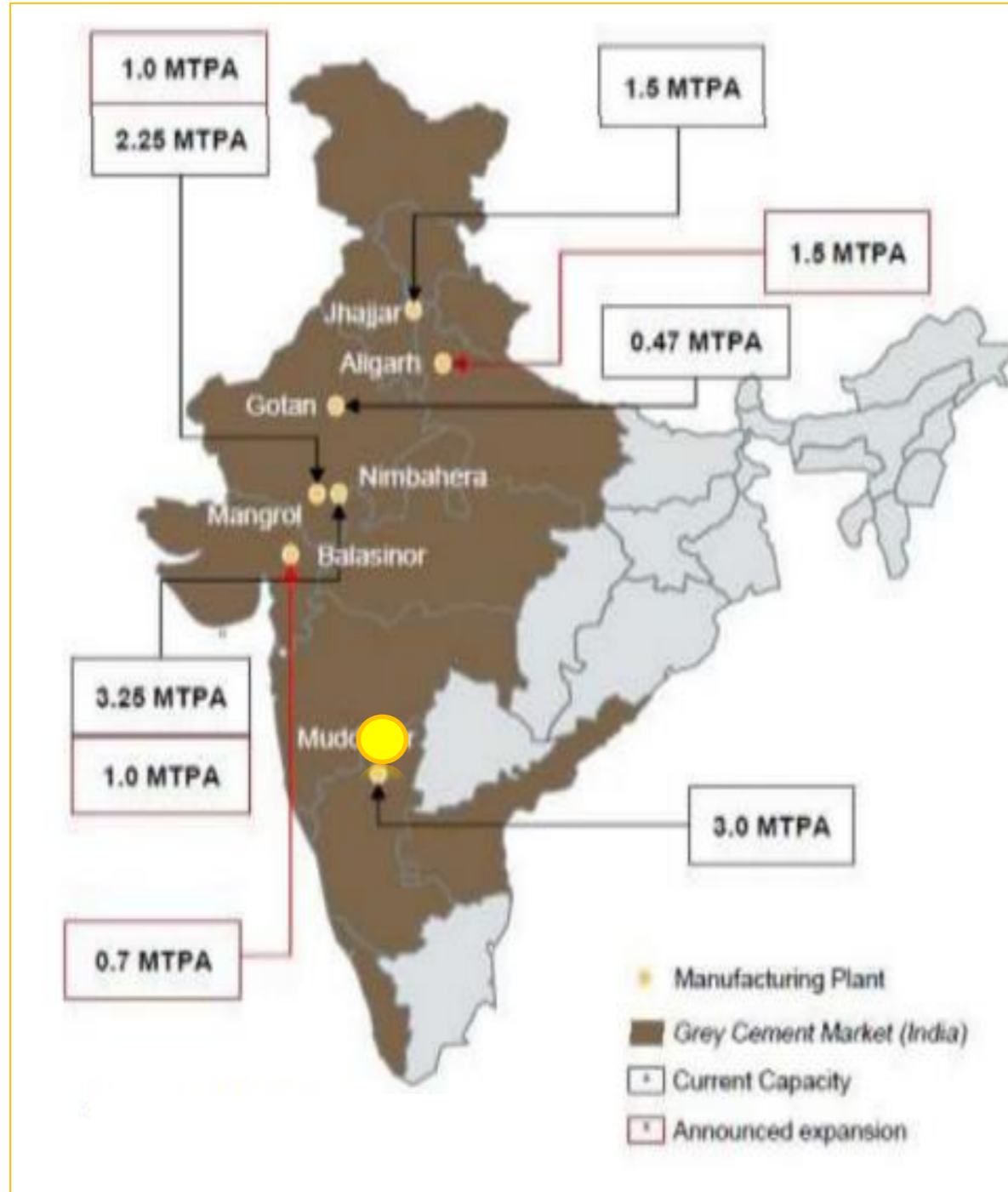




CII – 22nd National Award for Excellence in Energy Management 2021



Presented by
US Choudhary – Unit head
K. Srinivasu - Technical Head
Rajakumaran Kandasamy– Head Process



J.K. Cement Ltd. is a part of Industrial conglomerate JK Organization. The Company is promoted by Late Mr. Yadupati Singhania . The group entered the cement manufacturing business in 1975.



Grey cement capacity of **14.7 MTPA** & White cement capacity of **1.2 MTPA**



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



J K Cement Muddapur is certified with **ISO 14001:2015, ISO 9001:2015, ISO 45001:2015 & ISO 50001:2018**. **GreenCo Gold rating Plant, Great Place to work certified company**



Mining & Crushing

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



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



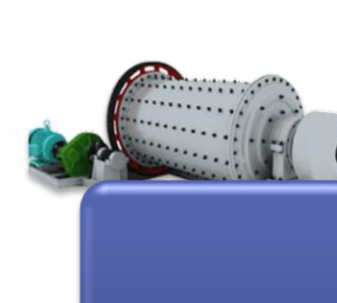
AFR & SNCR

Solid AFR
 Schenck
 20 TPH
Liquid AFR
 PH1
 2-4 KLPH
Shredder
 Weima
 20 TPH
SNCR
 KHD System
 25% Aqueous
 ammonia
 solution



Kiln & Cooler

Kiln
 FLSmith
 ILC-
 4.75ØX74
 5500 TPD
Calciner
 Low NOx
 ILC- 8.5ØX52
 Mtr.
Cooler- FLS
 Cross bar 4X6
 138.8 M2



Cement Mill

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



Packing Plant

Packer 1-4
 FLS
 Ventomatic
 12 Spout
 Double
 Discharge
 180 TPH

Created National Benchmark in Energy and Renewable energy category in GreenCo Rating

Green Supply chain

Promoting Reverse logistics & Bulk Dispatches

Material conservation

Reduction in clinker factor and using alternate raw materials

Waste Management

Achieved TSR 15 % in FY 20-21 and targeting for 50% in coming 2 years



Energy Efficiency

Achieved National Benchmark ,Roadmap for 59 kwh/T Cement

Water Conservation

Targeting to become 5 times Water Positive by FY 23

Renewable Energy

Increased the Renewable energy consumption up to 24 %.Target is 100 %

Green House Gases

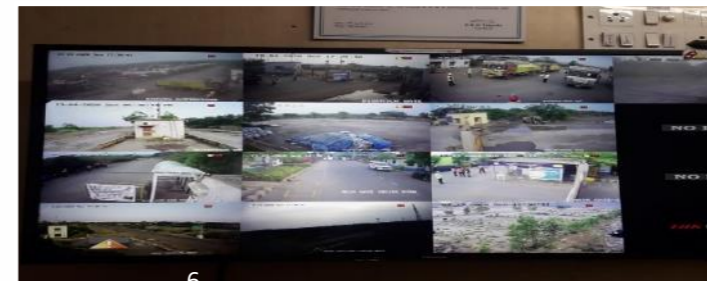
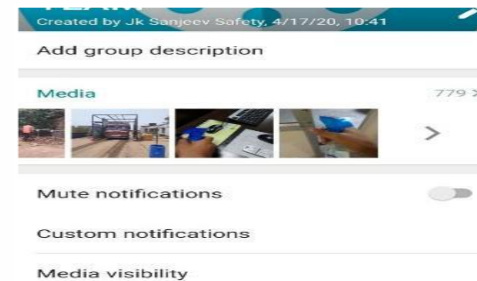
Gross CO2 Emission reduced by 27% from 874 to 639 kgCO2e/MT Cement – Target : 580 kgCO2e/MT Cement

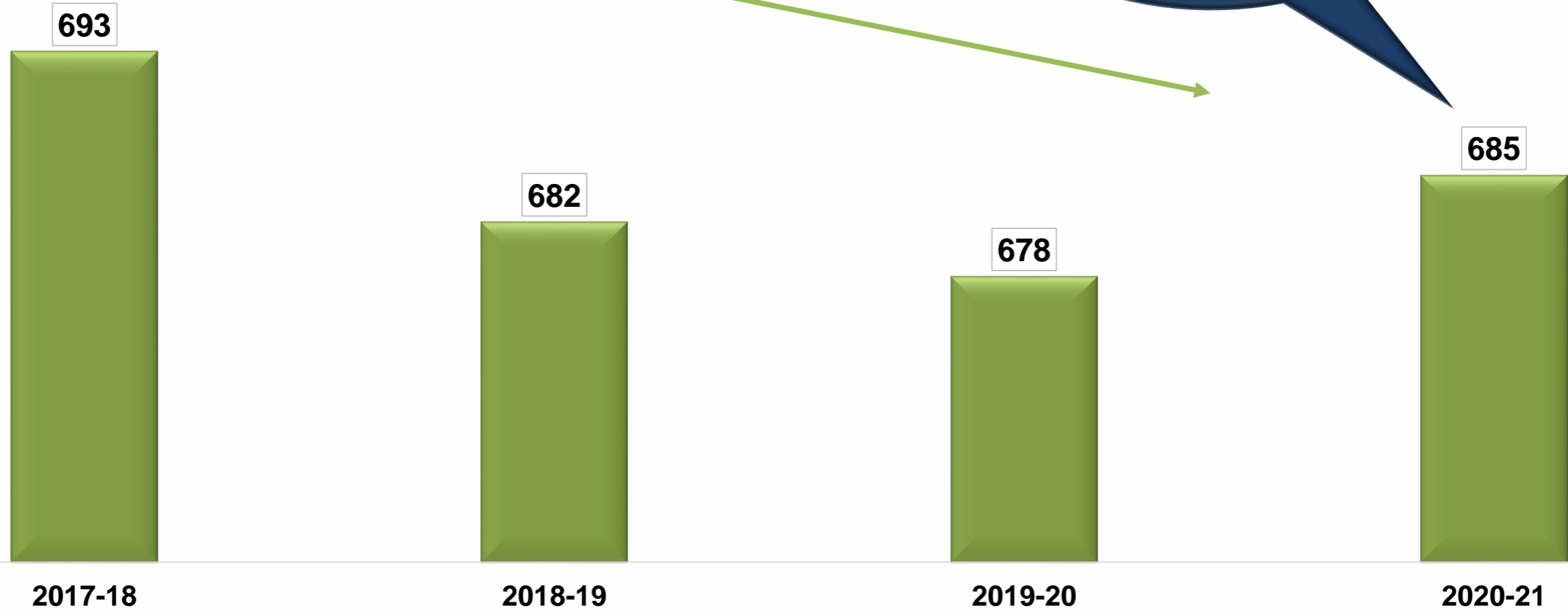
Initially, Due to Covid-19 Lockdown imposed affected the dispatches.

Later on when Lockdown eased, as per the market demand, we managed to cater the demand with proper planning and adhering the Covid guidelines and CAB.

Following actions has been taken to minimize the Impact of Covid 19:

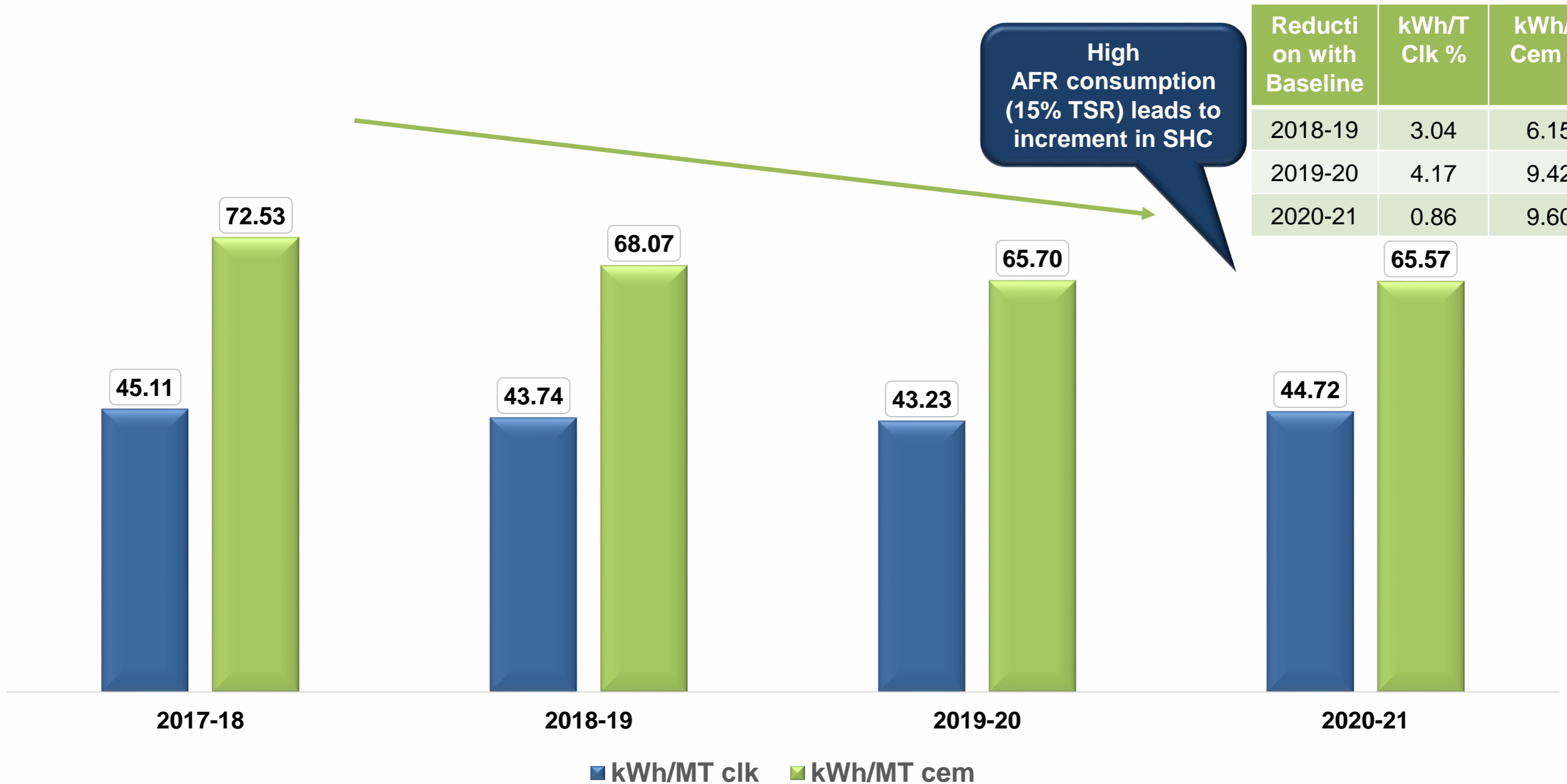
- a) Staggered timing for Shift changeovers
- b) Teams formation for Critical jobs & Roster Plan implementation
- c) Plant operation with minimum required person
- d) Quick Reaction Team formed with Response Mechanism
- e) Set up Surveillance Team with Dedicated Control room
- f) Maximizing Social Distancing
- g) Disinfection & Sanitization
- h) Entry of outsiders to Plant prohibited
- i) Paper less initiative taken to mitigate the risk of transmission





Reduction with Baseline (%)	
2018-19	1.59
2019-20	2.16
2020-21	1.15

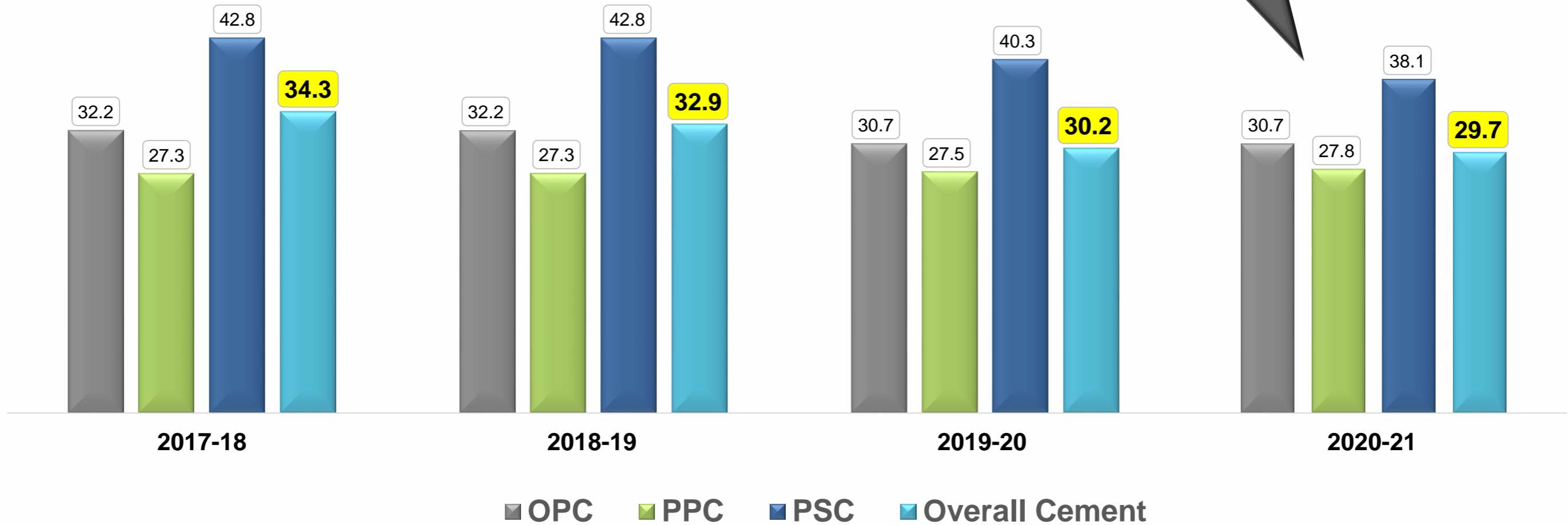
■ Kcal/kg clk

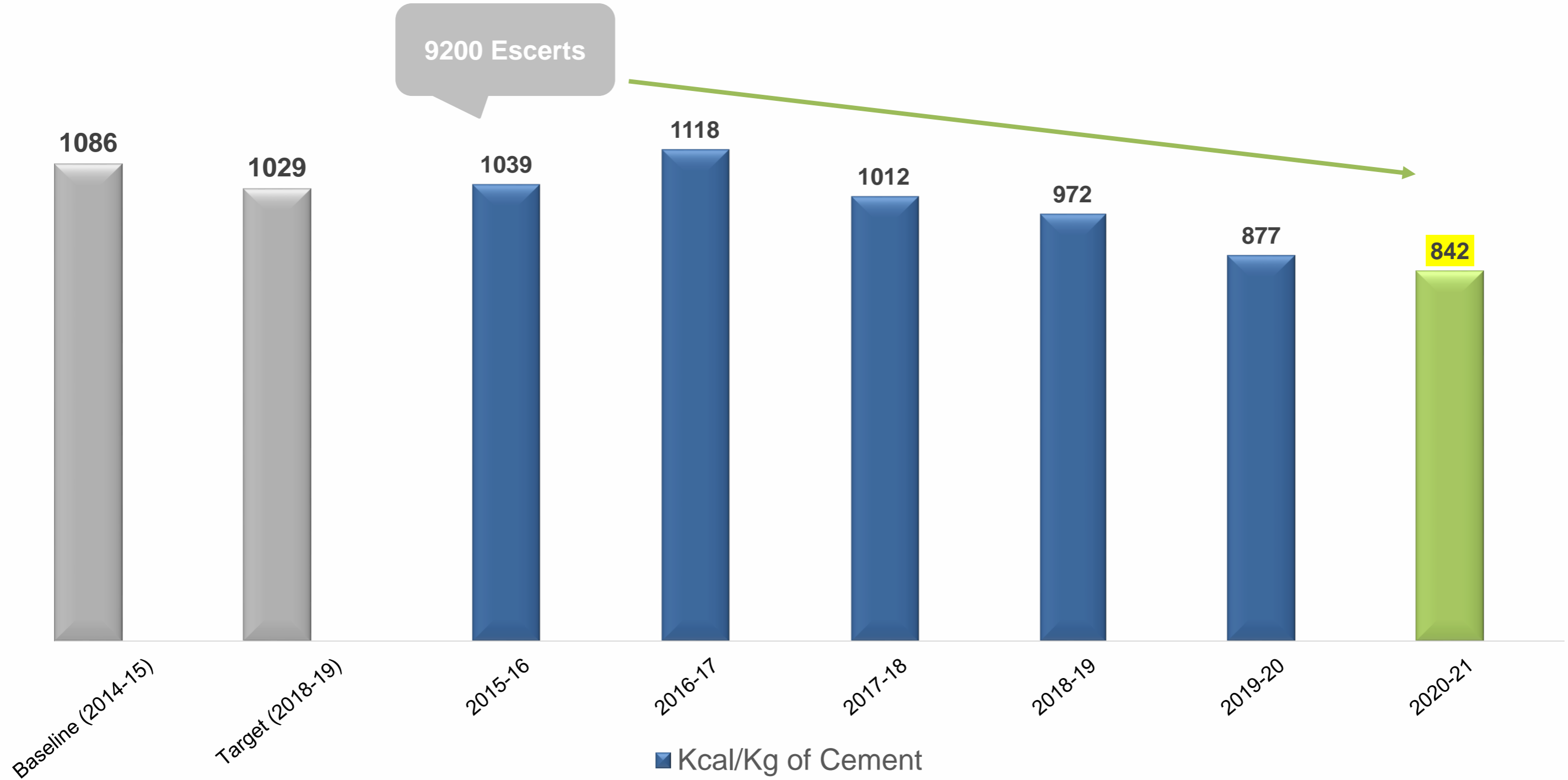


kWh/MT Cement

Slight increase in PPC power due to scarcity of DFA during Lockdown period

Reduction with Baseline (%)	
2018-19	4.1
2019-20	12.0
2020-21	13.4

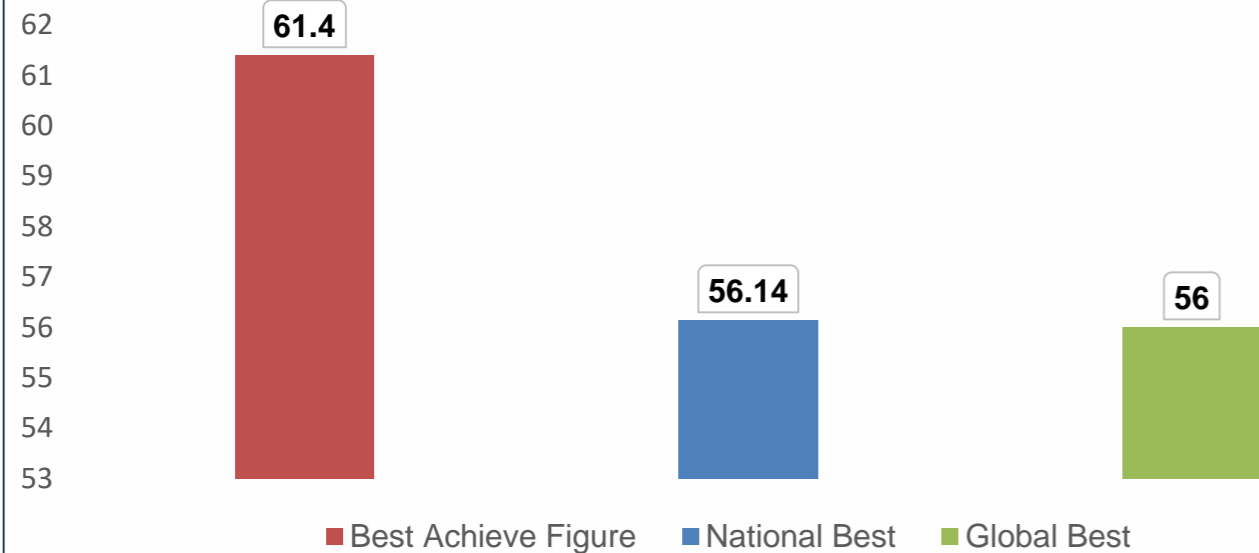




- **Only Plant in the World running without Raw meal CF Silo**
- **With CF Silo, Specific Power Consumption upto Clinkerisation will be around 41.8 kwh/T Clinker which shall be the best in Global Cement industry**

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

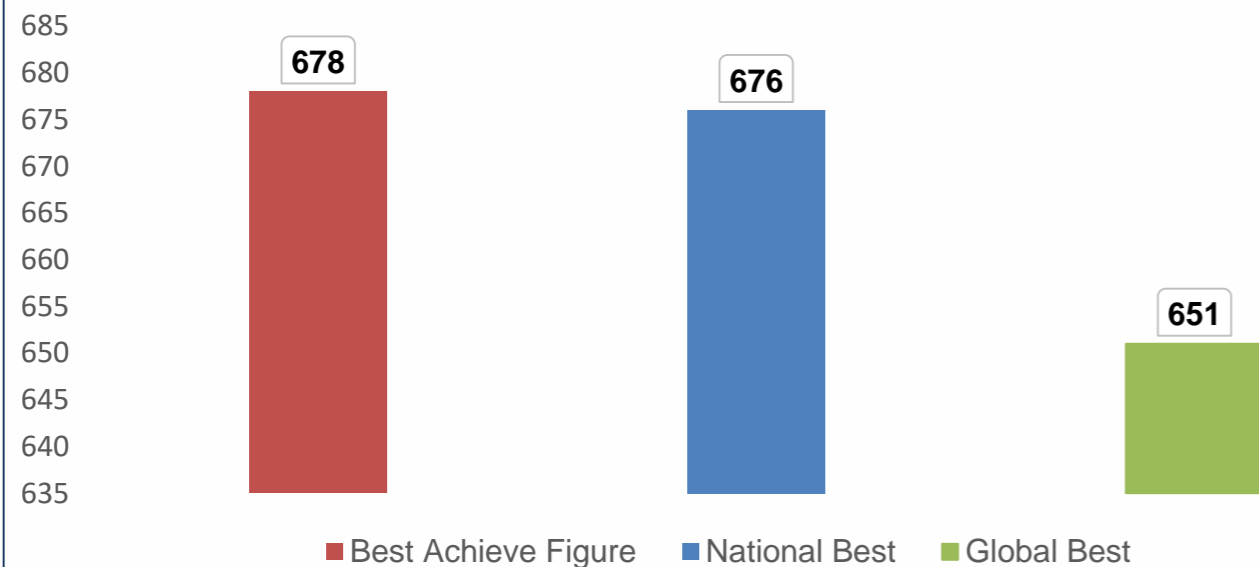
Total Plant Power (kWh/MT Cem)



Higher Electrical Energy:

- High Demand of **OPC** leads to high Clinker factor.
- Every **month shutdown** (only 15-17 days kiln running in a month).
- **Unavailability of CF Silo.**
- Petcoke grinding & consumption.
- During shutdown **PSC grinding** in Ball Mill.

SHC (kCal/kg clk)



Higher Thermal Energy:

- Due to Monthly stoppage based on demand.
- Due to **100 % petcoke** consumption.
- AFR Consumption of TSR up to 15 % and maximum usage of NH MSW
- High Oxygen level is being maintained for Higher AFR TSR %



Internal Benchmark

- Goal set by Management
- KPI



Kaizen

- Tool for Improvement
- Employee Motivation



Innovative Projects

- For cost reduction
- MTBF improvement



Brainstorming

- Involvement of Employee
- Development of ideas



Process Audit

- Third party audits
- Internal Audit



Technology Upgradation

- For plant improvement
- Sustainability



Sl.No	Title of project	Expected Savings KWh	Expected Savings Fuel (MT)	Saving (Rs Lacs)	Investment (Rs. Lacs)
1	Installation of VFD for Cooler ESP Vent fan	238080	-	16.7	20
2	Coal Mill Grit cone modification to improve Mill Stability.	59520	-	4.2	1
3	Coal Mill Seperator Seal Gap reduction through Stator Modification	119040	-	8.3	1.2
4	Reduction in Raw Mill Specific Power Consumption by Limestone size reduction initiatives.	1785600	-	125.0	0
5	CM-3 inlet duct modification to reduce the material accumulation and reduction in pressure drop.	212160	-	14.9	2
6	Felt seal installation at CM-3 dynamic separator seal gap	151008	-	10.6	2.5
7	CM-1 Separator up gradation to increase the performance of mill.	175200	-	12.3	45
8	Coal Mill Bag house compressed air optimization by reducing the distance between bags and impulse line	42160	-	3.0	2.5
9	CM-2 regrading to be carried out.	199200	-	13.9	35
10	RMH bagfilter BF 610 Fan motor de rated / VFD installation	53568	-	3.7	2
11	Reducing nitrogen gas pressure in raw mill roller accumulator.	148800	-	10.4	0

Sl.No	Title of project	Expected Savings KWh	Expected Savings Fuel (MT)	Saving (Rs Lacs)	Investment (Rs. Lacs)
12	Insulation on Kiln & Calciner Coal conveying line and Jet & Swirl Air blower line	-	24.8	1.9	2.5
13	REPDS installation in CM1 & 2 Cyclones	59970	-	4.2	2
14	Installation of Pre-Grinder System in Cement Mill -1 Ball Mill	1092000	-	76.4	250
15	Installation of slide gate instead of multi Louvre damper in pre heater fans with SPRS / GRR	119040	-	8.3	5
16	Installation of RAL in place of screw conveyor in feeding system in Coal Mill	119040	-	8.3	15
17	Solid AFR Double flap system replaced by RAL	107136	99.2	15.0	15
18	Chlorine Bypass system installation to increase AFR	-	1984	168.6	3700
19	Replacement of Kiln inlet & outlet seal with Graphite Seal.	-	463	39.3	90
20	Replacement of PD blowers with high efficiency Turbo blowers	148800	-	10.4	50
21	Wave grate installation in SF cooler to reduce power consumption	297600	-	20.8	120
22	Cement Mill -3 Mill Outlet duct Modification.	338400	-	23.7	25
23	Installation of Waste Heat recovery system from Preheater and Cooler waste gases of Pyro section	50160000	-	3511.2	15000

Year	No of Projects (Nil investment)	No of Projects (With Investment)	Investments (₹Lacs)	Savings (₹Lacs)
2018-19	24	23	133.9	364.4
2019-20	31	22	125.6	740.1
2020-21	57	7	15.1	417.6
Total	112	52	274.6	1522.1

Payback
2months

SN	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
A	FY 2018-19			
1	Service & Instrument Compressor air pressure optimization in CPP.	27000	-	0.19
2	Crusher house & Bunker floor bag filter fan made off in CPP	27000	-	0.19
3	Fly Ash LOI reduction by diverting iECO/APH & ESP ash conveying system discharge into Boiler-I & II instead of ASH SILO as a recycling method.	-	1.94	3.24
4	Feeding of coal from LS hopper & By passing of primary Coal crusher in CPP	9000	-	0.06
5	Turning off the 3 no. of Transformer during the plant shutdown condition.	45000	-	0.32
6	Derated of Cement Mill Compressor house P & V motor	12960	-	0.09
7	Auto logic for Kiln shell Cooling fan on/off operation	17280	-	0.12
8	Optimization of AFR gate operation	8640	-	0.06
9	Coal Mill Reject gate operation optimization	8640	-	0.06
10	Optimization of Coal mill compressors	12960	-	0.09
11	Optimization of Slag mill compressors	4320	-	0.03
12	Optimization of DP in Reverse air Bag house	8640	-	0.06

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
A	FY 2018-19			
13	Nozzle ring area reduction in Coal mill	43200	-	0.3
14	Process Optimization in Slag Mill to enhance Productivity	432000	-	3.02
15	Export of Power done through IEX to the grid by bidding	153000	-	1.07
16	Cooler ESP Power reduction w.r.t. emission level.	14400	-	0.1
17	Optimization of Air drier in CM-3 Slag Mill by Provided Auto start up command	1980	-	0.01
18	Rerouting of Pressure measurement point in RABH Fan	216000	-	1.51
19	Optimization of speed in Reverse Air Fan of Kiln bag house	30240	-	0.21
20	Reduction in Idle run of Raw Mill Feed group.	17280	-	0.15
21	Optimization of CM-3 Booster fan and Recirculation damper with PID Operation	72000	-	0.5
22	Optimization of RABH last chamber RAL with auto start sequence	20700	-	0.15
23	Auto start sequence for ESP RAL	20700	-	0.15
24	Optimization the use of compressed air in Packer -2	2700	-	0.02

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
B	FY 2019-20			
25	Delta to star conversion in Cement Mill -3 Roller lubrication pump drive	8640	-	0.06
26	Increased the angle of discharge chute & clay chute of Cement Mill-3	2000	-	0.01
27	Delta to star conversion in Cement Mill -1&2 mill Inlet seal air fan and Lubrication pump motor.	23040	-	0.16
28	Optimization of recirculation circuit running of Packer No-2	9308	-	0.07
29	Optimization of main bag fan filter fan speed of Packer No-2 & 4	8213	-	0.06
30	De-rating of Cooler Fan motor K31 from 350 kW to 200 kW	66528	-	0.47
31	Auto start logic Implementation for Coal Reclaimer	9990	-	0.07
32	Optimization Main burner transport air.	47520	-	0.33
33	Optimization of Separator stator gap in Raw mill	68640	-	0.48
34	Coal Mill booster fan motor de-rating from 75 kW to 38 kW	42240	-	0.3
35	Reduce power consumption in OPC bulk loading bag filter fan	7300	-	0.05
36	Optimization of Separator stator gap in CM-3	63360	-	0.44

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
B	FY 2019-20			
37	Cement mill MCC room P&V system power optimization	52560	-	0.37
38	Kiln feed bin aeration blower speed reduction	12461	-	0.09
39	Cement Silo-4 discharge air slide fan motor de-rating from 5.5kW to 3.7kW	8100	-	0.06
40	Utilization of only Single service air compressor is to cater the air requirement, in place of both Instrument & Service air compressor.	108000	-	0.76
41	Muffle furnace and Hot Air Oven Switching OFF practice implemented.	49720	-	0.38
42	Optimization of PA fan discharge pressure (from 1050 to 1000 mm WC)	52800	-	0.37
43	Leakage arresting across compressed airline in CPP	9600	-	0.07
44	ESP Hoppers Heater temperature set point reduction (105°C to 90°C) in CPP	7200	-	0.05
45	Implementation of Export Power Control Logic to control free cost power export from CPP to grid.	525000	-	3.7
46	Optimization of CEP and ACW pump VFD set points	23800	-	0.17
47	Auto operation of Boiler Feed pump	36000	-	0.25

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
B	FY 2019-20			
48	Split AC temperature set point raised	1800	-	0.02
49	Auto cascade logic operation of CEP	6000	-	0.04
50	Optimization of FD Fan air flow	30000	-	0.21
51	Exhaust heat extraction from the VFD Panel	3420	-	0.02
52	VFD optimization in the ACC Fan	80	-	0.001
53	VFD installation to the ACC Fan no. 03	13040	-	0.1
54	Replacement of ACC 07th cell Fan motor 132 KW by 110 KW	1000	-	0.01
55	VFD optimization in the ACC Fan (05 no, from set point 48% to 42%)	7200	-	0.05

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
C	FY 2020-21			
56	Modification of Preheater Fan-2 motor cooling system done from “In-direct cooling” to “Direct cooling”.	5928	-	0.42
57	Packer -1, 621BL300 Motor derated from 22 kW to 18.5 kW.	15330	-	1.1
58	Reduction of Idle run of Coal Mill reject Circuit.	59280	-	4.15
59	Reduction of Power Consumption by stopping unutilized RMH Bag filter BF 610 during Monsoon season.	27360	-	1.92
60	Optimization of Cooler ESP rectifiers to reduce the Power Consumption	160056	-	11.2
61	Raw mill reject elevator operation modification.	32110	-	2.25
62	Reduction of Compressor running hours of LS Crusher area by optimizing the Bagfilter purge cycle time	8428.9	-	0.59
63	False Air Reduction across VRM by installing Slide gate in Bypass duct.	136344	-	9.54
64	Bag filter 321BF020 fan speed optimization.	2173.6	-	0.15
65	Spikes welded on face racking centre part of LS reclaimmer in zigzag way to improve the output.	98800	-	6.92

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
C	FY 2020-21			
66	PP-3 Silo extraction gate operation in sequence.	8030	-	0.56
67	HTDB-1 light energy conservation	3942	-	0.28
68	Cement mill MCC P&V stand by blower pulley size reduction and motor derating from 18kW to 11.5 kW	43992	-	3.1
69	Packer-4 Bagfilter Fan Damper removal to reduce the pressure drop.	37960	-	2.66
70	Packer-4 , In-house Skirting installed to reduce false air to Bagfilter.	2920	-	0.20
71	Reduction of Pressure drop across CM 1 CA Fan inlet damper.	33600	-	2.35
72	Flexible covering provided to Raw Mill Seal Air pipe annulus area to reduce False Air	136344	-	9.54
73	RM MD motor cooling Blower speed reduction from 1000rpm to 773rpm by V-belt pulley size reduction	18792	-	1.32
74	Flexible covering at Coal Mill Pull rods to restrict False Air.	47424	-	3.32
75	RABH Fan speed control with RABH settling chamber draft through PID.	88920	-	6.22

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
C	FY 2020-21			
76	False Air Ingress through the Roller Lubrication hose annulus area, provided the flexible covering which restrict the false air and maintain the movement of hoses.	71136	-	4.98
77	Power transformer loading optimization.	105120	-	7.36
78	Kiln Hood door flanges is covered by Ceramic blanket to restrict the false air entry.	-	115.3	10.37
79	Coal Mill Fuzzy Operation.	148200	-	10.37
80	Optimization of Cement Mill-3 inlet draft by using Booster Fan during OPC grinding.	151200	-	10.58
81	CM-1, OPC Product grinding in Fuzzy Control.	95700	-	6.7
82	CM-3, OPC Product grinding in Fuzzy Control.	226800	-	15.88
83	CM-3, PPC Product grinding in Fuzzy Control.	154800	-	10.84
84	CM-3, PSC Product grinding in Fuzzy Control.	55800	-	3.91
85	Raw Mil Fan P&V blower speed reduction from 1000rpm to 773rpm by making use of V-belt pulley re-sizing.	23060	-	1.61

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹ Million)
C	FY 2020-21			
86	Fixing of standby chute for OPC bulk loading.	16228	-	1.136
87	In Packer area, EFF1 motor replaced with energy efficient IE3 motor	7300	-	0.511
88	PH MCC P&V blower speed optimized by re-sizing the P&V motor pulley.	7776	-	0.544
89	Shutting off of underload transformer.	27769	-	1.944
90	Existing combined APH + ECO ash conveying system - split-up modification & high LOI ash recirculation	-	240	12
91	Installation of VFD for ACC fan no. 06. Installed Change over switch between Unit 02 PA Fan VFD & ACC Fan no. 06, it is now being utilized for ACC Fan no. 06 during Unit - 02 Boiler stoppage.	60000	-	4.2
92	During shut down time, Two (2) No's transformers are to be kept ON condition at present. One transformer is used for all emergency power supply systems. Another One transformer is used for only CCR server room - Central Package AC run purpose. Essential MCC supply incomer shall be allotted from both PMCC.	24000	-	1.68
93	The conventional V- belt had been replaced by energy efficient Cogged V -Belt. At APH root blower	264	-	0.018

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹Million)	Investment (₹Million)
A	FY 2018-19				
1	Chemical Cleaning of ACC fins in CPP.	36000	-	0.25	0.02
2	HPSV & HPMV lights replacement by LED lamps in CPP	25200	-	0.18	0.18
3	HPMV lights (125W,15 No's) at BCN tunnels replaced with LED (40 W).	5220	-	0.04	0.04
4	Replacement of existing ARC in the Boiler feed pump in CPP.	86400	-	0.61	0.60
5	Installation of new pump in Central AC room, to reduce load on ACW pump.	36000	-	0.25	0.1
6	Replacement of Conventional tube rods (36 W) done by LED one's. (20 W, 25 No's) in CPP Office, MCC room, STG area.	864	-	0.01	0.01
7	Replacement of 5 No's HPSV/HPMV(125 W) lamps by LED(27 W) one's in the Boiler, STG & DM Plant area.	1080	-	0.01	0.01
8	Installation of VFD for Bucket Elevator to increase speed and around 5 TPH of coal feeding flow incremental observed.	12600	-	0.09	0.1
9	ACC fins cleaning by high pressure water jet system	54000	-	0.38	0.06
10	Turbo Ventilator to be fixed for TG building in place of exhaust fan.	19440	-	0.14	0.15
11	In TPP, VFD installed in the 03 no. of ACC Fan motor (110 KW)	162000	-	1.13	1.8
12	VFD Installation in Packer 3 Bag filter fan	29700	-	0.21	0.5

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹Million)	Investment (₹Million)
A	FY 2018-19				
13	Replacement of 125W MV lamp of 24 No's with 20 W LED retrofit light	9000	-	0.06	0.1
14	Replacement of 70W street lights 17Nos with 40W LED light fittings	1800	-	0.01	0.08
15	Replacement of 150W street lights 06 No's with 60W LED light fittings	1980	-	0.01	0.03
16	Installation of VFD for CM-2 Separator Vent fan	86400	-	0.61	0.5
17	Installation of New TCV and reduction of Pressure drop leading to Power reduction in BFP of CPP	77760	-	0.54	0.02
18	Installation of Transparent polycarbonate corrugated sheets in place of opaque metal sheets in stores	2520	-	0.02	0.1
19	Replacement of Conventional Lights with LED lights / Others bases on luminous intensity	5940	-	0.04	0.02
20	Replacement of Conventional Lights with LED lights / Others bases on luminous intensity in Factory premises	6840	-	0.05	0.02
21	Installation of VFD in CM-1 Separator Bag filter Fan	144720	-	1.01	0.5
22	Replacement of Conventional Lights by LED Well Glass One's.(27W – 4 No's)	900	-	0.01	0.015
23	Replacement of old burner with high efficient burner in Kiln	-	13759	15.9	7.5

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹Million)	Investment (₹Million)
B	FY 2019-20				
24	Installation of VFD in Packer -4 Bagfilter fan and reduce fan speed 80%	7665	-	0.1	0.18
25	CM-1 Vent bag filter hopper discharge air slide replaced by duct.	5760	-	0.04	0.03
26	Raw mill dam ring optimization.	427680	-	2.99	0.01
27	Preheater Fan tipping to increase the Productivity		47520	53.63	0.3
28	Replacement of 55 kw vertical turbine pump by 37kw pump for same working conditions.	95040	-	0.67	0.11
29	Reduction of Cone gap in CM-3 Fan by putting felt inside to increase the efficiency by 3%	110880	-	0.78	0.01
30	Coal crusher by pass installation	40075	-	0.28	0.01
31	Calciner firing blower Flow optimization through VFD installation.	105600	-	0.74	0.02
32	Installation of Raw mill RAL bypass system	20000	-	0.14	0.1
33	Removal of Damper in CM-3 BH Fan	237600	-	1.66	0.03
34	Slag mill Triple flap gate IE3 Motor changed in place of IE2 motor	43200	-	0.3	0.05

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹Million)	Investment (₹Million)
B	FY 2019-20				
35	VFD installation in FD Fan	288000	-	2	9.5
36	VFD installation to the ACC fan no-5 (Unit-1)	60000	-	0.42	0.4
37	CHP crusher house Bag filter fan Pulley size reduction (300 mm to 200 mm)	24000	-	0.17	0.002
38	Air washer fan Pulley Diameter reduction from 220 mm to 165 mm	21600	-	0.15	0.002
39	Bed Material charging done through newly installed higher dia 8" pipe instead of 6 " pipe, which is resulting in reduction of bed charging time from 90 minutes to 45 minutes.	6750	-	0.05	0.01
40	Replacement of cooling tower fan set by newly designed lighter epoxy energy efficient FRP fan set.	5760	-	0.04	0.13
41	Blending of Rice Husk along with Indonesian coal		220	0.2	0.01
42	Replacement of Old model ACC Fan by Aerodynamic technology light weight Epoxy FRP Fan (04 no.)	65280	-	0.46	1.7
43	Replacement of Conventional Light by LED light (120 W / 20 W)	1368	-	0.01	0.01
44	Replacement of Conventional Light by LED Light (36 W / 20 W) – WTP Control room & QC lab	937	-	0.01	0.002
45	Replacement of Conventional Light by LED Light (400 W / 120 & 20 W),	2893	-	0.02	0.01

Sl.No	Title of project	Electrical kWh	Thermal MKcal	Saving (₹Million)	Investment (₹Million)
C	FY 2020-21				
46	CM-3 Separator surrounding Annular gap reduction to increase Production and decrease specific power in PPC.	1085664	-	75.99	4.5
47	Raw Mill Dam ring Height optimization	782496	-	54.77	3
48	Specific Heat reduction by modifying feed box height in riser duct of PH String -1 Top cyclone.	-	231	20.74	1.5
49	Specific Heat reduction by modifying feed box height in riser duct of PH String -2 Top cyclone.	-	231	20.74	1.5
50	CM-3 Reject Elevator motor up gradation from 37 Kw to 45Kw.	75600	-	5.29	1.5
51	CM-3 , OPC productivity improvement by replacing the Silo -1 elevator Motor and GB from 55 to 75 kW.	411538	-	28.80	2.5
52	Slag mill bag house fan P&V Blower motor replaced from 15 kW to 11 kW.	12000	-	0.84	0.6

Enhancement of TSR% and coal mill availability.



Observation

Coal Mill tripping very frequently due to CO during AFR feeding



Problem

- High CO in coal mill as hot gases to Mill is given from PH exit.
- High CO in Preheater system during AFR feeding leading to disturbance in kiln operation.
- Intermittent peaks of CO due to release of material in bulk/bundle form whenever the solid AFR feeding chute gets jam or 100-liter shock blaster in chute gets operated.



Modification

- Replaced the high capacity blaster with two less capacity i.e. 25-liter blaster.
- Shock blasters operation logic given in such a way that no material will get released in bulk form to prevent CO.
- Provided one poking arm connected with pneumatic cylinder and operates in coordination with shock blaster to restrict chute jam.



Enhancement of TSR% and coal mill availability.



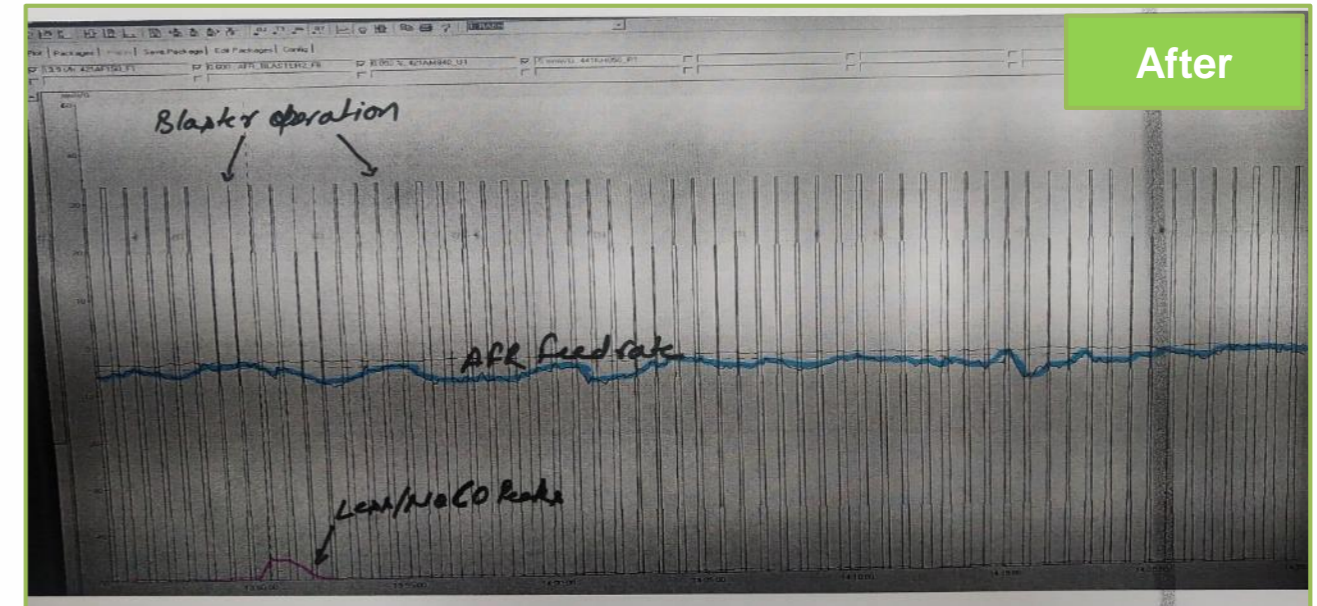
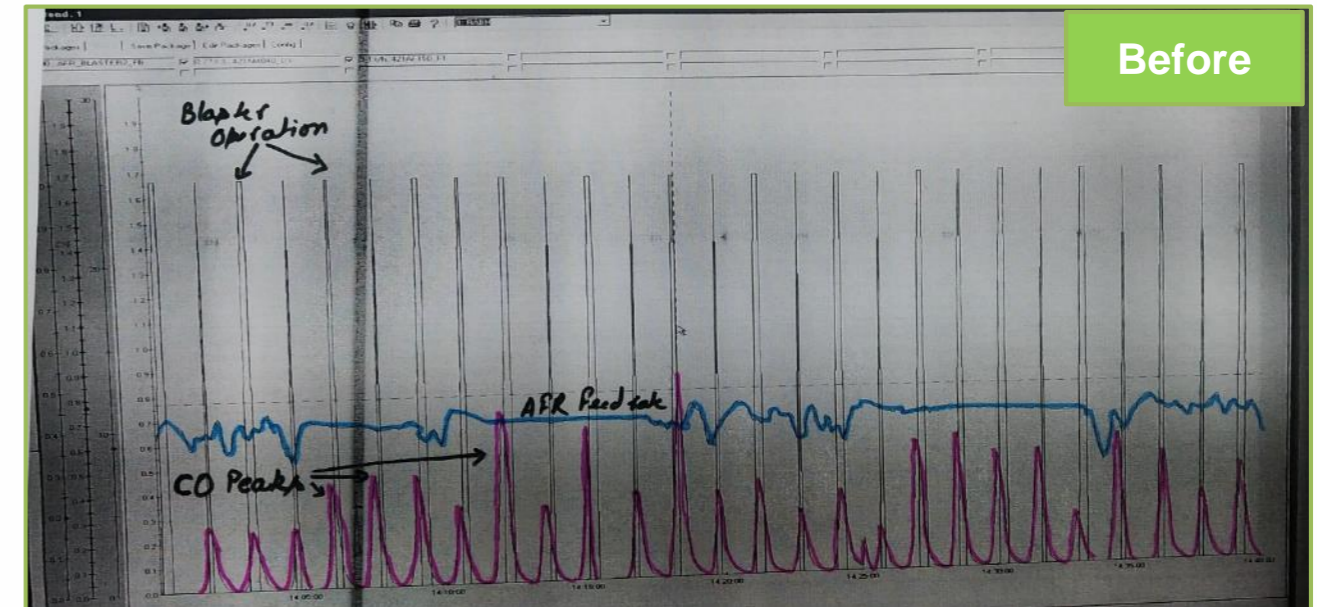
Benefits & Results

- AFR feeding rate increased up to 12 TPH.
- Coal mill availability has increased by avoid of tripping due to CO formation
- Achieved high AFR consumption with TSR % increased by 2.5%



Savings Achieved

- Cost savings due to **Power** - ₹ 14.9 lacs/Annum
- Cost savings due to **AFR** - ₹ 247.7 lacs/Annum
- **Total Cost Savings** - ₹ 262.7 lacs/Annum



Troubleshooting of RABH DP problem by process optimization



Observation:

- Continuous increase of RABH DP causing kiln production loss and high power consumption



Problem:

- RABH DP value was increasing continuously, resulting in decrease of Kiln feed and AFR.
- The frequency of reduction of kiln feed and AFR is around 3 to 4 times in day due to high RABH DP.
- High consumption of broad varieties of AFR leading to formation of alkali and chloride into system which plays an important role in the cohesivity, adhesivity, and promotes dust cake formation on the bags. Which deteriorate the bags and leads to the inefficient operation of Baghouse.



Modification:

- Modified the cleaning sequence pattern of the RABH.
- Checked the Acid dew point and maintain the RABH inlet temperature >180 Deg C.
- Interlocking of PH water spray given with RABH inlet temperature.

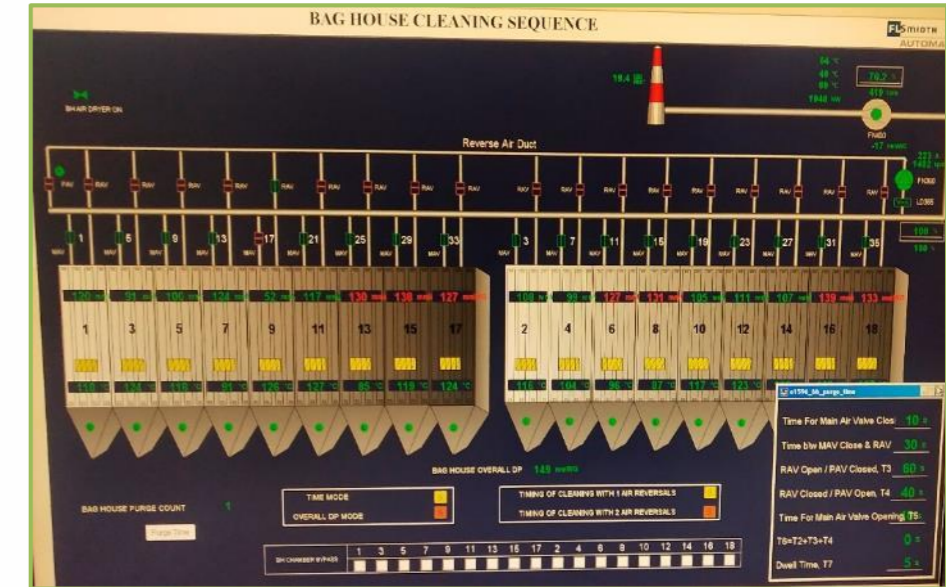


Troubleshooting of RABH DP problem by process optimization



Sequential Actions

- The air balancing operation has carried out by changing damper positions with kiln feed 450 TPH
- Acid dew point also checked and found 140-145°C and decided to maintain 30 deg more temperature in order to avoid acid condensation.
- In accordance to maintain RABH temperature preheater outlet water pump interlock given with preheater outlet temperature in order to maintain temperature at RABH i.e. above 180 °C.



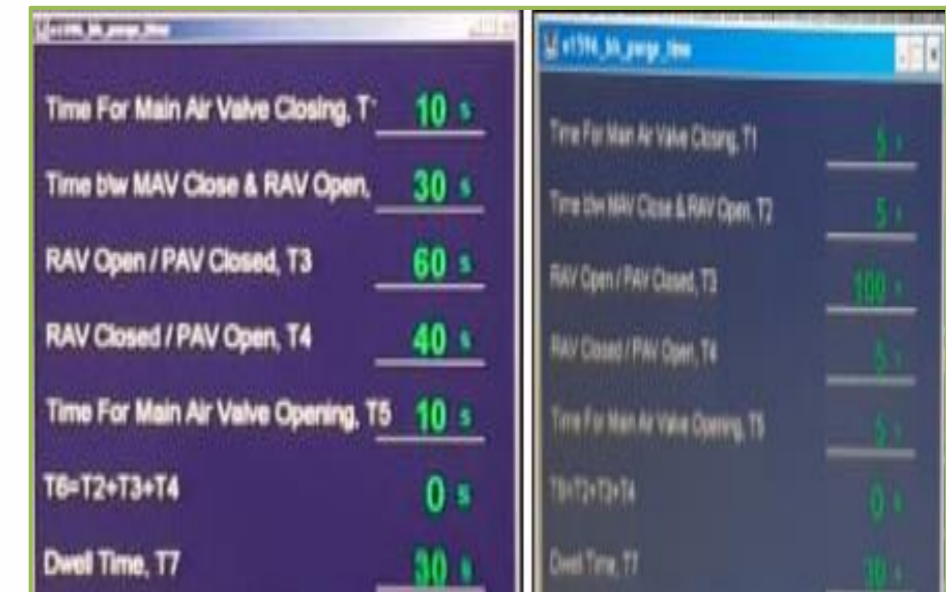
Benefits & Results

Optimized RABH temperature and Cleaning operation to operate kiln feed above 450 and AFR 13-14TPH.



Savings Achieved

- Achieved saving of 1342 lacs/yr on account of Power, production & % TSR loss .
- Achieved saving of ₹110lacs on account of full RABH bags upgradation.



Cement Mill-3(VRM) Productivity Improvement by reducing Annular Gap near separator



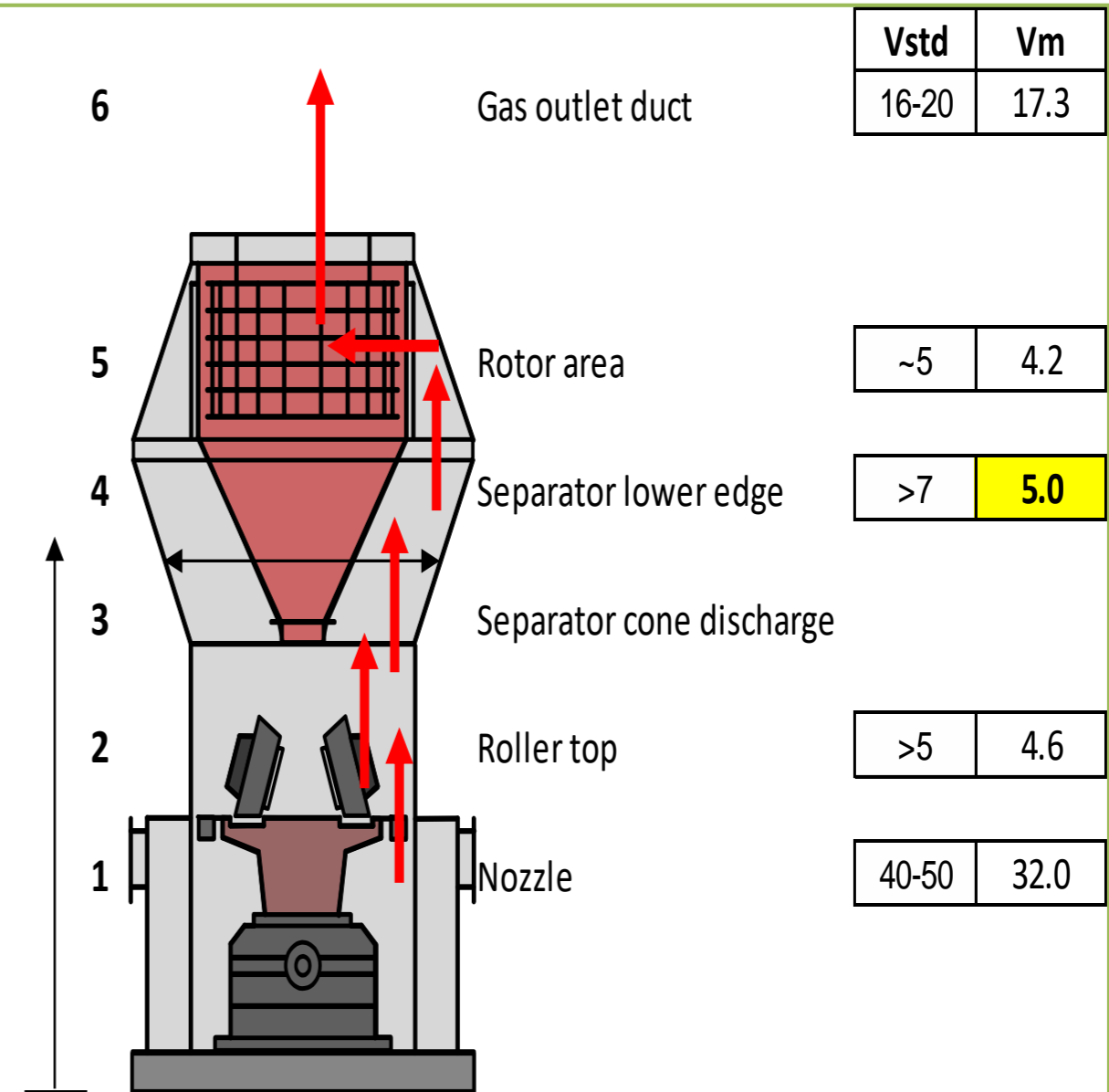
Observation

- In CM-3 VRM we were facing frequent tripping of mill with vibration.
- High Mill DP limiting the Feed rate.
- Less velocity at Separator lower edge area resulting the High internal circulation load.



Modification

- Our Mechanical team in concurrence with Process team has modified the mill cross-sectional area to increase the velocity across the Mill.
- We prepared drawing for this modification.
- After checking feasibility inside mill, we started in house fabrication of skirting to fit in separator surrounding lower edge area.
- Cross sectional area was reduced 29% by putting skirting inside the mill casing.



Cement Mill-3(VRM) Productivity Improvement by reducing Annular Gap near separator



Benefits and result

- Mill productivity increased in PPC from 295 to 345 without compromising Blaine and residue.
- Specific Power reduced from 23.5 kw/t to 21.5 Kw/t.



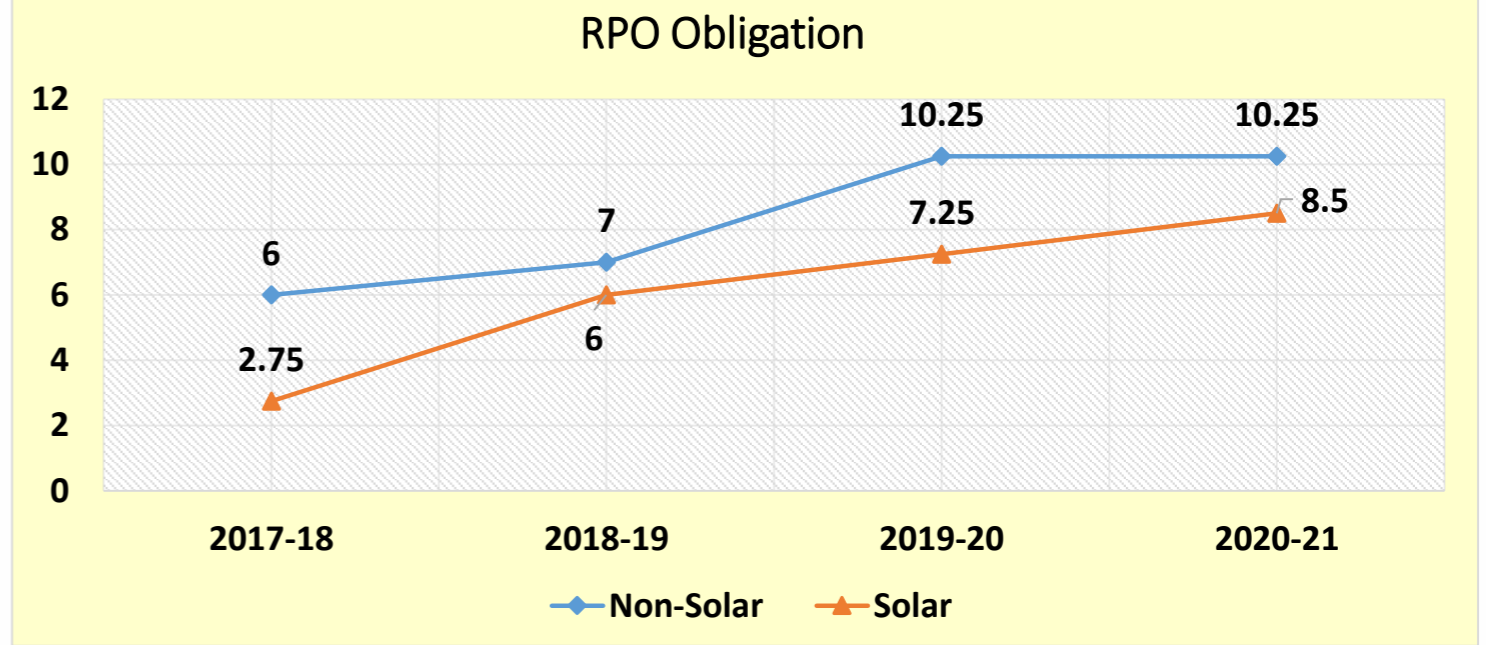
Savings Achieved

- Cost savings due to **Power - ₹ 75.2 lacs/Annum**
- Improved system Reliability

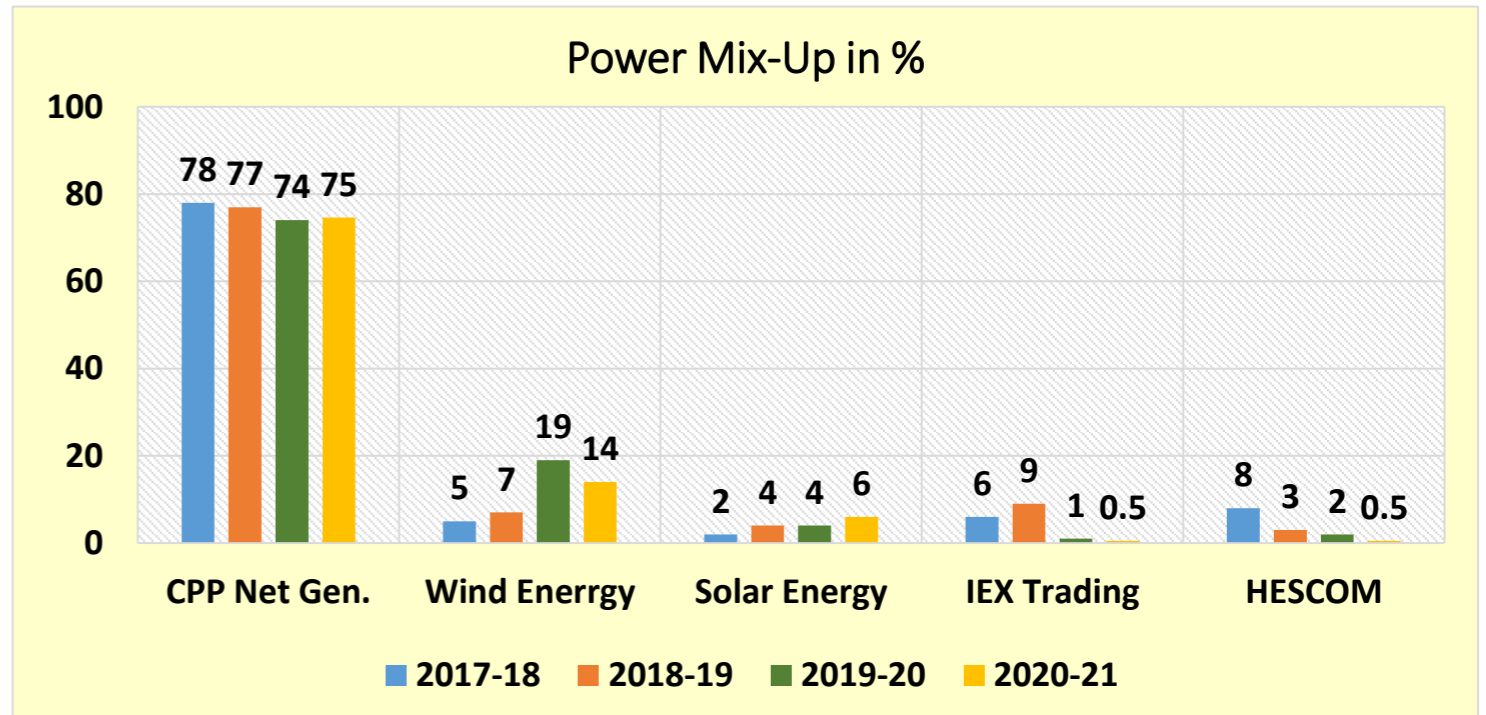


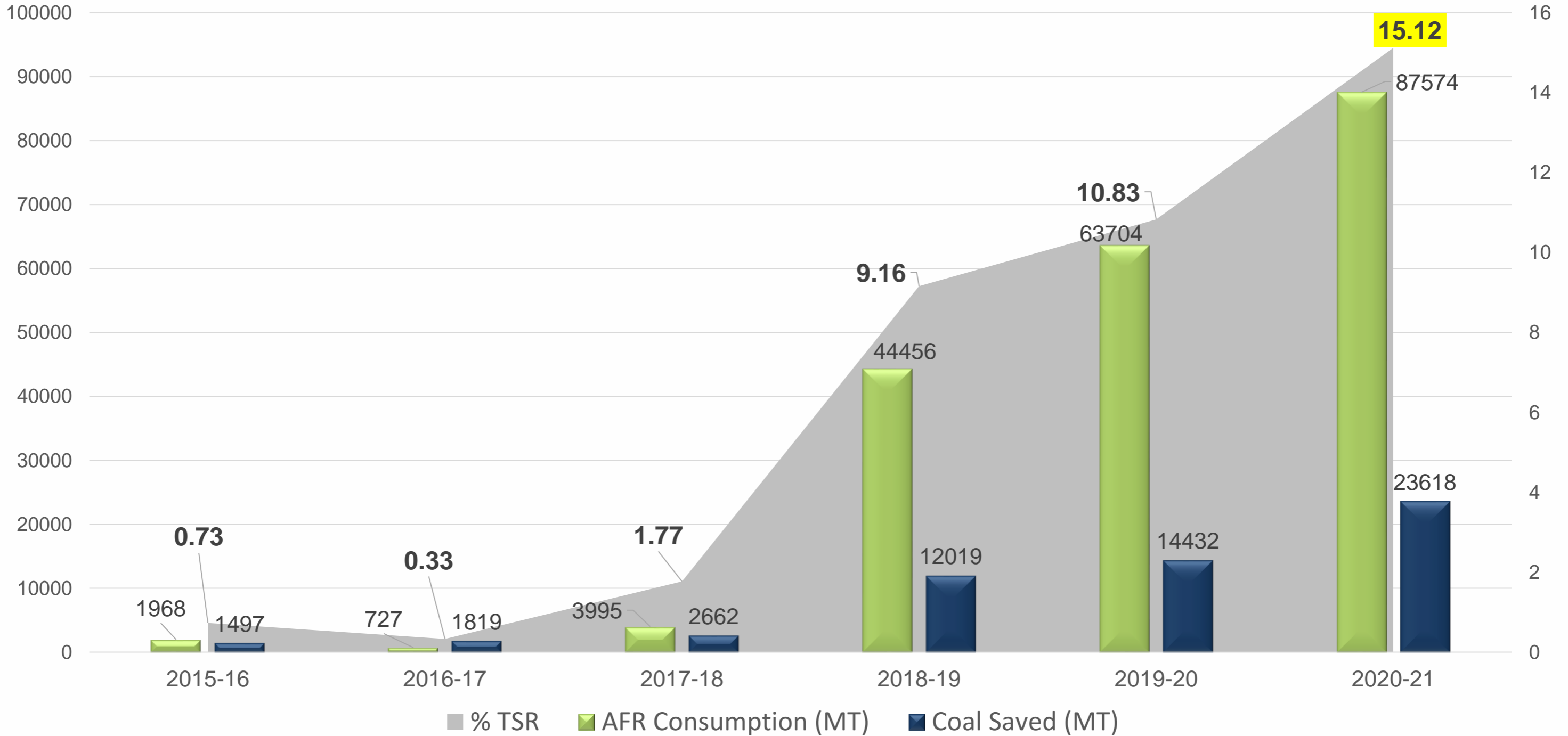
❖ Around Rs. 46 Million invested in **Wind Power Project** at Karnataka.

❖ Further planning to install onsite **5 MW Solar Power Plant** based on Opex/Capex Model.



SN	FY	UOM	Renewable Energy Consumption MWh & %	
2	2018-19	MWh	16465	12
3	2019-20	MWh	32208	24
4	2020-21	MWh	27600	20





Alternative Fuel Consumption

Year	2018-2019			2019-2020			2020-2021		
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%
INHOUSE COLLECTION	709	2996	0.4	2132	2786	1.2	1094	2620	0.5
PLASTIC WASTE	8993	2497	5.4	7476	3072	4.0	12960	2614	5.8
MSW	2125	2135	1.3	10680	2012	5.8	23232	2633	10.5
RDF	12671	3099	7.7	13520	3285	7.3	5896	2831	2.7
Other Solid & Liquid Waste	19973	2064	12.1	29896	1654	16.1	44392	2186	20.0
Total	44471	2465	27	63704	2264	34	87574	2417	39

Alternative Raw Materials

Year	2018-2019			2019-2020			2020-2021		
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	32069	Red Ochre/ GCP Dust/Red Mud	Iron Ore	46279	Red Ochre/ GCP Dust/Red Mud	Iron Ore	38581	
Red ash	Limestone	2871	Red ash	Limestone	790	Red ash	Limestone	15421	

- ❖ Installed with Solid AFR Shredder supplied by Weima capacity 20 TPH
- ❖ Followed by feeding system for handling large volume of waste 20 TPH, equipped with Schenck Weigh Feeder.
- ❖ Optimized the system by installing agitator, safety shut off gates and air blasters in the system.
- ❖ Modification of chutes in the conveying system for avoiding jamming at the discharge points.
- ❖ Installation of new liquid feeding system at Preheater there by enhancing the capacity up to 500 tons per month of Liquid AFR consumption.
- ❖ Impregnation pit for preprocessing sludges and hazardous powder wastes.
- ❖ Leachate collection pit for environmental and legal compliances.



REUSE 
REDUCE
RECYCLE



Cost Benefits

- Conservation & Reduction of Conventional/Fossil fuel which gives good cost reduction



Environmental Benefits

- CO2 reduction 1200-1300 MT/month & Chimney NOx shall be reduced by using AFR.



Contribution towards Nation Vision

- Contributing in Swachh Bharat Yojana by using Municipal Solid waste.



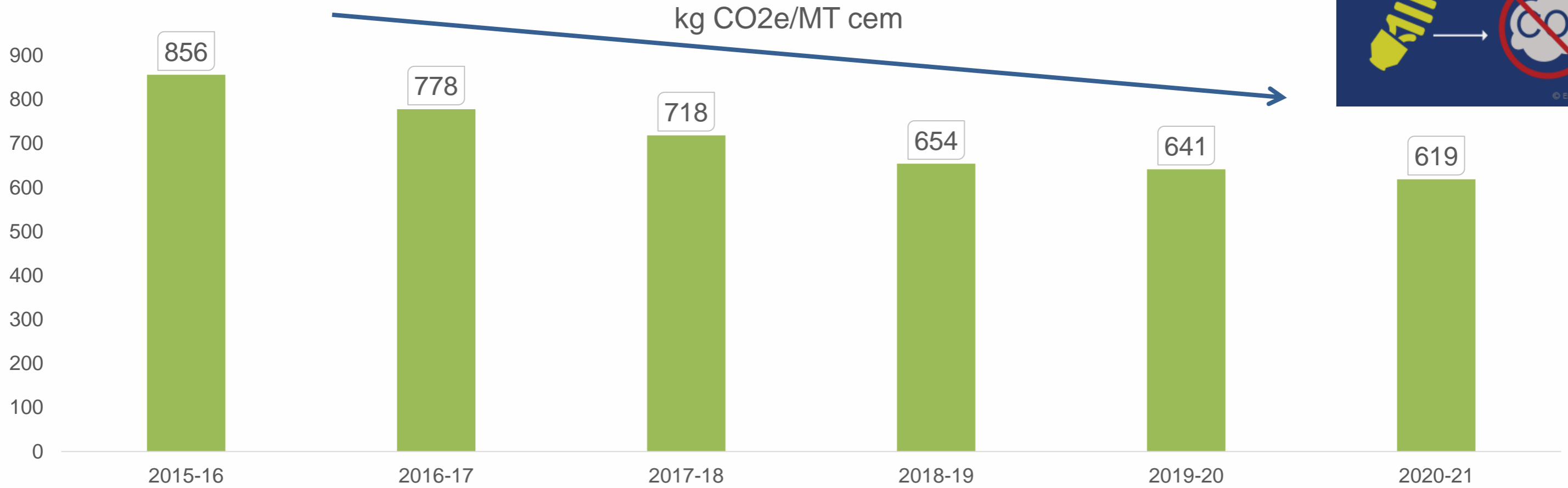
PAT Benefits

- To reduce 5% MTOE will be helpful by using AFR



Quality

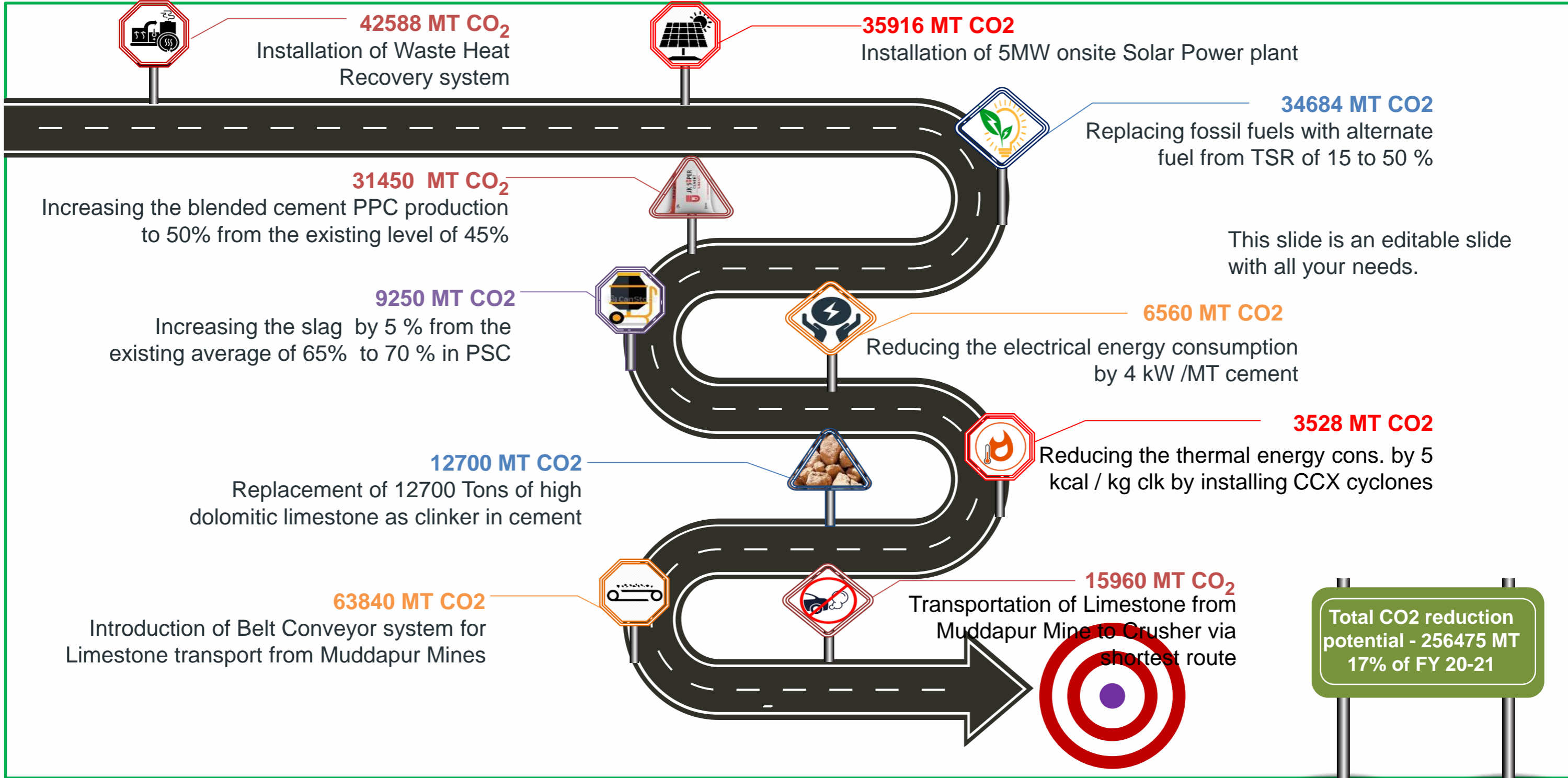
- No adverse effect in cement product quality.



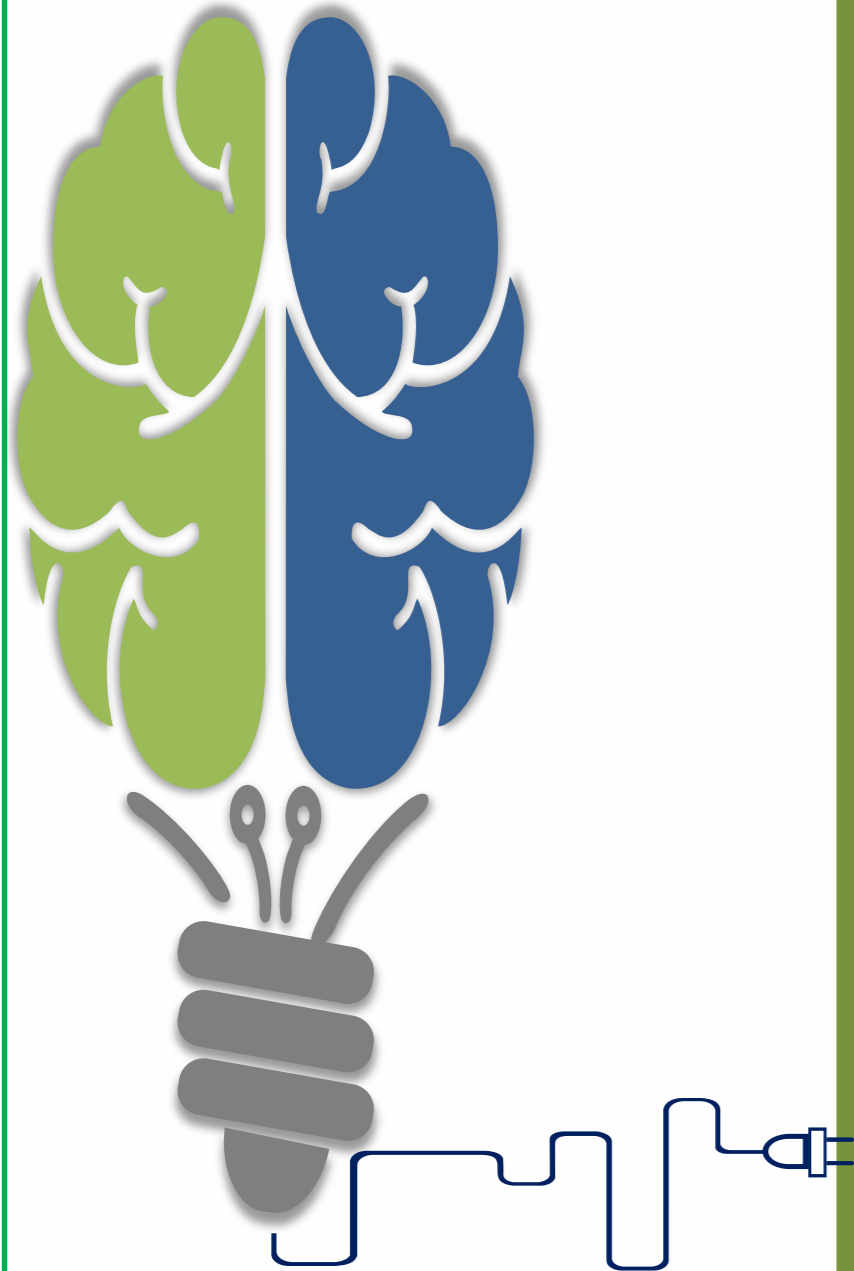
Year	Scope 1 Emissions CO ₂ e (MT)	Scope 2 Emissions CO ₂ e (MT)	kg CO ₂ e/MT of cement
2018-19	14,68,187	-1,22,099	654
2019-20	14,84,442	-1,47,728	641
2020-21	16,43,123	-2,18,900	619

GHG Reduction Projects 2016-21

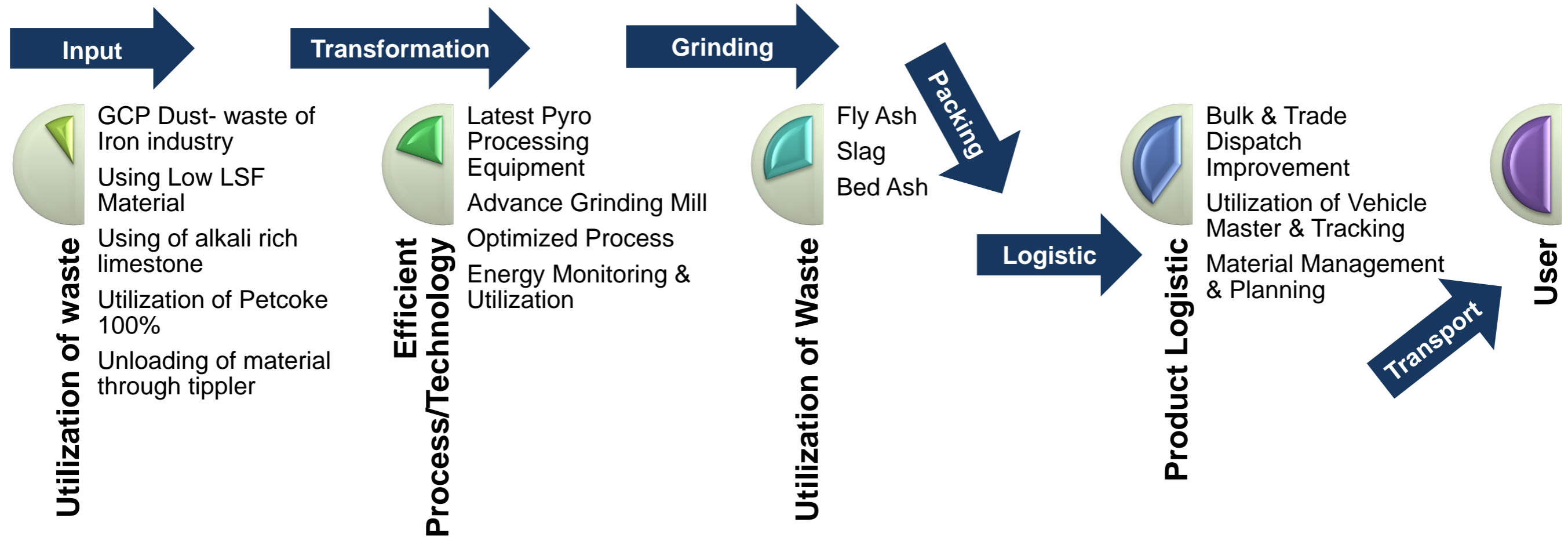
Replacement of conventional lightening with LED lights	Saving of 21,72,000 Units
Reduction of total plant power from 84.74 to 65.57 KWH/MT cem	By 22.6 %
Improvement of overall clinker factor from 0.780 to 0.739	By 5.3 %
Consumption of AFR Increased from 727 to 87574 MT	By 120 times
Reduction of CO2 from 856 to 619 kgCO2e/MT of cem	By 27.7 %
Plantation in the large-scale estate	Total 36171 no. of trees
Utilization of Renewable Energy Sources from 5600 MWh to 27600 MWH	By 5 times



This slide is an editable slide with all your needs.



- ❑ 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. **Preheater cyclone feed box height reduction**
 2. **Modification of VRM grit cone discharge chute**
 3. **PH Down comer pressure drop reduction by CFD analysis**



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

Green Supply Chain Policy



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

J.K. 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 supplychain and will work with Partners to:

1. Protect the environment by creating awareness
2. Adhere to the environment, health & Safety Compliance
3. Reduce, reuse and recycle resources
4. Train and educate to say no to Child labour
5. Nourish plantation and greenery in vicinity
6. Encourage saving of water and electricity
7. Reduce Greenhouse Gas emissions
8. Strive for sustainable partnership

Date: 1st April 2021

Place: Muddapur

Unit Head

Umashankar Choudhary

Transport Policy



JK Cement Works, Muddapur
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J.K. CEMENT WORKS, MUDDAPUR TRANSPORT POLICY

While ensuring continual efforts for the manufacturing of quality cement we also strive to achieve business excellence through responsible and efficient methods of Supply chain

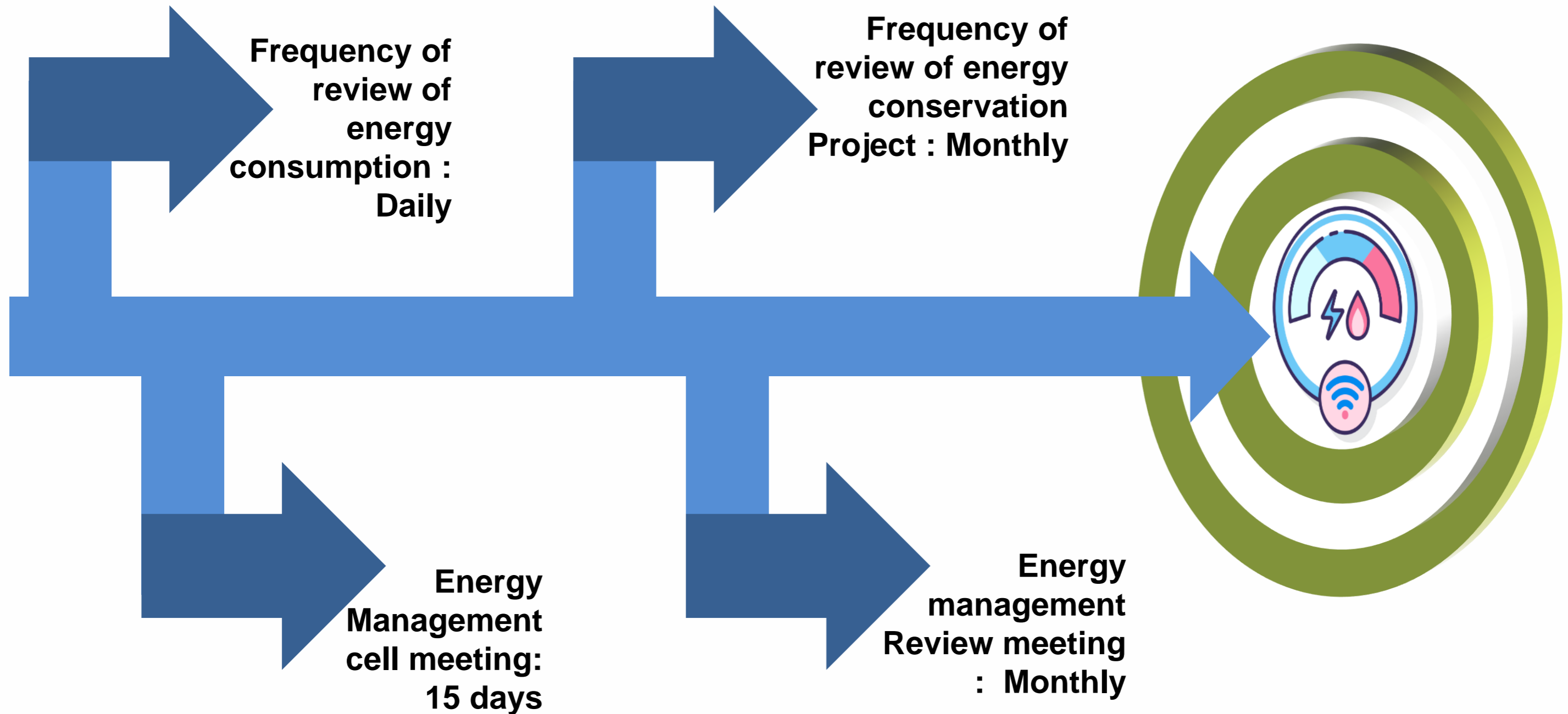
1. Not to engage vehicles more than 15 years Old
2. All Truck entering plant premises should carry valid PUC (Pollution Under Control Certificate)
3. Avoid re-handling and re-transporting policy of semi-finished products to maximum possible extent
4. All Trucks entering into factory will be inspected for general condition such as tyres & Pressure tanks etc.
5. Ensure that truck has valid insurance policy
6. Driver should be in sound state i.e. non-alcoholic
7. In View of environmental concern, we are demanding transporters to cover tarpaulins to avoid pilferage
8. Maintain legal norms strictly for driver's Competence
9. GPS should be installed in the vehicles for tracking and adopting Latest technology measures to ensure effective supply chain

Date: 1st April 2021

Place: Muddapur

Unit Head

Umashankar Choudhary



	FY 20-21						
	TPH	Run Hrs	Prodn (TPD)	KWh	U/T of Mat	U/T of Cl	U/T of Cmt
Crusher	882	3138	2767552				
Main motor			329	1031844	0.37	0.56	0.41
Crusher Aux			249	781347	0.28	0.42	0.31
Sub-Total				1813190	0.66	0.98	0.73
Raw mill	453	6069	2715505				
Main Drive			3124	18959997	6.98	10.68	7.89
Separator Fan			2028	12305163	4.53	6.93	5.12
Mill Aux			606	3675038	1.35	2.07	1.53
Sub-Total		138179		34940198	12.87	19.68	14.55
Coal mill	25	5866	145233				
Main drive		203	445	2611474	17.98	1.47	1.09
Bag filter Fan			300	1758445	12.11	0.99	0.73
Coal Crusher & Transport			43	252714	1.74	0.14	0.11
Mill Aux			223	1308392	9.01	0.74	0.54
Sub-Total				5931029	40.84	3.34	2.47
Kiln	292	6072	1775855	0			
Main motor			457	2774004	1.56	1.56	1.16
PH fan-1			1005	6104385	3.44	3.44	2.54
PH fan-2			1013	6148437	3.46	3.46	2.56
BH fan			785	4766299	2.68	2.68	1.98
Cooler ESP fan			104	633766	0.36	0.36	0.26
Kiln Aux			2696	16367056	9.22	9.22	6.81
Sub total			6060	36793949	20.72	20.72	15.32
Upto clinkerization						44.72	33.07

	FY 20-21						
	TPH	Run Hrs	Prodn (TPD)	KWh	U/T of Mat	U/T of Cl	U/T of Cmt
Cement Mill -3 OPC	239	2797	667709	0			
Main drive			4226	11820158	17.70		
Bag house fan			1836	5135549	7.69		
Mill Aux			759	2121708	3.18		
Mill-3 Compressor			132	370603	0.56		
Sub Total			6953	19444102	29.13		29.13
Cement Mill -3 PPC	271	2334	632656	0			
Main drive			4335	10118859	15.99		
Bag house fan			1851	4319748	6.83		
Mill Aux			775	1809152	2.86		
Mill-3 Compressor			139	324148	0.51		
Sub Total				16571907	26.19		26.19
Cement Mill -3 PSC	189	598	113053	0			
Main drive			4144	2479205	21.93		
Bag house fan			1745	1044009	9.23		
Mill Aux			779	466014	4.12		
Mill-3 Compressor			128	76767	0.68		
Sub Total				4056439	35.88		35.88
Cement Mill -3 Prem PPC	226	636	143981	0			
Main drive			4132	2628400	18.26		
Recirulation fan			1740	1106681	7.69		
Mill Aux			749	476573	3.31		
Mill-1 Compressor			122	77421	0.54		
Sub Total				4275304	29.69		29.69
Cement Mill -1 Total			220931	7958251	36.02		36.02
Cement Mill -2 Total			242690	7771296	32.02		32.02
Cement Mill -3 Total			1557399	44347751	28.48		28.48
Cement mill - Combined			2021020	60077299	29.73		29.73
Packer			2029155	2169974	1.07		1.07
Utilities				3450272	1.71		1.71
OPC - Kwh/T Cement				864385	26552549	30.7	74.9
PPC - Kwh/T Cement				875291	24021379	27.4	60.1
PSC - Kwh/T Cement				134645	5123804	38.1	55.0
Pr.PPC - Kwh/T Cement				146699	4379567	29.9	66.7
Upto Cement - Combined					145175910		65.57

Engineer-

- Shift
- Maintenance
- Monitoring Cell

- Section Head Kiln
- Section Head Cement Mill
- PM cell

**HOD
(Mechanical)**

**Unit/Tech
Head**

**HOD
(Production
& QC)**

- IMS Cell
- Process Manager
- Section head Kiln
- Section Head Cement Mill
- QC-Manager

Engineer-

- Site
- CCR
- Process
- Sr. Chemist
- General Chemist

Engineer-

- Shift
- Maintenance
- PLC

- Section Head Kiln
- Section head Cement Mill
- EMR

**HOD
(E & I)**

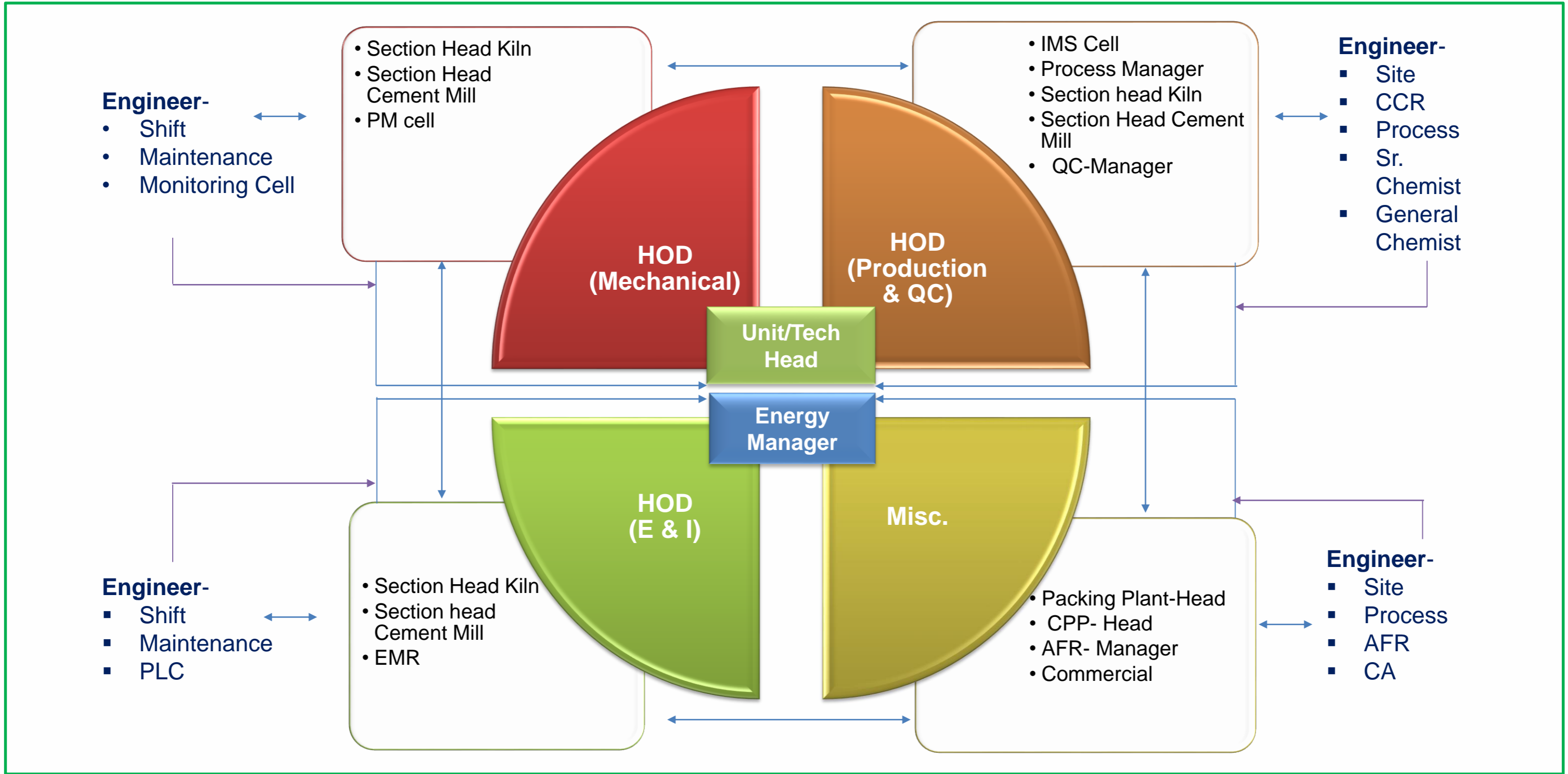
**Energy
Manager**

Misc.

- Packing Plant-Head
- CPP- Head
- AFR- Manager
- Commercial

Engineer-

- Site
- Process
- AFR
- CA





Proposed Energy Saving Projects scrutinized by Plant/ Technical Head.
Approval accorded immediately by Unit Head if Pay back is less than a year.



Energy saving proposal which having without/Marginal investment is approved by plant head after screening through Energy Cell/ Capex committee recommendation on monthly basis.



Energy saving proposal which involve high capex, require approval of Business Head through Plant head recommendation.

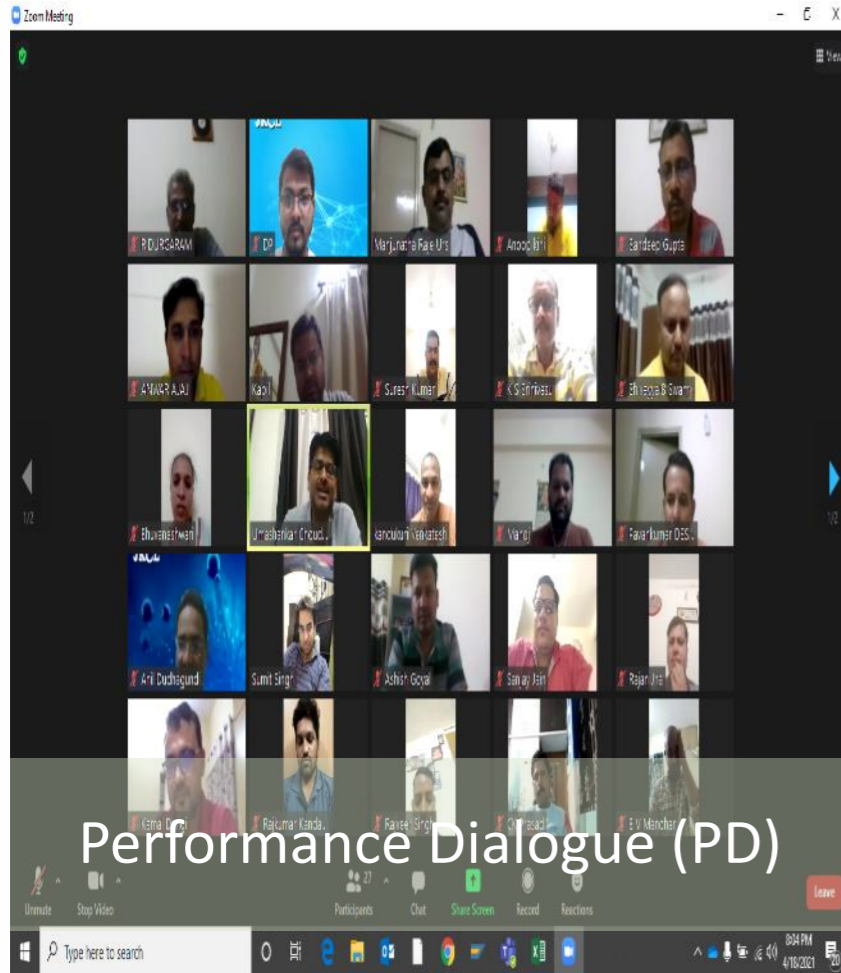


The fund allocation for the Energy saving project For FY'20-21 was around 0.15% of total allotment. However 5 % is reserved for the current year.

Proposed fund allocation for Energy Saving Projects FY'21-22

Energy saving project (In Lacs)	2934
Total Fund Allocation (In Lacs)	58690
Fund Allotted to Energy saving Project (In Lacs)	5.0 %

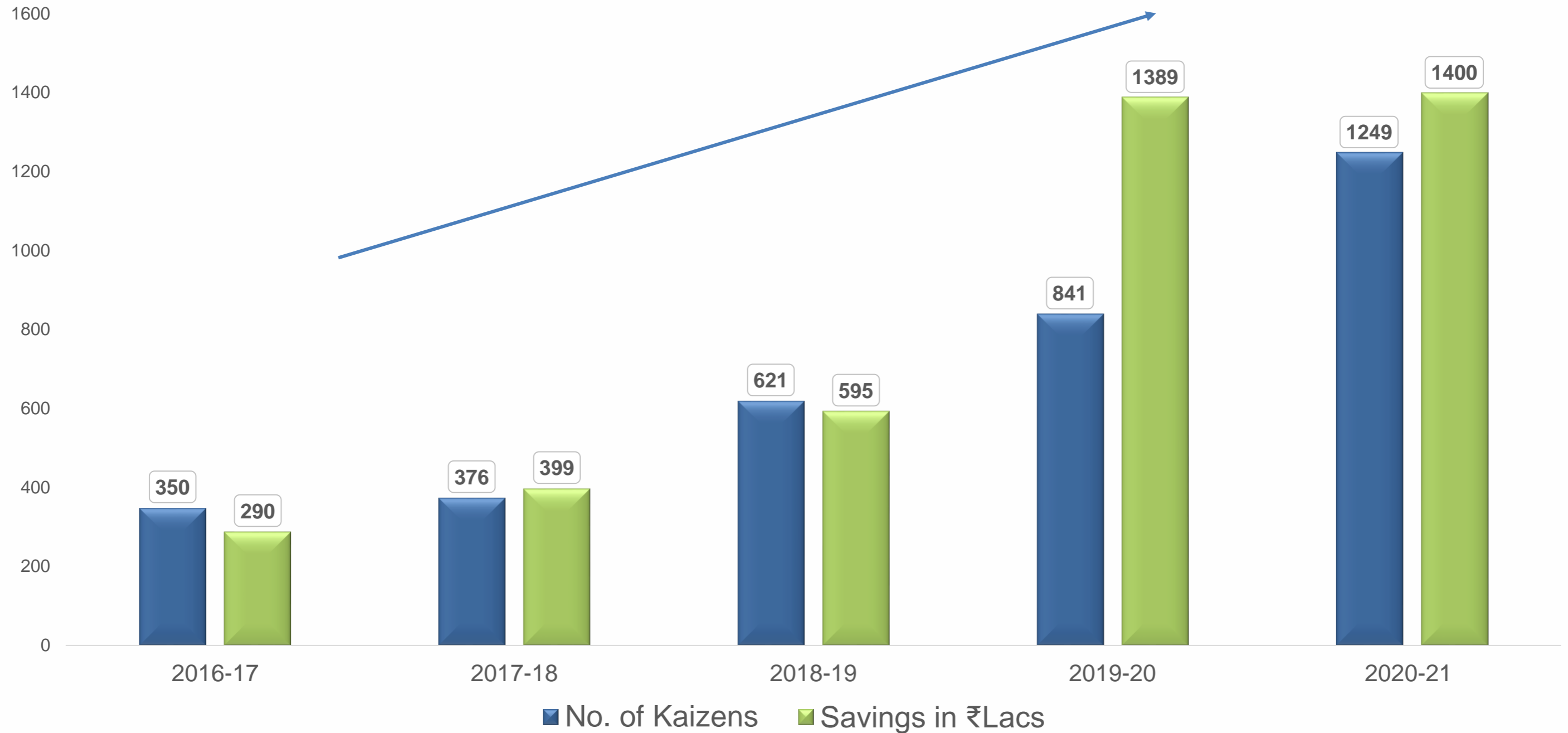
SN	Name of the Topic	Participants
1	BEE Energy Manager and Energy Auditor Exam 2021	6
2	Cement Manufacturing Process	9
3	Centrifugal Pumps - Efficient Selection & Operation	2
4	Certified Expert in Carbon Footprint	5
5	Certified Professional in Carbon Footprint	2
6	Certified Professional in Sustainable Waste Management	2
7	Climate change & best practices in sustainability	2
8	Designing Energy Efficient Compressed Air Distribution System	2
9	Energy Efficient System And Cost Saving Techniques	2
10	Energy reduction and Productivity improvement through plant upgrades	8
11	Energy Savings from Gas based Technologies Developed by ENCON Thermal Engineers	2
12	Impact of Raw mix design & burnability in cement quality	16
13	Operation & Maintainence of HT Motors	7
14	Operation & Maintenance of Conveyor System and critical application	8
15	Power Quality Solutions	2
16	Process fan	13
17	Save 40% with Energy Efficient Air Handling Units	2
18	The Art of Asset Management by Improving the Operational Efficiency of Cement Plant	6
19	Utilization of Bamboo as Alternate Fuel Resource for Cement Plants in India	16
20	Water Conservation & Hygiene for the Built Environment	8



Manufacturing Excellence drive: Project Vishwakarma



Management By Walk Around - MBWA.





Investment on Energy Saving project

% investment on Turnover

0.15% for FY'20-21

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



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Onsite 5 MW Solar Power Plant



Plantation of Beema bamboo



Dense plantation In front of stores area



Dense plantation behind Admin Building



CCR Building Area



CPP



Admin Building



Park Development



Garden Developed near stores



Plantation near Preheater



Garden Developed near old gate



Lawn developed in Temple premises



Plant Roadside Plantation



Drip irrigation



2017

Apex India Environment Excellence Gold Award-2017.



2017

Mission Energy Foundation "2017 SOx-NOx Award in Technology Excellence Operation & Maintenance"



2017

Energy Foundations FLY ASH UTILISATION AWARDS



2018

Green Tech Environment Platinum Award-2018.



2018

Golden Bird Excellence Gold Award 2018 in Energy Efficiency.



2018

CII-19th National Award-Excellence Energy Efficient 2018



2018

Mission Energy Foundation "2018 Award in Fly ash Utilization."



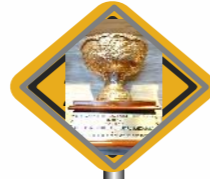
2019

CII-20th National Excellent Energy Efficient Award 2019



2019

6 Prestigious awards in 16th NCB International seminar



2019
ICON SWM Excellence achievement award



2020

Innovative Environment Project Award in 7th Edition of CII Environmental Best Practices Award 2020



2019

Green CO Gold rating certification by CII



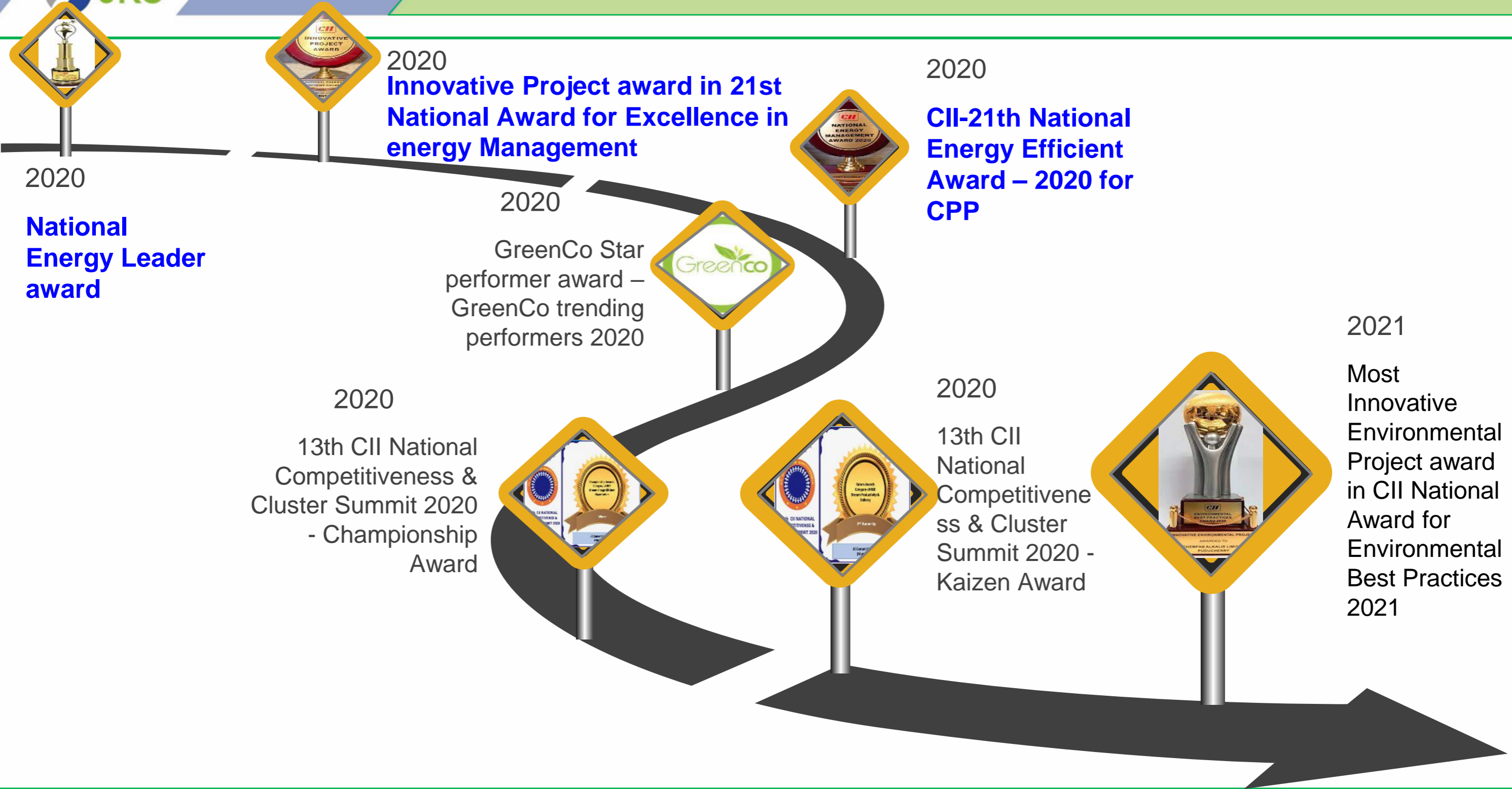
2019
Safety Apex India Gold Award



2020

CII-21th National Excellent Energy Efficient Award – 2020





2020

National Energy Leader award



2020
Innovative Project award in 21st National Award for Excellence in energy Management

2020

GreenCo Star performer award – GreenCo trending performers 2020



2020
CII-21th National Energy Efficient Award – 2020 for CPP

2020

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



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





*The woods are lovely dark & deep, but I have promises to keep,
And miles to go before I sleep, And miles to go before I sleep!*