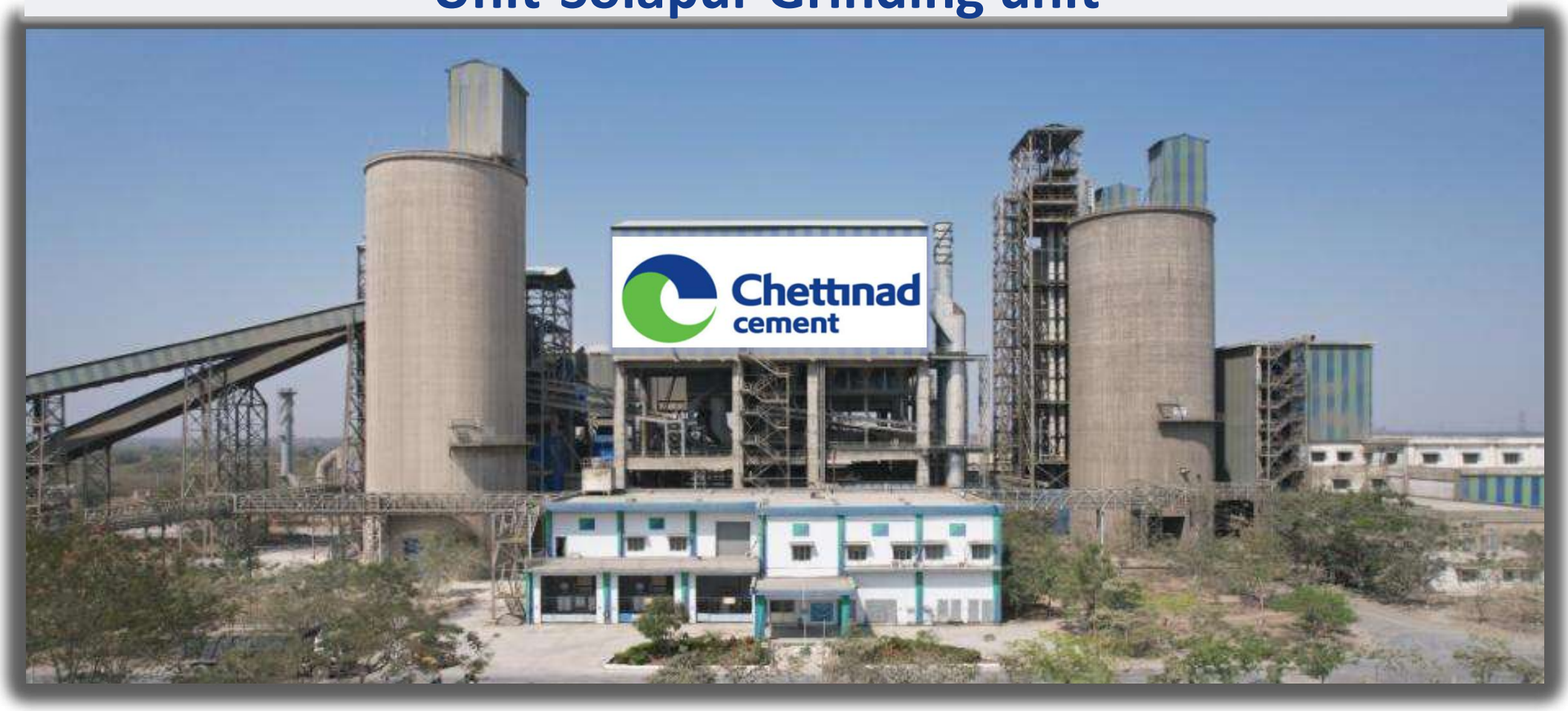
# CHETTINAD CEMENT PVT.LTD
# Unit-Solapur Grinding unit




**"25th CII National Award for Excellence in Energy Management 2024- Cement Sector"**

# CHETTINAD CEMENT PVT.LTD
## Unit-Solapur Grinding unit

Mentor- Mr. Sreenivasa Babu B.R (Unit Head)

Team Member-
Mr. Induvasan
(Operation – HOD)

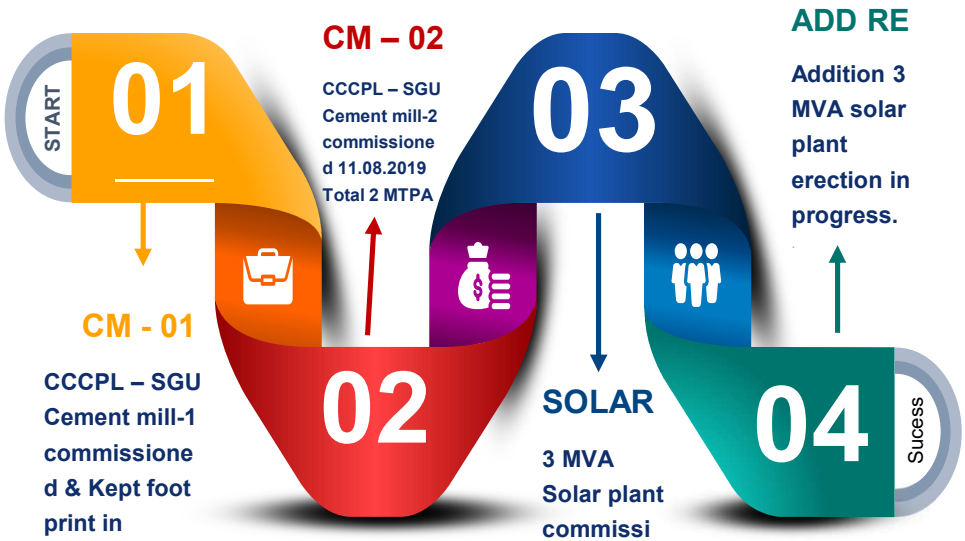
Team Member-
Mr. Veerakumar
(Mechanical – HOD)

# About Chettinad Cement Pvt.Ltd


## Group Established

Chettinad Cement's operations commenced with commercial production at its flagship grey cement first unit at Puliyur, Karur District Tamilnadu, commenced production in 1968

**Currently holding 14.6 MTPA Grey cement**



# Major Equipment

| Cement Mill- I & II | Packing Plant | Packing Plant | Wagon Tippler | Wagon Loading |
|---|---|---|---|---|
| 01 | 02 | 03 | 04 | 05 |
| Mill-01 & Mill-02 FL Smidth Ball Mill 150 TPH with 300 Blaine | Packers Total- 2 No's FLS Ventomatic 12 Spout Double Discharge 180 TPH | Conweigh Systems Roto Packer 2Nos 12 Spout each of 180TPH | Elecon- 1No. With capacity 25 Tipple per hour. Truck Loading 7 No's FLS 90 TPH | Conweigh, 10 Nos. of wagon loading machines with 90TPH |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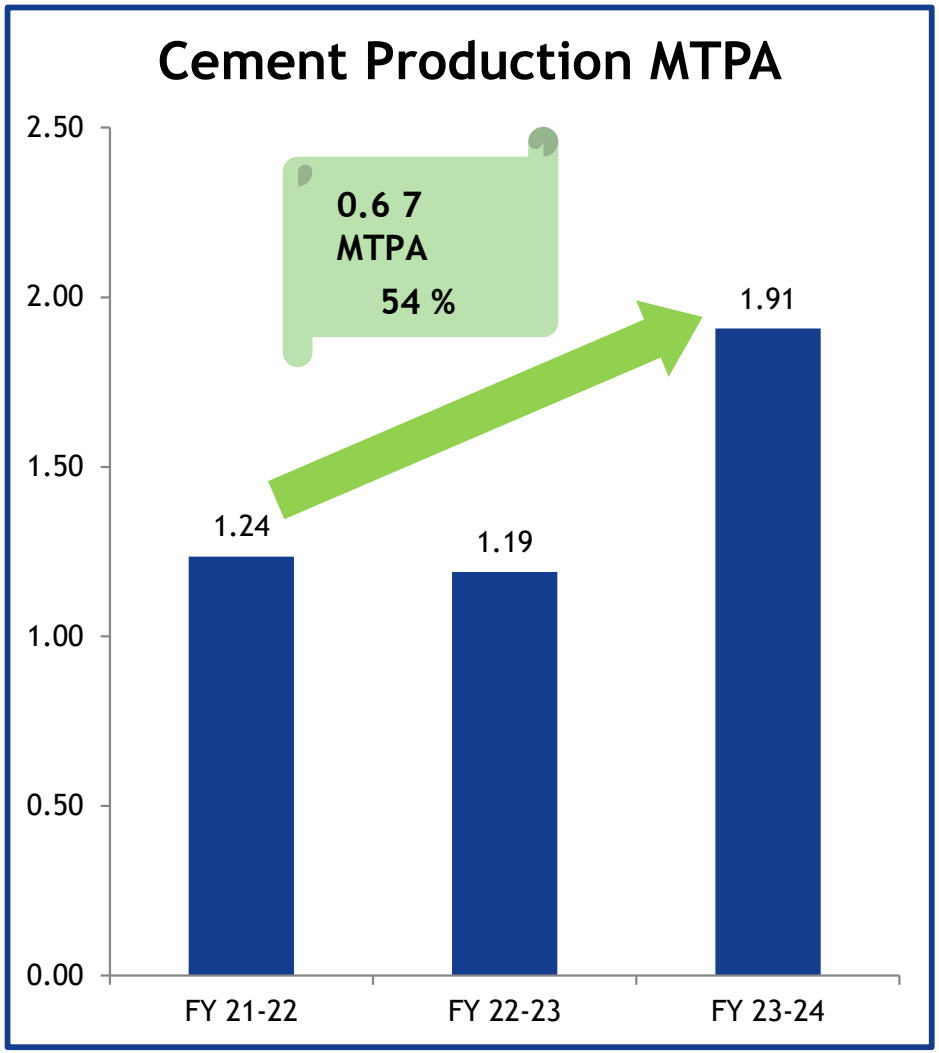
# Major Equipment

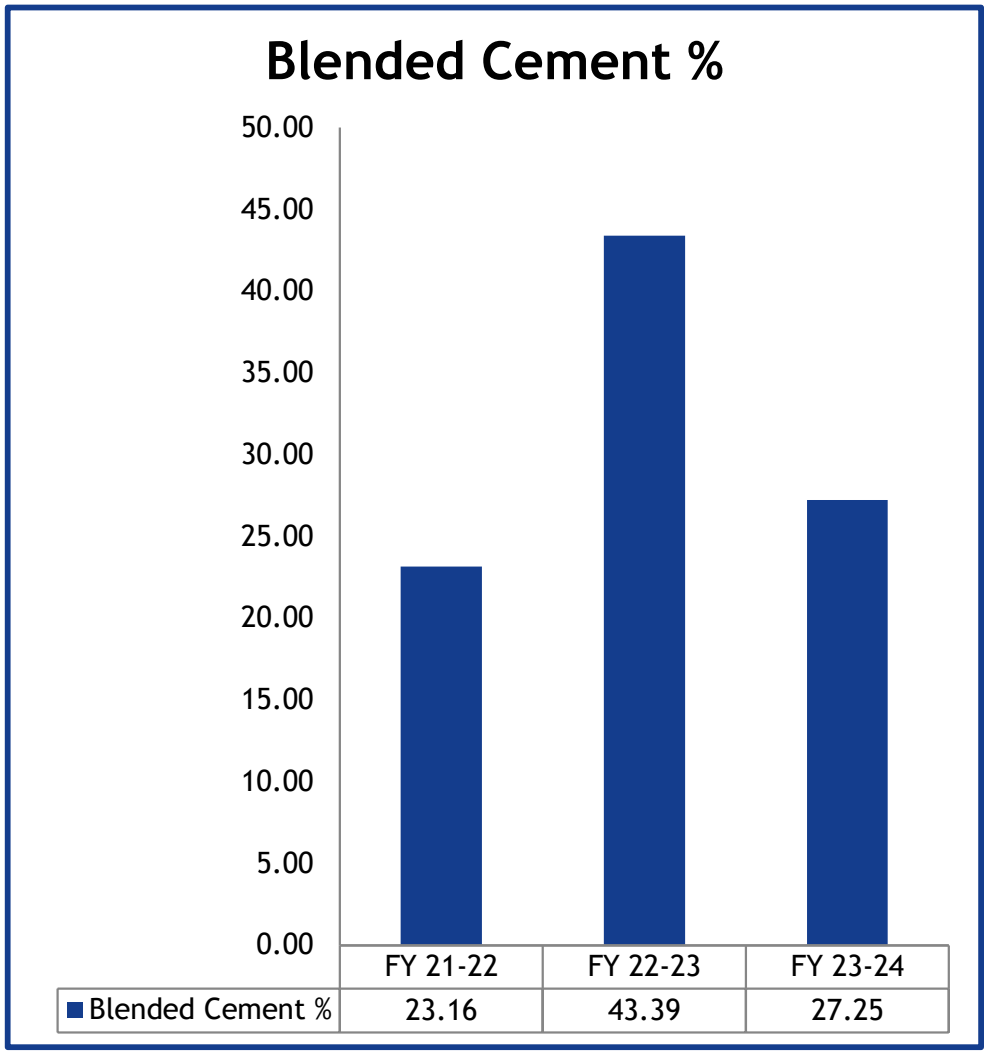
Wagon tippler
Elecon
Side discharge
25 tipple/hr

Cement Mill
Flsmidth
UMS 5X14
150 tph with 300 Blaine

Roto Packer
FLS(12RSE) & Conweigh (CWS-12RSP)
Total 4 Packer
180 TPH

# Productivity & Product MIX



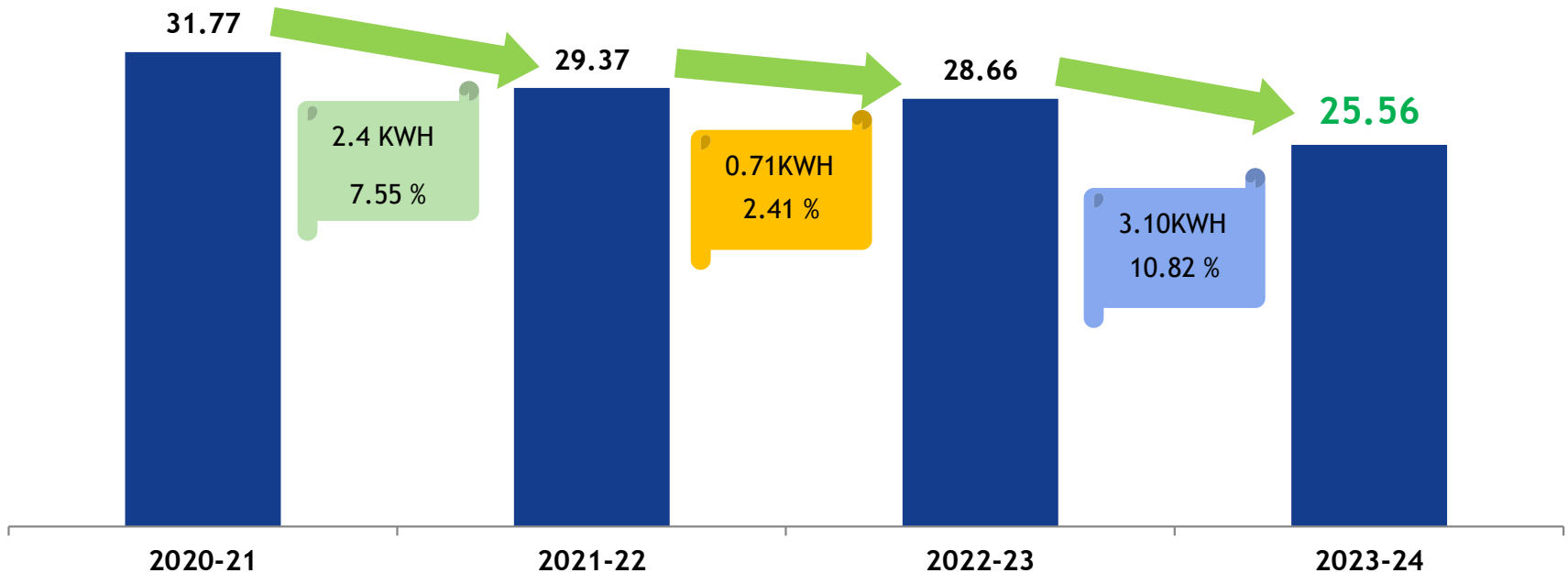
# SPC - PPC Ball mill

CII Benchmark Ball mill PPC 27.03 KWH as per Version - 6, May 2023
CCCPL-SGU : 25.56 (FY 23-24)

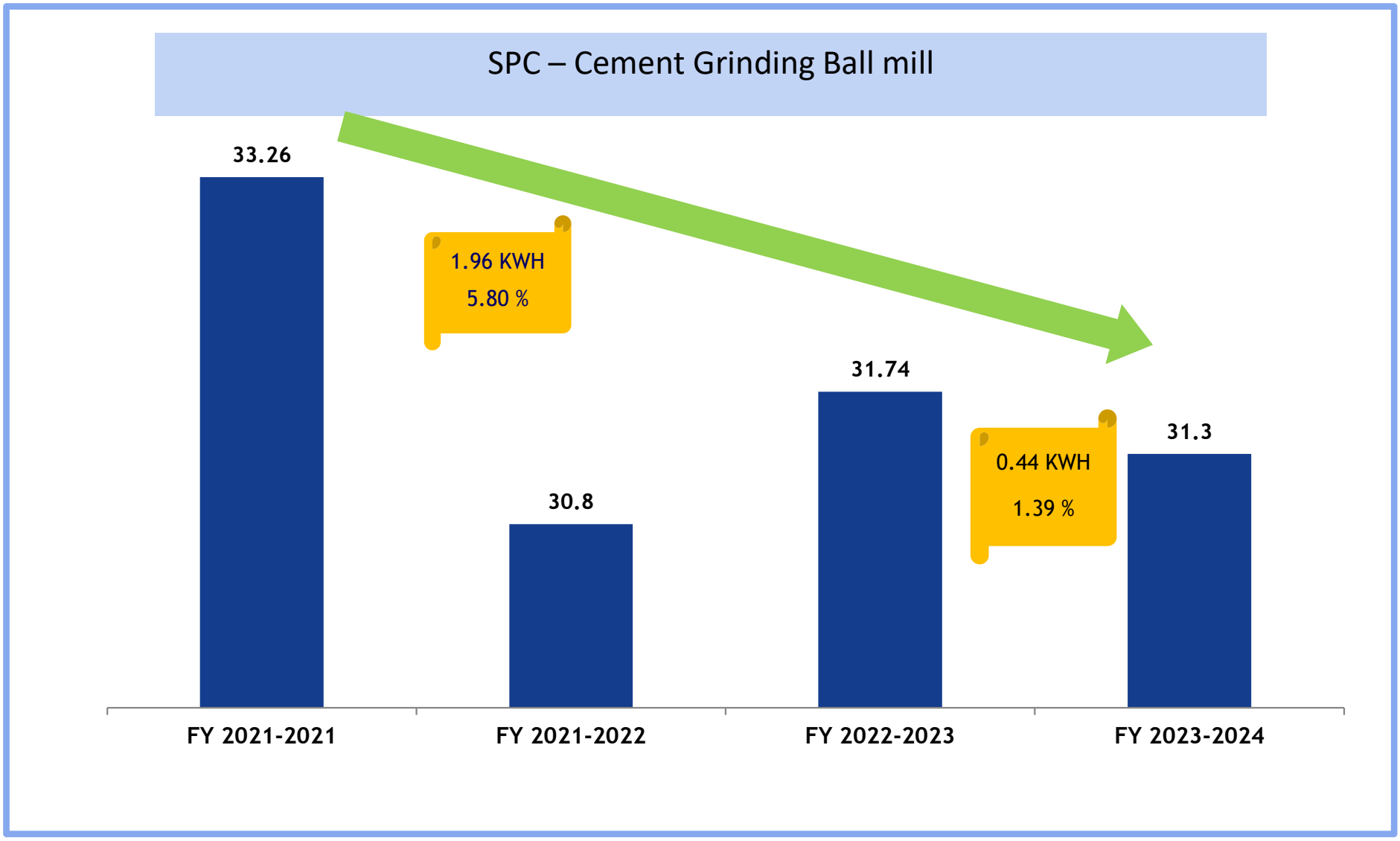
**Methodology Used:**

- Grinding media pattern optimization.
- Grinding aid usage for strength and productivity improvement.
- Scoop arrangement at diaphragm adjusted to increase the residence time inside the mill.

## Sp.Power Consumption (kw/MT in PPC



# SPC - Cement Grinding Ball mill

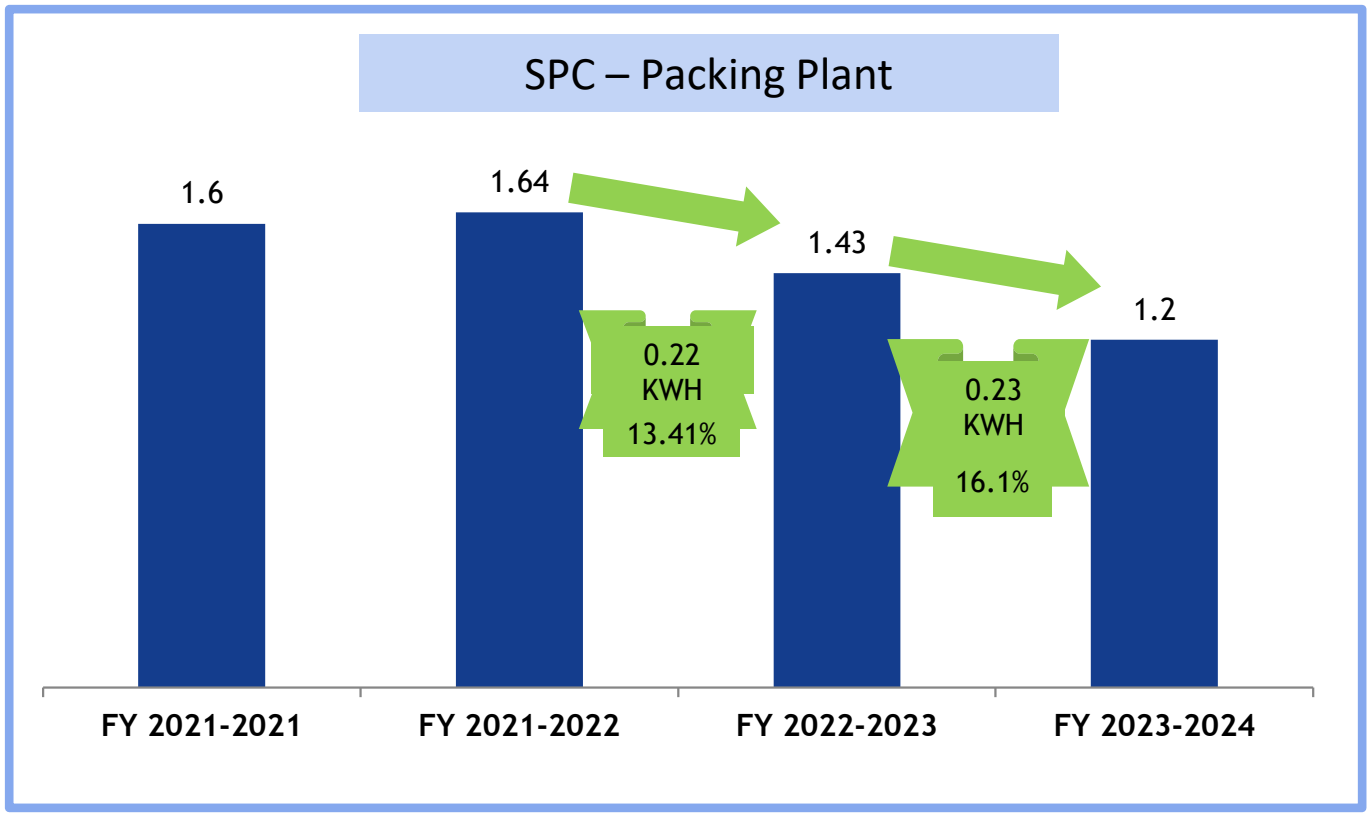


# SPC - Packing plant

**CII Benchmark packing section 0.70 KWH as per Version - 6, May 2023**
**CCCPL-SGU : 1.2 (FY 23-24)**

**Methodology Used:**

- Packer productivity increase by double discharge operation.
- VFD installed in packer Bag filter for power reduction.
- Packing plant idle running stop interlock given to packer and allied equipments like truck loading machine and Wagon loading machine.

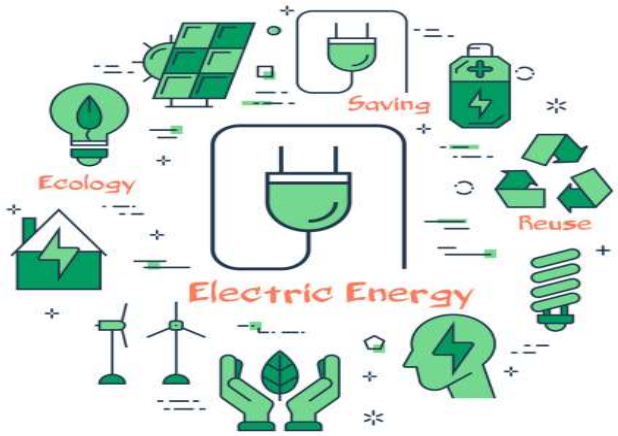



**Target 0.7 SPC in Packing FY 25-26**

# Energy Saving Projects Implemented in Previous years

E N E R G Y

| Financial Year | No of Energy saving projects | Investments (INR Million) | Electrical savings (Million kWh) | Thermal savings ( Million Kcal) | Savings (INR Million) |
|---|---|---|---|---|---|
| 2021-22 | 10 | 2.45 | 0.23 | NA | 13.23 |
| 2022-23 | 4 | 2.0 | 1.598 | NA | 11.99 |
| 2023-24 | 4 | 1.0 | 0.84 | NA | 6.80 |




# Road Map - ENCON action plan

**SHORT TERM 24-25**

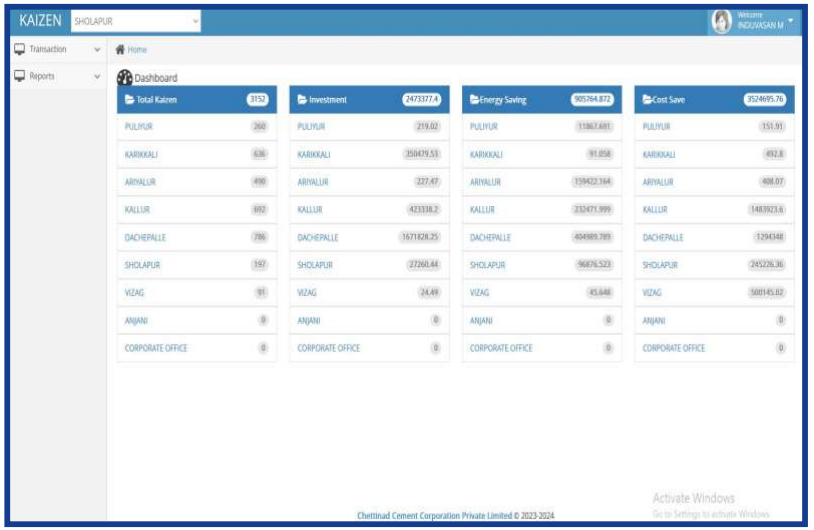
- Installation of 3MW solar plant at onsite.
- Addition of roller press with existing ball mill circuit for the TPH enhancement.
- Installation of VFD to compressor in the cement mill circuit and Bag filter fans.
- New grinding aid to be explored for the feed enhancement in OPC and reduce SPC in cement mill.

**LONG TERM FY 25, FY 26 & FY27**

- Replacement of V-Lift liners and classifying liners with the existing step and corrugated liners in the ball mill.
- Replacement of OLD AC with the Energy efficient BLDC AC .
- Up gradation of 3$^{rd}$ generation separator with 4$^{th}$ generation separator for the closed circuit ball mill.

# Encon Team & Kaizen Portal.

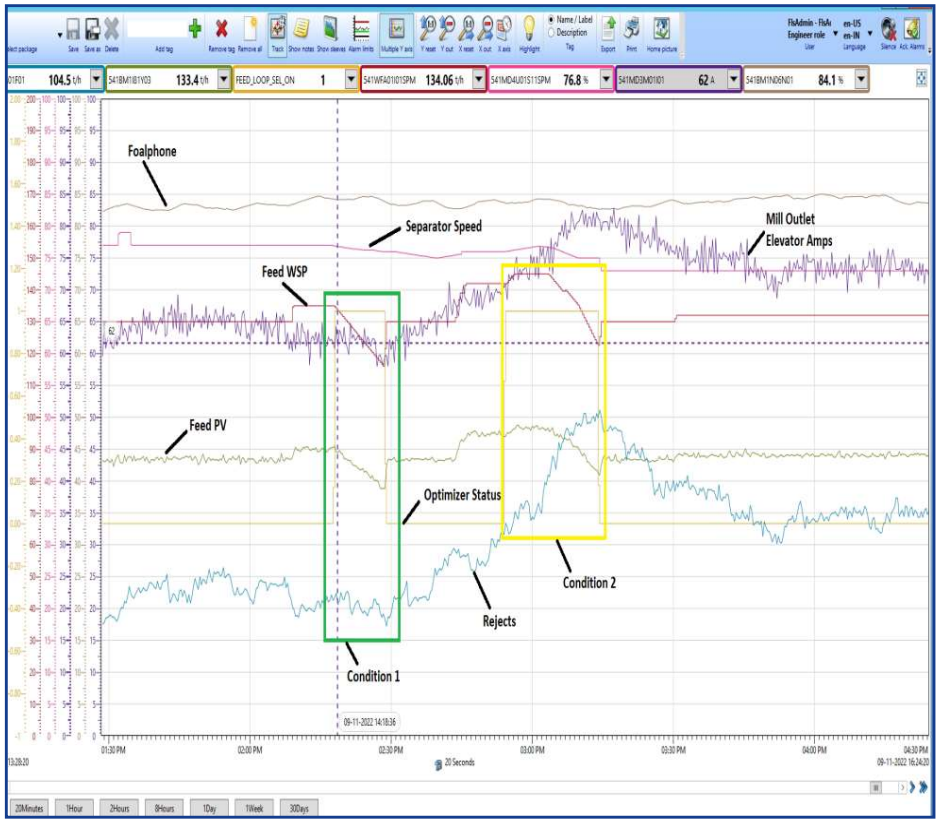
| S.No | Name | Dept - Desig |
|---|---|---|
| 1. | Mr. Sreenivasa Babu B.R. | Chairman |
| 2. | Mr. Senthil kumar | Encon-member-Quas |
| 3. | Mr. Induvasan | Encon-member-Process |
| 4. | Mr. Veerakumar | Encon-member-Mech |
| 5. | Mr. Arvind Kumar | Encon-Member-Inst |
| 6. | Mr. Nagaraj | Encon-Member-Ele |




Knowledge sharing & Brain storming session

# Smarta - Optimizer

| Product | PPC | | | | | |
|---|---|---|---|---|---|---|
| Mode | Manual | Optimizer | Manual | Optimizer | Manual (Avg) | Optmizer (Avg) |
| CM1 Run Hours | 9 | 9 | 3 | 3 | 12 | 12 |
| Total Production Totalizer | 1648 | 1670 | 495.41 | 509.8 | 1071.71 | 1089.90 |
| Total Production Optimizer | 1645.97 | 1670.82 | 495.23 | 511.2 | 1070.60 | 1091.01 |
| Average TPH | 183.5 | 185.65 | 165.08 | 170.4 | 174.29 | 178.03 |
| MD1 Power | 18304.29 | 18185.54 | 6076.01 | 6066.07 | 12190.15 | 12125.81 |
| MD2 Power | 19167.99 | 19065.92 | 6301.95 | 6275.04 | 12734.97 | 12670.48 |
| Sep Power | 233.84 | 287.48 | 104.93 | 77.05 | 169.39 | 182.27 |
| Sep Fan Power | 3447.08 | 3513.62 | 1211.53 | 1185.58 | 2329.31 | 2349.60 |
| Mill Vent Fan Power | 287.44 | 325.66 | 102.55 | 102.43 | 195.00 | 214.05 |
| Total Power Consumed | 41440.64 | 41378.22 | 13796.97 | 13706.17 | 27618.81 | 27542.20 |
| Sp.Power (Totalizer) | 25.15 | 24.78 | 27.85 | 26.89 | 26.50 | 25.83 |
| Sp.Power (Optimizer Report) | 25.18 | 24.77 | 27.86 | 26.81 | 26.52 | 25.79 |






**Smarta Optimizer (Ramco systems)**
**Guarantee in Production increment 2%**
**actual is 2.35%**
**Guarantee in the Power reduction 1.5%**
**actual is 2.75%**

# Encon Project LP compressor for FA unloading

Chettinad cement

**BEFORE**

**AFTER**




**Energy saved : 183960 kwh**

**Cost saved : 12.90 lakhs**

**ROI : 13.5 Months**

# Installation of capacitor bank in the HT lines.




Energy saved : 844800 kwh

Cost saved : 68.60 lakhs

ROI : 1.5 Months

# Summary of Encon Project last three FY

| Financial Year | Name of Energy saving project | Investments (INR Million) | Electrical savings (Million kWh) | Thermal savings ( Million Kcal) | Savings (INR Million) |
|---|---|---|---|---|---|
| 2021-22 | Substitution of 160 KW with LP 75 KW compressor for DFA unloading | 1.45 | 1.83 | NA | 1.29 |
| 2022-23 | Smarta Optimizer | 1.90 | 14.52 | NA | 10.89 |
| 2022-23 | Replacement of sodium vapor light with LED lights | 1.25 | 1.46 | NA | 1.095 |
| 2023-24 | Capacitor bank installation in HT liner for power factor improvement 0.96 to Unity | 0.5 | 8.45 | NA | 6.86 |

# ENCON Project at SGU

| S.No | Description | Saving | |
|---|---|---|---|
| | | KWH | Rs in Lacs |
| 1. | Substitution of 160 KW with 75 KW compressor for fly ash unloading LP compressor. | 183960 | 12.29 |
| 2. | Separator fan power vs. fan rpm PID loop provided | 132000 | 9.9 |
| 3. | Avoiding No Load losses in Dist. Transformer | 43624 | 3.30 |
| 4. | Compressor air dryer circuit modification to avoid idle running. | 1606 | 0.12 |
| 5. | Line-1 PNV system hardware interlock provided avoid idle running | 23500 | 1.65 |
| 6. | Hardware interlock for FA unloading compressor with proxy sensing to avoid idle running | 25550 | 1.78 |
| 7. | Installation of VFD in the Cement silo top bag filter fans. | 2190 | 0.16 |
| 8. | Replacement of HPVC with LED light | 30600 | 2.30 |
| 9. | Nature switch provided for the light circuit | 500 | 0.06 |
| 10. | Installation of VFD in the packing plant bag filter fans | 3030 | 0.23 |

# ENCON Project at SGU

| S.No | Description | Saving | |
|---|---|---|---|
| | | KWH | Rs in Lacs |
| 11 | 553FN2 and 553FN3 air slide two fan isolated (each 7.5 Kw savings) | 79200 | 5.94 |
| 12 | 531BF3 bag filter fan and RAL to be isolated from group.( 11 Kw Fan & 0.37 Kw RAL) | 29040 | 2.17 |
| 13 | Packer 1 & 2 discharge bag cleaning one blower isolated (15KW each ) | 118800 | 8.91 |
| 14 | Line 2 Hopper building lighting can be operate by Natural Switch | 500 | 0.06 |
| 15 | Gypsum transport group Idle running to be taken in loop | 3300 | 0.26 |
| 16 | Line 2 MCC room P&V system hook up with Auto operation | 17500 | 1.40 |
| 17. | 551RA3 RAL replaced with double flap chute to avoid frequent jam and power saving, we can remove 0.37Kw geared motor . | 2442 | 0.19 |
| 18. | silo 1 Air slide additional fan isolation and trial to be taken 7.5Kw savings. | 49500 | 3.96 |

# Renewable Energy Utilization- Onsite

| YEAR | SOLAR Generation Million kwh | Installed capacity | % of Overall Electrical consumption |
|---|---|---|---|
| FY 21-22 | 27.98 | 3 MW | 6.4 |
| FY 22-23 | 52.15 | 3 MW | 9.29 |
| FY 23-24 | 53.41 | 3 MW | 8.65 |

**Energy Generated : 13355010 kwh**

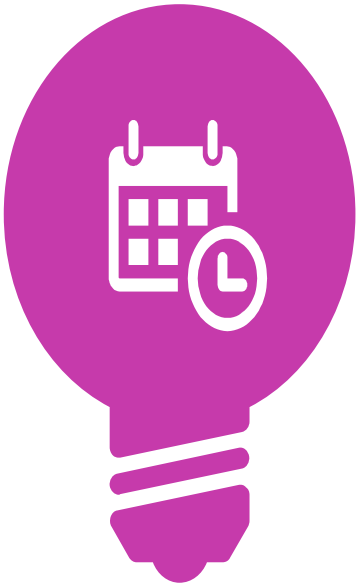
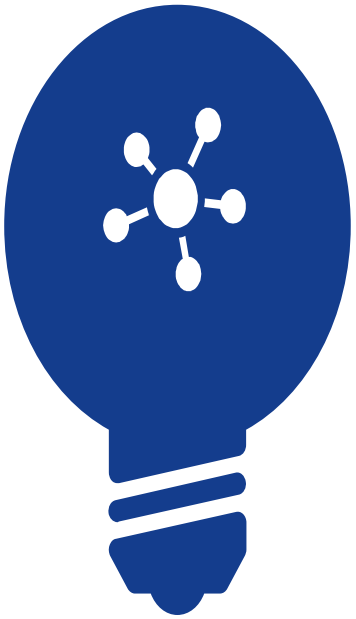
**Cost saved : 643.71 lakhs**

**ROI : 5.0 Years**

**Date of Commissioning : 28.08.2022**

# Renewable Energy Road map-onsite

Chettinad cement

| FY 21-22 | FY 22-23 | FY 23-24 | FY 24-25 |
|---|---|---|---|
|  |  |  |  |
| 6.9% | 9.29% | 8.65% | 16% |
| Solar Generation 2798402 Kwh | Solar Generation 5215506 KWH | Solar Generation 5341102 KWH | Target RE 750000 KWH |

# Renewable Energy Project- Onsite

**Additional 3MW RE Solar project is in progress to reduce the usage of conventional power and CO2 emission.**
**Expected to commission by 20th Sep-2024.**

# Green supply chain Management.

| Material Description | Units | FY 21-22 | FY 22-23 | FY 23-24 |
|---|---|---|---|---|
| Chemical Gypsum | MT | 44940.71 | 28923.99 | 22541.52 |
| Fly ash | MT | 100069.3 | 162594.2 | 197883.6 |
| Total recycled Materials | MT | 145010 | 191518.1 | 220425.1 |
| Cement Production | MT | 1227664 | 1189651 | 1908110 |
| Total recycled Materials | % | 11.81 | 16.10 | 11.55 |

- Installation of additional 3MW solar plant at onsite.
- Increase Plantation in plant premises.
- Increasing the PPC volume ratio from 25 % to 50%
- Reducing the clinker to cement ratio
- Implementation of identified energy conservation Project.
- Gypsum truck from Mumbai is sent back with cement bags.
- Increase the usage of solar energy instead of conventional energy.
- Planning to purchase EV vehicle for internal plant use and encouraging the EV vehicle for the company related our sourcing.

# Green belt development by Mass plantation.

# Learning from CII

- Our company has implemented a number of energy-saving initiatives that are copies of CII's knowledge-sharing activities, our group audit report and programs from CII.
- The Confederation of Indian Industry (CII) is working toward and creating awareness towards the greener India and Zero CO2/GHG emission
- On the journey toward the Encon- CII is good companion to Industrial sector in India.
- Energy excellence award is the good platform to recognize and learning platform for the other industry to implement or replicate the idea's learned from the program.



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