CII National Energy Award for Excellence in Energy Management 2022

Presented By:
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Sr. Mgr & DH (E&I)
JK Cement Works, Balasinor (Gujarat)

Overview of JK Cement Ltd. Balasinor

- **Company profile**

Group capacity	14.7 MnTPA
Group established	May-1975
Total units in India (IP+GU)	8
JK Balasinor unit capacity	0.7 MnTPA
JK Balasinor unit commencement in	October-2020
JK Balasinor unit production FY'21-22	0.54 MnTPA
Product Contribution of PPC (% of mMTPA)	100%

- **Technology/ specification of major sections**

Equipment	Type	Model no.	Capacity	Supplier
Cement Mill	VRM	OK 40-4	100 TPH	FLSmidth
Packer	Double discharge Roto-Packer	fillpac RV 16	240 TPH	Beumer

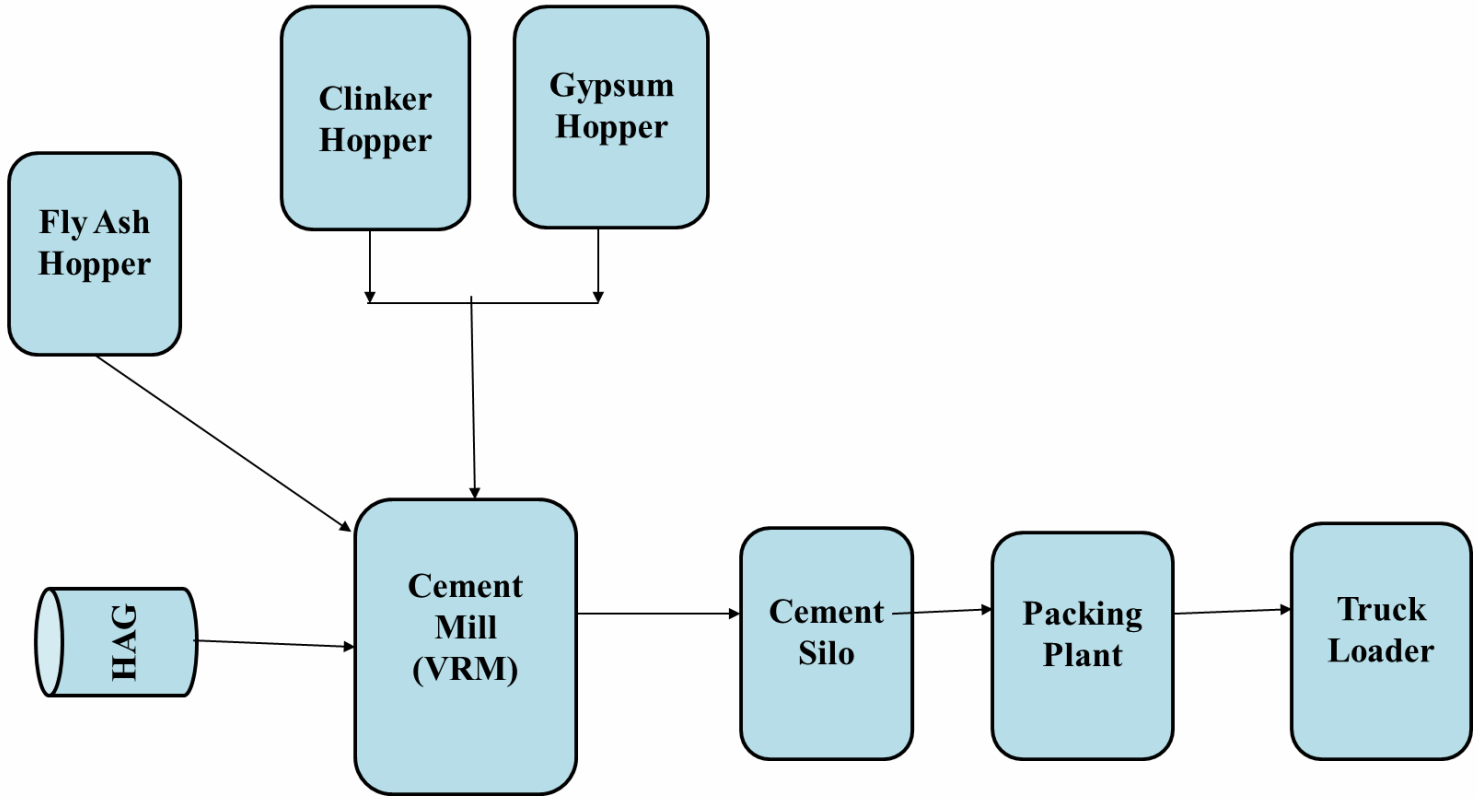
Cement Manufacturing Process & Flow Chart

a. Cement Manufacturing Process

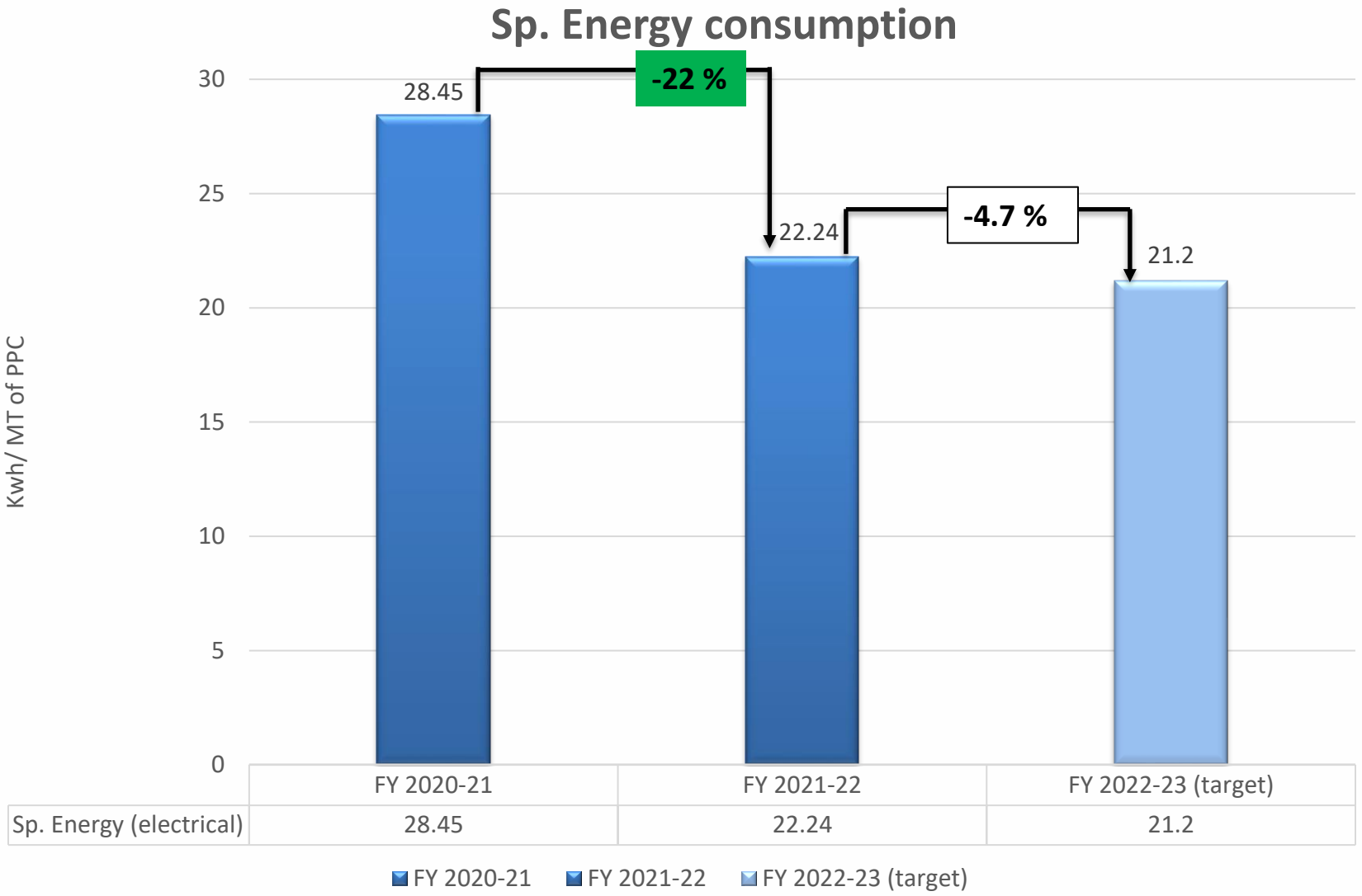
Comprises of following steps:

- Clinker storage & Handling
- Fly ash Storage & Handling
- Gypsum storage & Handling
- Hot Air Generator
- Clinker grinding in Vertical Mill
- Cement production and storage
- Cement packing & Dispatch

b. Process Flow Chart



Specific Energy Consumption

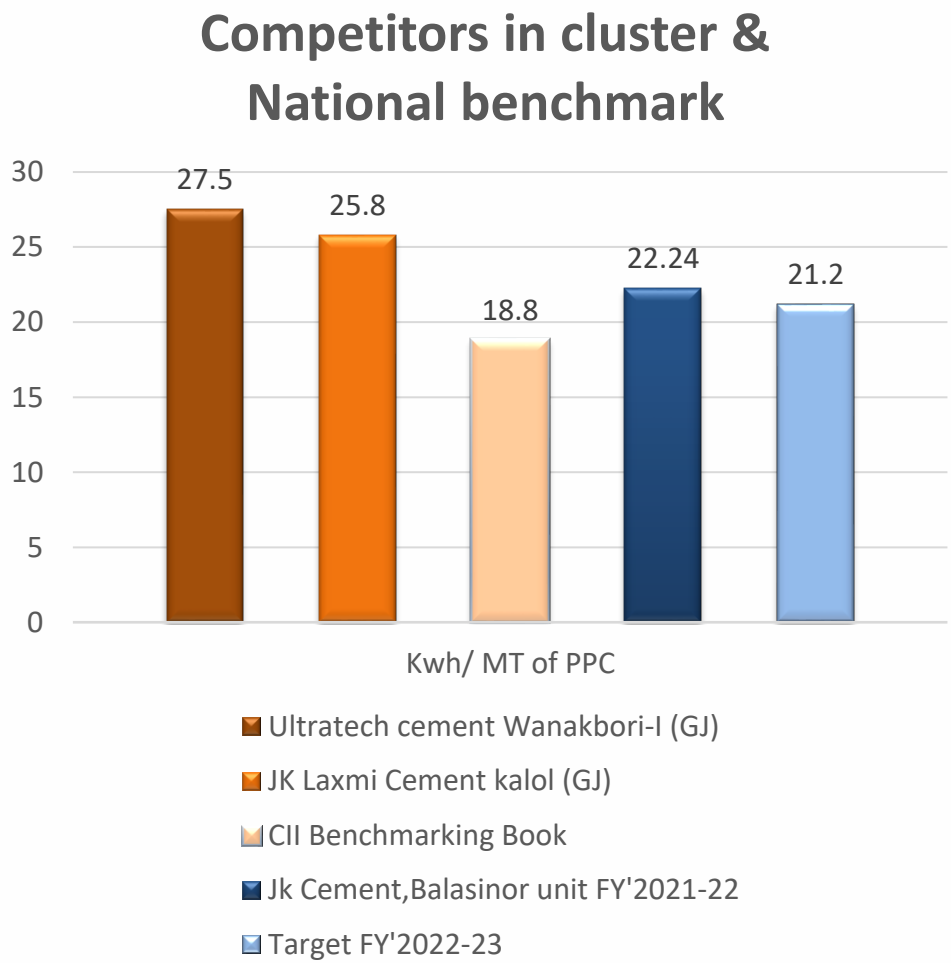


plant commencement in October 2020

Competitors & National Benchmark

- **Details of internal benchmarking/external benchmarking**

Name of Competitors	Kwh/ MT of PPC
Ultratech cement Wanakbori-I (GJ)	27.5
JK Laxmi Cement kalol (GJ)	25.8
CII Benchmarking Book (source:- CII)	18.8
JK Cement, Balasinor FY'2021-22	**22.24**
Target FY'2022-23 *(with 60% chemical gypsum mix)*	21.2



- **Action plan to achieve the energy efficiency target 2022-23**
  - Improving Clinker quality & increasing fly ash absorption.
  - Installation of VFDs (4nos) for capacity enhancement.
  - Optimization of compressors.
  - Process optimization.

List of Major EnCon Project Planned in FY 2022-23

S. No	Title of Project	Annual Saving (MillionkWh)	Investment (Rs in Million)
1	Grit Cone area reduction inside mill	0.01	0.5
2	Bucket elevator capacity enhancement work	5	5.5
3	Dam ring height to optimization & Modification of DFA feeding line in Mill	0.43	0.02
4	VFD installation in Bag filter Fan	2.6	1.4
Total		**8.0**	**7.4**

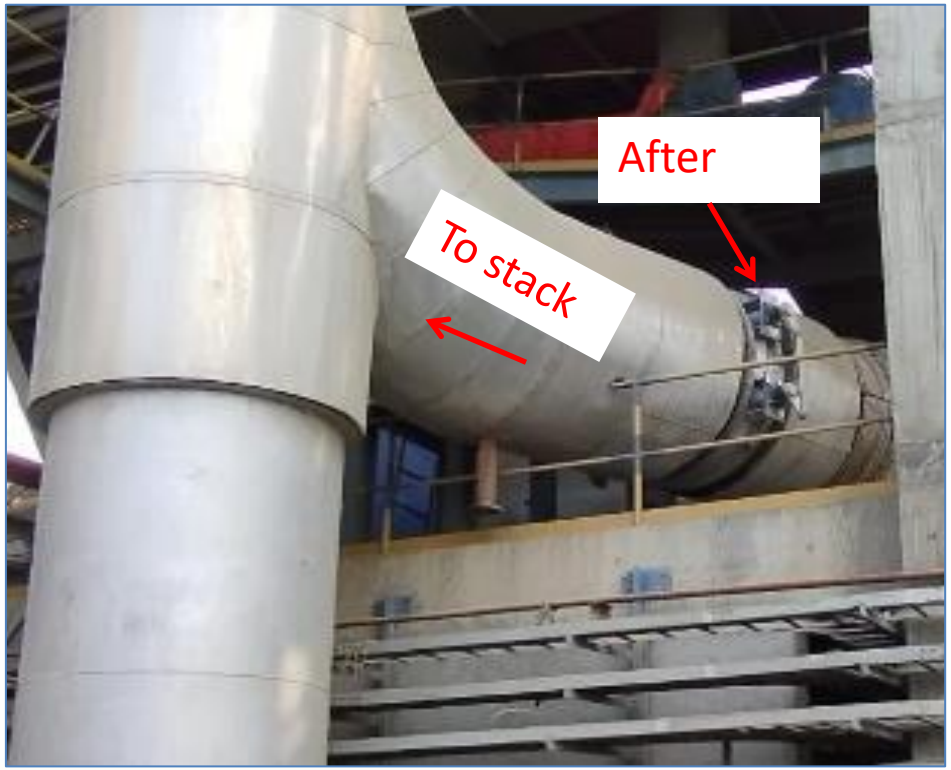
List of Energy Saving Projects Implemented

Year	No of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Kg/MT cement)	Savings (INR Million)	Impact on SEC (Electrical kWh /MT cement)
FY 2019-20	NA	NA	NA	NA	NA	NA
FY 2020-21	2	0.0	356	--	3.1	1.6
FY 2021-22	23	1.7	2071	0.3	21.2	3.87

Microsoft Excel Worksheet

Innovative Projects Implemented

Sr. No.	Particulars	Annual Thermal Savings (kg/MT Cement)	Annual Savings in INR in Lacs (FY'21-22)	Investment In INR
1	Installation of additional damper in the mill circuit, to increase recirculate gases (having temp 88-90 degree) quantity.	0.19	5.643	6.00



Utilization of Renewable Energy sources

Year	Type of Energy	Onsite/Off site	Installed Capacity (MW)	Generation (million kWh)	% of overall electrical energy
FY 2019-20	NA	NA	NA	NA	NA
FY 2020-21	NA	NA	NA	NA	NA
FY 2021-22	Wind	Off site	1.8	0.784	5.39

Wind Power Started from Dec 2021

Planning for FY 22-23 Renewable Energy sources

Year	Type of Energy	Onsite/Off site	Planned Capacity (MW)	Generation (million kWh)	% of overall electrical energy
FY 2022-23	Wind Power	Off site	1.8	5.2	37.14
FY 2022-23	Hybrid	Off site	1.8	1.0	7.14

Expecting Hybrid power from Dec 2022

GHG Inventorisation-JK Cement Ltd.

Performance highlights FY 2021-22

Financial Performance

13.1 MTPA Production Grey cement, White cement and Wall Putty. 19%	₹ 7,529 Crores Net Sales 21%
₹ 1,536 Crores EBITDA	₹ 631 Crores PAT 5%
₹ 4,252 Crores Equity 14%	0.51 Net Debt to Equity
₹15 per share Proposed dividend	1.45 Net Debt to EBITDA

ESG Performance

JK Cement is one of the Indian cement companies to submit the Energy Compact with the Ministry of New and Renewable Energy

0.56 LTIFR	ZERO Fatalities	65.6% Clinker Factor
32% Green power in energy mix	8.9% Thermal Substitution Rate	4.6x Water positive
~2x Growth in training hours for employees (y-o-y)	0.596 tCO_2e/tonne cementitious material GHG Emissions Intensity (Scope 1+2)	

yoy

Navigation Icons

Our capitals

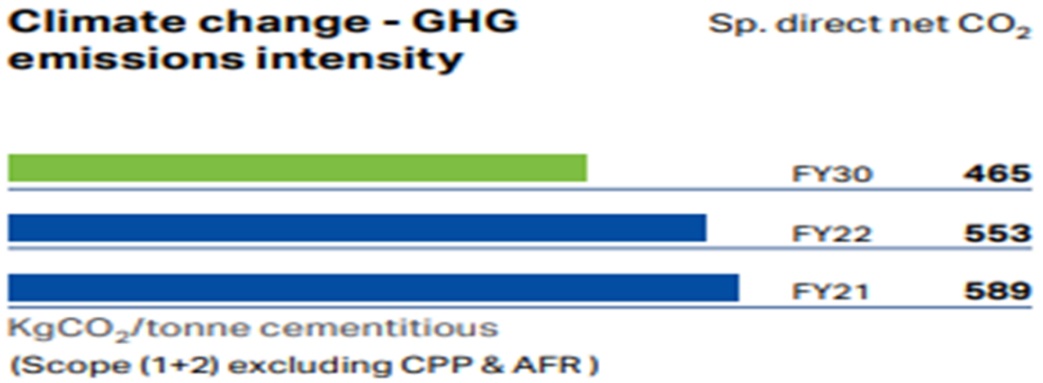
Financial · Manufactured · Intellectual · Natural · Human · Social and relationship

Our stakeholders

Shareholders · Employees · Dealers · Customers · Regulatory and statutory bodies · Media · Local communities

Our strategic objectives

S01 Capacity expansion · S02 Operational efficiency · S03 Consolidate market position · S04 Widen visibility · S05 Launch of value added products · S06 Customer centricity · S07 Sustainable operations

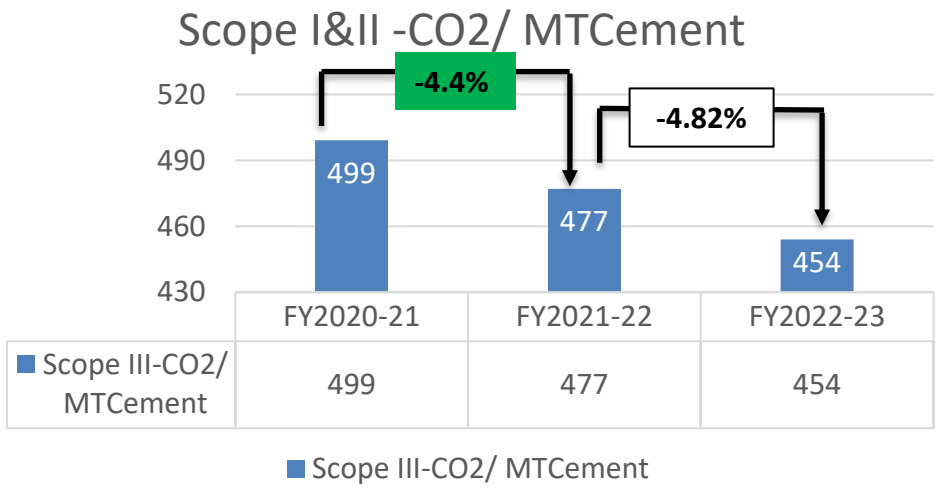


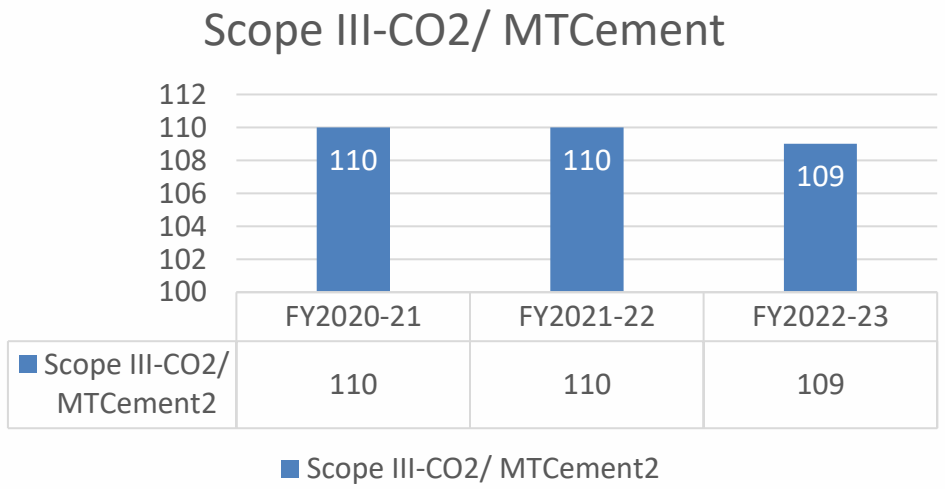
- We have taken a target to reduce 124 KgCo2/MT Cmt. by FY30, which 29% we have achieved in FY22.

Public disclosure:

- CO2 emission data of the entire JK cement group are shared on the official website in Sustainability reports for public disclosure.

GHG Inventorisation-JK Cement Works, Balasinor





CO2 reduction in FY2021-22:

- 9.8% reduction in fuel consumption by additional damper in the mill circuit & process optimization.
- 4% reduction in Clinker factor by process optimization

- Scope III- CO2 emission is calculated by the vehicle movement for the raw material & product and employee local conveyance.

Microsoft Excel Worksheet

Action plan for FY2022-23:-

Scope I & II

- Replacement of oil fired HAG by Agro waste based HAG.
- Maximize the use of Dry FlyAsh.
- Optimizing gypsum mix.
- Optimize the mill operation without water spray.

Scope III

- Uses of high capacity vehicle for inward and outward.
- Additional 20% Incentive offered to employees for purchase of Electrical Vehicles.

Green Purchase Policy

JK Cement LTD.

Procurement Policy

We at J.K. Cement Ltd. are committed to contribute in improving business results by combination of strategic sourcing and operational procurement, leveraging size & volume, cost reduction initiatives, sustainability and ensuring high standards of supplier relationship.

We strive for

- Creating value through strategic sourcing and cross functional approach with consistent focus on Total Value of Ownership
- Iimplementing efficient processes and systems
- Treating internal customers, suppliers and team members with respect and efforts for continuous skill development
- Maintaining the highest ethical standards in all our practices
- Institutionalizing quality, health, safety, environmental and energy efficiency consideration in procurement decisions
- Selecting equipment which are environment friendly as far as possible
- Promoting utilization of industrial wastes, reusable and recyclable materials to the extent possible
- Preferring suppliers with track records on Quality, Health, Safety, Environment & Energy Efficiency and supporting them by sharing best practices to improve them further

Yagyesh Gupta
Chief Procurement Officer

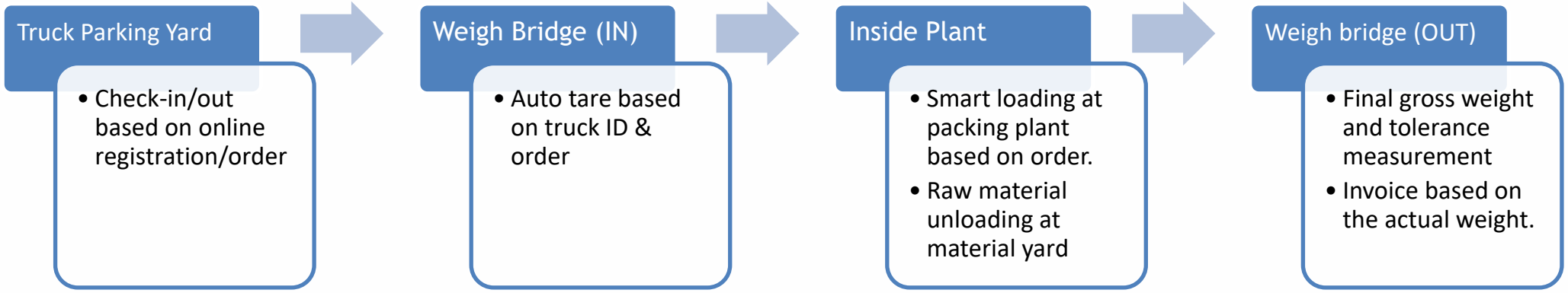
Green purchase policy- Included in our JK group purchase policy.

Initiatives Taken in Supply Chain to Reduce Energy

- **All Purchase orders & RFQ being send electronically.(from day of commencement)**
  - ✓ Total 7320 PO placed for JK balasinor plant and saved paper 21960 till date.
- **Initiative for merging of multiple PR in single PO.**
- **Explore of nearest dry flyash source at Balasinor, Which is L1 source for Balasinor unit.**
- **GPS installation for all Inbound and all outbound vehicles.**
- **The backhauling process i.e utilization of inward raw material trucks for cement outbound has results into:-**
  - ✓ Reduced traffic of heavy vehicle (no. separate fleet of trucks are required)
  - ✓ Reduced air pollution on account of less consumption of diesel/lubricants as a result of reduced traffic of heavy vehicle.

IoT Based Automation for Logistics

- **IoT based logistics automation project implemented in FY2020-21**
  - Digitize Delivery Order/Delivery Invoice creation to reduce time-consuming manual processes and paperwork
  - Stage-based tracking to analyze and reduce Turnaround Time.
  - Man less weighbridges control- Save time and effort while reducing human errors to zero.



Vehicle management flow chart

IoT Based Automation for Logistics

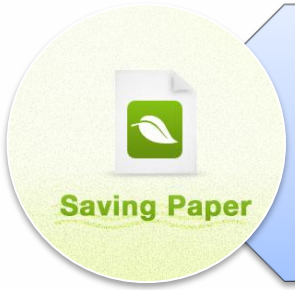
- **Savings by IoT based automation for logistic project**

Time saved

- FY2020-21:- 2,811 hours
- FY2021-22:- 11,285.3 hours

Diesel fuel saved in truck

- FY2020-21:- 10,965 liter
- FY2021-22:- 44,012 liter

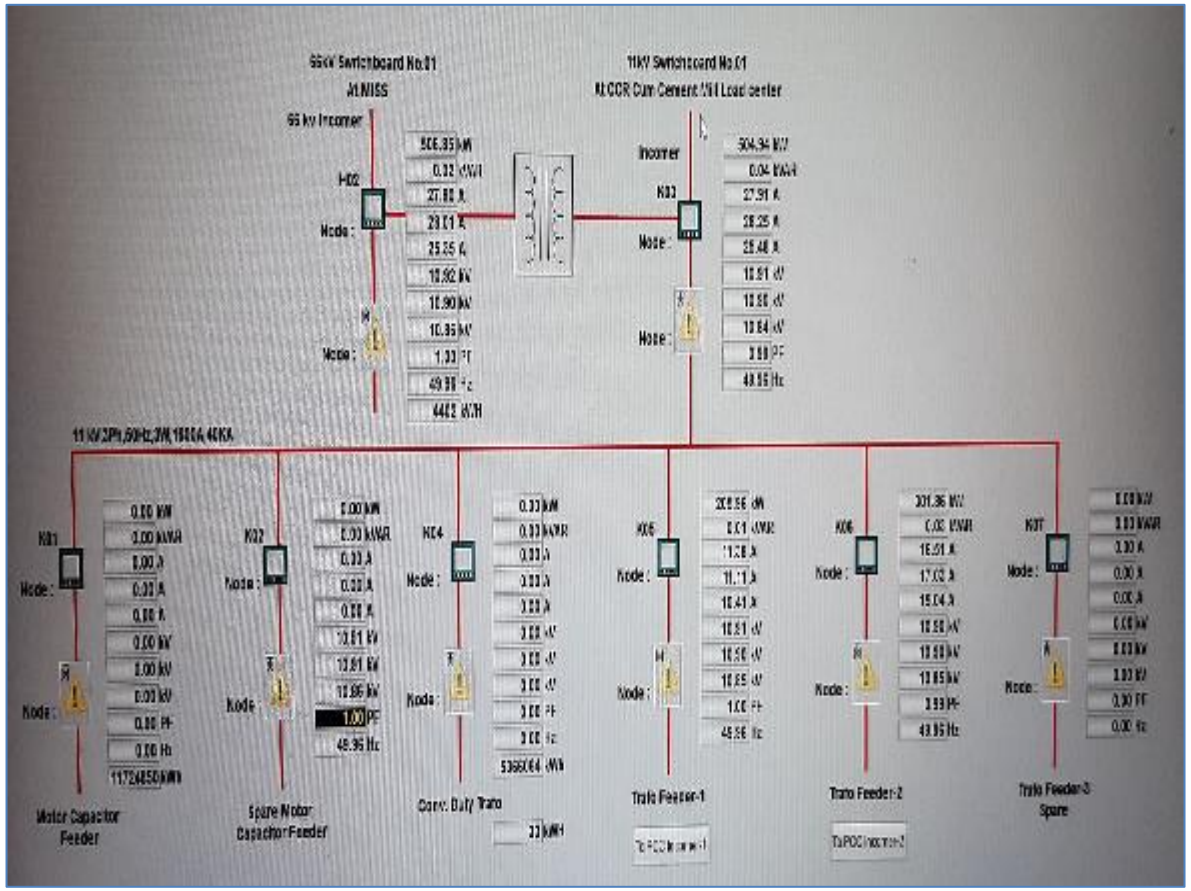


Paper saved

- FY2020-21:- 33,740 Nos.
- FY2021-22:- 1,35,424 Nos.

Energy Monitoring System

- Daily power report is generated and circulated with all team member.
- Energy Management Cell is formed to analyze & brainstorming for the reduction of the SEC.
- Regular study of area-wise equipment on deviation and their analysis.
- RCFA of all critical breakdowns
- CB Analysis of all EnCon Projects



Energy monitoring system

Daily Power Report

Dated:

RM Rcvd - Clinker	
RM Rcvd - DFA	
Cement Production	
Mill TPH	
Cement Dispatched	
Packer TPH	

Sno	Description	Unit Consumed	Power / MT Cement	PP. Total Power / MT Packing
	TOTAL Power			
a-1	Raw Material Handling - Clinker BRU to Silo Feed			
a-2	Raw Material Handling - DFA Unloading			
a-3	Raw Material Handling - silo ext. to Hopper			
(A)	**Total RM Handling**			
b-1	Cement Mill Main Drive			
b-2	BH Fan			
b-3	Mill Aux			
b-4	Cement Mill (Transport)			
b-5	DFA Feeding to Mill			
(B)	**Total Grinding Power**			
c-1	Packing Plant			
c-2	20% MCC5 (Silo Ext.)			
(C)	**Total Packing Plant**			
(D)	**Cement Mill (Compressor)**			
d-1	Plant Lighting & Constrction			
d-2	CCR AC			
d-3	Losses - Transmission			
d-4	Losses - Distribution			
(E)	**Total Misc**			
	Cross Check			
Total Power				
MGVCL				
Wind Power			**Wind power in %**	
DG		0	%	
1	Total Grinding Power (Kwh/mt)			
3	Total Bulk Power Kwh/mt (Except PP)		(RMH + Grinding)	
4	Total Power (Gross/MT Cement)			

Daily power report format

Energy Review Meeting & Appreciation for Best Kaizens

Energy review meeting

Price distributed for best Kaizens suggestion -Workmen

Projects Implemented through Kaizen- Workmen Level

- Lighting circuit optimization.
- Motion sensor installation at offices for lights & AC.
- Idle running of the equipment to reduce the SEC.
- Compressed air leakage is arrested to reduce the SEC.
- Identification & arresting of False air.

Implementation of ISO 50001

Lloyd's Register

Current issue date: 12 August 2021
Expiry date: 11 August 2024
Certificate identity number: 10304167

Original approval(s):
ISO 9001 - 12 August 2021
ISO 14001 - 12 August 2021
ISO 45001 - 12 August 2021
ISO 50001 - 12 August 2021

Certificate of Approval

This is to certify that the Management System of:

J. K. Cement Works

Tahsil – Balasinor, Ahmedabad Indore Highway, Village - Vadadala, Balasinor, 388255, Dist – Mahisagar, India

has been approved by Lloyd's Register to the following standards:

ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018

Approval number(s): ISO 9001 – 00032089, ISO 14001 – 00032086, ISO 45001 – 00032087, ISO 50001 – 00032088

The scope of this approval is applicable to:

Manufacture of ordinary Portland cements and blended cements at Balasinor.

Luis Cunha

Area Operations Manager - SAMEA

Issued by: Lloyd's Register Quality Assurance Limited

UKAS

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Certified by 50001:2018 Validity: 11 August 2024

- ISO 50001 brings an effective process to measure and manage energy use in order to Reduce/manage energy usage and operating costs.
- 0.07% investment of energy saving projects on total plant turnover for FY 2021-22

Other Awards

Gold Award- Apex India Green Leaf Award 2021 for plant efficiency cement sector.

Learning from CII Energy Award Program

- **VFD installation for bag filter fan.-** (reference i.- Excellence in Energy Management- 2009, Shree Cement ltd. Beawer. Reference ii.- National Award for Excellence in Energy Management – 2014, DALMIA CEMENT (B) LTD-ARIYALUR)
- **Bag filter optimization to run in D.P. mode.** (reference- CII – 15th National Award for Excellence in Energy Management 2014, UltraTech Cement Ltd. , unit: Aditya Cement Works)
- **To reduce the electrical energy consumption by conversion of delta to star connection.** (reference- National Award for Excellence in Energy Management 2014, ACC -Kudithini cement works)


Thank You