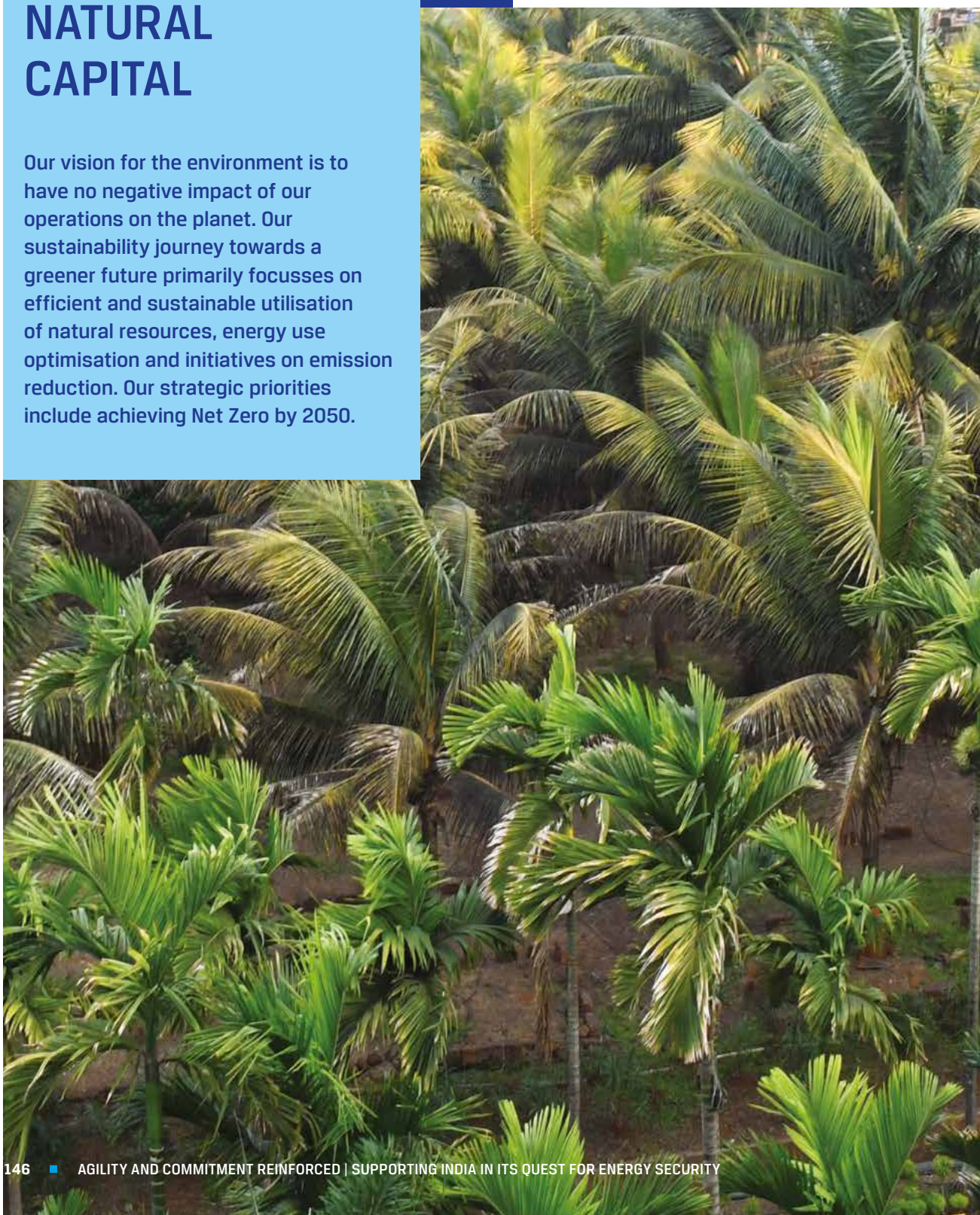
NATURAL CAPITAL

Our vision for the environment is to have no negative impact of our operations on the planet. Our sustainability journey towards a greener future primarily focusses on efficient and sustainable utilisation of natural resources, energy use optimisation and initiatives on emission reduction. Our strategic priorities include achieving Net Zero by 2050.



Description

Natural capital is the inventory of renewable and non-renewable natural resources of our ecosystem. It is about the investments made to protect depletion of natural resources and create a positive impact on the environment.

Management Approach

We are benchmarking KPIs on GHG emissions, water consumption, waste management and air emissions to create a sustainable ecosystem in the vicinity of our plants.

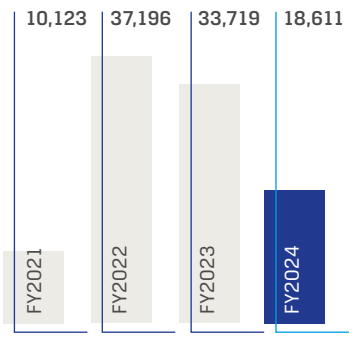
Significant Aspect

- Climate
- Preservation of biodiversity
- Management of environmental footprint
- Energy efficiency
- Preservation of natural resources

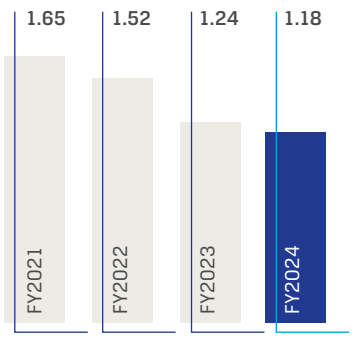
Key Performance Indicators	Material Topics	Strategy Linkage
• GHG emissions • Energy consumed • Energy saved • Water consumed • Water recycled • Waste generated and disposed	• Managing carbon emissions • Waste management • Water management • Biodiversity • Energy efficiency	S02 S04 S05

Key Performance Indicators

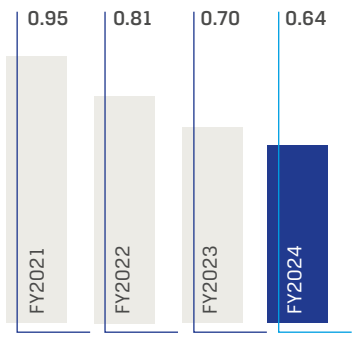
Number of Saplings Planted



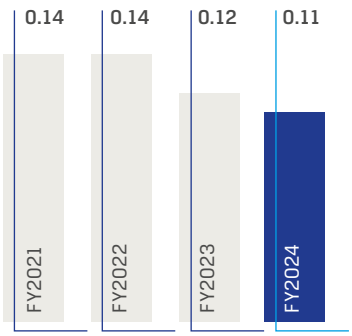
SOx (Kg/MWh)



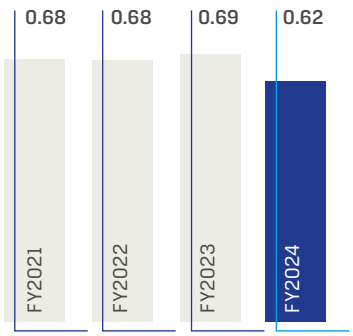
NOx (Kg/MWh)



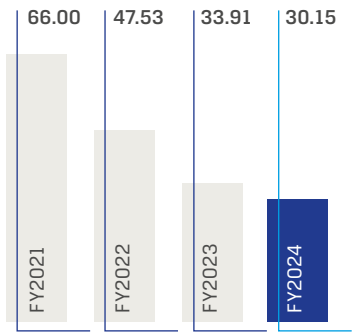
PM (Kg/MWh)



GHG Emissions Intensity (tCO_2/MWh)



Energy Savings (MU)



17,403 MT
Coal saving due to energy reduction and process improvements

2,03,000 MT
Estimated coal displacement due to use of waste gases in boiler

Plant-Wise Energy Saving Initiatives (FY 2024)

Barmer Plant

S. No.	Description of energy reduction initiative	Nature of initiative	Energy reductions in GJ	GHG emissions saved due to energy saving ($MTCO_2e$)
1	APH Tube Plugging done in Unit#2 (Energy savings - 1,925.51 KW)	Energy Saving	41,920.00	4,233.92
2	APH Tube Plugging/Replacement done in Unit#8 (Energy savings - 821.69 KW)	Energy Saving	11,683.79	1,180.06
3	APH Tube Plugging done in Unit#5 (Energy savings - 193.31 KW)	Energy Saving	4,352.67	439.62
4	APH Tube replacement done in Unit#6 (Energy savings - 898.95 KW)	Energy Saving	6,201.11	626.31
5	CT makeup pump power consumption optimisation	Energy Saving	291.03	29.39
6	Reduce power consumption of BFP by optimising the FCV pressure drop	Energy Saving	6,188.60	625.05
7	Reducing power consumption of HT Bed ash compressor by optimising the unloading hours	Energy Saving	1,773.35	179.09
8	Reducing ETP Power by installing VFD in Guard Pond Pump	Energy Saving	527.04	53.23
	Total		**79,126.193**	**7,313.453**

Ratnagiri Plant

S. No.	Description of energy reduction initiative	Nature of initiative	Energy reductions in GJ (Estimated annual average reductions in energy due to a particular initiative)	GHG emissions saved due to energy saving ($MTCO_2e$)
1	Turbine Sequential mode of operation of all four unit	Saving of coal	2,59,114	22,985
2	PA fans baffel replacement in Unit-3	Saving of Aux Power	4,250	1,025
3	Improvement in turbine cylinder efficiency of unit-3 by overhauling	Saving of coal	1,35,901	11,954
4	Improvement in Aux. Power Consumption by de-staging of CEP-B in unit-3	Saving of Aux Power	1,784	432
5	Improvement in Aux Power Consumption by de-staging of BFP 2A in Unit-2	Saving of Aux Power	1,874	453
6	Improvement in Aux Power Consumption by de-staging of BFP 3B in Unit-3	Saving of Aux Power	863	209
7	Improvement in Aux Power Consumption by de-staging of BFP 1B in Unit-1	Saving of Aux Power	588	142
	Total		**4,62,626**	**37,200**

Vijayanagar Plant

S. No.	Description of energy reduction initiative	Nature of initiative	Energy reductions in GJ	GHG emissions saved due to energy saving ($MTCO_2e$)
1	VFD installation in HFO Pump A SBU2	Energy savings	0.3	26.8
2	VFD installation in LDO Pump A	Energy savings	0.0	2.7
3	CWP-1A overhaul in SBU2	Energy savings	2.2	198.2
4	BFP power reduction in SBU2 due to FW flow reduction after TG overhaul	Energy savings	26.3	2,368.7
5	Optimise the generation pressure of Ash Handling Compressor in SBU2	Energy savings	0.5	48.8
6	First field hopper heaters of all Units stopped in SBU2	Energy savings	0.2	18.6
7	Hopper Heaters auto cut in & cut out temperature set points reduced in SBU2	Energy savings	1.0	90.8
8	Silo Blower is being stopped after bulker loading in SBU2	Energy savings	0.5	40.8
9	ESP Blower Being Stopped when the ash Conveying is stopped	Energy savings	0.2	14.3
10	Reduction of PA fan power consumption by 41 Kwh by reducing the primary air header pressure from 850mmwc to 780mmwc in SBU1	Energy savings	1.7	152.0
11	Avoid idle running of Lube oil pumps in SBU2 Mills	Energy savings	0.3	24.1
12	SBU1 U1 Seal air fan Chokage cleared in the unit running condition	Energy savings	0.248	22.31
13	SBU2 U1 GHR Improvement After TG Overhaul	Energy savings	10,121.50	15,954.04
14	Reducing Steam loss through flash tank venting at VAM discharge in SBU2	Energy savings	829.08	1,306.83
15	Vaccum improvement by COH & CW Pump overhaul	Energy savings	2,857.50	4,504.14
16	Heat rate improvement by APH Baskets replacement to reduce the leaving air temperature by 22 Deg C from 162 Deg C to 140 Deg C	Energy savings	6,226.03	9,813.80
	Total		**20,067.537**	**34,586.843**

Nandyal Thermal Power Plant (18 MW)

S. No.	Description of energy reduction initiative	Nature of initiative	Energy reductions in GJ	GHG emissions saved due to energy saving ($MTCO_2e$)
1	Only one SA fan taken into service at partial load of 4.5-10 MW, and savings estimated to be around 35 KW per hour	APC reduction and Energy saving	184.46	132.63
2	2 Drag Chain Feeders kept in service in place of 4 at part load operation of 5-9 MW, which, in turn resulted in 4.13-4.5 KWh power saving	APC reduction and Energy saving	23.72	17.05
3	ESP one field was isolated based on the SPM and savings estimated to be 25 KWh	APC reduction and Energy saving	395.28	284.21
4	During part load operations, only one BFP was taken in service up to 10 MW which resulted in saving of 250 KWh.	APC reduction and Energy saving	1,756.80	1,263.14
	Total		**2,360.261**	**1,697.028**

Environment Protection: Key Initiatives

AFFORESTATION

4,789
saplings planted at Vijayanagar Plant

THIS 7-ACRE LAND IS APT FOR MANGO PLANTATION DUE TO ITS FERTILE SOIL, GENTLE SLOPES AND PROXIMITY TO THE SEA.

Vijayanagar

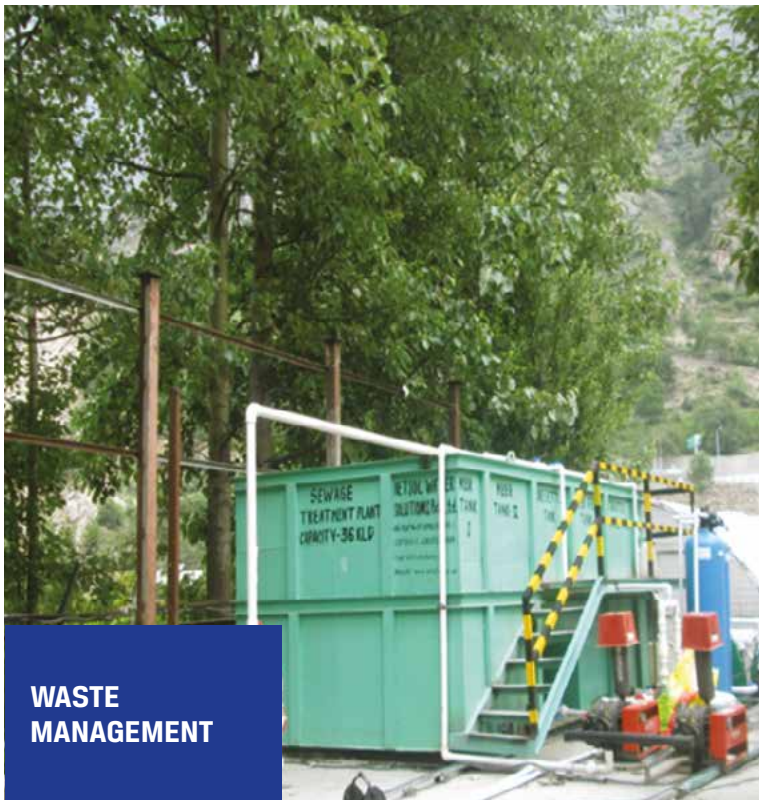
A passion for plantation

A total of 4,789 saplings have been planted inside the Vijayanagar Power plant to add to the greenery, along with maintaining all the gardens with lush green grass, artful boundary plants and beautiful hedges. Additionally, the Vijayanagar plant also celebrated the World Environment Day on 5th June, 2023 themed 'Solutions to Plastic Pollution' under the campaign #BeatPlasticPollution. To strengthen the existing green cover, a mass plantation was organised within the plant premises. Also, to motivate the employees and workers to continue their passion of plantation and gardening, a recognition of 'Best Horticulture Champion' was organised based on the efforts and work towards a clean and green city, and commitment and care for nature.

Ratnagiri

The Mango Haven

JSW Energy has embarked on a journey to create a sanctuary where mangoes reign supreme, and sustainability is perfectly aligned with innovation at a sprawling expanse of land. This 7-acre land is apt for mango plantation due to its fertile soil, gentle slopes and proximity to the sea. Besides the plantation, the land of stones and shrubs has been fully transformed by planting hundreds of trees, creating an expanse of green cover attracting the natural flora & fauna. By engaging local expertise and empowering dedicated manpower, we are fulfilling a deeper commitment to sustainability. As the orchard bears fruit, it will become more than just a source of sustenance, a transformational journey for the land, the people and Mother Earth.



WASTE MANAGEMENT

A 36 KLD SEWAGE TREATMENT PLANT (STP) HAS BEEN INSTALLED AT KUPPA CAMP. TWO MORE STPS, 600 KLD AT SHOLTU AND 15 KLD AT WANGTOO POWER HOUSE ARE ALSO INSTALLED TO MANAGE SEWAGE WATER.

Vijayanagar

The waste generated at the power plant, specifically bottom ash and mill rejection, was earlier disposed in landfills, which was costly and environment-unfriendly. The team created a process of converting waste materials of 20,720 MT into a viable fuel source. The pretreatment sludge totalling 550 MT was utilised by a micro pellet plant. This innovative approach to waste management and reuse of waste material benefited the environment, and created opportunities for economic growth and innovation.

Sewage Waste Management – JSW Hydro Energy Limited

Sewage Treatment Plants are installed at the BASPA II & Wangtoo power houses, main office, workshop and residential camps. Effluent discharged is checked on a regular basis by the Himachal Pradesh State Pollution Control Board and third-party to ensure it is within permissible limits and all the STPs are working as per the requirement

Effluent Treatment Plants installed:

- Sholtu (600 KLD)
- Wangtoo Power House (15 KLD)
- Baspa Power House (15 KLD)
- Kuppa Barrage Camp (36 KLD)
- Kilba Camp (45 KLD)
- Kakasthal workshop site (02 No.) (15 KLD and 30 KLD)

Solid Waste Management – JSW Hydro Energy Limited

Solid waste from the office premises, colonies and mess are segregated in non-biodegradable and biodegradable waste at the source. Fuel and manure is prepared from this biodegradable domestic waste. Each location is provided with composter of adequate capacity. A small Biogas plant is operated near the Sholtu main office and colony, which consumes the biomass. The non-biodegradable waste is stored adequately at the designated stores and subsequently sent to the vendors for further disposal and recycling.

A visionary Ash Management journey

Operating a state-of-the-art 1,200 MW thermal power plant in Jaigad -Ratnagiri, JSW Energy has been a cornerstone of the region's progress, providing vital energy sourced from imported coal from distant lands like Mozambique, Columbia, South Africa, and Indonesia. Amidst this vital energy generation, the Company faces a significant challenge of substantial production of staggering 1,800-2,000 metric tonnes of fly ash per day.

Traditionally, this fly ash has traversed to nearby cement units, RMC plants, and traders in bustling urban hubs like Mumbai, Pune and Kolhapur. However, our unwavering commitment to sustainability necessitated a re-evaluation of this process, particularly in light of periodic road movement restrictions. Disruptions in supply of fly ash from the newly-commissioned power plants of other organisations added layers of complexity to the situation.

Key Highlights:

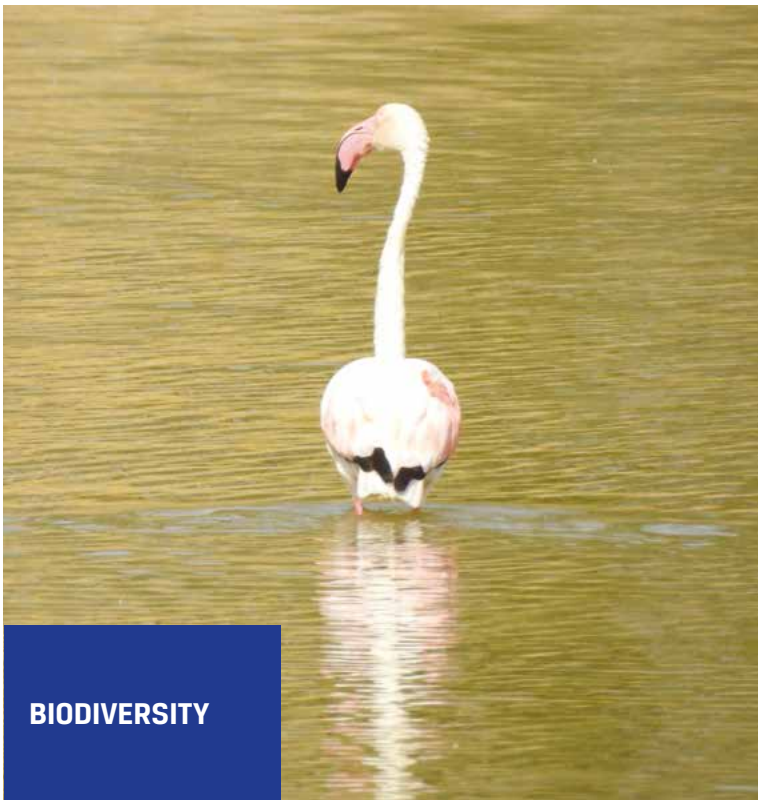
- **Strategic Ash Silo Construction:** Recognising the need for enhanced storage and transportation infrastructure, the Company embarked on construction of a cutting-edge ash silo with a colossal capacity of 45,000 metric tonnes. This strategic investment not only bolstered our bulk loading capabilities, it also ensured efficient ash management and minimised logistical challenges
- **Exploring Export Markets:** Leveraging its coastal location and proximity to a green field port, the Company embarked on an ambitious journey to explore export markets for fly ash. By tapping into coastal routes, it unlocked new avenues for sustainable ash disposal, reducing the environmental footprint, while expanding market reach
- **Triumphant Bulk Ash Shipments:** The culmination of our efforts was marked by successful loading of two bulk ash shipments destined for distant shores. These landmark achievements underscored our commitment to sustainability and innovation, setting new benchmarks for responsible ash management in the industry

The Company's visionary approach to ash management exemplifies its dedication to sustainability and environmental stewardship. By embracing innovative solutions and forging new pathways for sustainable ash disposal, we are not only mitigating environmental impact, but also driving positive change in the industry. As we continue to sail towards a greener future, the Company remains steadfast in its commitment to shaping a more sustainable world for generations to come.

Ash Export, Ratnagiri

47k MT
Quantity exported

THE COMPANY'S VISIONARY APPROACH TO ASH MANAGEMENT EXEMPLIFIES ITS DEDICATION TO SUSTAINABILITY AND ENVIRONMENTAL STEWARDSHIP. BY EMBRACING INNOVATIVE SOLUTIONS AND FORGING NEW PATHWAYS FOR SUSTAINABLE ASH DISPOSAL, WE ARE NOT ONLY MITIGATING ENVIRONMENTAL IMPACT, BUT ALSO DRIVING POSITIVE CHANGE IN THE INDUSTRY



BIODIVERSITY

PROPOSED DEVELOPMENT OF PONDS IN PLANT PREMISES AND SURROUNDING VILLAGES, ENSURING SUSTAINABLE WATER SUPPLY FOR THE ECOSYSTEM AND LOCAL COMMUNITIES

Ratnagiri

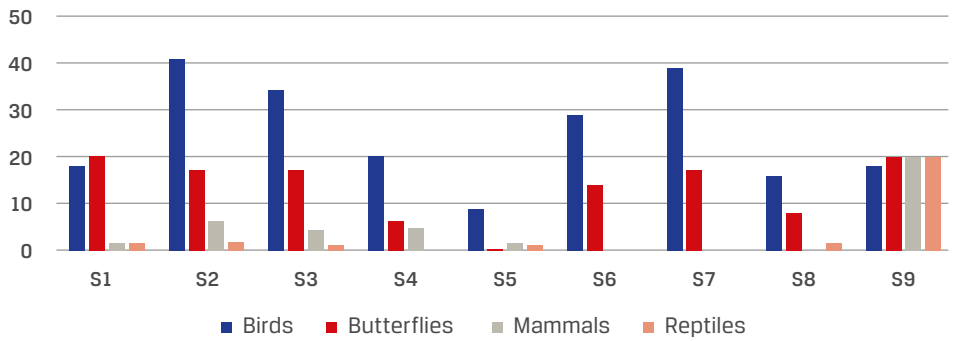
Quest for sustainability

The Company is inspired by a deep reverence for nature and fuelled by a desire to integrate sustainability into its industrial operations. Through its collective efforts, the Ratnagiri plant has been transformed into a beacon of sustainability, where industry and nature coexist in harmony. Its commitment to biodiversity conservation and environmental stewardship serves as a testament to the power of collective action in safeguarding the planet's future.

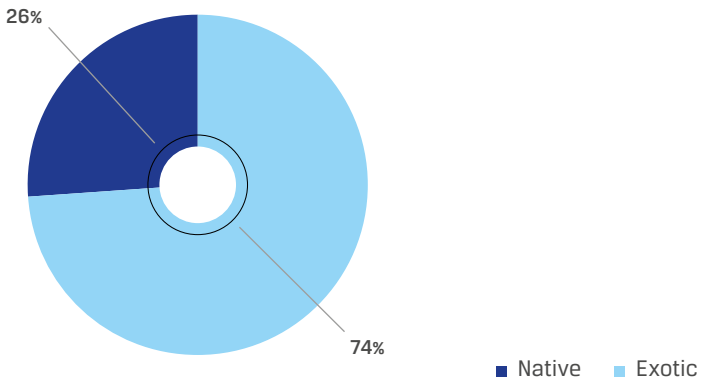
Key steps undertaken:

- Undertook a comprehensive biodiversity assessment to uncover hidden treasures of biodiversity surrounding the plant, where each species was catalogued meticulously, from towering Terminalia paniculata to the vibrant hues of Chromolaena odorata
- Proposed development of ponds in plant premises and surrounding villages, ensuring sustainable water supply for the ecosystem and local communities
- Understand the significance of preserving soil health, the team proposed topsoil management to minimise soil erosion and maintain soil fertility within the plant premises
- Pledged support for turtles, vowed to raise awareness and protect their nesting grounds around the coastline, engaging with Olive Ridley Turtle conservation and awareness programme
- Proposed introduction of a mixed type of plantation system, blending native species with exotic ones to enhance biodiversity and ecosystem resilience
- Envisioned development of a Herbal Garden under high-voltage AC transmission tower, showcasing the rich medicinal flora of the region
- Emphasised importance of selecting native forest tree species for afforestation programmes, promoting biodiversity conservation and ecosystem restoration
- Addressed plastic waste management practices, ensuring protection of natural habitats from pollution
- Collaborated with local authorities to develop snakebite prevention protocols, ensuring safety of employees and nearby communities

Site-wise faunal species recorded from JSW Energy Limited



Native/Exotic ratio of tree species



WATER STEWARDSHIP

500 m^3
Water saved

WE HAVE CONSTRUCTED A DAM NEAR VINAYAKWADI TOWNSHIP TO AUGMENT WATER STORAGE CAPACITY AND TO HARNESS NATURE'S BOUNTY TO SUPPLEMENT WATER SUPPLY

Ratnagiri

The Ratnagiri plant is a testament to sustainable development, with an ethos deeply rooted in responsible resource management, and a focus on conserving and safeguarding water. By embracing innovation, leveraging nature's abundance, and integrating cutting-edge technology, we are forging a path towards a more water-secure and resilient future.

Key Highlights:

Water Audit Mechanism

Central to our water conservation efforts is a robust water audit mechanism. Through quarterly walk-throughs and strategic installation of flow meters, we meticulously monitor and optimise water consumption across our operations. This proactive approach enables us to identify inefficiencies, detect leakages and implement targeted interventions to minimise water wastage, ensuring every drop of water is utilised judiciously.

Rainwater Harvesting

Understanding the paramount importance of rainwater as a renewable resource, the Company has invested in comprehensive rainwater harvesting infrastructure. We have constructed a dam near Vinayakwadi township to augment water storage capacity and to harness nature's bounty to supplement water supply. This sustainable practice reduces our reliance on external water sources and mitigates the impact of water scarcity on local communities, fostering resilience and self-sufficiency.

Reduction in Water Consumption

Through relentless innovation and efficiency optimisation, the Company has achieved significant reduction in water consumption. From implementing cutting-edge water-saving technologies to streamlining operational processes, the Company is focussed on maximising water efficiency, which has brought down our daily water consumption significantly.

Our transformative initiatives:

Installation of RO Plant

A state-of-the-art Reverse Osmosis plant will be deployed to convert sea water for process and service use. By harnessing the advanced RO technology, we are treating sea water to meet the daily requirement of water, thus reducing our reliance on freshwater. The advanced technology conserves fresh water, mitigates pollution and contributes to the overall ecological health of the region.

Development of Water Reservoir

We will undertake construction of a water reservoir to enhance water storage capacity. The reservoir will serve as a crucial resource during periods of low rainfall or drought, providing a buffer against fluctuating water availability and ensuring continuity of operations. By strategically managing water storage, we aim to optimise resource utilisation and maintain stable water supply for the facility and the surrounding communities.

28,479 m^3
Water Recycled in the plant

500 m^3
Water saved in the plant

Barmer

Improvement of RO to DM Plant line reliability

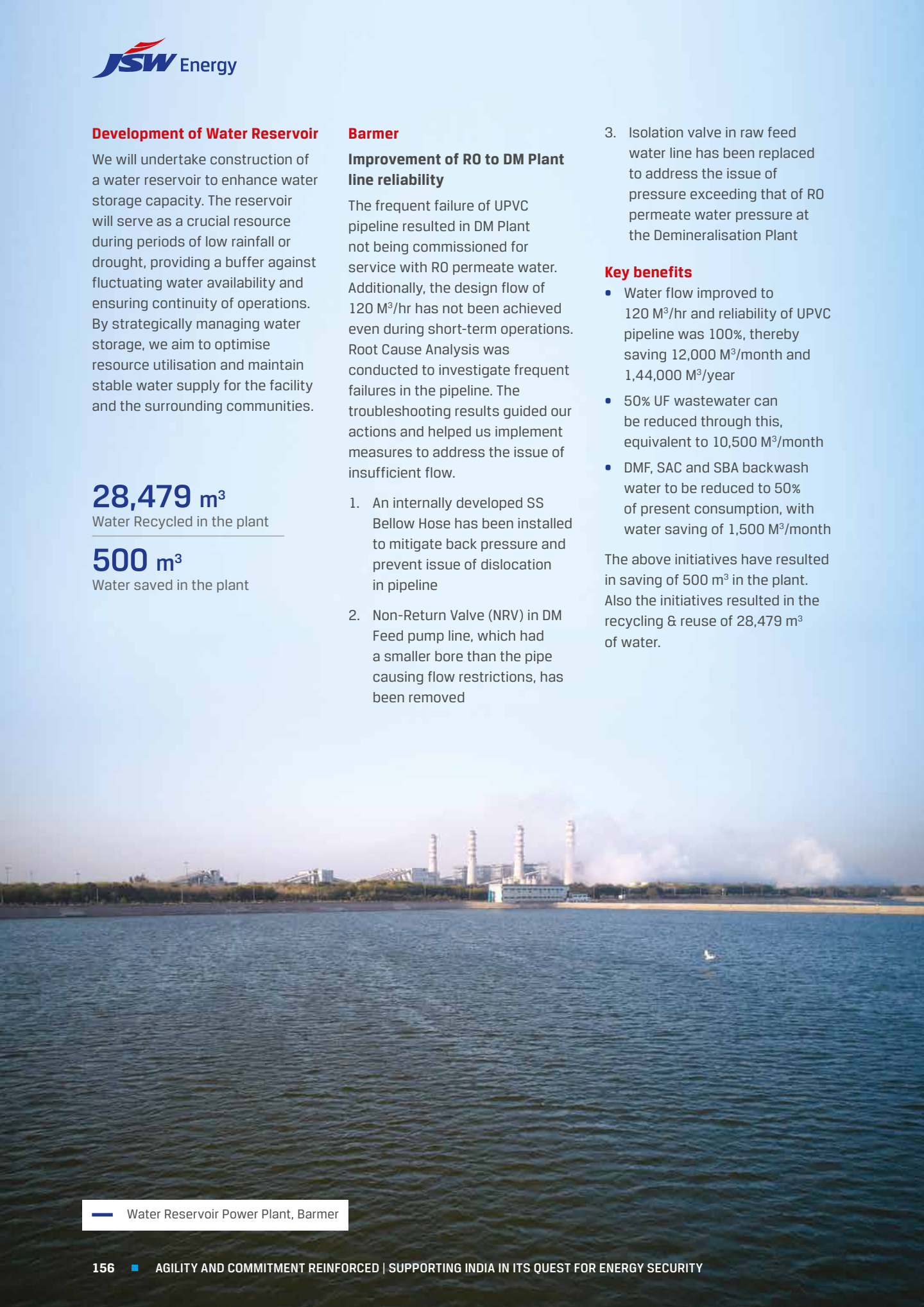
The frequent failure of UPVC pipeline resulted in DM Plant not being commissioned for service with RO permeate water. Additionally, the design flow of 120 M^3/hr has not been achieved even during short-term operations. Root Cause Analysis was conducted to investigate frequent failures in the pipeline. The troubleshooting results guided our actions and helped us implement measures to address the issue of insufficient flow.

1. An internally developed SS Bellow Hose has been installed to mitigate back pressure and prevent issue of dislocation in pipeline
2. Non-Return Valve (NRV) in DM Feed pump line, which had a smaller bore than the pipe causing flow restrictions, has been removed
3. Isolation valve in raw feed water line has been replaced to address the issue of pressure exceeding that of RO permeate water pressure at the Demineralisation Plant

Key benefits

- Water flow improved to 120 M^3/hr and reliability of UPVC pipeline was 100%, thereby saving 12,000 M^3/month and 1,44,000 M^3/year
- 50% UF wastewater can be reduced through this, equivalent to 10,500 M^3/month
- DMF, SAC and SBA backwash water to be reduced to 50% of present consumption, with water saving of 1,500 M^3/month

The above initiatives have resulted in saving of 500 m^3 in the plant. Also the initiatives resulted in the recycling & reuse of 28,479 m^3 of water.



Water Reservoir Power Plant, Barmer

ENERGY EFFICIENCY

287 KW
Power saved

THROUGH OUR TRANSFORMATIVE PROJECTS AND INNOVATIVE INITIATIVES, WE ARE SHAPING A FUTURE WHERE ENVIRONMENTAL SUSTAINABILITY IS ALIGNED FIRMLY WITH OPERATIONAL EXCELLENCE

Ratnagiri

Key Highlights

De-staging of Circulating Electric Pump

The destaging of our Circulating Electric Pump (CEP) exemplifies our dedication to efficiency and resource optimisation. Through comprehensive analysis and restructuring of the pumping system, we achieved significant reduction in energy consumption and operational cost, while minimising the environmental impact.

Improvement of Cooling Tower Availability

Recognising the critical role played by cooling towers in our operations, we embarked on a mission to enhance their efficiency and reliability. Through targeted upgrades and maintenance initiatives, we improved cooling tower availability, ensuring uninterrupted operations and maximising energy efficiency.

Overhauling of CW Pump with Energy-Efficient Coating

Our commitment to sustainability extends to our pumping systems too. Overhaul of the CW Pump with energy-efficient coatings is a testament to our commitment. By applying cutting-edge coatings to pump wetted surfaces, we optimised the performance and minimised energy consumption, paving way for a more sustainable future. Through our transformative projects and innovative initiatives, we are shaping a future where environmental sustainability is aligned firmly with operational excellence. By leveraging our strengths and embracing new opportunities, JSW Energy is driving positive change and leading the transition towards a more sustainable future for all.

Barmer

Reduction of PA fan and seal air fan power consumption in SBU-1 Unit-1

Being a part of an organisation, which deeply believes and finds every opportunity to conserve its resources for a better tomorrow, at SBU-1 Unit-1 we have identified an opportunity to reduce power consumption of seal air fan, and subsequently, reduce PA fan power consumption.

Auxiliary power consumption

Power consumed by the equipment within the power plant is a form of energy consumption. Reduction of auxiliary power consumption not only helps energy conservation, it also reduces its impact on the environment.

To increase the seal air pressure, the PA header pressure was increased from 800mmwc to 900mmwc, causing increase in PA fan power consumption. The reason for low seal air pressure was the choking of the suction filter.

Key outcome

After cleaning the seal air fan suction filter, the PA header pressure has been reduced to 780mmwc; PA fan speed has been reduced to 1210 rpm; and one seal air fan was stopped, which resulted in power saving of ~127.6 kWh. Several such initiatives are done each year to save power consumption within the plant.