

# Management Discussion and Analysis

## JSW Steel – An overview

JSW Steel, the flagship company of the JSW Group is one of India's leading steel players with integrated steel manufacturing facilities. With an annual capacity of 18 MTPA, the Company has seven state-of-the-art manufacturing units spanning western and southern India and a strategic overseas presence, making it among the foremost integrated steel players in the world. The Company manufactures and markets a highly diversified portfolio of steel products.

An expansion pan-India reach (over 8,600 exclusive and non-exclusive retail outlets) and an export presence in over 100 countries, gives the company the capability to customise offerings to varied market requirements. The Company is widely perceived as a preferred supplier of high-end and value-added steel.

In the preceding two-and-a-half decades, the Company has grown significantly with a deep and abiding commitment to nation-building. From a 1.6 MTPA capacity in 2002, it currently holds crude steel production capacity of 18 MTPA; and is on track to touch 40 MTPA in the next decade.

The Company has an extensive portfolio of flat and long products and is one of India's leading producers and exporters of coated flat steel products.

### Product Portfolio

- Hot rolled coils
- Sheets and plates
- Cold rolled coils and sheets,
- Galvanised and galvalume products
- Pre-painted galvanised and galvalume products
- Thermo mechanically treated (TMT) bars
- Wire rods and special steel bars
- Rounds and blooms
- Plates and pipes of various sizes
- Cold rolled non-grain-oriented products.

The company's integrated and enriched offerings fulfill the requirements of multiple industries, including construction, infrastructure, automotive, consumer durables and more. The Company meets these evolving needs by staying at the forefront of innovation in the steel sector. The Company has entered into technological collaboration with JFE Steel Corp. Japan for the manufacture of high-strength and advanced high-strength steel for the automobile sector.

The Company has also signed a joint venture agreement with Marubeni-Itochu Steel Inc., Japan, to set up contemporary steel processing centres. In addition, to strengthen its global network, the Company also operates a plate and pipe making steel mill, situated at Baytown, Texas in USA.

Further, as part of its backward integration strategy and with a focus to source iron ore locally, the company has acquired five iron ore mines in Karnataka. One of these mines became operational in February 2018 and the remaining four will be operationalised in the FY 19. Collectively they will provide 4.7 MTPA of iron ore, providing about 20% of the Company's iron ore requirements at Vijayanagar.

While the Company's downstream capacity of 3.6 MTPA serves as a strong risk mitigation strategy, it is well supported strong pipeline of new products. The Company also enhanced its focus on cold rolled, galvanised and galvanneal products for body panels of automobiles, a rising and attractive sector in the country. The Company has one of the largest colour coated facility to address construction, warehousing and roofing requirements, and commissioned Cold Rolled Non-grain Oriented (CRNO) steel plant facility to address domestic demand by substituting imports of high grade electrical steel.

The Company reduced its net debt on consolidated basis by ₹ 3529 crore in FY18, while diversifying funding sources. These have created a strong financial profile and cash flows:

- Strong Operating EBITDA margins of 21.1%
- Capex spend of ₹ 4700 crores
- Industry leading ROCE of 16.4%

The Company has announced cumulative capex projects of ₹ 44,415 crore to expand the Company's steel-making capacity from 18 MTPA to 24.7 MTPA by FY20 with downstream facilities and cost savings projects.

As a leading player with significant domestic and international exposure, JSW Steel's operations are impacted by geopolitical developments, policy changes, demand-supply nuances and competition. Despite these challenges, the Company continues to sustain its market leadership, following a continuous growth trajectory. JSW Steel's core strengths comprise:

- Agile operations
- Rich product mix
- Best-in-class technology
- Excellence in project execution
- Sustainable sourcing, and
- Consistent focus on employee engagement

The result of these is that Company has plant capacity utilisation of 91%, among the best the industry. JSW Steel also recorded the highest ever crude steel production of 16.27 million tons in FY18, up by 3%. With one of the lowest conversion costs producer, best-in-class return accretive investments in various steel facilities and prudent financial policies, the Company has created a sturdy and sustainable operating structure, coupled with a strong balance sheet and leverage matrices.

A measure of this operational excellence is that, in 2017, the Company was ranked sixth amongst top 36 world-class steelmakers according to World Steel Dynamics, based on a variety of factors. In particular, the Company achieved the highest rating (10 out of 10) on the following criteria:

- Conversion costs,
- Yields
- Expanding capacity,
- Location in high-growth markets and labour costs.

This ranking puts the Company ahead of all other steelmakers based in India.

Not the one to rest on its laurels, JSW Steel is constantly seeking new ways integrate sustainability into its operations, be a reliable partner in the country's journey to self-reliance, and, in the process, revolutionise steelmaking.

The following sections elaborate further on the above dynamics and aspects.

## 1. Economic analysis

### 1.1. Global economy

According to the International Monetary Fund (IMF), the global economy is on the road to recovery and grew by 3.8% in CY17, a 0.6 percentage point increase over CY16. This is the highest rate of global GDP growth after CY11. The growth happened owing to an increase in manufacturing activity, private consumption, investments and global trade.

The growth was broad based, with growth increasing in more than half of the world's economies aided by benign global financing conditions, revival in investment sentiment, accommodative monetary policies and higher commodity prices. The growth was higher as compared to the initial estimates with upside surprises in the second half of 2017 in advanced as well as emerging and developing countries. Two-thirds of countries accounting for about three-fourths of global output experienced faster growth in 2017 vis-à-vis previous year.

The advanced economies performed better than expected with a 0.6% growth in CY17 as compared to the previous year. There was stronger gross fixed capital formation and an acceleration in stock building which contributed to the pickup in investment, with accommodative monetary policy, stronger balance sheets, and an improved outlook helping release pent-up demand for capital goods.

On the other hand, emerging economies saw an upswing by 0.4 percentage point, primarily led by private consumption. In economies like India and China, resurgent exports too facilitated growth. The commodity exporting countries were largely benefitted by the global economic upswing during CY17, owing to firming up of prices of commodities.

After two years of uninspiring performance, global trade also picked up pace; and its impact was particularly pronounced in emerging markets. This happened owing to an improvement in investment growth.

In terms of commodities, energy prices indices grew by 24% in CY17 (y-o-y) while the non-energy indices grew by 6%. The metal price

## Management Discussion and Analysis continued

indices grew by 24%. Accelerated global growth lifted the demand for commodities while a number of commodities faced supply side contractions.

The global recovery offers a window of opportunity to strengthen policies and reforms that sustain the current upswing and raise medium-term growth for the benefit of all countries. According to the IMF, such policies should focus on reinforcing the potential for higher and more inclusive growth, building buffers to deal more effectively with future economic headwinds and fostering international cooperation.

### 1.1.1. Other Global Developments

- a) Oil witnessed a sharp increase from the levels of \$41 per barrel in 2016 to a four-year high at \$54 per barrel in 2017, driven by production cuts administered by OPEC.
- b) US monetary measures – US Dollar appreciated on the back of rising Federal Reserve rates from 0.75-1% in March 2017 to 1.50-1.75% in March 2018.
- c) Landmark tax reforms in the US, reducing tax rates from 35% to 21% to bolster investment and employment.

### 1.1.2. Challenges

- a) Rising oil prices
- b) Increasing protectionism, rising trade barriers
- c) Geopolitical risks
- d) Escalating global debt and rising interest rates

### 1.1.3. Outlook

Global growth is on an upswing and is expected to reach 3.9% in 2018 supported by strong momentum, favourable market sentiment, accommodative financial conditions and the domestic and international effects of expansionary fiscal policies. The global GDP is expected

to increase to \$88 trillion. Both advanced economies and emerging markets are expected to see a rise in growth figures in the near term before stabilisation in the medium-term.

This growth rate is the outcome of faster economic expansion in the Euro area, Japan, China and the US. Advanced economies are projected to grow at 2.5% in 2018 as compared to 2.3% growth in 2017 primarily driven by improving domestic demand and industrial activities, private investment, moderate inflation and focus on domestic manufacturing activities. In China, growth is projected to soften slightly from 6.9 % in 2017 to 6.6% in 2018. Over the medium term, the Chinese economy is projected to continue rebalancing away from investment toward private consumption and from industry to services. Growth in emerging market and developing economies is expected to increase further from 4.8 % in 2017 to 4.9 % in 2018 due to strong economic performance. This augers well and reflects improved prospects for commodity exporters after three years of weak economic activity.

There is also a positive momentum in global trade and it is expected to moderately improve with nominal trade escalation by \$2.0 trillion to \$19.5 trillion.

### Global Growth

Country / Region	2016	2017	2018
	(%)	(%)	projection (%)
World	3.2%	3.8%	3.9%
AMEs	1.7%	2.3%	2.5%
EMEs	4.4%	4.8%	4.9%
US	1.5%	2.3%	2.9%
EU-28	2.0%	2.7%	2.5%
China	6.7%	6.9%	6.6%
Japan	0.9%	1.7%	1.2%
Russia	-0.2%	1.5%	1.7%
Korea	2.8%	3.1%	3.0%
India	7.1%	6.7%	7.4%

Source: International Monetary Fund (IMF)

## 1.2. Indian economy

After a brief period that was dedicated to introducing economic reforms that would further formalise the economy and boost ease of doing business, India has achieved a growth of 6.7% in FY18 with a 7.1% growth in Q-4'18. India has bounced back as the fastest growing economy in the world during the third quarter for FY18.

The investment cycle exhibited a growth of 7.6% in FY18 and 14.4% in the Q-4'18. The FY18 is likely to see an improved growth of 7.5% due to transformative reforms undertaken by the Government.

India's economic fundamentals continued to improve during the year. The Index of Industrial Production (IIP) touched 4.3% during the FY18 after a robust growth of 6.2% in the Q-4'18, which was 1.9% in Q-1'18. Inflation figures are also largely in control, with the Consumer Price Inflation reducing to 3.6% in FY18 from a level of 4.5% in FY17, keeping the food prices under control. Through the year, India's foreign exchange reserves has also increased to more than US\$420 billion. The eight key sectors rose to 3.4% year-on-year in FY18, with cement, coal and electricity registering a growth of 13%, 9% and 6% respectively.

The Government of India has put in place multiple enablers to bolster the country's consumption demand. Higher spending on social schemes such as NREGA, continued thrust on rural infrastructure projects, raising of minimum support prices, implementation of 7th Pay Commission pay hikes across states and One Rank, One Pension scheme are also likely to lead to robust disposable income leading to higher spend and consumption.

The major driver of India's consumption economy is the country's large population of youth (more than half of the population is below the age of 35). Two consecutive years of favourable monsoon, addition of young working population and rising urbanisation are other major growth drivers.

The 2018-19 Union Budget has emphasised on India's infrastructural requirements

and the allocation on roads, railways and rural infrastructure has been significant. The Budget also focussed considerably on health and education sectors, which are instrumental in developing a sustainable economy and society.

### 1.2.1. Outlook

During FY19, India is likely to record a robust GDP growth of 7.4% (Source: IMF). This growth will be driven by structural and wide ranging reforms such as the Goods and Services Tax (GST) to widen the indirect tax base, Insolvency and Bankruptcy Code to address asset quality of banks and formalisation and digitisation of the economy improving business ecosystem, thrust on infrastructure development, and a liberal FDI regime. Banking reforms through recapitalisation and the Insolvency and Bankruptcy Code are expected to resolve the stressed assets of over-leveraged corporates and restore lending support to these sectors.

To make the growth broad based and inclusive, there is a clear budgetary and policy focus on rural development to construct 3.17 lakh km of road, 51 lakh houses, 1.88 crore toilets and provide electricity connections to 1.75 crore new households. Rural employment too, is expected to improve with MNREGA budget expanded by ₹ 7,000 Cr to ₹ 55,000 Cr. Further, the latest IMD forecast predicts a normal monsoon in 2018. Since over 65% of the nation is employed in the agricultural sector, this would boost the consumer expenditure resulting in improved demand prospects.

The strengthening global economy is also likely to stimulate exports. The country's exports are expected to touch US\$350 billion during 2018-19. Pick up in capital expenditure done by private corporate sector will also provide the necessary impetus to India's GDP growth.

## 2. Industry analysis

### 2.1 Global Steel Sector

2017 saw an improvement in global steel consumption, which grew 4.7% to 1.59 billion tonnes in the year, after a subdued

## Management Discussion and Analysis continued

growth of 1% in 2016. A low base-effect of 2016, along with improved steel consumption in China and investment-led recovery in advanced economies were the key factors driving this momentum. The government's stimulus measures and momentum in construction activities fuelled steel demand in China. Consumption in Europe (other than EU) too gathered pace in the year and grew ~2.5% with other countries like US with 6.4% , Brazil 5.3% Iran 4.5% follow the growth trajectory of rising global steel demand.

Global crude steel production grew by 5.3% or 63 million tonnes in 2017 to 1,691.2 million tonnes, as most economies registered good growth in steel production. Annual production grew between 4% and 6% for major economies of China, India, European Union and USA, among others. Turkey, South America and Brazil witnessed the highest growth in steel production at 13%, 8.7% and 9.9%, respectively.

China trimmed its capacities by eliminating Basic Oxygen Steelmaking (BOF) – Electric Arc Furnace (EAF) of 55 million tonnes in 2017. The world's largest steel producing country also closed 140 million tonnes of inefficient induction furnace capacity. These initiatives uplifted market sentiments and bolstered pricing power and profitability of most steel producers in the World. Overall, steel exports from China fell by 30% to 75 million tonnes in the year.

Global steel prices remained buoyant in 2017 due to: a) falling exports from China as it continues to reduce excess capacities; b) firm iron ore prices; and c) improving demand from China following the upswing in the infrastructure and construction sectors. The global capacity utilisation ratio stood at 69.5% in December 2017 — up 1.8 percentage points, compared to December 2016 level.

In the preceding couple of months, trade actions across economies aggravated to arrest imports, threatening the possibility of trade diversion.

### 2.1.1 Global Trade Actions

(figures in million tonnes)

	World	US	Europe	Turkey	Total
		Section	Safeguard	Safeguard	
		-232			
Quantity	335*	35	40	10	85

(\*) Global Steel trade net of EU-Intra-Trade @ 115-MnT

- Global threat to 85 MnT or ~25% quantity of steel trade
- Globally, iron and steel witnessed the highest number of trade actions
- The US has imposed largest number of trade actions (252) with 44% of these actions imposed on iron and steel products
- India has imposed second largest number of trade actions at 150 with only 14 actions on iron and steel products
- Globally, Indian exports are subjected to 125 trade actions, including 53 actions on iron and steel

China faces highest number of trade actions at 63% of total 1,118 global actions. In view of trade actions and counter actions, the export dependent economies viz Japan, Korea, China, Russia have to either cut production or look for new markets. As India's domestic demand is robust, the Indian steel industry should be watchful of any surge in import of steel into India from these countries.

### 2.1.2. Steel production of top 10 steel-producing countries

Rank	Country	2017 (million tonnes)	2016 (million tonnes)	% Change
1	China	831.7	807.6	3.0%
2	Japan	104.7	104.8	-0.1%
3	India	101.4	95.5	6.2%
4	United States	81.6	78.5	4.0%
5	Russia	71.3	70.5	1.3%
6	South Korea	71.1	68.6	3.7%
7	Germany	43.4	42.1	3.5%
8	Turkey	37.5	33.2	13.1%
9	Brazil	34.4	31.3	9.9%
10	Italy	24.0	23.4	2.9%

Source: World Steel Association

### 2.1.3. Outlook

World Steel Association estimates suggest that global steel demand is likely to touch 1,616 million tonnes in 2018, a growth of 1.8% vis-à-vis 2017. Continued strengthening of investments in advanced economies, improving manufacturing climate and recovery in commodity prices are expected to act as key catalysts to drive global steel demand.

A large part of this demand is likely to come from the emerging and developing economies (excluding China) with an estimated increase of 4.9% in steel demand in 2018. In the developed economies, steel demand is likely to grow by 1.8% in the current calendar year. Important downside risks to these estimates comprise rising wave of protectionism in global trade and higher interest rates in the US and the EU.

A large part of global steel demand is likely to emanate from the emerging and developing economies (excluding China) with an estimated increase of 4.9% in 2018.

#### 2.1.3.1. Developed markets

The US economy is likely to grow at a rapid pace in 2018 on the back of strong consumption and investments, favourable monetary policy framework, robust corporate earnings (on the back of tax reforms) and a healthy construction sector. In the presence of these catalysts, steel demand is expected to remain robust in the US this year.

Strong private consumption, broad-based recovery across countries and healthy demand both in domestic and international markets are key growth drivers for the EU economy, going forward. A pick-up in non-residential construction and healthy improvement in manufacturing initiatives are other positives for the EU region. Steel demand from this region is likely to remain encouraging in the current year.

Steel demand in Japan will continue to remain muted on the back of an ageing population, which reduces the growth potential. Economic growth in Japan is

expected to be sluggish in the coming years. Huge consumer debt, weak construction activity and a suffering shipbuilding sector are crucial challenges that may adversely impact steel demand in South Korea.

#### 2.1.3.2. China

Chinese economy is likely to witness slower growth in 2018 on the back of weak investments, high debt levels for both corporates as well as local government, slowdown in construction activity and decline in automotive and home appliances sectors. The Government's efforts to boost domestic consumption and growth of the machinery sector though could offset some of this pressure. Overall, steel demand is expected to remain flat in China in 2018. Steel exports from China are likely to remain under pressure due to trade actions against China by various countries and may have to accelerate the shutting down the excess steel capacities. China is expected to cut 30 million tonnes of excess steel capacity in 2018 – in continuation to its ongoing mandate to streamline Chinese steel industry. Increasing trade tensions, high inflationary pressures and tightening of monetary policies of developed economies could pose some challenges to steel companies, going forward.

#### 2.1.3.3. Emerging economies (excluding China)

Emerging and developing economies (excluding China) are likely to lead from the front as far as global steel demand is concerned. Firming up of oil and other commodity prices and higher reconstruction activities may strengthen steel demand from the MENA region. The growth though could be higher, depending on how fast the region can attain geopolitical stability.

Steel demand is likely to remain stable in Turkey even as the minor improvement witnessed in Russia and Brazil is expected to continue. Monetary policy easing, improving credit growth and higher consumer and business confidence will drive growth in Russia. Higher investments in the infrastructure sector though will lead to robust growth in steel demand in the ASEAN-5 countries.

## Management Discussion and Analysis continued

Steel Demand Forecasts	Million tonnes			y-o-y growth rates, %		
	2017	2018 (f)	2019 (f)	2017	2018 (f)	2019 (f)
<b>Regions</b>						
European Union	162.3	165.6	166.9	2.5	2.0	0.8
Other Europe	42.3	44.2	46.1	4.1	4.5	4.4
CIS	52.8	54.0	55.0	6.1	2.3	1.8
NAFTA	140.7	145.0	147.3	6.4	3.0	1.6
Central and South America	40.9	43.5	45.6	3.8	6.2	4.9
Africa	35.1	36.6	38.3	-6.8	4.5	4.6
Middle East	53.3	55.7	57.8	0.4	4.6	3.7
Asia and Oceania	1060.1	1071.4	1069.7	5.5	1.1	-0.2
<b>World</b>	<b>1587.4</b>	<b>1616.1</b>	<b>1626.7</b>	<b>4.7</b>	<b>1.8</b>	<b>0.7</b>
World excl. China	850.6	879.3	904.6	1.8	3.4	2.9
Developed Economies	410.7	417.9	422.7	2.9	1.8	1.1
China	736.8	736.8	722.1	8.3	0.0	-2.0
Emerging and Developing Economies excl. China	439.9	461.4	481.9	0.8	4.9	4.5
ASEAN-5	70.3	74.9	79.8	-5.2	6.6	6.4
MENA	71.7	75.3	78.5	-1.1	5.0	4.2

f- forecast

Source: World Steel Association

### 2.1.4. Key sectors driving steel demand

#### 2.1.4.1. Oil & Gas

Production cuts announced by the Organisation of the Petroleum Exporting Countries (OPEC) in 2017 lent support to crude oil prices and the good show is likely to continue, going forward. Strong demand and possibility of renewed US sanctions on Iran may lead to further escalation in crude oil prices from here on.

Improving prospects of crude oil will augur well for the sector, as it will lead to higher production by upstream oil and gas companies. This, in turn, will benefit downstream companies as well. Higher investments in the sector will positively impact steel demand.

#### 2.1.4.2. Metals and Mining

Commodity prices trended northwards for large parts of 2017; and the trend is likely to continue in 2018 as well. Higher prices will elevate production growth in the year and strengthen investments and upstream activity in this sector.

#### 2.1.4.3. Infrastructure

According to a report by Global Infrastructure Hub, every year investment worth US\$3.7 trillion is required to be made in worldwide infrastructure to meet the demand of the rising global population. Asian economies will account for more than half of these investments. Thus, the infrastructure sector will continue to play a major role in driving demand for the global steel industry.

#### 2.1.4.4. Capital Goods

Upswing in commodity prices, broad-based improvement in economic growth and positive outlook for automotive and construction sectors are likely to aid prospects of global capital goods companies. S&P Global Ratings expects the credit metrics of capital goods companies to improve on the strength of rising capital expenditure by private sector companies. Steel is the primary input to manufacture equipment and machinery; and hence stands to benefit from improving prospects of the capital goods sector.

### Rising trade protectionism

In the past few months, adoption of trade restrictive measures by different countries has intensified as governments look to protect the interest of domestic metal makers. The US imposed a 25% duty on steel imports and a 10% tariff on aluminium imports, effective from 23 March 2018.

China, too, implemented similar measures to reduce US imports. Given that steel exports represent a miniscule 2% to India's exports, such measures are unlikely to have significant impact on India. However India also may have to adopt similar measures to eliminate the import of steel at unfair prices that would cause injury to domestic industry.

India should remove Steel from all Free Trade Agreements (FTAs) prevailing in global trade. Consequent to the concessional duty under the FTAs for Japan, Korea and ASEAN regions, there is a price disparity of ~13.75%, equivalent to ₹ 6,500 per tonne or a price impact of 15% on domestic ex-mill prices. This disparity should be addressed by swift action from India.

During 2017-18, imports increased 5.4% to 8.4 million tonnes and displaced 17% of flat steel demand and 9% of total Indian steel demand. The share of defective steel imports in our country increased from 3% of total imports in 2016-17 to 5% of total imports in 2017-18. Rising imports despite prevalence of trade measures prove that these measures are completely ineffective. Increasing imports due to lack of monitoring the BIS quality standards is a threat to the high number of jobs created directly and indirectly by the Indian steel industry.

The Government of India must implement stringent policies to curb these imports. This wave of trade protectionism is expected to continue for a long period of time.

The Company will focus on widening its presence in areas across major global markets. In such a scenario, its revenue from global markets will continue to grow; and will largely remain safeguarded from rising protectionism.

Growing global footprint will enable JSW Steel to evolve into an organisation with an ability to tap into emerging opportunities across the world.

### 2.2. Indian Steel Sector

India's steel production grew 4.5% to its highest ever level of 102 million tonnes in FY18. The Government of India has been proactive in addressing the issues faced by domestic steel makers. It has taken major steps to stop unfair trade and to safeguard the interests of domestic players.

This has been accompanied by recovery in construction activity and shut down of excess capacities in China. China has phased out capacities to the tune of 115 million tonnes in the past two years; and is gearing up for another production cut of 30 million tonnes in 2018. Leading steel makers in India are well poised to benefit from this development.

Riding high on an all-round improvement in the growth of key sectors, namely automobiles, infrastructure, and capital goods, among others, India's steel demand grew at a high rate of 7.9% to 91 million tonnes in FY18. This pace may accelerate further as domestic steel demand growth is pegged at 8.3% to 98.2 million tonnes in the current fiscal year (Source: JPC). In FY18, India's per capita steel consumption grew 6.2% to 69 kg, while share of flats improved from 42% to 44%.

India's construction activity, particularly in highways, bridges and metro lines has bolstered the demand for long steel products in recent times. Given their size, long steel products are relatively difficult to ship and hence most contractors are sourcing them locally.

Domestic steel prices have started trending northwards since November 2017, owing to a surge in global prices, healthy recovery in domestic demand, and a weaker rupee. The prices though still trail international prices and hence there is a scope for further uptick in prices.

Governmental measures such as the National Steel Policy and extension of anti-dumping duty on steel products, imposition of quality standards are key facilitators for the growth of domestic steel sector in India. Additionally, the Government has earmarked ₹ 14.3 lakh crore towards infrastructure spending, which will also enhance steel demand in the domestic market.

## Management Discussion and Analysis continued

### 2.2.1. Highlights of India's Steel Industry

- Achieved all-time high crude steel production in FY18
- Third largest crude steel producer in the world in 2017
- Third largest consumer of finished steel in the world in 2017
- Steel consumption grew at a multi-year high in FY18
- Contributes nearly 2% to the country's GDP
- Producer of world-class steel of all major varieties and grades
- Government's wide-ranging reforms may aid the steel sector
- Broad-based improvement in the growth of infrastructure, automobiles, capital goods, among others in FY18

### 2.2.2. Crude steel production (million tonnes)

Production	FY14	FY15	FY16	FY17	FY18
Public Sector	16.8	17.2	17.9	18.5	19.8
Private Sector	64.9	71.8	71.9	79.5	82.5
<b>Total</b>	<b>81.7</b>	<b>89.0</b>	<b>89.8</b>	<b>98.0</b>	<b>102.3</b>

### 2.2.3. Steel consumption in India (million tonnes)

Consumption	FY14	FY15	FY16	FY17	FY18
	74.1	77.0	81.5	84.0	90.7

Source: Joint Plant Committee

### 2.2.4. Advantage India

The National Steel Policy, 2017 (NSP) aims to make India a self-sufficient steel producing nation by 2030. The Policy will promote the indigenous industry to

eliminate steel imports in the country by 2030. Reduction in import dependence for procuring coking coal, emphasis on BF / BOF technology, sharper focus on pelletisation and installation of slurry pipelines and conveyors, promotion of domestically manufactured steel in government procurement and production of value-added steel indigenously are the key goals of this Policy.

To achieve these targets, some Indian companies have undertaken capacity expansions, which will drive their market shares further in the coming years. The acquisition of debt-laden steel companies will reduce the time for ramping up existing capacities. Investments worth US\$210 billion would be required to achieve the targeted steel capacity of 300 million tonnes by 2030. Overall, the NSP will empower domestic steel makers by making them more competitive globally.

In the domestic market as well, there are multiple catalysts to drive steel industry growth. Relatively lower per capita steel consumption, healthy prospects of consumption demand on the back of buoyant infrastructure growth and strong growth in the automobile and railways sector being the prominent ones. Against this backdrop, it is expected domestic steel demand would grow by around 5% in the financial year 2018-19.

### 2.2.5. National Steel Policy, 2017 – Ushering in the next phase of steel growth in India

Particulars	FY18 actuals	NCP Target by 2030-31
Crude steel production (million tonnes)	102	300
Per capita steel consumption (kg)	69	160

Source: JPC, government

DEMAND ENABLERS	RISING INVESTMENTS	LOW-COST ADVANTAGE	FAVOURABLE POLICIES
Domestic growth to remain buoyant	Investments worth \$210 billion required to achieve steel capacity of 300 million tonnes by 2030-31	India is the world's third-largest producer of crude steel at globally competitive cost	100% FDI through the automatic route is allowed

DEMAND ENABLERS	RISING INVESTMENTS	LOW-COST ADVANTAGE	FAVOURABLE POLICIES
Healthy prospects of infrastructure, automobiles, consumer durables, oil and gas sectors	301 MoUs signed with various states for planned capacity of 486.7 million tonnes	Easy availability of skilled and unskilled workforce	Large infrastructure projects in the PPP mode are being formed
The National Steel Policy is a major effort to make India a self-sufficient steel-producing nation by 2030-31	The Ministry of Steel plans to set up Steel Research and Technology Mission in India	Presence of abundant iron ore reserves in India	Policy clarity and stability expected in respect of expediting auction of mining leases and forest clearances and operationalising these mines.

### 2.2.6. Union Budget 2018 Impetus

Measure 1	Measure 2	Measure 3
Higher infrastructure spending through various road projects under The Ministry of Road (including NHAI) and Pradhan Mantri Gram Sadak Yojana by 11% over the preceding year	Railway allocation increased by 22% with focus on building infrastructure, stepping up safety and improving maintenance	Measures aimed at enhancing farm income will bolster demand for automobiles and tractors. Improved prospects of automobile sector to aid domestic steel consumption

### 2.2.7. Domestic growth enablers Rural steel demand

Rural India is expected to reach a per capita consumption from 12.11 kg to 14 kg for finished steel by CY20. The policies like Food for Work Programme (FWP) and Indira Awaas Yojana, Pradhan Mantri Gram Sadak Yojana and Affordable Housing, among others are expected to drive the demand.

#### Housing demand

The allocation towards building houses in rural and urban areas under the PMAY scheme stood at ₹ 275 billion in the Union Budget 2018-19. Rising transparency in the real-estate sector following the implementation of The Real Estate (Regulation and Development) Act has bolstered the confidence of both investors and home buyers. In this scenario, housing demand is likely to accelerate going forward, leading to higher steel demand in the domestic market.

#### Renewable Energy

India aims to generate 275 GW of total renewable energy by CY27. Of the total pie, 72 GW will be from hydro-energy and 15 GW from nuclear energy. Nearly 100 GW is expected to come from 'other zero emission' sources. Both generation and transmission capacities are expected to raise steel demand from the sector.

### Automobile

The automobile industry is estimated to grow by US\$260-300 billion by 2026. With increasing capacity addition, steel demand is expected to be robust.

### 2.2.8. Outlook

According to the World Steel Association, consumption of finished steel products in India is estimated at 92 million tonnes in 2018 – a growth of 5.5% over 2017. Of the total incremental demand of 28.7 million tonnes in 2018 worldwide, India alone is likely to add steel demand of 4.8 million tonnes.

Pegged at 5.5%, the domestic steel demand is likely to grow at a faster pace than the global steel demand. Steel demand worldwide is likely to grow by 1.8% in 2018. The nation's per capita steel consumption is likely to improve to 72-74 kgs in 2018-19. Clearly, Indian steel players are looking inwards to achieve higher growth. As China continues to trim its excess capacities in 2018 as well, and given the low-cost, higher quality products offered by Indian companies, opportunity to grow exports is also sizeable. Against this backdrop, Indian players having significant capacity expansions on the cards are well poised to tap into these opportunities over the next few years.

## Management Discussion and Analysis continued

Pegged at 5.5%, the domestic steel demand is likely to grow at a faster pace than global steel demand, which is likely to grow by 1.8% in 2018.

### Critical measures needed to bolster India's Steel Industry

- Strengthening of existing trade measures by changing the form of duty from Reference Price to Fixed Duty (\$/tonne), coupled with the removal of the Lesser Duty Rule (LDR)
- Increase the Basic Customs Duty to at least 25% across all steel and steel-intensive products
- Higher emphasis on Quality Order compliance to arrest import of seconds and defective steel
- Make the public procurement policy more effective and conducive in favour of domestically produced steel

### 3. Business review

The Company grew with record numbers on multiple fronts in a year that began on a slow footing but ended on a high note. While growth was moderate during the first half of the year owing to sluggish demand, the second half saw the Company outperform its previous production and sales rates on the back of higher auto sector demand and recovery in construction and capital goods segment.

Overall, in FY18, the Company registered its highest ever yearly crude steel production at 16.27 million tonnes. During the year, the Company achieved a consolidated sale of 15.55 million tonnes, a y-o-y growth of 6%. This was driven by the highest ever domestic sales of 11.9 million tonnes with a south-west mix of nearly 84%. At a y-o-y level, the growth in domestic sales touched 9% compared to the domestic industry growth of 7.9%. Consequently, the Company's market share also witnessed an increase.

The share of value-added and special product (VASP) sale went up to 58% during the year, driving up the Company's margins. The total sale of VASP products stood at over 9 million tonnes, a 13% y-o-y growth.

During the year, the Company was prompt and agile to realign its sales based on the prevailing market conditions. It adopted the strategy to reduce exports to 23% of total sales, and focus on the faster growing and more attractive domestic market.

#### Domestic and exports sales ratio – 2-year comparison

Year	Domestic	Exports
FY18	77%	23%
FY17	74%	26%

#### 3.1 Product performance

JSW Steel's best-in-class technology and sustained R&D initiatives help deliver customised and innovative offerings. The Company focusses on expanding the share of the value-added products in its portfolio to enhance margins, resulting in industry-leading profitability.

##### 3.1.1 Flats

JSW Steel produces flat sheet products that include slabs, hot-rolled coils, cold-rolled coils, coated products and others. Flats also remained the Company's mainstay during the first half of the year, when demand for long products was low.

Continuing the trend from previous years, flat products occupied a significant proportion of the Company's product portfolio at 71% and registered a y-o-y sales growth of 2%. Robust demand in the automobile sector increased domestic flat sales by 11% y-o-y.

##### 3.1.1.1 Hot Rolled

Manufactured in the Hot Strip Mills (HSMs) of Vijayanagar (Karnataka) and Dolvi (Maharashtra) plants, the Company offers a wide variety of Hot Rolled products. With a capacity of 3.2 MTPA and 5 MTPA for HSM-1 and HSM-2, respectively, Vijayanagar Works is home to the country's widest HSM, occupied with sizing presses and an automatic line inspection facility.

The capacity stands at 3.6 MTPA at Dolvi Works, where India's first CONARC process was implemented for steel manufacturing. The name CONARC is a fusion of two

processes (CONverter ARChing) and the science behind this process is based on the increased use of hot metal in the electric arc furnace. This technology aims to optimise energy recovery and maximise productivity.

During the year, Hot Rolled Coils (HRCs) comprised 39% of the Company's product portfolio. Domestic sales of HRCs rose 8% y-o-y primarily in Southern and Western regions of India.

#### Key Sectors

JSW Steel is a leading steel supplier of HR products (HR) to multiple sectors such as Construction and Infrastructure, Industrial and Engineering, Pipes and Tubes, Automotive and Energy etc. that drive the economy.

The overall of sales of HR products grew by 4% during the year. While robust auto growth and a large number of infrastructure projects kept up the demand, the availability was somewhat restricted by factors such as higher consumption by downstream Cold Rolled and Galvanised units. The Company's supply to auto segment grew 45% y-o-y against Commercial Vehicles production growth of 10% y-o-y.

#### 3.1.1.2 Cold Rolled

Essential to the auto sector and several white goods, JSW Steel's Cold Rolled (CR) steel products are manufactured at its state-of-the-art Vijayanagar Works. CR products comprised 17% of the product portfolio in FY18. During the year, sales volume of Cold Rolled and Close Annealed (CRCA) grew 8% y-o-y with domestic growth of 20% y-o-y. CRCA sales grew 27% during the year and outpaced the growth of 15% posted by the automobile sector in India.

JSW Steel is the only steel producer with the capability of producing wider width and advanced high-strength steel grades. The Company's CR products thus are well regarded due to their superior surface appearance, uniform mechanical properties and excellent drawability.

#### Key Sectors

India's cold rolled products are primarily consumed by the automotive, industrial and engineering sectors.

#### a) Automotive sector

India's auto sector grew 15% during the year, with an overall production of vehicles in India crossing the 29-million mark. For the first time, India's passenger vehicle and utility vehicle production crossed the 4-million figure.

JSW Steel continues to focus on the automotive sector with sales growing 27% y-o-y during FY18. Quick and seamless approvals of the Company's CR products from automotive companies resulted in a fast ramp up of automotive steel sales. The cold rolled coils and galvanised and galvanealed steel are supplied to automobile Original Equipment Manufacturers (OEMs), leading to commercialisation of different grades developed for auto makers.

The CRM 2 in Vijayanagar Works produces ultra-high strength steel for India's automobile manufacturers. These steel products were earlier imported by auto majors, but are now being procured locally, giving a push for Make in India and the country's self-reliance.

#### b) Packaging sector

JSW Steel's CR products have received encouraging response in the packaging sector due to their superior surface, tight thickness tolerances and uniform mechanical properties.

#### 3.1.1.3. Electrical Steel

Electrical steel products are manufactured at the Company's state-of-the-art Vijayanagar Works facility. Electrical steel finds application across sectors such as electric motors, generators, nuclear power station, power generation plants, domestic appliances, transformers and automotive electricals.

During FY18, expedited customer approvals from clients resulted in rapid ramp-up of capacity utilisation. The Company's exclusive service centres that provide ready-to-use electrical steel products also aided the growth.

## Management Discussion and Analysis continued

As a result, the sales in electrical steel increased 40% y-o-y, driven by the strengthening of domestic appliances demand and the receiving of approval for alternators, industrial motors and compressors with new customers.

Going forward, the Company is geared to participate in India's journey towards energy efficiency and infrastructure development with expansion of its grade range to high silicon alloy content, development of customised and high permeability grades, and a wide range of insulation coatings.

### 3.1.1.4. Galvanised

JSW Steel is India's largest manufacturer and exporter of galvanised steel, and the first supplier of products with higher coating (550 gsm) to the country's solar sector. Four JSW Steel facilities manufacture galvanised coils and sheets – Vijayanagar, Vasind, Tarapur and Kalmeshwar.

Trusted globally, JSW Steel's galvanised steel is high in strength, resistant to corrosion, eco-friendly, durable and lightweight. In the markets, JSW's galvanised corrugated sheets, branded JSW VISHWAS, are the most sought after due to their unmatched resistance to weathering elements. Galvanised products comprised 11% of the product portfolio in FY18.

#### Key Sectors

India's galvanised products are primarily consumed by construction, infrastructure and consumer durables sectors. These products are also used in the solar energy sector, and JSW Steel caters to the galvanised steel segment with a market share of 42%. Eco-friendly Zero Spangle Organic coated ROHS compliant GI produced at Vijayanagar Works has been well received and approved by all major appliance, panel and duct manufacturers.

### 3.1.1.5. Galvalume

JSW Steel is the first licensee Galvalume producer in India that uses technology from BIEC International Inc., USA. The technology licence qualifies the Company to continually access the latest product innovations and process refinements through BIEC and the ZAC Association. Surpassing the growth of 14% in the domestic market, the Company clocked a volume growth of 17% in its GL products during the year, driven by development initiatives in Solar & Construction sectors. Its market share (domestic) stood at 38% in this product segment.

### 3.1.1.6. Colour coated

JSW Steel offers colour coated steel under the brands JSW Colouron, Colouron+, Pragati brands and Everglow. Produced at the Vasind, Tarapur and Kalmeshwar plants, a new facility is being set up at Vijayanagar Works as well.

Colour coated products comprised 4% of the Company's product portfolio in FY18. During FY18, total sales volume of colour coated products increased 26% y-o-y.

JSW Steel has one of the largest colour coated facilities to address construction, warehousing and roofing requirements and a state-of-the-art colour coating line for appliance grade products used in consumer durables.

#### Key Sectors

The major consumers of colour coated products in India are the construction and Infra and Consumer durables sectors. The colour coated brands of JSW Steel enjoy high market share in semi-urban and rural areas, catering to the requirements of the Individual Home Builder (IHB) segment.

The overall growth of this segment is driven by the rural sector recovery,

with the last year witnessing a subdued base due to demonetisation. Good monsoon, coupled with GST stabilisation, has resulted in overall demand growth. Accelerated growth in Q4 was largely due to the Company's brand-building measures and a consumer education drive to identify original JSW coated sheets. The residential roofing and cladding segment grew 27% over Q3 and warehousing/PEB by 5%, while industrial roofing declined by 2%. With growth in the rural sector, the warehousing / PEB segments have grown 5% during the year.

The demand in consumer durables has grown by 14% y-o-y. The government initiative for rural electrification saw a thrust in Q4 FY18, compared to 9M FY18. Rural penetration of online retailing of appliances increased the demand for consumer durables. The major manufacturers of consumer durables have increased their capacity, expanding the market for the Company's products.

### 3.1.2 Longs

Long products comprised 23% of the Company's product portfolio in FY18. During the year, long product sales increased 15% y-o-y.

#### 3.1.2.1 TMT

JSW Steel manufactures and markets JSW NEOSTEEL TMT bars that conform to domestic and international standards. Owing to their higher strength, ductility and shock resistance, this range of TMT bars have become a market favourite. The NEOSTEEL range has been deployed in multiple prestigious projects in India, such as metro rails, expressways and airports.

TMT Rebars are manufactured in Vijayanagar Works and Dolvi Works. They comprise 15% of the Company's product portfolio. During the year, the total sales volume increased 17% y-o-y. JSW Neosteel has increased penetration in semi-urban and rural areas with substantial business volumes from South India and West India.

### Key Sectors

The Company is proud of being part of India's growth story through supplying steel to metro rail projects in various cities.

JSW Neosteel was also used in major projects in the country from Indian Railway projects, aerospace, defence projects, port and airport projects, expressways and highways and critical atomic power projects. JSW Steel also caters to prominent educational institutions, hospitals, IT Parks and high-rise structures.

#### 3.1.2.2 Wire rods

The electrode, CHQ and low, medium and high carbon wire rod grades are produced at Vijayanagar, while Salem Works produces alloy and special grade wire rods.

#### 3.1.2.3 Special alloy steel

Alloy steel products are manufactured at JSW Steel's Salem Works. The Company is the largest domestic producer of spring steel flats, alloy steel rounds and bars and alloy steel wire rods. In terms of technology upgradation, the Company has commissioned a new continuous caster, which can give blooms and billets with reduced macro segregation due to higher EMS current.

The rolling mill at Salem was upgraded with a sliding stand in the bar and rod mill, which accommodates higher reduction ratio for bar products. A contemporary atmosphere-controlled Bell annealing furnace was installed for spheroidised annealing of coils for delivering products to cold heading quality product customers and bright bar manufacturers. An additional automatic billet grinding facility was installed, which ensures the supply of bars with high-surface quality in the 'as hot rolled' condition.

### Product Development Highlights

Eight new grades of special steel were approved, which included high value alloyed and micro-alloyed steel for various components of automotive engine, transmission, bearings and suspension.

The Company launched JSW Everglow in December 2017, a first-of-its-kind product in the steel roofing segment. JSW Everglow

## Management Discussion and Analysis continued

offers a 10-year paint warranty to the consumer, which is a country-wide first.

The product has a unique feature of matching colours at the bottom of sheet against the dull grey that is normally used. It has been launched in over nine states in FY 2017-18 and phased rollout is planned in FY19. The product has seen encouraging initial response from consumers.

### 3.2 Retail

The Company's expansive India-wide retail network is the backbone of its growth story and continued success. The Company has over 8,600 exclusive and non-exclusive retail outlets, spanning 575 districts across India, making it one of the country's largest steel retail networks. During FY18 the Company also engaged with 22,000+ influencers through 3,000+ meets.

The Company has three main retail formats: JSW Explore, JSW Shoppe and JSW Shoppe Connect, each catering to a different set of customers and geography.

#### 3.2.1. Brand Building

The Company has been undertaking focussed brand building initiatives in JSW Neosteel (TMT Bars), JSW Colouon+ (Colour Coated) and JSW Everglow (Colour Coated).

In JSW Neosteel the focus was on further strengthening the engagement with the influencers and educating them about the benefits of using high-quality steel. Consumer meets at retail counters were also conducted across several districts of South India. The consumers were delighted to engage directly with the Company as a large proportion of them were unaware of benefits of using good quality steel.

JSW Shoppe is a one-of-its-kind network of stores launched in 2007, which run on a franchisee model. With over 400 outlets, these stores combine sales and services for making available the right product for the

end consumer. Nearly half of this network is located in the country's semi-urban and rural areas.

JSW Colouon+ continued to be the leading colour coated brand in India with the highest market share. The Company undertook large-scale influencer awareness campaign to educate them on how to identify genuine products. Advertisements across regional television channels were also used as a communication medium to create brand awareness.

#### 3.2.2. Customer Relationship Management (CRM)

During the year, the Company started a project to enhance and improve relationships with its customers, putting them at the heart of its operations. The first phase has been launched, covering the following aspects:

- 1) Customer management
- 2) Customer 360-degree view
- 3) Pricing
- 4) MoUs with customers

The second and third phases will include important elements like credit management, complaint management, a customer portal and customer visit planning and report generation.

## 4. Financial Review

### 4.1 Standalone

Global manufacturing and construction activities have clearly improved year-on-year evidenced by macro growth numbers. Global crude steel production increased significantly in 2017 to a record 1691 million tonnes, up 5.3% from 2016 reflecting the investment led pick up in growth and cyclical rebound in global trade. The Chinese steel exports continued to decline on the back of supply reforms in China, in terms of closure of inefficient production facilities and pollution induced curtailments and strong domestic growth and consumption. This discipline from China helped improve the global steel demand-supply balance. On the back of this strong demand growth and moderation in exports at unfair prices, the steel prices rebounded with

increase in steel spreads. This improvement in steel spread during the year coupled with volume growth enabled the steel industry to deliver strong performance during the year.

India's steel demand growth improved in the second half of the year post the gradual normalisation of the effects of demonetisation and GST. The Indian steel consumption grew at a healthy 7.9% on the back of government's push for infrastructure spending and strengthening consumer demand. While steel imports into the country have moderated in recent months,

YTD import of flat products increased by 16% y-o-y. Import of coated products continues at an elevated level, pressurising domestic manufacturers. Import of colour coated products increased by a staggering 250% y-o-y.

In this volatile environment, the Company continued to increase its market share in the domestic market. This robust demand growth, increased steel spreads, focussed cost reduction drive and value added steel product portfolio helped the Company deliver strong profitable performance during FY18.

#### 4.1.1 Highlights FY18

	₹ (in crore)		
	2017-18	2016-17	Growth%
Revenue from operations	66,234	56,913	16%
Other Income	213	255	-16%
Operating EBIDTA	13,741	11,544	19%
EBIDTA margin (%)	21.1%	22.1%	-4%
Depreciation and amortisation expense	3,054	3,025	1%
Interest Expenses	3,591	3,643	-1%
Profit before Exceptional Items	7,309	5,131	42%
Exceptional Items	234	-	-
PAT	4,625	3,577	29%
Earning per share (diluted) (₹)	19.14	14.80	29%

The Company achieved a capacity utilisation of 91% and posted its highest ever production, shipments, revenue and EBITDA during the FY18.

For the year FY18, the Company reported a Crude Steel production of 16.27 million tonnes, a growth of 3% y-o-y. Production volumes in the first half were impacted due to water shortages and constrained iron ore availability and capacity utilisations increased to 94% in the second half of the year reflecting the steel demand growth and improvement in operational efficiencies.

During FY18, JSW Steel's revenues increased by 16% from ₹ 56,913 crore to ₹ 66,234 crore. An increase in realisations and sales volumes were the primary drivers of this performance. The Company's saleable steel sales volume for the year grew by 6% y-o-y to 15.62 million tonnes owing to the Company liquidating excess inventory to meet demand growth.

JSW Steel continued its focus on pruning costs by improving yields and productivity and optimised the mix and sourcing of key inputs like iron

ore and coal to withstand the volatile pricing environment. Further the JSW Steel commenced mining at one of its mines that was acquired as part of the mining auction in the State of Karnataka. The Company was able to achieve encouraging progress on key strategic initiatives like digitisation and logistics optimisation. This increase in steel product realisation and cost optimisation initiatives helped the Company report a operating EBITDA of ₹ 13,741 crore for the year, which grew by 19% y-o-y to and EBIDTA margin stood at 21.1%. The Company registered a net profit after tax of ₹ 4,625 crore. In the senerio, it is not surprising that the Company registered industry leading ROCE of 16.4% in the year.

During the year JSW Steel continued to strengthen its balance sheet and reduced net consolidated debt by ₹ 3,529 crores. The Company's total net debt gearing was at 1.27 as on 31 March 2018 (vis-à-vis 1.53, as on 31 March, 2017) and Net Debt to EBITDA stood at 2.59x as on 31 March 2018 (as against 3.20x as on 31 March 2017).

## Management Discussion and Analysis continued

### 4.1.2. Revenue analysis

₹ (in crore)

	2017-18	2016-17	Change	Change%
Domestic Turnover	53,380	45,322	8,058	18%
Export Turnover	11,666	10,922	744	7%
<b>Total Turnover</b>	<b>65,046</b>	<b>56,244</b>	<b>8,802</b>	<b>16%</b>
Other Operating Revenues	1,188	669	519	78%
	<b>66,234</b>	<b>56,913</b>	<b>9,321</b>	<b>16%</b>

### Product wise quantity break-up (Mt)

Products	2017-18	2016-17	% Growth
Rolled products - Flat	11.17	10.97	2%
Rolled products - Long	3.55	3.06	16%
Semis	0.90	0.74	22%
<b>Total Saleable Steel</b>	<b>15.62</b>	<b>14.77</b>	<b>6%</b>

JSW Steel's performance was relatively strong with the improvement in absolute volumes in the domestic market. The Company has also focussed on and increased VASP (Value Added and Special Products) sales. The total sales volume stood at 15.62 MnT, up by 6% vis-à-vis the previous year. JSW Steel also explored opportunities in the export market in addition to developing existing markets. The revenues were higher by 16% vis-à-vis the previous year on account of 6% volume growth and 18% increase in sales realisations.

The other operating revenue was higher by ₹ 519 crores compared to the previous year. The growth in other operating revenue was primarily due to higher incentive benefits recognised attributed to upward revision in incentive rates and increase in regional sales and realisations.

- Increase in rolled long products by 16% y-o-y on the back of strong demand
- Product mix improved with value-added and special products sales, reaching 58% of total sales

### 4.1.3. Other income

₹ (in crore)

	2017-18	2016-17	Change	Change%
Other Income	213	255	(42)	-16%

Other income for the year was lower primarily due to non-recognition of interest income on loans provided to certain subsidiaries due to uncertainty involved in its collectability as a result of losses incurred by these subsidiaries.

### 4.1.4. Materials

₹ (in crore)

	2017-18	2016-17	Change	Change%
Cost of material consumed	37,470	27,955	9,515	34%

The Company's expenditure on material consumption increased by 34% from ₹ 27,955 crores in FY17 to ₹ 37,470 crores in FY18 primarily on account of increase in production volumes and increase in prices of input raw materials like iron ore and coal.

### 4.1.5. Employee benefits expenses

₹ (in crore)

	2017-18	2016-17	Change	Change%
Employees Remuneration and Benefits	1,260	1,168	92	8%

Employee benefits expenses increased by 8% to ₹ 1,260 crores in FY18 from ₹ 1,168 crores in FY17. This increase was largely due to annual increase in compensation for the employees. The Company employed about 11,619 employees as at 31 March 2018, vis-à-vis 11,861 employees as at the end of 31 March 2017.

### 4.1.6. Manufacturing and other expenses

₹ (in crore)

	2017-18	2016-17	Change	Change%
Other Expenses	12,504	11,623	881	8%

Manufacturing and other expenses increased by 8% from ₹ 11,623 crores in FY17 to ₹ 12,504 crores in FY18. The increase was primarily a result of increase in power and fuel cost and stores and spares consumed.

Power and fuel cost, a 16% increase amounting to ₹ 674 crores, rose on account of additional power purchases for increase in production volumes and hike in the rates of steam coal prices over the last year. Stores and spares consumption increased by 12% largely due to increase in prices of refractories and graphite.

#### 4. 1.7. Finance cost

₹ (in crore)

	2017-18	2016-17	Change	Change%
Finance Cost	3,591	3,643	(52)	-1%

Finance cost decreased by 1% to ₹ 3,591 crores in FY18 from ₹ 3,643 crores in the previous year. The decline was primarily due to lower interest costs on account of repayment of borrowings and reduction in rupee term loans and reduction in benchmark lending rates of various banks. The weighted average interest cost of debt was lower at 6.98% as on 31 March 2018 vis-à-vis 7.40% as on 31 March 2017.

#### 4. 1.8. Depreciation and amortisation

₹ (in crore)

	2017-18	2016-17	Change	Change%
Depreciation and amortization	3,054	3,025	29	1%

Depreciation and amortisation increased by 1% to ₹ 3,054 crore in FY18 from ₹ 3,025 crores in FY17 due to additional depreciation on capitalisation of assets relating to projects and normal capex.

#### 4.1.9. Exceptional items

During the year a subsidiary of the Company has surrendered one of its iron ore mine in Chile considering its economic viability and accordingly the Company has reassessed the recoverability of the loans given to and investments made in subsidiaries and recognised an impairment provision of ₹ 234 crore which has been disclosed as an exceptional item.

#### 4.1.10. Tax Expense

The tax expense increased to ₹ 2,450 crore in FY 2017-18 from ₹ 1,554 crore in the previous year primarily on account of higher tax provision due to increase in profit before tax during the current year and higher effective tax rate. The effective tax rate was 34.62% during the current year as compared to 30.28% primarily due to discontinuance of additional tax incentives for investments in new plant and machinery and certain other disallowances.

#### 4.1.11. Property, Plant and Equipment

₹ (in crore)

	2017-18	2016-17	Change	Change%
Tangible assets	49,503	50,215	(712)	-1%
Capital work-in-progress	3,071	2,745	326	12%
Intangible assets	65	51	14	27%
Intangible assets under development	321	282	39	14%
<b>Total</b>	<b>52,960</b>	<b>53,293</b>	<b>(333)</b>	<b>-1%</b>

The net block of Property, Plant and Equipment reduced by ₹ 712 crore during the year primarily on account of depreciation charge of ₹ 3,026 crore during the year offset by additions to the Property, Plant and Equipment to the extent of ₹ 2,403 crore. The capital work-in-progress increased by ₹ 326 crore primarily due to capital expenditure spend during the year offset by capitalisation of Property, Plant and Equipment

#### 4. 1.12. Loans and advances

₹ (in crore)

	2017-18	2016-17	Change	Change%
Long-term loans and advances	5,165	2,771	2,394	86%
Short-term loans and advances	158	121	37	30%

Loan and advance on overall basis has increased primarily due to loans and advances provided to certain overseas subsidiaries to repay the borrowings guaranteed by the Company and other business needs of the subsidiaries.

#### 4. 1.13. Current Assets

₹ (in crore)

	2017-18	2016-17	Change	Change%
Other Non Current Assets	2,299	1,396	903	65%
Other Current Assets	3,070	2,370	700	30%

Other Non-Current Assets increased by ₹ 903 crore primarily due to increase in Capital Advances for upcoming projects.

Other Current Assets increased by ₹ 700 crore due to non-receipt of GST incentives and increase in supplier advances for iron ore.

#### 4. 1.14. Inventories

₹ (in crore)

	2017-18	2016-17	Change	Change%
Raw Materials	4,918	3,590	1,328	37%
Work-in-progress	690	747	(57)	-8%
Semi Finished/ Finished Goods	2,826	3,702	(876)	-24%
Production Consumable and Stores & Spares	1,648	1,231	417	34%
<b>Total</b>	<b>10,082</b>	<b>9,270</b>	<b>812</b>	<b>9%</b>

## Management Discussion and Analysis continued

The average inventory holding in terms of number of days as on March 31, 2018 for finished goods was 20 days vis-à-vis 33 days as on 31 March 2017. However overall inventory holding has come down to 72 days for FY18 vis-à-vis 83 days for FY17. The value of inventories increased by 9% predominantly due to higher cost of raw materials like coal and iron ore and spares as against the previous year. However, steel products inventory (SFG / FG) reduced by 1.47 lakh tonnes during FY18.

### 4. 1.15. Trade receivables

₹ (in crore)

	2017-18	2016-17	Change	Change%
Total Debtors	4,770	3,954	816	21%
Less: Provision for Doubtful debts	(78)	(6)	(72)	1198%
<b>Trade Receivables</b>	<b>4,692</b>	<b>3,948</b>	<b>744</b>	<b>19%</b>

The average collection period in terms of the number of days as on 31 March, 2018 was 26 days. There was no change in the average collection period as compared to the previous year. The increase is primarily on account of increase in steel prices during the year.

### 4.1.16. Borrowings

₹ (in crore)

	2017-18	2016-17	Change	Change%
Long-term borrowings	29,551	28,358	1,193	4%
Short-term borrowings	2,172	4,875	(2,703)	-55%
Current Maturity of Long Term Debt	4,099	4,703	(604)	-13%
Current Maturity of Finance Lease Obligations	359	337	22	7%
<b>Borrowings</b>	<b>36,181</b>	<b>38,273</b>	<b>2,092</b>	<b>5%</b>

Long-term borrowings (including current maturity of long term debt) increased by ₹ 611 crores mainly owing to availing new loans for capacity expansion projects during the year.

Short-term borrowings reduced by ₹ 2,703 crore during the year. This decrease was primarily due to repayment of working capital facilities.

### 4. 1.17. Trade payables

₹ (in crore)

	2017-18	2016-17	Change	Change%
Acceptances	8,098	8,415	(317)	-4%
Other than Acceptances	5,890	3,189	2,701	85%
<b>Total Trade Payable</b>	<b>13,988</b>	<b>11,604</b>	<b>2,384</b>	<b>21%</b>

Trade payables increased by 21% mainly due to increase in creditors and material in transit for raw material due to increased volume of production and surge in raw material prices.

### 4. 1.18. Capital Employed

Total capital employed increased by 2.5% from ₹ 64,375 crore as on 31 March 2017 to ₹ 65,986 crore as on 31 March 2018.

Return on capital employed was 16.4% for FY18.

### 4.1.19. Own Funds

Net worth increased from ₹ 24,098 crore as on 31 March 2017 to ₹ 27,907 crore as on 31 March 2018.

The book value per share was ₹ 115.45 as on 31 March 2018 as against ₹ 99.69 as on 31 March 2017.

### 4.2. Consolidated

The Company has reported consolidated revenue from operations, operating EBIDTA and net profit after tax of ₹ 71,503 crore, ₹ 14,794 crore, and ₹ 6,113 crore, respectively. The Company's consolidated financial statements include the financial performance of the following subsidiaries, joint ventures and associates.

#### 4.2.1. Subsidiaries

1. JSW Steel (Netherlands) B.V.
2. JSW Steel Italy S.R.L.
3. JSW Steel (UK) Limited
4. Periana Holdings, LLC (w.e.f. 23 January 2017)
5. JSW Steel (USA) Inc.
6. Purest Energy, LLC
7. Meadow Creek Minerals, LLC
8. Hutchinson Minerals, LLC
9. R.C. Minerals, LLC
10. Keenan Minerals, LLC
11. Peace Leasing, LLC

12. Prime Coal, LLC
13. Planck Holdings, LLC
14. Rolling S Augering, LLC
15. Periana Handling, LLC
16. Lower Hutchinson Minerals, LLC
17. Caretta Minerals, LLC
18. JSW Panama Holdings Corporation
19. Inversiones Eroush Limitada
20. Santa Fe Mining
21. Santa Fe Puerto S.A.
22. JSW Natural Resources Limited
23. JSW Natural Resources Mozambique Limitada
24. JSW ADMS Carvao Limitada
25. JSW Steel Processing Centres Limited
26. JSW Bengal Steel Limited
27. JSW Natural Resources India Limited
28. JSW Energy (Bengal) Limited
29. JSW Natural Resource Bengal Limited
30. JSW Jharkhand Steel Limited
31. JSW Steel Coated Products Limited
32. Amba River Coke Limited
33. Nippon Ispat Singapore (PTE) Limited
34. Erebus Limited
35. Arima Holdings Limited
36. Lakeland Securities Limited
37. Peddar Realty Private Limited
38. JSW Steel (Salav) Limited
39. JSW Industrial Gases Private Limited (formerly known as JSW Praxair Oxygen Private Limited) (w.e.f. 16 August 2016)
40. JSW Utkal Steel Limited (w.e.f. 16 November 2017)
41. Hasaud Steel Limited (w.e.f. 13 February 2018)
42. Milloret Steel Limited (w.e.f. 8 March 2018)
43. Creixent Special Steel Limited (w.e.f. 27 February 2018)
44. Dolvi Minerals & Metals Private Limited
45. Dolvi Coke Projects Limited
46. JSW Realty & Infrastructure Private Limited
- 4.2.2. Jointly controlled entities:**
47. Vijayanagar Minerals Private Limited
48. Rohne Coal Company Private Limited
49. Geo Steel LLC
50. JSW Severfield Structures Limited

51. JSW Structural Metal Decking Limited
52. Gourangdih Coal Limited
53. JSW MI Steel Service Center Private Limited
54. JSW Vallabh Tinplate Private Limited
55. Acciitalia S.p.A. (w.e.f. 30 November 2016)

## 5. Capital Expenditure Plan

FY18 marked a turning point for the domestic steel demand growth for the country, as elasticity of steel demand growth to GDP growth went back to >1x after more than 5 years. With rising spends in infrastructure projects, the medium term demand growth outlook is quite constructive. At the same time, with a 91% utilisation in FY18, there is an opportunity to expand capacity to participate in the strong India growth story.

With a strategic objective of augmenting the incremental capacity creation at a low specific investment cost so that they remain returns accretive, the Company has approved certain key new projects in addition to the existing capex pipeline to achieve the following:

- Expand overall steelmaking capacity from 18 MTPA to 24.7 MTPA by March 2020.
- Enrich the product mix with 3.2 MTPA additional downstream capacity.
- Backward integration projects to achieve cost reduction.

The new projects that would be undertaken are explained in detail in the operational review section

The overall estimated capex plan of ₹ 26,815 crore announced last year, is expected to be enhanced by ~ ₹ 17,600 crore to implement the above new projects. Overall, the Company is now implementing a cumulative capex pipeline of ₹ 44,415 crore over a 4 year period between FY18 to FY21. With spend of about ₹ 4,700 crore in FY18, the Company plans to spend the balance ₹ 39,715 crore over the next 3 years. These projects are planned to be funded by a mix of debt and internal accruals in such a manner as to keep the overall leverage ratios within the targeted threshold levels of 3.75x Net Debt/EBITDA and 1.75x Net Debt/Equity. The Company's capital investment cost is among the best in the industry at less than \$600 per MT. The Company has a successful track record of executing project within the planned timeline as well as budget.

## 6. Operational Review

### 6.1. Vijayanagar Works

Vijayanagar Works is the largest plant of JSW Steel with a total capacity of 12 million tonnes per annum. The facility is located 380 kilometres from Bengaluru at Toranagallu village in North Karnataka, in the Bellary-Hospet iron ore belt. It is well-connected to both Goa and Chennai ports. It is a fully integrated steel plant with a well-developed township. The Vijayanagar plant is counted among the world's most efficient steel production facilities in terms of conversion cost. This plant manufactures a wide range of steel products in the flat and longs segments.

The Vijayanagar facility has been the first mover in India in many areas. It was the first integrated steel plant in India to:

- Reach 12 MTPA capacity at a single location
- Use Corex technology for hot metal production
- Set up iron ore beneficiation facility
- Implement pellet making technology based on both dry and wet process
- Having combination of both non-recovery and recovery types of coke ovens

Other distinctive features of the plant include:

- Largest single location integrated steel plant in India
- Fastest growing steel plant in India
- Highest manpower productivity in India
- Highest growth rate in automotive steel sector in India
- Widest and largest hot strip mill in India

#### 6.1.1. Capacity expansions roadmap and key projects

Particulars	Current Capacity (MTPA)	Targeted Capacity (MTPA)	Timeline
Ramp up total capacity	12	13	December - 2019
Product- category wise break-up			
Flat Products	8.2	8.8	December - 2019
Long Products	2.8	4.0	July-2019
CRM1 complex capacity expansion	0.85	1.8	December - 2019
Colour Coating line	-	0.3	October - 2019

#### Upstream Projects – Augmenting crude steel capacity at Vijayanagar to 13 MTPA

The Company, in the last year, had announced a plan to revamp and up-grade capacity of Blast Furnace-3 at Vijayanagar, post which the higher cost BF-2 would have been ramped down keeping overall capacity at Vijayanagar at 12 MTPA. Considering the prospects of strong steel demand outlook, JSW Steel now plans to modify and enhance the capacities of Steel Making Shop and capacities of flat and long products mills with allied facilities to utilize the additional hot metal.

#### Capacity up gradation of SMS-3 at Vijayanagar Works from 1.4 MTPA TO 2.8 MTPA:

To handle the additional hot metal at the 13 MTPA stage, the SMS-3 would be upgraded up to 2.8 MTPA by adding associated facilities.

#### Capacity up gradation of HSM-1 at Vijayanagar Works to 3.8 MTPA:

HSM-1 at Vijayanagar works is to be revamped and upgraded to achieve 3.8 MTPA, by upgrading the reheating furnace and allied facilities.

#### New Wire Rod Mill No.2 at Vijayanagar Works:

To process additional Billets at the 13 MTPA stage, a new Wire Rod Mill of 1.2 MTPA capacity would be installed.

#### Cost reduction projects and manufacturing integration

Setting up of 8 MTPA pellet plant and 1.5 MTPA coke oven plant at Vijayanagar:

The Company has decided to set up an 8 MTPA pellet plant at Vijayanagar to strategically reduce the dependency on more expensive lump iron ore. The Company has also decided to set up a 1.5 MTPA coke oven plant at Vijayanagar to bridge the current and expected gaps in coke availability. Both these projects are expected to provide significant cost savings and are likely to be commissioned by March 2020.

#### 6.1.2. Initiatives undertaken in FY18

##### a) Project Deep Drive

JSW Steel implemented multiple cost optimisation initiatives under 'Project Deep Drive' at various business critical departments (logistics, agglomeration and iron making, steelmaking, rolling mills,

power and others) leading to substantial cost savings. Deep Drive follows the signature 4i methodology of 'Identify-Ideate-Implement-Institutionalise' to sweat out additional saving potentials in the system and trigger innovation.

**b) Cost reduction using Overall Plant Effectiveness (OPE) Loss Tree methodology**

OPE Loss Tree was introduced in FY18 in key production units to capture various loss elements due to lower availability, lower rate of production and poor quality. Specific cross-functional projects were taken up to address major loss elements. Improvement projects under the 0757 framework were also taken up to reduce various wastes and unearth cost benefits.

Sr. No.	Major OPE improvement projects in FY18
1	Modification of Green Mixture to improve productivity of Sinter Plant 3
2	Reduce repair time of Noduliser of Sinter Plant 3
3	Increase finishing throughput of BRM1 and BRM2 for export rolling
4	Reduction in baby coil scraps in CRM1
5	Decrease in roll change time in BRM2

**c) Leveraging IT for cost management**

IT has become an indispensable tool for informed and holistic decision-making. It further helps to improve visibility and provide the requisite information to the management. JSW Steel has implemented various IT modules to drive efficiencies across various functions ranging from optimising the raw material blend to elimination of manual intervention in roll change sequence, among others.

**6.1.3. Highlights of FY18**

This was the best year for Vijayanagar Works as the plant accomplished many firsts in terms of productivity.

- Improved capacity utilisation of compared to earlier years
- Operationalised the Tunga iron ore mines
- Added 47 new steel grades – 41 in flats products (mostly automotive steel) and 6 in long products

- A pouring station of capacity 10,000 TPD at SMS-1 for to handle torpedo and 140 T open-top ladles were commissioned to enhance steel melting shop productivity and casting capacity.
- Movable KR station at SMS-1 for pre-treatment (desulphurisation) of hot metal as required for producing special steel grades and silicon steel was commissioned
- HR Slitter line of 0.75 MTPA capacity at HSM-2 to cater to customer's requirement of HR black, HRPO, HRSPO and BH grade steel in narrow width was commissioned
- 11 patents were filed – six being product-based and five process-based and four patents were granted

**6.1.4. Priorities for FY19**

- Operationalisation of the remaining four mines (of the five acquired in the previous year in auction)
- Setting up of Pipe conveyor system to enable the transportation of iron ore to the plant.
- New water reservoir with a storage capacity of 32 million cubic meters, to meet the water requirement at Vijaynagar
- Participation in Iron ore and coal mine auctions to ensure sustained raw material availability for manufacturing

**6.2. Dolvi Works**

Located on the Western coast in the state of Maharashtra, Dolvi is the second largest facility at JSW Steel. With a current 5 MTPA capacity, the plant is undergoing a ramp-up and in the next three years, this capacity will double to 10.7 MTPA. This strategically located plant is also connected to a jetty that has a cargo handling capacity of 15 MTPA. The facility is also the only primary producer of long products in Western India.

Substantial quantum of HR Coils produced in Dolvi is directed towards JSW's downstream facilities for value addition. From automotive and industrial to consumer durables, Dolvi manufactures products that meet the needs of multiple sectors.

## Management Discussion and Analysis continued

### 6.2.1. Highlights of the facility

- Dolvi Works is India's first to adopt a combination of Conarc Technology for both steel-making and compact strip production (CSP), aiding the production of hot rolled coils.
- CO2 emissions at Dolvi Works is one of the lowest among the steel plants in India. All the existing projects within the facility are compliant with the Indian standards for emissions.
- Dolvi caters to JSW's downstream facilities. 90% of its production is sold in Maharashtra. The plant's bar mill is the highest speed bar mill at a worldwide scale.
- The plant is situated in close proximity to the Arabian Sea coast and this is a significant advantage for the Company. It provides easy access to the port, leading to cost reduction in logistics.
- Developed/customised new 17 grades.

### 6.2.2. Capacity Expansion Roadmap and key projects

Particulars	Current Capacity (MTPA)	Targeted Capacity (MTPA)	Timeline
Ramp-up total capacity	5	10.7	December 2020*
Product— category wise break-up			
Flat Products	3.5	8.5	December 2020*

\*to be commissioned between March 2020 to December 2020.

#### Augmenting Crude Steel capacity at Dolvi to 10.7 MTPA

In beginning of the year, JSW Steel announced that steelmaking capacity at Dolvi Works would be increased from existing 5 MTPA to 10 MTPA. The major facilities included in the project are a 4.5 MTPA Blast furnace with 5 MTPA Steel Melt Shop, 5 MTPA Hot Strip Mill, 5.75 MTPA Sinter plant, 4 MTPA Pellet plant, and 4 Kilns of 600 TPD LCPs.

The expansion project at Dolvi to 10 MTPA is currently under implementation. In order to effectively utilise the steel making and casting capacity, the Company

has decided to increase DRI capacity at Salav to 1.6 MTPA (from existing 0.9 MTPA) along with augmentation and modification of Steel Melting Shop at Dolvi for hot charging of DRI. This project is expected to be commissioned by March 2020. With this, the crude steel capacity at Dolvi would increase to 10.7 MTPA.

#### Phase-2 Coke Oven plant of 1.5 MTPA under DCPL:

The Company through its subsidiary, DCPL would set up a second phase of 1.5 MTPA coke oven plant along with CDQ facilities to cater to the additional coke requirement for the crude steel capacity expansion to 10.7 MTPA at Dolvi. This project is expected to be commissioned by June 2020.

#### Setting up 175 MW and 60 MW power plants at Dolvi:

The Company will set up power plants of 175 MW and 60 MW to effectively utilise flue gases and steam generated from CDQ, which will lead to savings in power costs. These power plants are expected to be commissioned in March 2020

### 6.2.3 Key Initiatives during the year

- Leveraging IT for driving plant and logistics efficiencies

Digitisation has been instrumental in driving efficiencies across the JSW value chain. At Dolvi Works, there were two focus areas for digitisation in FY18, as given below.

- Tracking of material movement between port and the facility – Using location-based tracking, the logistics movement to and from the plant and port can be monitored real time. Apart from bolstering diligence, this measure also results in identifying bottlenecks and safety issues that require immediate attention.
- Improving energy efficiency through real-time systems – Integrated steel plants like Dolvi Works require meticulously planned energy management systems. Efficient energy management helps ensure optimal production levels and lower costs. At Dolvi Works, technology-enabled systems assist in real-time monitoring and distribution of requisite energy to the multiple facilities at the plant.

## b) Research and development (R&D)

During the year, five patents (three process and two product) were filed and one process patent filed earlier was granted.

### 6.2.4 Highlights for FY18

- Installation of 500 TPD Vapour Pressure Swing Adsorption (VPSA) for increasing oxygen enrichment and ramp up hot metal production at blast furnace
- Addition of the sixth strand billet caster to the existing machines to enhance the productivity.
- Waste heat recovery system installed at Sinter Plant-2 by utilising the waste heat from the sinter cooler by generating 20 TPH steam.
- Safety remains a priority area at Dolvi and FY18 saw a decline in the LTIFR. To further explore and improve safety practices in and around shop floor, the Company has entered into a partnership with global consultants DuPont.

#### Key sustainability projects

The Dolvi unit is handling two major and unique Corporate Social Responsibility projects as detailed below.

- Mangrove restoration initiative – Mangroves act as the intermediate ecosystem between land and marine water. The buffer provided by the mangroves have been depleted in the recent past due to human-induced activities. This has caused flooding of the farmlands and destruction of the local ecosystem. As a socially committed organisation, JSW Steel has undertaken a large-scale initiative to restore mangroves to their pristine state with a project duration of three years. At present, over 5,000 hectares of land and over 7,800 people have been positively impacted. Over a lakh nursery plants have been developed and planted.
- Large-scale afforestation initiative – To spread the green cover and foliage near the plant's area of operations, JSW Steel has embarked on a journey of planting a million trees in Dolvi and surrounding areas.

While the community can reap the benefits of increased plantation, the initiative also helps JSW Steel to ensure sustainable operations in the area.

Both these initiatives are aimed at restoring natural diversity and directly involve the local community stakeholders in executing the projects and reaping their benefits.

### 6.2.5. Priorities for FY19

- Conversion of the existing Lime Calcination Plant 1, 2 and 3 from pulverised coal to mixed gas (BFG + COG) to improve the productivity and quality of lime.
- Construction of new centralised stores with Automatic Storage Retrieval System to cater to the requirement of 10.7 MTPA.
- Construction of pellet-covered shed to guard the iron ore fines from monsoon to reduce moisture levels.
- Mechanisation of coal yard by retrofitting with yard equipment and conveyor systems.
- Augmentation of pipe conveyor to railway siding for shifting the coke (0.6 MMTPA) to JSW Steel Vijayanagar by rake.
- Construction of coil storage shed for the storage and dispatch of hot-rolled coils and TMT bars.
- Laying of 1.1 metre diameter raw water pipeline from Nagothane intake pump house to Dolvi to cater to the requirement of 10 MTPA.
- Conversion of the existing slag grinding mill to coal mill for increasing coal injection in the blast furnace, which will result in cost savings by reduction in coke consumption.
- SMS Gas Cleaning Plant improvement by enhancing suction capacities and modification of bag house, which will improve productivity and control dust emissions.

### 6.3. Salem Works

Salem Works is India's largest special steel plant with 1 MTPA capacity and produces about 850 special grades of steel. It is distinguished as a leading virgin special steel producer with 100%

## Management Discussion and Analysis continued

waste utilisation. The plant is a major supplier to auto components and is a market leader for manufacturing special grade steel used in gears, crank shafts and bearings.

The strategic location of the Salem plant allows it to cater to the needs of the major auto hubs in southern India. Located nearly 340 km from Chennai and 180 km from Bengaluru, it is well connected through railways, highways and ports, which facilitates the transportation of raw materials and finished products.

### 6.3.1 Highlights for FY18

- Caster III Project with 3 Strands commissioned successfully to handle casting sections.
- Sliding Stand at BRM commissioned successfully to handle higher sections
- Coil Annealing with capacity of 48,000 TPA has been commissioned for value added end products
- Second Billet grinding machine has been set up during the year to improve quality of billets for Cold head quality and free cutting steels.
- Developed / Customised 9 new grades mostly in automotive components.

### 6.3.2 Priorities for FY19

- Pre & Post Pickling Treatment with capacity of 84000 TPA for BRM products
- Bar Annealing with capacity 18,000 TPA for further value addition
- CPP 3 with 30 MW is under erection
- Stove upgradation in BF 1 to improve Hot Blast temperature
- Third Billet grinding machine

## 7. Energy Management

Power consumption is quite high in steel plants due to their various manufacturing processes. The steel manufacturing process comprises exothermic reactions, which generate significant heat that can be recycled and put to optimal utilisation. At JSW

Steel, it is a constant endeavour of the team to maximise the use of hot air and gases generated during the various processes and to minimise the consumption of fossil fuels. This leads to significant savings in energy costs for the Company and helps reduce environmental footprint.

The outcome of such measures are explained below.

### 7.1. Vijayanagar Works

- a) Burner replacement of captive power plants no. 3 and 4 to replace usage of coal with gas to reduce fuel consumption
- b) Utilised of 100% gases generated in Corex

### 7.2. Dolvi Works

- a) Dolvi Works initiated the use of coke oven gas (COG) in place of natural gas (NG) at following locations to improve energy/cost efficiency during FY18:
  - o Partial replacement of NG for production of DRI, results in saving of 24,212 KNm<sup>3</sup> NG
  - o 100% NG is replaced with COG at Tunnel Furnace for slab heating, leads to saving of 30,293 KNm<sup>3</sup> NG
  - o Commissioning of Bar Mill on mixed gas
  - o COG consumption in SMS ladle preheater in place of NG resulted in saving of 1,040 ksm<sup>3</sup>/annum.
- b. Implementation of online air fuel ratio logic at CPP, resulted in reduction of CPP heat rate by 2.8%.
- c. Revamped Sinter plant # 1 for waste heat recovery boiler to generate 7 TPH steam
- d. Installed waste heat recovery boiler at Sinter Plant 2 to generate 20 TPH steam
- e. Reduced gaseous heat rate of Bar Mill from 0.45 Gcal/tp (in FY16/17) to 0.30 Gcal/tp
- f. Increased power plant generation by 10.65% through usage of mixed gases.

### 7.3. Salem

- Maximised steam generation through additional waste heat recovery boilers (WHRB # 4 and #5) resulting in reduction of coal consumption.
- Effective usage of hot metal production, by reducing the pig iron production resulted in savings of 0.12 Gcal/TCS
- Minimised fuel, power and BF gas consumption at blast furnace through optimisation of production between Blast Furnace #1 & #2, and usage of higher sinter percentage
- Optimised process at 150 TPD Air Separation plant resulting in savings of 45,000 kwh/month
- Reduced power consumption in furnace -1 through installation of energy efficient motors with regenerative drive for EOT Crane, energy efficient motor with drive in hydraulic system, 6.6kv drive in ID fan motor resulted in savings of 1,59,000 Kwh/month
- Saved energy in auxiliary cooling water pumps at CPP#2 through coating of pump internals resulted in savings of 8,300 Kwh/month
- Utilised waste heat from Non-Recovery Coke Ovens effectively through waste heat recovery boilers

## 8. Procurement

Raw materials and logistics continue to occupy the majority share of the steel industry's cost and hence backward integration and raw material security are key components of the JSW Steel's future strategy. JSW Steel believes that securing critical raw materials, either for sale on the global market or for direct use at its facilities, will help protect the Company from variations in raw material prices. Over the past few years, JSW Steel has instituted a strategy of diversifying its raw material sources. As a result, the Company believes it can strike the right balance between sourcing key raw materials and optimising input blend and cost.

During FY18, input costs witnessed a hike and JSW Steel neutralised the cost push partly owing to technology, continuous innovations and strategic procurement.

### 8.1. Iron ore

Iron ore is the key raw material for steel production. JSW Steel's strategy is to participate in more iron ore mines auction to bolster backward integration.

Iron ore procurement remains a key area of focus. Given the Company's upcoming capacity expansions, its requirement for iron ore is expected to grow. The Company procures iron ore from the third party sources through an optimum mix of domestic purchases and imports. In the case of Vijayanagar and Salem, the majority of the iron ore are sourced from within the State of Karnataka. The Dolvi's iron ore requirements are met from iron ore sourcing from State of Odisha and imports.

Further to address uncertainties in iron ore supply, JSW Steel has relied on in-house beneficiation technology to transform low grade iron ore into higher grade usable inputs. In addition, a strategy of ensuring raw material supply security from various regions is being pursued.

At present, differential pricing maintained for the state of Karnataka relative to that of prevailing in Odisha, is a key issue for the JSW Steel as the Company's largest plant (Vijayanagar Works) is situated in the state. During the year, the domestic prices were not in line with global levels and the benefits of competitive iron ore prices did not materialise for the Company.

Thus, to ensure the consistency of raw material supply and to maintain control over input costs, backward integration is adopted as the way forward for JSW Steel. JSW Steel will continue to evaluate additional raw material assets that fit within its strategic criteria and intend to look for further opportunities in India and abroad to secure key raw material supplies and to reduce its cost of production by targeting strategic tie-ups and investments in new technologies to achieve further backward integration. JSW Steel believes this will further enhance the raw material security of the Company and lead to integrated and efficient operations.

Towards this effect, five mines in Karnataka were acquired in the previous fiscal pursuant to the auction conducted for iron ore mines

## Management Discussion and Analysis continued

in the State of Karnataka. One of these mines has become operational during the year and the remaining iron ore mines are expected to start functioning within the next financial year. These mines have an estimated reserves of ~111 million tonnes, which meets approximately 20% of the total requirements of iron ore at Vijayanagar.

### 8.2. Coal

Coal is another major raw material for steel manufacturers. During FY18, coal prices remained bullish for major part of the year, but it started to stabilise by the year end. There were not many weather disruptions throughout the year. JSW Steel was able to mitigate the impact of coal pricing to some extent owing to an optimal procurement strategy and blend management.

At JSW Steel, its in-house and state-of-the-art blend management system ensures that the Company's dependence on premium coking coal is minimised. The process keeps the Company's operating parameters at peak levels and blends semi-softs, anthracites and other lower-grade coals to be used in coke ovens in place of premium coking coal.

With the pricing mechanism in world coking coal markets shifting from annual to quarterly to monthly to index, JSW Steel has had to alter its buying pattern ratio of periodic and spot material to remain competitive. JSW Steel now analyses market dynamics to maximise cost benefits without compromising on technical specifications. Similar developments have been witnessed in sourcing thermal coal and other products. Some of the key strategies for coal procurement are as follows

- New sources of thermal coal reduced single source dependency and unit cost of power generation.
- Coal blend stabilisation: This was achieved by rationalising carbon bearing material and improving input quality in coke ovens.

This has led to a significant reduction in the cost of production and decreases the overall consumption of coking coal.

With the introduction of new sources of imported raw material, strategic sourcing has achieved goals such as uninterrupted production, controlled inventory levels, diversified risks, reduced costs and enhanced bargaining strength.

Further, the JSW Steel risk management policies attempt to protect business planning from adverse commodity price movements of iron ore and coal. Accordingly JSW Steel also hedges commodity price exposures. Commodity hedging is undertaken as a risk offsetting exercise.

The Company has secured the Moitra coking coal block via an auction process. This mine has total extractable coal reserve of around 30 MnT; and the coking coal mine is in advanced stage of development.

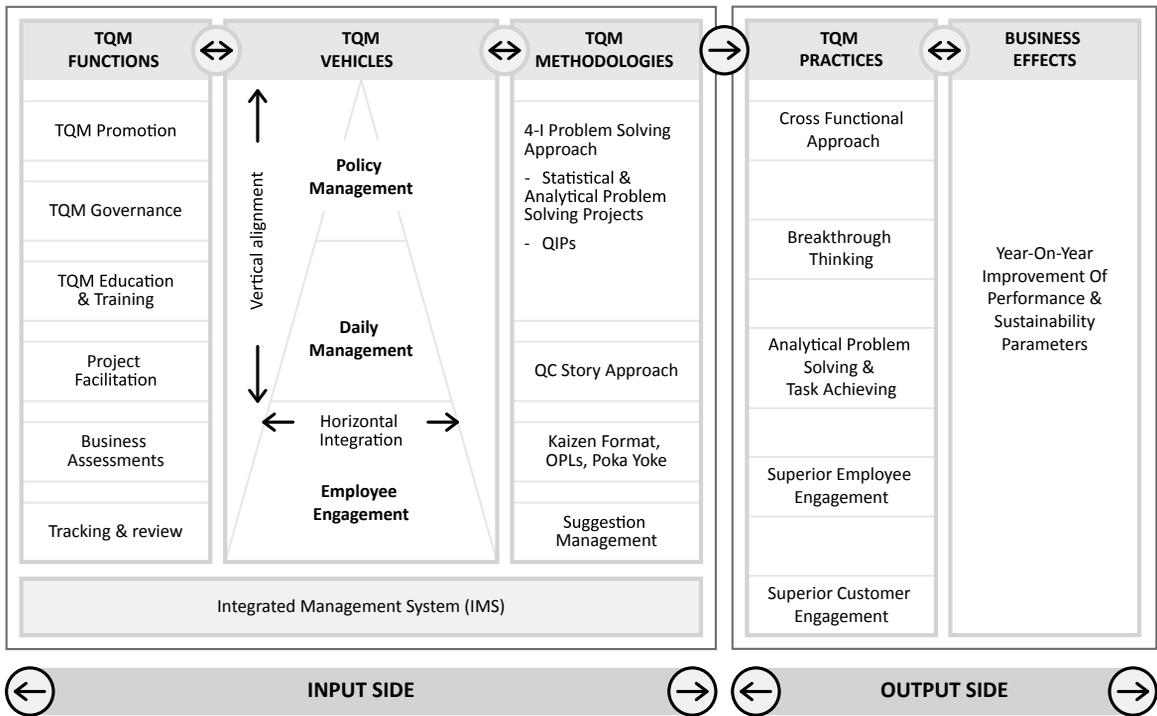
## 9. Quality management

Quality is elemental to every activity at JSW Steel and consistent quality improvement has become a habit for the entire team. The Company periodically invests in cutting-edge technologies, people practices and process enhancements to enhance its quality and stay ahead of the peers.

### 9.1. TQM – Deming Journey

JSW Steel is on a Total Quality Management (TQM) journey for attaining quality excellence with all ISO-certified facilities and multiple plants applying for the coveted Deming prize.

JSW Steel's Vijayanagar and Salem Works successfully qualified the TQM diagnosis in the July – September period of FY18. Moreover, the Company has submitted the application for Deming Challenge in March 2018 to Japanese Union of Scientists and Engineers (JUSE), Japan. Additionally, Dolvi Works has begun the Deming journey and aims to achieve the status by 2020.



JSW Steel’s plants have end-to-end, cross-functional quality assurance system, which has become a true hallmark. The Company’s focus on quality has helped its multiple facilities achieve both internal and external recognitions such as the ICQC Award for quality and the CII EXIM Award for Business Process Model.

## 10. Talent Management

JSW Steel continues to build a meritocracy, ready to embrace new competencies for a sustainable future. The Company firmly believes that their strong employee base builds competitive advantage. The talent management team at JSW Steel aligns its policies with the refreshed Human Resource vision, values and purpose to transform boardroom strategies into business realities.

### 10.1. Learning & Development – People and Skills

Learning and development continue to be a key employee value proposition for JSW Steel, as it remains committed to implementing new training methodologies for its people. The Company imparts training across all departments through structured initiatives that revolve around the organisation’s ‘BUILD FOR TOMORROW – STRATEGIC PILLARS’.

During FY18, JSW Steel employees underwent systematic learning interventions focussing on the next role of capability building, leadership and enhancement of functional skills. These training sessions captured the learning needs of people from the annual performance management discussion, which is designed around three pillars of capabilities - career, competency, and leadership. The Company recorded a total of 38,454 training hours for FY18.

### 10.2. Project Lakshya

JSW Steel aims to inculcate a high-performance work culture across all levels of the organisation. It has thus initiated Project Lakshya, a learning intervention for workmen-level employees in all plants. The intervention includes topics like driving self-motivation, time management, building the right habits, power of thinking, communicating with purpose, effective communication skills, presentation skills and conflict management. The Company covered 1,500 employees across plants through Project Lakshya.

## Management Discussion and Analysis continued

### 10.3. Future Fit Leaders

The Company has a robust framework to build a future-fit talent pool. It further endeavours to empower its team to take the organisation into the new level of growth and sustainability, while at the same time, driving career aspirations.

In FY18, the team identified 97 Future Fit Leaders (FFLs) from various business segments. A comprehensive capability development programme was designed and implemented for accelerating the progress of the FFLs. The development programme comprised classroom learning from ivy-league schools and on-field assignments. Additionally, the Company also commissioned systematic development programmes for ~1,319 high performers who underwent training at the development centre.

### 10.4. The IIM-A Executive Education programme focus

The primary objective of JSW Steel's IIM-A Executive Education programme is to prepare each participant for executing multi-faceted responsibilities of leadership roles at the Company. This programme provides a unique opportunity for both personal and professional growth. It allows the candidate to develop knowledge and insight and expand the breadth of perspective, cultivate leadership skills and inculcate strategic mindset.

### 10.5. JSW Springboard – Next Steps

#### 1) Women Leadership Programme

The Company believes in promoting diversity at work and thus wants to encourage women leaders at JSW Steel. The Women Leadership Programme is a structured need-based development journey for high-performing female employees, which will be piloted by IIM Bangalore.

#### 2) Gender Sensitisation Workshops

Gender sensitisation is a very important aspect in the Company's vision to add more women leaders to the organisation. Gender sensitisation workshops will be conducted for the leadership team and all line managers with women employees in their teams. These workshops will address the concepts of diversity and inclusion for

managers while focussing on behavioural changes.

#### 3) Building & Strengthening Performance Conversation

At JSW Steel, process and performance improvements are priorities and the Company views performance conversation as a catalyst for overall performance improvement. The entire capability development programme was based on the Great Place to Work survey results and the manager feedback report. These workshops help participants develop essential skillsets for more effective leadership roles in the Company.

#### 4) Candid Conversation – A Platform to interact with JSW Leaders

Face-to-face open discussions help build strong relationships and ensure lifelong connections. Keeping the same in mind, JSW Steel has created a two-way communication platform named 'Candid Conversations' to enable greater interaction between its employees and leaders.

#### 5) Pre-Retirement Workshops

Driven by the philosophy of 'Better Everyday', JSW Steel is taking a step ahead in enhancing employee lives even post retirement. The Company launched pre-retirement workshops for its retiring employees and their spouses to prepare them for the changes during and after retirement. These workshops also encourage them to explore new opportunities post retirement.

### 10.6. Fresh Talent – JSW Campus Engagement

The Company is focussed on widening its footprints across India's top college and university campuses through its Undergraduate Internship Programme, Summer Internship Programme and Management Internship Programme. JSW Steel has successfully established a strong presence among the Tier I engineering and management institutes, while its Undergraduate Internship Programme has gained significant traction among the most Tier I campuses. Interns absorbed through this programme further undergo the Graduate

Rotation Programme comprising four months of training and two sets of rotations.

### 2018 Internship Programme

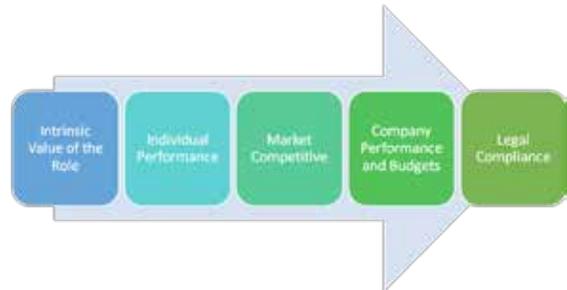
Programme Details	Summer Internship Programme	Management Internship Programme
Campus Category	Tier I	Tier I
Degree	B.Tech/ B.A/ B.Com/ B.Sc/ B.A./ LLB	MBA
Number of campuses targeted	16	10
Campus List	IIT-Delhi, IIT-Mumbai, IIT-KGP, IIT-Kanpur, BHU, Roorkee, Gandhinagar, Madras, BITS Pilani, VJTI, LSR, SRCC, St. Stephen's, FLAME, GLC, Symbiosis	IIM – Ahmedabad, Bangalore, Calcutta, Indore, Lucknow; MDI, IIFT, FMS, JBIMS, XLRI
Batch Size	33	23
Internship Duration	8 Weeks	8 Weeks
Applications Received	3,500 and above	2,700 and above

### 10.7. Great Places to Work – Trust Impact Tool

Great Places to Work (GPTW) survey was completed at JSW Steel in December 2016. It provided deep insights into the pulse of the JSW Steel employees. The survey was conducted across the Group and covered more than 16,000 employees through both online and

offline mode. The same led to discovery of various scores across demographics and their relative comparison with Top 100 companies, as well as the best in manufacturing industry. Improvement areas were identified and the Company is working diligently on them to deliver desired results.

### 10.8. Employee Compensation & Benefits



#### 10.8.1. Tenets of JSW Employee Remuneration Policy

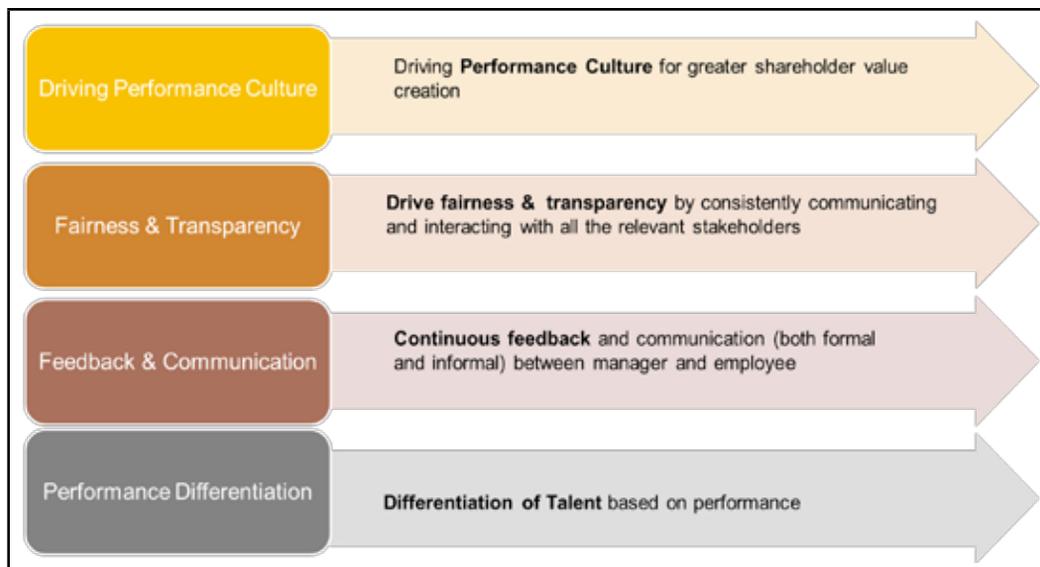
JSW Steel is a performance driven organisation that recognises and rewards good performance while focussing on employee retention and career growth. The Company provides its people competitive remuneration and regularly conducts studies to understand the trends in executive and employee pay positioning in steel and related industries.

The Company's remuneration programme is designed to attract, motivate and retain employees. It has a salary pay mix with appropriate performance incentives for managers and executives. At JSW Steel, employees share both risk and wealth creation with the Company in the form of long-term incentive plans. JSW Steel's future focus will be to further strengthen its performance-based pay philosophy. The Company has also launched initiatives like flexible compensation, encouragement for participation in National Pension Scheme (NPS) and retiree health insurance.

## Management Discussion and Analysis continued

### 10.9. Performance Management

JSW Steel's performance management process is a continuous journey to achieve the following four fundamentals.



Performance review is a three-step process in JSW Steel. It begins with the setting of organisational goals, aligning teams and individuals to the Company's objectives, strategies and processes and includes monthly review of goals and achievements with corrective actions. The employee then selects the specific JSW competency, which he/she needs to build upon and finally chooses his/her individual development plan.

### 10.10. JSW HR Digitisation

In the last few years, JSW Steel has adopted several collaborative initiatives to develop and connect various functions of the Company with its HR functions to facilitate improved decision-making.

During FY18, the Company adopted the following digitisation initiatives for HR:

- i. Launched online learning module for all employees across the Group with support from the digitisation partners Success Factors while it conducted courses and training in association with Harvard Manage Mentor and Skillsoft

- ii. Installed contract workforce management, which is currently underway in partnership with an industry expert.
- iii. Unveiled a single website with Single Sign On (SSO) access in the form of JSW intranet for all employees across the group
- iv. Shifted performance management system to more user-friendly and agile Success Factors system
- v. Commenced work on digitising the compensation management system for all group companies across locations and for employee expense management system with our partners Success Factors and Expensing

## 11. Information Technology

Information technology (IT) is critical in integrating JSW Steel's diverse operations and helps enhance the value proposition of the business. The Company has commissioned several projects to further strengthen and enhance IT penetration within its procedures, as IT facilitates disciplined processes and enables faster decision-making. The Company leverages ERP

solutions for its business operations, which are based on the SAP platform that empowers smooth data collation, decision-making, MIS and data security.

JSW Steel persistently strengthens its IT architecture to implement important initiatives, and thereby aligns its business processes to dynamic sectoral and economic realities.

During FY18, the Company's GST roll out was implemented successfully with entire set of systems reconfigured for the new tax regime. It further dynamically undertook subsequent modifications upon receiving change notifications.

### 11.1 IT-Business Initiatives

During FY18, the Company implemented several IT initiatives to enhance efficiencies, automation and digitisation of its core processes:

- a) Modernised various MES systems phase-wise at different steel plants.
- b) Enhanced customer-centricity and enabled all round customer focus through a leading customer relationship management solution that is being deployed, which will ensure the sales force is more responsive to customer needs.
- c) Ensured two-way communication between the Company and its customers through a web- and app-based customer portal that is being developed.
- d) Strengthened HR processes further with best-in-class solution for all employee processes from hire to retire (including recruitment, on boarding, performance management, e-learning, and exit); compensation management/career development and succession planning through IT-based processes is also underway for FY19.
- e) Designed comprehensive contract workforce management system to efficiently manage the workforce; deployment for steel plants has already started and will end for all plants within FY19.
- f) Digitised all mining processes using the most modern digital technologies — the digital mining processes will be extended to all mines as and when they are scheduled to get operational.
- g) Approved the critical technical architecture initiative of migrating the base SAP platform

and the process is currently on, which will be completed in FY19; an analytics platform will also be deployed along with it.

- h) Reinforced cyber security through multiple projects, which are underway.
- i) Created the architecture strategy for JSW Steel to migrate from SAP base platform to HANA, enabling SAP to become the digital core; the new architecture will be realised by the end of FY19 and multiple architecture projects are currently in progress.
- j) Implemented the distributor management system for secondary sales in the retail segment.
- k) Deployed multiple projects enhancing process efficiency and data visibility like exports and imports documentation management; Total Quality Systems and portals; advances planning and optimisation projects for providing delivery commitment to customers; order management solutions, legal case management solution and others — all in different stages of completion.

### 11.2. Digital Initiatives

During FY18, JSW Steel incorporated digitalisation in critical areas of manufacturing operations, supply chain, and sales and marketing. It collaborated with global firms to facilitate a smooth digital journey.

JSW Steel's digital project has the following critical components:

- a) Governance setup for digital projects
- b) Establish a dedicated digital Centre of Excellence
- c) Identification of projects in Wave 1 and Wave 2

The Company's digital journey began with 'the art of possibility' where all improvement areas across the businesses were identified and consolidated. JSW Steel applied scientific criteria to shortlist projects and understand the applicability of digital levers, ROI, impact and delivery period. These projects went through an approval process and became digital projects for delivery and were named Wave 1 projects. Similarly, Wave 2 was run to arrive at further

## Management Discussion and Analysis continued

projects and ~35 such projects were identified having significant impact on the bottom line.

The projects will deploy Internet of Things, value in use, optimisation tools, data modelling and analytics to solve the business issues. The digital journey, at JSW Steel, will continue in FY19 with the addition of 2-3 critical processes to improve the bottom line.

### 12. Risk Governance

JSW Steel follows the globally recognised 'COSO' framework for risk governance. The Company is aware that recognising and identifying emerging risks to mitigate them is a critical business activity. It has a robust risk management framework that identifies and evaluates business risks and opportunities to:

- a) Protect the interest of its shareholders and stakeholders

- b) Achieve its business objective
- c) Enable sustainable growth

Pursuant to the requirement of Regulation 21 of the Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations, 2015 and Clause 49 of the erstwhile Listing Agreement, the Company has constituted a sub-committee of Directors to oversee Enterprise Risk Management framework and ensure:

- a) Execution of decided strategies with focus on action
- b) Monitoring risks arising out of unintended consequences of decisions or actions related to performance, operations, compliance, incidents, processes, systems and the same are managed appropriately

Key risks and the Company's response strategies are detailed below.

### Strategic risk(s)

Risk type	Movement	Impact	Response strategies
Competitive dynamics & industry Cyclicity		The following can affect sales & margin: 1) Adverse global and domestic demand-supply dynamics 2) Cyclical nature of steel industry 3) Unfair trade practices resulting into surge in imports 4) Trade barriers imposed by other countries like US, Europe.	Company de-risks by - 1) In-house research team tracks macro environment with help of reports of specialised agencies & interactions with all concerned. 2) Due diligence review carried out before dealing with unknown markets. 3) Better market intelligence with inputs from marketing team. 4) Widening and deepening customer reach in domestic & international markets. This gives flexibility in switching over from domestic to export market & vice versa. 5) Broadening product range like CRM, auto grade etc.. 6) Increased Value added products like galvanised, galvalume. 7) Responsive credit & pricing policy so as to stay competitive.
Marketing		At present, global steelmaking capacity exceeds global consumption of steel products. This often results lower realisation & reduced margins. Company's capacity expansion at Dolvi may be impacted due to lack of market potential for increased volumes.	1) Indian Steel demand expected to grow at 7+% CAGR. The Company expects to increase its domestic market presence & share. 2) Indian steel exports expected to grow due to improving competitiveness in couple of years; which will help Company to improve its exports volume. 3) Company's downstream capacity is being expanded. This will result in additional HR demand from its downstream units. 4) Company's price competitiveness is expected to help in import substitution of HRC in Western region.

Risk type	Movement	Impact	Response strategies
Raw material availability & cost	↔	Availability and cost of required grade of Iron ore are impacted by: 1) Global movement and parity of landed cost considering price, freight, tariff and exchange rates. 2) Domestic demand-supply gap, constraints & vendor actions 3) Govt. Policies on mining, auction of mines and tariff	1) Company has successfully participated in public auction of mines & bagged 20 years leasing rights of 5 mines (approximate 5 MTPA capacity). The production is expected to start in FY19. This will reduce dependency on State suppliers & other vendors. 2) During last year, company imported iron ore from Brazil & Australia as the landed cost of imports is relatively lower on the concept of value-in-use. 3) Regular tracking of Government policies & announcements for future auctions & regulatory changes in sourcing countries.
Infrastructure & Logistics	↑	Company is in the process of brownfield expansion at its Dolvi plant. Various factors can affect movement of enhanced quantity of inbound raw material & outbound goods like - a) Port congestion, unloading / loading infrastructure, rail connectivity, channel blockage. b) Storage & material handling (RMHS) system to protect material from exposure to weather thereby its metallurgical property.	Various measures are being taken such as – 1) Additional gates being constructed for smooth movement of vehicular traffic. 2) the rail track length in Rail yard & HSM area is being increased. 3) higher capacity barges / Mini Bulk Carriers (MBCs) being procured for transportation of inbound raw material & outbound finished goods. This will also reduce pressure on road movement. 4) Improving infrastructure facilities at Dharamtar jetty like – increasing jetty length, dredging for deeper draft, additional barge unloaders. 5) Additional storage yards for iron ore fines & coal are being constructed to handle the enhanced volumes.

### Operational risk(s)

Risk type	Movement	Impact	Response strategies
Availability of water for production	↔	Shortage of water can affect production.	1) Company is proactively developing water storage capacities at its plants to match the increasing water requirement due to capacity expansions. 2) Apart from this, to reduce water consumption, Company is investing in various technologies like- a) Converting water condensers to Air condensers in captive power plant, b) Setting up Zero liquid discharge plants, RO Plants, sewage treatment plants, c) Water reduction in coke production through Coke Dry Quenching (CDQ) technology.
Availability of power for production	↑	Company's proposed expansion at Dolvi would increase the power requirement. Inadequate power supply & network bandwidth may lead to operational interruptions & affect the production.	1) The power required would be met partly through captive from Coke oven / Blast Furnace gases and balance being sourced from JSW Energy, Ratnagiri & MSEDCL through open access. 2) In order to have network bandwidth, 200 KV additional transmission line of 20 kms is planned from Nagothane to Plant.

## Management Discussion and Analysis continued

Risk type	Movement	Impact	Response strategies
Environment		<p>Steel making process involves emission of CO<sub>2</sub>, dust &amp; other hazardous gases / waste. These emissions pose risk to environment &amp; sustainable growth.</p> <p>India is also a part of Paris agreement (COP 21) which aims at reducing carbon emissions.</p>	<ol style="list-style-type: none"> <li>1) Company ensures compliance with norms through selecting right equipment, technology, processes, inputs and regularly monitor emissions.</li> <li>2) Company regularly tracks changes in technology &amp; future norms; so as to plan in advance.</li> <li>3) Company gives thrust on sustainable products that are safe for consumers. Company has developed products that are environment friendly &amp; safe for usage like high-strength low carbon steel, lesser weight steel used in Auto sector that makes the vehicle lighter which helps in reducing the carbon footprint as well as safety of travellers.</li> <li>4) Last year, JSW Steel was 1st Indian steel company to get an Environmental Product Declaration (EPD) label for HR steel strip in line with ISO 14025.</li> </ol>
Human resource		Human workforce with required skillset & experience is critical for maintaining current level of operations & upcoming expansions at plants.	<ol style="list-style-type: none"> <li>1) Senior leadership support helps in setting the tone at the top.</li> <li>2) Company has strong HR policies &amp; processes in place for hiring &amp; retaining of talent.</li> <li>3) Robust performance management system to reward performers which helps attracting &amp; retaining the talent.</li> <li>4) Adequate training &amp; grooming for future-fit leadership with specially designed courses from IIM-Ahmedabad &amp; Cornell university, USA.</li> <li>5) Launched 'SKILLS 2020' programme where in employees have to acquire 10 skills, as suggested by World Economic Forum, through online learning tool over next 2 years.</li> <li>6) Gender diversity initiative 'SPRINGBOARD' launched for women leadership development.</li> </ol>
Information systems		Absence of robust Information security may lead to compromise of confidentiality, integrity & availability of information	<p>Company ensures strengthening cyber security through-</p> <ol style="list-style-type: none"> <li>1) Implementation of policies on IT security.</li> <li>2) Deployment of antivirus / endpoint security at all locations.</li> <li>3) Creating security awareness amongst employees through e-mails &amp; regular communication.</li> <li>4) Establishment of Disaster recovery site for SAP-ERP &amp; other critical applications/software.</li> <li>5) Implementation of SAP-GRC control to ensure segregation of duties &amp; role based access to information.</li> </ol>

## Compliance risk(s)

Risk type	Movement	Impact	Response strategies
Health & Safety	↔	Any safety lapses would result in damage to property, assets & human capital.	<ol style="list-style-type: none"> <li>1) International consultant 'DuPont' has been engaged for rolling out their international safety standards,</li> <li>2) All 14 standards are being implemented across all plant locations,</li> <li>3) Safety has been added as Key Performance Indicator (KPI) for Managers. There is provision of disincentives for any safety breach incidents, accidents reported in the department,</li> <li>4) Periodic safety training imparted to employees &amp; associates.</li> <li>5) Mandatory usage of safety gadgets such as safety shoes, helmets, hand gloves, masks on shop floor/ plants.</li> <li>6) Monthly apex safety meetings are held for review of safety aspect, fatal accidents/near miss accidents, if any.</li> <li>7) Fire protection systems in place like fire extinguishers, fire tenders, periodic mock drills.</li> <li>8) Medical facilities, Medi-claim policy cover for employees &amp; their families; Group insurance policy for employees.</li> <li>9) Strong Security arrangements like security check-post, entry pass / identity cards, access control system, CCTV at critical locations.</li> </ol>

### Forward looking and Cautionary Statements:

Certain statements in this release concerning our future growth prospects are forward looking statements, which involve a number of risks, and uncertainties that could cause actual results to differ materially from those in such forward looking statements. The risks and uncertainties relating to these statements include, but are not limited to, risks and uncertainties regarding fluctuations in earnings, our ability to manage growth, intense competition within Steel Industry including those factors which may affect our cost advantage, wage increases in India, our ability to attract and retain highly skilled professionals, time and cost overruns on fixed-price, fixed-time frame contracts, client concentration, restrictions on immigration, our ability to manage our internal operations, reduced demand for steel, our ability to successfully complete and integrate potential acquisitions, liability for damages on our service contracts, the success of the companies in which – has made strategic investments, withdrawal of fiscal governmental incentives, political instability, legal restrictions on raising capital or acquiring companies outside India, unauthorized use of our intellectual property and general economic conditions affecting our industry. The Company does not undertake to update any forward looking statements that may be made from time to time by or on behalf of the Company.