WELCOME TO

RAIN CEMENTS LIMITED

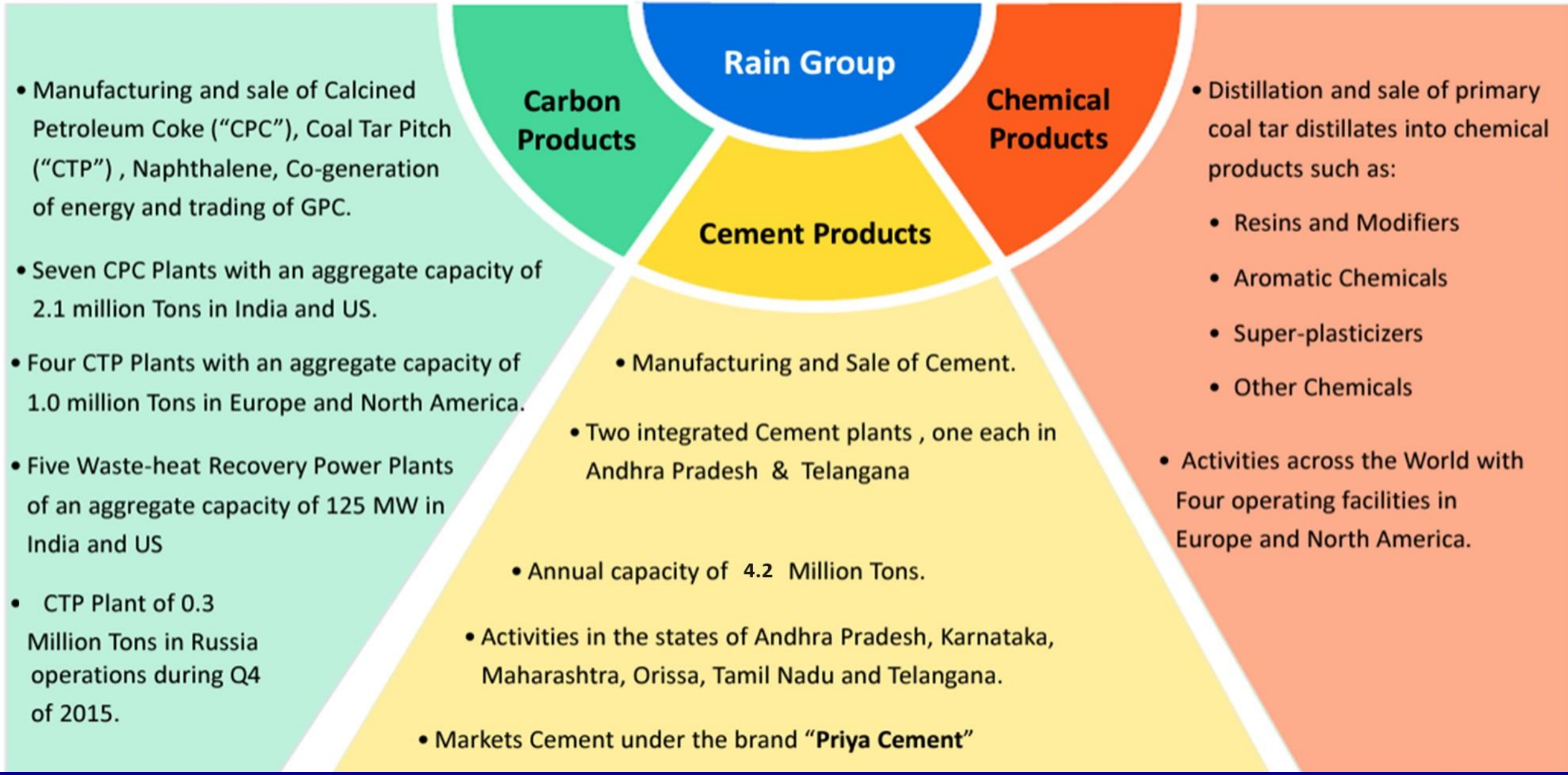
National Award for

"Excellence in Energy Management 2024"

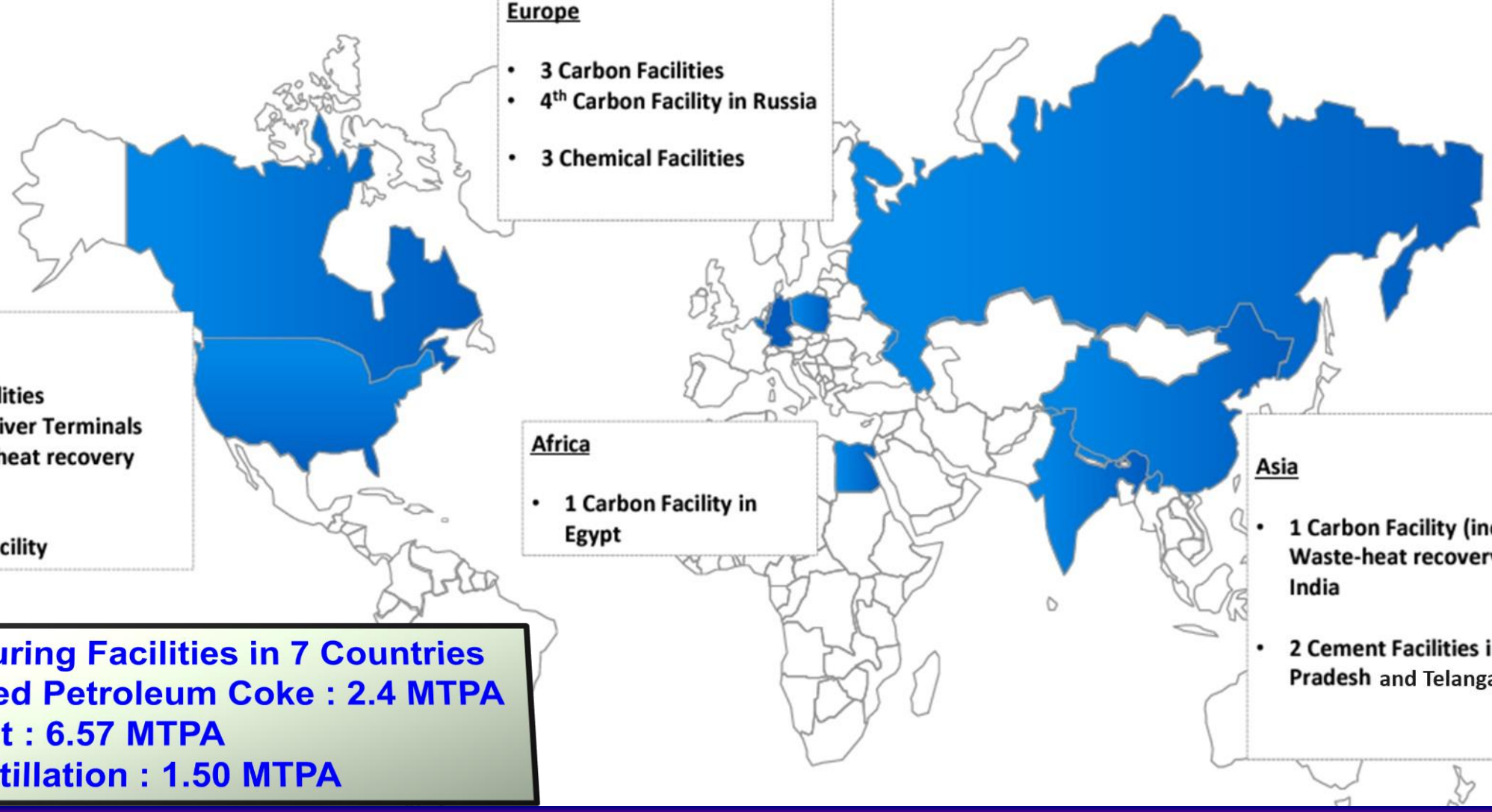
RAIN CEMENTS LIMITED

UNIT-II, SREEPURAM

RAIN INDUSTRIES LIMITED (RAIN)



RAIN INDUSTRIES LIMITED (RAIN)



Europe

- 3 Carbon Facilities
- 4th Carbon Facility in Russia
- 3 Chemical Facilities

North America

- 7 Carbon Facilities (Including 3 River Terminals and 4 Waste-heat recovery facilities)
- 1 Chemical Facility

Africa

- 1 Carbon Facility in Egypt

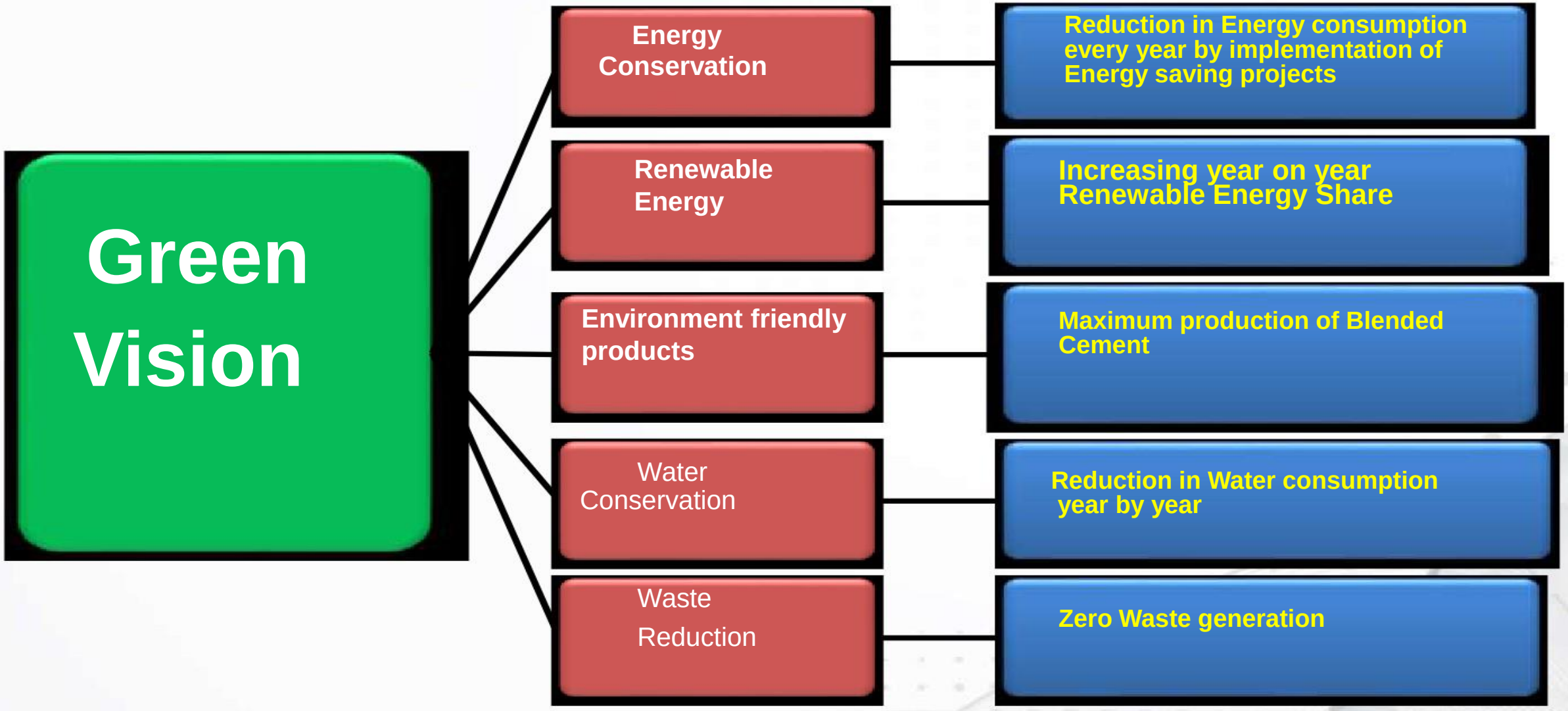
Asia

- 1 Carbon Facility (including 1 Waste-heat recovery facility) in India
- 2 Cement Facilities in Andhra Pradesh and Telangana

Manufacturing Facilities in 7 Countries

1. Calcined Petroleum Coke : 2.4 MTPA
2. Cement : 6.57 MTPA
3. Tar Distillation : 1.50 MTPA

RCL GREEN VISION



RCL CEMENT BUSINESS

Contributing to Bharath Nirman

RCL Cement Business

Location	Capacity- MTPA
Ramapuram- Telangana	1.50
Sreepuram- AP	2.77
Ramapuram - Telangana (Under Execution)	2.30
TOTAL CEMENT PRODUCTION CAPACITY	6.57

RAIN CEMENTS LIMITED

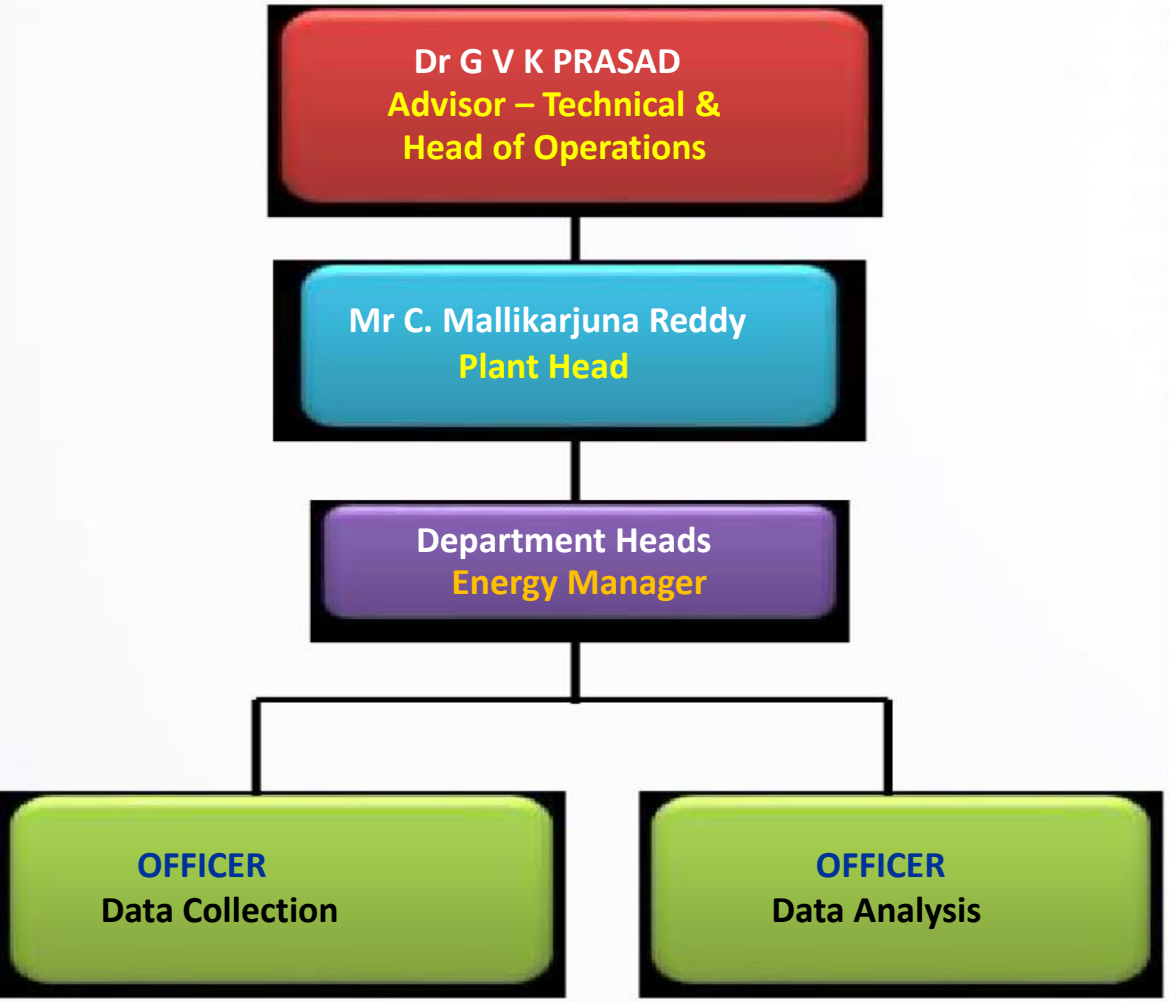
MAJOR EQUIPMENT – RCL UNIT-II

PRIYA CEMENT
Lives Forever

Equipment	Supplier	Rated	Operating	Beyond Capacity
Crusher	L&T	800 TPH	920 TPH	+15%
Raw mill VRM	FLS	305 TPH	340 TPH	+11.5%
Pyro 5stage Preheater	FLS	3800 TPD	4450 TPD	+17.1%
Coal mill VRM	FLS	30 TPH	35 TPH	+16.5%
Cement mill Roller press	TKIL	145 TPH	195 TPH	+34%

RAIN CEMENTS LIMITED

FORMATION OF
RCL ENERGY MANAGEMENT CELL



Designation	Roles & Responsibilities
Advisor – Tech & Head - Operations	• Drive the energy saving culture in the organization. • Set targets for reduction in various parameters inline with the Vision & Energy policy. • Fiscal validation of Power saving projects and necessary allocation.
Plant Head	• Review status of Power saving projects through Monthly review meetings. • Drive employee involvement initiatives
Department Heads & Energy Manager	• Identification & implementation of energy conservation projects. • Drive employee involvement initiatives. • Generate energy conservation ideas. • Measure, Monitor & analyze section wise energy consumption in the factory

RAIN CEMENTS LIMITED (RAIN)

Energy Saving Projects Implemented during 2021-2022

Sr.No	Name of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)
1	Application of Aluminum Heat resistant paint for Kiln Shell for 40 mts	0.596	0.00	22.235	3.73
2	Preheater False air reduction	0	0.06	---	0.38
3	Raw Mill False air reduction	0	0.06	---	0.35
4	Coal Mill False air reduction	0	0.07	---	0.39
5	Installation of VFD for Line-2 Blending silo areation blower	0.25	0.06	---	0.38
6	Replacement of Line-2 Kiln shell cooling fans (metal fans) with FRP fan blades	0.1	0.20	---	1.18
7	Optimization of cooler fans operation with PID controls	0.2	0.56	---	3.37
8	Packer's hopper aeration line changed from compressed air to blower air	0.3	0.09	---	0.53
9	Installation of VFD for Line-2 LS hoppers bag filter fan	0.4	0.06	---	0.38
10	Replacement of Line-2 plant return water pump (15KW) with energy efficient pump (5.5KW)	0.5	0.10	---	0.58
11	Line-1 cementmill upgradation by installing roller press	46.9	5.29	---	31.72
12	Air conditioners switched OFF by providing heat vent-out ducting for ESP TR-set panels	0.6	0.03	---	0.18
13	Air dryer ON/OFF interlocked with compressor air line pressure	0.7	0.01	---	0.07
14	Installation of VFD for WHR Aux-cooling tower water pump	0.7	0.07	---	0.44
15	LS hoppers reversable belt conveyor removed, by arranging direct chute.	0.7	0.02	---	0.10
Total:		51.95	6.67		43.78

RAIN CEMENTS LIMITED (RAIN)

Energy Saving Projects Implemented during 2022-2023

Sr.No	Name of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)
1	Installation of 500KVAR HT Capacitor bank at Line-2 load center-4 to save energy by improving power factor.	0.36	0.35	--	1.93
2	Plant water pump (U2CH800-15KW) replaced with energy efficient pump (5.5KW)	0.11	0.09	--	0.52
3	Line-2 Raw Mill Main drive power reduced by increasing mill temperature increased 65^0C to 72^0C	0.00	0.36	--	2.19
4	Line-2 Raw mill auxiliary Bag filters purging time increased from 12 sec to 30 sec	0.00	0.05	--	0.33
5	Installation of compressor air flow meters phase-II	0.67	0.10	--	0.58
6	Replacement of Line-1 DC motors with AC Motors	0.15	0.02	--	0.10
7	Replacement of Line-2 water feeding standby pumps (45KW & 22KW) with energy efficient pump (45KW)	0.15	0.15	--	0.90
8	Installation of roof top solar 40KW on canteen and 20KW on Administrative building	2.03	0.08	--	0.50
9	Optimize the Ventilation volume of packing plant bag filter fans for all 3nos by installing VFDs	0.66	0.23	--	1.37
10	Optimization of compressor pressure settings to save energy	0.00	0.35	--	2.09
11	Optimization of transformers operation	0.00	0.04	--	0.27
12	Installation of additional cooler for Line-2 Cement mill Slide shoe bearing	0.40	0.05	--	0.28
Total:		4.53	1.87	--	11.04

RAIN CEMENTS LIMITED (RAIN)

Energy Saving Projects Implemented during 2023-2024

Sr.No	Name of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)
1	Avoid pressure drop & damper Loss in Auxiliary bag filter fans (3Nos) in Line-2 VRM by providing VFDs.	1.13	0.19	---	1.05
2	Lightly loaded Motors connections conversion from Delta to Star in Line-1 Polycom, Packer & L2 VRM.	0.00	0.05	---	0.26
3	Optimization of air conditioner's operation in Line1 Polycom & Line-2 LC-1.	0.00	0.03	---	0.17
4	Line-1 Polycom belt (5C1-BCO4) Removed by arranging Y-chute.	0.18	0.05	---	0.27
5	Line-1 Cement mill CA fan HT Motor (350KW, 6.6KV) replaced with LT Motor (160KW) with VFD	0.18	0.24	---	0.86
6	Line-1 Polycom Baghouse fan Soaft Starter replaced with VFD.	1.05	0.57	---	3.12
7	Replacement of Line-2 cement mill recirculation water pump with energy efficient pumps	0.15	0.03	---	0.19
8	Replacement of Single stage centrifugal pump (15KW) with multistage submersible pump (7.5KW) for Line-2 make up water pump.	0.04	0.07	---	0.36
9	under rating roots blowers with suitable blower for Fly ash unloading at Line-2 Cement mill	0.35	0.04	---	0.22
10	Optimization of Line-2 RABH pursing time to save energy	0.00	0.98	---	5.38
11	Usage of tyre oil in place of HSD for Kiln's light up firing	1.08	0.00	229.77	10.34
12	Utilization of Lime stone in place of Fly ash as performance improver	0.00	0.00	---	24.33
13	Line-2 Cooling tower Fans start-stop logic for running hours optimization	0.02	0.03	---	0.14
14	Optimization of Compressor air in Line-2 Kiln & coal mill sections	0.00	0.37	---	2.02
15	Coal crusher bypass during coal crushing	0.00	0.25	---	1.35
Total:		4.17	2.88	229.77	50.07

RAIN CEMENTS LIMITED (RAIN)

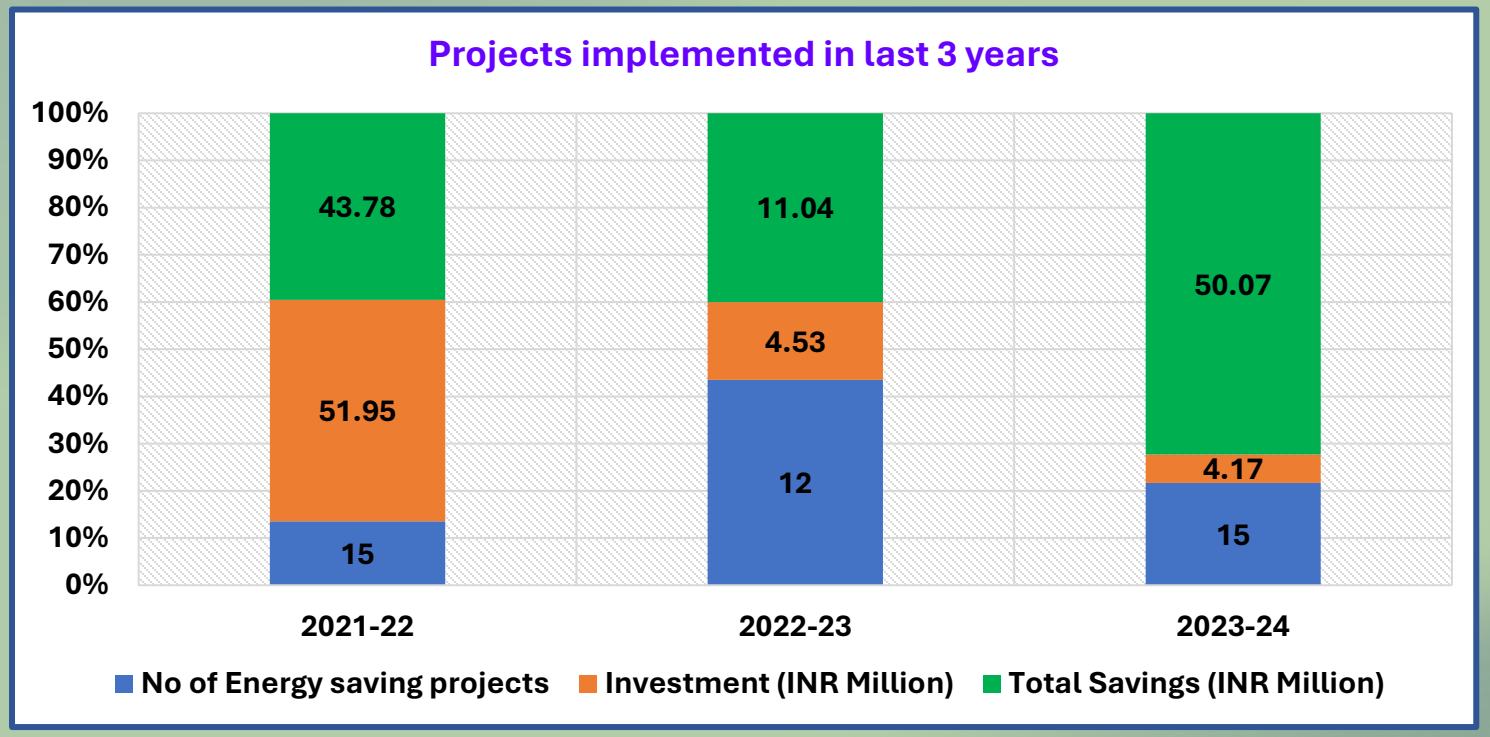
Energy Saving Projects Planned during 2024-2025

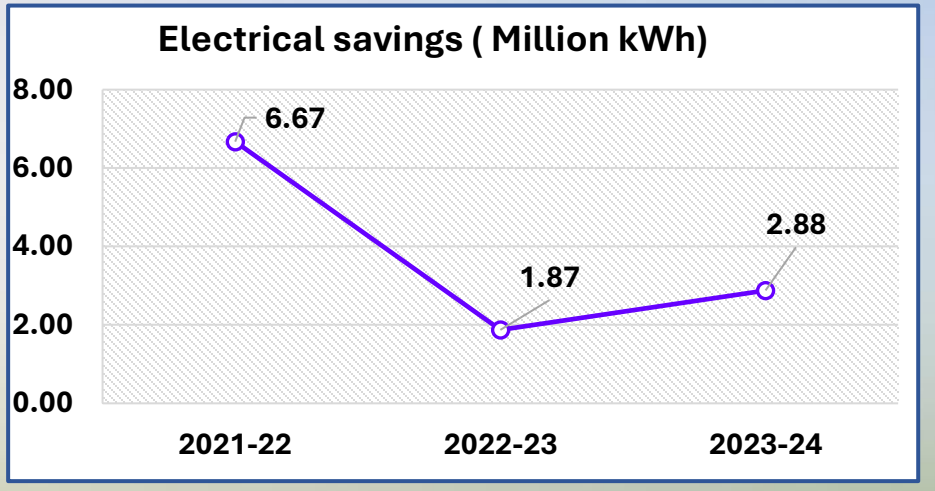
Sr.No	Title of Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Annual Energy Saving (ToE)	Investment (Rs in Million)	Estimated Payback (months)
1	Installation of Energy Savers for AC units	0.30	0	25.800	1.096	7.43
2	Reduce preheater and kiln radiation losses by thermal insulation paint-Phase-2	0.00	4137.536	413.754	1.166	2.06
3	SPRS for Line-2 VRM CA Fan	1.88	0	161.353	20	23.26
4	Installation of 883 KVAR HT capacitor bank to improve power factor.	0.14	0	12.37	0.648	8.33
5	Line-2 Cooler upgradation to increase recuperation efficiency	0.00	7341.477	734.148	27.5	27.42
6	L2 Cooler out bag filter fan switched off by connecting venting line to ESP fan	0.09	0	8.037	0.2	4.35
7	Installation of Efficient blower for Kiln Firing	0.144	1.3392	12.384	10	52.17
8	Replacement of Line-2 Cement mill CA Fan with energy Efficient impeller	0.792	0	68.112	8	22.04
9	Hormonic study in all load centers and installation of Hormonic filters	0.11	0	9.382	0.3	6.00
10	Operating CEP to maintain the Deaerator level by VFD control rather than control valve	0.09	0	7.818	0.85	20.40
11	Installation of solar water heaters for colony Quarters (A+, A, B,C,D,E, F & SR)	0.20148	0	17.327	8.98	89.17
12	Installation of roof top solar power on Mines office, school & Hospital	0.1914	0	16.460	3.721308	38.89
13	Construction of New CSP in Line-2	0	145.879	1.646	2538	20.15

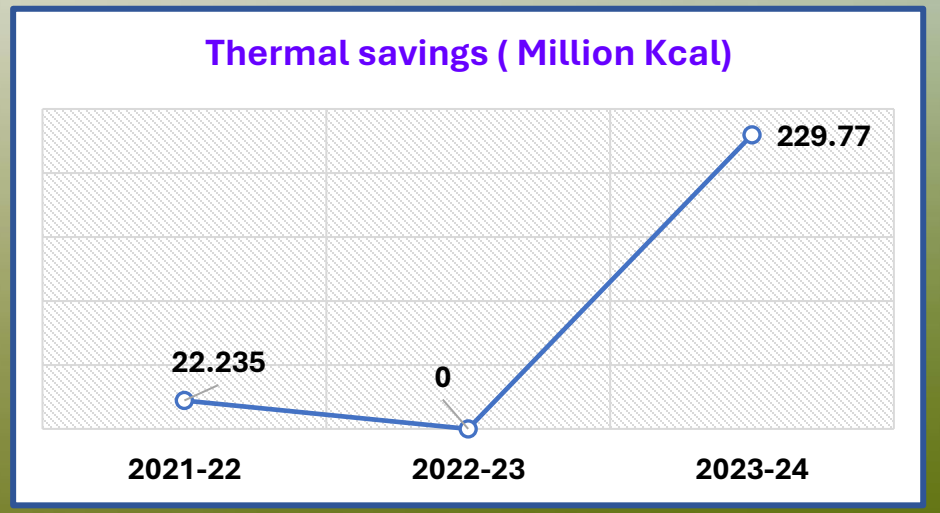
SUMMARY OF PROJECTS IMPLEMENTED IN LAST 3 YEARS

RAIN CEMENTS LIMITED

PRIYA CEMENT Lives Forever







Year	Reduction SEC kWh /MT cement
2021-22	3.61
2022-23	0.94
2023-24	1.36

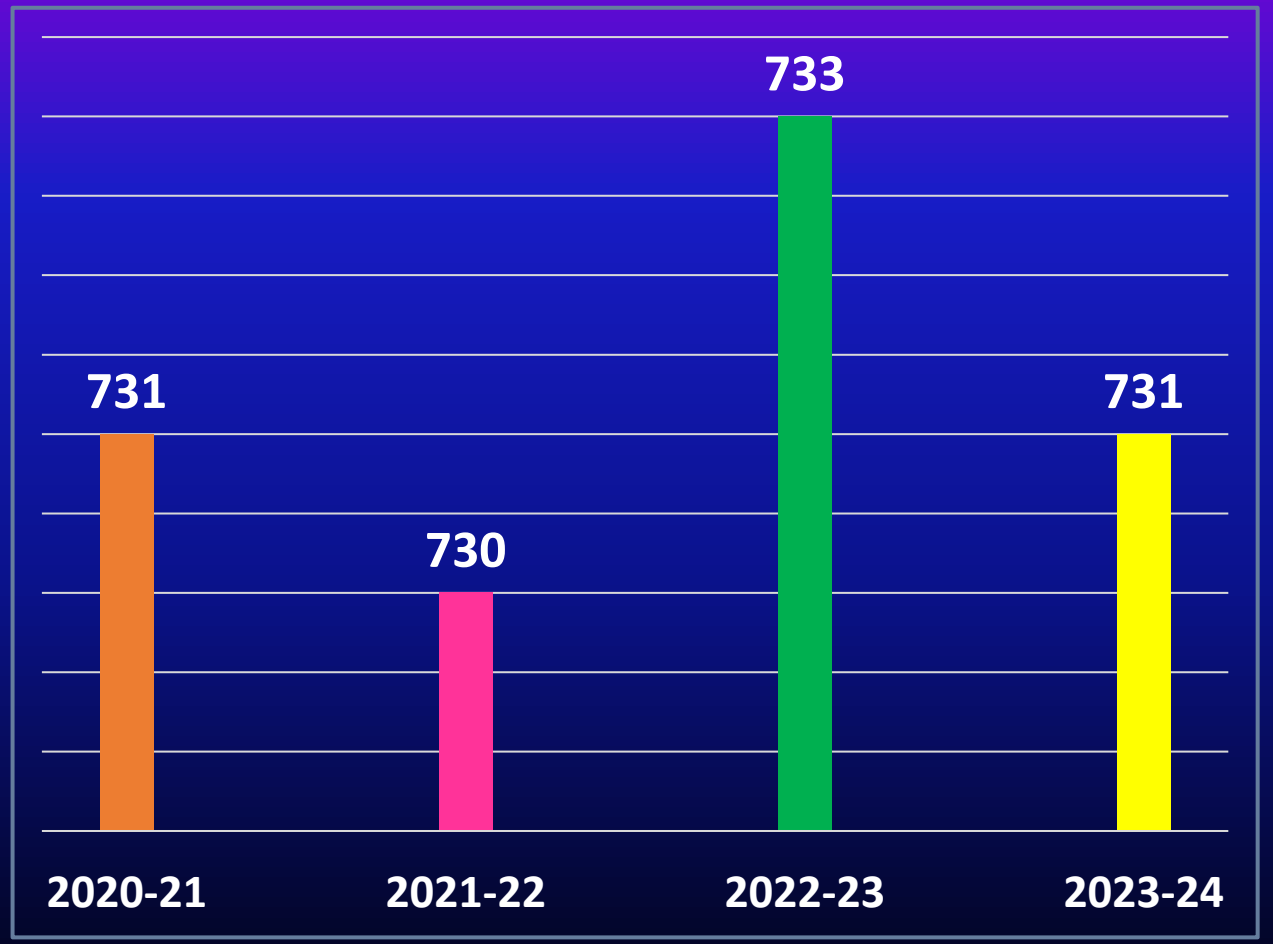
ENERGY CONSUMPTION - CLINKER

Specific power consumption

Up to Clinker – KWh/T

Specific Heat Consumption

Kcal/Kg Clinker

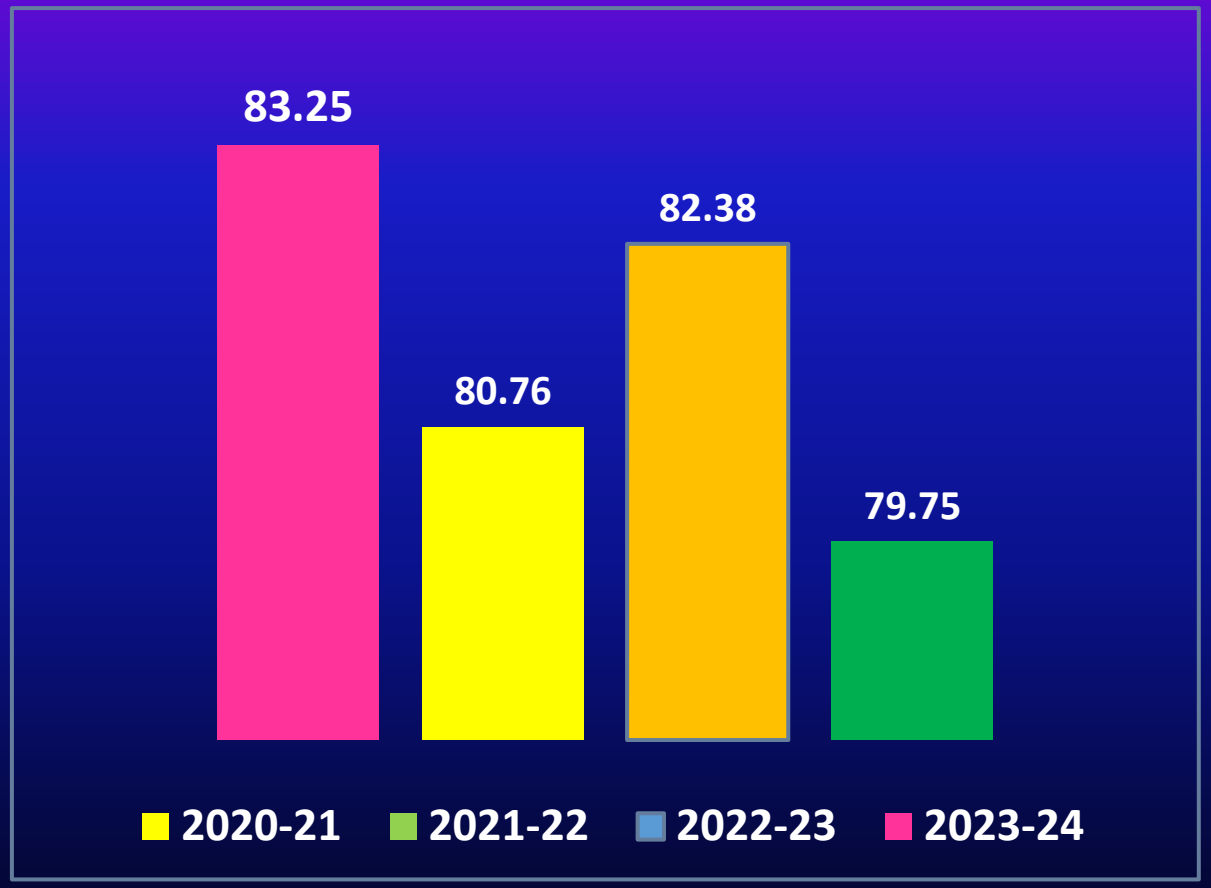


ENERGY CONSUMPTION IN 2022-23 INCREASED DUE TO USAGE OF PET COKE

ENERGY CONSUMPTION - CEMENT

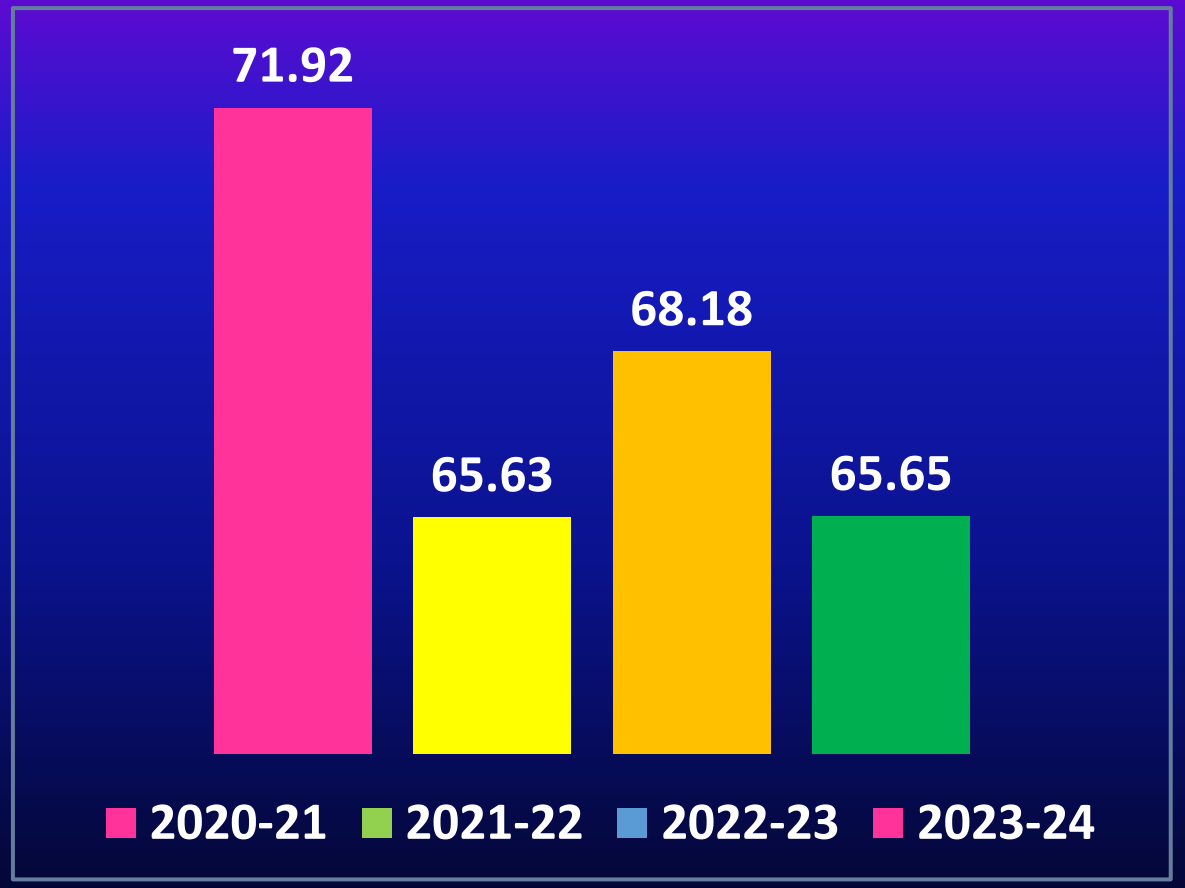
Specific power consumption

Up to OPC – KWh/T



Specific Power Consumption

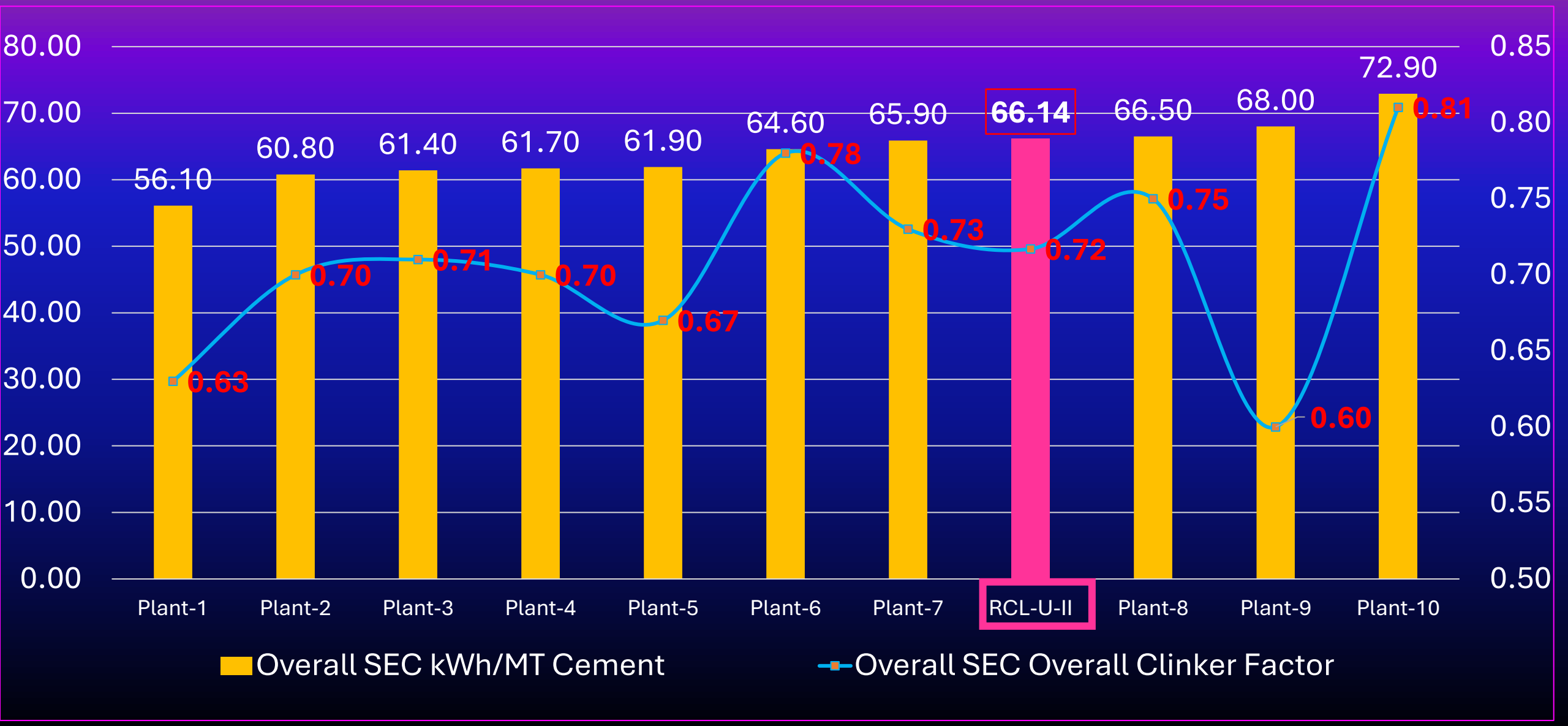
Up to PPC – KWh/T



ENERGY CONSUMPTION IN 2022-23 INCREASED DUE TO USAGE OF PET COKE

ENERGY CONSUMPTION – TOP TEN CEMENT PLANTS

Overall SEC & Clinker factor

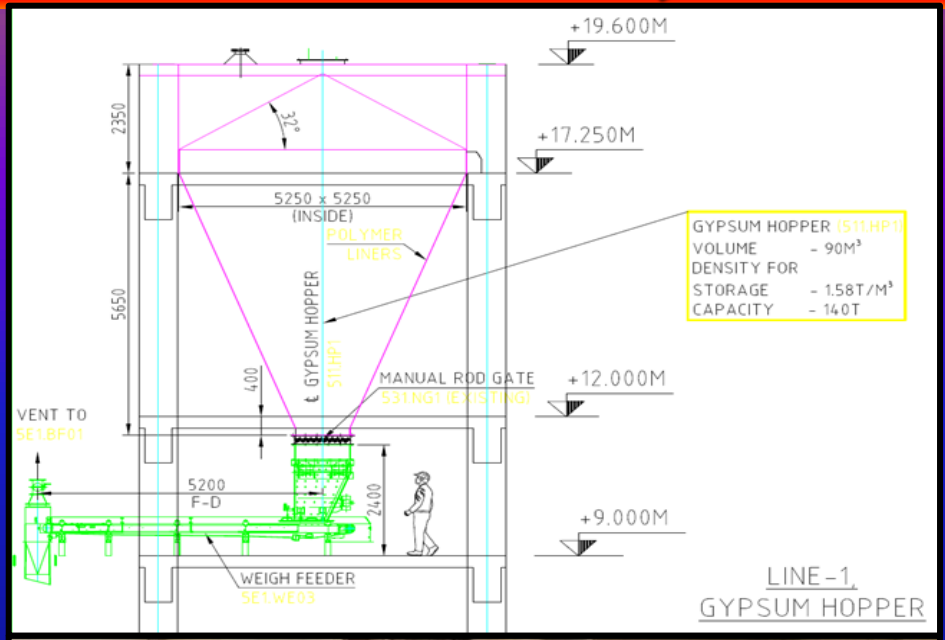


Innovative Project – 1 : Additives Mixing in Limestone Pile

ADVANTAGE: ***ZERO INVESTMENT***

- Uniform Quality of Raw Mix
- Smooth Operation of Kiln
- Avoided internal movement of Additives
- Stopped Additive Crusher
- Reduction in HSD Consumption
- No Jamming in Chutes / Hoppers
- Consistence in Quality of Clinker
- Reduction in Clinker Cost
- Reduction in CO2 Emission due to less HSD Consumption

Innovative Project – 2 : Enhancement of PPC Production



Project Description:

Previously in Line-1 cement mill Gypsum weigh feeder capacity was 15 Tons only, due to this, we are unable to increase cement mill production.

Action Taken:

Our team decided to modify the gypsum weigh feeder chute by extra opening and adjusted the load cells up to 22 tons capacity. Test trial was taken and achieved an increased in PPC Production from 165 TPH to 195 TPH.

Benefits: ZERO INVESTMENT

PARTICULARS	BEFORE	AFTER
RP Output -TPH	165	195
Power Consumption- KWh/T	26.23	23.23
Fly Ash %	32	33

- Amount Saved : Rs 20.64 Lakh/Year

Innovative Project – 3 : Enhancement Limestone pile Capacity

Project Description:

- Previously limestone Pile Capacity is 18,500 MT
- Mining Equipment is being utilized under capacity

Action Taken:

- ✓ Increased the Stacker retention time at both ends of limestone pile
- ✓ Increased the Stacker boom height by 500 mm

Benefits: ZERO INVESTMENT

PARTICULARS	BEFORE	AFTER
Pile Capacity - MT	18,500	22,500
Reclaimer output- TPH	500	530
Reclaimer power- KWh	94	88

Innovative Project – 4 : Cement Mill CA fan HT Motor(350KW) replaced with LT Motor (160KW)

Project Description:

- ❖ Previously Line-1 Cement mill CA fan 350KW 6.6KV HT motor operating @ 95KW.
- ❖ After Polycom installation, it was found under loaded, there is margin for energy saving by replacing with suitable rating LT motor

Action Taken:

- ✓ Proposed to replace 350KW HT motor with available 160KW LT Motor with VFD to save energy.

Benefits:

PARTICULARS	BEFORE	AFTER	Saving(Kw)
Power consumption(KW)	97.32	61.4	35.92

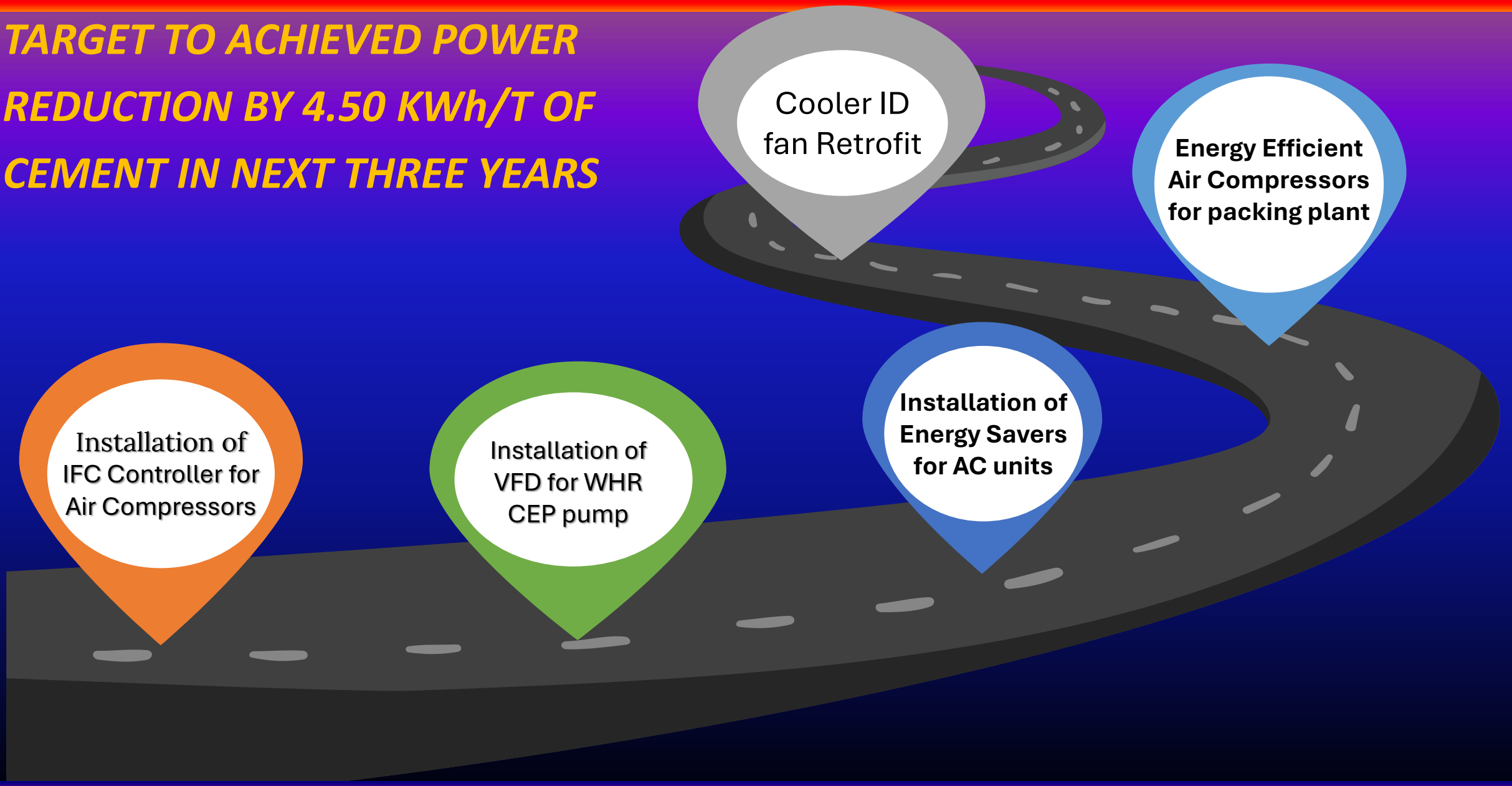
Energy Savings per annum: 1,56,710 KWH

Reduction in Specific power: 1.5kwh/ton of cement

- ➢ Amount Saved : Rs 8.61 Lakh/Year

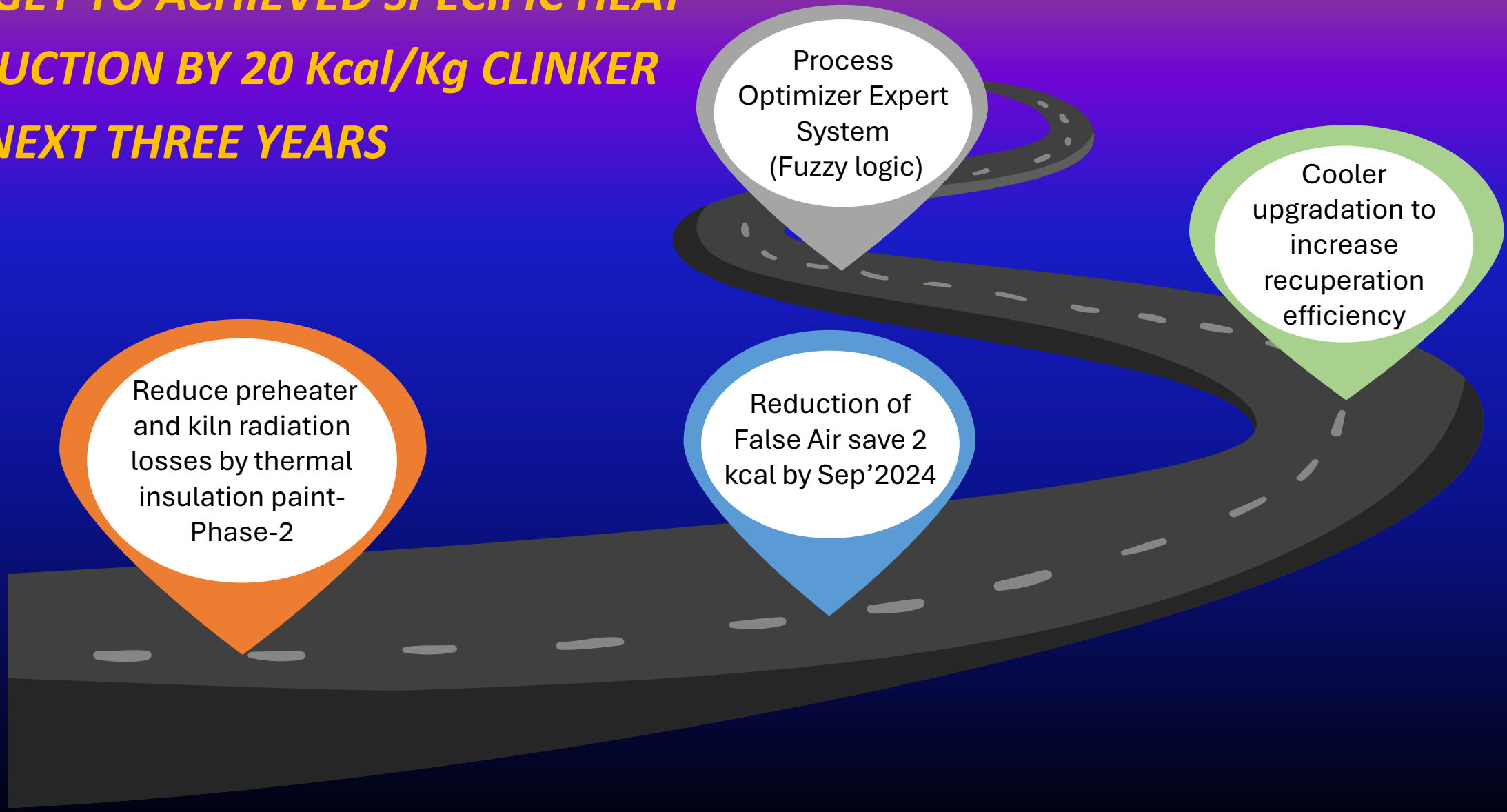
ROAD MAP FOR ACHIEVING NATIONAL / INTERNATIONAL BENCHMARK

TARGET TO ACHIEVED POWER REDUCTION BY 4.50 KWh/T OF CEMENT IN NEXT THREE YEARS



ROAD MAP FOR ACHIEVING NATIONAL / INTERNATIONAL BENCHMARK

TARGET TO ACHIEVED SPECIFIC HEAT REDUCTION BY 20 Kcal/Kg CLINKER IN NEXT THREE YEARS



RCL RENEWABLE ENERGY

RAIN CEMENTS LIMITED
RCL GREEN POWER

Green Power	Capacity
Solar	19.30 MW
WHR	10.60 MW
Total	29.90 MW

Contributing to 43% RCL Power Requirement

RCL UNIT-2 SOLAR POWER PLANT
CAPACITY : 13.26 MW

Our Plant is operating with 43% of Green Energy

RAIN CEMENTS LIMITED
RCL CEMENT UNIT - II

INSTALLED 6.45 MW WHR PLANT CATERING TO 32% OF OUR POWER REQUIREMENT


Established RAIN Oxygen park with
8,200 Saplings as a part of Environmental
Sustainability.

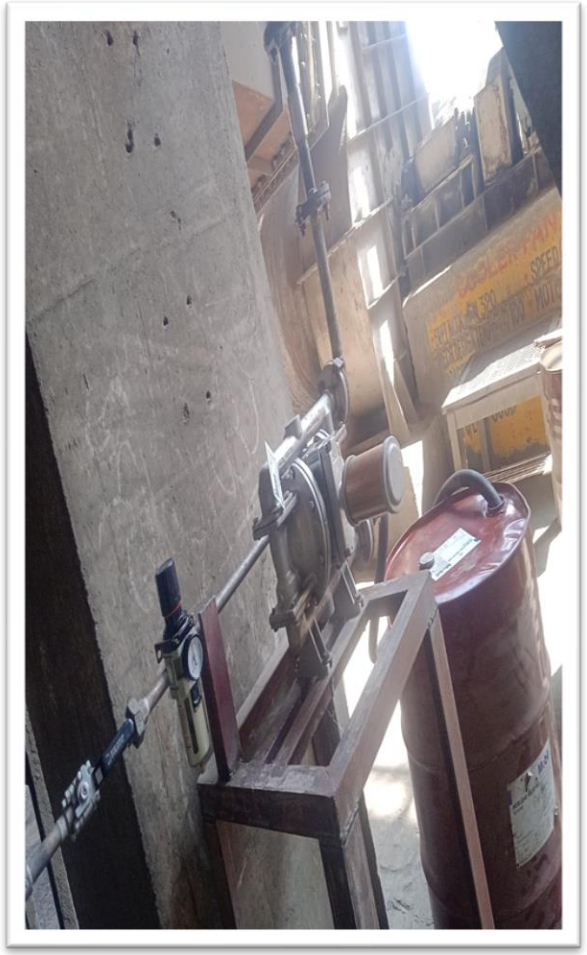
RAIN CEMENTS LIMITED

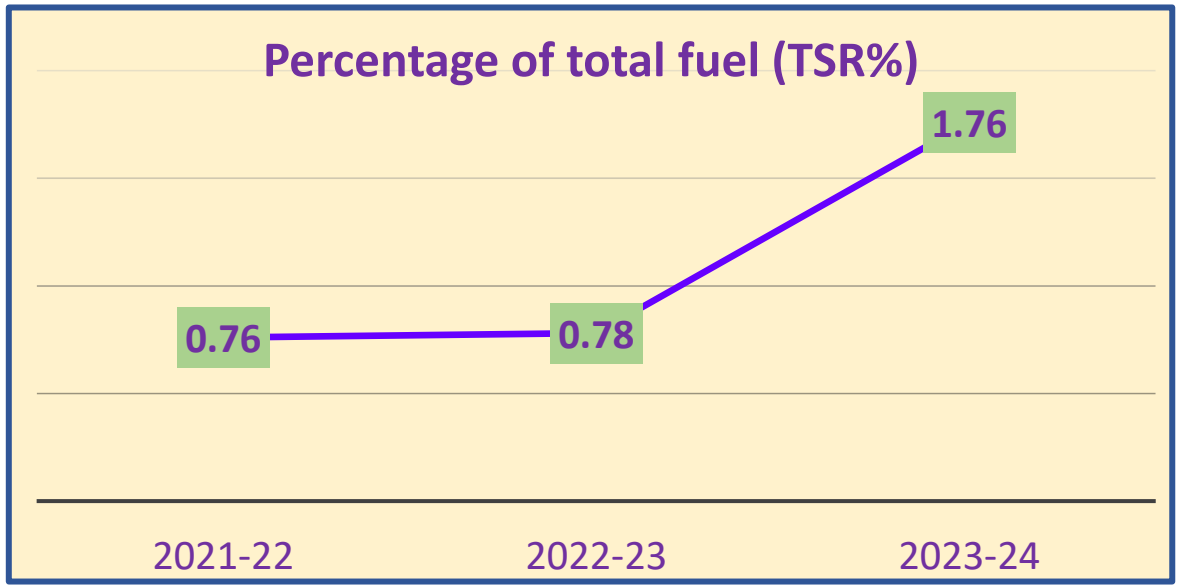
WE ARE MORE THAN FOUR TIMES WATER POSITIVE

PRIYA CEMENT
Lives Forever

Our Conservation efforts helped us Harvest 10,234 Million Liters Rainwater within our Premises and nearly Villages, boosting Water availability for local Communities around our Plant.

Waste utilization and management

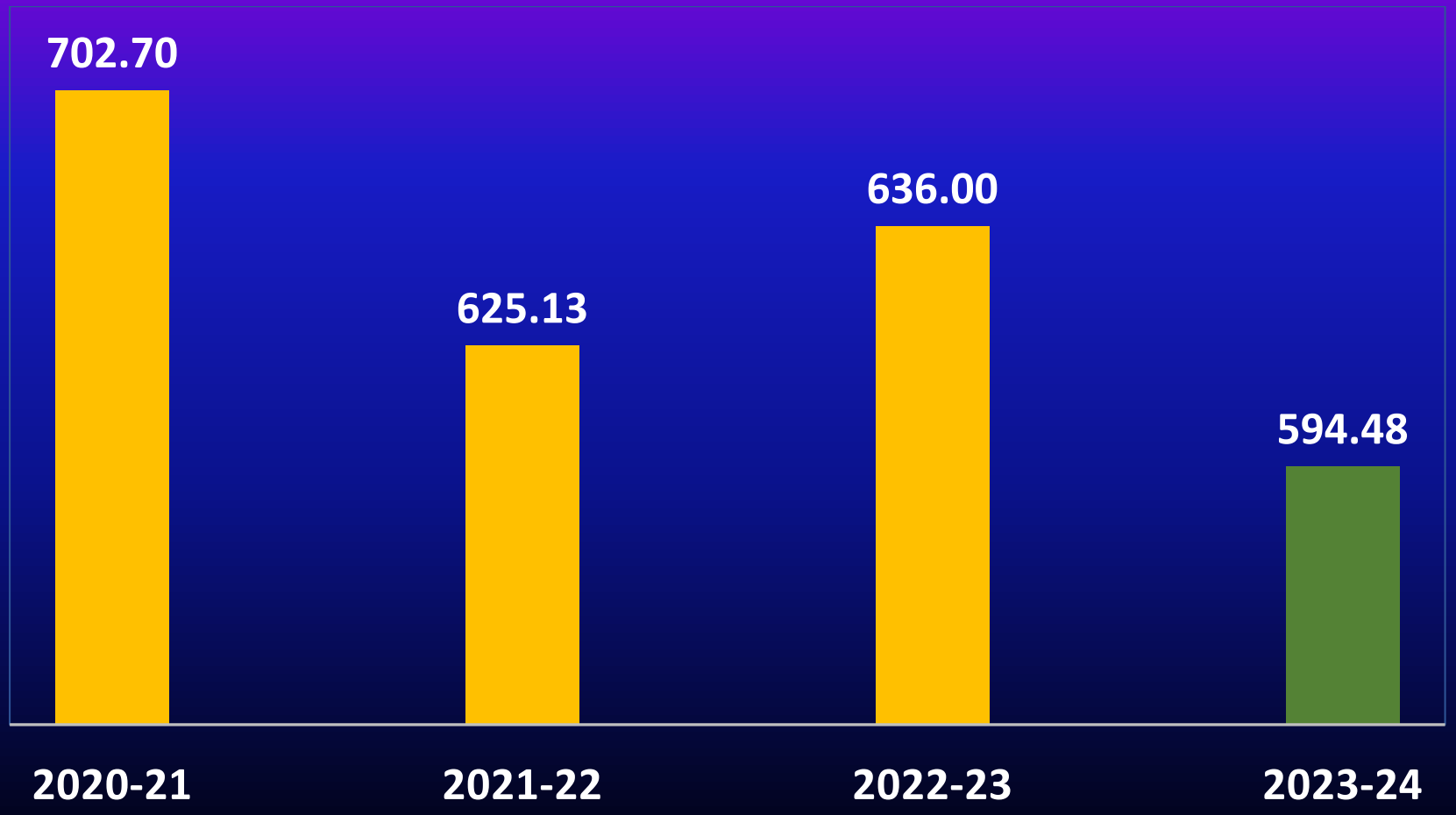




Waste as fuel	2021-22 (MT)	2022-23 (MT)	2023-24 (MT)
Waste grease	23	19	38
Waste Oil	8	12	59
PP bags wrapper	1548	1674	2479
Plastic waste	10	13	39

RAIN GHG JOURNEY

Scope -1,2& 3 emission Kg CO_2 / T Cement Journey



RCL Achievements – Green Supply Chain

- Adopted *Green Transport Policy* for transportation of cement and enforcement of *Green Procurement Policy for* selection of suppliers to purchase critical equipment
- Relocation of bag / raw material suppliers to closer proximity of cement plant to minimize transportation
- Provided housing facility for 95% of employees within one KM radius
- Streamlining movement of vehicles inside the factory
- Installed RFID in the vehicles to improve vehicle turn around time
- Implemented Reverse logistics for cement and coal / additives transport
- EVs have been used for internal transportation.

RCL– Net Zero Commitment

1

Road map for achieving target

- Installed 13.26MW solar power pant (onsite).
- Further Purchase Green Power 50 lakhs units per year.

2

Short term action plan

- Plantation 50000 saplings per year
- Increase Blended cement (PPC).

3

Long-term action plan

- Reduction of Scope-1 by enhancing AFR up to 30% TSR by 2030
- Conversion of Mines vehicles into E-vehicles.

RAIN CEMENTS LIMITED
RCL CEMENT UNIT - II

RCL BEST PRACTICES

COLLECTION AND FIRING OF COLONY WASTE

PERSONAL CLEANING STATION

DEDUSTING STATION FOR EMPLOYEES & WORKMEN

To meet OSHA Standards, RCL installed this Blower to give safe and effective tool for dedusting and clean down of their Employees work wear and PPE equipment

- **THIS BLOWER PRODUCES HIGH VOLUME AND LOW PRESSURE AIR WHICH POSES NO THREAT TO PERSONAL SAFETY**
- **LOWER NOSE EMISSIONS (< 78dB)**
- **LOW POWER CONSUMPTION**

GOSALA – RCL CEMENT PLANT

RCL Gosala main aim is to Provide Shelter and good food to Cows collected from local villages

SOLAR – RCL CEMENT PLANT

COLONY RESIDENTIAL COMPLEXES COVERED WITH SOLAR WATER HEATERS / STREET LIGHTS / SOLAR FENCING

RAIN CEMENTS LIMITED

Energy Monitoring Tools & variance analysis

PRIYA CEMENT
Lives Forever

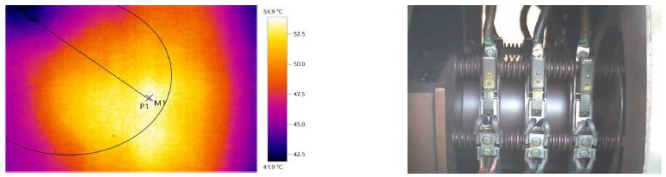
Equipment condition monitoring by Thermography

Line-1 Raw mill fan motor

Company	Rain Cements Limited Unit 2 Sreepuram Nandyal(Dist)	**Customer**	Line-1 Raw mill fan motor Unit-2 Sreepuram Nandyal
Tester	G Bhaskar Reddy		

Device testo 875-1i Serial No.: 2562953 Lens: 32° x 23°

Task Thermography of Line-1 Raw mill fan motor

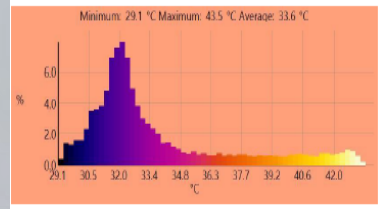


Picture data: Date: 12/22/2023 Time: 2:02:14 PM File: IV_00990.BMT
Emissivity: 0.95 Refl. temp. [°C]: 20.0

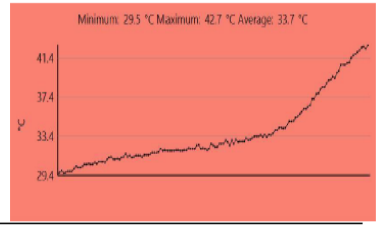
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	53.7	0.95	20.0	-
Measure point 2	42.7	0.95	20.0	-

Histogram:



Profile line:



Remarks: Non drive end side bearing temperature analyzed by thermography instrument found satisfactory.

Review: Raw mill fan motor bearings and slip ring unit jumpers connection area temperatures analyzed by thermography instrument found satisfactory.

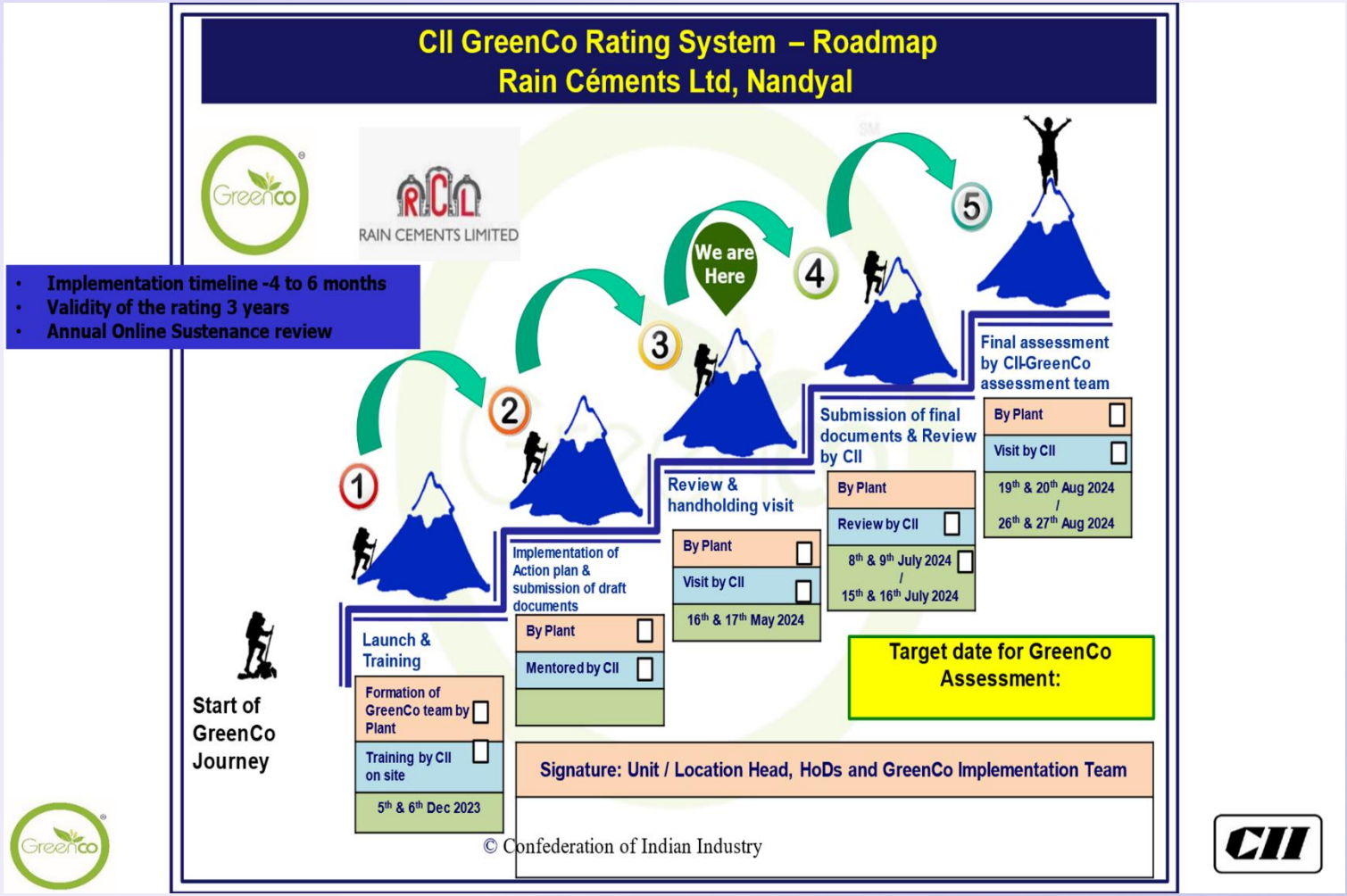
Compressor air monitoring through air flow meters on daily basis

Date	L-2 LS Crusher (m3)	L-2 LS Crusher RHS	Air Per hour	Production	Per ton Material	L-2 Coal Crusher (m3)	L-2 Coal Crusher RHS	Air Per hour	Production	Per ton Material	L-1 Crusher (m3)	L-1 Crusher RHS	Air Per hour	Production	Per ton Material	L-2 Rawmill hoppers (m3)	L2 Rawmill (m3)	L2 (F+G) Rawmill total	Raw mill RHS	Air Per hour	Production	Per ton Material
01.04.2024	84	13.400	6.27	10379	0.008	399	17.166	23.24	459.000	0.87	53	0.000	#DIV/0!	0.000	#DIV/0!	690	1055	1745	24.00	73	7494.10	0.23
02.04.2024	26	10.700	2.43	8024	0.003	423	16.333	25.90	455.000	0.93	51	0.000	#DIV/0!	0.000	#DIV/0!	656	858	1514	24.00	63	7574.60	0.20
03.04.2024	29	11.667	2.49	8553	0.003	398	15.583	25.54	424.000	0.94	65	0.000	#DIV/0!	0.000	#DIV/0!	676	860	1536	22.67	68	7127.80	0.22
04.04.2024	0	2.200	0.00	1653	0.000	191	16.417	11.63	457.000	0.42	61	0.000	#DIV/0!	0.000	#DIV/0!	509	953	1462	16.17	90	5089.60	0.29
05.04.204	27	11.800	2.29	9084	0.003	310	16.500	18.79	448.000	0.69	106	0.000	#DIV/0!	0.000	#DIV/0!	574	683	1257	18.25	69	5937.20	0.21
6.042024	31	12.000	2.58	9078	0.003	305	14.500	21.03	404.000	0.75	66	0.000	#DIV/0!	0.000	#DIV/0!	531	608	1139	15.75	72	5291.30	0.22
07.04.2024	0	0.000	#DIV/0!	0	#DIV/0!	295	17.500	16.86	485.000	0.61	63	0.000	#DIV/0!	0.000	#DIV/0!	670	804	1474	23.50	63	7884.10	0.19
08.04.2024	80	12.667	6.32	9342	0.009	357	16.583	21.53	465.000	0.77	107	0.000	#DIV/0!	0.000	#DIV/0!	572	796	1368	20.50	67	6825.80	0.20
09.04.2024	0	0.000	#DIV/0!	0	#DIV/0!	322	14.667	21.95	409.000	0.79	22	0.000	#DIV/0!	0.000	#DIV/0!	554	1429	1983	18.50	107	6202.40	0.32

Equipment Loads monitoring as per schedule with power analyzer

Utilities CFT meeting

Greenco Certification & LCA



LCA REPORT

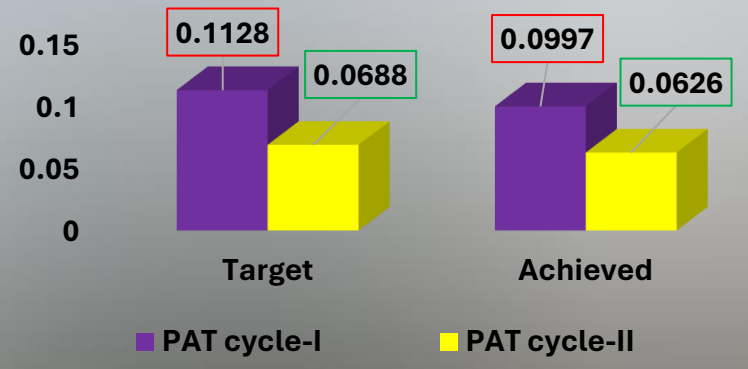
Draft report received on LCA conducted. Final report to be received

PAT- TARGTES & EnMS System

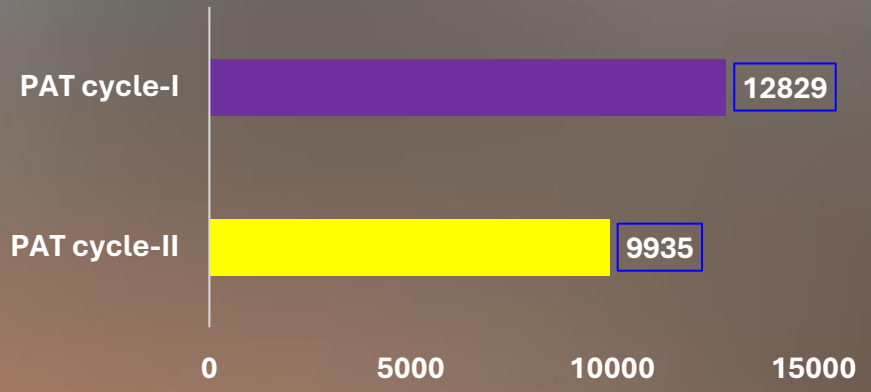
RAIN CEMENTS LIMITED

PRIYA CEMENT Lives Forever

PAT TARGTES & ACHIEVEMENTS

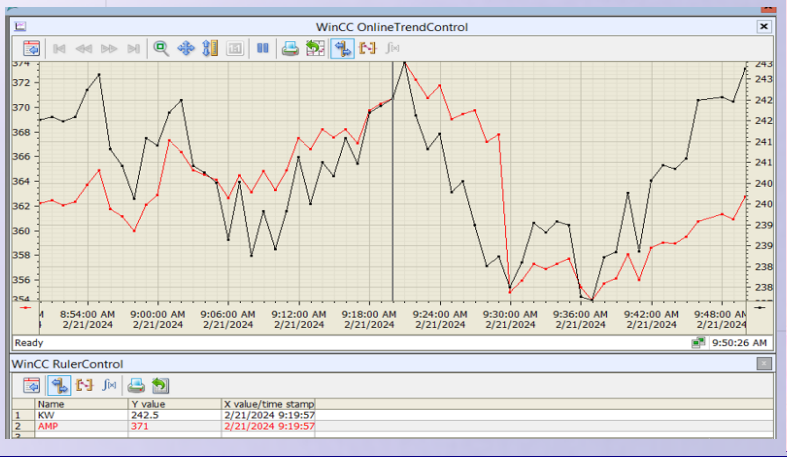


Energy savings Certificates



Energy Management System

- Equipment wise real time energy 30KW & above and all equipment



Bureau Veritas Certification

ISO 50001 CERTIFICATE

RAIN CEMENTS LIMITED

RAIN CEMENTS LIMITED

SREEPURAM, BOINCHERUVUPALLI VILLAGE, PEAPULLY MANDAL, NANDYAL DISTRICT – 518 220, ANDHRA PRADESH, INDIA.

Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above Organisation has been audited and found to be in accordance with the requirements of the Management System Standard detailed below.

Standard

ISO 50001:2018

Scope of certification

MANUFACTURE AND DESPATCH OF CEMENT

Original cycle start date: 07 July 2023
Expiry date of previous cycle: Not Applicable
Certification Audit date: 19 April 2023
Certification cycle start date: 07 July 2023

Subject to the continued satisfactory operation of the Organisation's Management System, this certificate is valid until: 06 July 2026

Certificate No. IND.23.7570/EN/U Version: 1 Issue date: 07 July 2023

For certificate authenticity, click here https://certcheck.ukas.com/

ISO 50001 IN043726

Signed on behalf of BVCH SAS UK Branch
Jagdheesh N. MANIAN
Director – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division

Certification body address: 6th Floor, 66 Prescot Street, London, E1 8HG, United Kingdom.

Local office: Bureau Veritas (India) Private Limited (Certification Business) 72 Business Park, Marol Industrial Area, MIDC Cross Road "C", Andheri (East), Mumbai – 400 093, India.

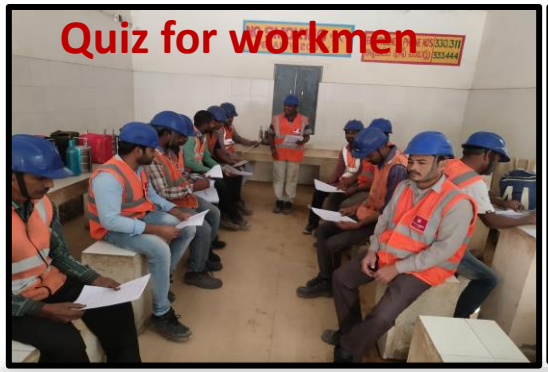
Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
To check this certificate validity please call + 91 22 8274 2000.

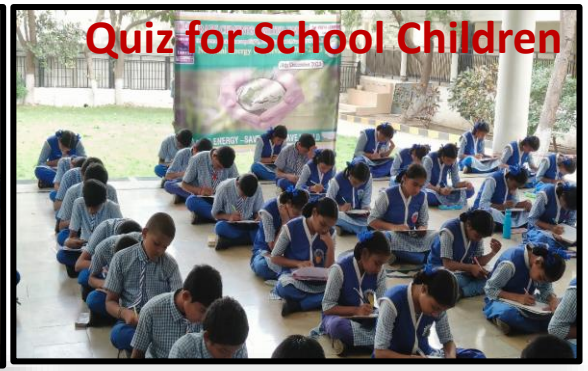
RAIN CEMENTS LIMITED

AWARDS

PRIYA CEMENT
Lives Forever

ENERGY CONSERVATION DAY - 14th DEC-2023






THANK YOU
WE WORK TOGETHER AS PARTNERS