UltraTech Cement Limited

(Unit: Bela Cement Works-Power Plant)

Welcome to CII 22nd National Award for Excellence in Energy Management 2021

Team Members

1- Mr Dayanand Singh (AGM)

2- Mr. Janakiram Kandregula (AGM)

3- Mr Ramniwas Tripathi (AM)

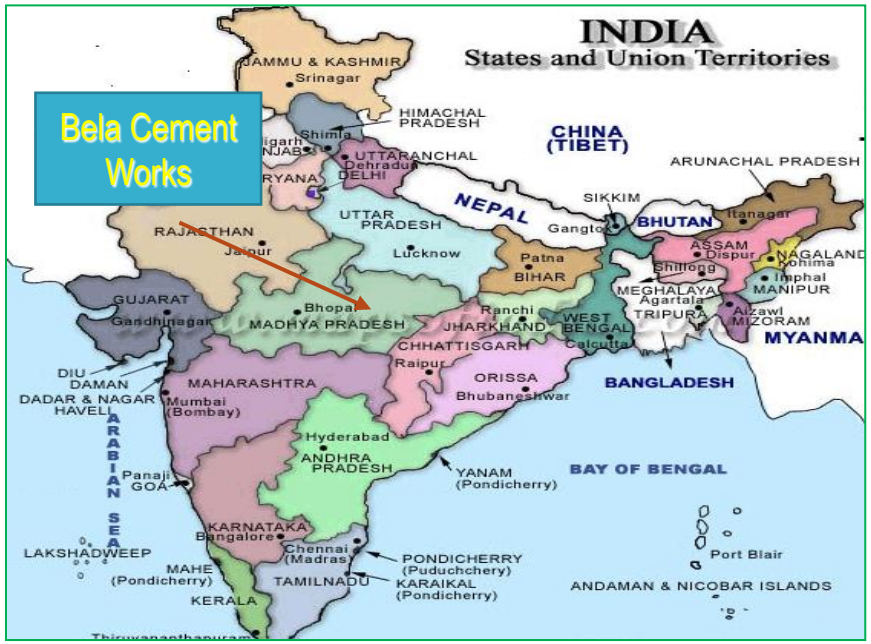
(Bela Cement Works-Power Plant)

Company Profile

- UltraTech Cement Limited is the company of the Aditya Birla Group.
- It is the largest manufacturer of grey cement, RMC and white cement in India
- UltraTech is a founding member of GCCA
- UltraTech reaches out to more than 2.1 million beneficiaries in over 500 villages in 16 states across India
- Internal Carbon Price and Energy Productivity (#EP100) as part of its efforts to accelerate adoption of low carbon technologies

MTPA of Grey Cement	116.75
Ready Mix Concrete plant	100+
UBS stores in India	1000+
Integrated Units	22
White Cement Unit	1
Grinding Units	27
Clinkerisation Unit	1
Bulk Terminals	7
Captive Jetties	5

Annual Sales of Rs. 44,726 crores

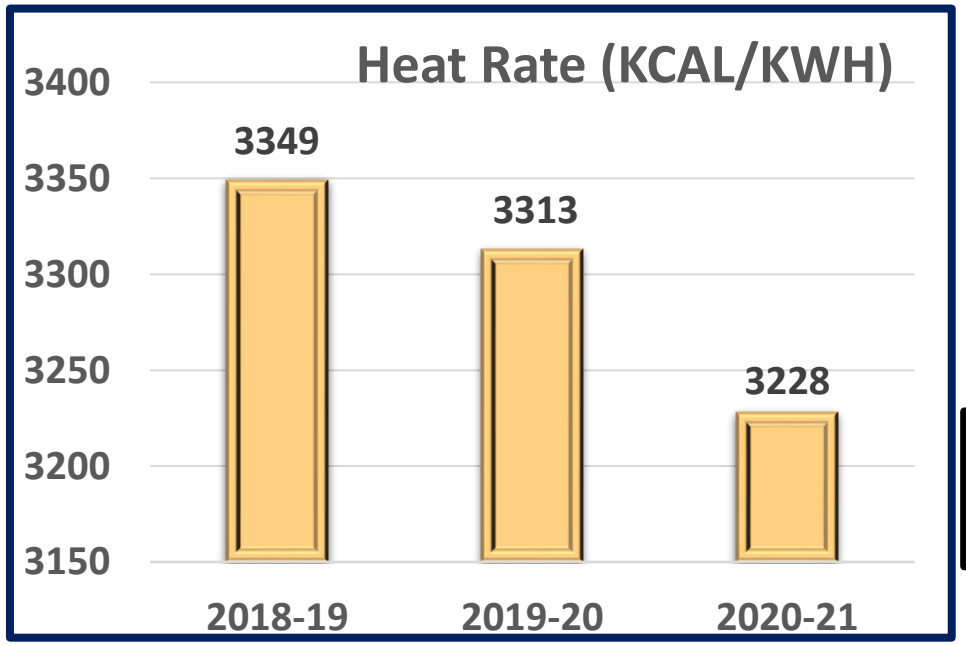


UNIT	CAPACITY
Thermal Power Plant	27MW
Clinker Capacity	2.10 MTPA
Cement Capacity	2.60 MTPA
Packing Plant	5Nos. x 120 TPH

Energy Consumption Overview

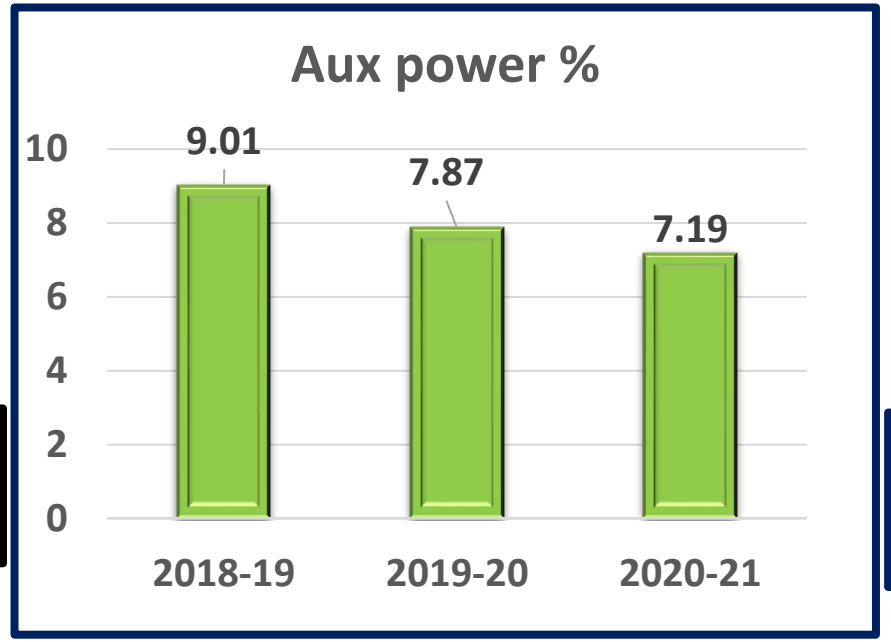
1 Annual Generation	Lacs Kwh	1503
2 PLF	%	75.31
3 Power cost	Rs./kwh	5.35
4 Gross Heat Rate	Kcal/Kwh	3228
5 Auxiliary Power	%	7.19
6 DM Water consumption	Ltr./Kwh	0.06
7 Raw Water Consumption	Ltr./Kwh	0.33
8 Turbine Heat Rate	Kcal/Kwh	2692

Last Year Performance



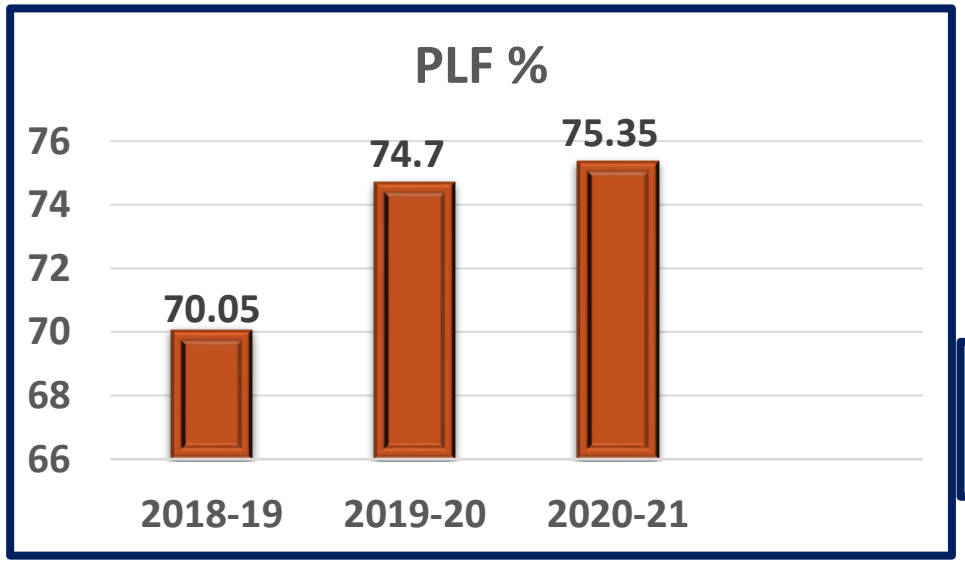
GOOD

Improvement
FY 19-20: 1.07 %
FY 20-21: 2.56 %



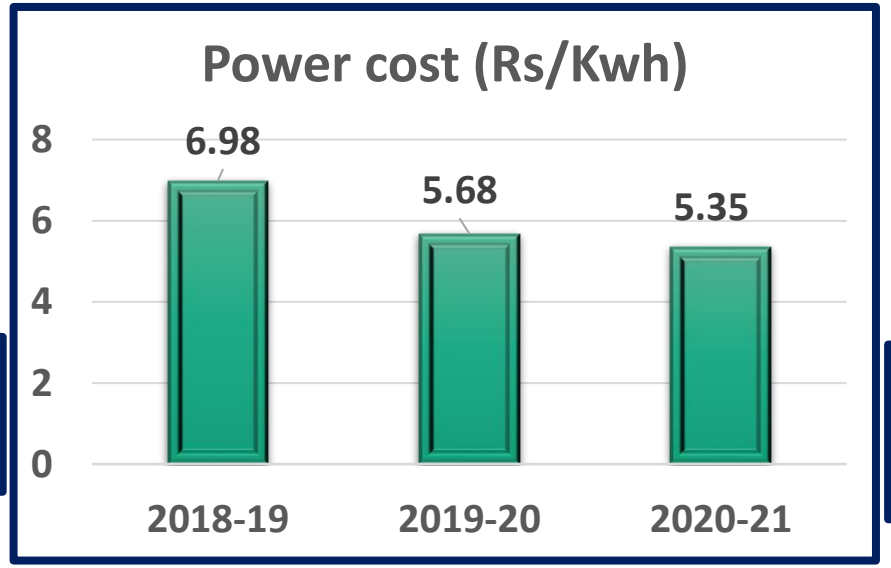
GOOD

Improvement
FY 19-20: 1.14 %
FY 20-21: 0.70 %



GOOD

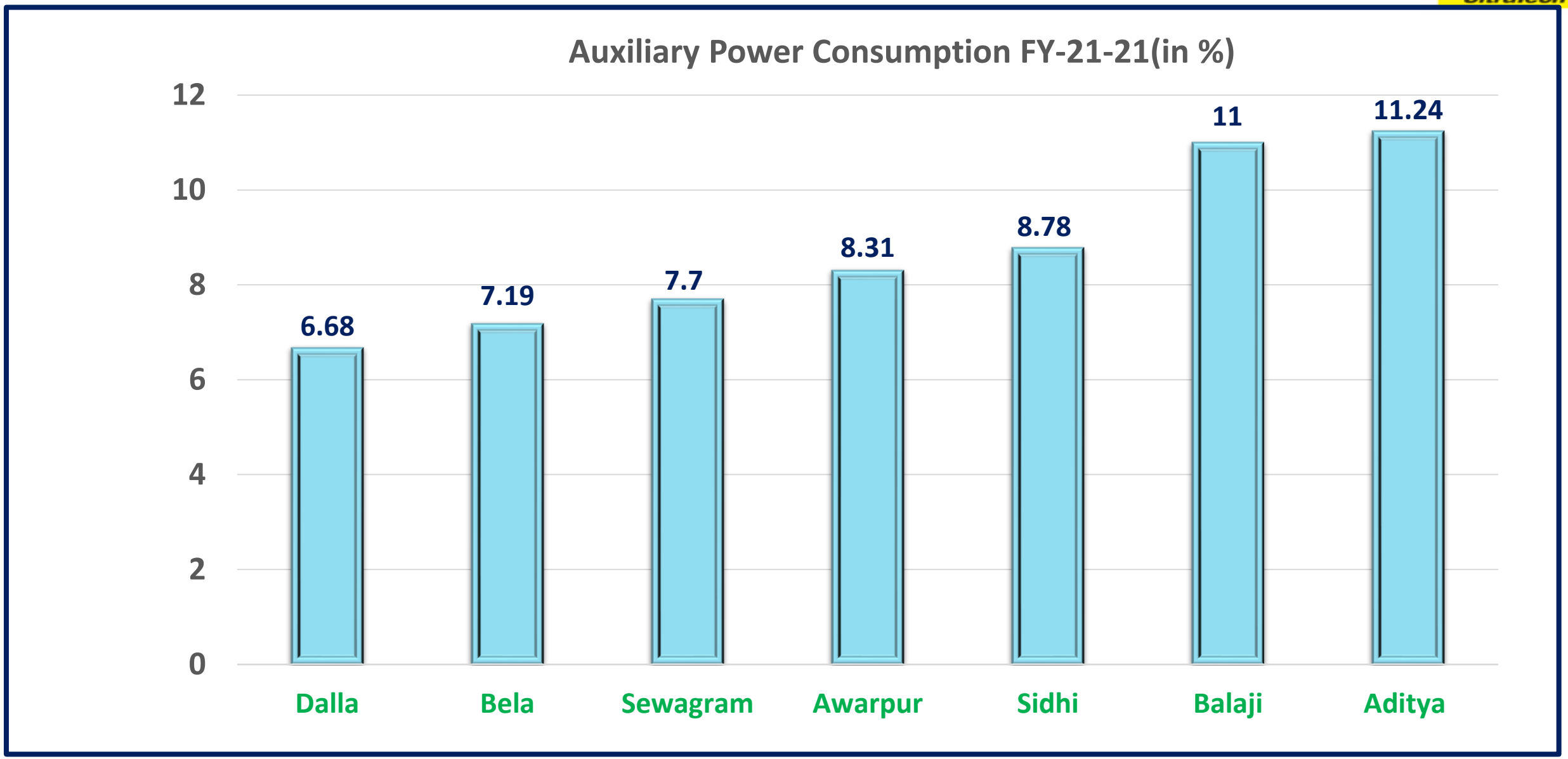
Improvement
FY 19-20: 4.65 %
FY 20-21: 0.65 %



GOOD

Improvement
FY 19-20: 18.6 %
FY 20-21: 5.8 %

Benchmark APC (AFBC Boilers UTCL)



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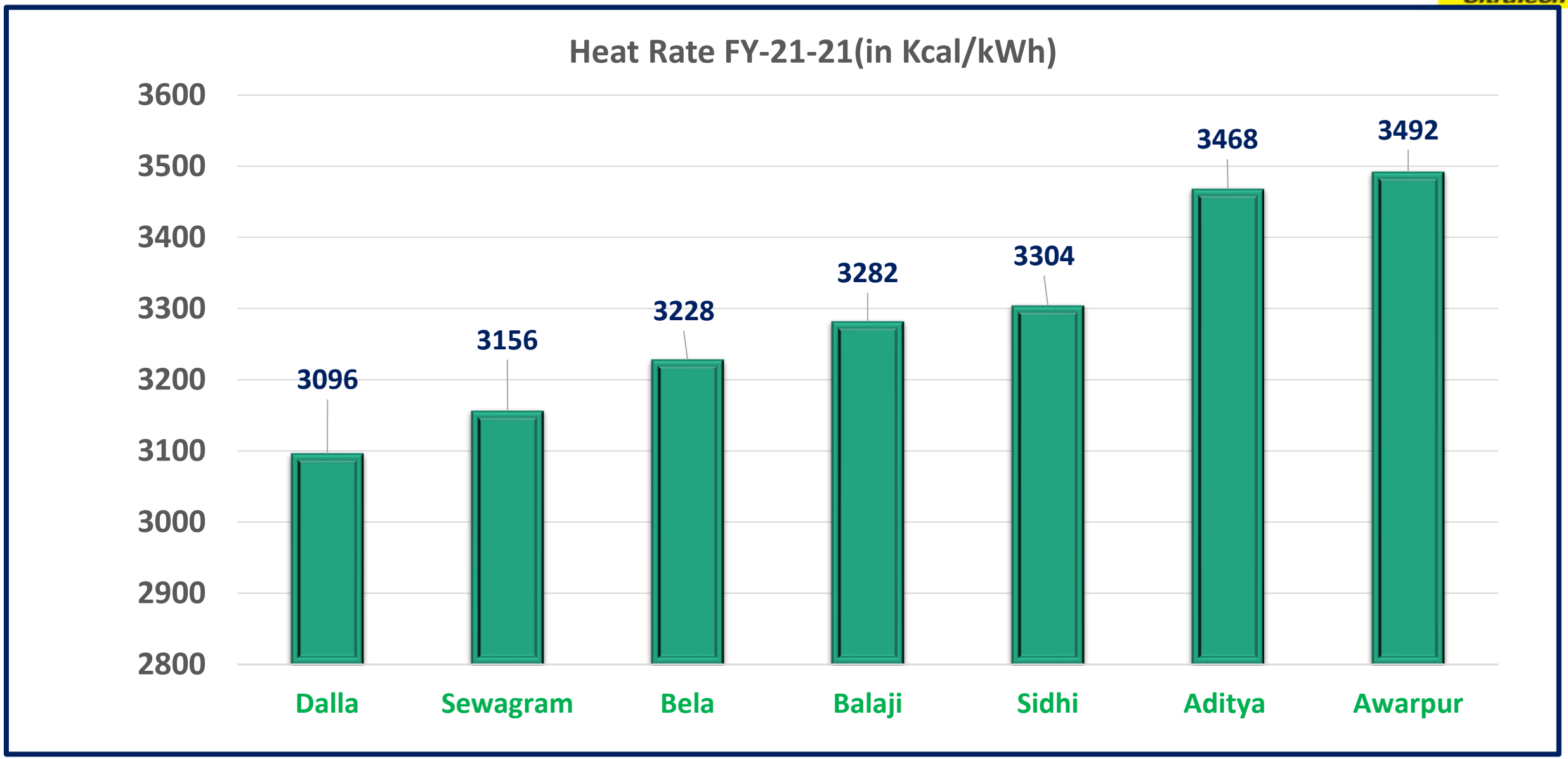
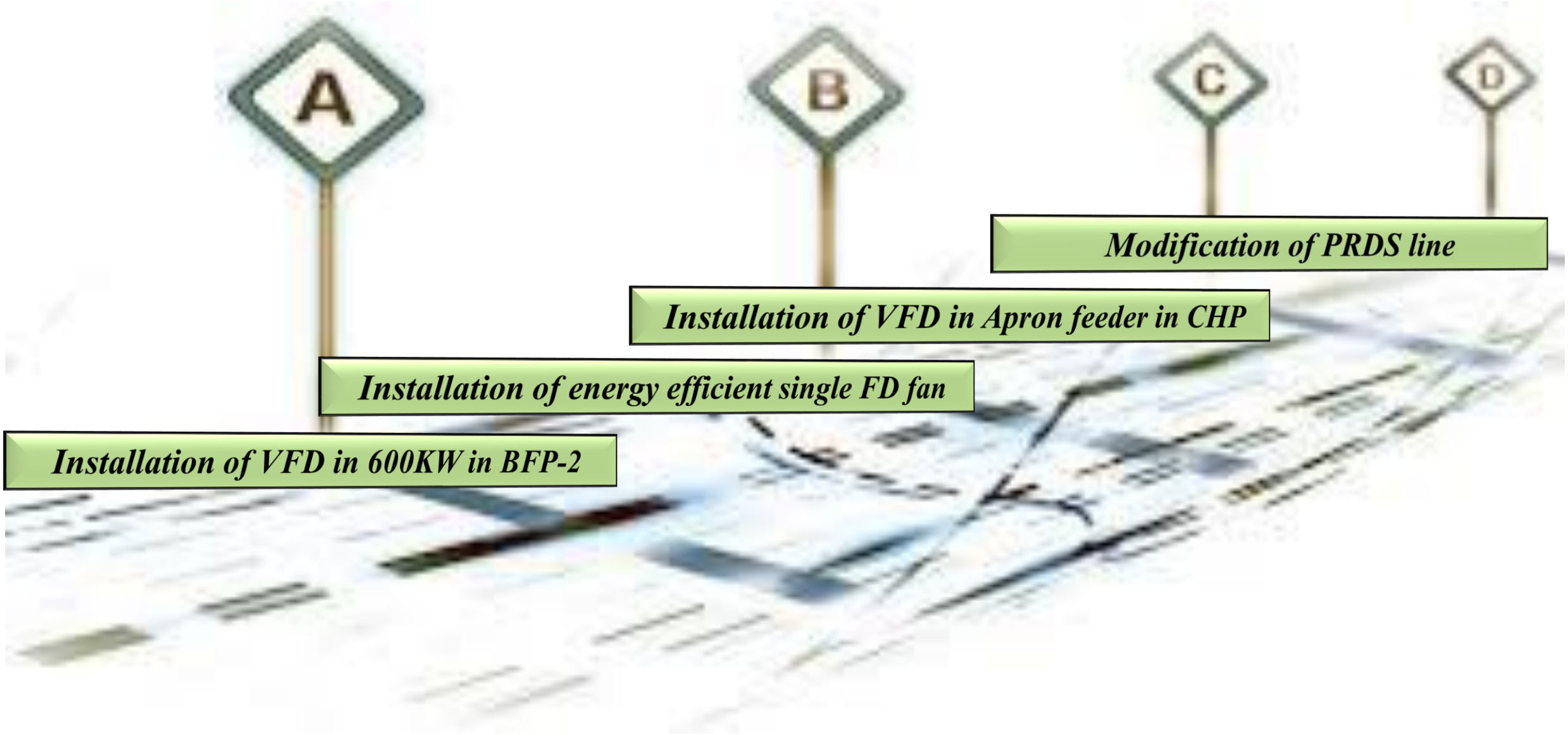


Road Map for Achieving Benchmark



Saving in Last Three Year through En-Con Project

Savings in million: 24.24

- Investment in million: 9.5
- Electrical Saving(Million kWh): 3.498
- No of Proposals:5
- Thermal savings(Million Kcal): 0.0

Savings in million: 9.5

- Investment in million: 2.4
- Electrical Saving(Million kWh): 0.495
- No of Proposals:7
- Thermal savings(Million Kcal): 6.78

Savings in million: 14.01

- Investment in million: 8.5
- Electrical Saving(Million Kwh): 0.250
- No of Proposals:9
- Thermal savings(Million Kcal): 12.67

Innovative Projects

BAISE AND TIMER BASED OPERATION OF ASH HANDLING SYSTEM

Reason for Selection:

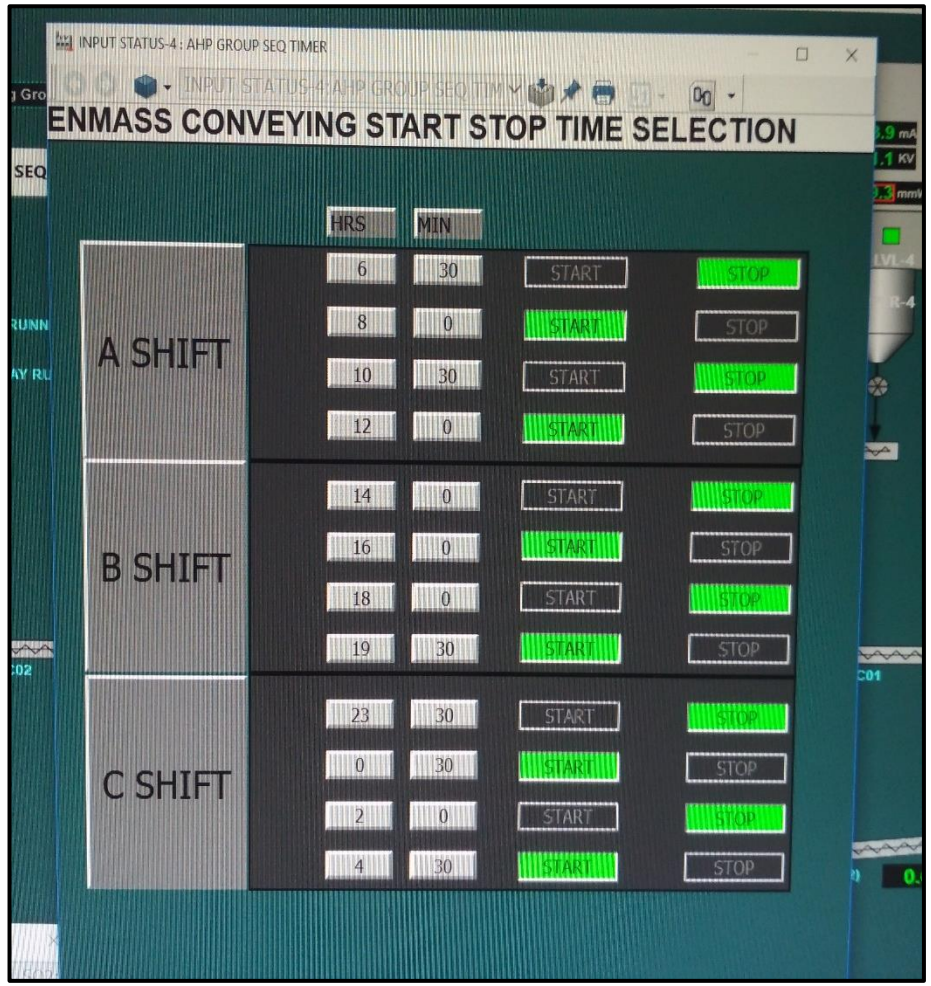
- Higher Power Consumption.
- Continuous operation of ash handling system (24 X 7).
- No time for preventive maintenance.

Technology Adoption:

- Identified Value adding time
- According Ash Generation timer value Selection
- Baise logic application if all hopper draft reached Negative then stop conveying.

Benefits:

- Total Savings in Power: 350 Kwh/day
- Equipment running hours reduction up to 9 hours in a day.



Energy Saving Project in Last Three Year

ADITYA BIRLA
UltraTech

- *Installation of VFD in 90KW in CEP-2*
- *Installation of VFD in 75 KW ACW-3*
- *Installation of VFD in 75 KW in BF-3*
- *Installation of VFD in 11 KW HPP*
- *Installation of Energy efficient Pump in 600 KW BFP*
- *Waste heat recovery Boiler Installation*
- *Steam Turbine Major Over Hauling for Heat Rate*

Energy Saving Project in Past Three Year

ADITYA BIRLA
UltraTech

- *Installation of VFD in 75 KW BF-3 at CHP*
- *Water Jet Cleaning of APH tube for heat gain*
- *Installation of VFD in 11 KW HPP at DM plant*
- *Air Leakage Arresting of Pneumatic Air Supply Lines*
- *ACC tube Bundle Foam Cleaning*
- *Water Jet cleaning of Economiser tube for Effectiveness Improvement*
- *Refractory Application in Bed Coil for Increasing Main Steam Temperature*

Environment Management Emissions Monitoring

Particulars	UOM	2019-20	2020-21
Total CO2 emission per KW of Generation	TON/KW	0.001340606	0.00133301
Current SOX emission at full load	mg/nm3	431	407
Current NOX emission at full load	mg/nm3	162	256
Particulate Matter	mg/nm3	25.31	32.87
Mercury	mg/nm3	0.01	0.01

Best Practice for Emission control Monitoring

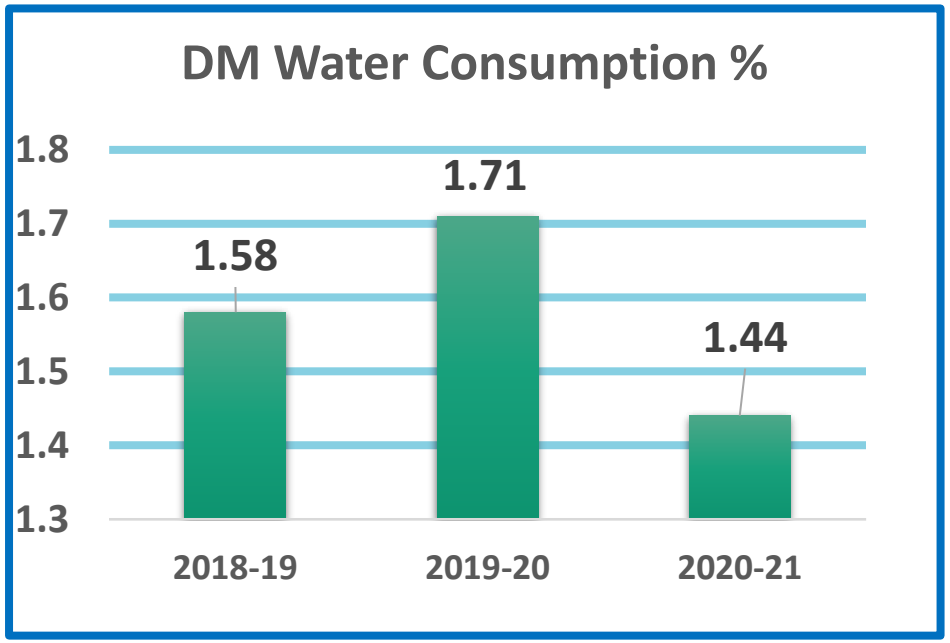
S. No	Name of Stacks	Make	Parameters	Remarks
1	CPP – Boiler Stack	Siemens,	SO2, Nox & PM	Working smoothly

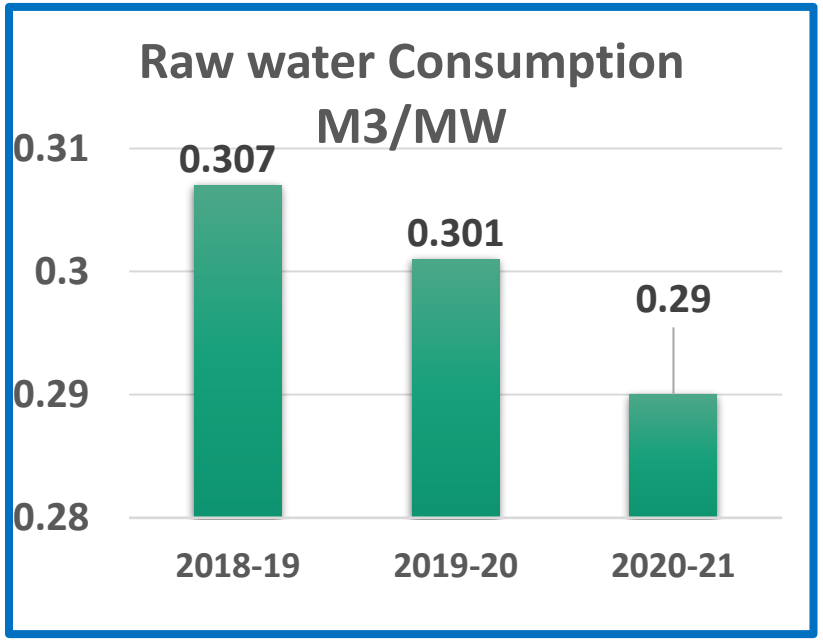
1- Raw Meal Powder feeding in to Boiler for Sox Control

2- ESP Water Jet Cleaning and Field alignment for SPM Reliability

3- Operation of Boiler with optimised air and low bed temperature for Nox control

Environment Management - Water



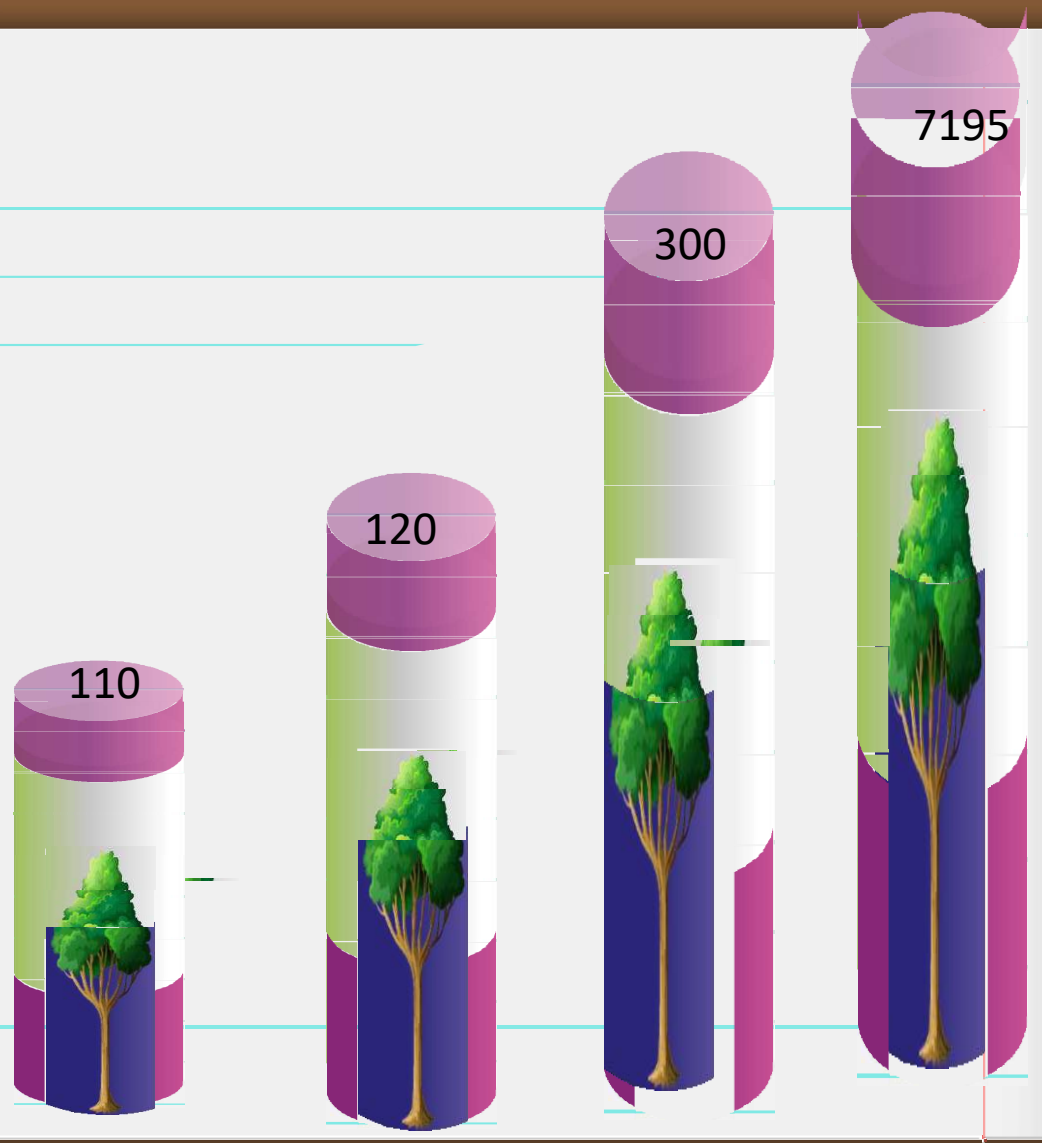


- ❖ Thermal Power Plant is adopting zero water Discharge practice.
- ❖ For Zero Water Discharge We are Using Following Best Practice:
- ➢ Blow Down Water Utilization at 10 KL tank for cooling and reutilization as Raw water for cooling Tower
- ➢ Cooling Tower COC operation 5-15 after addition of RO water and reduction blow down
- ➢ RO Reject utilization for Hot Bed material Quenching

Corporate Social Responsibility

Corporate Social Responsibility

Tree Plantation



UltraTech Cement Limited, Unit Bela Cement Works			
Year Wise Plantation Details			
S.No.	Period (Year)	No. of tree Planted	Total Area Covered (ha.)
1	Up to 31.03.2017	56629	22.65
2	2017- 18	110	0.04
3	2018- 19	120	0.05
4	2019-20	300	0.12
	2020-2021	7195	2.88
Total		64354	25.7

Total Area Covered :25.7 Hac. i.e. 37.6 % area covered as Greenbelt

Best Practice

Particulars	UOM	2018-19	2019-20	2020-21
Ash Generated	MT	36663	31786	37385
Ash Utilization	%	100	100	100
Ash Utilized in Cement	MT	100	100	100
Ash Conveying method	MT	50% DRY	50% DRY	50% DRY
Dry Ash Transporting by Browser	MT	50% DRY	50% DRY	50% DRY

Best Practice

ADITYA BIRLA
UltraTech

1- Daily Job Planning Before 01 Day

2-Walk Through inspection and reporting to concern by my -Setu

3- Competition for green Circle award (Zero unsafe Condition)

4-Tool Box Talk Meeting in Every shift

5-Area Owner ship Culture (This is my machine and I am owner of this)

6- Seven steps of Self Maintenance practice

7- Knowledge sharing like I love my UltraTech

Best Practice

1- RR (Reward & Recognition for Best shift Performer)

2-Near Miss Reporting By My-setu

3- incident Investigation (Why-Why analysis)

4-internal recruitment for application best practice in other cluster unit

5-Area Owner ship Culture (This is my machine and I am owner of this)

6-Adopting Self Maintenance full practice

7- Knowledge sharing like I love my UltraTech

Best Practice

ADITYA BIRLA
UltraTech

Power Saving in Air cooled condenser with Vacuum Set Point PID

Theme

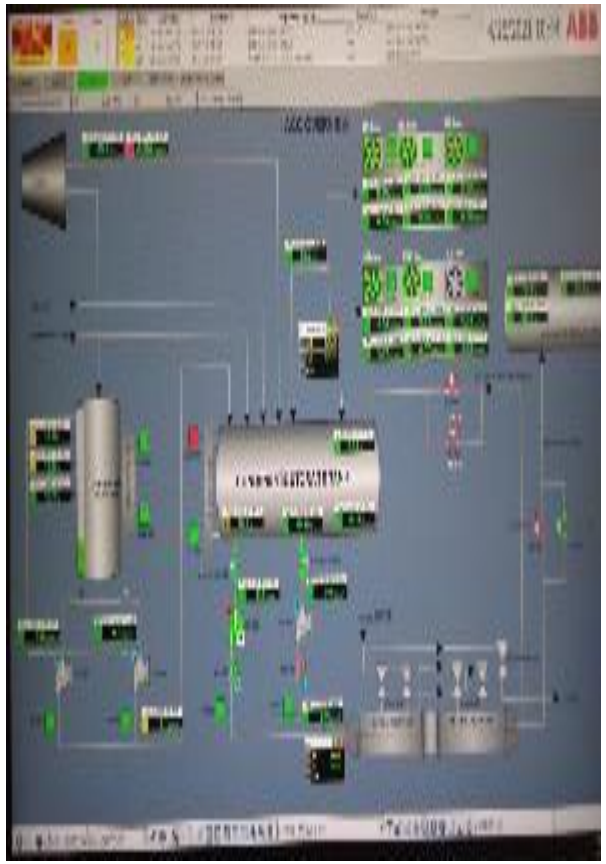
Power saving in ACC with Vacuum set point PID loop in DCS

Problem

Earlier all the six fans were operating with individual set point mode and operators manually control the fan RPM based on vacuum requirement in ACC.

Solution

- Prepared one PID loop in DCS with vacuum set point in ACC, so that all six fans will be controlled simultaneously in auto mode with vacuum set point through PID loop.



Benefit

- Earlier we used to operate the individual fans with 80% - 100% RPM set point now with the auto PID loop the average RPM has come down to 30 - 60% only.
- Saving in power is 55 kWh / Hrs (approx.) noticed and chances for further reduction w.r.t. load and Ambient. Temperature.

Best Practice

Frequency based load shedding during TPP Island operation

Theme

Implemented frequency-based load shedding scheme to save TG tripping during TPP & WHRS Island operation

Problem

Earlier we don't have frequency-based load shedding scheme for TPP Island operation since TPP was operated always parallel with grid only. After commissioning of WHRS, we compelled to operate TPP & WHRS combination in Island mode and experienced black out condition two times due to TG inlet steam pressure low during overloading.

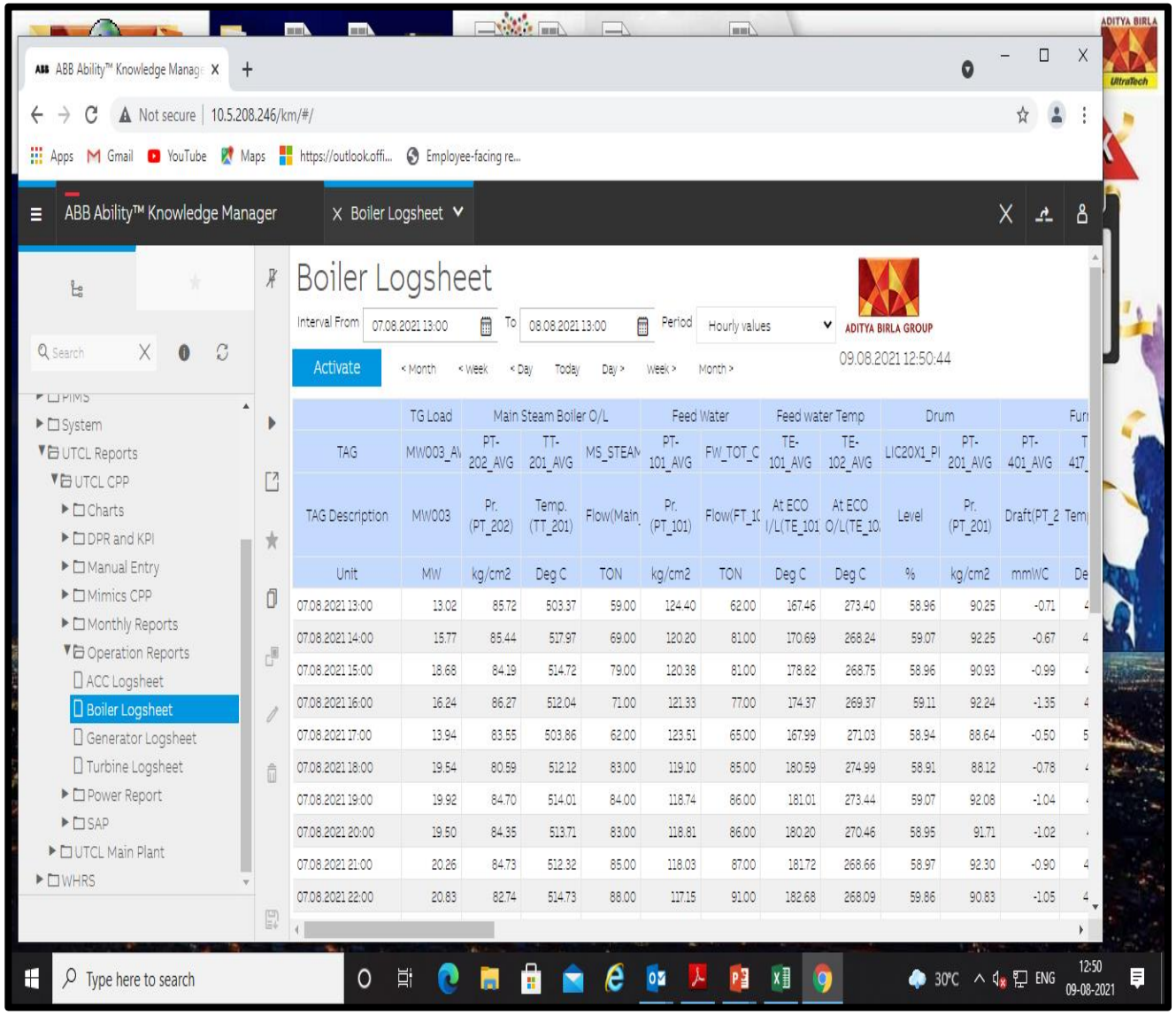
Solution

- We have one P341 (Islanding Protection Relay) with us in TG incomer in MRSS. We have prepared the PSL logic in that for 4 stage frequency-based tripping of cement plant loads in the event of TG overloading. Successfully implemented the scheme and getting the desired results.

Benefit

- Black out of TPP is greatly avoided during overloading / steam pressure low condition of TG.
- Reliability of TPP & WHRS system enhanced resulting plant availability.

Daily Monitoring System

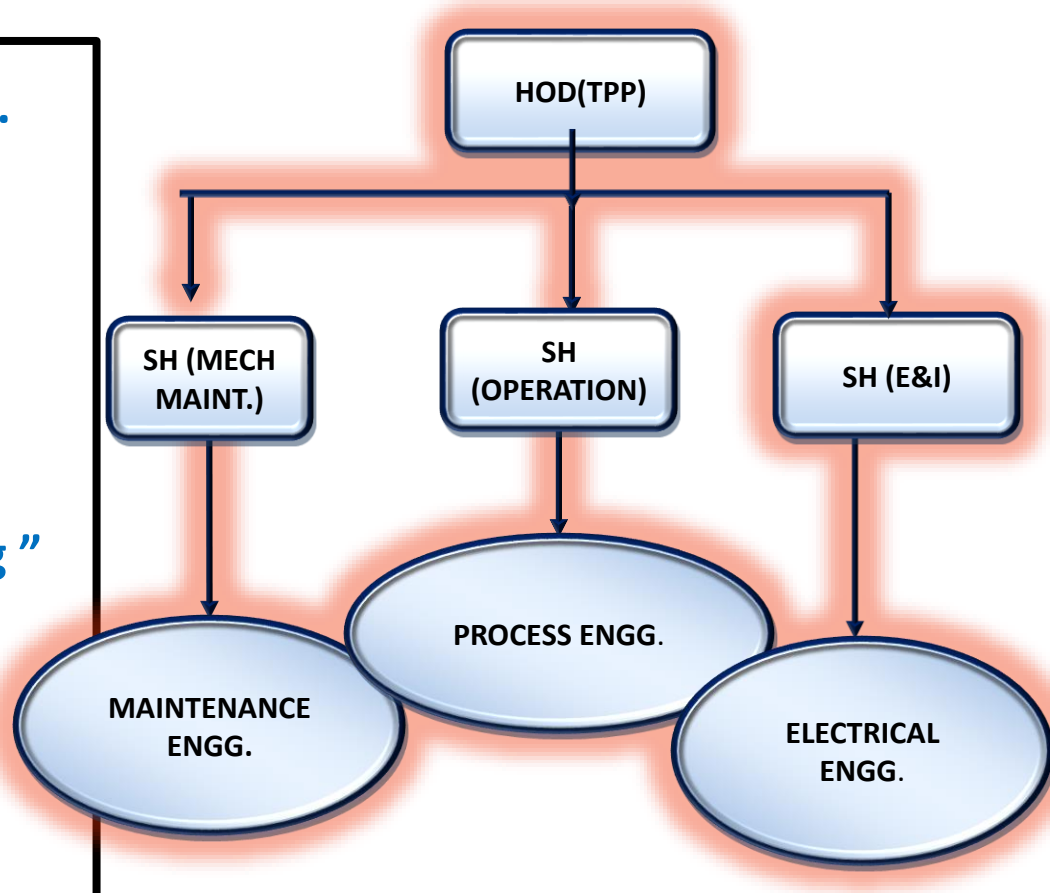


DATA FETCHING SOFTEWARE KM SERVER

PLANT RELIABILITY PULSE SERVER

Review Meeting Chaired

- Well Established energy management cell headed by HOD(TPP) .
- Daily monitoring of Heat rate and Aux. power deviation report.
- Analysis of equipment SPC performance for deviation.
- Identification of energy conservation scope.
- Theme base suggestions/Kaizens scheme under “Energy Saving ”
- Feasibility study of suggestions & submit proposal for sanction.
- Preparation of detail action plan.
- Benefits analysis after project implementation.



DAILY MEETING STRUCTURE at 11:00 AM

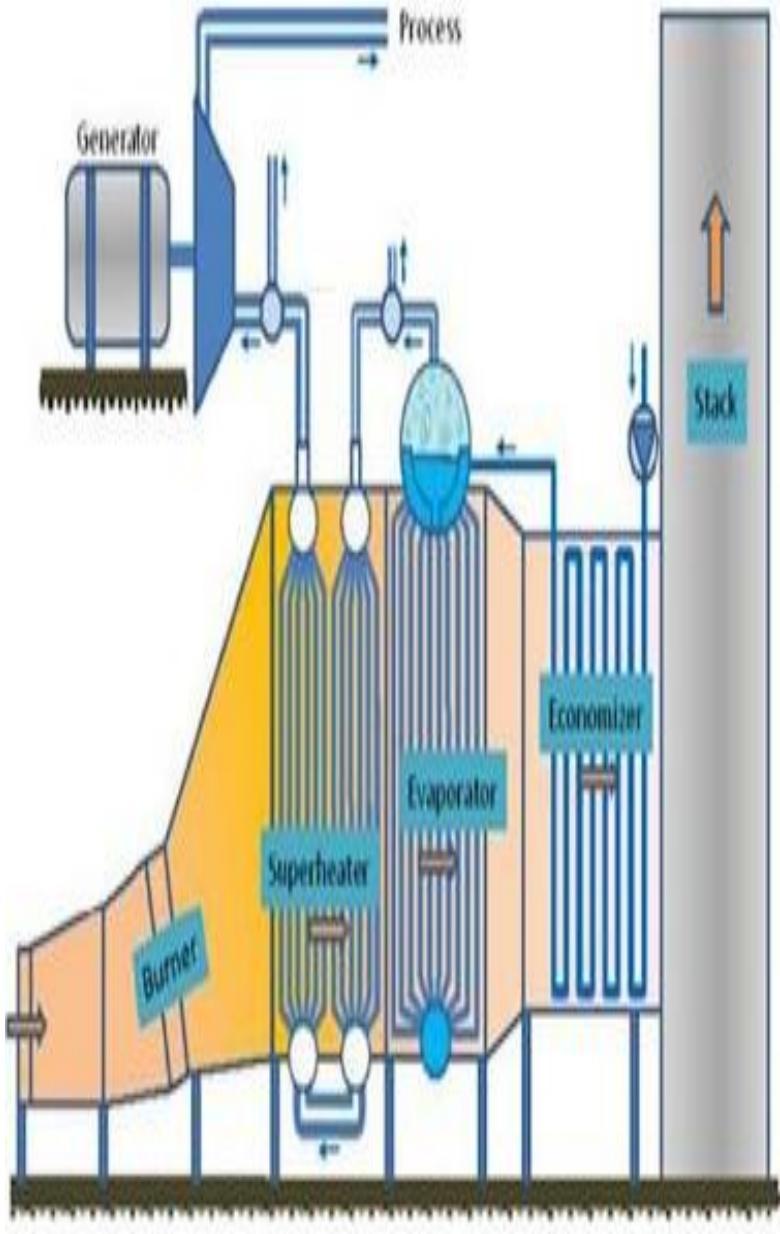
Team Work By Employee & Workman

Sr. No.	Idea	Status
1	Reduction of Instrument air leakage and Achieving 700 KWh power from 900 kWh Per day Basis.	Continuous in practice
2	Ejector inlet motive Steam Temperature low. Identified root cause for extra power consumption in Air cooled condenser and to be replaced from 25 mm to 50 mm.	Next Shut down
3	Extra Power Consumption in Coal circuit due to manual control of coal feeding. Proposal for VFD and based apron feeder	Next Shut down
4	Intermittent run for Fly ash conveying system (drag Chain feeder)for avoiding continuous operation and Power Saving 300 kWh/day.	Completed
5	Raw meal Powder feeding for Sox control and idea with implementation of unloading system for lime powder storage at bunker	Continuous in practice
6	Drained bed Material sieving and reutilization.	Continuous in practice

Investment in Green Energy Power Projects

Power Generation up to July-21	Lacs Kwh	4206693
Power Cost Saving up to July-21 Under project	Crore	1.8
Total investment	Crore	120
Fuel saving (Coal) up to July-21	Ton	3394

WAST HEAT RCOVERY BASED POWER PROJECT		
Boiler	AQC - (HP) 44 TPH Pressure : 18.6 /420 Kg/cm² /Deg. C PH-1 (HP) - 15.7 TPH Pressure : 19.6 /290 Kg/cm² /Deg. C PH-1 (LP) - 10.4 TPH Pressure : 4.0 /195 Kg/cm² /Deg. C PH-2 (HP) - 8.9 TPH Pressure : 19.6 /290 Kg/cm² /Deg. C PH-2 (HP) - 6.0 TPH Pressure : 4 /195 Kg/cm² /Deg. C	MAKE THYSSEN KRUPP
Turbine	Capacity : 13 MW Pressure : 18 Kg/cm² Type : Injection Steam RPM :6828	Triveni Turbine Ltd.



Awards & Accolades

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"Gold Award" under the cement sector for Project "Swavlamban" 23-09-2019

Awards and Accolades

'Best Innovative CSR Project' 14-02-2019

Thanks for Your Sincere & Kind Attention