

J K Cement Muddapur Works, Karnataka



**Shri. Umashankar
Choudhary**
Unit Head



Shri. K Srinivasu
Technical Head



Presenter Details



Mr. Rajan Jha
Senior Manager



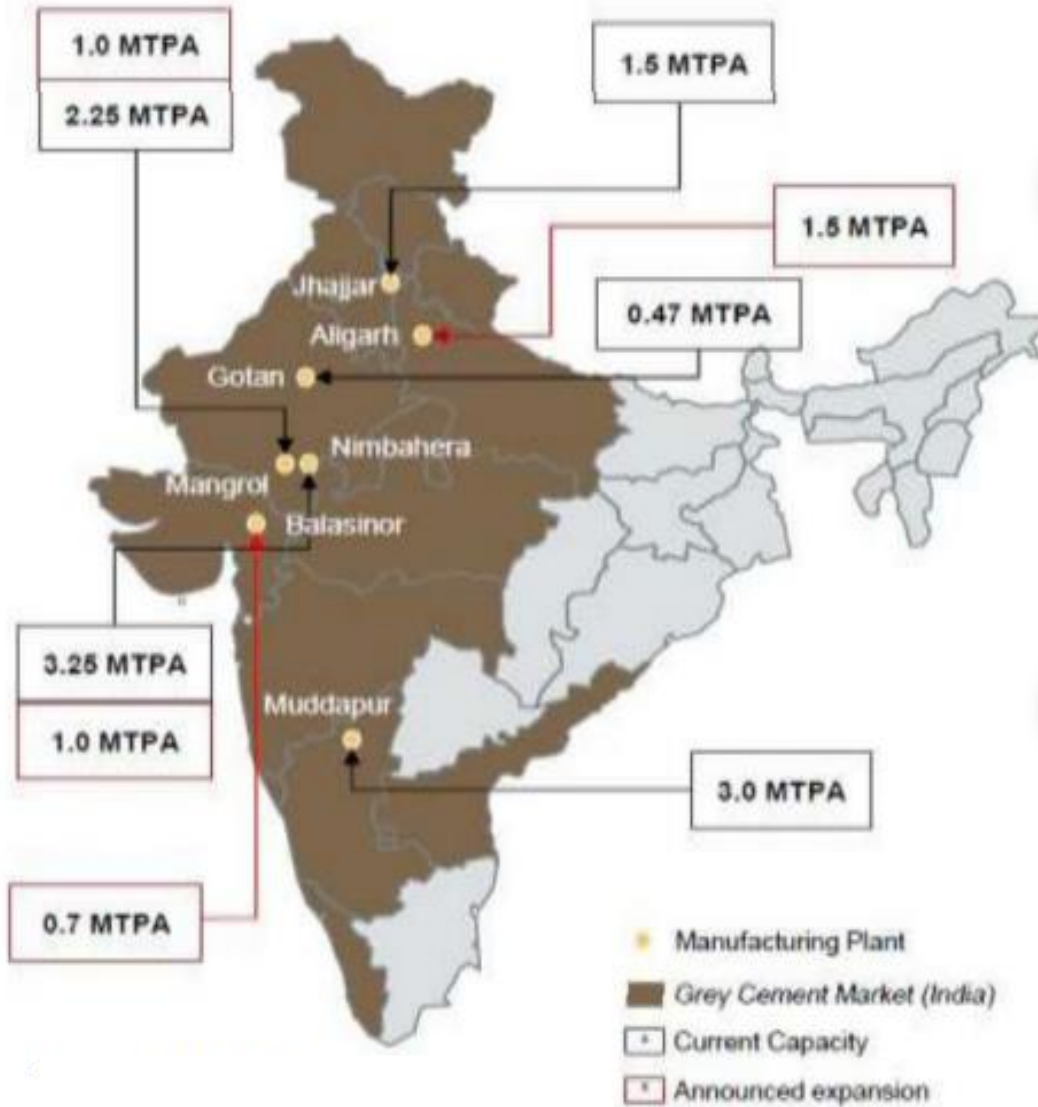
Mr. Jaideep Iad
Assistant Manager



Mr. Praveen Patil
Assistant Manager



**India's standalone integrated Cement Plant with
"Greenco Platinum Rating"**



J.K. Cement Ltd. is a part of Industrial conglomerate JK Organization. The group entered the cement manufacturing business in 1975.



Currently holding 16 MTPA Grey cement and 1.2 MTPA White cement.



JK Cement Muddapur having Capacity of 2.20 MTPA Clinkerisation & 3.50 MTPA Finished Cement Grinding

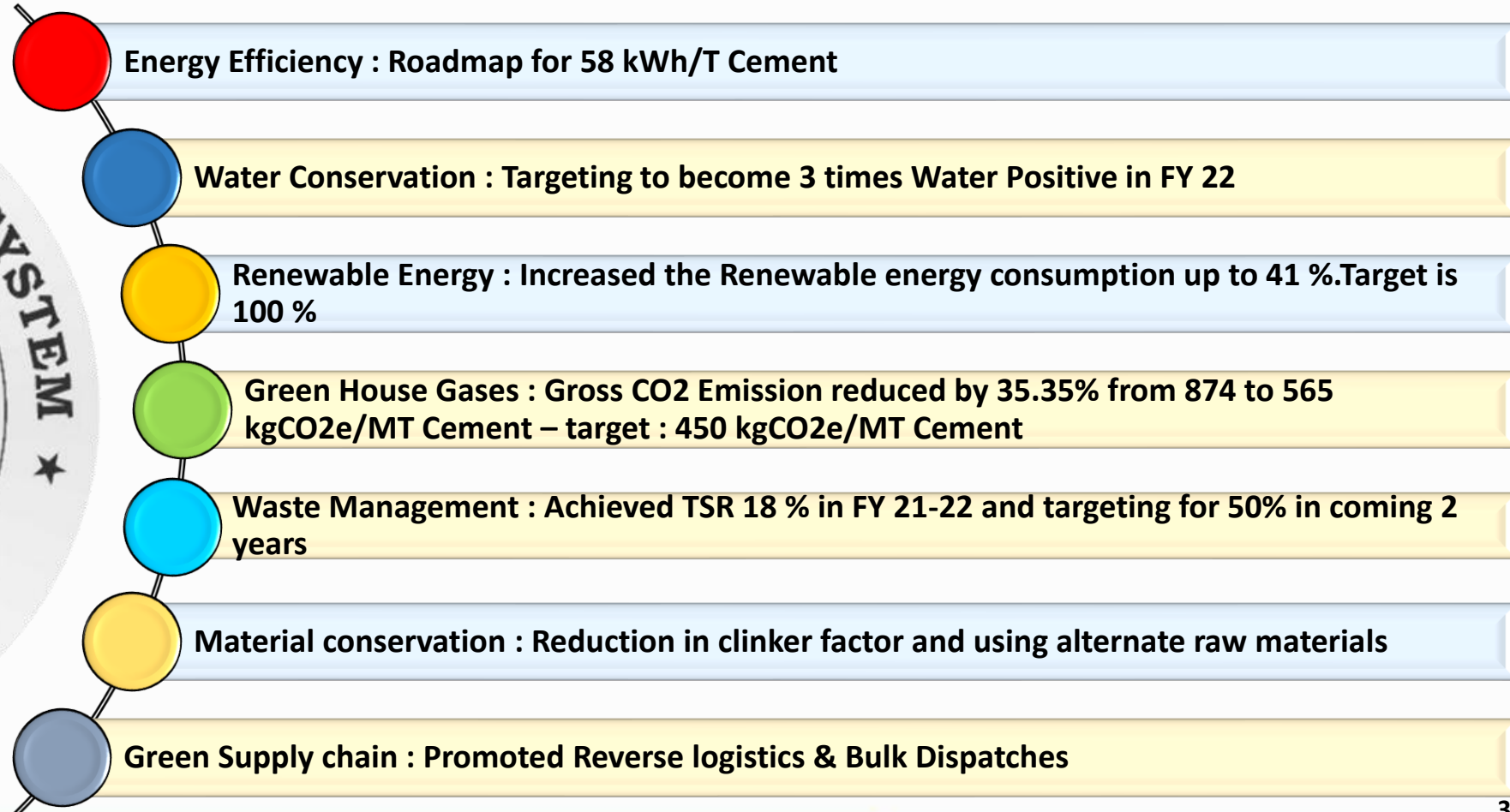


J K Cement Muddapur is certified with ISO 14001, ISO 9001, ISO 45001 & ISO 50001:2018
Greenco Platinum rated Plant ,Great Place to work certified company

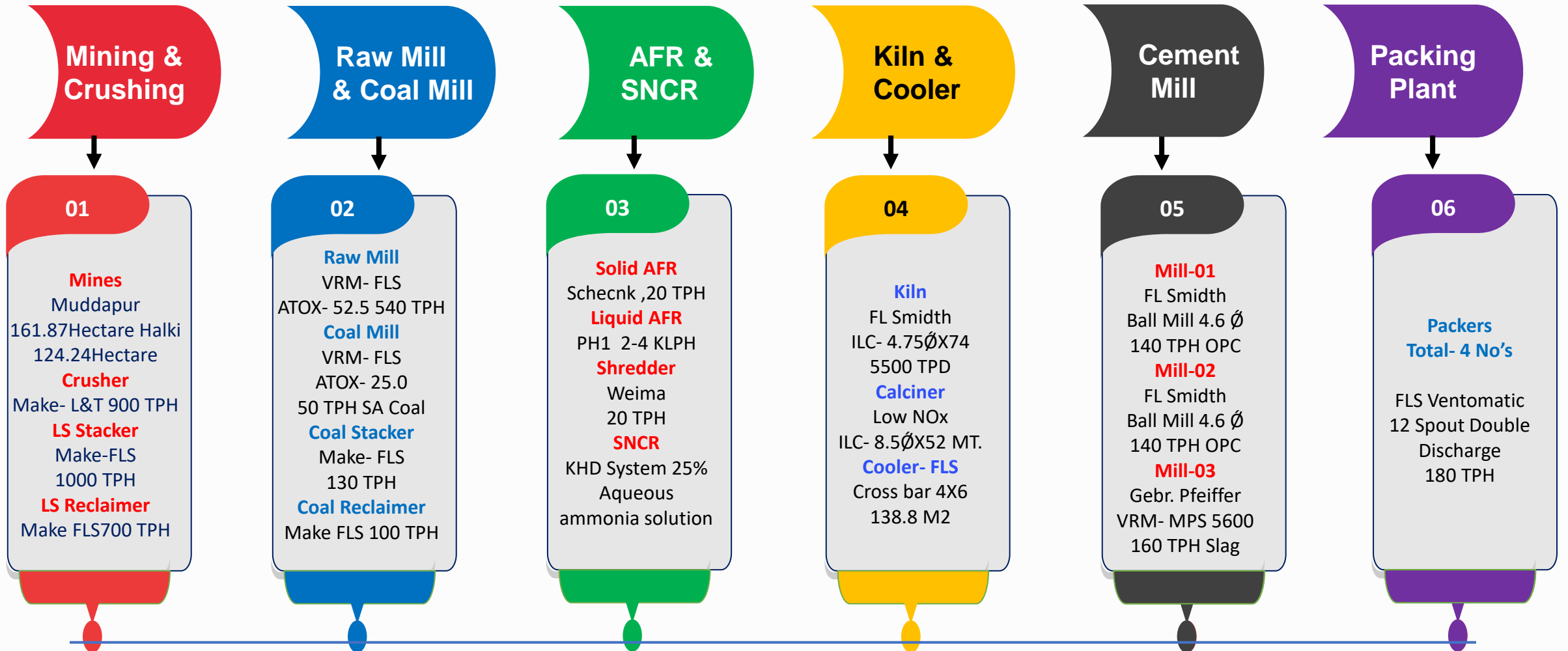
Created National Benchmark in following category at Greenco Rating

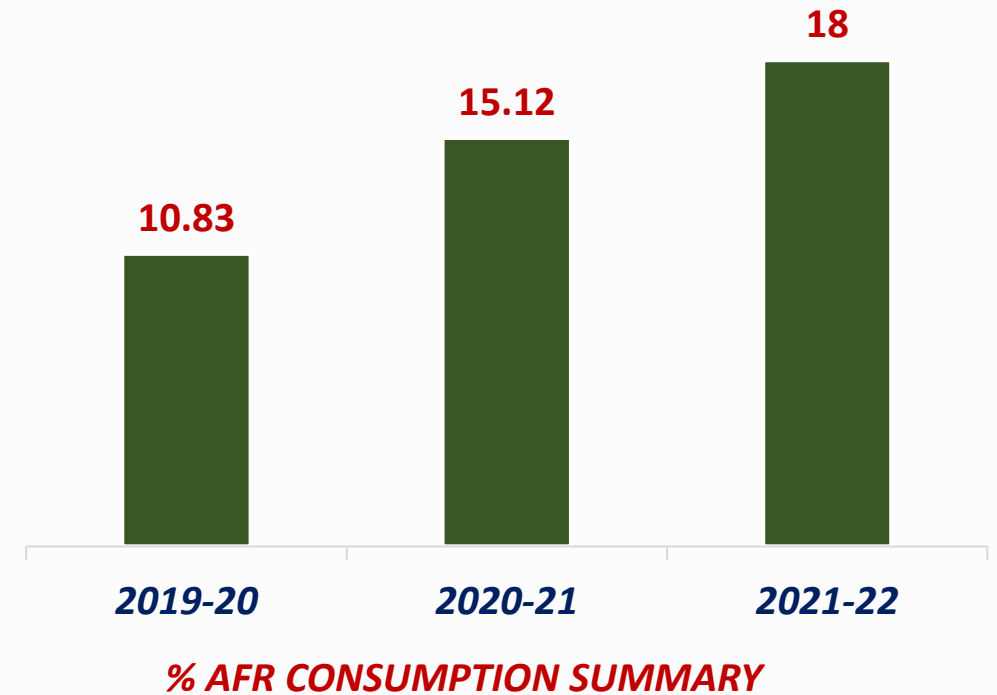
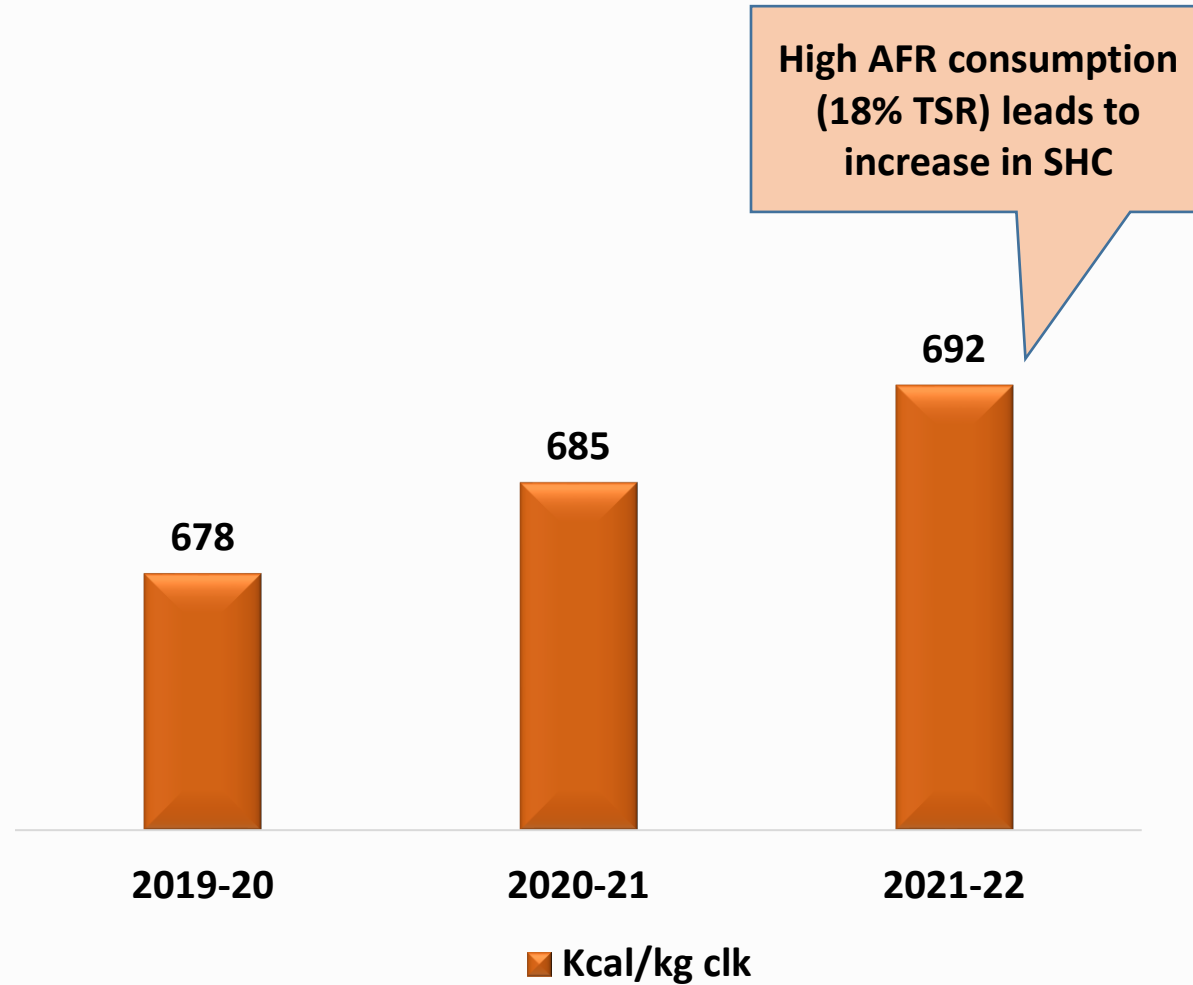
India's only integrated
Cement Factory with
Greenco Platinum Rating

- Green House Gas Emission
- Product Stewardship & Life Cycle Assessment
- Green Infrastructure and Ecology

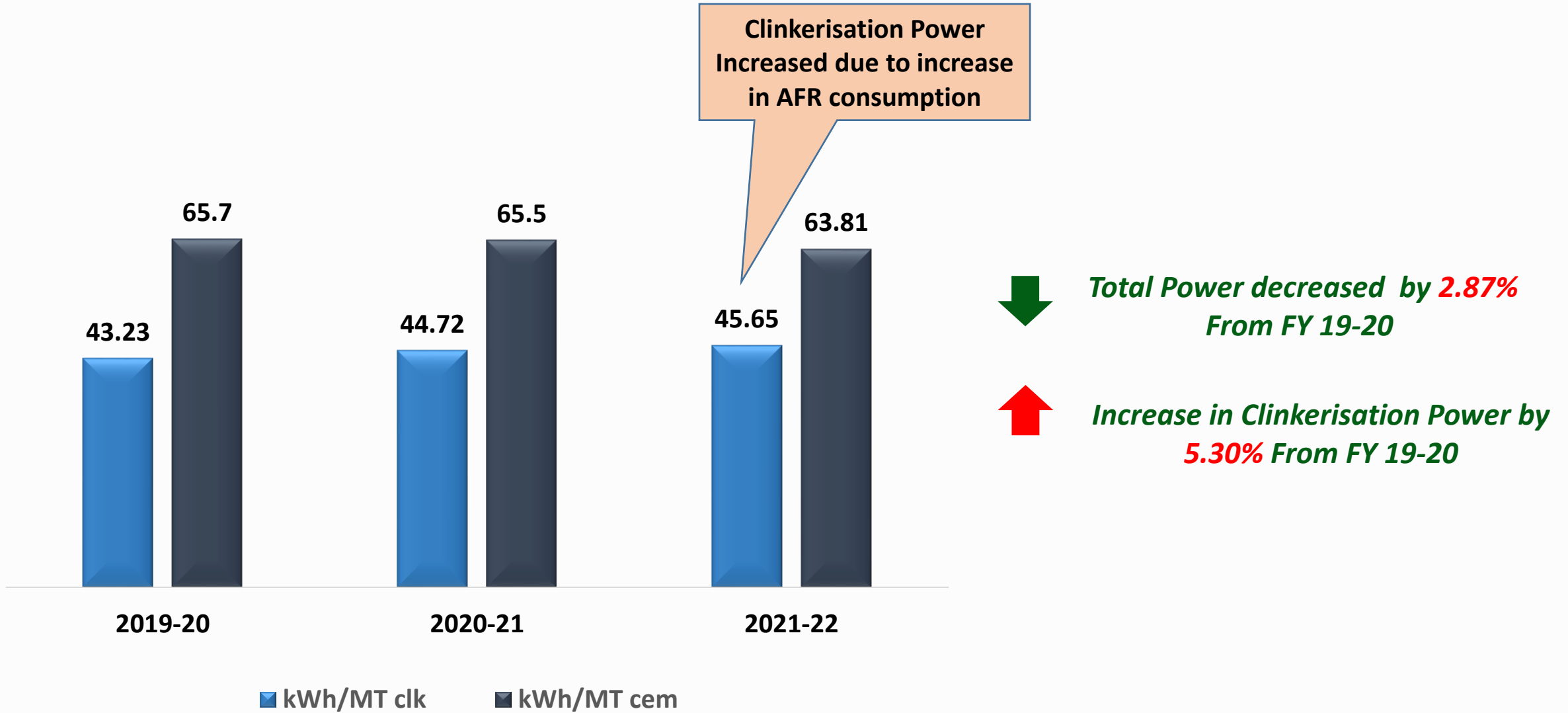


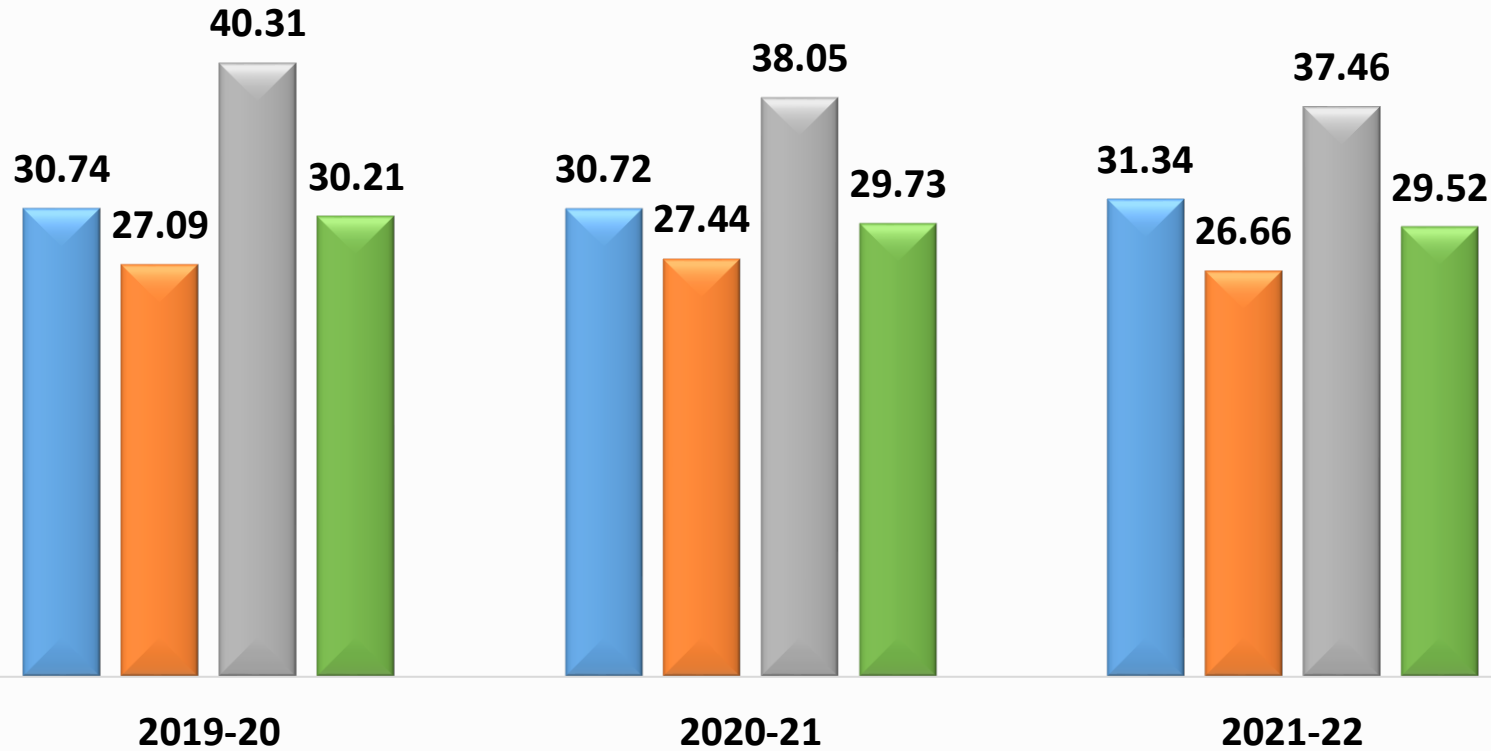
• Our Mines has received 5 star rating, consecutive 2 years from Ministry of Mines








**↑ Despite Increase in 18% TSR our heat is increased only by 2.02%
From FY 19-20**





 *PPC Power decreased by 1.61 % From FY 19-20*
 *PSC Power decreased by 7.6 % From FY 19-20*
 *Grinding Power decreased by 2.33 % From FY 19-20*

■ OPC
 ■ PPC
 ■ PSC
 ■ Overall Cement

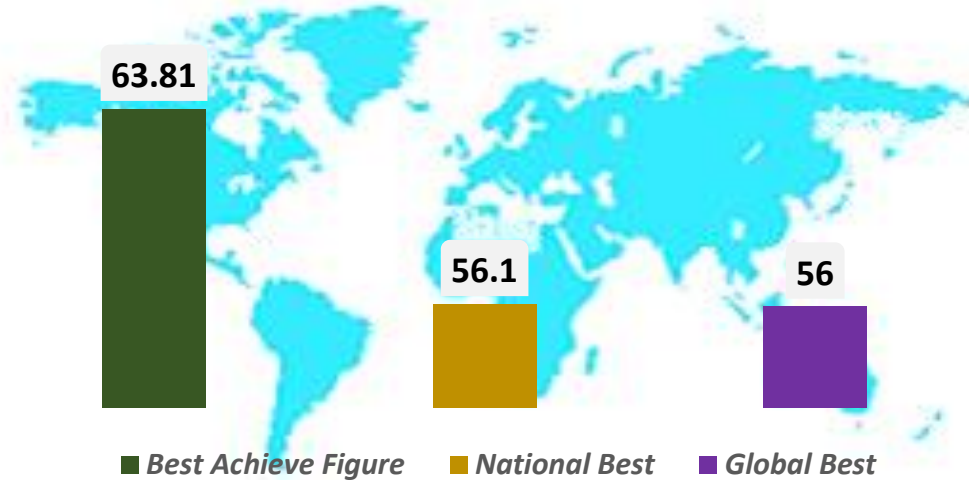
- **Only Plant in the World running without Raw meal CF Silo**
- **With CF Silo, Specific Power Consumption upto Clinkerisation will be around 41.8 kWh/T Clinker which shall the best in Global Cement industry**

Impact Comparison	UOM	Without CF Silo	With CF Silo	Deviation
Raw Mill Throughput	TPH	450	600	-150
Raw Mill Specific Power Consumption	kWh/ MT Mat	13.0	11.5	+1.5
Kiln Feed SD	-	2.9 <	0.8 <	+2.9



- ❖ Reduction of Clinker factor by manufacturing blended cements with Maximum additives as per norms without compromising the market strength requirement (**PPC Fly ash – 35 % and PSC Slag – 65-66 %**)
- ❖ Reduction of GHG emissions by 15.74 % in last 3 years, currently we are 565 kg CO₂/T cement (Aspiration is 450 kg CO₂/T Cement)
- ❖ **Ever Highest %TSR achieved -18% (Aspiration 25% in FY 22-23)**
- ❖ Substituting Renewable Energy usage of 41 % from Conventional energy in total plant energy requirement and our target is **100 % (We have achieved 70% in Last quarter)**
- ❖ **Ever Lowest plant specific power achieved is 63.81 kWh/T of cement in FY 21-22**
- ❖ **Ever highest kiln running days achieved which is 294 days in FY 21-22 (Without CF silo)**
- ❖ Utilization of 100 % harvested rainwater in Cement Plant , Currently **1.7 times Water Positive**
- ❖ Conservation of Limestone resources by utilizing the 100 % High Sulphur Petcoke in Pyro section

Total Plant Power (kWh/MT Cem)



Higher Electrical Energy:

- 2021-22 : 63.81kWh/MT Cem
- **Unavailability of CF Silo.**
- Pet coke grinding & consumption.
- During shutdown **PSC grinding** done from Ball Mill.
- AFR Consumption of TSR up to 18%

SHC (kCal/kg clk)



Higher Thermal Energy:

- AFR Consumption of **TSR up to 18 %** and maximum usage of MSW
- High Oxygen level is being maintained for Higher AFR TSR %
- Due to 100 % pet coke consumption

SHORT TERM		MEDIUM TERM		LONG TERM	
TARGET FOR ELECTRICAL ENERGY REDUCTION					
FY 2022-23		FY 2023-24		FY 2024-25	
PARTICULARS	POWER (kWh/TON OF CEMENT)	PARTICULARS	POWER (kWh/TON OF CEMENT)	PARTICULARS	POWER (kWh/TON OF CEMENT)
Existing level	63.81	Existing level	61.00	Existing level	60.19
Target	61.00	Target	60.19	Target	58.00
Reduction expected	2.81	Reduction expected	0.81	Reduction expected	2.19

Particulars	Indicators
Existing Level	63.81 kWh/T Cement
Target	58 kWh/T Cement
Reduction expected	5.81 kWh/T Cement
Investment	Rs.44.21 Crores
Savings	Rs.12.62 Crores/Annum
Payback	3.5 years



We have achieved 59.82 kWh/MT cement in July 2022 by implementing various nil investment Encon projects, further sustainable reduction is expected after implementing projects with Investment.

Sl.No	Project description	Achievement of Annual energy savings			Investment incurred on the project Rs. (Lakhs)
		Electricity	Fuels	Total savings (Rs. Lakhs)	
		(kWh)	Coal (ton)		
1	Improving the cooler recuperation efficiency by Drop zone in ABC inlet	-	124	19	12
2	Solid AFR Double flap system replaced by RAL	107136	99.2	15	15
3	Installation of RAL in place of screw conveyor in feeding system in Coal Mill	119040	-	8	15
4	Replacement of Reciprocating compressors with oil free Screw compressors in fly ash unloading	119040	-	8	20
5	Replacement of Kiln inlet & outlet seal with Graphite Seal.	-	463	39	90
6	Aluminization in preheater to reduce radiation loss	-	206		120
7	Installation of Pre-Grinder System in Cement Mill -1 Ball Mill	1092000	-	76	250
8	Installation of secondary crusher to reduce the Raw Mill grinding power	2737920	-	192	500
9	ThyssenKrupp's PREPOL S external combustor System installation for Solid Feeding System	-	15872	1349	500
10	Cement Mill-3 classifier upgradation	6071429	-	2917	1380
11	Replacement of standard motors with Premium and Super premium efficiency (IE3/IE4) motors.	210000	-	14.5	23

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Financial Year	No of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Savings (INR Million)	Impact on SEC (Electrical kWh /MT cement)
2019-20	53	12.56	2.90	54669	74.01	1.54 kWh/MT Cement
2020-21	64	5.40	2.80	43162	41.76	1.38 kWh/MT Cement
2021-22	45	1.61	4.64	38263	36.00	1.95 kWh/MT Cement

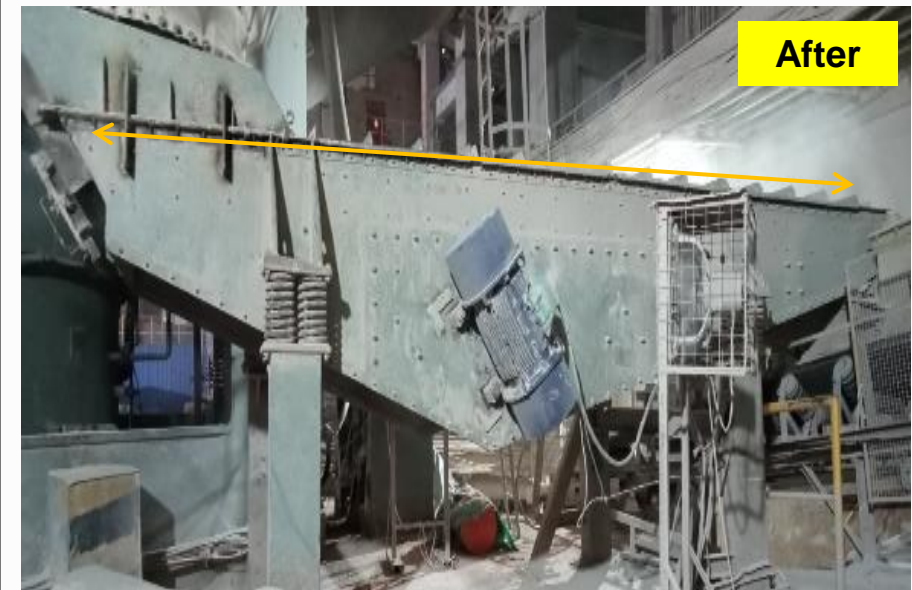
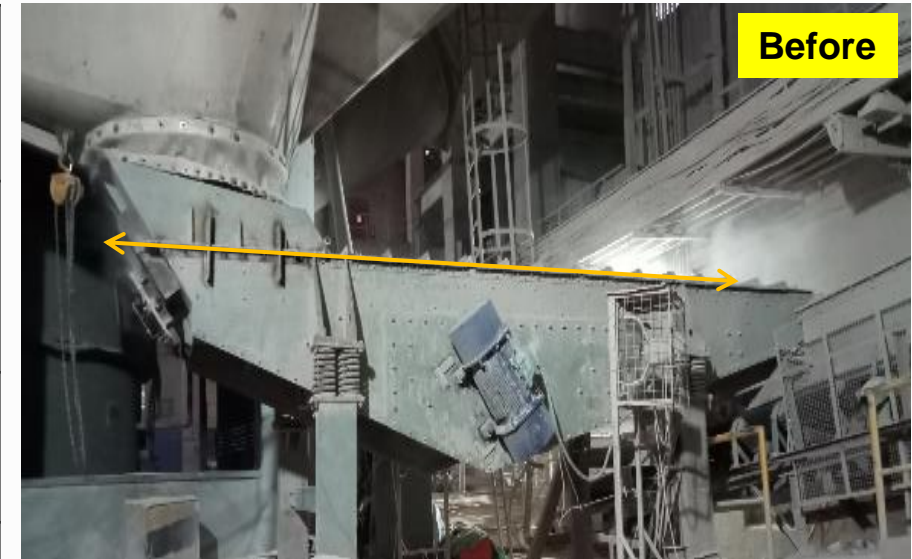
DESCRIPTION : Raw mill vibrofeeder angle modification

BEFORE: Raw mill power high and frequent stoppage due vibrofeeder tripping & also dust emission was more.

AFTER : Raw Mill Reject Vibroconveyor angle reduced from 6 degree to 0 degree

BENEFITS / RESULTS:

- 1) After angle changeover accumulation of material inside scrapper chamber eliminated.
- 2) Mill tripping got reduced.
- 3) 0.5KW/Mt power got reduced.
- 4) 0.395 Kg Co2 per MT of material reduced
- 5) Dust emission controlled



DESCRIPTION : Raw Mill cyclone Pressure drop reduction by trimming of Dip tube.

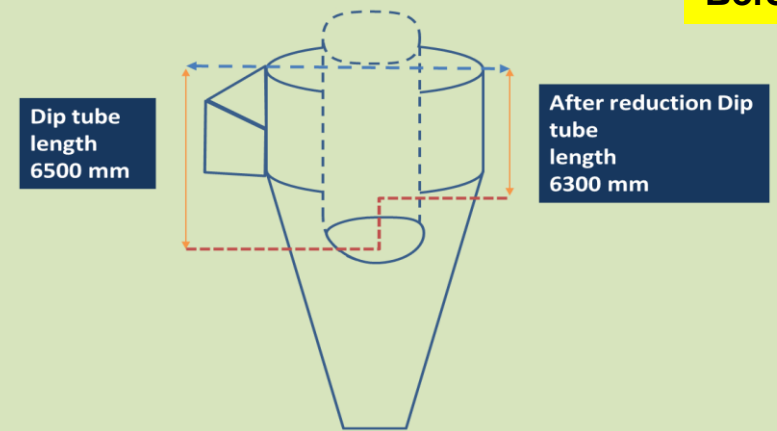
BEFORE: Across Raw Mill cyclones Pressure drop was in the range of 100-110 mmWg, further potential for Pressure drop reduction was **there**

AFTER : Out of four, in two cyclones Dip Height reduced by 200 mm in FY'18. Therefore remaining two cyclones dip tube height reduced by 200 mm

BENEFITS / RESULTS:

- 1) Pressure drop reduced by 15 mmWg.
- 2) Saving of 35 kWh in Fan.
- 3) Annual Saving = 35 kWh X 24 hrs. X 250 days =210000 kWh
- 4) Carbon foot prints 166 Tons of CO2 reduction/Annum

Schematic representation:



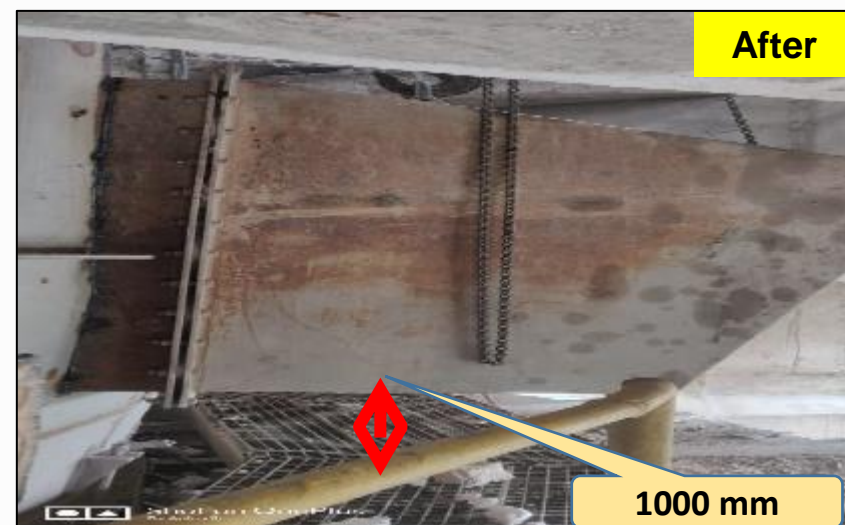
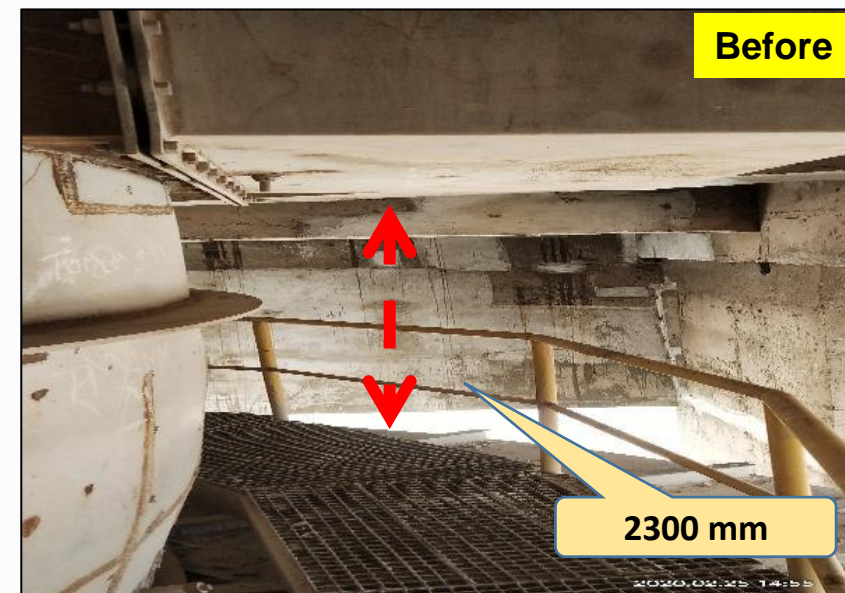
DESCRIPTION : Specific Heat reduction by modifying feed box height in riser duct of cyclone.

BEFORE: Low Heat transfer observed in St-1 ,Riser 2-1 of Stage 2 cyclone at Preheater 8th Floor as the height of Feed box is higher (i.e. 2.3 m) than other stages .

AFTER : Decided to reduce feed box height by 1.3 m. In order to increase heat transfer between hot gases & feed material

BENEFITS / RESULTS:

- 1) String -1 Outlet temp reduced by 2 Deg C.
- 2) SHC reduced by 1.0 KCal/kg Clk
- 3) Achieved saving of ₹ 20.8 Lacs/Yr.
- 4) 490 MT of pet coke saved per anum
- 5) 1708 MT of CO₂ emission reduction per anum

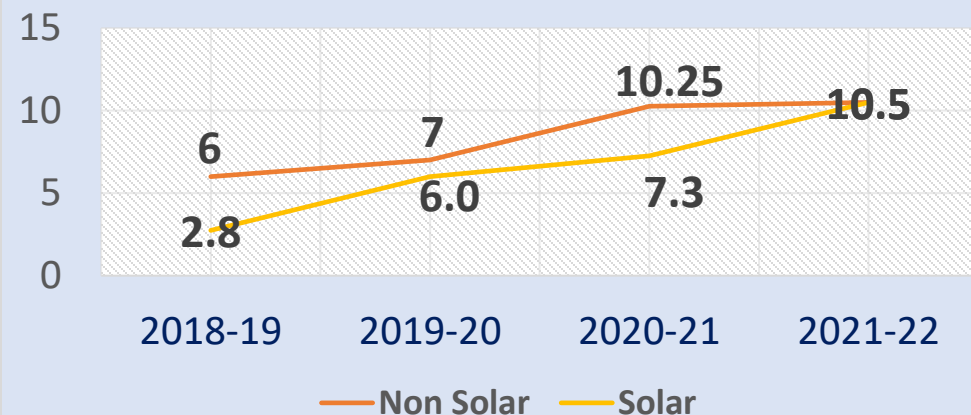


❖ Around **Rs. 46 Million** invested in **Wind Power Project** at Karnataka.

❖ **5 MW Solar Power Plant** installed and in operation

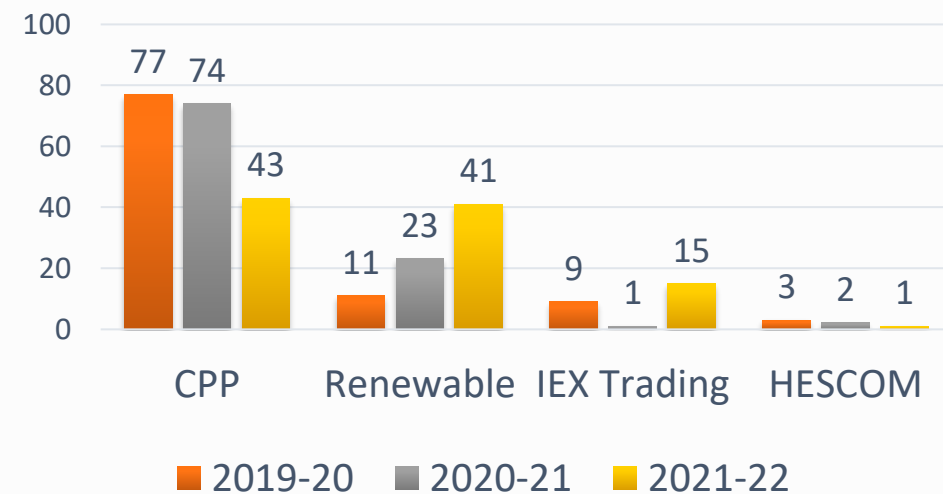


RPO Obligation



Year	Technology (Electrical)	Type of Energy	On-site / Off site	Installed Capacity (MW)	Generation (Million KWH)	% of Overall Electrical Energy
2019-20	-	Solar Energy	Off-Site	-	1.14	0.85
	-	Non Solar Energy	Off-Site	-	31.03	19.44
2020-21	-	Solar Energy	Off-Site	-	8.40	5.75
	-	Non Solar Energy	Off-Site	-	19.20	13.13
2021-22	Solar PV Cells	Solar Energy	On-Site	5.00	3.25	1.94
	-	Solar Energy	Off-Site	-	34.72	20.74
	-	Non Solar Energy	Off-Site	-	29.70	17.74

Power Mix Up %



Sr. No	Projects	Investment	RE Substitution
1	Group Captive Mode Off site Solar PPA with M/s Forth Partner (1.5 Crore Units/Annum– Expected Generation from Nov-22)	Rs. 3.5 Cr	≥ 9 %
2	16 MW WHRS System (Tender floated)	Rs. 160 Cr	≥ 35 %
3	Additional 5 MWp Group Captive On-site Solar Power Plant	Rs. 2 Cr	≥ 6%

In July-2022 we have achieved 99.5% RE energy utilization and our Aspiration is for 100% RE energy

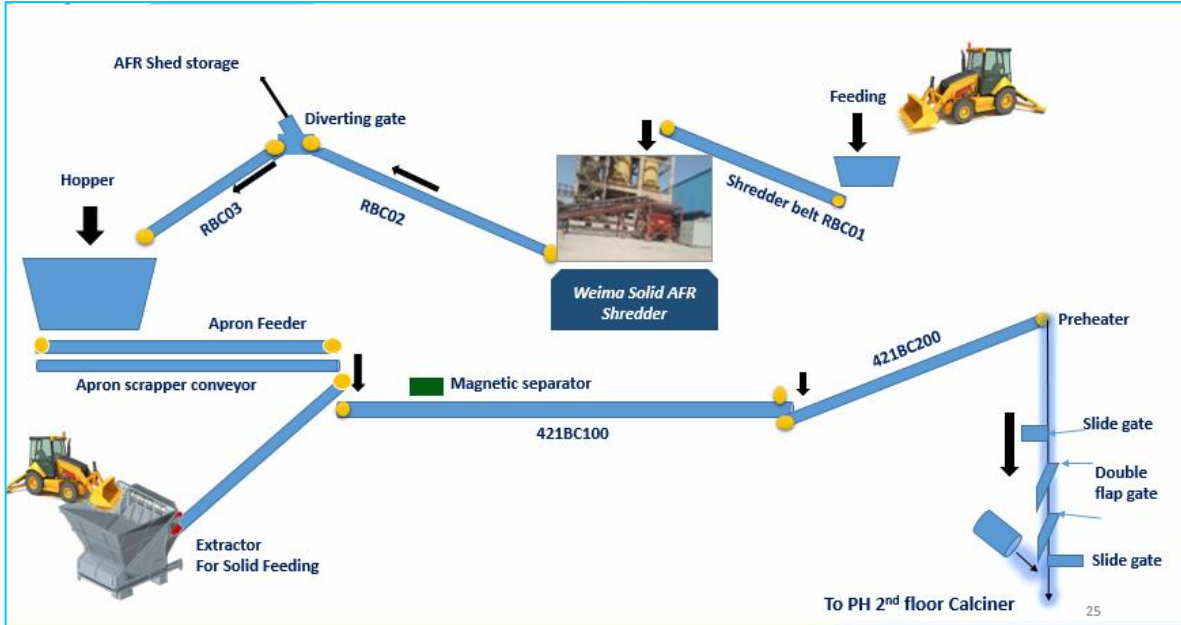
Alternative Fuel Consumption

Year	2019-2020			2020-2021			2021-2022		
Name of the Fuel	Quantity of waste Fuel used (MT/year)	GCV of fuel (kCal/kg)	Waste as percentage of total fuel%	Quantity of waste Fuel used (MT/year)	GCV of fuel (kCal/kg)	Waste as percentage of total fuel%	Quantity of waste Fuel used (MT/year)	GCV of fuel (kCal/kg)	Waste as percentage of total fuel%
MSW/RDF	24200	2723	13	29128	2673	13	35610	2826	13
PLASTIC WASTE	7476	3072	4	12960	2614	6	19224	2683	7
Hazardous Industrial Waste	13883	1274	7	29006	1862	13	31427	2192	11
Other Solid & Liquid Waste	18145	2077	10	16480	2649	7	39614	1453	14
Total	63704	2264	34	87574	2391	39	125875	2214	46

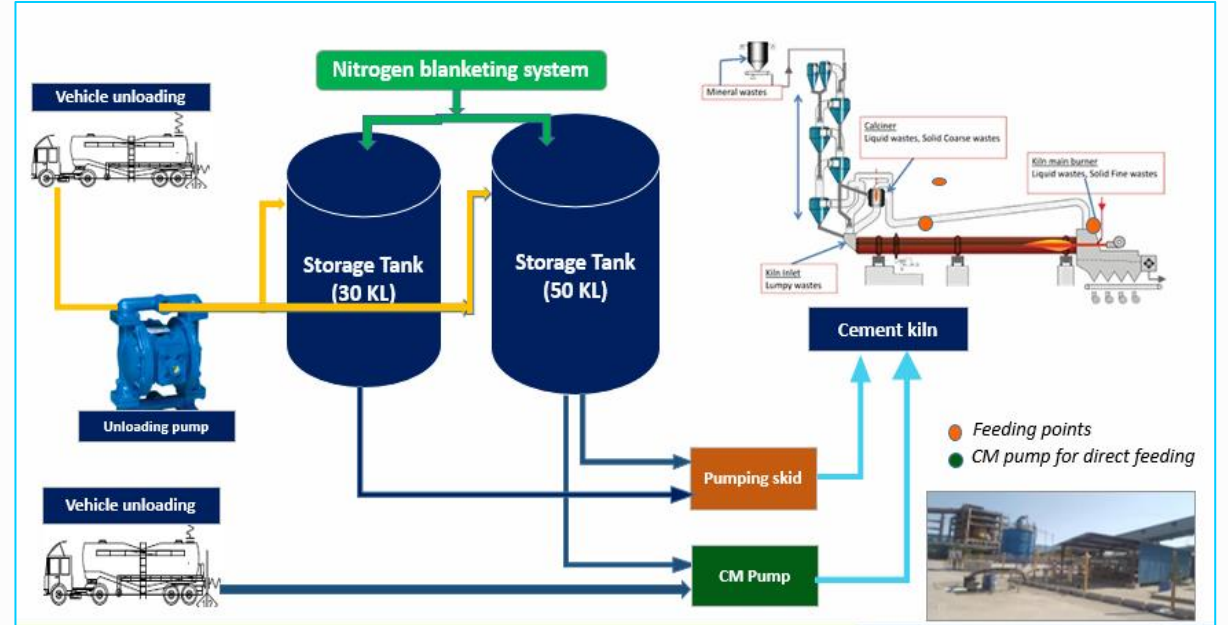
Alternative Raw Materials

Year	2019-2020			2020-2021			2021-2022	
Name of Alternative raw material	Name of material gets replaced	Quantity used (MT/Year)	Name of Alternative raw material	Name of material gets replaced	Quantity used (MT/Year)	Name of Alternative raw material	Name of material gets replaced	Quantity used (MT/Year)
Red Ochre/ GCP Dust/Red Mud	Iron Ore	46279	Red Ochre/ GCP Dust/Red Mud	Iron Ore	38581	Red Ochre/ GCP Dust	Iron Ore	27243
Red ash	Limestone	790	Red ash	Limestone	15421	Lime sludge	Limestone	1855

Solid AFR feeding System



Liquid AFR feeding System



World class AFR Laboratory Setup



Micro Digester



Agilent ICP-OCE 5800



Chemical Lab



Titration & Era Flash

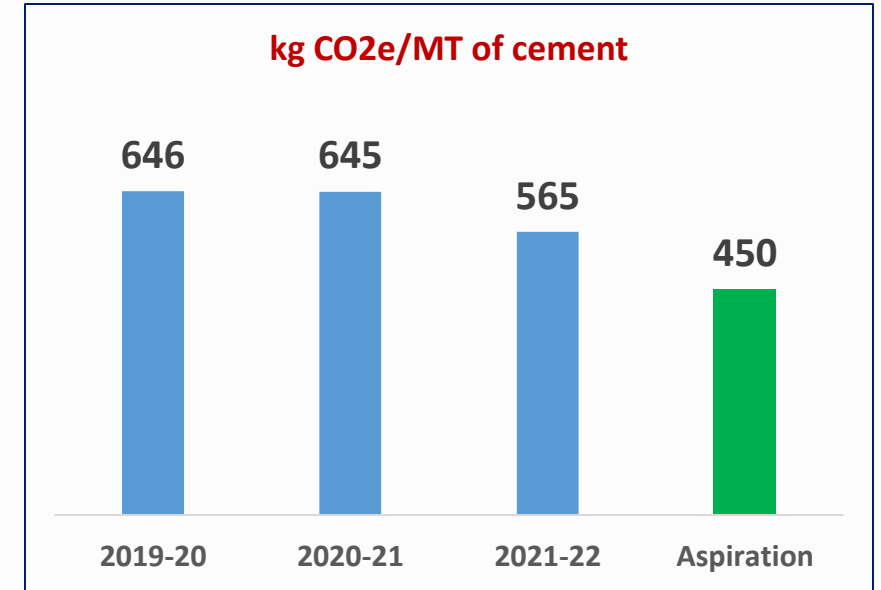


Project will be commissioned in Sept 2022

Year	Scope 1 Emissions CO ₂ e (MT)	Scope 2 Emissions CO ₂ e (MT)	Scope 3 Emissions CO ₂ e (MT)	kg CO ₂ e/MT of cement
2019-20	1484442	-147728	34130	646
2020-21	1659753	-216353	39191	645
2021-22	1697368	-222791	44686	565

Scope 1 2 3 Emissions Evaluation Parameter

Scope-1 Plant Fuel	Scope-2 Import/export clinker, power	Scope-3 Vehicle Diesel consumption
Calcination -Limestone	CO ₂ from external power generation	Cement Dispatch - Road Transport
Kiln - Coal, Diesel/Heavy oil, Pet Coke, Waste Oil, Solid AFR, Power plant- coal	CO ₂ from net clinker imports (+)	Mines Diesel - contract vehicles
Fabrication –Acetylene, R & AC -Freon (R22 & R134A)	CO ₂ from net clinker exports (-)	Internal Shunting - contract vehicles
Canteen –LPG, Company Vehicles usage	CO ₂ from Renewable Energy	Pet Coke, Gypsum, Fly ash, Slag & AFR - Road Transport



Scope 1 2 3 Emissions % reduction from Base line FY 2018-19

Reduction	%
2019-20	3.72%
2020-21	3.87%
2021-22	15.79%





EV Vehicles inside Plant



RFID Implementation



Procure to Pay

Procurement Policy

Document no: P2P/Policy/6.0

Version: 1.0, Issue Date: 1st October 2016

Signature

Purchase Policy



JK Cement Works, Muddapur
(Unit : JK Cement Ltd)
CIN : L17229UP199PL017199
Works : P.O. Muddapur - 587 122 Dist. Bagalkot (Karnataka) India
☎ +91-8350-289007 📧 factory.muddapur@jkcement.com
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JK Cement Works – Muddapur

Green Supply Chain Policy

We at JK Cement Works – Muddapur are committed to protect the environment by striving for the Greening of Supply Chain in Collaboration with our stakeholders for long term sustainability

JK Cement Works – Muddapur is committed to maintain & expand its green supply chain and will work with Partners to

1. Protect the environment by creating awareness
2. Adhere to the Environment, Health & Safety Compliance in own & Supply managed operations
3. Reduction of Carbon emission by optimizing routes & relocating sources of material
4. Train and educate to say no to Child Labour
5. Nourish plantation and greenery in vicinity and Embedding Green Initiative in Supply Chain Partners
6. Encourage saving of Water & Electricity
7. Reduce Greenhouse Gas Emission and promoting '3R' policy (Reduce, Reuse and Recycle) within the organization and Supply Chain Partners
8. Strive for sustainable partnership
9. Promoting & Strengthening the Green procurement within the organization
10. Encourage conservation of natural resources, minimization of waste generation & reduction of environmental emissions by adopting energy efficient processes, products & services

Date
April, 2021

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Umashankar Choudhary

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Jharli (Bihar) | Kashi (M. P.) | Aligarh (U. P.) | Baleshwar (Odisha)

Registered Office : • Kamla Tower, Manpur-208001, U.P., India. ☎ +91-512-2371476 to 85 ☎ +91-512-2379854 🌐 www.jkcement.com



Green Supply chain Policy

Projects Implemented	Investment (₹ Million)	Description	Cost Savings (₹ Million)	CO2 reduction (MT)
Reverse Logistics - Cement to Alternate Fuel	Nil	We are supplying our cement to Goa market by trucks and we are reverse loading RDF Alternate fuel from Goa itself - No of vehicles used is 7 Nos daily and quantity is 140 TPD	13.86	391
Reverse Logistics - Cement to Alternate Raw material	Nil	We are supplying our cement to Raichur market by trucks and we are reverse loading Alternate Raw material from Raichur area - No of vehicles used is 4 Nos daily and quantity is 100 TPD	9.90	279
Bulk Transport of Cement	Nil	In 2020-21, Our Bulk Cement dispatch is 240770 MT. This enable us to reduce the standard vehicle by 1700 trips nos.	13.02	368
Cement dispatch lead distance reduction by GPS tracking	2.0	We have installed GPS in all trucks and drivers are instructed to follow the shortest route which is validated by our Logistics dept.	5.86	165
Total	2.0	-	42.64	1203

Action plan for expanding green supply chain

- Increase in Bulk (Loose) dispatches from current monthly average of 22000 MT to 25000 MT.
- Will increase the BSVI standard trucks by 75 Nos. every year and by end of 2025 minimum 70% BSVI trucks.
- Educating our vendors regarding benefits of BSVI vehicles.
- Educate and encourage our employees to opt BSVI vehicles and EV's.
- Already using EV's for commuting within the plant and out station which will be further increased.
- Company's green initiatives for purchasing of EV's by providing additional 20% amount (Company's vehicle policy is attached)

Energy conservation awareness training program



Daily PD meetings

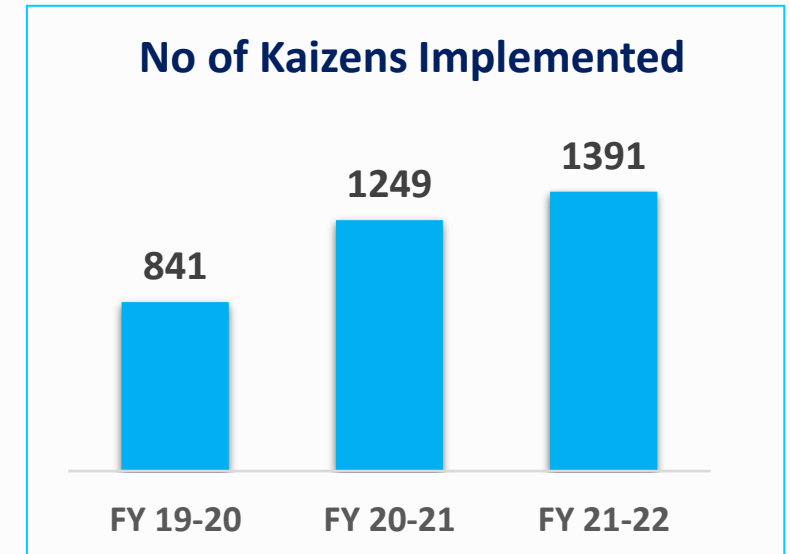


1. **Daily monitoring of deviations in PD meeting.**
2. **Monthly Energy cell meeting chaired by Unit head, discussion on KPI parameters**
3. **Separate Budget for energy Conservation is allotted**

Best Kaizens are been awarded



Projects implemented through Kaizens by Workers



ISO 50001



2011

ISO 50001-2011:
STAGE -1 visit
was conducted
in Dec-2017



2018

Certificate
Issue Date:
4 April
2018



2018

ISO 50001-2018:
Certificate Issue
date – 3rd
March'20

ISO 50001-
2011: STAGE -2
visit was
conducted in
March-2018.

2011



ISO 50001-2018:
Surveillance and
transition Audit
conducted in
Jan'20

2018



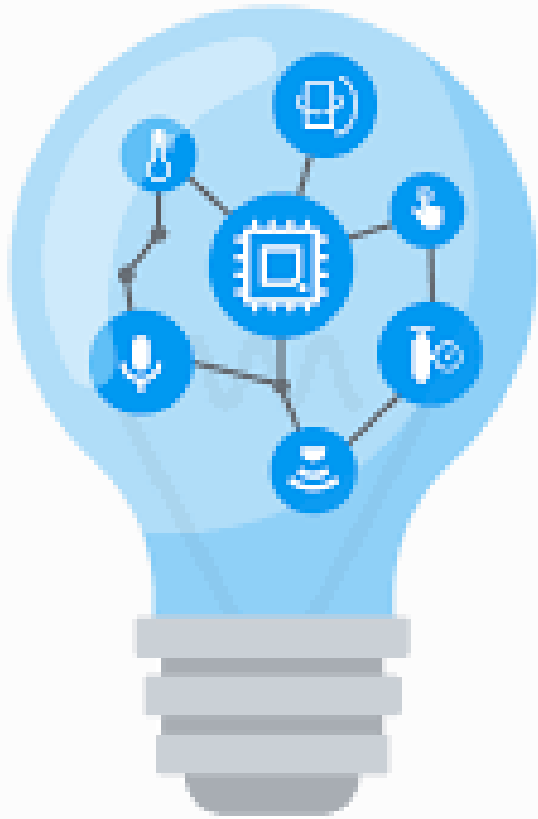
Investment

% investment on Turnover

0.25% for FY'21-22

Certificate Identity No. 10257092





- **The Confederation of Indian Industry (CII) is working to facilitate Industries Achieve World Class Levels In Energy Efficiency.**
- Various events and training programs conducted by CII are extended learning and knowledge sharing platforms where we can unearth the best practices, latest technologies and future roadmaps to achieve Excellence in energy efficiency.
- The most conventional and effective way to implement energy efficiency projects is through direct implementation by project beneficiaries.
- As a responsible corporate, JK Cement owns its responsibility towards the Energy Conservation and efficiency. **In the journey of Excellence we found CII as most enduring companion.** Various Energy saving projects implemented in our plant are replicated from Knowledge sharing programs and events by CII. Some of these projects are as follows:
 - 1) **Cement Mill-3(VRM) Productivity Improvement by reducing Annular Gap near separator**
 - 2) **BLDC fans installation in place of conventional ceiling fans**
 - 3) **Installation of FRP blades for kiln shell cooling fans in place of metal blades.**





SNCR



Liquid AFR Feeding System



5 MW Solar Plant



Miyawaki Plantation



2019

6 Prestigious awards in
16th NCB International
seminar



2020

Innovative Project award in 21st
National Award for excellence in
energy Management

2020

GreenCo Star performer
award – GreenCo trending
performers 2020



2020

13th CII National
Competitiveness & Cluster
Summit 2020 - Kaizen Award

2021

Most
Innovative
Environmental
Project award
in CII National
Award for
Environmental
Best Practices
2021



2021

22nd National Award
Excellent Energy
efficient unit



2021

22nd National Award
National Leader In
Energy Efficiency



Journey continues towards Grey to Greener



5 star Award for Muddapur and Halki mines



Excellent Energy efficient unit



"Unnatha Suraksha Puraskara" Award - 2021



Awarded with Most Innovative Environment



The Bureau of Energy Efficiency (BEE) the 31st National Energy Conservation Awards (NECA-2021).



National Leader In Energy Efficiency



Best Energy Efficient Organization award



CII GreenCo Star Performer award 2021



Thank You

***J.K. Cement Works, Muddapur.
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“ Net Zero is not an option but a Need of the Hour ”