UltraTech Cement Limited
Hotgi Cement Works

Team Members

1. **Mr. Kasi Viswanadham – Deputy General Manager**
2. **Mr. Hanumanthappa - Manager**

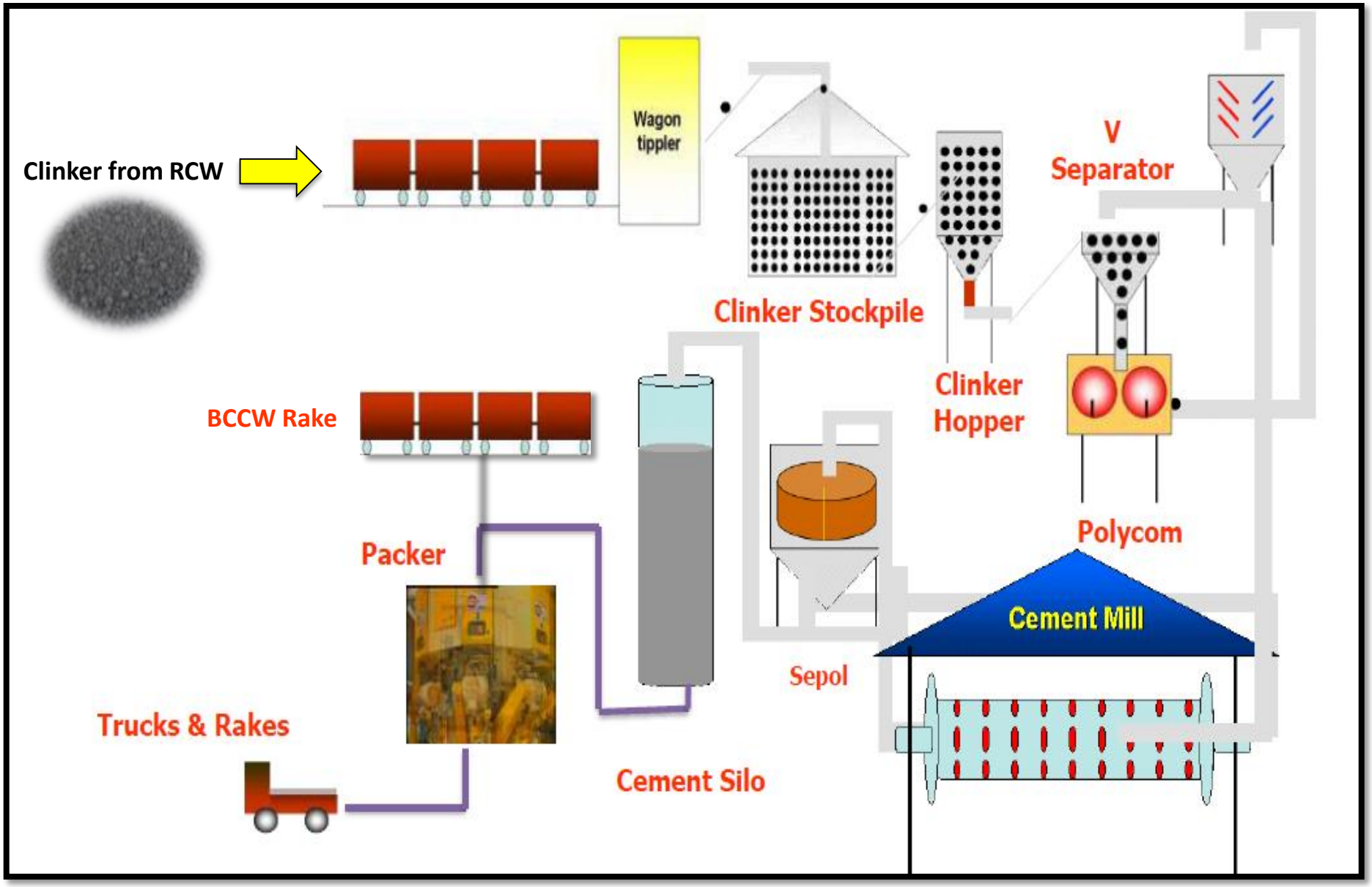
August 2021

1.a. Unit Introduction – Plant Details

ULTRATECH CEMENT LIMITED, HOTGI CEMENT WORKS	
Land Acquisition – 265 Acres	**1994**
Line-1 commissioned – Capacity 1.2 MTPA Products – OPC 43, OPC 53, PPC & PPCS	**23 July 1995**
Introduction of PPC at Line 1 - Capacity enhanced by 0.8 MTPA **Total Capacity 2 MTPA**	**2008**
Line-2 commissioned with Capacity – 2.0 MTPA Products – OPC 43, OPC 53 & PPC	**20th March 2013**
Total Plant Capacity is 4.0 MTPA	

- Located at South Solapur, Maharashtra on Mumbai – Hyderabad broad gauge line
- Caters market of entire South-West Maharashtra.

1.b. Unit Introduction – Process Overview



2. Impact of COVID 19

➢ **Impact on workplace:**

Problem:

- Sudden spike in Covid19 positive cases in plant created a panic & fear in employees.
- Employees are against the testing, fearing they would be tested positive.

Actions taken:

- Conducted 100% Antigen test to all O&S and CWM. Proactive measures taken to make our plant Covid free work place.
- Made tie up with government & private testing centers for testing purpose. Hospital people will directly contact the persons and take sample from their home.
- For treatment in Private hospitals we gave the patient name to the hospital cashless treatment section, who immediately sent the ambulance for picking up the patient.

➢ **Impact on Production**: In FY 2020-21 got decreased by 2.11% compared to FY 2019-20.

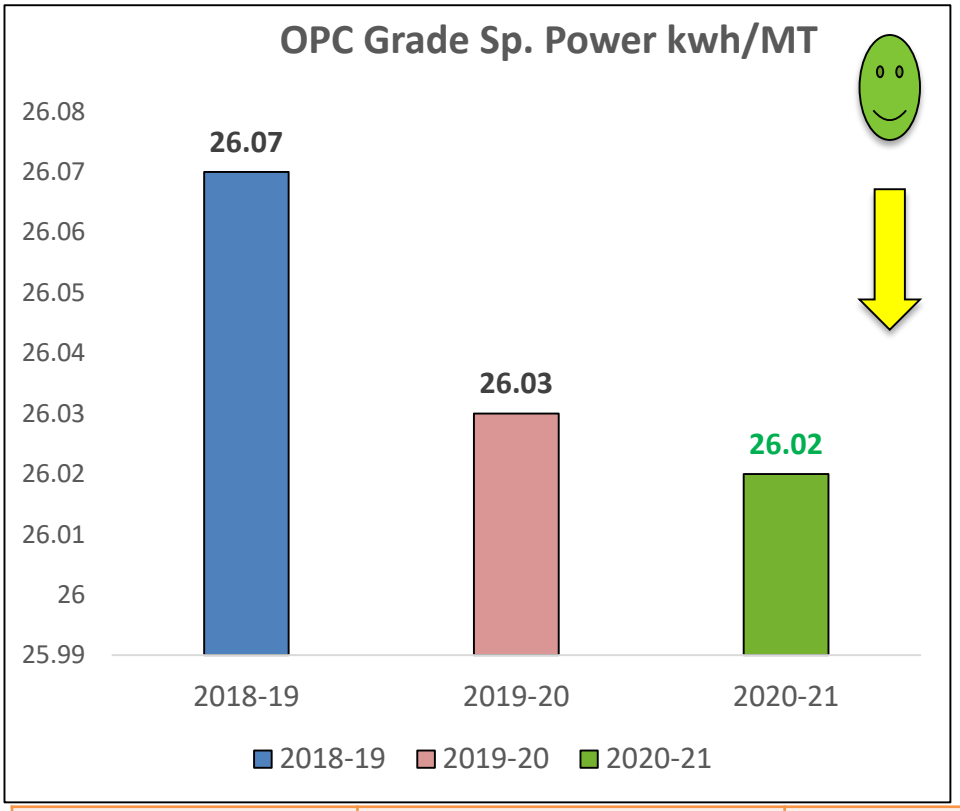
➢ **Impact on Dispatch:** In FY 2020-21 got decreased by 1.65% compared to FY 2019-20.

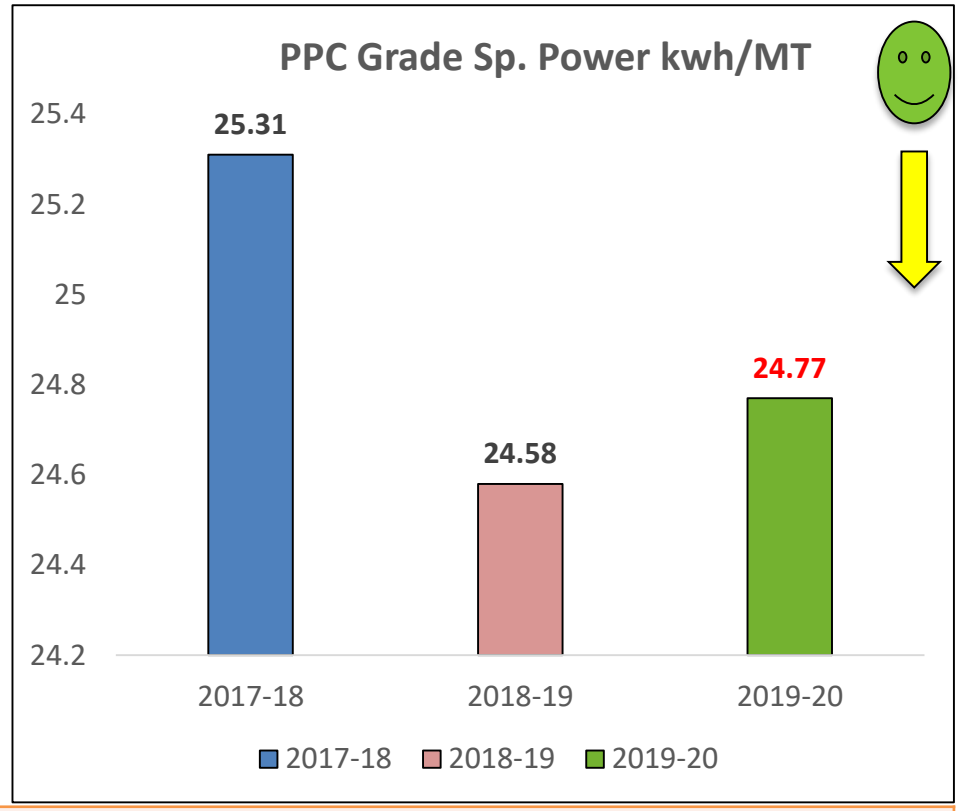
➢ **Impact on Energy Conservation:**

- Funds allocation for executing major capex jobs, including energy conservation jobs got deferred due to Covid impact.
- Stop start operations of Cement Mill & Idle run hours of Packing plant got increased because of lockdown effect resulting in increase of total power consumption by **0.02 kwh/t** compared to 2019-20.

(Total power consumption in 2019-20 is **28.82 kwh/t** & in 2020-21 it is **28.84 kwh/t**)

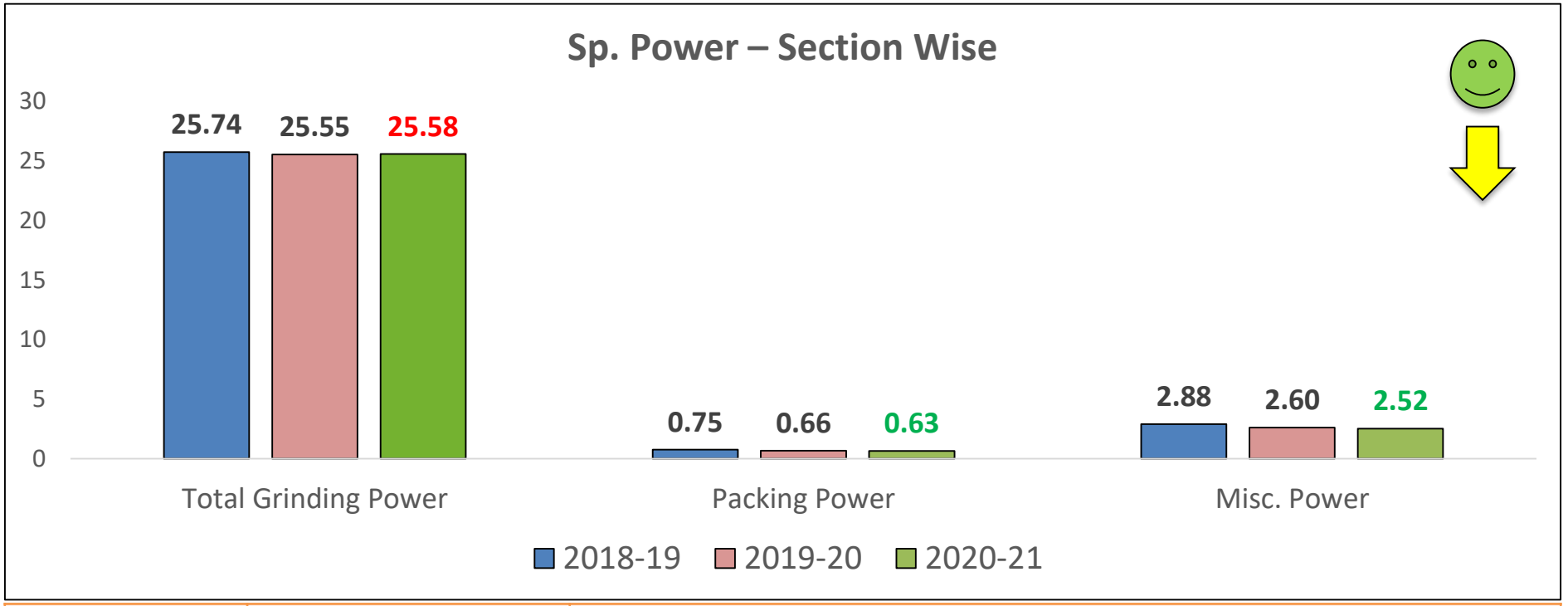
3.a. Sp. Energy Consumption – Product Specific (FY 2018-21)





Cement Grade	Improvement % (compared to 2018-19)	Remarks
OPC	0.16	Installation of Thin classifying liners, Expert Optimizers, VFD's for bag filters, C-194 Impeller replacement, Grinding Media Regradation, RP Rollers profiling in every six months etc. Improvement in OPC grade sp.power by **0.03%** compared to last year Sp.power consumption increased by **0.77%** in PPC grade compared to last year is mainly because of increase in pondash consumption.
PPC	2.14	

3.b. Sp. Energy Consumption – Section Wise (FY 2018-21)



Section	Improvement % (compared to 2018-19)	Remarks
Grinding Power	0.62	Thin classifying liners, Expert Optimizer, C-194 Impeller replacement, Grinding Media Regradation, VFD operated bag filters, Roller profiling in every six months etc.
Packing Power	16	Wagon loading bay extension, VFD operated bag filters, Increase in Packer speed, Increase in BCCW dispatches, installation powerless bag diverters
Misc. Power	12.5	VSD compressors in place of IR, AC energy savers, reduction of idle running of equipment's, Installation of LED lights utilization of only one cooling tower in monsoon etc.

4.a. Benchmarking
(RP +Ball Mill Circuit)

Internal Benchmarking & Targets

Line 1 HOCW - Sp. power Consumption (Kwh/t) comparison with similar circuit plants					
Grade	Aditya Cement Line 1	Rajashree Cement Line 3	**Present Sp. Power Line 1**	Short Term Target	Long Term Target
OPC	**23.99**	25.26	24.15	**23.67**	23.49
PPC	25.97	32.48	**24.99**	**24.49**	24.33

Line 2 HOCW - Sp. power Consumption (Kwh/t) comparison with similar circuit plants						
Grade	Nagpur Cement Line 1	Rajashree Cement Line 4	Jharsuguda Cement Line 2	**Present Sp. Power Line 1**	Short Term Target	Long Term Target
OPC	27.36	26.85	-	**26.64**	26.11	**25.43**
PPC	26.09	30.02	**24.67**	30.04	29.44	**28.83**

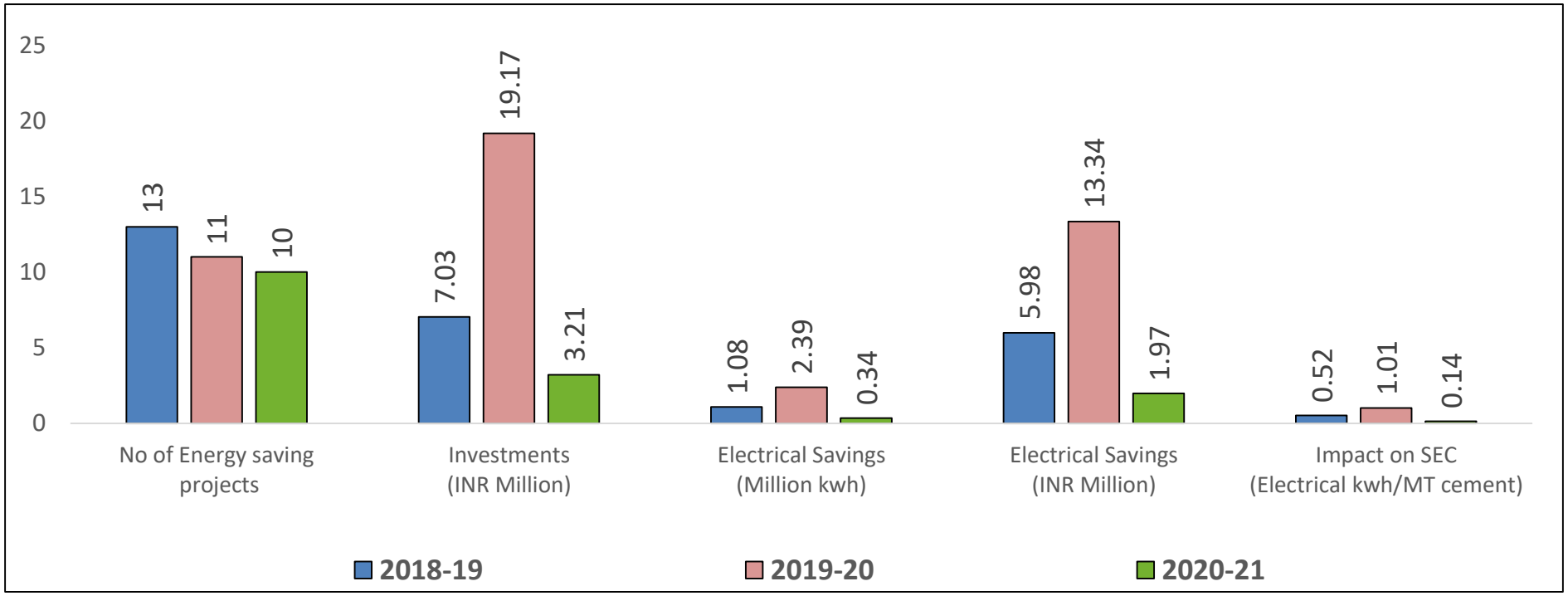
Short term target duration: 1 year i.e. 31.03.2022
Long term target duration: 2 years i.e. 31.03.2023

4.b. Encon initiatives planned in 2021-22

S.N	Encon projects planned in 2021-22	Investment (Rs in Lacs)	Approx. Savings Lac units/annum	Impact on SEC kwh/t
1	Installation of MV drive for line 2 Roller Press	215.85	11.63	0.50
2	Re-gradation of grinding media at line 1	45.65	4.05	0.18
3	Conventional Lighting replacement with LED's - 1230 Nos 35 W – 350 Nos, 45 W – 425 Nos Flood Light 200 W – 116 Nos, Street Light 70 W – 110 Nos Tube Lights 17 W – 230 Nos	17.64	2.76	0.12
4	Installation of Fanless Cooling Tower at line 1	5.00	0.69	0.03
5	Power savings due to ESP to BH conversion (Power savings will be achieved by removing transformers)	---	0.60	0.03
6	Increasing fly ash usage in Ultra super from 20% to 26% on incremental manner	---	0.45	0.02
7	Replacement of Old Split AC's with new (4 no's)	1.24	0.07	0.004
8	Elimination of continuous operation of Cement Mill HP pump.(DCS logic modification done)	---	1.10	0.05
9	Automation of CM Pinion Shaft LP Lubrication pumps operation.	1.50	0.58	0.03
	Total	**286.88**	**21.93**	**0.95**

5. Energy Saving projects implemented (FY 2018 -21)

Year	No of Energy saving projects	Investments (INR Million)	Electrical Savings (Million kwh)	Savings (INR Million)	Impact on SEC (Electrical kwh/MT cement)
2018-19	13	7.03	1.08	5.98	0.52
2019-20	11	19.17	2.39	13.34	1.01
2020-21	10	0.61	0.34	1.97	0.14



5. Energy Saving projects implemented (Major Projects)

Year	Project Details	Investments (Rs in Lacs)	Savings per annum (Rs in Lacs)	Payback (Years)
2020-21	Installation of Expert Optimizer at Line 1	28.00	14.97	1.87
2019-20	Installation of Thin Classifying Liners at line	105.00	74.24	1.41
2019-20	Installation of Expert Optimizer at Line 2	26.00	30.00	1.42
2019-20	Installation of energy efficient impeller for C-194 Seperator fan. (2019-20)	21.34	15.59	1.37
2019-20	Installation of Airtron energy conservation units for AC's (2019-20)	9.43	5.86	1.61
2018-19	Replacement of Water Cooled fixed speed Compressor with VSD air cooled compressor	16.32	20.27	0.81
2018-19	Installation of 1 HT VFD & 5 LT VFD’s in CM 1 & Packing Plant	45.61	22.09	2.06

6. Innovative Project implemented

Theme

Enhancement of Truck Loaders loading capacity

Problem

- Existing truck loaders can load Cement trucks up to 32 MT due to height constraint.
- We are not able to meet logistic requirement of loading more than 36 MT trucks because of the above limitation.
- Decrease in shift output & increase in power consumption.

Solution

- Brainstorming session carried out with the team & decided to carry out in house modifications:
- Increased the height of conveyor by changing the orientation of the lifting cylinder bracket.
- Increased the length of luffing by 750 MM & feed trolley by 1500 mm

Benefit

- Flexibility of Machine increased for loading various capacity of trucks up to 40 MT.
- Increase in shift output by 228MT. Trucks more than 32MT are loaded continuously thereby eliminated 1.5 Hours of Packer 1 & its loading belts operation. Approximate savings of 0.86 Lac units/annum - Rs 4.78 Lacs
- Customer satisfaction - Meets the Logistic requirement
- Increased OTIF
- Replication Potential: Yes

7. Utilisation of Renewable Energy sources

Year	Technology (Electrical)	Type of Energy	Onsite/Offsite Generation	Installed Capacity / Enhanced Capacity (MW)	Power Generation (million kWh)	% of overall electrical energy
2018-19	Ground Mounted	Solar	Onsite	1.00	1.03	1.67
2019-20				-	1.34	1.96
2020-21				-	1.18	1.76

Details:

- Installed capacity: 1 MW.
- Investment: Rs 52.96 Million
- Solar power generation start date: 20th Jun'2018
- RPO obligation – Yes
  (Solar obligation is fulfilled against wheeling power).
- Achieved 3.10 MU against RPO target of 2.12 MU in last 3 years

Way Forward: Feasibility study is in progress for installation of 2.0 MW Solar plant.

8. Learning from CII Energy Award 2020

Green Purchase Policy:

- Our Unit does not have Green Purchase Policy. We are having Sustainable Supply chain Policy at Group level.
- We are working on the unit specific sustainable supply chain policy & activities which we need to be initiated to monitor the life cycle of the product.

Energy Saving projects:

- Interlocking of Silo top bag filter fan operating RPM with silo feeding time. ***(Unit: Dalmia, Bengal Cement Works).***
- Optimize the voltage in material handling transformer ***(Unit: Dalmia, Jharkhand Cement Works).***
- Astronomical timer installation in high mast switching circuit in above. ***(Unit: Dalmia, Jharkhand Cement Works).***
- Developing system for running hour monitoring of compressor, belt conveyor, ID fan motor, highlighting increase of idle running. ***(Unit: Dalmia, Kapilas Cement Works).***
- Tilting solar modules two times in a year with trials at different angle on every season, i.e. Winter & Summer. (***Unit: Dalmia, Kapilas Cement Works).***
- Switching of power transformer of solar power during night hours. ***(Unit: Dalmia, Kapilas Cement Works).***
- Installation of Soft Starter and SQIM in Place of Slip ring Motor with LRS ***(Unit: Jhansi, Heidelberg).***

Others:

- Eye on Wheels project: To reduce truck turn around time – Implementation is in progress.

9. GHG Inventorisation

Environment Compliance status

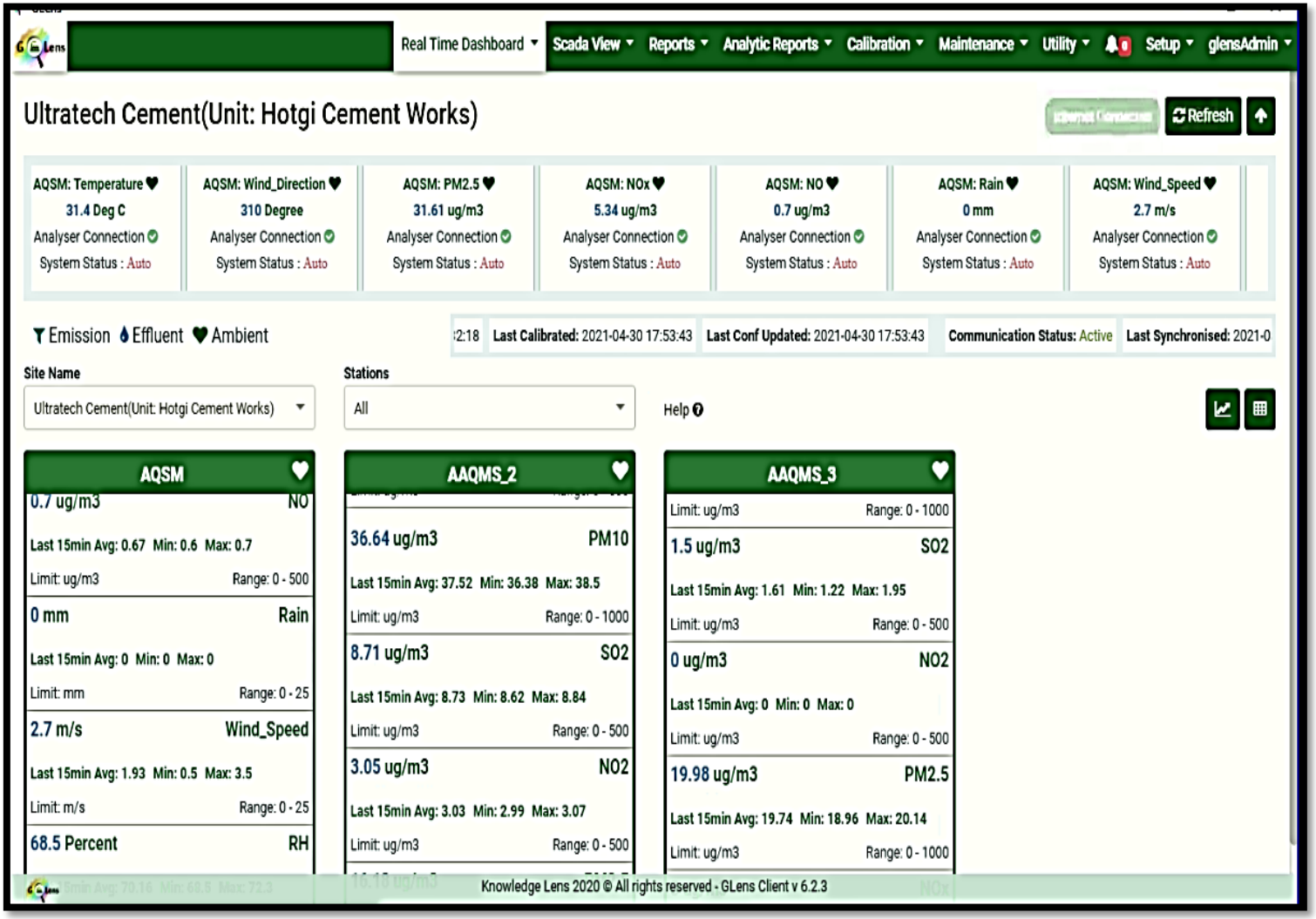
HOCW	PM Limit as per MoEF	PM Cement mill			NOX Limit as per MoEF	NOX			SOX Limit as per MoEF	SOX		
UOM	mg/Nm3	2018	2019	2020	µg/M^3	2018	2019	2020	µg/M^3	2018	2019	2020
Line 1 Cement Mill ESP	30	21.48	16.76	16.58	-	NA	NA	NA	-	NA	NA	NA
Line 2 Mill Vent Bag House	30	22.47	16.11	16.39	-	NA	NA	NA	-	NA	NA	NA
Line 2 Seperator Vent	30	23.34	16.21	15.71	-	NA	NA	NA	-	NA	NA	NA
AAQM	-	NA	NA	NA	80	28.10	25.11	21.01	80	9.96	8.61	9.37

9. GHG Inventorisation

Public disclosure

- Environment display board displays daily monitoring results of Air Emissions & control, STP, Hazardous waste generation etc.
- Continuous monitoring & display of ambient Air quality from AAQMS & data transfer to MPCB & CPCB.

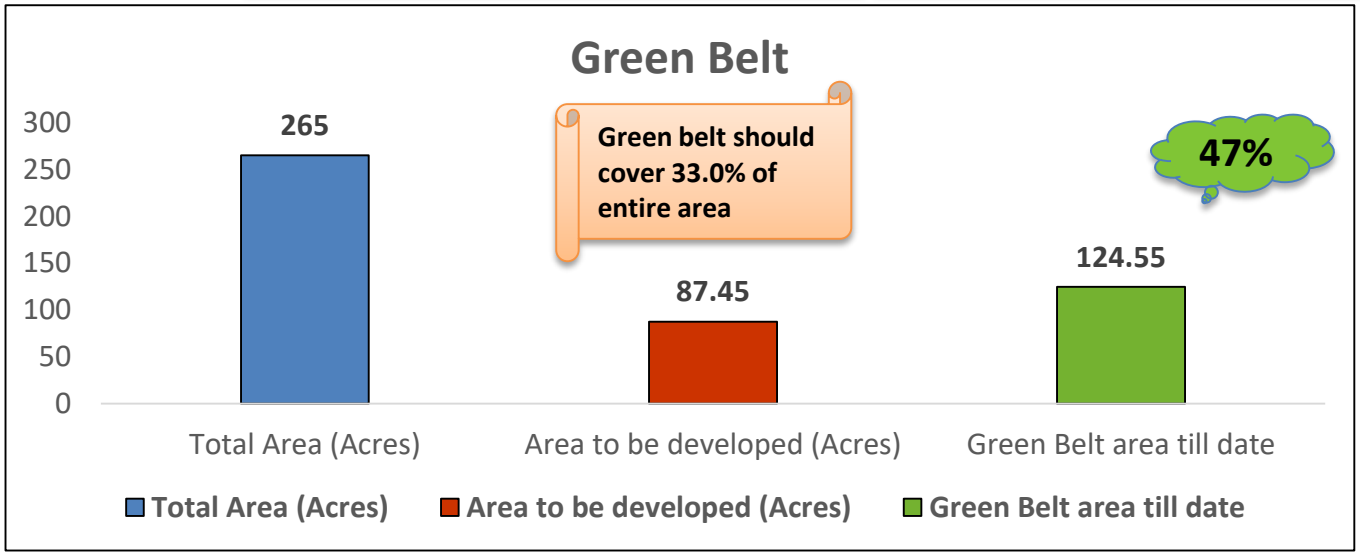
9. GHG Inventorisation



Installed Glens software for integration of all 3 AAQMS data and to display at main gate.

9. GHG Inventorisation

Green Belt Development



10. Green Supply Chain Management

- Our Unit does not have Green Purchase Policy. We are having Sustainable Supply chain Policy at Group level.
- We are working on the unit specific sustainable supply chain policy & activities which we need to be initiated to monitor the life cycle of the product.

Environmental thinking in Supply Chain Management

- Clinker is sourced from Rajashree Cement Works (ISO 14001 & 50001 certified), where AFR used as partial fuel in clinkerisation process thereby conserving fossil fuel reserves & reduce greenhouse gas emissions
- Utilization of 35% dry ash is used in PPC.
- Dry Ash is also obtained in jumbo bags through rake from distant sources in large quantities & increased the PPC production to meet the market requirements. Road transportation is eliminated thus reducing GHG emissions.
- Wet Ash /conditioned Ash, which is also a waste product of power plant is used while making blended Cement. Increased the Pond Ash utilisation from 5% to 15% to cater the market requirement.
- Chemical Gypsum which is a waste product of chemical industry is used at 50% for production of all cement grades.
- Replaced CFC truck with Diesel tanker (2500 L capacity) to procure diesel for plant operations. Quantity of Diesel required in a month for plant operations is obtained in 6 trips through diesel tanker compared to 12 trips of CFC truck thereby reducing GHG emissions.
- Usage of STP treated water for Process & gardening.
- Planning to set up BTAP type flyash rake unloading system, so that flyash is procured through rakes by rail instead of bowsers by road. Feasibility study & detailed engineering work completed.

11. Teamwork, Employee Involvement & Monitoring

Monitoring system of Energy Consumption:

1) Daily Performance Review meeting chaired by Unit Head
2) Monthly Performance Review meeting chaired by Cluster Head

Sections covered during daily & monthly review meetings related to energy:

a) Specific Power consumption - All grades, Section wise (Grinding, Packing & Misc. power)
b) Power Wheeling – Wheeling losses
c) Solar Power (renewable energy) generation – Deemed Generation
d) IOT: Monitoring utilization & efficiency of IOT systems like Expert Optimizer, Dalog Monitoring system.
e) Initiatives to be taken/action plan for reduction in power consumption.
f) Comparison of specific power & flyash consumption with other grinding units in UltraTech with similar circuit.

- Brainstorming sessions are conducted every quarter involving all the employees to generate ideas/suggestions for reducing the power consumption. Cross functional Task force teams are formed to implement the identified power saving initiatives.

Budget for Energy Conservation:

System in UltraTech Cement business:

- All the energy conservation proposals from integrated plants, grinding units & bulk terminals will be sent to TPMC (Technology & Performance Monitoring Cell – includes SME's) & Projects department at Head Office for review & finalisation.

- TPMC will also have separate budget for implementing the new energy conservation initiatives across UltraTech (POC will be done at single/multiple units) & approved initiative will be implemented at applicable units in UltraTech.

- In general, proposals with simple payback period of less than 3 years is preferred.

11. Teamwork, Employee Involvement & Monitoring

Projects implemented from suggestions given by workers and supervisor - Kaizens

- Bucket Elevator 3 discharge chute modified thereby eliminated the usage of 2.2 KW blower for transferring of material into silo. Estimated Annual Savings: 0.78 Lac units

- Local start stop push button provided for all flyash compressors at flyash unloading area. Operator can stop compressor immediately after completion of unloading. Idle run hours are minimized.
  Estimated Annual Savings: 0.57 Lac units

- Temperature interlocking of VFD Panels with their inverter cooling fans. Provided temperature interlock with converter and inverter cooling fan, whenever VFD panel become idle after stopping the motor, cooling fans will stop after attaining desired temperature.
  Estimated Annual Savings: 0.22 Lac units

- Installed 11 no's body cleaning blowers covering all the locations in plant thereby eliminated usage of compressed air for body cleaning & reduced the load on compressors.

- Operation of bore wells through mobile starter thereby eliminated idle running hours, saved water & time.

- Provision of hooter at wagon loading machines for diversion of bags towards desired wagon loading machine without stopping the belt & bag diverting operating panel is also placed near the loaders

12. Implementation of ISO 50001/Green Co/IGBC rating

- Our Unit is not certified for ISO 5001:2018
- We are in process for Certification of ISO 50001: 2018 from ISO DNV-GL in 2021-22.

Accomplishments

- Hotgi Cement Works won the CII Energy Efficient Unit Award in the 21st National Energy award for 2020 conducted by CII in the month of Aug'20.
- Hotgi Cement Works won the 2nd prize in 15th State Level Energy Conservation & Management Awards conducted by Maharashtra Government in the month of Dec'20.
- Hotgi Cement Works Bagged a "Certificate of Merit" from NSCI Maharashtra Chapter for achieving "ZERO" Accident frequency rate for the year 2018.
- Hotgi Cement Works is the highest pond ash consuming grinding unit (RP + Ball Mill Circuit) across the UltraTech. We have Increased the Pond Ash usage from 5% to 15% and increase the PPC Production thereby reducing the clinker factor.
- UltraTech has received Green Pro certification from Confederation of Indian Industry's (CII) Indian Green Building Council for its Portland Pozzolana Cement and Composite Cement products.

Thank You

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