

## ORIENT CEMENT LIMITED, DEVAPUR UNIT

**CII National Award for Excellence in Energy Management 2021**

### Presentation Team:

**Mr. Y. Padmaveer, AVP-Operations**

**Mr. Vijayapal Ratna, Sr Manager-Production**

**Mr. Shailesha Rajawat, Dy Manager-Process**

**Great  
Place  
To  
Work®**

**Certified**  
APR 2020–MAR 2021  
INDIA



**Mr. Shiv Kant Pandey**  
President - Manufacturing



**Mr. RVR Murthy**  
Sr. Vice President - Works



**Mr. Y. Padmaveer**  
AVP- Operations

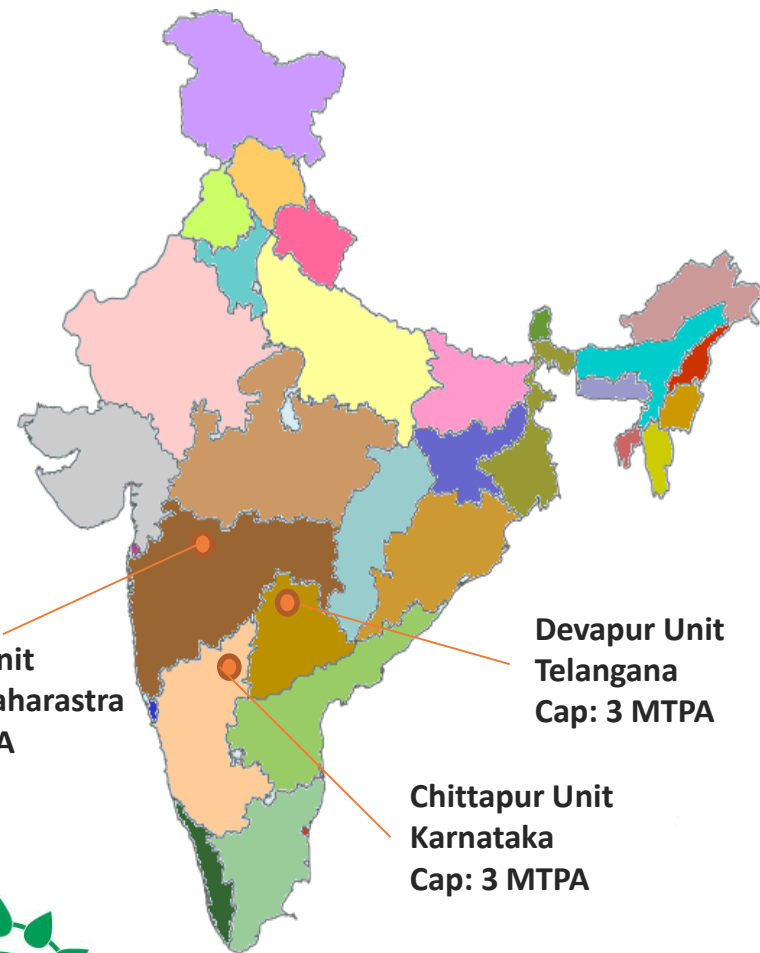
Orient Cement operating 3 Cement Plants in India:

- ❖ Integrated Plant (incl:CPP) - Devapur, Telangana
- ❖ Cement Grinding Unit - Jalgaon, Maharashtra
- ❖ Integrated Plant (incl:CPP) - Chittapur, Karnataka

**Overall Capacity of Orient Cement is 8.0 MTPA.**

**Plant is certified with IMS:**

- ❖ ISO 9001:2015
- ❖ ISO 14001:2015
- ❖ ISO 45001:2018
- ❖ ISO 50001:2018
- ❖ TPM-Phase I & II
- ❖ (Excellence and Excellence in consistent)
- ❖ NABL Accredited Quality Control Laboratory
- ❖ **Member of CSI (WBCSD)**
- ❖ **Green Pro certified by CII**



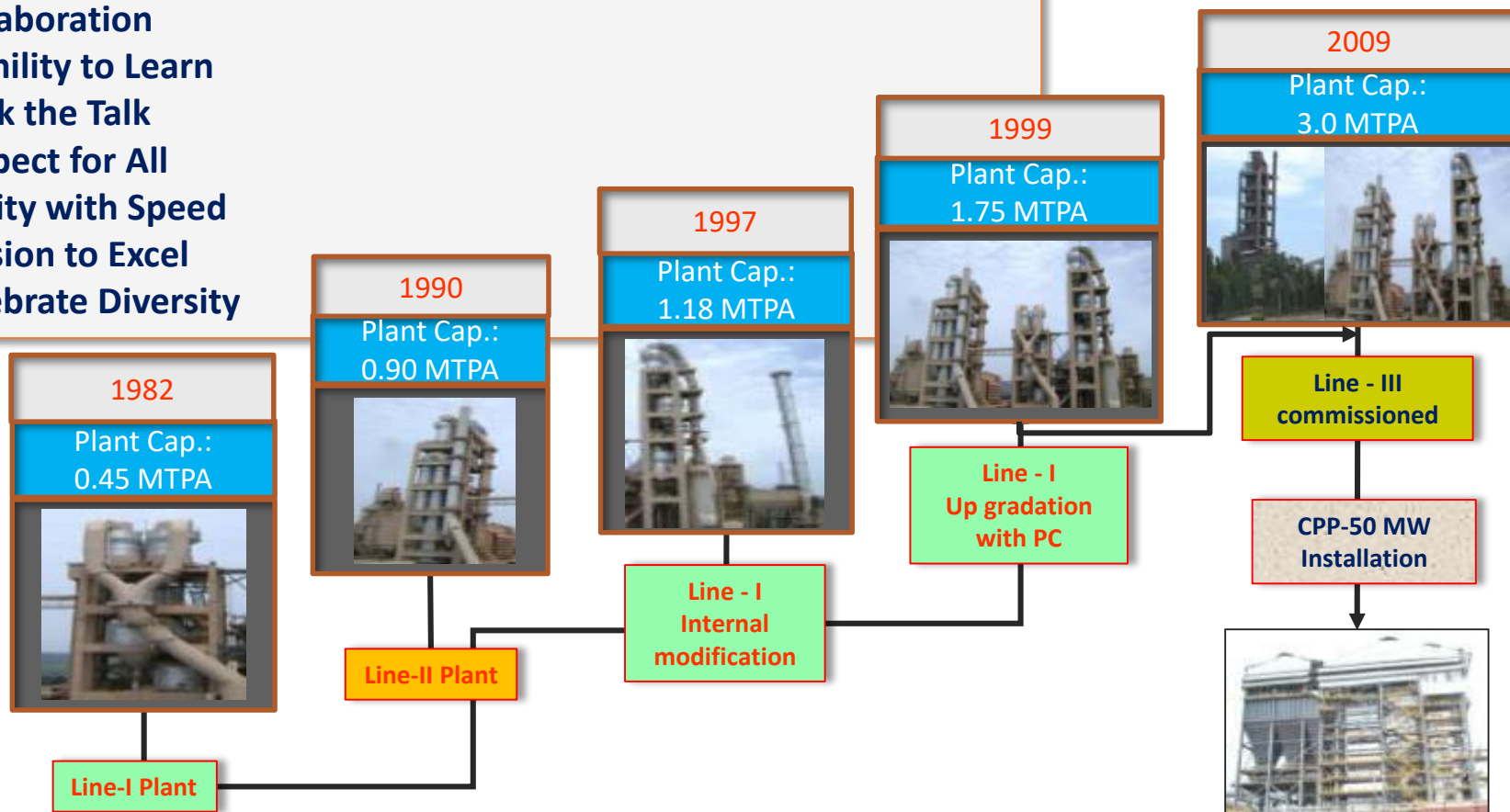
## OUR VISION & VALUES

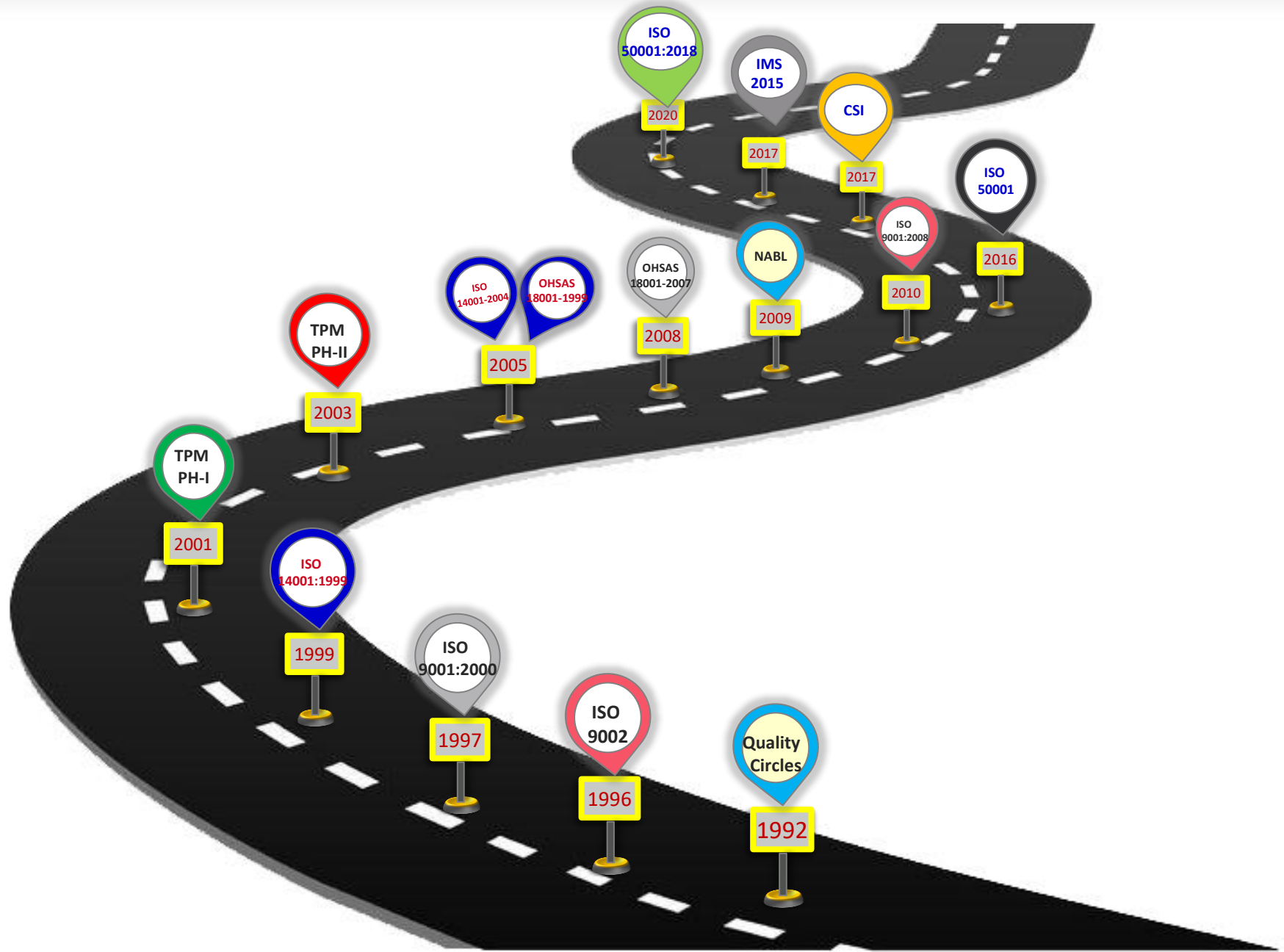
### Vision

**Build Sustainably** to Be a Valued Partner in Progress.

### Values

- ❖ Collaboration
- ❖ Humility to Learn
- ❖ Walk the Talk
- ❖ Respect for All
- ❖ Agility with Speed
- ❖ Passion to Excel
- ❖ Celebrate Diversity







**ORIENT CEMENT LIMITED**

**INTEGRATED MANAGEMENT SYSTEM POLICY  
(ISO 9001:2015, ISO 14001:2015,  
ISO 45001:2018 & ISO 50001:2018)**

Orient Cement Limited aims to be a leading company by providing consistent quality products and customer satisfaction through capabilities building, use of best practices, reliable relationships with all stakeholders and innovative cement products with a commitment to maintain environment friendly, safe, healthy and sustainability working condition in all its operations.

We are committed to:

- Operating the plant energy efficiently and increase the usage of alternative fuels & minimizing the energy losses;
- Complying applicable legal & other requirements;
- Protection of environment includes prevention of pollution by optimising the consumption, responsible sourcing, reuse and recycle;
- Eliminating hazards, reducing risks and exploring opportunities by continual improvement of all processes to enhance the IMS performance, professional development and knowledge sharing;
- Developing safety culture, safeguarding employees, workers, and their representatives from injury & ill health through their consultation and participation in safety assessment and adherence to PPE;
- Available information is utilised for enhancing objectives & targets with optimal resources.

**SK PANDEY**  
PRESIDENT - MANUFACTURING

Date: 01.04.2019



## MANAGEMENT SYSTEM CERTIFICATE

Certificate No:  
210226-2018-AE-IND-RvA

Initial certification date:  
09 February 2017

Valid:  
09 February 2020 - 09 February 2023

This is to certify that the management system of

### Orient Cement Limited

P.O. Devapur Cement Works, Mancherla - 504218, Telangana, India and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Energy Management System standard:  
**ISO 50001:2018**

This certificate is valid for the following scope:  
**Manufacturing of Cement.**

Place and date:  
Barendrecht, 11 May 2020



For the issuing office:  
DNV GL - Business Assurance  
Zwolsseweg 1, 2994 LB Barendrecht,  
Netherlands



**Eric Koek**  
Management Representative

## Impact on annual production performance:

- ❖ Reduced more than 27.23% in clinker and 25.33 % in cement compare with 2018-19.

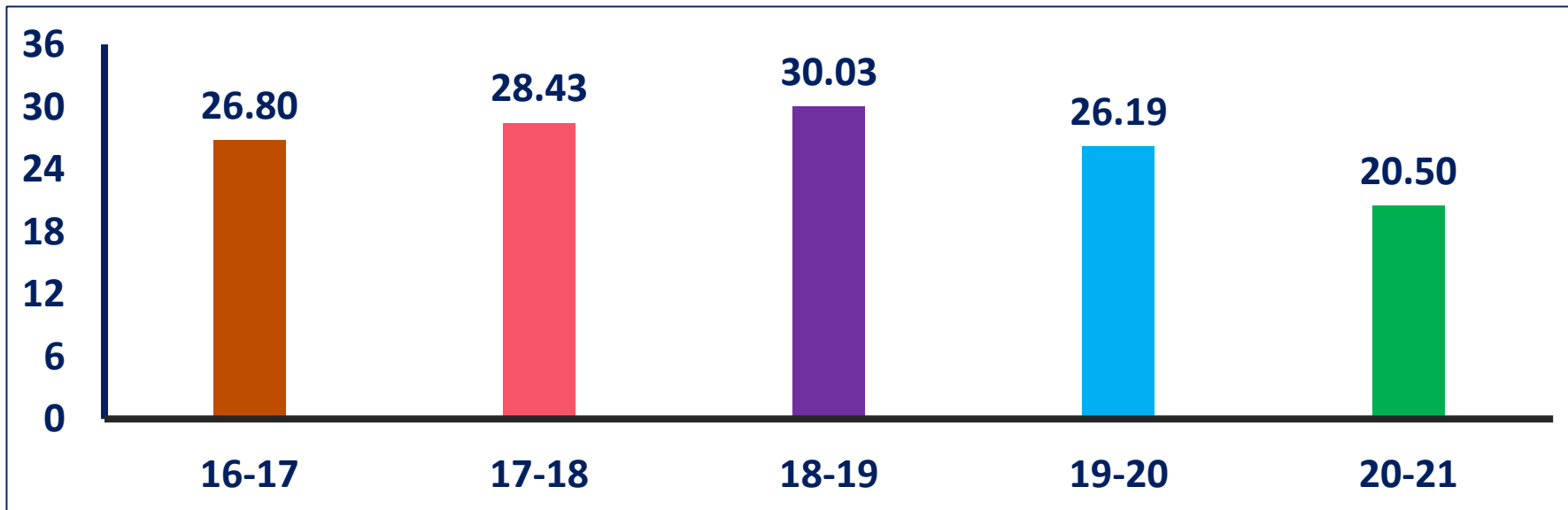
## Impact on Specific energy consumption (SEC):

- ❖ No change in SEC

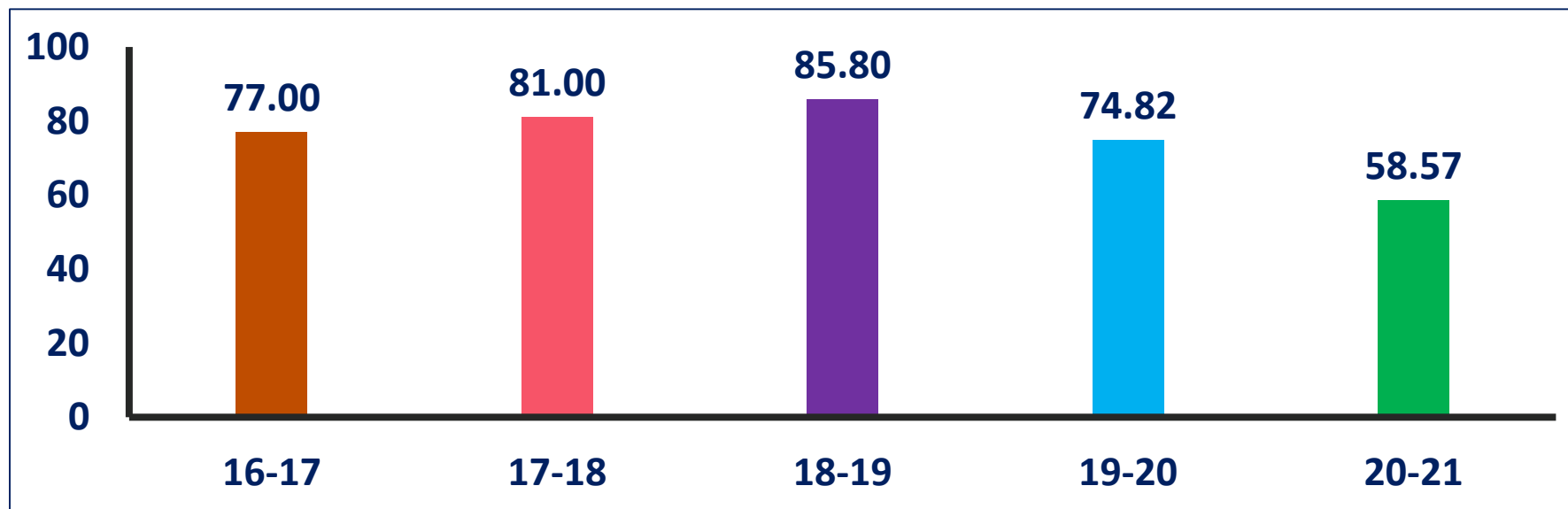
## Measures taken by the plant/unit to address the challenges

- ❖ Initiatives undertaken to improve capacity utilization
- ❖ Production planning rescheduled to improve the productivity
- ❖ Energy efficiency improvement measures undertaken

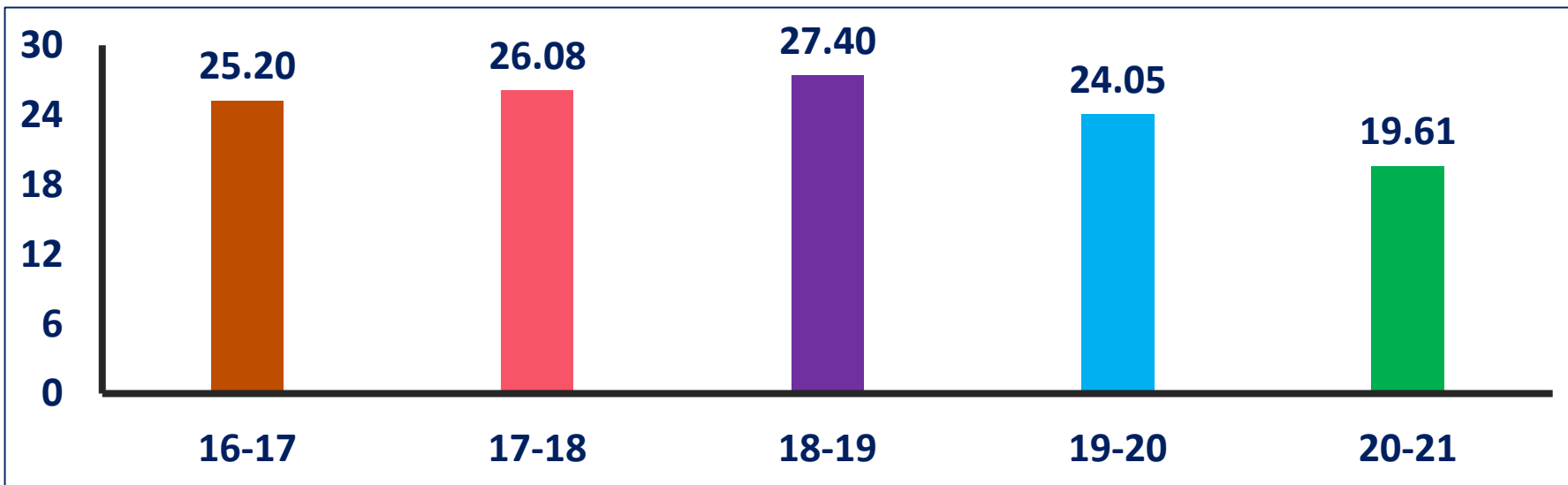
## Clinker Production- Lac MT



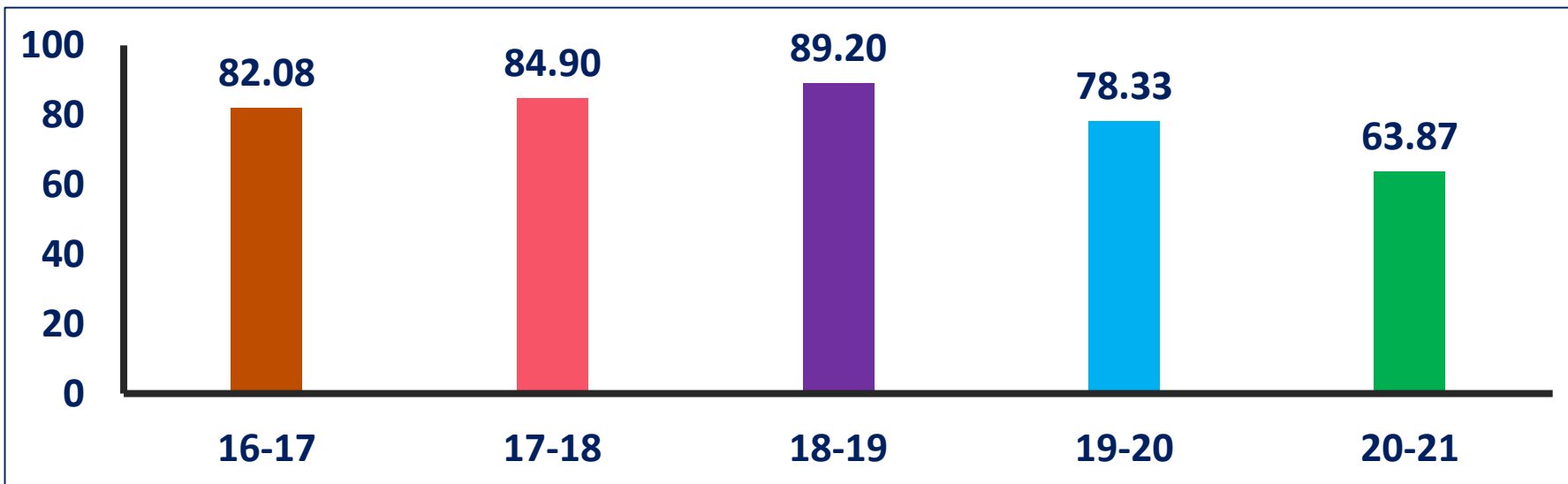
## Capacity Utilisation % - Clinker



## Cement Production- Lac MT

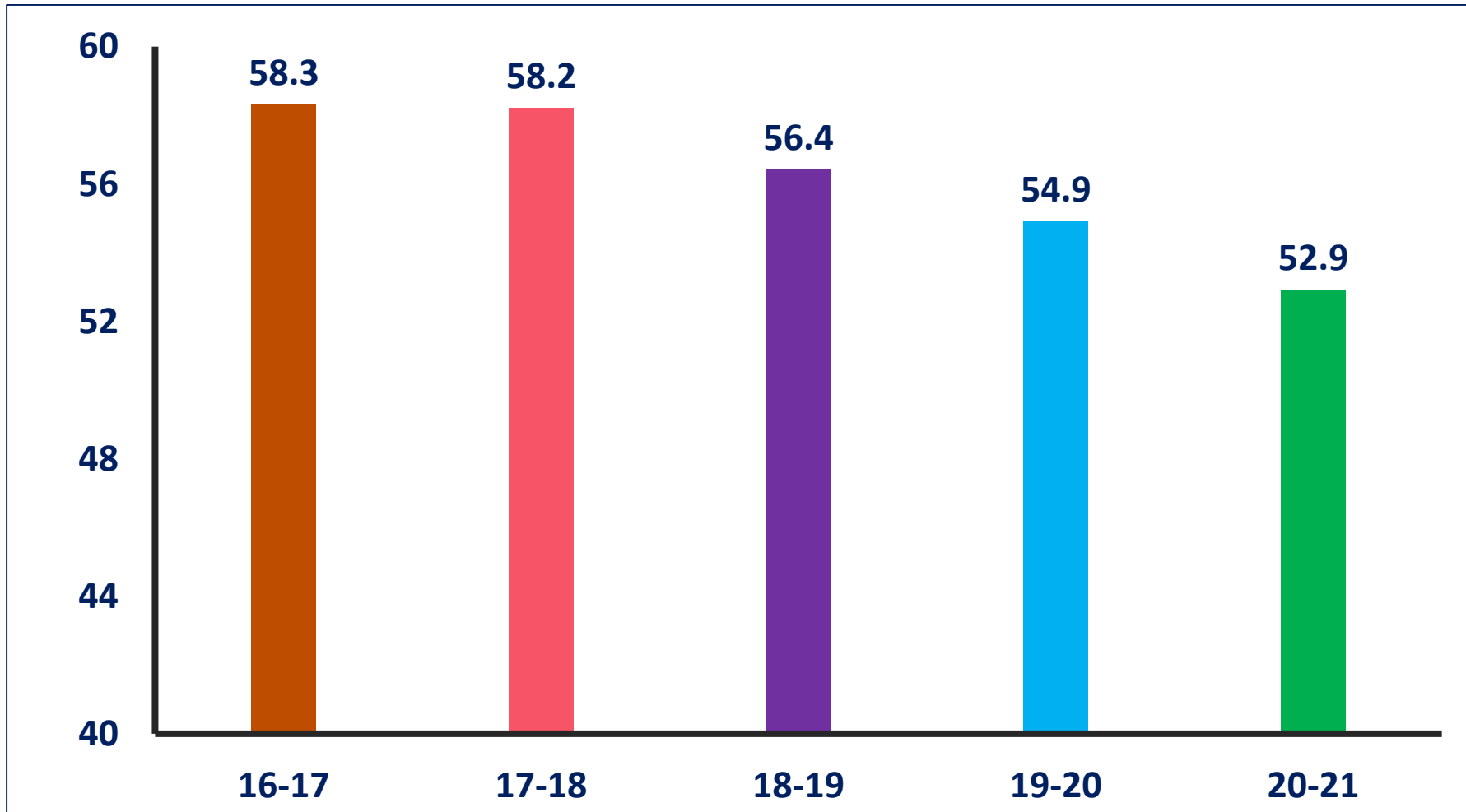


## Capacity Utilisation % - Cement

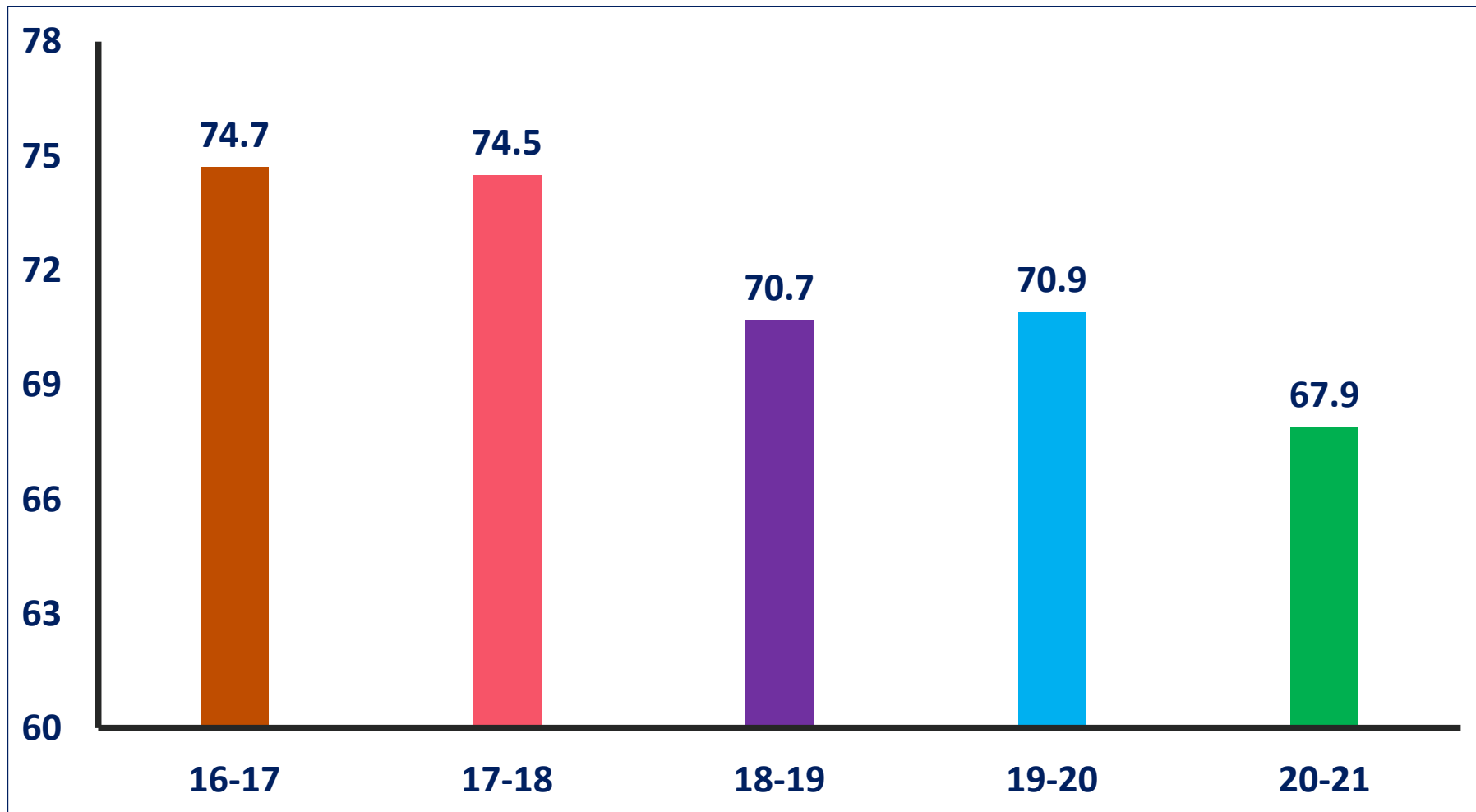




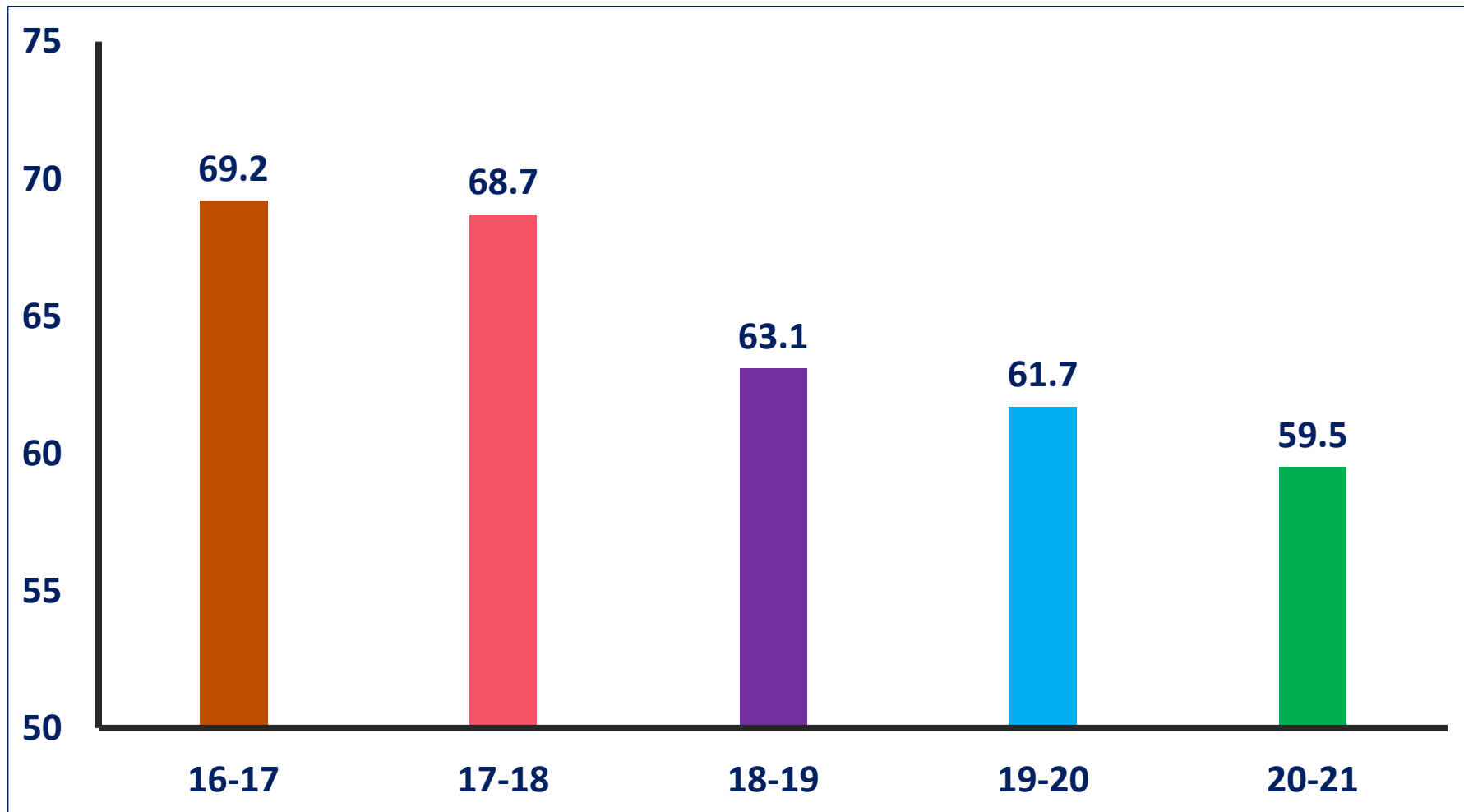
**Sp. Power up to Clinker (Kwh/ MT)**



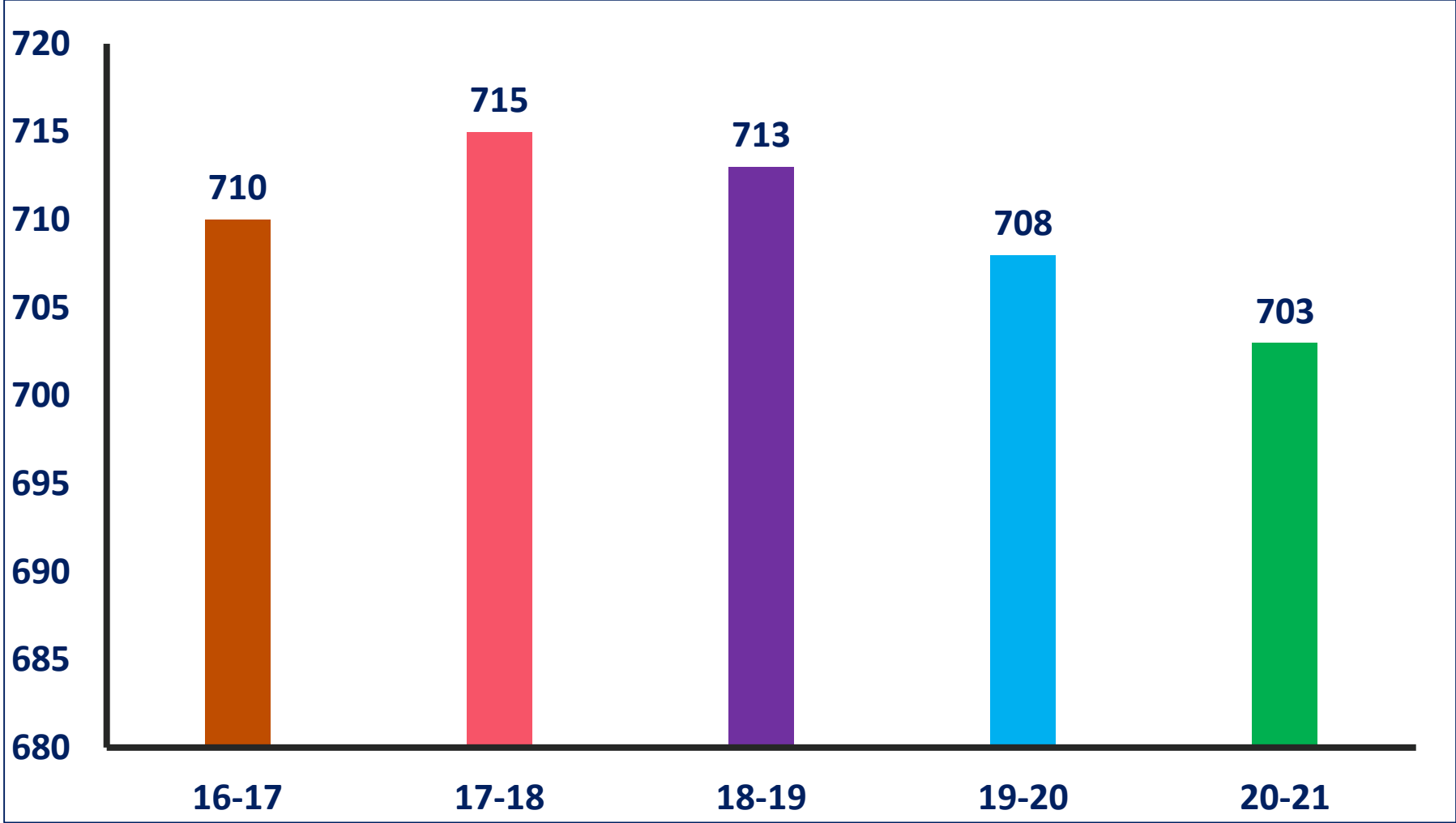
## Sp. Power up to Cement (Kwh/ MT)



## Sp. Power up to PPC (Kwh/ MT of Cement)



**Specific Heat Consumption – Kcal/ Kg Clinker**



## USAGE OF ALTERNATIVE FUELS

- ❖ Rice Husk
- ❖ Cotton stalk
- ❖ Coconut fiber
- ❖ Wood chips
- ❖ Carbon Black
- ❖ Recovered waste
- ❖ Hazardous Waste

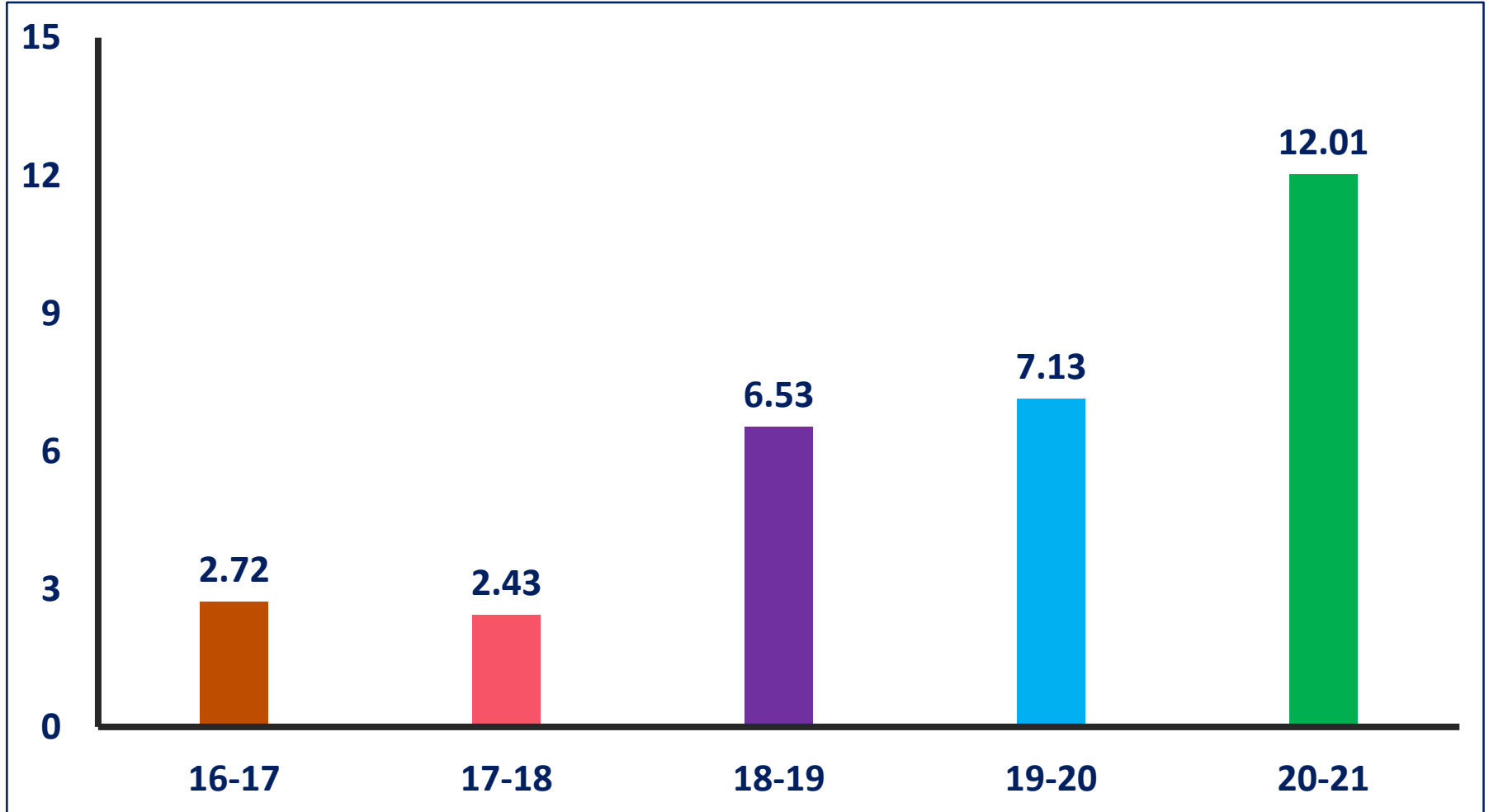


Plastic Shredder Machine

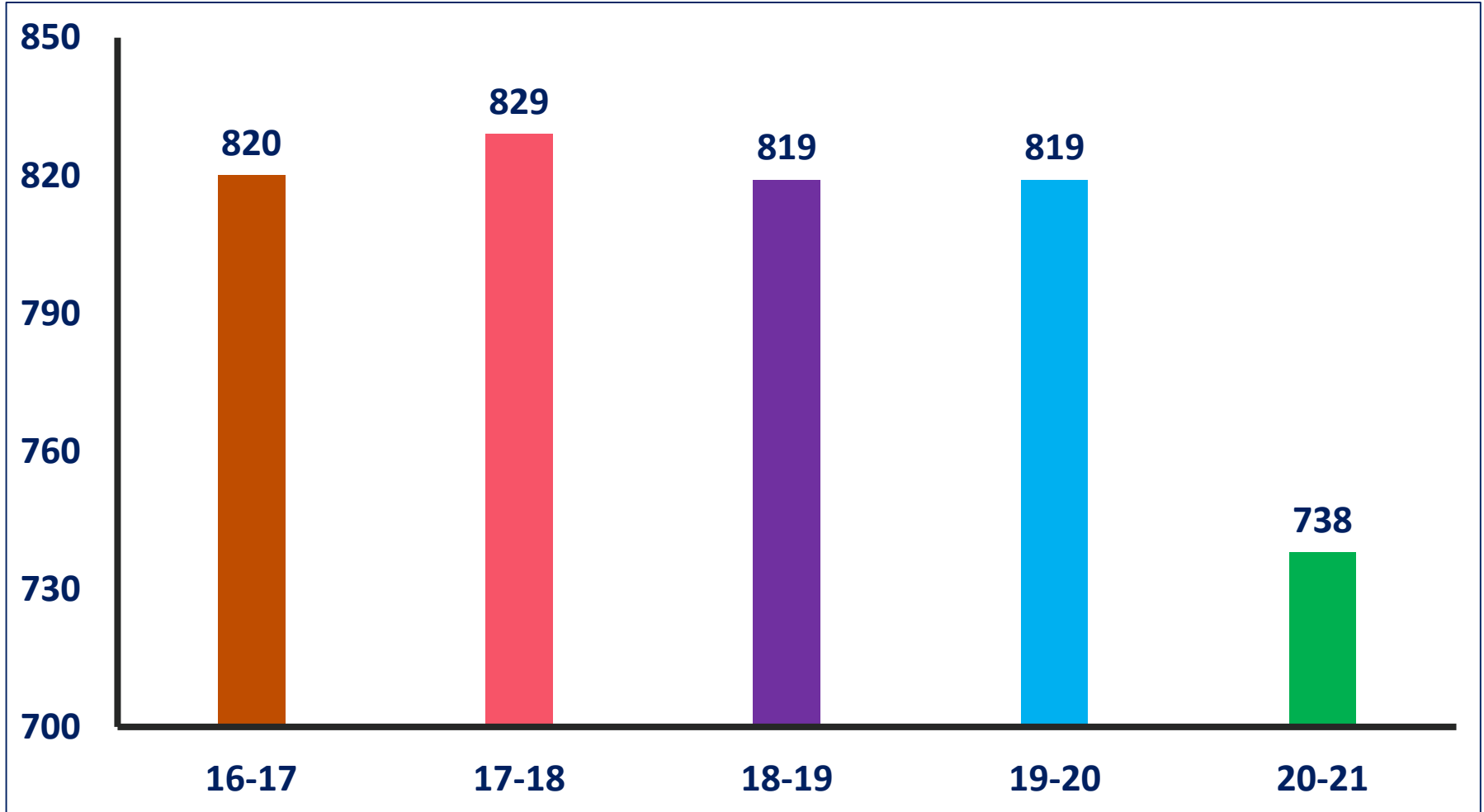


Rice Husk Feeding System

## TSR %



## CO<sub>2</sub> Kg/MT of Cement



## Energy Saving projects implemented in last three years

Year	No of Energy saving projects	Investments (INR Million)	Electrical Savings ( Million kWh)	Thermal Savings ( Million Kcal/ MTOE)	Savings ( INR Million)
FY 2018-19	12	0.89	1.877	0.0	7.51
FY 2019-20	11	2.71	1.845	0.0	7.39
FY 2020-21	19	1.02	3.645	0.0	14.6



S. No.	Title of Project	Annual Electrical Saving (Units in Lakhs)	Thermal Energy savings (MT per annum)	Annual Savings (Rs. Lakhs)	Investment Made (Rs. Lakhs)
1	Optimisation of compressor in Kiln-3.	1.86	0.0	7.4	0.00
2	Modification of Rawmill-3 Main dust collector material discharge line.	0.59	0.0	2.4	0.1
3	Cementmill-1 Rollerpress discharge Bucket elevator venting bag filter Fan is converted from direct drive to V-belt drive.	0.32	0.0	1.3	0.2
4	Cementmill-1 541BC3 venting bag filter Fan is converted from direct drive to V-belt drive.	1.30	0.0	5.2	0.2
5	Cementmill-1 blender venting bag filter Fan is converted from direct drive to V-belt drive.	0.34	0.0	1.4	0.2
6	Cementmill-1 Mill discharge bucket elevator venting bag filter Fan is converted from direct drive to V-belt drive.	0.38	0.0	1.5	0.2
7	Cementmill-2 Mill main dust collector discharge airslide blower outlet duct modification.	0.14	0.0	0.6	0.1
8	Kiln-3 all Cooler fans inlet bell mouth modification.	15.36	0.0	61.5	1.4
9	Raw Mill-1 mill venting Dust collector discharge Line modification (Blower stopped).	0.25	0.0	1.0	0.3

S. No.	Title of Project	Annual Electrical Saving (Units in Lakhs)	Thermal Energy savings (MT per annum)	Annual Savings (Rs. Lakhs)	Investment Made (Rs. Lakhs)
10	Reduced Number of bends in Return coarse airslide blower (Raw mill-3 91-067A).	0.021	0.0	0.1	0.1
11	Reduced Number of bends in Return coarse airslide blower (Raw mill-3 91-067C).	0.065	0.0	0.3	0.1
12	Reduced Number of bends in Silo feed BE airslide blower (Raw mill-3 91-084).	0.10	0.0	0.4	0.1
13	Kiln-1 all Cooler fans inlet bell mouth modification.	9.50	0.0	38.0	2.4
14	Installation of VFD for Kiln-1 Cooler ESP and Motor changed from HT to LT.	3.80	0.0	15.2	0.1
15	Reduced Number of bends in Sepol Separator fine to Silo feed BE airslide blower (Raw mill-1 3059).	0.03	0.0	0.1	0.1
16	Installation of VFD in Line-1 VRM Dust collector Fan.	0.71	0.0	2.9	0.1
17	Installation of VFD in Line-1 Coal mill CA Fan.	1.02	0.0	4.1	2.5
18	Line-1 Cooler fan-1A relocated for outlet duct modification.	0.47	0.0	1.9	1.0
19	Line-1 Cooler fan-1B outlet duct modification.	0.23	0.0	1.0	1.0
<b>Total</b>		<b>36.54</b>	<b>0.0</b>	<b>146.2</b>	<b>10.2</b>

**Total savings for the year 2020-21 : 146.2 Lakhs**

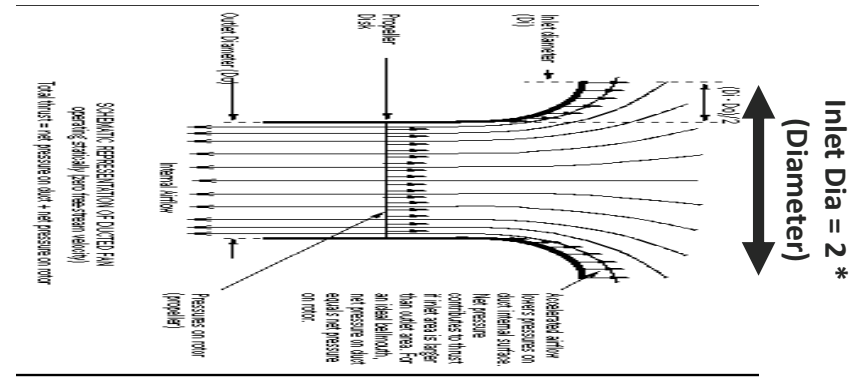
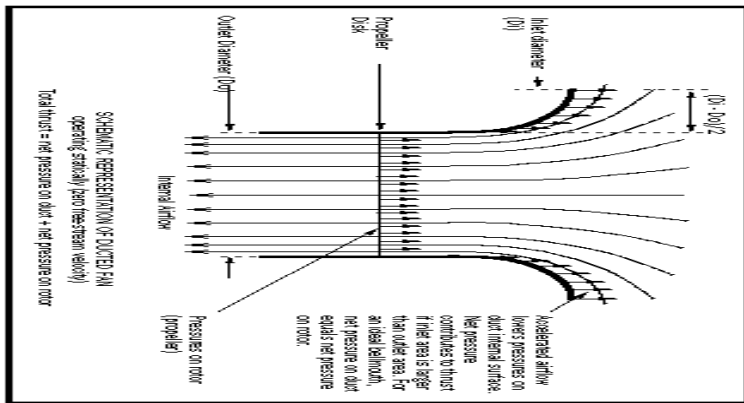
## KILN - 1 & 3 Cooler Fans Inlet Mouth Modification

### Problem:

- ❖ Kiln- 1 & 3 Cooler Fans Inlet pressure high.
- ❖ Power Consumption high due to pressure drop.

### Action Taken:

- ❖ Process study was conducted by the internal team and after Detailed Discussions, Detailed Engineering with two models prepared with approval of President (Mfg), Unit Head, Sr GM (Prod) and Sr GM (Engg).



- ❖ Modification done in one fan with both designs, after observing the operational parameters the second model was considered and same modification was carried out for all other Cooler fans.

### Benefits

- ❖ Total Average Power saving of Avg 194 Kwh in line -3 and Avg 120 Kwh in line-1.
- ❖ Cooler Inlet pressure reduced.

## Before



## After



**Date: 29.08.2020    Kiln Feed : 316 TPH**

Description	Before Modification			After Modification			Savings (KW)
	Fan inlet pressure (mmwg)	Flow (m3/hr)	Power consumption (KW)	Fan inlet pressure (mmwg)	Flow (m3/hr)	Power consumption (KW)	
<b>Cooler Fan 1</b>	-20	28087	76	-5	34532	69	7
<b>Cooler Fan 2</b>	-69	72641	185	-11	79699	132	53
<b>Cooler Fan 3</b>	-75	65864	174	-10	78693	150	24
<b>Cooler Fan 4</b>	-50	62278	148	-13	74311	136	12
<b>Cooler Fan 5</b>	-47	53295	127	-5	54976	80	47
<b>Cooler Fan 6</b>	-40	51083	93	-4	41486	49	44
<b>Cooler Fan 7</b>	-17	28830	46	-3	32039	32	14
<b>Total Savings (KW)</b>							<b>201</b>

**Date: 07.12.2020**
**Kiln Feed: 238 TPH**

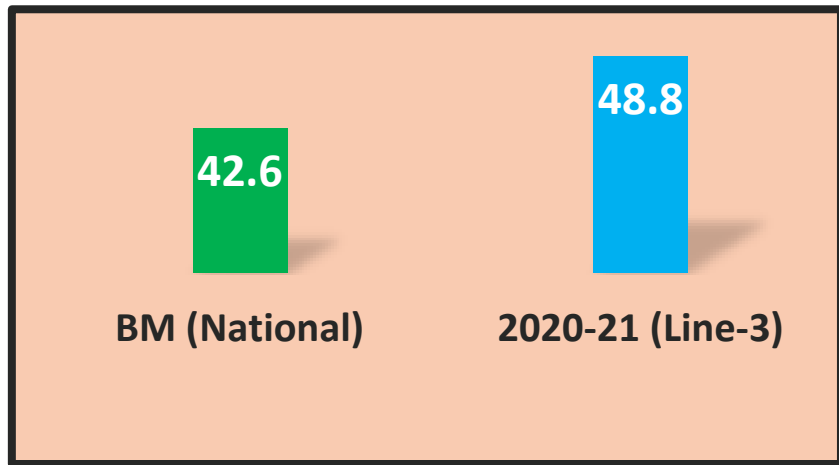
Description	Before Modification			After Modification			Savings (KW)
	Fan inlet pressure (mmwg)	Flow (m3/hr)	Power consumption (KW)	Fan inlet pressure (mmwg)	Flow (m3/hr)	Power consumption (KW)	
Cooler Fan 1A	-156	23779	87	-21	20096	79	8
Cooler Fan 1B	-150	24866	89	-26	22952	82	7
Cooler Fan 2A	-85	14636	46	-9	16210	54	-8
Cooler Fan 2B	-45	18419	49	-16	21495	66	-17
Cooler Fan 1R	-70	17477	32	-9	16470	30	2
Cooler Fan 1S	-45	17324	49	-5	23427	34	15
Cooler Fan 2L	-70	23296	73	-9	24861	46	27
Cooler Fan 2R	-115	24141	42	-20	37540	54	-12
Cooler Fan 2S	-55	16291	29	-9	18612	24	5
Cooler Fan 3	-60	43570	64	-2	35887	40	24
Cooler Fan 4	-33	45071	79	-2	41012	42	37
Cooler Fan 5	-25	34443	50	-1	27977	18	32
<b>Total Savings (KW)</b>							<b>120</b>

## Installation of VFD for Kiln-1 Cooler ESP Fan and Motor changed from HT (350KW) to LT (200KW).

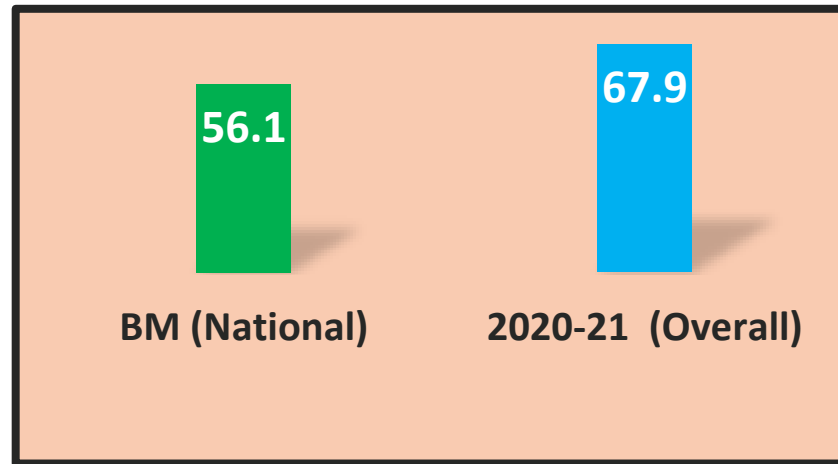
Description	UOM	Before modification	After modification
Volumetric flow	m3/hr	277748	285726
Power consumption	KW	107	59
Fan RPM	RPM	60% Damper	580 RPM
<b>Total Power saving</b>	<b>KW</b>	<b>48</b>	

**Total Power Savings : 48 Kwh**

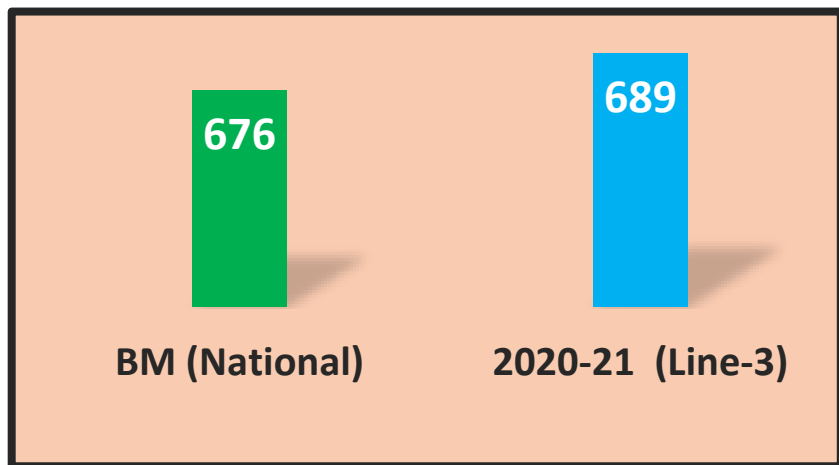
### Sp. Energy Consumption to Clinker – KWh/MT



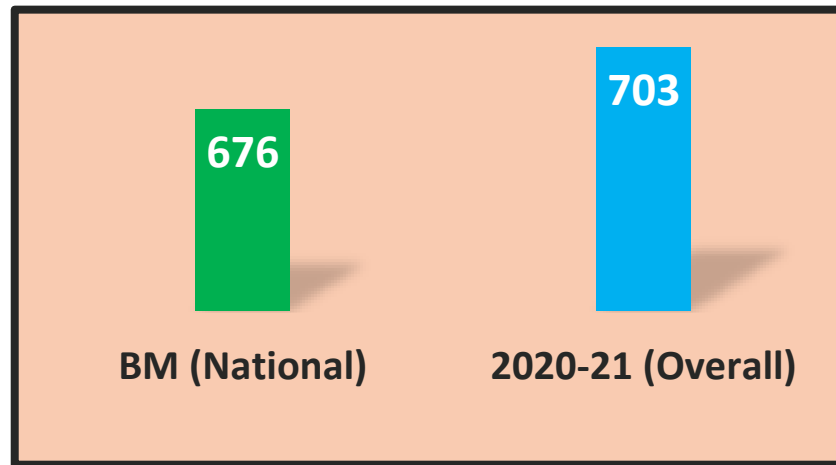
### Sp. Energy Consumption Up to Cement – KWh/MT



### L-3, Sp. heat Consumption – KCal/ Kg of Clinker



### Overall Sp. heat Consumption – KCal/ Kg of Clinker





1. Replacement of existing Cooler with latest generation Cooler Line-1 & 2.
2. Study & upgradation of process fans.
3. Replacement of existing separators with new generation separators in Cement Mill-1.
4. Installation of WHRS for three kilns.



**Achieve  
BM**

S. No	Energy Saving Proposals	Electrical energy saving per annum (Units in Lakhs)
1	Cementmill-1 New dynamic separator replaced in place of Sepol and VSK separator	27.95
2	Optimisation of cooler fans in Kiln-2	2.37

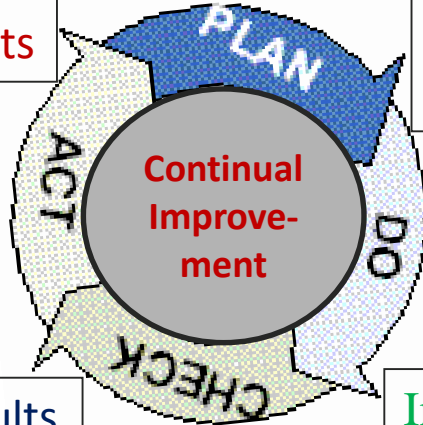
## Future aspects for Green Supply Chain Management :

- ❖ Usage of Hazardous waste.
- ❖ Usage of Rain harvesting water rather outsource.
- ❖ Usage of agro based waste.
- ❖ Ideas towards reduction of Carbon emissions.
- ❖ Adoption of automation technologies.
- ❖ Safety standards and reliability



Analyse and Act on results

- Capturing of Energy consumptions
- Discuss and Compare
- Identify the Problem
- Identify Causes along with Actions/ solutions

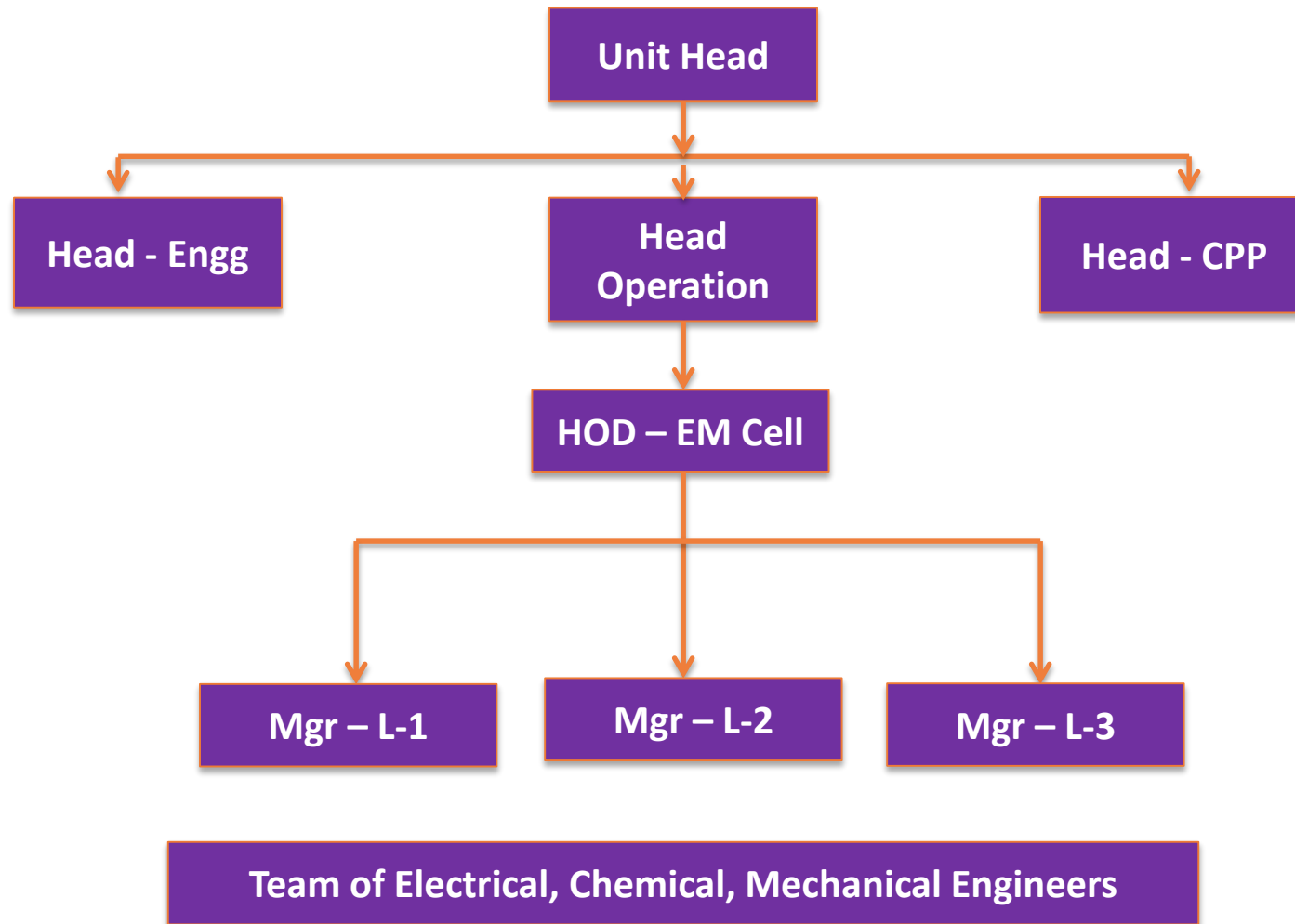


Check for Results

Implement solutions



A special team has been designated for monitoring of Energy consumptions. Electrical as well as Thermal consumption is being monitored on a daily basis and highlighted to bring the level down. The daily Energy consumptions of concerned departments are discussed during daily review meetings. Actions and brainstorming are done based on actual vs targets.



**List of active members of Energy Management Cell within the organisation and their role Do you have a designated energy manager (need not be exclusive for energy) at your unit.**

1. Mr. RVR Murty (EA-1944)
2. Mr. Y. Padmaveer
3. Mr. MNV Satyanarayana
4. Mr. Atul Kumar Agrawal
5. Mr. Vijayapal Ratna
6. Mr. Shailesha Rajawat
7. Mr. Mahesh
8. Mr. Sathish

### **Responsibilities of Energy Manger:-**

- a) Planning and Conducting Energy review meetings
- b) Energy monitoring activities.
- c) EnMS – ISO 50001, Documentation and compliance to standard.
- d) Energy conservation projects
- e) Conducting periodical Energy Audits
- f) Create Awareness & training to employees on Energy conservation activities.
- g) Compliance to PAT schemes etc.

### **Energy Management Activities:-**

Activities are monitoring of section wise and main motors electrical consumption, Monitoring Thermal energy consumptions, Heat balance, Leakage monitoring, Suggesting new energy efficient equipments and modifications, Explore usage of alternative fuels, Conduct energy audits, awareness & training etc.



## WAYFORWARD:

A Study is in progress to install Roof top solar panels (above Colony quarters) from our Corporate. Evaluation is under progress.





## Muchas Gracias Card & Good To Find :



**ORIENT CEMENT LIMITED: DEVAPUR**



**“Excellence in Energy Management 2020”** award as Energy Efficiency Unit by CII.  
21<sup>st</sup> National Award (Virtual) Event held on 25 - 28 Aug 2020.

**ORIENT CEMENT LIMITED: DEVAPUR**



**“Energy Excellence Award 2019”** received from “CII” at Hyderabad on 18<sup>th</sup> Sep 2019



**APEX INDIA EXCELLENCE AWARD 2019** in the Category of “Platinum” for Environment, “Gold” for Safety and Energy Efficiency received on 24<sup>th</sup> September 2019 at New Delhi.

## ORIENT CEMENT LIMITED: DEVAPUR



## SEEM NATIONAL ENERGY MANAGEMENT PLATINUM AWARD 2019

From SEEM received at Delhi on 27<sup>th</sup> September 2019

## ORIENT CEMENT LIMITED: DEVAPUR



“Telangana State Energy Conservation Award” received on 20<sup>th</sup> Dec 2019

**ORIENT CEMENT LIMITED: DEVAPUR**



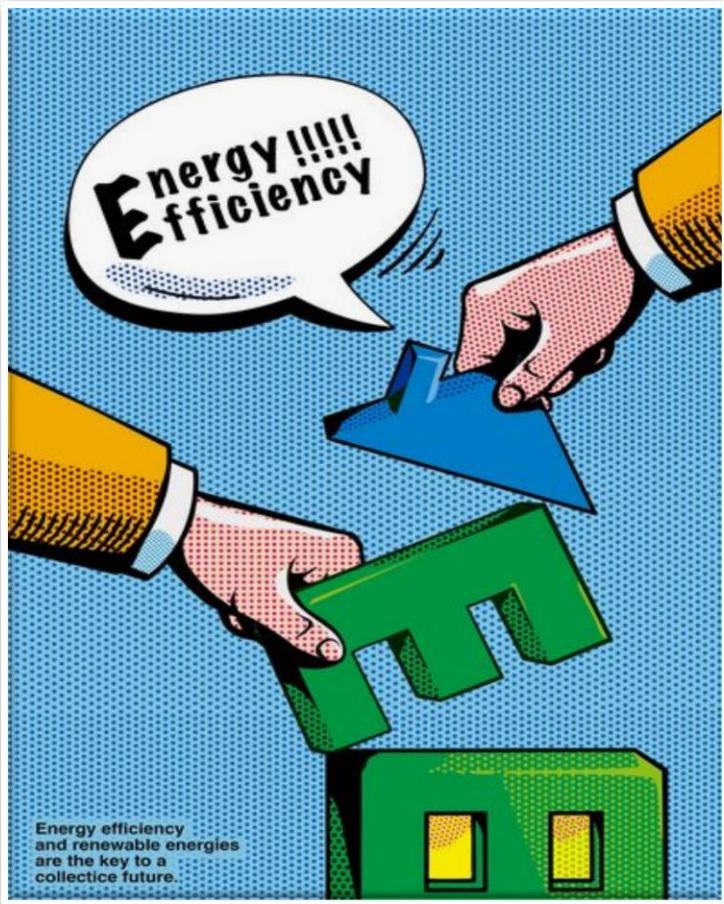
**APEX INDIA EXCELLENCE AWARD 2018** in the Category of "Gold" for Energy Efficiency received on 18th Feb 2019 at New Delhi.

**ORIENT CEMENT LIMITED: DEVAPUR**



**APEX INDIA EXCELLENCE AWARD 2017** in the Category of **“Gold”** for **Energy Efficiency** received on 29<sup>th</sup> May 2018 at New Delhi.





Thank You