J K Cement Muddapur Works, Karnataka

"Greenco Platinum Rated Plant"

A new chapter in the sands of time...

GREEN COMPANY RATING SYSTEM
CII - SOHRABJI GODREJ GREEN BUSINESS CENTRE, INDIA
Greenco
JK Cement Works; Muddapur
PLATINUM
2022 -2025

Shri.Umashankar Choudhary
Unit Head

Shri. Arun Sharma
Technical Head

24th CII National Award for Excellence in Energy Management 2023

JKCement

A SOLID LEGACY OF TRUST

Presenters :

Mr. Sujay
Process Manager

Mr. Praveen Patil
Asst Manager Elect

Organization and Muddapur Unit Overview

20.7 MTPA
Grey Cement Capacity

2.21 MTPA
White Cement & Wall Putty Capacity in India

64 MW
Waste Heat Recovery System (WHRS)

111 MW
Green Power Capacity

47 MW
Captive Solar and Wind Power Capacity

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

Great Place To Work. Certified Feb 2023 - Feb 2024 INDIA

J K Cements are certified with **Great place to work** for the fourth consecutive years.

Greenco Platinum Award 2022

JK Mudappur plant creates history by receiving

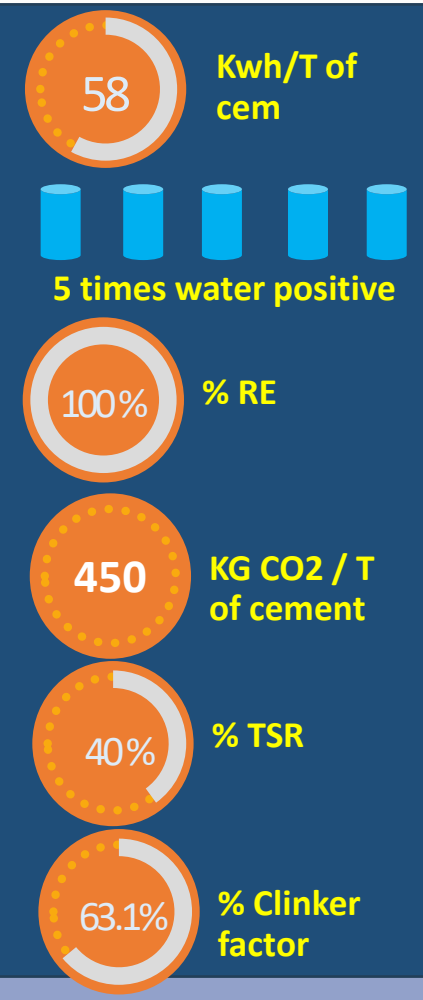
"Greenco Platinum Rating" from CII

Created National Benchmark in following category at Greenco Rating :

1. **Greenhouse Gas Emission**
2. **Product stewardship &**
3. **Green infrastructure and ecology**

MAJOR GOALS

1. Overall plant power : Achieved 63.61 units / T of cement
2. Water Conservation :Achieved 3 times water positive
3. Renewable Energy : Presently RE consumption upto 79%
4. GHGs Emission : Present 559 kg CO2/T of Cement
5. Waste Management: Achieved 20 % TSR in FY22 - 23
6. Clinker Factor : Achieved 66.56 % in the FY 22-23



Process Flow & Major Equipment Specification

1 → **Mining & Crushing**

Mines
Muddapur
161.87Hectare
Halki
124.24Hectare
Crusher
Make- L&T 900 TPH
LS Stacker
Make-FLS
1000 TPH
LS Reclaimer
Make FLS700 TPH

2 → **Raw Mill & Coal Mill**

Raw Mill
VRM- FLS
ATOX- 52.5 540 TPH
Coal Mill
VRM- FLS
ATOX- 25.0
50 TPH SA Coal
Coal Stacker
Make- FLS
130 TPH
Coal Reclaimer
Make FLS 100 TPH

3 → **AFR & SNCR**

Solid AFR
Hopp feed-60 TPH
Liquid AFR
PH1 **5** KLPH
Shredder
Weima
20 TPH
SNCR
KHD System 25%
Aqueous
ammonia solution

4 → **Kiln & Cooler**

Kiln
FL Smidth
ILC- 4.75ØX74
5500 TPD
Calciner
Low NOx
ILC- 8.5ØX52 MT.
Cooler- FLS
Cross bar 4X6
138.8 M2
CBS System
Designed for 15% Bypass

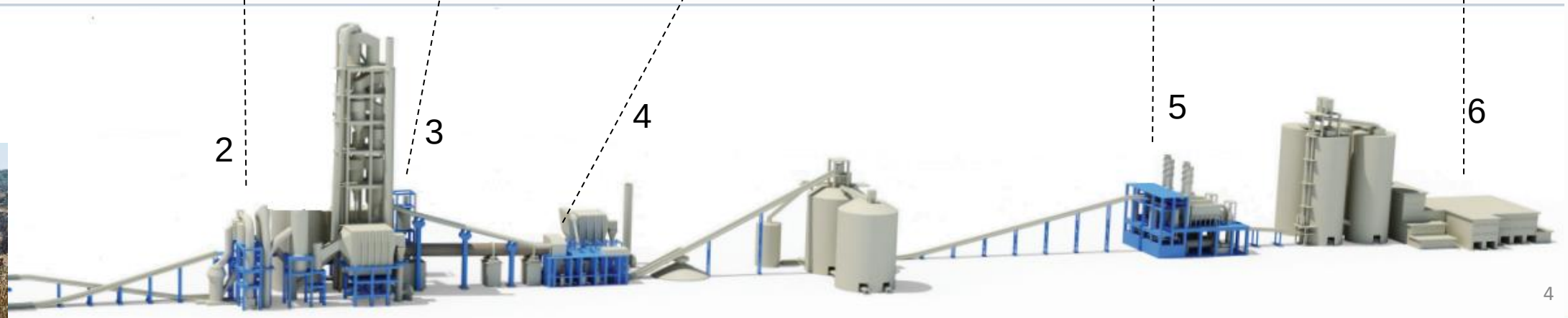
5 → **CEMENT MILL**

Mill-01
FLSmidth
Ball Mill 4.6 Ø
140 TPH OPC
Mill-02
FL Smidth
Ball Mill 4.6 Ø
140 TPH OPC
Mill-03
Gebr. Pfeiffer
VRM- MPS 5600
160 TPH Slag

6 → **PACKING PLANT**

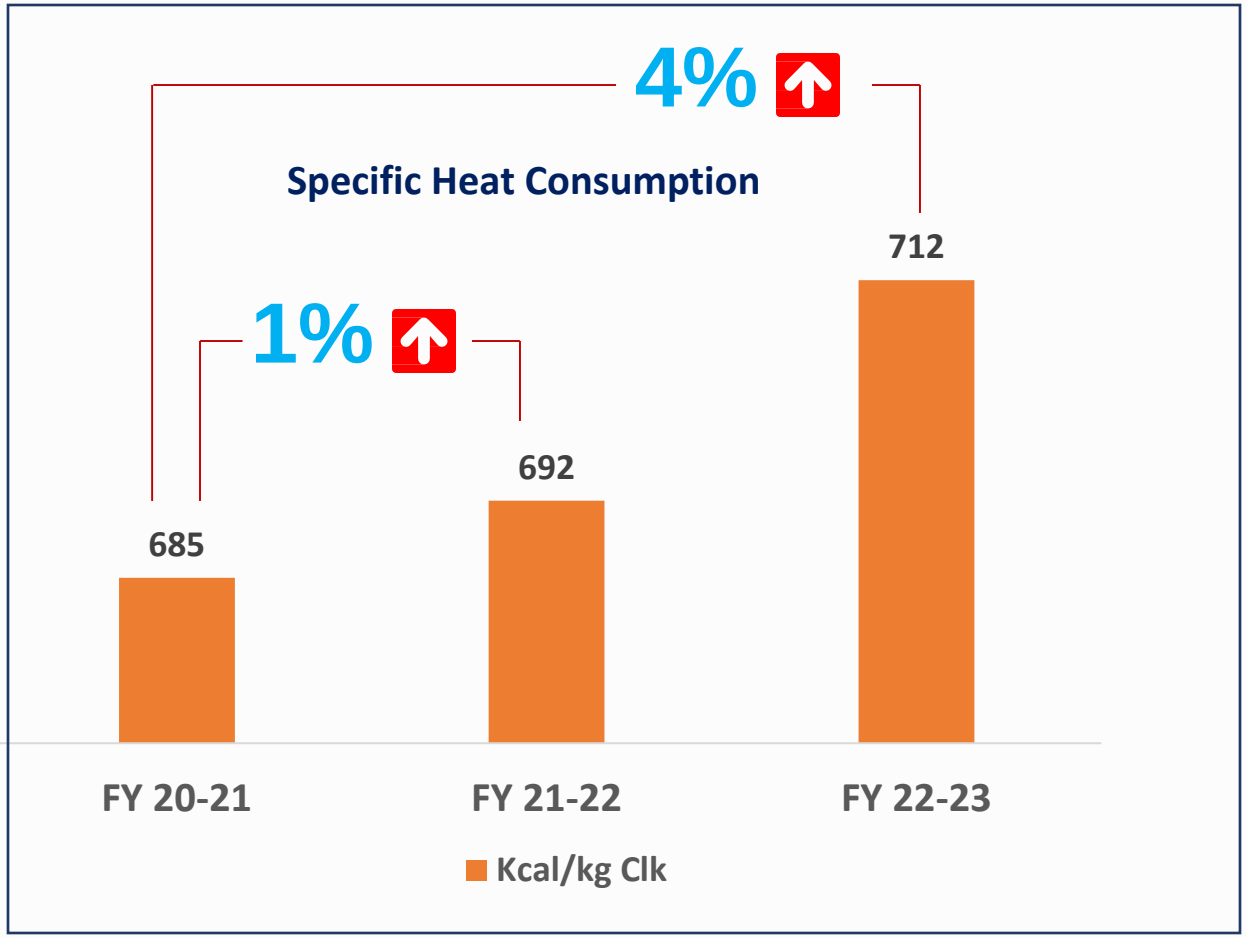
Packers
Total- 4 No's

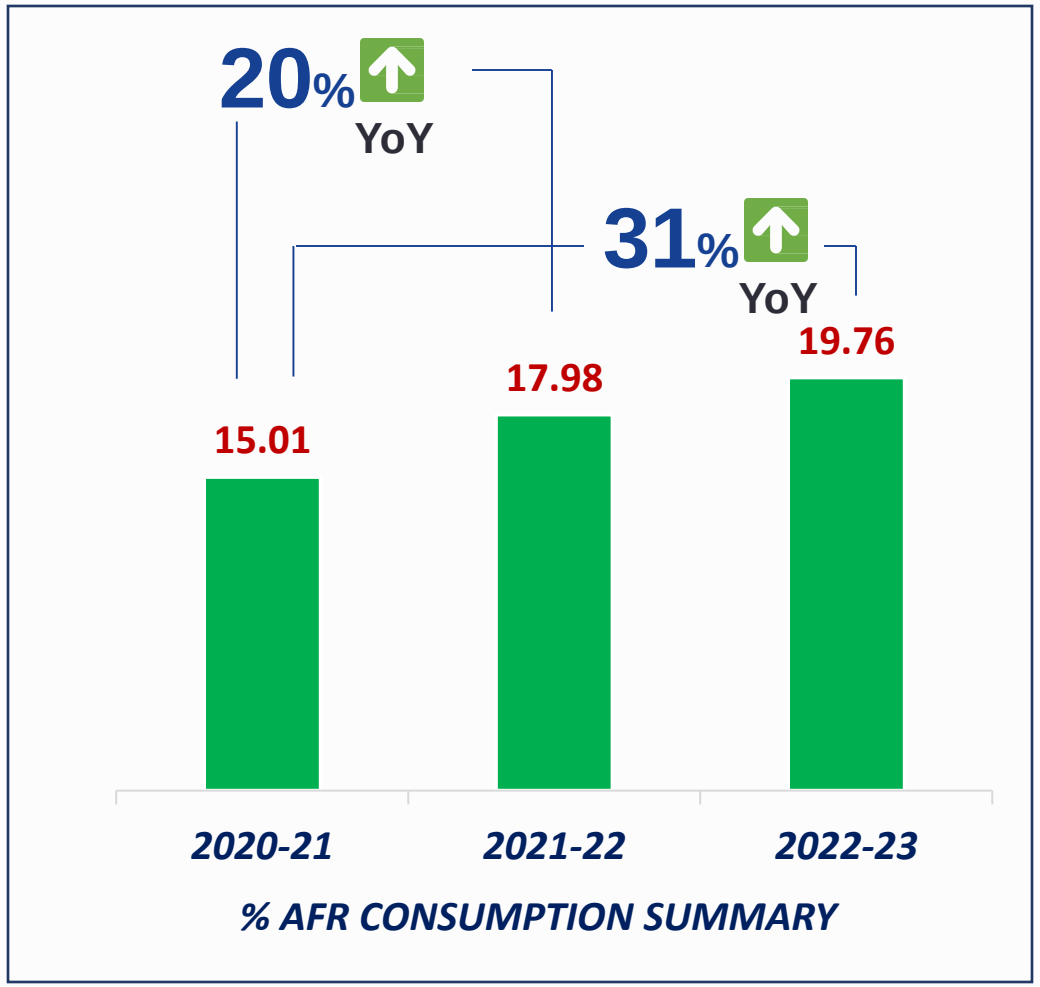
FLS Ventomatic
12 Spout Double
Discharge
180 TPH



Thermal Specific Fuel Consumption

- Thermal SFC Increased due to increase in Alternate fuel consumption



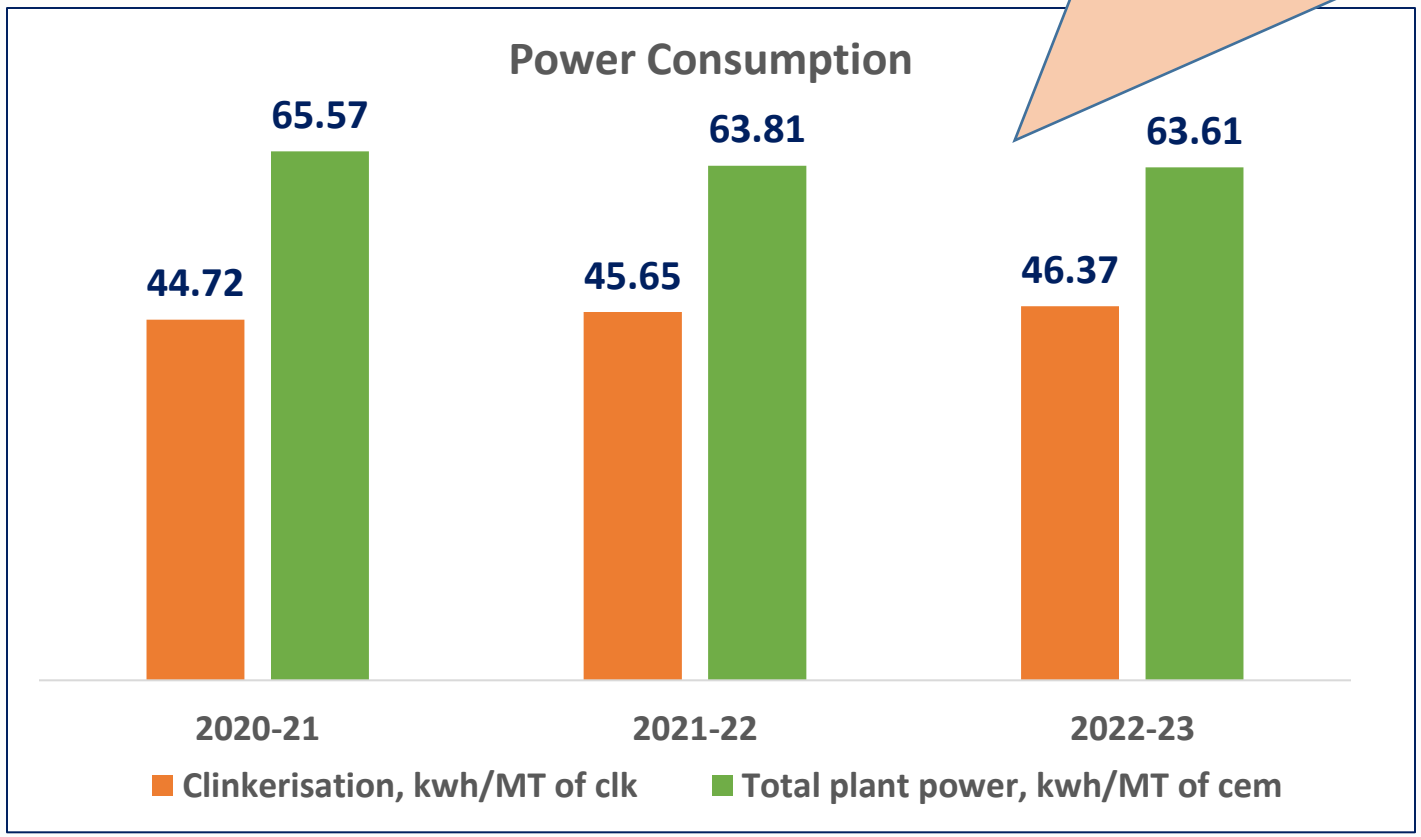


Despite Increase in 31% AFR consumption our heat rate is increased only by 4% From FY 20-21

- *For every 1% increase in TSR%, 3kCal of SHC will increase*
- *For every 1% increase in CBS Bypass ,2 kCal of SHC will increase*

Electrical Specific Power Consumption

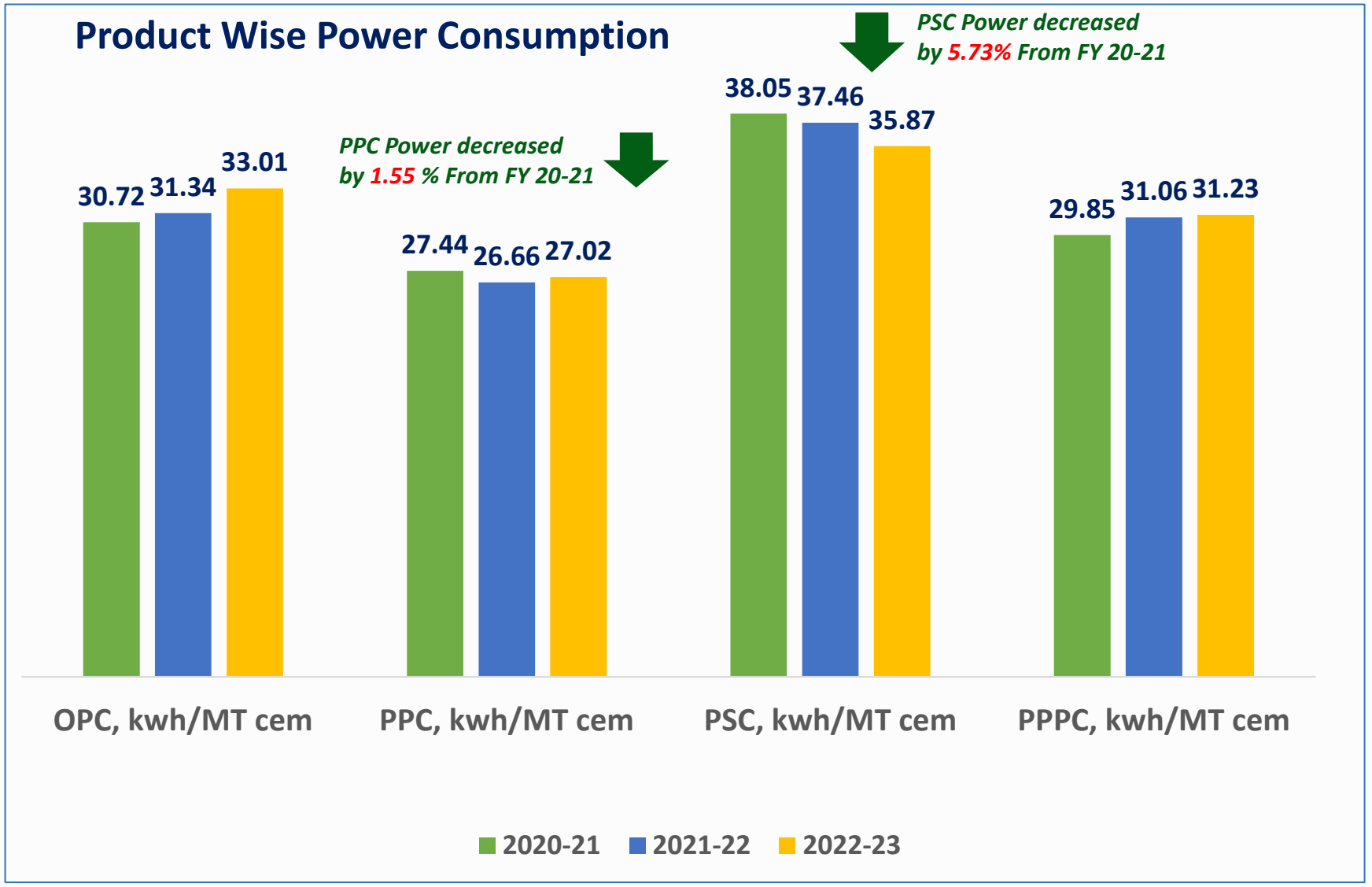
1. Clinkerisation Power Increased due to increase in Alternate fuel co-processing
2. Operation of CBS Bypass system resulting in High clinker power

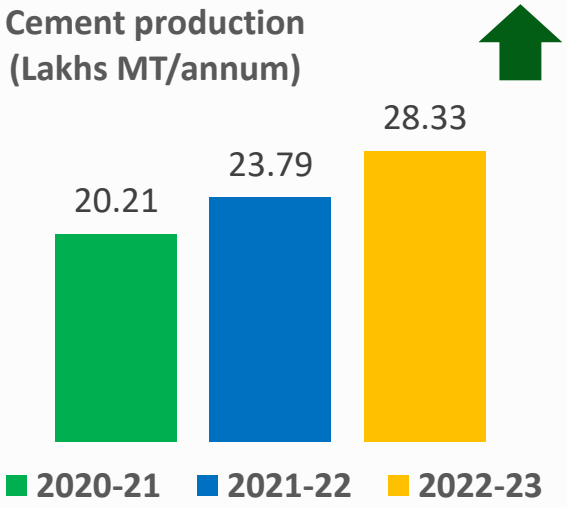


Total Power decreased by 3.08% From FY 20-21

Increase in Clinkerisation Power by 3.68% From FY 20-21

SPC Cement Grinding



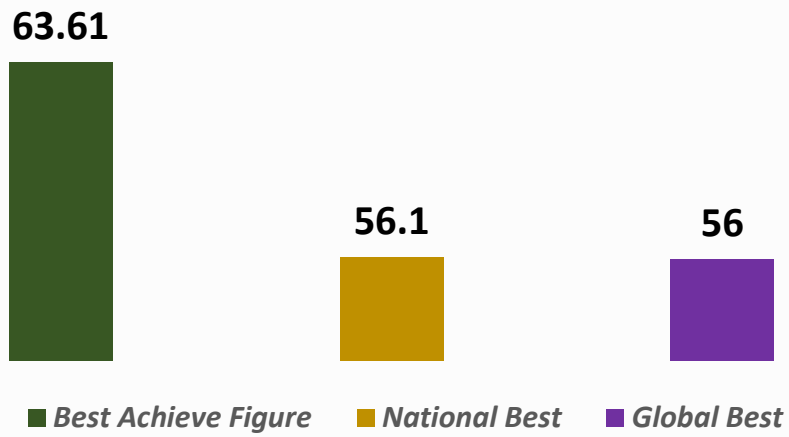


- Since Cement demand is high, utilization of CM-1 & CM-2 (Ball mills) is increased resulting high Grinding Power.
- Planning to install pre-grinder to reduce overall power in both the conventional ball mills.

Energy Benchmarking

Referred from CII Benchmarking

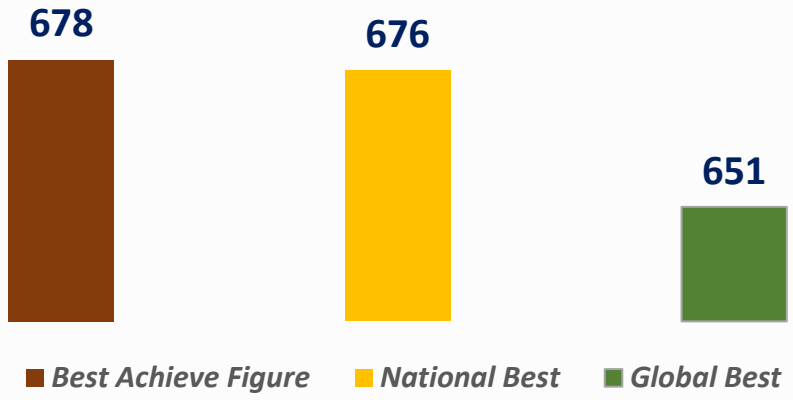
Total Plant Power (kWh/MT Cem)



Higher Electrical Energy:

- **2022-23 : 63.61kWh/MT Cem**
- **Unavailability of CF Silo.(Impact is 2.34 kWh/ton of Clk)**
- Pet coke grinding & consumption.
- Increase AFR Co-processing and CBS System
- Due to high cement dispatch, ball mills utilization % has increased.

SHC (kCal/kg clk)



Higher Thermal Energy:

- AFR Consumption of TSR up to **19.76% FY'22-23** and **23.75% up to July'23.**
- High Oxygen level is being maintained for Higher AFR TSR %
- Due to operation of CBS System
- Due to 100 % pet coke consumption

Uniqueness of JK Muddapur Palnt

- Only Plant in the World running without CF Silo
- With CF Silo, Specific Power Consumption up to Clinkerisation will be around **44.02 kWh/T** Clinker which shall the best in Cement industry.

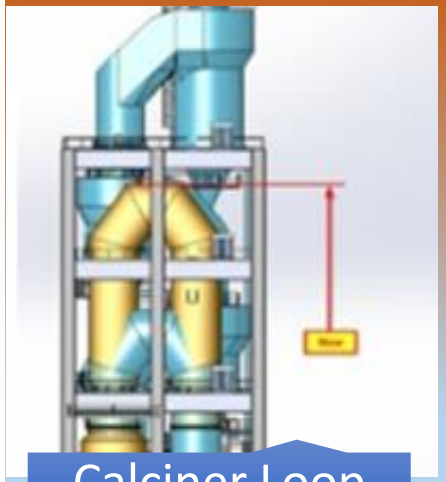
Impact Comparison	UOM	Without CF Silo	With CF Silo	Deviation
Raw Mill Throughput	TPH	450	600	-150
Raw Mill Specific Power Consumption	kWh/MT Mat	13.0	11.5	+1.5

❖ Ever highest kiln running days achieved which is **308 days in FY 22-23 (Without CF silo)**

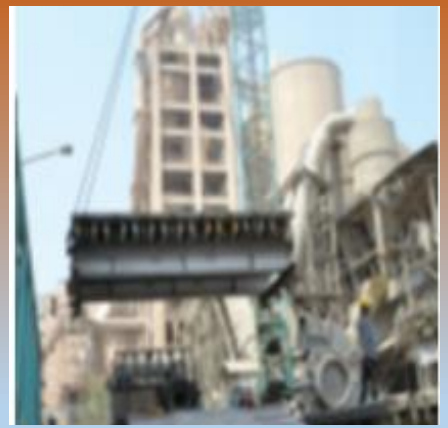
Capacity enhancement projects for the FY 2023-24

Current Capacity 6700 TPD

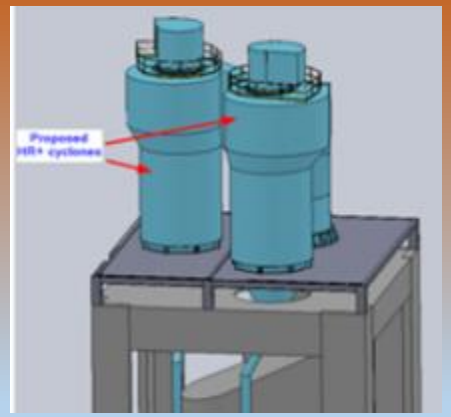
Future Capacity 7500 TPD



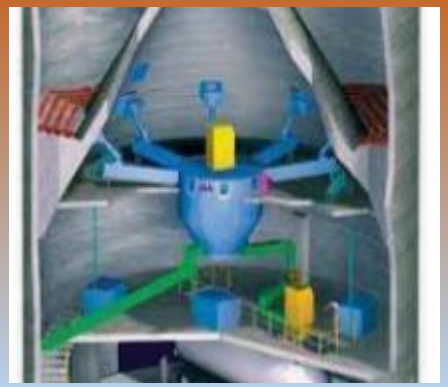
Calciner Loop duct extension



Cooler Module extension



Top Stage Cyclone replacement



New CF Silo

New Preheater Fan

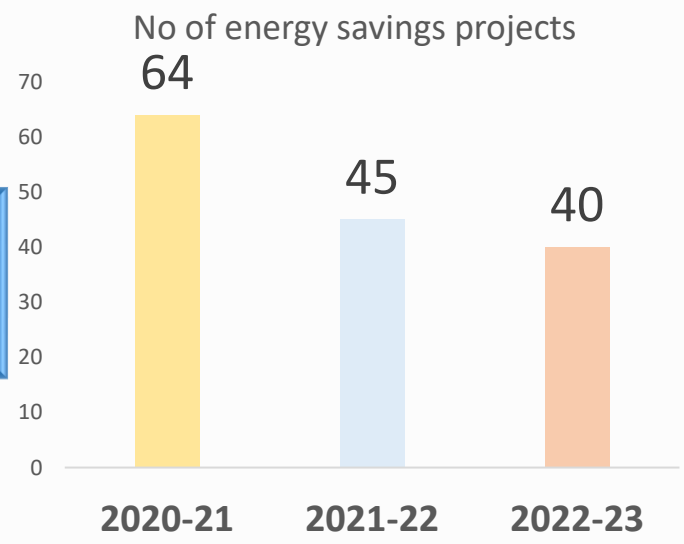
Encon Major projects planned in FY 2023-24

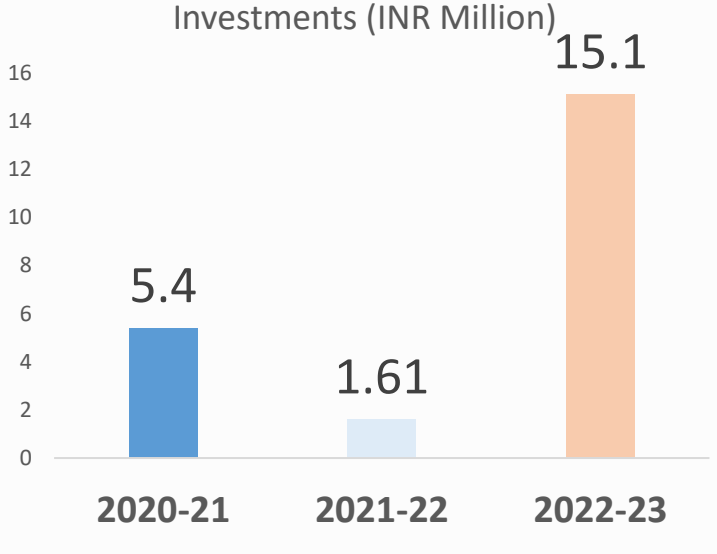
	S.n	Project description	Electricity (kWh)	Investments Crores	Tot.savings (Rs. Lakhs)	Tot.savings (Crores)
MAJOR PROJECTS	1	Installation of WHRS with HAR	124074074	290	8685	95.4 ROI 3.0 Y
	2	Preheater calciner and top stage cyclone upgradation	1170000		81.9	
	3	Upgradation of SF Cooler Module extension	3510(Mkcal)		88	
	4	Preheater fans upgradation	2340000		310	
	5	Installation of New CF Silo for Raw Meal storage	4936950		345	
	6	Coal Mill Booster fan Upgradation	446400		31	
MINOR PROJECTS	7	Installation of VFD for Coal Mill , Raw mill &RABH fan	1398720	11.9	98	4.8 ROI 2.47 Y
	8	Install Solar Drier for slag & pond ash moist. removal.	1827360		128	
	9	CM-1 grinding media regrading work	324000		23	
	10	Installation of pillard burner in PC (Latest design)	-		48	
	11	Cement Silo-04 elevator upgradation	2600650		182	

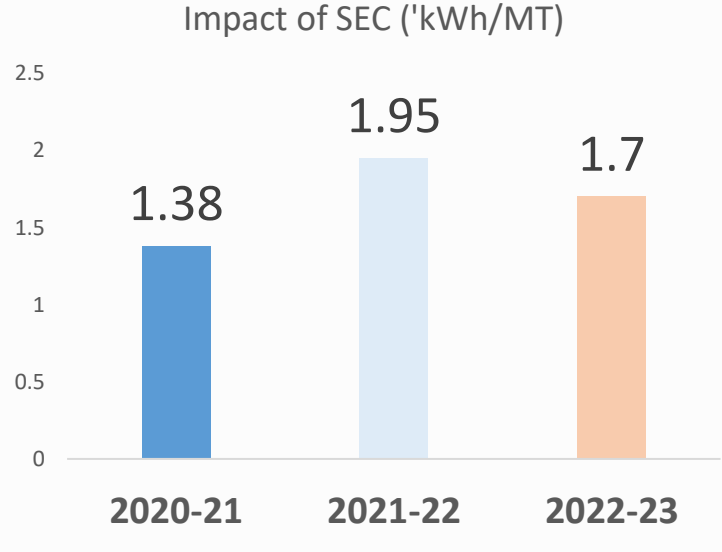
Energy Saving Projects Implemented in last three years

ENERGY

Financial Year	No of energy savings projects	Investments (INR Million)	Electrical Savings (M kWh)	Thermal Savings (Mkcal)	Impact of SEC (kWh/MT)
2020-21	64	5.4	2.8	43162	1.38
2021-22	45	1.61	4.6	38263	1.95
2022-23	40	15.1	3.7	3098	1.7







Major Projects Implement in FY 2020-21

Year	Name of Energy saving project	Investments (Rs Lacs)	Electrical savings (kWh)	Thermal Saving (Mkcal)	Total savings (Rs. Lacs)
2020-21	CM-3 Separator surrounding Annular gap reduction to increase Production and decrease specific power in PPC	4.5	1085664		76.00
	Packer -1, 621BL300 Motor de-rated from 22 kW to 18.5 kW.	0	15330		1.1
	Reduction of Idle run of Coal Mill reject Circuit.	0	59280		4.1
	Reduction of Power Consumption by stopping unutilized RMH Bag filter BF 610 during Monsoon season.		27360		1.9
	Raw mill reject elevator operation modification.	0	32110		2.2
	Raw Mill Dam ring Height optimization	3	782496		54.77
	Specific Heat reduction by modifying feed box height in riser duct of PH String -1 Top cyclone.	1.5		1660	20.7
	Power transformer loading optimization.	0	105120		7.36

Major Projects Implement in FY 2021-22

Year	Name of Energy saving project	Investments (Rs. Lacs)	Electrical savings (kWh)	Total savings (Rs. Lacs)
2021-22	Raw Mill Reject Vibro conveyor angle changed from 6 deg to 0 deg	0	282240	20.6
	Slag mill main drive load was on higher side, Dam ring height reduced by 40 mm	0	332052	24.2
	Reduction in pressure drop across damper in RABH.	0	38102	2.8
	In slag mill, hydraulic cylinder accumulator isolation	27	300000	21.9
	Limestone reclaimer belt motor upgradation to premium efficiency motor	0	39728	2.9
	Cm-3 mill building bag filter, hopper building bag filter & belt area bag filters purging line modified	0	69177	5.1
	Idle screw compressor from CPP utilized & 2 JM compressors stopped	0	164380	0.12
	Replacing CFL lights to LED lights for saving	0.4	26192	1.9
	Air slide blower (351FN346), 9.3kW motor was running with 45% loading only, there was scope of motor de-rating.	1.93	26460	1.93

Major Projects Implement in FY 2022-23

Year	Name of Energy saving project	Investments (Rs. Lacs)	Electrical savings (kWh)	Total savings (Rs. Lacs)
2022-23	Replacement of Standard Efficiency motor (IE1) to Super Premium Efficiency (IE4)(Cooler Fan K41 was running with standard efficiency motor (IE 01) - Rating 300 KW)	9.0	37498	2.6
	Replacement of Standard Efficiency motor (IE1) to Super Premium Efficiency (IE4) (CM 03 Feed belt 515BC600)	0.45	7560	0.5
	Lime Crusher Bag filter Fan speed optimization	2	18000	1.3
	Energy Saving in Coal Mill Hopper feeding (Optimization done in Bin range level)	2	28080	2.0
	Increase in productivity of Cement Mill-03 (Reduction in nozzle ring area for increases of velocity)	0.7	1181818	82.7
	AFR - Conversion of Motor Delta connection to Star	0.0	21600	1.5
	Optimization in Packing Plant - Bag Filter Fan speed	0.0	7140	0.5
	CM 02 - In-house Interlock modification of Cooling water circuit	0.0	7515	0.5
	Rectification of recirculation damper operating positions (Coal Mill) (461TV410)	0.1	120000	8.4

Innovative Project - 1

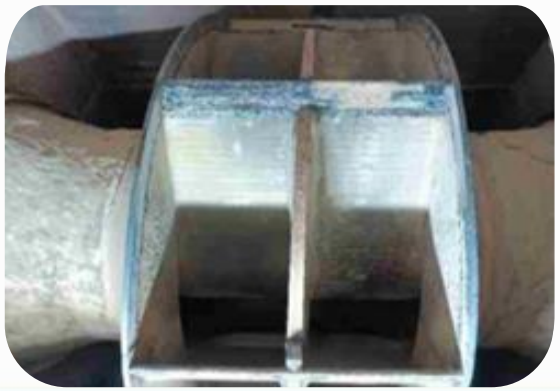
Productivity Enhancement in CM3 VRM by process optimization.

4. Nozzle ring modifications:

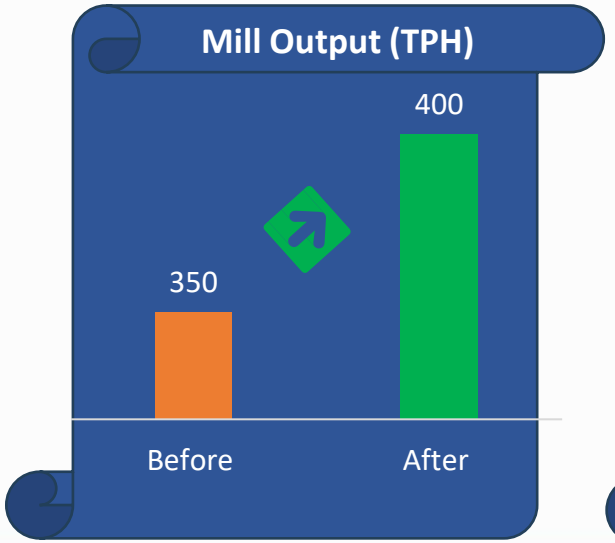
1. Dispersion plate in the fly ash feeding location

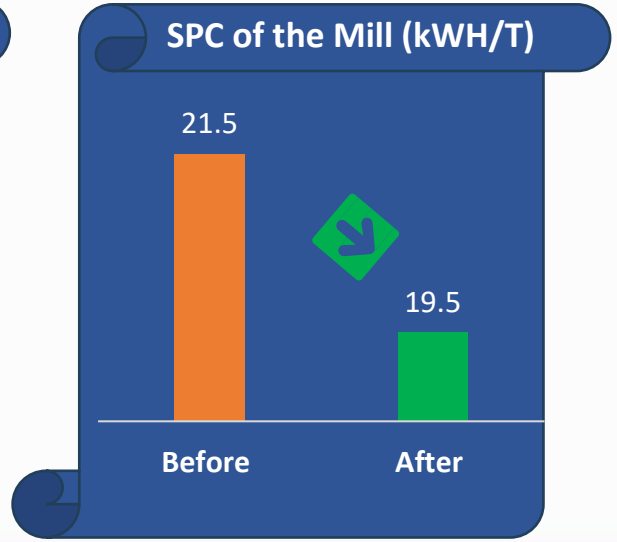
2. Water Spray modifications

3. Fan Tipping for higher Fan Volume



Benefits in terms of productivity and Power Consumption in PPC





Innovative Project - 2

DESCRIPTION : Use of yellow Shale from Mines for improved kiln feed burnability & Improved clinker quality.

BEFORE: At J K Cement Muddapur plant, the kiln feed burn ability was moderate to poor, however on some days with some Limestone stack piles, the kiln performance is excellent and the resultant clinker quality is very good.

It was observed that the limestone piles made with use of around 1 to 3 % yellow Shale exhibited good kiln performance and good consistent improved clinker quality.

AFTER : Impact of Yellow shale on clinker quality

Raw Mix Description	Chemical Composition														Physical Parameter				
	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	CaO (%)	LOI (%)	LSF	SIM	ALM	C3S (%)	C2S (%)	C3A (%)	C4AF (%)	F.CaO (%)	Liquid Content (%)	Blaine (M2/Kg)	Strength (Mpa)			
																01 Day	03 Days	07 Days	28 Days
Control	20.31	4.95	4.30	62.42	0.42	95.29	2.20	1.15	45.67	25.78	5.84	13.08	2.44	28.05	320	28.6	33.6	37.2	48.3
With Yellow Shale	20.42	5.03	4.10	62.66	0.37	95.26	2.24	1.23	50.06	22.77	6.41	12.46	1.35	27.86	323	30.1	35.4	39.7	50.6

BENEFITS / RESULTS:

1) The yellow shale had lower fusion temperature than the conventional clinker liquid formation temperature
2) Enhancing the C3S formation reactions.
3) Improving the Kiln feed burnability and pyro processing performance.
4) Result in improving clinker quality and also result in achieving lower clinker factor in Blended Cement Products.

Innovative Project - 3

DESCRIPTION: **Utilization of Solar Power during grid failure by synchronization with Diesel generator sets**

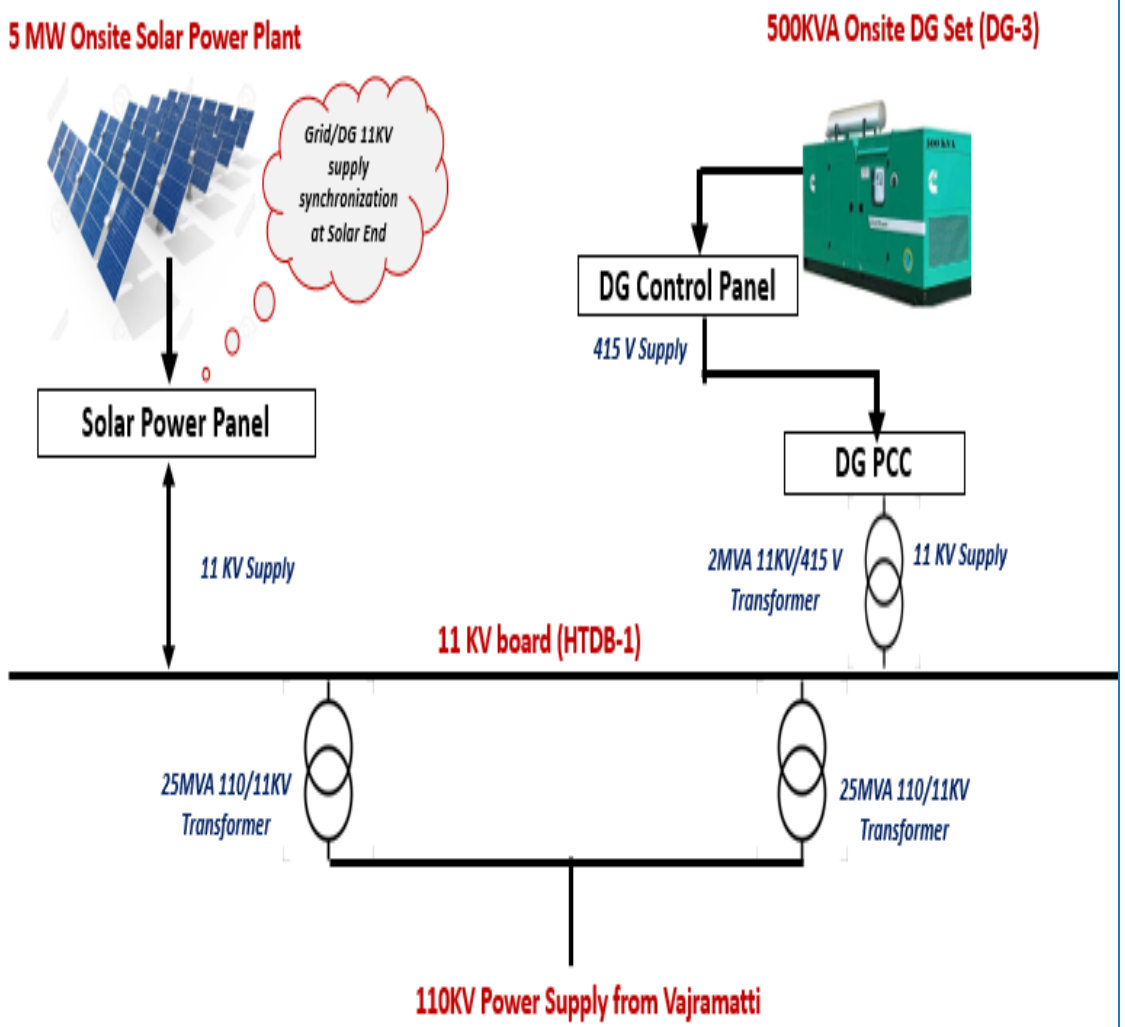
BEFORE: As plant is running through grid power hence during grid power failure we are unable to utilize Solar power, As there was no 11KV source available.

AFTER :

- DG power stepped up from 415V to 11KV and fed to solar power connected bus bar
- Synchronization program is established
- 20% load will be on DG and balance load will be on Solar

BENEFITS / RESULTS:

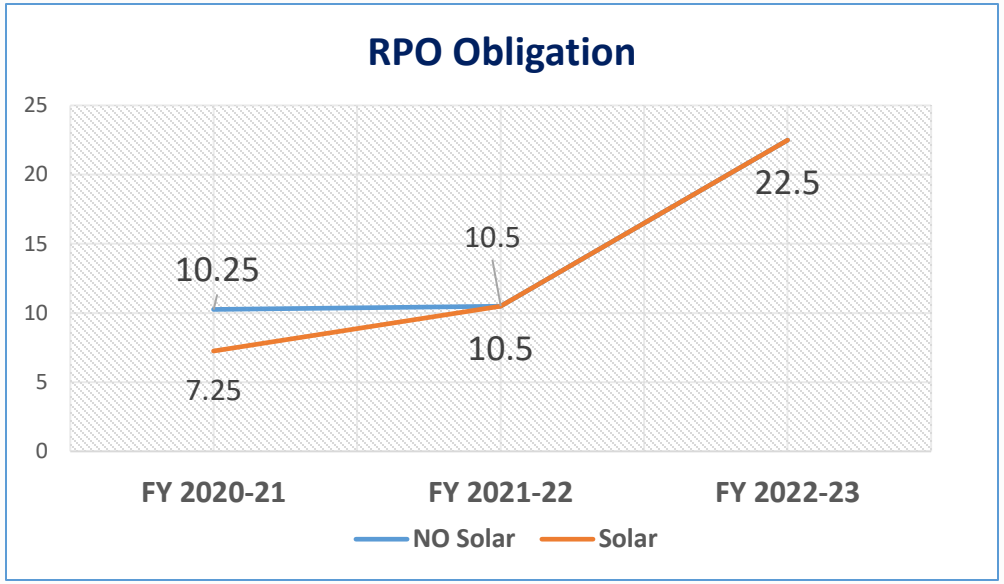
- Successfully synchronization scheme is tested.
- Minimum load on DG hence saving of Diesel
- Saving of Power is achieved through Solar DG synchronization

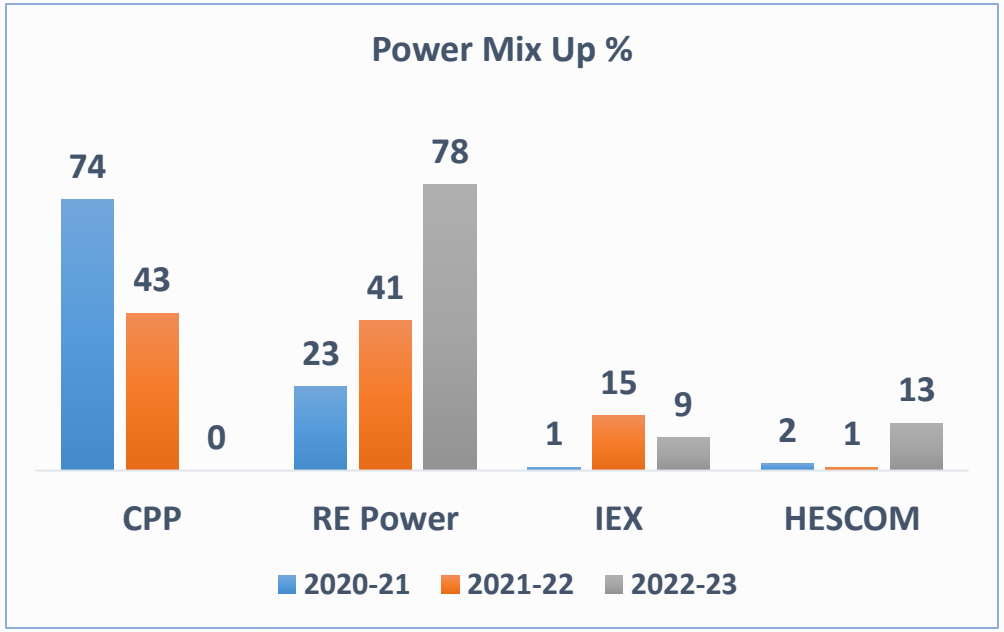


Utilization of Renewable Energy sources

- **M/s Fourth Partner (Solar)Commissioned in February 2023.**
- **5 MW Solar Power Plant** installed and in operation (**Group Captive Mode)**

Year	Technology (Electrical)	Type of Energy	On-site / Off site	Installed Capacity (MW)	Generation (Million kWh)	% of Overall Electrical Energy
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	4.80
	-	Solar Energy	Off-Site	-	34.72	51.30
	-	Non Solar Energy	Off-Site	-	29.70	43.90
2022-23	Solar PV Cells	Solar Energy	On-Site	5.00	6.39	3.50
	-	Solar Energy	Off-Site	-	38.84	21.20
	-	Non Solar Energy	Off-Site	-	100.37	54.80

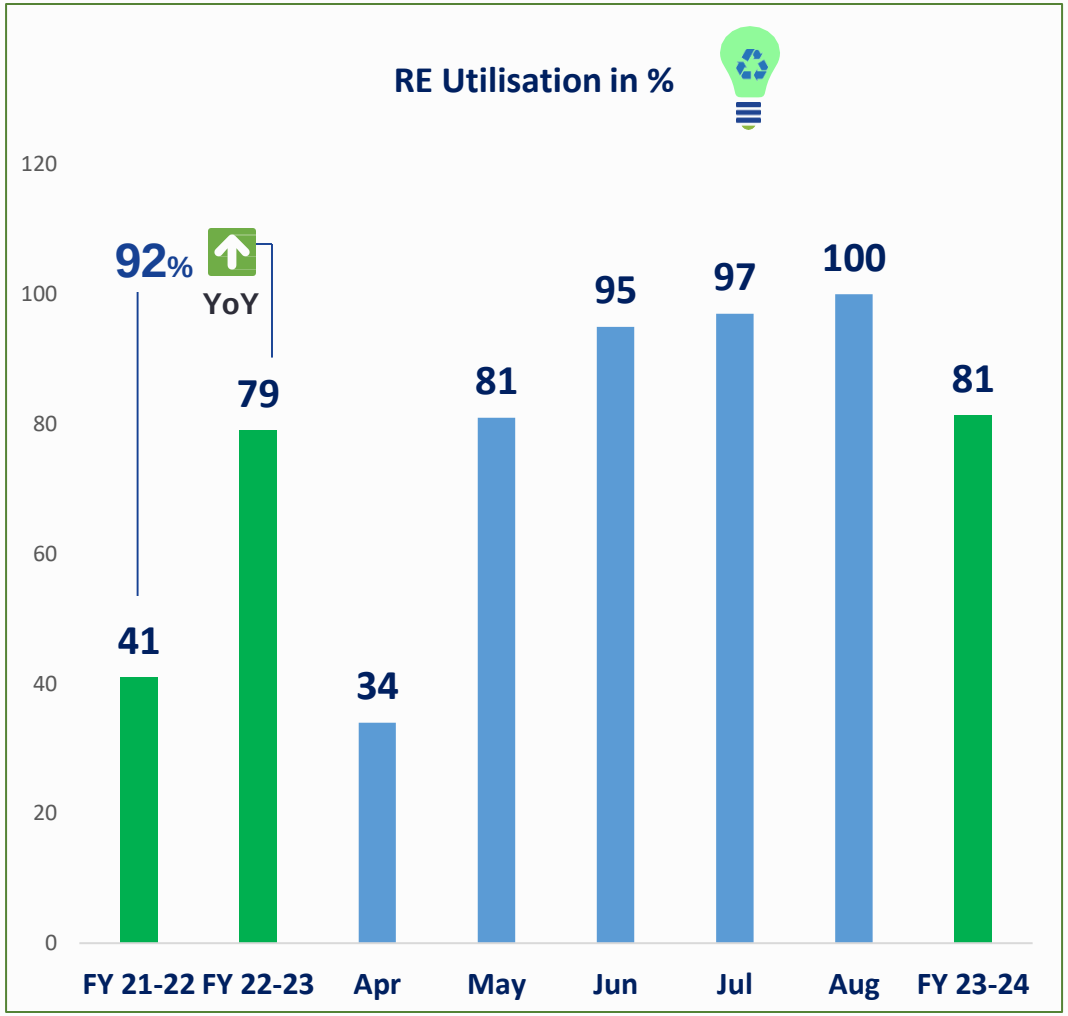




Road Map for Sustainable 100% RE

81% Current Year

A Record share of renewable power sourced through PPA's



- Group Captive Mode Off site Solar PPA with M/s Cleanmaxx (Hybrid) (1.2 Crore Units/Annum– Expected Generation from Oct-23)
- Additional 5 MWp Group Captive On-site Solar Power Plant
- 16 MW WHRS System will be commissioned and operation by Apr-2024

Our Aspiration is to become India's first integrated Cement Plant operating with 100% RE by 2025.(Along with WHRS)

Various Types Waste Usage At Muddapur

Solid Hazardous Waste

1. WASTE MIX SOLID
2. PROCESS WASTES, RESIDUES AND SLUDGE-21.1
3. SPENT CARBON (CAT 28.3) –SOLID
4. CHEMICAL SLUDGE
5. OFF SPECIFICATION PRODUCTS-28.4
6. DATE EXPIRED PRODUCTS -28.5
7. BARREL/LINNER CHEM WAST(33.1)
8. SLUDGE FROM WASTE WATER CATEGORY-34.2
9. CHEMICAL CONTAINING RESIDUE(34.1)
10. EXHAUST GAS CLEANING RESIDUE (CAT 35.1)
11. SPENT CATALYST CATEGORY-28.2
12. DISTILLATION RESIDUE SOLID(CAT-20.3)
13. ETP SLUDGE 35.3
14. SPENT CATALYST AND MOLECULAR SIEVES-1.6
15. SPENT CLAY (CAT NO.4.5)

Solid Non Hazardous Waste

1. SHREDDED RDF
2. RDF
3. TRADE REJECTS
4. MUNICIPAL SOLID WASTE
5. PLASTIC WASTE
6. REJECT POP MATERIAL
7. BBD- COCA COLA AFR
8. WASTE PLASTIC PULP MIXED
9. MULTI LAYERED PLASTIC"(MLP) WASTE
10. BBD LIQUID

Liquid HAZ / Non HAZ Waste

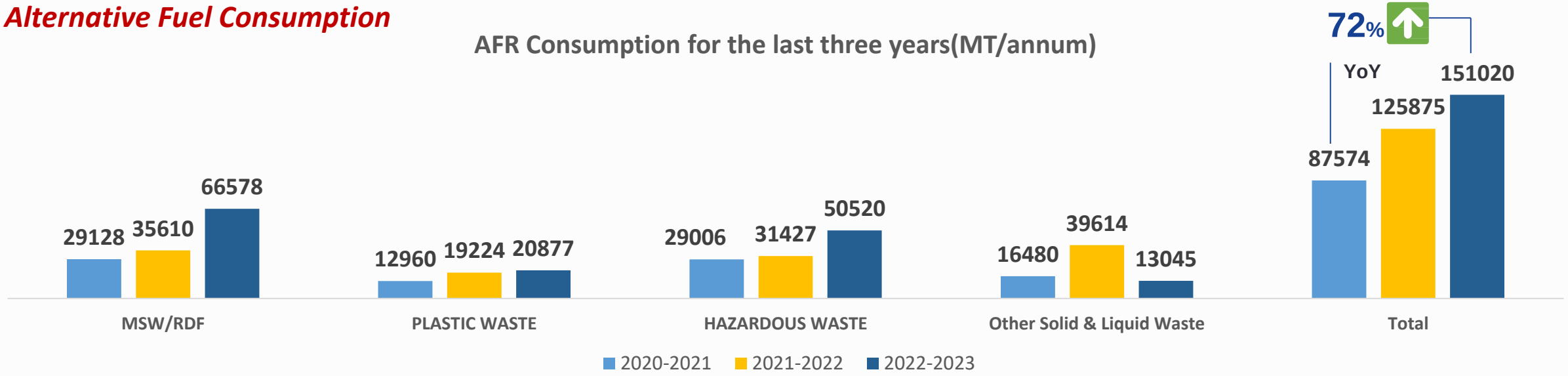
1. WASTE MIX LIQUID
2. DISTILLATION RESIDUE-LIQUID-20.3
3. SPENT ORGANIC SOLVENT (CATEGORY: 28.6)
4. PROCESS RESIDUE (CAT 29.1)– LIQUID
5. SPENT ORGANIC LIQUID (CATEGORY: 28.6)
6. LOW CV PPF OIL
7. SLUDGE CONTAINING RESIDUAL PEST. (29.2)
8. DISTILLATION RESIDUES CATEGORY-36.1
9. PROCESS RESIDUE AND WASTE (LIQUID)-28.1

Agro Waste

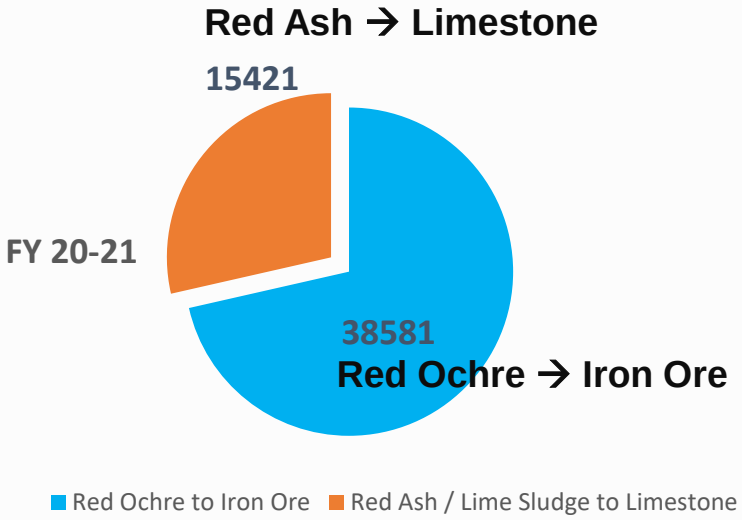
1. RICE HUSK
2. BAGASSE
3. GROUND NUT HUSK
4. BIOMASS BRIQUETTES
5. BAGASSE PELLETS
6. DRY CHILLY WASTE
7. PALM SHELL
8. BIO. BRIQUETTES
9. Wood Waste

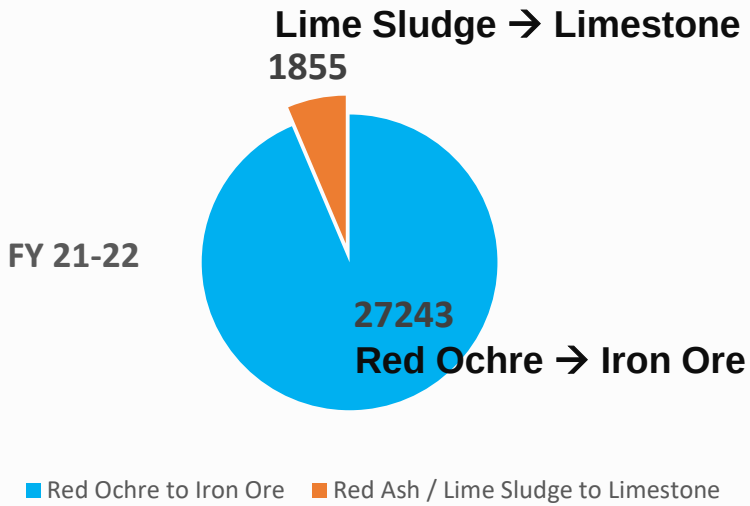
Waste utilization and Management

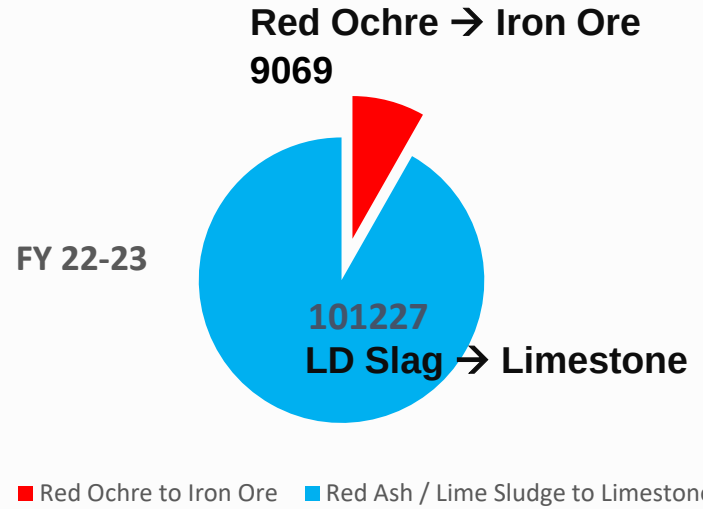
Alternative Fuel Consumption



Alternative Raw Materials(MT / Annum)

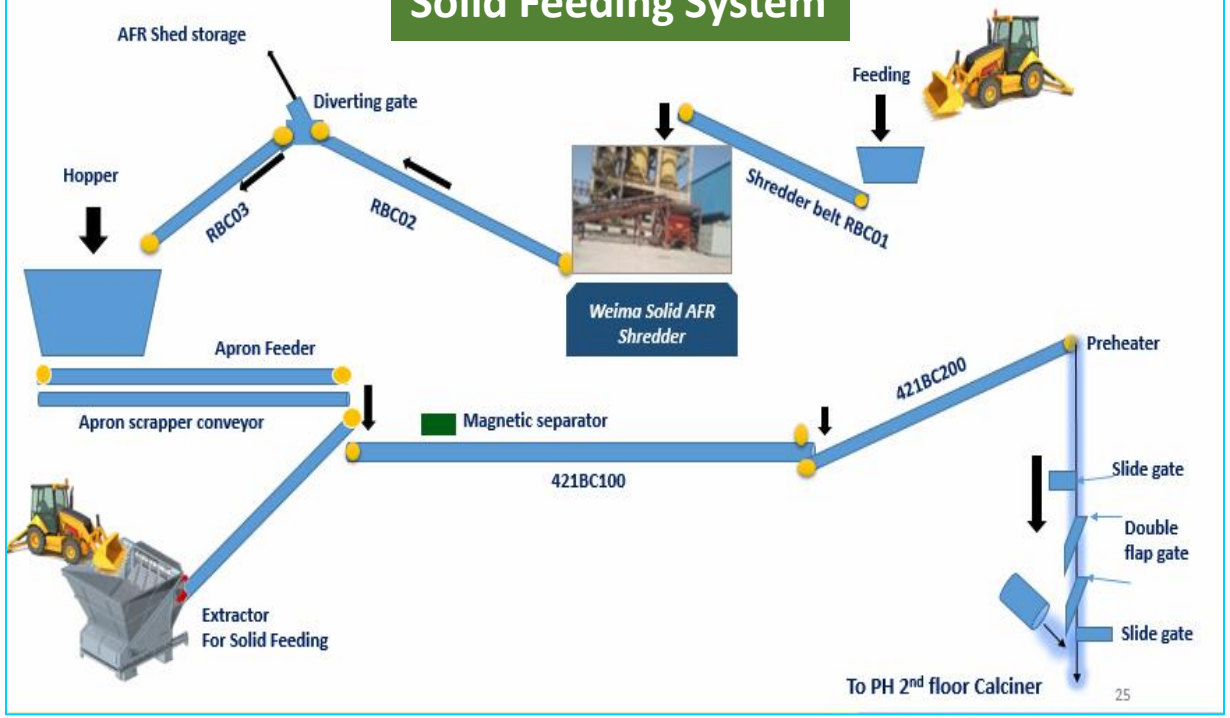




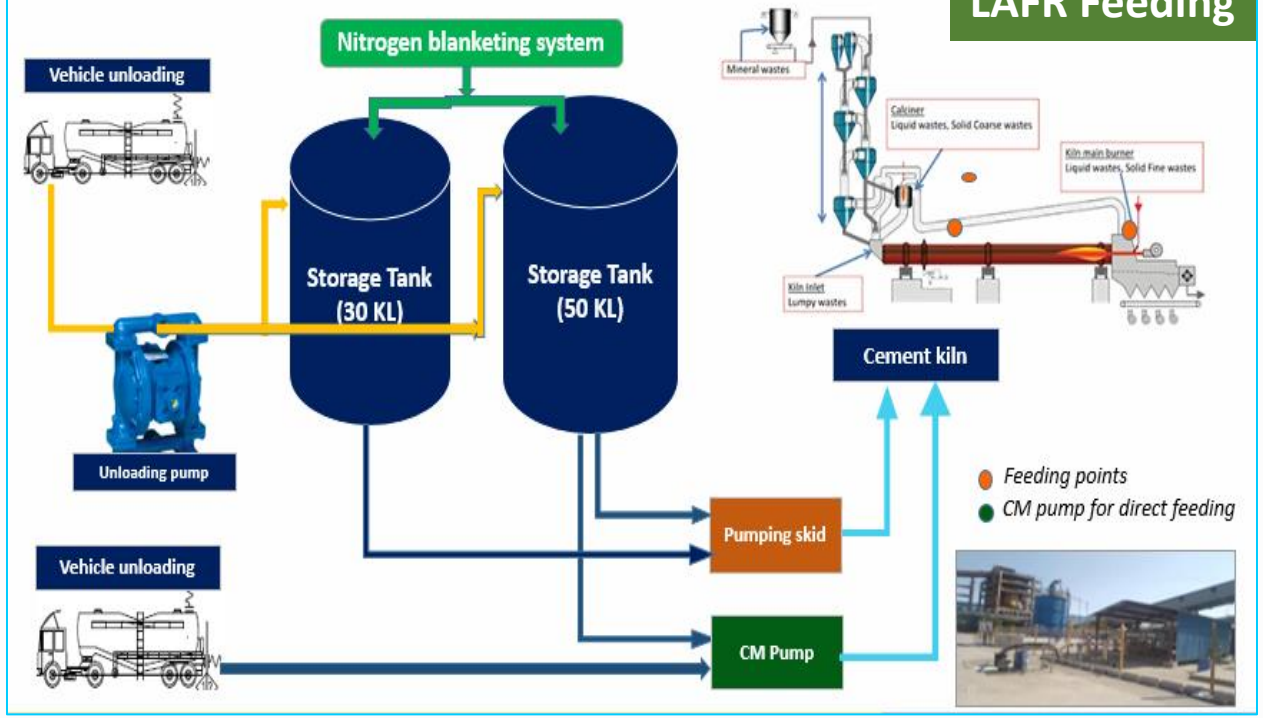


Advanced AFR Co-processing

Solid Feeding System



LAFR Feeding



Latest Terex Electrical Mobile Shredder and Screen

Glimpses of Solid AFR System

Weima Shredder

SAF Weigh Feeder

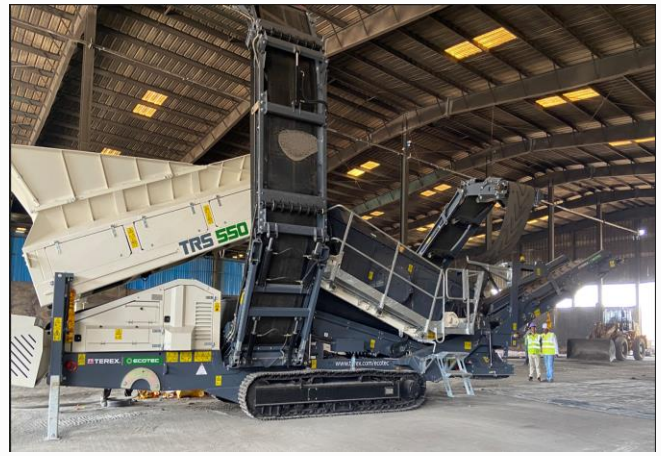
Agro waste Cutter

Mobile Shredder

Leachate- Impregnation Pit

Liquid AFR Feeding System

AltSf Finished Feeding

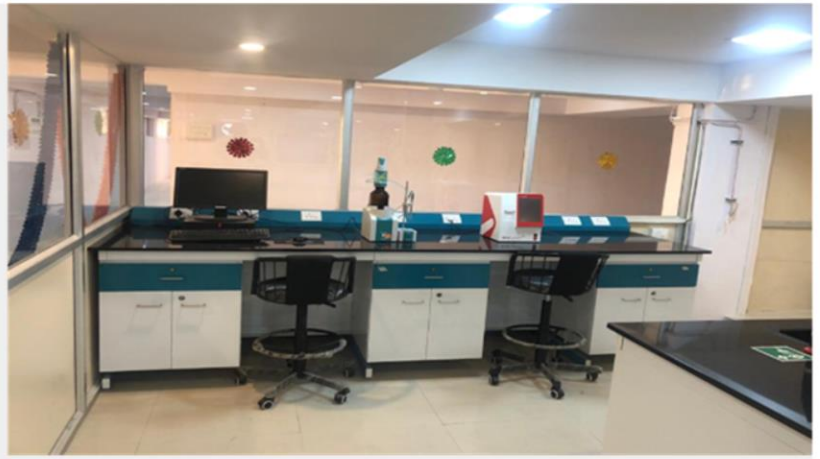


Terex Electrical Screen

Set up of AFR Lab

AFR Lab View

Chemical Lab



Titrant & Era Flash

Micro Digester

Agilent ICP-OCE 5800

Fume Hood

Enhancing The Share of Clean Green Energy

16 MW

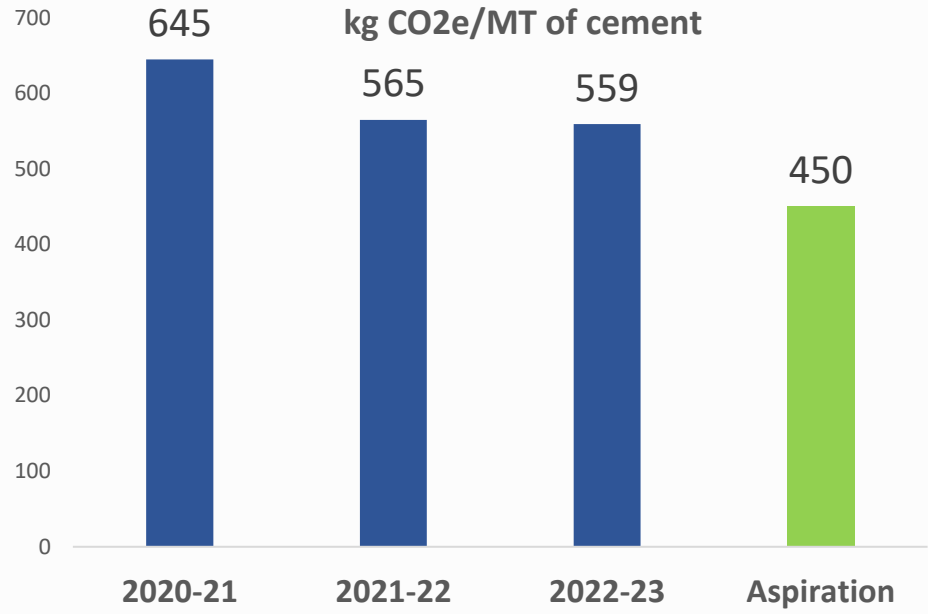
Waste Heat Recovery Will be Commissioned in Apr-24 at JK Cement Muddapur Plant

84000 MT CO_2

savings/annually

GHG Inventorisation

Year	Scope 1 Emissions CO_2e (MT)	Scope 2 Emissions CO_2e (MT)	Scope 3 Emissions CO_2e (MT)	kg CO2e/MT of cement
2020-21	1659753	-216353	39191	645
2021-22	1697368	-222791	44686	565
2022-23	1680394	-220563	44239	559



Scope 1 2 3 Emissions Evaluation Parameter

Scope-1 Plant Fuel	Scope-2 Import/ export clinker, power	Scope-3 Vehicle Diesel consumption
Calcination -Limestone	CO2 from external power generation	Cement Dispatch - Road Transport
Kiln - Coal, Diesel/Heavy oil, Pet Coke, Waste Oil, Solid AFR, Power plant- coal	CO2 from net clinker imports (+)	Mines Diesel - contract vehicles
Fabrication –Acetylene, R & AC -Freon (R22 & R134A)	CO2 from net clinker exports (-)	Internal Shunting - contract vehicles
Canteen –LPG, Company Vehicles usage	CO2 from Renewable Energy	Pet Coke, Gypsum, Fly ash, Slag & AFR - Road Transport

Scope 1 2 3 Emissions % reduction from Base line FY 2020-21

12.47%
FY-22

13.33%
FY-23

GHG Reduction Action Plan

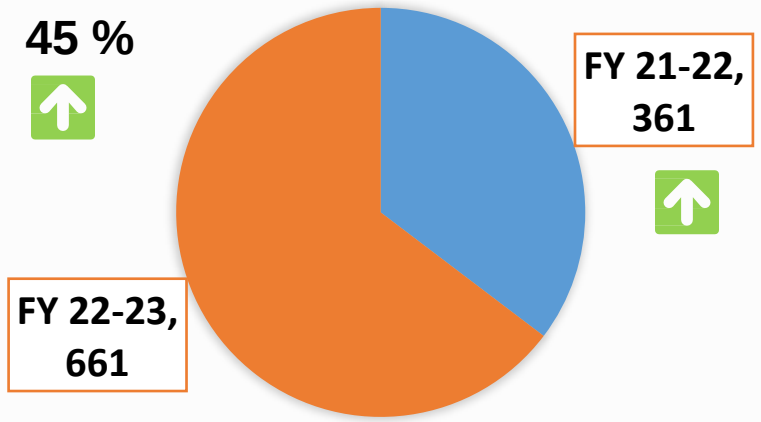
	S.n	Project description	CO_2 reduction potential MT / annum
MAJOR PROJECTS	1	Installation of WHRS (16 MW) and additional 5 MW Solar system	101104
	2	Increase of AFR from 25% to 40% by Calciner Loop duct extension	83117
	3	Introduction of Belt Conveyor system for Limestone transport from mines	63840
	4	Cooler Module extension SF 4*6 to 4*7	19557
	5	Replacement of 12700 Tons of high dolomitic limestone as clinker factor	12700
	6	Installation of New Raw Mill Silo (Raw Mill Power reduction 1.5 units/mat)	6510
MINOR PROJECTS	7	Replacement of PH Top cyclone with HR+ Cyclones	2955
	8	Install High Efficiency PH Fan	2516
	9	Cement Silo-04 elevator upgradation	2447
	10	Regradation of Grinding Media in CM -1	2100
	11	Improve heat transfer by replacing Kiln inlet and Outlet Seal	1956

280318

11974

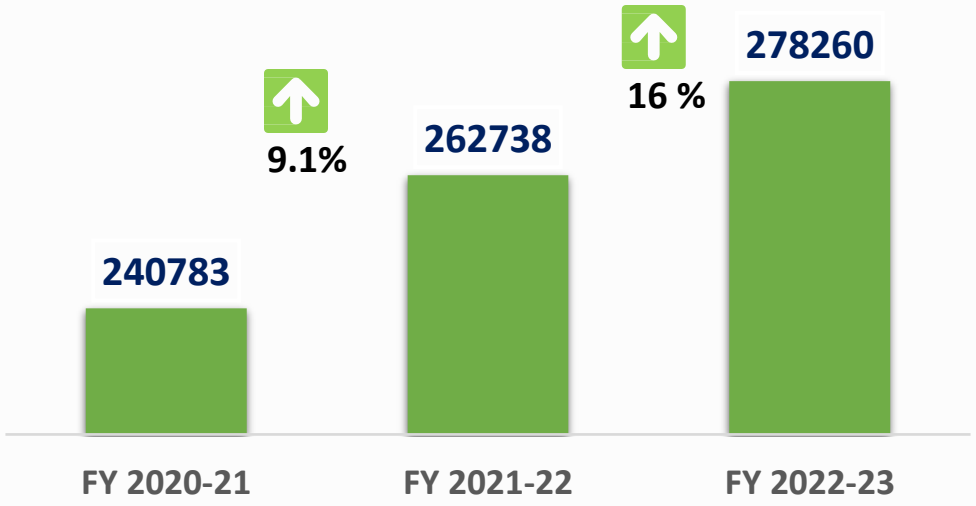
Green Supply Chain Managements

BS VI



- No of BS VI vehicles drastically increased from 361 to 661
- Generating awareness and Encouraging vendors to shift towards BSVI vehicles lead to achieve high numbers.
- Last year we have set a target to achieve 75 BSVI vehicles for the next year. We have crossed the number well in advance and increased utilization of vehicles.
- By the same way we will encourage vendor by explaining the importance of Eco friendly vehicles.

BULKER DISPATCHES



- Achieved Ever Highest Yearly Bulker dispatches of 2.78 LMT in FY 2022-23.
- Bulker Dispatches Increased by 6% in FY 2022-23 over last FY 2021-22 (From 2.63 LMT To 2.78 LMT).
- Increase in Bulker dispatches resulted into reduction in Packing Material & Other relevant expenses like Manpower Cost, Power Cost etc.
- In current scenario/increase in Infra project, expecting increase in Bulk dispatches in coming Financial Year too.

Green Supply Chain Management

EV Vehicles inside Plant

RFID Implementation

Cycling by Employees

Car and bike Pooling

Involvement of Employees in Plant Performance

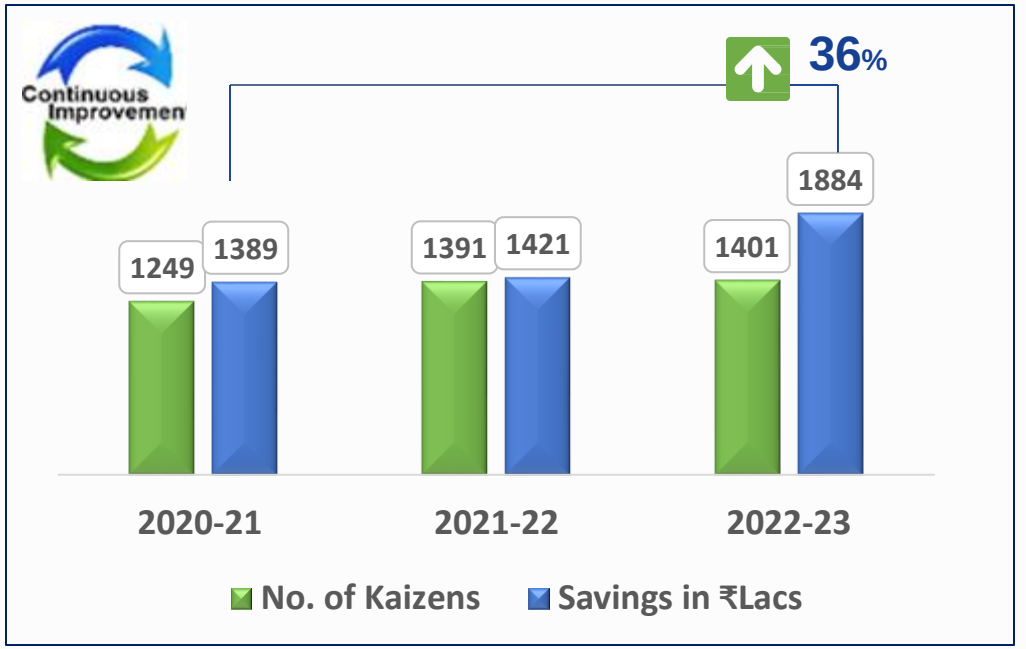
Protsahan Awards Ceremony

Energy conservation training program

Best Kaizens are been awarded

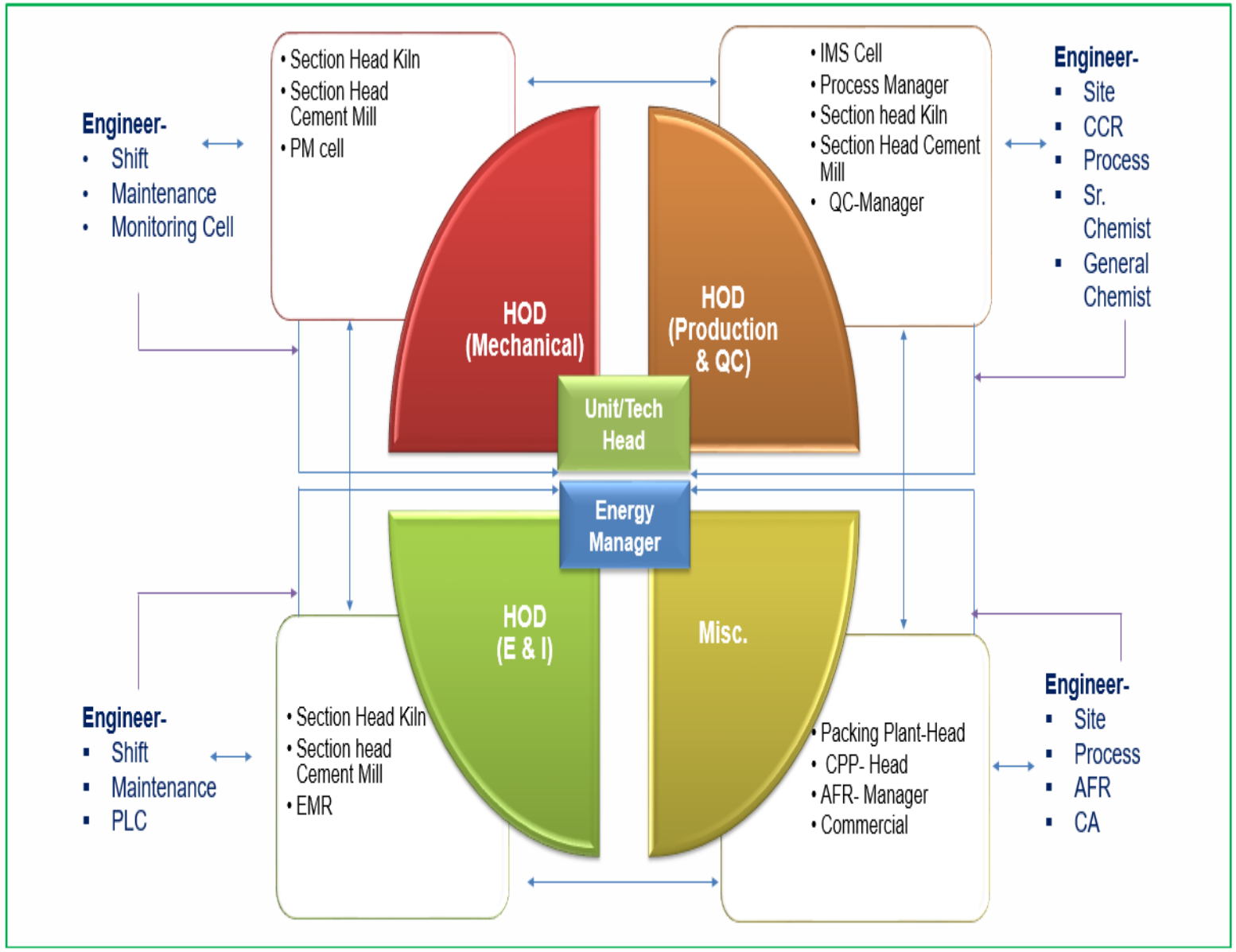
Management by walk around

1. Daily monitoring of deviations in PD meeting.
2. Monthly Energy cell meeting chaired by Unit head, discussion on KPI parameters
3. PROTSAHAN Reward and Recognition (R&R) scheme
4. Management by walk around
5. Weekly Performance Review on Every Saturday with technical team.



- *YoY increase in Saving potential from Kaizens*

Energy Monitoring System & Energy Policy



JKcement

JK Cement Works, Muddapur
(Unit : J.K. Cement Ltd)
CIN : L17229UP1994PLC017199
Works : P.O. Muddapur - 587 122 Distt. Bagalkot (Karnataka) India
+91-8350-289607
factory.muddapur@jkcement.com
www.jkcement.com

JK Cement Works-Muddapur

Energy Policy

While ensuring continual efforts for the manufacturing of quality cement we also strive to achieve business excellence through responsible and efficient use of Energy both Thermal and Electrical and we are committed to:

1. Reduce specific energy consumption wherever possible to reduce energy and fossil fuels.
2. Reduce Green House Gas (GHG) emission for better sustainability
3. Be efficient in the field of energy by effective management and use machinery/services.
4. Be progressive in the field of technology/manufacturing by adopting technologies.
5. Monitor the efficiency/effectiveness of equipment's on periodic basis depicting them by Energy Score Cards.
6. Make employees vigilant towards energy conservation by training participation.
7. Reduce CO_2 emission by exploring the importance of alternative fuel and other renewable energy sources and manage the expenses by this mechanism manner.
8. Enhance the utilization of renewable energy in the overall energy long-term energy security in focus.
9. Obey all the related and necessary guidelines. Make green and clean conservation.

Utilization of RE Energy

Reduction of SEC

Reduction of GHG

Training and Awareness

Adapt Latest technologies

Introducing Score cards

Date: April, 2022
Review: 2, Revision No:01

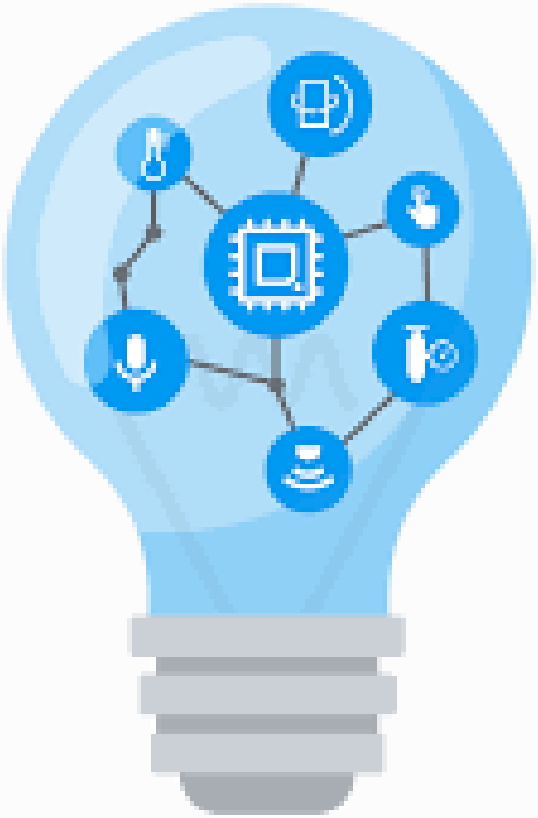
Umashankar Choudhary
Unit Head

Daily Energy Monitoring Detail Analysis

July'23							
Equipment	TPH	Run Hrs	Prodn (TPD)	KWh	U/T of Mat	U/T of Cl	U/T of Cmt
Crusher	850	343.84	292118				
Main motor				128243	0.44	0.66	0.42
Crusher Aux				100086	0.34	0.51	0.33
Sub-Total				228329	**0.78**	**1.17**	**0.75**
Raw mill	438	707.83	309732				
Main Drive				1994337	6.44	10.12	6.54
Separator Fan				1412341	4.56	7.16	4.63
Mill Auxi				447337	1.44	2.27	1.47
Sub-Total				3854015	**12.44**	**19.55**	**12.64**
Coal mill	29	584.57	16941				
Main drive				275536	16.26	1.40	0.90
Bag filter Fan				197628	11.67	1.00	0.65
Coal Crusher & Transport				31248	1.84	0.16	0.10
Mill Aux				158800	9.37	0.81	0.52
Sub-Total				663212	**39.15**	**3.36**	**2.18**
Kiln	279	707.84	197161				
Main motor				278010	1.41	1.41	0.91
PH fan-1				912995	4.63	4.63	3.00
PH fan-2				936633	4.75	4.75	3.07
BH fan				790991	4.01	4.01	2.60
Cooler ESP fan				90246	0.46	0.46	0.30
Kiln Auxi				1853928	9.40	9.40	6.08
Sub total				4862803	**24.66**	**24.66**	**15.95**
Upto Clinkerization						**48.74**	**31.53**

July'23						
Equipment	TPH	Run Hrs	(TPD)	KWh	U/T of Mat	U/T of Cmt
Cement Mill -3 OPC	252	118.16	29766			
Main drive				456722	15.34	
Bag house fan				253512	8.52	
Mill Aux				110851	3.72	
Mill-3 Compressor				14454	0.49	
Sub Total				835539	**28.07**	**28.07**
Cement Mill -3 PPC	363	262.94	95452			
Main drive				1094882	11.47	
Bag house fan				611660	6.41	
Mill Aux				287756	3.01	
Mill-3 Compressor				35868	0.38	
Sub Total				2030168	**21.27**	**21.27**
Cement Mill -3 PSC	190	54.17	10296			
Main drive				208867	20.29	
Bag house fan				114360	11.11	
Mill Aux				53749	5.22	
Mill-3 Compressor				6426	0.62	
Sub Total				383402	**37.24**	**37.24**
Cement Mill -3 Prem PPC	240	238.13	57220			
Main drive				930854	16.27	
Recirculation fan				506934	8.86	
Mill Aux				238142	4.16	
Mill-1 Compressor				28468	0.50	
Sub Total				1704398	**29.79**	**29.79**
Cement mill - Combined			**301775**	8562980	**28.38**	**28.38**
Packer			300942	263278		**0.87**
Utilities				517064		**1.71**
OPC - Kwh/T Cement				2769108	**33.8**	**78.1**
PPC - Kwh/T Cement				3706072	**24.3**	**54.1**
PSC - Kwh/T Cement				383402	**37.2**	**50.2**
Pr.PPC - Kwh/T Cement				1704398	**29.8**	**64.5**
Upto Cement - Combined				18951681		**62.49**

Learning from CII Energy Award



- **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 ACC cooling fans**

ISO Certification

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

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

Certificate Issue Date: 4 April 2018

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

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

Certificate Identity No. 10257092

ISO 50001-2018: Certificate Renewable date – 9th Nov'20

Certificate Identity No. 10305836

Investment on Energy Saving project

% investment on Turnover

3.31% for FY'22-23

Lloyd's Register

Current issue date: 9 November 2020
Expiry date: 24 July 2023
Certificate identity number: 10305836

Original approval(s):
ISO 14001 - 31 July 2012
ISO 45001 - 26 January 2019
ISO 50001 - 4 April 2018
ISO 9001 - 31 July 2012

Certificate of Approval

This is to certify that the Management System of:

J K Cement Works

(Unit of JK Cement Ltd), Muddapur, Taluka – Mudhol, District – Bagalkot, Karnataka, 587122, India

has been approved by Lloyd's Register to the following standards:

ISO 14001:2015, ISO 45001:2018, ISO 50001:2018, ISO 9001:2015

Approval number(s): ISO 14001 – 0060494, ISO 45001 – 0052683, ISO 50001 – 0060519, ISO 9001 – 0060495

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

Manufacture of ordinary portland cements and blended cements including associated mining operation at Muddapur and Halki.

Luis Cunha
Area Operations Manager - SAMEA

Issued by: Lloyd's Register Quality Assurance Limited

UKAS

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Issued by: Lloyd's Register Quality Assurance Limited, 63-64, Kalpataru Square, 6th floor, Kondivita Lane, Off Andheri-Kurla Road, Andheri (E), Mumbai, 400059, India for and on behalf of: Lloyd's Register Quality Assurance Limited, 1 Trinity Park, Bickenhill Lane, Birmingham B37 7ES, United Kingdom

Page 1 of 3

Green Development

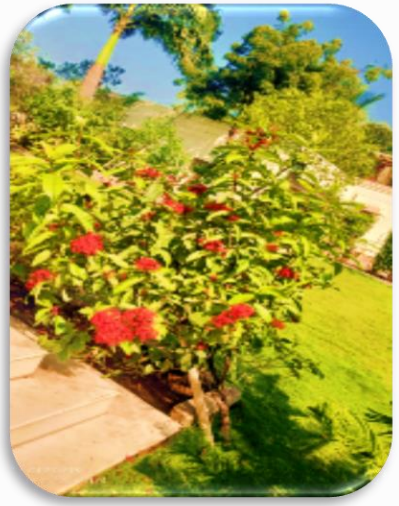
Green Belt near Muddapur Mines office

Dense plantation in plant area

Green Belt near Halki Mines office

Nursery inside colony area

Dense plantation In front of stores area



Fruit and Flower Park inside plant

Environment Projects

SNCR

Liquid AFR Feeding System

5 MW Solar Plant

Miyawaki Plantation at Colony

Smart organic composter

Dust Suppression by Dustex

Awards and Accolades

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

Awards and Accolades

2022

Received Two awards in **CII National Energy Efficiency Circle Competition - 2022.**

2022

1st Runner up in Best energy efficient organization (Large Category)

2022

Cement Plant - **Excellent Energy efficient unit in 23rd National Award for Excellence in energy Management conducted by CII**. for consecutive fifth time

2022

Appreciation in innovations in Energy Efficiency (Large Category)"

2022

Cement Plant - National Leader in Energy Efficiency in 23rd National Award for Excellence in energy Management conducted by CII. for consecutive third time

2022

National Award by NCCBM in Energy Excellence, Environment excellence, Quality excellence, Circular economy.

JKCement

“ Sustainable is Attainable ”

Thank You

J.K. Cement Works, Muddapur.
Muddapur-587122, Taluk- Mudhol,
Dist.-Bagalkot, Karnataka,
Ph-08350-2891900
factory.muddapur@jkcement.com