UltraTech Cement Limited

(Unit: Sewagram Cement Works-Thermal Power Plant)

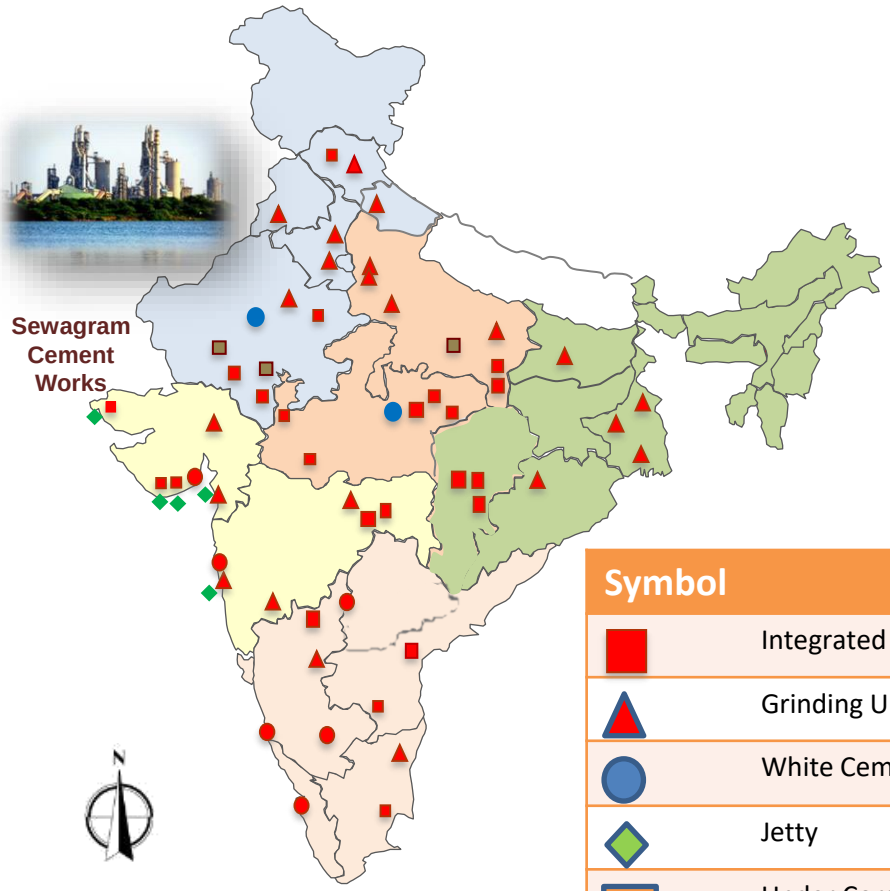
Welcomes Assessors

23rd National Award for Excellence in Energy Management 2022

Team Members

- Kamlesh Verma
- Gopesh Kumar Sharma
- Md. Shakil Khan
- Priyank Shukla

Business Overview-UltraTech Cement Limited



Grey Cement
Products include Ordinary Portland Cement, Portland Slag Cement and Portland Pozzolana Cement

White Cement
Products to design smart aesthetic buildings – interior, exterior, roofing and flooring, plasters, coatings, mouldings, and decorations

Concrete
Ready mix concrete (RMC), Specialty Concretes

Building Products
AAC blocks, water proofing solutions, grouting solution, jointing mortars

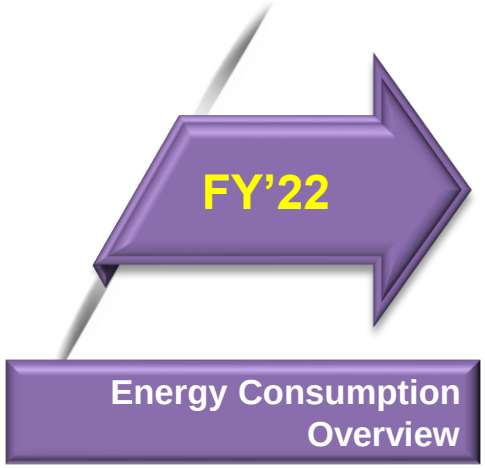
Building Solutions
One-stop-shop for primary construction needs

Symbol	Plant	Nos
	Integrated Units	23
	Grinding Units	27
	White Cement & Putty Units	03
	Jetty	05
	Under Commissioning	

Integrity | Commitment | Passion | Seamlessness | Speed

Unit At Glance-Sewagram Cement Works

Units	Month & Year of Commissioning	Installed Capacity
Thermal power Plant	TPP 1-Sept'09 /TPP 2-Jul'11	TPP1-35 MW, TPP2-22.5MW
Desalination Unit	Jul'09	6600 M^3/Day
Solar Power Plant	Aug'18	5MW
Clinkerization	Line I-Sept'09/Line II-Feb'11	3.60 MTPA
Cement grinding	CM1-Mar '09 /CM2-Dec'10 /CM3- May'12	3.10 MTPA
Packing Plant	Packing Plant 1-Mar '09 /Packing Plant 2- Jul'10	4 Nos. x 180 TPH



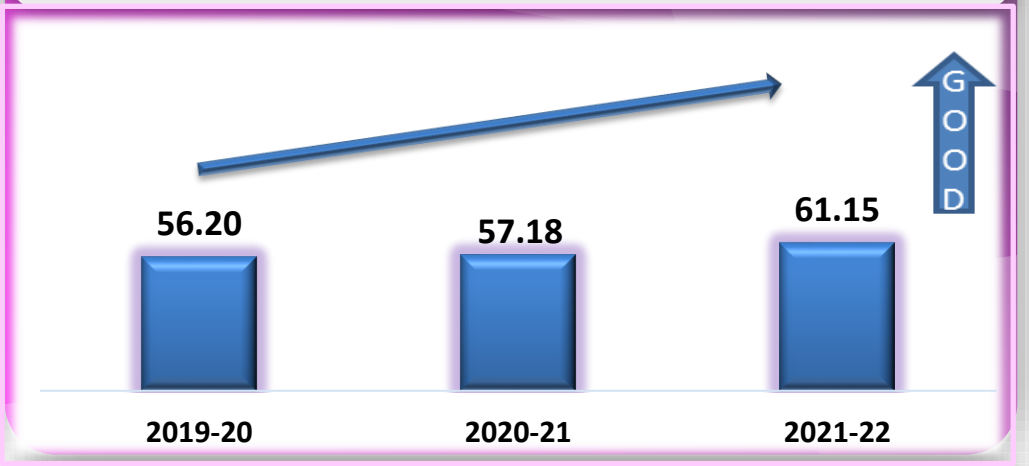
Sr no.	Parameter	UOM	Value
1	Annual Generation	Lac kWh.	2164.12
2	PLF	%	61.15
3	Availability	%	89.58
4	Gross Heat Rate	Kcal/Kwh	3156
5	Auxiliary Power	%	9.15
6	DM Water consumption	m3/MWh	0.087
7	Raw Water Consumption	m3/MWh	0.289
8	Specific Oil Consumption	ml/kWh	0.11166

FY'22 Performance

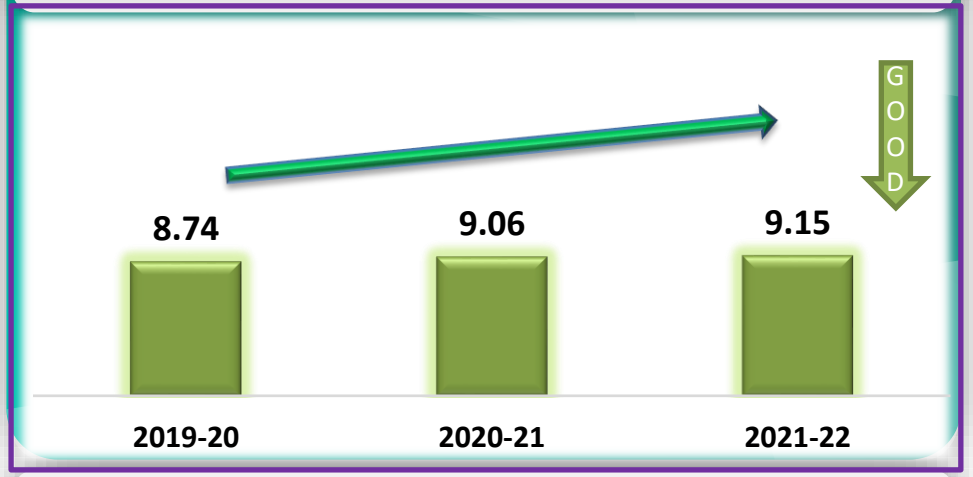
Particulars	UoM	TG#01	TG#02	Total
Annual Generation	Lac kWh	1478.62	685.50	2164.12
PLF	%	59.45	65.19	61.15
Availability	%	81.12	98.03	89.58
Gross Heat Rate	kCal/kWh	3153	3164	3156
APC without S/D	%	9.14	8.05	8.79
APC with S/D	%	9.37	8.68	9.15
Boiler Efficiencies (station wise)	%	85.94	85.10	
Turbine Heat Rates (station wise)	kCal/kWh	2709	2693	2704
DM Water consumption	m3	4908	1526	6434
Raw Water Consumption	m3	18516	3752	22269
Specific Oil Consumption	ml/kWh	20.955	3.209	24.164

Sp. Energy Consumption in last 3 years (FY 2020-22)

PLF %

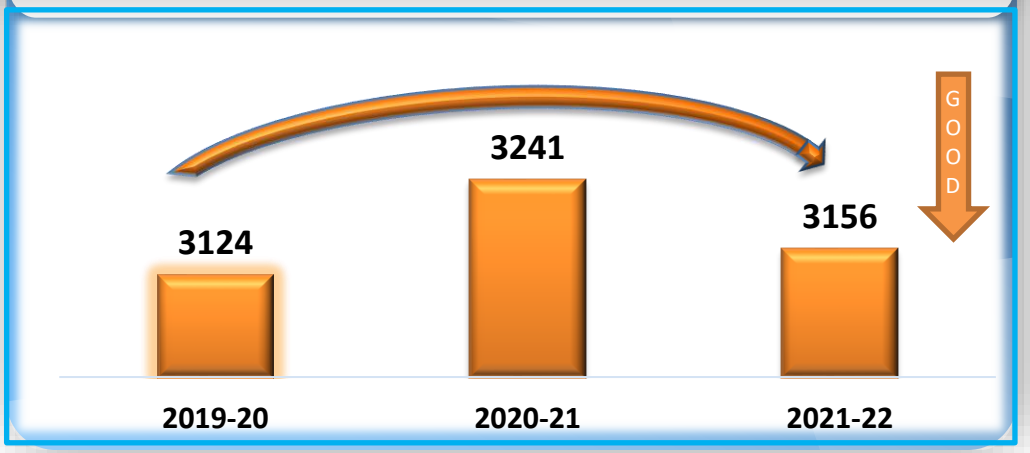


AUX %

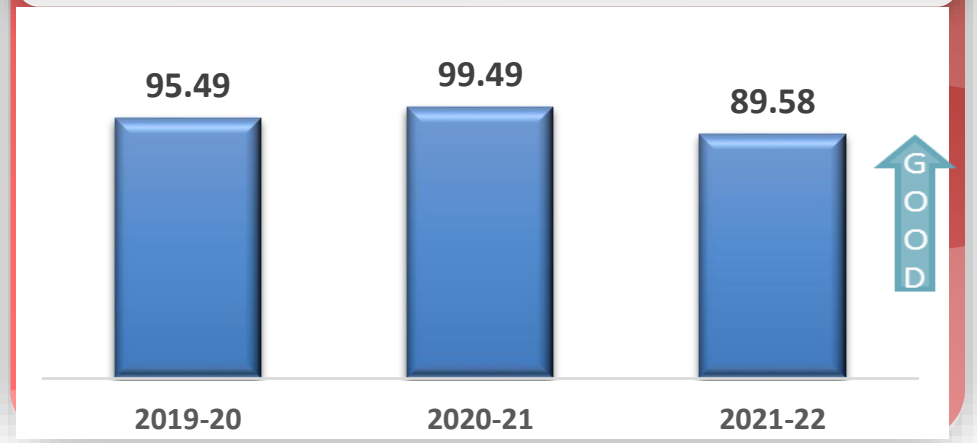


PHR

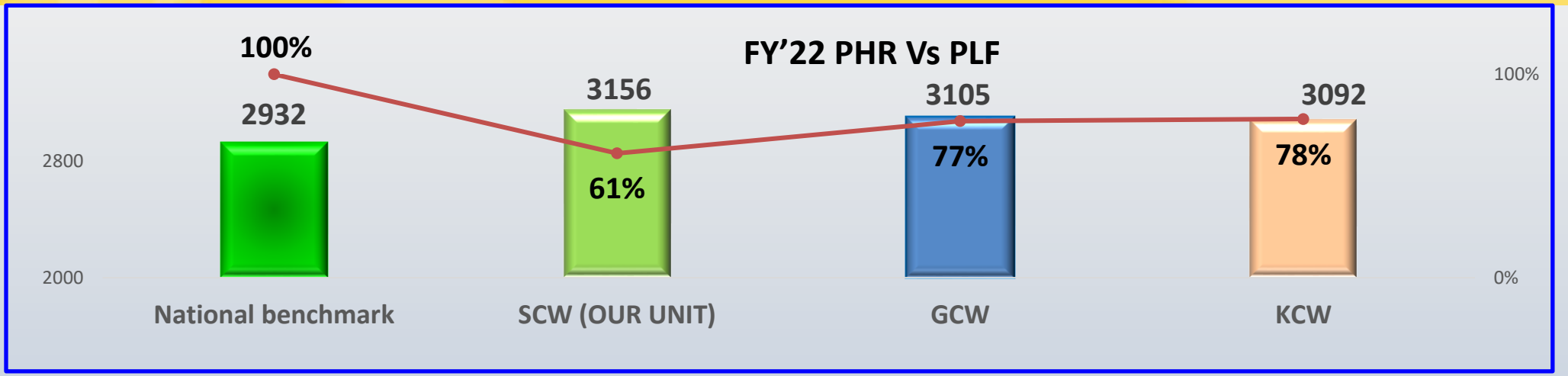
(Kcal/Kwh)

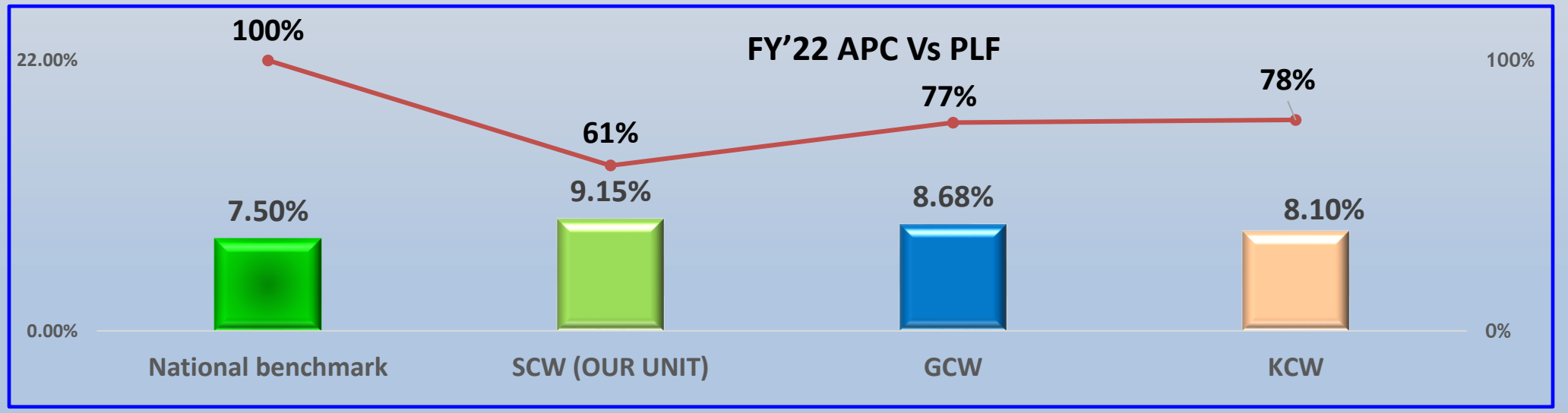


Availability %



Comparison with Benchmark & Cluster Units

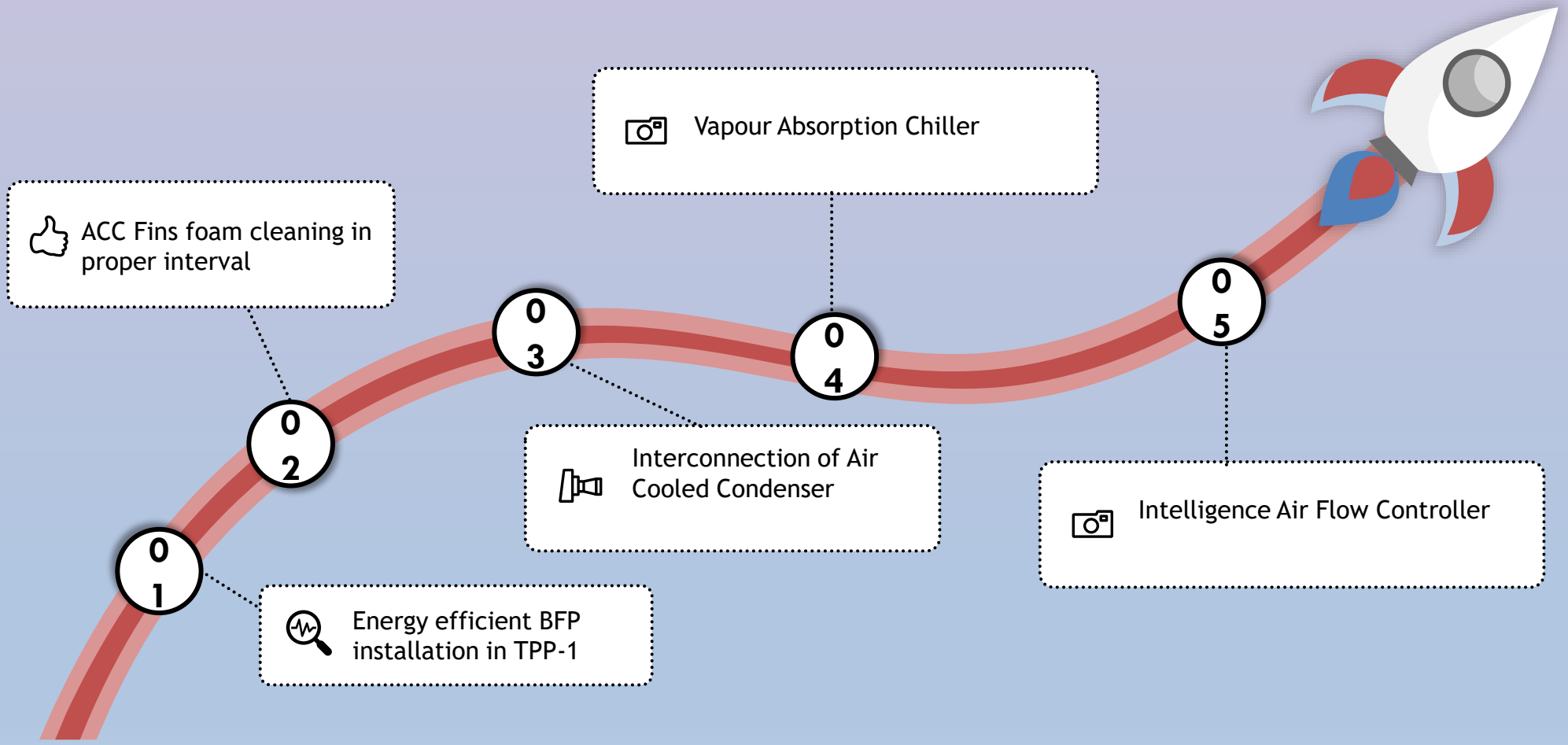




Captive Power Plant National Benchmark (NBM) for
Heat Rate -2932 Kcal/kwh & Aux. Power- 7.50% (CII data)

Roadmap to achieve Target Auxiliary % in FY'23

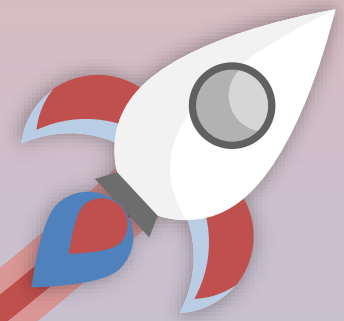
Target Auxiliary-8.75%



Current Auxiliary: 9.15%

Roadmap to achieve Target Heat Rate for FY'23

Targeted Heat Rate: 3120 Kcal/Kwh



Boiler#02 damaged APH Tube Replacement

ACC-1 Fins chemical cleaning

01

APC Optimax system implementation

02

03

04

Daily process data monitoring Vacuum, O2, TG inlet steam pressure and temperature, false air, ESP outlet temperature, Load management with cement plant

05

Interconnection of Air Cooled Condenser

Current Heat Rate: 3153 Kcal/Kwh

Major Encon project planned in FY 2022-23

Sl. No.	Auxiliary Saving projects for FY'23	Proposed Savings kWh/Day	Target Dates
1	Installation of SRC Bundle in TPP-1 ACC (Air Cooled Condenser)	2904	Proposed in Capex FY'23
2	Reduction in Fan power by Boiler-1 APH tube replacement & Cleaning	4000	Completed in Jun'22
3	Energy efficient BFP installation in TPP-1	1992	Under Discussion with TPMC
5	ACC fin Cleaning to be done in Every 6 Month	480	Dec'22
6	Optimization of Bed height and maintain the O2 as per design	450	Continuous
7	Optimization in Ash conveying system power consumption	380	Oct'22
8	Installation Intelligence Air Flow Controller in Instrument air	182	Capex Approved
9	VFD installation in Mechanical spreader in Boiler-2	72	Proposed in Capex FY'23
10	VFD installation in DCF 11-15 in Boiler-2	24	Proposed in Capex FY'23
Total Saving in kWh		10484	

Energy Savings Projects in FY'19-20

Sr.	Project Details	Investment (Rs. Lacs)	Saving (Rs.Lac)	Payback (Months)
1	Solar Renewable Power utilization	0.00	52.11	0.0
2	APH high pressure hydro jet cleaning and Tube replacement	3.50	33.74	1.2
3	Pipe line laying for Harvesting Mines pit water Utilization	23.16	29.57	9.4
4	AFBC boiler's ESP-2nd field ash conveying line diverted to Boiler-1 furnace to reuse unburnt carbon	0.00	20.03	0.0
5	Reducing APC after TPP-1 ACC Fin cleaning	2.56	10.69	2.9
6	Reducing APC after TPP-2 ACC Fin cleaning	1.92	9.27	2.5
7	Turbo ventilator installation on TG Roof to reduce exhaust fan power	9.60	5.91	19.5
8	BFP Power Optimization while running it alternate unit.	0.00	2.59	0.0
9	Idle Bed Ash Cooler Fluidization Air Isolation as per Ash % in coal	0.00	2.47	0.0
10	Increasing CFBC boiler reliability by prevention of cyclone jamming using service air.	0.05	2.19	0.3
11	Ash conveying probe mode with line block timer	0.50	1.94	3.1
12	Standby VFD power OFF	0.00	1.78	0.0
13	CEP Logic Modification to reduce discharge valve throttling loss	0.00	1.41	0.0
14	Service Water Pump Running Hour optimization	0.00	1.23	0.0
15	ESP power optimization by changing its field milliamp as per boiler load	0.00	1.22	0.0
16	Feed water station logic modification to reduce throttling feed water loss	0.00	1.08	0.0
17	Installation of Air Blower for Cleaning	0.00	0.87	0.0
18	SOV installed in CHP Inst. Air line and open it from CCR only	0.20	0.77	3.1
	TOTAL :	41.49	178.86	

Energy Savings Projects in FY'20-21

S.No.	Title of Project	Investment Made (Rs Lacs)	Total Annual Savings (Rs Lacs)	Payback (Months)
1	Modification of CT make-up water Line for reducing degasser pump running hours.	0	0.24	0.0
2	Utilization of Cooling water pump-A instead of Raw water pump for drinking tank makeup	0	0.72	0.0
3	Installation of Energy Efficient Pump In place of existing Raw Water Pump	1.9	1.21	18.8
4	Reduction in Idle running hours of TPP Coal Handling Plant L2 group	0	0.85	0.0
5	Solar Renewable Power utilization	0.00	44.06	0.0
6	Reducing APC after TPP-1 ACC Fin cleaning	2.82	8.73	3.9
7	Reducing APC after TPP-2 ACC Fin cleaning	2.22	6.99	3.8
	Total	69.400	628.07	

Energy Savings Projects in FY'21-22

S.No.	Title of Project	Investment Made (Rs Lacs)	Total Annual Savings (Rs Lacs)	Payback (Months)
1	PHR improved by TG-1 Overhauling	9	46.77	2.3
2	Installation of Energy Efficient Pump In place of existing Raw Water Pump	1.3	0.97	16.0
3	RO reject water utilized by Reject water Pump in place of Raw water Pump	0.4	1.15	4.2
4	PHR Improvement by arresting Start-up Vent passing	1.8	18.974	1.1
5	PHR Improvement by ACC leakage arresting work	8	23.72	4.0
6	APH high pressure hydro jet cleaning and Tube replacement	27	66.72	4.9
7	Reducing APC after TPP-1 ACC Fin cleaning	2.98	33.59	1.1
8	Reducing APC after TPP-2 ACC Fin cleaning	2.2	8.47	3.1
9	Solar Renewable Power utilization	0.00	185.55	0.0
	Total	526.800	3859.16	

Energy Savings Projects of last 3 FYs

Year	No of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal/ MTOE)	Savings (INR Million)
FY 2019-20	18	4.149	1.90	12	17.89
FY 2020-21	7	0.694	8.34	0	6.28
FY 2021-22	9	5.268	10.64	1590	38.59

Reduction in Throttling loss by Installation of VFD in DM Plant RO high pressure pump

Opportunity

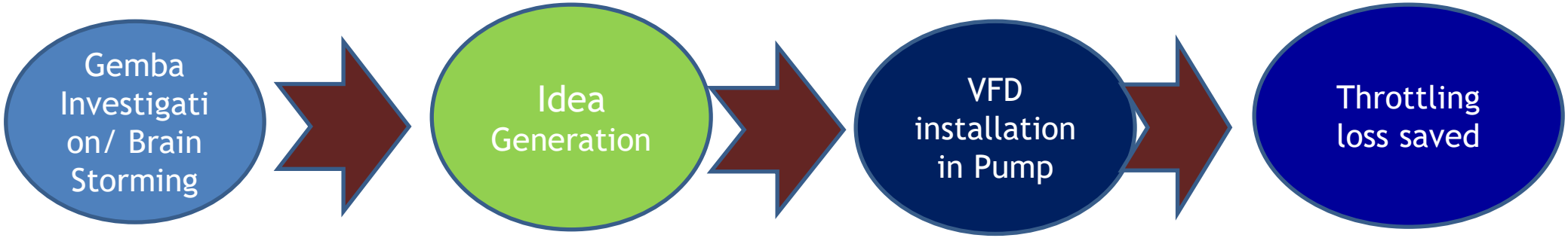
- In DM Plant, RO high pressure pump was running at full RPM. Valve was being throttled for controlling flow of Pump. Hence Throttling loss was increasing its power consumption.

Modification

- VFD was installed in Motor of RO high pressure pump of DM Plant.
- Thereby throttling loss was reduced due to VFD being operated at low RPM when less flow is required.
- Investment made was Rs. 0.88 Lac

Benefits

- Power saving achieved of 25.52 kWh/day
- Saving of Rs. 0.42 Lac per annum.
- Reduction in vibration of its discharge line is also there.



ACC tube bundles leakages in-house Arresting Work.

Opportunity

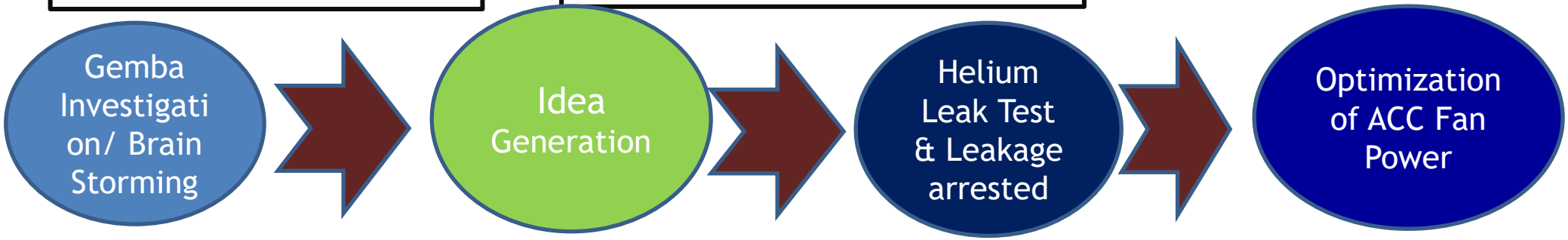
- Two Ejectors were needed to keep in line to maintain Turbine-1 Vacuum and vacuum was not getting maintained at higher load due to leakage in ACC tube bundles. Due to this, TG-1 Auxiliary Steam Consumption was higher (1 TPH)

Modification

- Leakages in ACC tube Bundles were identified by helium leak test.
- After identification of leakage points, leakages tubes were made dummy by taking care of proper removal of NCG gases during TPP-1 shutdown with in-house by online consultation with M/s ACC Praharpur.

Benefits

- Improvement in TG-1 Reliability.
- Auxiliary steam consumption in ejector reduced and recovered by 0.50 TPH.
- Financial Savings by Recovery of Rs. 38.76 Lac per annum



Enhancement in coal capacity of Silo-2 Apron

Opportunity

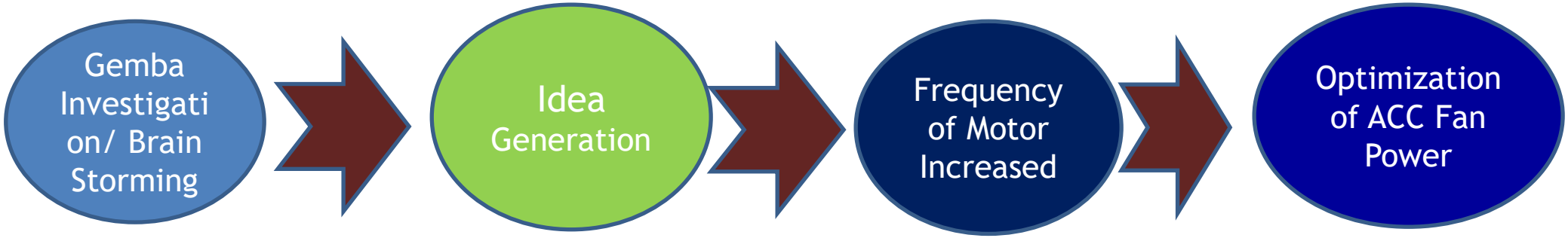
- Coal silo-2 Apron capacity was only 110MT per hour hence running hours of coal plant was high.
- Coal handling circuit was running with under load

Modification

- Operating Frequency of Motor of coal silo-2 apron motor of was increased from 50Hz to 60Hz.
- Thereby we achieved coal transfer capacity of 160 MT per hour which was 110 MT per hour previously.

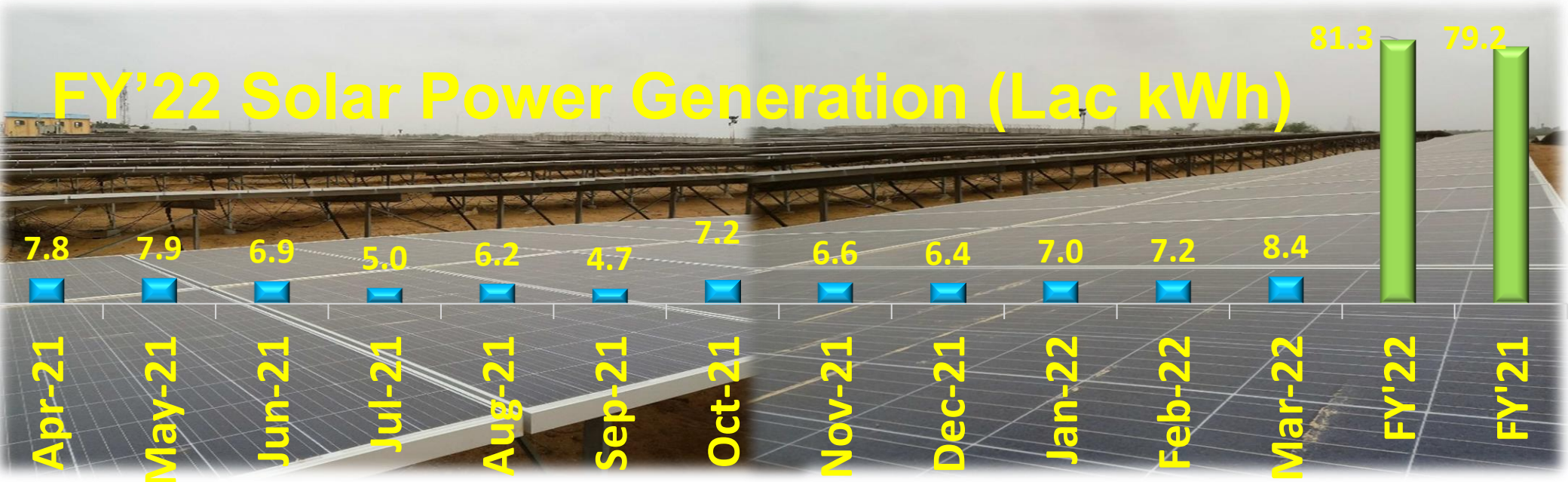
Benefits

- Power saving achieved of 80.1 kWh/day
- Saving of Rs. 1.2 Lac per annum.
- Reduction in running time of coal Plant by 50 minutes/day

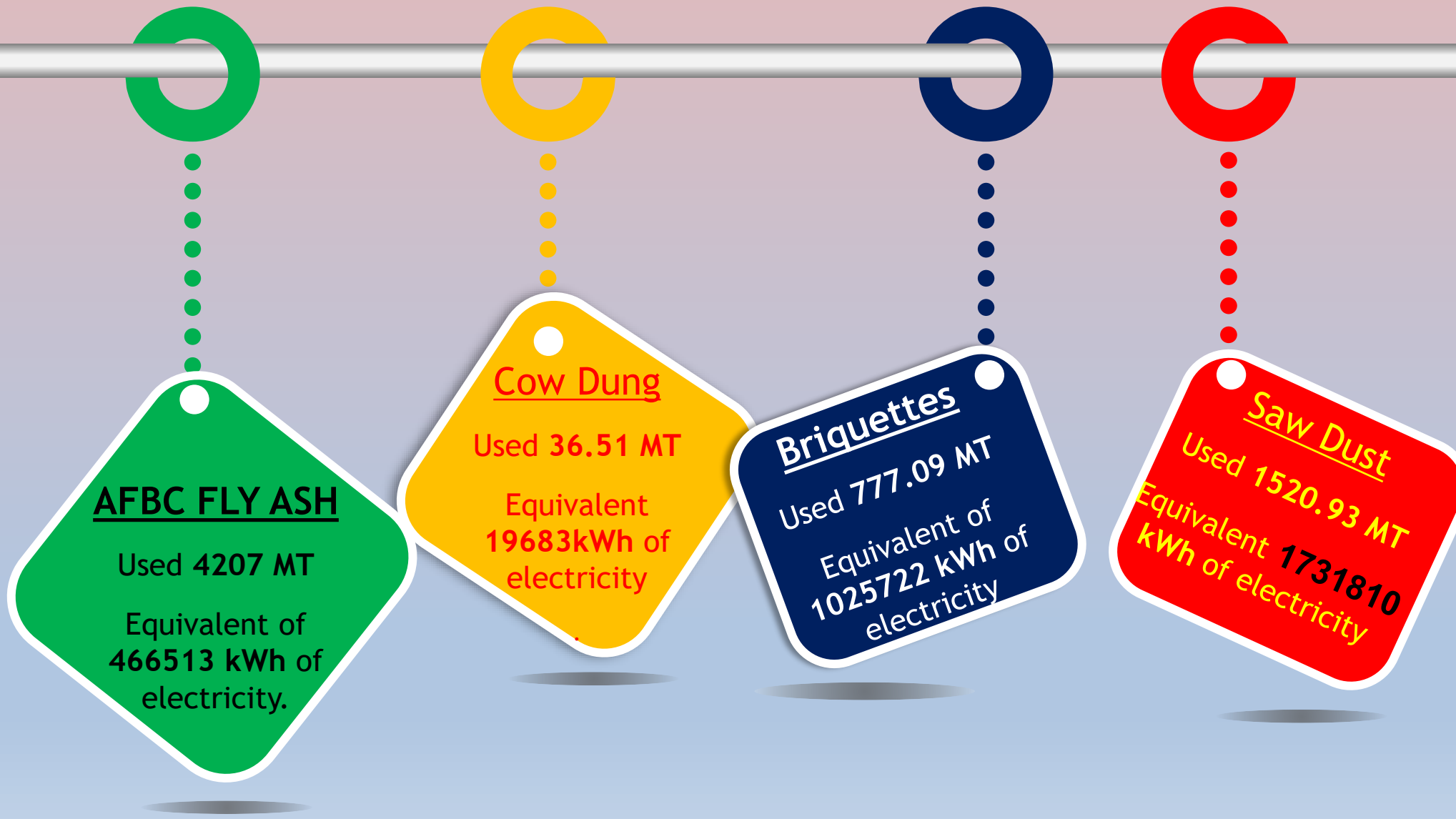


Utilisation of Renewable Energy sources

Year	Technology	Type of Energy	Onsite/ Offsite	Installed Capacity (MW DC)	Generation (million kWh)	% of overall electrical energy
FY 2019-20	Electrical	Solar	Onsite	4.00	8.26	3.97
FY 2020-21	Electrical	Solar	Onsite	4.00	7.92	3.85
FY 2021-22	Electrical	Solar	Onsite	4.00	8.13	3.85



Firing of Alternate Fuel FY 21-22



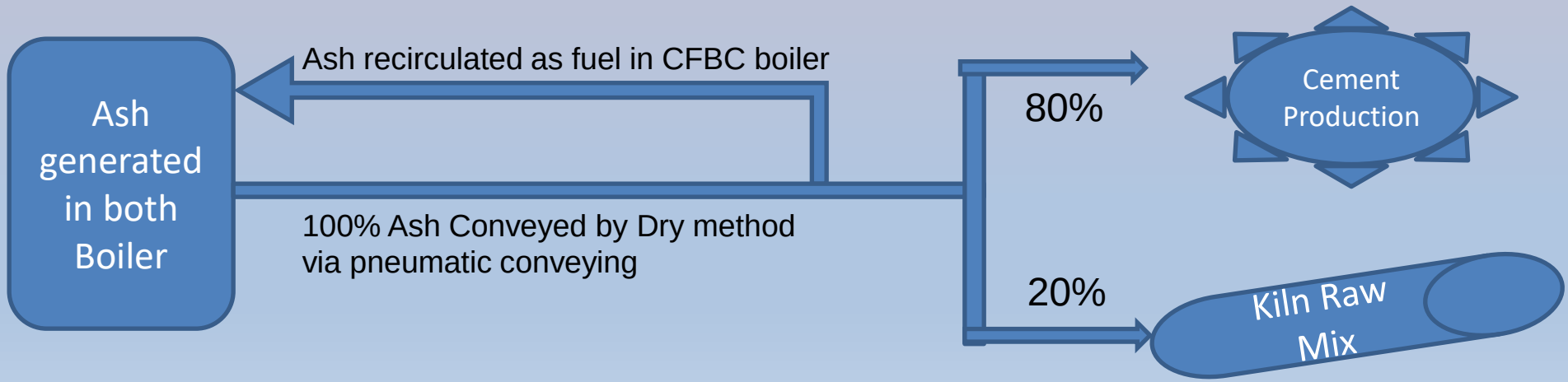
8a. Environment Management- Ash Utilization

1. Annual Ash Utilization of past 3 years (FY 19-20 to FY 21-22)

Particulars	UOM	2019-20	2020-21	2021-22
Ash Generated	Tons	46186	35777	56887
Ash Utilization	%	100	100	100

2. Modes of Ash Conveying – Dry (Pneumatic Conveying)

3. Distribution of Areas of Ash Utilization – Cement Plant



8b. Environment Management- Ash Utilization

Particulars	UOM	2019-20	2020-21	2021-22
Ash Stock in Plant (2 no.s of Silos)	Tons	600	600	600
Ash Generated	Tons	46186	35777	56887
Ash Utilization	%	100	100	100
Ash Utilized in Cement	%	80	80	80
Ash Utilized in Kiln Raw mix	%	20	20	20
Expenditure on Ash Utilization (annual)	INR (Lacs)	25.01	25.01	25.01
Ash Conveying method	Dry / Wet	100% DRY	100% DRY	100% DRY

8c & 8d. Environment Management-Emission

Particulars	UOM	2019-20	2020-21	2021-22
CO_2 Emissions Per Generation	Ton/kW	0.0011	0.0013	0.0012
SOx Emissions at Full Load	mg/Nm^3	454	396	412
NOx Emissions at Full Load	mg/Nm^3	209	164	196
Particulate Matter	mg/Nm^3	28	27	36
Mercury	mg/Nm^3	<0.01	<0.025	<0.025

Best Practices Adopted for emission Control and Monitoring:

- ❑ *Continuous emission Monitoring system*
- ❑ *Ambient Air Quality Monitoring System*

Current Emission:

SOX- 402 mg/Nm3; NOx- 158 mg/Nm3; SPM- 28 mg/Nm3

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

- ❑ *Premix Limestone taken with coal in coal bunker to control Sox in Boiler.*
- ❑ *Continuous Limestone dosing in boiler to control Sox*
- ❑ *ESP Tuning as per Particulate matter emission*
- ❑ *To clean and inspect ESP, Rappers and its plates whenever get opportunity..*
- ❑ *Recirculating fly ash with high petcoke usage for maintaining bed temperature and thereby Nox*

8e. Environment Management- Water

Particulars	UOM	2019-20	2020-21	2021-22
DM water Consumption	%	1.70	1.35	2.014
Raw Water Consumption	m3/MW	0.29	0.28	0.29
Liquid discharge	m3	ZERO	ZERO	ZERO

Best Practices in Water Management

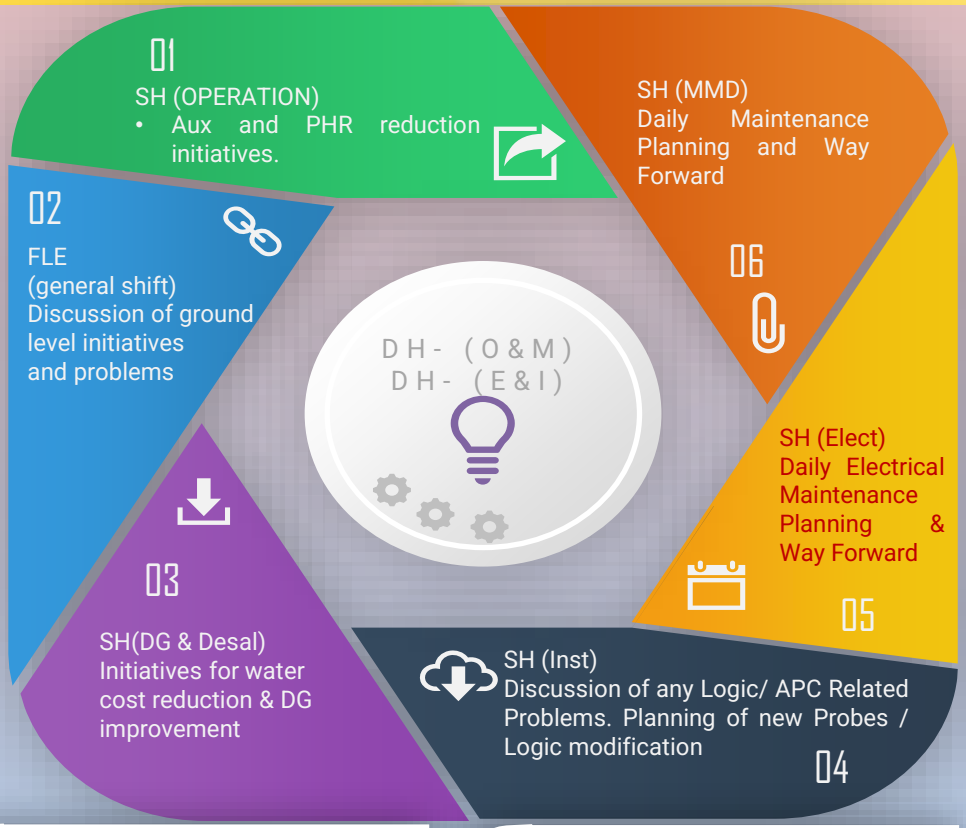
- ✓ Reusing RO reject water as Service Water at Silo Ash Unloading, Gardening etc.
- ✓ Daily monitoring of Service water pump running hours and its optimization by installation of local switch at various locations.
- ✓ Circulating Daily defect list twice a day to attend any leakages.
- ✓ Daily checking of water balancing.
- ✓ Steam dumping is preferred rather than venting to recover DM water during load cut off condition
- ✓ Roof Rain water harvesting at shopping complex. .

9. Best Practices

- Energy monitoring system installation for better analysis of Aux. Power consumption
- Shift wise report generating and sharing for monitoring
  - ✓ Auxiliary power
  - ✓ Environment Parameters like Sox, Nox and SPM
  - ✓ Turbine inlet Steam pressure and temperature
  - ✓ Steam Venting & Dumping
  - ✓ Turbine Vacuum
- Energy efficient Motors & LED Illumination System
- Installed Alarm to identify idle running of CHP.
- Maximum utilization of AFBC boiler high LOI fly ash in CFBC boiler as a fuel.
- Daily Power cost monitoring report generation and its sharing to all.
- 100% ash of boiler, utilized for Cement Manufacturing .
- Disturbance recorder in DCS for quick identification of fault during abnormality.

10. Teamwork, Employee Involvement & Monitoring

- Daily Performance Monitoring of Auxiliary, PHR, Boiler Efficiency, Water Consumption and other critical parameters of Plant is done.
- Daily Performance Monitoring meeting is chaired by HOD- TPP
- Energy Awareness Training Program by Energy Manager and Auditors.
- 101 Kaizens implemented at worker and supervisor level.
- Boiler Fans and ACC are the areas whose Power Consumption is to be optimized.




Training on EE


Best KAIZEN Team award

Energy efficiency / awareness training program

SL.	TITLE OF THE PROGRAMME	VENUE	DATE (S)
1	Electrical Energy Conservation & Management	J.K. Cement WORKS (RTC)	June 10 - 11, 2019
2	Electrical, Cable, Energy Management, Mining Solution, HT motors	Virtual Training	03.04.2020
3	Energy reduction and Productivity improvement through plant upgrades	Virtual Training	03.04.2020
4	Energy efficiency in cement manufacturing & certified green cement expert	Virtual Training	13.04.2020
5	Latest solution for Energy Management System with Live demo	Virtual Training	04.04.2020
6	Energy Sustainability, Best Practice adopted all over the Industries.	Virtual Training	04.04.2020
7	Energy & Carbon Management Technical Standard	Virtual Training	04.04.2020
8	Energy management through Aluminum metal spraying and Aluminum based polymeric coatings	Virtual Training	05.05.2020
9	CII Certified Professional in Energy Efficiency (Cement Sector) from 8 -12 March 2021	Virtual Training	8 -12 March 2021
10	Energy Management System	Sewagram Cement Works	16.05.2020
11	Awareness Session on ISO 50001	Sewagram Cement Works	02.06.2021
12	Energy Conservation & Management	Sewagram Cement Works	8.11.2021
13	Energy reduction awareness session	Sewagram Cement Works	14.03.2022

Energy Management System ISO50001:2018 & Green Products

ADITYA BIRLA

UltraTech

ULTRATECH CEMENT LIMITED

UNIT: SEWAGRAM CEMENT WORKS

ENERGY & CARBON MANAGEMENT POLICY

We are committed to demonstrate excellence in reduction in Energy consumption & carbon emissions in all our activities of manufacturing of cement and clinker on continual basis so as to make our Unit & its surrounding environmentally sustainable for future.

We shall achieve this by:

- Maintaining positive legal compliance to energy & carbon regulations.
- Raising awareness to encourage efficient use of energy resources, with a focus on reducing its energy intensity and carbon footprint.
- Increasing the use of renewable energy & alternative fuels wherever possible.
- Adopting cleaner and efficient technologies to support the low carbon solutions through economically viable management systems and best practices.
- Engaging internally and externally with its stakeholders to understand and collaborate on actions promoting low carbon approaches to benefit both the Business and associated communities.
- Ensure the availability of Information, necessary resources & purchase of energy efficient products & services for energy reduction.
- Monitor, measure and report energy usage and carbon emissions in compliance with internationally recognized protocols and communicate approach and achievements to relevant stakeholders.
- To 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.

Revision No.: 01

JEP & Unit Head

Date: 12/03/2019

GreenPro and LCA studies helped assess various initiatives taken by the company for reducing the environmental impact of manufacturing cement at every stage of its lifecycle.

Well defined Energy Policy

Formation of Energy cell-Cross functional Team comprising various levels.

Energy Policy

Gap analysis with respect to target and systematic action plan to achieve the target

Task force teams formation for different sections.

Gap Identification

Monthly review by TOP Management
New return base CAPEX approved on top priority-ROI<3 Yrs.

Daily review by Technical Head along with all Departmental Head .

Review Mechanism

Time to Time participation in different energy saving initiative national as well as group level workshop

REPRISM-Implementation of other unit best practices at respective units

National Workshop & REPRISM

SCW has got “Certification from International organization for standardization for Integrated Management systems for Energy Management System (**ISO 50001:2018**) from certification agency DNV.

Learnings from CII Energy Award

Knowledge	• Helped in building technical knowledge to increase energy efficiency of plant
Troubleshooting of Problems	• Different case studies acts as a ocean of knowledge helped in trouble shooting of problems..
Best Practices	• We have implemented many best practices which have improved the performance of our plant.
Recognition	• The Awards give an opportunity to companies to shine and be known nationally and internationally for their innovative products and services and its commitment towards Energy Conservation

CII –Awards

Platinum-**Team TPP(O & M)**

Gold award – Team TPP(E & I)

CII The Super Challenger Trophy

Gold-**Team TPP(O & M)**

Gold-**Team TPP(O & M)**

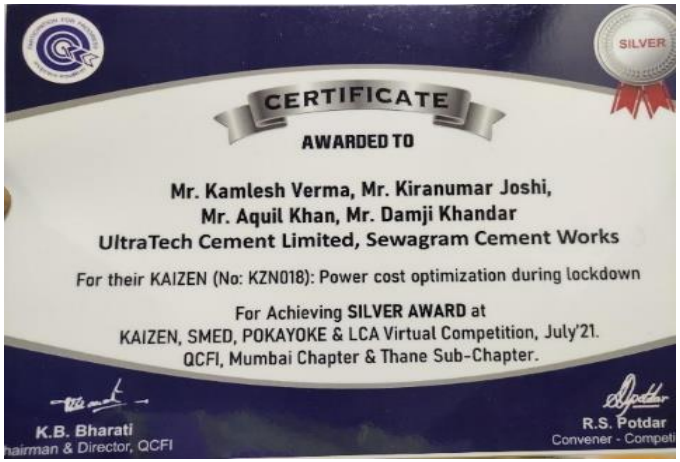
Quality Circle Awards

Par Excellence Award in 46th ICQCC 2021

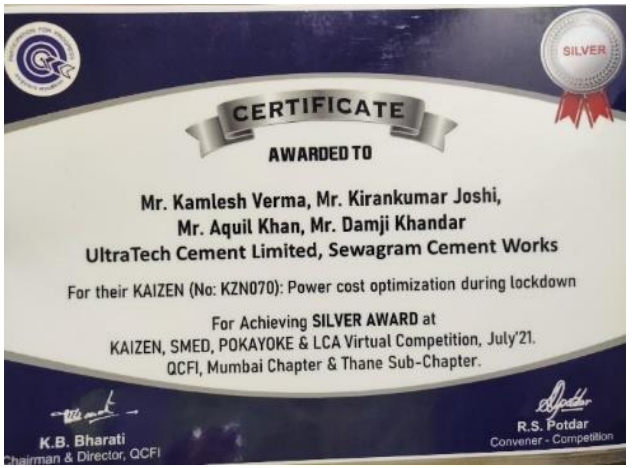
QCFI: National Convention 2021 Coimbatore Chapter

Gold- QCFI 2nd Virtual Competition on Kaizen

Gold award in QCFI Kaizen 2021



QCFI: Mumbai-Thane Chapter: Kaizen, Poka-Yoke, SMED, LCA Virtual competition



CSR Focus Area

Education	Health	Sustainable livelihood	Infrastructure Development	Social Empowerment
Initiating and Supporting Education programs	Facilitating the strengthening of Health Services and the health delivery network	Providing training in various vocational skills and opportunities for community	Supporting the development of community Infrastructure	Develop Positive attitude among the villagers towards Social evils

We are committed to the overall development of the villages around our factories/projects through multi-stakeholder partnerships

Government **NGO Partnerships** **Employee Engagement**

Thank You

Team Members:

1) Kamlesh Verma- 9922413023 (kamlesh.verma@adityabirla.com)
2) Gopesh Kumar Sharma- 7069091338 (gopesh.kumar@adityabirla.com