
THE RAMCO CEMENTS LIMITED
ALATHIYUR WORKS
Excellence In Energy Management

Presenting members

Muthusamy P
GM-Quality control

Radhakrishnan P V
Sr. Manager-Process

Vengadesh S
Manager-Process

The Ramco Cements Limited, Alathiyur Profile

01

A flagship company of RAMCO Group, having five Ceme
manufacturing units, six grinding units and one packing u
mortar and one ready mix unit with the total capacity of 1

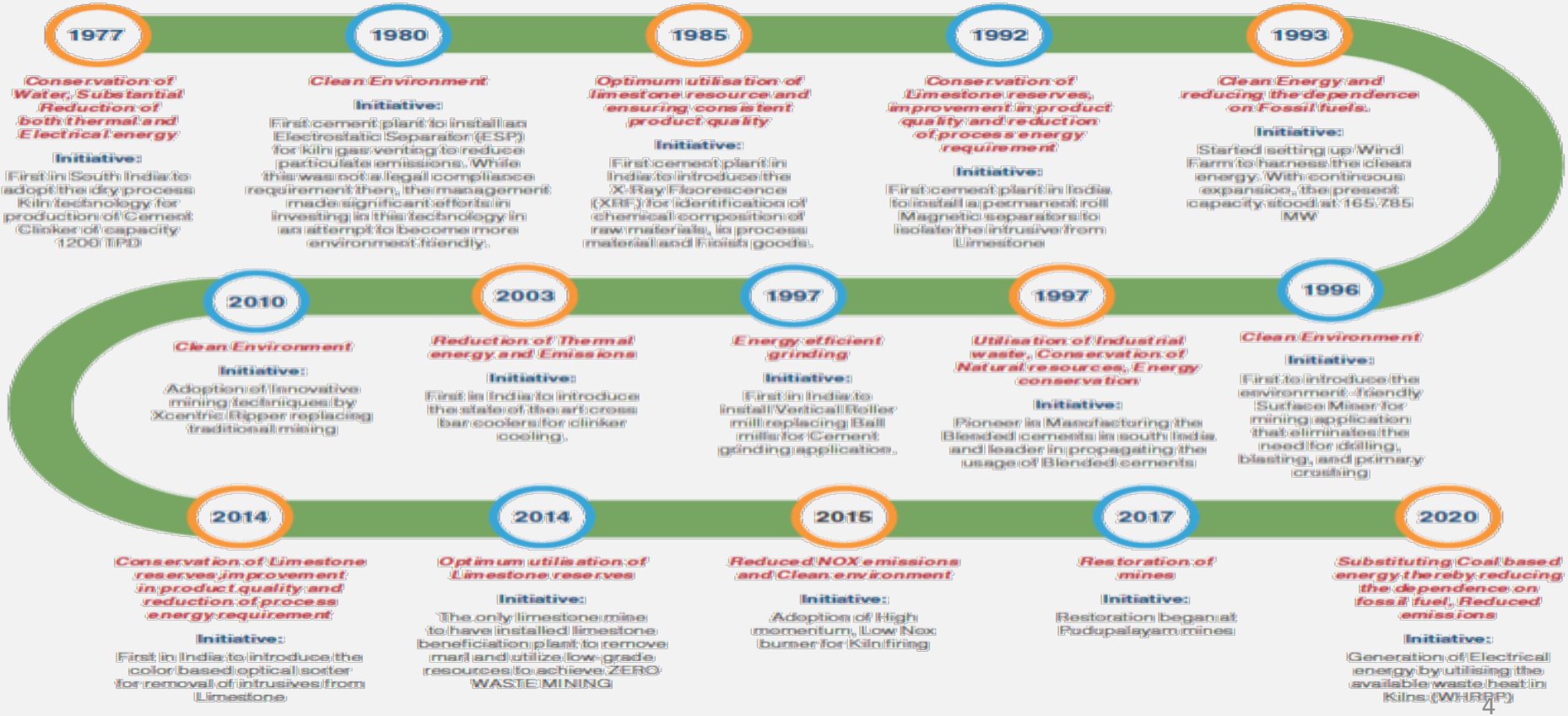
02

Alathiyur plant was setup in two phases 1997 & 2001 wit
capacity of 3.05 Million Tons / Annum and 2 X 3700 TPD
2X18 + 6 MW - Coal based Thermal power plant

03

The manufacturing products are Ordinary Portland Cemen
Pozzolana Cement and SRPC as per BIS & SLS standards

Ramco Sustainability Journey



IS/ISO 9001: 2008

Quality Management System

IS/ISO 14001: 2004

Environment Management System

IS 18001: 2007

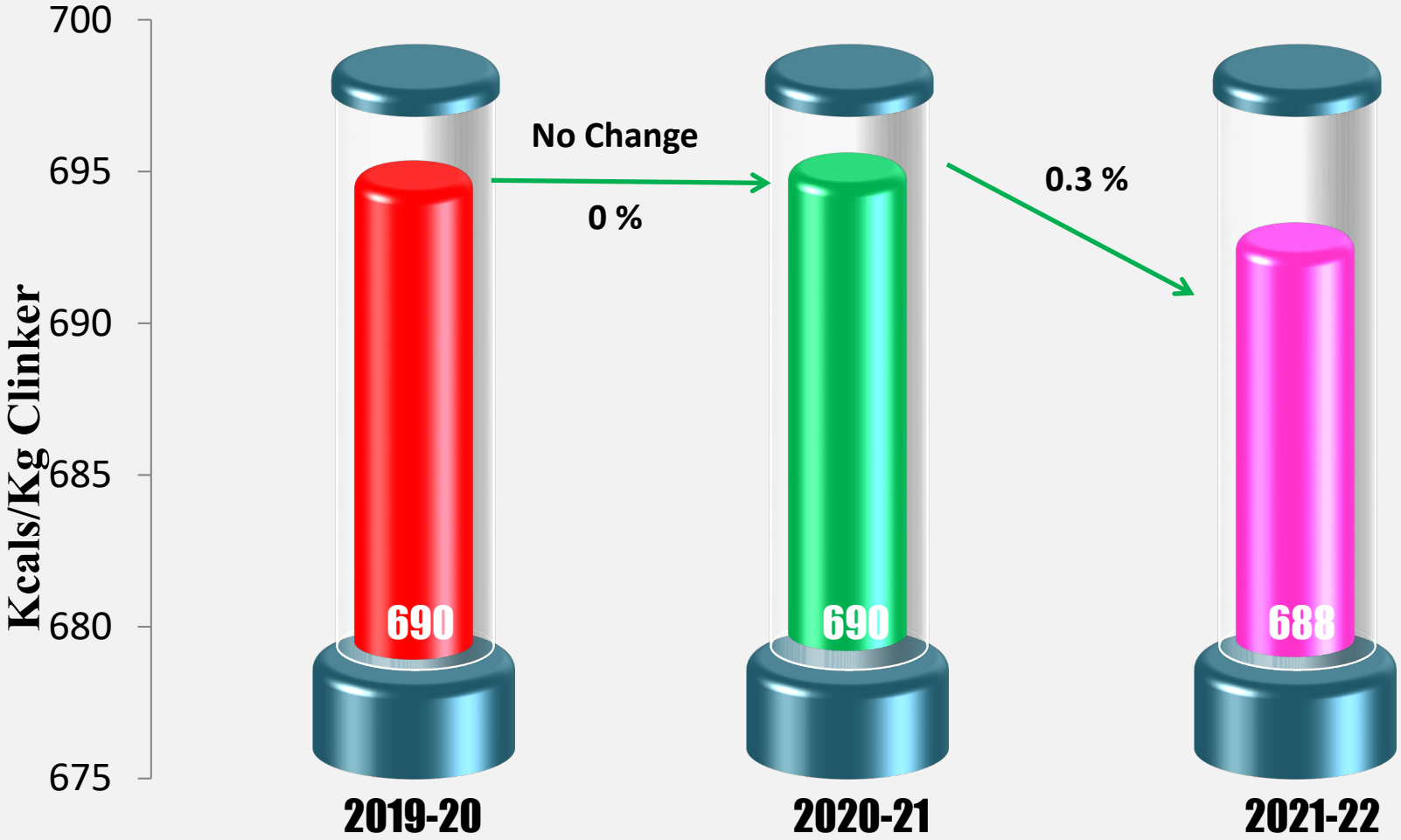
Occupational Health & Safety Management System

IS/ISO 50001:2011

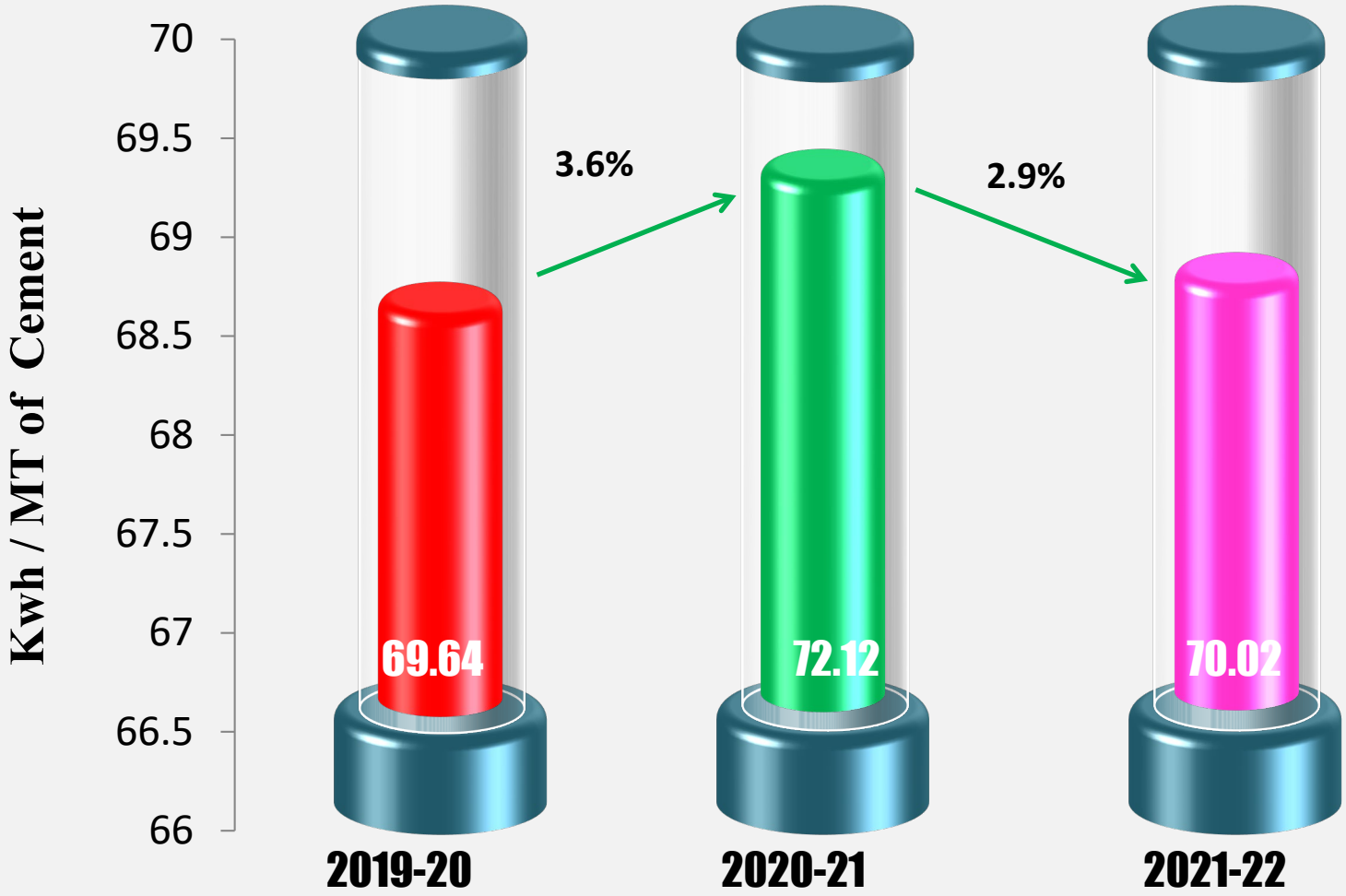
Energy Management System

5S Excellence Certified Company

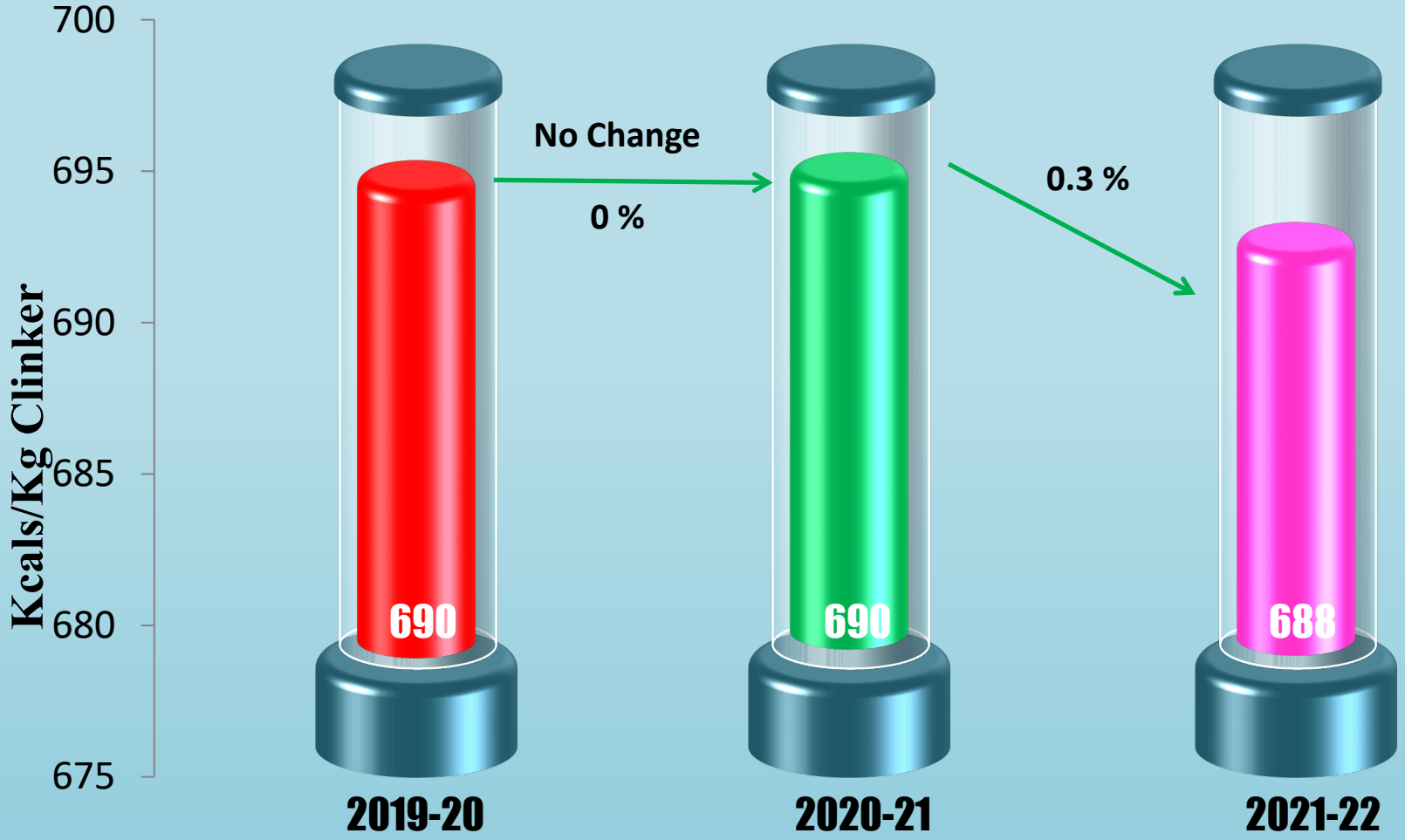
Thermal energy Consumption



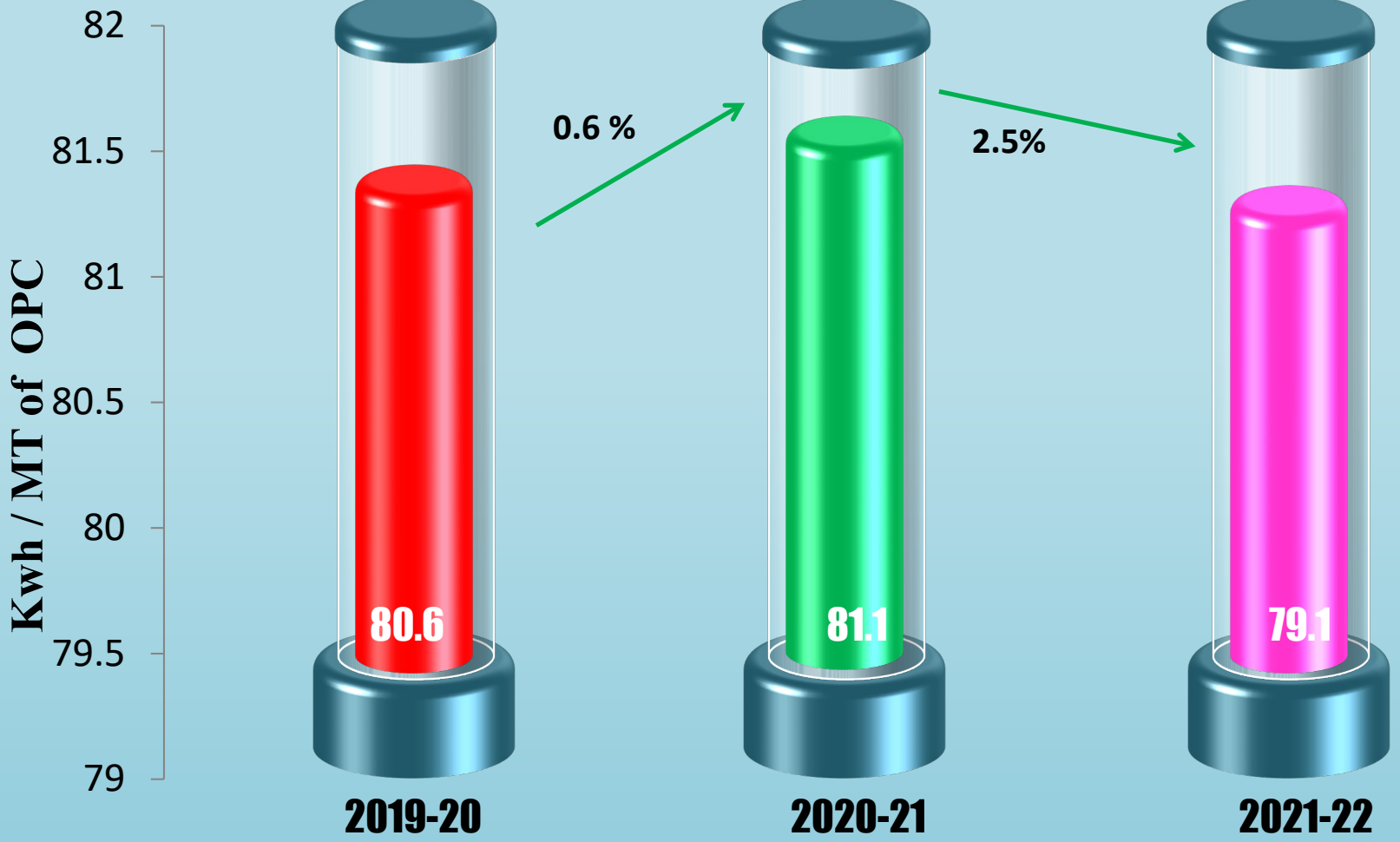
Electrical Specific Energy Consumption-Cement



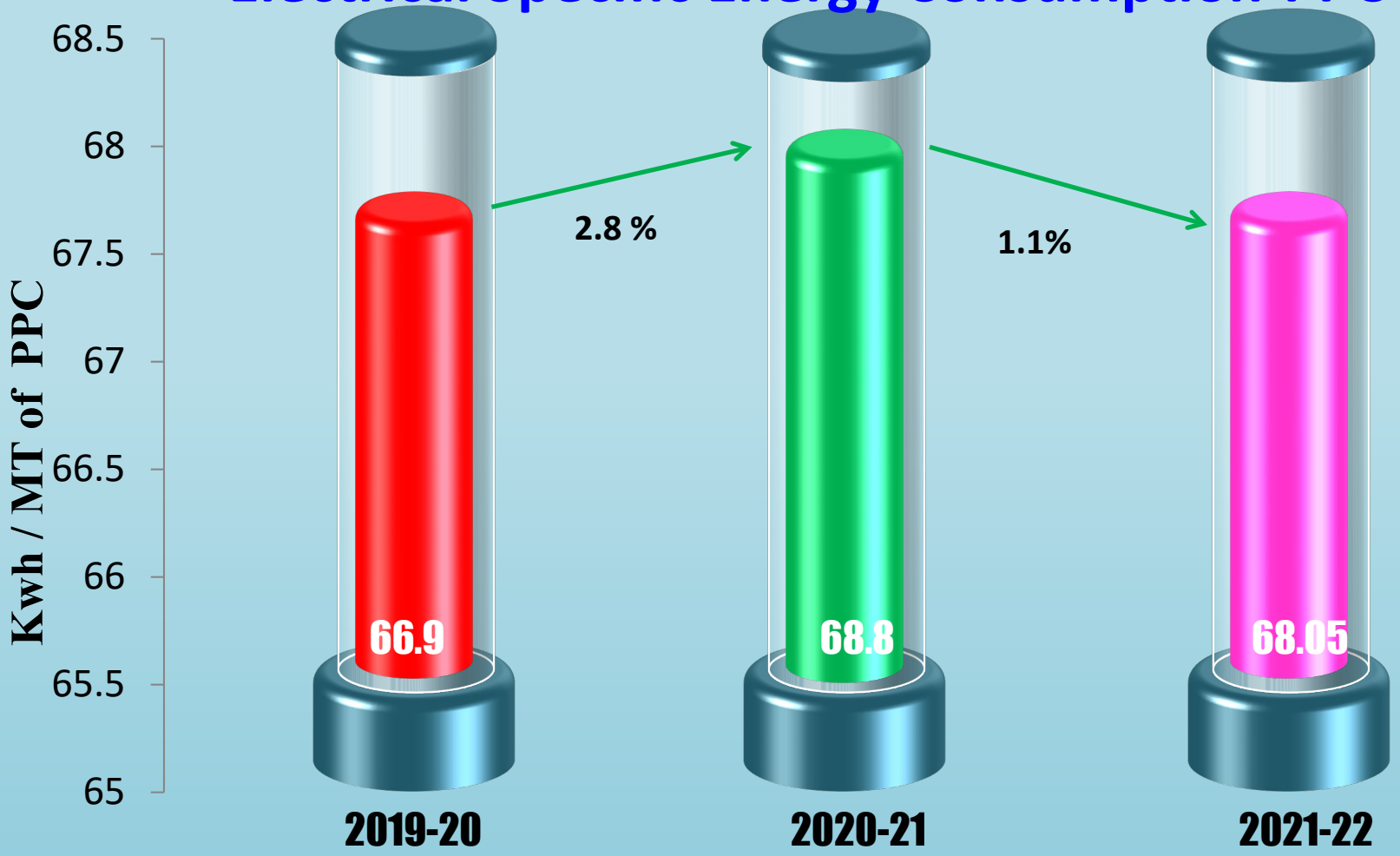
Thermal energy Consumption



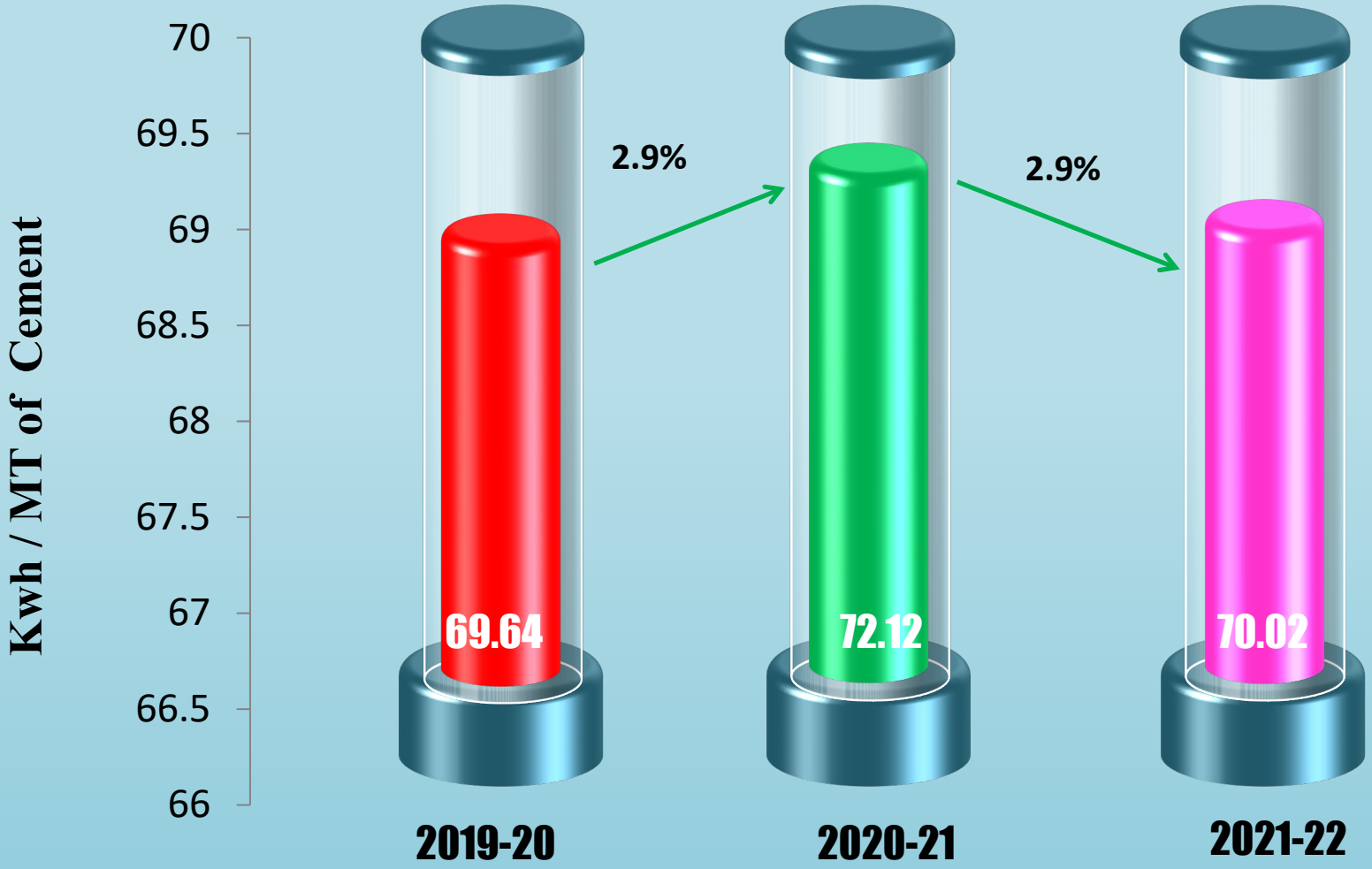
Electrical Specific Energy Consumption-OPC



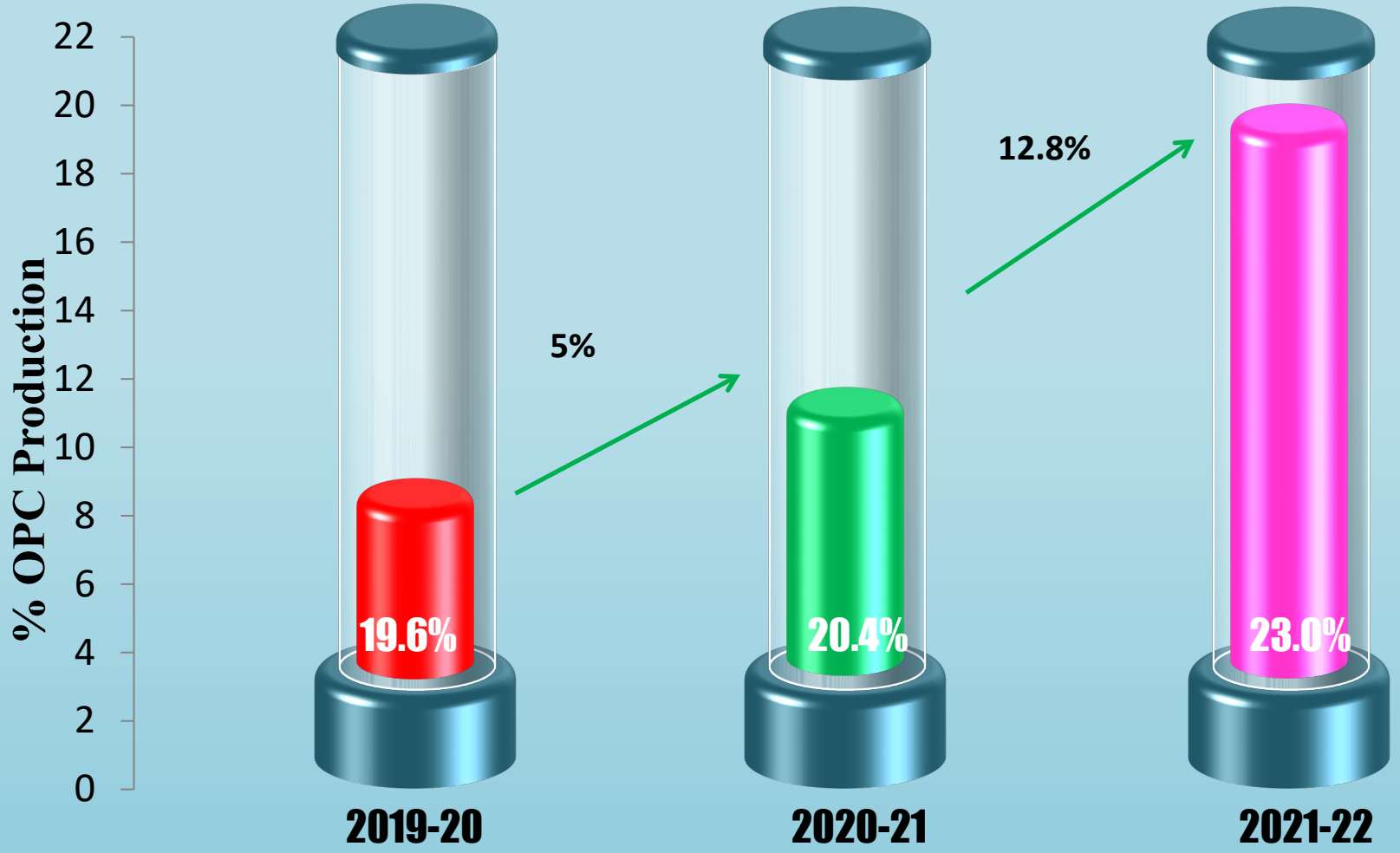
Electrical Specific Energy Consumption-PPC



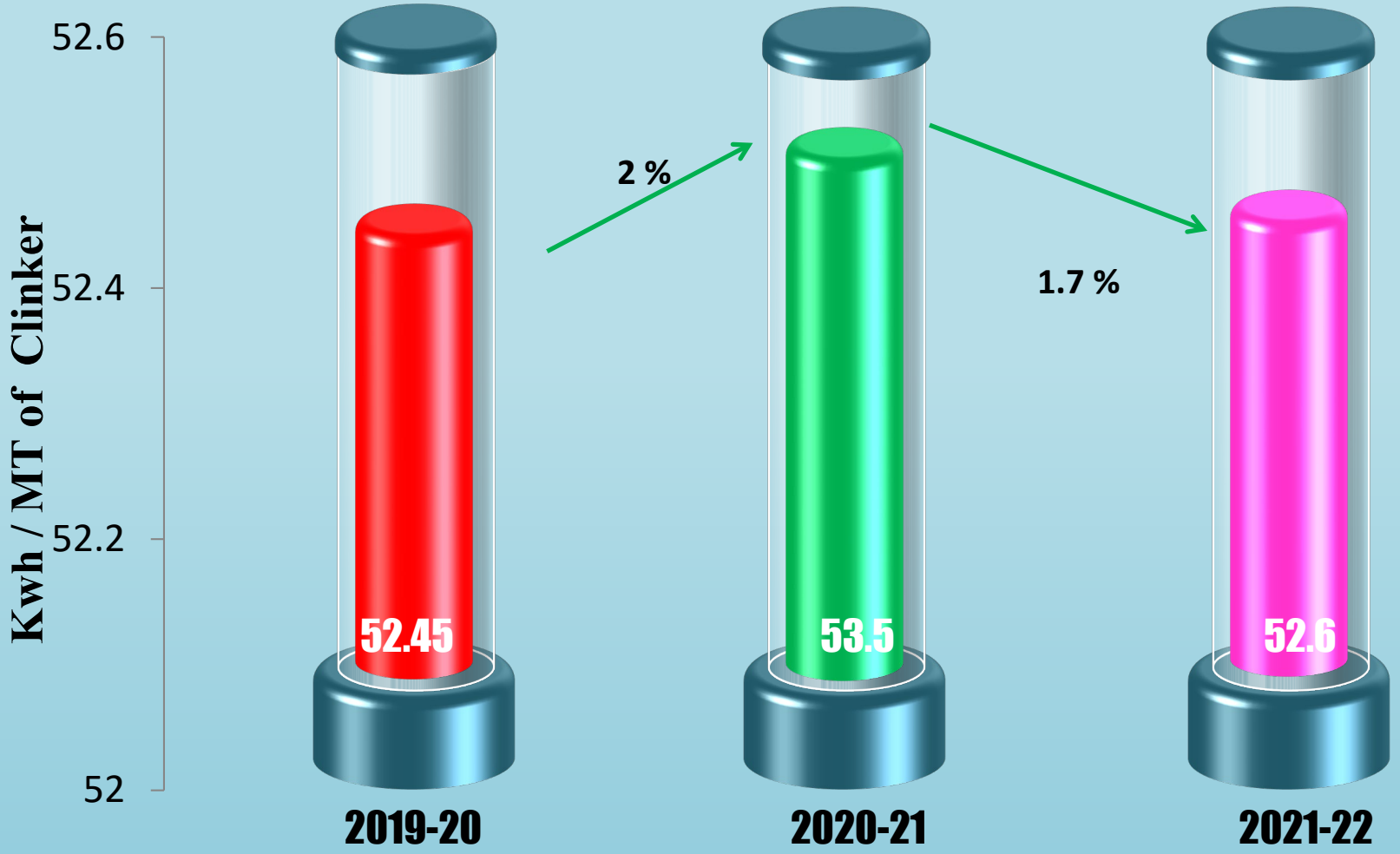
Electrical Specific Energy Consumption-Cement



OPC Contribution in Total Cement Production



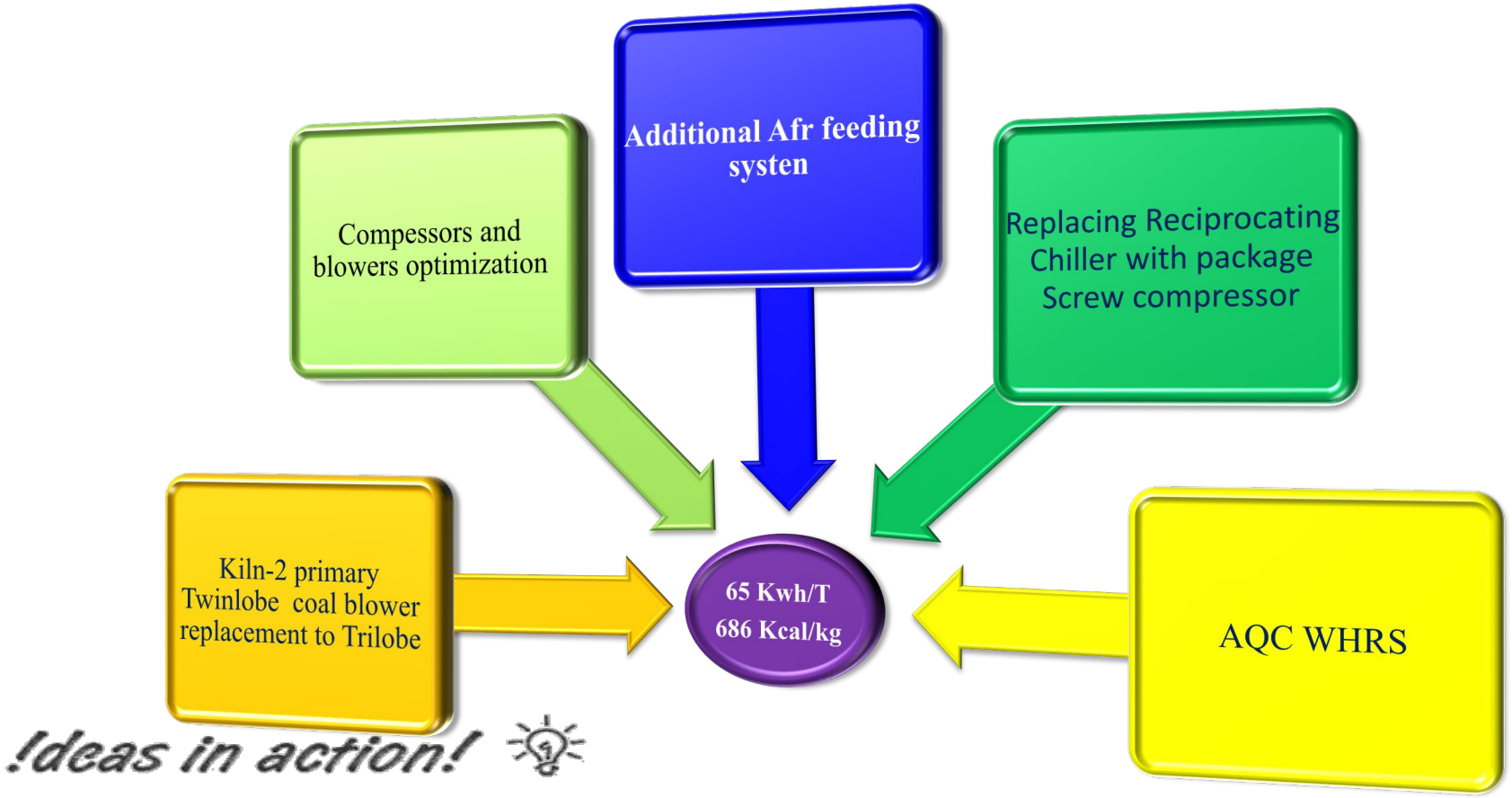
Electrical Specific Energy Consumption up to Clinker



Global Norms/Standards

International Benchmark	• SHC-665 Kcal/Kg Clk • SEC-65 Kwh/T Cem	01
National Benchmark	• SHC-685 Kcal/Kg Clk • SEC-63.9 Kwh/T Cem	02
TRCL Alathiyur	• SHC-688 Kcal/Kg Clk • SEC-70.02 Kwh/T Cem	03

Road Map To Achieve Benchmark



!deas in action!

Energy Conservation Projects Implemented in the years 2019-20 , 2020-21& 2021-22

	No. of Projects	: 16
	Projects with NIL investment	: 10 Nos.
	Total amount invested	: Rs.6440 Lacs
	Cost savings achieved	: Rs. 1277 Lacs
	Electrical energy saved	: 95.28 Lac Kwh
	Thermal Energy saved	:6832 MT of coal
	**Reduction in GHG emissions**	**: 19149 MT of CO_2**

Energy Conservation Project 2019-20

S. No.	Energy Saving Project	Savings (Rs. Lacs)	Investments (Rs. Lacs)
1	Installation of VFD for Line-1 Preheater fan	5.58	12
2	Installation of VFD for Cement mill compressor	0.92	1
3	Heat resistant paint in preheater-2	1.58	0.2
4	Compressor air optimization in rawmill-1,coal mill-2	10.3	0
5	Blower air optimization in rawmill-1 and 2	6.6	0
6	Cement mill-1 unit bag filter optimization	1.8	0

Energy Conservation Project 2020-21

S. No.	Energy Saving Project	Savings (Rs. Lacs)	Investments (Rs. Lacs)
1	compressor optimization in Line-1 and 2	2.9	12
2	Unit bagfilter optimization in line-1 and line-2	0.9	1
3	Operating Mills and kiln in Advanced process control	8.6	0.2
4	Reduction in oxygen level from 4.2% to 3.8 %	2.9	0
5	Blowers optimization in Cementill-1	1.1	0

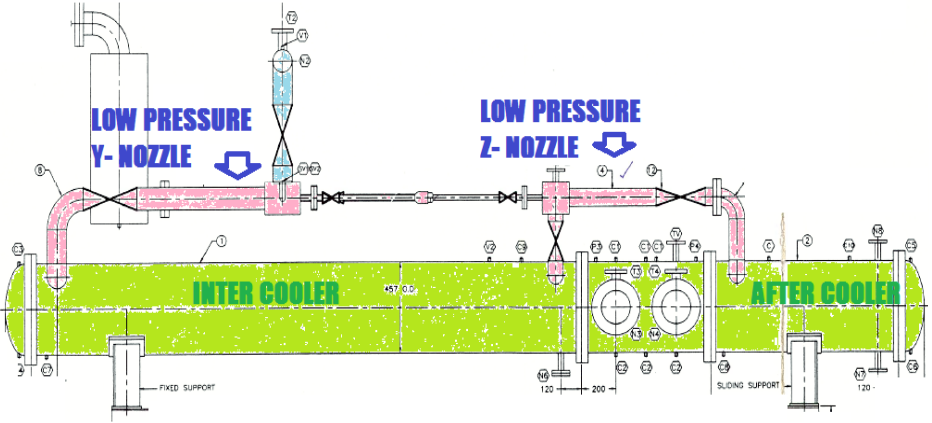
Energy Conservation Project 2021-22

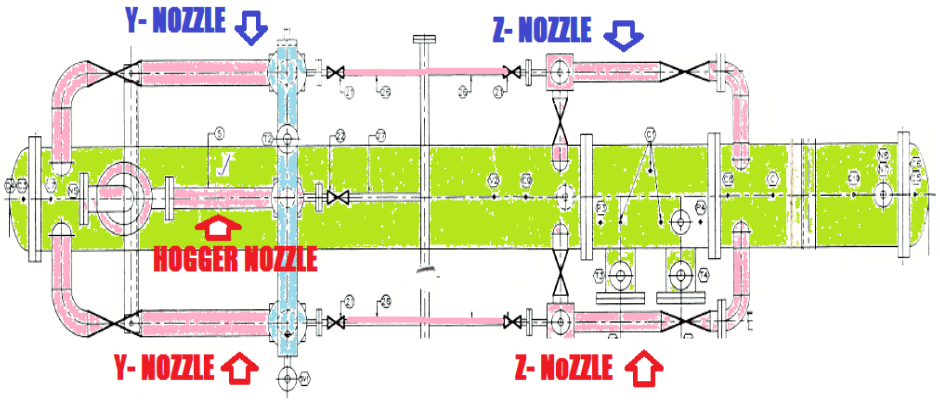
S. No.	Energy Saving Project	Savings (Rs. Lacs)	Investments (Rs. Lacs)
1	Rawmill high efficiency fan retrofit with VFD drive	50.7	189
2	WHRS system in kiln-1 and 2	2800	108
3	Air cooled condensor for TPP	3248	105.8
4	Solar panel installation	135	92.5
5	Existing 89M3/ hr Boiler Feed pump **VFD - ENERGY SAVINGS**	69	38.88

Energy Conservation Projects

Year	No of Proposals	Investments- Rs Lacs	Savings-Rs Lacs
2019-20	6	132	99.5
2020-21	5	0	16.4
2021-22	5	534.2	6302

WHRS steam to TPP ejector circuit


LOW PRESSURE
Y- NOZZLE
LOW PRESSURE
Z- NOZZLE
INTER COOLER
AFTER COOLER
FIXED SUPPORT
SLIDING SUPPORT


Y- NOZZLE
Z- NOZZLE
HOGGER NOZZLE
Y- NOZZLE
Z- NOZZLE


MAZDA LIMITED

➢Installed Cement Waste Heat Recovery (CWHR) Boilers with regenerative feed cycle in Line 1& 2 Clinker Cooler.

➢ Reduction in coal consumption @ 30 TPD.

•Achieved Thermal energy savings @ 330 kcal/kWh.

Waste Heat Recovery Boiler @ a cost of Rs.43 Crores

- Installed Cement Waste Heat Recovery (CWHR) Boilers with regenerative feed cycle in Line 1& 2 Clinker Cooler.

- Reduction in coal consumption @ 30 TPD.

- Achieved Thermal energy savings @ 330 kcal/kWh.

We have Erected and Commissioned 2 Nos. Waste Heat Recovery Boilers (AQC Boilers). We have earlier installed Ejectors for ACC as per the design steam output pressure from AQC Boilers @ 25-29 Kg/cm2 and Temperature of 370-390 Deg C.

Accordingly, we have designed and installed steam pipeline to take 0.3 TPH of steam to each Air cooled condenser Ejector @ 25 Kg/cm2 pressure

During normal running of WHR Boilers, we are unable to get constant designed steam pressure of 25 Kg/cm2 due to various Kiln operating conditions. The AQC Boiler steam pressure is varying from 9 Kg/cm2 to 30 Kg/cm2.

Due to this steam pressure fluctuation, we are unable to utilize the WHR Boiler steam continuously for Air cooled condenser Ejectors. To overcome this issue, we propose to change Ejector nozzles so as to operate ACC Ejectors at minimum pressure of 9 Kg/cm2.

Innovative Project -1

Steam savings – 0.3 Tons/Hr

Total coal savings per day – 1.89 MT

Coal cost– 10000 Rs per Ton

Total cost savings –18900*30*300= 68 lacs/Year

Investment Cost : Rs. 5 Lacs

Simple Pay Back Period : 1 Months

Froath floatation

Recovery of Limestone from Reject Material
by Floatation Plant @ Cost of Rs.63 Crores

- **Achieved 20% Recovery of Limestone from reject**
- **80% of Reject material used for Backfilling of Mine Pits**

In our Alathiyur mines we are having very low grade limestone (with silica of 18 – 25 %) 68 Lakhs Tones which is 26% in total reserves and Very Very low grade (25-33% silica) 52 Lakhs Tones which is 20% in total reserves which is not usable directly for cement manufacturing process.

- We have installed Beneficiation / washing plant in year 2014 for consuming 18-25% silica lime stone for Clinker production after washing.

- In the existing Limestone Beneficiation plant, we are able to recover 55-56% of cement grade limestone with silica range of 14-16 % and LSF range between 100-110.

- Out of the Balance rejected material, 32% of the material is being rejected as slurry with 60% moisture and 12 % of the material is rejected as sand (-2 mm).

- The slurry contains very fine particle of less than 300 microns and almost 75% of the particles are less than 25 microns.

- Due to smaller particles, drying of slurry is very difficult task and it took more than a month to reduce the moisture level from 60% to 35 %

- The basic principle is to change the mineral element surface properties of hydrophobic (water repellent) and hydrophilic by adding some Reagents.

If a mixture of hydrophobic and hydrophilic particles are suspended in water and air is bubbled through the suspension, then the hydrophobic particles will tend to attach to the air bubbles and float to the surface and hydrophilic particles are settled down as tailings.

To process the slurry from limestone benefication plant and recover cement grade limestone from waste..

The slurry generated in benefication plant is feed to the froath floatation cells.

- 6 banks of cells is present in the froath floatation process.

- Sodium hydroxide , sodium silicate and sodium oleate is used in the respective cell for seperation of silica and CaO from slurry.

Renewable Energy

Type of RES	2019-20		2020-21		2021-22	
	Energy Generated (kWh)	Annual Savings (Rs.)	Energy Generated (kWh)	Annual Savings (Rs.)	Energy Generated (kWh)	Annual Savings (Rs.)
Solar photovoltaic	52924	224927	51092	201813	480000	2880000

Total installed **capacity during the year 1996 is 33.235 MW**, which was the **SINGLE LARGEST WIND FARM IN THE SOUTH EAST ASIA** at that time.

The wind mill capacity is constantly upgraded and now at present the **capacity is 166 MW with 229 individual Wind Electric Generators. The unit generation is 268.7 Million KWh for 2021-22**

Utilization of waste material as fuel

S. No	Type of Waste Fuel used	Quantity of waste fuel used (MT)	Equivalent of Conventional energy used (Ton of coal)	Waste fuel as % of total energy
1	AFR Liquid	794.81	189	0.2%
2	AFR Solid	3583.3	896	0.7%
3	Lignite Unburn (Pond Ash)	5368	1764	1.4%
4	TPP Reject	7225.5	1498	1.2%
5	Ambika Reject	538	61	0.05%
6	AFR Liquid Mix Spent	394.53	27	0.02%
Total				3.59%

Utilization of waste material as Raw material

S. No	Name of Alternative raw material	Name of material gets replaced	Quantity used (MT/ Year)		
			2019-20	2020-21	2021-22
1	slag	Iron ore	117704	79734	82379
2	Chemical sludge	Limestone	1003	675	1166

GHG Inventorisation

Year	Scope 1 emissions CO_2e (MT)/T Cement	Scope 2 emissions CO_2e (MT)/T Cement	Scope 3 emissions CO_2e (MT)/T Cement	Total CO_2e (MT)/T Cement	% Reduction in emission
2019-20	1068	-390	15.00	693.2	
2020-21	901	-217	12.10	696	
2021-22	903.9	-225	12.10	691	

Scope 1 emissions	Calcination, Fuel for kiln & CBPP, owned vehicle, Refrigeration & AC
Scope 2 emissions	Power consumption
Scope 3 emissions	Raw Material Supply & Product delivery

Green Supply Chain Management

Yes, We have a integrated green purchase policy to ensure the Conservation of Energy for sustainable development,

Adopting the state of art technology, energy efficient procurement and practices,

Life cycle cost assement of equipment's andencouraging team efforts .

Projects:

Procurement of high efficiency fan in rawmill-1, Rawmill -2 classifier fan.

AQC steam optimization

AQC steam to ejector circuit

Energy Reporting Format

Power Report on	dd-mm-yyyy																			
											Line1			Line2			For L1 and L2		
Equipment	Production		R.Hrs.		TPH		Parameter	KWH		KW		Kwh/ Matl	Kwh/ Clinker	Kwh/ Cement	Kwh/ Matl	Kwh/ Clinker	Kwh/ Cement	Kwh/ Matl	Kwh/ Clinker	Kwh/ Cement
	L1	L2	L1	L2	L1	L2		L1	L2	L1	L2									
LSS							Crusher Main Motor													
							Crusher Auxiliaries													
							Mines													
							Sub total													
Raw mill							Raw Mill Main Motor													
							Raw Mill Fan													
							RM,RMH MCC&AC													
							Sub total													
Coal mill							Coal Mill Main Drive													
							Coal mill fan													
							Coal Mill Auxiliaries													
							Coal Handling													
							Coal crushing													
							Sub total													
Kiln							ELE-K1-ID Fan													
							ELE-K1-B.H.Fan													
							ELE-K1-B.H.MCC													
							ELE-K1-C.F.MCC													
							ELE-K1-D.C.Drive													
							Cooler Fan & C'ker Trans													
							Kiln & Kiln Feed MCC													
							Sub Total													
Service							**Tr.Loss,Lighting, CCR A/C and Pump House**													
Up to clinkerisation							kWh / MT of clinker													
Cement mill							Cement Mill Main drive													
							Cement Mill Fan													
							Booster Fan													
							Fly Ash Hand													
							Cement Mill Auxiliaries													
							Sub total													
Despatch without Bulker																				
Bulker Despatch																				
Packing plant							Packing Plant													
Service							**Tr.Loss,Lighting and Pump House**													
Total							TOTAL													

Factor for Equiv	Clinker		Cement		Clk	Cem	SERVICE UNITS			On Date	Mon Date					
	L1	L2	L1	L2	For LI & L2											
CRUSHER							LIGHITING					Clk Prod.			KW	
RAWMILL							PUMP HOUSE					Cem Prd.		Cooler Vent Fan-1		
COALMILL							CCR AC					Desp		Cooler Vent Fan-2		
KILN							LOSSES					P. Comb.				
							TOTAL					Line-1				
												Line-2				

Energy Manager GM –E&I AVP-Works

Involvement of Employees in ENCON

Energy management cell : 7 Teams

Thermal Energy audit : Heat balance in Pyro section-
Preheater, Kiln, Cooler & False Air study.

Electrical Energy audit : Efficiency of Motors, Fans, Blowers, Compressors etc.,

Quality circle forum : 10 Quality teams

5S & Suggestion scheme implemented

Green Product and ISO 50001

GreenPro

CII

Confederation of Indian Industry

CII-Green Products and Services Council

hereby certifies that

Ramco Supergrade PPC

(GPR01RC01001)

manufactured by The Ramco Cements Limited meets the requirements of GreenPro Certification and qualifies as a Green Product. This certification is valid till December 2026

Jamshyd N Godrej
Chairman
CII-Godrej GBC

ParasuRaman B
Chairman
CII-Green Products & Services Council

K S Venkatagiri
Executive Director
CII-Godrej GBC

Sponsoring Council and programmes

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
LICENCE FOR THE ENERGY MANAGEMENT SYSTEMS CERTIFICATION

The Ramco Cements Limited
Alathiyar Works
Cement Nagar Post
Sendurai Taluk, Ariyalur District,
Tamil Nadu- 621 730

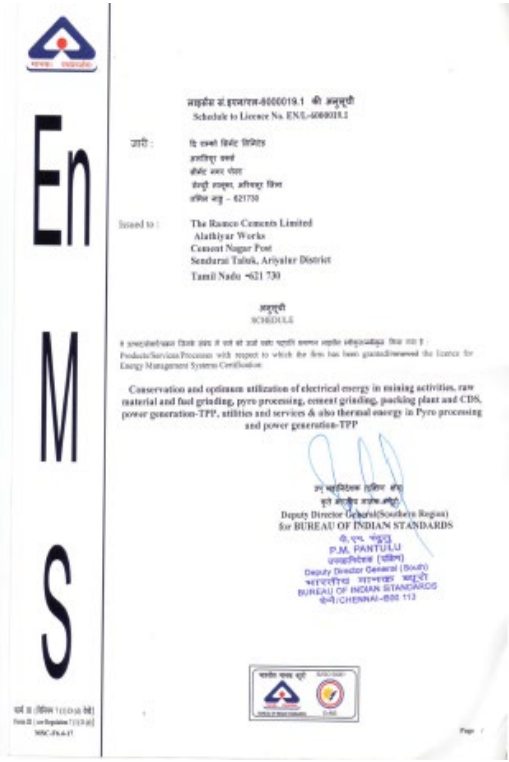
IS/ISO 50001:2011

This licence shall be valid from 27 November 2017 to 04 September 2020 and may be renewed as prescribed in the Regulations.

Signed, Sealed and Dated this 10th day of January 2018

Deputy Director General(Southern Region)
for BUREAU OF INDIAN STANDARDS

P.M. PANTULU
Deputy Director General (South)
BUREAU OF INDIAN STANDARDS
CHENNAI-600 113



Schedule to Licence No. ENL-6000019.1

The Ramco Cements Limited
Alathiyar Works
Cement Nagar Post
Sendurai Taluk, Ariyalur District
Tamil Nadu -621 730

SCHEDULE

Conservation and optimum utilization of electrical energy in mining activities, raw material and fuel grinding, pyro processing, cement grinding, packing plant and CDS, power generation-TPP, utilities and services & also thermal energy in Pyro processing and power generation-TPP

Deputy Director General(Southern Region)
for BUREAU OF INDIAN STANDARDS

P.M. PANTULU
Deputy Director General (South)
BUREAU OF INDIAN STANDARDS
CHENNAI-600 113

Other Innovative technologies implemented

01

Advance process control - Fuzzy logic for improving Producti
reduction in stoppages in the optimization of raw mill, coal
cement mill in advance process control mechanism to elimi
intervention to reduce fossil fuel and electrical energy.

02

The prediction model such as regression model and Neural
has been used to predict the result before and optimize the
operating parameters.

03

The mills has been optimized with continuous monitoring of
logic programme to optimize the production with low specif
consumption.

Other Innovative technologies implemented

04

The kiln has optimized using various loops in controlling the
reduce the fuel consumption based on the operating param

05

Fuzzy logic nullifies the manual errors and optimize the proc

06

Waste heat recovery system installed which has a high impa
reduction of power cost. A mini turbine is proposed for utili
WHRS steam

Long Term Vision on EE

01

The long term target on electrical efficiency is 65 Kwh per t t
and reduce the specific heat consumption to 686 Kcal per k

02

The support required to meet the target is achieved by mea
Technical team along with Financial allotment. Our manage
having keen interest for implementing all energy conservin
proposals.

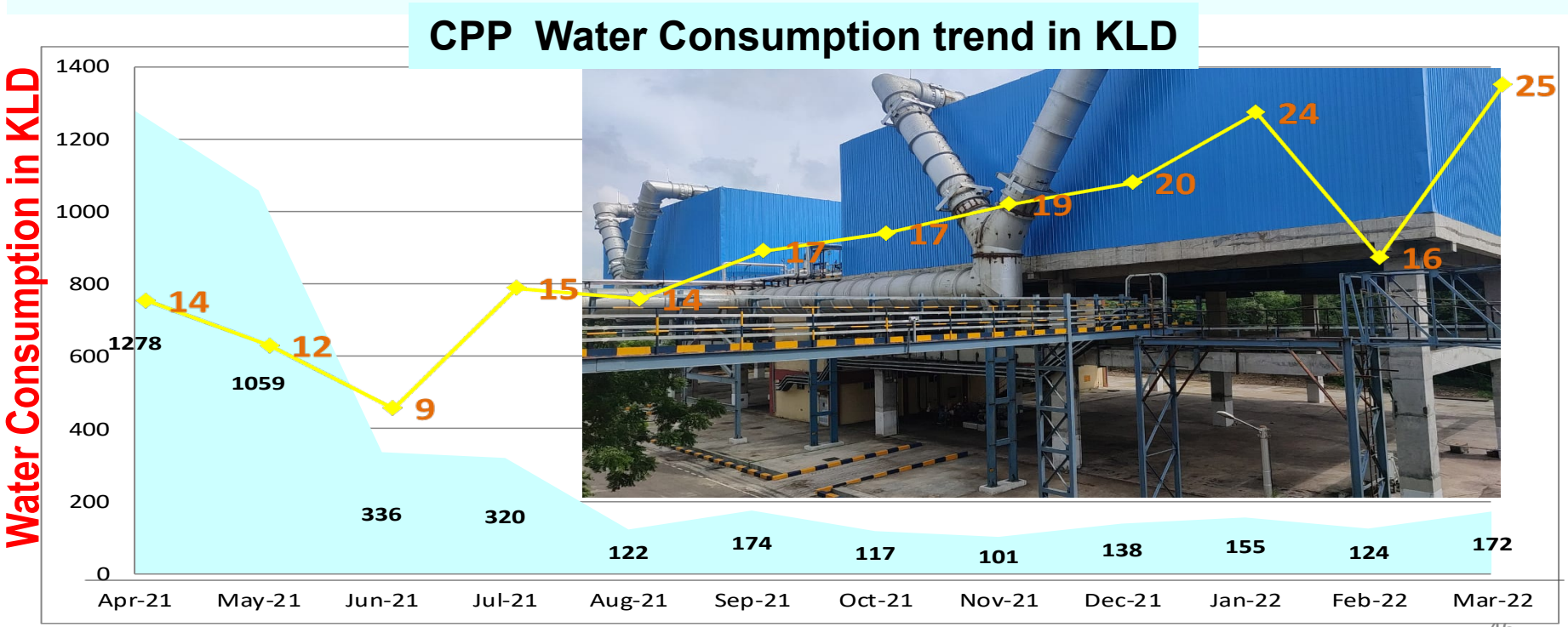
03

To achieve this target the proposal are-

1. WHRS system
2. Compressors and blowers optimization
3. Mills and kilns optimization by Fuzzy logic

Air Cooled Condenser for 2X18 MW Captive Thermal Power Plant at a Cost Of Rs.40 Crs

Achieved Raw water consumption Reduction by 92% (3843 KLD to 353 KLD) and effluent Generation Reduction i.e., 883 KLD to 97 KLD.



Procured Battery Car for Site rounds

Procured Electric vehicle for Internal material transfer

ECOMMUTE DAY EVERY WEDNESDAY

Procured CNG vehicle for Water Tanker usage @ 20 Lakhs

Bio-Diesel consumed Qty (2021) : 3,15,000 Liters

Usage of Bio-Diesel for Factory Auto

AFR Shredder, Storage Shed & Feeding system-35 crores

National Level Energy Awards

"Apex India Occupational Health & Safety Award 2021

"Occupational Health & Safety Award - 2020" from Apex India, New Delhi

"Effective Safety Culture Awards 2021" from GreenTech Foundation ,New Delhi

"CSR Excellence Award – 2019" from Apex India, New Delhi - received on Dec 2020.

"ET NOW World CSR Congress" Holistic Community Development Award 2020

"Commendation for Significant Achievement in CSR" CII-ITC Sustainability Awards 2020.

"7th CSR INDIA AWARD - 2020" from Greentech Foundation, New Delhi .

CII-EHS EXCELLANCE GOLD AWARD 2021-22

CII-EHS BEST PRACTICE IN WATER MANAGEMENT AWARD 2021-22

"Green Belt Development Achievement Award" -2020 from Green tech foundation, New Delhi.

IGMC Award– 2018 from IRIM, Mumbai

Afforestation in Mines,Factory and surroundings

Year	No of Saplings Planted	Area covered (acres)
1996 - 2022	1,31,500	127.2
2022-23 (Plan)	1,600	0.30
% of Green belt area (1996- March 2022)		42.48 %

Types of Species planted

1	NSSO	11	Tamarind
2	Manis Kondrai	12	Bamboos
3	Pungai	13	Sapotta
4	Thungumoonji	14	Amla
5	Gulmohar	15	Guava
6	Naval	16	Mango
7	Jack Fruit	17	Spoor Thodia
8	Petlophorum	18	Sarakonna
9	Subakumil	19	Gulmohar
10	Acacia	20	Belt Farm
		21	Lokossdomia

At 89% Survival Rate

Mines Name	North Mines	South Mines	Tular Mines	South of South Mines	Total
Number of Saplings Planted since 2010	47,314	95,691	89,741	32,477	2,65,223

We have donated 1000 saplings to Adhanakurichi (600), Alathiyur (250) and Manakkudayan (150) panchayat to plant in the panchayat vacant lands.

Bio Gas Plant in colont and factory

Fuel Saved : 12-15 Kg LPG/day

Bio Gas Plant	At Factory Canteen	At Colony / Bachelor Mess
Capacity (Food waste)	150 Kg/Day	150 Kg/Day
Cumulative Feed per year	28 Tons	14.6 Tons
Bio Gas Generation per year(M3)	2753	1460
LPG cylinders savings per year	72.4	38.4

Rain Water Harvesting Pond and Bird Sanctuary

Bio Composting

Vermi Composting

Environment Projects 2020-22 @ a cost of 190.58 Crores

No	Project	Project Cost	Impact
1	Raw Mill Secondary Classifier Project	39.00 Cr	Resource conservation
2	Air Cooled Condenser for 2X18 MW Captive Thermal Power Plant	40.00 Cr	Water Conservation
3	Recovery of Limestone & Water from Tailings by Floatation Plant	63.00 Cr	Resource conservation
4	Solar Plant Installation – 290 KWp	1.35 Cr	Renewable Energy usage
5	Line 1 Preheater fan MV VFD installation	1.08 Cr	Energy Conservation
6	Line-1 Cement Mill bag house bag replacement to reduce SPM<10 mg/Nm3	0.56 Cr	Prevention of Pollution
7	Bag Cleaning Device in 4th Packer	0.14 Cr	Prevention of Pollution
8	Mines Additional Base Road Formation	1.15 Cr	Prevention of Pollution
9	Procured CNG vehicle for Water Tanker usage	0.20 Cr	Prevention of Pollution
10	Segregation Shed for Solid Waste	0.13 Cr	Prevention of Pollution
11	Waste Heat Recovery Boiler (Air Quenching Chamber)	43.00 Cr	Energy Conservation
12	Boiler Feed Water Pump VFD Installation	0.52 Cr	Energy Conservation
13	Upgraded Online Stack PM Emission Monitors	0.40 Cr	Env Monitoring

THE RAMCO CEMENTS LIMITED
ALATHIYUR WORKS

Thank you