# CII NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT 2022

# RCCPL PVT LTD (MP BIRLA GROUP)

## 10,000 TPD PLANT , MAIHAR (M.P.)

# AN INTRODUCTION :
# MP BIRLA GROUP OF COMPANIES

**Birla Corporation Limited** is the flagship Company of the **M.P. Birla Group**. Incorporated as Birla Jute Manufacturing Company Limited in 1919, it was Late **Mr. Madhav Prasad Birla** who gave shape to it. As Chairman of the Company, he transformed it from a manufacturer of jute goods to a leading multi-product corporation with widespread activities. Under the leadership **of Mr. Rajendra S. Lodha**, the Company posted its best ever results in the years ended 31.3.2006, 31.3.2007 and 31.3.2008. The Company continued to record impressive growth in 2008-09 and 2009-10.

**Mr Harsh V Lodha is now Chairman of the Company**.

The Company had a turnover of Rs 6,785.45 crores in 2020-21 and a net profit of Rs 630.14 crores. The Company is **primarily engaged** in the manufacturing of **cement as its core** business activity. The Company has **acquired 100% shares of Reliance Cement Company Private Limited** (Reliance Cement). This acquisition provides Birla Corporation Limited with the ownership of high-quality assets, taking its total capacity from 10 MTPA to 15.5 MTPA.

Birla Corporation currently produces cement at eight locations through its 11 manufacturing units with a combined capacity of almost 20 million tons per annum.

| S.No. | UNIT | OPERATIONAL CAPACITY |
|---|---|---|
| 1 | RCCPL Pvt LTD – Maihar, IU | 3.3 MTPA |
| 2 | RCCPL Pvt LTD- Mukutban | 3.9 MTPA |
| 3 | Satna Cement Works, IU | 2.6 MTPA |
| 4 | Chanderia Cement Works, IU | 4.0 MTPA |
| 5 | RCCPL Pvt LTD, Butibori, GU | 0.5 MTPA |
| 6 | RCCPL Pvt LTD, Kundanganj, GU | 2.1 MTPA |
| 7 | Birla Corporation, Raebareli, GU | 1.2 MTPA |
| 8 | Birla Corporation, Durgapur, GU | 2.0 MTPA |

# VISION, MISSON & VALUES

## VISION

To be admired
For our Performance,
Ethics and Culture

## MISSION

To be the best- in- class
in every sector we operate

## VALUES

- Integrity
- Professionalism
- Value Creation
- Social Commitment

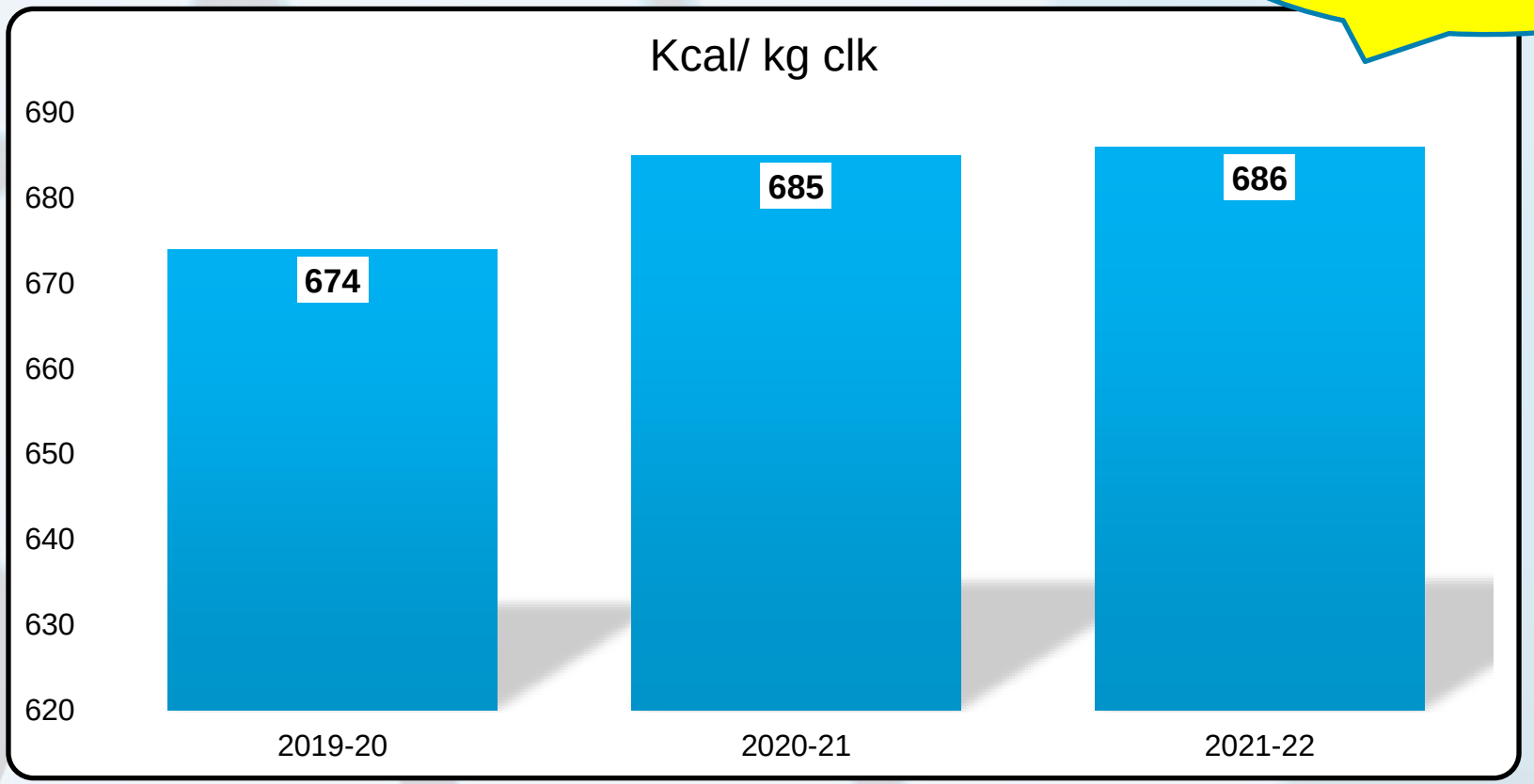
# AN INTRODUCTION :
# RCCPL PVT LTD–10000 TPD CLINKER & 3.3 MTPA CEMENT PRODUCER


RCCPL PVT LTD is an entity of MP Birla Group, having per day installed production capacity of 10,000 TPD Clinker and 3.3 MTPA Cement. Plant was green field project commissioned on 26.01.2013. The plant is one of the largest Clinker Manufacturing Unit having all automatic controlled operation with clinker capacity of **3.3 million tonnes per annum**. To monitor and control the quality of its product it has fully automated robotic lab including online particle size analyzer. Maihar Unit has received prestigious "Greentech Gold Award" for "HR Best Strategy" from Greentech Foundation and "International Safety Award" from British Safety Council for demonstrating strong commitment to good health and safety.

| SN | Section | Make/Supplier |
|---|---|---|
| 1 | Crusher | Double Roll, Impact Crusher, 1800 TPH, with 2000 TPH OLBC of 07 KMS |
| 2 | Raw Mill | Roll Press (2 Nos) – 400 TPH, 400 TPH. POLYCOM – 2/12 8C |
| 3 | Pyro | 10,000 TPD Kiln with DOPOL 90 twin string, 6 stage, POLYTRACK 13/4.0 – 2.5 Cooler & POLYFLAME VN Burner. |
| 4 | Coal Mill | FLSmidth make, ATOX 32.5, 90 TPH. |
| 5 | Cement Mill | LOESCHE- LM56.3+3 Mill with 245 TPH PPC. |
| 6 | Packing | FLSmidth V – ROTOPACKER 210 tph X 4 Nos |

# AN OVERVIEW OF SPECIFIC HEAT CONSUMPTION

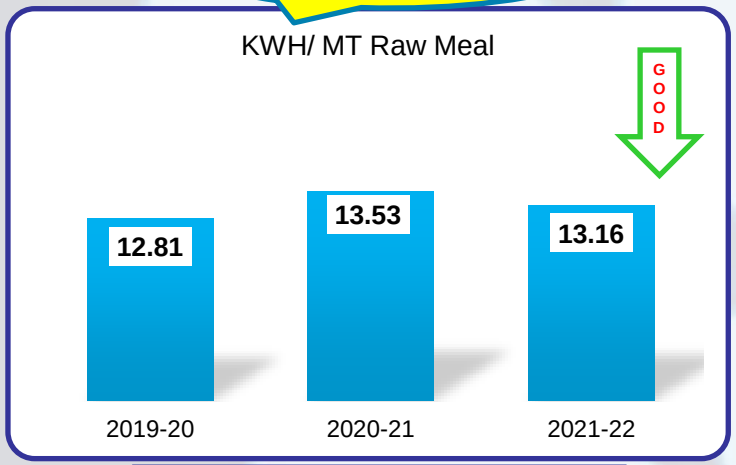
SHC increased by 1.8 % over FY-19-20; after WHRS commissioning




**SHC FOR CLINKERISATION**

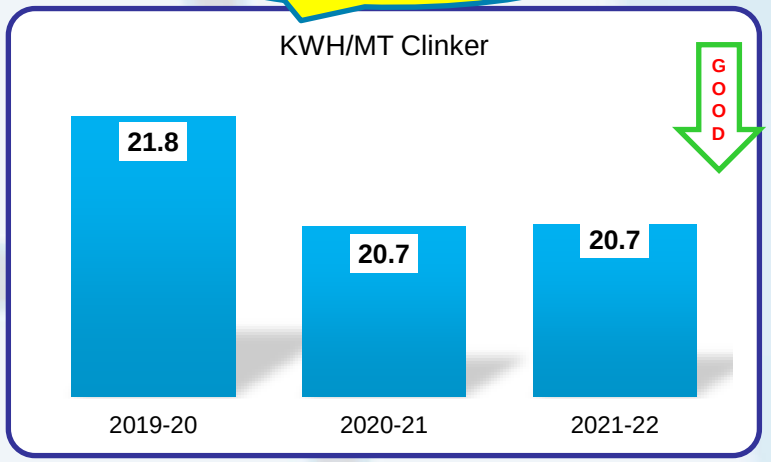
# SECTION WISE SPECIFIC ENERGY CONSUMPTION : YEAR WISE

3% reduction in Raw meal over FY 20-21



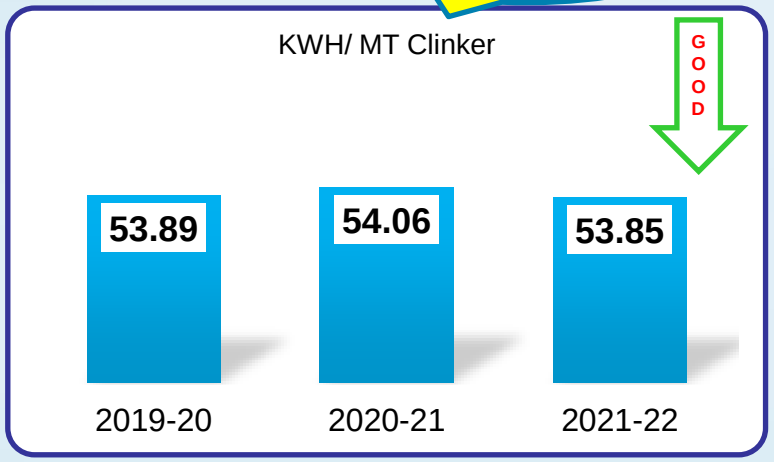

RAW MEAL GRINDING

5 % reduction in Kiln section over FY 19-20



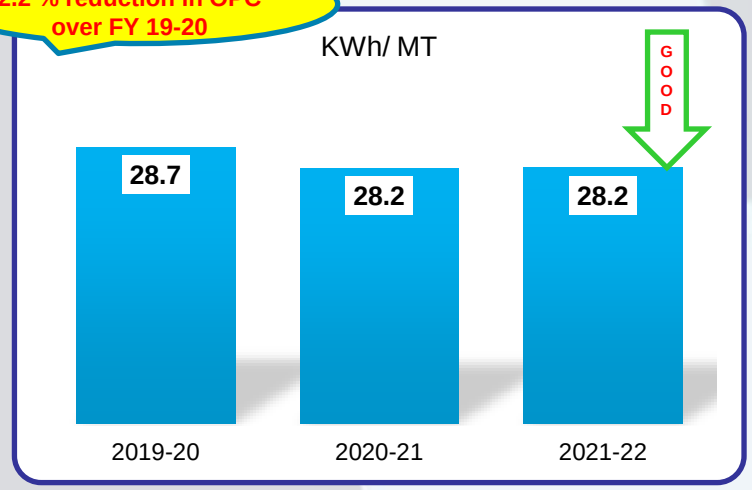

KILN SECTION

0.4 % decrease in SPC of Clinker over FY 20-21

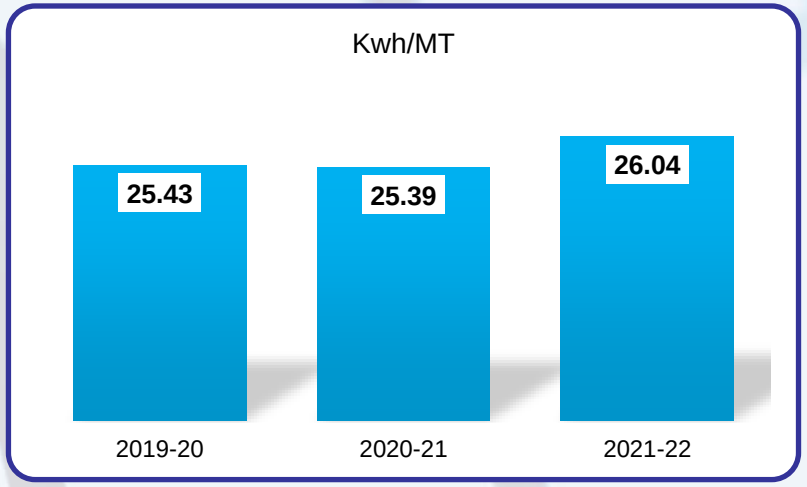



CLINKERISATION

2.2 % reduction in OPC over FY 19-20

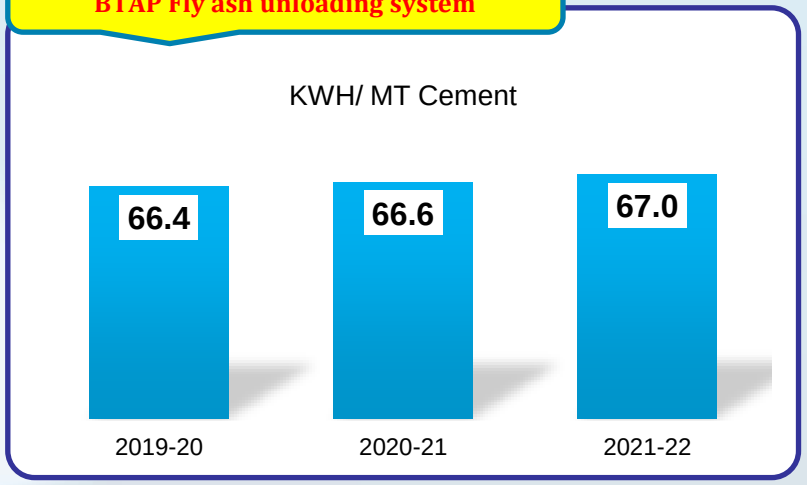



OPC GRINDING POWER




PPC GRINDING POWER

Power increased after installation of BTAP Fly ash unloading system




OVERALL POWER CONSUMPTION

# AN OVERVIEW OF PAT CYCLE-3

| | | |
|---|---|---|
| Baseline year (2015-16) | Kcal/kg eq cem | 0.0791 |
| Baseline Equivalent Major Product | | PPC |
| Cycle-3 Target Reduction | % | 5.56% |
| Cycle-3 Target | kcal/kg eq cement | 0.0747 |
| Cycle-3 Assessment Year | | 2019-20 |
| Cycle-3 Achievement (Without Normalisation) | kcal/kg eq cement | 0.0632 |
| Cycle-3 Achievement (With Normalisation) | kcal/kg eq cement | 0.0691 |
| Cycle-3 Achievement (ESCerts) | | 22231 |

# UPCOMING PLANNED ENCON PROJECTS

| S.NO | PRODUCTIVITY IMPROVEMENT | Investment ( Lac INR) | Target of Completion |
|---|---|---|---|
| 1 | Modifying cooler fans and cooler upgradation for enhancing production capacity and WHRS generation | 500 | Dec-23 |
| 2 | Reduction of thermal energy through surface heat reduction in preheater cyclones through heat resistant paint. | 100 | Dec-23 |
| 3 | Reduction of electrical and thermal energy through false air reduction in preheater system | 50 | Dec-23 |
| 4 | Electrical saving through RM bag house fan replacement with HE fan | 45 | Dec-23 |
| 5 | Raw mill fan casing modification for reduction in pressure drop | 40 | Dec-23 |

# UPCOMING PLANNED ENCON PROJECTS

| S.NO | PRODUCTIVITY IMPROVEMENT | Investment ( Lac INR) | Target of Completion |
|---|---|---|---|
| 6 | New roller replacement in raw mill-2 to increase mill tph and reduce SPC. | 1050 | Dec-23 |
| 7 | New AFR system installation in Pyro system to increase TSR rate from existing 1.5% to 7%. | 931 | Sep-22 |
| 8 | Kiln tip casting modification will be done by replacing manual casting with pre-fired & pre-casting block to save shutdown and enhance extra clinker production. | 108 | Dec-23 |
| 9 | Installation of VFDs in blowers and bag filter fans in pyro and raw mill section. | 118 | Dec-23 |
| 10 | PXP Upgradation project(Fuzzy Logic) for kiln ,cooler and coal mill to reduce SHC and SPC and improve plant operation efficiency. | 90 | Dec-23 |

# ENERGY EFFICIENCY MEASURE IMPLEMENTED : 2019-20

| Sl.NO | PRODUCTIVITY IMPROVEMENT | INVESTMENT ( LAC INR) | SAVINGS ( LAC INR /annum) |
|---|---|---|---|
| 1 | Installation and Commissioning of 7.7 MW AC Solar Power Plant | 3453 | 312 |
| 2 | Installation and Commissioning of 12.25 MW Waste Heat Recovery Power Plant | 13405 | 2115 |
| 3 | Enhancement of Raw mil-1 output from 375 TPH to 400 TPH through modification of gearbox internals (increase of roll circumfential speed from 1.8 m/sec to 2.0 m/sec | 60.4 | 21.83 |
| 4 | Installation of Air Cooled compressor in Cement Mill area- At the time of Cement mills stoppage & for operation of Packing plant, Air cooled compressor is being used which reduces the operation of cooling tower pumps & fans | 18.7 | 0.75 |
| 5 | Installation of diverter gate in place of 231BC5 belt conveyor | 5.07 | 2.8 |

# ENERGY EFFICIENCY MEASURE IMPLEMENTED : 2019-20

| Sl. No | PRODUCTIVITY IMPROVEMENT | INVESTMENT ( LAC INR) | SAVINGS ( LAC INR /annum) |
|---|---|---|---|
| 6 | Discharge chute modification of Raw mill recirculation bucket elevators –<br>a. Reduction of fugitive dust emission from mill feed belt conveyors<br>b. Unwanted mill tripping due to dust accumulation on metal detectors<br>c. Prevention of condensation in discharge hoppers of bag filters because of mixed hot (recirculation) and cold material (fresh feed) | 2.02 | 1.2 |
| 7 | Replacement of 10 no's of 150 ltr. air blasters with 70 ltr. Blasters. | 1.8 | 2.07 |
| 8 | Installation and Commissioning of VFD's in Kiln coal Firing Blower 481BL1 and Calciner coal Firing blower 451BL1 | 8.5 | 60.62 |
| 9 | Installation and Commissioning of VFD for Utility Compressor D32CP1 | 7.5 | 13.30 |

# ENERGY EFFICIENCY MEASURE IMPLEMENTED : 2020-21

| Sl. No | PRODUCTIVITY IMPROVEMENT | INVESTMENT ( LAC INR) | SAVINGS ( LAC INR/annum ) |
|---|---|---|---|
| 1 | Replacement of 37 KW pump used for filling of 5000 liter water tanker with 3.7 KW pump at RO system. | 0.4 | 5.11 |
| 2 | Removal of Gyro screen system (2.2 KW) & RAL (1.5 KW) in Carbon black feeding system | 0.25 | 1.9 |
| 3 | Consumption of alternate fuels in pyro processing | 250 | 203 |
| 4 | Refractory design modification- Installation of HASSLE refractory blocks at kiln inlet slope | 80 | 15.44 |

# PROJECTS IMPLEMENTED: 2021-22

| Sl.No | PRODUCTIVITY IMPROVEMENT | INVESTMENT (Lacs INR) | SAVINGS (Lacs INR/annum) |
|---|---|---|---|
| 1 | Electrical energy saving through replacement of Cement Mill-1 mill fan with new high efficiency fan. | 38 | 15.96 |
| 2 | Electrical energy saving through installation of VFD in cement mill compressor | 10 | 3.98 |
| 3 | Electrical energy saving through installation of VFDs in packing plant bag filter fans 641FN1, 642FN1, 643FN1, & 644FN1. | 32 | 13.05 |
| 4 | Electrical energy saving through installation of VFDs in bag filter fans 532FN1, 531FN1, 562FN2, & 561FN2 | 32 | 5.8 |
| 5. | Replacement of 37 KW pump used for filling of 5000 liter water tanker with 3.7 KW pump at RO system. | 0.3 | 5.11 |

# INNOVATIVE PROJECTS IMPLEMENTED

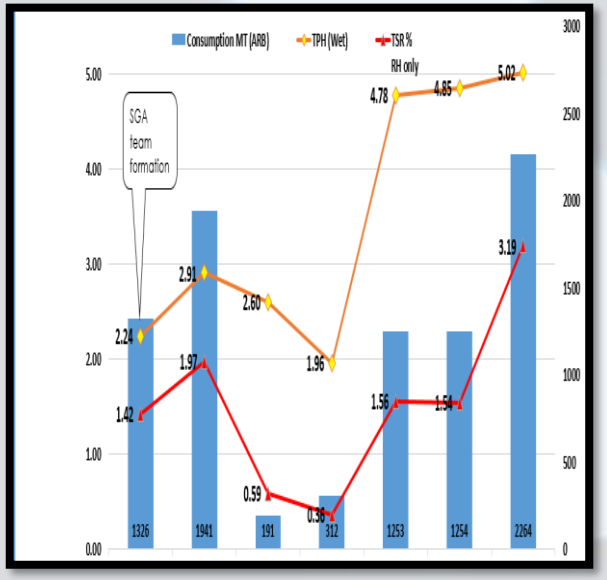
| Sl.No | PRODUCTIVITY IMPROVEMENT | REMARKS |
|---|---|---|
| 1 | Curtain wall installed in Cooler to improve recuperation efficiency of cooler.<br>• Improved TAD and Secondary air volume from 0.7 Nm3/kg clk to 0.75 Nm3/kg clk<br>• Increased Secondary Air temperature by ~7 Deg C<br>• Increased TAD temperature by ~20 Deg C | Saving of 3 to 4 Kcal/kg clk |

**INSTALLATION OF CURTAIN WALL**

| Sl.No | Parameters | UOM | Before WHRS installation | After WHRS Installation | After Curtain wall installation |
|---|---|---|---|---|---|
| 1 | SA Temperature | Deg C | 1127 | 1100 | 1107 |
| 2 | TAD temperature | Deg C | 968 | 910 | 930 |

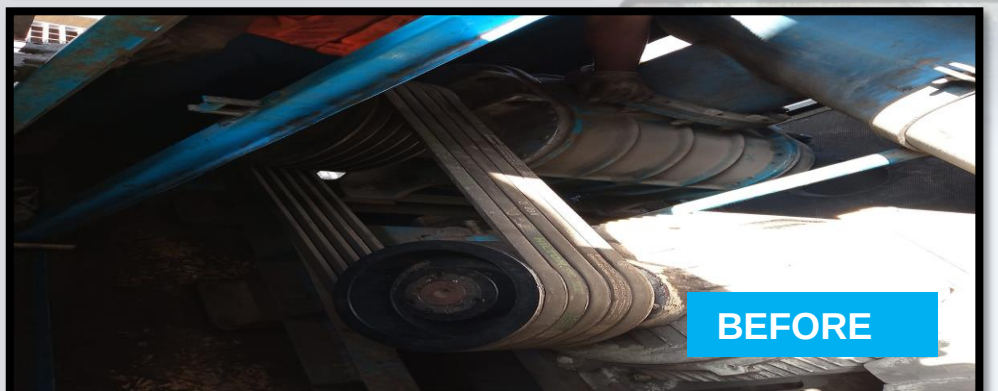
# INNOVATIVE PROJECTS IMPLEMENTED

| Sl.No | PRODUCTIVITY IMPROVEMENT | REMARKS |
|---|---|---|
| 1 | Various types of AFR material feeding done through rice husk pneumatic system by modification in pneumatic conveying system<br>1) Nozzle size modification from 83mm to 110 mm.<br>2) Air to material ratio has been increased through addition of another blower.<br>3) Pulley diameter modification done | Saving of Rs 59 Lac per month.<br>Various types of AFR consumed : Lantana , Saw dust, Shredded MSW , Shredded plastic waste from paper industry |






NOZZLE SIZE MODIFICATION





MOTOR PULLEY CHANGED TO 300 MM

# INNOVATIVE PROJECTS IMPLEMENTED

| Sl.No | PRODUCTIVITY IMPROVEMENT | INVESTMENT (Lacs INR ) | SAVINGS (Lacs INR/annum) |
|---|---|---|---|
| 1 | Installation of Hassle Block in Feed pipe and Kiln Slope.<br>Precast and Prefired Hassle blocks are installed in bottom stage cyclone 1A,1B feed pipe and kiln inlet. This is done to reduce coating formation problem in kiln inlet and feed pipes and have ease in feed pipe cleaning during shutdown. | 80 | 15.44 |

HASSLE BLOCK INSTALLATION

# INNOVATIVE PROJECTS IMPLEMENTED

| Sl.No | PRODUCTIVITY IMPROVEMENT | INVESTMENT (Lacs INR ) | SAVINGS (Lacs INR/annum) |
|---|---|---|---|
| 1 | Installation of BTAP wagon system for transport of fly ash and minimize the use of bulker. | 1500 | 708 |


**BENEFITS OF BTAP WAGON UNLOADING SYETEM :**

1) **Step towards Green and clean energy**
2) **Procuring of fly ash through bulkers are significantly reduced .**
3) **Freight charges levied by bulkers are reduced.**
4) **Handling loss reduced**

# INNOVATIVE PROJECTS IMPLEMENTED

| SN | PRODUCTIVITY IMPROVEMENT | BENEFITS |
|---|---|---|
| 1 | Relocation of Carbon Black feeding point done from Coal mill inlet to outlet to avoid tripping of mill due to vibrations and facilitate more consumption of Carbon black in mill. | Carbon black consumption increased |
| 2 | Chute modification done of 291 BC 5 discharge to reduce jamming frequency . | Consistency in operation achieved |

MOFIFICATION DONE IN CHUTE

RE-LOCATION OF CARBON BLACK FEEDING POINT

# MODIFICATION AND LOGIC CHANGES TO IMPROVE PRODUCTIVITY

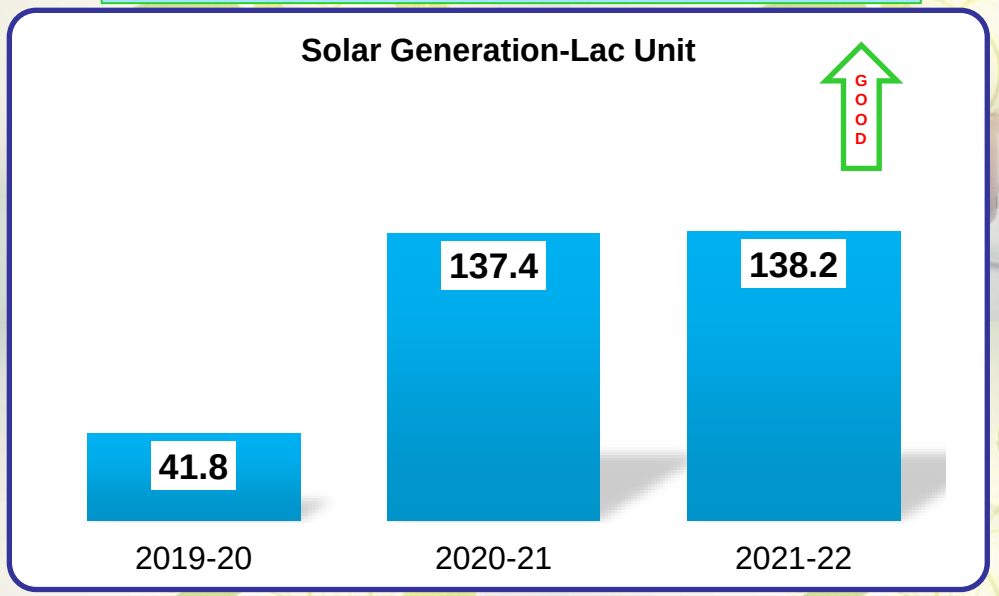
| Sl.No | PRODUCTIVITY IMPROVEMENT | SAVINGS (Lacs INR/annum) |
|---|---|---|
| 1 | Raw mill operated in PID with Roll press(kW) vs slider operation.<br>Recirculation bucket elevator logic modified and current limit increased from 480 to 500 amps. | 7.8 |
| 2 | <u>Coal Mill TPH increased from 55 TPH to 64 TPH</u><br>• Mill table speed increased by increasing GRR from 92% to 100%.<br>• Mill grinding pressure increased from 150 bar to 155 bar.<br>• False air across mill reduced from 9 to 7.5% by arresting all the leakages.<br>• Mill table water spray modified and lances tilted towards the roller so as to improve grinding efficiency.<br>• Increased dam ring height by ~10mm to reduce mill gear box vibrations. | 60.67 |
| 3 | <u>Logic made for reduction of idle run of cement mill transport group and aux circuit.</u><br>• Logic implemented for stopping of mill fan timer from earlier 5 min to 3min.<br>• Logic implemented for stopping of 511BF7 fan from earlier 60 min to 5min.<br>• Incorporated T21CP5 compressor idle interlock logic. | 0.86 |

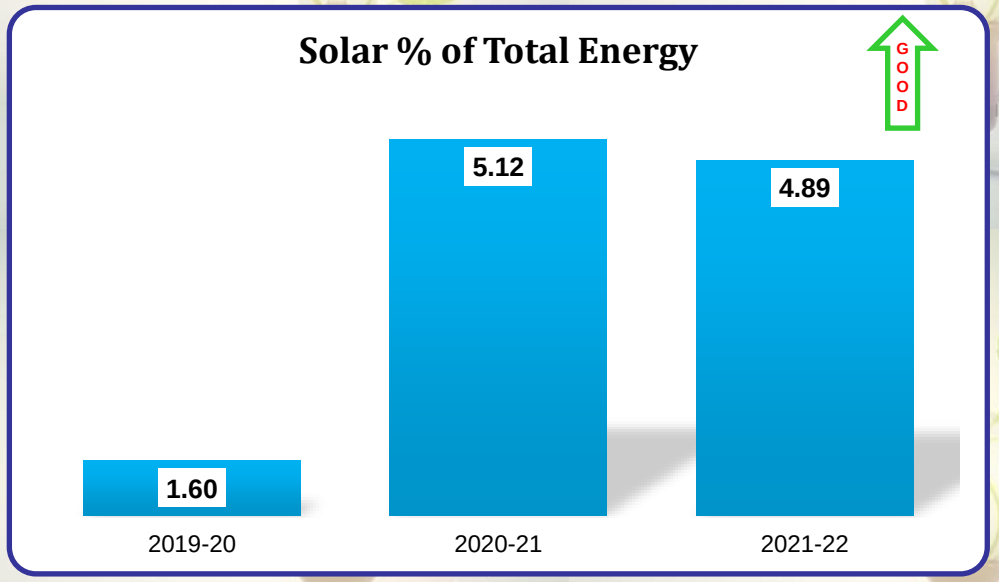
# MODIFICATION IN LOGIC TO IMPROVE PRODUCTIVITY

| Sl.No | PRODUCTIVITY IMPROVEMENT | SAVINGS ( Lacs INR/annum ) |
|---|---|---|
| 4 | Reduced compressor loading and unloading pressure by 0.2 bar. | 19 |
| 5 | Switched off Load center lights of 1,3,5 and 9 due to minimal movement of manpower and achieved savings | 0.32 |
| 6 | Reduction of Idle running of clinker transport group (511BC1/681FN1/681FN2/511BC9/K911WF1 and purging panel). | 4.55 |
| 7 | Reduction of Idle running of Gypsum transport group (K91BC3/K91BC2/K91BC1 and dedusting bag filter). | 6.8 |
| 8 | Reduction of Idle running of flyash transport group.(T31BF2/T31FN2/T31RF2 and purging panel circuit) | 1.56 |
| 9 | Mill recirculation diverter taken in auto mode to reduce mill reject handling by recirculating in circuit. | 3.5 |
| 10 | Modification in shuttering of feed pipe done to save casting time. Earlier feed pipe casting was done in 4 rotations but presently casting is done in only 2 rotations | 01 days extra clinker production |
| 11 | Enhanced the consumption of conditioned flyash from 1% to 3% by installing 4 nos of electric vibrators in dump hopper to reduce clogging and improve extraction. | Fly ash consumption increased. |
| 12 | Optimizing of Idle running of clinker transport ., gypsum feeding and fly ash unloading bag filters | 11.6 |

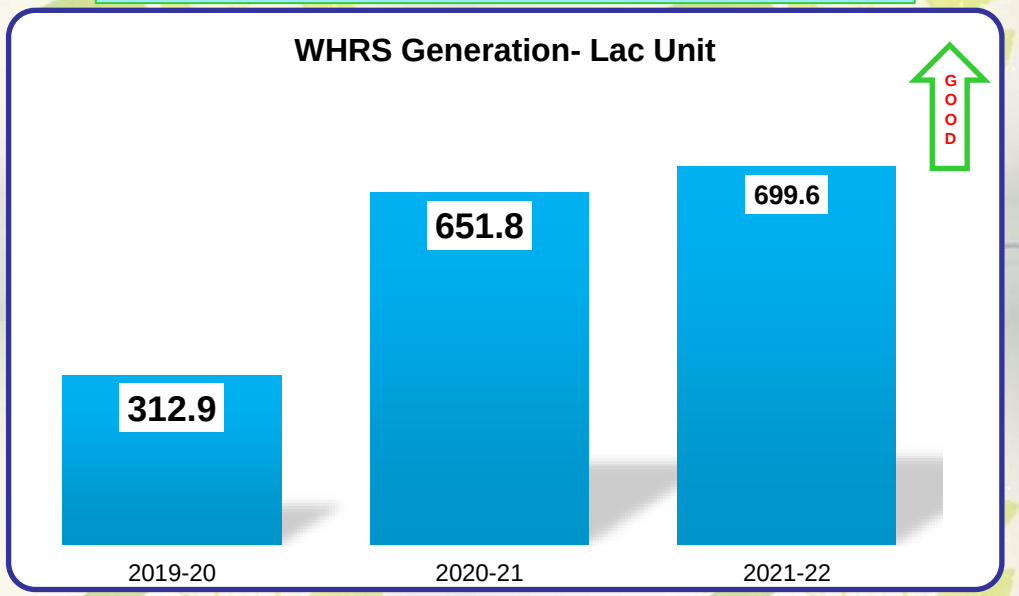
# GREEN AND CLEAN ENERGY : SOLAR AND WHRS GENERATION

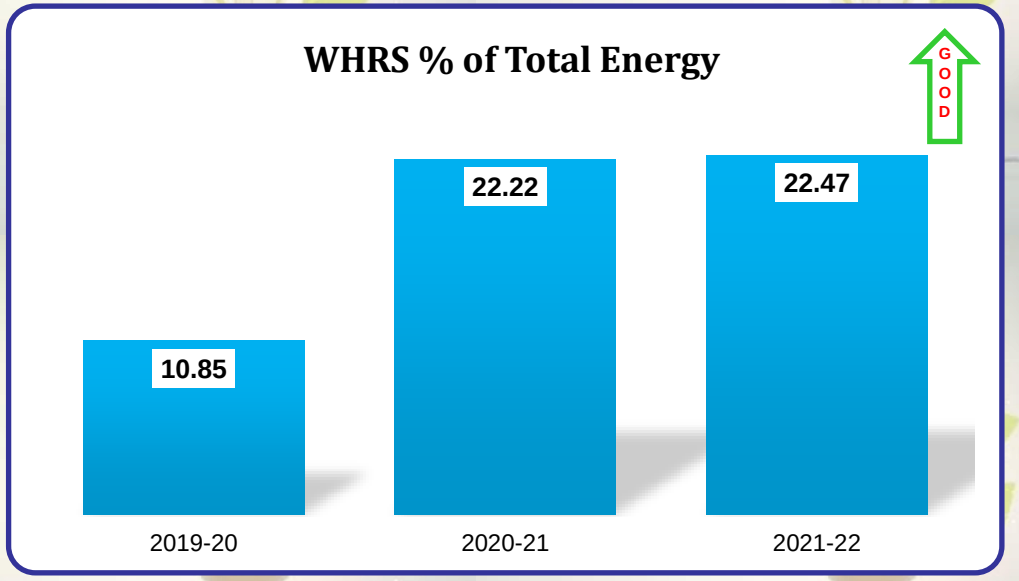
## SOLAR CAPACITY : 7.7 MW



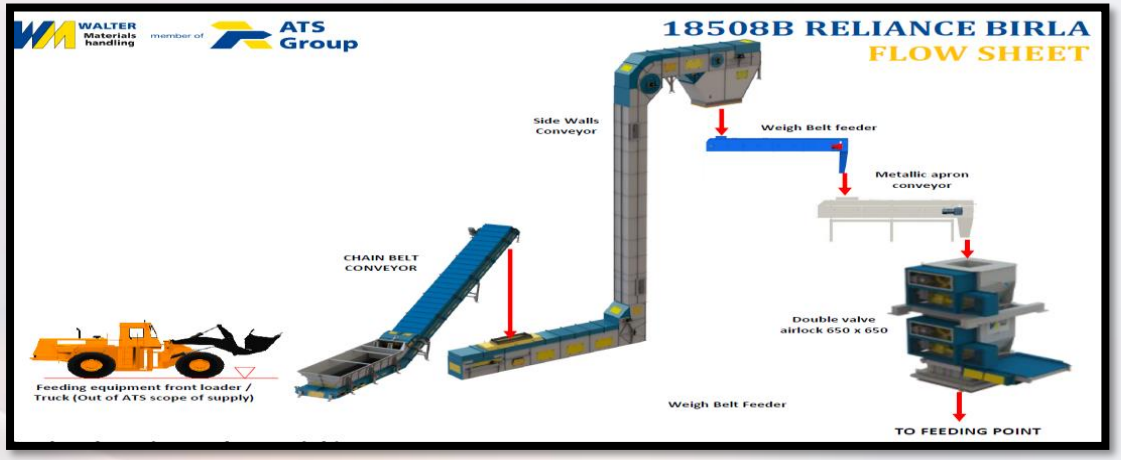




## WHRS CAPACITY : 12.25 MW

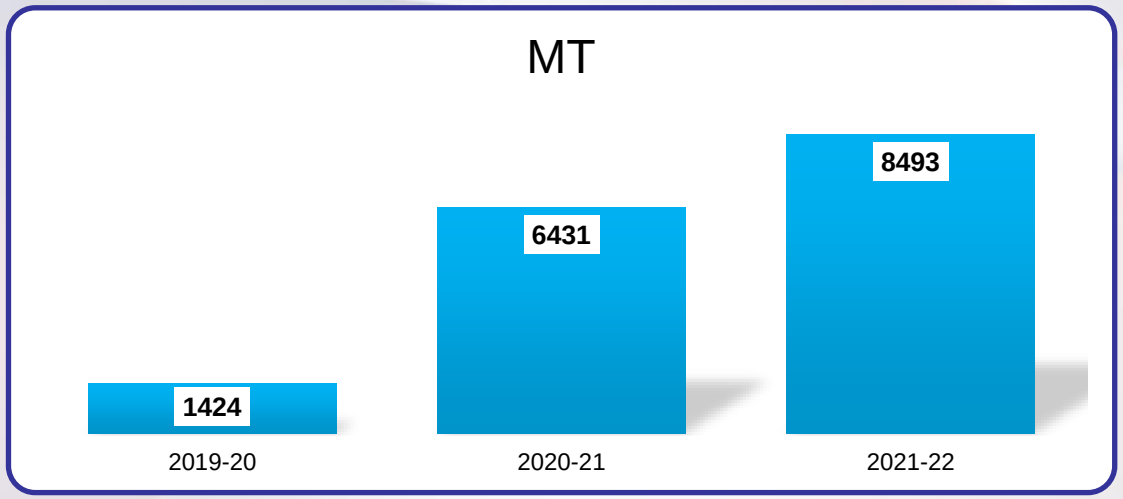


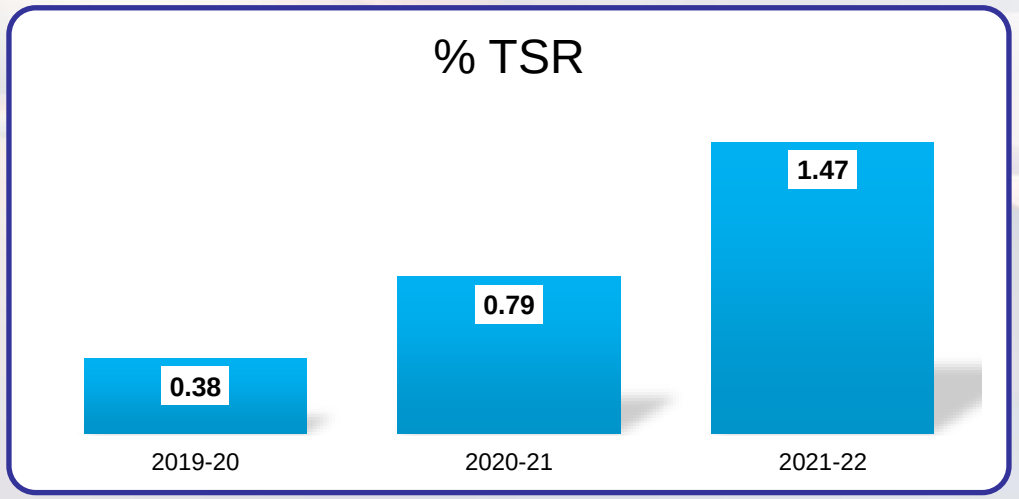
# WASTE UTILIZATION AND MANAGEMENT




**New AFR System is under commissioning which will increase TSR rate to 7 %**

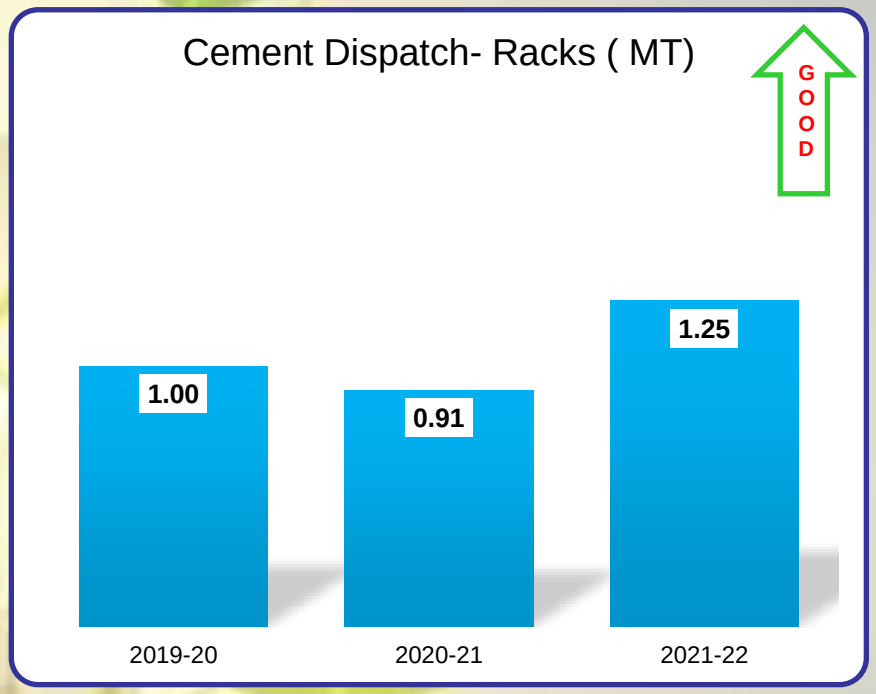



**AFR CONSUMPTION IN MT**




**TSR RATE**

# GREEN SUPPLY CHAIN MANAGEMENT


**BTAP SYSTEM:** Fly Ash procured through BTAP rake so as to reduce fly ash bulker freight cost.

Procurement of coal from Sialgohari mines through trucks and the same trucks are being used for transporting of cement to near by markets so as to lower freight cost and reduce overall cost of cement.

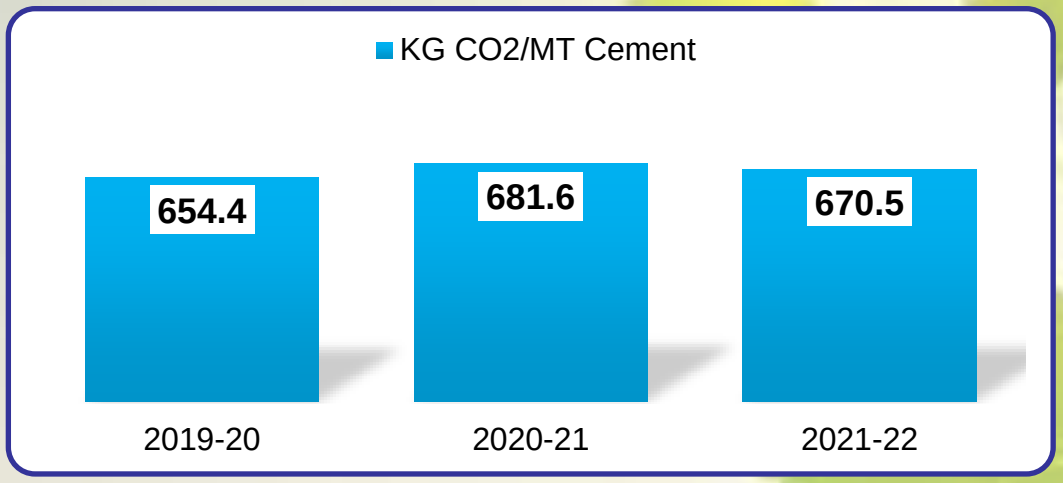
Dispatching of cement through Rail mode instead of road ways to save costing as rail freight is comparatively very lower.

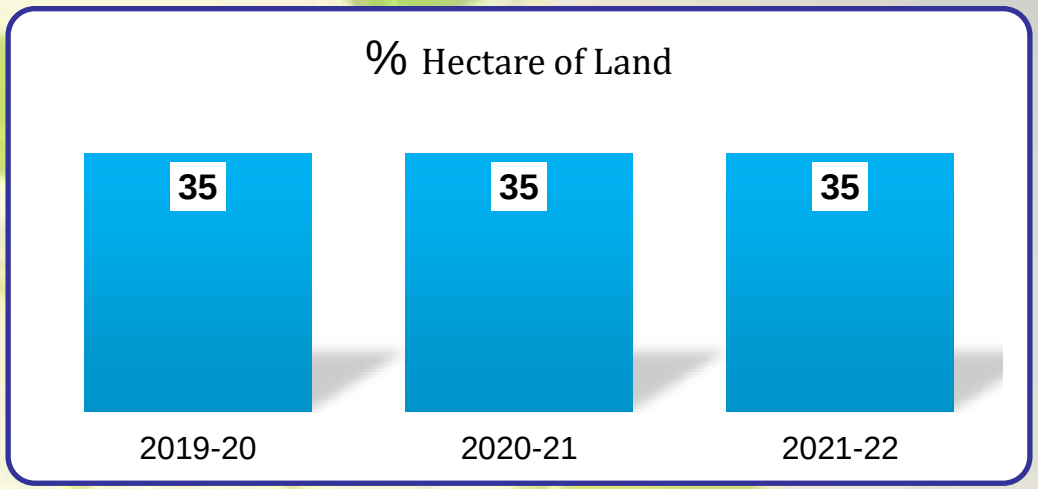
Procurement of CFA through railway racks instead of trucks .

# ENERGY MANAGEMENT SYSTEM

- REVIEW OF ENERGY CONSUMPTION ON DAILY BASIS
- ANALYSIS OF ENERGY PERFORMANCE AT DEPARTMENTAL LEVEL ON DAILY BASIS
- SMALL GROUP ACTIVITIES HEADED BY PLANT HEAD TO REDUCE ENERGY CONSUMPTION
- ANALYSIS AND MONITORING OF SGA ACTVITIES AT REGULAR INTERVAL
- MONTHLY PERFORMANCE AND ENERGY MEETING HEADED BY CHAIRAMAN
- FURTHER SCOPE OF NEW IDEAS IMPROVEMENT AND IMPLEMENTATION TO REDUCE ENERGY CONSUMPTION.

# GHG INVENTORISATION



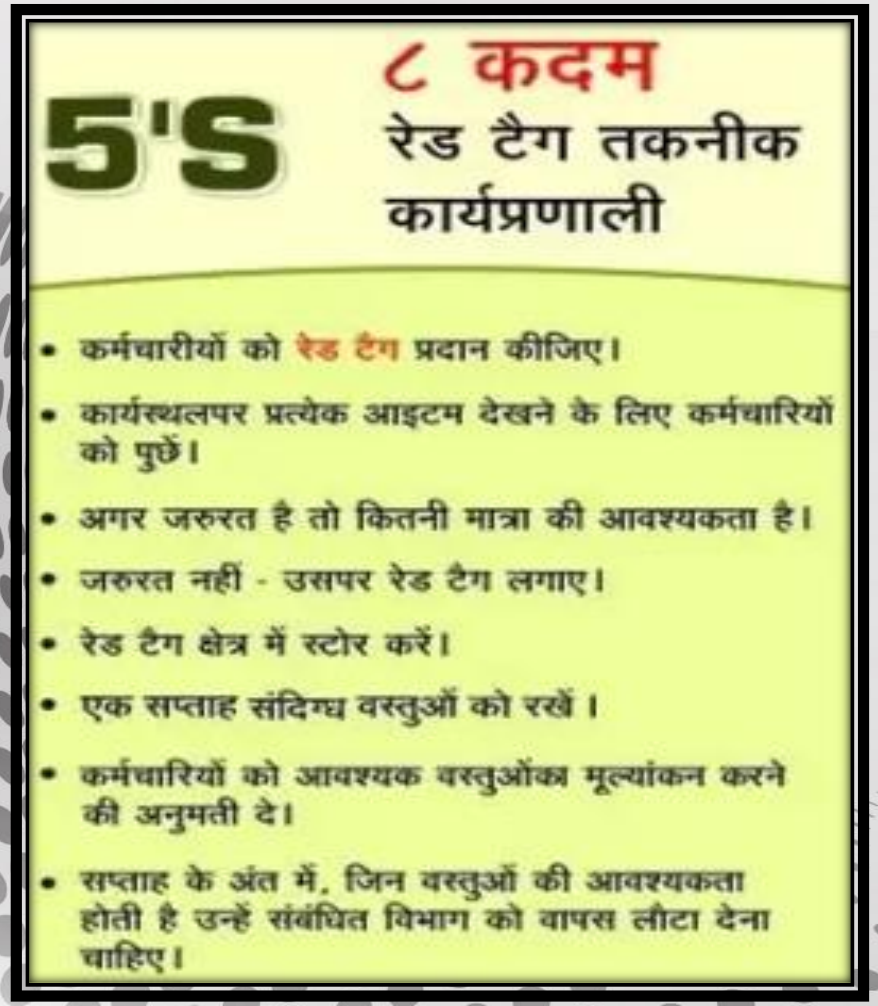

**CO2 EMISSION FIGURES**

**Hectare land converted into green field**

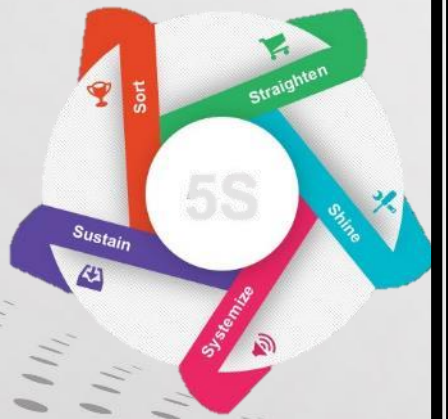
# AWARENESS TRAINING PROGRAM

## 5'S - Activity

**"Process for tagging, removing, and disposing of items not needed in the work area"**




We have started 1S "SEIRI – SORT". **This is the 1st step to starting up the 5S Activities,** to identify and implement the **"RED TAG AREA"** in your workplace/ zone and complete this activity on 25th June 2022


# AWARENESS TRAINING PROGRAM

- **Reward & Recognition to workers for their commendable work .**



# AWARDS & ACCOLADES

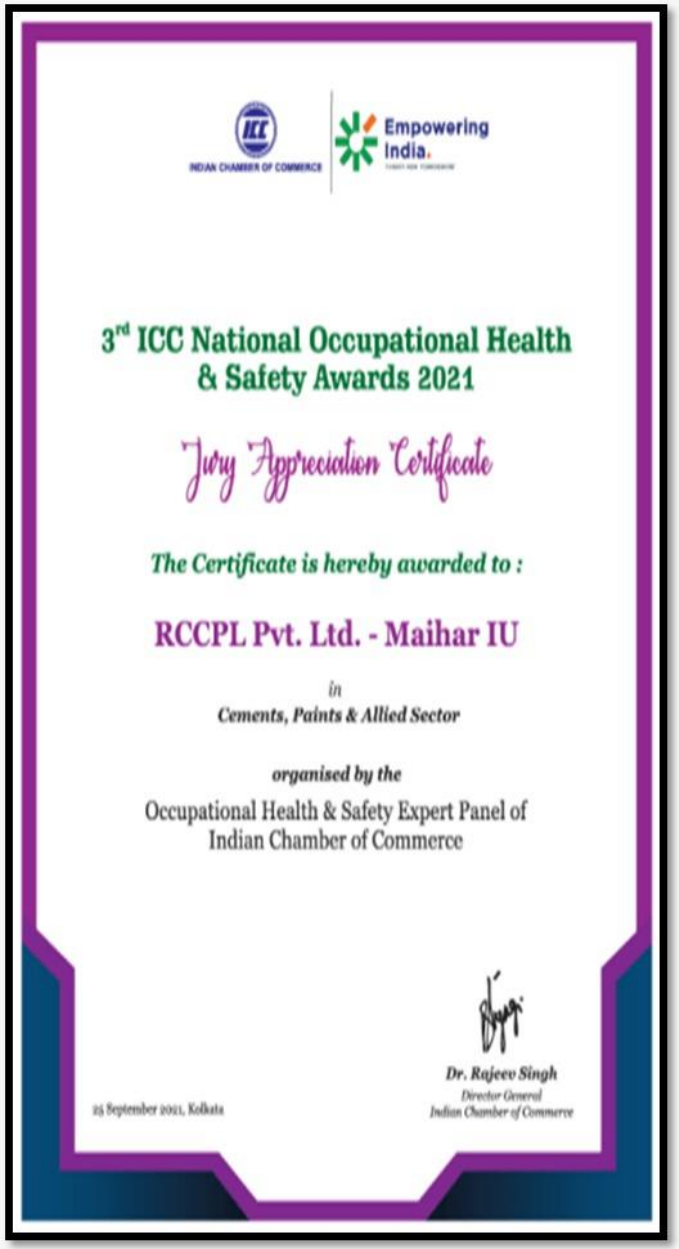

- **RCCPL Mines has bagged 5 Star Rating award on 12th July, 2022 by Hon'ble Shri Prahlad Joshi (Minister of Coal, Mines & Parliamentary Affairs during 6th Conclave of Mines and Minerals at New Delhi.**



- **Achieved Runners Up position under the award category Cement Plant of the Year-Western region by cemWHR 2022 Energy conference & Award**

# AWARDS & ACCOLADES






# Thanks

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