OPGC
Power for Progress

Odisha Power Generation Corporation
2 X 660 MW

Team Members:

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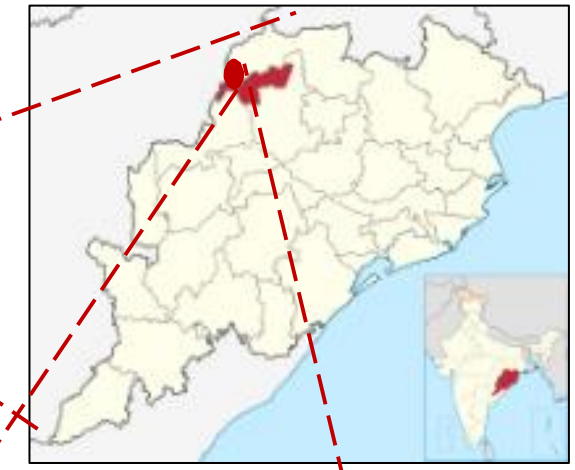
Sandeep Sahu
Braja Kishore Das

CII-25th National Award for Excellence in Energy Management Sept-2024

Company Profile: About OPGC



PLANT SITE

- ✓ **The only fully owned Government company of State of Odisha in Thermal Sector**
- ✓ **Total generation capacity of 1740 MW**
  - **2x210 MW Subcritical (Stage-I)**
  - **2x660MW Supercritical (Stage-II).**
- ✓ **Units 1 & 2 (OPGC- I) commissioned in Dec'94 & Jun'96 respectively**
- ✓ **Unit 3 & 4 (OPGC II) commissioned in July'19 & Aug'19 respectively**
- ✓ **OPGC is the Top Performer/ contributor in Odisha Power Sector - catering >30% load share of the state alone.**

An ISO 9001, 14001,55001 ,45001 & ISO 50001 Certified Company

Company Profile: OPGC at a Glance..

100% PPA with GRIDCO (State of Odisha)

5.5 Km Long Dedicated Water Intake Channel from Hirakud Reservoir, with Contracted allocation 1 . 3 L m3 /day

Dedicated Coal Mines with Annual Contracted Capacity of 80 LMT from OCPL for OPGC- II

48 Km Long Dedicated MGR Railway Line from OPGC to Manoharpur for Coal Transport

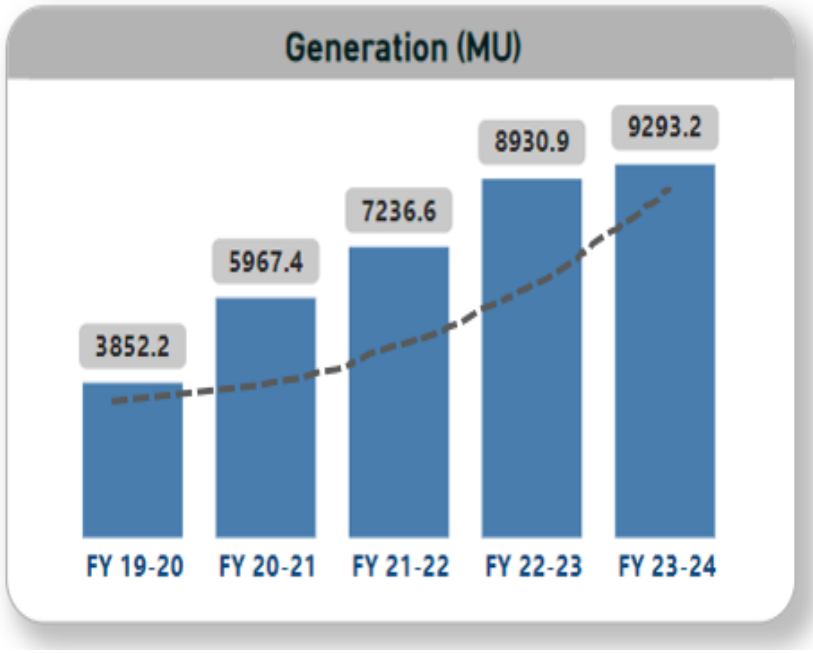
Energy Consumption Overview – FY 23-24

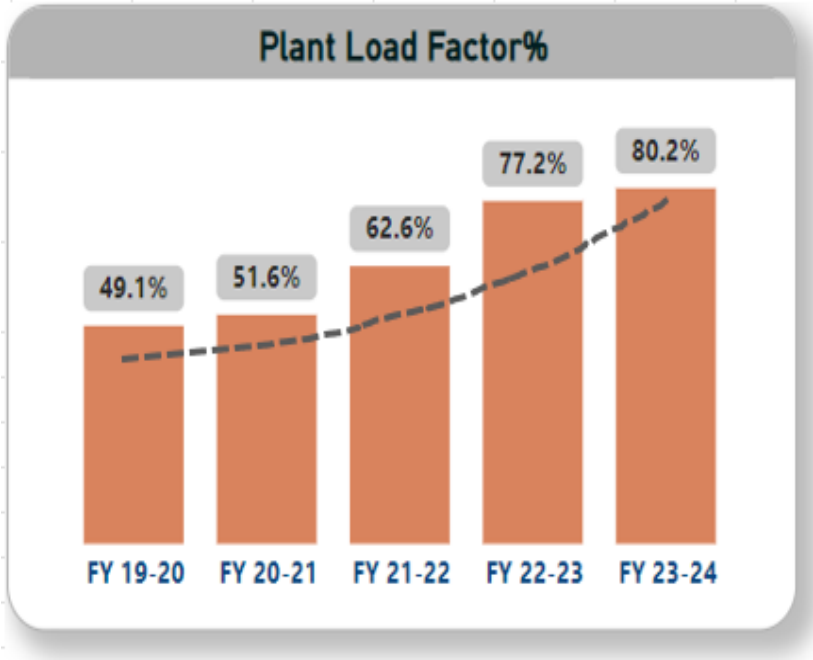
Annual Generation	Plant Load Factor:	Plant Availability:
9293.2 MU Annual Avg Gen : 1058MW	80.15%	88.23%

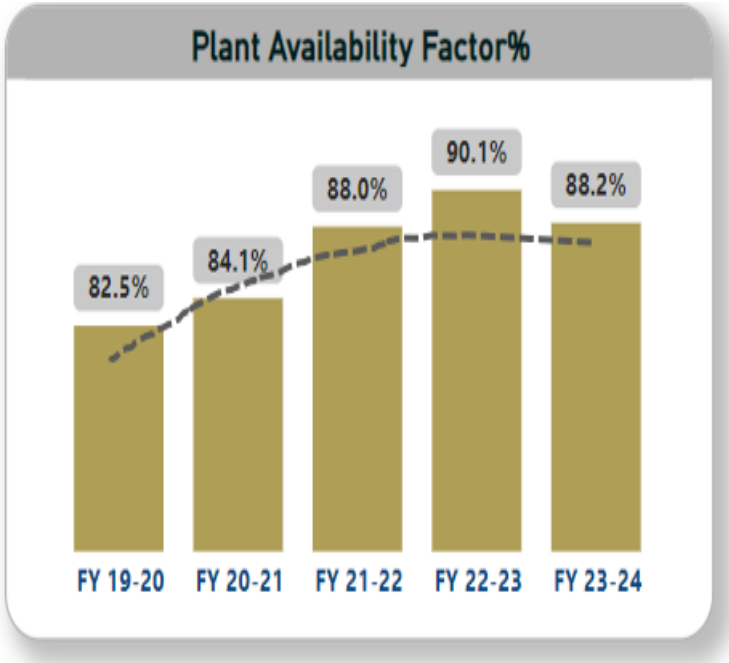
Gross Heat Rate	Auxiliary Power	Turbine Heat Rate
2154 Kcal/Kwh	5.58%	1870 Kcal/kwh

Boiler Efficiency	DM Water Consumption	Specific Oil Cons
86.8% Coal Consumption: 6478715 MT	0.7% DM Consumption: 277726 MT	0.194 ml/Kwh Oil Cons: 1799 KL

Energy Consumption Overview: Performance Trend..



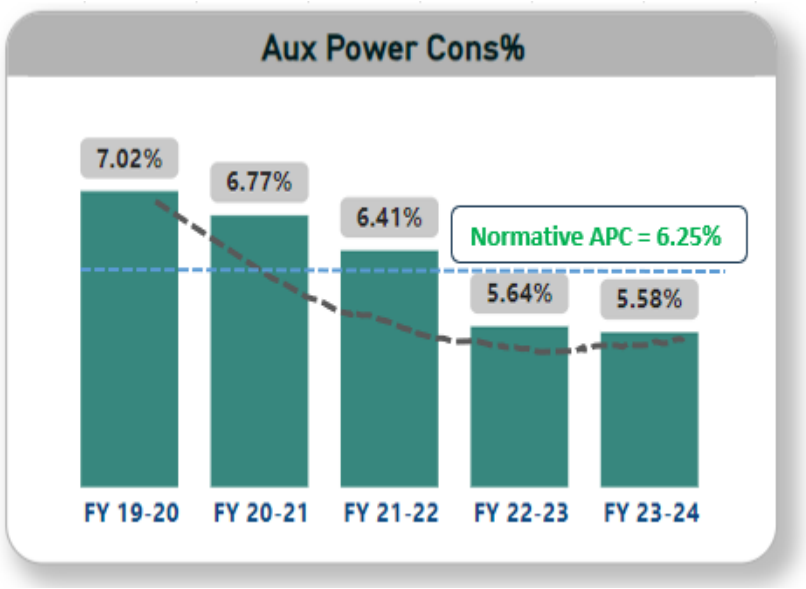


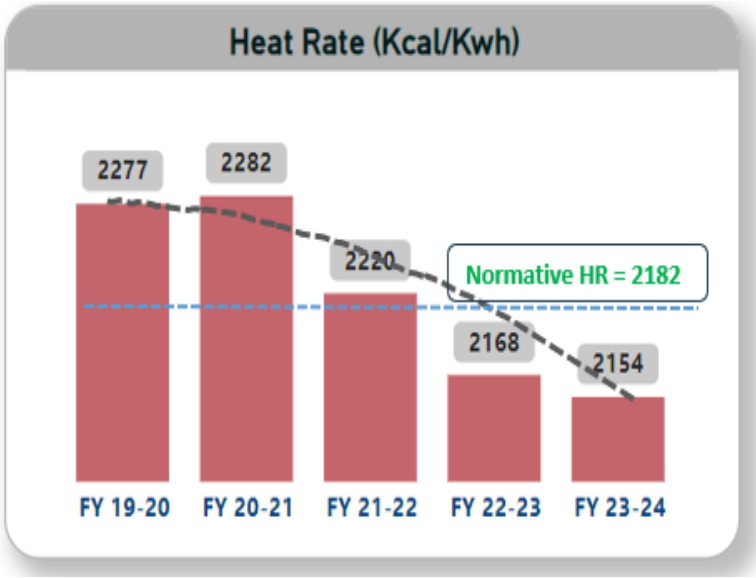


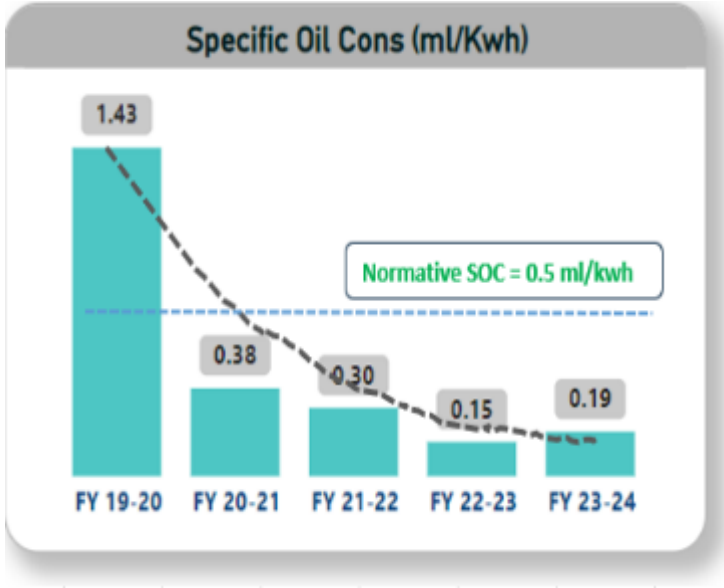
- In FY 21 & 22, PLF% was low mainly due to Ash Evacuation Constraints. After completion of Ash Extraction & Conveying System Modification(in Jan22), PLF improved significantly.
- Continual improvement in Plant load factor resulting into surpassing avg. PLF of 80% in FY 23-24

  (OPGC PLF is among the Top 5 best State utility Power Plants in the Country in FY 2023-24)
- After the completion of ongoing Ash Augmentation Project in Unit#4, OPGC PLF is projected to be more than >85% in FY 24-25.

Energy Consumption Overview: Performance Trend..



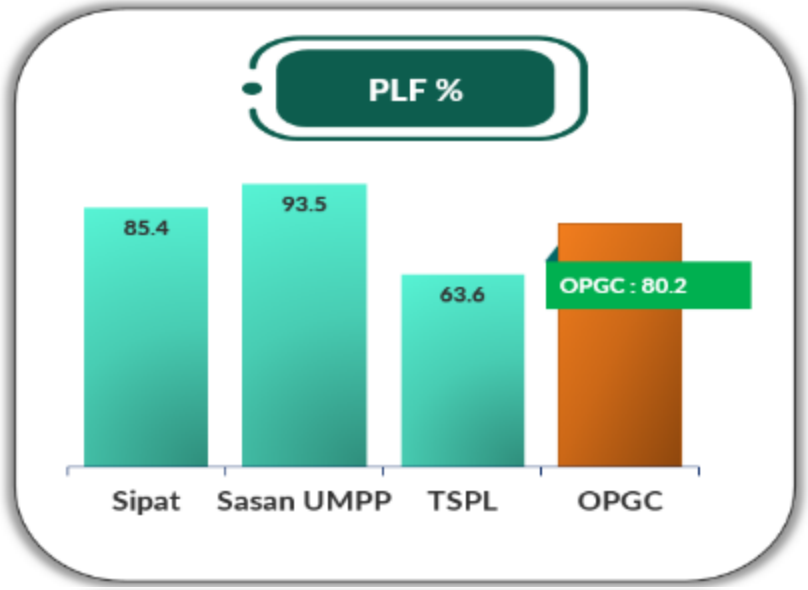


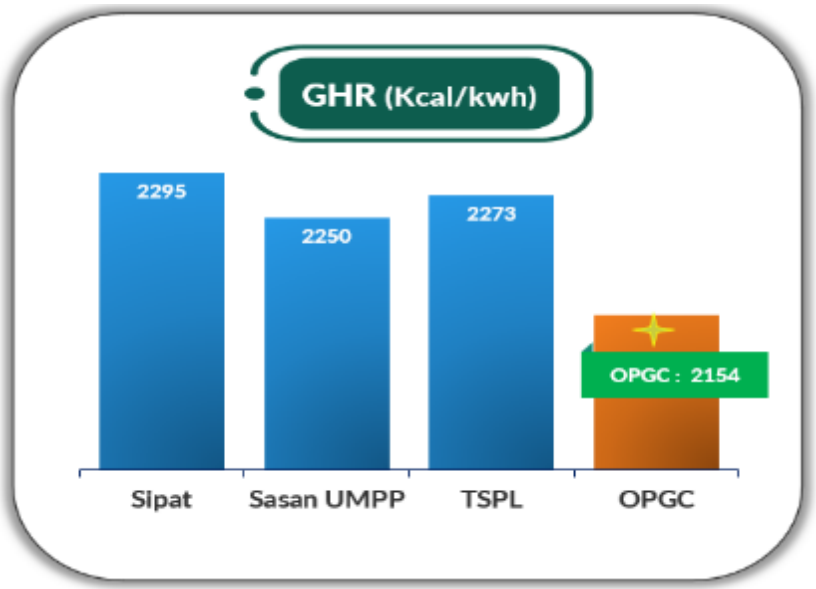


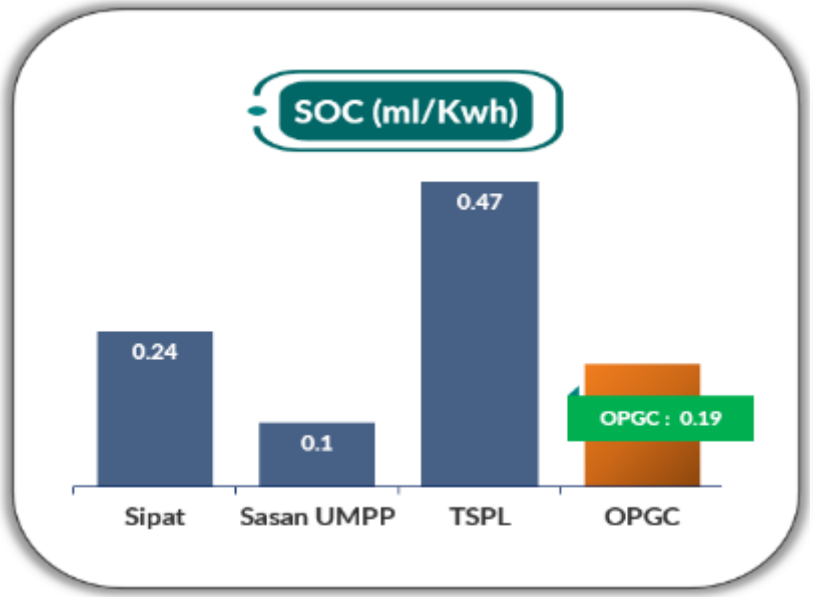
- Central electricity regulatory commission (CERC) has fixed a normative Heat Rate for OPGC at 2182 kcal/kwhr & APC% at 6.25% based on the technology.
- OPGC has been able to maintain Gross Heat Rate & APC % below the Norms continuously for last two years even at 80% PLF.
- Heat Rate Improved by 14 Kcal/kwh & Net Heat Rate improved by 17 Kcal w.r.t Last Year

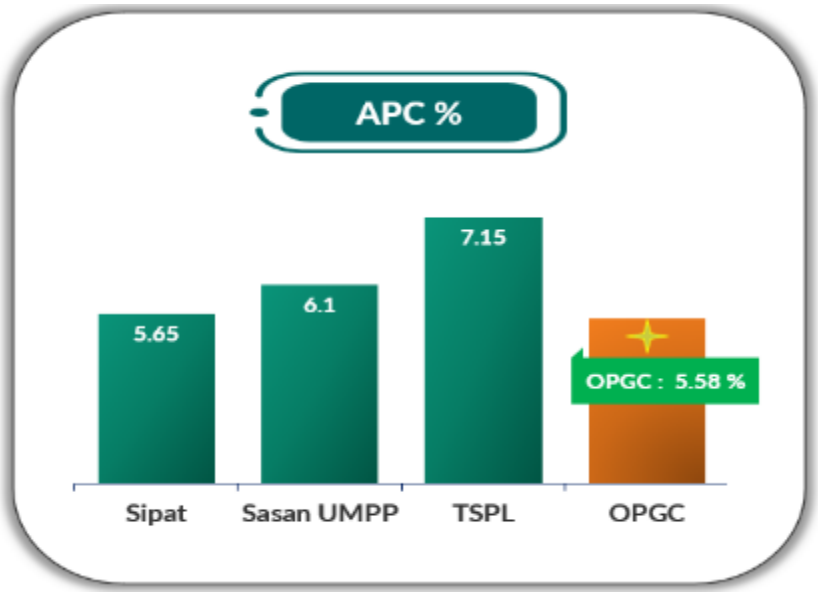
  (Station Heat Rate improved more than > 70 Kcal in last two years due to efficient & reliable Operation, implementation of several improvement projects and adopting best O&M Practices).

Energy Benchmarking: FY 2023-24









OPGC Stance among other Peers:

- OPGC is one of the pioneer company in thermal utility of India and has set a high-performance benchmark among other similar capacity plants.
- The Performance Parameters (like Heat Rate & APC) of OPGC is one of the best in the country among the similar capacity power plants.

❖ **Our Short-Term Plan:**

- Efficient & Reliable Operation
- Efficient Energy Monitoring and taking remedial measures
- Implementation of ENCON Projects
- Exploring New Opportunities and Using Latest Technologies

❖ **Our Long-Term Plan:**

- continual improvement by adopting best O&M practices, efficient Operation and by use of energy efficient products and services

Road Map to achieve Global Benchmark:

AVAILABILITY

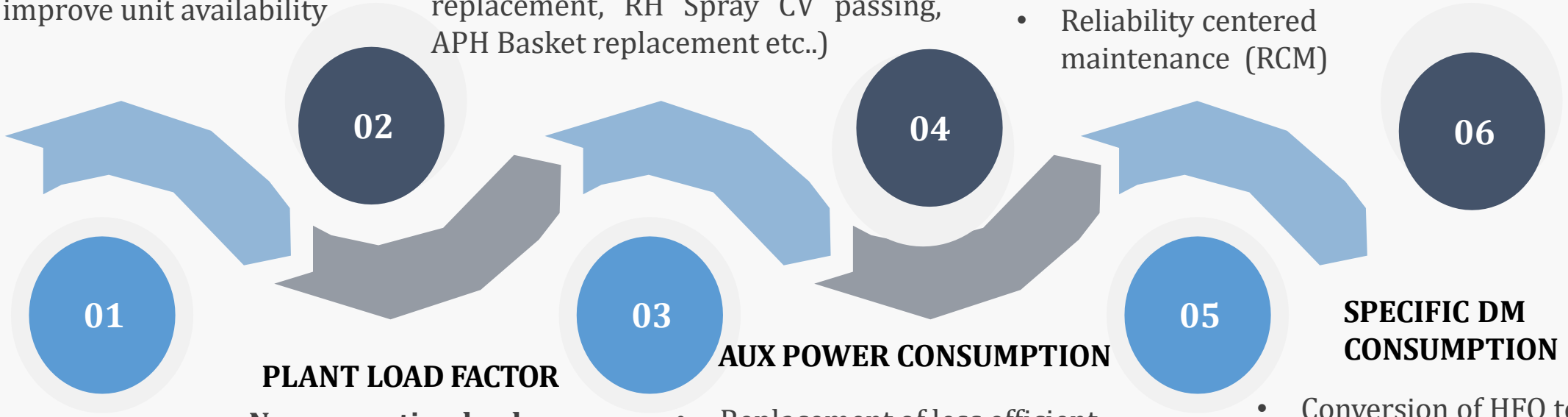
- **Ash Augmentation project** for FA & BA is under implementation to improve unit availability

GROSS HEAT RATE

- Initiated Heat rate improvement project under **PRAYAS** (APRDS interconnection, TDBFP RC valve replacement, RH Spray CV passing, APH Basket replacement etc..)

SPECIFIC OIL CONSUMPTION

- Zero Forced Outage Program to reduce unit outages
- Reliability centered maintenance (RCM)



PLANT LOAD FACTOR

- **No generation back down as per merit order** from SLDC due to low cost reliable power available by OPGC

AUX POWER CONSUMPTION

- Replacement of less efficient motors with **energy efficient IE4 Motors**
- **New design CT Fan blade** replacement.
- Performance based maintenance practices

SPECIFIC DM CONSUMPTION

- Conversion of HFO to LDO to reduce steam cons.
- Utilization of CT Blowdown water by passing through RO system

Major Encon Projects Planned for FY 24-25

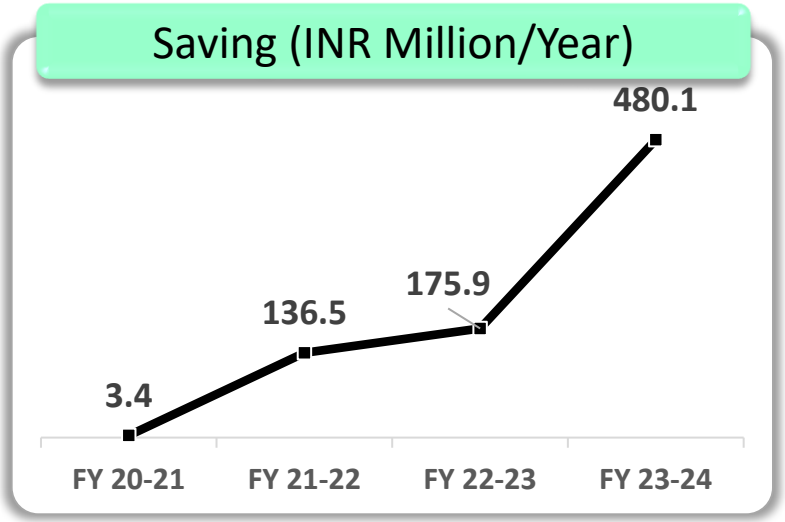
1	2	3	4	5
Replacement of FRH Inner bend tubes	**APRDS Interconnection between Stage-1 & 2**	**HFO to LDO Conversion**	**Ash Augmentation project**	**Implementation of AIML as a part of Industry 4.0**
Benefit: Improve the HRH temp. by 20 deg.(Coal saving of ~7850 MT/Yr)	**Benefit:** Improving Start up time & reduction of sp. Oil (~60 KL/Yr)	**Benefit:** Saving of coal due to reduction in steam cons.(~ coal 19667 MT/Yr)	**Benefit:** Improving unit PLF & Heat rate by 4% & 10kcal/kwh respectively(Coal saving ~15919MT/Yr)	**Benefit:** Saving in APC of ~0.7 Mu/Yr and Coal saving ~14460 MT/Yr
Payback Period: 4 .4 Months	**Payback Period:** 20.6 Months	**Payback Period:** 3.5 Months	**Payback Period:** 5.3 Months	**Payback Period:** 6.5 Months
₹ 14.5 Million/Yr	₹ 4.1 Million/Yr	₹ 27.3 Million/Yr	₹ 1091.0 Million/Yr	₹ 29.6 Million/Yr

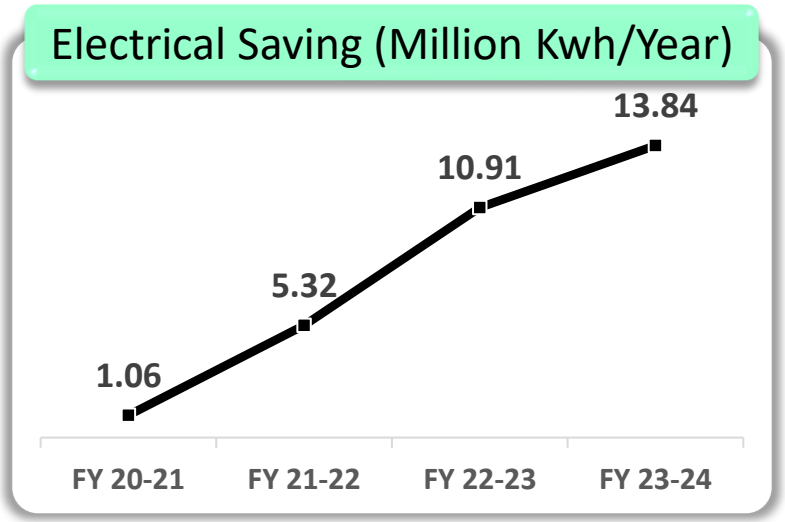
Major Encon Projects Planned for FY 24-25

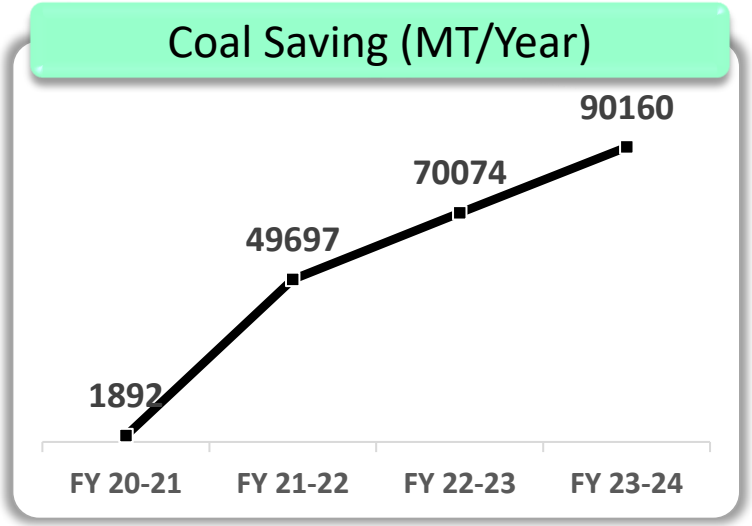
6	7	8	9	10
Installation of Sonic soot blowing system in APH	**VFD Installation in LP Pump at AHP**	**Installation of Energy efficient IE4 Motor in 90 nos. of motors**	**New profile basket replacement in APH**	**IFC Installation in Compressed air system**
Benefit: Saving in steam consumption (Steam saving of ~11169 MT/Yr)	**Benefit:** Saving in Electrical energy (~0.9 MU/Yr)	**Benefit:** Saving of electrical energy by 1.6 MU/Yr	**Benefit:** Saving of coal due to reduction in FGET. (~ coal 9159MT/Yr)	**Benefit:** Saving in APC due to saving of compressed air by ~0.4 Mu/Yr
Payback Period: 2.5 Months	**Payback Period:** 10.9 Months	**Payback Period:** 14.2 Months	**Payback Period:** 31.0 Months	**Payback Period:** 19.5 Months
₹ 6.9 Million/Yr	₹ 0.3 Million/Yr	₹ 5.7 Million/Yr	₹ 16.9 Million/Yr	₹ 1.2 Million/Yr

ENCON Projects Summary (Last 3 years):

Year	No. of Energy Saving Project	Investments (INR Million)	Electrical Saving (Million kWh)	Thermal Saving (Million Kcal)	Saving (INR Million)
FY 2021-22	11	18.3	5.33	155,478	136.5
FY 2022-23	11	31.8	10.9	218,193	175.9
FY 2023-24	14	572.7	13.84	278,324	480.1
Total	**36**	**622.8**	**30.1**	**651,995**	**792.5**







ENCON Project Details FY 23-24

Sl	Title of Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Total Annual Saving (Rs Million)	Investment (Rs Million)	Payback (Months)
1	HRH Temp. improvement by replacing FRH inner bend tubes	-	51,361	30.8	5.4	2.1
2	APH Soot blowing line modification	-	27,879	16.7	1.03	0.7
3	Reduction in DFG losses after replacement of new profile APH basket	-	35,953	21.6	13.1	7.3
4	Replacement of Conventional lights with LED	1.1	-	3.6	1.0	3.4
5	Online change over of bunker flap gate to reduce the belt idling time by 2.15 hrs/day	2.6	-	0.9	0	0

Replacement of FRH inner bend tubes

APH Soot blowing line size modification

APH Basket replacement after water washing

ENCON Project Details FY 23-24 cont..

Sl	Title of Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Total Annual Saving (Rs Million)	Investment (Rs Million)	Payback (Months)
6	Energy Efficient CT Fan blades replacement	2.2	-	7.5	10.3	16.5
7	Arresting of APH seal & Duct Leakage to save APC in ID,FD & PA Fan	7.7	-	26.7	15.5	7.0
8	Stoppage of CT Fan during winter	1.5	-	5.1	0	0
9	Repair & replacement of high energy passing valves (TDBFP RC,MAL drn, HWL etc..)	-	28248	16.9	17.0	12.1
10	Cond. vacuum improvement(Jet clean, IDCT nozzle replace,Helium leak test,ceramic coat)	-	15,408	9.2	2.4	3.1


Energy Efficient CT Fan blade replacement


Thinning & Damaged Radial seal


New Seal Replacement

APH Damaged Seal replaced with new one


Damaged cage of TDBFP RC valve


Cond. Bullet clean


Ceramic coated

Condenser bullet cleaning & Ceramic coat

ENCON Project Details FY 23-24

Sl	Title of Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Total Annual Saving (Rs Million)	Investment (Rs Million)	Payback (Months)
11	Online Drain Temp. monitoring	-	17,905	10.7	0.5	0.6
12	Implementation of OSI Pi software along with 6 applications	1.1	37,172	26.1	19.4	8.9
13	Reduction in cycle make-up loss	-	6.420	3.9	5.5	17.3
14	Implementation of Ash augmentation project in Fly ash & Bottom Ash	-	57,974	300.2	481.5	19.2
	Total	13.8	278,324	480.1	572.7	


Thermopad connected in all drains


Online drain temp. monitoring


APC monitoring dashboard


Installation of 600 TPH new Intermediate silo


Ash Transport vessel

Ash Augmentation project in Fly ash system.

Major Encon Project Details FY 21-22 & FY 22-23

S No	Title of Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Total Annual Saving (Rs Million)	Investment (Rs Million)	Payback (Months)
1	New Energy efficient CT Fan Blade replacement	0.1	-	0.3	0.4	17
2	Replacement of conventional lights with LED	0.9	-	3.1	2.7	11
3	Stoppage of cycle make up pump by using gravity hot well make up	0.2	-	0.7	0	0
4	Stoppage of one HFO forward pump & ACW pump in winter	0.4	-	1.4	0	0
5	RH Temp. improvement by repairing of HPBP Spray CV and RH spray Block & Control valve	-	35,652	21.6	2.7	1.5
6	192 nos. of APH Basket replacement and water washing of the APH in Unit-4	-	50,374	30.8	0.6	0.2
7	Start-up Oil saving due to modified start-up practices and additional drain in atomizing line	-	1,803	6.6	0	0
8	Energy saving in ID, FD , PA Fans & ESP by attending APH seal leak, duct leakage	7.9	-	26.8	0.5	0.2
9	Condenser Heat Loss reduction by vacuum improvement	-	30,224	18.4	1.5	1
10	APH Soot blowing line size modification along with higher valve size in both the APH of Unit-4	-	44,654	27.3	1.0	0.5

Innovation Project-1 : Ash Augmentation Project

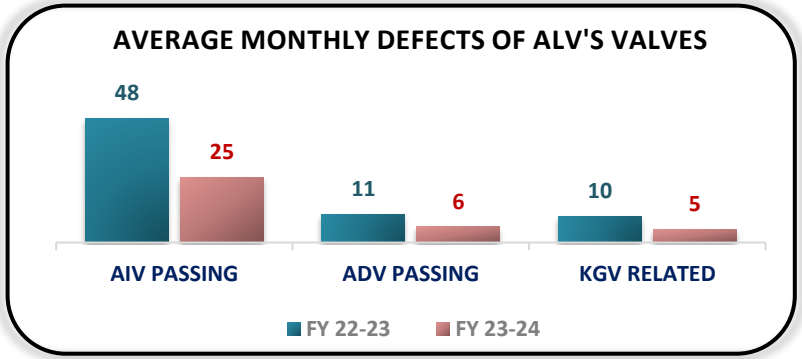
1a. FLY ASH AUGMENTATION:

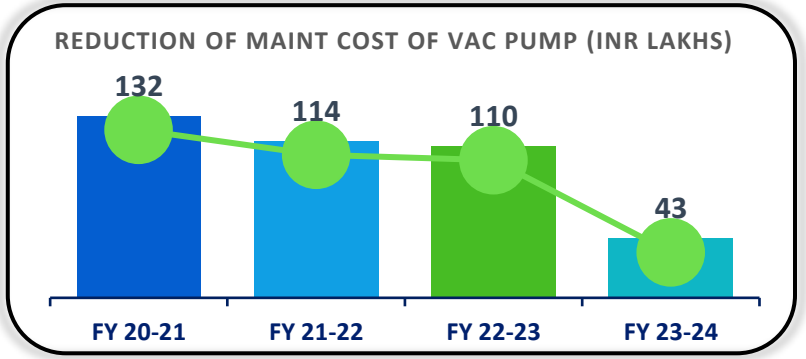
FLY ASH SYSTEM KEY CHALLENGES

- Deviation in conveying rate and evacuation rate was causing ash built in buffer hopper
- Frequent passing and jamming issues in Air intake vessel & Air discharge vessel of air lock vessels
- Frequent failures in ALV vent lines and valve, due to coarse ash from 1st two fields increased downtime
- Extraction was getting hampered due to poor ash evacuation from 1st two fields of each pass

MODIFICATION & ACHIEVEMENTS

- Installation of **Ash conveying vessel's** & **New Intermediate Silo** (Common for both units) to accommodate ash collected from 1st & 2nd field hoppers.
- Top discharge ALV's were replaced with **bottom discharge ALV's with fluidizing arrangement**
- Buffer hopper manual KGV's were replaced by **pneumatic actuated KGV's** which resulted in less maintenance downtime.
- Sizing of Vent line and valves to buffer hopper end was changed **from 65 NB to 100 NB**, resulting in reduced cycle time
- Modifying **closing of AIV & ADV-80% fast & 20% slow pace**, resulting in reduced impact of disc on the valve seat which reduced the sys downtime





Innovation Project-1 : Ash Augmentation Project

1b. BOTTOM ASH AUGMENTATION :

BOTTOM ASH SYSTEM KEY CHALLENGES

- Ash built up due to under design BAH
- Under design CG & Jet pump
- Erosion of CG teeth due to larger ash
- Higher particle size at the outlet of CG
- Manual operation of KGV's causing delay

BOTTOM ASH MODIFICATONS & ACHIEVEMENTS:

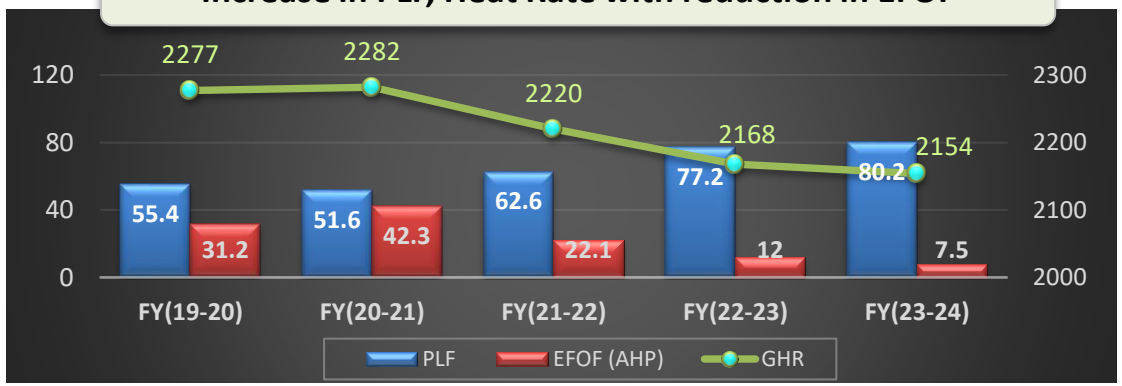
Replacement of existing 75 TPH Clinker Grinder & Jet pump with **90 TPH CG** & Jet pump with necessary modifications in the drive mechanism

Replacement of Existing manual slurry duty **high pressure KGV's with MOV.** After replacement, the effective changeover time is reduced from 01 Hrs. 30 mins to 15 mins

Improved performance of refractory achieved after reduction and strengthening of anchor spacing over shorter walls

After modification, time taken for **bottom deashing is reduced from 2.30 hrs. to 1.10 hrs.** Unit-3 is now able to operate at full load

Increase in PLF, Heat Rate with reduction in EFOF



Total Annual Cost Saving of the Project: ₹ 30 Cr

Innovation: Project-2: DSM Software

In House Application for Generation & Export Deviation Monitoring (DSM Software)..

COMPLIANCE

- Helps in complying to CERC DSM Norms, while maintaining “Grid” discipline.
- Helped in minimizing penalties due to Under injection / over Injection

MONITORING

- Software Accurately measure and monitors the real-time export data. Logs, calculates
- Displays Frequency, ADC, ACP, DC, UI charges for each block of the day as well as for 24 HRS

KEY FEATURES

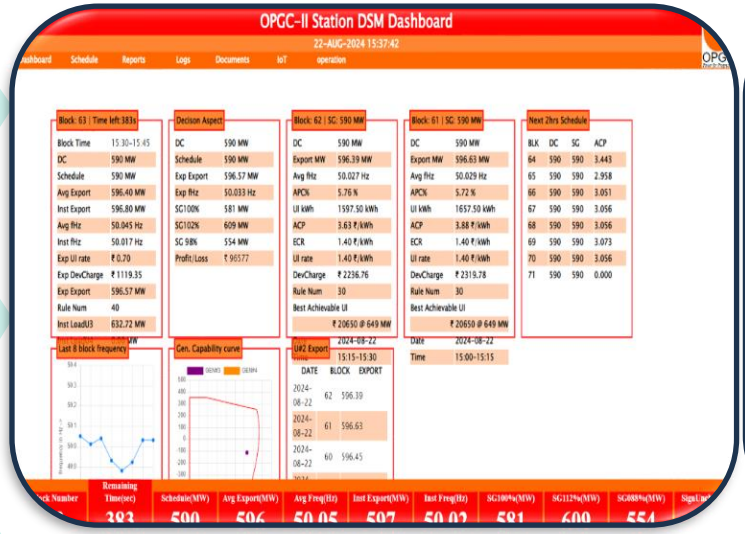
- Displays frequency trends for last 8 blocks for operator action, average export, instantaneous export, required load.
- Daily reports are generated and sent to desired recipients

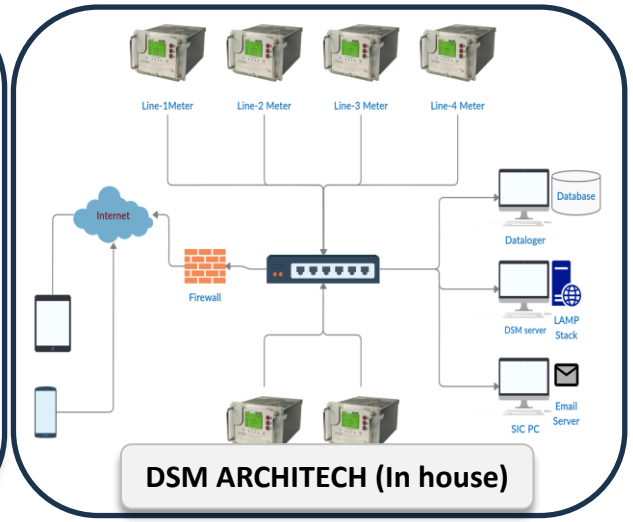
SOFTWARE/ HARDWARE

- Installation of Energy meters at important nodes/ locations (This was the only cost incurred), C and MySQL, HTML5, CSS3 and JavaScript, Python.

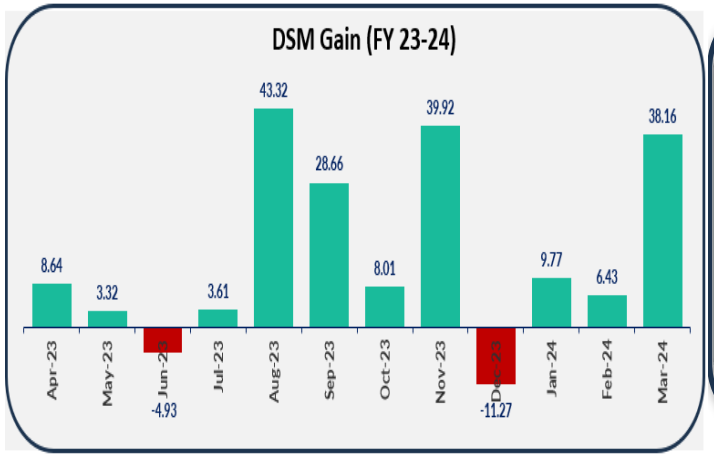
REVENUE GENERATION

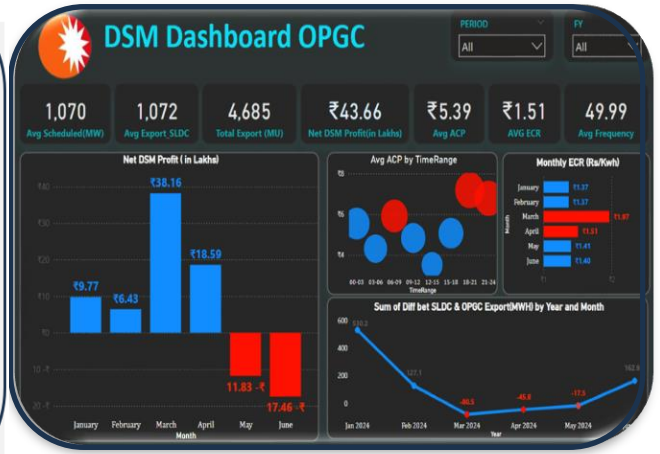
- Additional revenue was generated, and Coal saving was done with the help of DSM, by regulating load looking at the frequency





DSM ARCHITECH (In house)

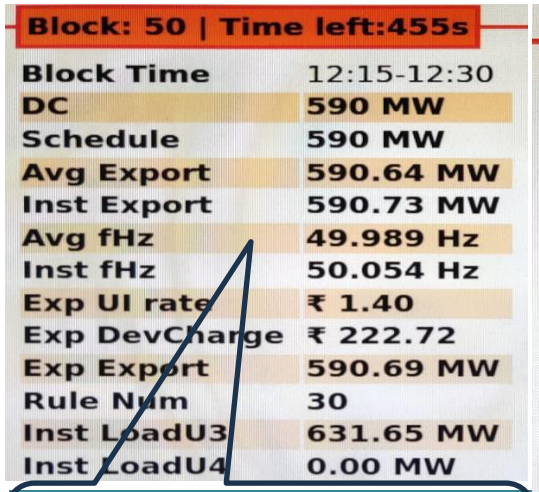




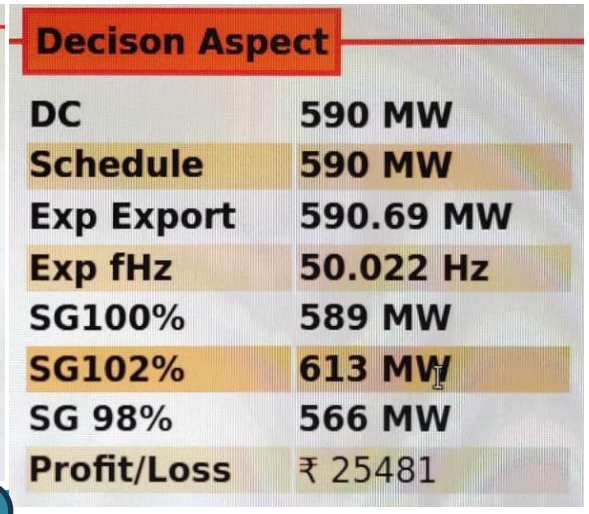
Total Investment: ₹ 0

Total Annual DSM Gain in FY 23-24: ₹ 1.97 Cr

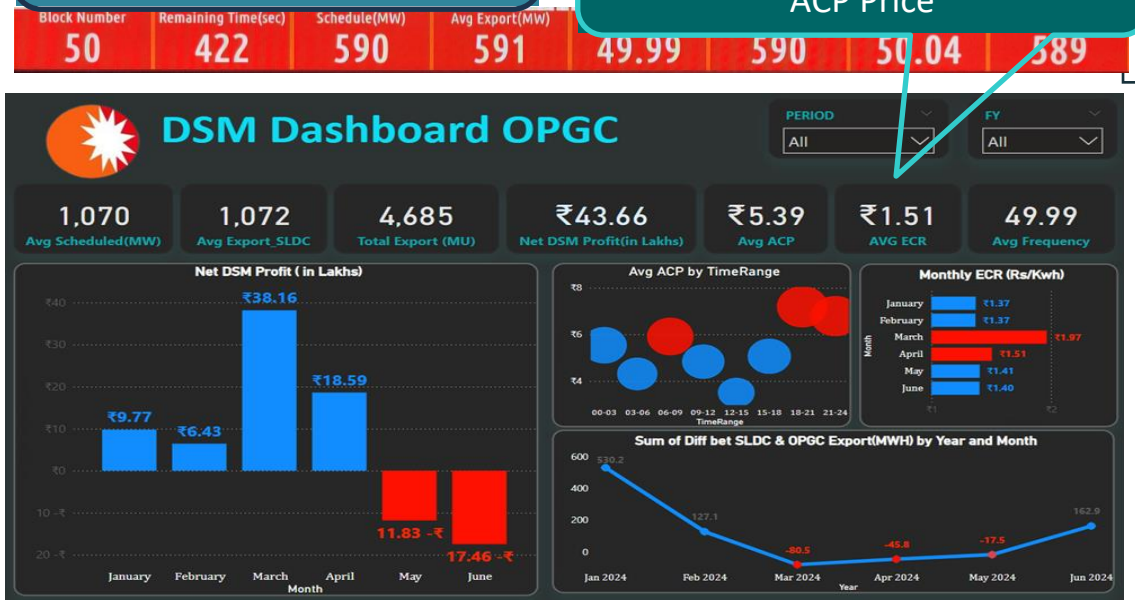
Innovation: Project-2: DSM Software

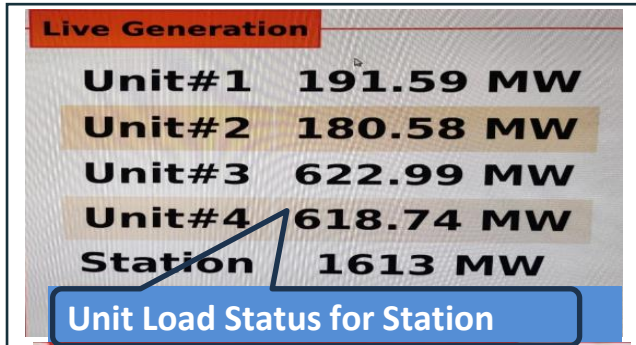


Current block no., generation, export, frequency & other important details

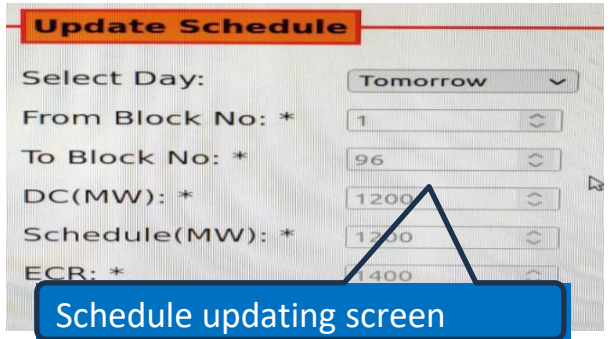


Consolidated DSM DashBoard with Export, Import, DSM Gain, ACP Price

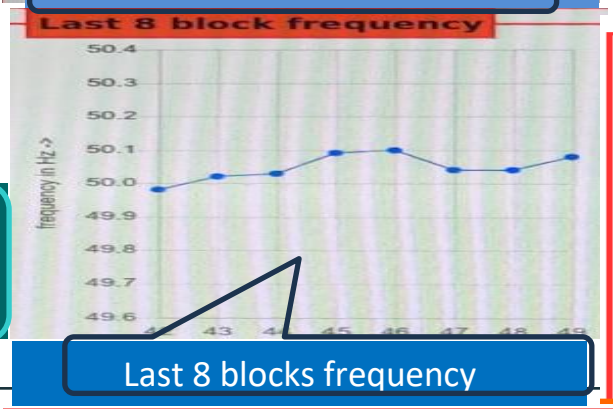




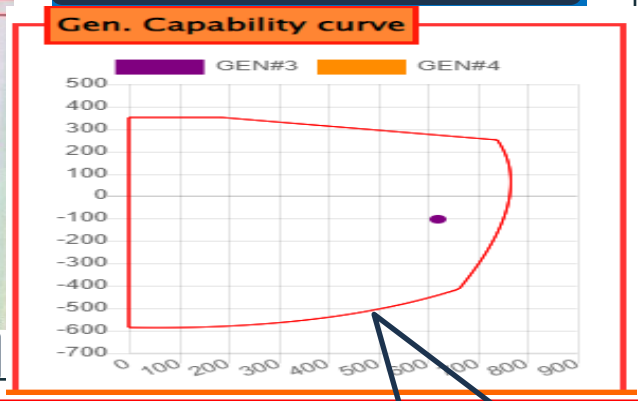
Unit Load Status for Station



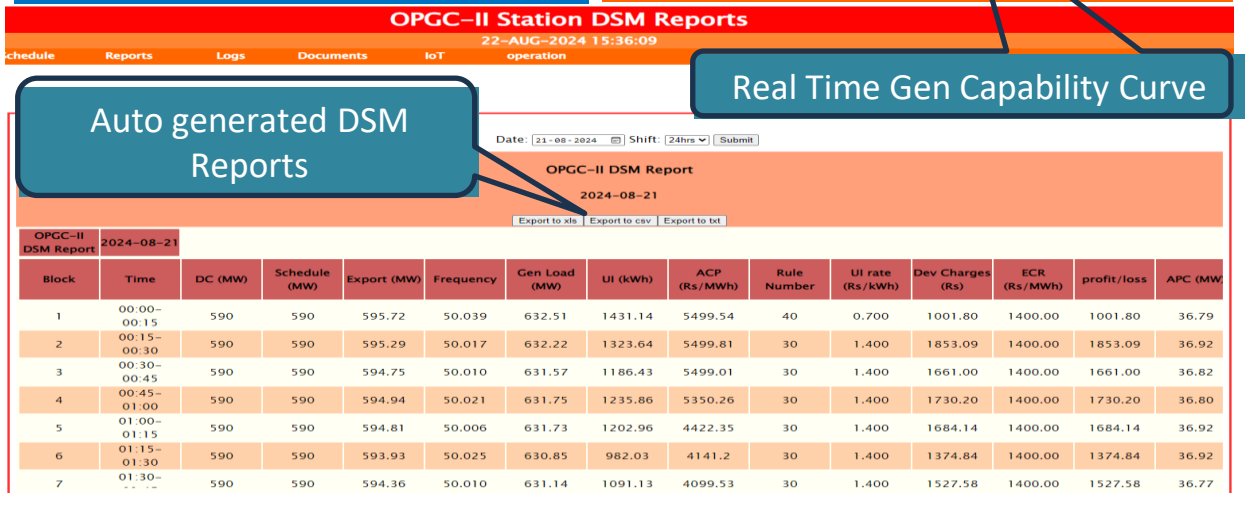
Schedule updating screen



Last 8 blocks frequency



Real Time Gen Capability Curve



Auto generated DSM Reports

Date: 21-08-2024 Shift: 24hrs Submit

OPGC–II DSM Report 2024–08–21

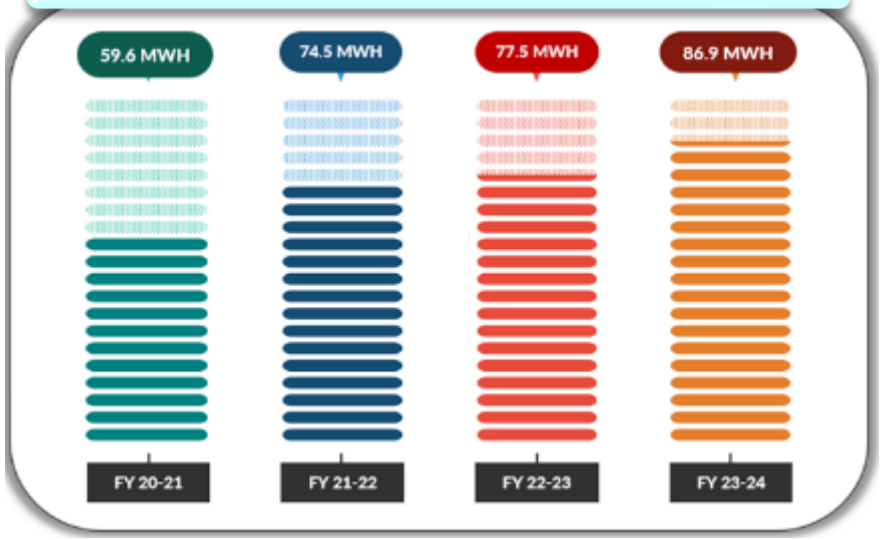
Export to xls | Export to csv | Export to txt

OPGC–II DSM Report 2024–08–21

Block	Time	DC (MW)	Schedule (MW)	Export (MW)	Frequency	Gen Load (MW)	UI (kWh)	ACP (Rs/MWh)	Rule Number	UI rate (Rs/kWh)	Dev Charges (Rs)	ECR (Rs/MWh)	profit/loss	APC (MW
1	00:00–00:15	590	590	595.72	50.039	632.51	1431.14	5499.54	40	0.700	1001.80	1400.00	1001.80	36.79
2	00:15–00:30	590	590	595.29	50.017	632.22	1323.64	5499.81	30	1.400	1853.09	1400.00	1853.09	36.92
3	00:30–00:45	590	590	594.75	50.010	631.57	1186.43	5499.01	30	1.400	1661.00	1400.00	1661.00	36.82
4	00:45–01:00	590	590	594.94	50.021	631.75	1235.86	5350.26	30	1.400	1730.20	1400.00	1730.20	36.80
5	01:00–01:15	590	590	594.81	50.006	631.73	1202.96	4422.35	30	1.400	1684.14	1400.00	1684.14	36.92
6	01:15–01:30	590	590	593.93	50.025	630.85	982.03	4141.2	30	1.400	1374.84	1400.00	1374.84	36.92
7	01:30–	590	590	594.36	50.010	631.14	1091.13	4099.53	30	1.400	1527.58	1400.00	1527.58	36.77

Renewable Energy:

Solar Generation (MWh/Year)



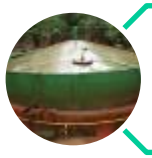
OPGC Long Term Plan

- Proposed 50 MW Solar power plant at Ash pond area is under pipe line (Tendering will start).
- Another 2 MW Solar power plant feasibility study & DPR under progress at Raw water intake channel

OPGC Green Initiatives

Solar water Heater for Colony & Canteen:

2900 LPD Capacity of Solar water heater installed for 160 families & for canteen



Biogas Plant:

Waste feeding capacity of 1MT/day and releases 3 cylinder of gas/day (42 kg/day), used for cooking in guesthouse

Solar LED installation at Colony & Ash pond:

60 nos. of 50Watt LED's are installed at ash pond with capacity of 3KW

Roof top Solar PV plant installation:

Total 39 KW of solar PV plant installed in plant canteen, Service building, WTP & Switchyard

Wind driven Turbo ventilation fan:

30 nos. of wind driven cooling fans are installed in WH & another 25 will be replaced in CW,IDCT & FOPH area from motor to wind

Rain water Harvesting:

1800 M3 Capacity of rain water harvesting pond to utilize the water in CHP system.

Roof top rain water harvesting:

Roof Top Rain Water Harvesting from all buildings.

Renewable projects implement

Solar water Heater at Canteen & colony.

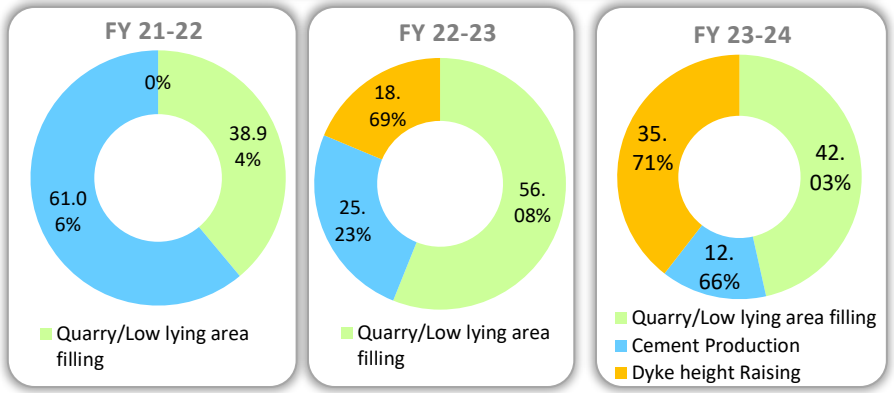
Solar LED light installation.

Roof top Solar plant at plant canteen

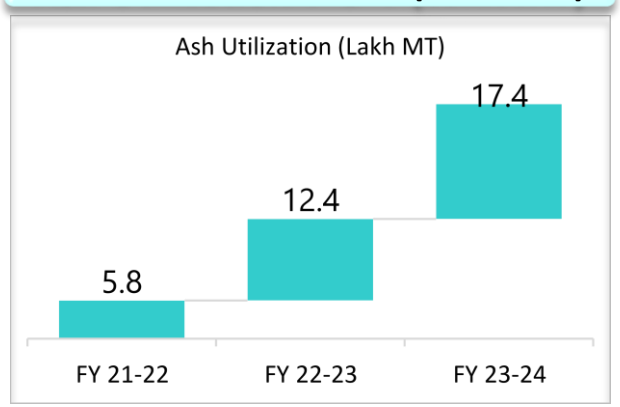
Biogas Plant at Colony

Environment Management: Ash Utilization

Ash Utilization Break up



Ash Utilization Y-O-Y (Lakh MT)



Ash Utilization Y-O-Y (Lakh MT)

Ash Parameter	UOM	2021-22	2022-23	2023-24
Ash Stock in Plant (Yard + Pond)	LMT	40.3	62.0	83.3
Ash Generated	LMT	24.2	28.3	26.3
Ash Utilization	%	23.8	23.3	19.2
Ash Utilization Expenditure	INR Lakhs	811	397	333

Best Practices in Ash Utilization

Action Plan for 100% ash utilization

Agreement with M/s Ambuja & M/s Dalmia cement (20 Lakh MT/Year):

Dedicated rake to be deployed for ash transportation from OPGC to Ambuja & DCBL.

Requirement for new NH constructin. (8 Lakh MT):

Estimated ash utilization of 8 Lak MT for the New NH construction from Jharsuguda-Kanaktora

Requirement for NHAI Sambalpur div. (7.9 LMT):

OPGC has received Order from NHAI Sambalpur div for supplying ash to NH-42 (Angul-Sambalpur Sect).

Requirement for Qry & Low lying area(5.75 LMT):

Identified the Kudopali low lying area of 2.75 LMT & quarry filling at Niladunguri Jujomura is ~ 3 LMT

Requirement for Qry & Low lying area(8.8 LMT):

CTE has been obtained from OSPCB for 5 Lakh MT & balance 3.8 Lakh MT is in process for several abandoned quarries/ low lying areas

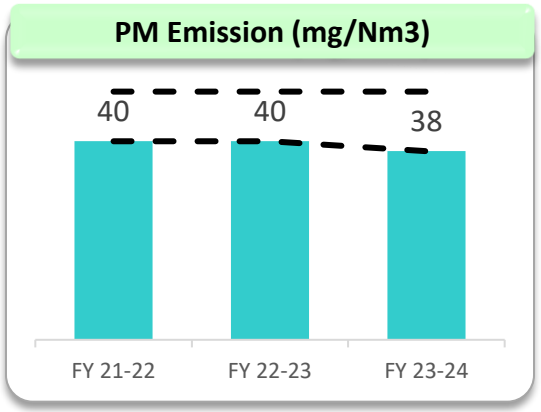
Ash requirement for Bricks manufacture(0.5 LMT):

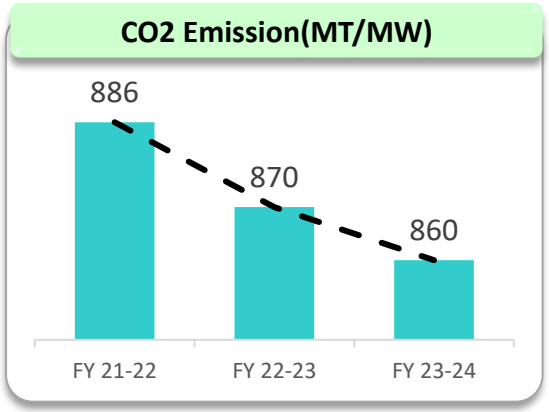
OPGC to manufacture and supply of 30 Lakh Bricks through inhouse brick manufacturing plant.

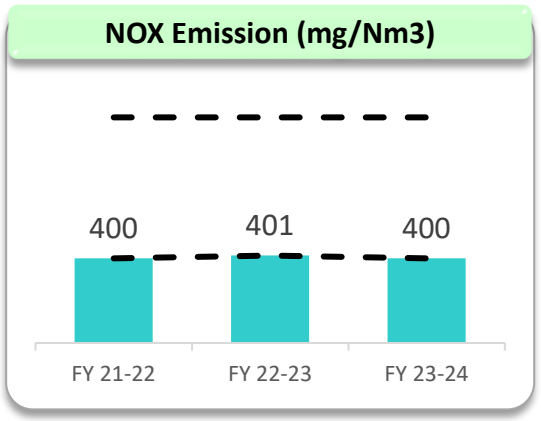
Huge ash utilization potential at OCPL mines:

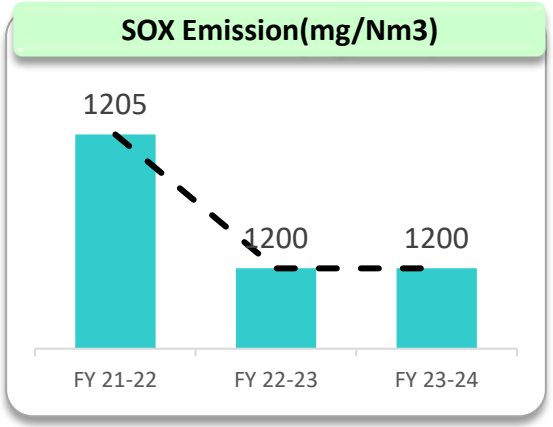
OPGC initiated feasibility study at OCPL mines for concurrent filling and OB mixing in the mines has the huge potential for long term ash utilization.

Environment Management: Emissions









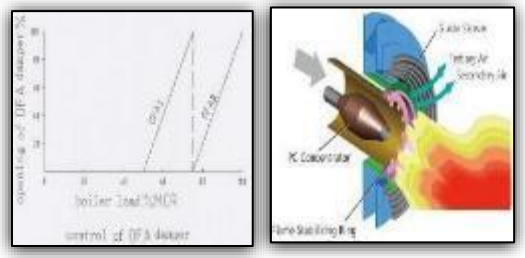
Public Disclosure :

1. GHG data is submitted to Central Electrical Authority (CEA) **(Scope-1).**
2. The data is displayed in front of plant gate and on company website for public interest.
3. Refer link : https://www.opgc.co.in/env/half_comp_powerplant.asp

Practices adopted for emission control & monitoring

- Retrofitting of wet FGD system: Target Dec'25 & 70% work completed

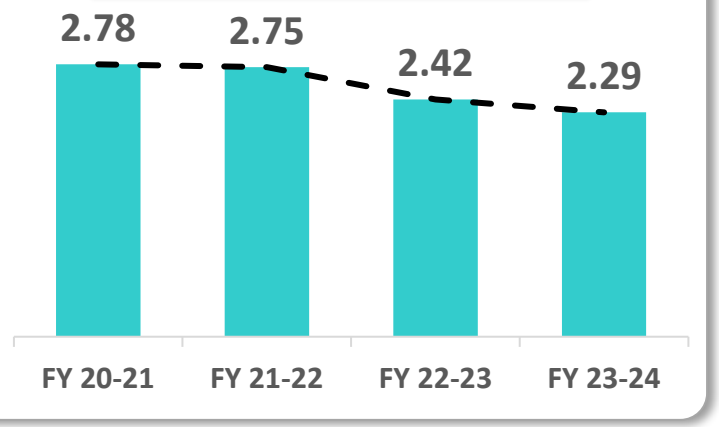
- NOx control by Low Nox fuel Burner and COGA & SOFA Dampers



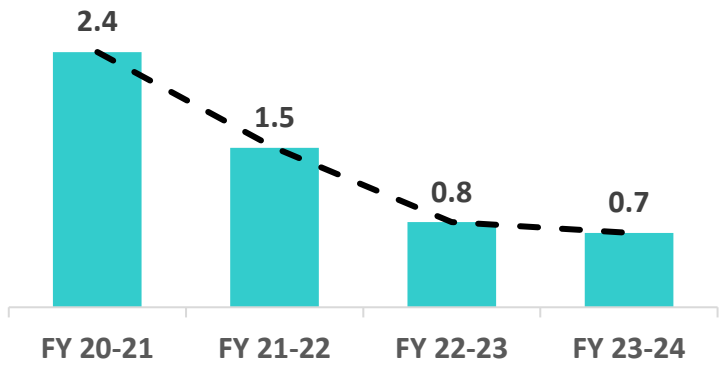
- 160 ESP fields installed in each unit to control SPM

Environment Management: Water

Raw water Cons. (m3/MW)



DM water Consumption (%)



Best Practices in Water conservation

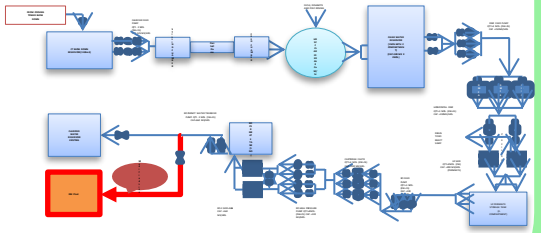
- **Zero liquid discharge plant**
- **Automation** of make up water to all the tanks in plant viz. service water tank, CCW make up tank, Potable water tank to avoid overflowing of water
- **Benchmarking** with industry leaders & capturing of best practices
- Identification of significant water usage equipment/process
- **KPI** monitoring for water consumption and recycle & reuse of water

Recycle & Reuse of waste water

- 21000 m3 waste water recycled
- 1000 KLD capacity STP for treatment of Domestic Sewage & reused In horticulture
- ETP capacity of 200m3/hr & 200000m3 of water reuse in CT M/u & to DM plant water i/l.

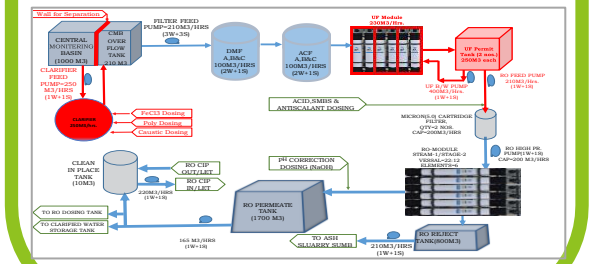
Utilization of CT Blowdown water

- Utilization of 35 lakh m3/year CTBD water through CTBD RO system is of fresh raw water
- Reduction in DM regeneration frequency from 530 to 180



Water Management system

- Flow meters are installed in all incoming & outgoing water lines, to quickly identify the cons.
- Water audits are conducted by 3rd party for water management.



Rain water harvesting

- 1800 M3 Capacity of rain water harvesting pond to utilize the water in CHP system.
- Rain water harvesting from roof tops are reused in AHP.

Best Practices : Digitization

Digitization

OSI Soft PI
Historian & Real Time Monitoring system

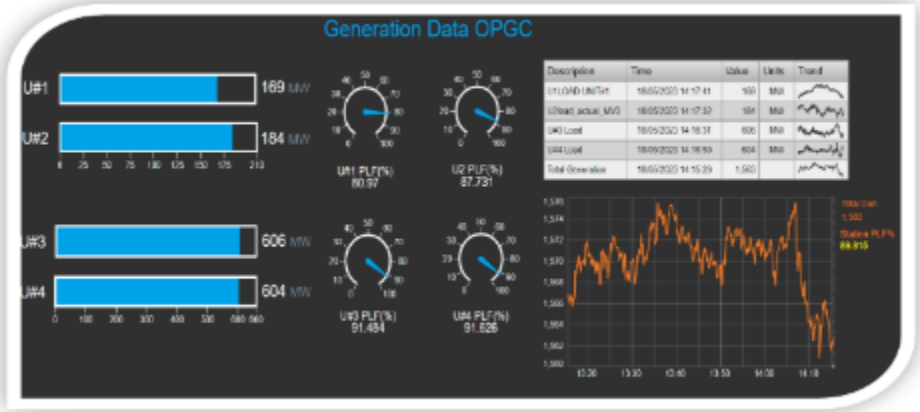
PADO
Performance Analysis, Diagnosis & Optimization tool

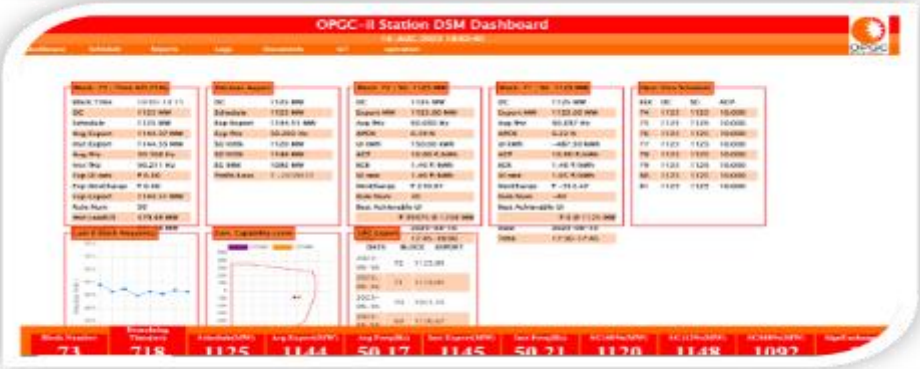
DSM Software
Real Time Export, Sch, ACP & Deviation Monitoring

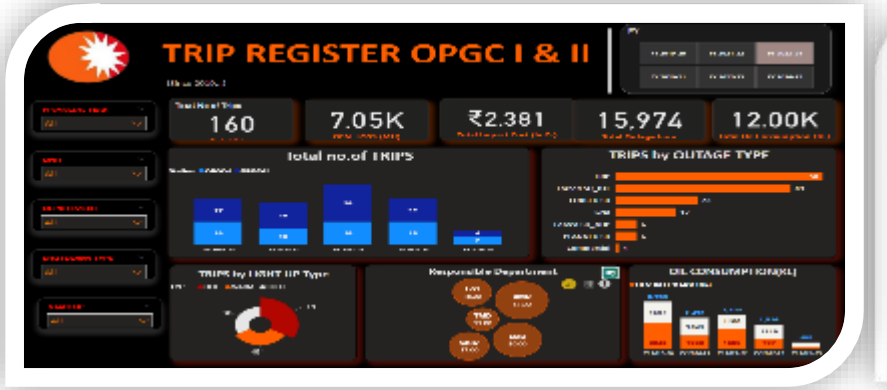
ENMS System
Energy Mang System for HT Drives Cons tracking

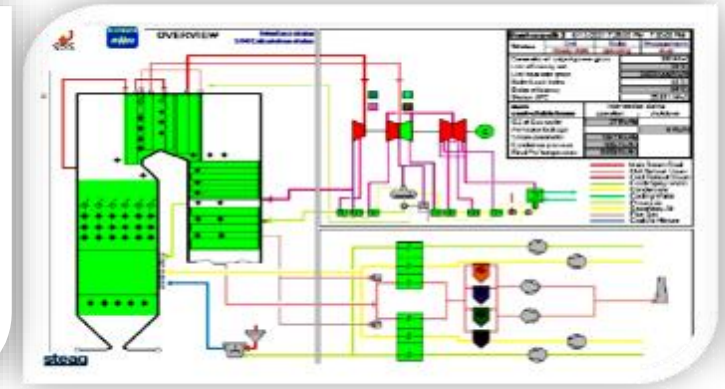
Power BI
Dynamic & Interactive Dashboard & Monitoring System

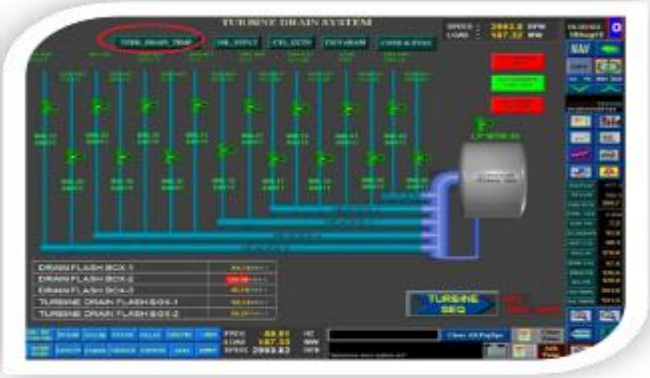
Online High Energy Drain Temp & Coal Pipe temp Monitoring









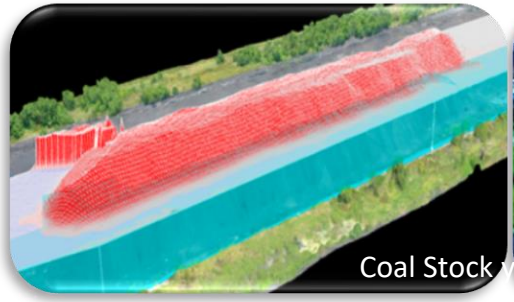


Best Practices :New Technology Initiatives

New Technology

Monitoring Through "Drones"

Smart Surveillance enabling Bird's Eye view of the project/Process, Eliminating Human Risk



Coal Stock yard Inspection & PV through Drone:

Monitoring Through "Robotics"

Boiler Tube, Bunker Inspections

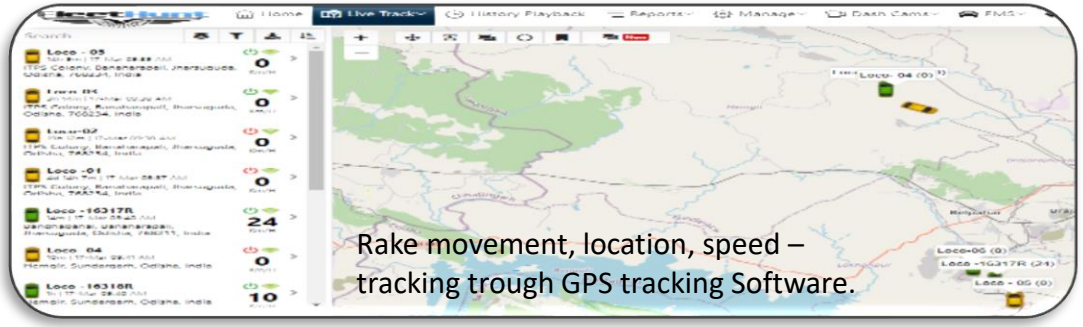
Cooling Tower Inspection, Burner & WB Inspection & Chimney Inspection through Drone

Implementation of "EV Cars"

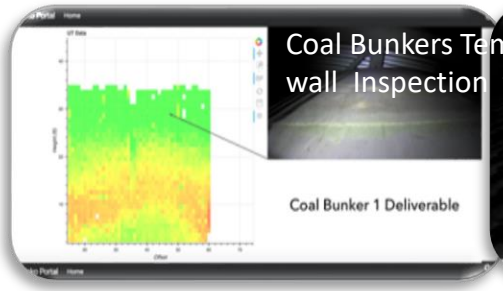
A Step Towards Energy Efficiency & Renewable Energy."

Deployment of EV cars for O&M activities inside the plant

Rake Movement Tracking Through GPS Tracking Software (In House)

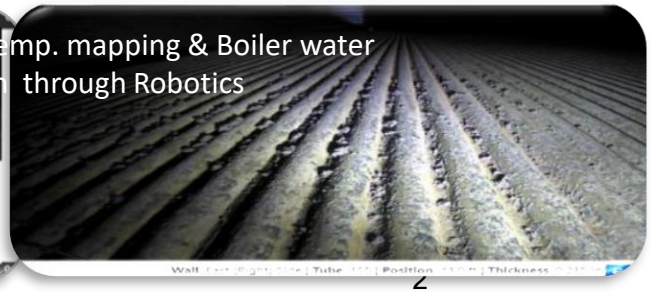


Rake movement, location, speed – tracking trough GPS tracking Software.



Coal Bunker 1 Deliverable

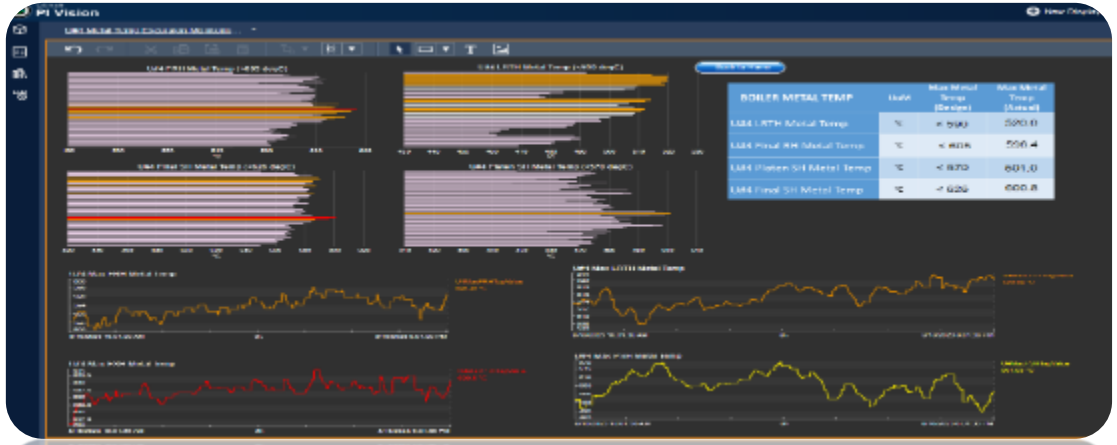
Coal Bunkers Temp. mapping & Boiler water wall Inspection through Robotics



Best Practices : Analytics & Industry 4.0

- With the Use of PI Applications like E log Book, PI Vision, PI message Alert, AF tools, PADO Analytical & Diagnosis tools etc, Interactive & Real Time Dash Boards have been created which not only provide real time data, trend & efficiency, but also give instantaneous Alert (through Message & Mail) if any major deviations occur.

Process improvement through critical Parameters Tracking

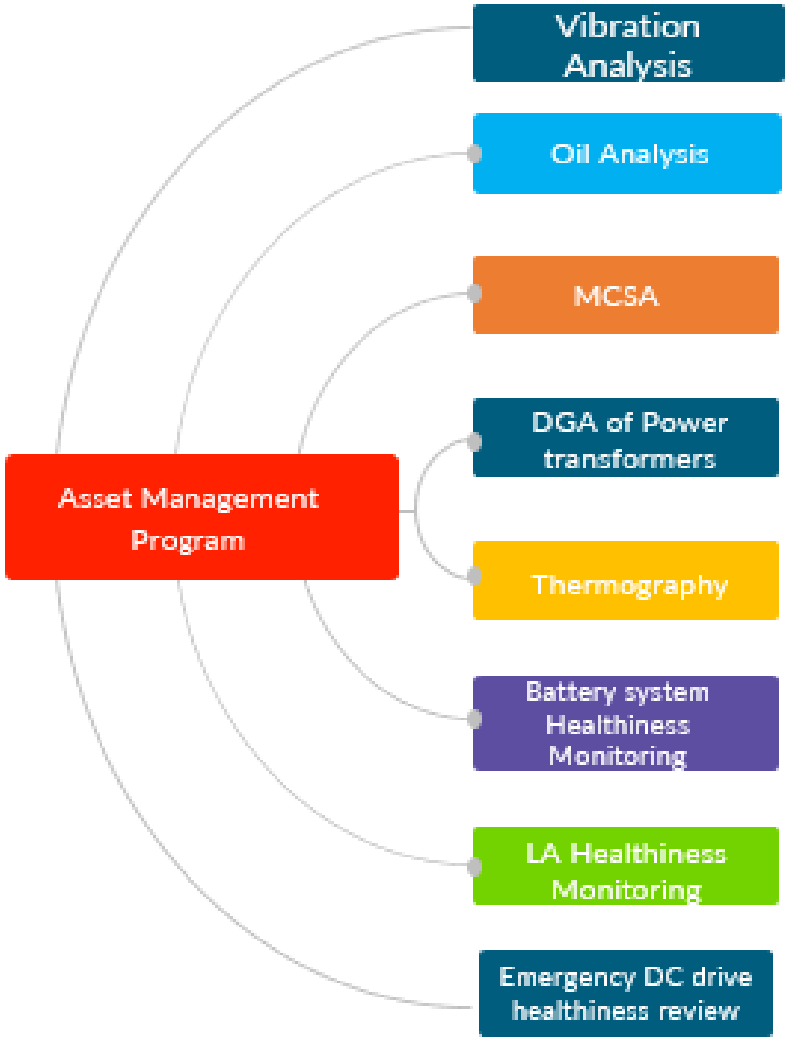


Reliability improvement through Boiler Metal Temp Excursion Monitoring

Reduction in Aux Power Cons through SEUs & HT equipments cons monitoring

Heat Rate improvement through real time Turb & Boiler Loss deviation Analysis

Best Practices : Asset Optimization



Best Maintenance Practices:

Remote Breaker Operation

NABL Accreditation for Coal Lab

Man-lifter Operation

Eco Friendly Solar Trolly System

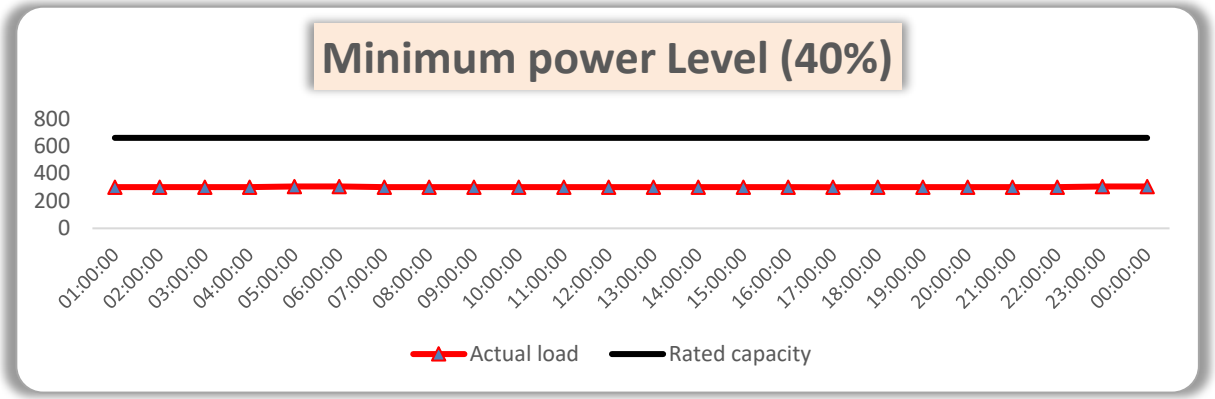
QR Codes scanners in Switchgears

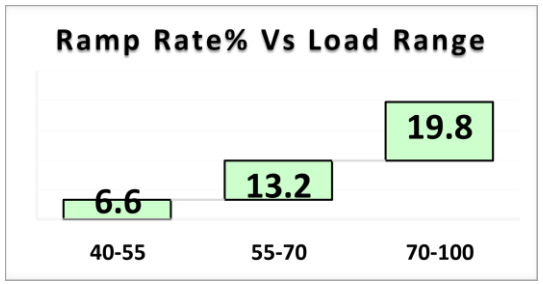
ARC Flash Suits

Best Practices: Flexible Operation

GENERATION FLEXIBILITY

- MINIMUM POWER LEVEL √
- FASTER RAMP RATE *
- FASTER START-UP TIME *





Minimum Power Level

Achievement of Minimum Power Level

- Determine mill combination
- Check the coal quality
- Flame quality & stability
- Axial fan performance monitoring
- Dynamic response of controller & check the Excursion parameters
- Dead bend & speed response of Turbine controller

******Note*: OEM (Siemens) has been awarded to study & give necessary solutions, Training to O&M Team by Siemens on Flexible operation

Best Practices: Performance Monitoring & Efficiency Testing

Efficiency Best Practices

- Isokinetic Coal sampling for coal fineness
- Dirty Air Velocity Testing
- Water Flow Measurement
- Oxygen mapping in Flue Gas path
- LOI Testing for FA & BA
- Cooling Tower Performance Testing
- Monthly Perf Testing of Turb. & Boiler
- Equipment Performance Testing


Isokinetic coal sampling


Dirty Air Velocity Testing


Oxygen measurement in Flue gas path

Dedicated Efficiency Lab


Water Flow measurement


IDCT Performance Testing


Ash sample collection for LOI

Best Practices: Afforestation

GREEN OPGC

- The Green belt covers 34.73% against the statutory requirement of 33%
- OPGC has developed more then 200 acres of green belt which is additional to the 225 acres natural forest inside the plant (mostly sal tree).
- Strategically chosen species like neem, Bakul, teak, arjun, Kadamb, Karanja etc. for plantation
- OPGC also distributes ~1000 hybrid mango saplings per year for developing afforestation in the community

NATURAL FOREST

GREEN TOWNSHIP

Hybrid mango sapling distribution to nearby community

Plantation on Environment Day

Plantation by school students

Implementation of ISO

EMS (ISO 14001:2004)

Implementation of **Environment** Management System (EMS)

2004

OHSAS

(ISO 18001:2005)

Implementation of Occupational Health & Safety Management System (**OHSAS**)

2005

QMS

(ISO 9001:2008)

Implementation of **Quality** Management System (QMS)

2016

AMS

(ISO 55001:2014)

Implementation of Asset Management System (AMS) & Upgradation of QMS

2017

OHSAS

(ISO 45001:2018)

Upgradation of Occ. Health & Safety Management System (OHSAS)

2021

IMS &

ENMS

(ISO 50001:2018)

Establishment of Integrated Management System **(ISO 9001, ISO 14001 & ISO 45001)** & Energy Management System **(ISO 50001)**

2023

Journey of ISO in OPGC

OPGC achieved ISO 50001 certification from both M/s Bureau Veritas & M/s BSCIC with successful implementation of Energy Management System in the Year 2023 .

ISO Certifications

ISO 50001 by M/s Bureau Veritas

ODISHA POWER GENERATION CORPORATION LTD.

IB THERMAL POWER STATION, ODISHA POWER GENERATION CORPORATION LTD
P.O. BANHARPALI, DIST. JHARSUGUDA – 768 234, ODISHA, INDIA.

Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above organization has been audited and found to be in accordance with the requirements of the Management System Standard detailed below.

Standard

ISO 50001:2018

Scope of certification

THERMAL POWER GENERATION (2 X 210 MW) & (2 x 660 MW)

Original cycle start date: 02 January 2024
Expiry date of previous cycle: Not Applicable
Certification Audit date: 10 November 2023
Certification cycle start date: 02 January 2024
Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until: 01 January 2027
Certificate No. IND.23.7670/EN/U Version: 1 Issue date: 02 January 2024

Signed on behalf of BVCH SAS UK Branch
Jagdheesh N. MAMAN
Director – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division

Bureau Veritas Certification

ISO 50001 by M/s BSCIC

BSCIC

Certificate

ENERGY MANAGEMENT SYSTEM

This is to certify that:

ODISHA POWER GENERATION CORPORATION LIMITED

IB THERMAL POWER STATION, BANHARPALI,
DIST. JHARSUGUDA-768234, ODISHA, INDIA

Hereby granted the certificate number: BN22605/21391 Rev. 00

Subsequent to the Assessment of the organization, it has been found to be operating an Energy Management System which complies with the requirements of

ISO 50001:2018

For the following scope:

Thermal Power Generation
(2 X 210 MW and 2 X 660 MW)
IAF Scope: 25

For BSCIC CERTIFICATIONS PVT.LTD.
Sanjay Seth
Managing Director

Originally Registered: 20-Oct-2023 1st Surveillance Due on: 19-Oct-2024
Issue Date: 20-Oct-2023 2nd Surveillance Due on: 19-Oct-2025
Expiry Date: 19-Oct-2026

(In case if Surveillance Audit is not allowed to be conducted, this Certificate shall be Suspended/Withdrawn).

Registered

Page 1 of 1

BSCIC

IAS-ANZ

IMS (ISO 9001,14001 & 45001) by M/s Bureau Veritas

ODISHA POWER GENERATION CORPORATION LTD.

P.O. BANHARPALI, DIST. JHARSUGUDA – 768 234, ODISHA, INDIA.

Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the Management System Standards detailed below.

Standards

ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018

Scope of certification

THERMAL POWER GENERATION (2 X 210 MW) & (2 X 660 MW).

Original cycle start date for ISO 9001: 06 January 2018
Original cycle start date for ISO 14001: 02 June 2014
Original cycle start date for ISO 45001: 01 January 2021
Recertification cycle start date: 27 December 2023
Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until: 31 December 2026
Certificate No. IND.23.6208/IM/U Version: 2 Issue date: 02 January 2024

Signed on behalf of BVCH SAS UK Branch
Jagdheesh N. MAMAN
Director – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division

Bureau Veritas Certification

Energy Conservation Week

MOU Signed with EESL for IE4 Motors

Winners

Drawing Competitions

EC Awareness to School Students

EC Awareness to Township Ladies

Awards & Accolades:

National Energy Conservation Award -2023

CII Excellent Energy Efficient Unit Award: 2023

ET Energy Leadership Awards:2023 (CEO of the Year)

Power Generation Company of the Year Award: 2023

British Safety Council Award -2023

State Energy Conservation Award -2023

Thank You

Sudhakar Swain (Plant Head): sudhakar.swain@opgc.co.in
Madhumita Soren (Energy Manager): madhumita.sore@opgc.co.in
Pravupada Acharya : pravupada.acharya@opgc.co.in
Braja Kishore Das: braja.das@opgc.co.in