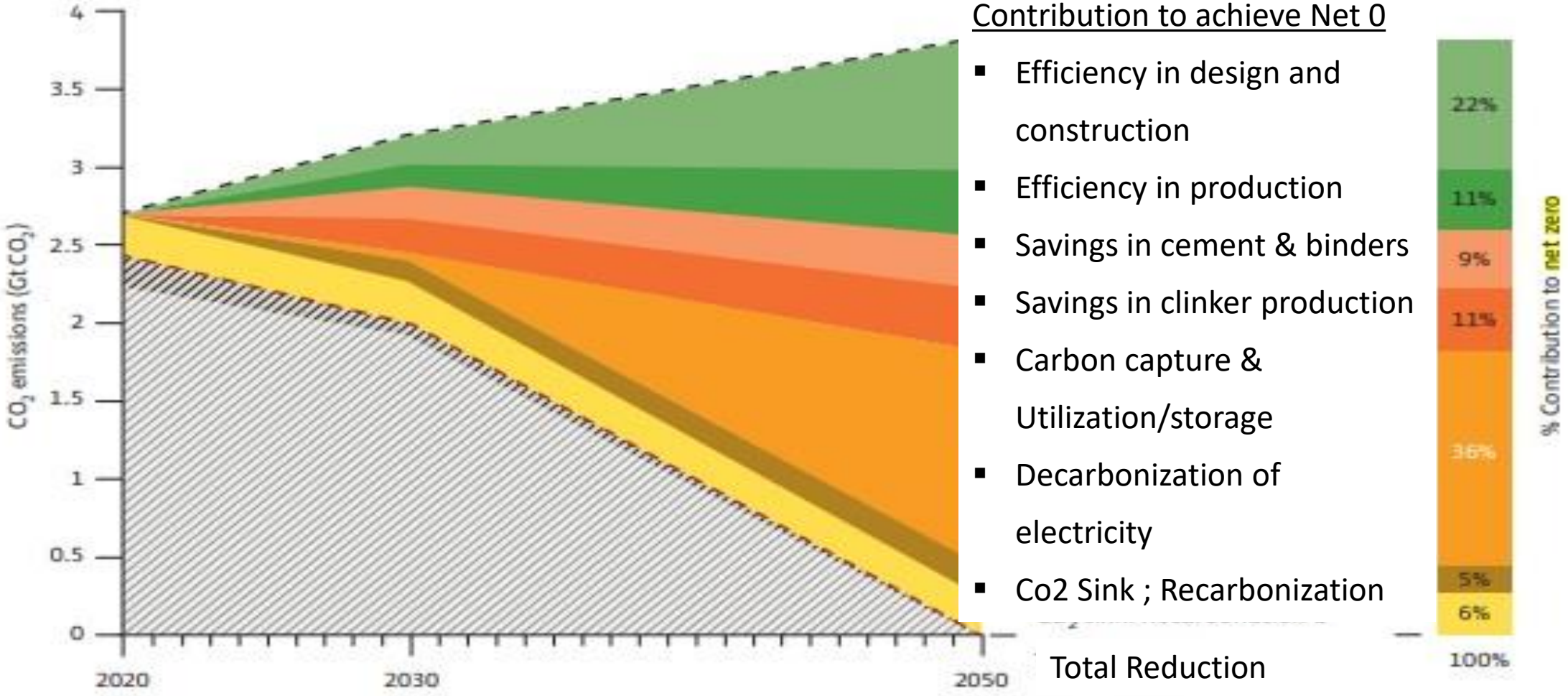
ISO 27001

Have GreenPro certification of our products

Integrity | Commitment | Passion | Seamlessness | Speed

UltraTech Net Zero Pathway

- We are the founding members of Global Cement and Concrete Association (GCCA)
- We are among global leaders striving to produce carbon-neutral concrete by 2050



Contribution to achieve Net 0

- Efficiency in design and construction
- Efficiency in production
- Savings in cement & binders
- Savings in clinker production
- Carbon capture & Utilization/storage
- Decarbonization of electricity
- Co2 Sink ; Recarbonization

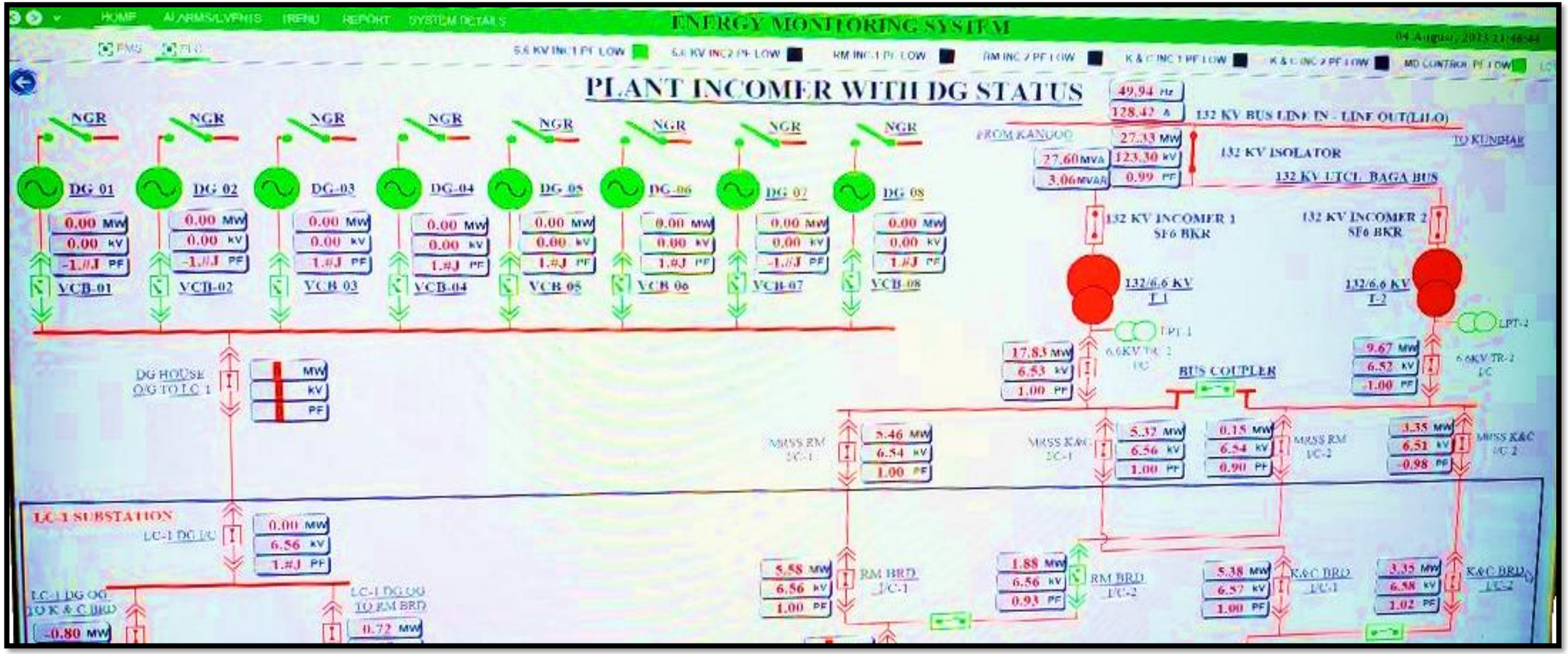
Total Reduction

Unit's Achievements

- **Quality Consistency Award From BIS PARWANOO BRANCH *For Zero Customer Complaint In Last Three Years***
- **Uses of 100% Petcoke**
- **Awarded with Five star rated mine by Ministry of Mines**
- **Baga has won The Prestigious" CII Excellent Energy Efficient Unit" Award. It is highest in the award category – Sep 23.**
- **Appreciation letter from HP State for using the Municipal waste as Alternative Fuel**
- **Manufacturing of PPC using 100% wet fly ash (34.99%)**

Energy Monitoring, Reporting & Implementation Methodology

Online Energy Monitoring System

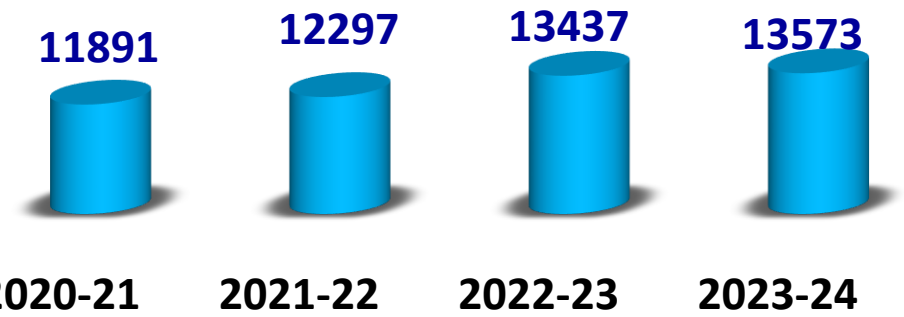


Integrity | Commitment | Passion | Seamlessness | Speed

Best Practices in Green Supply Chain

- **Reverse Logistics in Trucks**
- **Eye on Wheels – to reduce truck turnaround time**

Reverse Logistics – No. of Truck



Incoming Flyash Trucks

Outgoing Clinker & Cement Trucks

Awards: Journey Towards Excellence

CII 25th National Award for Excellence in Energy Management 2024

Looking Ahead

- 2019 — Golden Peacock Env. Mngmt. Award
- 2019 — Apex India Quality Excellence
- 2019 — Apex India HR Excellence
- 2019 — ISO Certifications
- 2019 — CII Quality Circle Debut Award
- 2019 — NCB commendation certificate for Energy Efficiency and Environment Excellence
- 2019 — FICCI Road Safety Award
- 2019 — GreenTech Safety Excellence Award
- 2020 — ASSOCHAM "The Energy Efficiency Award"
- 2021 — FAME Business Excellence Award
- 2022 — Appreciation Certificate from Himachal State Government for AFR initiatives
- 2023 — CII-Award "Excellence in Energy Management" Second Year in a Row
- 2024 — "Mines 5 Star Rating" 4th year in a Row

Integrity | Commitment | Passion | Seamlessness | Speed

Energy Auditor/Manager

Name- Deepak Kumar Pandey
Energy Auditor / Manager No-15950

Name- Sunder Shyam Jha
Energy Manager No- 16351.

Name –Pramod Kumar Verma
Energy Manager No- 14780.

ADITYA BIRLA
UltraTech

Build beautiful
UltraTech CEMENT
The Engineer's Choice

Save Energy Now for a better tomorrow

Thank You

Integrity | Commitment | Passion | Seamlessness | Speed