Energy Management

vedanta
transforming for good

TSPL

Presentation By:-

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LEAD- BTG Operation

O&M Performance

About Us

Benchmarking

TSPL Energy Management & Other Initiatives

"TSPL Vision, Mission & Values"

VISION

To become the best performing & the most competitive power plant in India with world-class sustainabliity practices aided by technology, Innovation and strong governance framework with aim to partnering in progress of the nation.

MISSION

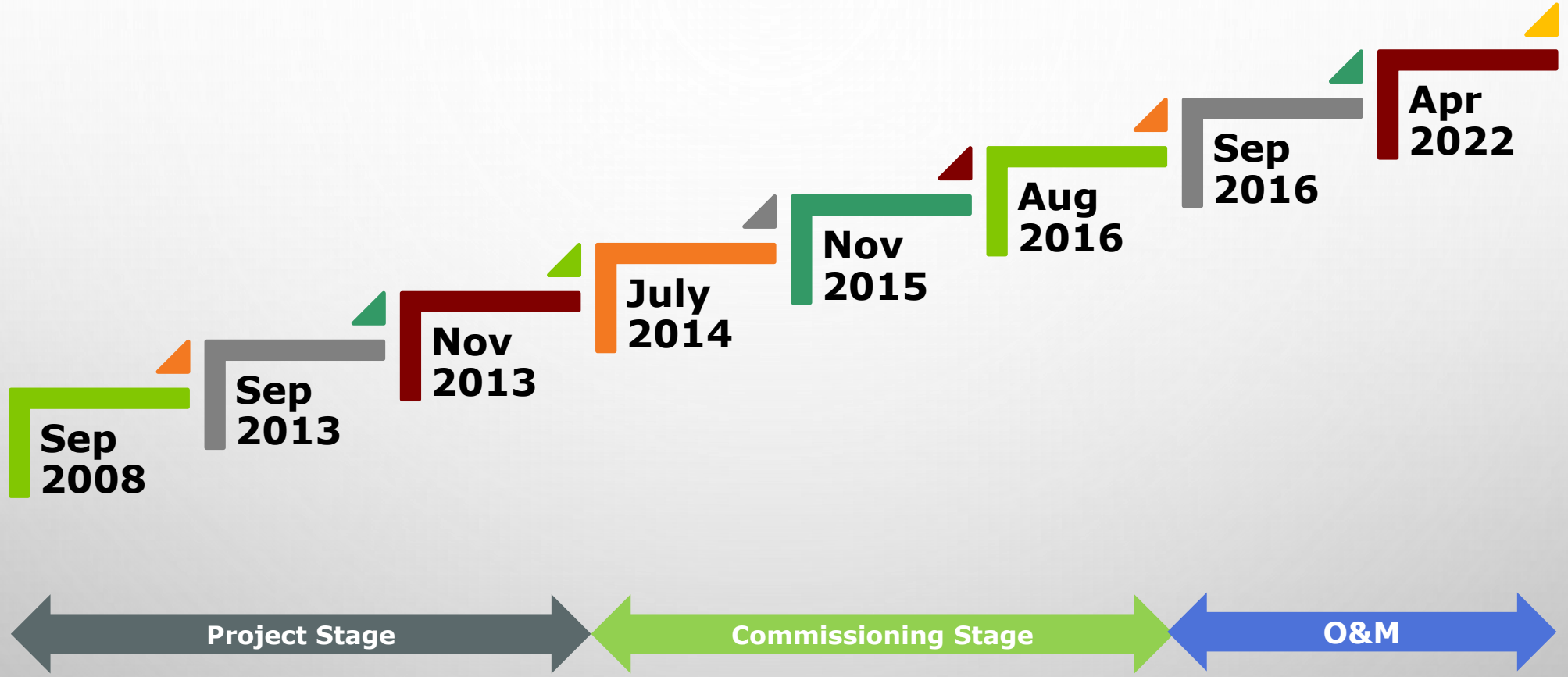
To power India's growth by sustainable technologies that efficiently utilize energy resources embracing Vedanta's core values.

VALUES

- Trust 
- Enterpreneurship 
- Innovation 
- Excellence 
- Integrity 
- Respect
- Care 

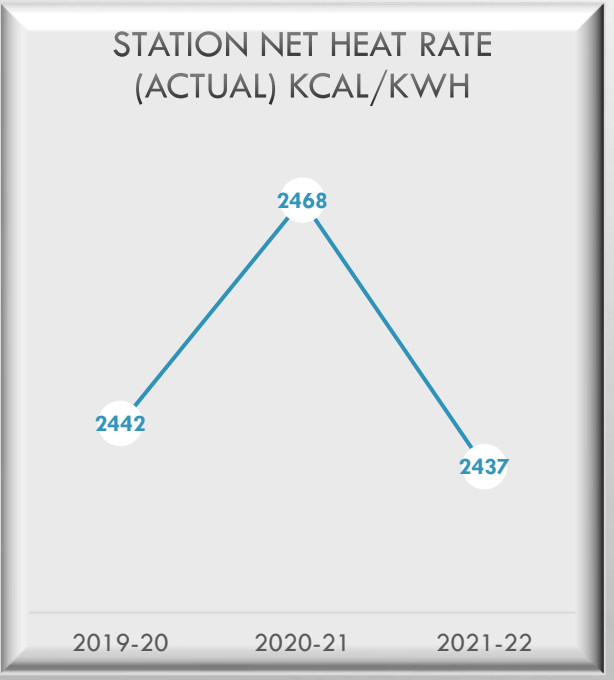
Component	Details
Location	Village- Banawala, Dist. Mansa, Punjab
Land	2113 Acres
Technology	Super Critical Power Plant
Plant size	3 x 660 MW
Water Resource	Water corridor from Kotla Branch of Jagga Canal.
Water Allocation	80 Cusec
Coal Linkage	Mahanadi Coal Limited (MCL) Fuel Supply Agreement with MCL of 7.72 MTPA
Railway Line Connectivity	Rail Corridor from Sadda singhwala Railway station.
Power Evacuation	3 Double circuit 400 KV lines
Nearest Railway Station	Sadda Singhwala (16 Kms)

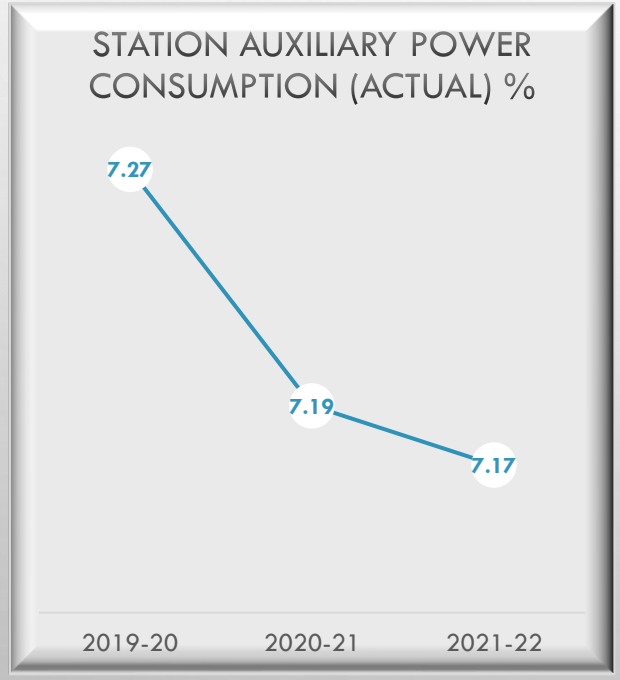
Major Milestones

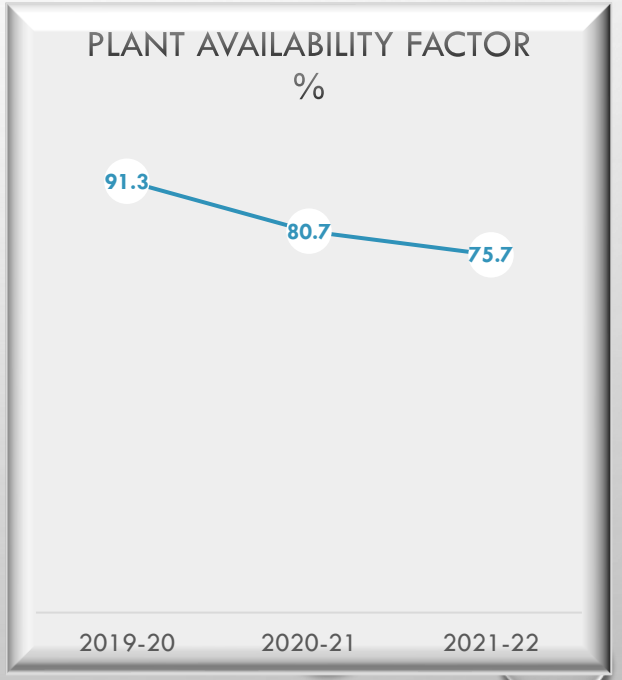


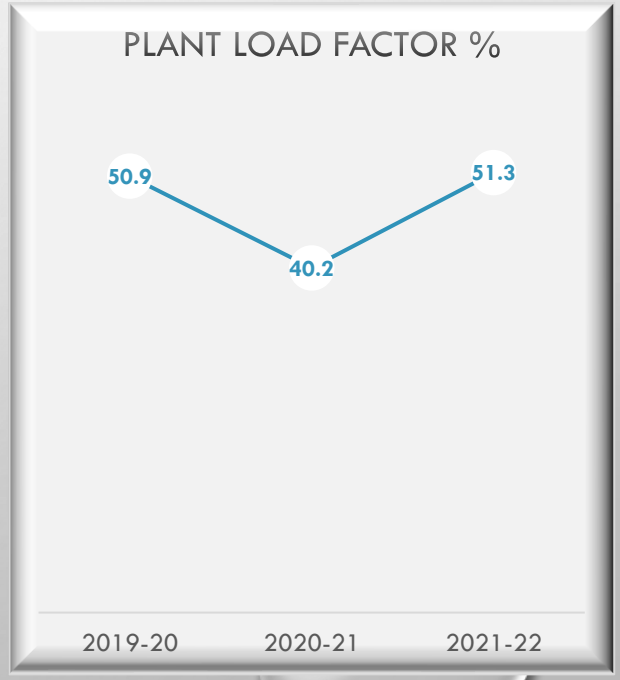
O&M Performance

Parameters	UoM	2021-22
Annual Generation	MUs	8896
PLF	%	51
Availability	%	76
Gross Heat Rate	KCal/KWh	2262
Auxiliary Power	%	7.17
Boiler Efficiency	%	86.6
Turbine Heat Rate	KCal/KWh	1949
DM Water Consumption	%	1.33
Raw Water Consumption	m3/MW	1.81
Specific Oil Consumption	ml/KWh	0.47



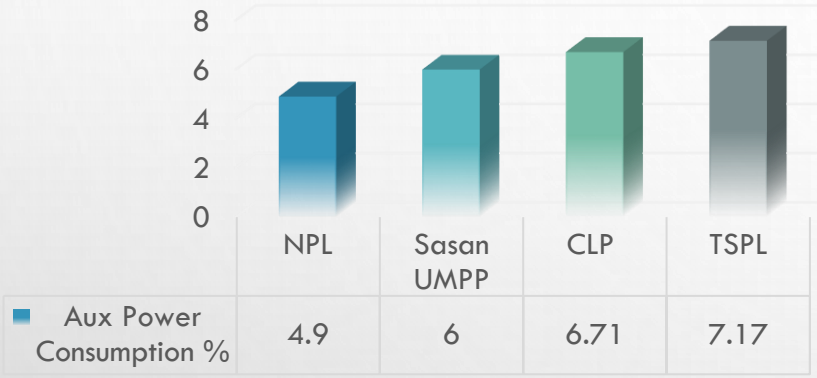




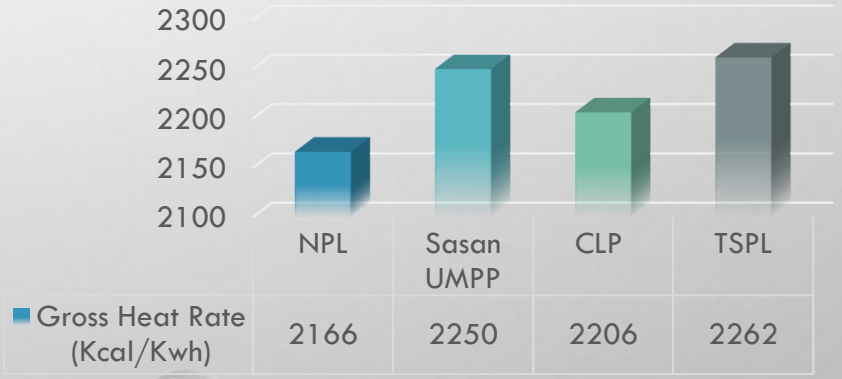


Benchmarking

AUX POWER CONSUMPTION %



GROSS HEAT RATE (KCAL/KWH)



List of Major Encon project

List of ENCON Project Planned 2022-23				
Title of Project	Annual Electrical Saving	Annual Thermal Saving	Investment	Comment
	(Million kWh)	(Million Kcal)	(Rs in Million)	
1				50MW Solar power plant
2	2.20			CW Pump 1A Motor Speed reduction
3	0.29			Station OCCW Inter connection to stop 1 OCCW pump stopping out of 3

List of ENCON Project 2021-22				
Title of Project	Annual Electrical Saving	Annual Thermal Saving	Investment	Comment
	(Million kWh)	(Million Kcal)	(Rs in Million)	
1	4.23	3634	2.5	Unit 2 CW motor pole increase for speed reduction
2	2	1641	2.5	Unit 3 CW motor pole increase for speed reduction
3	0.36	307		Firefighting pipeline underground to overground (phase 1 completed)

List of ENCON Project 2020-21				
Title of Project	Annual Electrical Saving	Annual Thermal Saving	Investment	Comment
	(Million kWh)	(Million Kcal)	(Rs in Million)	
1	0.355			Conversion of HFO to LDO, Stoppage of HFO forwanding pump
2	0.052		0.25	High-Capacity boiler Drain pump in Unit 3
3	0.484		0.75	Bottom ash slurry pump impeller trimmed to reduce RPM
4	8.203		20	CEP VFD installation in Unit 1 & Unit 3

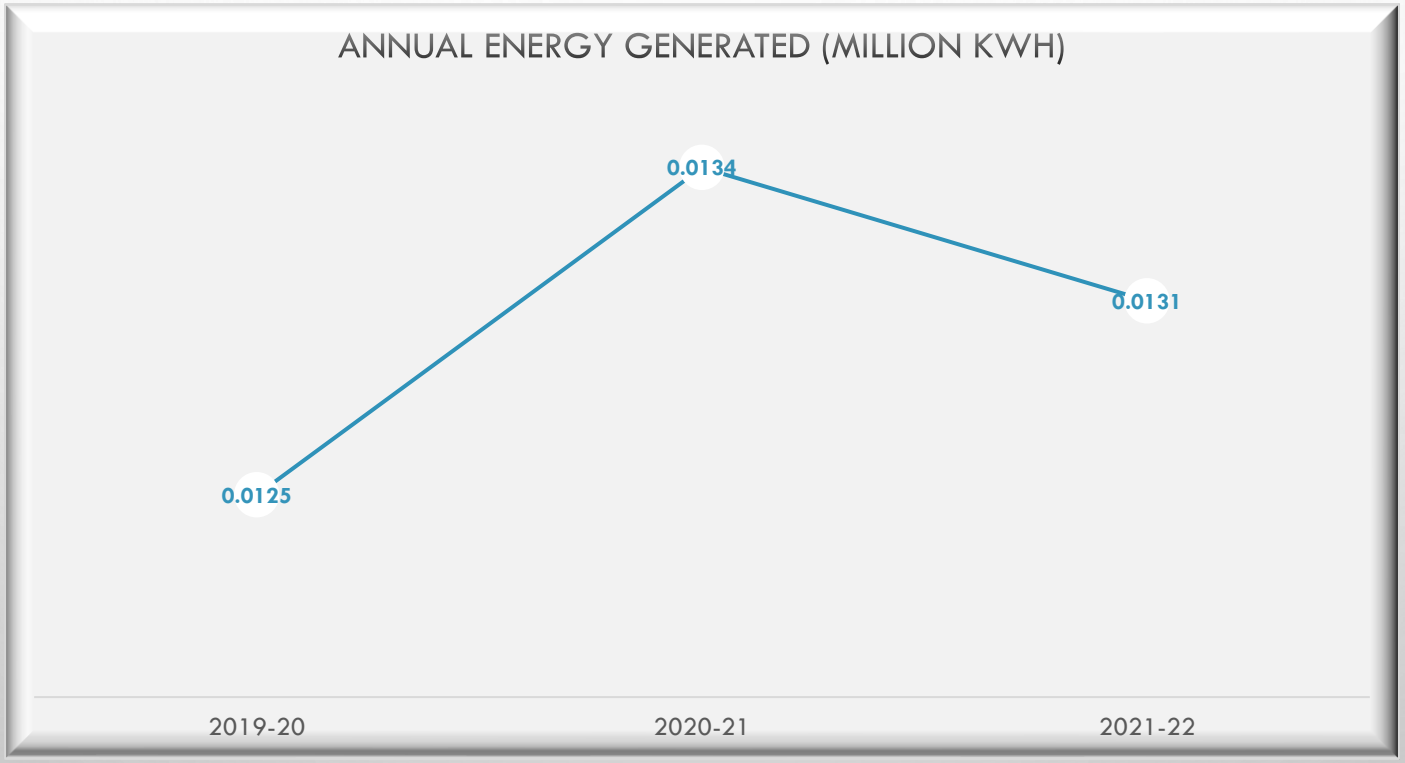
List of ENCON Project 2019-20				
Title of Project	Annual Electrical Saving	Annual Thermal Saving	Investment	Comment
	(Million kWh)	(Million Kcal)	(Rs in Million)	
1	0.00	1435.5	0.855	O2 Grid Installation for Dry Flue gas reduction
2	2.30		9.2	CEP VFD installation in Unit 2
3	0.003		0.325	OCCW Corrocoating in unit 3 AOH
4	0.01		2.2	Use of Solar power in Hostel roof
5		8672		Condenser segregation from vacuum system side for condenser vacuum improvement.

Innovative Projects

Name of the Project	Brief description on why innovative	Trigger for implementing the project	Replicability	Impact on SEC
Cooling water pump motor pole change	"CWP speed reduction by CW motor pole changing from existing 16 to 20 Pole. 02 Nos. of CW motors (11kV,5.25MW, 373RPM,16 pole) are installed for individual unit & 06 nos. for 03 Units. At present, in normal operating condition, CW motors power consumption is 9.5 MW with both pumps running at full speed i.e., 370 RPM. However, during single pump operation, CW motor power consumption is in the range of the 4.2 - 4.7 MW.As we are operating our units mostly at less load, There is a high potential of power savings due to less Cooling water flow required. Study from M/s VVR Consultant has highlighted that total flow of CW pumps are more than total design flow requirement. Further, to meet the design / process efficiency M/s VVR Consultant has suggested to reduce the one of the existing motor speeds from 370 RPM to 328 RPM."	At Less Load, Low Delta T across condenser due to high CW flow	Implemented in U2,U3	1000 KW in 1 unit
Installation of VFD in condensate extraction pump	There is substantial pressure drop across the Deaerator Control valve . Due to high operating pressure than required, the power consumption of CEP is also higher than the required. The discharge pressure of condensate pump varies from 30-32 kg/cm² whereas De-aerator pressure is around approx. 11.0 kg/cm².TSPL commissioned VFD in U2 CEP motor in June 2019. VFD installation will incur significant advantages in terms of APC reduction. Throttling losses are reduced effectively by employing variable Frequency Drive. TSPL commissioned VFD in U2 CEP motor in June 2019. VFD installation will incur significant advantages in terms of APC reduction. Throttling losses are reduced effectively by employing variable Frequency Drive.	APC Reduction	Implemented in all units	500 KW in 1 unit
Reduction of Specific Raw Water Consumption	Thermal power stations are one of the most water consuming industries. Since water remains the scare resource, its optimum utilization is necessary for the sustainability of the environment. Many of the power plants across the world were shutdown owing to source of water for running the plant dried due to less rainfall in the specific regions. Different strategies are proposed to increase the cycle of concentration for thermal power stations to conserve the water requirement. We had optimized COC and it has a significant effect on the reduction in the water use.	SRW reduction	Implemented	Specific raw water reduce from 1.99 to 1.81 l/kWh

Renewable Energy

Installed Capacity:- 0.03 MW



Environment Management – Ash Management

Particulars	UoM	2019-20	2020-21	2021-22
Ash Stock in Plant (Yard+Pond)	Tons	2499978	3267418	3492696
Ash Generated	Tons	1868370	1935130	2401432
Ash Utilization	%	107.5	60.3	90.6
Ash Utilized in Manufacturing of cement/concrete - other similar	%	68.8	29.9	35.3
Ash Utilized in ash fly bricks	%	10.6	16.3	31.3
Ash Utilized in mine filling	%	3.0	0.6	7.3
Ash Utilized for Roads pavements	%	25.2	13.4	16.8

Environment Management - Emission

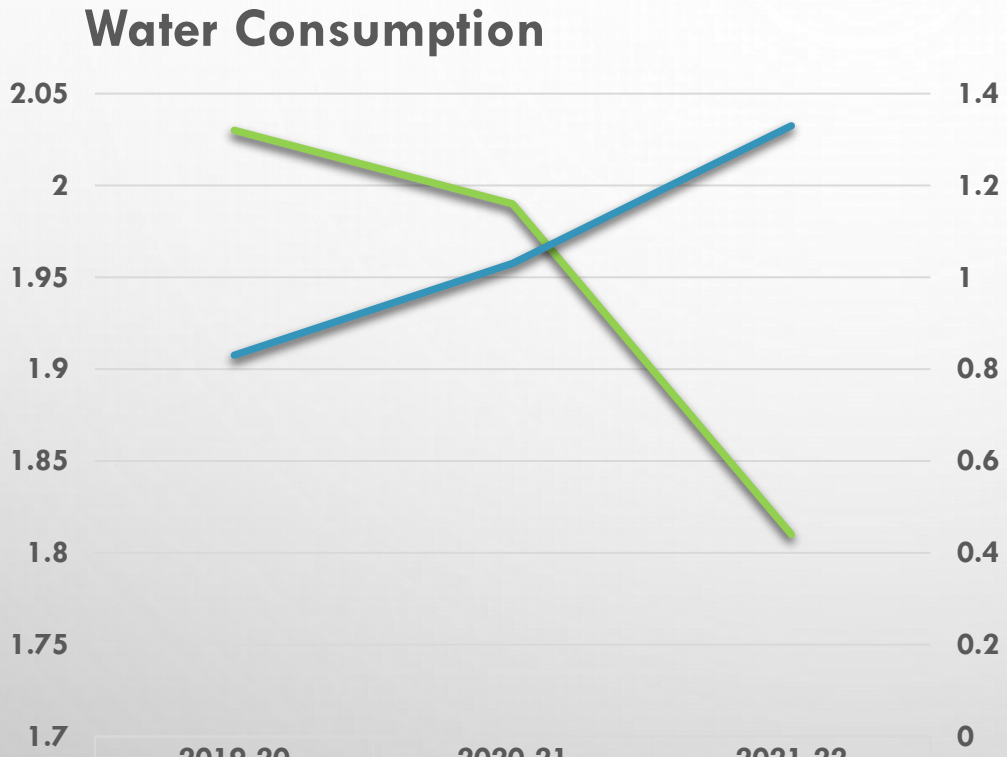
Particulars	UoM	2019-20	2020-21	2021-22
Total CO2 Emissions Per KW of Generation	Ton/KW	0.000908	0.000916	0.000908
Current Sox Emissions at Full Load	mg/Nm3	910	950	935
Current NOx Emissions at Full Load	mg/Nm3	210	240	218
Particulate Matter	mg/Nm3	47.65	49.21	48.63
Mercury	mg/Nm3	BDL	BDL	BDL

The timelines to comply with the Sox norms for TSPL is by 31st December 2024. (MOEF & CC notification. To ensure compliance, TSPL is proceeding with further steps in consultation with PSPCL and other related parties for retendering for FGD project.

TSPL is also planning to implement biomass cofiring within their boilers.

Environment Management - Water

Zero Liquid Discharge Plant



	2019-20	2020-21	2021-22
Raw water Consumption of Plant m3/MW	2.03	1.99	1.81
DM Water Consumption of Plant %	0.83	1.03	1.33

Best Practices in water management
Daily Monitoring of Water balance
Firefighting line upgrade from underground to Overground
Increase of COC from 5 to 7 for NDCT make up reduction
Fire water usage approval mechanism for Head O&M

Best Practices In Plants – (Non Energy Efficiency)

1. Asset Optimization (AO) framework in place for ensuring standardize operational and maintenance practices. AO framework has become key driver for business excellence and operational efficiencies. Helps improve and sustain organizational performance through the adoption of right processes, practices & capabilities. A specific focus on improving the Asset performance and reliability.
2. Vedanta sustainability assurance program (VSAP) framework in place for ensuring standardize HSE and Non-HSE practices. VSAP has become key driver for business excellence. A Specific focus on improving the HSE, supplier and contractor management and social sustainability and stake holder engagement.
3. Integrated Management System (IMS) framework in place for ensuring streamlined procedures and continual improvement to push business with better quality, improved health and safety, and increased productivity.
4. TSPL's premises is covered with green belt with approximately 4.5 lakh trees inside the plant. TSPL has also taken the initiative and developed Miyawaki (mini thick forest) near plant vicinity by planting 5000 trees (approx.) in Village Peron. In this FY, we are planning to plant more than 15000 saplings in the vicinity for increasing the green cover in the vicinity.

Teamwork, Employee Involvement & Monitoring

- Daily Review Meeting includes defects, issues and plant performance & Chaired by Head O&M.
- Monthly Operational Review includes entire month plant performance and chaired by COO.
- Digital solution for monitoring like PIVISION and FLEETMONITORING.
- Digital solution for automatic daily report generation.
- Efficiency monitoring and action plans alongwith schedule review with management in place.
- AO framework in place to ensure best in class analytical tools and practices been carried out for asset management, followed by monthly internal audits and annual external audit.
- VSAP framework in place to ensure best in class safety standards and practices been carried out for HSE and Non-HSE function, followed by monthly internal audits and annual external audit.
- Rewards and Recognition for business and sub-business partners.

Awards and Recognitions

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