

Ultratech Cement Limited



Unit: Dalla Cement Works

Welcome All
in
23rd National Award
For
Excellency in Energy Management -2022

Presented By:

Mr. Jagdish Tiwari : FH-TPP. Mr . Deepak Kharkar : HOD TPP. Mr . Ritesh Sinha : SH-TPP



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Company Profile



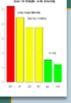
Unit Profile



Plant Configuration



Energy Consumption



National Benchmarking



Road map to benchmark



Energy Saving of last 3 years



Innovative Projects



Way forward for energy saving



Renewable Energy



Environment Management



Best Practices



ISO Implementation



Awards



Company Profile – At a Glance

3rd Largest Producer Cement in the world (excluding China)

Our Vision

To the Leader in Building Solution.

The Company has a consolidated capacity of 119.95 million tonnes per annum (MTPA) of grey cement.



Our Mission



To deliver superior to stockholder on the four pillars of

- * Sustainability * Customer Centricity
- * Team Empowerment * Innovation



Unit Profile – At a Glance



Dalla Cement Works (DLCW); a flagship unit of Ultratech Cement Ltd. (UTCL), was taken over from Jaiprakash Associates Ltd. on 29th June 2017. The unit is located around 120 km from Varanasi on Varanasi - Pipari SH-5 on the southern bank of river Sone.

Unit has certified for Integrated Management System & upgraded to 2015 version; which has inclusion of ISO 9001, ISO 14001, EnMS 50001 & OHSAS 18001

Dalla having two units (Line- 4 & 5) with ultimate capacity of 2.0 MTPA Clinker and 0.5 MTPA cement production with 1 X27 MW TPP.

Dalla Cement Limestone Mines is the largest Multi pit Limestone Mine in UP with sanctioned capacity of 3.3 Million Ton per annum fulfilling the Limestone requirement.



Plant Configuration

Particulars	Make	Туре	Capacity & feature
Boiler	BHEL	AFBC	125TPH, Pr. 87 Kg/cm2, Temp515 +/-5°C
Turbine	Siemens	Condensing	27 MW, Pr84 Kg/cm2 ,Temp510 °C, Steam Flow -109.5TPH
Generator	TDPS	Brushless Excitation	
Coal & Lime stone Handling	TECPRO	Blow bar crusher	Coal Crusher-120 TPH
DG (02 Nos.)	Wartsila	12VG	10.86 MW
DM Plant	Doshin	RO+ DM Plant	2* 20 M3/hr

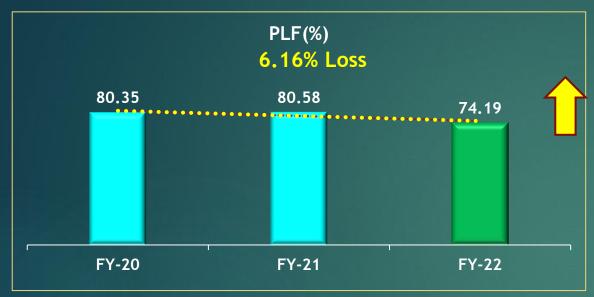


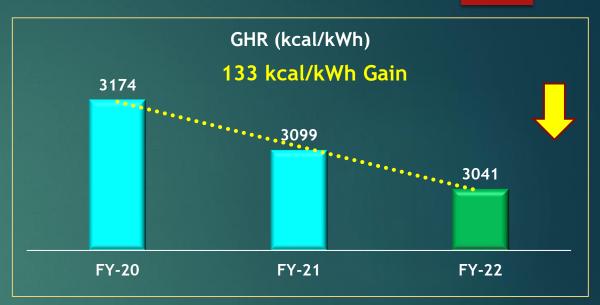
Energy Consumption Overview- FY'21-22

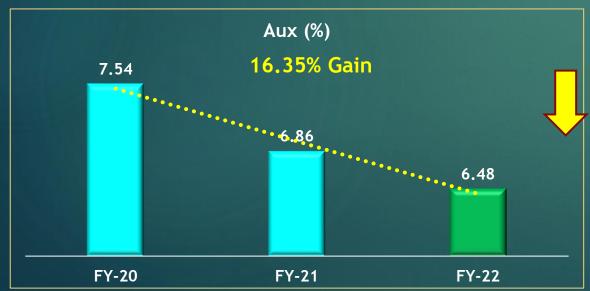
Sr. No	Particulars	UOM	FY'21	FY'22
1	Annual Generation	Lac. kWh	1652.6	1628.44
2	Plant Load Factor	%	80.58	74.19
3	Gross Heat Rate	kcal/kWh	3099	3041
4	Aux Power Cons	%	6.86	6.48
5	Availability	%	86.00	94.43
6	Boiler Efficiency	%	84.05	84.77
7	Turbine Heat Rate	kcal/kWh	2608	2577
8	Sp. Raw Water Cons.	m³/MW	0.32	0.24



Sp. Energy Consumption in last 3 years



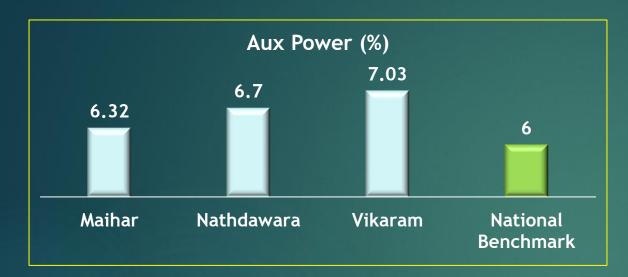


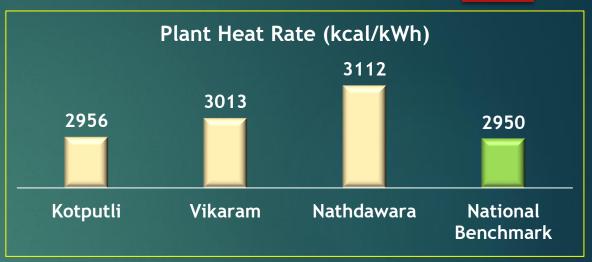


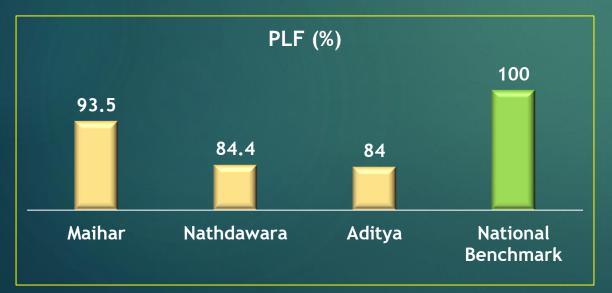




Competitors, National & Global Benchmark



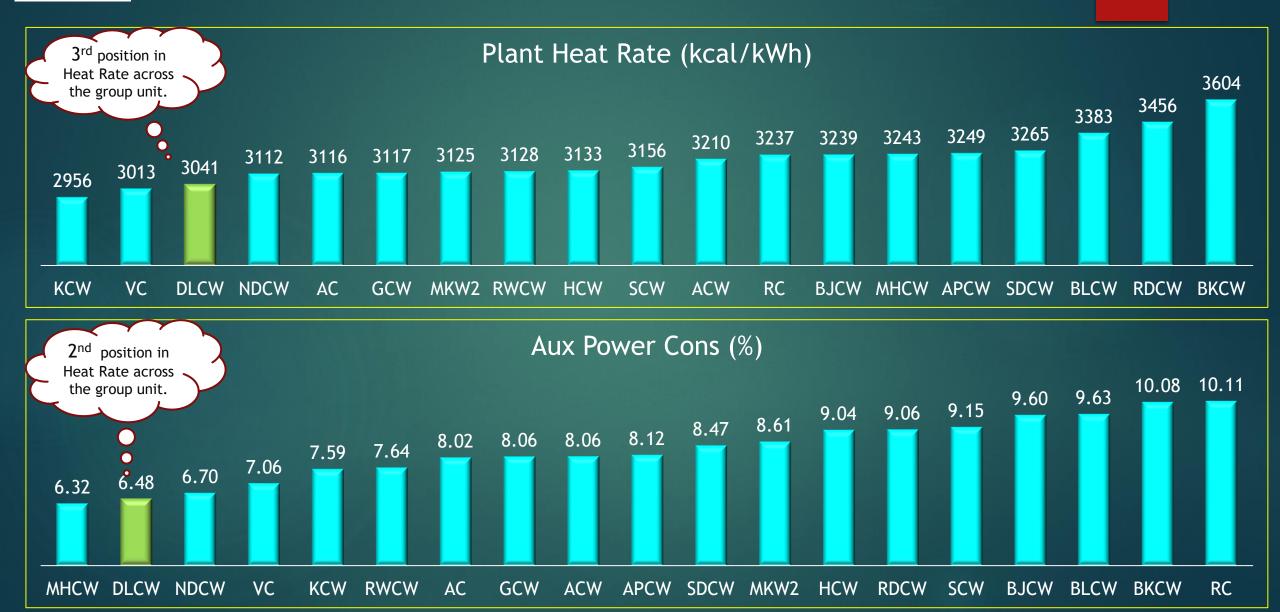






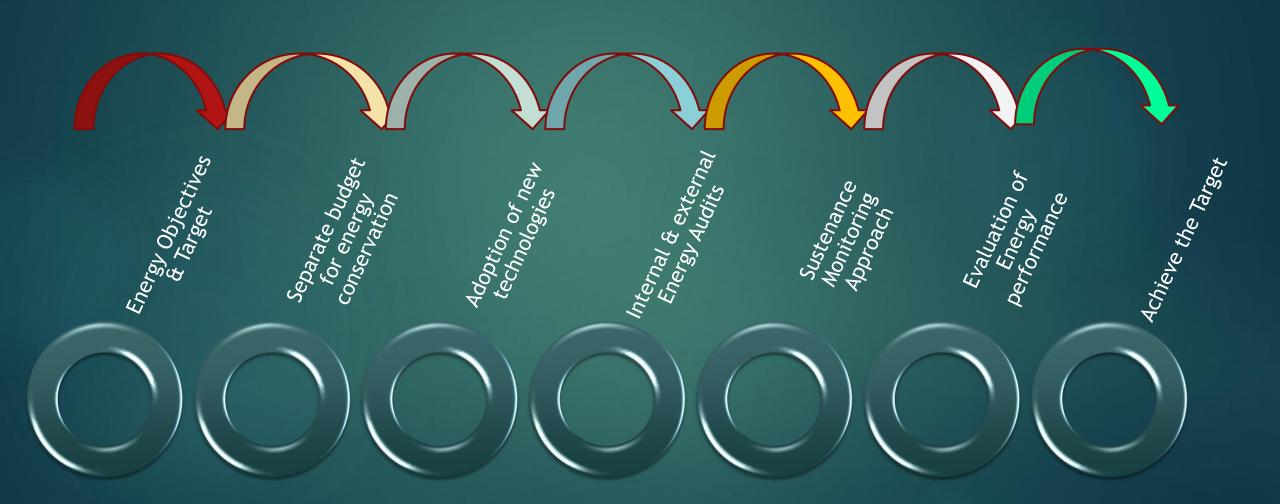


Benchmarking Across the Group Units





Road map to achieve national/global benchmark





Energy Saving in Last 3 years





Energy Saving projects – FY'19-20

SN	Title of Project	Annual Electrical Saving (Lac. kWh)	Annual Electrical Cost Saving (Rs.million)	Annual Thermal Saving (kcal)	Annual Thermal Cost Saving (Rs.million)	Total Annual Savings (Rs.million)
1	Reduction in False air to 3% by arresting leakages in Boiler and ducts.	0	0	7969.5	7.81	7.81
2	Reduction in BFP power consumption	2.07	1.24	0	0.00	1.24
3	Reduction in PA fan Power Consumption	0.69	0.41	0	0.00	0.41
4	Optimisation in FD air flow to maintain O2 3.5% from previous 6.5%	5.18	3.11	6659.6	6.53	9.63
5	Installation of VFD in Instrument air compressor-1	1.66	1.00	0	0.00	1.00
6	Reduction in compressor Power consumption	4.14	2.48	0	0.00	2.48
7	ACC Fins cleaning by water jet	0.83	0.50	0	0.00	0.50
8	Installation of VFD in CHP Group#02 Bag Filter Fan	0	0.00	0	0.00	0.00
9	Installation of VFD in CHP Group#01 Bag Filter Fan	0.3	0.18	0	0.00	0.18
10	Incorporated new logic to reduce BFP discharge Pressure set point bias (corresponding to drum pressure)	0	0.00	0	0.00	0.00
11	Raw Water Gravity inlet line interconnected with Raw Water Pump discharge line	0.3	0.18	0	0.00	0.18
	Total Saving	15.17	9.10	14629.10	14.34	23.44



Energy Saving projects – FY'20-21

SN	Title of Project	Annual Electrical Saving (Lacs kWh)	Annual Electrical Cost Saving (Rs.million)	Annual Thermal Saving (kcal)	Annual Thermal Cost Saving (Rs.million)	Total Annual Savings (Rs.million)
1	Reduction in Coal nozzle height by 80 mm to control LOI < 3.5%	0	0.00	3470.38	3.40	3.40
2	Maintain TG steam pressure at 85 - 86 Kg / cm2 (Against 83 Kg/Cm2)	0	0.00	925.44	0.91	0.91
3	Maintain TG steam temp 515 Deg C (against design of 510 Deg. C)	0	0.00	1156.79	1.13	1.13
4	Excess air optimisation by maintaining O2< 4%	0	0.00	1768.24	1.73	1.73
5	APH hydro jet cleaning to reduce dry flue gas losses	0	0.00	991.54	0.97	0.97
6	ACC hydro jet cleaning	0	0.00	2313.59	2.27	2.27
7	Boiler soot cleaning	0	0.00	826.28	0.81	0.81
8	Reduction of false air < 3 %	0	0.00	809.76	0.79	0.79
9	Closed loop optimization and EMS system	0.41	0.25	0	0.00	0.25
10	Optimization of CHP Power Consumption	0.99	0.59	0	0.00	0.59
11	Reduction in ACC Fan Power Consumption	1.98	1.19	0	0.00	1.19
12	Boiler Fan Power optimization	3.39	2.03	0	0.00	2.03
13	Optimization of compressor power	1.65	0.99	0	0.00	0.99
14	Reduction in Power consumption of Lighting Load	0.17	0.10	0	0.00	0.10
15	Reduction in Boiler feed Pump Power Consumption	1.65	0.99	0	0.00	0.99
16	Optimization of Hot Well Pump Running and hence Power Consumption	0.13	0.08	0	0.00	0.08
	Total Saving	10.37	6.22	12262.02	12.02	18.23



Energy Saving projects – FY'21-22

SN	Title of Project	Annual Electrical Saving (Lac kWh)	Annual Electrical Cost Saving (Rs.million)	Annual Thermal Saving (kcal)	Annual Thermal Cost Saving (Rs.million)	Total Annual Savings (Rs.million)
1	Reduction in BFP - 1, 2 & 3 discharge pressure set point through bias optimization	0.87	0.52	0	0.00	0.52
2	Optimization of Boiler FD fan Discharge Pressure for Power Saving	0.99	0.59	0	0.00	0.59
3	Reduction in False air to 2% by arresting leakages in Boiler and ducts.	0.51	0.31	5216.5	5.48	5.78
4	Installation of Energy Efficient Boiler Feed Pump	2.77	1.66	0	0.00	1.66
5	Optimized the Furnace Bed height at different load	3.8	2.28	0	0.00	2.28
6	Replacement of dummy & jammed FD air nozzles in boiler furnace	0.86	0.52	0	0.00	0.52
7	Optimization of instrument air compressor power	0.82	0.49	0	0.00	0.49
8	Cleaning of APH through high pressure water jet to remove all jamming	0	0.00	1650	1.73	1.73
9	7 Nos pump absolute in DM water operation by taking Raw water through gravity.	0.76	0.46	0	0.00	0.46
	Total Saving	11.38	6.83	6866.50	7.21	14.04



Innovative Projects

5 Best Innovative Projects:

- Boiler Reliability Enhancement Project
- Installation of Energy Efficient Boiler Feed Pump
- Optimization of Coal Handling Power
- Installation of Fan Less Cooling Tower
- Installation of Energy Efficient PA Fan





Project-1: Boiler Reliability Enhancement

Theme

• Implementation of Advanced Artificial Intelligence solution for Boiler Reliability and Performance Monitoring

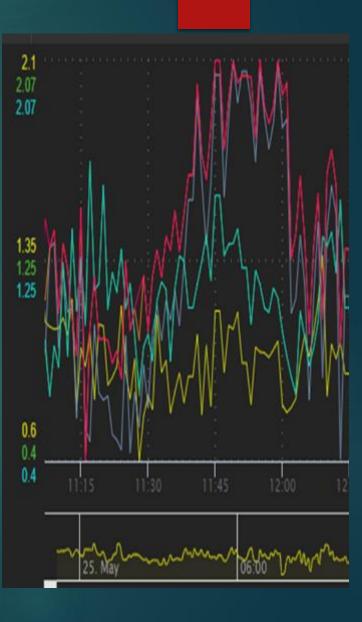
Problem

- Constant changes in load, fuel mix, maintenance regime, etc create stress in the boiler's pressure parts and sometimes lead to extreme stress, sometimes leading to Boiler Tube failures.
- Hence, it is important to monitor and maintain the thermodynamic profile of these parameters within optimal ranges to ensure maximum boiler efficiency and improved reliability

Solution

• Boiler reliability project is advanced analytics and artificial intelligence platform Pulse, helps convert the freely available plant operations data to timely insights that can be used by plant.

- Improved Productivity,
- Predictive Maintenance,
- Fault diagnosis & root cause analysis,
- workforce productivity





Project-2 Installation of Energy Efficient BFP

Theme

Reduction of Aux Power Cons by installation of Energy Efficient Boiler Feed Pump

Problem

• Due to variable load demand TPP running at varying PLF, and many wheeling unit fulfill their load requirement from solar plant also so at the day time TPP PLF also become less near about 50-60% & at this PLF optimize the aux power cons is big challenge.

Solution

• Major power consumption equipment is BFP. So taken challenge to optimize the power cons of same, already we installed VFD in our BFP so to move forward we replaced the old BFP with energy efficient BFP which having huge energy saving potential.

- Saving of 40 kW/day @ 75-80% PLF
- Saving of Rs 0.51 lac/annum





Project-3: Optimization of Coal Handling Power

Theme

 Reduction of Aux Power Cons by Optimization of coal handling power

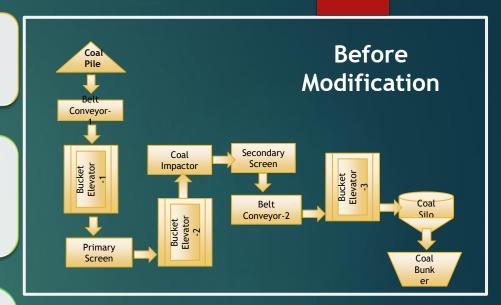
Problem

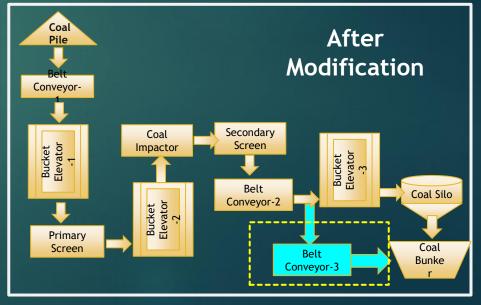
• CHP power cons is running higher side and to optimized its sp. power cons.



- To optimize the power cons we done a small modification in which we can eliminate the running the bucket elevator -3 & directly take the coal feed to coal bunker.
- Also to optimize the ideal running hrs. we create a auto logic to stopped the conveyor belt during this condition

- Saving of 52 kW/day
- Saving of Rs 0.65 lac/annum







Project-4: Installation of Fan Less Cooling Tower



• Reduction in power consumption by installation of fan less Cooling Tower



- Existing Cooling Tower condition was deteriorating day by day. The wooden structure of the Cooling Tower was very weak & Unsafe.
- High vibration in cooling tower fan due to unbalance, bio-fouling & hedges formation inside the CT was deteriorating the water quality as well as increasing scale formation and heavy dust accumulation in CT decreased the OEE of the Cooling Tower.
- OEM was offering for repair of Cooling Tower with cost incurring approx.Rs.35 Lakhs.

Solution

• Installed new Fan less Cooling Tower with Total Cost 17.68 Lakhs only

- Power savings 60 kWh/day
- Cost Saving- Rs 4.96 Lakhs / Year
- Cost Saving Rs. 17.38 Lakhs / Year instead of repairing old one.
- ullet Increase in ΔT across Cooling Tower from 2 Deg. C to 6 Deg. C
- Increase in productivity TG running at rated capacity i.e. 27 MW





Project-5 Installation of Energy Efficient BFP

Theme

• Reduction of Aux Power Cons by installation of Energy Efficient PA Fan in Boiler

Problem

• Boiler PA fan having old design with higher capacity which is not required as per the current running parameters due to which the power consumption of PA fan is comparatively higher side.

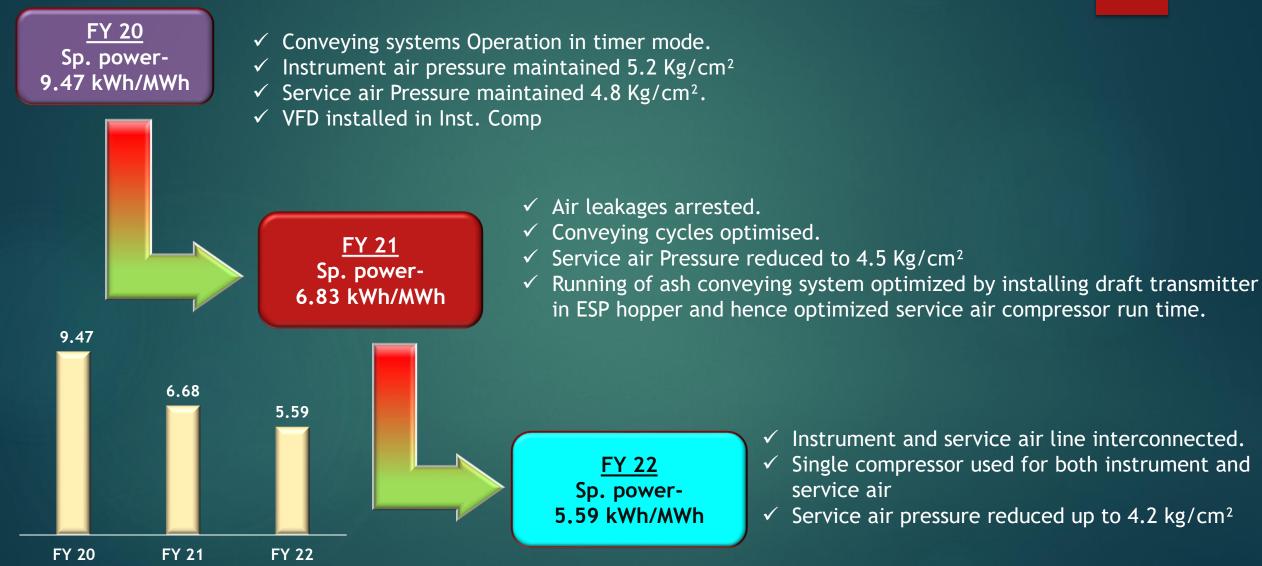
Solution

• To optimize the aux power cons we have done brain storming session in which we concluded that replacement of old PA fan with high energy efficient PA fan is best solution. So we can replaced our one PA fan with high energy efficient fan & optimized our process parameters accordingly.

- Saving of 22 kW/day @ 75-80% PLF
- Saving of Rs 0.27 lac/annum



Best Practices- Optimization of Compressor Power





Best Practices- Optimization of BFP Power



- ✓ VFD installed in BFP 1 and 3
- ✓ Single BFP operation whenever load is less than 24 MW
- ✓ ARC replaced in BFP -3



- ✓ Running of BFP with auto logic to maintain discharge pressure more than the bias set point(corresponding to drum pressure).
- ✓ Spray control station bypass line control valve removed as flow reduced due to high pressure drop.
- ✓ BFP discharge pressure optimized to 108 Kg/Cm2 at full load.

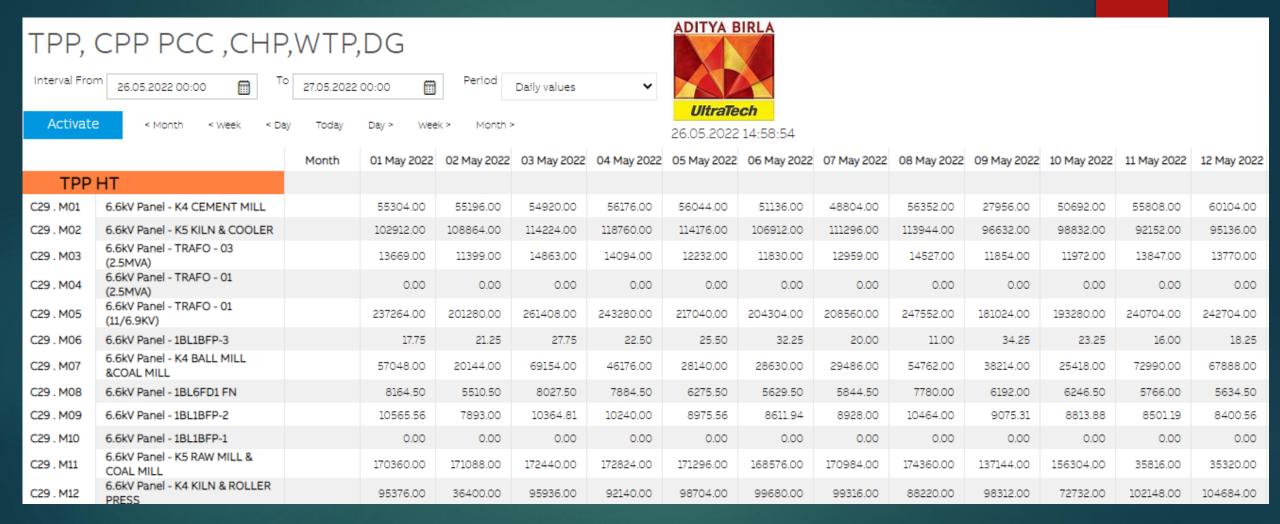


FY 22 Sp. power-19.36 kWh/MWh

- ✓ Installation of Energy Efficient Boiler Feed Pump
- ✓ Optimized the Bias set point.



Best Practices-Energy Management System



Auto Generated Power consumption data shown, Transformer wise & Equipment wise of Total Plant



Way Forward for Energy Saving

SN	Project Description	OPEX/CAPEX	Investment Rs. Lacs	Saving	Target
1	8.5 MW Solar plant Installation	CAPEX	4500		Oct-22
2	Replacement of energy efficient FD fan	CAPEX	23	40 kWh	Dec-22
3	Energy efficient pumps of CEP	CAPEX	10	5 kWh	Nov-22
4	Energy efficient pumps of WTPs	CAPEX	12	5 kWh	Dec-22
5	Power wheeling to Grinding Unit & IEX to excess power to maintain 100 % PLF	OPEX		20 kcal/kWh	Oct-22
6	Air Nozzle Replacement	OPEX	6	5 kcal/kWh	Dec-22
7	Advance process controller in Boiler	CAPEX	5	15 kcal/kWh	Dec-22
8	CBD water heat utilization to heat up make up water to Deaerator/ Hot well	OPEX	8	2 kcal/kWh	Nov-22
9	Upgradation of existing ESP	Capex	40	< 25 mg/Nm3	Dec-22
10	Replacement of high energy efficient ID Fan	Capex	15	20 kWh	Dec-22







WHRS- Green Generation

13 MW WHRS unit commissioned on 11th Oct'21 & Green Energy production and CO2 emission reduction with 30 % Reduction of Power cost

WHRS Generation (Lac kWh)







Solar Power Plant- 8.5 MW



Solar Power

Capacity- 8.5 Mw.

Status- Civil work under in progress

Commissioning On: Oct-22

Impact- Green energy production and To fulfill the requirement of RPO





Environment Management- Ash Utilization

Particulars	UOM	FY'19-20	FY'20-21	FY'21-22
Ash Stock in Plant	Tons	0	0	
Ash Generated	Tons	70516	61631.40	58200.61
Ash Utilization in Manufacturing of Cement	%	100	100	100
Ash Utilized in Fly Ash	%	100	100	100
Ash Utilized in Mines Filling	%	0	0	0
Ash Utilized for Road pavements	%	0	0	0

Ash Handling Done Through Various Method							
Particulars	UOM	Value	Mode/Methods				
Ash Handled (Wet Method)	%	0					
Ash Handled (Dry Method)	%	100 %	Through D-pump/Bulker				
Ash Handled (Semi Method)	%	0					



Environment Management-Emission

Particulars	UOM	FY'20	FY'21	FY'22
Current Sox Emission at full load	mg/Nm³	450-600	450-600	450-600
Current Nox Emission at full Load	mg/Nm³	141	147	155
Particulars Matter	mg/Nm³	45	44	38
Mercury	mg/Nm³	0.027	0.026	0.028

- ✓ Online monitoring of SO2, NOx and SPM with real time data.
- ✓ Logic implemented to control SOx value in which SOx value interlock with furnace temp & O2%, and according to same lime RAV RPM adjusted in Auto.
- ✓ ESP Operation in CBO mode.
- ✓ To control ESP SPM as per new norms we proposed "new Capex Project"



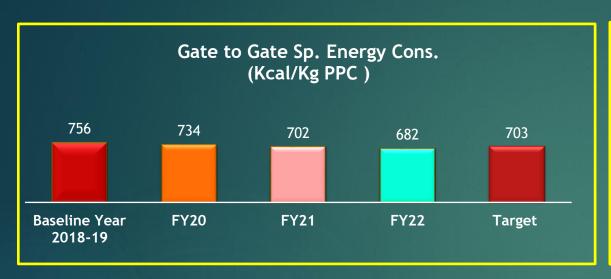
Environment Management- Water

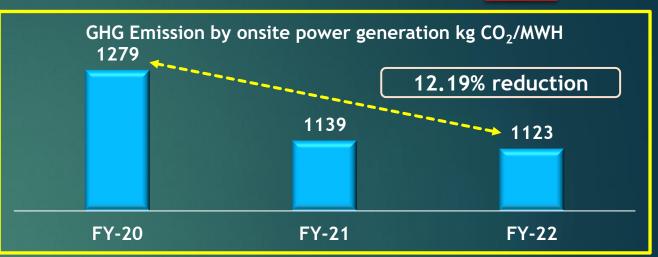
Particulars	UOM	FY'20	FY'21	FY'22
DM Water Consumption	%	1.01	0.83	0.59
Raw Water Consumption	M³/MW	0.36	0.32	0.24

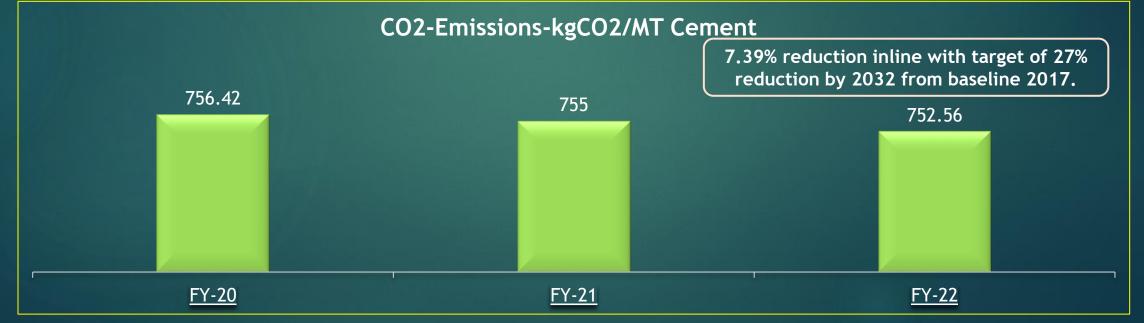
- ✓ Effluent water used in TPP area cleaning, Bed ash cooling and fogging (water spraying) in air cooled condenser during summer, road sprinkling @ coal yard.
- ✓ Gravity Pipe installed and by pass the pump operation to cater water requirement of cooling tower and WTP.



GtG energy consumption status (Cement & Power Plant)









Best Practices in the Plant/ Team Involvement

- ✓ "Chai Pe Charcha" one more safety initiatives started with our shop floor
 workman to directly connect with upper management & discuss to develop
 safety at site.
- ✓ Every day self maintenance practices started in which all department manpower involves at schedule location & done the self maintenance of that area.
- ✓ Developed the 3 Nos garden at different location of TPP to make green work environment.
- ✓ Monthly safety gate meeting for increasing awareness at all level & motivating employees & contractor workmen by awarded then as "Best safety person of the Month" & "Best citizen for the Month"
- ✓ Weekly training/discussion on specific topic with all team members to enhance the learning & sharing culture.
- Celebrate the target achievement cake cutting with team mates.





Employee Involvement/ Knowledge Sharing

- ✓ Monthly Brain Storming session to get the valuable inputs from all team mates.
- ✓ Green Circle award to eliminate the unsafe condition from site.
- ✓ Best SBO award to behavioral development of all workman towards safety
- ✓ Monthly gate meeting for safety and performance sharing to all members
- ✓ Implement Kaizen and suggestion scheme in Department and sharing Kaizen of other Unit.
- ✓ Monthly Training schedule prepare and designate employee for presentation.
- ✓ Monthly TPP meeting to share team performance and rewards & Recognition.
- Cross functional team formation for Projects.
- ✓ Daily self maintenance of the specific site as per the schedule.



Methodology adopted for Energy Monitoring

- ✓ Energy management cell headed by FH-TPP.
- ✓ Daily monitoring of PLF, Heat rate and Aux. power deviation.
- ✓ Analysis of equipment performance for deviation.
- ✓ Identification of energy conservation scope through Loss Cost Matrix,
- ✓ Brain Storming and Theme base suggestions/Kaizens scheme under "Energy Saving".
- ✓ Feasibility study of suggestions & submit proposal for sanction.
- ✓ Preparation of detail action plan.
- ✓ Monthly review to monitor project progress.
- ✓ Benefits analysis after project implementation.
- ✓ Sustainability of the project



Implementation of ISO 50001/Green Co/IGBC rating



ISO 9001:2015





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intertek

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

UltraTech Cement Limited (Unit: Dalla Cement Works)

Main Ste: SH 5, Kota, Post Dalla, Distt Sonebhadra-231207, Uttar Pradesh, India

has been registered by intertek as conforming to the requirements of:

DIN EN ISO 50001:2018

The management system is applicable to:

Manufacture and marketing of clinker & cement at Dalla site including operation of time stone mines as well as captive power plant. The EnMS covers all energy consumed by the company.

The EnMS covers all energy consumed by the company

Certificate Number 2020-0070550

Initial Cartification Date: 30 December 3017

Date of Cartification Decision: 20 May 2021

Implify Date: 20 May 2023

Valid Until: 19 December 2022

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accepted Certification Body with

ISO 50001:2018





ISO 45001:2018



Implementation of ISO 50001/Green Co/IGBC rating



DALLA CEMENT WORKS (ULTRATECH CEMENT LIMITED)

ENERGY AND CARBON POLICY

Dalla Cement Works, A unit of **Ultratech Cement Limited** Group Company of **Aditya Birla Group** recognizes energy consumption and carbon emissions are amongst the most important issues currently affecting the planet. We comprehend the risk of dependence solely on fossil fuels and associated carbon emissions related to our operations. We are committed to take actions within our businesses and supply chain and work with our stakeholders to find long-term solutions to reduce our energy and carbon footprint.

We shall endeavor to:

- Maintain positive legal compliance to energy and carbon regulations;
- Raise awareness to encourage efficient use of energy resources, with a focus on reducing its energy intensity and carbon footprint;
- Increase the use of renewable energy wherever possible;
- Promote research and development for cleaner and efficient technologies to Support the adoption of low carbon solutions:
- Continually improve energy and carbon management within and across the supply and value chains by adopting internationally accepted and economically Viable management systems and best practices;
- Engage internally and externally with its stakeholders and wider communities to understand and collaborate on actions promoting reduced energy intensity and low carbon approaches to benefit both the Business and associated
- Actively communicate and disclose its approach and achievements to stakeholders and regularly seek feedback through stakeholder forums;
- Monitor measure and report energy usage and carbon emissions in compliance with internationally recognized protocols.

This policy shall be reviewed periodically for its suitability and updated as necessary.

(Unit Head-Dalla & Super Cement)



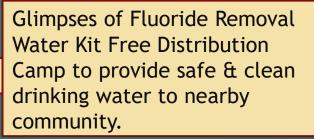


CSR Activities



Solar Based water supply system of 2000 ltr. Capacity to provide water facility to nearby villages.

National Energy Consumption week celebration with nearby community by organising awareness campaign through drawing & slogan competition



Mega Medical Camp A step towards health care services at doorstep of local community with Multi-specialist medical practitioners under one umbrella by Dalla Unit













CII-Awards







TPP Dalla is awarded as "Excellent Energy Efficient Unit" under CPP category by CII from last 2 years continuously



Thank Ofour

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Ph.no: 7069091171