Ultratech Cement Limited
(Unit: Dalla Cement Works-Power Plant)

Welcome to All

22nd National Award for

Excellence in Energy

Management - 2021

Presenter :

Mr. Jagdish Tiwari – Sr. GM (FH-TPP)

Mr. Devendra Agrawal – AGM (HOD- TPP O&M)

Mr. Ritesh Sinha - Dy. Manager (TPP O&M)

Slides to Share….

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Company Profile – At a Glance

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

The Company has a consolidated capacity of 116.8 million tonnes per annum (MTPA) of grey cement.

- 22 Integrated Manufacturing Units
- 27 Grinding Units
- 01 Clinkerisation Unit
- 07 Bulk Packaging Terminals

Our Vision

To the Leader in Building Solution.

Our Mission

To deliver superior to stockholder on the four pillars of

* Sustainability
* Customer Centricity
* Team Empowerment
* Innovation

Unit Profile

- ✓ 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.
- ✓ 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** thermal power plant.
- ✓ 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.

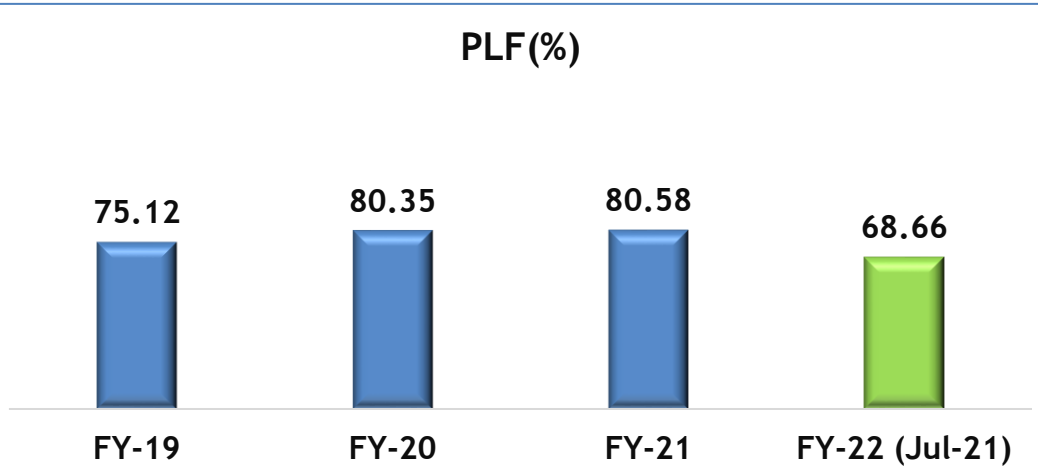
Plant Configuration

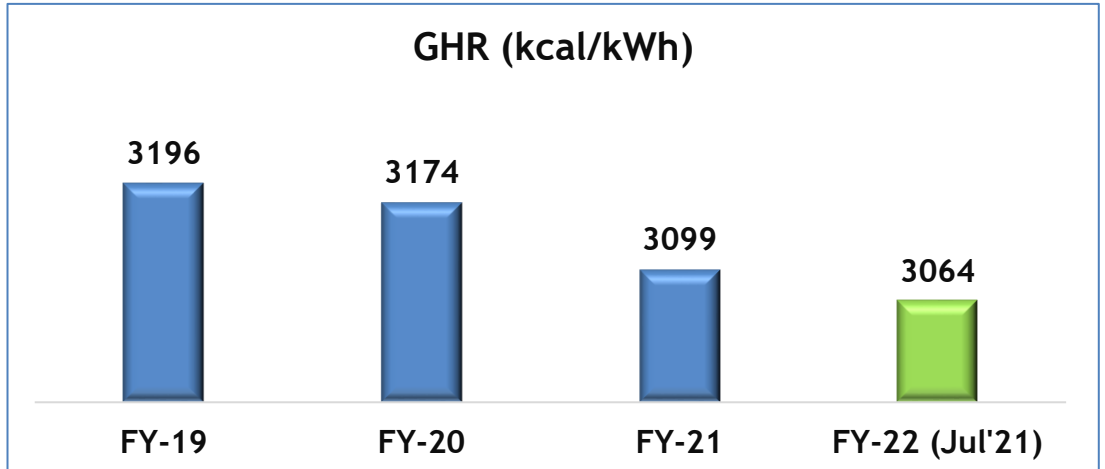
Particulars	Make	Type	Capacity & feature
Boiler	BHEL	AFBC	125TPH, Pr. 87 Kg/cm2, Temp.-515 +/-5^{0}C
Turbine	Siemens	Condensing	27 MW, Pr.-84 Kg/cm2 Temp.-510 ^{0}C, Steam Flow -109.5TPH
Generator	TDPS	Brushless Excitation	
Coal & Lime stone Handling	TECPRO	Blow bar crusher	Coal Crusher-120 TPH
DG (02 Nos.)	Wartsila	12VG	10.86 MW
DM Plant	Doshin	RO+ DM Plant	2* 20 M3/hr

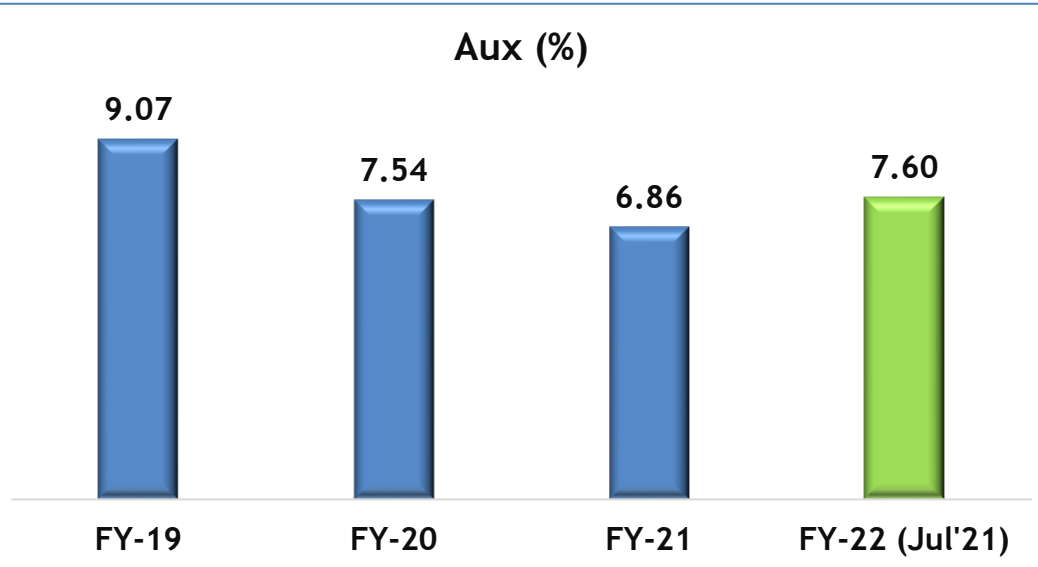
Energy Consumption Overview- FY'20-21

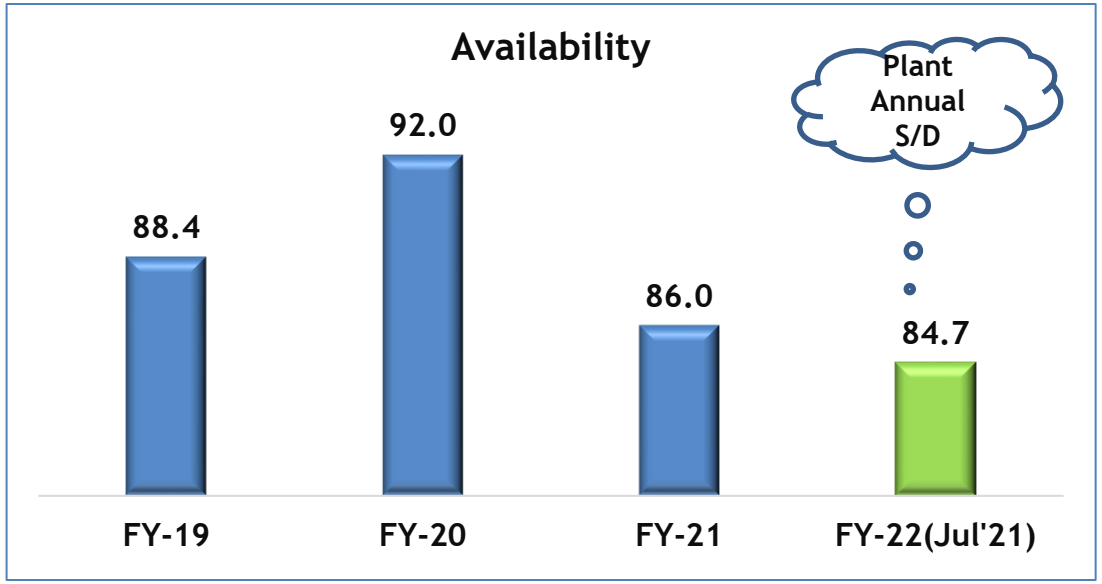
Sr. No	Particulars	UOM	FY'22 (July'21)
1	Annual Generation	Lac. kWh	1652.6
2	Plant Load Factor	%	80.58
3	Gross Heat Rate	kcal/kWh	3099
4	Aux Power Cons	%	6.86
5	Availability	%	86.00
6	Boiler Efficiency	%	84.05
7	Turbine Heat Rate	kcal/kWh	2608

Sp. Energy Consumption in last 3 years (FY 2019-21)







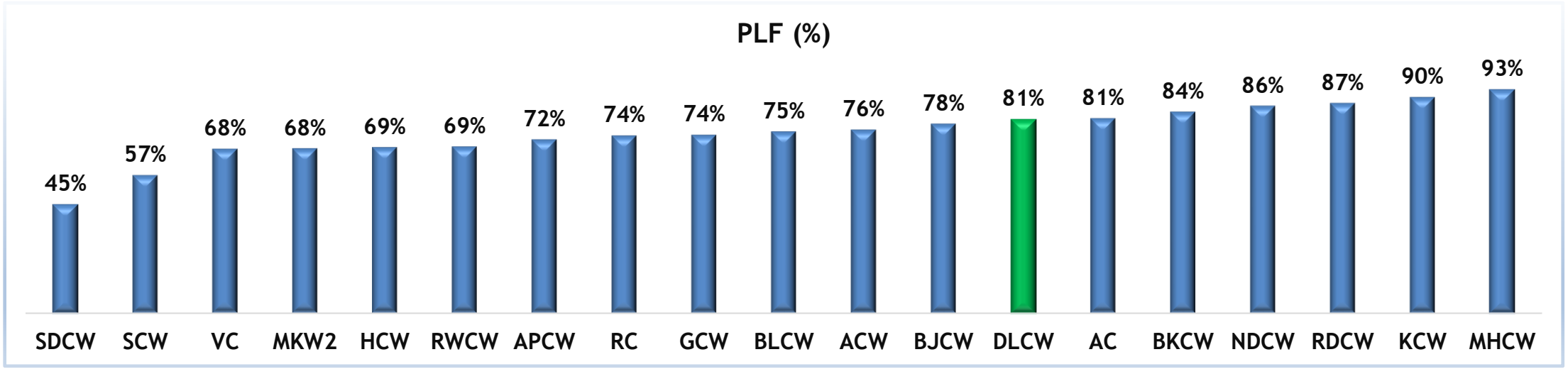


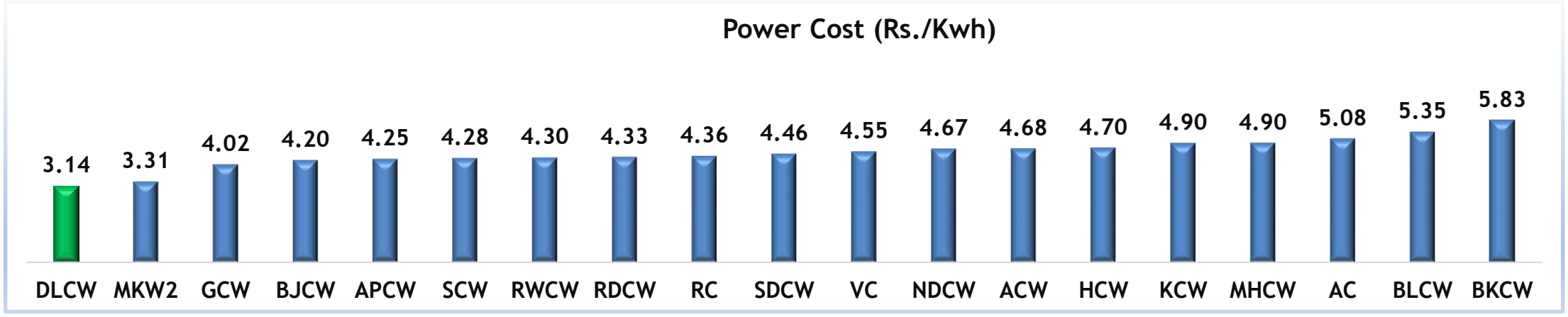
Sp. Energy Consumption in last 3 years (FY 2019-21)

Gain & Loss Matrix

Particulars	FY-19	FY-22	Gain/ Loss	Reason for Deviation
PLF	75.12	80.58	6.77 %	TPP Operated as per the load demand from Cement Plant & wheeling Unit
GHR	3196	3097	3.19 %	Gain in GHR of 132 kcal/kWh through taking many initiatives within the year
Aux	9.07	6.86	32.21 %	Gain of 1.47% in aux power cons through many energy initiatives projects.
Availability	88.41	86.0	2.80 %	Due to plant stopped in Apr-20 YTD of this month is comparatively less. Otherwise unit availability is 100% from last two months.

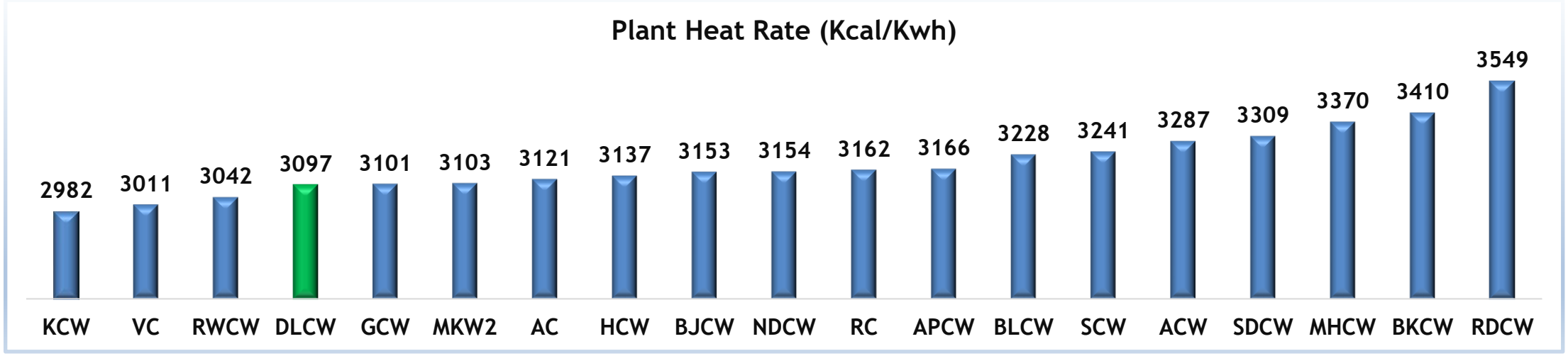
Benchmarking FY'21- PLF & Power Cost Group Units

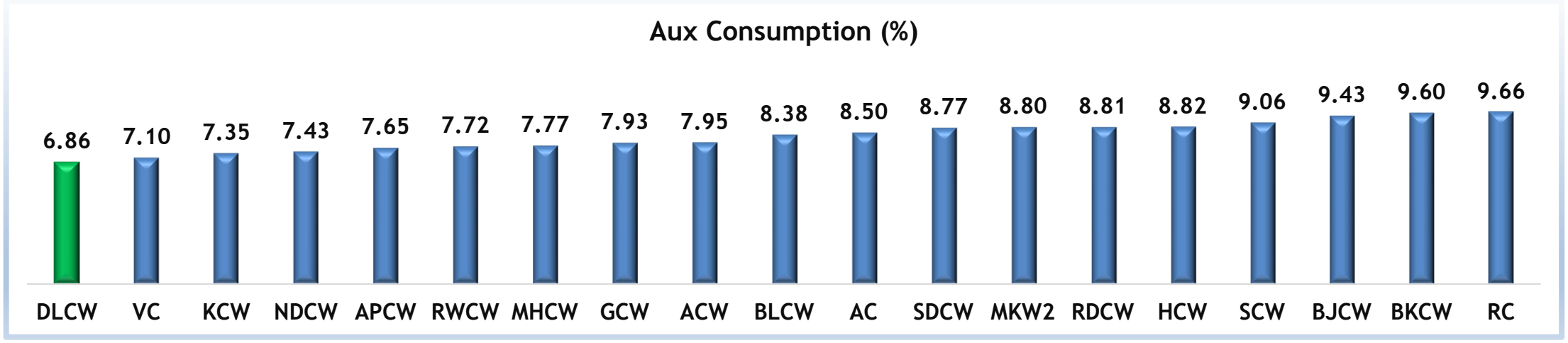




Dalla Power cost is Lowest in Group Units

Benchmarking FY'21 - Heat Rate & Aux. Power Group Units



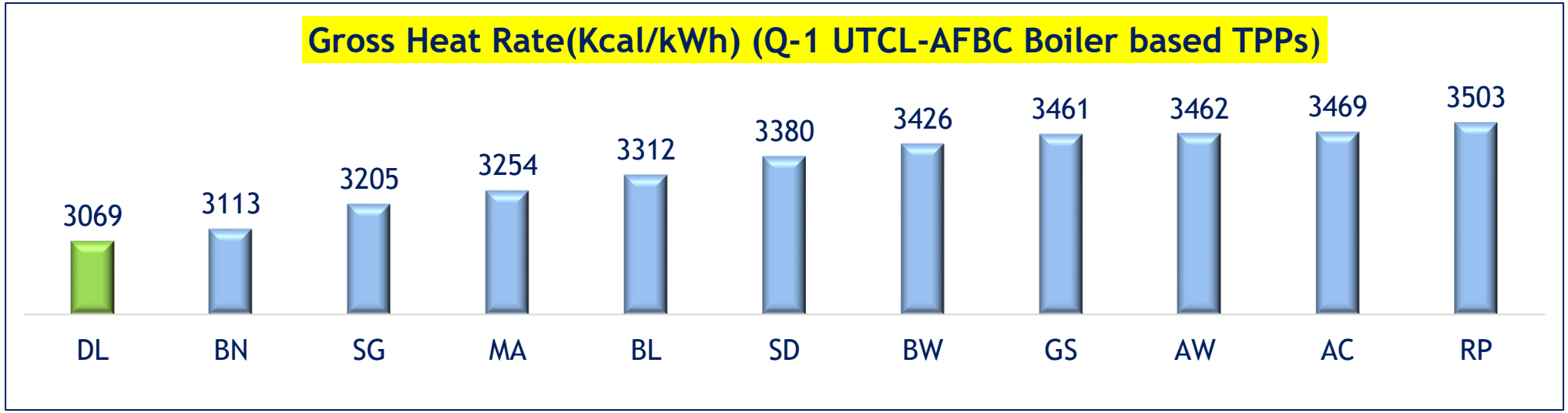


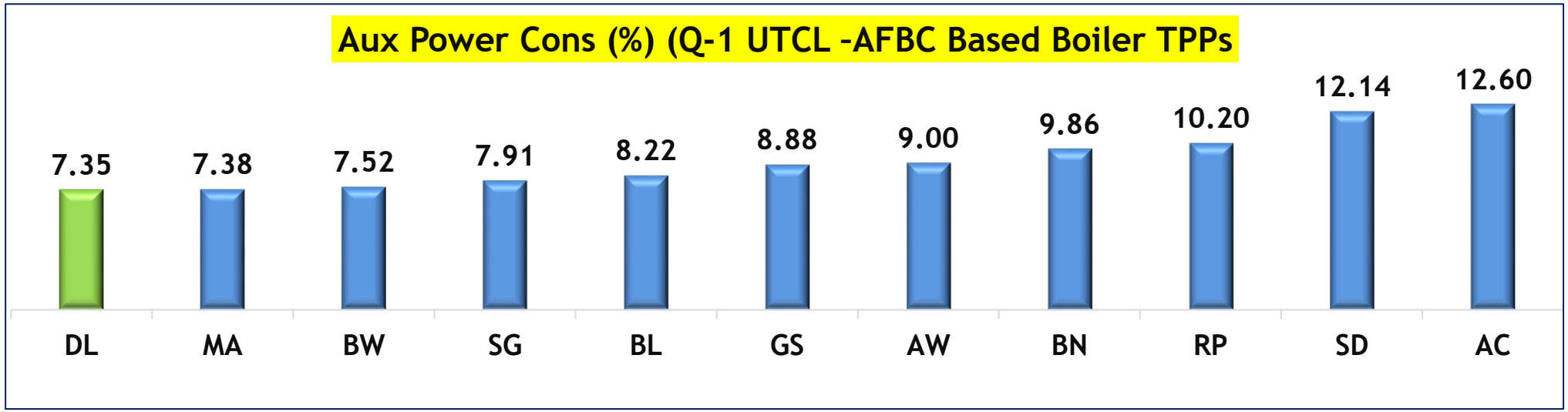
First time in UTCL Dalla achieved < 7% Aux. Power.

National Benchmark (NBM) for Heat Rate -2932 Kcal/kwh & Aux. Power- 6.50% (CII data)

Benchmarking in our Group units- Q1 (AFBC Boilers)

1st Position in Both Heat Rate & Aux Power Cons in Q-1 @ Group Units.





Competitors, National & Global Benchmark

Energy Benchmarking

Sr. No	Particulars	UOM	Compititor-1 Bela	Compititor-2 Sidhi	Compititor-3 Maihar
1	Aux. Power	%	8.38	8.77	7.77
2	Gross Heat Rate	kcal/kWh	3228	3309	3370

National/Global Benchmarking

Aux Power Cons	**%**	**6.5**
Heat Rate	**Kcal/kWh**	**2932**

Our Achievement

Aux Power Cons	**%**	**6.86**
Heat Rate	**Kcal/kWh**	**3097**

Road map to achieve national/global benchmark

Steps to Achieve the National/Global Benchmarking

- Energy Objectives & Target
- Separate budget for energy conservation
- Adoption of new technologies
- Internal & external Energy Audits
- Sustenance Monitoring Approach
- Evaluation of Energy performance
- Achieve the Target

Energy Saving projects - FY'19-21

Total Energy Saving in Last 3 Years - Lac. kWh 59.87

Energy Saving
27.12 Lac. kWh
Cost Saving
Rs.million 5.91/-

FY'18-19

Energy Saving
22.37 Lac. kWh
Cost Saving
Rs.million 19.35/-

FY'19-20

Energy Saving
10.38 Lac. kWh
Cost Saving
Rs.million 13.89/-

FY'20-21

Energy Saving Projects – FY'18-19

Sr. No	Projects Implemented	Annual Energy Saving (Lac kWh)	Annual Cost Saving (Rs. million)	Annual Thermal Saving (Rs.million)	Total Cost Saving (Rs. million)	Investment (Rs. million)
1	Service air compressor running Hrs optimised by installing 7 Nos. Draught transmitter in APH and all ESP fields hopper.	0.90	0.32	0	0.32	0.28
2	Installation Of VFD in CEP	0.55	0.12	0	0.12	0.278
3	Installation of VFD in PA Fan	1.66	0.59	0	0.59	0.299
4	Installation of Fan less and finless cooling tower	2.48	0.89	0	0.89	2.50
5	Installation of VFD in BFP-3	11.59	0.42	0	0.42	3.30
6	Old FRP blades of ACC Fans replaced with new E glass Epoxy Blade	9.94	3.58	0	3.58	1.97
Total Saving in FY'18-19		**27.12**	**5.91**	**0**	**5.91**	**8.62**

Energy Saving Projects – FY'19-20

Sr. No	Projects Implemented	Annual Energy Saving (Lac kWh)	Electrical Saving (Rs. million)	Thermal Saving (Rs. million)	Total Saving (Rs. million)	Investment (Rs. million)
1	Reduction in False air to 3% by arresting leakages in Boiler and ducts.	0.00	0.00	7.8	7.79	0.075
2	Reduction in BFP power consumption	2.07	0.72	0.0	0.72	0
3	Reduction in PA fan Power Consumption	0.69	0.24	0.0	0.24	0
4	Optimisation in FD air flow to maintain O2 3.5% from previous 6.5%	5.18	1.81	5.9	7.68	0
5	Installation of VFD in Instrument air compressor-1	1.66	0.58	0.0	0.58	0.3
6	Reduction in compressor Power consumption	4.14	1.45	0.0	1.45	0.05
7	ACC Fins cleaning by water jet	0.83	0.29	0.0	0.29	0.14
8	Installation of VFD in CHP Group#02 Bag Filter Fan	0.00	0.11	0.0	0.11	0.22
9	Installation of VFD in CHP Group#01 Bag Filter Fan	0.30	0.11	0.0	0.11	0.25
10	Incorporated new logic to reduce BFP discharge Pressure set point bias (corresponding to drum pressure) to 10.5 kgf/cm2	0.00	0.24	0.0	0.24	0
11	Raw Water Gravity inlet line interconnected with Raw Water Pump discharge line	0.30	0.15	0.0	0.15	0.03
Total Saving in FY'19-20		**22.37**	**5.69**	**13.7**	**19.35**	**1.07**

Energy Saving Projects – FY'20-21

Sr. No	Projects Implemented	Annual Energy Saving (Lac kWh)	Annual Electrical Saving (Rs. million)	Annual Thermal Saving (Rs. million)	Total Saving (Rs million)	Investment (Rs. million)
1	Reduction in Coal nozzle height by 80 mm to control LOI < 3.5%	0	0	3.01	3.016	0.136
2	Maintain TG steam pressure at 85 - 86 Kg / cm2 (Against 83 Kg/Cm2)	0	0	0.81	0.804	0
3	Maintain TG steam temp 515 Deg C (against design of 510 Deg. C)	0	0	1.1	1.005	0
4	Excess air optimisation by maintaining O2< 4%	0	0	1.53	1.537	0
5	APH hydro jet cleaning to reduce dry flue gas losses	0	0	0.86	0.862	0
6	ACC hydro jet cleaning	0	0	2.01	2.01	0.18
7	Boiler soot cleaning	0	0	0.72	0.718	0.05
8	Reduction of false air < 3 %	0	0	0.7	0.7	0.15
9	Closed loop optimization and EMS system	0.41	0.13	0	0.129	0
10	Optimization of CHP Power Consumption	0.99	0.31	0	0.31	0.60
11	Reduction in ACC Fan Power Consumption	1.98	0.62	0	0.62	0.18
12	Boiler Fan Power optimization	3.39	1.06	0	1.06	0
13	Optimization of compressor power	1.65	0.52	0	0.517	0
14	Reduction in Power consumption of Lighting Load	0.17	0.051	0	0.051	0.15
15	Reduction in Boiler feed Pump Power Consumption	1.65	0.52	0	0.517	0.07
16	Optimization of Hot Well Pump Running and hence Power Consumption	0.13	0.04	0	0.042	0.25
Total Saving FY'20-21		**10.38**	**3.24**	**10.65**	**13.89**	**1.77**

Innovative Projects

Best Innovative Projects :

- Installation of High Energy Efficient Boiler Feed Pump
- Increase Power Wheeling
- Reduction of LOI %
- Spray Attemperator Nozzle Modification

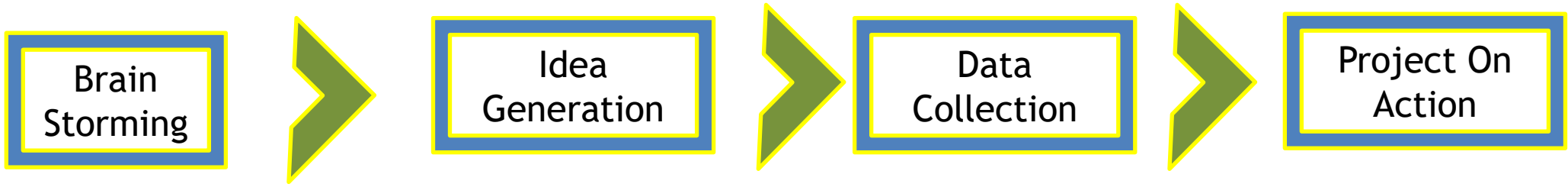
Installation of High Energy Efficient Boiler Feed Pump

Objective :

Reduction of TPP aux power cons through utilization of new technology (**High Energy Efficient**)

Project Background :

- TPP having 2 boiler feed pump in which 2 in running condition at full load 27 MW and one Boiler Feed Pump kept at stand by mode. Due to which while plant operating more than 85% its aux power running higher side by operating 2 Boiler Feed Pump.
- Also during aux comparing with other unit our power consumption by Boiler Feed Pump is comparatively higher.
- So analysis & brainstorming done to optimize our aux power cons through utilizing new technology.

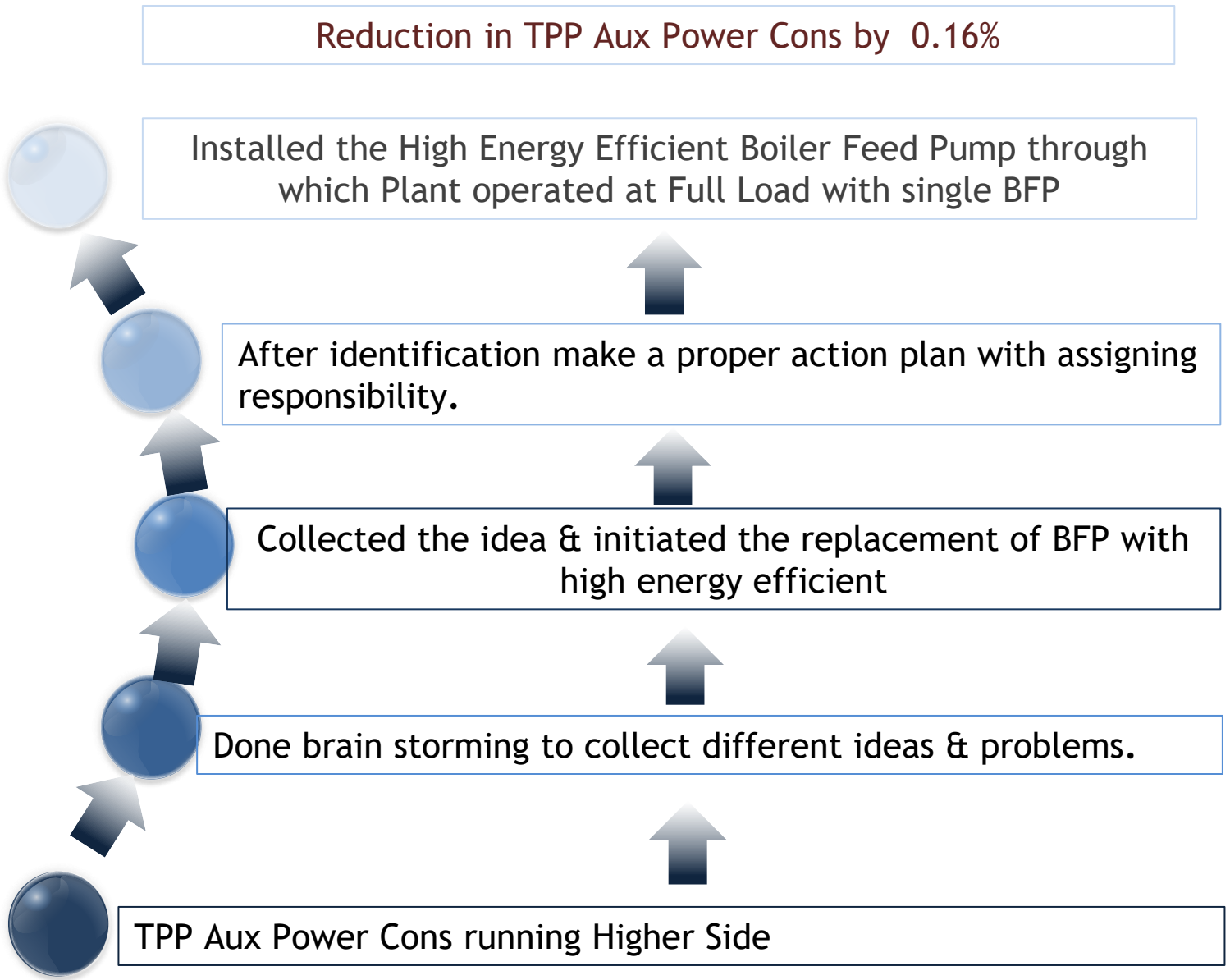


Installation of High Energy Efficient Boiler Feed Pump

Action Initiated:

Installed high Energy Efficient BFP

Boiler Feed Pump Power Reduction



Installation of High Energy Efficient Boiler Feed Pump

Saving/Benefits :

- ✓ Saving of 960 kWh in total BFP power
- ✓ Reduction of Aux power cons by 0.16 %
- ✓ Only One BFP is operated at full load (27 MW) & 2 BFPs kept at stand by mode
- ✓ Achieved best aux power cons in our group units.

Increase in Power wheeling and Operating Plant at VWO condition

Theme

- Power Wheeling to GU's (Tanda, SKCW, Aligarh & Dadri)

Problem/ Background

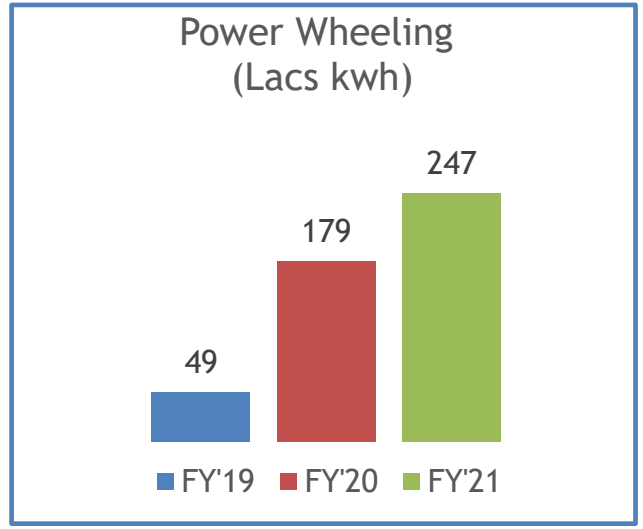
- GU's were taking power from Grid/outside which cost is Rs. 6.80/Kwh.
- Low power availability at Dalla due to high APC and not running Plant at Full load

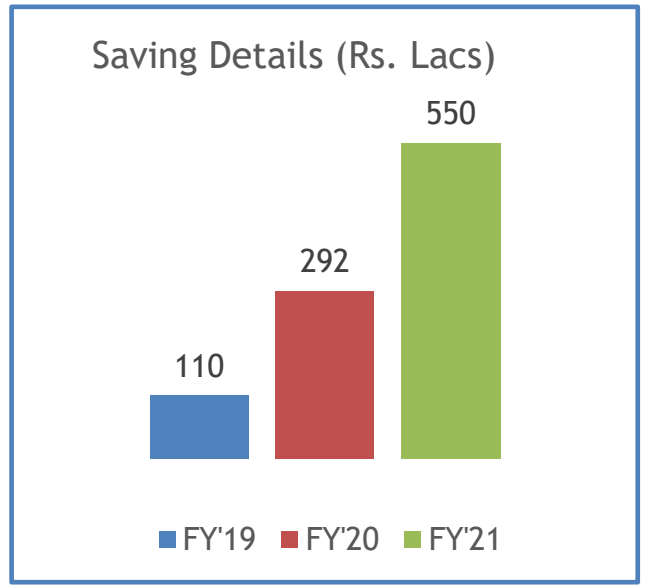
Solution/ Execution

- Coordination with Cement Plant and GU's for Utilization of max Power from Dalla
- Projects taken for reduction in APC to wheel power
- Operated the TG at VWO during peak load
- Up to 90% power at Tanda consumed by Power wheeling

Result/ Benefit

- Total 247 Lacs kwh units Wheeled in FY'21 against 179 lacs Units in Fy'20
- Saving of Rs. 550 Lacs to Gu's
- Improvement in PLF by 11% and reduction in Heat rate by 22 Kcal/kwh





Reduction in Heat rate By optimizing Boiler LOI

Theme

- Reduction in power cost, by increasing Boiler Efficiency through reduction in Boiler ash LOI from 5.5% to 2.7%

Problem/ Background

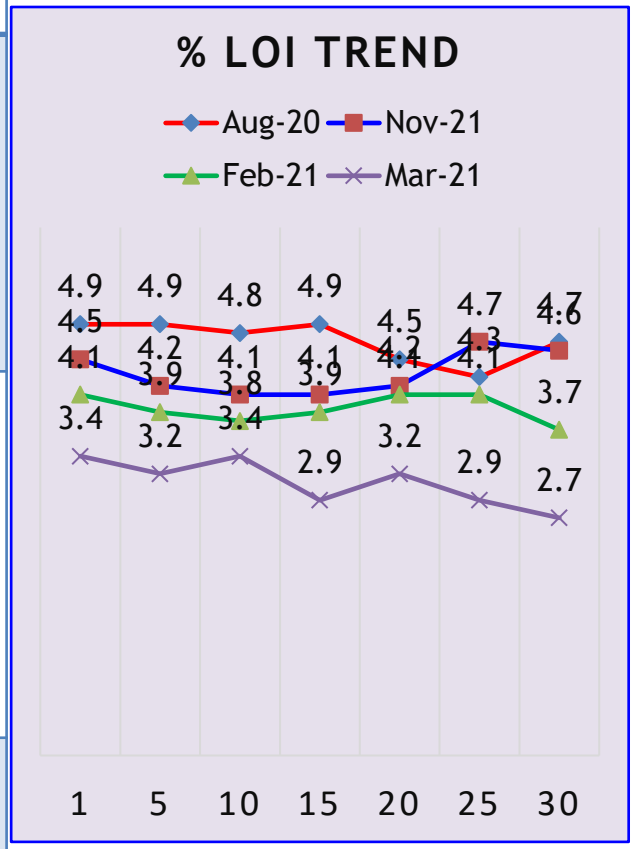
- LOI of Boiler was on higher side i.e. 5.5%.
- Lower Boiler efficiency due to Higher LOI %
- Power cost was increasing due lower Boiler efficiency.
- Disposal of Ash was major concerns.

Solution/ Execution

- Optimized the air flow in Boiler and maintained O2 < 5 %.
- Replaced the coal nozzle and coal cap and maintained its height .
- Maintained the coal size by monitoring shift wise analysis and adjusting crusher Gap.
- Furnace draft reduced and maintained below -2 mmWC.
- Reduce PA fan discharge Pressure

Result/ Benefit

- Reduction in Fly ash LOI by 2.0%.
- Increment in Boiler Efficiency by 1.0 % which interns 40 Kcal/Kwh Heat rate saving and Rs. 60 Lacs/annum
- 100 % Utilization of Ash in Cement plant.



Optimization of Boiler FD fan Discharge Pressure

Theme

- Optimization of Boiler FD fan Discharge Pressure for Power Saving

Problem/ Background

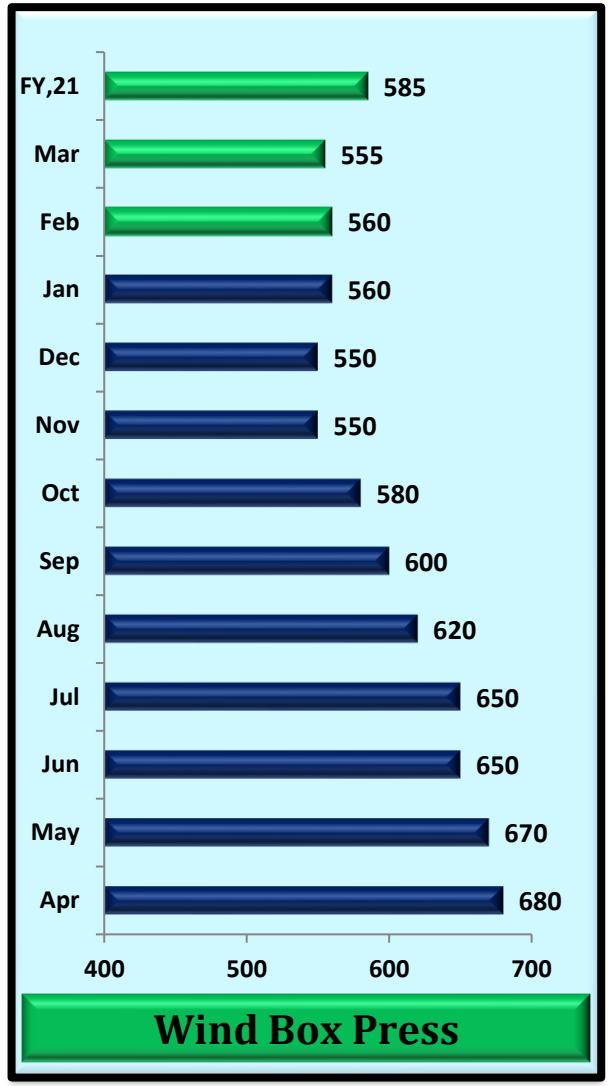
- Higher power consumption of FD Fan approx. 13000 KWH / Day

Solution/ Execution

- FD Fan Discharge pressure was being maintained in between 500-600 mmWC against OEM Recommendation of 750 mmWC .
- With the Brain Storming with Operation Team it was decided to optimized the Boiler FD Fan Discharge.
- Pressure further up to 600 mmWC in 3-4 Steps maintaining Boiler Combustion efficiency . Monitoring done – FD Discharge Pressure, Power Consumption & Boiler Combustion efficiency i.e. LOI .

Result/ Benefit

- Achieved Power Saving - 1500 Kwh/Day
- Cost Saving - Rs 18.11 lacs/ Year



Attemperator Nozzle modification for BFP Power Reduction

Theme

- Attemperator Nozzle hole size enlarging to reduce BFP Power Consumption

Problem/ Background

- At full load of Boiler , Flow required by Attemperator is 10 TPH at 96 kg/cm2 (BFP outlet pressure). But to meet this condition at full load, it was required to raise BFP outlet pressure up to 106 KG/cm2 to maintain required flow of 10 TPH. This was causing high auxiliary power consumption by BFP.

Solution/ Execution

- Review of attemperator nozzle hole size done in collaboration with M/s Thermax Ltd. Enlarging of holes done from 6.0 mm to 6.8 mm. Also one new hole drilling done to meet the required area for 10 TPH flow through attemperator. The area of discharge through holes of nozzle increased from 763.02 mm2 to 1016.35 mm2.

Result/ Benefit

- Power Saving – 20 Kwh/ Hrs
- Saving of Rs. 5.34 Lacs/annum

Before

After

Hole Size Increased from 6.0 mm to 6.7 mm & one extra hole drilling done

Utilisation of Renewable Energy sources

Installed 13 MW WHRS

AQC Boilers

Renewable energy generation will start from Sep-21

TG and ACC

Way Forward

SN	Project Description	OPEX/CAPEX	UOM	Saving in Kw/Hr	Target
1	5 MW Solar plant Installation	CAPEX			Mar-22
2	Replacement of energy efficient FD fan	CAPEX	KW/Hr	40	Dec-21
3	Installation VAM and reduce chillers operation (Based on utilization of steam from Turbine extraction)	CAPEX	KW/Hr	5	Mar-22
4	Energy efficient pumps of CEP	CAPEX	KW/Hr	5	Dec-21
5	Energy efficient pumps of WTPs	CAPEX	KW/Hr	5	Dec-21
6	Reduction of false air < 2 %	OPEX	Kcal/Kwh	5	Dec-21
7	Power wheeling to Grinding Unit to maintain 100 % PLF	OPEX	Kcal/Kwh	20	Oct-21
8	Air Nozzle Replacement	OPEX	Kcal/Kwh	5	Dec-21
9	Reduce LOI by 0.5 %	OPEX	Kcal/Kwh	10	Oct-20
10	Advance process controller in Boiler	CAPEX	Kcal/Kwh	15	Dec-21
11	CBD water heat utilization to heat up make up water to Deaerator/ Hot well	OPEX	Kcal/Kwh	2	Nov-21

Environment Management- Ash Utilization

Particulars	UOM	FY'18-19	FY'19-20	FY'20-21
Ash Stock in Plant	Tons	0	0	0
Ash Generated	Tons	53745.83	70516	61631.40
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'19	FY'20	FY'21
Current Sox Emission at full load	mg/Nm^3	450-600	450-600	450-600
Current Nox Emission at full Load	mg/Nm^3	272	255	240
Particulars Matter	mg/Nm^3	45	45	40

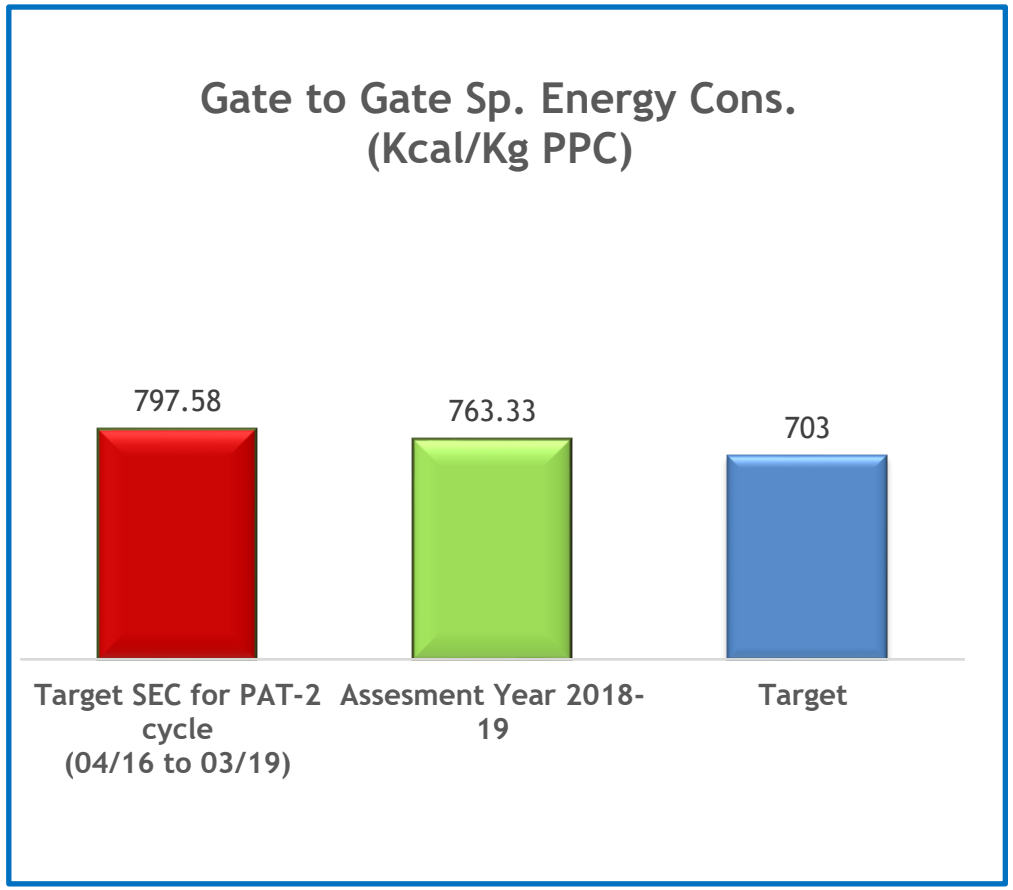
- ✓ Online monitoring of SO2, NOx and SPM with real time data.
- ✓ Logic implemented to control SOx value in which SOx value interlock with furnace temp & O2%, and according to same lime RAV RPM adjusted in Auto.
- ✓ ESP Operation in CBO mode.

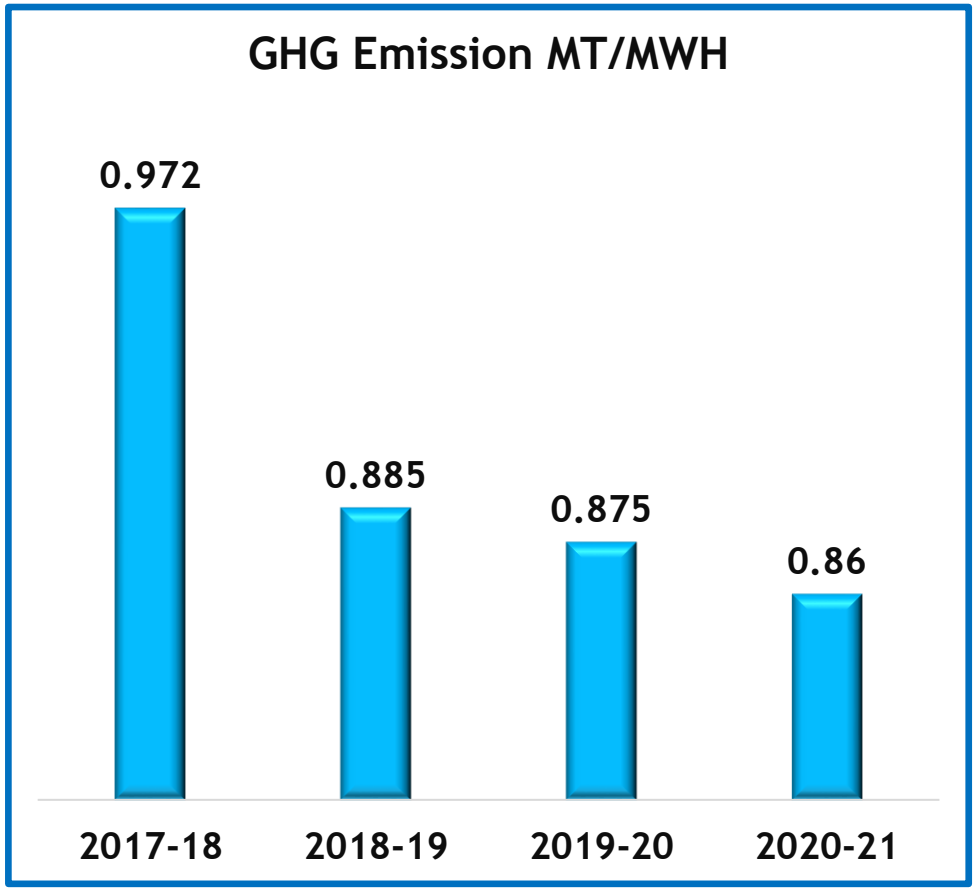
Environment Management- Water

Particulars	UOM	FY'19	FY'20	FY'21
DM Water Consumption	%	1.01	0.83	0.59
Raw Water Consumption	M^3/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.
- ✓ 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

✓ Monthly safety gate meeting for increasing awareness at all level & motivating employees & contractor workmen.

✓ Implement Kaizen and suggestion scheme in Department and sharing Kaizen of other Unit

✓ Maintaining zero discharge from plant : Utilizing fully treated waste water for gardening & dust suppression.

✓ 100% ash of Boiler, utilized for Cement Manufacturing .

✓ All new procurement is on the basis of energy efficiency.

✓ TPP Ki “Paathshala program organised on Saturday of every week to enhance knowledge of employees at every level.

✓ Job card distribution to all concern department for abnormality rectification

✓ 100 % Utilisation of Fly ash in cement plant 0 % Water discharge Recycling of Bed materials

Employee Involvement/ Knowledge Sharing

- ✓ Monthly Brain Storming session.
- ✓ Green Circle award
- ✓ Best SBO award
- ✓ Monthly gate meeting for safety and performance sharing
- ✓ 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.

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 Communities;
- 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)

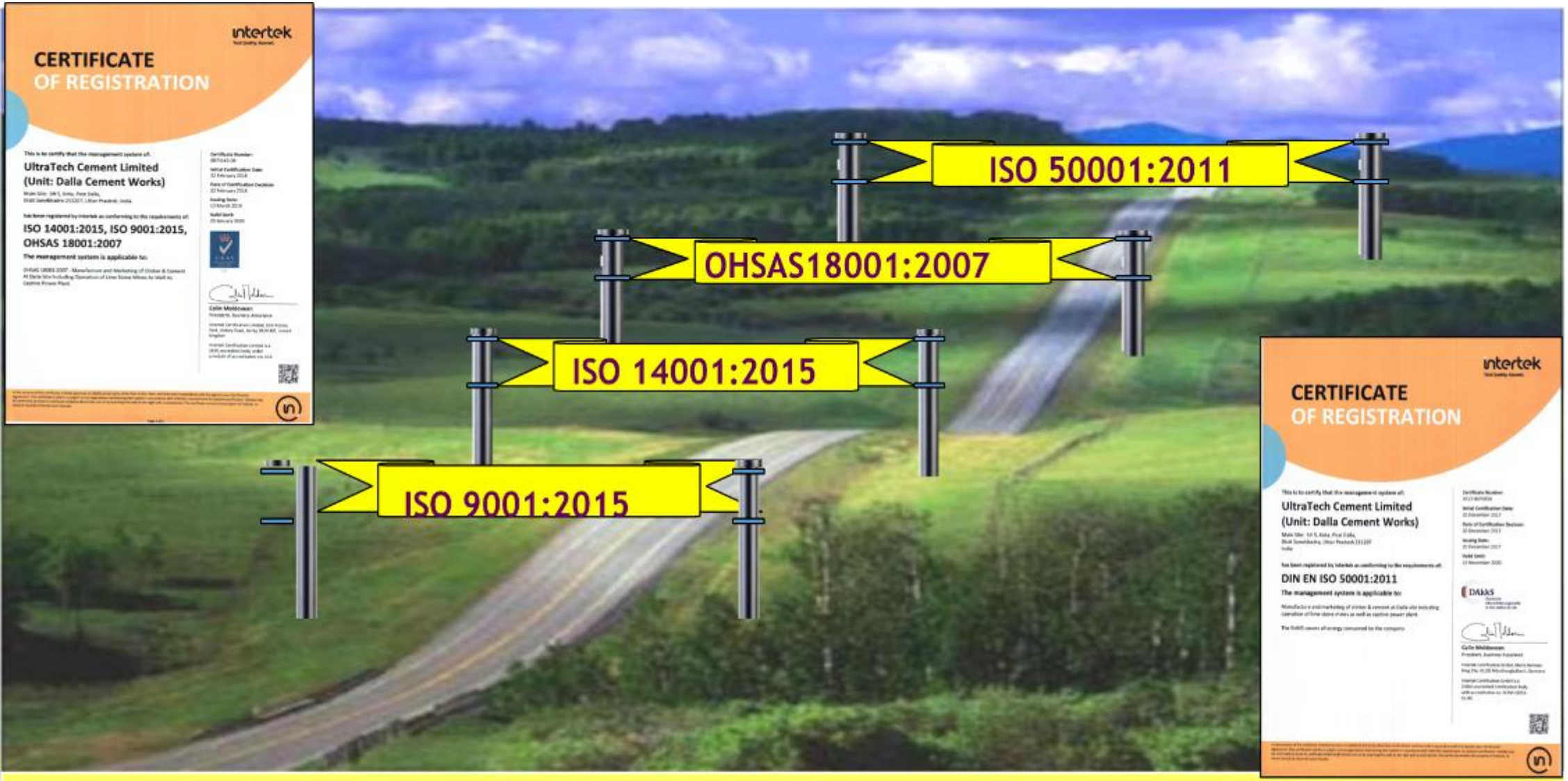
Version: V-1

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 foot print

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

Vision Alignment | Systems….



intertek

CERTIFICATE
OF REGISTRATION

UltraTech Cement Limited
(Unit: Dalla Cement Works)

ISO 14001:2015, ISO 9001:2015,
OHSAS 18001:2007

intertek

CERTIFICATE
OF REGISTRATION

UltraTech Cement Limited
(Unit: Dalla Cement Works)

DIN EN ISO 50001:2011

Proliferation of Excellence concept across the Stakeholders

Green Belt Development

"Van Mahotsav" festival is celebrated as a festival of life in the first week of July every year in which trees / saplings are planted across the country. The festival educates the awareness of trees among people and portrays the need of planting and tending of trees, as trees are one of the best ways to prevent global warming and reduce pollution.

This year also Dalla Cement Works have taken Target to plant 50,000 nos of saplings. On 04th July 2021, UTCL DALLA initiated celebration of "Van Mohatsav" by organising awareness campaigns and planted 1000 nos of Saplings in Township, plant premises & nearby villages (Kota Gram & Billi Gram).

Hon. Chief Guest Shri Sarju Ram, Asst. District Labour Commissioner & Shri Radhe Shyam , Regional Officer, U.P.P.C.B initiated the Campaign by Planting the saplings. Guest of honour Smt. Deepika Saighal & our Senior Dignitaries (FH – HR, Sh Pankaj Poddar, FH – Mines, Sh Vivek Khosla, FH – F&C, Sh Prasham Jain), DHs , SHs & other employees, Ladies Club Members & children also whole heartedly joined the campaign.

CSR Activities

On "World Nature Conservation Day" under the leadership of Unit Head Shri Rahul Saighal & guidance of FH-HR Shri Pankaj Poddar, Dalla Cement Works has organised free seeds distribution programme through CSR which was chaired by FH – Finance Sh Prasham Jain at Village Kota on 28.07.2021.

Approx. 12 Quintals of 4 varieties of seeds i.e Arhar, Maize, Jawar, Bajra were distributed to the needy farmers and also distributed 350 nos Guava Saplings.

Hon. Chief Guest Shr R.C Gautam – GM DIC, Shri O.P Verma –ADO Agriculture, Shri Pankaj Yadav -AAI, Sh Prahlad Cheroo - Gram Pradhan initiated the Campaign by handing over seed packets in presence of DH – Administration, Security & CSR Sh Rishiraj Singh Shekhawat, Sh RC Pandey, Sh Anup Pandey & Sh Dinesh Yadav & other CSR Team members.

Seed Distribution to near by Villages.

Vaccination Camp - Fight Against COVID-19

Vaccination Drives to Protect Each & Every one Against COVID-19

Awards & Accolades

CII-2020

CII-2019

CII-2013

CII-2012

Excellence Journey Continue toward

< 3000 Kcal /kWh Heat Rate & < 6.0% APC.....