ADITYA BIRLA
UltraTech

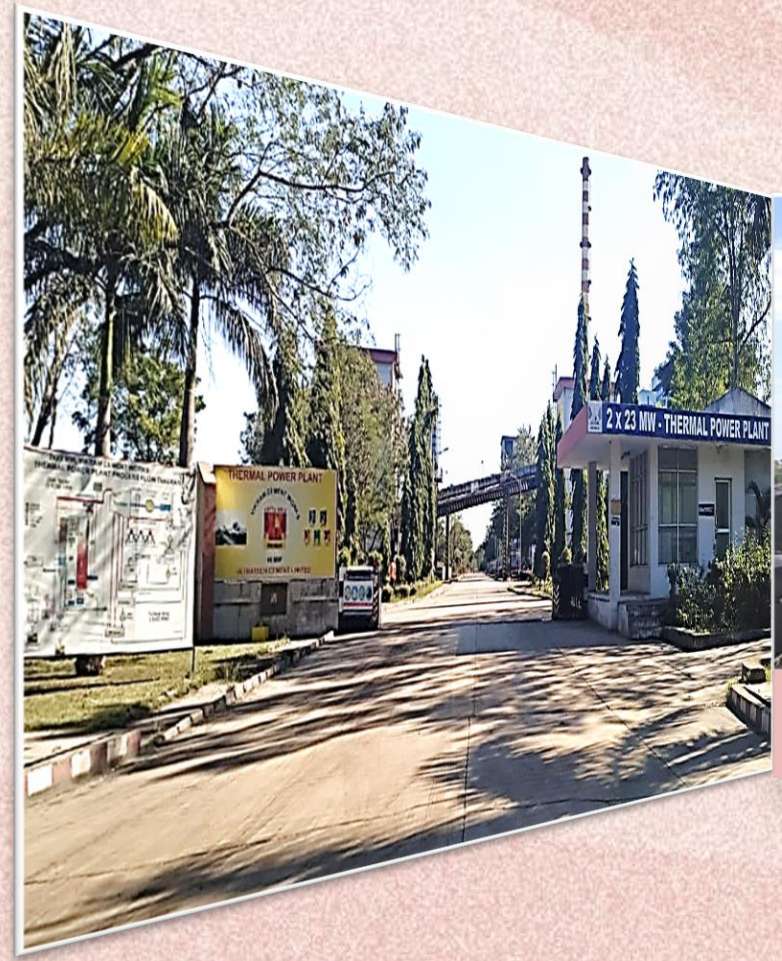
UltraTech Cement Works

Confederation of Indian Industry

Unit Vikram Cement Works

Thermal Power Plant (2x23 MW)

Welcome You!



23rd National Award for Excellence in Energy Management 2022

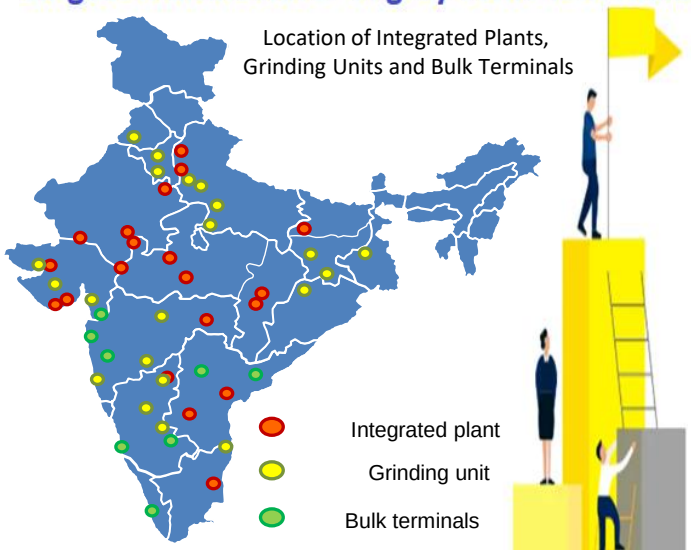
Team Presenter

Praveen Vijayvargiya – GM,TPP
Rakesh Sharma- Sr. Manger, TPP
Angad Singh – Manager TPP

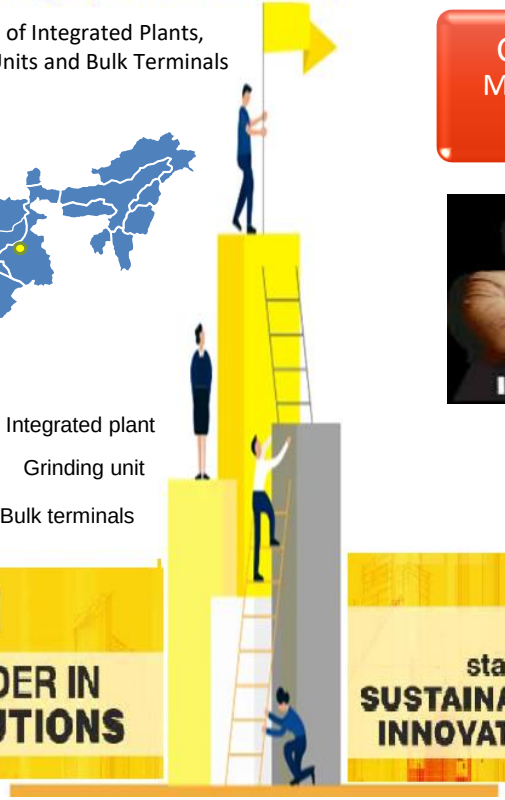
Company- UltraTech Cement Ltd

22 Integrated Manufacturing Units → 27 Grinding Units → 01 Clinkerisation Unit → 08 Bulk Packaging Terminals

3rd Largest producer cement in the world (Excluding-China)
Largest manufacturer of grey cement in India



Consolidated Capacity 119.95 Million Tonnes Per Annum (MTPA) of Grey Cement



VISION

TO BE THE LEADER IN BUILDING SOLUTIONS

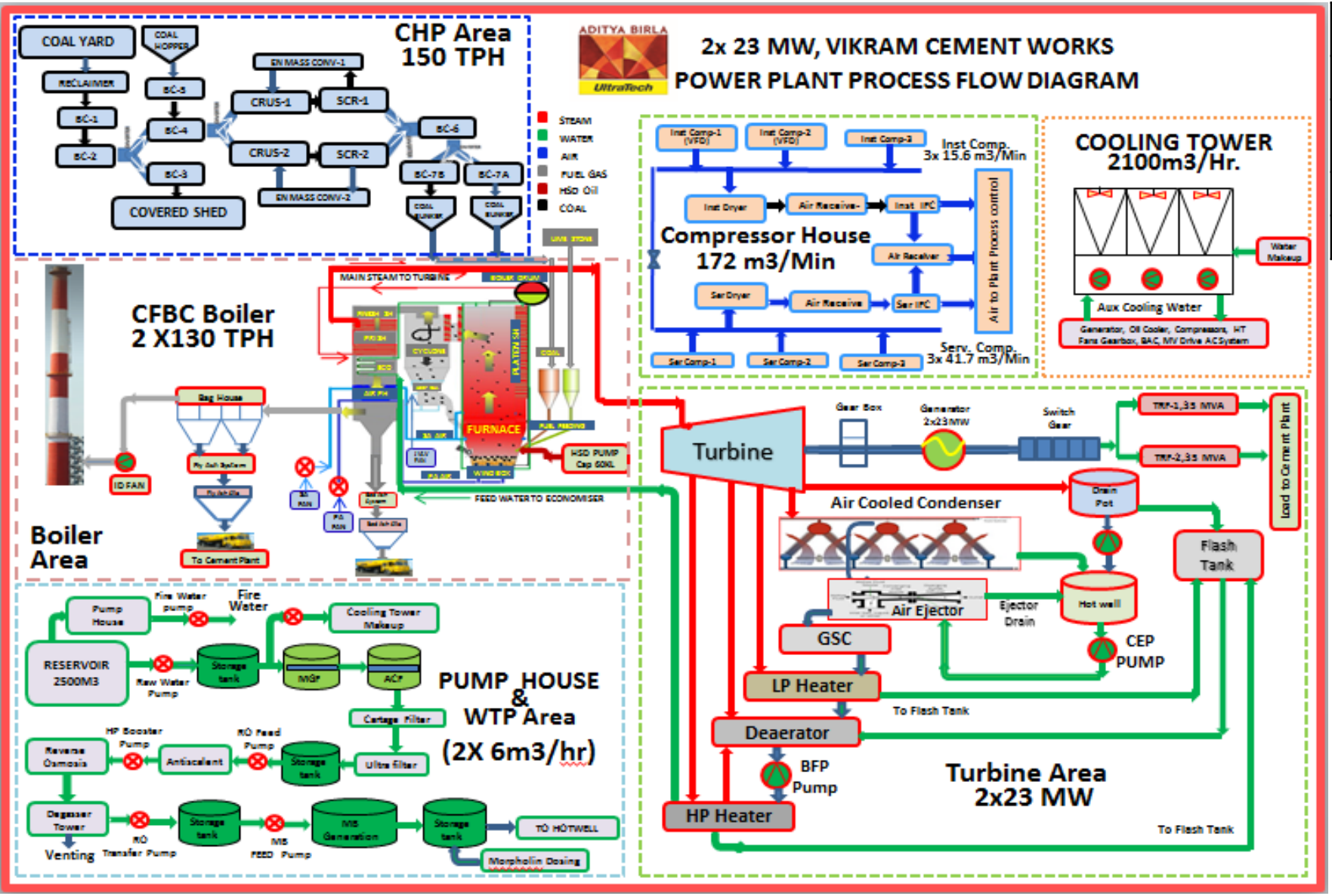
MISSION

To deliver superior value to stakeholders on the four pillars of SUSTAINABILITY, CUSTOMER CENTRICITY, INNOVATION AND TEAM EMPOWERMENT

UltraTech Cement Ltd – Vikram Cement Works

- UTCL : A part of ABG the **best employer in India and Asia Pacific region.**
- Unit has **46 MW** Captive Thermal Power Plant (2X23MW).
- Installed Capacity **8.9MWp** Solar Power Plant
- Installed **482KWp** Roof Top Solar Plates
- First Cement Plant in India that
  - **1) Acknowledged as pioneer of TPM, JIPM Japan in 1995**
  - 2) Obtained **ISO 14001 in 1997, EMS Certification from DNV**
- Certified with ISO 9001, 14001, OHSAS 18001, ISO 50000,ISO 27001, SA8000
- **Certified with ISO50001** & Implemented Energy Policy in 2013
- Adopted WCM Excellence Model & Achieved **Two times Gold award**
- Unit awarded with **CII National Excellent Energy Efficiency Award in power**
  - **1) Sept,2019 as CII National Excellent Energy Efficient Award**
  - **2) Sept,2021 as CII National** awards as **"Energy Efficient Unit"**

TPP Overall process diagram & Major equipment



Steam Turbine, capacity 2x23 MW
Make: Hangzhou Steam Turbine Co.Ltd
Type: Single Cylinder Multi stage, three uncontrolled extraction condensing type
Speed: 7026RPM,
Inlet steam Parameter: 90 Kg/cm2, 535 Deg.C

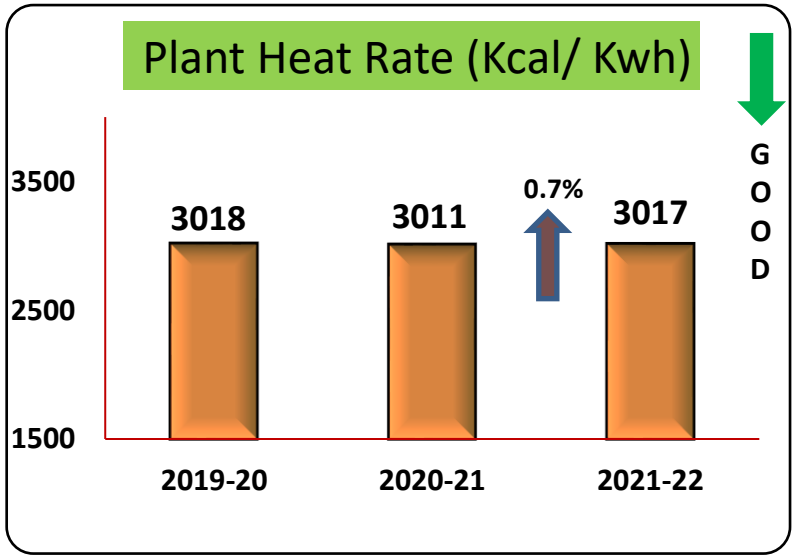
Air Cooled Condenser (6 Fans)
Make: Shanghai Turbine Co.Ltd
Air Cooled Dry type with Force draft fans
VFD control force draft fan.
FRP Blade with Dia 9.7m, aerodynamic design

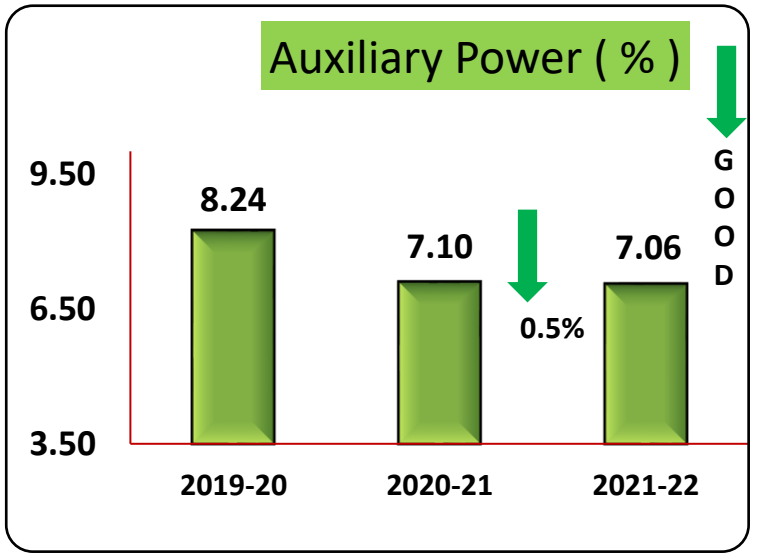
Generator, Capacity (2x23MW)
Make: Shandong Jinan Power Equipment Factory
Rated Voltage: 11KV
Speed: 3000RPM, HZ;50

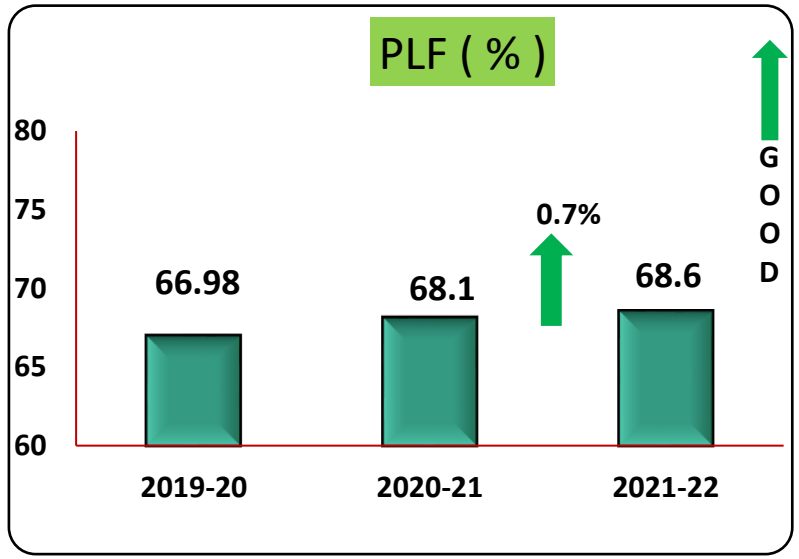
Boiler, Rated Capacity (2x130TPH)
Make: Dongfeng Boiler Industry Group Co. Ltd.
Type: CFBC with Multi fuel firing ability, Hot Cyclone
Inlet steam Parameter: 100 kg/cm2, 535 + 50C

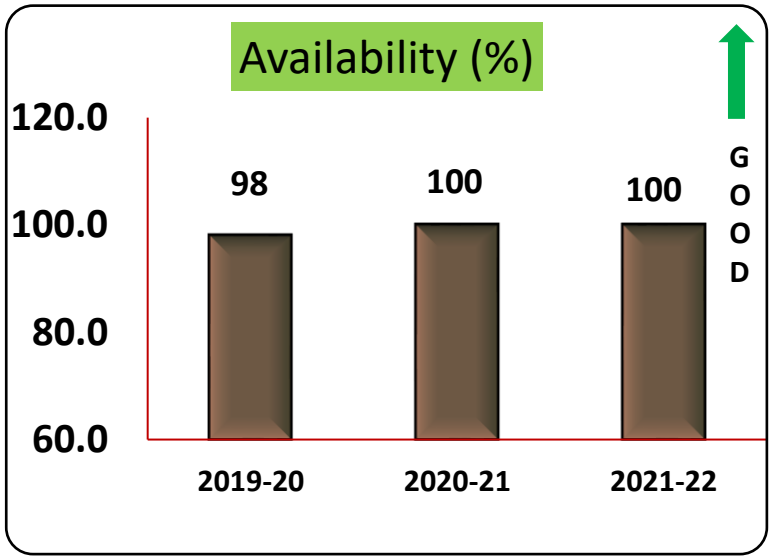
Energy Performance *(Sp. Energy Consumption)*

Parameters	YTD Figure			Remarks for Deviation
	FY-21	FY-22	Gain/ loss	
Auxiliary (%)	7.10	7.06	1.18 %	Gain 1.18% Many Encon Project taken
Gross Heat Rate (Kcal/Kwh)	3010.59	3016.56	5.97 Kcal/kWh	Plant Start/Stop Increased in FY-22
Plant Load Factor (%)	68.10	68.55	0.45 %	TPP Run As per load demand
Availability (%)	99.6	100	0.4 %	Plant Availability 100%









Major Energy Conservation Projects (FY2019-22)

"INNOVATION = IDEA + LEADER + TEAM + PLAN"

Power cost Rs./KWH	5.13
Fuel cost Rs./KWH	4.05
Aux (%)	8.26
PLF (%)	66.98

2019-20

EnCon Projects: 16 Nos.

Energy Saving 28.9 Lac Units

Cost Saving Rs.148.3Lac

Power cost Rs./KWH	4.57
Fuel cost Rs./KWH	3.55
Aux (%)	7.10 %
PLF (%)	68.11%

2020-21

EnCon Projects: 23 Nos.

Energy Saving 25.2 Lac Units

Cost Saving Rs.140.2Lac

Power cost Rs./KWH	6.79
Fuel cost Rs./KWH	5.75
Aux (%)	7.06 %
PLF (%)	68.55%

2021-22

Major EnCon Projects Identified: 32 Nos.

Energy Saving 6.8 Lac Units

Cost Saving Rs.142.8Lac

Our Vision FY2022-23

APC-5.5 %

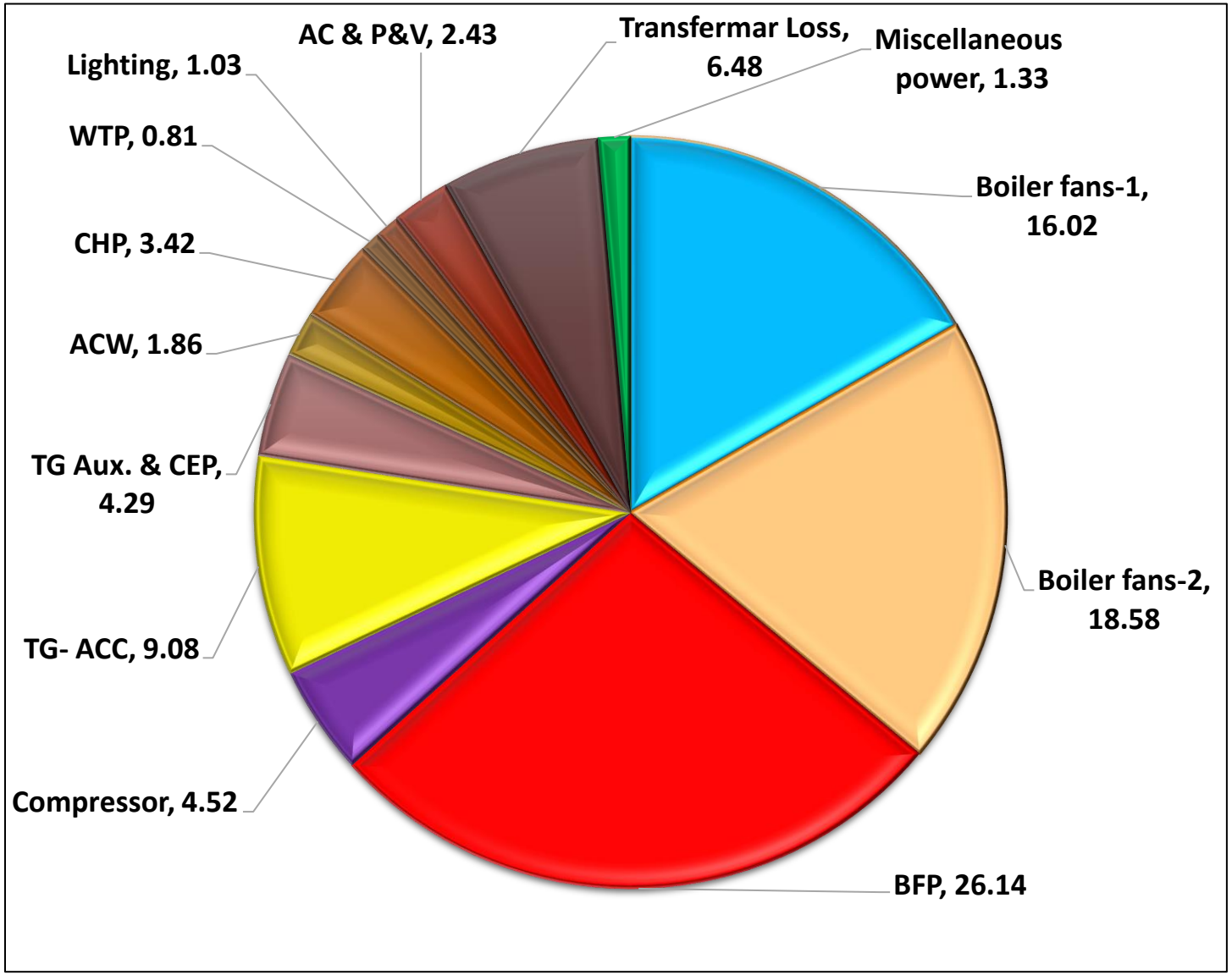
PHR-2950 Kcal/kWh

Thermal Saving :897.6 Mkcal/MTOE
Electrical Saving: 60.9 Kwh/MTOE
Total Saving Rs. 431.2 Lacs

ROI 1.45 Years

Year	No of EnCon projects	Investment Returnable Capex	Electrical Saving	Electrical Saving	Thermal Saving	Saving	Total Saving
UOM	Nos.	(INR Million)	Million Kwh	Million kWh/MTOE	Million Kcal/MTOE	INR Million	INR Million
FY2019-20	16	50.53	2.89	14.83	0	0	**14.82**
FY2020-21	23	12.26	2.5	11.42	219.56	2.6	**14.02**
FY2021-22	32	0.31	0.68	58.46	678.05	9.67	**14.28**

Energy Consumption- Overview



Energy Mapping data FY2021-22

PLF: 68.55%

Aux: 7.06%

Area for Improvement:

- **Boiler fans**
- **Transformer losses**
- **Air Cooled Condenser**
- **Aux. Cooling Water / Cooling Tower**
- **Compressor Power**

Plant Performance & Benchmarking with UltraTech units

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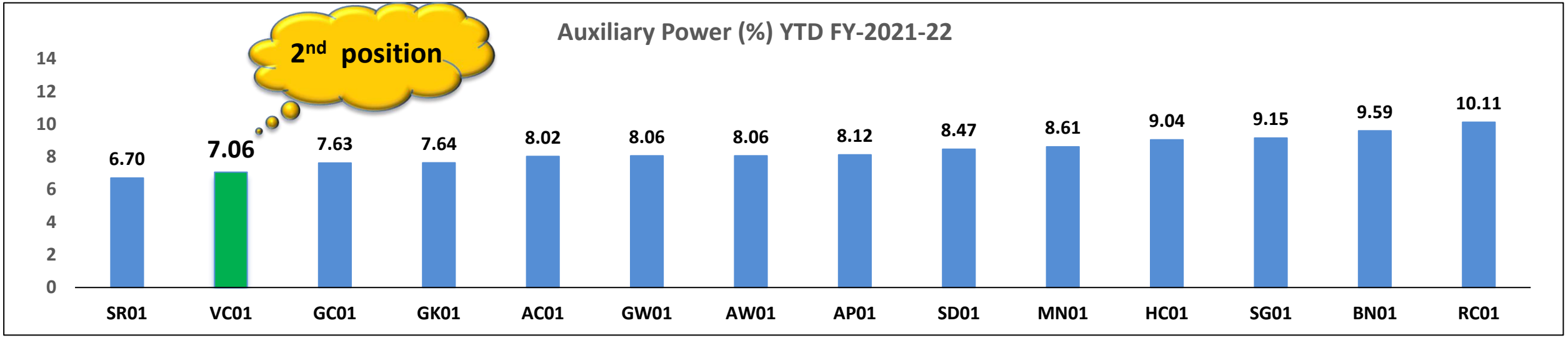

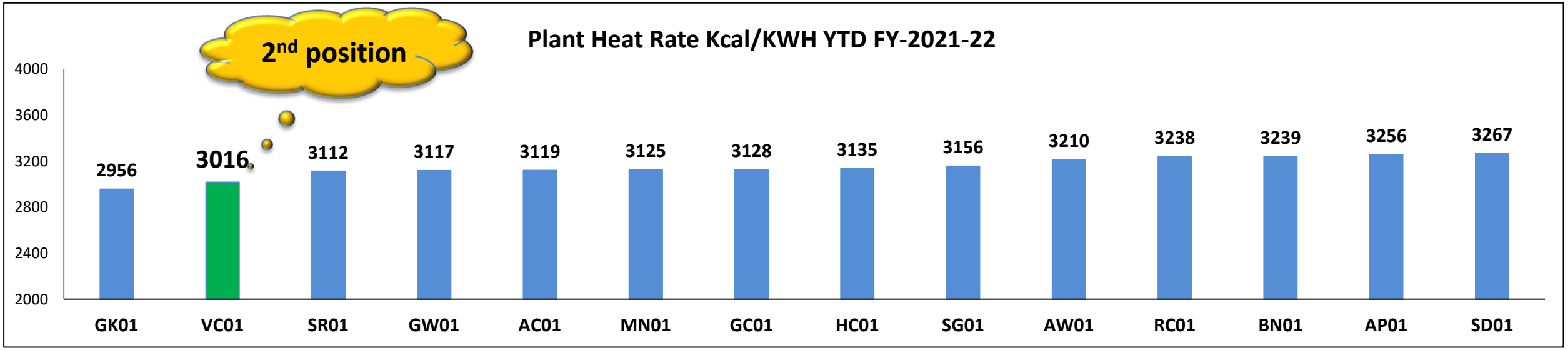

National Benchmarking & Road map for achieving best

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ANALYSIS OF CAPTIVE POWER PLANTS

S.No	Area/Equipment	CFBC(kW/MW)	AFBC(kW/MW)	VCW (KW/MW)
1	Boiler Feed Pump (BFP)	22.60	20.00	20.43
2	Secondary Air (SA) Fan/Forced Draft fan(AFBC)	6.07	10.50	4.34
3	Compressors	4.26	4.00	4.26
4	ACC fans	3.05	2.90	7.85
5	Induced draft (ID) Fan	10.50	2.50	14.31
6	Primary Air (PA) Fan	10.20	2.00	12.37
7	Water Treatment Plant (WTP)	0.74	0.70	0.78
8	Coal Handling Plant (CHP)	0.61	0.70	0.64
9	Auxiliary Cooling Water Pump (ACWP)	1.56	3.10	1.42
10	Condensate Extraction Pump (CEP)	1.59	1.50	0.98
11	ESP	1.55	1.20	1.32
12	Lighting	0.58	0.50	0.58
13	AC & Vent	0.58	0.50	0.62
14	Boiler Aux.	1.51	3.50	0.68
15	Over all Auxiliary Consumption (%)	6.53	5.36	7.06%

Data source from CII

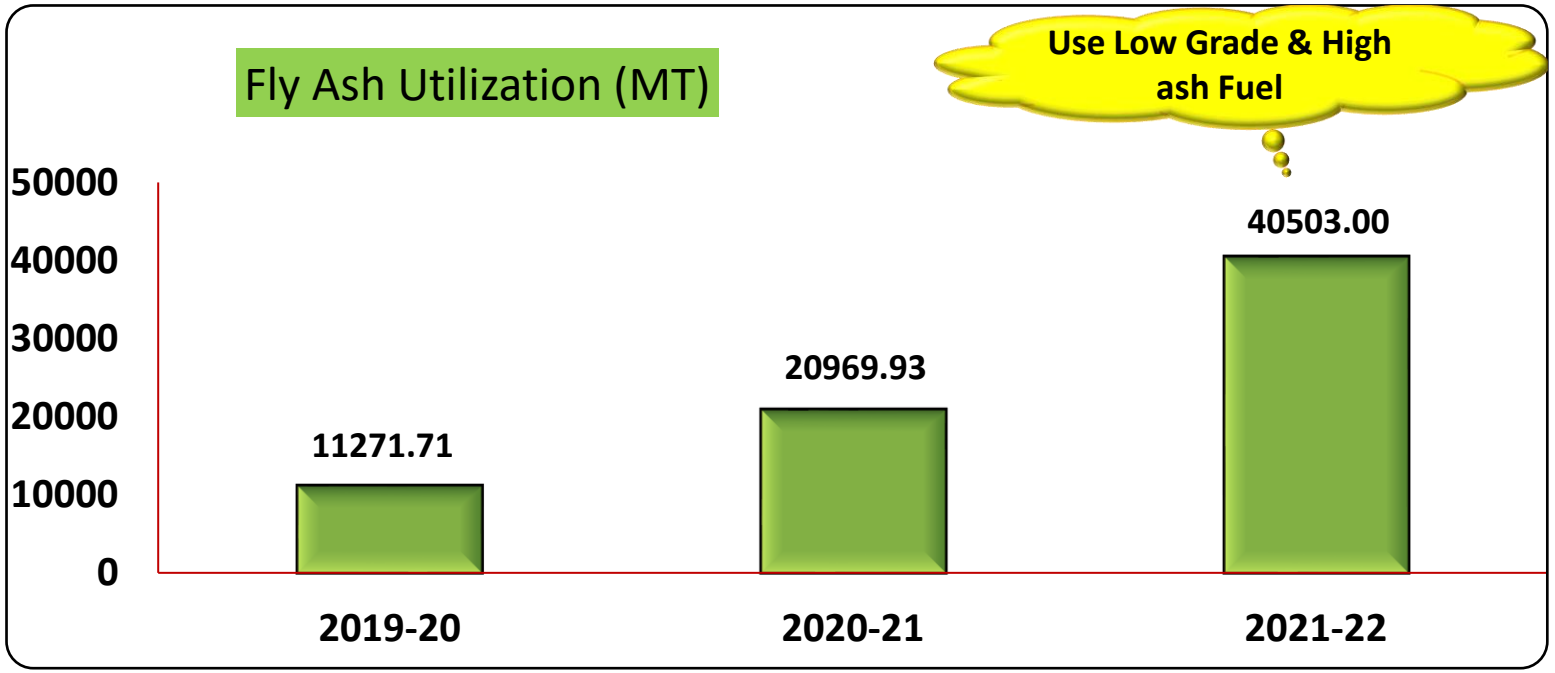
Road map for achieving benchmark

0.53%

- ACC Fan Interconnection to optimization of ACC Pas Power in Summer season
- Attemperator tapping form BFP discharge for power saving
- APH Tube Bundle Replace in Boiler-1
- Boiler feed pump replacement for single unit operation
- LT motor 09 nos. with energy efficient motor
- Energy Efficient Condensante Extraction pump installation.

Environment Management- Ash Utilization

- fly ash generated from boilers are conveyed to fly ash silos.
- From Silos, fly ash is again transported through Bulker to cement mill silos where it is consumed 100% for cement manufacturing.
- It is used completely as a raw material for cement plant. It is added in the raw meal additive hopper for further processing at cement plant.



Fly Ash Transportation by Bulkers

Environment Management- Ash Utilization

S.No.	Particulars	UOM	2019-2020	2020-2021	2021-2022
1	Ash Stock in Plant (yard + pond)	Tons	0	0	0
2	Ash Generated	Tons	11272	20967	40954
3	Ash Utilization	%	100	100	100
4	Ash Utilized in Fly Ash Bricks	%	0	0	0
5	Ash Utilized in Mine filling	%	0	0	0
6	Ash Utilized for Roads pavements	%	0	0	0
7	Ash Utilization in Other Areas – Please mention below	%	NA	NA	NA
8	Expenditure on Ash Utilization (annual)	NR (Lakhs)	18	18	19.5

Ash Handled (Wet Method)	%	NA
Ash Handled (Dry Method)	%	100
Ash Handled (semi wet)	%	NA

100 % of Fly Ash transport to Cement Plant for Cement Production.

Environment Management-Emission

S.No.	Particulars	UOM	2019-20	2020-21	2021-22	Remarks
1	Total CO2 Emissions Per kW of Generation	Ton/kWh	0.00086	0.00108	0.00092	
2	Current SOx Emissions at Full Load	mg/Nm3	375.2	295.2	375	
3	Current NOx Emissions at Full Load	mg/Nm3	137.2	126.4	182	
4	Particulate Matter	mg/Nm3	29.4	29.8	32	
5	Mercury	mg/Nm3	<0.001	<0.001	<0.001	

Detailed plan for achieving the current emission norms for thermal power plants.

- Raw Meal Powder/Limestone screen reject used and maintaining environment norms.
- Less Sulphur coal fired in Boilers.
- Auto SMS alert to Concerned Persons while the Environment parameters is exceeding alarming limit before reaching the CPCB Norm.

CPCB ENVIRONMENT MONETERING SYSTEM

Environment Management- Water

❑ DM water Consumption of Plant (Unit - %)

FY	2019-20	2020-21	2021-22
%	2.46	1.45	1.43

❑ Raw Water Consumption of Plant (Unit – M^3/MW)

FY	2019-20	2020-21	2021-22
M^3/MW	0.293	0.196	0.191

❑ Weather Plant is Zero Liquid Discharge- Yes

- RO Reject water being used after treated in Gardening in Thermal & Cement Plant.
- RO reject water & Continues Blow Down water is used in Cooling Tower Make Up.

Best Practices in Water Management

Optimization of Power Consumption by elimination of Air blower for Neutralization of WTP Effluent Water

- Reduction of auxiliary power consumption approx.-
- 15 KWH*2 Hrs.*13 days/month*12= 4680 KWH/year
- **Cost saving- 4680*Rs 8.5= Rs 39780 per year**
- Maintenance free, safe and easy to work arrangement

Installed Diaphragm drum manual operating pump

- **Eliminate the risk of contacting with chemical hazards**
- **Power cost saving- 109.5X5.5= Rs 602/year**

IMPROVEMENT PROJECT ON FOREBAY MESH REPLACEMENT

- **Total power saving-43058 kwh/ Annum**
- **Power cost saving- Rs 3.66 Lacs/annum**

List of Major EnCon project planned in FY 2021-22

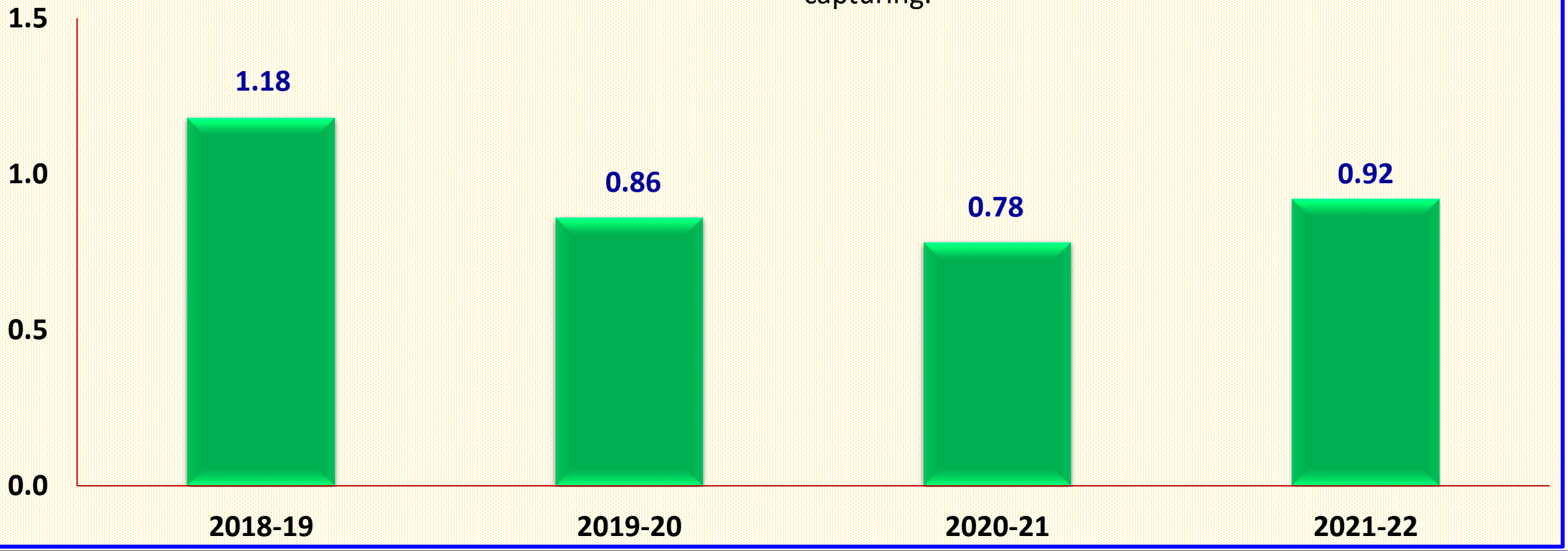
Sl. No.	Improvement Project	kWh/ Day	Running Days	Kwh/ Year	Saving In Millions kWh	(Rs. in Lac/ Annum)	Saving in Rs. Millions
1	ACW Power Optimization by Reducing Discharge Pressure from 1.48Kg/cm2 to 1.35kg/Cm2 & Replacement of pump with High energy efficient pump designed to deliver 600m3/hr. flow at 2kg/cm2	200	365	73000	**0.073**	495670.00	**0.50**
2	BFP#3 SP power consumption running high up to 2.15%, system check and found its ARC valve having passing. Ask the vendor regarding passing. He came & during inspection it is found that stem and valve seat found damage. It is replaced under warranty on FOC Basis. After replacing SP consume. reduced up to 1.81% and Saving is approx. 30 Kw*24h=720 Kwh/day.- Saving in APC is 0.09%. Saving in cost@₹ 7.63= 20 lac / Annum. We also saved the cost of new ARC@ 5-6 lac. It is done in FOC by little bit efforts.	720	365	262800	**0.263**	1784412.00	**1.78**
3	CHP Bucket Elevator 1 &2 Operation with Single VFD based one selection	25	150	3750	**0.004**	25462.50	**0.03**
4	Cooling Fan Installation in GT-1 Radiator cooling to reduce losses	5	365	1825	**0.002**	12391.75	**0.01**
5	LED Installation in place of HPSV at DG and CHP Area	9	365	3285	**0.003**	22305.15	**0.02**
6	Boiler Drum level control on cascade DP mode operation	21	365	7665	**0.008**	52045.35	**0.05**
7	Bed Ash cooler 1A & 1B Auto Start/Stop along with close loop operation	15	365	5475	**0.005**	37175.25	**0.04**
8	BFP-3 suction filter cleaning improvement job without taken shutdown (6 nos. shutdown avoided for 4Hrs.)	12	365	4380	**0.004**	29740.20	**0.03**
9	Air loss trap installation in place of Electronic drain at air receivers	72	365	26280	**0.026**	178441.20	**0.18**
10	Diaphragm drum type pump without power consumption	15	365	5475	**0.005**	37175.25	**0.04**
11	Boiler Fan power reduction through PID fine tune as per type of coal used for feeding	352	365	128480	**0.128**	872379.20	**0.87**
12	VAM & AC Power reduction initiatives by reducing Minimum RPM locking and set point reduction & VAM & AC Power reduction initiatives by reducing Minimum RPM locking and set point reduction.	6	365	2190	**0.002**	14870.10	**0.01**
13	MOT mist fans vent line of both TGs modified. In old system both vent goes to down tank at ground floor and than vented in air. Due to this fan takes more power to discharge vapours in air and also oil waste in air in vapour form.	50	365	18250	**0.018**	123917.50	**0.12**
14	Boiler fan Power reduction by Process optimization.	157	365	57305	**0.057**	389100.95	**0.39**
15	Compressor power optimization through process optimzation	128	365	46720	**0.047**	317228.80	**0.32**
16	PA and SA fan Bell mouth suction duct 08 Nos. wire mesh size increased upto 4 sq. Inch from 1 sq. inch. power saving approx. 100 Kwh /day. Saving in APC is 0.01%. Saving in cost@₹ 7.63= 2.80 lac / Annum.	100	365	36500	**0.037**	247835.00	**0.25**

Heat Rate		**Kcal (Million)**	**Coal (MT)**	**Rs. (8000)**
17	Turbine Heat rate improvement by increasing the turbine inlet steam temp by 3 Deg .C	**1692.432**	**0.30**	**2.40**
18	HP Heater drain bypass valve leakage rectification increased temp up to 5.3Deg.C	**5093.61588**	**0.90**	**7.21**

GHG Inventorisation and Publication

Specific CO_2 Emission of TPP (MT CO_2/MW)

1. Use low Sulphur Fuel (With blending of Different Coal).
2. Use Raw Mill Power & Crushed Lime Stone for Sulphur capturing.



Green Power

- 8.9 MWp Solar power installation done and power generate Avg. 45 to 50 MW/day.
- 482KWp Roof top solar plats installed at Druga colony and staff colony school buildings.
- Study have been done for 13 MW WHRS.
- 1.5MWp Expansion is going on at Loader colony area
- Feasibility study is planed for roof top solar plats at thermal power plant

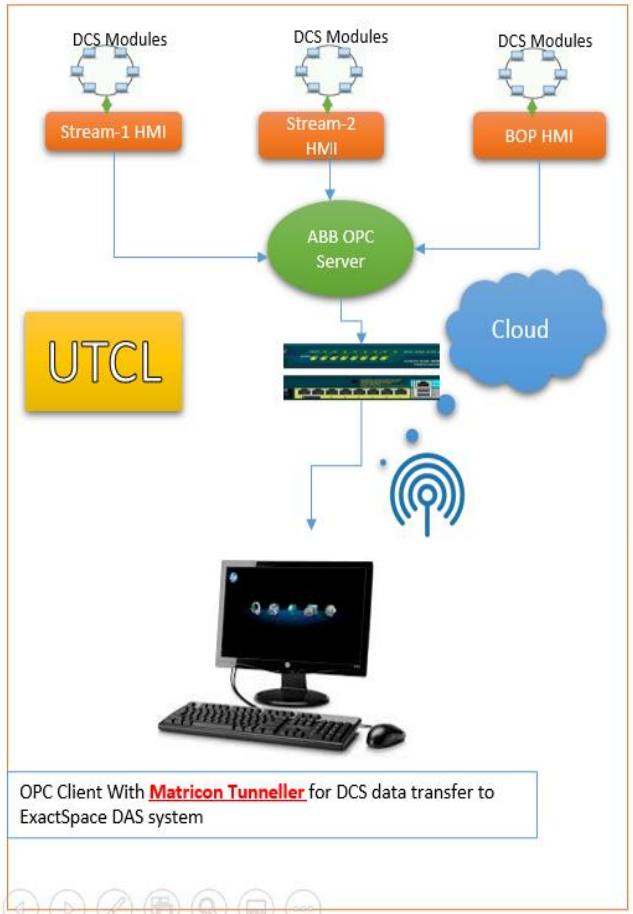
100% Green House Building :

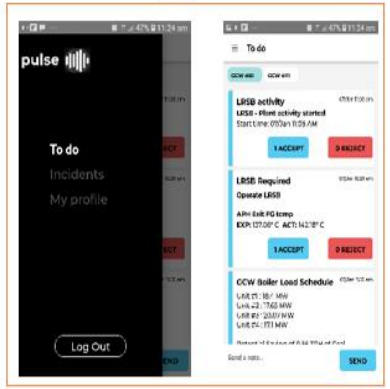
VCW Hospital, ABPS School , ABHSS- School , e3 Cinema Hall, Shopping Complex, and young manager home buildings

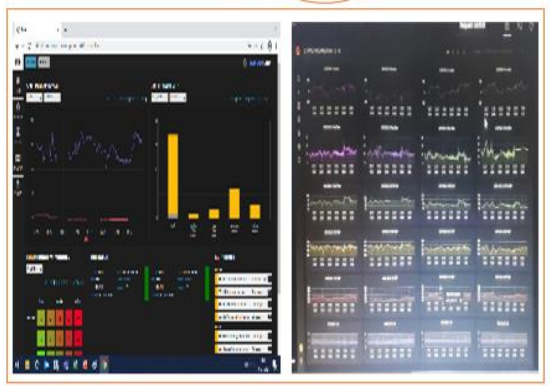
8.9 MWp Solar power Generating 45 to 50 MW/day power

482 KWp Roof top Solar plats power Generating Power 1.5 to 2.35 MW/day

System Architecture







Benefits :

1. Reduction in Unplanned Failures by 10%
2. Maintenance costs reduced by 5%.
3. Improvement in Overall Heat Rate by around 10 Kcal/kWh
4. Improvement in decision making through system supported advisories and discipline to maintain operating parameters consistently (irrespective of individual operator's decisions)
5. Help operating team to act proactively on change in pattern of critical parameters of equipment (through triggering of alarms)

Advanced Artificial Intelligence solution for Improved Boiler Reliability and Performance

Best Practices in the Plant *(Reliability : Non-Energy Efficiency)*

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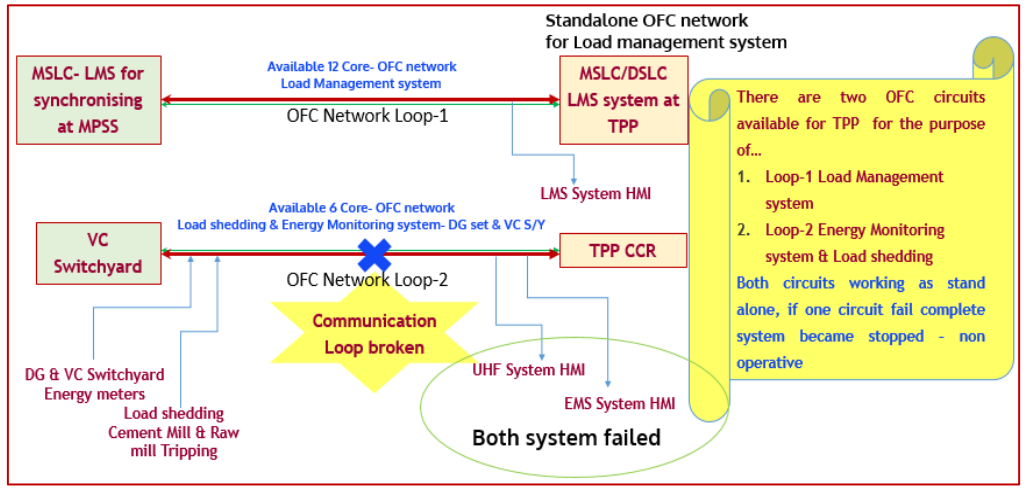
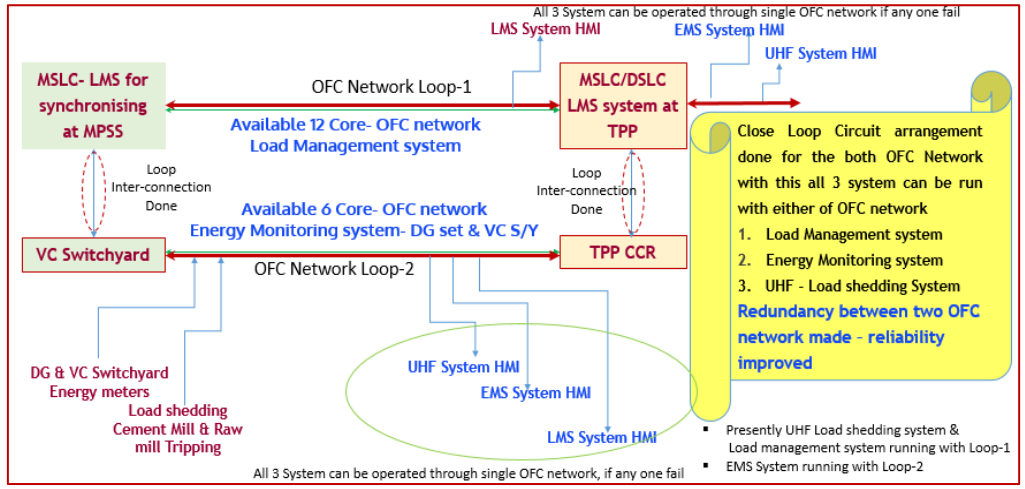
Reliability Initiative

Before: Stand alone OFC network for EMS and LMS

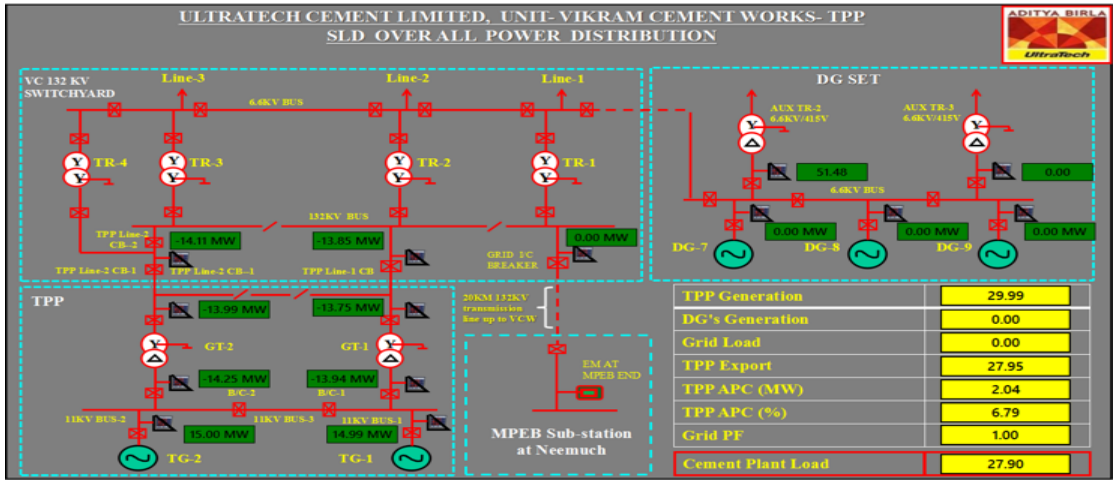


After: Redundant OFC network for EMS and LMS



Digitization

EMS system Hook up with DCS Plant automation System



Best Practices in the Plant *(Reliability & Safety: Non-Energy Efficiency)*

Environment Initiative

Fugitive dust control during fly ash bulker loading

Before

Fork type level sensor

After

Vibrating rod type sensor

Safety Initiative

Pull rope type switch installed in all take-up pully

Before

After

Energy Monitoring Review Mechanism

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MEA Report findings

MPR Meeting

REPORT			Today			MTD	
Area	Parameter	Ref. value / Design Value	Line # 01	line # 02	Combined	Total	Aug
	Generation (KWH)		318000	4E+05	684000	1352000	19176000
	Auxilliary (KWH)		24400	28400	52800	104000	1515811
	Auxilliary (%)		7.67	7.76	7.72	7.69	7.91
	Auxilliary from cement plant						
	Auxilliary % (cement plant)						
	Total Steam Generation (MT)		1336	1535	2871	2871	115333
	Specific Steam Consumption(Kg/kwh)		4.20	4.19	4.20	4.21	4.19
	Shut Down power		0	0	0	0	
	Plant Load Factor (%)	100	57.61	66.30	61.96	61.23	58.8800
	Avg.Load (MW)	23	13.25	15.25	28.50	28.17	27.05
	Gross Heat Rate (Kcal/Kwh)		3017.67	####	3014.80	3016.78	3014.38
	Ambient Air Temperature (avg/max/min)		27.94/34.26/24.58				
	Power Cost (Rs./KWH)		4.60	4.63			
	Fuel Cost (Rs./KWH)				3.73	3.75	
	Lime Stone Cost (Rs./KWH)		0.040	0.040	0.040	0.040	
	Fix cost (Rs./KWH)						
	Electricity Duty (Rs./KWH)					0.75	
	RPM (Assumption as per flash)					0.099	
	Stores & Spares (Rs./KWH)					0.052	
	Fly ash Credit @814 Rs/MT (Rs/kWh)		0.080	0.085	0.081		
	Boiler Efficiency (%)		87.52	87.52	87.52	87.36	87.41
	Fuel Consumption (Kg/KWH)	0.421	0.452	0.451	0.452	0.4518	0.423
	Coal Consumption (MT)		154.42	154.42	308.84	610.86	8028.69
	Coal GCV (Kcal/KG)		6677	6677	6677	6677.00	7107.66
	O2 Average (%)	2.5%-3.5%	4.60	4.74			
	coal feeder status	OK / Not OK	Ok	Ok			
	Bed ash coolers status	OK / Not OK	Ok	OK			
	Wind Box pressure (mmwc)		890	900			
	LOI FA/BA (%)	<2.5	7.24	6.94			
	BLAINE FLY ASH(sqmtr/kg)						
	Lime Stone Consumption		20.12	25.43	45.55		
	Fly Ash Generation		31.18	38.23	69.41		
	Soot Blower status	OK / Not OK	Ok	Ok			
	Total Coal Feed (MT)		394.7				
	CHP Run Hrs		11.12				
	CHP Average Feed rate (TPH)		48.51				
		mm 8	1.52				

27.08.2019 | 28.08.2019 | 29.08.2019 | 30.08.2019 | 31.08.2019

KPI's review meeting

TPP Daily Report

09-Sep-19

Parameters	Units	Budget Unit-1	Budget Unit-2	Budget Total	Today Unit-1	Today Unit-2	Today Total	MTD Unit-1	MTD Unit-2	MTD Total	YTD Unit-1	YTD Unit-2	YTD Total
Plant Performance													
Availability Factor	%	100.00	100.00	100.00	100.0	100.0	100.0	100.0	100.0	100.0000	46.4	99.6	72.9
STG Running Hours	Hrs	744.00	744.00	1488.00	24.0	24.0	48.0	72.00	72.00	144.0000	1738.5	3720.0	5458.5
Plant Load Factor	%	49.04	78.70	63.87	54.71	62.32	58.51	56.64	64.01	60.33	56.29	79.44	67.86
Gross Generation	KWH	8352000.00	13468000.00	21860000.000	302000	344000	646000	938000	1060000	1998000.00	21596000	67956000	90472000
Aux Consumption	KWH	695000.00	1077000.00	1772000.000	23800	27000	50800	75200	83300	154800.00	1820715	5805612	7626328
	%	8.32	8.07	8.11	7.88	7.85	7.86	7.73	7.76	7.75	8.05	8.54	8.43
	Kwh	0.00	0.00	0.00	0	0		428	0	428.0000	45305	0	45305
Aux. Power from Cement Pl	Kwh	0.00	0.00	0.00	0	0	0	0	0	0.0000	0	0	0
Aux. power including SD		8.37	8.07	8.18	7.88	7.85	7.86	7.77	7.76	7.77	8.29	8.54	8.43
Net Generation	MWh	7650000.00	12380000.00	20071000.00	278200	317000	595200	865091	977703	1842793.80	20599999	62160388	82800387
Average Load	MW	11.28	18.10	14.69	12.58	14.33	26.92	13.03	14.72	27.75	13.95	18.27	31.22
TG I/L Steam	MT	0.00	0.00	0.00	1268	1442	2710	3949	4451	8400.00	94985	284450	379333
Steam from Boiler-1	MT	0.00	0.00	0.00	1268	0	1268	3949	0	3949.00	93077	0	93077
Steam from Boiler-2	MT	0.00	0.00	0.00	0	1442	1442	0	4451	4451.0000	1906	284450	286456
Sp. Steam Cons	Kg/Kwh	0.00	0.00	0.00	4.20	4.19	4.20	4.21	4.20	4.20	4.18	4.34	4.15
Turbine Heat Rate	Kcal/KWH	0.00	0.00	0.00	3541	2638	2628	2606.78	2606.86	2606.82	2655	2622	2625.45

tpp daily Report

Daily Energy Rev. Meeting

DAILY AUXILARY POWER REPORT

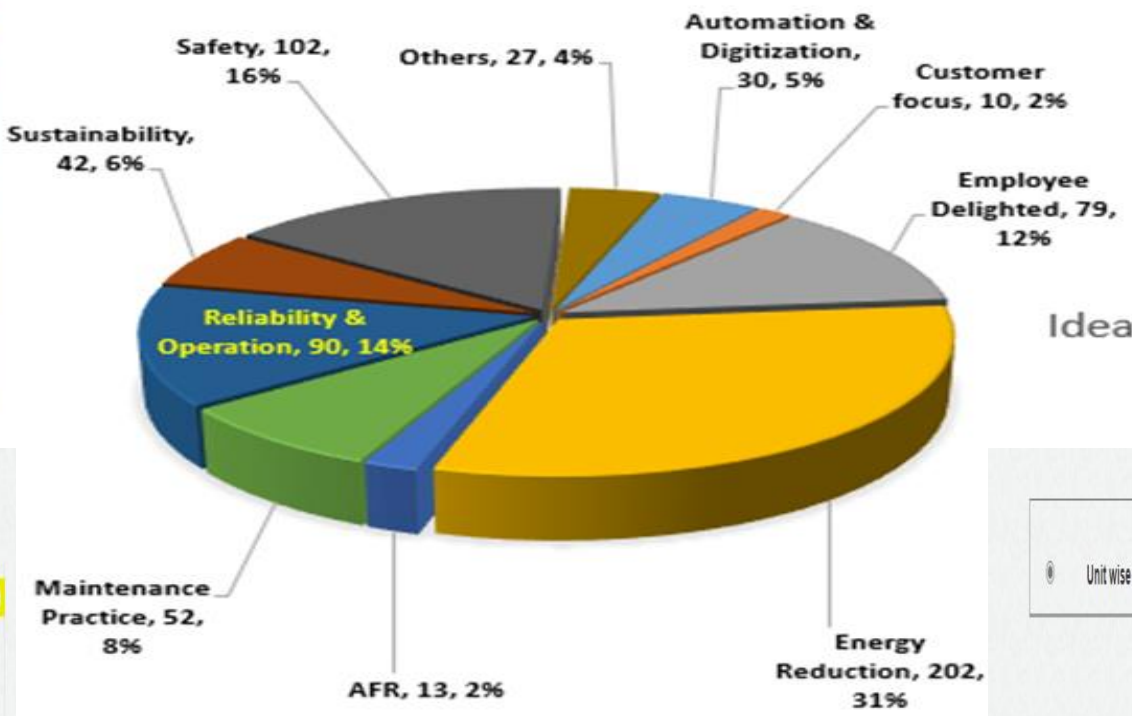
Report Date: 2019-09-03

Sr. No.	System description	Equipment Name	Rated Load (KW)	2019-09-03 Today Average	2019-09-03 Today Today	2019-09-03 Today Sum of Aux.	2019-09-03 Today SEC	2019-09-03 Today % Aux.	2019-09-02 Monday Y. Day	2019-09-02 Monday Sum of Aux.	2019-09-02 Monday SEC	2019-09-01 Sunday Y. Day	2019-09-01 Sunday Sum of Aux.	2019-09-01 Sunday SEC
1	Boiler System	ID FAN-1	1120	98	1972				2019			2012		
2		PA FAN-1	450	282	6593				6542			6421		
3		SA FAN-1(LT MOTOR)	250	21	410	9667	7.62	19.03	501	9758	7.41	429	9570	7.39
4		P. FAN-1	185	0	0				0			0		
5		Boiler-1 Auxiliaries	338	26	692				697			708		
6		ID FAN-2	1120	87	2244				2623			2365		
7		PA FAN-2	1000	312	7357				7881			7541		
8		SA FAN-2 (LT MOTOR)	250	39	604	10769	7.34	21.20	717	11888	7.54	671	11129	7.29
9		P. FAN-2	185	0	0				0			0		
10		Boiler-2 Auxiliaries	336	55	564				567			552		
11		BFP-1	1000	0	0				0			0		
12		BFP-2	900	585	13677	13677	2.12	26.92	14323	14323	2.09	14106	14106	2.11
13		BFP-3	900	0	0				0			0		
14	Compressed Air System	Service Comp-1	275	0	0				0			0		
15		Service Comp-2	275	0	0				0			0		
16		Service Comp-3	275	0	0				0			0		
17		Inst. Air Comp-1	100	76	2158	2610	0.40	5.14	1867	2311	0.34	1860	2213	0.33
18		Inst. Air Comp-2	100	42	167				158			99		
19		Inst. Air Comp-3	100	43	22				38			14		
20		Ash handling and Compressor syste	86	25	262				247			239		
21	Turbine System	TG-1 Auxiliaries	518	36	302				296			299		
22		TG-1 ACC	6 X 110	71	1307	2138	0.71	4.21	1438	2292	0.72	1397	2241	0.70
23		TG-1 CEP	2 X 90	22	529				558			545		
24		TG-2 Auxiliaries	606	63	823				814			808		
25		TG-2 ACC	6 X 110	55	1060	2445	0.71	4.81	1169	2597	0.71	1092	2477	0.71
26		TG-2 CEP	2 X 90	24	562				595			577		
27		ACV-1	132	0	0				0			0		
28		ACV-2	132	60	1417	1648	0.26	3.24	1412	1586	0.23	1336	1501	0.22

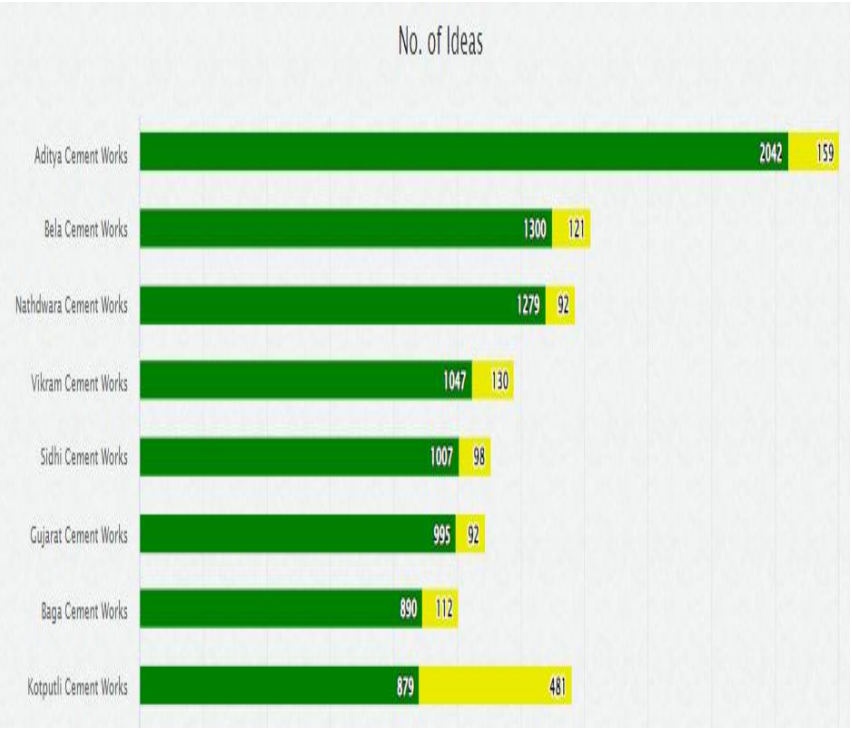
Aux. Report

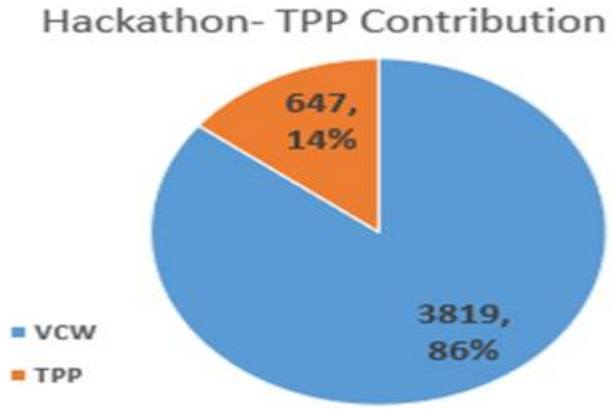
Team Work , Employee Involvement & Monitoring

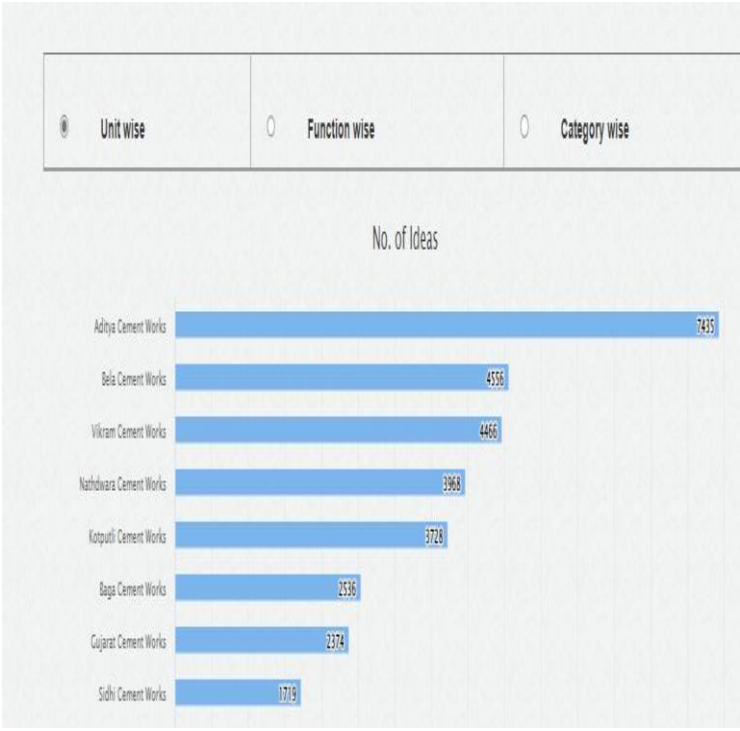
Confederation of Indian Industry



Ideation Drive at Unit Level

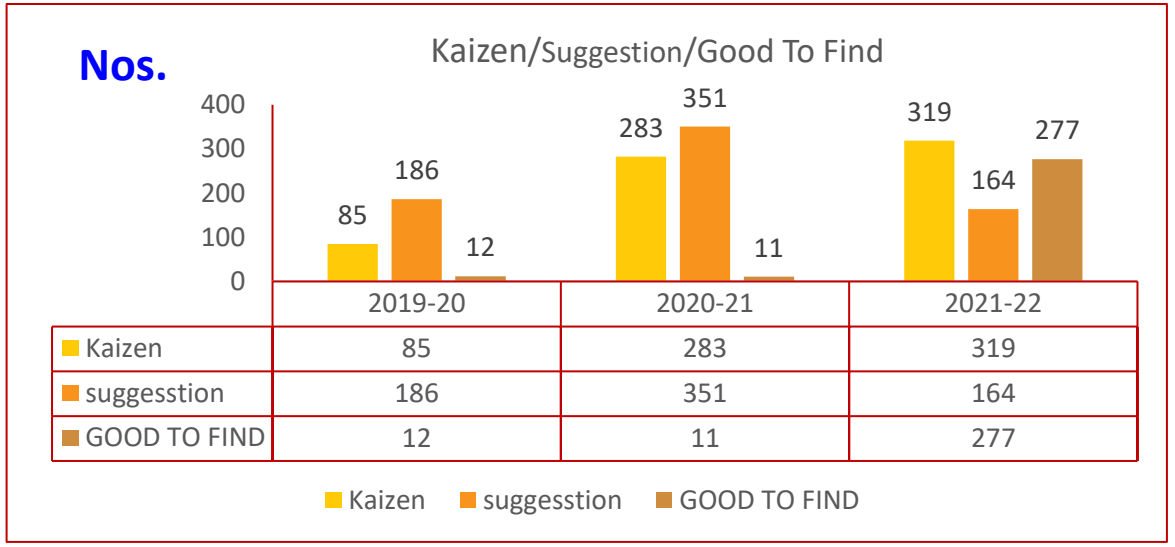


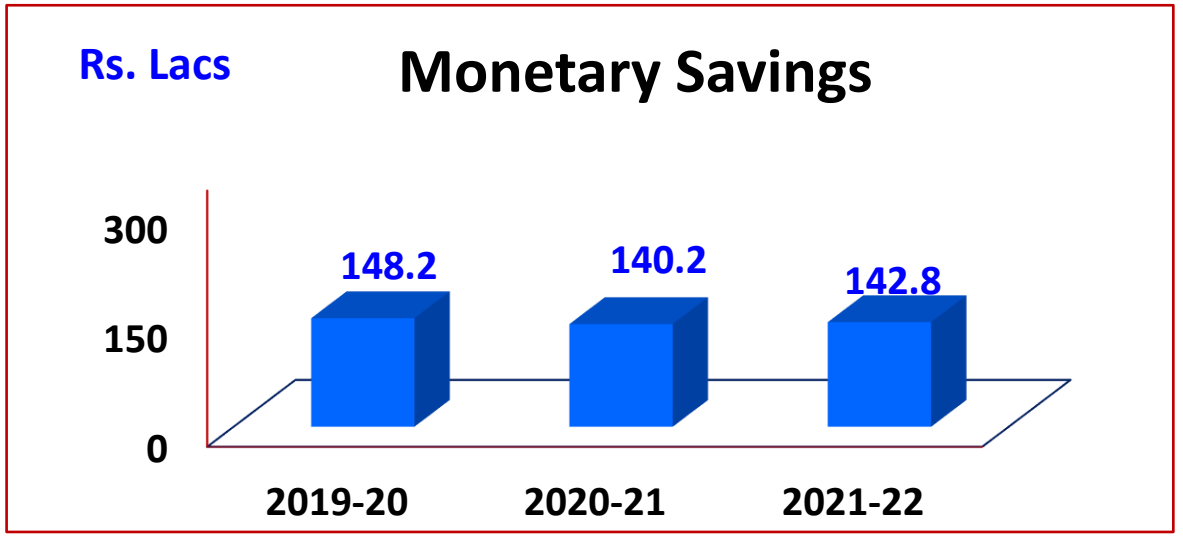




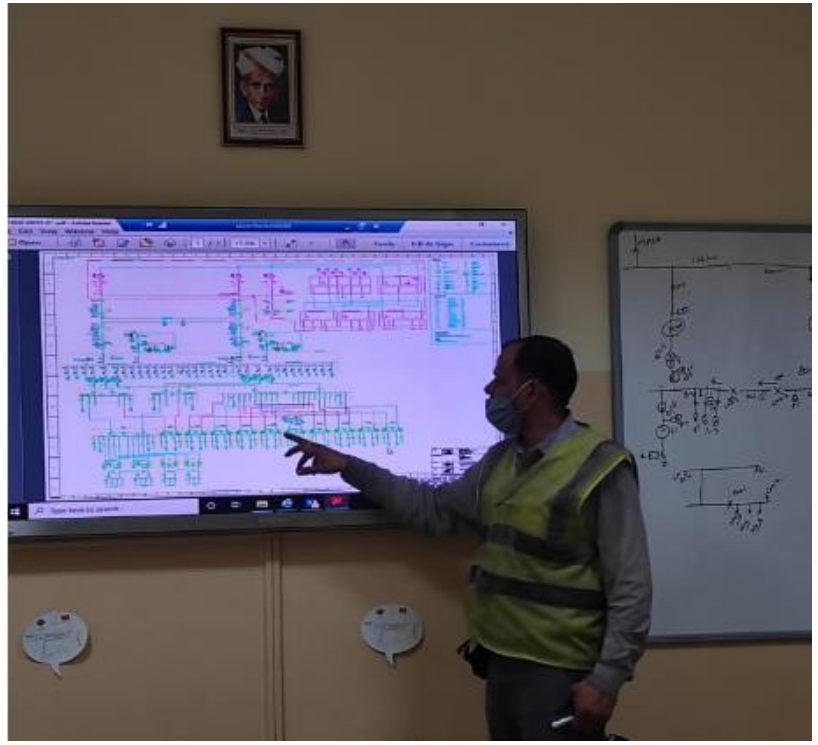
Employee Involvement & Team working

- Kaizen & Suggestions Schemes
- Annual Improvement Projects
- Organization Knowledge
- KIP Visits
- External & Internal Trainings on Energy
- Participation in Seminars
- Team competition
- Energy Conservation Week
- Awareness creating to all Colony residents for Energy Conservation
- Online Training need identification through Poornata on Energy Conservation
- Reward & Recognition





Employee Engagement – Training on Functional topics/OJT



Unit-1 LT Drives Preventive Maintenance Activities Pic

Control Valve Dismantling, Gasket Replacement, stem, seat, cage, aping, blue matching & calibration

Implementation of ISO certification

Confederation of Indian Industry

Energy Management System Standard

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

ULTRATECH CEMENT LIMITED
Unit: Vikram Cement Works, Vikramnagar, P.O.Khor, District Neemuch - 458470, Madhya Pradesh, India

has been found to conform to the Energy Management System standard:
ISO 50001:2011

This certificate is valid for the following scope:
Manufacture of cement.

Place and date:
Barendrecht, 24 May 2018

For the issuing office:
DNV GL – Business Assurance
Zwolseweg 1, 2994 LB, Barendrecht, Netherlands

Eric Kosk
Management Representative

MGMT. SYS. RvA C 024

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

1.0 Reduction in Fuel Cost

Theme	**Reduction in Fuel cost by use low-cost Fuel ,blending with high GCV Coal.**
Problem	Present Fuel cost is increasing continuously and had reached up to 1400 Rs/MCV. This high Fuel cost is resulting in increase of TPP Generation cost.
Solution	• Carbon shale was introduced in ratio of 10 % by heat in Boiler and trial was taken . Trial was successful and we had now reached to 20% fuel mix.
Benefit	• **Saving in Fuel cost by 160 Rs/MCV for 20% of Carbon shale used with Imported coal and reduce Power Generation Cost.** • **Increase Fly ash Generation due to use of High ash coal.** • **Total saving in terms of Imported Aus. coal (March to June'21) - 113.28 Lacs**

Coal Shale

2.0 Best Practices : Energy saving *(Innovative project)*

Theme

Air loss trap installation in place of Electronic drain at air receivers

Problem

It was observed that there was loss of compressed air every time when electronic drain operates; it was not much reliable as we must manually set timer & it is not operated on water level / moisture content basis.

Solution

Electronic drain by air loss trap drain, which can help to discharge Moisture only & trap compressed air by balancing .There is no loss of compressed air hence optimizing compressor power .

It also increase system reliability as Discharges condensate as soon as it is formed.

Following features are also available in air loss trap system

- ✓ **Leak proof operation**
- ✓ **Can be repaired online after proper separation**
- ✓ **Robust & Reliable**

Benefit

- ✓ **Discharges condensate as soon as it is formed**
- ✓ **Can handle large quantities of condensate.**
- ✓ **Avoids corrosion of compressed air lines and consumers.**
- ✓ **Power Optimisation by 355 kwh/day, saved Rs. 11.01 Lacs/ annum**
- ✓ **Reduced manpower intervention , increasing safety**
- ✓ **S&S cost reduction upto Rs 0.20 lakh per auto drain**

Before

After

3.0 Best Practices : Energy saving *(Innovative project)*

Theme

Boiler Fan power optimization by Process parameter optimization along with Advance process optimizer (Digitalization)

Problem

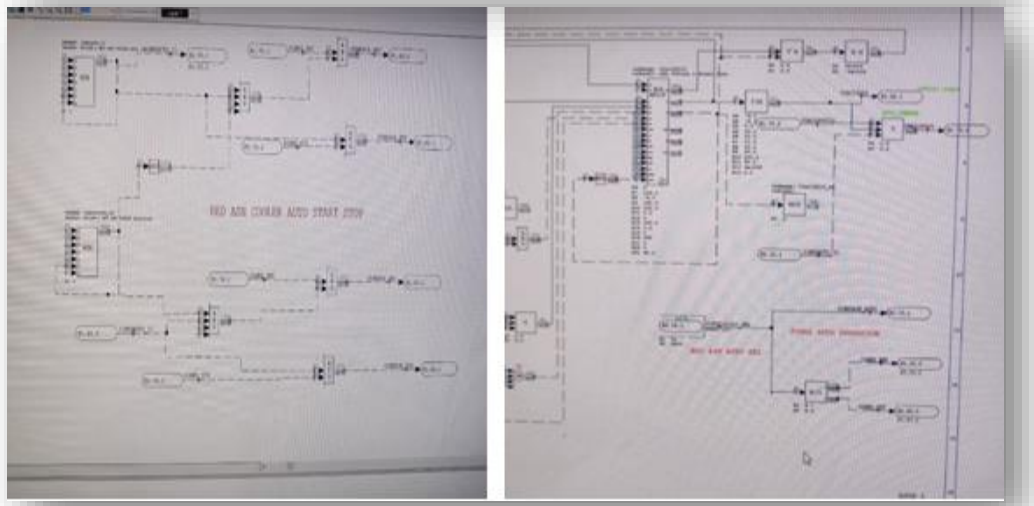
Higher Specific fan power consumption for Boilers-1&2 .

Solution

- Optimization of Bed height 8.5 Mpa to 7.8 Mpa.
- Maintain Optimum Bed temp. (925 °C To 938 °C) according to power demand of Cement Plant.
- Maintain Sufficient Oxygen level in Boiler 4.0% to 3.5 %.
- Both Boiler and Plant running on Island Mode.
- APC optimizer maintained constant Pressure (90 Kg/Cm2) and Temp (540 °C .) of Main Steam along with all above parameters in cascade operation.

Benefit

- ✓ Boiler-1&2 Fan power reduced by **980 Kwh/day** (i.e. optimized **sp.Power 1.10 kwh/MW of generation, in Rs. 27.48 lacs/ annum**).
- ✓ Eliminated manual intervention



4.0 Best Practices : Energy saving *(Innovative project)*

Theme

Boiler Drum level control on cascade DP mode operation

Problem

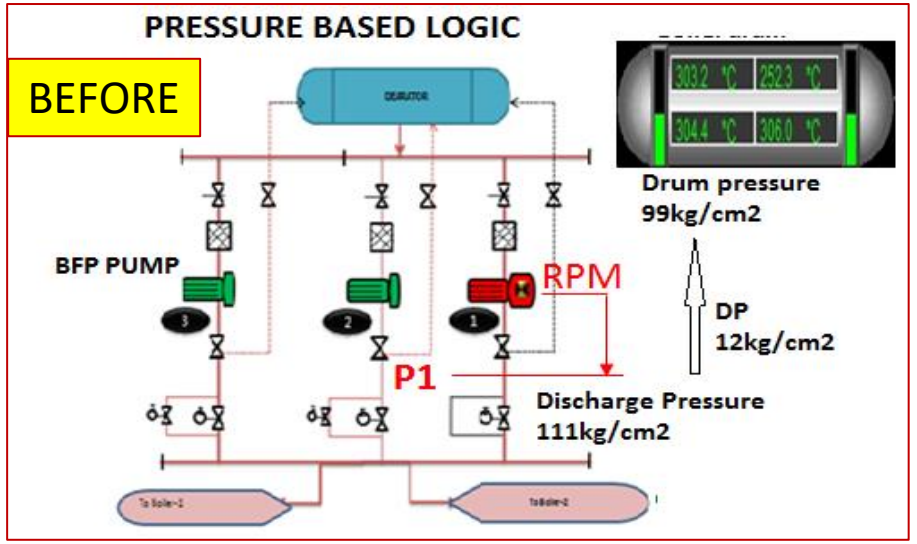
- High Specific Energy Consumption of BFP due to pressure fluctuation.
- BFP operates in Auto in drum level, hence BFP discharge pressure fluctuating
- High pressure drop across control valve due to maintaining high discharge pressure set point

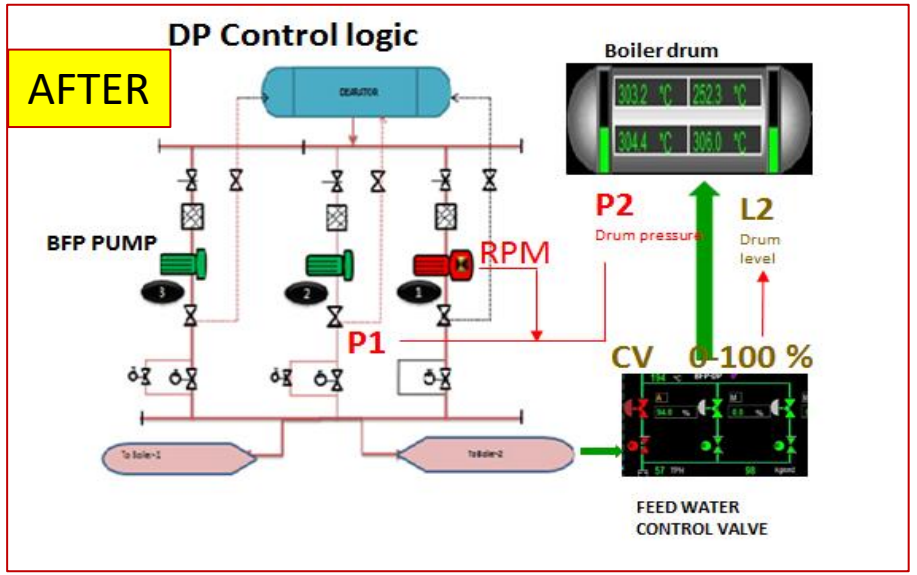
Solution

- DP logic developed on cascade operation considering power generation, Boiler steam flow, Steam temperature & Boiler drum. BFP Minimum RPM Locking reduced from 87% to 83%
- BFP Standby pump avoid started by changing Header pressure set point 103 kg/cm2 to 97.5 kg/cm2

Benefit

- ✓ **Eliminated manual intervention & pressure fluctuations**
- ✓ **Energy Saving: 482 kwh/day, 159060 kwh /Annum**
- ✓ **Annual Saving in terms of money: 13.52 Rs. Lac**





Way Forward FY 2022-23

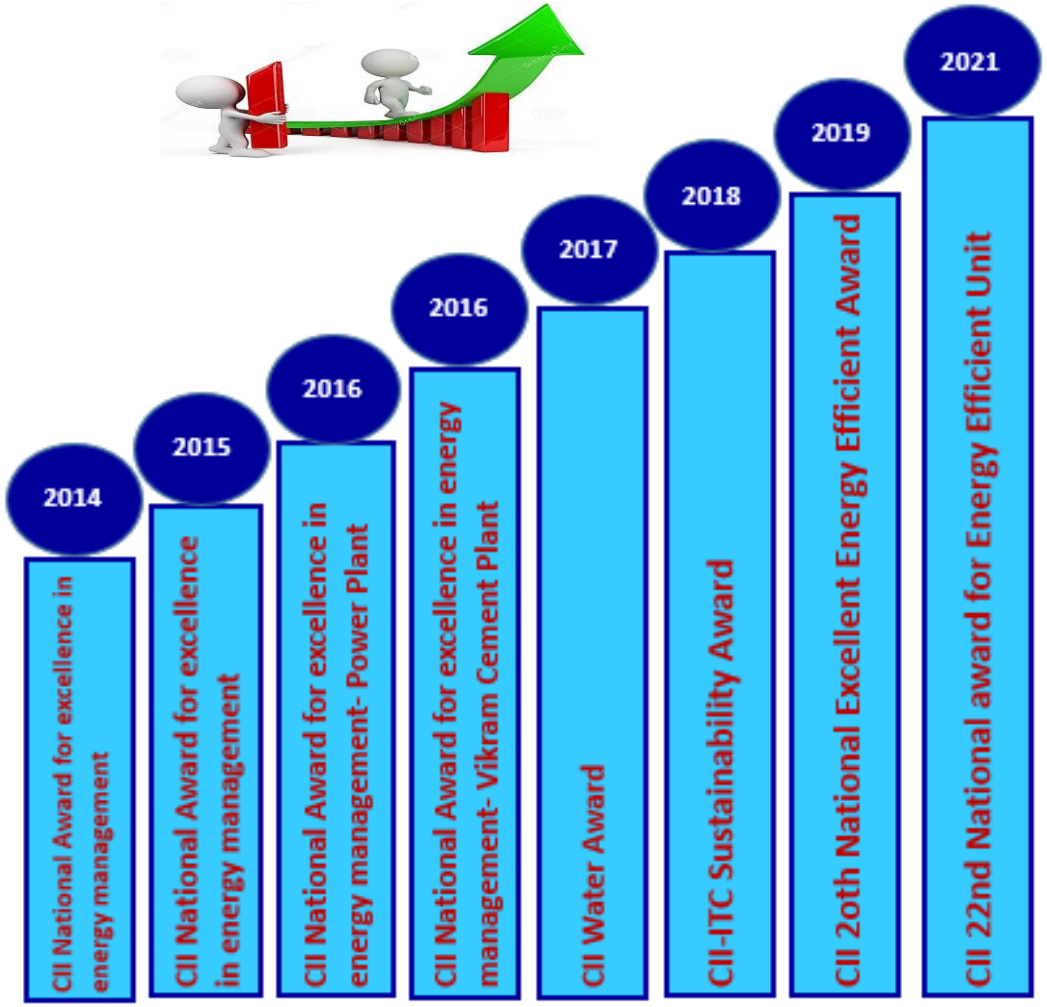
Sl. No.	Improvement Project	kWh/Annum	Saving In Millions kWh	(Rs. in Lac/ Annum)	Saving in Rs. Millions
1	ACC Fan Interconnection to optimization of ACC Pas Power in Summer season	135050	**0.135**	1147925	**1.15**
2	Energy Efficient Condensate Extraction Pump installation.	5475	**0.005**	46537.50	**0.05**
3	APH Tube Bundle Replace in Boiler-1	547500	**0.548**	4653750.	**4.65**
4	Attemperator tapping form BFP dischage for power saving	21900	**0.022**	186150.	**0.19**
5	LT motor 09 nos. with energy efficient motor	9125	**0.009**	77562.50	**0.08**
6	Boiler feed pump replacement for single unit operation	73000	**0.073**	620500	**0.62**
7	Installation of 482 KWp Roof Top solar in Colony areas	70000	**0.070**	595000	**0.60**
8	Solar 1.5 MWp installation under PPA	2190000	**2.190**	18615000	**18.62**
9	8.92 MWp Solar installation under PPA	18250000	**18.250**	155125000	**155.13**
Heat Rate		Kcal/kWh	Kcal	Coal (MT)	Rs. In Million
1	ACC Fan Interconnestion for inprove TG Heat rate by improve vacuum set point from -0.80 to -0.83 Kg/CM2	**24.76**	**4373606400**	**774.09**	**6.193**
2	Feed water drain and steam line drain valves replace with new one.	**0.5**	**88320000**	**15.63**	**0.125**
3	APH Tube Bundle Replace in Boiler-1	**6.85**	**1209984000**	**214.16**	**1.713**

Awards, Accreditation & Recognition

Confederation of Indian Industry

UltraTech Cement Limited, Unit-Vikarm Cement Work received 160 Nos. award and certification in different Categories from 1990 to till date…

Accredited 8 Nos of Awards from CII

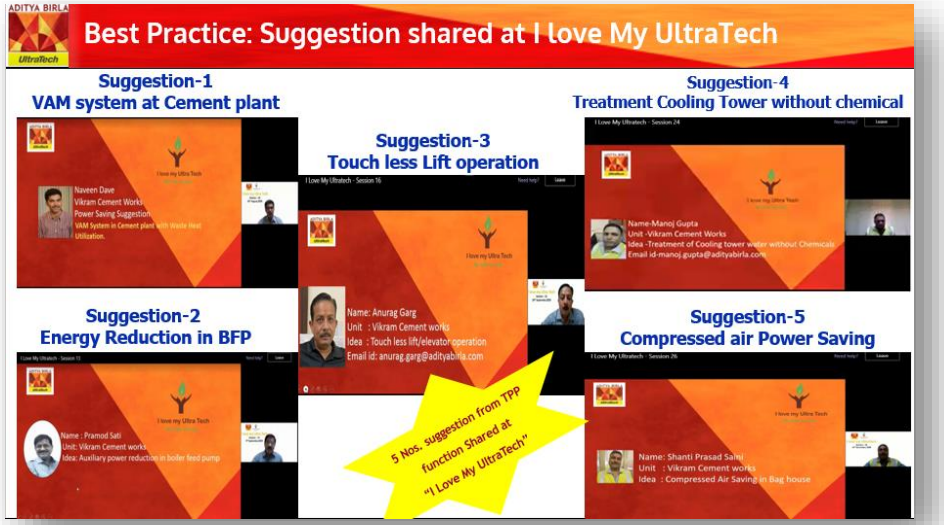


Learning from CII & Other Award function

Confederation of Indian Industry

Learning :

- *Replication of various ideas and proven technology .*
- *Implementation of best practices learned from CII or other award function.*
- *Improving knowledge of the process and new technology.*
- *Avail opportunity to achieve high business benefits.*
- *Learned Project planning ,Execution and Application engineering.*
- *Enhanced uses of various QC tools, Analysis & presentation skill.*



***Sharing*:**

The Success Story of same shared among our group units of

ABG & Idea Sharing Platform " I Love My UltraTech"

"Alone we can think so little; together we can think a lot"

Thanks for Your Sincere & Kind Attention

Presented By:

Praveen Vijayvargiya
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p.vijayvargiya@adityabirla.com

UltraTech Cement Ltd.
Vikram Cement Works
CPP