An assessment of value delivered

BUSINESS VALUE DRIVER

FINANCIAL CAPITAL

To create value for all our stakeholders, we actively focus on maintaining a prudent financial management system.

JSW Energy Limited has always focused on improving shareholder returns by maintaining an optimal capital structure. We have significantly enhanced our operational performance by establishing prudent risk management framework. Moreover, the secure and reliable management of our cash flows ensures access to adequate funding opportunities to meet our operating needs and strategic objectives.

Financial Overview

Over the years, we have demonstrated significant prudence in our capital allocation decisions while balancing our growth aspirations. We continue to be one of the few power generating companies in India with a strong balance sheet, and this provides us with financial strength and flexibility to be on course and focus on the future, even in adverse macroeconomic scenarios.

Despite the Covid-19 pandemic crisis, our plant operations continue to run smoothly, while ensuring adherence to necessary safety measures. Our balance sheet and liquidity margins remain robust, well-positioned to navigate challenging circumstances. Our Net Debt to Equity ratio improved to 0.77x from 0.85x a year ago and Net/Debt to EBTIDA stood at 2.76x vis-à-vis 3.12x at the end of previous fiscal.

During the year, the total revenue declined by ~10% on a YoY basis to ₹8,560 Crore from ₹9,506 Crore in the corresponding previous year primarily due to lower sales and decline in fuel cost. However, we maintained steady EBITDA of ₹3,244 Crore as compared to ₹3,221 Crore in the previous year.

Creating Value

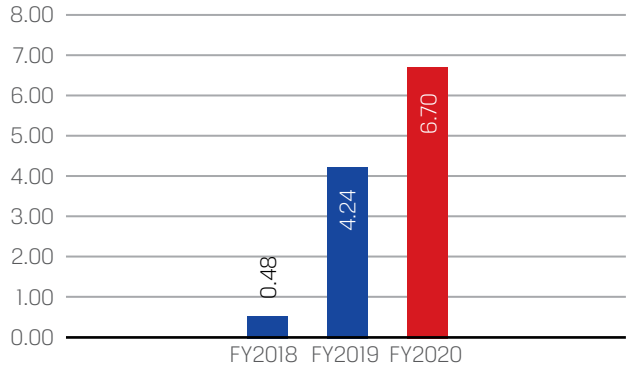
(₹in Crore)

Delivering Shareholder Value	KPI	Trend	FY2018	FY2019	FY2020
Profit after tax (before exceptional items) was ₹1,038.46 Crore, up by 49%. This reflects strong operational performance.	Profit after Tax (before exceptional items)	●	495.91	695.13	1038.46
Return on Equity improved to 8.92% (before exceptional items), reflecting an enhanced value to shareholders.	Return on Equity (%)	●	4.46%	5.88%	8.92%
Our Net Debt to Equity Ratio was at 0.77, making us well-positioned to pursue future growth opportunities	Net Debt to Equity Ratio (x)	●	1.02	0.85	0.77

Legend
- ● Increasing Trend
- ● Decreasing Trend
- ● No Trend

We use the following financial measures to track progress against our strategy to create value from our business.

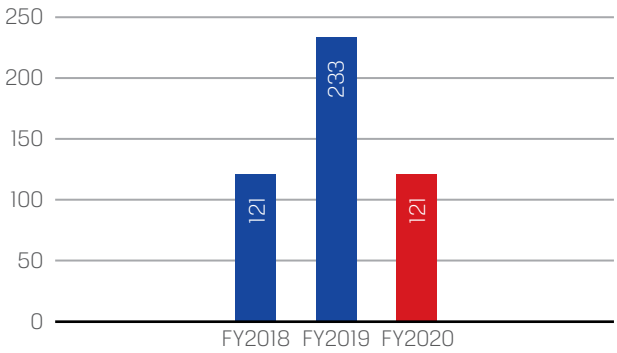
Earnings Per Share (₹)



Strategic Relevance: Earnings per share is an important barometer to gauge a company's profitability per unit of shareholder ownership.

Performance: In FY2019-20, the Earnings Per Share of the Company increased by 58% due to improvement in margins, lower operating cost, reduction in finance cost and one time reversal of deferred tax liability

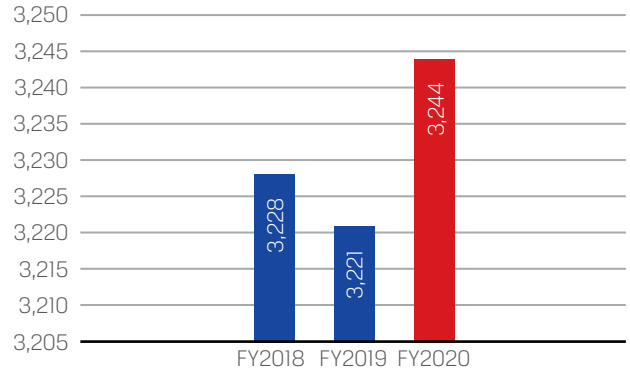
CAPEX (₹in Crore)



Strategic Relevance: Capital expenditures are used to purchase, improvement, or maintenance of long-term assets to improve the efficiency or capacity of the Company.

Performance: There was higher cash outflow for the capital expenditure (Capex) in FY 2019 on account of 18 MW Thermal Power project each at Nandyal and Salboni and 10MW of Solar projects.

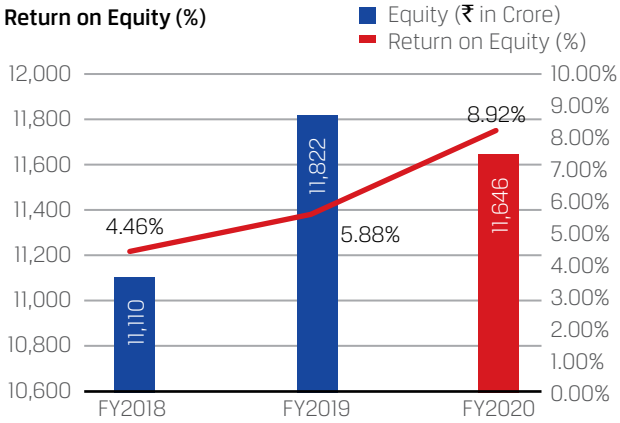
EBITDA (₹in Crore)



Strategic Relevance: Our strategic objective is to earn a sustainable level of operating profit over the long term.

Performance: We have maintained stable growth in our operating profit with our prudent expense management.

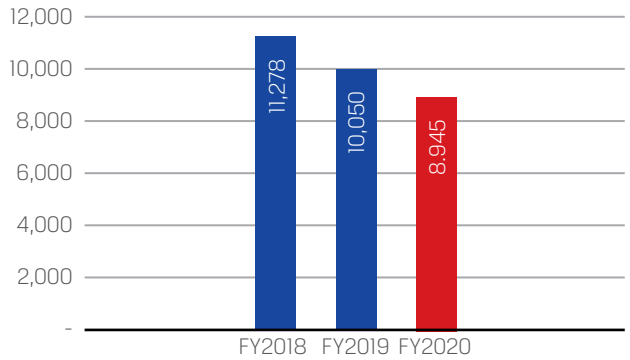
Return on Equity (%)



Strategic Relevance: Return on Equity indicates the value created on the shareholder's capital.

Performance: Our increasing return on equity signifies the profits that we have generated with the money invested by shareholders.

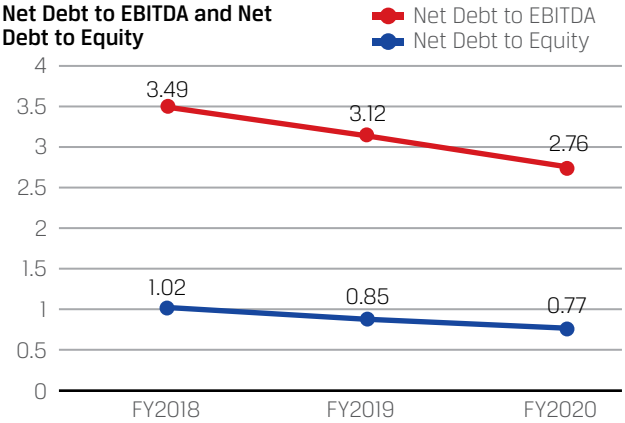
Net Debt (₹in Crore)



Strategic Relevance: Our focus is on actively striking a balance between growth aspirations and risk management.

Performance: By proactively reducing our net debt levels, we have significantly improved balance sheet strength.

Net Debt to EBITDA and Net Debt to Equity



Strategic Relevance: These leverage metrics are important parameters of the credit profile strength of the Company.

Performance: By following sound capital allocation principles and robust balance sheet management, we have managed through downturns while at the same time enabled sufficient headroom to meet our long-term growth objectives.

BUSINESS VALUE DRIVER

MANUFACTURED CAPITAL

Our plant infrastructure acts as a key strength of our organisation that we use efficiently and utilise our resources throughout our value chain to ensure quality power supply to our customers.

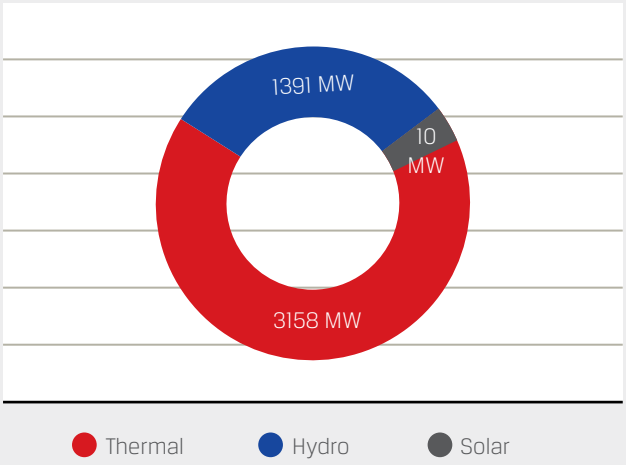
At JSW Energy, we consistently focus on improving the efficiency of our plants to create a sustainable value for our stakeholders. Our activities encompass power generation, transmission and trading, lignite/coal mining. Our philosophy relies heavily on the optimum utilisation of resources, which makes us competitive and resilient as we operate in dynamic economic conditions. It also enables us to act as a responsible corporate citizen towards our society and environment.

Operational Review

We have one of the best run thermal and hydro plants across India. Our plants have been consistently recognised for their efficient operational capabilities. We are also exploring opportunities in the renewable energy. During FY2020, our Karcham Wangtoo Hydro Electric Power plant achieved its highest ever PLF in FY2020 since commissioning.

In FY2020, our net generation stood at 21,252 MUs as against 22,088 MUs in the previous year. The deemed Plant Load Factor was at 66.01% as against 65.18% in the previous year.

Generation By Source



4,559 MW

Total Generation Capacity

Creating Value

Optimum Utilisation of Resources	KPI	Trend	FY2018	FY2019	FY2020
The Total Net Generation stood at 21,252 MUs recording a decrease of 3.78%	Total Net Generation (MUs)	●	21,816	22,088	21,252
The Plant Load Factor for the year was 66.01%, which has recorded an increase of 83 bps YoY	Deemed Plant Load Factor (%)	●	64.53%	65.18%	66.01%
The current installed capacity is 4,559 MW, which has increased by 18 MW from the previous year	Installed Capacity (MW)	●	4,531	4,541	4,559

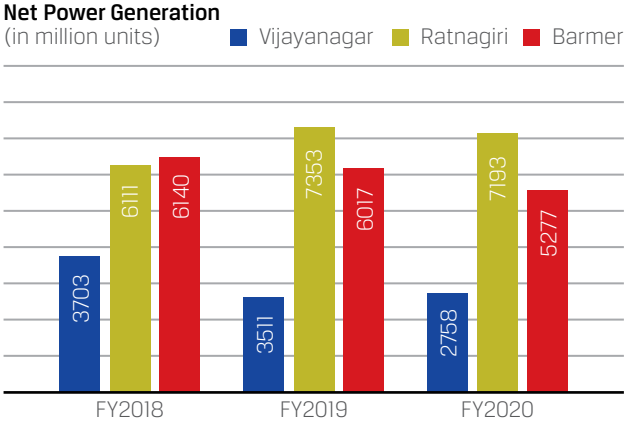
Legend
- ● Increasing Trend
- ● Decreasing Trend
- ● No Trend

Our Plants

Thermal Power Plants

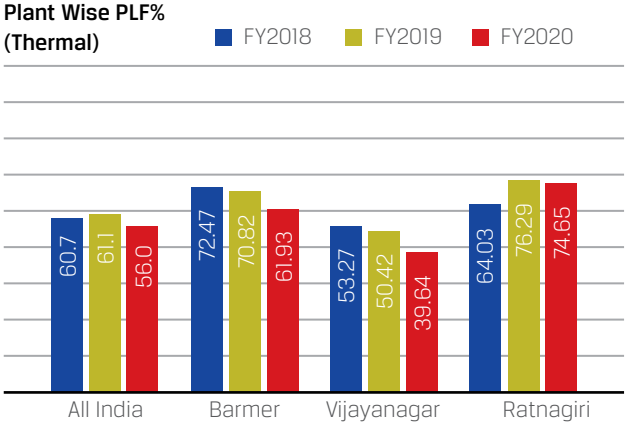
We procure primary fuels such as coal and lignite, and secondary fuels such as heavy fuel oil and Light diesel oil. We identify the risks and opportunities at the time of coal selection. Therefore, we focus on selecting coal, which has low impact on the environment, post combustion. We ensure regular maintenance and refurbishment of our plant equipment to maximise production efficiency. Furthermore, we ensure strict implementation of the standard operating procedures.

Net Power Generation
(in million units)



In addition to above the net generation from Nandyal Thermal Plant in FY 2020 - 58 million units

Plant Wise PLF% (Thermal)

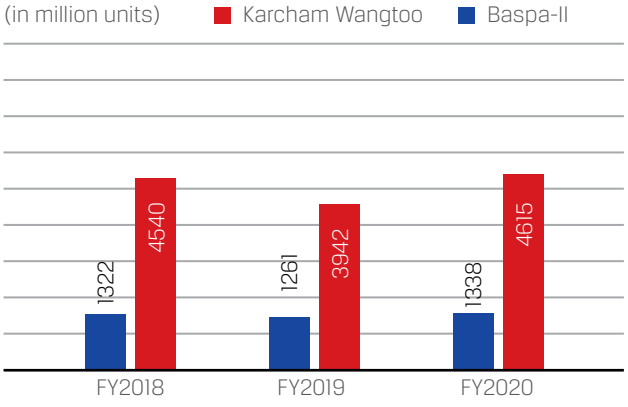


Source: CEA

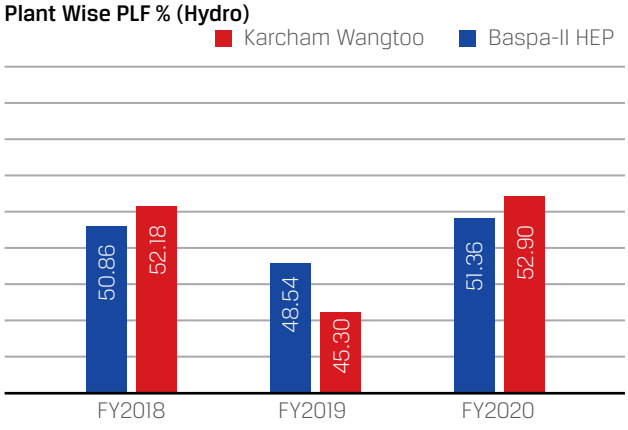
Hydro Power Plants

Hydro power a renewable source of power generation, forms about 31% of our total generation capacity. With state of the art infrastructure, our Karcham Wangtoo plant, with 1091 MW installed capacity is the country's largest private sector hydro power plant.

Net Generated Power
(in million units)



Plant Wise PLF % (Hydro)



Solar Power Plants

We have 10 MW of solar power plants, which is spread across different locations in Rajasthan, Andhra Pradesh, Maharastra and West Bengal. Going forward, our vision to achieve 10 GW capacity over the medium term will be primarily driven by renewable energy.

13 million units

Net Solar Power Generation in FY2019-20
Net Solar Power Generation in FY 2018-19 - 4 million units

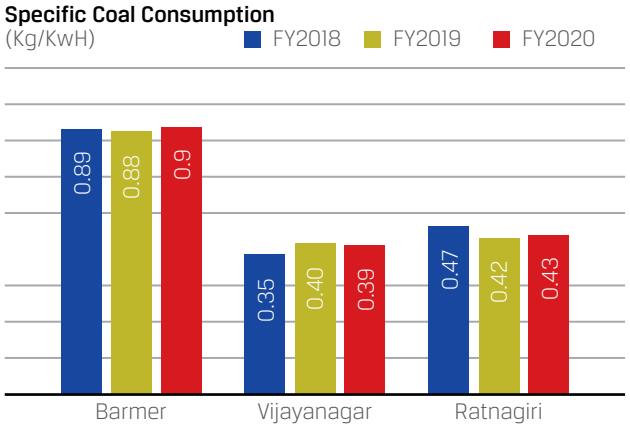
Other Operational Assets

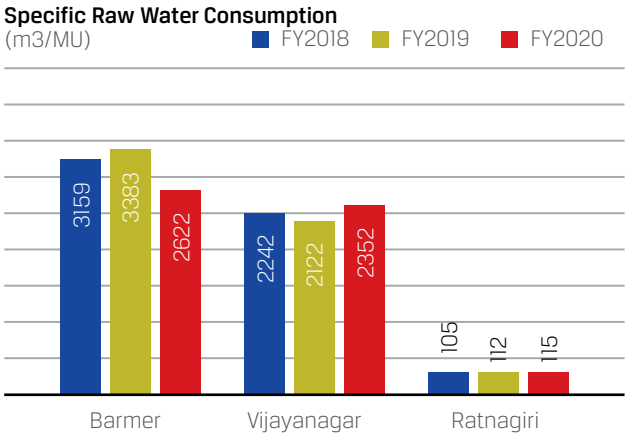
We have two 400 kV transmission lines in Maharashtra in Joint Venture with Maharashtra State Electricity Transmission Company Limited (MSETCL).

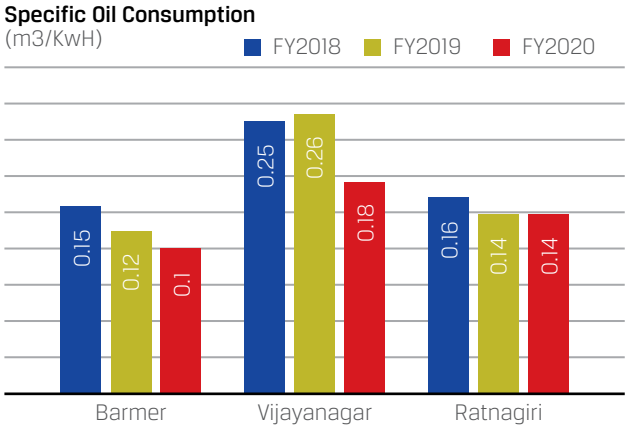
We have a 9 MTPA combined capacity of lignite mines in Rajasthan in a Joint Venture with Rajasthan State Mines and Minerals Limited (RSMML).

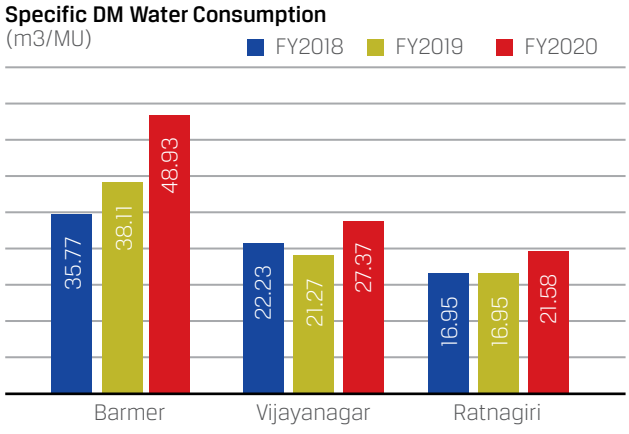
We are engaged in Power Trading since 2006.

Key Performance and Highlights

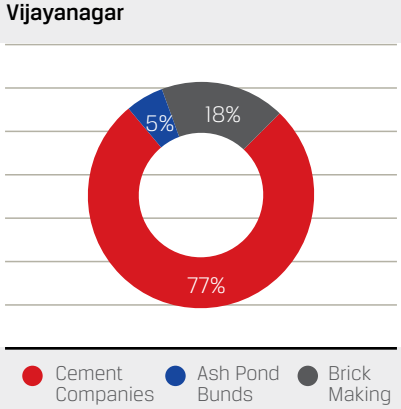


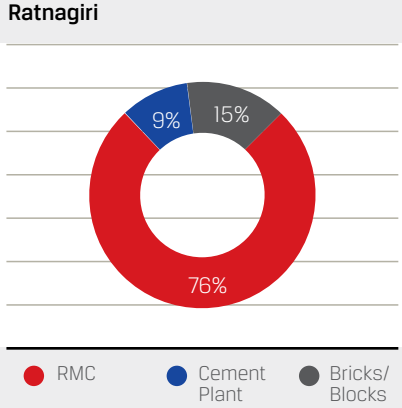


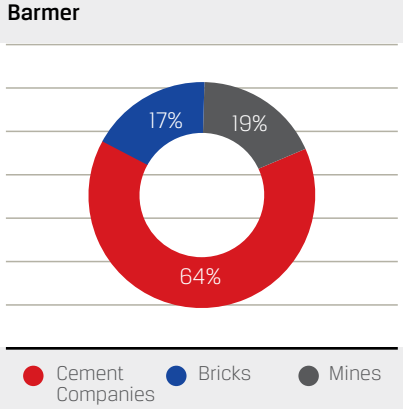




Fly Ash Utilisation Streams







Compliance Audits

Following audits are conducted across all our plants as part of compliance requirements as well as leveraging the ideal of 'continual improvement'

- Environmental Audits – Internal & External
- Integrated Management System Audit & Re-certification – External
- Health and Safety – Internal & External

Quality Certifications

For us, quality, occupational health, safety, and environmental factors play a very critical role in our production process. Therefore, we strive to maintain the best quality while also emphasising on the importance of health and safety of our workers who contribute towards the successful operations of our plants. Furthermore, we identify the impact of our production activities on the environment and address them for sustainable growth and development.

Our plants are certified to the following management systems:

- JSW Energy Limited-Vijayanagar (860 MW): ISO 9001-2015, ISO 14001-2015, BS OHSAS 18001-2007, and ISO 50001-2011
- JSW Energy Limited-Ratnagiri (1,200 MW): ISO 9001-2015, ISO 14001-2004, OHSAS 18001-2007, and ISO 50001-2011
- JSW Energy Limited-Barmer (1,080 MW): ISO 9001-2015, ISO 14001-2015, OHSAS 18001-2007, and ISO 50001-2011
- JSW Hydro Energy Limited (1,391 MW): ISO 9001-2015, ISO 14001-2015, and OHSAS 18001-2007

Recognition

Our constant efforts towards making the optimum utilisation of our resources, efficient operations, ensuring occupational safety, and minimising environmental impacts are reflected in the recognitions that we receive year after year. In FY2020, our plants were recognised with several awards.

JSW Energy Limited, Vijayanagar

During the year, the Company received the following awards:

- **'Shining Glory Award-2019'** by Green Maple Foundation, Chandigarh- Awarded on 26 May-2019- Trophy and Certificate (Won under Environment Management-Achiever Category)- for Excellent Performance in Environmental Management
- **'Global Environment Award 2019'** by Energy and Environment Foundation, Delhi – Awarded on 23 August-2019 at Convention Centre, NDCC- New Delhi- Trophy and Certificate(under Platinum Category)- for Achievement in Latest Environmental practices and Management
- **CII National Award for Excellence in Energy Management -2019** by Confederation of Indian Industry(CII)- Awarded on 18 September-2019 at HICC(Hyderabad International Convention Centre) Hyderabad- Awarded as Energy Efficient Unit(Trophy & Certificate)- For the Energy conservation measures and Best practices adopted for conservation of Energy
- **'SEEM National Energy Management Award 2019'** by Society of Energy Engineers and Managers,- Awarded on 26 September-2019 in the Award Ceremony at Islamic Cultural Centre, New Delhi - Won Silver Award (Trophy & Certificate)- For the Energy conservation measures and Best practices adopted for conservation of Energy
- **State Level Safety Award – Best Power Boiler'** by Director of Factories, Boilers, Industrial Safety & Health, Bangalore, Govt of Karnataka for Captive Power Plant # 1 boiler - Awarded on 04 March-2020- Got "First Prize" (Trophy & Certificate) For the best safe practices adopted
- **Certificate on Excellence in Safety** to the Captive Power Plant # 2 by JSW Steel Limited during the National Safety day celebrations on 04 March 2020- For maintaining commendable safety performance during the calendar year 2019.

JSW Energy Limited, Barmer

- **"Shining Glory Award - 2019" under "Business Excellence" category** from Green Maple Foundation.
- **"Shining Glory Award - 2019" under "Women Empowerment" category** from Green Maple Foundation.
- **"Rajasthan CSR Leadership Award 2019" under "Poverty Alleviation" category.**
- **"National NGO & CSR Excellence Award-2019", for "Water & Sanitation-2019"** presented at the 6th National NGO and CSR summit-2019.
- Received **"Certificate of Appreciation for Good Practices in Safety Systems"** at 8th FICCI Safety Systems Excellence Awards for Industry 2019, New Delhi.
- **IPPAI "20th Regulators & Policymakers Retreat-2019" award,** certificate of excellence and trophy received for the Best Innovation.

JSW Energy Limited, Ratnagiri

- **CII National Award for Excellence in Energy Management -2019** by Confederation of Indian Industry(CII)- Awarded on 18 September-2019 at HICC(Hyderabad International Convention Centre) Hyderabad- Awarded as Excellent Energy Efficient Unit (Trophy & Certificate)- For the Energy conservation measures and Best practices adopted for conservation of Energy
- **The Best Operating Thermal Power Plant National award by IPPAI Power Awards – 2019** awarded on 7th December 2019 (Trophy). The award was announced at 20th Regulators & Policymakers Retreat-2019, a platform for thought-provoking discussions and creation of recommendations for the future of the Indian power sector. The objective of award is to recognise the contributions made towards energy efficiency.
- **Certificate of Appreciation from Confederation of Indian Industry (CII)** for good work in area of sustainability during CII ITC Sustainability Awards 2019. The certificate was received in January-2020
- **Declared 1st Winner Award at the 14th State level Energy Conservation Award** by Maharashtra Energy Development Agency (MEDA) for excellence in energy conservation and management.
- **Golden Bird Excellence Award-2020-** Declared winner in Gold Category on 29th November 2019 for the outstanding project on energy efficiency.

BUSINESS VALUE DRIVER

HUMAN CAPITAL

We want to be the 'Employer of Choice'. The blueprint of our employee development is co-related to our larger organisational objective that supports our strategy to sustain JSW Energy's position as one of the leading energy companies, competitively-ahead, and performance-driven with a strong foreseeable future.

At JSW Energy, we cultivate employee skills and capabilities to drive shared organisational objectives. Our five strong facets – Confidence, Courage, Commitment, Compassion, and Collaboration define the way JSW Energy works. We are committed to providing a progressive workplace that is focused on the overall development of our employees. Therefore, our human resource management team plays a crucial role of a strategic business partner by driving the organisational goals of growth, agility, and enhanced productivity. Our people development practices help generate and strengthen the competencies of our human capital to deliver notable results on the trajectories of operational efficiencies and productivity. To enhance the employee experience in our organisation, we have developed and deployed a model called CARE, which attempts to encompass the aspects of an engaging and interactive workplace.

JSW Energy's CARE Model

We constantly aim to create a best workplace experience for our employees that motivates them to contribute more towards the organisational goal. To ensure an engaging and interactive workplace, the human resource management team at JSW Energy formulated and deployed a model called CARE. The model is devised on four strategic elements – Communication, Agility, Responsibility, and Elevation. The model aims to achieve comprehensive development of employees and bring out their best capabilities. It intends to provide them a platform to communicate and interact with their teammates. Through the various aspects of this model, we endeavour to encourage our people so that they are always motivated to work with us.

Strategic Elements of CARE

Through our CARE Model, we try to address and achieve the key objectives of the four critical aspects that bind our human capital together while enhancing their competencies and productivity.

Communication

To bring alignment among employees towards the broader organisational objectives by creating transparency in communication. Our initiatives under this pillar are focused towards building solid employee networks and interactions. To this end, we offer a platform where the employees can communicate with each other and the Management. This is done by several employee engagement programs such as Samwaad that is a two-way communication between employees and the management; Townhall, which is a platform to encourage interactions between associate employees; Skip Level Meetings; and Family Get-Togethers, amongst other programs. We also publish our in-house magazine, BOLT, every quarter. During FY2020, C-Live, which is our quarterly forum where the CxOs share industry updates, company scenario, future roadmap along with addressing questions from the employees through a web-telecast went live.

Agility

Building organisation and employee capabilities by developing future leaders and enhancing analytical competences to address business-related challenges.

Our initiatives under Agility pillar are focussed on employee development and building collaboration. Key initiatives to drive Agility are:

Training and Development

JSW Energy strongly believes in consistent development and improvement of its human capital and recognises it as a key to a successful organisation. During the year, we continued our flagship leadership development program, Future Fit Leaders (FFL). Eight of our employees were shortlisted for the FFL program at Tier I institutes such as Cornell University, IIM Bangalore, Indian School of Business Hyderabad and IIM Ahmedabad. As our effort to promote diversity in the organisation, two of our women employees were also selected for development program at IIM Bangalore under the Springboard program. Additionally, we organised multiple strategic training programs in functional, behavioural, technical, safety and Total Quality Management categories. As our business is headed towards a strong growth, we started Diploma in Solar to develop internal talent for upcoming growth opportunities in new business verticals.

UMANG

UMANG has been an integral part of our human resource development initiatives since nine years. It provides a platform to connect our employees with each other. Under this program, we conduct team based interactive games and contests where teams are formed across cross section of hierarchy, department, gender, and age, thereby building strong bonds among the employees. This helps them in building networks and trust, sharing and instilling spelling agility in the system. During FY2020, our initiative 'Lose For the Gain' was launched with an aim to increase cross functional interaction among the diverse teams to build agility in the system. Through this, we have also promoted the importance of physical well-being by incentivising the teams to achieve the desired BMI range.

Responsibility

Involving employees in the execution of business strategies through problem solving initiatives.

Our Leadership and Innovation practices play a pivotal role to drive this pillar. During FY2020, we have launched IGNITE, which is a digital platform for logging Ideas, Projects and Sujhaav. We launched Mission 10 Gigawatt and conducted a leadership workshop to define the company goals for the medium term. Various HR initiatives were implemented to enhance the employee engagement scores. In a planned approach, dipsticks were conducted in-line with the engagement survey scores. Based on the inputs from the dipstick, we organised 'Connect workshops' to promote collaboration at the workplace and 'Lead with Conversations' workshops for managers to nurture trust-based relationships between the managers and their subordinates.

Elevation

Recognising the valuable contribution of our employees to further enhance their morale and encourage an ownership culture. We believe in Recognising and Rewarding (R&R) the contribution of our employees in the organisational growth and success. We see this as a significant part of our work culture. To keep them encouraged, we have devised multiple rewards and recognition programmes such as:

Kaizen and J2-J3 Projects: Employees participate to resolve business and operational problems through problem solving tools and techniques. The employee contribution in addressing business and operational problems is rewarded through Kaizen awards.

Spotlight: In FY2020, an online platform to instantly reward our colleagues and team members was implemented to promote individual contribution to the organisation in day to day working. The R&R program enables Managers and Leaders to recognise employees who rise above and beyond the call of duty. Individuals and Teams demonstrating JSW Group values and tangible drivers are appreciated.

LAMHE: To appreciate long and meritorious association of employees with the organisation, employees are awarded LAMHE awards.

Best Employee of the month Award: Across the plant locations, best employee of the month award is given to the employees based on the nominations from various departments.

Our Progress Under CARE

19 sessions
Organised Under Samwaad

15 employees
Selected for Diploma in Solar

18 employees
NEBOSH Trained

11 workshops
Conducted under Mission 10GW

How far we've come

At JSW Energy, we have recognised the importance of having a motivated and talented workforce. Therefore, through CARE, we have set forth various strategies in our business plan to build a strong and much evolved human capital that shares with us a mutual goal of organisational success.

Process Improvement

We have embarked on the journey to implement Total Quality Management (TQM) in the organisation and have adopted TQM approach of Daily Management in all our HR systems and processes. Employee safety is also an integral KPI for our business performance and we are working on implementing DuPont safety standards. Our HR team also plays a crucial role in building capability by facilitating training and certifications of reputed course such as NEBOSH, which is a safety certification.

Employee Engagement

In 2018, we conducted 'Great Place to Work' survey to achieve our purpose of emerging as one of the most preferred companies to work with. With this objective, we have introduced several interventions to enhance collaboration among the employees.

Manpower Optimisation

Another focus area for the next 5 years is to optimise our manpower requirements through digitalisation and automation. A central digitalisation team is formed to drive automation and expand digital footprint across all our plants.

Reskilling and Redeployment

To support business expansion into renewable business, we focus on reskilling and redeployment. The existing manpower is being trained and developed for upcoming solar and wind projects. We have also offered Diploma in Solar Certification to the employees who have completed the relevant training. In FY2020, we have successfully offered the certificates to one batch of 15 employees.

Our Achievements

Our efforts to build a solid workplace with an efficient workforce have been time and again recognised and awarded with outstanding titles.

Golden Peacock award for HR Excellence – 2019

JSW Energy was awarded the coveted "Golden Peacock award for HR Excellence" in power sector for the year 2019

Award for "Organization with Innovative HR Practices" by World HRD Congress

JSW Energy received the coveted Award by World HRD Congress (9th Edition) in the event of "Dream Companies to Work for" under the category of "Organization with Innovative HR Practices"

5.17 training mandays
Of Executive employees

146 employees
Rotated to different roles/ departments

684 Kgs
Weight lost by 1414 employees

25 sports
Done under Umang

Key Performance Highlights

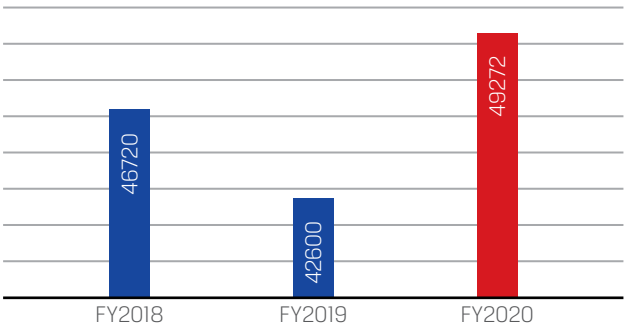
1,677
Total Employees

49,272
Man Hours invested in various trainings

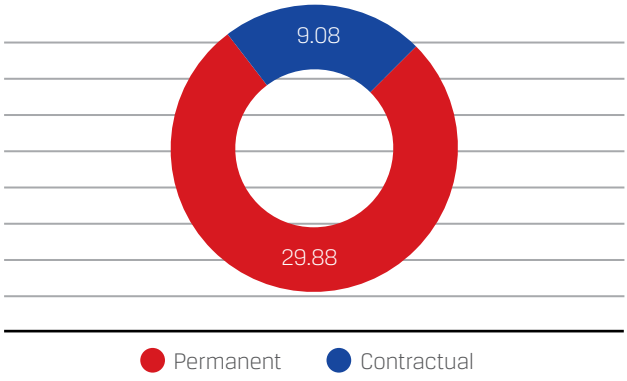
303
Unique Employee Training Conducted

41.86%
of our Management Council represented by women
FY2019: 36.5%

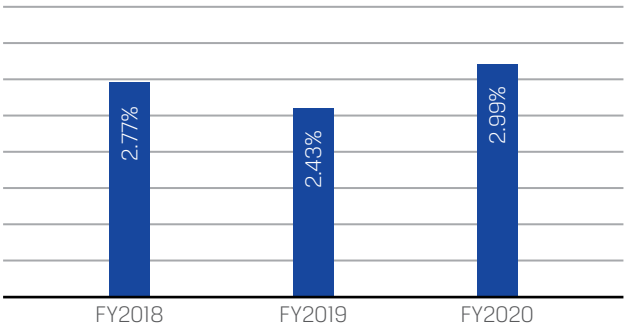
Manhours on Training



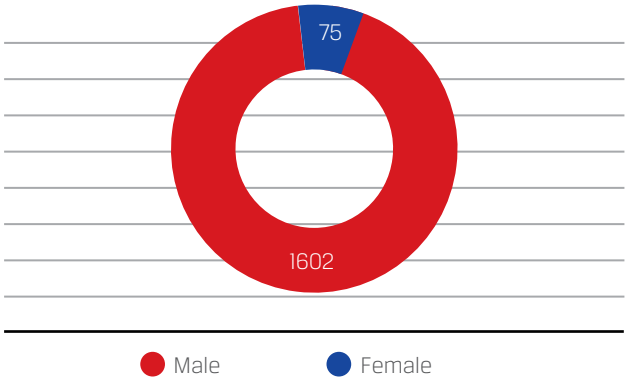
Employee - Wise Training Hours



Attrition Rate



Gender Diversity



Diversity and Inclusion

75 women employees and 06 differently-abled employees are a part of our permanent workforce.

Engagements and Interactions

To strengthen interactions among employees, we encourage candid conversations through regular town-hall meetings and SAMVAD by senior leadership with cross-section of employees in all the locations.

Workplace Ethics

We have designed and circulated a policy on Prevention of Sexual Harassment at Workplace (POSH), and Whistle-blower Policy, amongst others. To record and address grievances, we have formed a communication channel where employees can send their grievances.

100% of employees in managerial cadre were provided awareness on POSH in FY2020.

During FY2020, we received no complaint related to sexual harassment. We regularly monitor and ensure that all the rules and regulations related to human rights, which are applicable in our area of operations, are strictly adhered to.

Grievance Communication Channel: energycares@jsw.in

Employee Association

At JSW Energy, the Management identifies 01 employee association, which is represented by 25% of our permanent employees.

BUSINESS VALUE DRIVER

SOCIAL AND RELATIONSHIP CAPITAL

Engaging effectively with stakeholders enables us to understand and respond to their interests and expectations. It is an important driver for building long-term relations, which facilitates us in delivering on our strategy.

JSW Energy's success has always stemmed from our ability to build trusted relationships with all our stakeholders, in accordance with our values and a high standard of ethics and performance. Moreover, it also depends on our ability to work constructively with our stakeholders and to improve their sustainable performance. Through continuous dialogue and seeking constant feedback, we hope to deepen our engagement with our stakeholders and fulfil our role as a responsible leader.

Engaging with our Stakeholders

At JSW Energy, we believe that as a responsible corporate, we must create shared economic and social value for our stakeholders. As we prepare to step up our business for next-level growth, value creation for key stakeholders remains our priority.

Our relationships with our stakeholders are imperative to our business success. We work hard throughout the year to understand the needs and requirements of our customers, suppliers and partners to ensure that the decisions we take are in both their interests and the interests of JSW Energy's future success. Only through regular communication and the pursuit of continuous improvement in our engagement and service can we ensure that we have supportive stakeholders and partners for the long term.

Acknowledging the importance of engagement with stakeholders, we have defined a set of processes for interacting and engaging with various stakeholders at various levels. A Committee of the Board deals with the grievances and engages with the Investors and shareholders. Likewise, departments have been set up at Project locations for interacting and engaging with other stakeholders at various levels. The specialised teams ensure communication with various stakeholders internally and externally, which helps the Company in understanding their concerns and respond to them appropriately.

Community Engagement

JSW Foundation has been working alongside the communities and other stakeholders to create shared vision and values that rally around not only to create a synergy among the individuals but also serve to multiply the benefits of its CSR initiatives. Through its various CSR interventions, the Foundation has benefited 60,268, 54,000 and 67,381 beneficiaries directly in 2017-18, 2018-19 and 2019-20, respectively.

Working relentlessly, JSW's initiatives have been able to nurture substantial social capital. While over 1,100 likeminded farmers and 200 women have been facilitated to converge as common interest groups, more than 260 women have been trained and facilitated for employment at BPO centres and close to 115 women have been trained on tailoring to help them earn their living with dignity. Furthermore, over 1,300 youths have been trained to enhance their vocational skills and in turn, their employability. Needless to reiterate that these networks would strengthen the development of shared purpose and thus motivate the members to take charge and evolve further.

While facilitating the community entities, extensive efforts have gone in fostering strategic linkages with various entities such as marketers, facilitators and trainers, which has immensely helped to take the initiatives to their logical conclusion while channelising the energies in the right direction. A few examples of such synergies are connecting the women's group involved in the production of handloom products at Himachal Pradesh to the market; linking women's group in the mango pulp production at Ratnagiri to the urban consumers, and; organising the farmers at Bellary for training on an improved package of practices. JSW has also facilitated over 20,000 community members to avail their entitlements for various government welfare schemes. This, in turn, shall build long term resilience through a connection with various public institutions for longer-term sustenance and better governance while at the same time it will work to reduce the dependence on the company thereby leading to freeing of precious resources for more strategic interventions.

Working in close collaboration has resulted in the emergence of a deep, trust-based relationship with the stakeholders, which further underlines the significant social capital nurtured through the journey thus far. This is manifested through the willingness of the communities to assume upkeep of the common property resources created by JSW as well as their openness to commit resources, not only monetary but also the assets and in-kind assistance, which together make JSW's CSR initiatives the joint ventures in true sense.

For more details on our CSR initiatives, please refer Page 48.

Creating Value, Impacting Lives

Delivering Stakeholder Value	KPI	FY2018	FY2019	FY2020
Our CSR contribution enables inclusive growth for our local communities.	CSR Investment (₹ in Crore) (JSWEL Consolidated)	32.53	25.17	16.75
JSW Energy strives to make a net-positive social, economic and environmental contribution to the communities in which we operate. A wide variety of people and groups are affected by the decisions that we make.	Number of Direct Beneficiaries Impacted	60,268	54,000	67,381

Overview of our interventions under various categories

Sr No.	Category as per Companies Act, 2013	JSWEL Consolidated (₹ in Crore)
1	Improving Living Conditions	2.67
2	Promoting Social Development	3.31
3	Addressing Social Inequalities	5.32
4	Addressing Environmental Issues	1.37
5	Preserving National Heritage	0.34
6	Promotion of Sports	1.92
7	Rural Development	0.72
8	Swachh Bharat Abhiyan	0.26
9	Project Management Cost	0.84
	TOTAL	**16.75**

BUSINESS VALUE DRIVER

NATURAL CAPITAL

Being a leading energy company, we realise the responsibility that an organisation like ours has towards environment. To create a sustainable value, we focus on efficient utilisation of natural resources.

At JSW Energy, we achieve environmental excellence by ensuring that our plants operate at maximum efficiency levels. We also strive to optimally utilise the limited resources available in nature. It is our strong belief that development and sustainability should co-exist. To ensure that we are following this belief, we regularly take into account the ecological impact of our business activities. Furthermore, we have shaped our efforts accordingly to maintain the sensitive natural balance of our country's geology and reduce the chemical emissions into the atmosphere.

Our Environmental Performance

The scope of our Integrated Management Policy is to conserve and protect the environment and our entire value chain. All our plants are cautious, and they maintain the generation of emissions and waste within the permissible levels.

We have taken on the responsibility to address and combat long-term global challenges such as demographic change, climate change, and diminishing resources, in a socially, ecologically, and economically responsible manner. Coal is a primary raw material to our thermal plants. Hence, we put a lot of effort in the selection process of coal so that we are able to minimise its environmental effects.

How we manage our environmental impact

During FY2020, we have undertaken several efforts at our plant sites to ensure we minimise the environmental effects of our production activities.

JSW Energy Limited, Vijayanagar

- Replacement of the ESP field spike-type electrodes with spiral-type electrodes, which has increased the availability of ESP fields
- Reduction in fossil fuel consumption by decreasing the auxiliary power consumption by 62,749 KWh through various in-house and process improvements

JSW Energy Limited, Ratnagiri

- Replacement of basket for APH-A (Air Preheater) of Unit-1, which resulted in saving nearly 150 kW in ID Fan power consumption as well as improvement in boiler efficiency by 0.35%
- Installation of trim sets in four BFP recirculation control valves, which has resulted in saving 853 kW
- Replacement of Cooling Tower fans with high efficiency fans, which has resulted in saving 4kCal/kWh in the heat rate through vacuum improvement

JSW Energy (Barmer) Limited,

- Reduction in fossil fuel consumption due to 0.69% decrease in the heat rate through various in-house process improvements
- Environment emissions are maintained within the norms and limestone is being treated to maintain SOX emissions to minimum
- Helium leak detection test is executed to assess air ingress and improve condenser vacuum
- Rainwater harvesting has been implemented as Barmer is a desert location

Pre-Treatment Plant - Output Water Quality

1.5 NTU

Turbidity Achieved

During FY2020, we have implemented various initiatives to improve the water quality. We have also installed a system with auto logic to ensure proper drainage of sludge, which is a form of waste. Our several efforts have resulted in an improved water quality and we have achieved 1.5 NTU i.e. Nephelometric Turbidity Units out of a 5 NTU design

JSW Hydro Energy Limited

- Regular plantation drives have been initiated and 4,269 plantations were completed in FY2020
- Prohibition on single use of plastic in the premises
- Implementation of solid waste management

Emissions and Waste Management

Thermal Power Plants:

JSW Energy Thermal Power Plants are in compliance with prescribed permissible limits as per Central Pollution Control Board (CPCB), State Pollution Control Board (SPCB) for air emissions, effluent quality and discharge, solid and hazardous waste generation and disposal.

Hydro Power Plants:

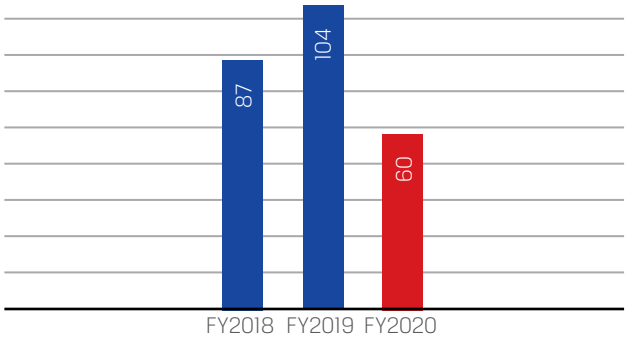
The river quality is analysed by the State Pollution Control Board as a part of monitoring the environmental impact of the operations. No adverse effect of the plant or its operations on the water quality has been reported.

Zero Effluent Discharge

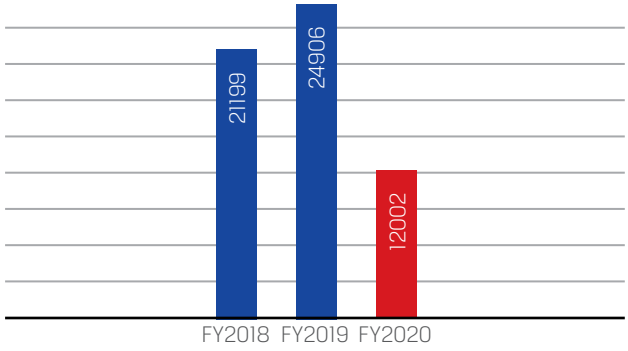
At Vijayanagar plant, the CW blowdown water (9,98,199 m3) is recycled in Reverse Osmosis (RO) Plant. The entire wastewater is treated in the effluent treatment plant based on Reverse Osmosis (RO) technology, and the recycled product, that is, water, is used in cooling towers as make-up water, while the RO reject stream is used for plantation. Thus, this helps us in achieving zero discharge of effluent water. Similarly, at our Barmer plant, the wastewater is treated in the Reverse Osmosis (RO) based effluent treatment plant and recycled water is combined with raw water as part of the feed to the demineralised water plant or as part of the make-up water to the cooling towers. The RO rejected water is used for plantations and ash/lignite spray, amongst others. Thus, zero effluent discharge is achieved here as well. We follow a similar practice in our Ratnagiri plant.

Key Performance Highlights

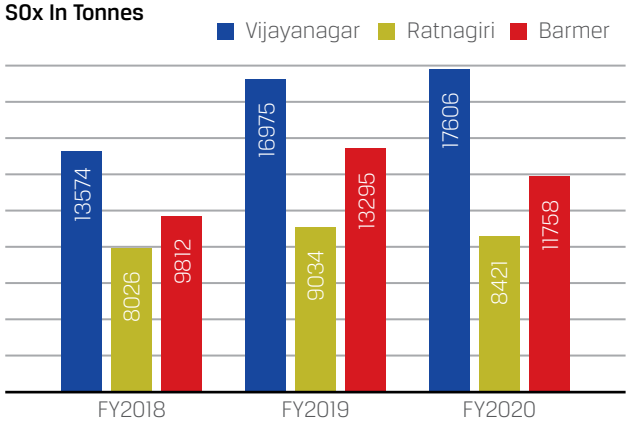
Energy Savings (MUs)



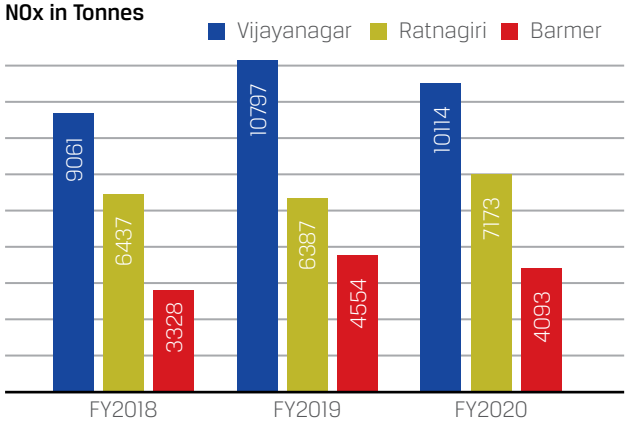
Tree Plantation



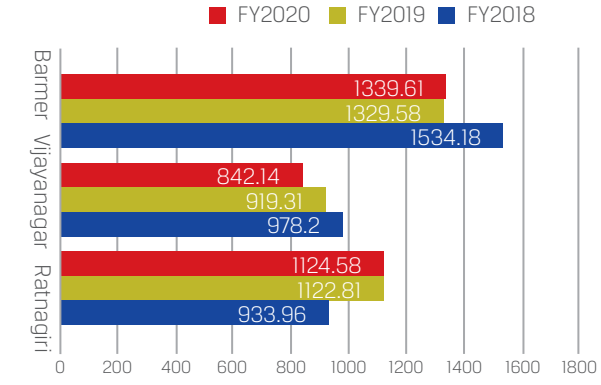
SOx In Tonnes



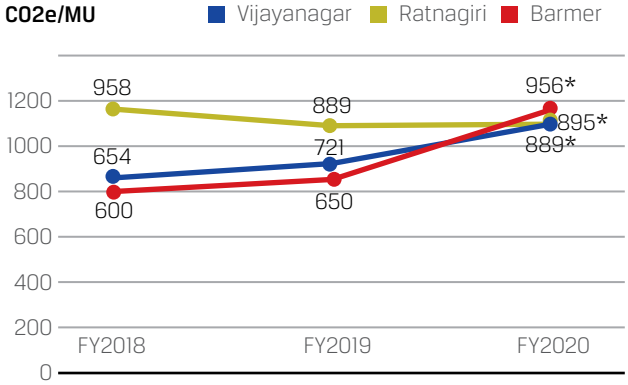
NOx in Tonnes



SPM in tonnes



GHG Emission in MT CO2e/MU



*FY2019-20 onwards IPCC method using emission factor has been adopted for calculation of GHG emissions at all plants instead of fixed carbon method. Hence, there is a steep variation at Barmer and Vijayanagar plant from the previous years.

BUSINESS VALUE DRIVER

INTELLECTUAL CAPITAL

We focus on improving organisational processes by implementing relevant technologies, embedding learnings into the business and supporting a culture of innovation, which will reinforce our drive for operational efficiency and resource optimisation.

An organisation's ability to enhance its knowledge base and innovate in its business goes a long way. In our industry, in particular, intellectual capital plays a significant role. As we operate in a highly competitive environment and we differentiate ourselves by employing our systems, data capabilities and insights to manage risk, deliver quality power, manage costs and build our business for the future. We always try to strengthen our knowledge-based capitals so that we can enhance the performance of our machinery and equipment.

Strategic Focus

Innovation is driven and leveraged by the technology organisation, new materials business, and services and solutions business. The process also focusses on building new competencies and capabilities to enable our organisation to be future-ready.

Moreover, technology and a culture of continuous improvement are key enablers towards achieving the strategic objectives of industry leadership and cost leadership. We will continue to enhance our production processes, cost competitiveness, and environmental performance through capability building and collaboration with technology and research partners. Amidst changing customer needs, with renewables gaining pace and increasing regulatory risks, we strive to innovate and adapt to change continuously.

During FY2019-20, we focused on leveraging our R&D and innovation capabilities through Process Improvements, System Updations and IT System & Infrastructure Upgradations.

Process Improvement and Governance

Delivering Stakeholder Value	KPI	Trend	FY2018	FY2019	FY2020
Energy conservation initiatives led to reduced cost, enhancing profitability	Energy Conservation (MUs)	●	86.79	104.00	59.92
	Monetary Savings due to Energy Conservation (₹ in Crore)	●	15.03	47.95	12.70
Cost incurred towards Intellectual Capital to increase operational margin by optimising process, systems, IT and Infrastructure	Cost Incurred towards Intellectual Capital (₹ in Crore)	●	7.64	6.12	12.63

Legend
- ● Increasing Trend
- ● Decreasing Trend
- ● No Trend

IT System & Infrastructure Upgradations

Towards Infrastructure Upgradation

As the world is progressing towards high-end technology and infrastructure upgradations, we are also progressing towards having an IT support system and infrastructure. During the year, to improve fault isolation, we installed support routing between different VLAN, which enabled Support high-speed scalability and accountability. Moreover, we enhanced security management control and monitoring of network traffic routing. We have ensured that all shop floor applications are always available for live and historical monitoring at all level.

Cyber Security Enhancements

Cybersecurity is an important firewall with the upgradations in technology. Towards this end, we have standardised the smart protection suite at the end-user level by the deployment of Trend Micro AV with primary and secondary servers to facilitate the periodical auto refreshment of patches. Moreover, we have re-architected perimeter firewalls across all energy plants by hardening of services and allowing a need to have basis principles.

Additionally, we deployed the Vulnerability Management system to proactively identify errors and get it remediated before it is exploited by external/internal intrusion or malware. Further enabled periodic risk assessment for public-facing systems. For all public facing applications for plant-related data monitoring on handheld devices, we have enabled secure mode access.

Implementation of Dashboard on Qlik Sense Platform.

MIS reporting tool which facilitates for viewing/monitoring of plant performance, maintenance, procurement, consumption and finance related data on a single platform. Deploying the Web-based common application with a single screen covering the multiple plants with major five modules, namely Finance and Summary, Plant performance, Consumables, Procurement and Market intelligence.

With the augmented graphics and data discovery features, Qlik Sense helps in spreading data literacy which means that users regardless of their skill set and capabilities can learn to intuitively draw meaningful insights from data and hence, learn to comprehend data. The capability of data scaling is also very beneficial to users who need to use a large amount of data from big data sources. Also, such efficient scalability allows many users to work on the same application at a single time.

Implementation of Digital Enabled Platform to Facilitate the Concept of Work from Home

Due to Covid-19 pandemic impact in India, the working professionals had to undergo the dynamic changes to understand and cope up with the demand of working from the home concept wherein the multi-sites, multi peoples, multi-task are to be brought on a single platform to meet the current need of business requirement. This situation has made us bring in the concept of the virtual world connect on a single platform to collaborate the working culture to achieve a common goal.

Process Improvements

During the year, the process improvement initiatives focused on conservation of energy through the reduction in auxiliary power consumption, start-up oil consumption, and coal consumption.

VIJAYANAGAR PLANT	BARMER PLANT	RATNAGIRI PLANT
Reduction in Auxiliary Power Consumption **30Kwh** Reduced power consumption of instrument air compressor by running in suction throttle mode over base mode during reserve shutdown of the unit. Reduced auxiliary power consumption for every cold startup by optimising the equipment's in service during the minimum export schedule, optimisation of total airflow, replacement of APH baskets during opportunity shutdown. Reduction of Oil Consumption Reduced oil consumption by adopting best operation practices such as deaerator preheating/pegging and use of BF gas during unit startup. Reduction in Coal Consumption **2,74,352 MT** Coal saved by using waste gases from blast furnace as fuel.	**29,952 Kwh** Energy Saved by stopping CT Fans in Winter season. Energy Saving through APH Tube replacement **2,381 kW** in Unit 2 **588 kW** in Unit 4 **1,041 kW** in Unit 6 Approximately 1KPa Condenser Vacuum improvement by Helium leak detection device. **48 T/day** Reduction in DM Water consumption by rerouting condensate from VAM to Condensate Storage Tank.	Reduction in Auxiliary Power Consumption Optimised discharge head pressure of PA Fans and CEPs, and running hours of CT Fans and SWIPs. The number of running mills was optimised so as to keep the optimum number of coal mills running at higher coal flow Reduction in Coal Consumption **0.38%** increase In efficiency of boiler by replacement of baskets in APH-A of Unit-1, along with the saving in ID Fan power consumption.

System Upgradation

Following initiatives were taken towards system upgradations for the betterment of processes, product development, cost reduction and import substitution:

VIJAYANAGAR PLANT	BARMER PLANT	RATNAGIRI PLANT
Replaced switchyard pneumatic generator circuit breakers with spring charge breakers, 6.6 kV breakers with improvised rack in/out facility type, 400kv bus CVTs with new version, and plant type battery banks with tubular battery banks for UPS. Implementation of DSM (Deviation settlement mechanism) in ABT as per 5th amended CERC regulations. Upgraded DCS Control room LVS (Large Video Screen) to Laser-based for better life enhancement. Replaced SBU1 CT Fans vibration mechanical switch with two-wire advance transmitter and signals extended to DCS for improved protection interlock, reliability improvement.	Boiler Second pass water washing is done with an ultra-high pressure water jet to remove deposits and improve heat transfer at SH and RH tubes in Unit 5. The anti-abrasive coating on Boiler tubes started to improve the life of boiler tubes and MTBF. In Boiler PLSH area, refractory material and application procedure changed to reduce outages due to refractory damage.	CT Fans (Cooling Tower Fans) in Unit 2 were replaced with high-efficiency fans having better airfoil design. The MS pipeline of ACW system was replaced by SS316L material to minimise the leakages in the system due to seawater. Shifting of ESP control station to the main plant control room to optimise auxiliary power. Implementation of Layer-3 switch with VLAN configuration that enabled network loop protection and Ring Configuration for failover. Setup of Security Command Control Room for centralised surveillance and upgradation of CCTV storage from 15 days to 45 days. Upgradation of the plant to township intercom communication using E1 gateways to improve reliability.