

# CII National Award for Excellence in Energy Management 2024

**Dalmia Cement (Bharat) Limited, Dalmiapuram  
Tiruchirappalli, Tamil Nadu**

**Dalmia Cement**

**Congratulations CII on  
their Silver Jubilee..**

**25<sup>th</sup> Anniversary**



**L. Bobby Pravin**  
**GM- IED, Env & PH**



**D. Kumaresan**  
**GM- E& I**



**P. Balaji**  
**AGM- Production**

**1. Brief Introduction on Company / Unit**

**2. Energy Consumption Overview and Specific Energy Consumption in last 3 years**

**3. Information on Competitors, National & Global Benchmark**

**4. Energy Saving Projects implemented for last 3 years**

**5. Innovative Projects implemented**

**6. Utilization of Renewable Energy Sources**

**7. Utilization of Waste material as fuel**

**8. GHG Inventorization**

**9. EMS System and Other Requirements**

**10. Net Zero Commitment**

**11. Awards & Team Involvement**

# 1. Company Profile

## Cement Business 16 units

### East - 6 Plants

- Orissa – RGP
- Orissa – Kapilas
- Bengal – Medinipur
- Jharkhand – Bokaro
- Bihar – Banjari
- WB – Siliguri

### North East – 4 Plants

- Assam – 3 Plants
  - Lanka,
  - Umrongso
  - Jagi Road
- Meghalaya

### South 5 Plant

- Dalmiapuram
- Ariyalur
- Kadapa
- Belgaum
- Sattur
- West - 1 - Chandrapur



Cement

Power & Energy

Sugar

## Other Businesses

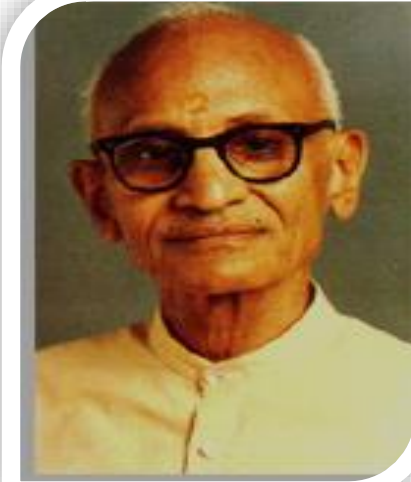
### Sugar Units (5)

- Ramgarh (UP)
- Nigohi (UP)
- Jawaharpur (UP)
- Kolapur (MH)
- Sangli (MH)

### Wind Farm

- Kanyakumari

**In 1935**



**Shri. Jaidayal  
Dalmia –  
Founder**

**In 2024**



**Shri. Puneet  
Dalmia –  
M.D & CEO**

# Dalmia Cement Dalmiapuram – An 85 Years Young Plant

Capacity	Clinker	3.23 MTPA
	Cement	5.0 MTPA
	CPP	27 + 23 MW
Product	Cement	12 Varieties
	Others Solar Power	5MW
By Product	WHRS	7 MW



DPM Green Fuel TSR annual average achieved 27% in FY 2023

Only plant in the world making 12 varieties & operating 8 management systems

DPM is 6.7 times water positive

100% renewable power under fossil free electricity initiative – 2030

First Cement Company to Join RE-100

EV 100 – Significant Electrical Vehicles Transition by 2030

Double energy productivity - 2030 (EP 100)

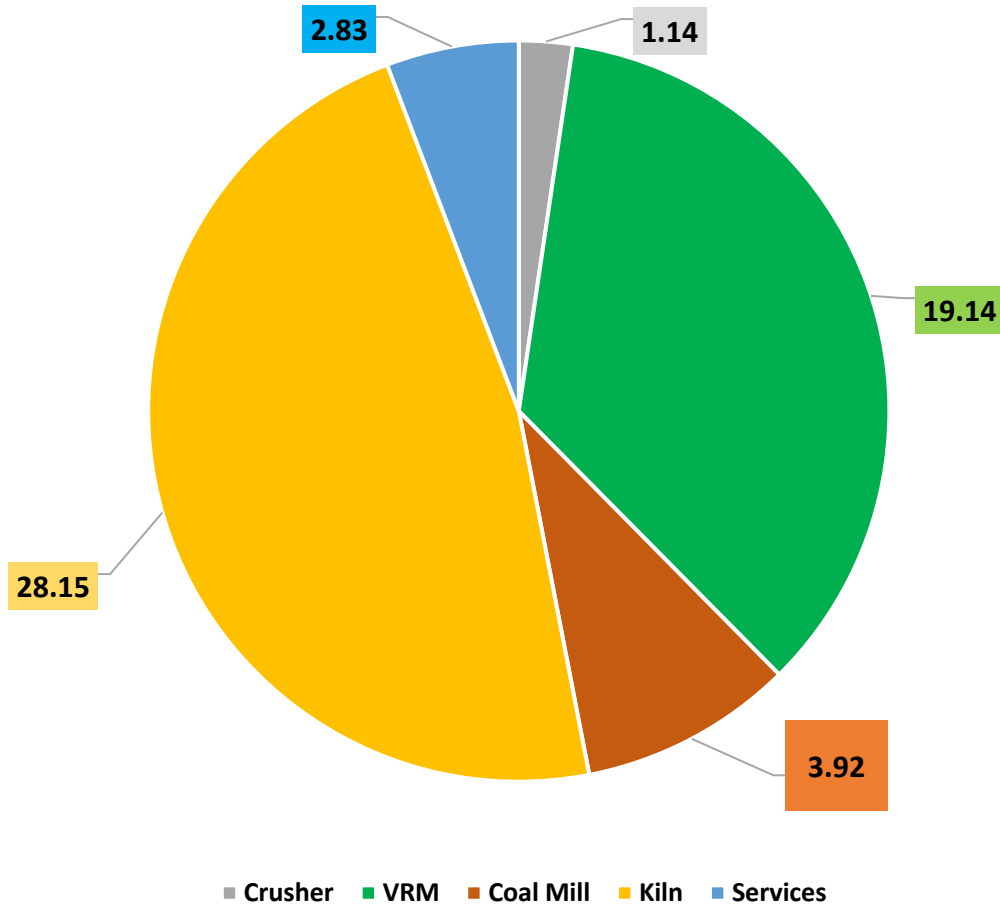
Carbon Negative Cement Group 2040

## B. Specifications of major sections

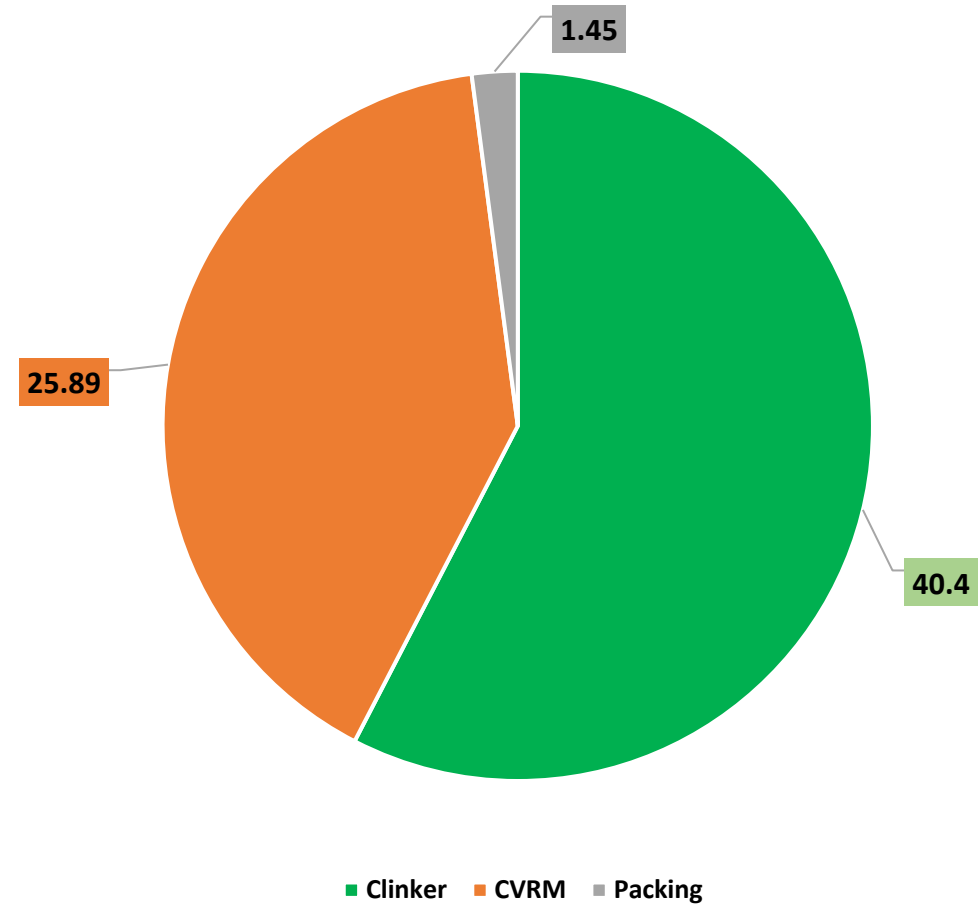
Equipment Name	Make	Rated Capacity
<b>LINE 1</b>		
Raw Mill	Loesche LM 30.31	190 TPH
Coal (Ball) Mill	KHD	22 TPH – Coal , 12 TPH – Petcoke
KILN	KHD (3.8 M D * 56 M L)	3250 TPD <b>upgraded to 3800 TPD</b>
Cement Vertical Roller Mill	Loesche LM 46.2 + 2	160 TPH
<b>LINE 2</b>		
Raw Mill	Loesche LM 30.31	320 TPH
Coal Mill	Loesche LM 46.4	33 TPH - Coal , 20 TPH - Petcoke
KILN	FLS (3.95 M D * 62.1 M L)	3800 TPD <b>upgraded to 4950 TPD</b>
Cement Vertical Roller Mill	Loesche LM 56.3 + 3	320 TPH

# 2. Energy Consumption Overview - FY 23-24

Up to Clinkerisation (KWH/MT)



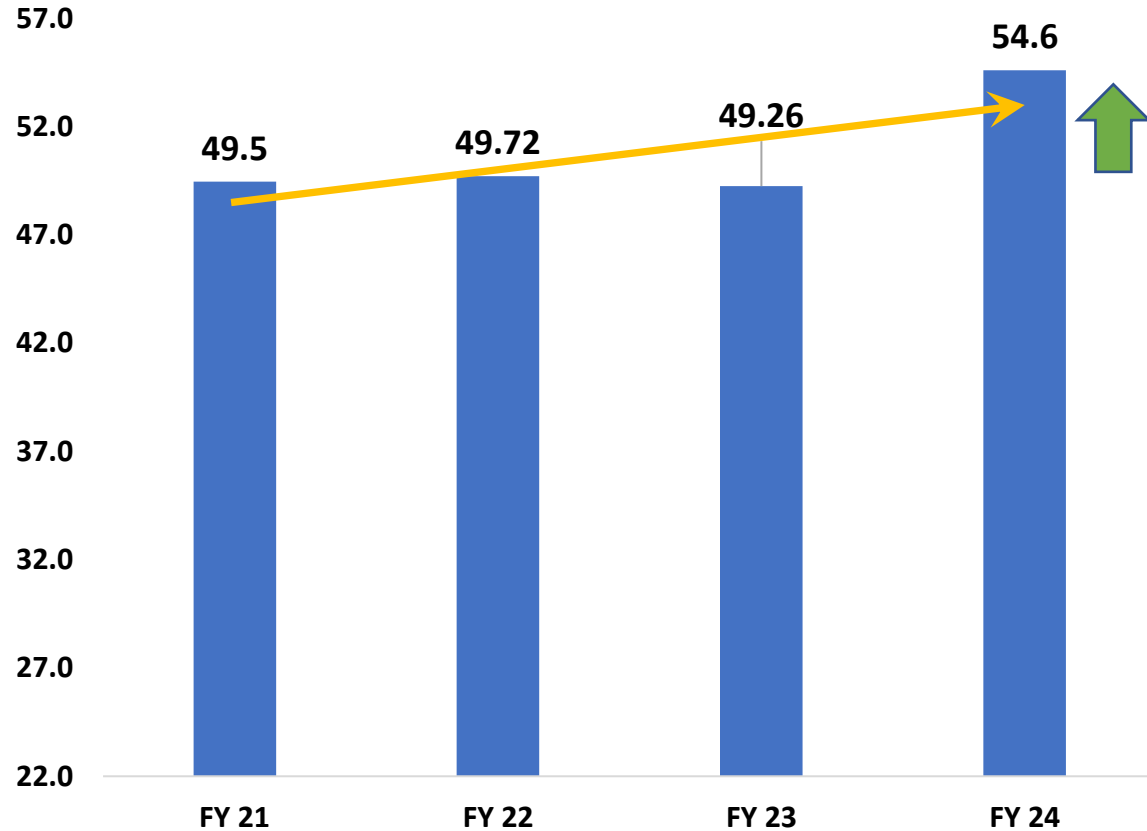
Up to Cement (KWH/MT)





## 2. Specific Energy Consumption in last 4 years (Upto Clinkerisation)

Up to Clinkerisation (KWH/MT)

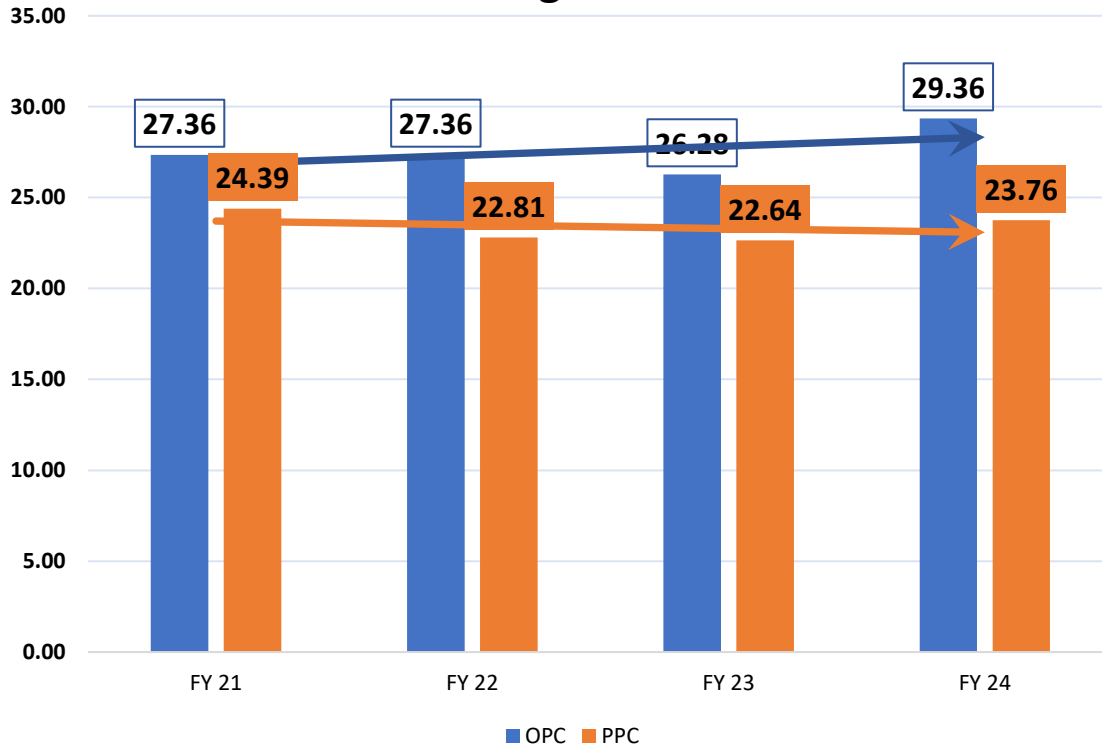


Section	UOM	FY 21	FY 22	FY 23	FY 24
Crusher	KWH/MT Matl	0.84	0.85	0.8	0.79
Raw Mill	KWH/MT Matl	11.2	11.2	11.3	12.5
Coal Mill	KWH/MT Matl	55.5	58.2	51.4	49.9
Kiln	KWH/MT Clinker	23.1	23	22.9	27.9
Clinker	KWH/MT Clinker	46.5	46.7	46.4	51.7
Services	KWH/MT Clinker	3	3.1	2.8	2.83
Total Clinker	KWH/MT Clinker	49.5	49.7	49.3	54.6

- ✓ PH , RABH fan power increased after increasing TSR from 20 % to 35%
- ✓ AFR preprocessing unit and CBS contributes 2 kWH/MT clinker

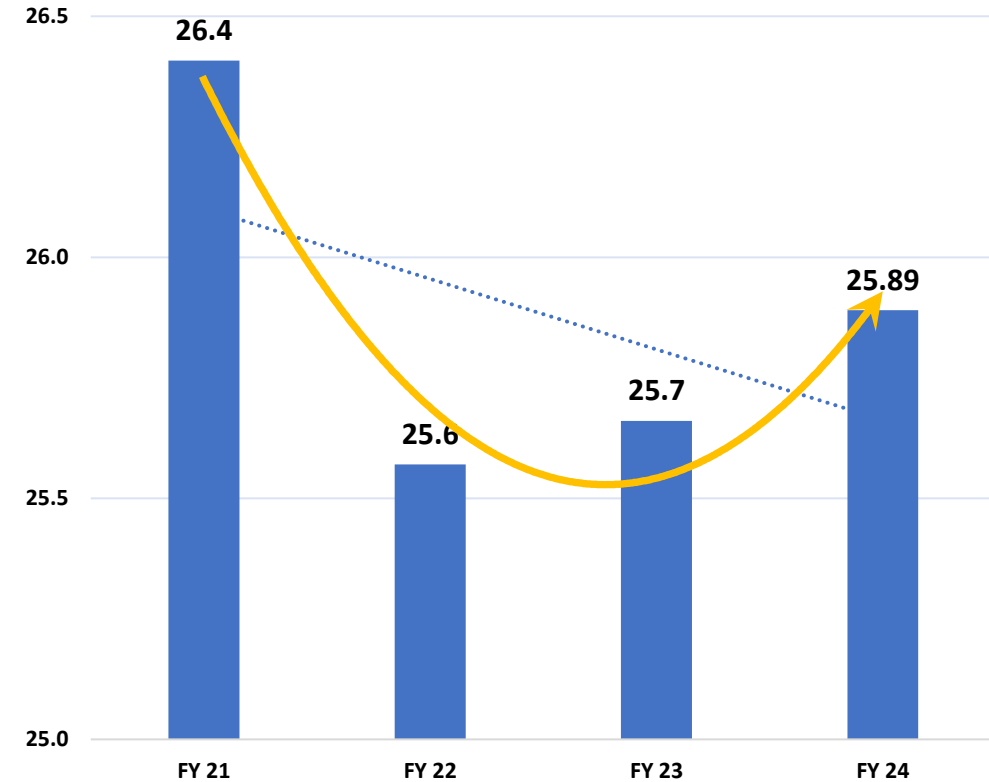
## 2. Specific Energy Consumption in last 4 years (Cement Grinding)

### Cement Grinding OPC vs PPC (KWH/MT)



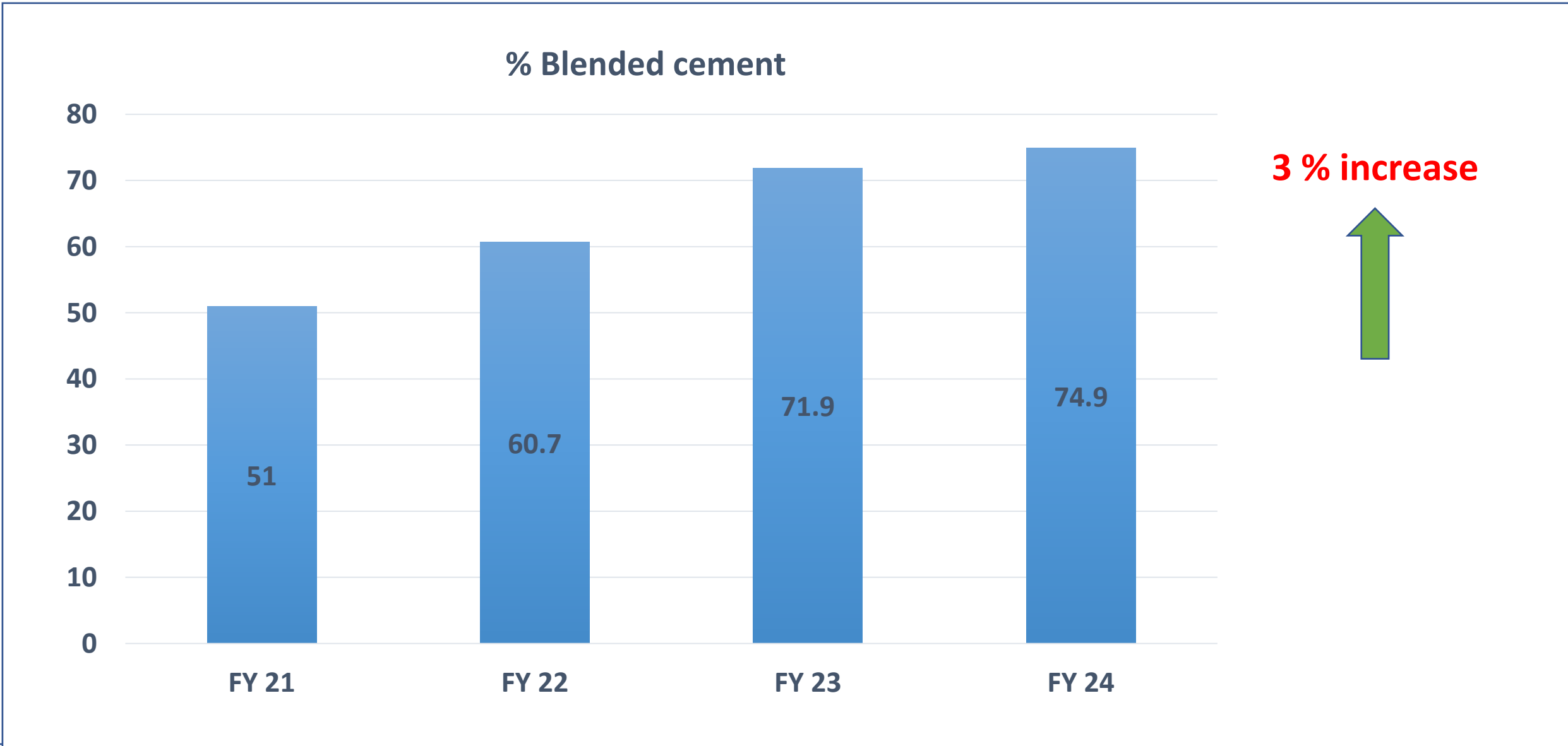
- ✓ Clinker grindability increased (from 13.5 to 15.5) due to more fine fraction causes increase in grinding power
- ✓ Grinding aid addition to improve the grindability & mill performance

### Overall Cement Grinding (KWH/MT)



- ✓ Premium PPC % increased from 19 % to 22 % in overall cement grinding

# Blended Cement %



### 3. Information on Competitors, National & Global Benchmark

#### Energy Bench Marking

Sl. No.	Section	
<b>A</b>	<b>Electrical Power Consumption</b>	
1	LS CRUSHER (Kwh/MT of Limestone)	0.57
2	RAW MILL (Kwh/MT of Rawmeal)	10.80
3	COALMILL (Kwh/MT of Coal)	27.60
4	KILN (Kwh/MT of Clinker)	15.50
5	SPC Upto Clinkerisation (Kwh/MT of Clinker) with Shutdown Power	42.6
6	PACKING PLANT (Kwh/MT of Cement)	0.70
<b>B</b>	<b>Fuel Consumption ( Kcal/Kg of Clinker)</b>	683

#### Energy Bench Marking

Parameters ( 23-24 )	Electrical SEC (kWh / T of Cement )	Thermal SEC (kcal / kg of Clinker)
<b>Comparison of specific energy consumption (SEC)</b>		
SEC : Dalmia Dalmiapuram	54.6	791
SEC Values for Competitor - 1	56.1	675
SEC Values for Competitor - 2	60.8	682
SEC Values for Competitor - 3	61.4	683
National Benchmark for SEC :	56.1	683
International Benchmark for SEC :	62.0	660

# Road Map for FY 25

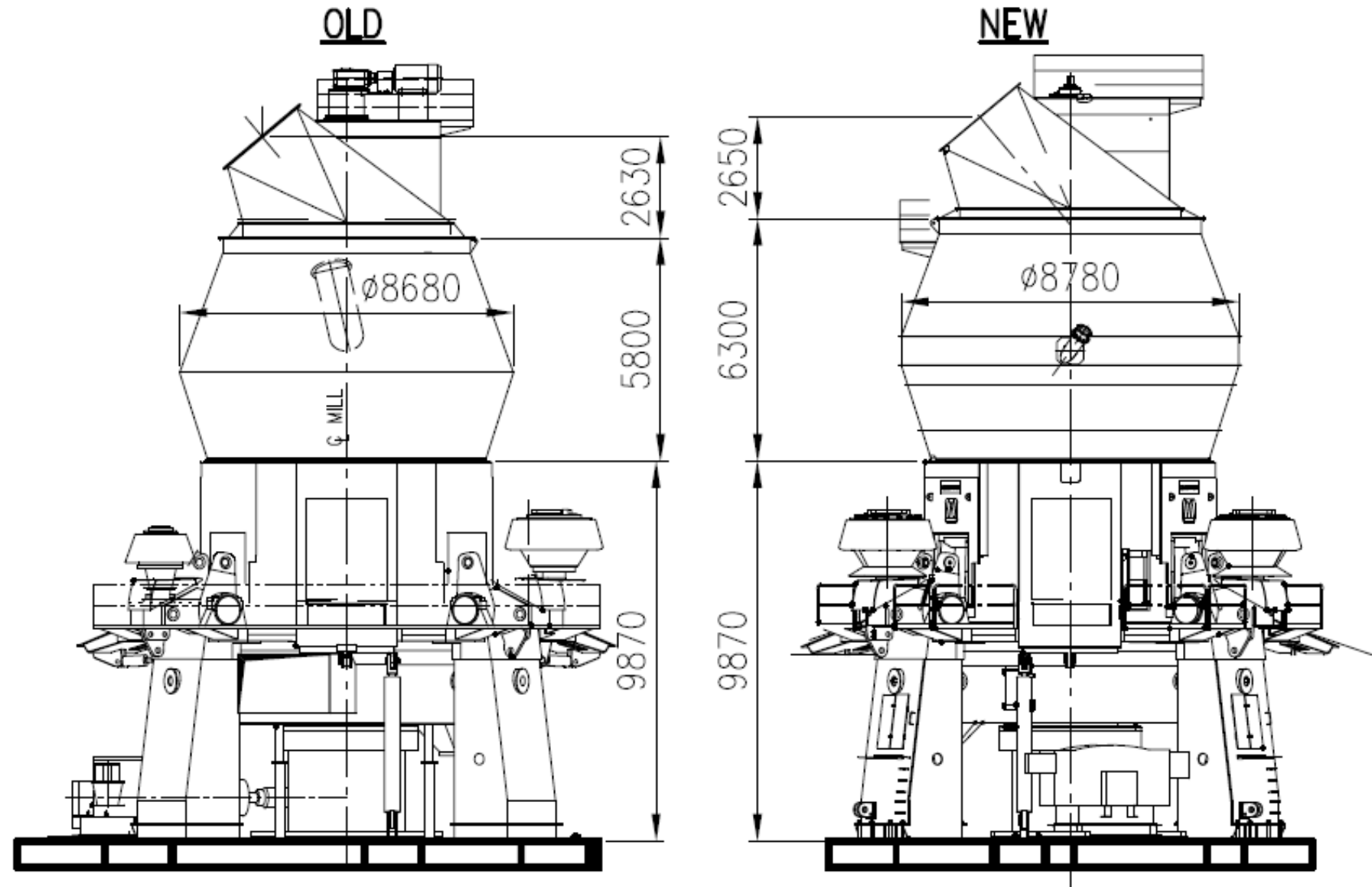
Sl. No	Title of Project	Year	Saving Kwh/T of Clinker	Annual Electrical Saving (kWh)	Annual Electrical Saving (Million kWh)	Investment (Rs. In Lacs)	Investment (Rs. In Million )	Annual Thermal Saving (Million kcal)
1	Replacement of CVRM-1 mill fan with high efficiency	24-25	-	698400	0.7	155	15.5	-
2	Installation of Fine shredder for Line-2	24-25	-	-	-	3180	318	13242
3	High efficiency compressor for Line-1 Pyro	24-25	-	300960	0.3	640	6.4	-
4	Procurement of existing LP compressor in line-I DFA applications.	24-25	-	367200	0.37	40	4	-
5	Procurement of Trommel & Air density separator for Line-II AFR Applications.	24-25	-	-	-	80	8	8277
6	Replacement Of AQC Boiler PSH With High Grade MOC	24-25	-	1731.5	0.00173	104	10.4	-

# 4. Energy Saving Projects implemented for 2023-24

## LIST OF ENCON PROJECTS MEASURES IN 2023 – 2024

S. No	Year	Title of Project	Investment Made (Rs Million)	Annual Electrical Saving (MillionkWh)	Annual Thermal Saving M kcal	Total Annual Savings (Rs Million)	Impact on SEC/ SHC (Electrical kWh /MT cement or Kcal/Kg cement)
1	2023-24	Upgradation of latest generation classifier CVRM 2	269.50	0.31	-	2.0	1.5 kWh/MT cement
2	2023-24	Line-1 cooler upgradation	120.00	0.35	34907	69.4	50 Kcal/Kg cement
3	2023-24	Line-1 Top stage cyclone modification	400.00	-	4363	8.4	6 Kcal/kg cement
4	2023-24	Line-1 Precalciner height increase	360.00	-	2618	5.0	6 Kcal/kg cement
5	2023-24	Increase no. of Bags in Line 1 Bag house to reduce DP	2.00	2.13	-	13.7	3.0 kWh/MT cement
6	2023-24	WHRS in Line-1 Kiln (AQC boiler)	438.50	18.8376	16200.34	146	-
7	2023-24	Reduce Bag House DP of CVRM 2 Bag house	4.45	0.18	-	1	-
			<b>1594</b>	<b>22</b>	<b>58088</b>	<b>246</b>	-

# 4.1 Upgradation of CVRM-2 Classifier



## 4.2 Increase no. of bags in VRM II baghouse to reduce DP

### Upgraded System :-

1. Total Filtration area increased from 9690m<sup>2</sup> to 12274m<sup>2</sup>
2. Air Volume increased from 550000m<sup>3</sup>/hr to 680000 m<sup>3</sup>/hr with in existing casing
3. Bag House pressure drop reduced from 180 mmWC to 80 mmWC by increased the casing height.
4. Bag house fan power reduced from 5.5 kWh/MT clinker to 3.0 kWh/MT clinker.

**Power  
Savings 2.5  
kWh/MT**







## Challenges:

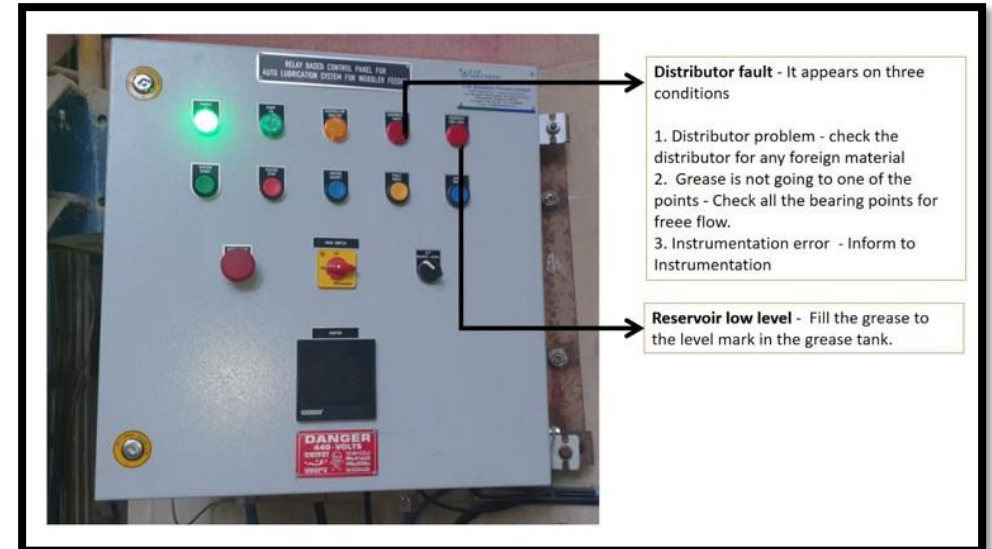
- Wobbler shaft bearing shaft replacement due to teeth failure

## Upgradation:

- Lubrication system made by installing inhouse forced lubrication system in automatic at regular interval

## Benefit:

- ❖ Apron feed reduction to avoid wobbler shaft loading avoided
- ❖ Crusher output increased the capacity.
- ❖ Crusher Down time reduced on account of wobble shaft bearing failure.



## 5. Innovative Project 3 - Significance Achievement-Chlorine Bypass System

### Existing:

- ❖ TSR not able to increase above 25 %
- ❖ Clinker Cl above 0.07 %

### Challenge:

- Disposal of Chlorine by pass dust
- Higher Specific Heat consumption

### Action Taken:

- ✓ By pass system designed with 15 %
- ✓ Dust disposal circuit back to system no external handling

### Result:

- ❖ AFR increased upto 40 %
- ❖ SPC increased by 0.5 kWh/Mt clinker



# 6. Utilization of Renewable Energy Sources

## Wind Mill

➤ First Cement Plant in Tamil Nadu. Location and Capacities are as mentioned as below:

**Site-I** : In Muppandal, Kanyakumari District with **Capacity : 11.5 MW**

**Site-II** : In Karungulam Village at Tirunelveli District with **Capacity : 5.025 MW**



### OFF-SITE

S. No.	Year	Source	Installed Capacity (MW)	Capacity addition after FY 2021	Total Generation (Million kWh)	Share % w.r.t to overall energy consumption
1	FY 2021-22	Wind	16.5	-	21.49	14.7%
2	FY 2022-23	Wind	16.5	-	24.34	16.7%
3	FY 2023-24	Wind	16.5	Including Import from Third party	31.60	13.4%

## 6. Utilization of Renewable Energy Sources

ON-SITE						
S. No.	Year	Source	Installed Capacity (MW)	Capacity addition after FY 2021	Total Generation (Million kWh)	Share % w.r.t to overall energy consumption
1	FY 2021-22	Solar	-	-	-	-
2	FY 2022-23	Solar	5	5	3.25	1.55%
3	FY 2023-24	Solar	5	-	7.95	3.38%



**Solar Power Plant  
Installed with a  
capacity of 5MW at a  
Cost of Rs. 42.5 Crores**

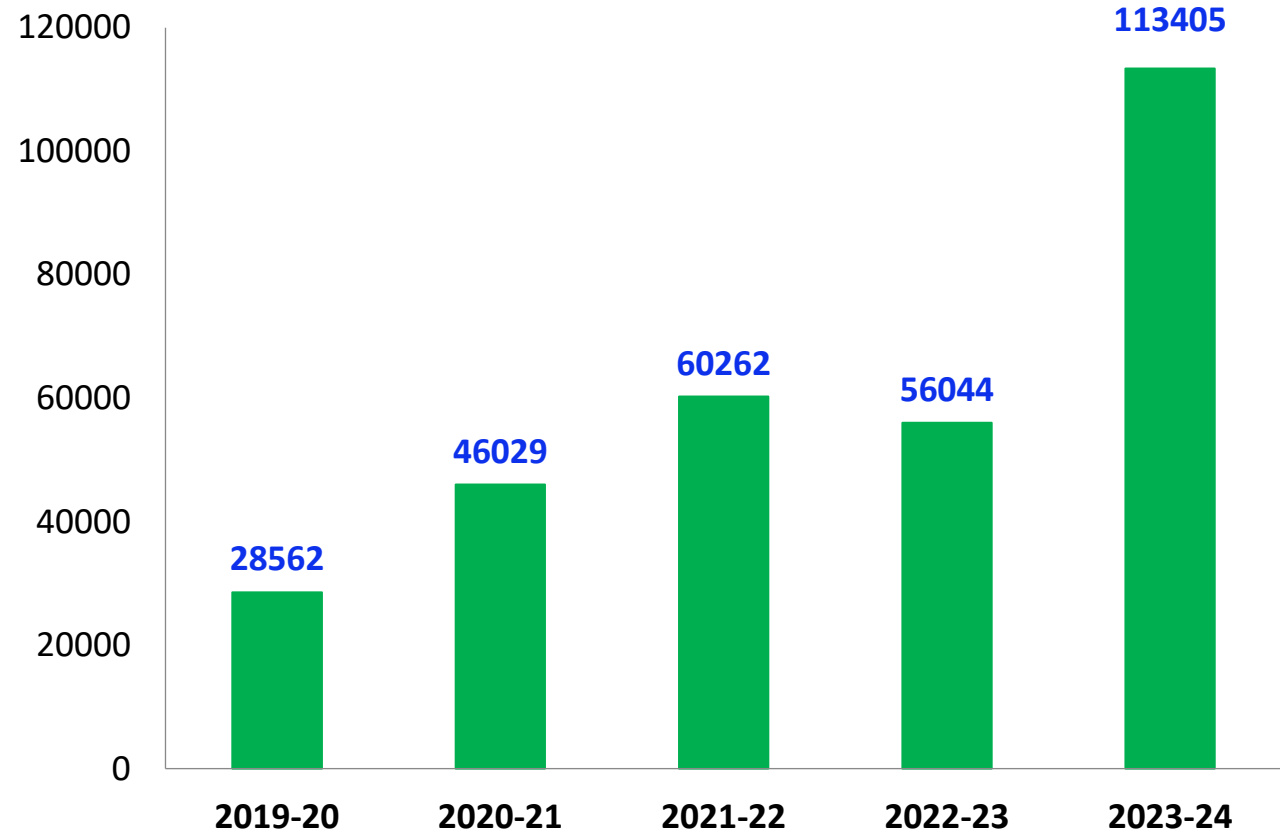
## 7. Waste Utilization and Management

Sl. No.	Year FY (2022-24)	Waste as Fuel	Quantity (MT)	GCV (kcal/kg)	Waste as Percentage of total fuel (TSR%)
1	2021-22	Plastic Waste, RDF, Foot wear waste, Spent wash, Carbon Black, CPP Ash, Cotton waste and Waste Mix	60319	4205.3	20%
2	2022-23	Plastic Waste, RDF, Foot wear waste, Spent wash, Carbon Black, Cotton waste and Waste Mix	56045	5671.1	17%
3	2023-24	Plastic Waste, RDF, Foot wear waste, FRP Waste, Bio Mass, Cotton waste, Grinding Sludge and Waste Mix	113336	3191.4	27%

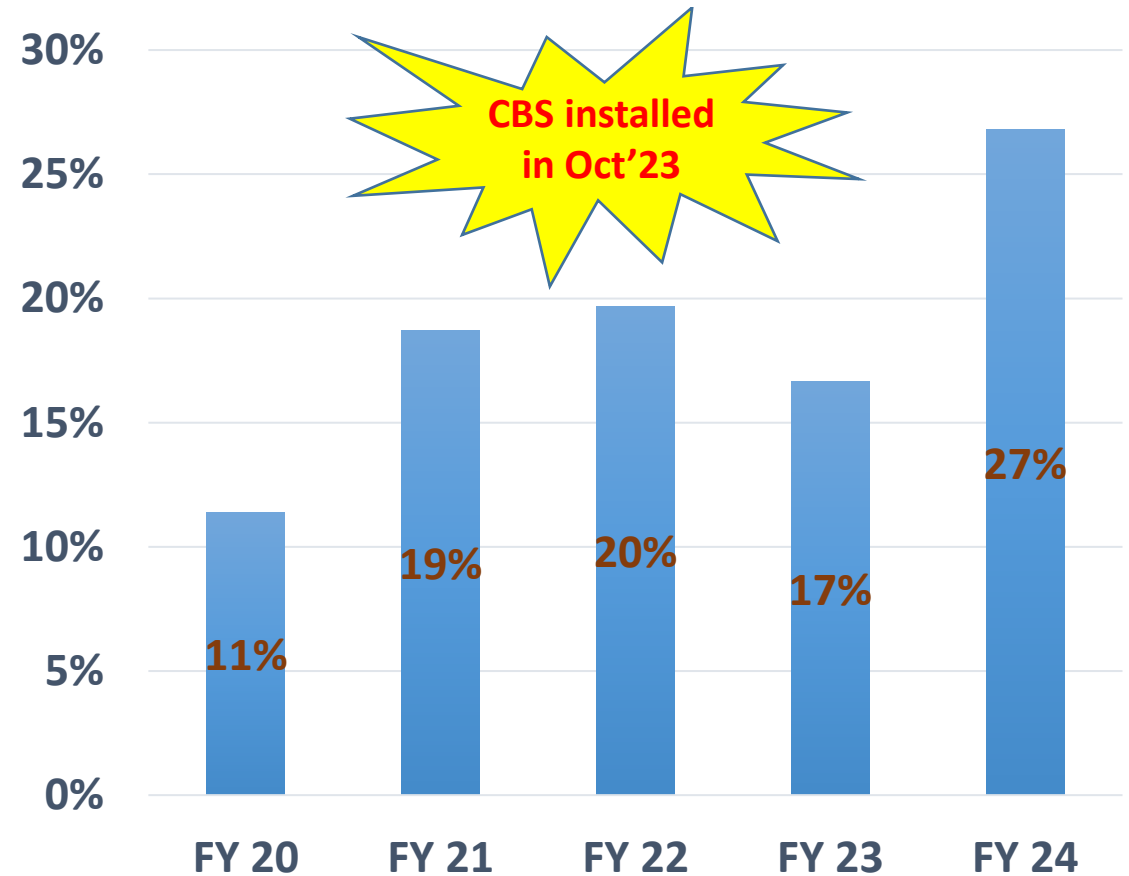
Sl. No.	Year FY (2022-24)	Waste as Raw Material	Quantity (MT)	Replaced Material	Waste as Percentage of Raw Material
1	2021-22	ETP Lime Sludge	8128	Lime Stone	0.15%
2	2022-23	ETP Lime Sludge	13431	Lime Stone	0.22%
3	2023-24	ETP Lime Sludge	17720	Lime Stone	0.29%

## 7. Waste Utilization and TSR % Year Wise

### Waste Utilization in MT



### TSR %



**Reduction of TSR in FY 23 due to Kiln stopped for 40 days project work and stabilization**

## 7. Waste Utilization – WHRS Installation

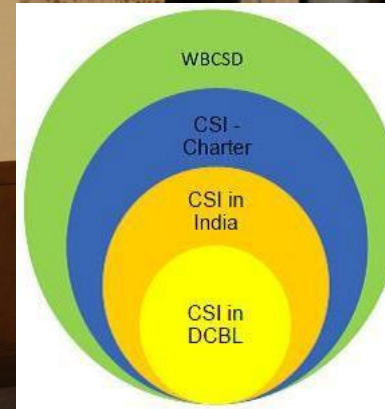


### ON-SITE

S.NO	Year	Source	Installed Capacity (MW)	Capacity addition after FY 2021	Total Generation (Million kWh)	Share % w.r.t to overall energy consumption
1	FY 2021-22	WHRs	-	-	-	-
2	FY 2022-23	WHRs	6	6	2.84	1.35%
3	FY 2023-24	WHRs	6	-	29.6	12.57%



## MD Signing the new Charter at Seoul , Oct 2012



## Partnership with IFC and CII



Our Group Advisor (Cement) Shri.Mahendra Singhi represented India at the Highlevel signing ceremony of Paris Agreement on Climate Change.

# 9. EMS System and Other Requirements

Management Overview

Data Last Refreshed On: Sep 9, 2024, 9:41:20 AM

### Dalmia Cement Plant Overview - South & North-East Region

Grid of process flow diagrams for various units: HSP, DPM-L1, DPM-L2, ARV-L1, BDM, MGH, Lanka CMI 1, Lanka CMI 2, GDM, CALCOM, MCW.

Kavach My Safety

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### Safety Observation & Inspection

Category Wise Observation

- Tools & Equipment: 11.0%
- House Keeping: 12.8%
- Position of People: 4.8%
- Standard & Procedure: 29.7%
- PPEs: 38.4%
- Reaction of People: 3.3%

Legend: All Inspection, All Observation, Closed Inspection, Closed Observation, Open Inspection, Open Observation

INFINITE UPTIME MONITORING

Area Name: Pyro 1

Equipment: Cooler Vent Fan | Asset: Cooler vent fan\_MOTOR | Measurement Location: Cooler Vent fan MNDE

### Trend History

Graph showing Horizontal Velocity, Axial Velocity, and Vertical Velocity over time.

### ML Status History

Operational, Warning, Disconnected, Sensor Fault

Realtime Data Stream and Frequency Spectrum Visualization

Dalmia Cement Dalmiapuram Plant

### DMP L1 Process KPI Dashboard

Section	Status	Param...	Unit	Target ...	Target ...	Actual	Deviation
Raw Mill - VRM	Active	Process	KWh/t	14	13.1	0	
Pyro	Active	Process	KW	56	21	0	
Pyro	Active	Process	Kcal/Kg	870	1.9	0	

### ACTIVE PRODUCT

Hierarchy	Value
OPC SSS	Active
ESPL	Active
SLS	Active
KOPC	Active
DIG	Active
SOC SSS NSPL	Active
PPC	Active
OPC	Active
PSC	Active
SRPC	Active
DSP	Active

Kavach My Safety

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### Incident Reporting Form

6/2024 - 30/09/2024

Primary Area: DPM 1301

Unit: Line-1 DPM

Zone: ZONE-00 DPM

Area: Coal handling

Incident No. - 15: Missing of vehicle Observed

Incident No. - 16: Warning removal done safety at the specified location?

Incident No. - 17: Full body harness lifetime, fall arrester Good

DRS Platform

### Service History

By	Time	Asset	Location	Status	Details
By NTF	28-08-2024 08:47 pm	CVRM / VRM-1		Completed-TF	ONLINE
By NTF	28-07-2024 12:16 pm	DCBL_DPM Dalmiapuram CVRM / CVRM-1	VRM-1 Mill fan - VRM-1 Mill fan	Completed-TF	ONLINE
By Parameeswara.g@infiniti-upptime.com	28-07-2024 11:41 am	DCBL_DPM Dalmiapuram CVRM / CVRM-1 (Cement Mill)	Cement Mill - 1 Main Drive - Cement Mill - 1 Main Drive Gearbox - Cement Mill - 1 Main Drive Gearbox - Cement Mill - 1 Main Drive Gearbox	Completed-TF	ONLINE
By NTF	28-07-2024 11:55 am	DCBL_DPM Dalmiapuram CVRM / VRM-1	VRM-1 Mill fan - VRM-1 Mill fan	Completed-TF	ONLINE
By Parameeswara.g@infiniti-upptime.com	27-09-2024 10:03 pm	DCBL_DPM Dalmiapuram CVRM / CVRM-1 (Cement Mill)	Cement Mill - 1 Main Drive - Cement Mill - 1 Main Drive Motor BALL-1 - MAIN DRIVE MNGD	Completed-TF	ONLINE

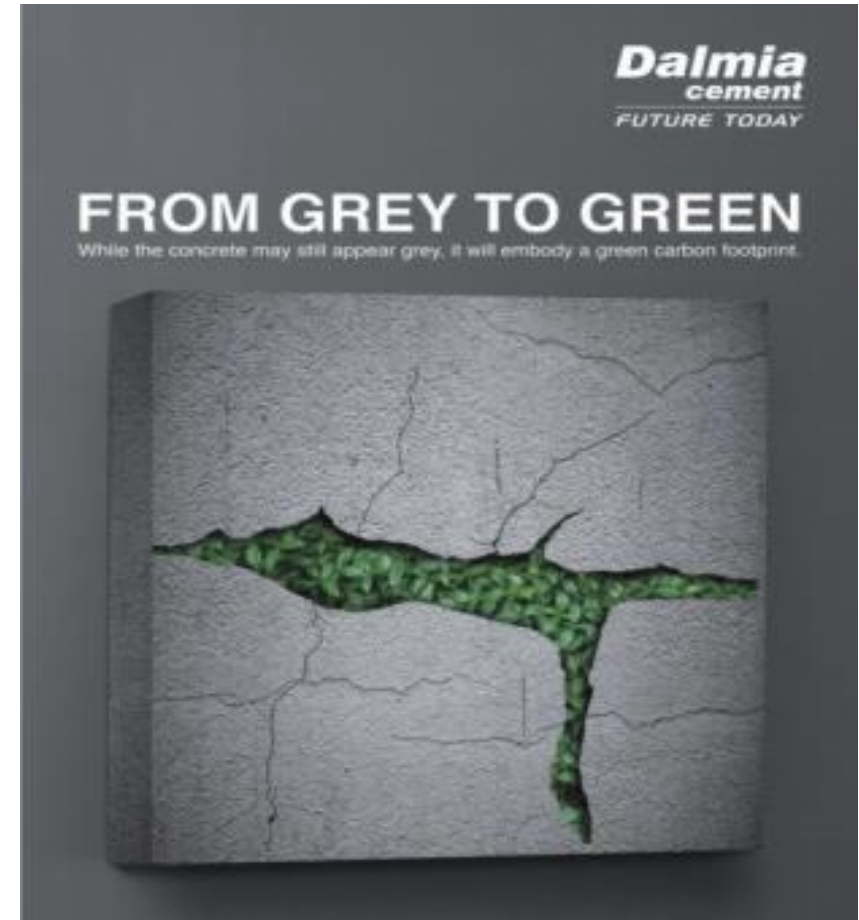
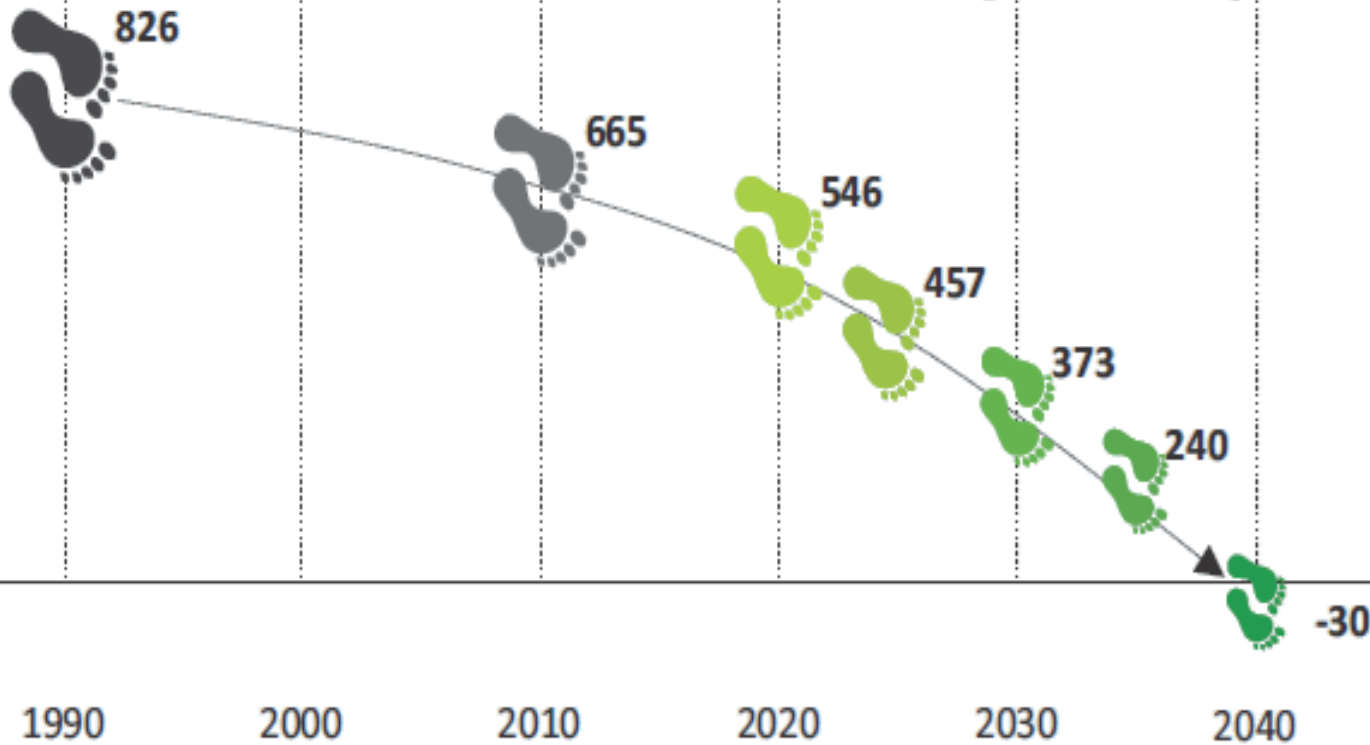
# 10. Net Zero Commitment Road Map

## Ranked No 1 Cement group Globally on Business Readiness for Low Carbon Transition

Source: CDP Global Cement Sector Report, April 2018

Kg/T of Cement

Dalmia Determined Contributions (DDCs)  
Moving from grey to green  
Roadmap for carbon negative transition



## 10. Net Zero Commitment Road Map



Dalmia Cement and FLSmidth of Denmark sign a MoU for cooperation in next generation cement technology towards building a sustainable future in presence of Danish Prime Minister and Indian Prime Minister in Copenhagen

# 11. Awards & Team Involvement

- Suggestion Scheme
- Good Work Award
- Long Service Award
- Employee of the Month
- EOM Training and Dinner
- Workers Education Class
- Safety Quizzes & Messages sharing in Gate Meeting
- Productivity week/ Environmental Day/NSE Celebrations Various Contests
- Health & Safety Committee Meeting Members Participation
- Various External Awards Participation
- Birthday Fiesta/Long service Mass Tree Plantation
- Trained for New Safety Approaches





**Thank**

**You**