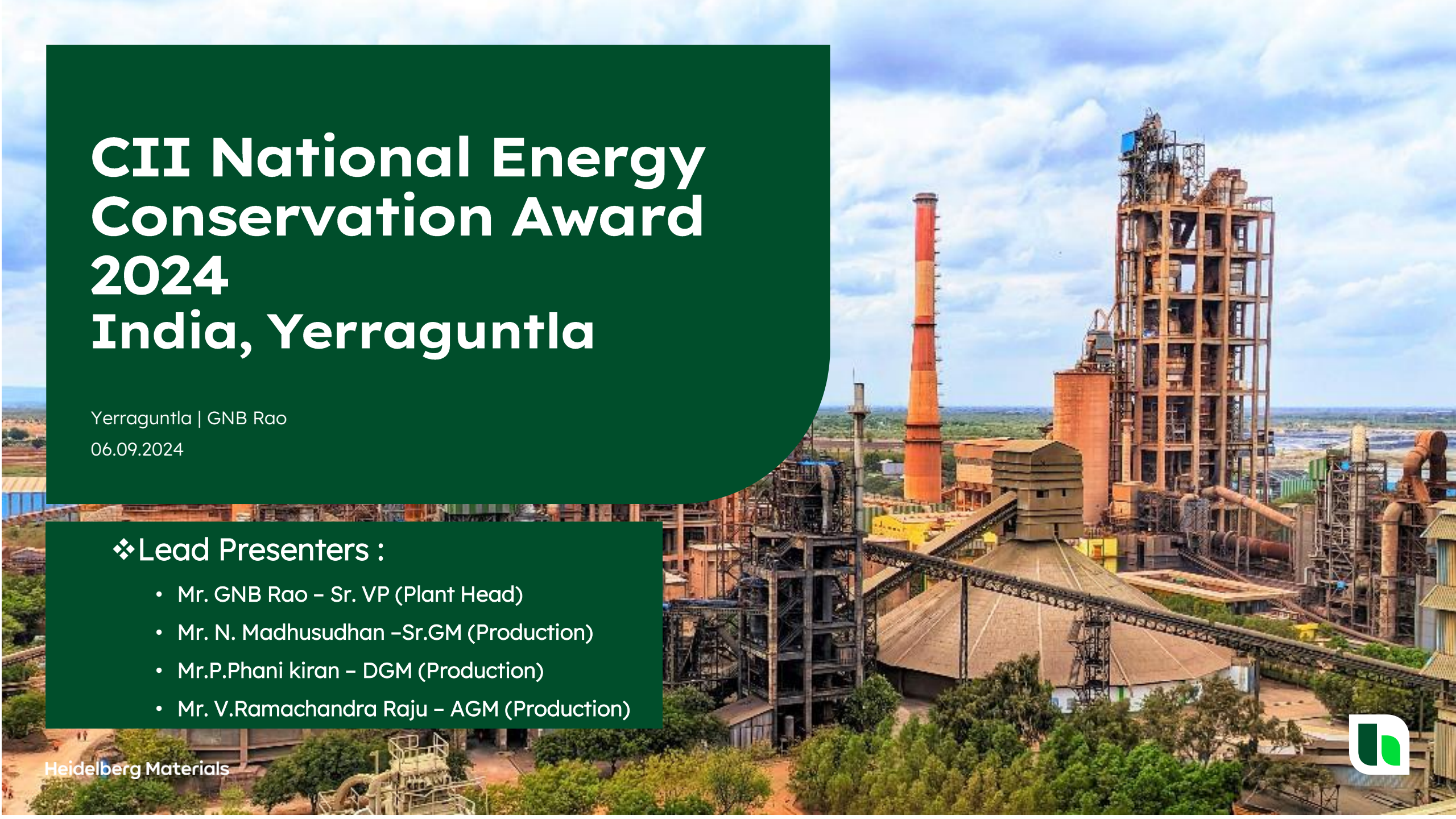
CII National Energy Conservation Award 2024
India, Yerraguntla

Yerraguntla | GNB Rao

06.09.2024

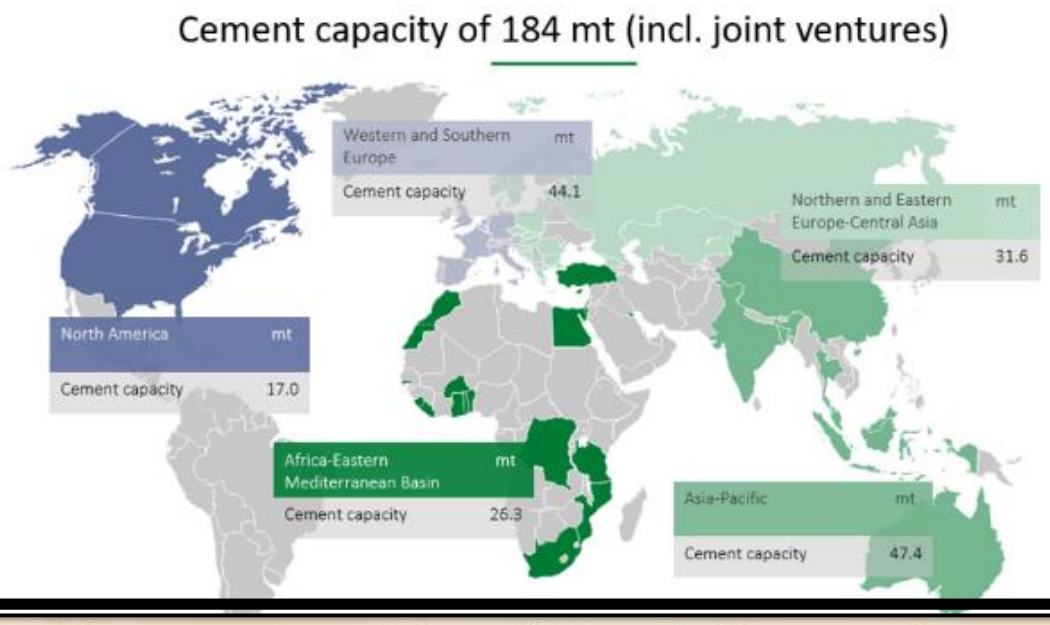


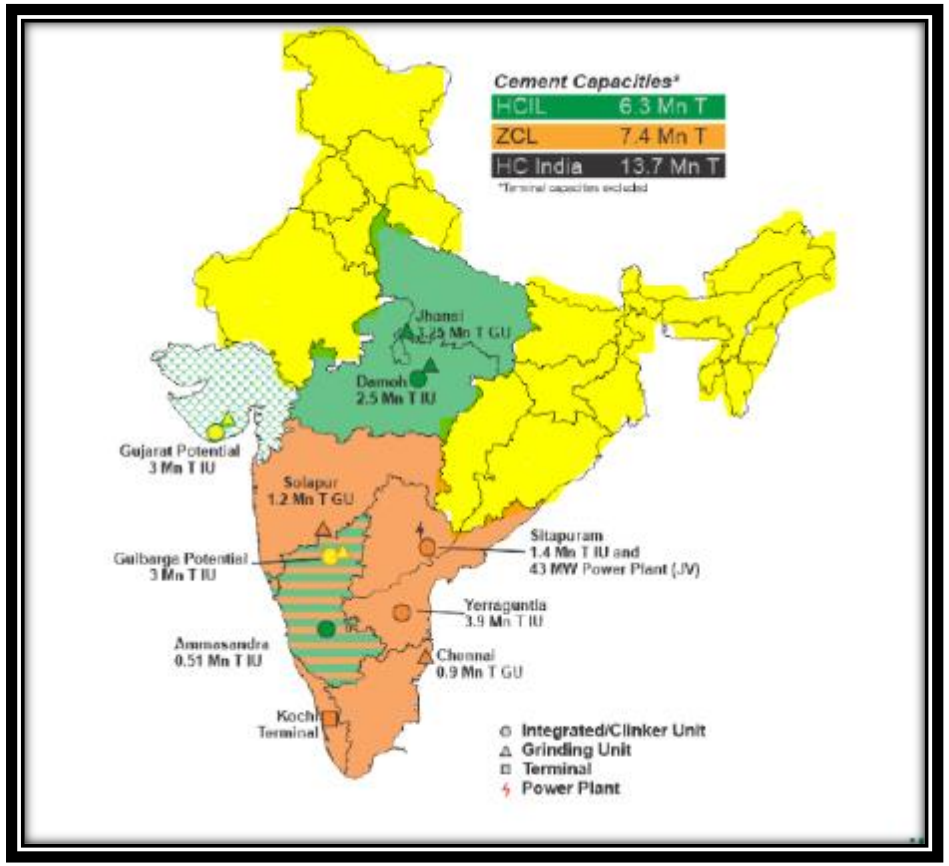
❖Lead Presenters :

- Mr. GNB Rao – Sr. VP (Plant Head)
- Mr. N. Madhusudhan –Sr.GM (Production)
- Mr.P.Phani kiran – DGM (Production)
- Mr. V.Ramachandra Raju – AGM (Production)

Heidelberg Materials

1.Brief introduction Heidelberg Cement and Zuari Cement unit



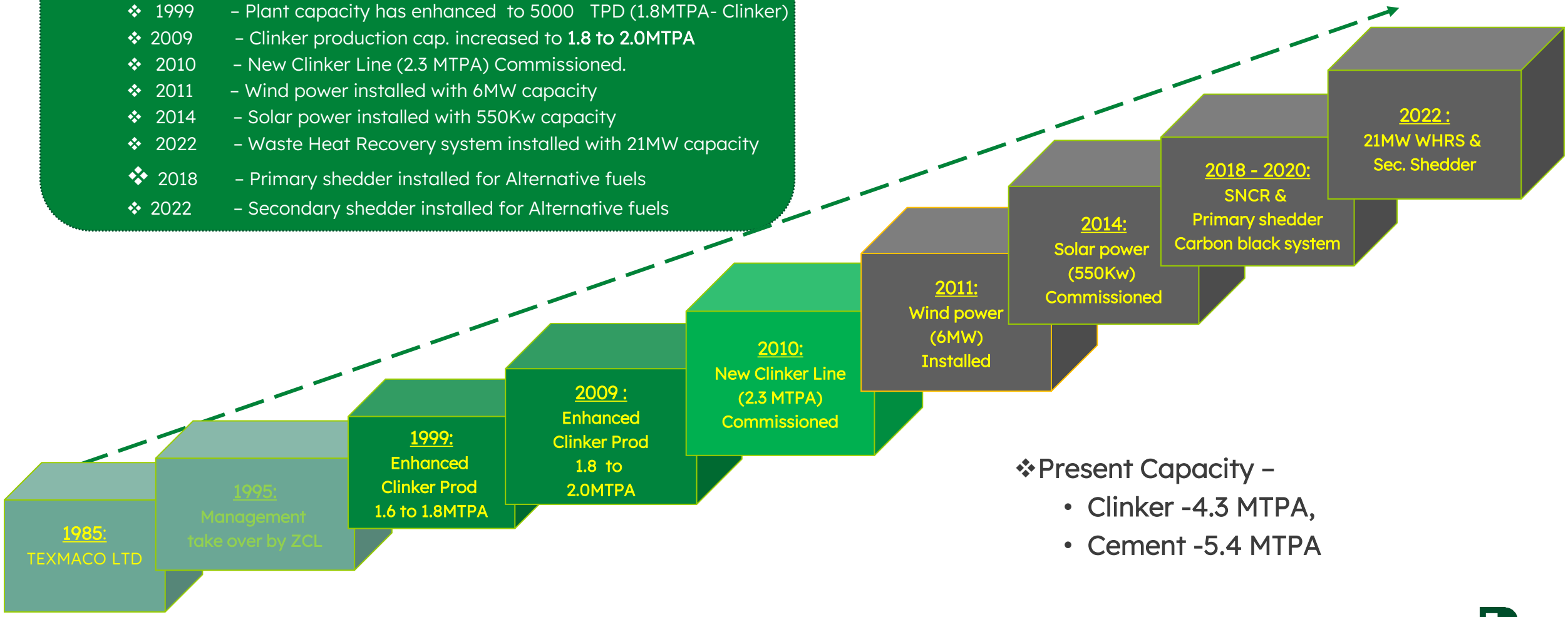


Our Focus

- To be on the path to carbon-neutrality.
- Progressive minds with the ambition to drive transformation

Yerraguntla Unit -Milestone

- 1985 – M/s TEXMACO LTD Capacity – 1500TPD Cement Plant
- 1995 – Management Change to **ZUARI INDUSTRIES LIMITED**
- 1999 – Plant capacity has enhanced to 5000 TPD (1.8MTPA- Clinker)
- 2009 – Clinker production cap. increased to **1.8 to 2.0MTPA**
- 2010 – New Clinker Line (2.3 MTPA) Commissioned.
- 2011 – Wind power installed with 6MW capacity
- 2014 – Solar power installed with 550Kw capacity
- 2022 – Waste Heat Recovery system installed with 21MW capacity
- 2018 – Primary shedder installed for Alternative fuels
- 2022 – Secondary shedder installed for Alternative fuels

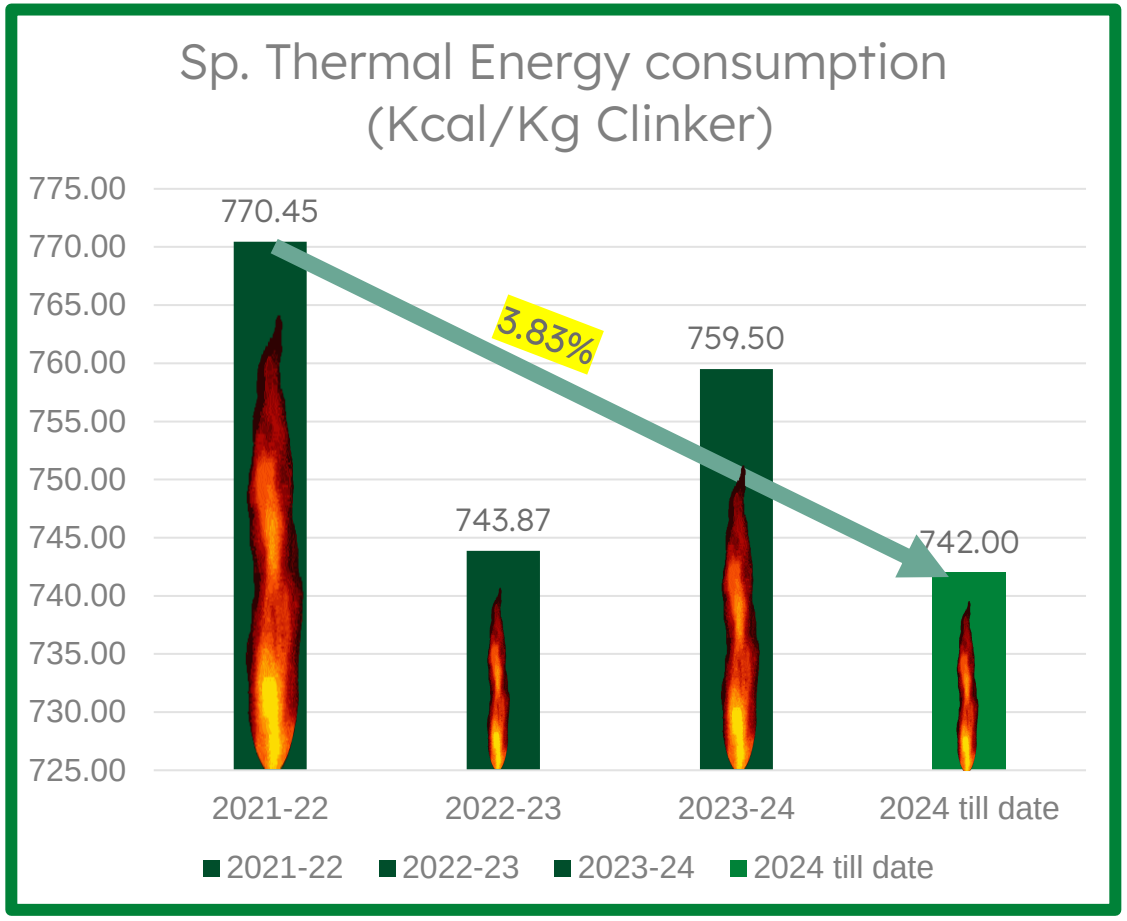


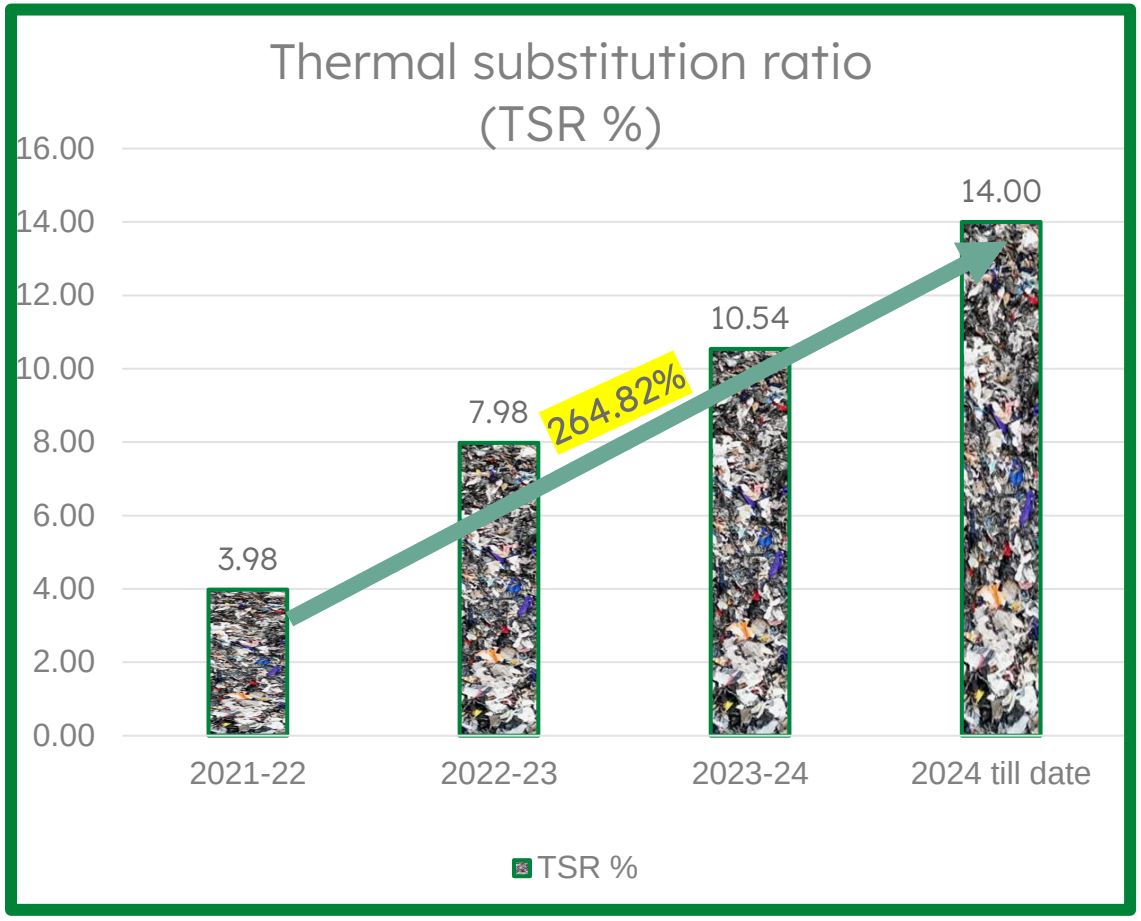
- Present Capacity –
  - Clinker -4.3 MTPA,
  - Cement -5.4 MTPA

Major Equipment

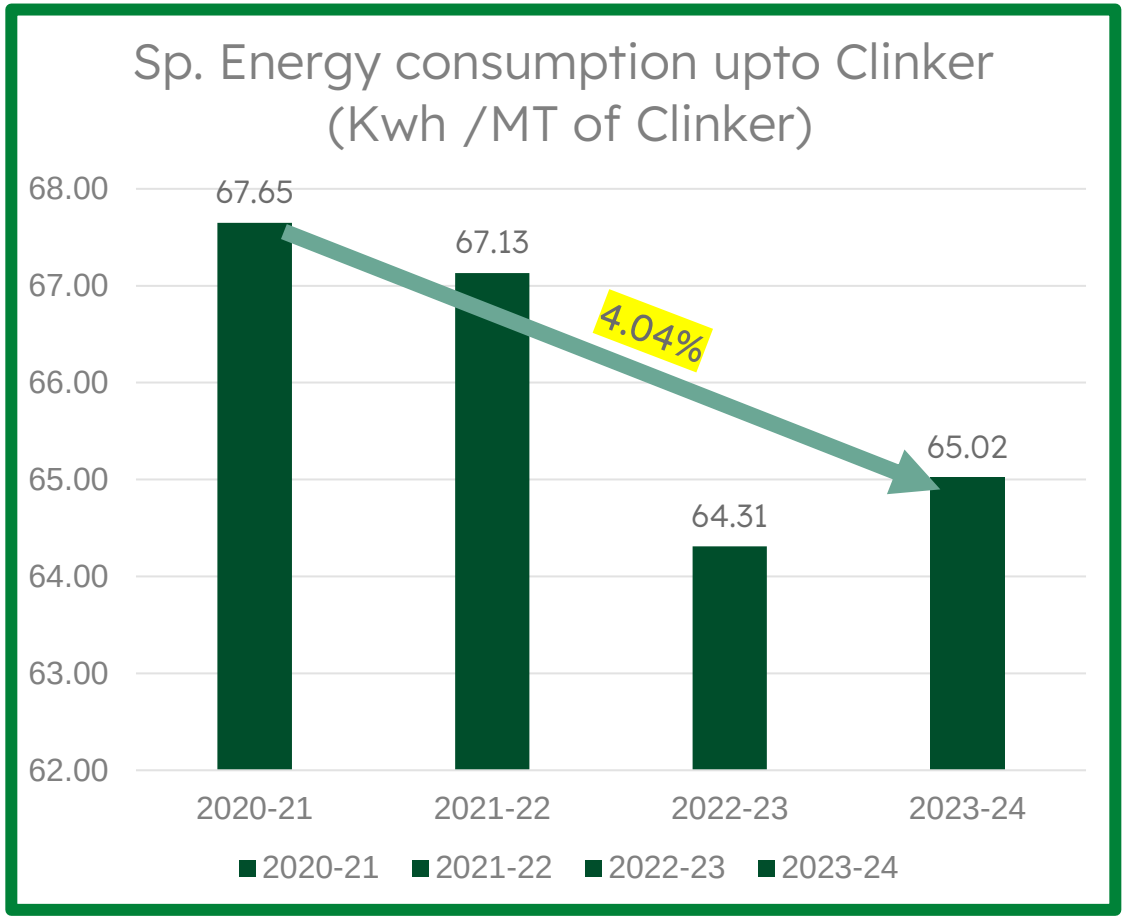
Equipment	Capacity	Make	Other particulars
Kiln - 1	5500 TPD	FLSmidth	SLC Double string (K - 4, C - 6) Conventional Cooler with KIDS
Kiln - 2	6300 TPD	FLSmidth	ILC Double string six stage with Cross bar Cooler
Coal Mill - 1	22 TPH	Thermax	Ball Mill with static separator
Coal Mill - 2	28 TPH	FLSmidth	ATOX - 20 (VRM)
Coal Mill - 3	45 TPH	FLSmidth	ATOX - 25 (VRM)
Raw Mill - 1	140 TPH	FLSmidth	Ball Mill with separator
Raw Mill - 2	250 TPH	FLSmidth	ATOX - 45 (VRM)
Raw Mill - 3	430 TPH	FLSmidth	ATOX - 55 (VRM)
Cement Mill - 1	100 TPH	FLSmidth	UM 40 * 11.5 Double pinion side drive
Cement Mill - 2	105 TPH	FLSmidth	UMS 42*13.5
Cement Mill - 3	105 TPH	FLSmidth	UMS 42*13.5
Cement Mill - 4	185 TPH	FLSmidth	OK Mill - 3750 Kw (VRM)

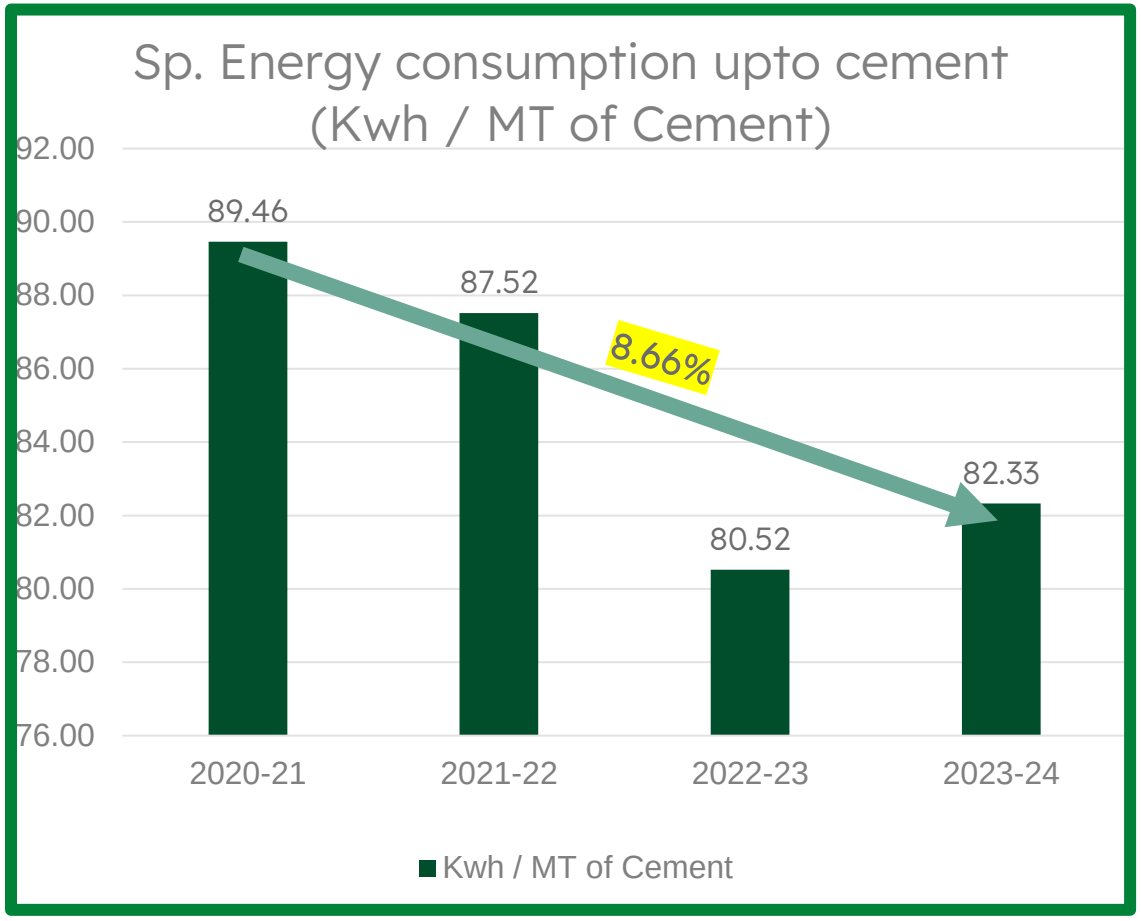
2.Specific Thermal Energy consumption & TSR %



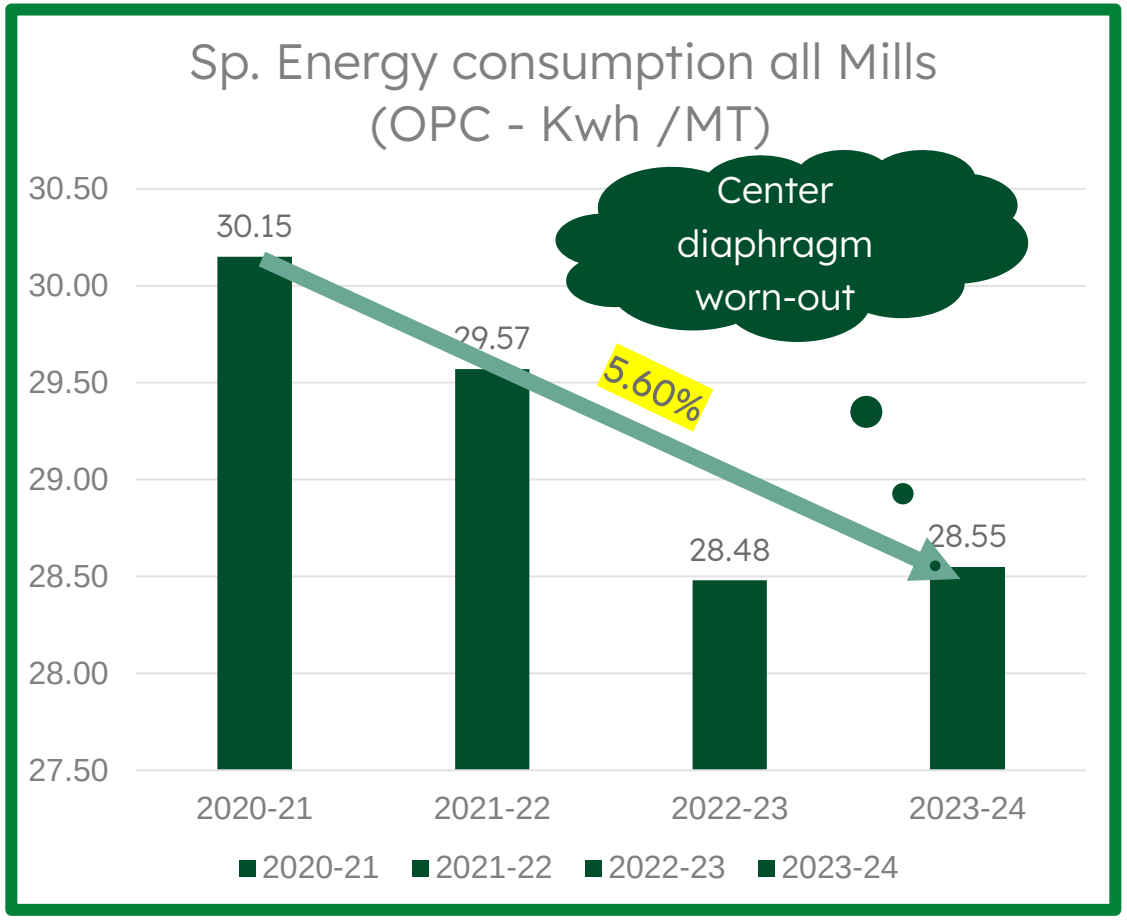


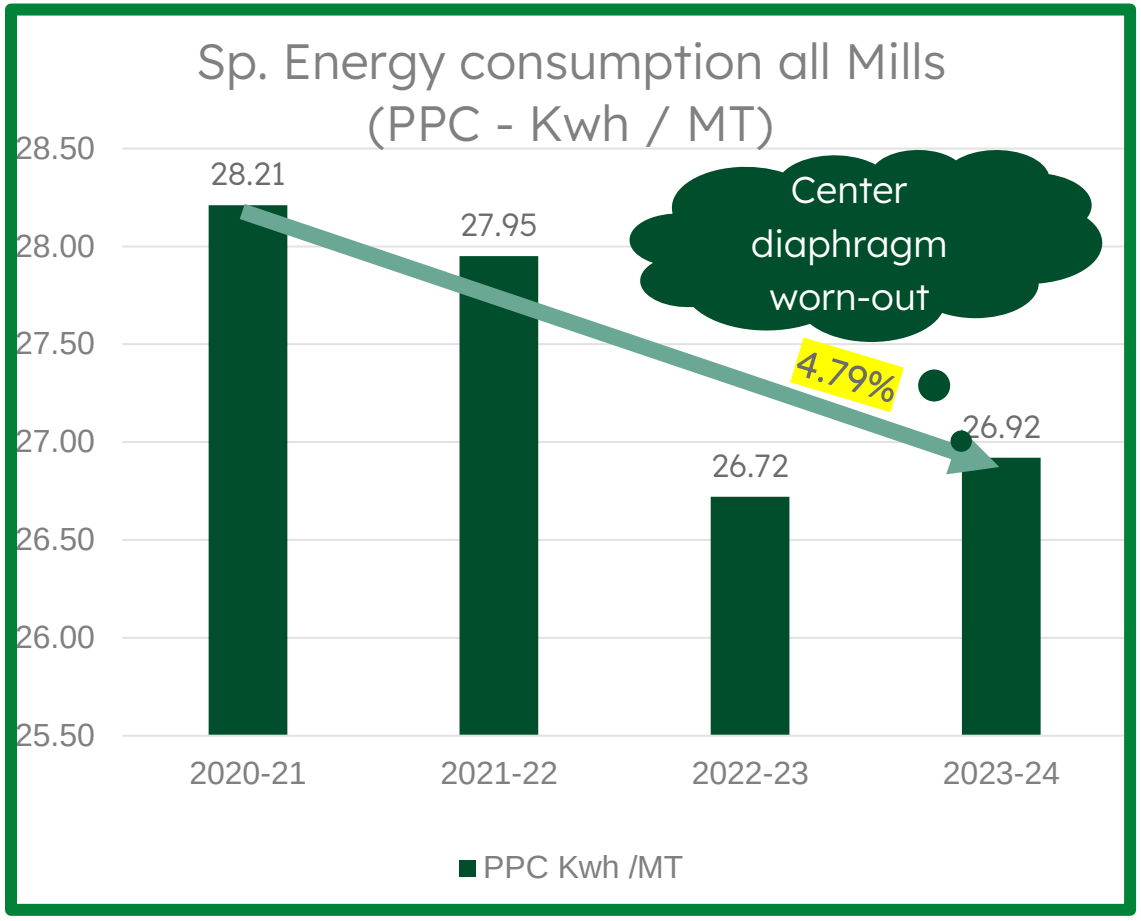
2.Specific Energy consumption upto Clinker & Cement



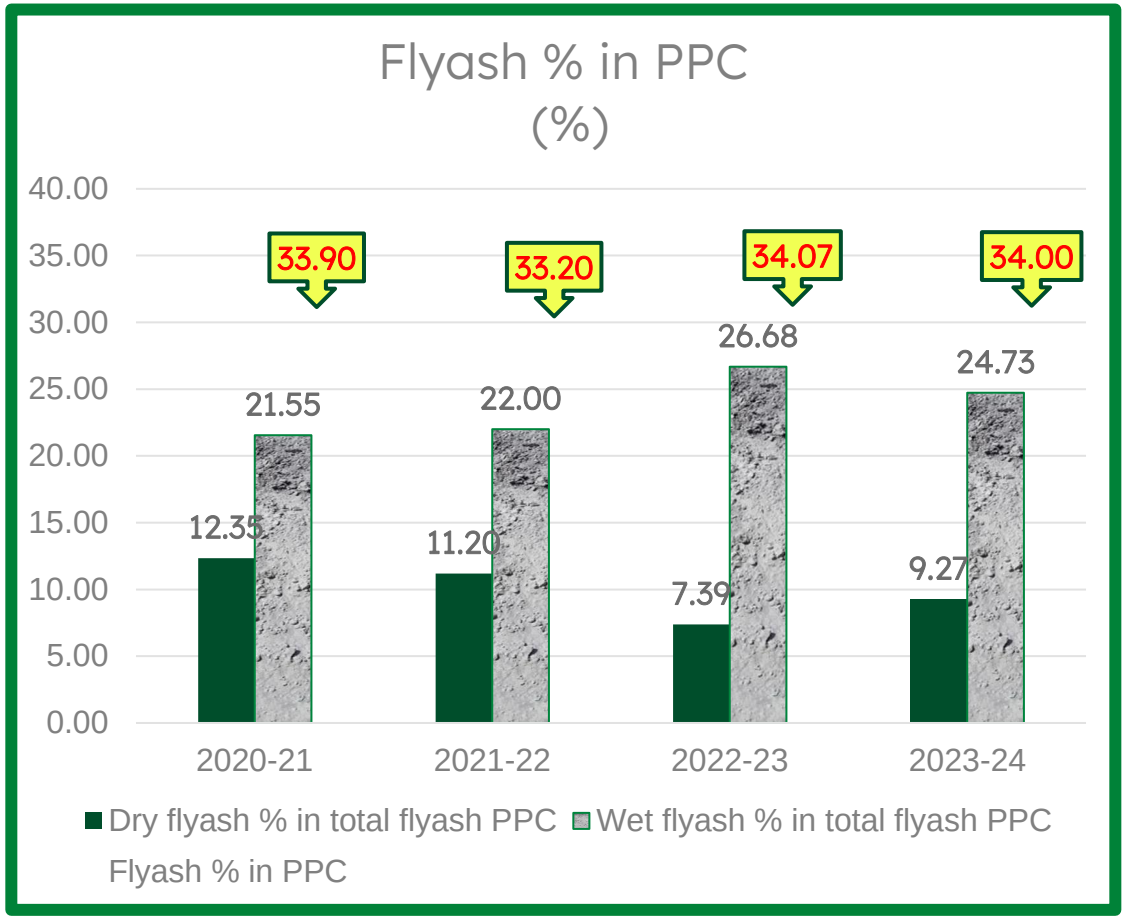


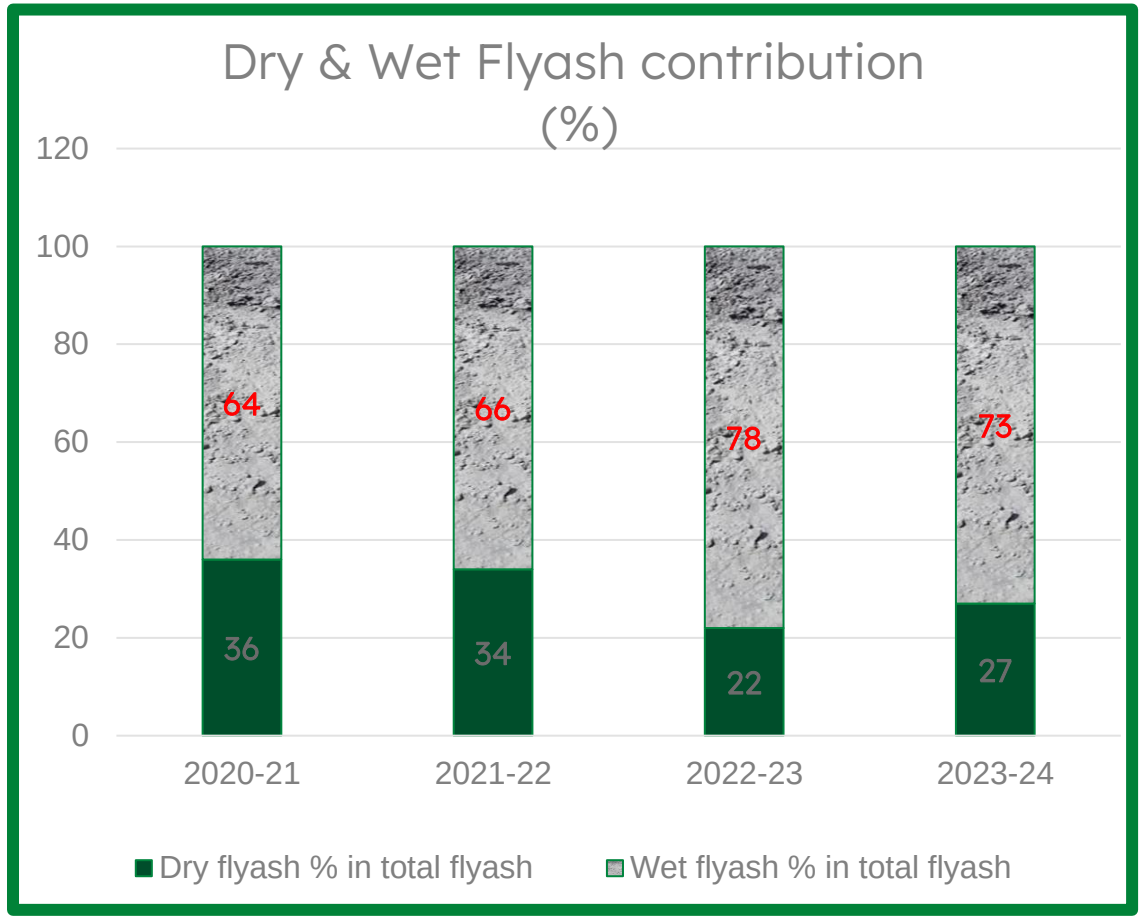
2.Specific Energy consumption OPC & PPC (Including all Mills)



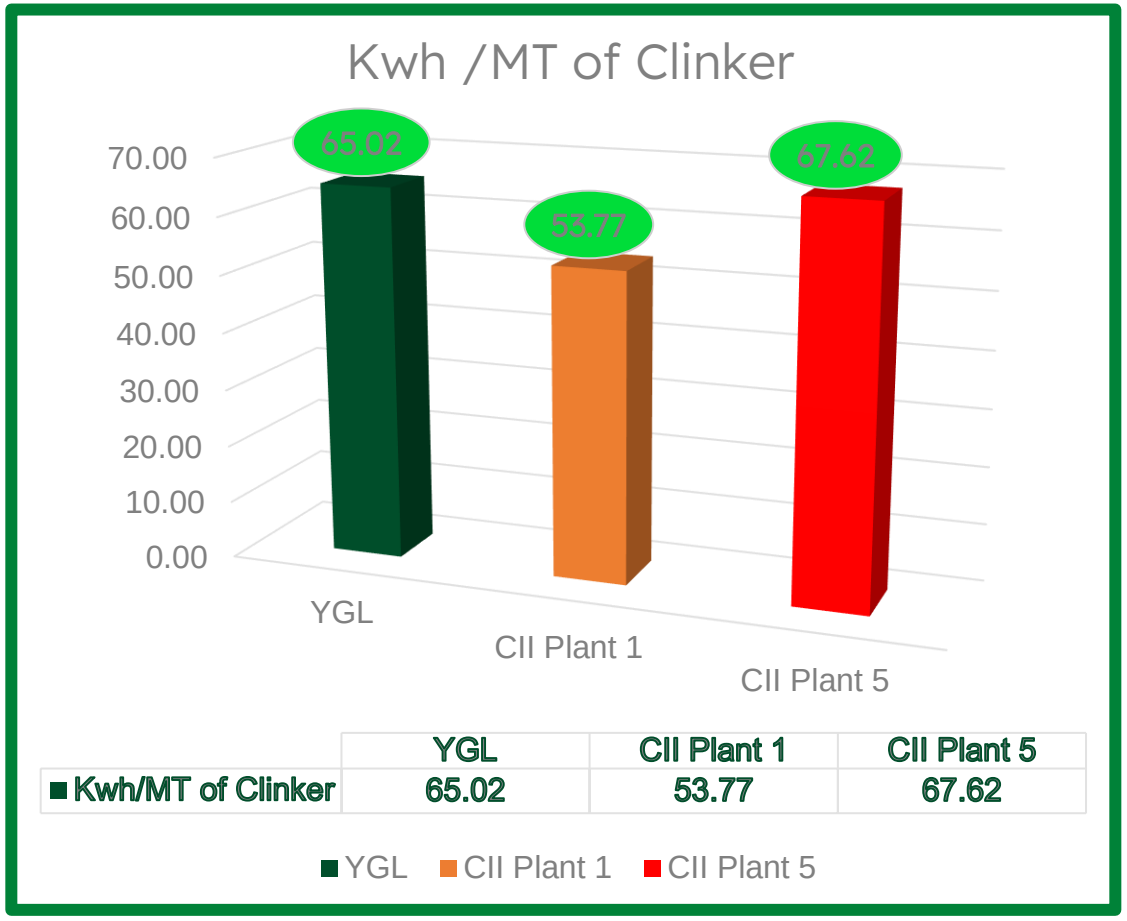


2.Overall Flyash consumption (%)



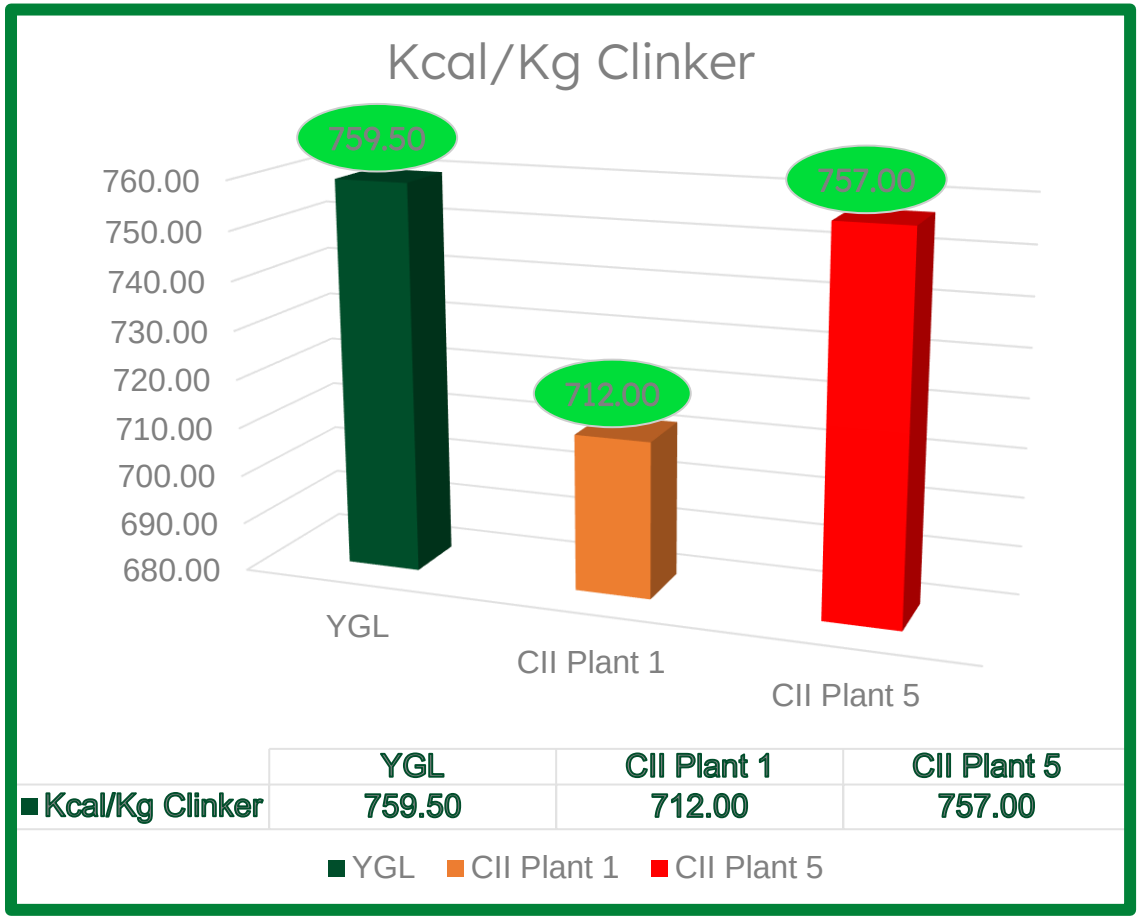


3.Specific Energy consumption & Benchmark



	YGL	CII Plant 1	CII Plant 5
Kwh/MT of Clinker	65.02	53.77	67.62

YGL CII Plant 1 CII Plant 5



	YGL	CII Plant 1	CII Plant 5
Kcal/Kg Clinker	759.50	712.00	757.00

YGL CII Plant 1 CII Plant 5

3. Road Map for Thermal Energy saving

Target - 725 Kcal/ Kg Clinker

1. Line # 1

- Burner upgradation
- Relocation of AF Feeding point for enhancing the retention time
- 4th Cyclone diverting gate upgradation
- False air reduction from 9.8 to 7.8 %
- Cooler hammer mill stoppage avoided by modification of casing and platform with UT Pump.

2. Line # 2

- TAD damper modification
- AF feeding belts capacity enhancement.
- Flap gates modification of bottom cyclones
- False air reduction from 8.6 to 7.0%
- Installation of dip tube in bottom cyclones
- Insulation from PH downcomer duct to Raw Mill inlet duct

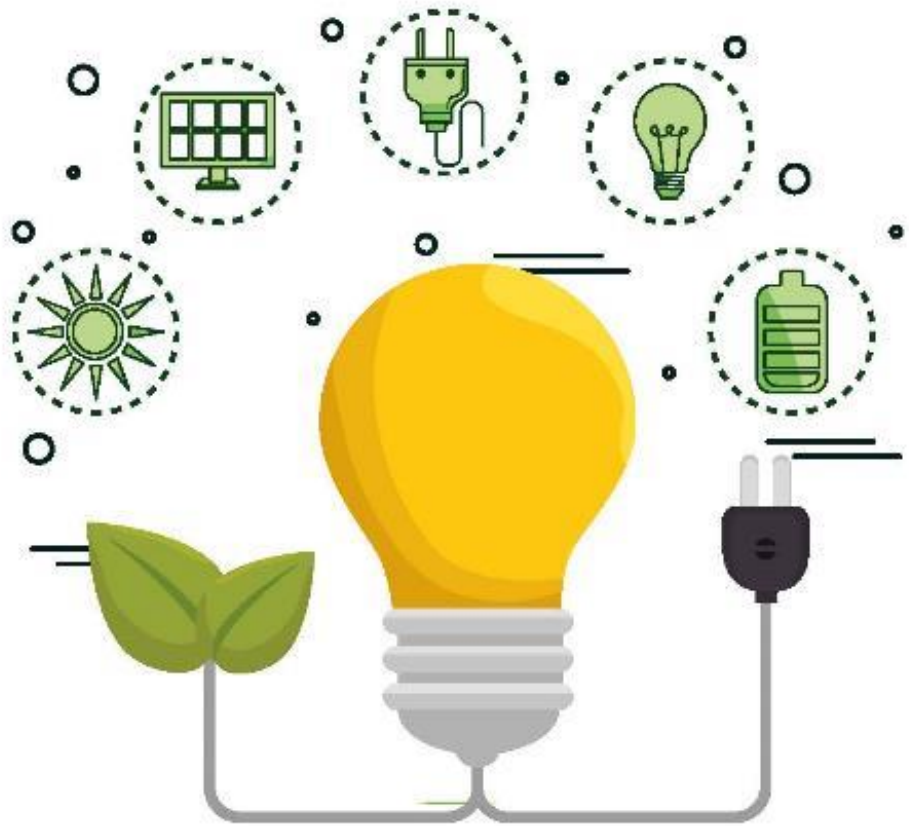
3. Road Map for Electrical Energy saving

Target - 60 Kwh/ MT Clinker

Line # 1 & 2

- Burner upgradation
- Process optimization
- Raw Mill system resistance shall be reduced by modification of separator seal gaps
- Insulation from Line # 2 PH downcomer duct to Raw Mill inlet duct
- All process fans efficiency to be enhance by modification / optimisation of the process
- Optimisation of compressor air consumption.
- False air reduction by 5% in all the sections
- All Bag filters shell be run in DP mode
- Inlet cone and diaphragm modification for Cement Mill #2
- Segregation of grinding media for enhancing the productivity

Energy Saving Projects



4. Energy saving projects implemented in last three years

Year	No of Energy saving projects	Investment (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Impact on SEC/ SHC (Electrical kWh /MT cement or Kcal/Kg cement)
FY 2021-22	9.00	87.10	4.88	0.00	34.67	1.952 Kwh /MT Cement saving
FY 2022-23	13.00	21.02	1.96	0.00	13.89	0.784 Kwh /MT Cement saving
FY 2023-24	34.00	57.50	10.01	266.39	408.81	4.0Kwh / MT Cement saving

4. List of Major Encon projects in FY2021 - 22

Year	Name of Energy saving projects (2021-22)	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Impact on SEC/ SHC (Electrical kWh /MT cementor Kcal/Kg cement)
1	Raw mill#3 Fan output duct modification by increasing the volume & Optimisation of energy	0.60	2.72	0.00	19.33	1.2 Kwh/ton of material
2	Line-1 Vertical coal mill Main Drive SRIM with VFD, Motor and Converter transformer for pet coke grinding.	7.00	0.07	0.00	0.47	10 KW/Hour saving
3	Line-1 Kiln Main Drive upgradation from DC drive to AC VFD	15.00	0.08	0.00	0.56	10 KW/Hour saving
4	Line-1 Cooler DC Drive upgradation from DC drive to AC VFD	1.50	0.02	0.00	0.17	3 KW/Hour saving
5	Re installation of standby Fly ash dense phase system	3.00	0.03	0.00	0.22	Continous availability of flyash feeding
6	Replacement of existing Vento packer machine 1&2 in Packing plant-2 with Higher efficiency & Energy savings	13.50	0.16	0.00	1.12	Existing equipment obsolete
8	Inlet cone with diaphragm modification at cement mill-2	7.50	0.40	0.00	2.81	Power saving 0.5Kw/t of material
9	Replacement of second chamber liners with energy efficient liners	4.00	0.32	0.00	2.25	Power saving 0.4Kw/t of material
10	Replacement of Cooler heat exchanger at Line-2	35.00	1.09	0.00	7.73	Power saving 0.6Kw/t of material
	Total	87.10	4.88	0.00	34.67	

4. List of Major Encon projects in FY2022 - 23

Year	Name of Energy saving projects (2022-23)	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Impact on SEC/ SHC (Electrical kWh /MT cement or Kcal/Kg cement)
1	Replacement of conventional metallic fans with energy efficient FRP fans for kiln 1 & 2 shell cooling fans.	12.00	0.22	0.00	1.55	24 Shell cooling fans changed for two kilns
2	Replacement of conventional metallic fans with energy efficient FRP fans for Line - 2 cooling tower fans.	0.60	0.05	0.00	0.36	Replacement of conventional metallic fans with energy efficient FRP fans
3	Run hour's optimization of Line-2 cooler heat exchanger fans.	0.00	0.20	0.00	1.41	Logic modification. Screw conveyors run only 5minutes per hour
4	Run hour's optimization of VCLM-1 drives.	0.00	0.02	0.00	0.12	Logic modification
5	Avoided running of Air Slide Blower between Cemntmill Silo 3&5 Top .	0.00	0.02	0.00	0.14	Cement Mill-3 location
6	Power saving with K-line BH purging optimization	0.00	0.09	0.00	0.61	Logic modification implemented in K-Line in the month of March 2023
7	Line-1 LV motors replacement with Energy efficient motors (Phase Manner)	8.00	0.32	0.00	2.25	Power Saving 0.2Kwh/ton of material
8	Usage of boiler blow down water to Auxiliary cooling tower	0.10	0.00	0.00	0.00	50M3/day of raw water saving
9	Boiler Blow down water is transferring to guard pond is modified from pump to gravity	0.05	0.02	0.00	0.11	45KWh/day savings @ 7.50/-KWh – 330days.
10	Hot well pump ON & OFF frequently modified by optimizing.(WHRS)		0.01	0.00	0.06	25KWh/day
11	Oil Cooler Performance improved by adding 16 new plates (WHRS)	0.10	0.03	0.00	0.24	95KWh savings in ACT Fan
12	ACC Fans Foam Cleaning (WHRS)	0.18	0.06	0.00	0.45	Resistance come down
13	De-aerator steam venting is optimized (WHRS)	0.00	0.93	0.00	6.60	15 Ton of steam saving
	Total	21.02	1.96	0.00	13.89	

4. List of Major Encon projects in FY2023 - 24

Year	Name of Energy saving projects (2023-24)	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Impact on SEC/ SHC (Electrical kWh /MT cement or Kcal/Kg cement)
1	Reduction of Radiation Loss from Kiln Shell using Thermal Insulation Paint	0.80	0.00	250.00	6.24	Kiln emissivity come down
2	Line-1 K-Line Preheater fan LRC replacement with GRR having 50 to 100% regulation.	2.50	1.31	0.00	17.75	0.5 Kwh/ton saving & Process optimized
3	Primary Rotor Assembly For Limestone Crusher-1 to improve the output as well as Specific energy optimization	8.00	0.11	0.00	56.80	Output improved by 20TPH as well as power saved by20Kw
4	Secondary Rotor Assembly For Limestone Crusher-1 to improve the output as well as Specific energy optimization	6.50	0.11	0.00	46.15	Output improved by 20TPH as well as power saved by20Kw
5	Replacement of conventional metallic fans with energy efficient FRP fans for kiln 1 & 2 shell cooling fans.	12.00	0.22	0.00	85.20	24 Shell cooling fans changed for two kilns
6	Run hour's optimization of Line-1 C-Line GCT water pump.	0.00	0.05	0.00	0.00	Logic modification in Line-1 C-Line Bag House
7	Run hour's optimization of VCLM-2 Classifier Gearbox Lubrication Pump.	0.00	0.00	0.00	0.00	Logic modification implemented in VCLM-2 in the month of April 2023
8	Run hour's optimization of Line-2 VCLM coal transport	0.00	0.04	0.00	0.00	Logic modification implemented in VCLM-2 in the month of May 2023
9	Avoided running of Cemntmill2 Silo3 Top Dust Collector fan.	0.00	0.05	0.00	0.00	Logic modification implemented in Cement Mill 2 in the month of May 2023
10	Run hour's optimization of Line-1 Kiln fine coal bin transport.	0.00	0.04	0.00	0.00	Logic modification implemented inVCLM1 in the month of May 2023
11	Run hour's optimization of Line-1 OCLM fine coal bin transport.	0.00	0.02	0.00	0.00	Logic modification implemented in OCLM in the month of May 2023
12	Run hour's optimization of ORM Oil and Grease Pumps	0.00	0.00	0.00	0.00	Logic modification implemented in ORM in the month of July 2023

4. List of Major Encon projects in FY2023 - 24

Year	Name of Energy saving projects (2023-24)	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Impact on SEC/ SHC (Electrical kWh /MT cement or Kcal/Kg cement)
13	Optimization of Line-1 VRM Cyclone Rotary Air Locks	0.00	0.01	0.00	0.00	Logic modification implemented in VRM 1 in the month of July 2023
14	Avoided Idle running of VCLM-2 Booster fan Cyclone Circuit Drives	0.00	0.01	0.00	0.00	Logic modification implemented inVCLM2 in the month of July 2023
15	Installation of VFD for Fly Ash Compressor-2	0.50	0.03	0.00	3.55	CM-2&3 in the month of July 2023
16	Run hour's optimization of Silo-2 feeding transport.	0.00	0.02	0.00	0.00	Logic modification implemented in Cement Mill 2&3 in the month of OCT 2023
17	Run hours optimization of Silo9&10 De-dusting system.	0.00	0.01	0.00	0.00	Logic modification implemented in Packing Plant in the month of OCT 2023
18	Run hour's optimization of ORM Air Separator Sump Pump	0.00	0.00	0.00	0.00	Logic modification implemented in ORM in the month of Dec 2023
19	Run hour's optimization of Ok mill Feed belt magnetic separator	0.00	0.00	0.00	0.00	Logic modification implemented in Ok in the month of Sep 2023
20	Run hour's optimization of Okmill Reject belt magnetic separator	0.00	0.00	0.00	0.00	Logic modification implemented in Ok in the month of Sep 2023
21	Run hour's optimization of CM2 feed belt magnetic separator	0.00	0.00	0.00	0.00	Logic modification implemented in Cement Mill 2 in the month of Dec 2023
22	Run hours optimization of CM3 Feed belt de-dusting system	0.00	0.00	0.00	0.00	Logic modification implemented in Cement Mill 3 in the month of Dec 2023
23	Run hours optimization of VRM2 Hot dust Bin Dust Collector Fan	0.00	0.00	0.00	0.00	Logic modification implemented in VRM 2 in the month of Dec 2023
24	Run hour's optimization of ORM Grease Pumps	0.00	0.01	0.00	0.00	Logic modification implemented in ORM in the month of July 2023

4. List of Major Encon projects in FY2023 - 24

Year	Name of Energy saving projects (2023-24)	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Impact on SEC/ SHC (Electrical kWh /MT cement or Kcal/Kg cement)
25	Run hour's optimization of ORM Rawmill Fan Gearbox Lubrication Pumps	0.00	0.01	0.00	0.00	Logic modification implemented in ORM in the month of DEC2023
26	Run hour's optimization of Crusher-3 Magnetic separatorp	0.00	0.01	0.00	0.00	Logic modification implemented in Crusher 3 in the month of DEC2023
27	Run hour's optimization of Line-2 compressor	0.00	0.04	0.00	0.00	Logic modification implemented in Line 2 in the month of June 2023
28	Replacement of existing separator with high efficiency separator with motor and VFD at Rawmill-1	14.00	1.24	0.00	99.40	0.75 Kwh/T Clk
29	Replacement of Rawmill-1 fan with high efficiency fan with VFD	10.00	0.79	0.00	71.00	0.50 Kwh/T Clk
30	Mist spray provided under the ACC fans (WHRS)	0.20	0.39	0.00	1.42	4months @5hrs/day
31	Carried out Helium leak test	0.15	0.00	0.00	1.03	3 medium leaks attended
32	VRM Inlet duct insulation from PH Boilers outlet duct as VRM I/L temp was less	2.85	5.32	16.39	20.27	Before & After insulation at VRM I/L temp. – 110/125°C
33	RAV's & DCC's are operated in timer logic (WHRS)		0.04	0.00	0.00	PH#1&2,K-string boilers
34	CEP to CST/Deaerator logic modification (WHRS)		0.14	0.00	0.00	Logic modification
	Total	57.50	10.01	266.39	408.81	

Innovative Projects

5. Innovative Projects - Curtain Wall installed in Cooler (Line # 2)

Problem :

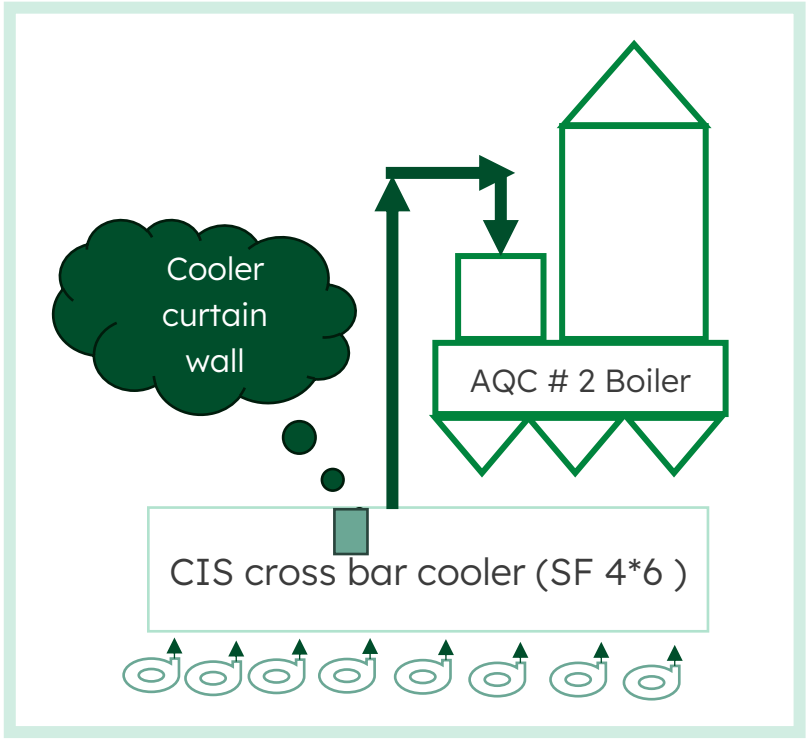
- Cooler hood pressurization while running WHRS dilution air fan.
- Some portion of cooler recuperated air is passing through WHRS duct by physical observation.
- Clinker is not cooling well because We unable to push the more air through cooler last fans

Improvement / Job done :

- Curtain wall installed just before the WHRS duct in the cooler

Benefits :

- Running of WHRS dilution air fan is minimized
- Cooler hood pressurization is come down
- Clinker also cooled well by increasing the cooler fans
- PH fans also not required to increase so that over all the Power saved by 296Kw/Hr. which is equal to 1.21Kw /T. Below results are for your reference.
- Clinker temperature come down by 35Deg C by increasing the last fans
- Mid tap temp reduced from 700Deg C to 600Deg C as required of WHRS system
- Overall thermal saving 8.55Kcal / Kg clinker.



5. Innovative Projects - Cement Mill -3 center diaphragm Modification

Problem :

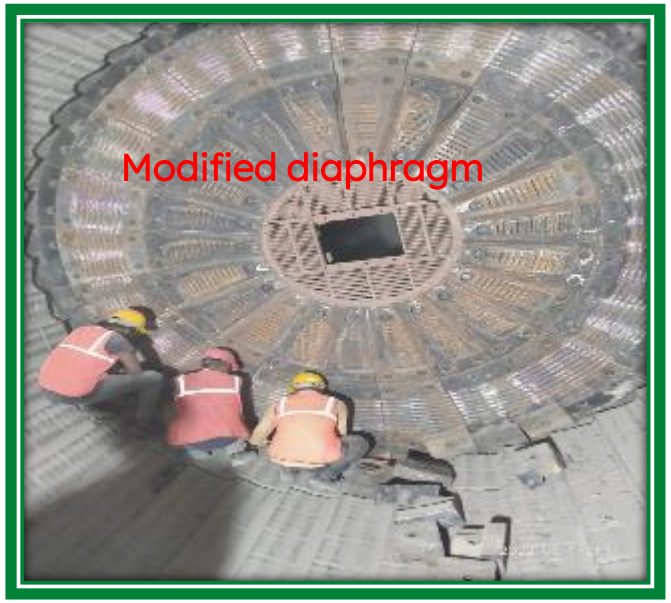
- Nibs' recirculation
- 2nd chamber feed size is more

Improvement / Job done :

- Center diaphragm change with LCD diaphragm

Benefits :

- Mill output increased from 100 TPH to 110TPH.
- Specific power consumption reduced from 29.34Kw/T to 29.0Kw/T
- Nibs' recirculation reduced



5. Innovative Projects - Water & Power conservation in WHRS

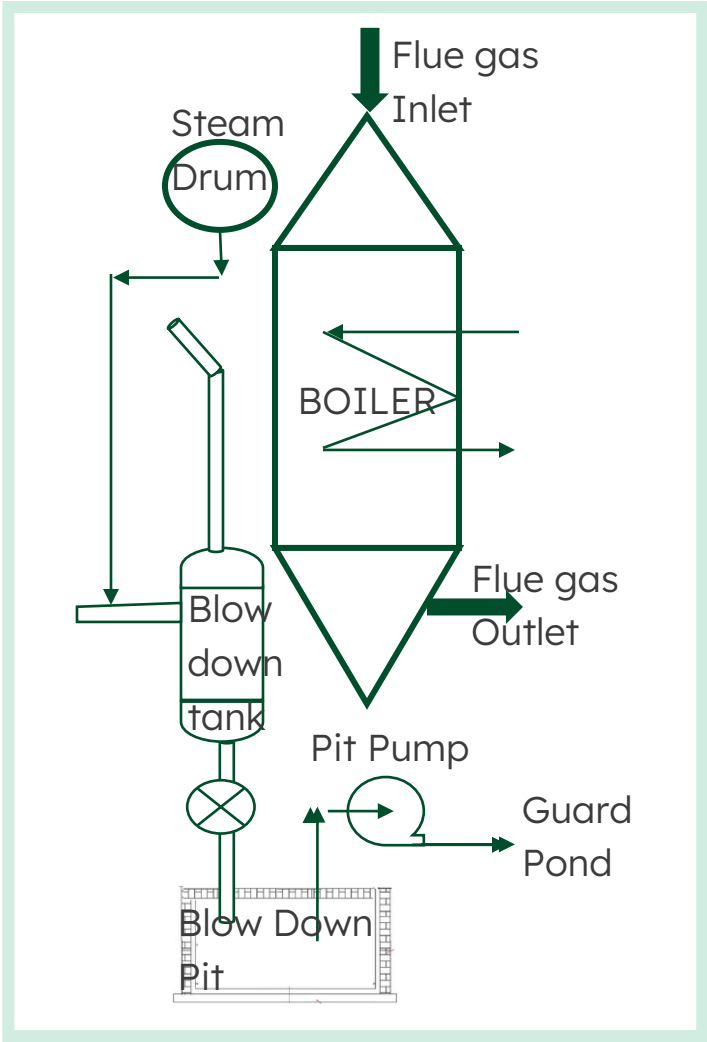
All boilers (06 Nos) are supplied with 6 blow down tanks and Blow down pit pumps :

- **Before Modification :** From boiler steam drum water is drained to Blow down tank and from Blow down tank to Blow down pit. Collected water from blow down pit is pumped to guard pond
- **After Modification :** From blow down tank, water is routed to cooling tower (By laying pipe) by gravity to cooling tower.
- **Result :**

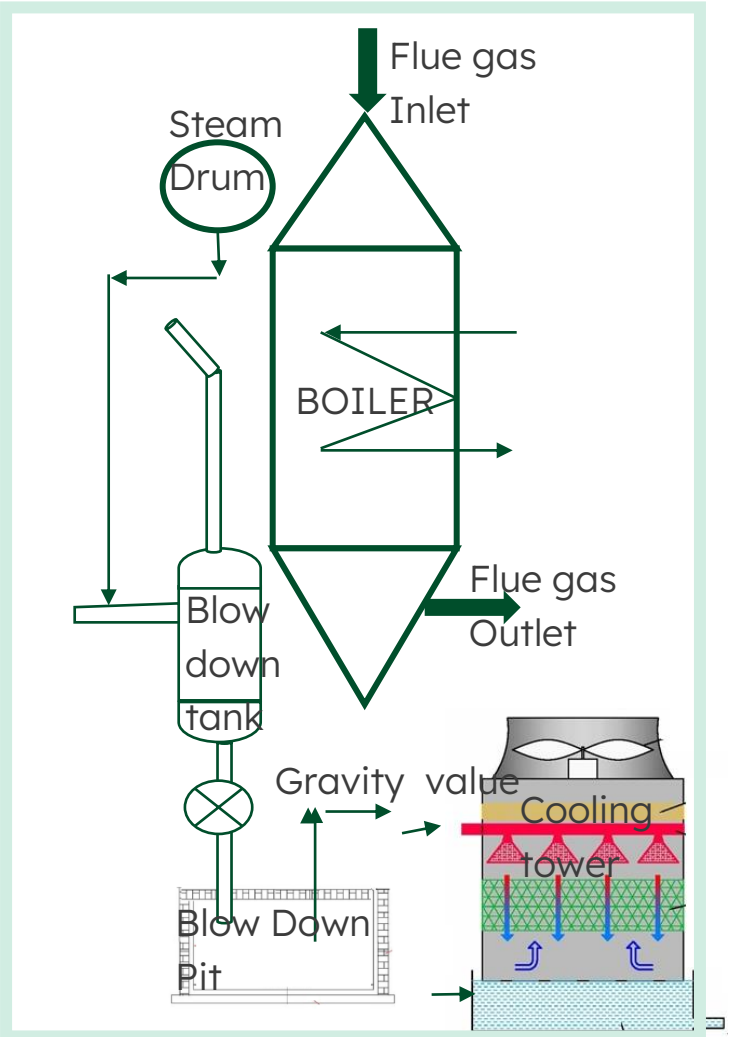
- Blow down water can be used in cooling tower by which 5 Pumps (1.1KW) are avoided and water is used in cooling tower as against disposing it to guard pond.

45KWh/day of power & 70M3/day of water savings are attained.

Parameter	BD water	CT Water
PH	8.5	8.5
Conductivity	<100	2500
Hardness	<5	300



Before Modification



After Modification

Utilization of Renewable Energy sources

6. Utilisation of Renewable Energy sources

On site					
Year	Source (Solar, wind, etc.,)	Installed capacity (in MW)	Capacity addition (MW) after FY 2021	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
FY 2021-22	Ground mounted solar	0.55	0	0.49905	0.21
FY 2022-23	Ground mounted solar	0.55	0	0.48895	0.19
FY 2023-24	Ground mounted solar	0.55	0	0.40859	0.14

Off site					
Year	Source (Solar, wind, etc.,)	Total offsite Installed capacity (MW)	Capacity addition (MW)	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
FY 2021-22	Wind (Group capitive)	6	0	11.089384	4.78
FY 2022-23	Wind (Group capitive)	6	0	9.70182	3.86
FY 2023-24	Wind (Group capitive)	6	0	8.339705	2.95

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	2020-21	Biomass ,RDF,Pharma waste,etc..	25797.77	2384	4.14
2	2021-22	Biomass ,RDF,Pharma waste,etc..	31230.9	2434	3.98
3	2022-23	Biomass ,RDF,Pharma waste,etc..	51534.75	3122	7.98
4	2023-24	Biomass ,RDF,Pharma waste,etc..	68776.21	3558	10.54

WHRS : -

WHRS	UOM	FY 2022-23	FY 2023-24
Installed capacity of WHR	MW	21	21
Specific power generation from WHR	KWH/T clinker	20	26.35
Annual Power Generation from WHR	Million kWh	18.94	80.57
Annual Operting Hours	HRS	2815.31	7674.08
Share of Total Electricity consumption (%)	grid/whr/RE	7.53	28.47
Heat recovered	Million kcal / annum	94140.16	361901.34

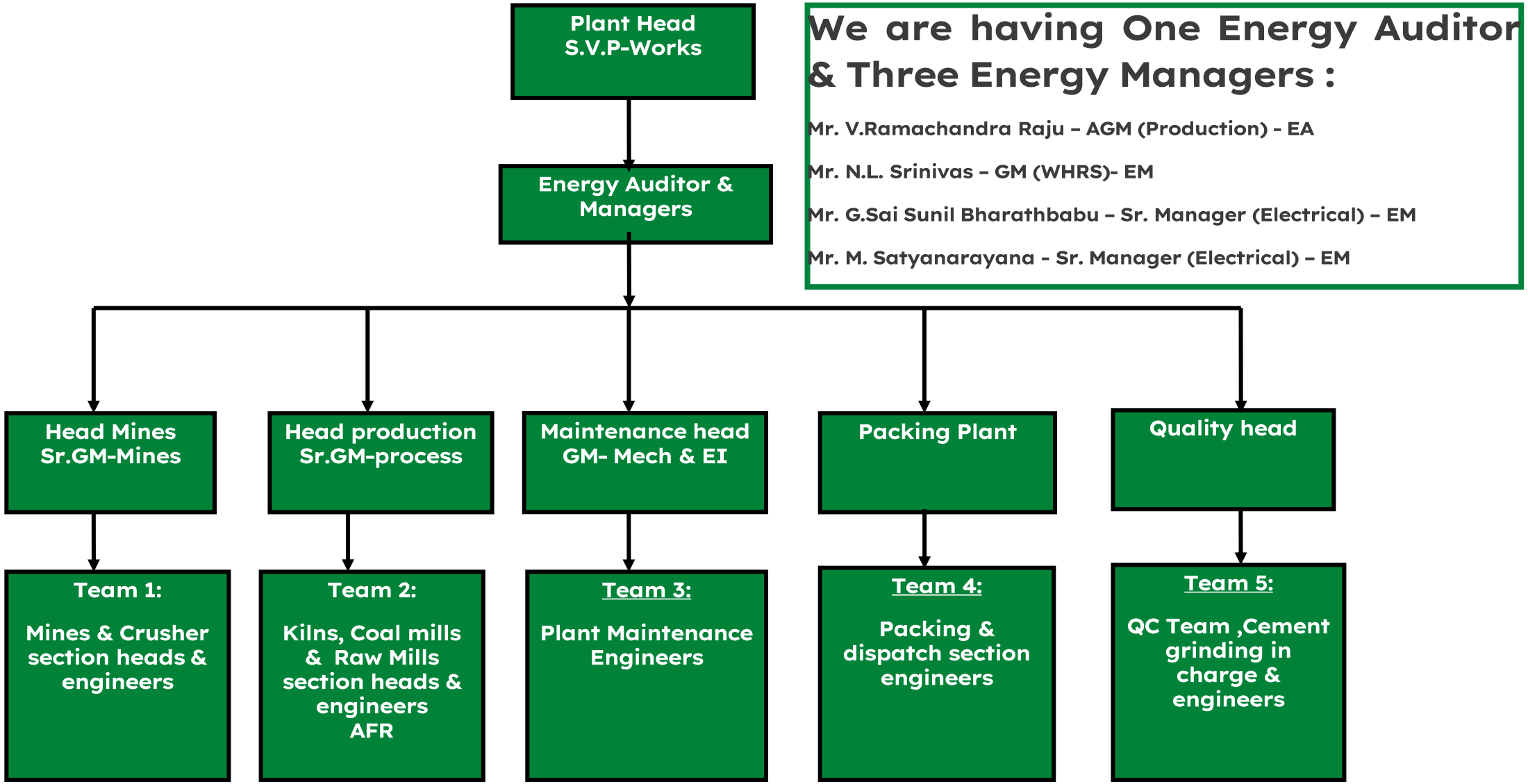
8. GHG Inventorisation

GHG	UOM	2020-21	2021-22	2022-23	2023-24
Scope 1 Emission (direct emission from fuels used)	Kg CO2/Equivalent Product	685.59	667.12	633.64	651.39
Scope 2 Emission (indirect emission from grid electricity)	Kg CO2/Equivalent Product	78.85	74.89	74.41	73.96

GHG Emission Intensity reduction (Scope - 3)

Scope -3	
Inbound Logistics	Outbound Logistics
Raw materials Lead distance reduced by devolving the local vendors	**Clinker:** Lead distance reduced from 730Kilometers to 300 Kilometres by swapping the Clinker with ACC Limited, Wadi
Spares Parts & Others: We developed the local vendors	**Cement:** 45% Dispatches are going through rail only.
Packing Bags: Lead distance reduced by 150Km by developing the local vendor. **Local transportation:** Battery vehicles for material transportation inside the boundary	**Manpower:** •Pool Vehicle for Employee shift travel operation •Employee commuting and business travels have been drastically reduced since last one year. •All the trainings and official works communicating through teams only.

9. Energy Management Team



We are having One Energy Auditor & Three Energy Managers :

Mr. V.Ramachandra Raju – AGM (Production) - EA

Mr. N.L. Srinivas – GM (WHRS)- EM

Mr. G.Sai Sunil Bharathbabu – Sr. Manager (Electrical) – EM

Mr. M. Satyanarayana - Sr. Manager (Electrical) – EM

9. EMS System and other requirements

ISO 50001 : 2018

ISO 9001 : 2015

ISO 14001 : 2015

ISO 45001 : 2018

ISO Certifications by TUV

9. EMS System and other requirements

GRIHA Council

This is to certify that the product of

"Zuari Cement Limited"

PPC
(under typology Pozzolana cement)

has been included in the GRIHA Product Catalogue under the following categories:

GRIHA V.3 criterion: 15;
GRIHA V.2015 criterion: 19;
GRIHA V.2019 criterion: 19 & 21
&
SVAGRIHA criterion: 11

The product can be used in GRIHA & SVAGRIHA registered projects to meet the GRIHA & SVAGRIHA norms, respectively. This is valid only for the product which has been mentioned above.

The certificate for the above mentioned product is valid from
11th July 2022 – 10th July 2024

Sanjay Seth
Chief Executive Officer

- PPC

GRIHA Council

Government of Andhra Pradesh

Andhra Pradesh Greening and Beautification Corporation

AP Green Awards - 2017

This is to certify that Mr. / Ms. / M/s Zuari Cement Ltd. Yerraguntla, Kadapa Dt.

has been Awarded Spl. Jury Award in the category of Industries, Corporates and Institutions (Industries - Private) for contributing in the field of greenery development.

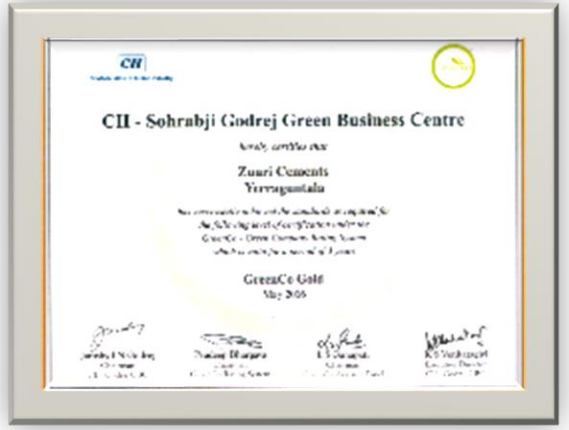
Managing Director
APG&BC

AP Green Awards - 2017

CII-Green Products and Services Council

Zuari - Portland Pozzolana Cement (PPC)

CII - GreenPro Certification



CII - Sohrabji Godrej Green Business Centre

Zuari Cements
Yerraguntala

GreenCo Gold

CII – GreenCo Gold Award

9.Monthly reviewing meeting

- Monthly specific Energy Consumption (Thermal & Electrical)
- Best practices or improvements in HC group
- H & S alerts
- One step – One week
- DPR report
- Status of improvement points
- Capex status
- CO2 Emissions

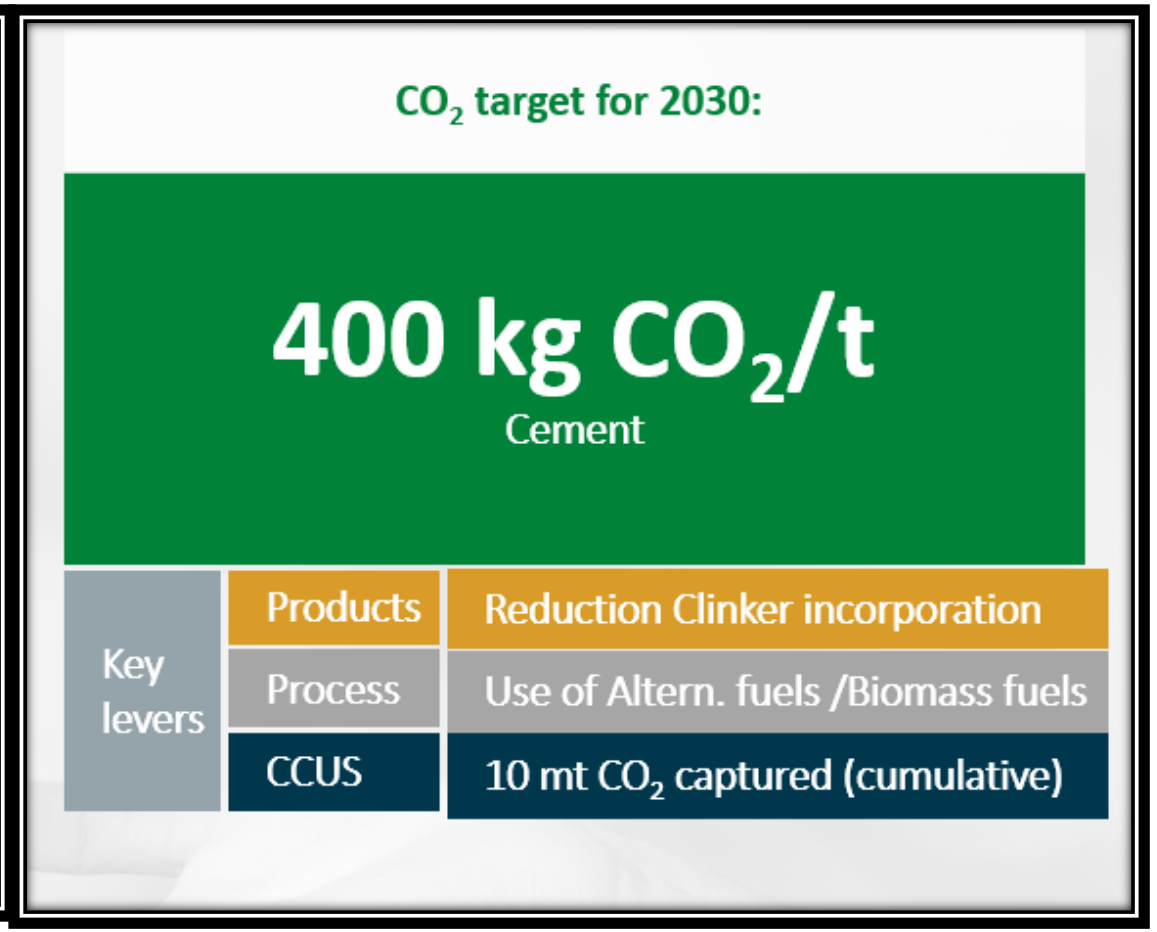
9.Encon projects reviewing in site with all CFT team members


NET
ZERO
Co_2


CARBON NET ZERO

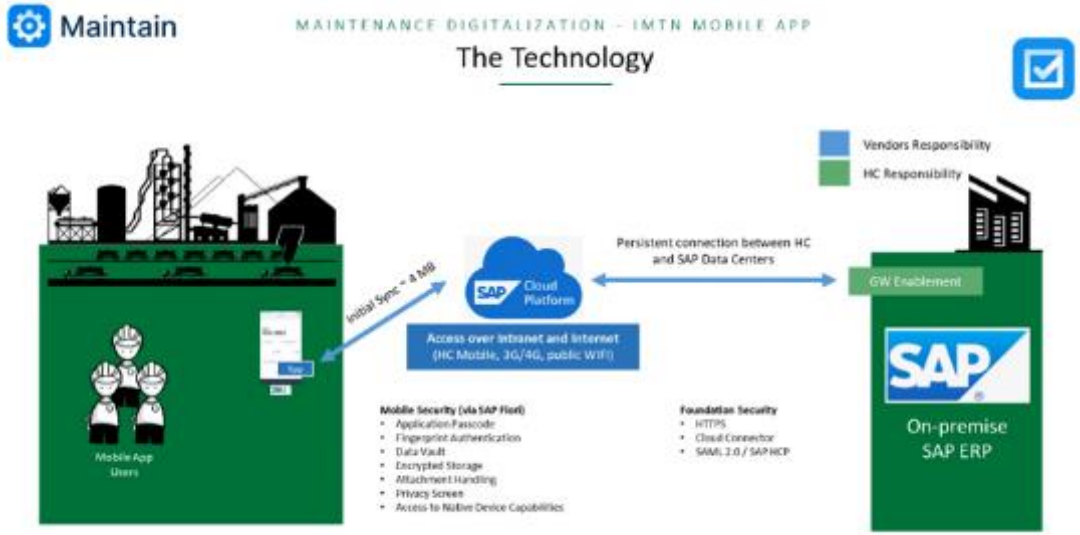

Net-Zero Emissions
2050

Group Focus and Target



HC India Sustainability Dashboard

Innovative IOT Technology



Implementation of Digital Signature on Cement outward documents

- We have been manually signing all Tax Invoices, and Delivery Challans on sale/despatch of cement / clinker.
- Now, all sales related documents including Debit note and Credit Note are digitally signed by the system.
- There is no need for keeping office copy resulted into saving of >100K A4 size papers per annum; contributes to save Environment.
- Retrieval of documents in future becomes very easy.

10. Net Zero commitment

The world's first carbon captured net-zero cement

Introducing our evoZero® products

The world's first carbon captured net-zero cement with 100% quality and transparency

Heidelberg Materials

Search Menu

Carbon capture in the cement industry

We aim for mechanical completion of our CCS facility in Brevik ↗, Norway, by end of 2024. Based also on the knowledge gained in Brevik, Heidelberg Materials has launched around a dozen other CCUS projects, some of which come with significantly higher capture rates and will completely decarbonise some of our cement plants already before 2030.

Among others, these projects include:

- **Edmonton** in Canada,
- **Padeswood** in the United Kingdom,
- **Geseke** in Germany, and
- **Slite** ↗ in Sweden.

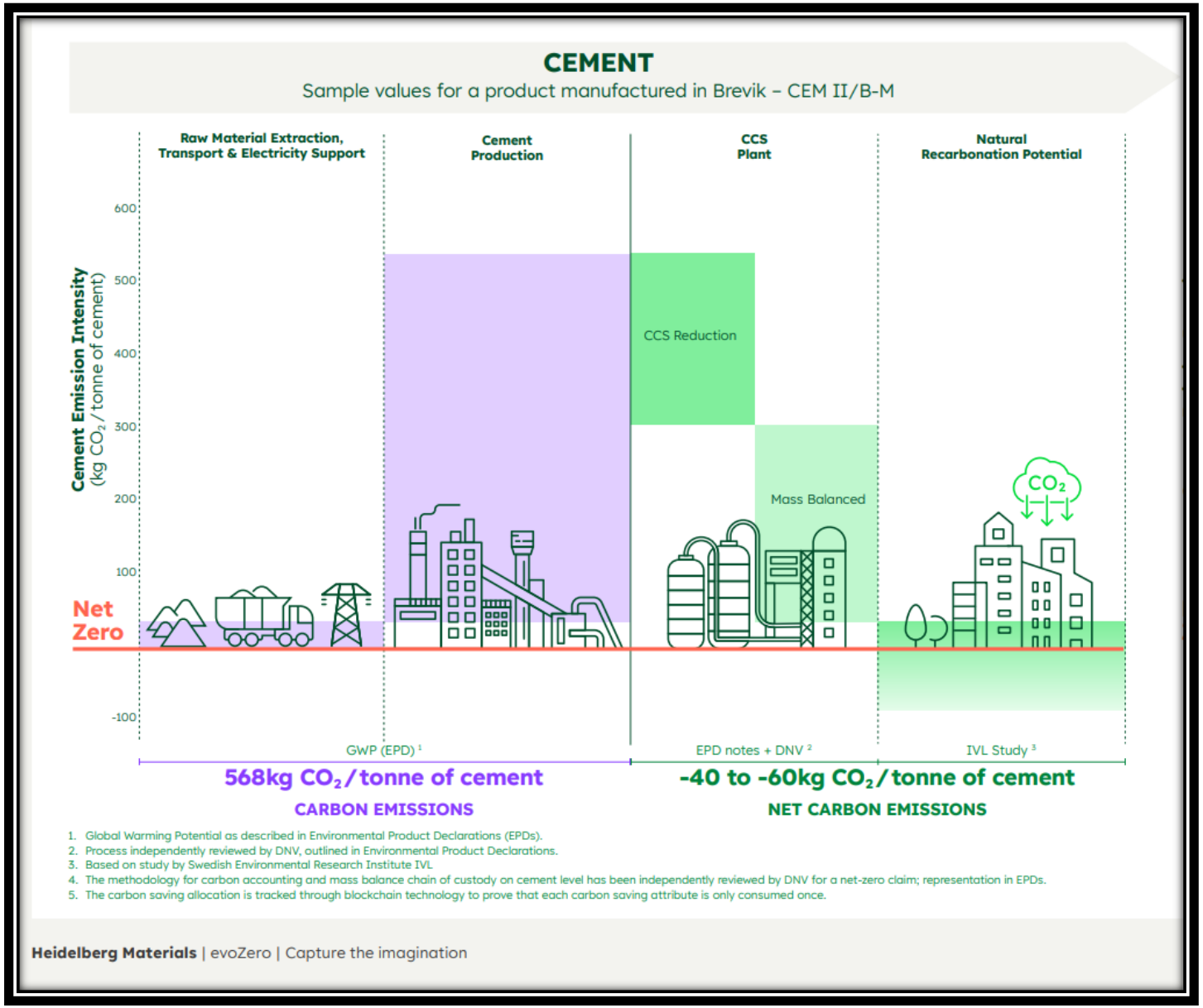
Net-zero by 2050

CCUS is a key component of our climate strategy. With Heidelberg Materials' already launched CCUS projects alone, we aim to cut our carbon emissions **by 10 million tonnes** cumulatively by 2030.

We will offer **carbon captured net-zero concrete** across our entire product portfolio by 2050 at the latest. In doing so, we are focusing on a combination of measures: in addition to CCUS, we are focusing on the increased use of substitute fuels and alternative secondary cementitious materials (including recycled materials).

CCS project completion by end of 2024 in Brevik, Norway

CO_2 capture 400KT per year which is equal to 50% of the Plants emissions.



Decarbonising cement is one of the most complex tasks in the Green Transition. At Heidelberg Materials, we are addressing this challenge with our full energy.

We're taking the lead in the decarbonisation of our sector. With our Brevik CCS project, we're pioneering carbon capture and storage in our industry at scale. Our new evoZero range makes us the first company in the world to offer carbon captured net-zero cement through the application of CCS technology in Brevik, Norway – and without using offsetting with credits generated outside our value chain.

Pioneering the decarbonisation of our sector

Carbon capture technology has the potential to completely transform cement production and enable a whole new level of CO_2 reduction. We have been developing the industry's first large-scale CCS facility in Norway since 2005.

Once operational, the facility at our Brevik plant will capture 400,000 tonnes of CO_2 annually, equaling 50% of the plant's emissions.

The success of Brevik CCS is the result of our unique team spirit and belief in new technology, plus years of expertise and thousands of hours of hard work. As the world's first site to capture carbon emissions from clinker production on an industrial scale, Brevik is revolutionising cement production.

Heidelberg Materials