THE RAMCO CEMENTS LIMITED

RAMASAMY RAJA NAGAR

24th National Award for Excellence in Energy Management

G. Vinayagamoorthy - Mechanical
G. Sivasubramanian - Electrical
R. Muthukumar - Process

DATE: 13-09-2023 VENUE: HICC, HYDERABAD

About Ramco group

Textile Division

Cement industry

Building materials

Wind farm

logistics

education

software

RAMCO GROUP

RR NAGAR PLANT PROFILE

- RAMCO Group has 5 integrated cement manufacturing units, 6 grinding units and the current capacity 22 MTPA.
- RR Nagar plant was commissioned in the year 1961 with capacity of 0.06 MTPA and the Current Capacity is 2.0 MTPA
- First plant to install latest technologies like SF cross bar cooler, Cross belt analyser, X-ray analyser, ESP, FLS Combidon mill etc.
- First plant in India to install optical sorter in mines

INTEGRATED MANAGEMENT SYSTEM CERTIFICATION

IS/ISO 9001: 2015

Quality Management System

IS/ISO 14001:2015

Environment Management System

IS/ISO 45001: 2018

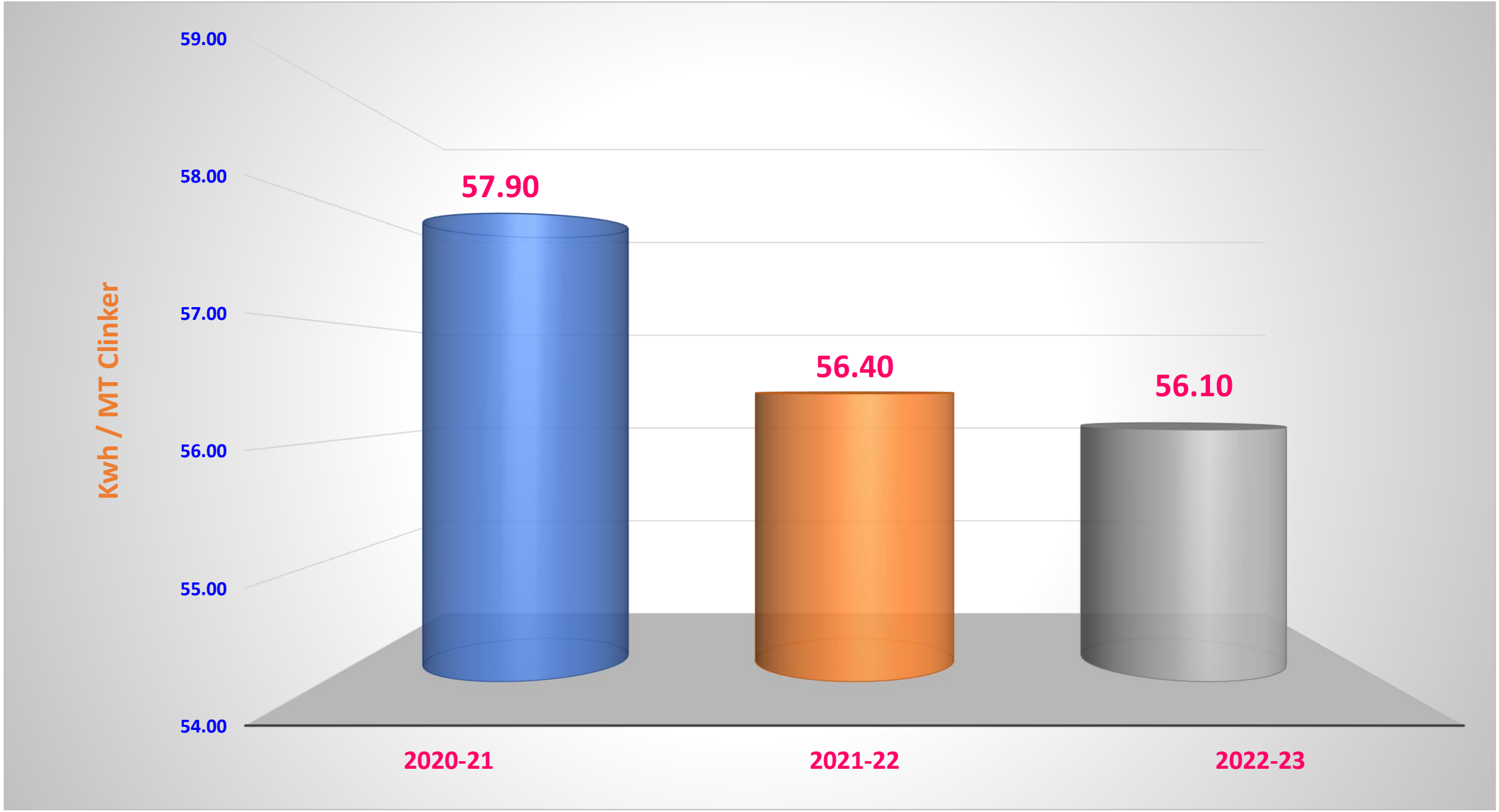
Occupational Health & Safety Management System

IS/ISO 50001: 2018

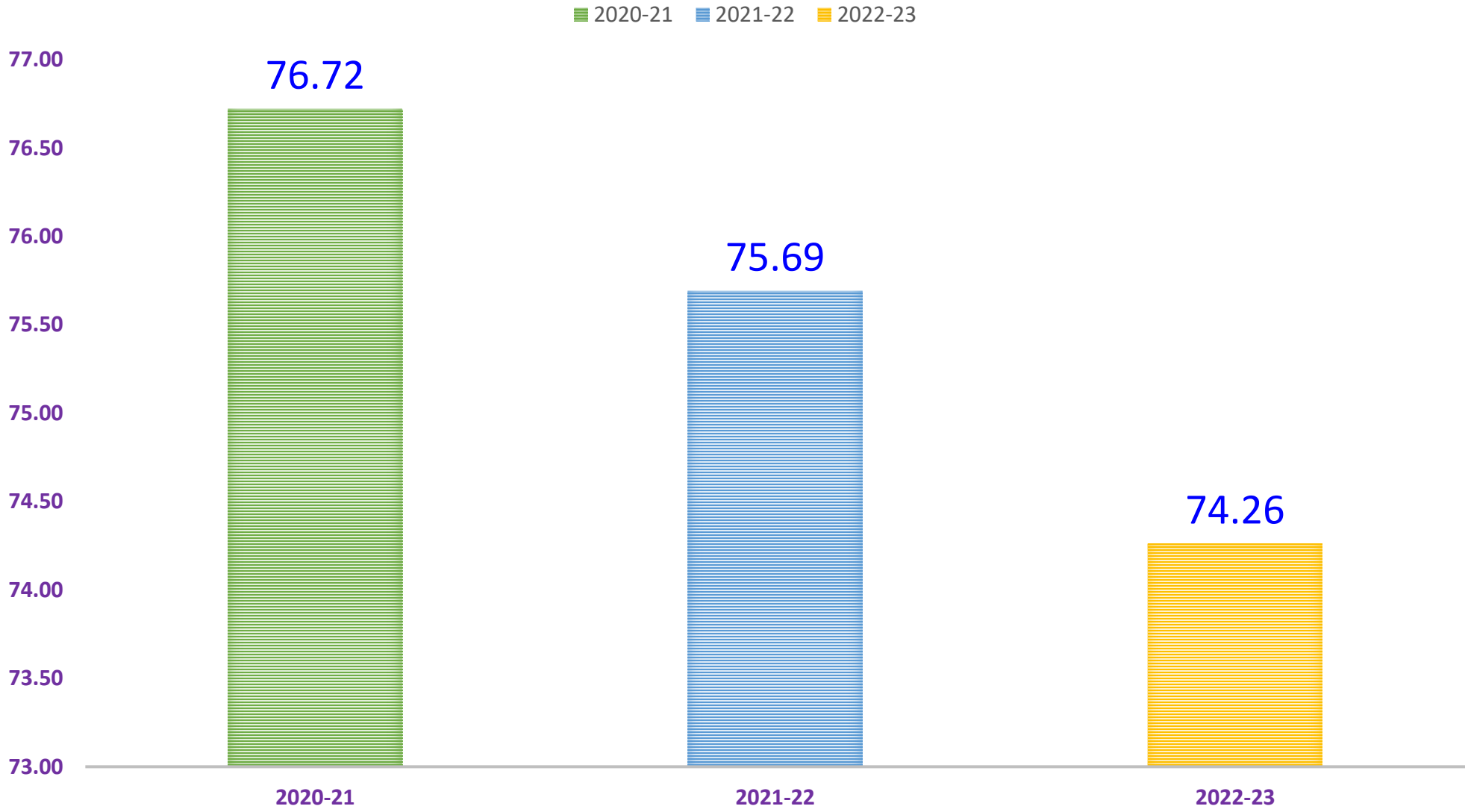
Energy Management System

5s Certified company with JUSE

SPECIFIC ELECTRICAL ENERGY CONSUMPTION - CLINKER

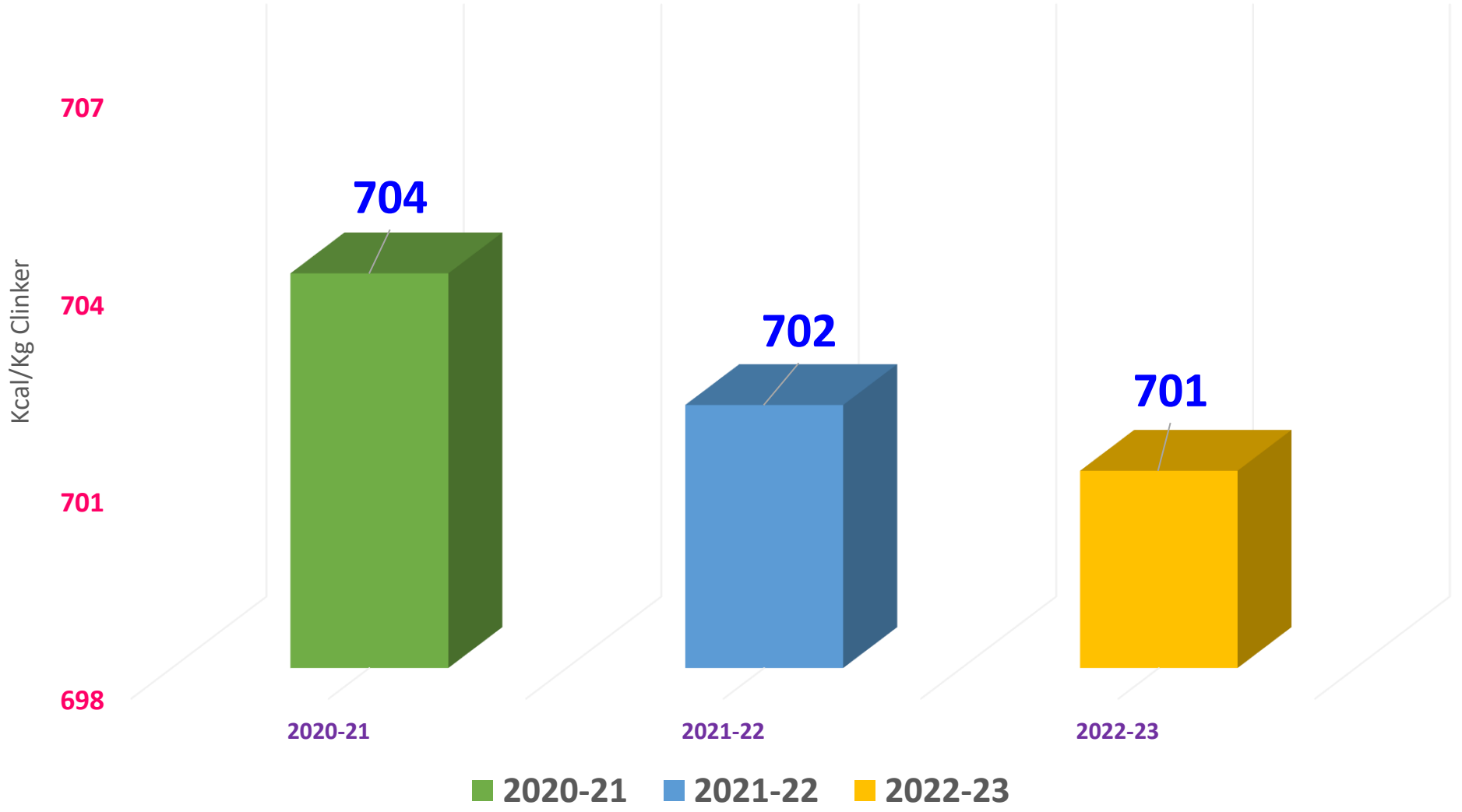


SPECIFIC ELECTRICAL ENERGY CONSUMPTION - CEMENT



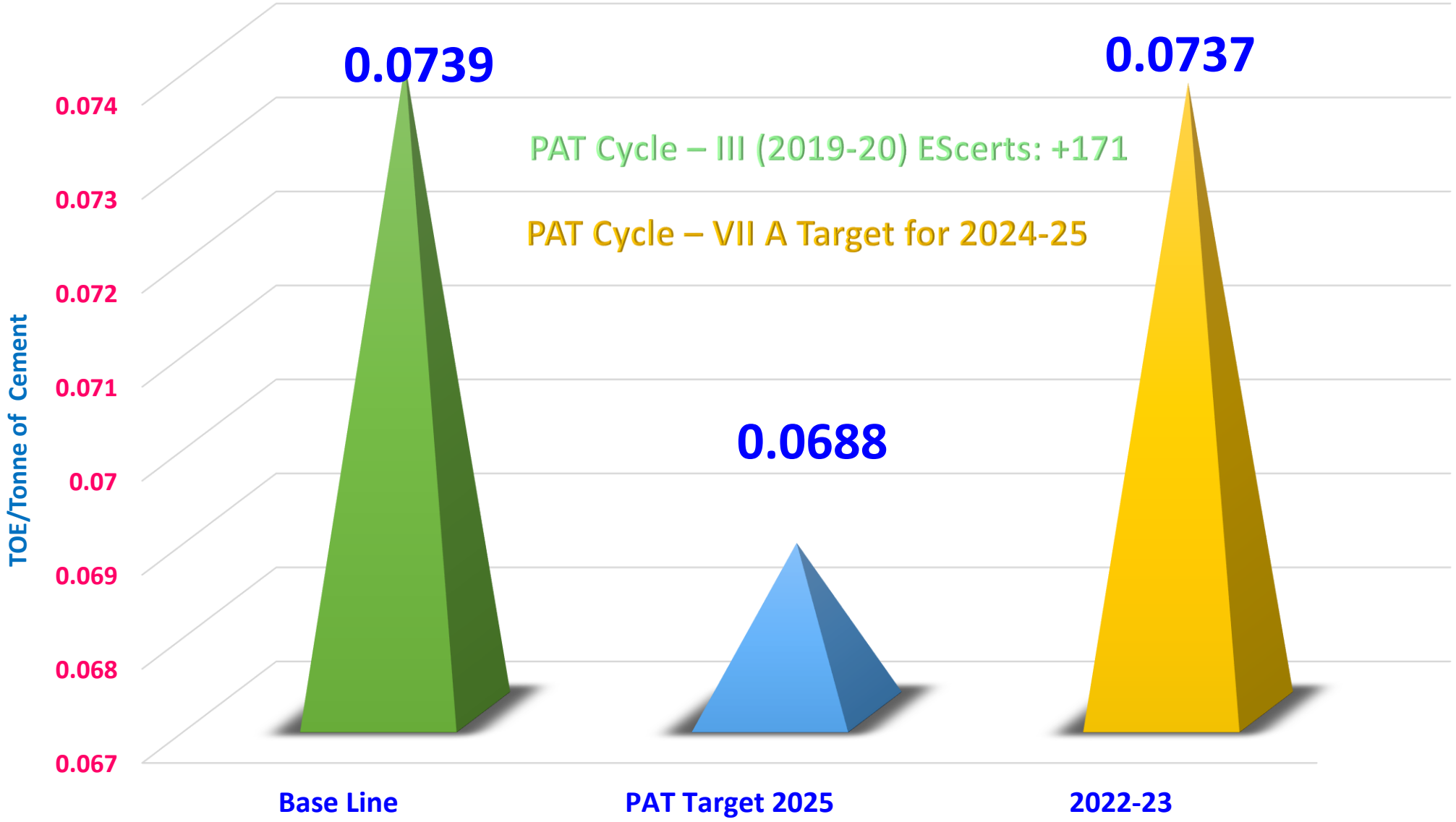
Absolute Electrical Energy savings – 3,47,110 units over previous year Percentage of Electrical energy savings - 1.9 %

SPECIFIC THERMAL ENERGY CONSUMPTION

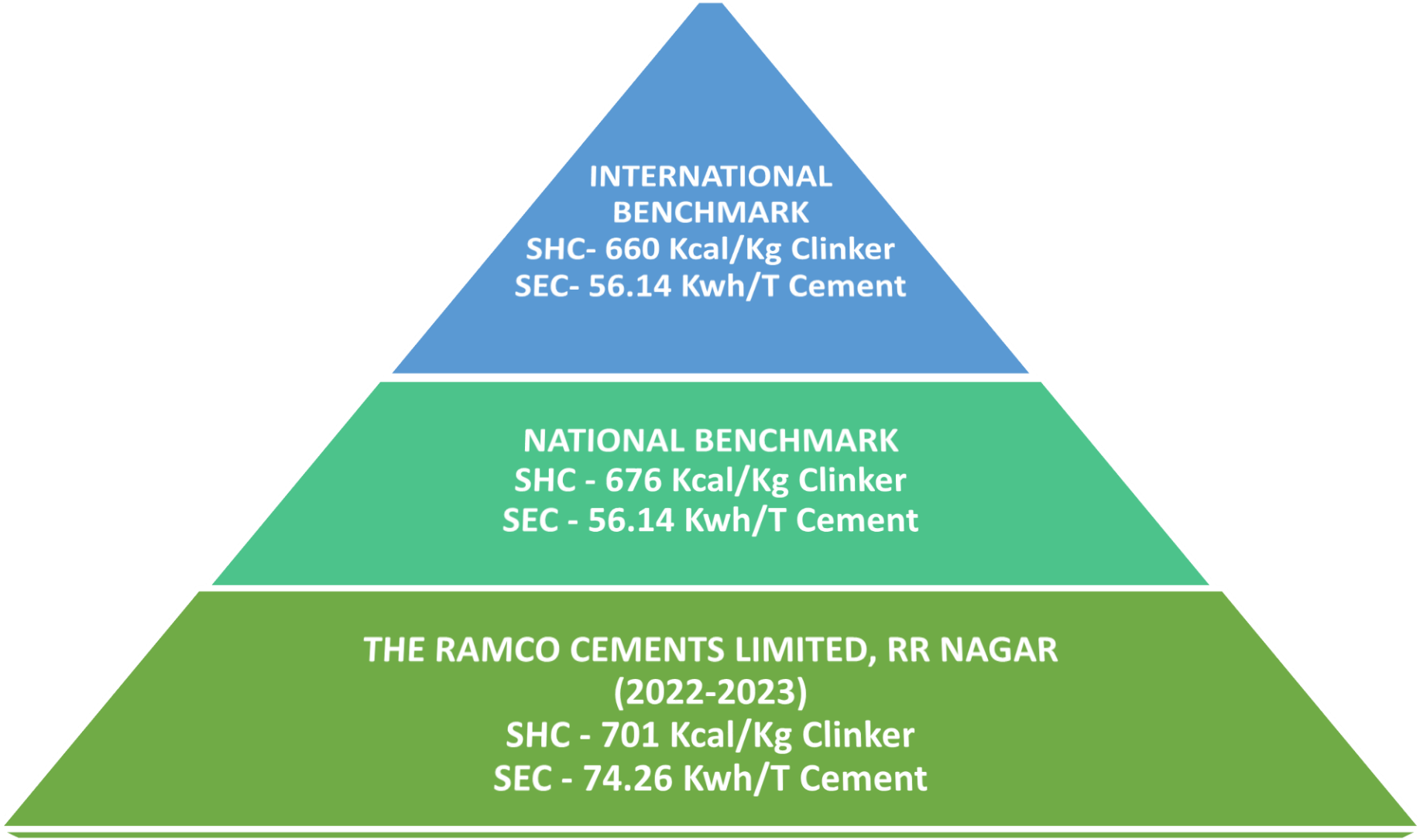


Percentage of Thermal energy savings - 0.3 % over previous year

SPECIFIC THERMAL ENERGY CONSUMPTION



GLOBAL NORMS - SHC & SEC



Source of Information: CII Energy Benchmarking

ENCON PROJECTS

ENCON PROJECTS 2020-21

Sl.No	ENCON Project Implemented for the year 2020-21	Savings (Rs. in Lakhs)	Investment made (Rs. in Lakhs)
1	Reduction of false air in Kiln	10.5	0
2	Re-routing of Limestone feeding system	6.1	3.0
3	Replacement of efficient shell cooling fan (2 nos.) in Kiln1	2.6	2.2
4	Factory lighting power consumption reduction by replacing LED lights	1.9	6.0
5	Replacement of 2 nos. blower in Kiln-2	1.3	0
6	Optimization of Compressor air consumption in bag filter	0.7	0
7	Reduction of idle run hours in Packing plant - 4	0.4	0
8	Coal handling belt conveyor length reduced	0.2	1.0
	SUMMARY	23.7	12.2
	RETURN ON INVESTMENT	6 Months	

ENCON PROJECTS 2021-22

Sl.No	ENCON Project Implemented for the year 2021-22	Savings (Rs. in Lakhs)	Investment made (Rs. in Lakhs)
1	Re-routing of kiln -1 secondary firing pipe line	45.4	1.4
2	Installation of new high efficiency shell cooling fan (7 nos.) for Kiln	13.2	7.3
3	Installation VFD for Coal mill-1 main bag house fan	7.5	0.91
4	Installation of VFD for Cement VRMP vent fan	6.9	8.7
5	Interlinking of stacker and reclaimer compressor line	6.2	0
6	Factory lighting optimization by replacing LED lights	4.6	9.3
7	Optimization of Raw mill VRMP vent fan efficiency	2.5	0
8	Installation of new high efficiency booster fan in Coal mill	2.2	5.5
9	Reduction of pulley size in kiln feed extraction blower	2.1	0
10	Compressor air optimization by re-routing of pipe lines in Cement mill	2.1	1.0
11	Optimization by stopping air slide blower in Kiln feed section	1.1	0
	SUMMARY	93.8	34.11
	RETURN ON INVESTMENT	5 Months	

ENCON PROJECTS 2022-23

Sl.No	ENCON Project Implemented for the year 2022-23	Savings (Rs. in Lakhs)	Investment made (Rs. in Lakhs)
1	Modification of secondary firing nozzle in Kiln	32	0.9
2	Installation of new high efficiency tyre cooling fan (4 nos.) for Kiln	11.3	8
3	Factory lighting power consumption reduction by replacing LED lights	3.4	4.2
4	Dp transmitter for the unit bag filters their by saving power in compressor	3.3	5
5	Removal of damper in Cement mill VRMP vent bag filter fan	2.4	0
6	Optimization of air pressure & air leak arresting in compressor	1.8	0.9
7	Optimization by stopping the aeration blower in Cement mill	0.9	0
8	Installation of occupancy sensor in kiln substation	0.7	0.1
9	Reduction of idle run hours in CSR circuit	0.6	0
	SUMMARY	56.4	19.1
	RETURN ON INVESTMENT	4 Months	

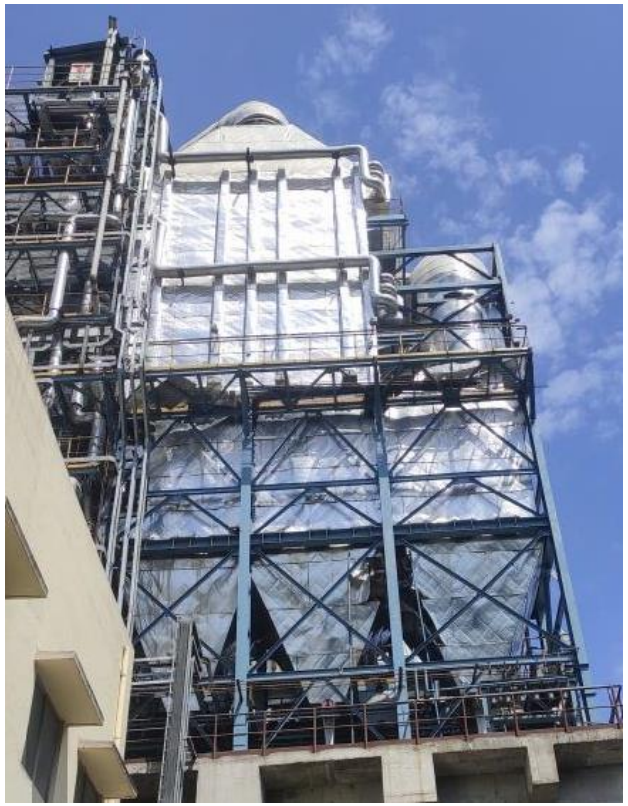
ENCON SAVINGS SUMMARY

S.No	Period	Cost savings without investment (Rs in lakhs)	Cost savings with investment (Rs in lakhs)	Investment cost (Rs in lakhs)
1	2020-21	13.0	10.8	12.2
2	2021-22	12.0	81.9	34.11
3	2022-23	3.9	54.4	19.1
	Total	28.9	147.1	65.41
Total cost savings achieved - Rs 176 lakhs				

WASTE HEAT RECOVERY BOILER PERFORMANCE

PH Boiler

AQC Boiler



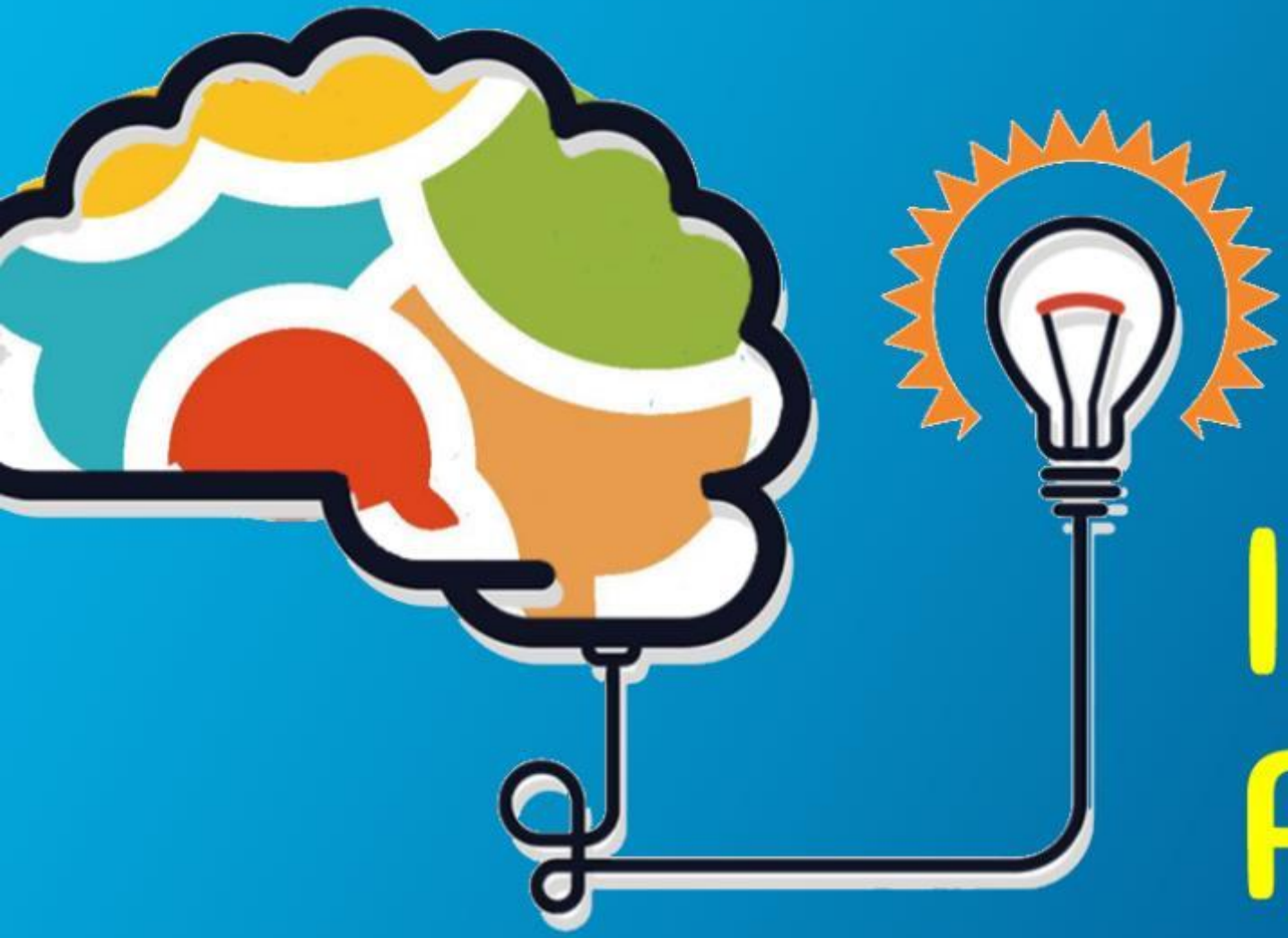
Heat Rate Savings at TPP in 2022-23: 305 Kcal/kwh

Heat Saving: 46467 Million Kcal/annum

Coal Saving: 9111 MT/annum

PROPOSED ENCON PROJECTS

Sl.No	ENCON Project proposed for the year 2023-24	Expected savings (Rs. in Lakhs)
1	Commissioning of new Raw mill	405
2	Commissioning of new Kiln	341
3	Commissioning of new Coal mill	114
4	Modification of Kiln raiser duct	51.8
5	Low pressure compressor for Kiln bag filter to avoid losses in regulator	7.7
6	Installation of VFD for cement mill higher capacity compressor	5.8
7	Factory lighting power consumption reduction by replacing LED lights	5.4
8	Installation of occupancy sensor in IMCC room	0.5
	TOTAL	931.2



Innovative Projects

INNOVATIVE PROJECT-1
REPLACEMENT OF KILN TYRE COOLING FAN

REASON TO CHOOSE THE NEW SYSTEM

- High power consumption and expected power saving 4 Kw/hr per fan
- To improve fan performance

DEVELOPMENT OF NEW SOLUTION

- As per the OEM, Kiln shell cooling fan and tyre cooling fans are given at the same capacity
- It is decided to take trial with lower capacity fan. New fan 1 no. purchased and installed for trial.
- After the trial, found no increase in tyre/shell temperature
- Due to low pressure, fan power consumption has reduced

TYRE COOLING FAN

Design		
Parameters	Existing fan	New Fan
Dia (m)	0.90	0.90
Area (m2)	0.64	0.64
Volume (m3/hr)	36000	27000
Static Pressure (mmwg)	50	20
Total Pressure (mmwg)	55	28.2
Fan speed (rpm)	1400	1410
Power (Kw)	11	3.7

PERFORMANCE IMPROVEMENT & BENEFITS ACHIEVED

- **Number of fan changed : 4 nos.**
- **Power Saving : 4.5 Kw/hr/fan**
  : 1,47,312 Units/annum
- **Cost saving : Rs. 11.33 Lakhs/annum**
- **Project Cost : Rs. 8.2 Lakhs**
- **Payback Period : 9 Months**

INNOVATIVE PROJECT-2
OPTIMIZATION OF RAW MILL-2 PERFORMANCE

REASON TO CHOOSE

- To avoid material flushing from surge bin
- To improve mill performance
- Reduce Specific power consumption

DEVELOPMENT OF NEW SOLUTION

SLIDE GATES

- In-house made double chute system installed with slide gates
- Slide gates will closed if the material flush from the bin

PERFORMANCE IMPROVEMENT & BENEFITS ACHIEVED

- **Power Saving : 0.45 units / MT**
  : 4,70,340 Units/annum
- **Cost saving : Rs. 36.17 Lakhs/annum**
- **Project Cost : Rs. 1.5 Lakhs**
- **Payback Period within month**
- **Housekeeping improved**
- **Equipment and Manpower safety Improved**

RENEWABLE ENERGY

UTILIZATION OF WASTE AS FUEL

Name of the Fuel	2020-21		2021-22		2022-23	
	Quantity (MT)	Waste fuel as % of Energy used	Quantity (MT)	Waste fuel as % of Energy used	Quantity (MT)	Waste fuel as % of Energy used
TPP Coal Ash	11990	1.2	10966	4.3	9499	3.84
Shredded Tyre Rubber	-		216.6		15.1	
Shredded Coir & Rubber mix	-		227.7		2311	
Plastic Waste mix	-		265.4		104.4	
Mica Shreds	-		-		1385	
Solid Waste mix	-		-		690.4	
Carbon Black	-		1037		-	

UTILIZATION OF WASTE AS RAW MATERIAL

Name of the Fuel	2020-21		2021-22		2022-23	
	Quantity (MT)	% on Raw material used	Quantity (MT)	% on Raw material used	Quantity (MT)	% on Raw material used
ETP Sludge	101	0.01	213.5	0.01	413.3	0.02

RENEWABLE ENERGY

Replacement of Electrical Energy with Renewable Energy	2020-21		2021-22		2022-23	
	Annual Energy Generated (Lakhs kWh)	% Share	Annual Energy Generated (Lakhs kWh)	% Share	Annual Energy Generated (Lakhs kWh)	% Share
Wind mill	3010.0	0.67	2600.0	0.80	2850	11.9

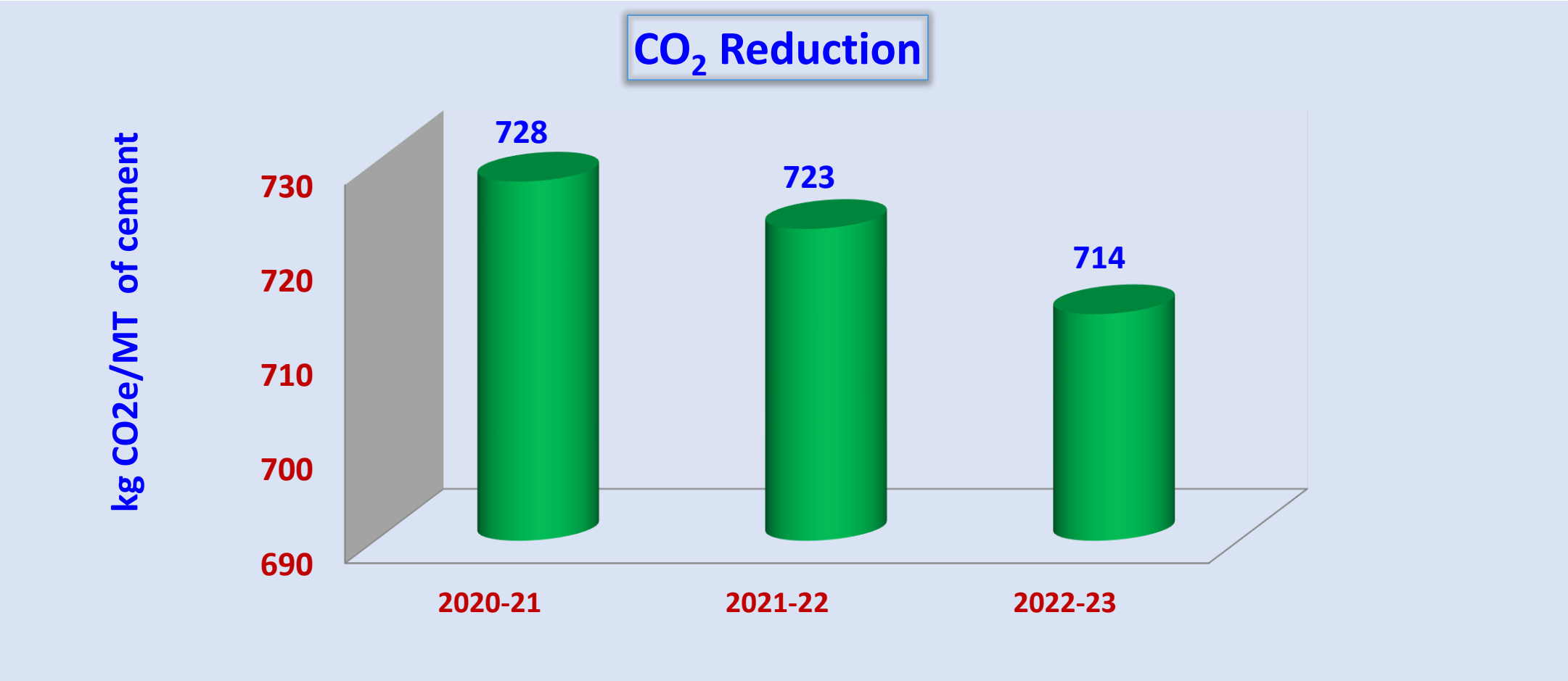
During 1996 **wind mill installed with capacity** of 33.24 MW, Present Capacity is 160 MW

Replacement of Thermal Energy with Renewable Energy	2020-21		2021-22		2022-23	
	Equivalent Fuel Saving (Lakhs Kcal)	% Share	Equivalent Fuel Saving (Lakhs Kcal)	% Share	Equivalent Fuel Saving (Lakhs Kcal)	% Share
Biogas (Canteen)	100.3	12.9	117.9	13.23	114.5	13.58

UTILIZATION OF RENEWABLE ENERGY

Solar Power Generation during 2022-2023: **38200 Units**

CARBON FOOT PRINT ACTIVITIES



Carbon Emissions is in reducing trend

IMPLEMENTATION OF ENERGY FRONT AMONGST ASSOCIATES

Sl.No	Name Of Associate / Vendor	Name Of Service Provided To Vendor	Energy Consumed Prior To Implementing ENCON	Energy Consumed After Implementation Of ENCON	% Improvement	Type Of Inputs / Projects Provided To Vendor/ Associate
1	**M/s. CIBI Transports**	**Raw material internal shunting contractors**	**603 Litres/year**	**402 Litres/year**	**33 %**	**New shortest route provided**
2	**M/s. Ammaiyaper Transports**	**TPP Ash feeding**	**700 Litres/year**	**540 Litres/year**	**23 %**	**Higher Capacity Bulker Placed**
3	**M/s. Muthaia Contractor**	**Alternate Fuel Feeding**	**203 Litres/year**	**180 Litres/year**	**11 %**	**Higher Capacity Tipper replaced instead of tractor**


ENERGY MANAGEMENT SYSTEM
MONITORING & REPORTING
THE RAMCO CEMENTS LIMITED
RAMCO

ELEMENTS OF ENERGY MANAGEMENT SYSTEM

Main Elements of a Strategic Energy Management Program

THE RAMCO CEMENTS LIMITED

RAMASAMY RAJA NAGAR

ENERGY POLICY

The Ramco Cements Limited places highest values for sustainable development in our activities including energy conservation and reducing our carbon footprint. We at Ramasamy Raja Nagar Works, involved in Mining of limestone, Manufacturing Cement and Generating captive power are committed to achieve excellence in our energy management practices.

We shall achieve the intended outcomes of energy management through:

- Continuous monitoring of energy consumption, Adoption of energy efficient technologies, benchmarking and optimisation of our manufacturing and support processes .
- Compliance with legal and other requirements applicable to energy use, consumption and efficiency.
- Continual improvement of energy performance and the Energy Management system.
- Ensuring availability of information and resources to set, review and achieve our energy objectives and targets.
- Enhancing energy awareness to facilitate Identification of opportunities, Implementation of sound energy management methodologies, encouraging utilization of renewable energy and utilizing industrial waste wherever feasible.
- Considering energy performance Improvements in procurement, design and modification of our facilities, equipment, systems and processes.
- Promoting employee participation recognizing and rewarding innovative energy conservation Ideas & Initiatives Implemented by our employees.

Date : 01January 2021

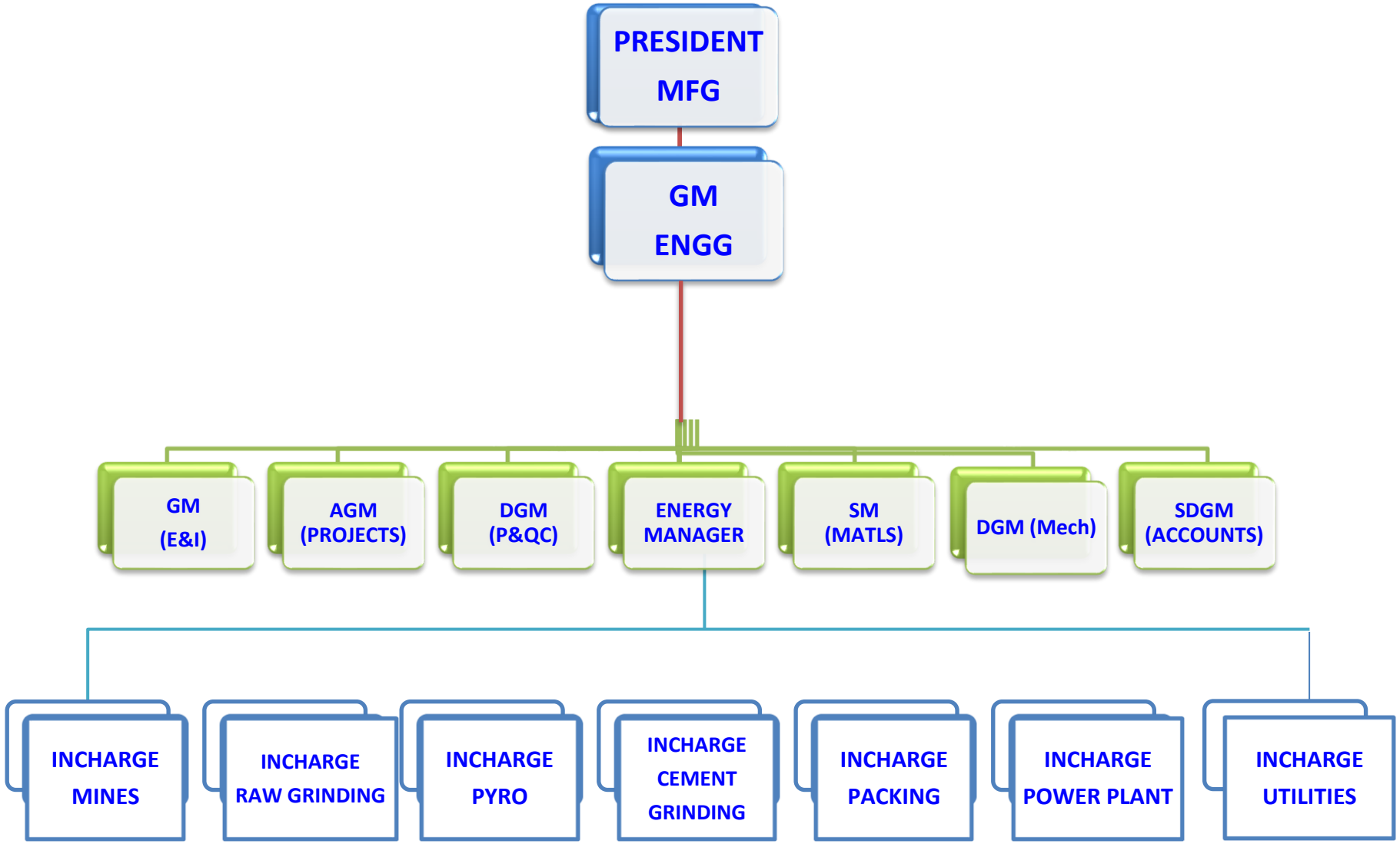
Approved by: **Unit Head**

ENERGY MONITORING AND REPORTING SYSTEM

S.No	Description	Frequency
1	Daily Energy consumption review	Daily (Production meeting)
2	Energy Management cell meeting	15 days
3	Energy Management System Review meeting	Monthly

Energy management review meeting is conducted by Unit Head in presence of the steering committee

ENERGY MANAGEMENT STEERING COMMITTEE



ENERGY MANAGER ACTIVITIES

- Daily monitoring of Energy reports & Root cause analysis for deviation from the targets .
- Study and implementation of Energy/Cost saving suggestions from the suggestion schemes.
- Creating awareness of Energy Conservation amongst the employees and motivating them to develop ideas on ENCON.
- Conducting energy conservation audits.

ENERGY REPORTING FORMAT DAILY REPORT

SPECIFIC POWER CONSUMPTION - DAILY REPORT							
EQUIPMENT	TPH	RUN HRS	PRODUCTION (TPD)	KWH	U/T OF MATL	U/T OF CLINKER	U/T OF CEMENT
MINES							
RAW MILL-1							
MOTOR-1							
MOTOR-2							
SEP FAN							
MILL AUX							
RAW MILL-2							
MAIN DRIVE							
CA FAN							
MILL AUX							
COAL MILL 1							
MAIN DRIVE							
MILL AUX							
KILN-1							
PH FAN							
BH FAN							
COOLER							
BAG HOUSE							
KILN FEED							
COAL FIRING							
CLINKER SILO AUX							
SERVICE-1							
UPTO CLINKERISATION							
CEMENT MILL							
RP DRIVE-1							
RP DRIVE-2							
RP BAG FILTER FAN							
CM MAIN DRIVE							
SEPARATOR							
RC ELEVATOR							
RP & BM AUX							
PACKER							
SERVICE-2							
UPTO CEMENT							

ENERGY REPORTING FORMAT MONTHLY REPORT

SPECIFIC ENERGY CONSUMPTION – MONTHLY REPORT												
PROCESS UNIT	ON DATE RUN HRS	MTD RUN HRS	ON DATE PROD QTY	MTD PROD QTY	ON DATE KWH	MTD KWH	ON DATE U/T OF MATL	MTD U/T OF MATL	ON DATE U/T CLK	MTD U/T CLK	ON DATE U/T CEM	MTD U/T CEM
RAWMILL-1												
RMVRMP-1												
COMBINED RM & RM-VRMP												
COALMILL-1												
COALMILL-2												
COMBINED COALMILL												
KILN-1												
KILN-2												
COMBINED KILN												
SERVICE-1												
ZM-PPC-1												
ZM-PPC-2												
COMBINED CEMENTMILL												
PACKER PPC-1												
SERVICE-2												
GRAND TOTAL												

TEAM WORK ENCON PROJECTS

ENCON EFFORTS

Employee involvement through suggestion schemes

Year	No of Suggestions approved towards ENCON	Savings in Units / Annum
2020-21	27	160800
2021-22	36	227800
2022-23	26	185300

- Rewards were given to all the employees who have raised suggestions.
- Monthly meetings conducted by core committee and report will be submitted.
- Implementation status of all the suggestions will be reviewed by our UNIT HEAD.

EMPLOYEE ASSOCIATION IN ENCON ACTIVITIES

ENCON Team meeting

Energy Conservation Day

ENCON EFFORTS

Sl.No	Source of ENCON IDEA	Idea originated	Details of members involved	Progress of implementation
1	Middle Management	2020-21	Utility department	Completed
2	Workmen	2021-22	Engineering department	Completed
3	Middle Management	2022-23	Packing Plant Team	Completed

PROJECT 1 : KILN-1 FEED EXTRACTION SCREW MODIFICATION

- There are 2 nos. of 47 meters length screw conveyor in our kiln feed extraction
- We have faced the following problems in the screws
  - Screw cut off, Connecting shaft damage and Hanger bearing failure
- One of the Mechanical Engineer suggested to reduce the screw length from 47 to 18 meters by replacing with Air slide as the space is available for slope
- Due to reduction in screw length the power consumption is reduced
- **Power Saving : 32160 Units/annum**

  Cost Saving : Rs. 1.61 Lakhs/annum

PROJECT 2 : SS PLATE PLACED AT COAL MILL INLET BEND

- In Coal mill-2, we frequently noticed coal accumulation in the inlet chute.
- Due to this accumulation, mill productivity affected and there was occasional firing at coal mill inlet.
- Engineer suggested to modify the inlet feed chute by providing a guide plate to uniformly feed coal to the mill without accumulation.
- Implementation of this idea resulted in the reduction of coal mill run hours from 15:30 Hours to 15:00 hours a day.
- Power Saving : 60550 Units/annum

  Cost Saving : Rs. 3.04 Lakhs/annum

PROJECT 3: INSTALLATION ROLLER IN PLACE OF MOTOR DIVERTER

- In our packing plant, we have motorised belt diverter for diverting bags in to the loading point
- Based on truck availability & loading machine availability the diverter is changed for the loading point.
- One discharge point is having two loading machines. In our operation, it needs to divert the bags several times.
- An innovative drum diverter locally designed, fabricated and installed in place of motorised diverter
- After doing this modification we have achieved the following power savings
- Power Saving : 17,600 units/annum

  Cost Saving : Rs. 1.35 lakhs/annum

ENVIRONMENTAL PROJECTS

ENVIRONMENTAL PROJECTS

Sl. No	List of the Major Environmental Projects	Year of Implementation
1	Installation of Wagon tippler for Fuel & Clinker	2020
2	Conversion of open trailers in to covered for limestone shifting	2020
3	Formation of rain harvesting pond in new material yard	2021
4	Water spray system installed in Coal shed to avoid flying of fine dust	2022
5	Formation of road in material storage yard	2022

FUTURE ENVIRONMENTAL PROJECTS

Sl.No	List of the Future Environmental Projects	Investment (Rs. Lakhs)
1	Installation of new high efficiency Kiln in place of existing Kiln-2	48600
2	Stacker & Reclaimer with closed shed for Additives	5600
3	Installation feeding system for Alternate fuel	15.5
4	40 Nos. LED lights in place of Conventional lights	2.0

GREEN BELT DEVELOPMENT

Year	Location	Area covered in Acres	No. of Species planted
2020-21	Mines	110	87377
	Factory & Colony	10	12625
	School	6	8000
	Nearby villages	17	23750
2021-22	Mines	156	128097
	Factory & Colony	12	6500
	School	10	5000
2022-23	Mines	160	111074
	Factory & colony	30	22850
	School	5	250
	Nearby villages	10	4400


ECO PARK-MINES

RAMCO - ECO PARK

Abandoned mines at pandalgudi was converted as an ECO PARK

ENVIRONMENTAL PROJECTS

Limestone Stacker and Reclaimer

Coal Stacker and Reclaimer

ENVIRONMENTAL PROJECTS

Surveillance CCTV Monitoring

Dramix fiber Concrete road

LED Display for Energy Monitoring

LED Street Light

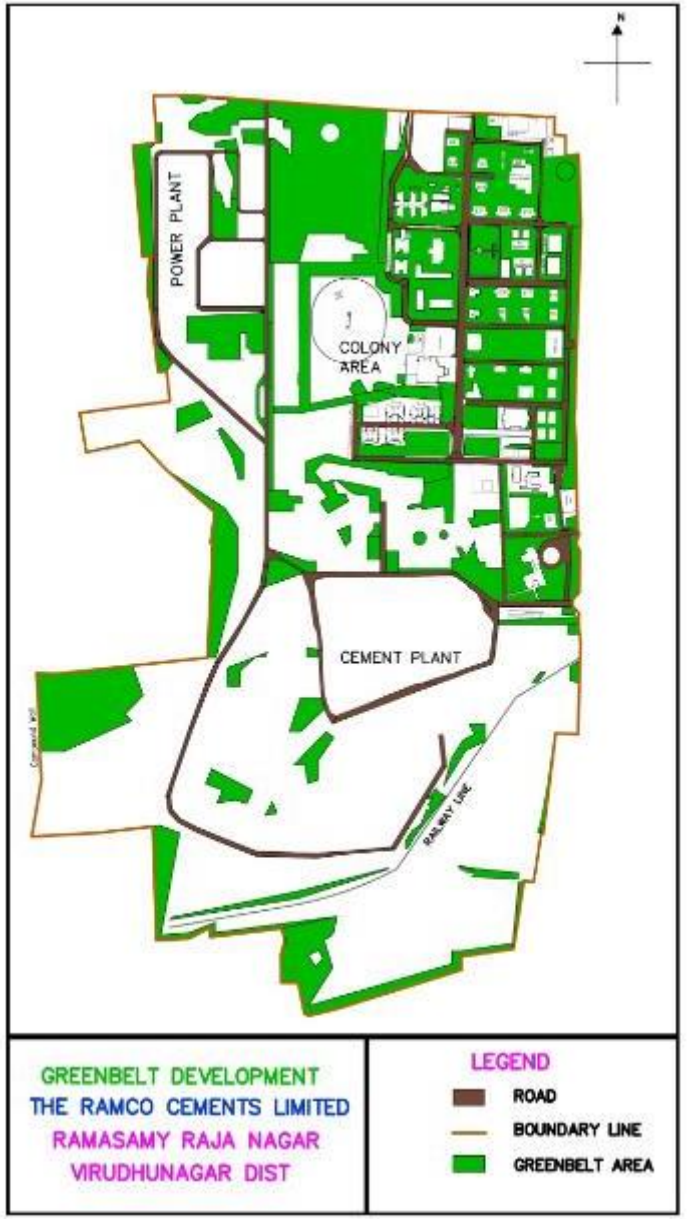
ENVIRONMENTAL PROJECTS

Rain Harvesting Pond

Rain Harvesting Pond

Bio-Gas Plant

GREEN BELT DEVELOPMENT AT FACTORY



ENVIRONMENTAL GREENERY DEVELOPMENT

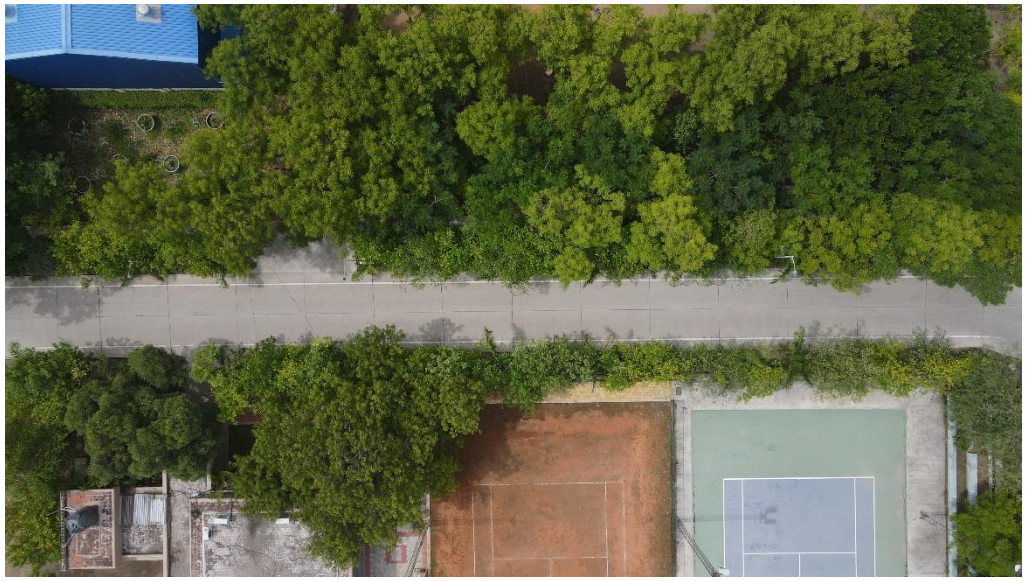
Afforestation in Mines colony area

Afforestation in Dump yard

Mines office entrance

ENVIRONMENTAL GREENERY DEVELOPMENT-COLONY

ENVIRONMENTAL GREENERY DEVELOPMENT-COLONY



RAMCO VIDYALAYA SCHOOL

GREENBELT DEVELOPMENT AT MADURAI AIRPORT

REHABILITATION OF WATER BODIES

Kousika River

Ayyan Oorani

Ethilappanpatti South Kanmai

EMPLOYEE ASSOCIATION IN ENCON ACTIVITIES

Environment day celebrations

Environment day celebrations

Rewards for suggestion scheme

One employee – One tree scheme

SOLID WASTE PROCESSING UNIT AT RR NAGAR PLANT

AWARDS DETAILS

CII ENERGY AWARD 2021-22

Gold Medal award from M/s. International Research Institute for Manufacturing, India and Aatmanirbhar Factory Award in National Awards for Manufacturing Competitiveness 2022.

RAMCO-CSR

SPONSORED TRICYCLE & HEARING AID

BY OUR MANAGING DIRECTOR

EYE CAMP

- RSSL has been conducting Monthly Eye camp in coordination with Aravind Eye Hospital, Tirunelveli for the benefit of nearby villages regularly on every second Sunday of the month.
- 210th Eye Camp conducted on 11.04.2023. Cataract Surgery -12846

Total Beneficiaries

45012

MEDICAL CAMP FOR TRIBAL PEOPLE AT THANIPPARAI VILLAGE

E-TOILETS FOR GOVT. HOSPITAL, MADURAI


thank
you