



# 22<sup>nd</sup> national award for excellence in energy management- 2021

## JK LAKSHMI CEMENT LTD.- SIROHI, RAJASTHAN



Mayur Yeole  
(Manager- Data Analytics)

Manoj Ubana  
(Dy. Mngr.- Electrical)

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(Engr.- Process)



# BRIEF INTRODUCTION OF JKLC, SIROHI



**OPC 43**



**OPC 53**



**PPC**



**"PRO+" PPC**



**JK LAKSHMI Power Mix**  
READY MIX CONCRETE



**JK SMARTBLOX**  
Autoclaved Aerated Concrete



**JK LAKSHMIPLAST**  
PLASTER OF PARIS



**ISO 9001**



**ISO 14001**



**ISO 50001**



**ISO 45001: 2018**



**EQUIPMENT DETAILS**

<b>EQUIPMENT</b>	<b>AFTER MODIFICATION CAPACITY (TPH)</b>	<b>OPERATING CAPACITY (TPH)</b>
Ball Mill	180	180
China VRM	180	226
VRM-1	225	326
VRM-2	225	323
Coal Mill-1	16	20.5
Coal Mill-2	35	32.4
Coal Mill-3	18	22
Kiln-1	4500	4755
Kiln-2	5000	5175
Kiln-3	5000	5129
Cement Mill-1	85	75
Cement Mill-2	150	210
Cement Mill-3/4/5/6	75/75/75/75	80/79/79/79



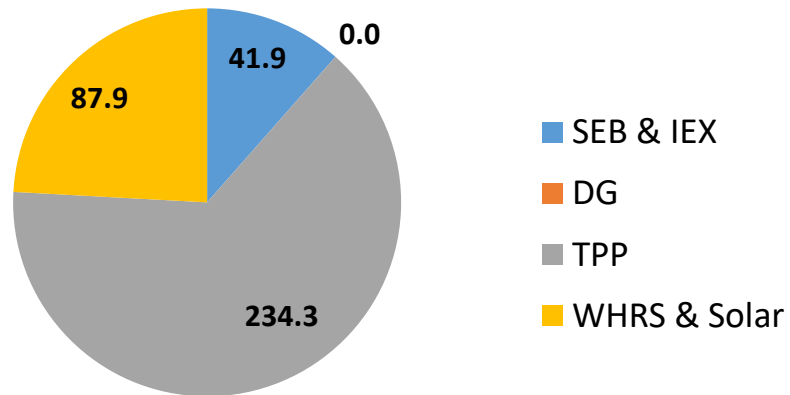
## IMPACT OF COVID-19

- Specific electrical energy as well as Thermal energy consumption has been increased
- Clinker Production has been reduced by around 15 %
- AFR consumption has been reduced due to Non- Availability
- There was a shortage of Man Power during day to day operation

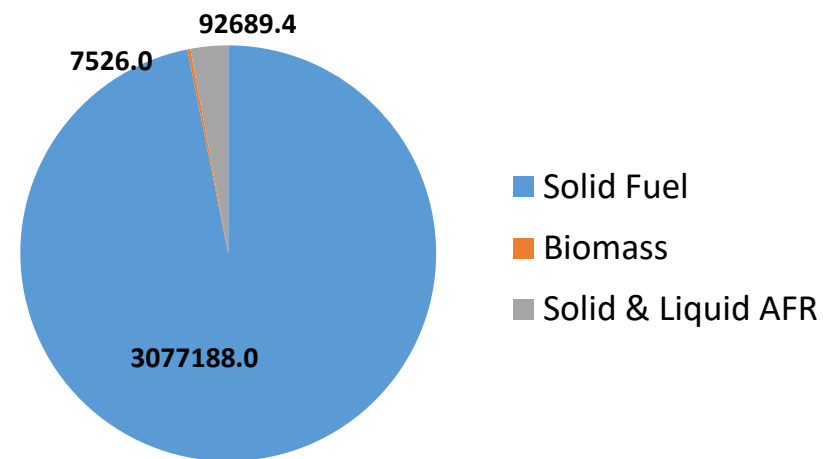


## ENERGY USED IN LAST YEAR

**Electrical Energy Consumption from different sources (In MkwH)**



**Thermal Energy Consumption (in MkwH)**



## ENERGY USED IN LAST THREE YEARS

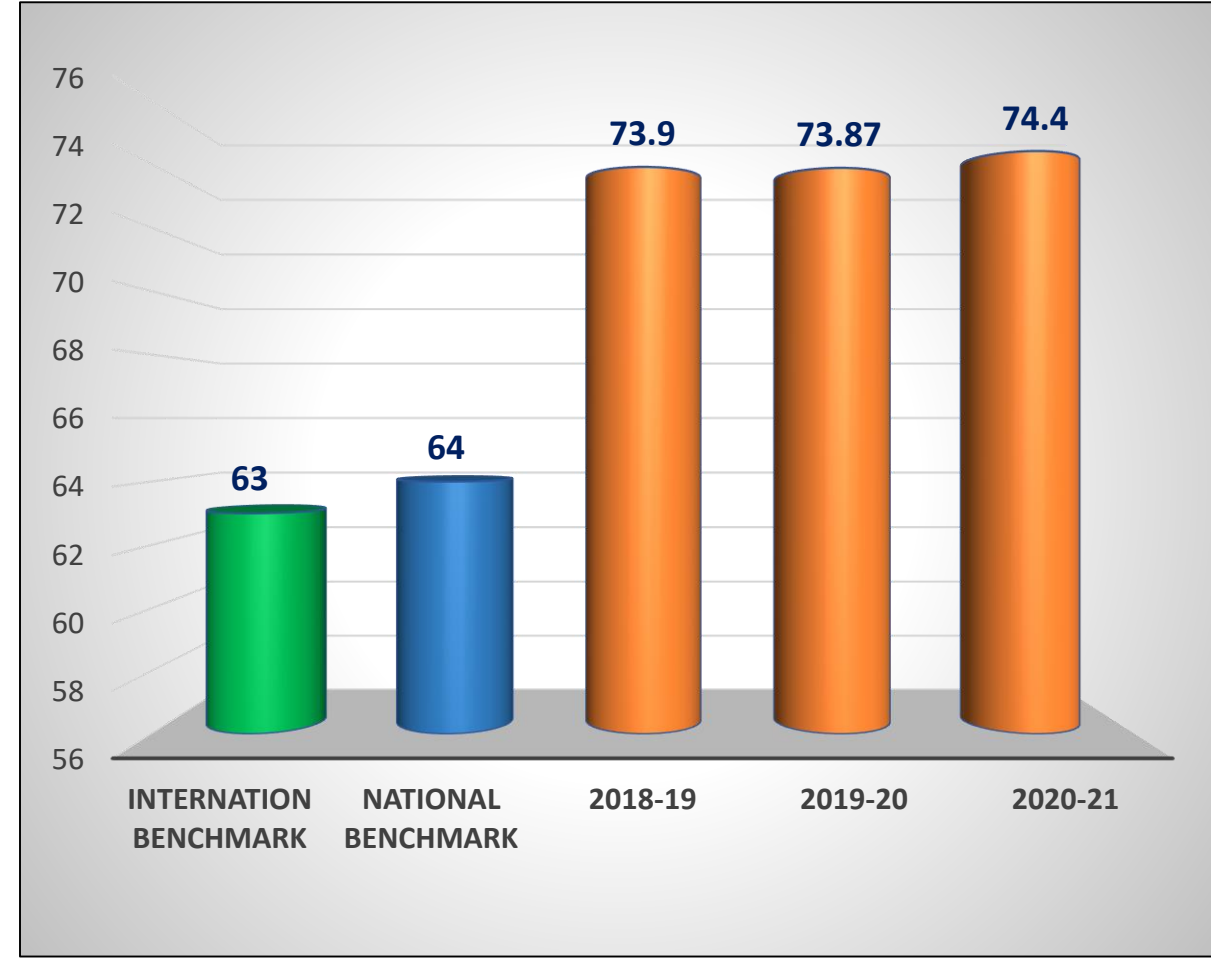
Parameters	UOM	2018-19	2019-20	2020-21
Annual Thermal Energy Consumption	Million Kcal	358727	327209	317740
Annual Electrical Energy Consumption	Million KWH	358.042	344.862	363.893



## SPECIFIC THERMAL ENERGY CONSUMPTION

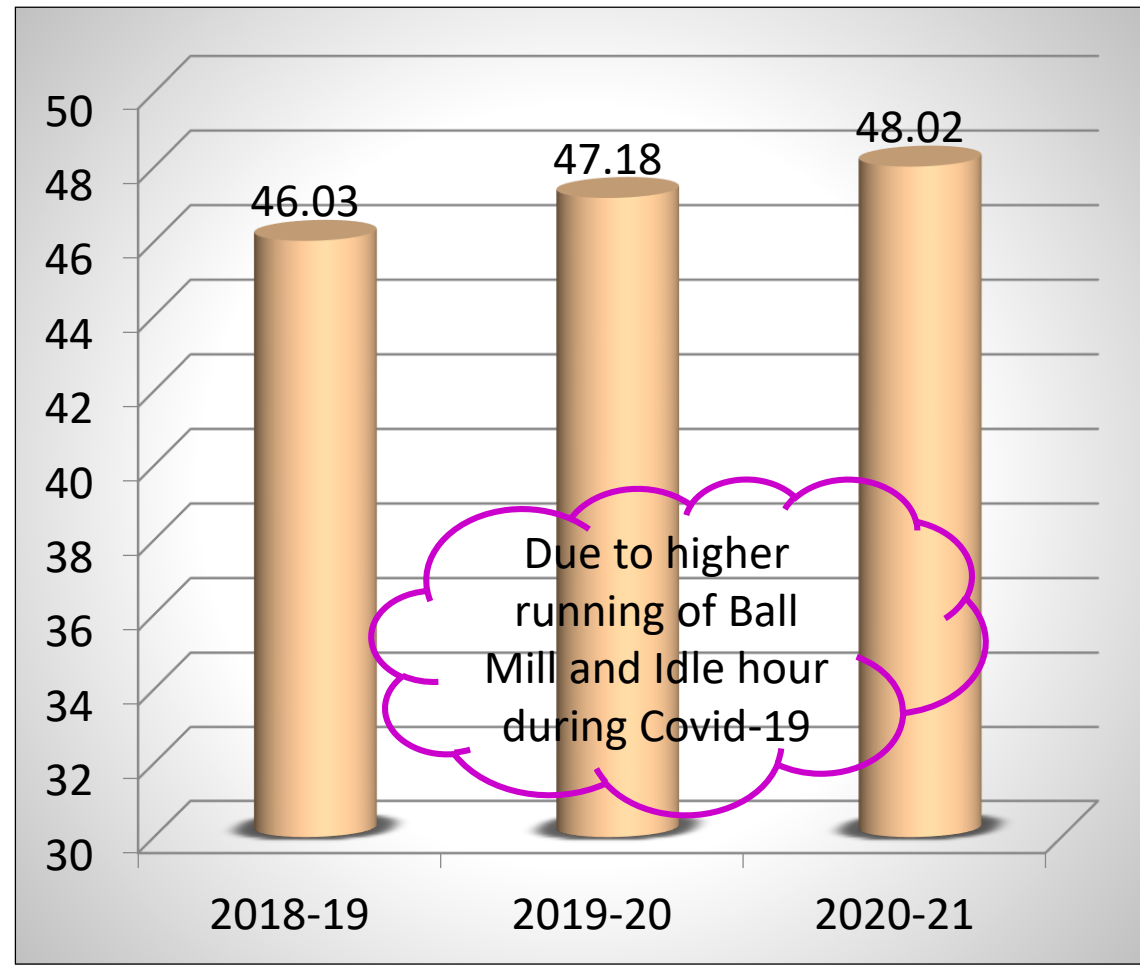


## SPECIFIC ELECTRICAL ENERGY CONSUMPTION

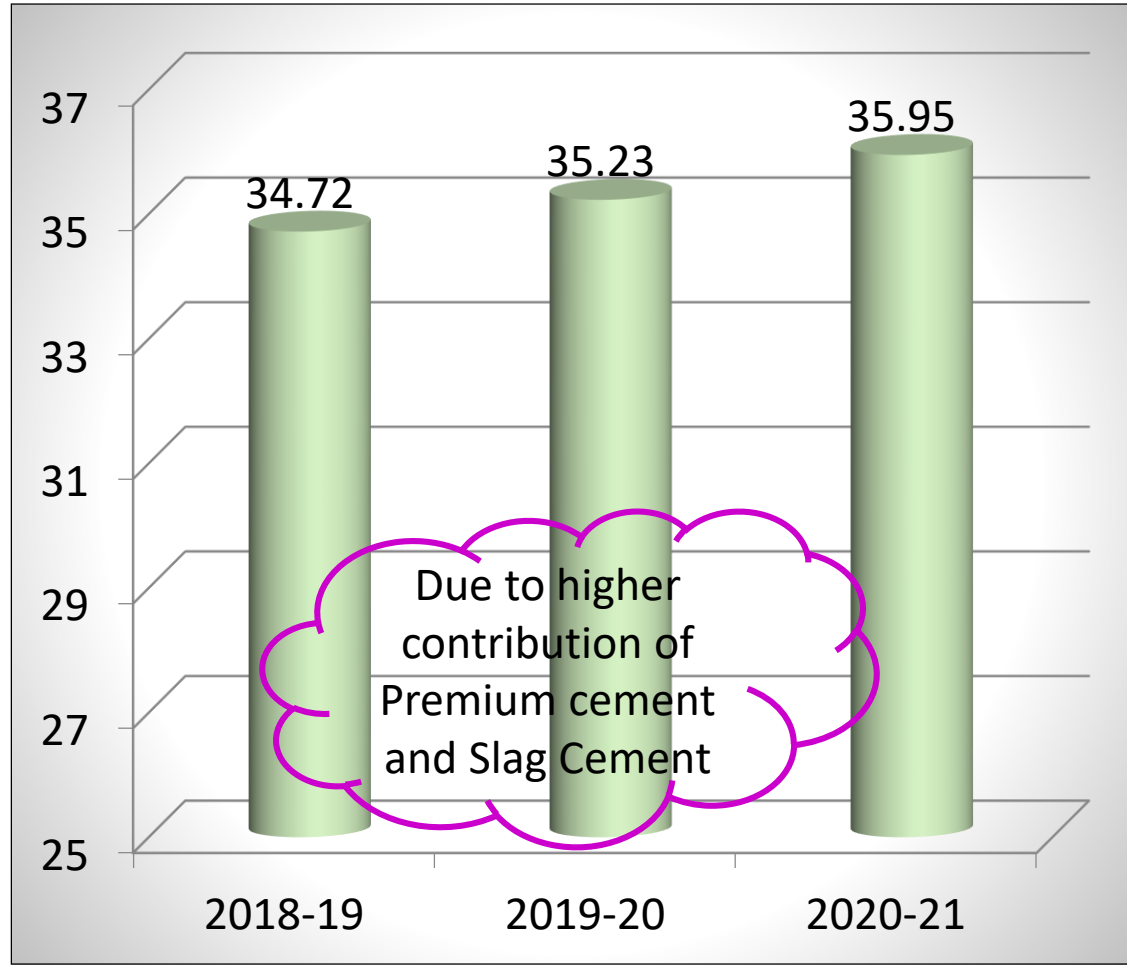




### SPECIFIC ELECTRICAL ENERGY CONSUMPTION UPTO CLINKERIZATION



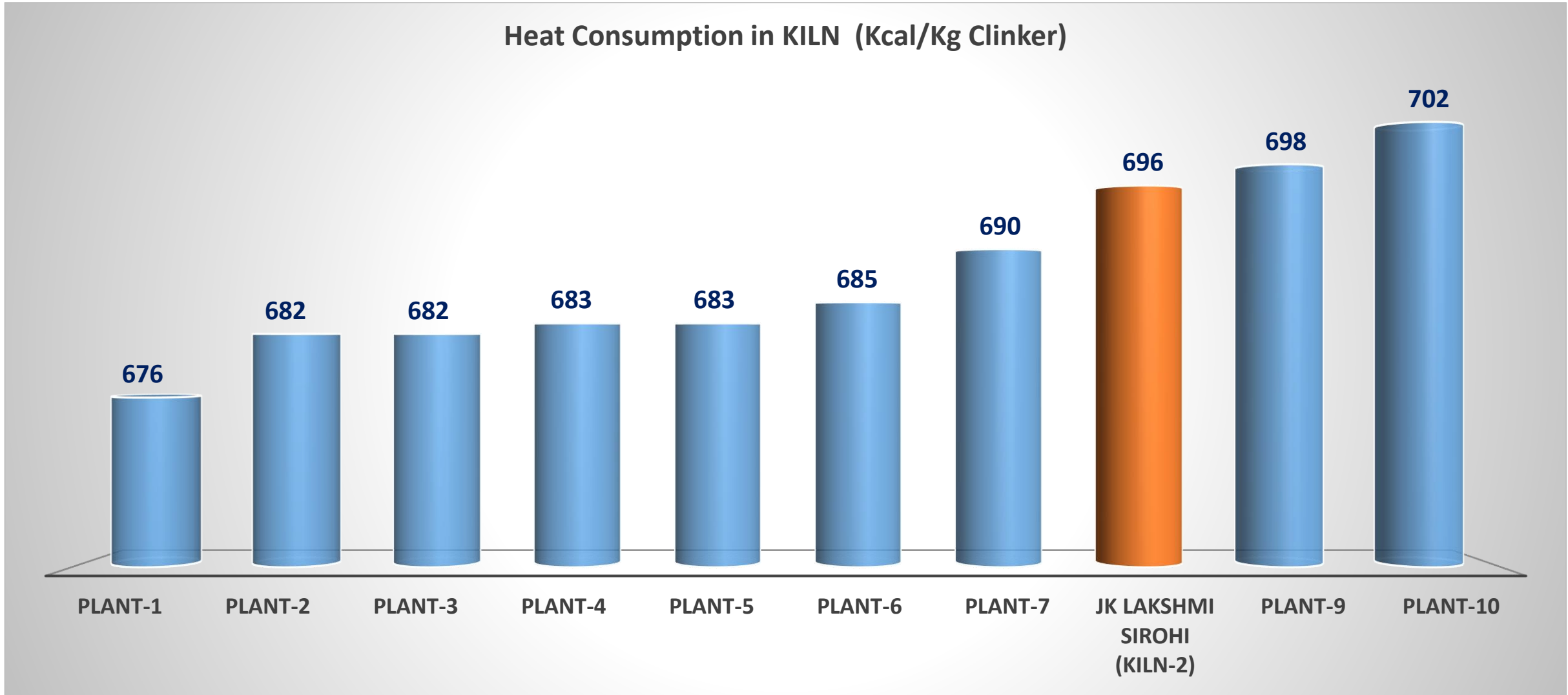
### SPECIFIC ELECTRICAL ENERGY CONSUMPTION OF OVERALL CEMENT





# THERMAL SEC IN SAME CLUSTER

## Energy Benchmarking By CII 2020-21





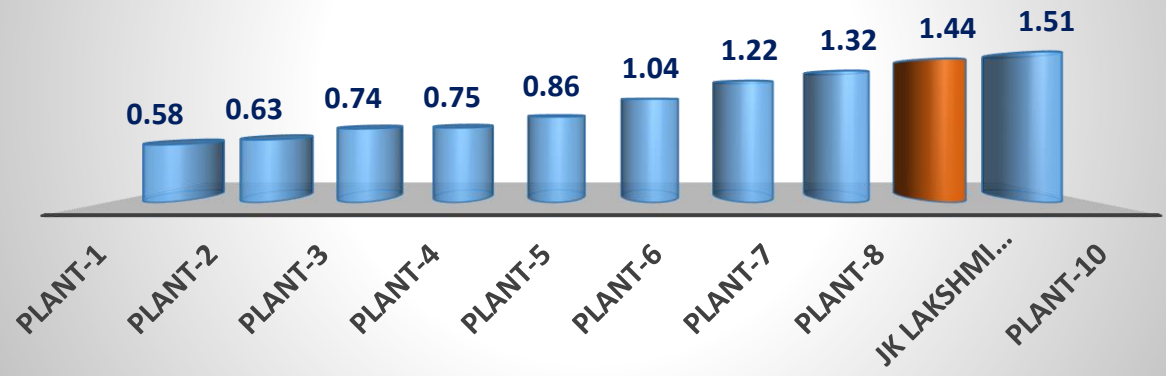


# ELECTRICAL SEC UP TO CLINKER IN SAME CLUSTER

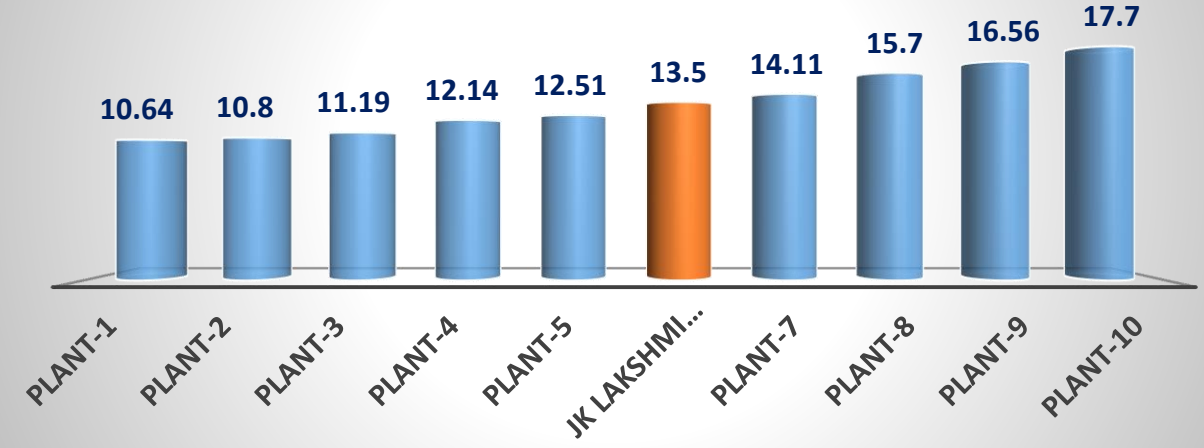


## Energy Benchmarking By CII 2020-21

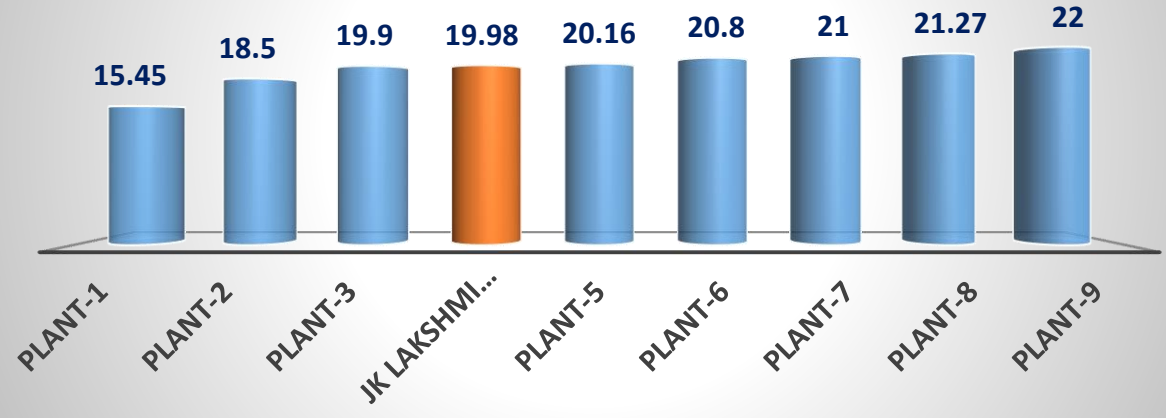
### Crusher section Power Consumption (Unit/ T Material)



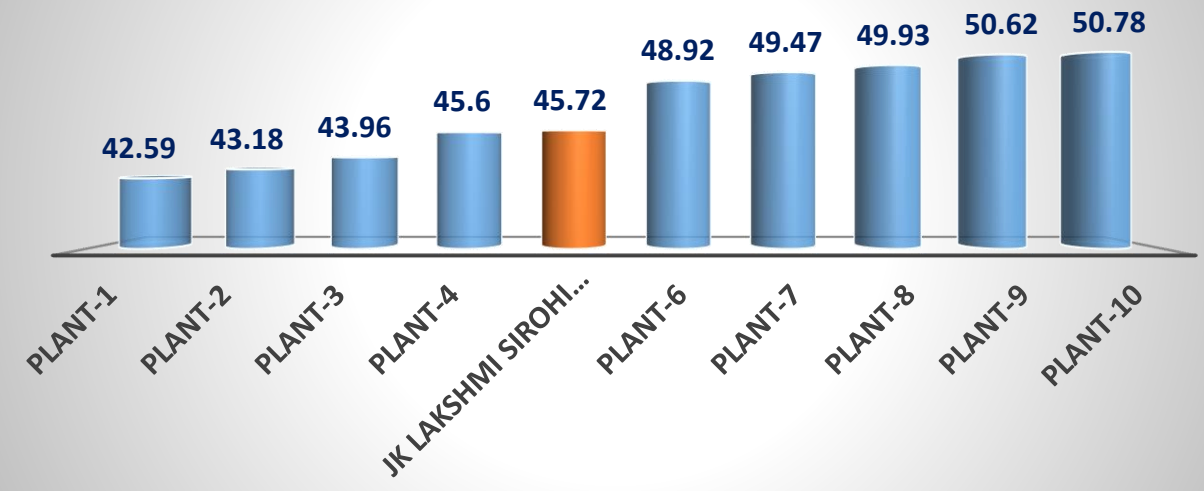
### VRM section Power Consumption (Unit/ T Material)



### Kiln section Power Consumption (Unit/ T Material)



### Power Consumption Upto Clinker (Unit/ T CLK)





ROAD MAP TO ACHIEVE INTERNATIONAL AND NATIONAL BENCHMARK

- ✓ Installation of ITECA Seal in Kiln-3
- ✓ Reduction in SEC of cement grinding section by optimization of process (0.5 Unit/Ton of Cement)
- ✓ Modification in PH Boiler and installation of AQC Boiler with Hot air recirculation in Kiln-3 (12MW Increase in Power Generation )
- ✓ Installation of new burner in Kiln-1 (Thermal Energy Saving Potential of 1 kCal)
- ✓ Installation of Low Heat Recovery ORC Boiler (1 MW Increase in Power Generation )
- ✓ Reduction in Kiln-3 PH Fan power consumption by CFD of PH Fan in Kiln-3 (Energy Saving Potential of 50 kW)
- ✓ Installation of Pre-Grinder in cement Mills
- ✓ Installation of High Efficient Separator in Coal Mill

TARGET OF FY.-2021-22 TOWARDS ACHIEVE INTERNATIONAL AND NATIONAL BENCHMARK

No	Title of Project	Expected Electrical Saving (Million kWh)	Expected Thermal Saving (Million kCal)	Investment (Rs in million)
1	Installation of Iteca Seal in Kiln-3	0.2376	0	4
2	Installation of New Burner in Kiln-3	0	1584	12
3	Installation of High Efficient Seperator in Coal Mill	0.11385	0	4
4	Reduction in Power Consumption of PH Fan by CFD	0.396	0	1
	Total	0.74745	1584	21



## ENERGY SAVING PROJECTS SUMMARY FOR 3 YEARS

DESCRIPTION	UNITS	WITH INVESTMENT	WITHOUT INVESTMENT
TOTAL PROJECT IMPLEMENTED	NOS	7	20
TOTAL ELECTRICAL ENERGY SAVINGS	MILLION KWH	3.03	5.01
TOTAL THERMAL ENERGY SAVING	MT OF COAL	NIL	NIL
ELECTRICAL SAVING	RS MILLION	22.39	37.12
THERMAL SAVING	RS MILLION	NIL	<b>200*</b>
TOTAL SAVINGS	RS MILLION	22.39	<b>200*</b>
TOTAL INVESTMENT	RS MILLION	12.17	NIL

\*In Without investment projects Thermal saving & Total Saving in Rs. Million are inclusive of usage of AFR



# INNOVATIVE PROJECT

## CEMENT MILL OPTIMISER TOOL

### BACKGROUND

- ❖ All cement mill are having different efficiency in different grades.
- ❖ We have Six Cement Mill from which we are producing different type of cement.
- ❖ On daily basis, it was very difficult to plan day to day production of cement mill
  - ❖ A team of Young Engineer have developed an optimizer

### BENEFITS

- Easy to use and plan in a single command
- Gives an idea of combination of different cement grades to be produced in different cement mills and achieve the best possible production and power consumption figures.
- Can also tell whether demand for the day can be met or not which in turn helps to prioritise the grade wise production



**WHAT IS THIS TOOL**

- It works on simplex method of linear Programming.
- It is basically a graphical method for solving an optimisation problem.
- To get the solution within few seconds ,this method is converted into tool .

**HOW IT WORKS**

**INPUT DATAS**

Max Running Hours	CM-1	CM-2	CM-3	CM-4	CM-5	CM-6
OPC 43	24	24	24	24	24	24
OPC 53	24	24	24	24	24	24
PPC	24	24	24	24	0	0
PRO+	24	24	24	24	0	0
PSC	0	0	24	0	0	0

Std. Production Rate	CM-1	CM-2	CM-3	CM-4	CM-5	CM-6
OPC 43	92	205	89	88	89	89
OPC 53	85	170	82	78	77	80
PPC	103	225	78	96	0	0
PRO+	76	157	69	70	0	0
PSC	0	0	58	0	0	0

Daily Electricity Consumption	CM-1	CM-2	CM-3	CM-4	CM-5	CM-6
OPC 43	3208	6129	2844	2857	2940	2785
OPC 53	3208	6129	2844	2857	2940	2785
PPC	3208	6129	2844	2857	0	0
PRO+	3208	6129	2844	2857	0	0
PSC	0	0	2844	0	0	0



# INNOVATIVE PROJECT

Grade	Min Limit 2000	Has to be	Grinding 2006	Has to be	Max Limit
OPC 43	4000	<=	4000	<=	15648
OPC 53	5000	<=	6777	<=	13728
PPC	2500	<=	2500	<=	12048
PRO+	0	<=	0	<=	8928
PSC		<=		<=	1392

Running Hours	CM-1	CM-2	CM-3	CM-4	CM-5	CM-6
OPC 43	0	0	0	0	22.55	0
OPC 53	0	0	24	0	1.45	24
PPC	0	24	0	14.34	0	0
PRO+	24	0	0	9.66	0	0
PSC	0	0	0	0	0	0
Sum of Running Hours	24.0	24.0	24.0	24.0	24.0	24.0
Has to be	<=	<=	<=	<=	<=	<=
Maximum	24	24	24	24	24	24

<b>Total Grinding</b>	<b>15288.46</b>
Energy Consumption of the Day	498294.30

<b>Specific power</b>
32.60



## Energy Savings through Cement Mill Optimizer Tool

- **Total Power Savings : 0.3 kWh/Ton**
- **Total Annual Saving in Rs. Million : 8.58**



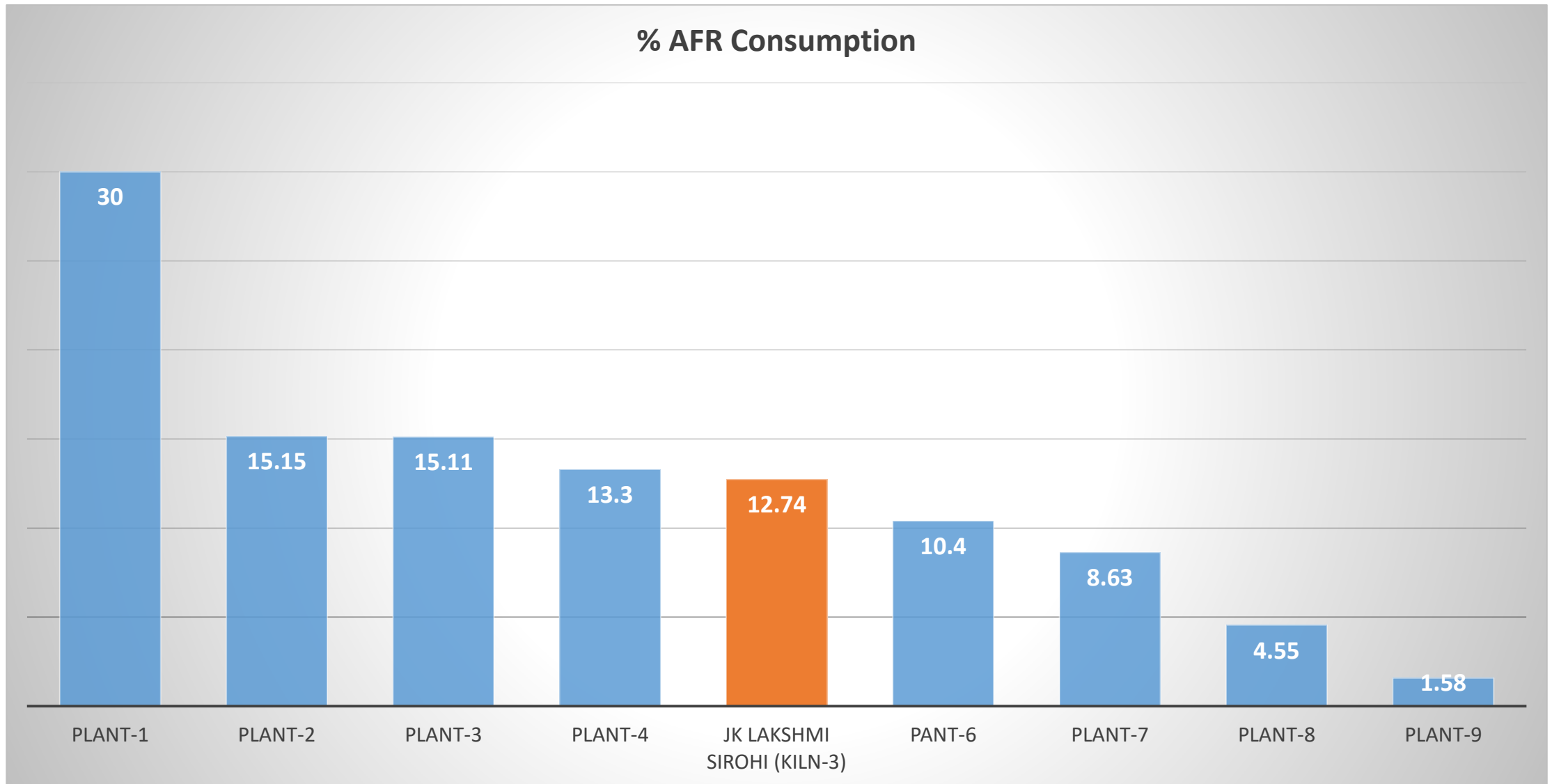
## UTILIZATION OF RENEWABLE ENERGY SOURCES

Technology (Electrical)	Type of Energy	Onsite/Offsite	Installed Capacity (MW)	Generation (million kWh)	% of overall electrical energy
Waste Heat recovery	Green Power	On site	15	82.29	22.61
Solar PV (Bldg Integrated)	Green Power	On site	0.27	0.294	For colony Lighting
Solar PV for Plant	Green Power	On Site	4.16	5.4062	1.49

Technology (Thermal)	Type of Energy	Installed Capacity	Usage (million kCal)	% of overall thermal energy
Bio Mass	Green Energy	25 TPH	7446	0.23



## UTILIZATION OF AFR AS RENEWABLE ENERGY



Reference: Energy Benchmarking By CII 2020-21

# RENEWABLE ENERGY AT JKLC

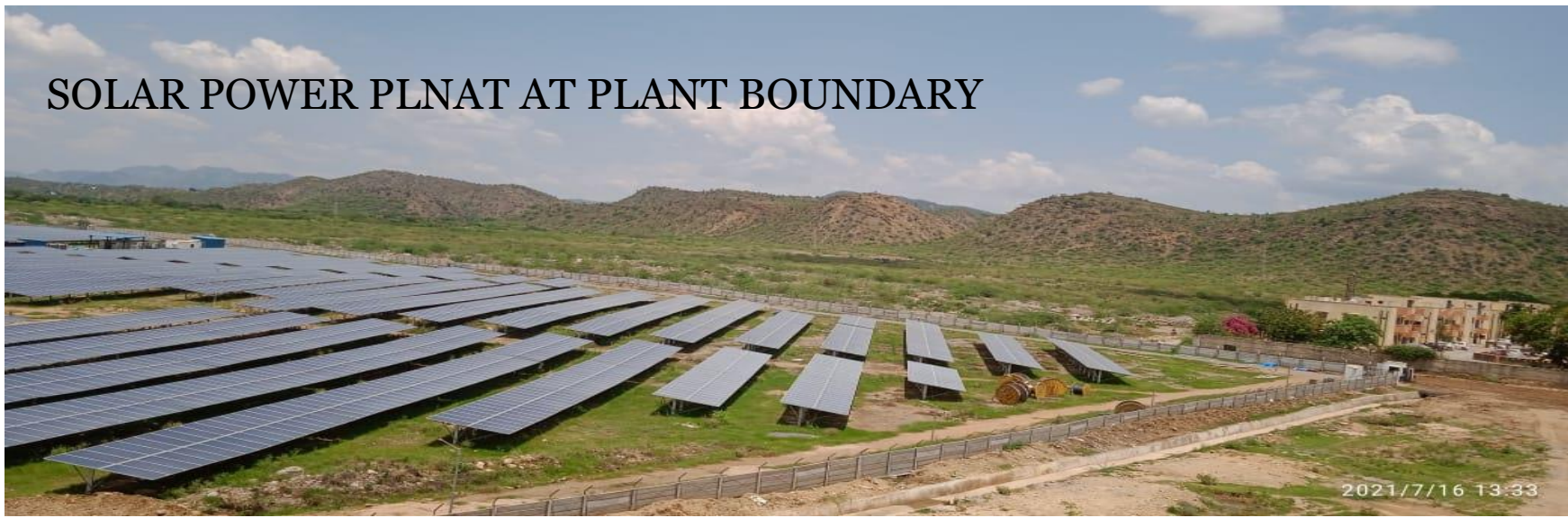
SOLAR POWER PLANT AT JAYKAYPURAM COLONY



**CAPACITY : 268 kW**  
**CO2 Saved= 962 Tons**

**Newly installed 4.16 MW solar plant**

SOLAR POWER PLANT AT PLANT BOUNDARY



**12 MW WHR Going to be Installed**



## WASTE UTILIZATION AND MANAGEMENT

SI No	Year	Waste Details	Quantity (in MT)	GCV	Heat value (Mkcal)	Waste as percentage of total fuel on Energy
1	2020-21	23 TYPES OF SOLID & LIQUID AFR	53675.6	1727.53	92726.72	2.9%

SI No	Year	Waste Details	Quantity (in MT)
1	2020-21	CALCITE	19420.39
2	2020-21	HIGH GRADE CALCITE	468.75
3	2020-21	CALCIUM CARBONATE	6.88
4	2020-21	POSPHATE SLUDGE	192.22
5	2020-21	MARBLE KHANDA	75298



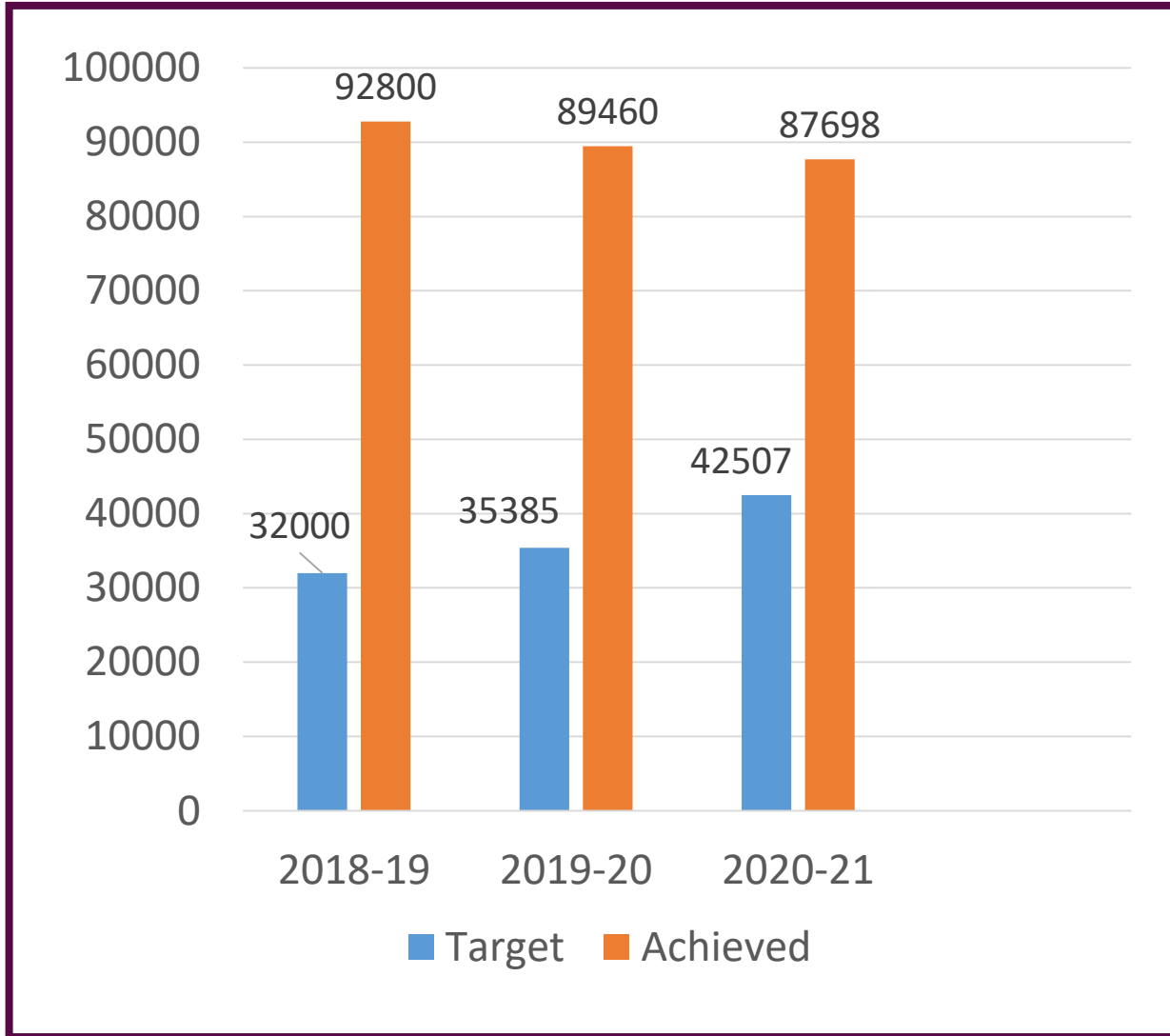
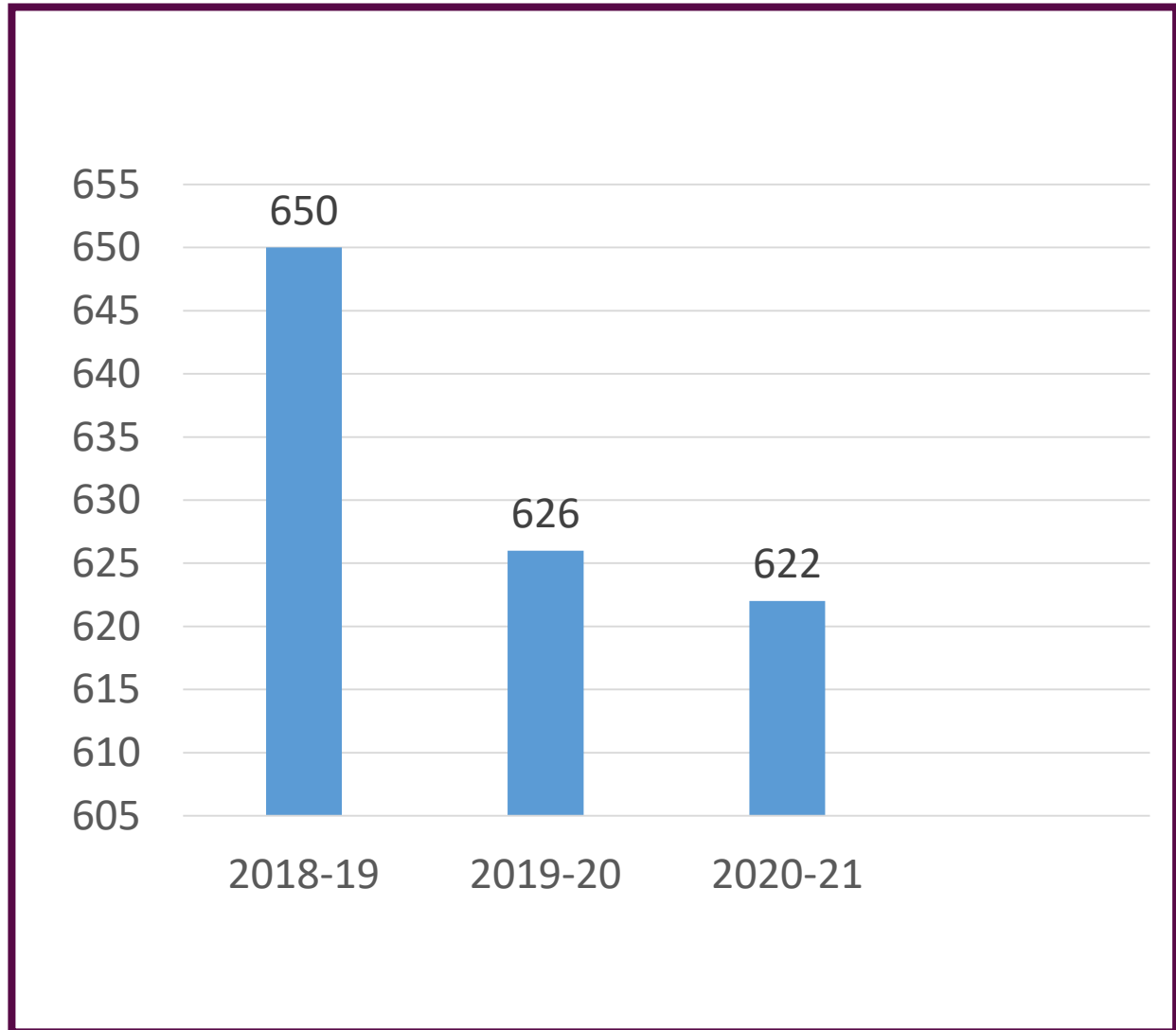
## LEARNING FROM CII ENERGY AWARD PROGRAMME

- Insulating paint over high temperature area to reduce radiation losses
- Installation of Active Harmonic Filter for Power factor improvement
- Use of Thermodynamic Steam Trap in our WHRS Steam line



## ACHIEVEMENT IN GHG INVENTORISATION

## RPO - TARGET v/s ACHIEVED

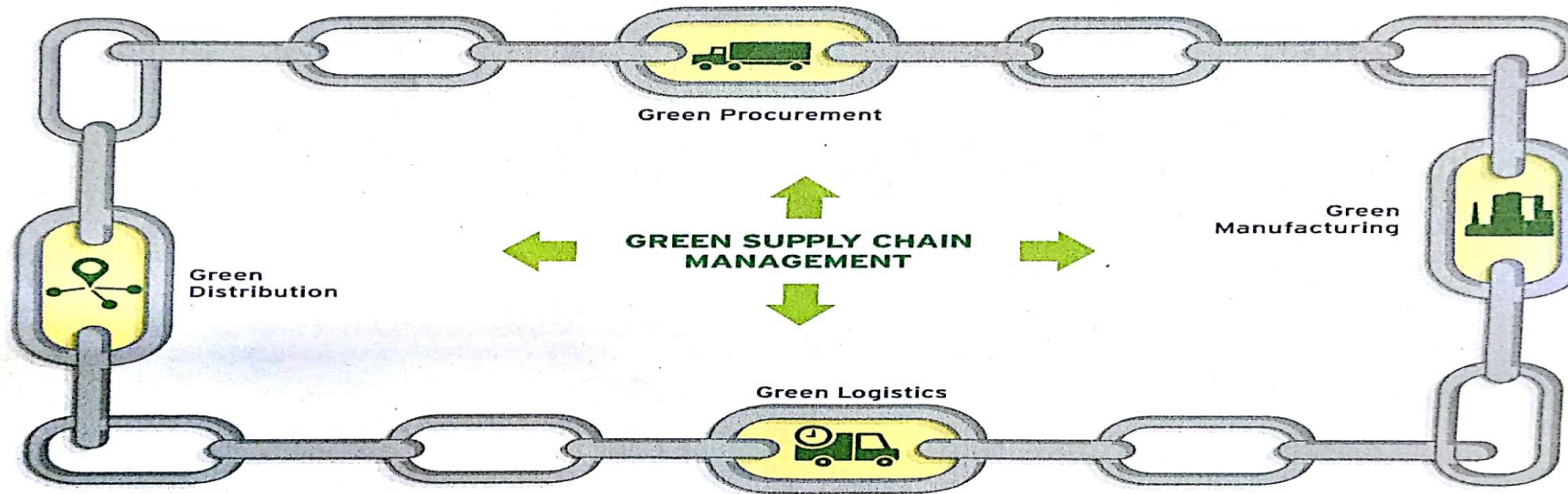




# GREEN SUPPLY CHAIN POLICY

The supply chain of a company has a major environmental impact right from procurement of raw materials to transportation and distribution of products. In order to incorporate elements of sustainability in its supply chain, JK Lakshmi Cement Ltd. has adopted the management approach of Green Supply Chain Management (GSCM), which consists of diverse aspects such as Green

Procurement, Green Manufacturing, Green Distribution, and Green Logistics. Green Procurement is an upstream segment of the GSCM which aims to minimise environmental impact throughout the lifecycle of our products by implementing green strategies in our procurement process.



Green Supply Chain Management at JK Lakshmi Cement Ltd.

At JK Lakshmi Cement Ltd. we have established Green Procurement Guidelines, which consist of a comprehensive set of assessment criteria and recommendations for selection of suppliers. These guidelines help us in collaborating with suppliers who illustrate ideal practices such as optimal use of raw materials, minimisation of carbon footprint, energy and resource efficiency, preservation of ecosystems, material recycling, and initiatives towards enhancing economic and social sustainability.

In order to establish long-term relationships with suppliers committed towards sustainable development, JK Lakshmi Cement Ltd. evaluates their policies / processes on the following parameters at their manufacturing locations:

- Environmental Sustainability
- Social Sustainability

<https://www.jklakshmicementsrm.com/SRM/>



## GREEN DISTRIBUTION, GREEN LOGISTIC & GREEN PROCUREMENT

Utilizing same Truck to dispatch packed cement in same route which is coming with additives at plant site



Utilization of same Bulker to dispatch loose cement in the same route which is coming with Dry Fly Ash.

Procuring only Energy Efficient Motors (IE3 ) and LED Lights

Utilizing the various hazardous and non- hazardous waste of various industry as alternative fuels.



# GREEN MANUFACTURING: CII GREEN PRO CERTIFICATION

Confederation of Indian Industry

**CII-Green Products and Services Council**

hereby certifies that

**PHD (Portland Pozzolana Cement)**  
(GPJK83005)


Manufactured by JK Lakshmi Cement Limited at their integrated plants in Sirohi - Rajasthan, Durg - Chattisgarh and grinding units located at Kalol, Gujarat, Jhajjar, Haryana and Surat, Gujarat, meets the requirements of GreenPro Certification and qualifies as Green Product.  
This certification is valid till December 2021

*Jamshyd N Godrej*  
Chairman  
CII-Godrej GBC

*ParasuRaman R*  
Chairman  
CII-Green Products & Services Council

*K S Venkatagiri*  
Executive Director  
CII-Godrej GBC

Supporting Council and programmes





Confederation of Indian Industry

**CII-Green Products and Services Council**

hereby certifies that

**Portland Pozzolana Cement (PPC)**  
(GPJK83001)

Manufactured by JK Lakshmi Cement Limited at their integrated plants in Sirohi - Rajasthan, Durg - Chattisgarh and grinding units located at Kalol, Gujarat, Jhajjar, Haryana and Surat, Gujarat, meets the requirements of GreenPro Certification and qualifies as Green Product.  
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Supporting Council and programmes





Confederation of Indian Industry

**CII-Green Products and Services Council**

hereby certifies that

**Platinum (Portland Pozzolana Cement)**  
(GPJK83004)

Manufactured by JK Lakshmi Cement Limited at their integrated plants in Sirohi - Rajasthan, Durg - Chattisgarh and grinding units located at Kalol, Gujarat, Jhajjar, Haryana and Surat, Gujarat, meets the requirements of GreenPro Certification and qualifies as Green Product.  
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Supporting Council and programmes







# GREEN MANUFACTURING: CII GREEN PRO CERTIFICATION

Confederation of Indian Industry

**CII-Green Products and Services Council**

hereby certifies that

**Sixer (Portland Pozzolana Cement)**  
(GPJK83003)


Manufactured by JK Lakshmi Cement Limited at their integrated plants in Sirohi - Rajasthan, Durg - Chattisgarh and grinding units located at Kalol, Gujarat, Jhajjar, Haryana and Surat, Gujarat, meets the requirements of GreenPro Certification and qualifies as Green Product.  
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CII-Godrej GBC

Supporting Council and programmes





Confederation of Indian Industry

**CII-Green Products and Services Council**

hereby certifies that

**PRO + (Portland Pozzolana Cement)**  
(GPJK83002)



Manufactured by JK Lakshmi Cement Limited at their integrated plants in Sirohi - Rajasthan, Durg - Chattisgarh and grinding units located at Kalol, Gujarat, Jhajjar, Haryana and Surat, Gujarat, meets the requirements of GreenPro Certification and qualifies as Green Product.  
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Confederation of Indian Industry

**CII-Green Products and Services Council**

hereby certifies that

**PHDP (Portland Pozzolana Cement)**  
(GPJK83006)


Manufactured by JK Lakshmi Cement Limited at their integrated plants in Sirohi - Rajasthan, Durg - Chattisgarh and grinding units located at Kalol, Gujarat, Jhajjar, Haryana and Surat, Gujarat, meets the requirements of GreenPro Certification and qualifies as Green Product.  
This certification is valid till December 2021


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Supporting Council and programmes





Confederation of Indian Industry

**CII-Green Products and Services Council**

hereby certifies that

**Portland Slag Cement (PSC)**  
(GPJK83007)


Manufactured by JK Lakshmi Cement Limited at their integrated plants in Sirohi - Rajasthan, Durg - Chattisgarh and grinding units located at Kalol, Gujarat, Jhajjar, Haryana and Surat, Gujarat, meets the requirements of GreenPro Certification and qualifies as Green Product.  
This certification is valid till December 2021

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## IMPLEMENTATION OF INTEGRATED QENHSE

### **QEnHSE External Audit Report**

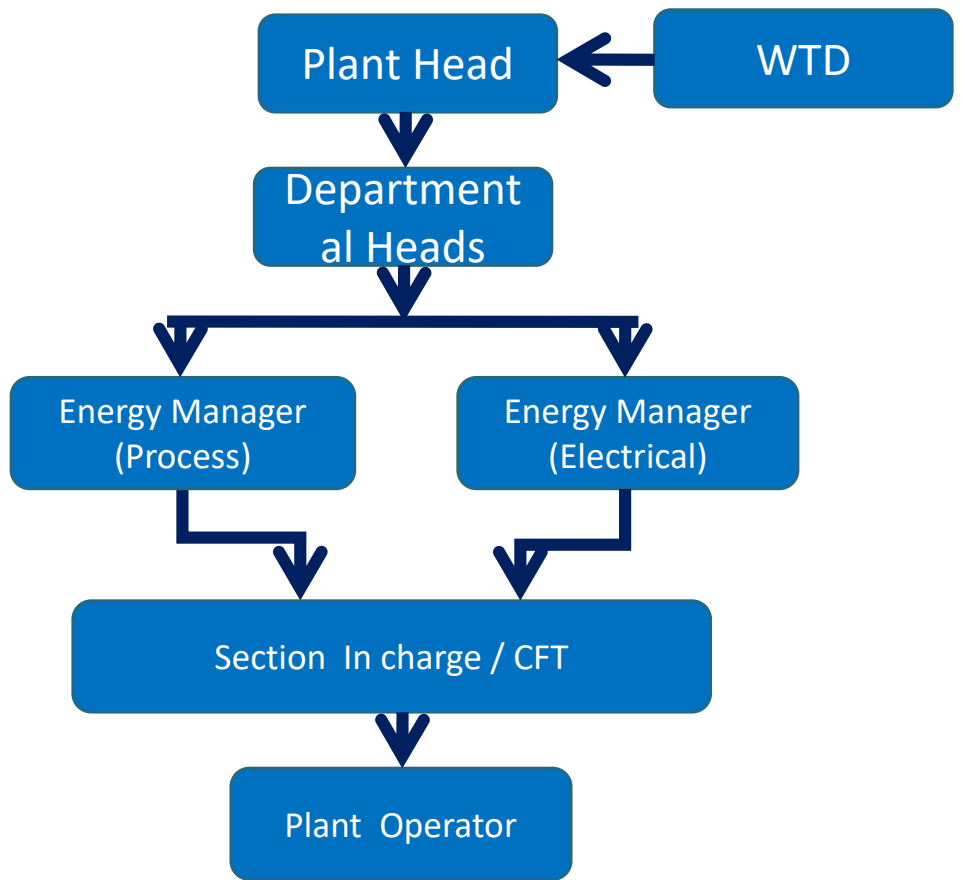
(There were no non-conformities/observations during QEnHSE Audit)

<b>S. No.</b>	<b>Observations</b>	<b>Status</b>
1	History of mechanical breakdowns to be maintained at the department	Completed
2	Bio Mass operations may be considered for assessment of environmental aspects and HIRA risks.	Completed
3	Apply reasonable controls to restrict assembly of unwanted workers or waiting trucks in the loading area	Completed
4	Encourage reporting first aid cases inside the plant.	Completed
5	Involvement of health officer in risk evaluation criteria for HIRA & Significant environmental aspect, may be considered.	Completed
6	Consider health checkup of lorry drivers (vision & colour blindness) for those transporters, who have regular contract with us and have permanent drivers	Completed
7	Copy of legal compliance related to the department, may be maintained.	Completed



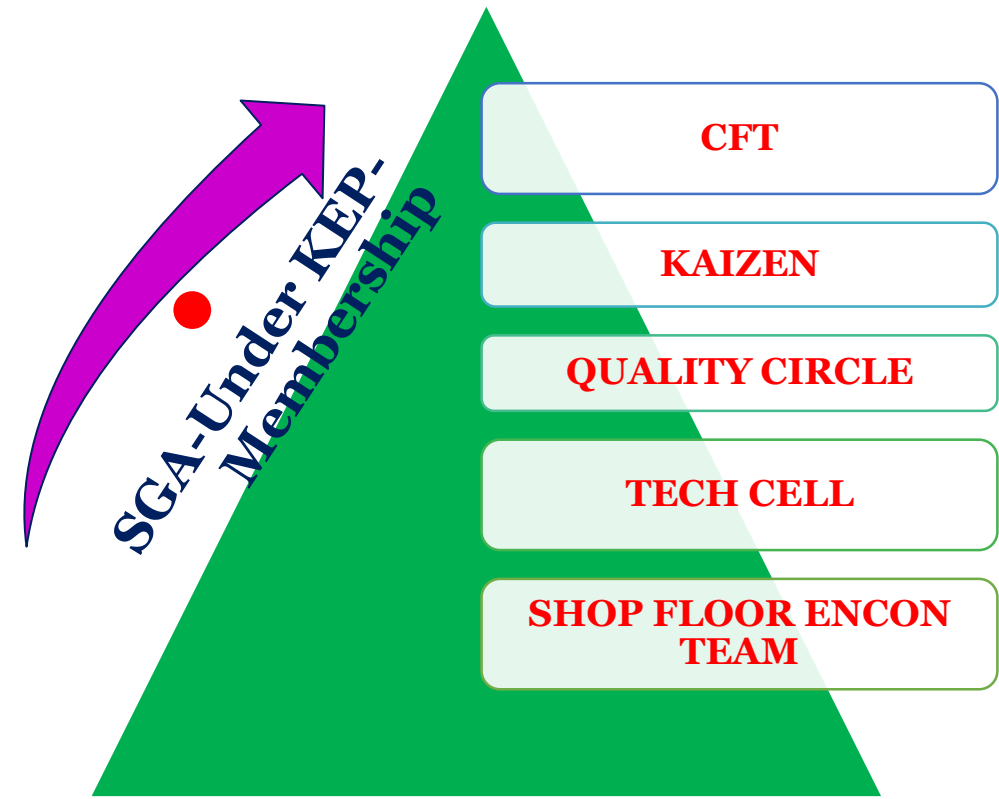


### ENERGY MANAGEMENT TEAM



Energy Review Meeting Chaired By Unit Head

### EMPLOYEE ENGAGEMENT ACTIVITIES AT JKLC



Total 45 projects implemented in Last Year



# IMPLEMENTATION OF ISO 50001

VEXIL BUSINESS PROCESS SERVICES



## Certificate

This Certificate is issued to

**JK Lakshmi Cement Ltd.**  
Jaykaypuram 307 019  
Dist. Sirohi  
Rajasthan  
INDIA

who have implemented an Energy Management System, which meets the requirements laid down in ISO 50001:2018, with the following scope:

**Manufacture of Clinker, Ordinary Portland Cement (OPC) of Grade nos. 43 & 53 and Portland Pozzolana Cement (PPC)**

Certificate No. : En9121018  
Original Issue : 30 October 2014  
Latest Issue : 27 October 2020  
Valid Till : 26 October 2023

*The continuing validity of this certificate is subject to timely conduct of surveillance audits*

Surveillance 1 due before : 14 October 2021  
Surveillance 2 due on : 14 October 2022

  
 for Vexil Business Process Services Private Limited  
 80 F, Kamla Nagar, Delhi 110 007




## ISO 50001:2018

To check the validity of the certificate, please email to [info@vexilbps.com](mailto:info@vexilbps.com)  
 The validity of the certificate can also be verified at <http://www.vexilbps.com>  
 Coloured reproduction of this certificate is not permitted.  
 Upon request, the Certificate shall be returned to Vexil Business Process Services Private Limited.



# Rewards and Recognition



**State Safety Award-2021**



**Water Optimization Award 2020**



**“QCFI – National Water Excellence Award - 2019**



**State Safety Award-2018**