



CII 24th National Award for Excellence in Energy Management 2023



UTCL – Baga Cement Works



Integrity

Commitment

Passion

Seamlessness

Speed



1. Company Profile & Products



2. Specific Energy Consumption (Thermal; Electrical-100% renewal).

3. Road Map to achieve Benchmarked performance



4. Energy Saving Projects

5. Innovative Projects



6. Waste utilization and management

7. GHG Inventorisation



8. EMS & Green Pro certification

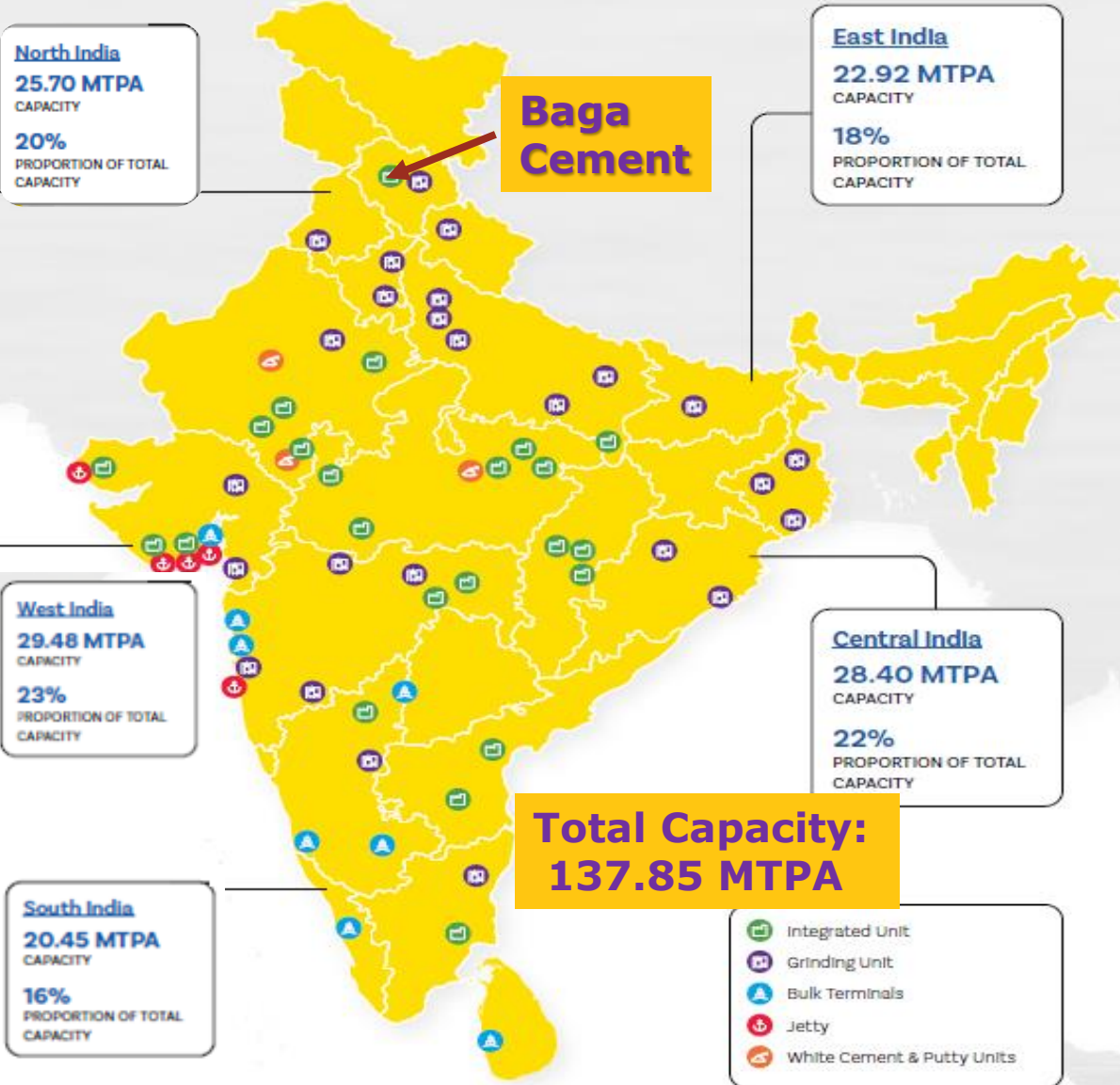
9. Net Zero Commitment

10. Milestones

11. EMS Monitoring

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

UltraTech Baga Cement Works -Profile



Production Capacity Installed
Clinker : 3.3 MTPA; Cement : 2.5 MTPA
Product Mix:
PPC - 48%; OPC 43 - 34%; OPC 53 - 18%

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



Integrity

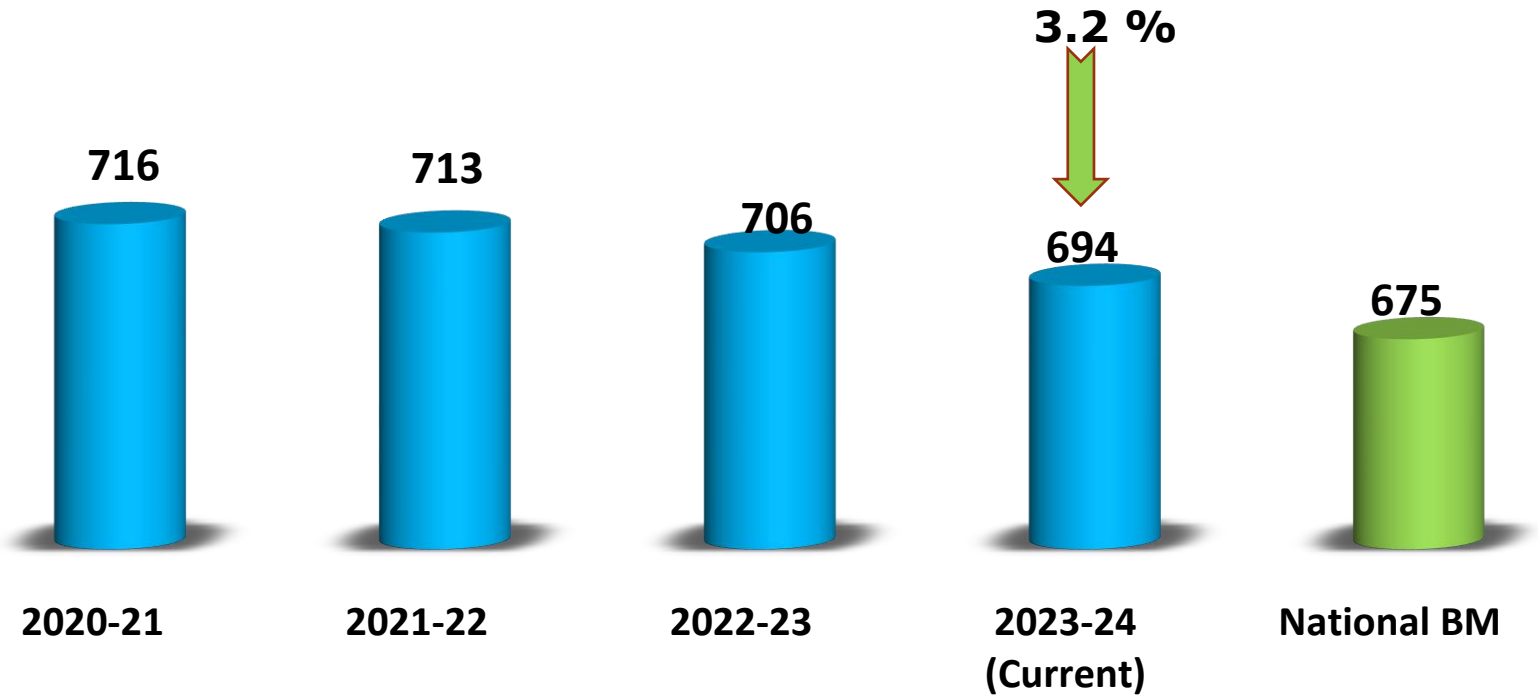
Commitment

Passion

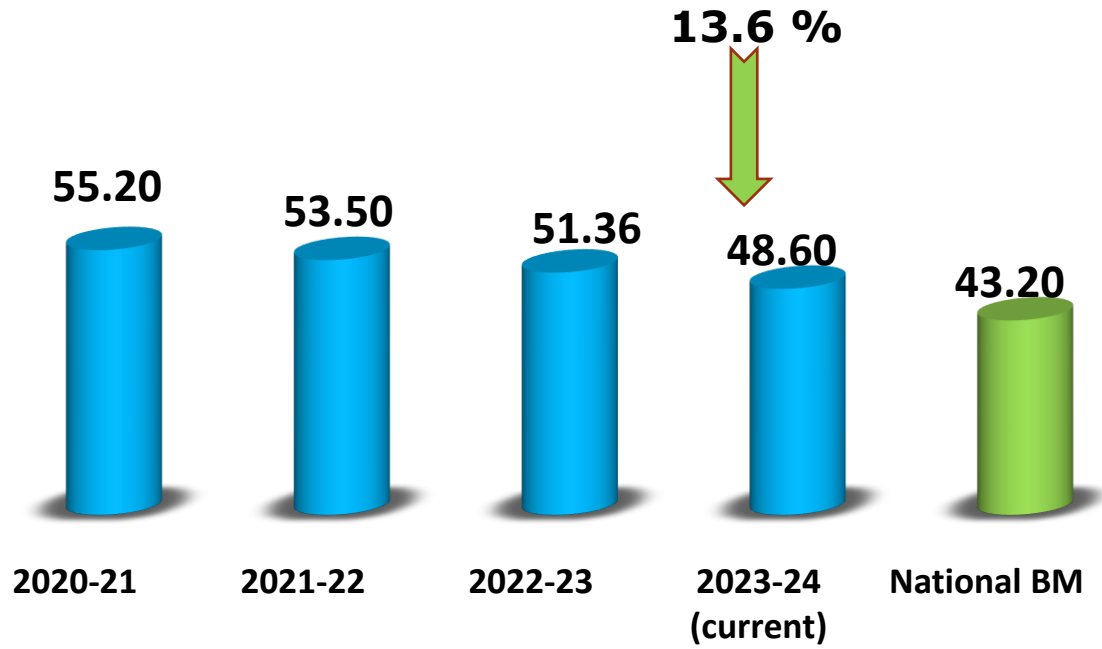
Seamlessness

Speed

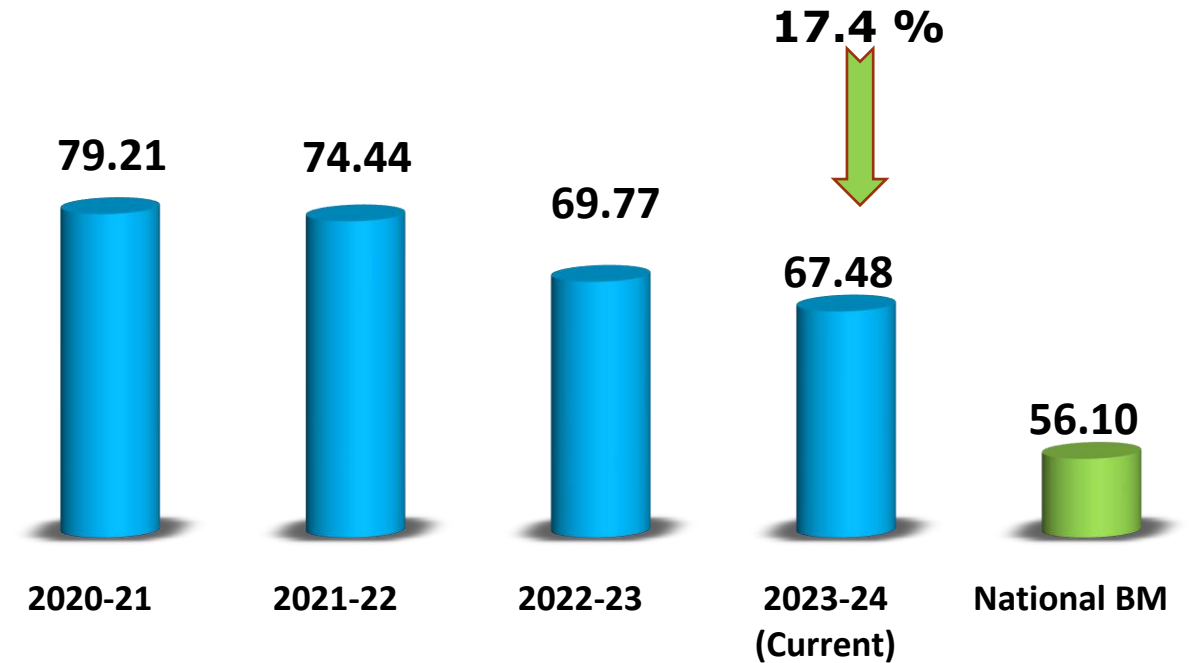
Sp. Heat (Kcal/Kg of Clinker)



Sp. Power kWh/MT of Clinker

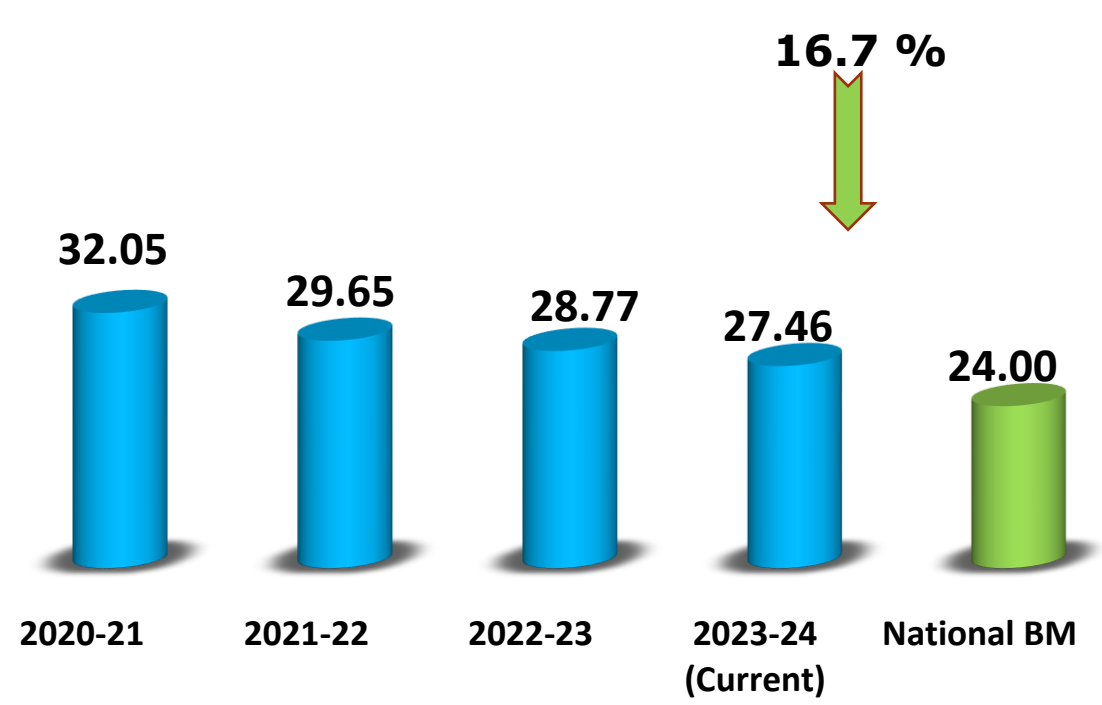


Total Sp. Power kWh/MT of Cement

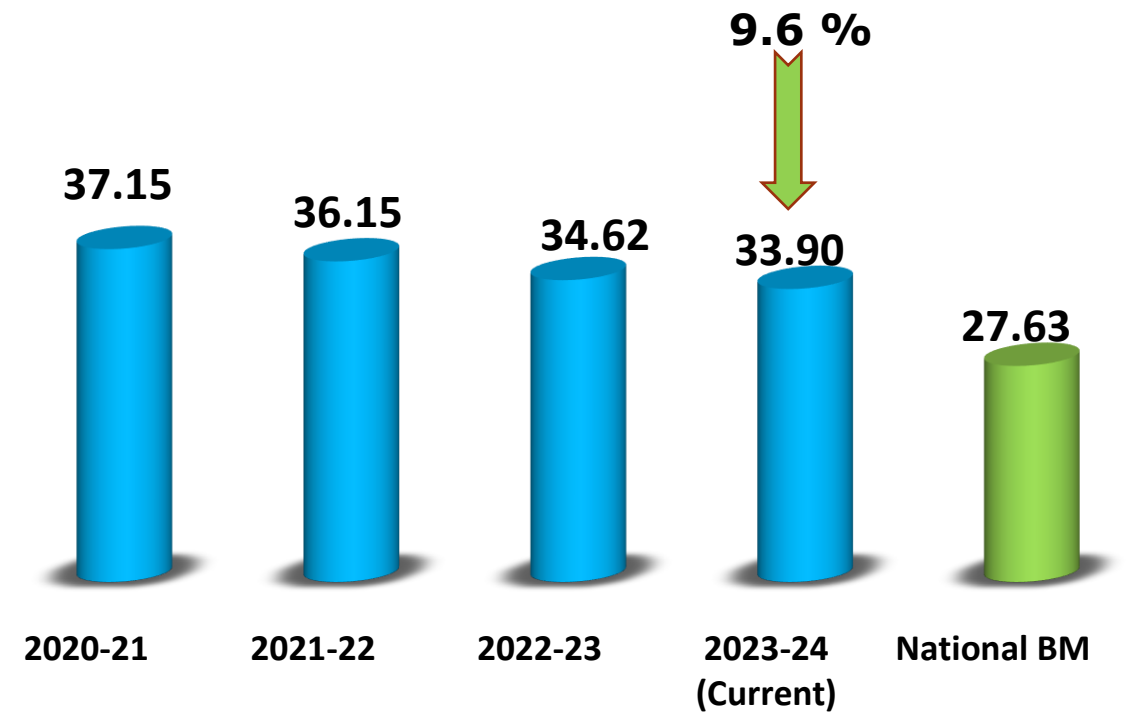


Electrical Energy Performance OPC 43 & 53

OPC 43 : Sp. Power kWh/MT of Cement

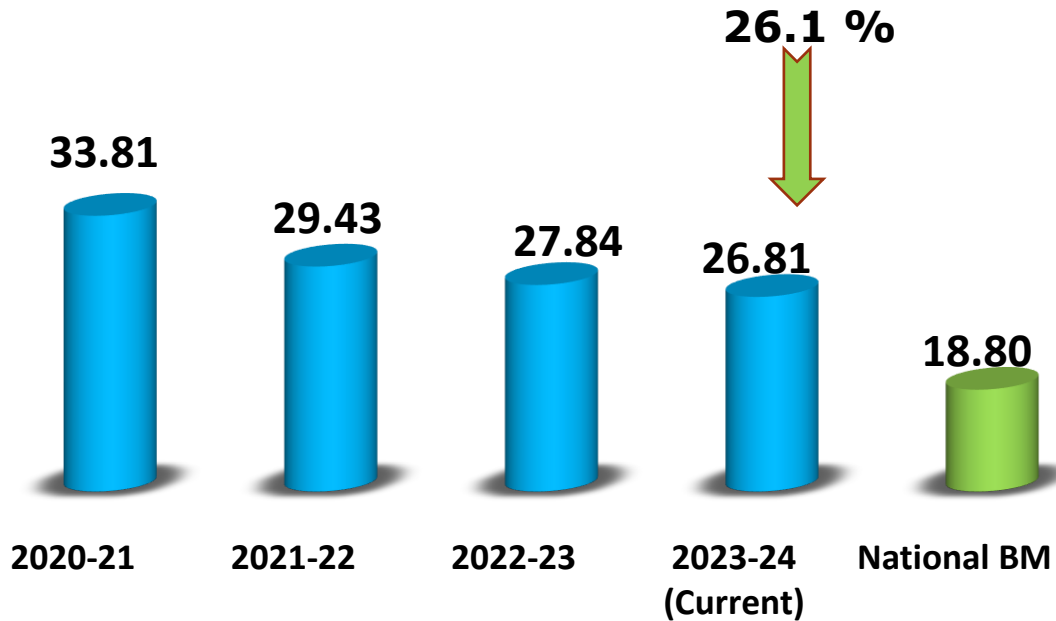


OPC 53 : Sp. Power kWh/MT of Cement

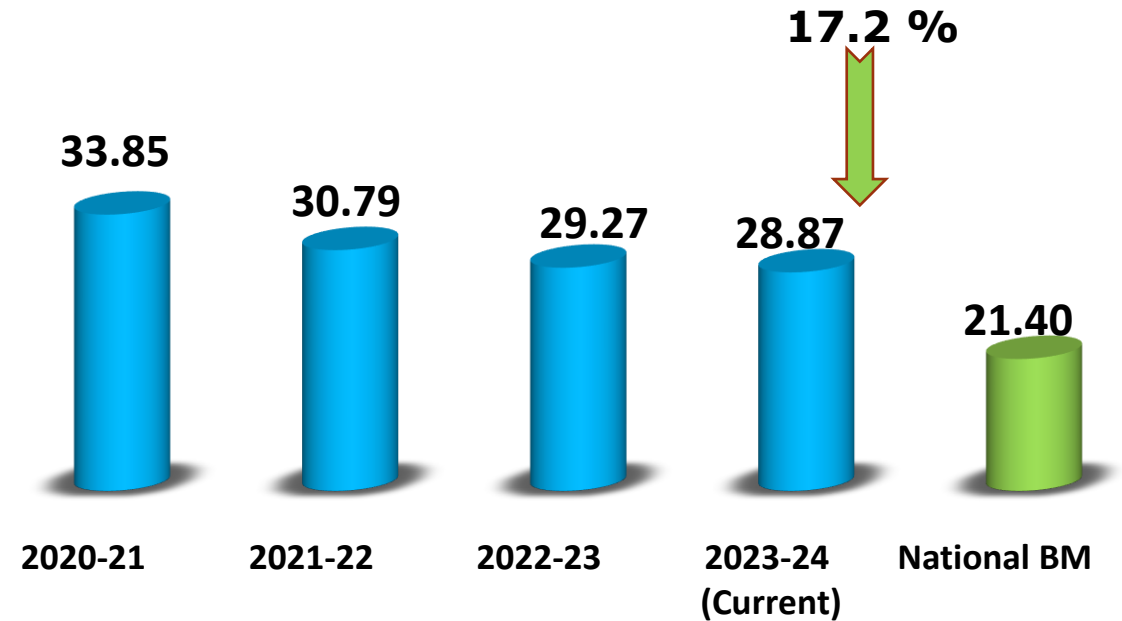


Electrical Energy Performance PPC & Total Cement

PPC : Sp. Power kWh/MT of Cement



Combined : Sp. Power kWh/MT of Cement



Utilizing 100 % Renewal Power from State Hydro Power Projects

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Road Map to achieve Benchmarks

Sr. No.	Ongoing Encon Projects 2023-24	Investment (INR Million)	Energy Savings (Million kWh)	Thermal Savings (Million Kcal)	Target
1	Raw mill 1 TFG replacement with gravel gate for power saving	7.7	0.84	-	Completed
2	Energy Efficient Screw Blower in place of existing Tri-Lobe Blower for Jet air Blower	5.1	0.44	-	Completed
3	WHRS installation	400	67.2	-	11 MW Capacity Preliminary study completed
4	3 reciprocating compressor to be replaced with energy efficient screw compressor.	10	0.46	-	In-process
5	Clinker Sp. heat consumption reduction	In-house	--	24000	Plan 10 Kcal/kg clk. achieved 5 Kcal/kg clk till date
6	Raw mill 2 TFG replacement with gravel gate for power saving	7.7	0.84	-	In-process

Road Map to achieve Benchmarks

Sr. No.	Ongoing Encon Projects 2023-24	Investment (INR Million)	Energy Savings (Million kWh)	Thermal Savings (Million Kcal)	Target
7	Predictive alerts(IoT) for small-medium rotary equipment - Online vibration and temperature Monitoring	6.0	0.32	-	In-process
8	Process optimization through digitalization likes PID tuning, MCX VRM Model, Blaine prediction etc.	5.0	0.98	-	In-process
9	VFD installation in Nuisance Bag Filter Fans	1.0	0.13	-	Capex under execution
10	Cement mill Baghouse fan replacement with high efficiency fan	9.0	0.79	-	Capex under execution
11	Automation of STP Operation	0.1	0.04	-	Under planning

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Summery of Projects Last 3 Year



Year	No of energy saving projects	Invest ment (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 2020 - 21	12	17.20	7.47	-	37.30	Overall 2.0 kWh/Mt Cement power saving
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 3.6 kWh/Mt Cement power saving

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Energy Conservation Projects 2022-23



Sr. No.	Name of energy saving projects	Invest ment (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)
1	Cooler fan operation in PID along with cascade mode	In-house	1.74	-	8.71	0.07 kWh/Mt
2	Optimized the Bag house DP purging cycle from 90 to 60mmwg. Raw mill fan damper logic modified	In-house	1.00	-	5.02	0.4 kWh/Mt
3	Raw Mill : Optimized gap between nozzle & table by fixing 30 mm bar	In-house	0.64	-	3.23	0.02 kWh/Mt
4	Cement Mill : Optimized gas velocity 41 m/s from 36 m/s, by reducing nozzle area with nozzle blanking	In-house	0.56	-	2.81	0.4 kWh/Mt
5	Cement Mill false air reduction - Rocker Arm Sealing by cloth & RAL blades gap reduced from 30 to 4 mm	0.32	0.43	-	2.13	0.3 kWh/Mt
6	Cement Mill : Elimination of idle running equipment	In-house	0.39	-	1.95	0.4 kWh/Mt
7	Modified the bag filter fan suction pipes of packer-2 and isolated 30kWh bag filter from operation	In-house	0.29	-	1.45	0.1 kWh/Mt

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Energy Conservation Projects 2022-23

Sr. No.	Name 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)
8	Cement Mill : Optimized gas velocity from 41 to 46 m/s by implementing scatter ring (65 + 25 mm)	In-house	0.283	-	1.42	0.2 kWh/Mt
9	Cement Mill : Classifier seal gap reduced by fixing felt through out ring	In-house	0.28	-	1.42	0.2 kWh/Mt
10	Optimized kiln hood draft from -5 mmwg to -3 mmwg	In-house	0.25	-	1.25	0.1 kWh/Mt
11	Installed DP transmitter in 4 no's nuisance bag filter & purging kept on DP mode	In-house	0.20	-	1.01	0.06 kWh/Mt
12	Raw Mill : Reduction in Input LS Size <50mm by 6%	In-house	0.18	-	0.95	0.05 kWh/Mt
13	2 no's of VFD installation in kiln feed Bag filter (431FNJ & 431FNK)	1.0	0.17	-	0.87	0.07 kWh/Mt
14	Optimized reverse air fan along with RAL operation in RABH circuit	In-house	0.12	-	0.62	0.07 kWh/Mt
15	Optimization of nuisance bag filters (321BF1, 321BF2, 331BF2) RPM by optimizing suction pressure at each point	In-house	0.10	-	0.51	0.06 kWh/Mt

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Energy Conservation Projects 2022-23

Sr. No.	Name 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)
16	Modified venting line and stopped one bag filter i.e. 561BF2 in cement mill circuit	In-house	0.08	-	0.42	0.05 kWh/Mt
17	Raw Mill 2 moon plate reorientation to improve nozzle velocity from 38 to 41 m/s	In-house	0.08	-	0.43	0.07 kWh/Mt
18	RM Classifier seal gap reduction by fixing felt circumferentially to cover gap	In-house	0.08	-	0.41	0.04 kWh/Mt
19	Fan impeller tipping by 25 mm in Raw mill 1 and 2	In-house	0.07	-	3.79	0.04 kWh/Mt
20	Modification of water spray nozzle to ensure water spray in Raw Mill 2.	In-house	0.06	-	3.43	0.06 kWh/Mt
21	Coal Mill fan power reduction with optimized impeller cut off gap.	In-house	0.06	-	3.02	0.04 kWh/Mt
22	Coal Mill Table and Roller rebuilding work. Mill productivity improved by 4 TPH	In-house	0.04	-	2.28	0.02 kWh/Mt
23	Installation of Fan-less cooling tower. 150 kW/Day saving	0.07	0.03	-	1.85	0.02 kWh/Mt
24	Eliminated idle run of mixing chamber 2 no's of RAL Raw Mill	In-house	0.0007	-	0.37	0.01 kWh/Mt

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Energy Conservation Projects 2021-22



Sr. No.	Name 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)
1	Partial Cooler upgradation	99.30	1.44	28800	87.84	12 Kcal/Kg
2	PID optimisation for minimizing manual operating losses.	6.00	0.1	454	12.70	0.2 Kcal/Kg
3	Raw Mill 2 roller & table liner replaced. Mill productivity improved by 10 TPH	0.68	0.24	-	1.28	0.04 kWh/MT
4	Coal Mill roller & table liner replacement. 5 TPH gain in output	0.32	0.21	-	1.05	0.01 kWh/MT
5	HT motor cooling blower interlock with motor winding temperature	2.00	0.20	-	1.08	0.08 kWh/MT
6	Installation of new high efficiency impeller for Raw mill fan 1 & 2.	15.8	1.60	-	8.00	0.6 kWh/MT
7	Reduction of false air in cement mill.	In-house	0.29	-	1.49	0.01 kWh/MT

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Energy Conservation Projects 2021-22

Sr. No.	Name 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)
8	Installation of energy efficient blower for Kiln coal firing blowers	0.80	0.37	-	1.89	0.13 kWh/MT
9	Automation of VFD/MV drive/SPRS panel room AC automation with room temperature	1.50	0.11	-	0.58	0.14 kWh/MT
10	Installation of LED lights in place of existing conventional lights	0.21	0.11	-	0.58	0.01 kWh/MT
11	Reduction of suction loss in identified cooler fans by modifying the inlet area	In-house	0.08	-	0.40	0.002 kWh/MT
12	Reduction of false air across Coal Mill.	In-house	0.04	-	0.23	0.01 kWh/MT
13	Installation of BLDC fan with conventional ceiling fans	0.22	0.02	-	0.13	0.01 kWh/MT
14	Installation of efficient lighting controls	0.03	0.0006	-	0.003	0.01 kWh/MT

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Energy Conservation Projects 2020-21

Sr. No.	Name 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)
1	Raw Mill 1 and 2 gas flow optimized through installation of deflector plate.	In-house	2.10	-	10.50	0.4 kWh/MT
2	Cement Mill roller liner replacement work for power saving.	In-house	0.31	-	15.61	2.5 kWh/Mt
3	SPRS installation in Raw Mill 2 Fan. 200 kWh power saving.	9.00	0.78	-	3.93	0.6 kWh/MT
4	RM 2 classifier modification through SRSMES PD across classifier reduced by 40 mmwg.	6.00	0.70	-	3.50	0.6 kWh/MT
5	Coal dosing Low Pressure compressor replacement with root blower.	1.20	0.26	-	1.30	0.13 kWh/MT
6	Cement Mill HAG replacement with high-capacity idle HAG (16 Mcal/Hr). PPC output increased by 10 TPH	In-house	0.22	-	1.10	1.0 kWh/Mt

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Energy Conservation Projects 2020-21

Sr. No.	Name 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)
7	Reduction of pressure drop in the fan of RABH 1&2 by removing the damper.	In-house	0.10	-	0.53	0.05 kWh/Mt
8	Installation of lower size / new energy efficient water pump (centrifugal).	0.40	0.10	-	0.54	0.05 kWh/Mt
9	Installation of energy efficient LED lights in place of conventional lights	0.25	0.07	-	0.35	0.06 kWh/Mt
10	High efficiency screw compressor for packing plant.	0.60	0.06	-	0.32	0.1 kWh/MT
11	Installation of new high efficiency water pump in cement mill area	0.14	0.02	-	0.15	0.06 kWh/Mt
12	Optimization of the operation of RA fan and Bag House Fan in RABH	In-house	0.01	-	0.06	0.03 kWh/Mt

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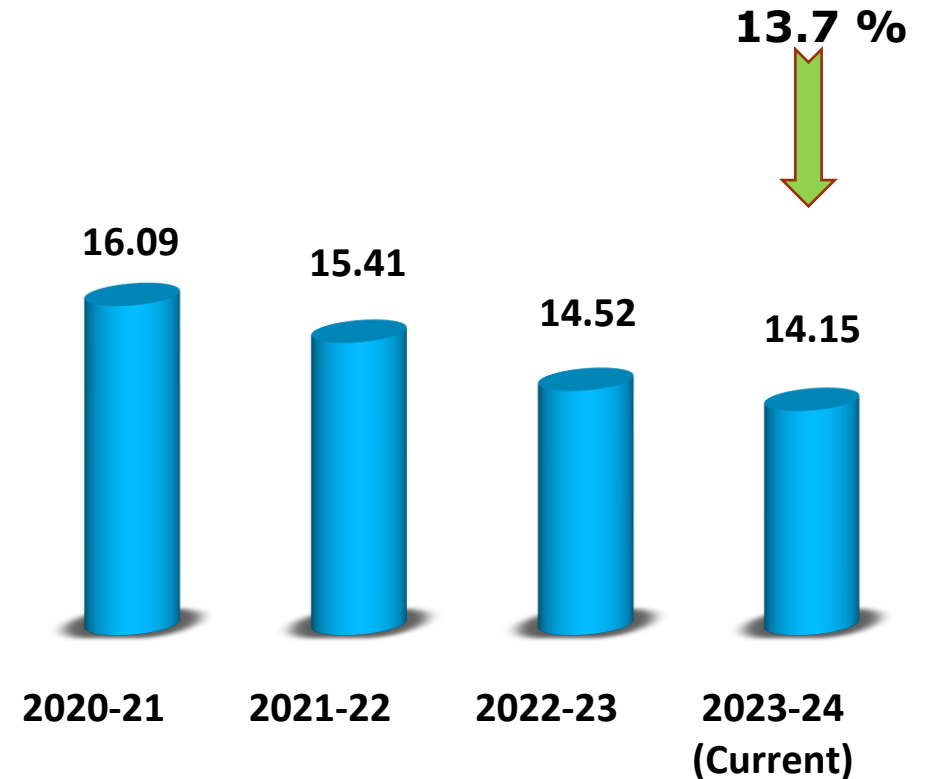
Objective: Reduction of power consumption.

- ❑ Replaced raw mill fan impeller with high efficiency 83%. Gain of 0.4 kW/MT.
- ❑ Installed rotary air lock in place of triple feed gate. Reduction of 6% of false air across mill.
- ❑ Fan power reduction by tipping of impeller. Gain of 0.4 kWh/MT.
- ❑ Optimized mill velocity profile by reducing gap between table & scatter ring, nozzle blanking and modification in water spray nozzle. 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 1.94 kWh/MT material.

Sp. Power kWh/MT of Material



Investment:

Rs. 265 Lacs.

Objective:

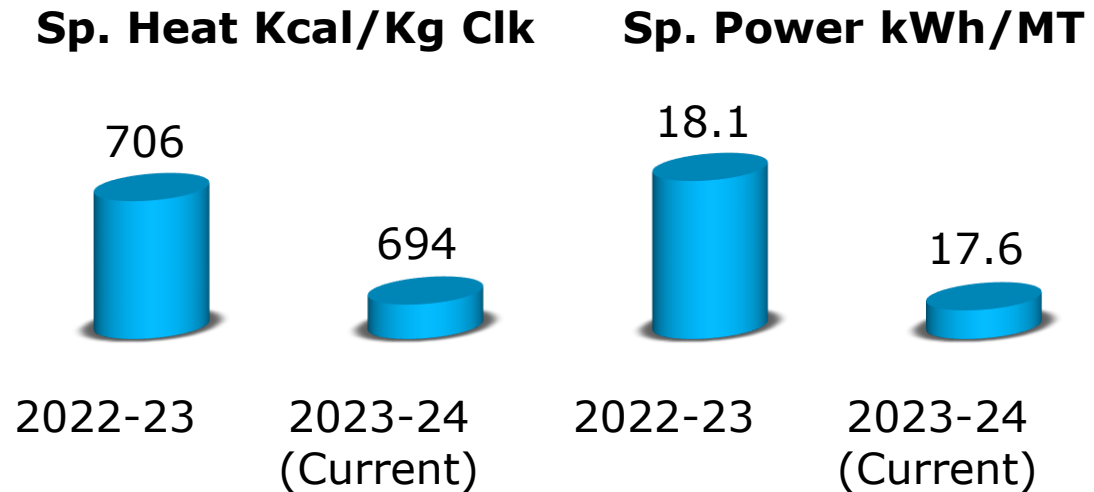
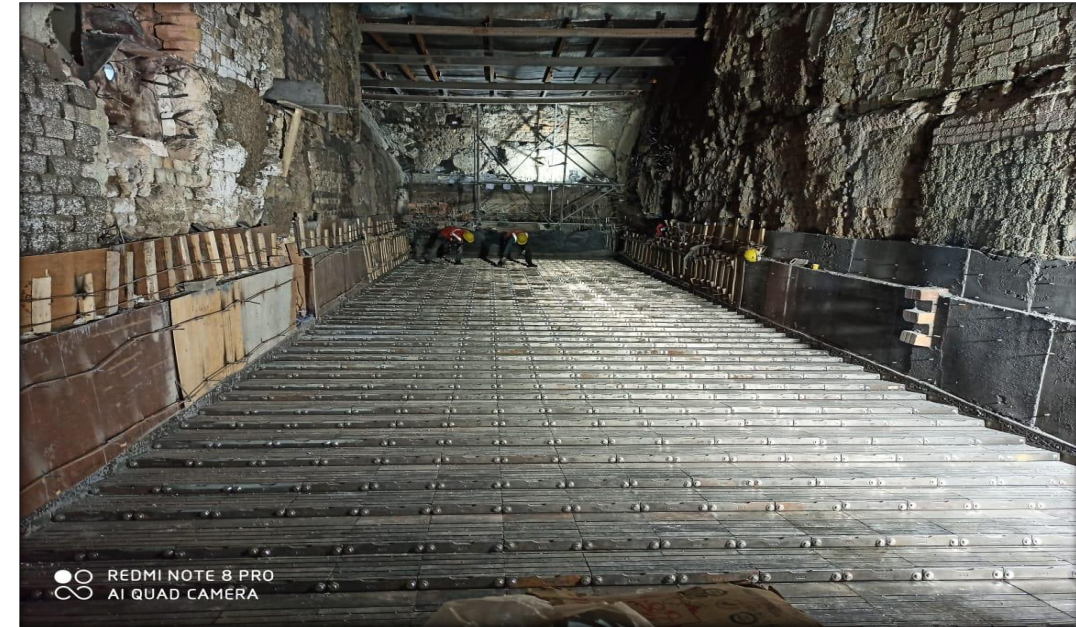
Cooler upgradation: Static grate along with 1st and 2nd grate pyro step cooler modified to Cemprotec cooler.
Technology used : High pressure low volume.

Benefits:

- Reduction in Specific Heat Consumption by 12 Kcal/kg Clinker
- Improved Reliability
- Better Operational Control
- Flexible control for better Heat Recuperation

Investment:

Rs. 991 Lacs



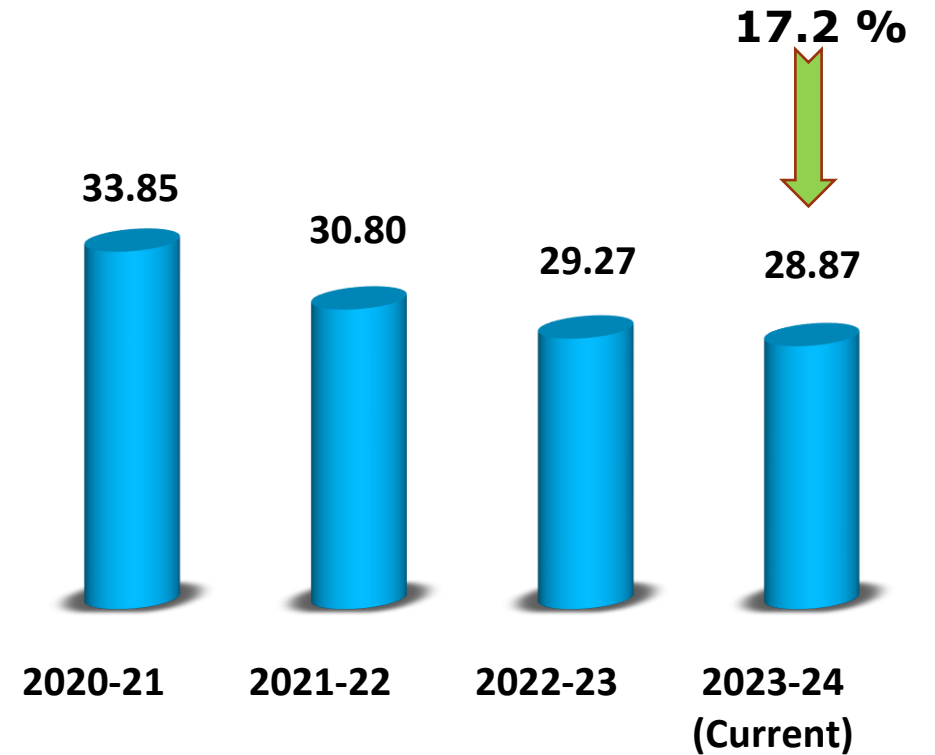
Objective: Reduction of power consumption.

- ❑ Optimized mill velocity profile from 39 to 44 and further 48 m/s & dam ring height optimized. Gain of 0.8 kWh/MT of cement.
- ❑ Scatter ring area reduced to reduce pressure drop across nozzle. Gain of 0.2 kWh/MT.
- ❑ Optimized nuisance bag filter / bag house purging operation. Gain of 0.1 kWh/MT.
- ❑ Eliminated idle running of equipment (RAL, airslide blowers, bag filters etc.) by modification in circuit.
- ❑ Reduction of false air across circuit (~ 10%) by roller sealing, RAL blades clearance reduction.
- ❑ Improved classifier efficiency by eliminating seal gap.

Benefits:

- ❑ Reduction in Specific Power Consumption by 4.98 kWh/MT of cement.

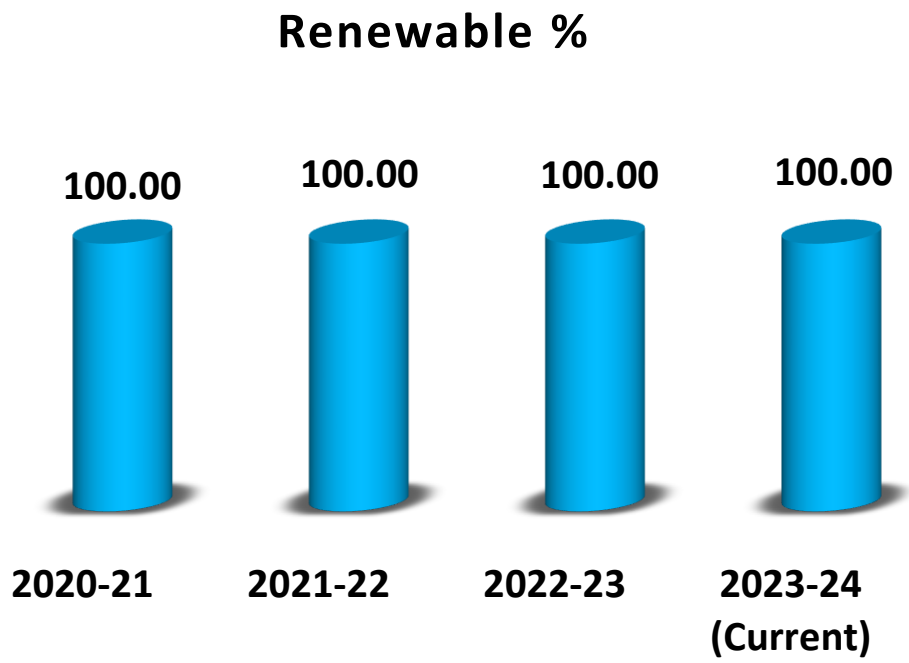
Sp. Power kWh/MT of Cement



Investment:

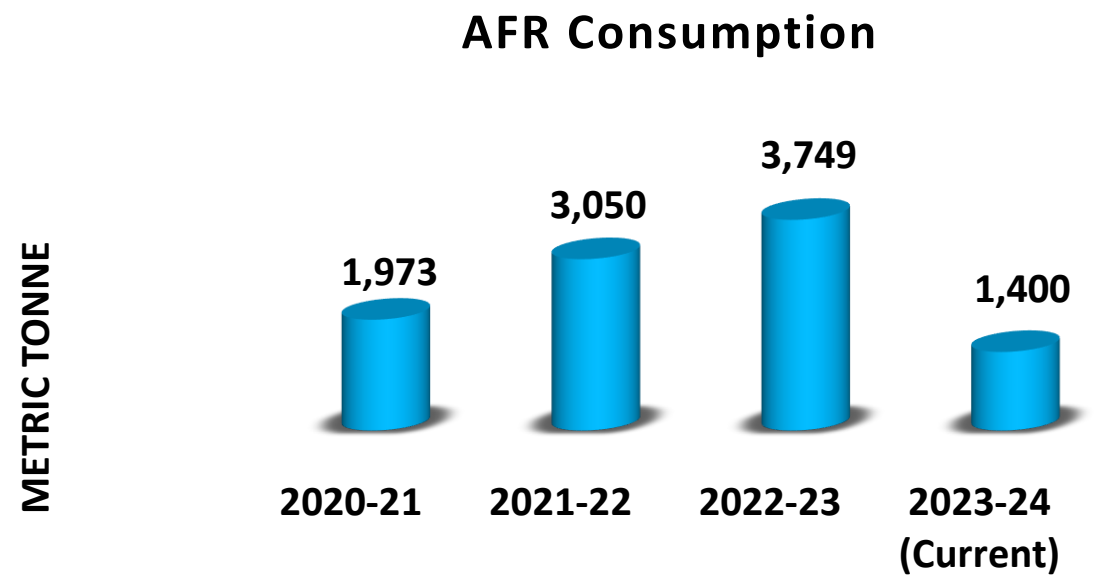
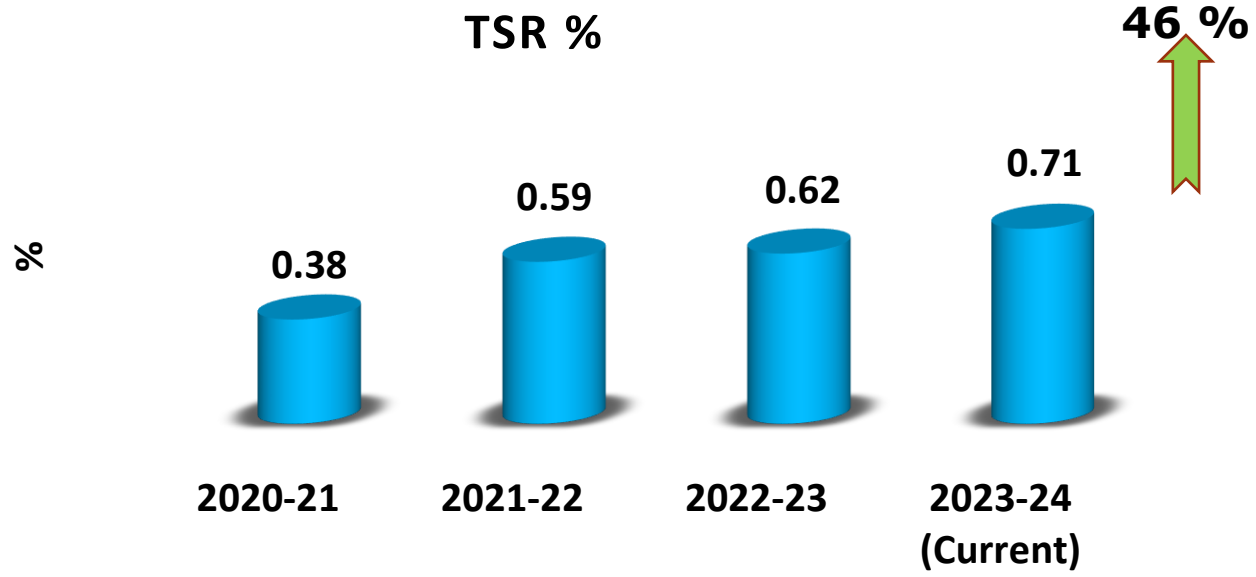
Rs. 86 Lacs.

Green Power through WHRS -under pipeline



Utilizing 100 % Renewal Power from State Hydro Electric Projects

Utilization of Waste Material

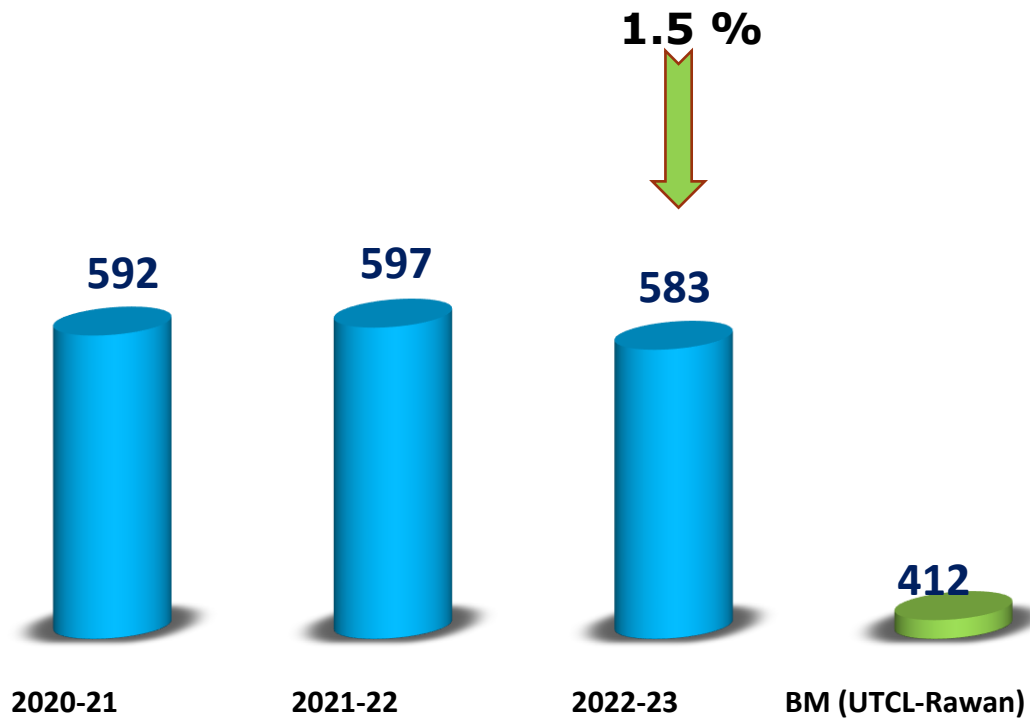


- WOODEN CHIPS
- MSWRDF WASTE
- SAW DUST
- FMCG WASTE
- PLASTIC WASTE



Public disclosure in integrated sustainability report 2022-23

Sp. CO₂ Emission Kg CO₂/MT Cement



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

Substitution of 34% of electricity by green energy by 2024.

MoU signed with Coolbrook for implementation of their technology Roto Dynamic Heater TM



EMS and GreenPro Certification



ISO 9001

ISO 14001

ISO 45001

ISO 50001

ISO 27001



Have GreenPro certification of our products



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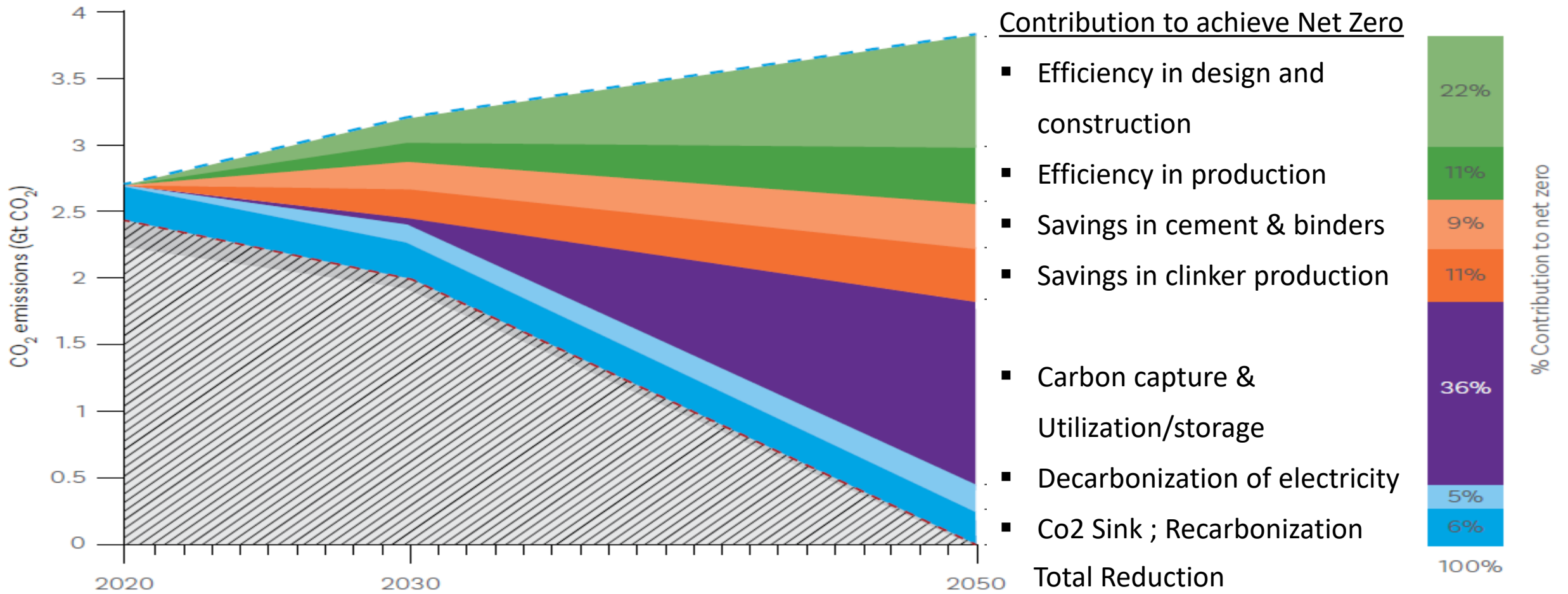
Passion

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UltraTech Net Zero Pathway

- We are the founding members of Global Cement and Concrete Association (GCCA)
- We are committed to reduce Scope 1 Emissions by 27% by the year 2032



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Manufacturing of PPC using 100% pond ash (35%)

Lowest Overall sp. power 66.52 kWh/MT of Cement

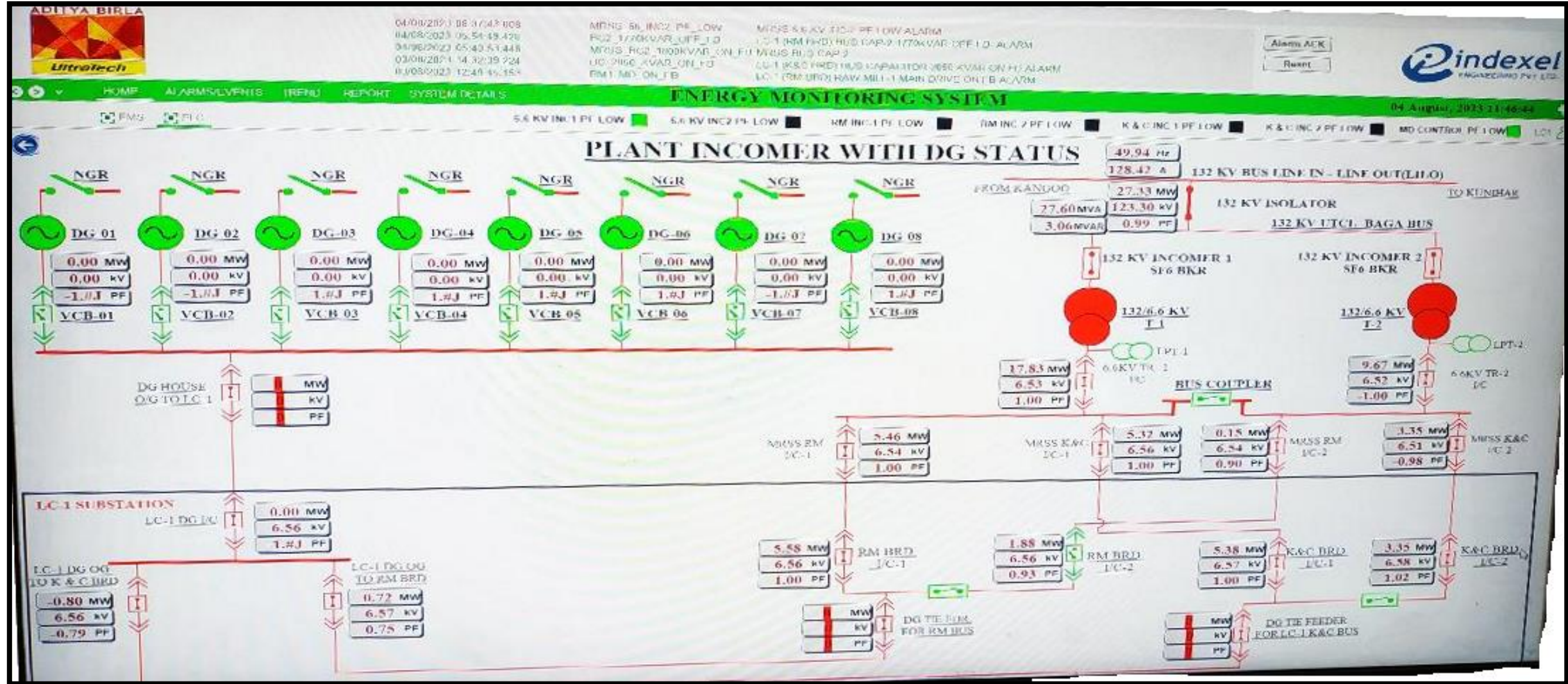
Lowest Clinkerization sp. power 47.72 kWh/MT of Clinker

Lowest cement mill sp. power 28.33 kWh/MT of Cement

Reduction of specific heat -12 Kcal/Kg clinker

Appreciation letter from HP State for using the Municipal waste as Alternative Fuel

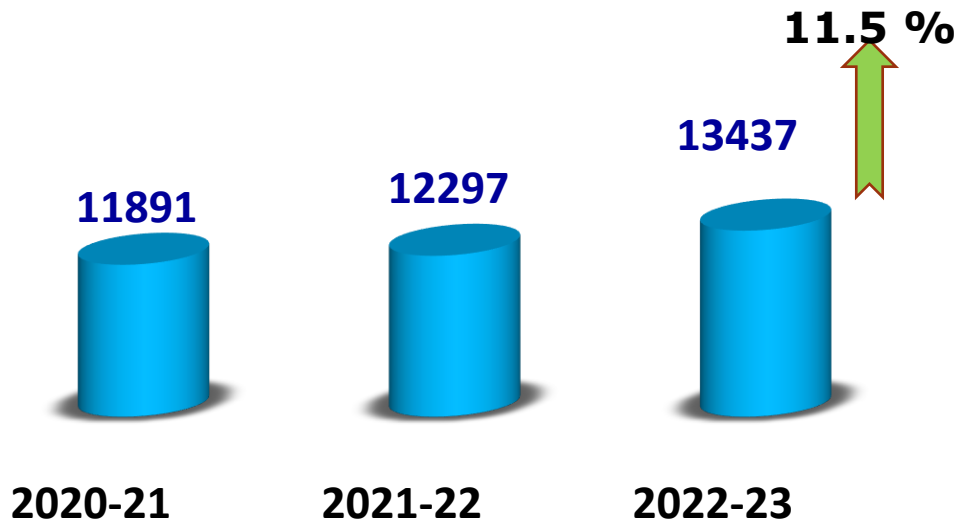
Online Energy Monitoring System





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

Reverse Logistics – No. of Truck



Incoming Flyash Trucks



Outgoing Clinker & Cement Trucks

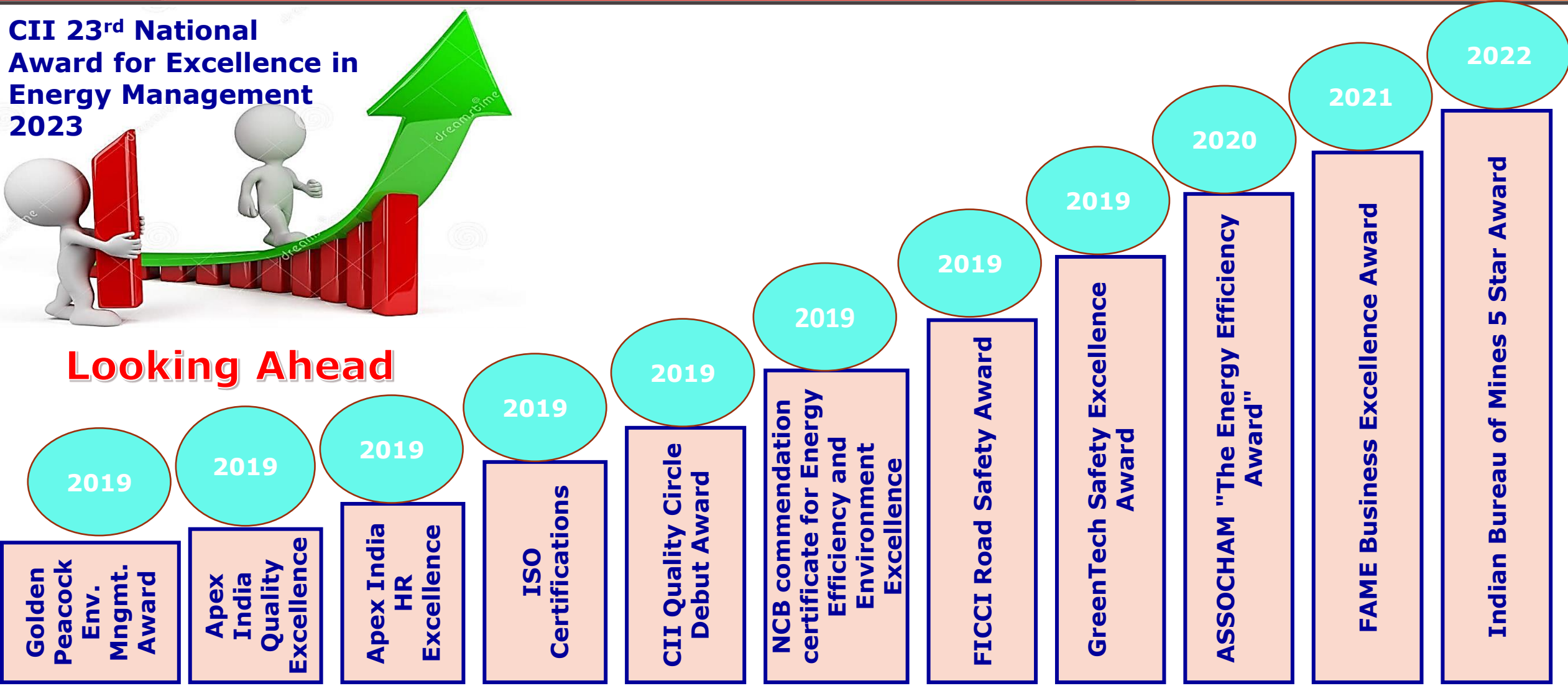


Awards: Journey Towards Excellence

CII 23rd National Award for Excellence in Energy Management 2023



Looking Ahead





**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.**

Practice Conservation For the Future Generation

Thank You



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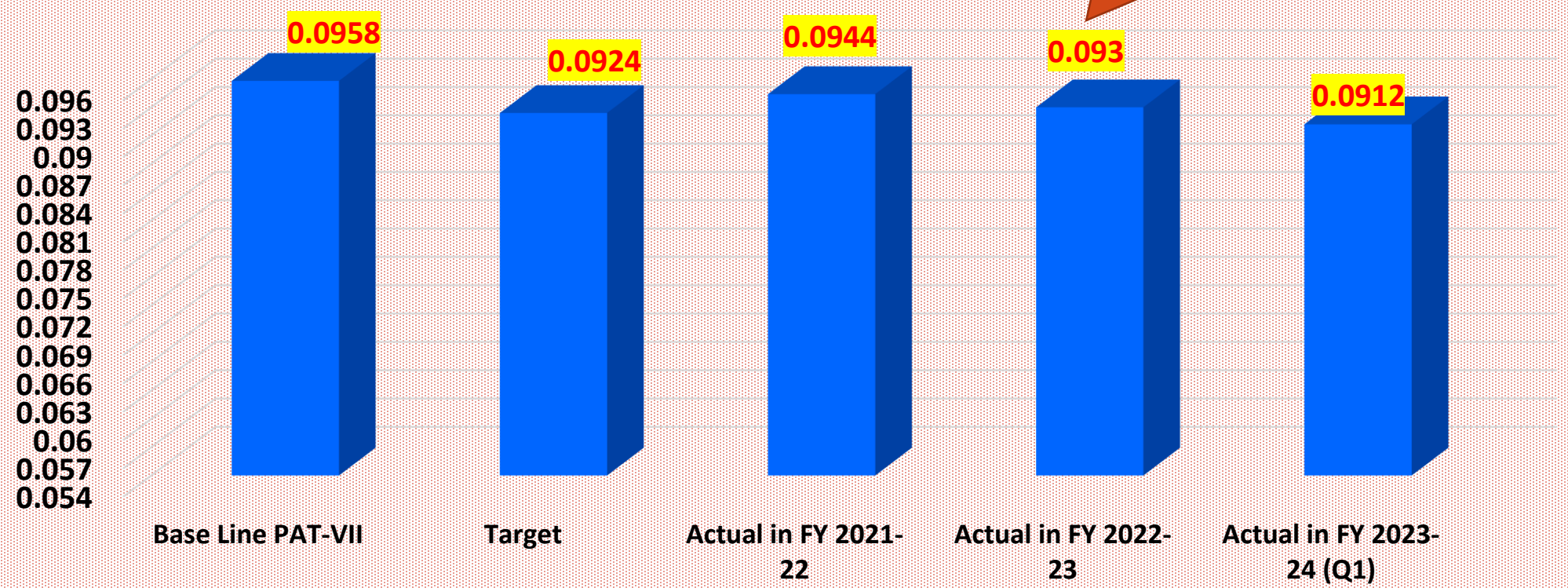
Passion

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PAT Status – 7987 Ecerts Achieved

TOE/Ton of Product



Save Energy - Save Money - Save the Planet

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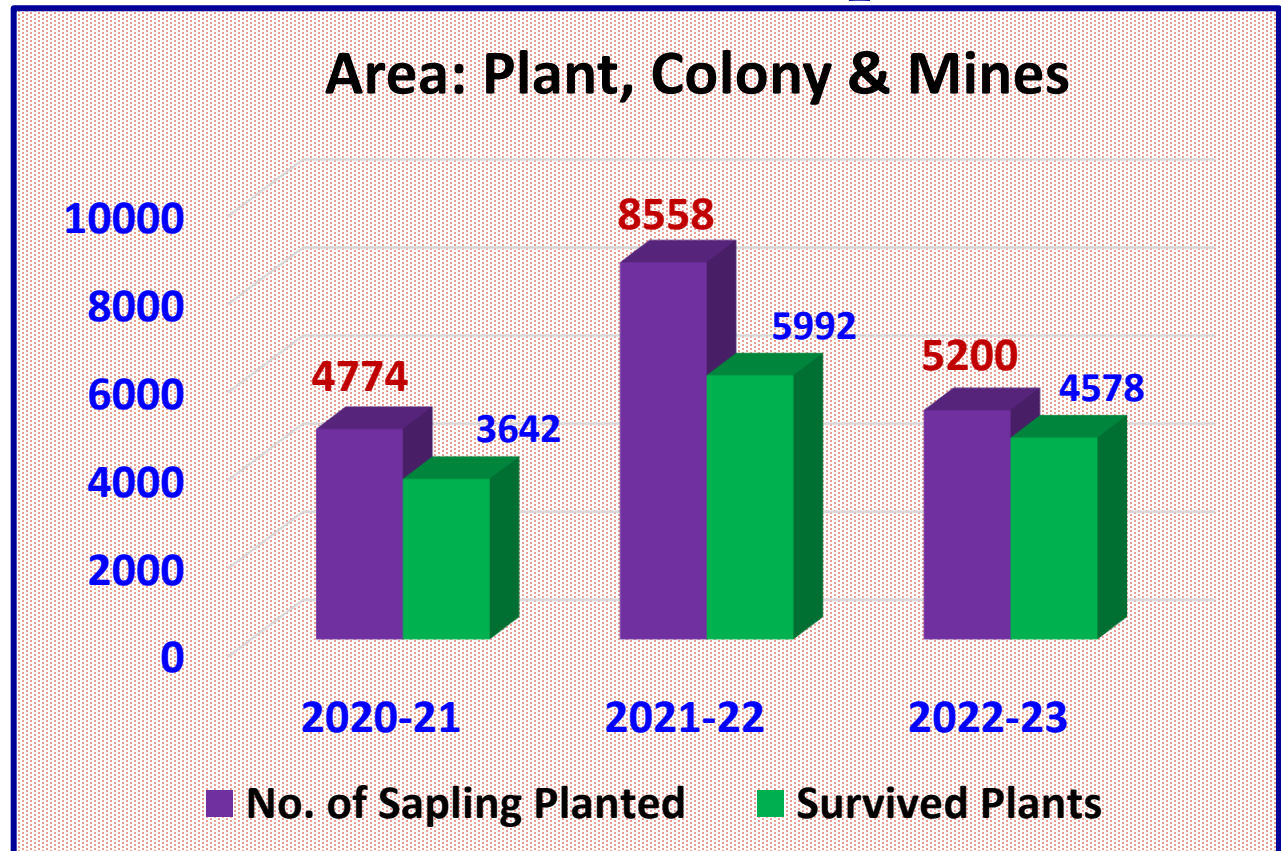
Speed

Rain Water Positive Ratio



Entire water requirement for Baga Bawan & Security Resident & STP treated water reuse in the dust separation and Horticulture.

Green Belt Development

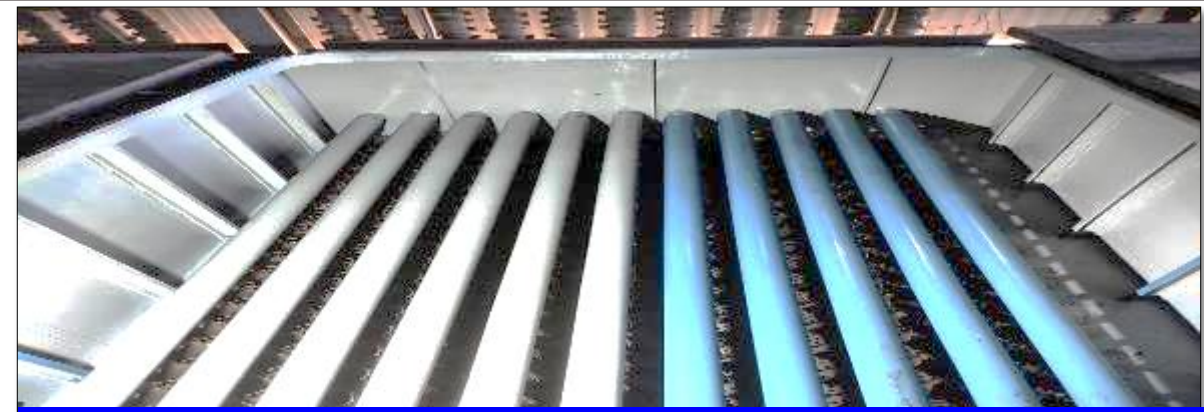


Unit is committed to develop Green Belt with cumulative Plantation till FY23- 111215

Environmental Initiatives



Installed new Hydraulic filter press at township STP, to reduction of evaporation and fast drying process of sludge in rainy seasons



Regular maintenance and cleaning of installed Bag filters by using pulse jet air method



Organized various environmental awareness programs, to aware environmental issues i.e. Single use plastic ban, world environment day, world water day etc

Dedicated Energy Cell

Cross Functional Action Team for Energy Conservation

1	LS Crushers	Mr. Sunder Jha	Instt. (SH)	5	Cement Mill	Mr. Deepak Pandey	Electrical(SH)
		Mr. Kamal Dev	Mech.			Mr. JD Babu	Mech
		Mr. Satyaendra Singh	Elect.			Mr. Rakesh Sharma	Instt.
		Mr. Rajendra Pathat	Mines Operations			Mr. Amardeep Khuje	Process
		Mr. Manoj Kumar	Mech.			Mr. Vikas Kumar	Mech(SH)
2	Raw Mills	Mr. Hemant Verma	Mech(SH)	6	Packing Plant	Mr. R.Mohan Reddy	PP Operation
		Mr. Phoolchand Prajapati	Tech. Services			Mr. Kanwar Chauhan	Mech
		Mr. Bishwajit Biswal	Electrical			Mr. Jayant Batta	Instt.
		Mr. Manish Diwedi	Process			Mr. Devendra Rajvi	Elect.
		Mr. Anup Kumar	Instt.			Mr. K.V.Ranga Reddy	Electrical(SH)
3	Coal Mill	Mr. Pramod Verma	Electrical(SH)	7	Utility	Mr. Manoj Tiwari	Utility (SH)
		Mr. Abhishek Kumar	Mech.			Mr. Hemendra Sisodiya	Mech.
		Mr. Vijay Negi	Instt.			Mr. Anshul Bali	Elect.
		Mr. Nirmal Das	Process			Mr. Bhargab Goswami	Electrical
		Mr. Gopal Sharma	Electrical				
4	Kiln	Mr. Diwan Kashyap	Instt. (SH)				
		Mr. Kanukuntal Raju	Mech				
		Mr. Umesh Devliya	Mech				
		Mr. Nitin Kumar	Process				
		Mr. Rajesh Sharma	Electrical				

Energy Cell Meeting

- All team presents sectionwise Power and Performance
- Discussion over deviation (if any)
- New Ideas on power saving
- Target date and Responsibility allocation
- Last meeting MOM review