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FOR MEMBERS' USE ONLY

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VIEW OF AUDITORIUM OF DELHI CHAPTER



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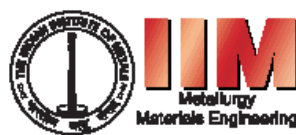
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CHAIRMAN'S MESSAGE

Dear Fellow Members,

It is my proud privilege to be the chairman of Indian Institute of Metals, Delhi Chapter and I feel honoured to serve this chapter having illustrious members from industries, R& D Institutions, Academia & Government. I would like to sincerely thank the EC members for reposing their faith in me & look forward to our collective leadership in organizing various technical activities & cultural events with larger participation to take this chapter to greater height.

I would also like to thank all past Chairmen and Executive Committee Members for their outstanding contribution in making this chapter most active and vibrant. Unlike many chapters who are mentored by corporate houses for carrying out their technical activities, entire credit goes to its members for their active participation & dedication for making Delhi chapter most dynamic & energetic.

Country has witnessed study growth in mineral & metal sector in the past with India become the second largest steel producer in 2018 replacing Japan with 106.5 Mt steel production. But the sector is now facing substantial challenges due to recent environmental, societal, economic and technological development which lead to fourth stage of industrial revolution. The fourth industrial revolution termed as Industry 4.0 is empowered by wide range of digital technology, new materials, artificial intelligence, advanced robotics, machine learning, new formation of automation etc etc. One such example is the next generation of electric vehicles (EVs) begins to hit the roads. Steel is set to play a vital role because in recent years, it has increasingly been favoured over aluminium as a material of choice in EV construction largely because of its lower cost & superior strength. Materials like Advanced High Strength Steel are going to play an important role in lowering vehicle weight while still offering high passenger safety.

Another most talked subject today for manufacturing sector is the circular economy in which society reduces the burden on nature by ensuring the resources remain in use as long as possible. As a permanent material, steel is fundamental to achieving the circular economy. It is easy to reduce the weight of steel product by developing new materials with enhanced physical & mechanical properties & steel components can be effectively reuse, remanufactured or recycled. As such, our focus will be to organize more & more technical activities related to current & futuristic industry oriented issues.

I look forward to have more suggestions and ideas from our members to enhance the activities of Delhi Chapter. I am confident that with your support and active participation, we will continue to build excellence in Delhi Chapter and make this chapter more industry oriented.

With best regards,

K. K. Mehrotra
Chairman

OUTLOOK OF STEEL INDUSTRY – 2019

2018 was a subtle year full of upheavals especially for the iron and steel industry. Steel360 compiled insights which could help in determining what can be expected from steel industry in 2019.

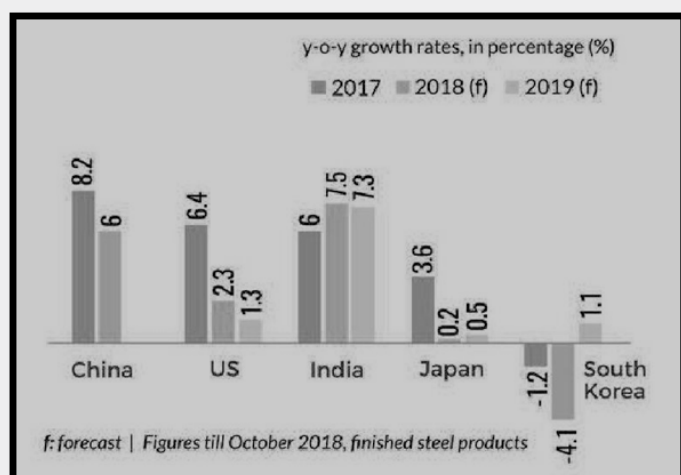
Top 5 countries with highest steel demand							
Serial no.	Countries	Quantity in million tonnes (mnt)			y-o-y growth rates, in percentage (%)		
		2017	2018 (f)	2019 (f)	2017	2018 (f)	2019 (f)
1	China	736.8	781	781	8.2	6	0
2	United States	97.7	99.9	101.2	6.4	2.3	1.3
3	India	88.7	95.4	102.3	6	7.5	7.3
4	Japan	64.4	64.5	64.8	3.6	0.2	0.5
5	South Korea	56.4	54.1	54.7	-1.2	-4.1	1.1

f – forecast

Figures till October 2018, finished steel products

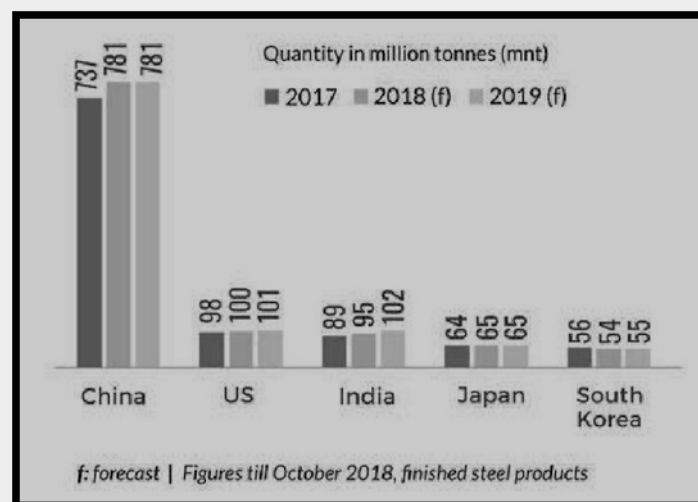
Global Steel Demand

- After a contraction of -3.0% reported in 2015, global steel demand is continuously growing and as we are entering in 2019 the demand for steel is expected to remain on the positive side. While the robustness of steel demand recovery seen in 2017 was carried forwarded to 2018, risks have also increased. Rising trade tensions and volatile currency movements are increasing uncertainty in the global steel industry.



- The Short Range Outlook of the World Steel Association (worldsteel) projected that global steel demand will reach 1,657.9 Million Tonnes (mnt) in 2018, an increase of 3.9% over 2017. For year 2019, it is forecasting that global steel demand will grow by 1.4% reaching to 1,681.2 mnt.

- The report is also forecasting that the demand for steel in the developed world remains healthy, while in the developing countries steel demand will continue to recover amid challenges.



Highest Y-o-Y steel consumption growth for India

India's steel demand is increasing every consecutive year and in 2019, it is being forecasted by worldsteel that it will overtake the United States in steel demand. The demand will be supported by improving investment and infrastructure programmes. Stressed government finances and corporate debt weighs on the outlook," the body added in its report.

Impact

Domestic prices to continue to correct in Jan-19:

Domestic HRC prices have corrected by ~4% in the last month to INR 43,000/t (Mumbai). However, we note that China export prices have corrected much more, down 15% in the last two months with spot at USD 512/t CNF India. With Indian domestic prices outperforming regional prices, domestic prices are now at 3-4% premium to import parity vs. 4-5% discount history. According to the report of Macquarie it is expected domestic prices to correct by 5-6%.

Domestic demand remains robust but expects imports pressure to increase:

Domestic steel consumption growth remains robust with FY19 YTD (Year to Date) growth at 8.2% YoY till Nov-19. Imports and export run-rate too remains steady where India remains a net

importer of 1mntpa. However, with domestic prices outperforming regional prices, we expect net imports to increase in Dec18- Mar19 period. Higher imports will further put pressure on domestic prices and bring it close to historic discount levels of 4-5% on import parity.

Performance & Profitability Parameters for 2018-19 for JSW, SAIL & TATA STEEL INDIA			
	JSW	SAIL	TATA Steel India
Crude Steel production	16.69 MT	16.26 MT	16.81 MT
Saleable Steel sales	15.76 MT	14.115 MT	16.26 MT
Revenue from operations	INR 76,727 crore (standalone)	INR 66,267 crore	INR 88,987 crore
	INR 84,757 crore (consolidated)		
EBITDA	INR 18,403 crore (standalone)	INR 10,267 crore	INR 23,883 crore
	INR 18,952 crore (consolidated)		
PAT	INR 8259 crore (standalone)	INR 2179 crore	INR 9652 crore
	INR 7524 crore (consolidated)		

Courtesy: Shri Manoranjan Ram, Associate Vice President, Sales & Marketing, M/s Paul Wurth India Pvt. Ltd.

Outlook for Raw Material:

Coal-The significant rise in thermal coal production does support the rising steel production in the country, which particularly finds application in Sponge Iron industry. However, its availability to the steel sector has also been scarce, as the government continues to prioritize power plants for their supplies. There has been an upsurge in imports coal sourcing.

According to Indian Captive Power Producers Association (ICPPA), whose members include players from key sectors such as steel and aluminium, most captive power producers are facing severe shortage of the fuel which may lead to closure of plants. "The coal-based steel, power and aluminium plants continue to face supply-related issues due to unavailability of adequate railway rakes," ICPPA secretary general Rajiv Agarwal said. The Steel Secretary Binoy Kumar said the government is also taking measures to resolve the logistic issue for smooth supply of raw materials.

Stubborn costs to bring 2H19E margins under pressure:

Both, Iron ore and coking coal prices remains strong notwithstanding the steel price pressure. Coking Coal, spot at USD 228/t FoB

Aus, 3rd Quarter 2019 average of USD 220/t is 15% higher than 2nd Quarter 2018, impacted by supply restrictions in China. Whereas iron ore remains steady in USD 65-70/t range with higher-than-expected China steel production growth. With steady costs amidst declining prices we forecast 2H19 margins of TATA, JSPL to be USD 30-40/t lower than 2nd Quarter 2019 levels. Given the lag on costs and contracted volumes, Macquarie expects a down-trending margin with 3rd Quarter 2019 margins to be lower than 2nd Quarter 19 and 4th Quarter 19E margins to be lower than 3rdQuarter 19E.

China's steel demand will remain flat on year at 781mnt in 2019

China's steel demand is being forecasted to remain flat at 781 mnt in 2019 as the nation's economy undergoes "rebalancing" and environmental regulations become more stringent. From last two years, China is holding around 49% share of the world total crude production but China's steel demand growth is expected to decelerate in the absence of stimulus measures.

Association of Southeast Asian Nations

Demand in the ASEAN region is expected to resume its growth momentum backed by infrastructure programmes in 2019 and onwards. Steel demand in developing Asia excluding China is expected to increase by 5.9 per cent and 6.8 per cent in 2018 and 2019, respectively.

Major global miners proposes to switch to 65% Fe fines index pricing in Pellet contracts

Brazilian Multinational Corporation engaged in metals and mining Vale S.A. and other miners in Canada, Europe and Russia are planning to propose a switch to 65% Fe fines index pricing in pellet contracts from the 62% Fe benchmark Index has been met with concern in the steel industry.

US-China Trade Truce Agreement

- Trade War Truce is an announcement of ceasefire amid the ongoing trade war between the two countries (i.e. US and China).
- The announcement of trade war truce between Unites States and China eased the

trade tensions between the two countries for 90 days.

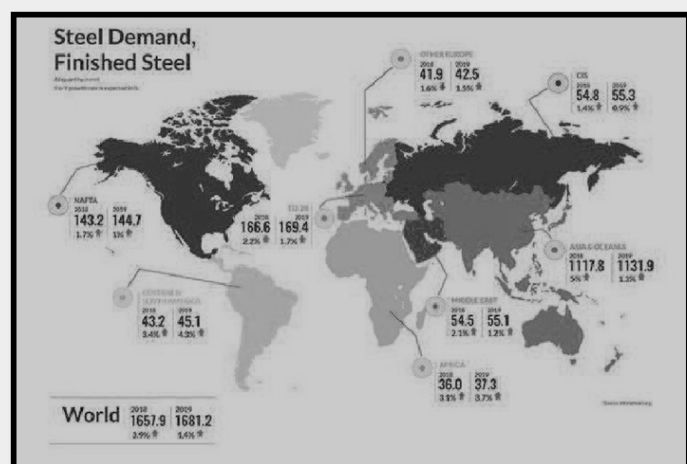
- For now US will postpone raising tariffs on Chinese imports for a fixed period of time while China pledged to purchase more US goods among others making trade war truce a win-win situations for both the countries.

Metal prices can rise

The demand from the large metal-consuming sectors is expected to grow strongly next year. Similarly, demand for other essential metals for the manufacturing of electric vehicles like the demand for copper, aluminium and nickel will increase further. Besides, ongoing global growth in construction sector activity and the worldwide planned infrastructure investments also provide a good basis for sustained demand for industrial metals. In a market situation where demand is growing faster than supply, prices tend to rise.

The Government to Focus on Increasing Per Capital Steel Consumption to 160 kg by 2030

- The government of India is keeping a brave face and its focus areas for the new year include increasing per capital steel consumption, finding new markets for India-made steel and a shift in the industry's attention towards production of special steel. The government has fixed a target to ramp up the country's crude steel production to 300 mnt by 2030 from about 138 mnt at the end of March 2018. The target for the per capital steel consumption is 160 kg by 2030.



- Union Steel Minister Chaudhary Birender Singh said "The per capita steel consumption

in India is at around 68 kg as against the world average of around 208 kg. It is very low,"

- India is number two in the world in terms of steel output and as the production is growing, it needs to look for markets locally as well as outside India, he said. "Market is possible when consumption also increases. Our focus in the new year will be to increase the per capita steel consumption in India," he said.
- The focus in 2019 would also be on increasing the output of special steel in India, the minister said. Minister added the Indian steel sector is full of opportunities and the country must aim to grab the numero uno position in quality steel production.
- Steel Secretary Binoy Kumar said steel players, especially the PSUs, will have to produce more value-added products in the coming years. The aim will definitely be to increase the output of special steel in the country, while the PSUs would need to ramp up their overall production, he said. Kumar also assured that the government would strive to ensure better availability of raw materials, which has been a key demand of the industry.
- Indian Steel Association (ISA) Secretary General Bhaskar Chatterjee said the domestic steel demand outlook in China is not optimistic and this situation raises fear of large export volumes from that country. "We hope that 2019 will not see the spectre of large scale dumping of steel in India," he said.

Source: www.steel-360.com

CURRENT STATUS OF MINERAL RESOURCES IN INDIA

Bauxite

Total resources of bauxite as per United Nations Framework Classification (UNFC) in the country are placed at 3,897 million tonnes. These resources include 656 million tonnes reserves and 3,240 million tonnes remaining resources. By grades, about 81 percent resources are of metallurgical grade. The resources of refractory and chemical grades are limited and together account for about 5 percent. By

States, Odisha alone accounts for 51 percent of country's resources of bauxite followed by Andhra Pradesh (16 percent), Gujarat (9 percent), Jharkhand (6 percent), Maharashtra (5 percent), Chhattisgarh and Madhya Pradesh (4 percent each). Major bauxite resources are concentrated in the east coast in Odisha and Andhra Pradesh.

Chromite

As per UNFC system, total resources of chromite in the country are estimated at 344 million tonnes, comprising 102 million tonnes reserves (30 percent) and 242 million tonnes remaining resources (70 percent). About 96 percent resources of chromite are located in Odisha, mostly in the Sukinda valley in Jajpur and Keonghar districts. Minor deposits are scattered over Manipur, Nagaland, Karnataka, Jharkhand, Maharashtra, Tamil Nadu and Andhra Pradesh and Telangana. Gradewise, charge-chrome grade accounts for 31 percent resources followed by ferrochrome grade (18 percent), beneficiable grade (25 percent) and refractory grade 14 percent. Low, others, unclassified and not known grades together account for 13 percent.

Copper

The total resources of copper ore in the country are estimated at 1511.50 million tonnes with about 12.16 million tonnes of copper metal. Of these 207.77 million tonnes (13.74 percent) fall under Reserve category containing 2.73 million tonnes of copper metal and the balance 1303.73 million tonnes (86.26 percent) are 'Remaining Resources' containing 9.42 million tonnes of copper metal. Rajasthan is credited with 813.33 million tonnes ore (54 percent) containing 4.48 million tonnes of copper metal, Madhya Pradesh 283.43 million tonnes ore (19 percent), containing 3.42 million tonnes copper, Jharkhand, 295.39 million tonnes ore (20 percent), containing 3.28 million tonnes of copper metal and the rest 7 percent are accounted for by other states namely Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Meghalaya, Nagaland, Odisha, Sikkim, Tamil Nadu, Telangana, Uttarakhand and West Bengal.

Gold

As per UNFC system, the total resources of gold ore (Primary and Placer) in the country were estimated at 527.96 million tonnes. Out of these, 17.23 million tonnes were placed under reserves category and the remaining 510.73 million tonnes under remaining resources category. Total resources of gold (primary), in terms of metal, stood at 654.74 tonnes. Out of these, 70.09 tonnes were placed under reserves category and 584.65 tonnes under remaining resources category. The resources include placer-type gold ore in Kerala estimated at 26.12 million tonnes containing 5.86 tonnes gold metal.

By states, largest resources in terms of gold ore (primary) are located in Bihar (44 percent) followed by Rajasthan (25 percent) and Karnataka (21 percent), West Bengal, and Andhra Pradesh (3 percent each), Telangana & Madhya Pradesh (2 percent each). Remaining very small quantity of resources of ore are located in Chhattisgarh, Jharkhand, Kerala, Maharashtra and Tamil Nadu. In terms of metal content, Karnataka remained on top followed by Rajasthan, Bihar, Andhra Pradesh, Jharkhand etc.

Iron Ore

Hematite and magnetite are the most important iron ore in India. About 59 percent hematite ore deposits are found in the eastern sector. About 92 percent magnetite ore deposits occur in southern sector, especially in Karnataka. Of these, hematite is considered to be superior because of its higher grade. Indian deposits of hematite belong to the Precambrian iron ore series and the ore is within banded iron ore formations occurring as massive, laminated, friable and also in powdery form.

As per UNFC system, the total resources of hematite are estimated at 22,487 million tonnes of which 5,442 million tonnes (24 percent) are under 'reserves' category and the balance 17,045 million tonnes (76 percent) are under 'remaining resources' category. By grades, lumps constitute about 56 percent followed by fines (21 percent), lumps with fines (13 percent) and the remaining 10 percent are black iron ore, not-known and other grades. Major resources of hematite are located in Odisha – 7,559 million tonnes (34 percent), Jharkhand –

5,286 million tonnes (24 percent), Chhattisgarh – 4,858 million tonnes (22 percent), Karnataka – 2,467 million tonnes (11 percent) and Goa – 1189 million tonnes (5 percent). The balance resources of hematite are spread in Andhra Pradesh, Assam, Bihar, Maharashtra, Madhya Pradesh, Meghalaya, Rajasthan and Uttar Pradesh.

Magnetite is another principal iron ore that also occurs in the form of oxide, either in igneous or metamorphosed banded magnetite-silica formation, possibly of sedimentary origin. As Per UNFC system, the total resources of magnetite as in 2015 are estimated at 10,789 million tonnes of which 'reserves' constitute a mere 53 million tonnes while 10,736 million tonnes are placed under 'remaining resources'. Classification on the basis of grades shows 20 percent resources of metallurgical grade while 80 percent resources belong to unclassified, not-known and other grades. The resources of coal washery and foundry grades constitute meagre proportions. India's 96 percent magnetite resources are located in four states, namely, Karnataka – 7,802 million tonnes (72 percent) followed by Andhra Pradesh – 1,392 million tonnes (13 percent), Rajasthan – 617 million tonnes (6 percent) and Tamil Nadu – 507 million tonnes (5 percent). Assam, Bihar, Goa, Jharkhand, Kerala, Maharashtra, Meghalaya and Nagaland together account for the remaining 4 percent resources.

Lead and Zinc

The total resources of lead and zinc ores as per UNFC system, are estimated at 749.46 million tonnes. Of these, 106.12 million tonnes (14 percent) fall under 'reserves' while balance 643.34 million tonnes (86 percent) are classified as 'remaining resources'. The resources of ore containing + 10 percent Pb and Zn were estimated at 124.33 million tonnes, ore containing 5 to 10 percent Pb and Zn were 329.88 million tonnes and ore containing less than 5 percent Pb and Zn were 295.35 million tonnes.

Rajasthan is endowed with the largest resources of lead-zinc ore amounting to 670.34 million tonnes (89.44 percent), followed by Andhra Pradesh 22.69 million tonnes (3.02 percent), Madhya Pradesh 14.84 million tonnes

(1.98 percent), Bihar 11.43 million tonnes 1.52 percent) and Maharashtra 9.27 million tonnes (1.24 percent). Resources are also established in Gujarat, Meghalaya, Odisha, Sikkim, Tamil Nadu, Uttarakhand and West Bengal.

Manganese Ore

The total resources of manganese ore in the country are placed at 496 million tonnes as per UNFC system. Out of these, 94 million tonnes are categorised as reserves and the balance 402 million tonnes are in the remaining resources category. Gradewise, ferro-manganese grade accounts for 7 percent, medium grade 11 percent, BF grade 28 percent and the remaining 54 percent are of mixed, low, others, unclassified, and not-known grades including 0.17 million tonnes of battery/ chemical grade. Statewise, Odisha tops the total resources with 44 percent share followed by Karnataka 22 percent, Madhya Pradesh 12 percent, Maharashtra and Goa, 7 percent each, Andhra Pradesh 4 percent and Jharkhand 2 percent. Rajasthan, Gujarat and West Bengal together shared the remaining about 2 percent resources.

Nickel

Important occurrence is nickeliferous limonite in the overburden of chromite in Sukinda Valley, Jajpur district, Odisha, where it occurs as oxide. A suitable process is being developed for its utilisation. Nickel also occurs in sulphide form along with copper mineralisation in East Singhbhum district, Jharkhand. In addition, it is found associated with uranium deposits at Jaduguda, Jharkhand and process is being developed for its recovery. Other reported occurrences of nickel are from Karnataka, Kerala and Rajasthan. Polymetallic sea nodules are another source of nickel. As per UNFC, the total resources of nickel ore have been estimated at 189 million tonnes. About 92 percent resources; i.e., 175 million tonnes are in Odisha. The remaining 8 percent resources are distributed in Jharkhand (9 million tonnes) and Nagaland (5 million tonnes). Nominal resources are reported from Karnataka (0.23 million tonnes).

Tungsten

The total resources of tungsten ore in the country,

as per UNFC system, have been estimated at 87.4 million tonnes containing 142,094 tonnes WO₃ content. All these resources are placed under 'remaining resources' category. Resources are mainly distributed in Karnataka (42 percent), Rajasthan (27 percent), Andhra Pradesh (17 percent) and Maharashtra (9 percent). Remaining 5 percent resources are in Haryana, Tamil Nadu, Uttarakhand and West Bengal. At Degana, Rajasthan, WO₃ value in vein deposits varies from 0.13 to 0.80 percent while in gravel deposit, it is, on an average 0.04 percent. In Sirohi deposit, Rajasthan, WO₃ content ranges from 0.18 to 0.51 percent.

Barytes

The total resources of barytes in India as per UNFC system are placed at 86.7 million tonnes constituting 59.2 percent reserves and 40.8 percent remaining resources. By grades, 64 percent resources are of oil-well drilling grade followed by 6 percent of chemical grade 0.5 percent of paint grade and 27 percent constitute low grade. About 2.5 percent resources are of other, unclassified and not-known categories. Andhra Pradesh alone accounts for 92 percent of the country's barytes resources followed by Telangana and Rajasthan.

Diamond

Diamond occurrences are reported since prehistoric times in the country. Presently, diamond fields of India are grouped into four regions: 1) South Indian tract of Andhra Pradesh, comprising parts of Anantapur, Cuddapah, Guntur, Krishna, and Kurnool districts and Mahaboobnagar in Telanga; 2) Central Indian tract of Madhya Pradesh, comprising Panna belt and Chhatarpur districts; 3) Behradin-Kodawali area in Raipur district and Tokapal, Dugapal etc. areas in Bastar district of Chhattisgarh; and 4) Eastern Indian tract mostly of Odisha, lying between Mahanadi and Godavari valleys. As per the UNFC system all India resources of diamond are placed at around 31.84 million carats. Out of these, 0.96 million carats are placed under reserves category and 30.87 million carats under remaining resources category. By grades, about 2.38 percent resources are of gem variety, 2.64 percent of industrial variety and bulk of the resources (95 percent) are placed under unclassified

category. By states, Madhya Pradesh accounts for about 90.18 percent resources followed by Andhra Pradesh 5.73 percent and Chhattisgarh 4.10 percent.

Dolomite

Dolomite occurrences are widespread in the country. As per UNFC system, total resources of dolomite are placed at 8,415 million tonnes, out of which 679 million tonnes are placed under reserves category. Major share of about 88 percent resources was distributed in eight states: namely, Madhya Pradesh (27 percent), Andhra Pradesh (15 percent), Chhattisgarh (11 percent), Odisha (10 percent), Karnataka and Rajasthan (7 percent each), Gujarat (6 percent) and Maharashtra (5 percent). The remaining 12 percent resources are distributed in Arunachal Pradesh, Jharkhand, Haryana, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal.

Fire Clay

India possesses substantial reserves of fireclay. The best deposits occur in association with the coal seams in the lower Gondwana coalfields of Andhra Pradesh, Jharkhand, West Bengal, Madhya Pradesh and Neyveli lignite fields in Tamil Nadu. Notable occurrences of fireclay, not associated with coal measures, are reported in Gujarat, Jabalpur region of Madhya Pradesh and Belpahar-Sundergarh areas of Odisha. Reserves and resources of fireclay as per UNFC system are estimated at 723 million tonnes. Out of the total resources, Odisha accounts for 24 percent followed by Madhya Pradesh (18 percent), Tamil Nadu (16 percent), Jharkhand (9 percent) and Rajasthan and Gujarat (8 percent each). Gradewise, refractory-plastic grade accounts for 37 percent followed by refractory-unspecified (14 percent) and refractory-non-plastic/semi-plastic (16 percent). The remaining 33 percent are of others, unclassified and not known grades.

Fluorspar

As per the UNFC system, the total resources of fluorite in the country in 2015 are estimated at 18.18 million tonnes. Out of these, 0.29 million tonnes are placed under reserves category. By states, Gujarat accounts for 66 percent of the total resources having 12 million tonnes,

followed by Rajasthan with 5.24 million tonnes (29 percent), Chhattisgarh 0.55 million tonnes (3 percent) and Maharashtra 0.39 million tonnes (2 percent). Gradewise, the resources are classified into marketable grade which accounted for 81 percent to the total resources, followed by low grade (17 percent) and unclassified grade (2 percent).

Gypsum

As per UNFC system, the total resources of mineral gypsum in India are estimated at 1,330 million tonnes of which 37 million tonnes have been placed under 'reserves' and 1,293 million tonnes under 'remaining resources' category. Of the total resources, fertilizer/ pottery grade accounts for about 80 percent and cement/ paint grade 13 percent. The unclassified and not-known grades together account for 5 percent resources. The remaining two percent of resources is shared by surgical plaster and soil reclamation grades. By States, Rajasthan alone accounts for 81 percent resources and Jammu & Kashmir 14 percent resources. The remaining 5 percent resources are in Tamil Nadu, Gujarat, Himachal Pradesh, Karnataka, Uttarakhand, Andhra Pradesh and Madhya Pradesh.

Graphite

Graphite occurrences are reported from various states but the deposits of economic importance are located in Andhra Pradesh, Jharkhand, Karnataka, Kerala, Odisha, Rajasthan and Tamil Nadu. As per the UNFC system, the total resources of graphite are placed at about 194.89 million tonnes, comprising 7.96 million tonnes in the reserves category and 186.93 million tonnes under remaining resources category. Arunachal Pradesh accounts for 37 percent of total resources, followed by Jammu and Kashmir (32 percent), Odisha (10 percent), Jharkhand (9 percent) and Tamil Nadu (4 percent). However, in terms of reserves, Jharkhand has leading share of about 52 percent followed by Tamil Nadu 41 percent.

Ilmenite

Ilmenite and rutile along with other heavy minerals are important constituents of beach sand deposits found right from Ratnagiri coast (Maharashtra) in the west to Odisha coast in the east. These minerals are concentrated in Kerala,

Tamil Nadu, Odisha and Andhra Pradesh. As per the UNFC system, the total resources of ilmenite are estimated at 355.48 million tonnes (including leucoxene), inclusive of indicated, inferred and speculative categories.

Kaolin

China clay resources in the country as per UNFC system have been placed at 2,941.25 million tonnes. The reserves constitute only about 8 percent of the resources at 229.47 million tonnes. The resources are spread over in a number of states of which Kerala holds about 23 percent, followed by West Bengal 14 percent, Rajasthan 18 percent, Odisha 10 percent and Karnataka 9 percent. Out of total resources, about 26 percent or 771 million tonnes fall under ceramic/ pottery grade, 4 percent are classified under chemical, paper filler and cement grades and about 70 percent or 2,040 million tonnes resources fall under mixed grade, others, unclassified and not-known categories.

Kyanite and Sillimanite

The total resources of kyanite as per UNFC system in the country are placed at 105 million tonnes. Statewise, the share of Telangana is 46 percent of total resources followed by Andhra Pradesh 30 percent, Karnataka 13 percent and Jharkhand 7 percent. Remaining 4 percent resources are in Kerala, Maharashtra, Rajasthan, Tamil Nadu and West Bengal.

The total resources of sillimanite as per UNFC system in the country in 2015 are placed at 70.2 million tonnes. The resources are located mainly in Tamil Nadu and Odisha (25 percent each), Uttar Pradesh (16 percent), Andhra Pradesh (13 percent), Kerala (10 percent) and Assam (7 percent). Remaining 4 percent resources are in Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Rajasthan and West Bengal.

Limestone

The total resources of limestone of all categories and grades as per UNFC system are estimated at 203,225 million tonnes. Karnataka is the leading state having 27 percent of the total resources followed by Andhra Pradesh and Rajasthan (12 percent each), Gujarat (10 percent), Meghalaya (9 percent), Telangana (8 percent) and Chhattisgarh (5 percent).

The total resources of chalk of all categories and grades as per UNFC system in 2015 are estimated in Gujarat at 6.75 million tonnes of which 5.06 million tonnes (75 percent) are under reserves category and 1.69 million tonnes are under remaining resources category.

Mica

Most important mica-bearing pegmatites occur in Andhra Pradesh, Bihar, Jharkhand, Maharashtra and Rajasthan. Occurrences of mica pegmatites are also reported from Gujarat, Haryana, Karnataka, Kerala, Odisha, Tamil Nadu and West Bengal. As per UNFC, the total resources of mica in the country are estimated at 635,302 tonnes. Andhra Pradesh leads with 40 percent share in country's total resources followed by Rajasthan (28 percent) Odisha (16 percent), Maharashtra (13 percent), Bihar (2 percent) and balance (less than 1 percent) in Jharkhand and Telangana.

Magnesite

The total reserves/ resources of magnesite as per UNFC system are about 394 million tonnes. Substantial quantities of resources are established in Uttarakhand (59 percent), followed by Rajasthan (14 percent) and Tamil Nadu (25 percent). Resources are also located in Andhra Pradesh, Himachal Pradesh, Jammu and Kashmir, Karnataka and Kerala. Occurrences of magnesite in Tamil Nadu are low in lime and high in silica whereas those of Uttarakhand are high in lime and low in silica.

Phosphate Minerals

The total resources of apatite as per UNFC system are placed at 24.04 million tonnes. Of the total resources, the bulk (57 percent) is located in West Bengal followed by Jharkhand (30 percent) and Meghalaya (5 percent). The remaining 8 percent resources are available in Rajasthan, Andhra Pradesh, Gujarat and Tamil Nadu. The total resources of rock phosphate as per UNFC system in 2015 are placed at 312.68 million tonnes. Of the total resources, 34 percent are in Jharkhand, 31 percent in Rajasthan, 19 percent in Madhya Pradesh, 8 percent each in Uttar Pradesh and Uttarakhand. Meagre resources are located in Gujarat and Meghalaya.

Other Minerals

Other minerals occurring in significant quantities in India are bentonite (Rajasthan, Gujarat, Tamil Nadu, Jharkhand and Jammu & Kashmir), corundum (Karnataka, Andhra Pradesh, Rajasthan, Tamil Nadu, Telangana and Chhattisgarh), calcite (Andhra Pradesh, Rajasthan, Madhya Pradesh, Tamil Nadu, Haryana, Karnataka, Uttar Pradesh and Gujarat), fuller's earth (Rajasthan, Telangana, Arunachal Pradesh, Assam, Madhya Pradesh and Karnataka), garnet (Tamil Nadu, Orissa, Andhra Pradesh, Rajasthan and Kerala), pyrites (Bihar, Rajasthan, Karnataka, Himachal Pradesh, West Bengal and Andhra Pradesh), steatite (Rajasthan, Uttarakhand, Kerala, Maharashtra, Andhra Pradesh and Madhya Pradesh), wollastonite (Rajasthan and Gujarat), Zircon (beach sands of Kerala, Tamil Nadu and Orissa) and quartz and silica minerals and Granite are widespread and occur in nearly all states. Besides, the country has vast marble, slate and sandstone deposits. Marble occurs mainly in Rajasthan, Gujarat and Jammu and Kashmir; slate in Andhra Pradesh and Haryana.

NB: The resource data pertaining to the latest available information for the period 2015

Source: India 2018

300 MNT BY 2030 A SCORABLE GOAL?

India does not seem to be faring too badly against the backdrop of the global steel industry. As per the World Steel Association's (WSA's) Short Range Outlook (SRO), April 2019, demand for steel in India is expected to grow by above 7% in the current as well as next year compared to the global steel demand growth of 1.3% in 2019 and an even slower 1% in the upcoming calendar of 2020. According to WSA, it is likely that India will also pip the United States to become second in steel use by the end of 2019 as its steel demand is expected to clock 102.3 million tons (MnT), a growth of around 7.5% year-on-year. Even officials at ICRA tracking the steel industry say that a 6-7% growth in steel consumption should be sustainable in India going forward.

But India should not stay contented. As a new government settles in and as we move towards

the targeted 300 MnT of crude steel capacity by 2030-31, questions do arise as to how realistic a goal this is, despite the fact that we still have 11 years to dribble towards it. But, are 11 years that long a period? Because planning and execution take time, there are land hurdles too in terms of greenfield options and steel plants have long gestation period. Industry insiders that Steel 360 spoke to do voice concern over certain factors that could be obstacles to scoring this goal. These roadblocks include factors like the consumption rate, the quantum of investment required to reach 300 MnT of installed crude steel capacity and, importantly, over-production.

Consumption

So what would have to be the consumption trend, to warrant a doubling of capacity?

Finish long steel PRODUCTION	45.18 ^{FY18}	48.07 ^{FY19}
Finish flat steel PRODUCTION	45.18 ^{FY18}	48.07 ^{FY19}
Finish long steel CONSUMPTION	45.18 ^{FY18}	48.07 ^{FY19}
Finish flat steel CONSUMPTION	38.16 ^{FY18}	41.57 ^{FY19}

Qty in mt | Source: JPC, SteelMint Stats

An industry source says, "Even if the plants run at 80-85% capacity by 2030-31, production would be at 250-260 MnT. So, the present over-100 MnT production level should reach around 260 MnT by 11 years, ignoring imports and exports, assuming that these two will cancel out each other." The source adds a footnote: "But that consumption number may not be astronomical by 2030."

India's consumption of finished steel grew 7.5% year-on-year (y-o-y) in April-March, 2018-19 (FY19) to 97.54 MnT, as per data available of Steel 360. According to other sources, it is estimated that the country will end FY19 with a consumption volume of 96-97 MnT and this

is expected to rise to 102-103 MnT in FY20 and 110-111 million tons in FY21. As per IBEF, India's steel consumption is anticipated to increase to an ambitious "230 MnT by 2030-31 from 90.68 MnT in 2017-18". The National Steel Policy, 2017, on its part, aims to increase per capita steel consumption to a more conservative 160 kg by 2030-31. At the same time, it cautions that today the steel industry in India faces challenging external conditions manifest in slow economic growth and idle steel capacity globally.

Going forward, the accelerated spend in the infrastructure sector, expansion of railways network, development of the domestic shipbuilding industry, opening up of the Defence sector for private participation, anticipated growth in the automobile and capital goods industry and construction in urban and rural areas, are expected to create significant demand for steel in the country. Growth in steel consumption in a country is typically linked to the economic growth and steel intensity. While growth in GDP is a crucial determinant of growth in the overall consumption level, steel intensity is the definitive parameter for an economy and determines the growth rate of steel demand vis-à-vis consumption over time, as per the NSP, 2017.

The 2017 Policy further says it is expected that at the current rate of GDP growth, steel demand will grow threefold in the next 15 years to reach 212-247 MnT by 2030-31. However, even with this demand of finished steel by 2030-31, India's per capita consumption would reach only 160 kg, lower than the current global average of 208 kg. But the Policy also avers that with weak global economic prospects, the Indian steel industry will have to strongly depend on the growth of domestic consumption for its future. Currently around 40% of the steel consumption is from the construction and infrastructure sectors, which is expected to increase to 59% by 2030-31. A highly placed industry source, when posed the question, replied: "If you want my personal opinion, well, we will not be anywhere close to it (300 MnT by 2030). And what makes me say that? Because, we are not adding capacity to that extent. We can't add capacity unless we reach consumption to a level that warrants that capacity." However, the positive aspect is that India's per capita

steel consumption stood at 70 kg, which is way below the world average of 208 kg, indicating that there is a huge unrealised potential for steel demand growth, say industry sources.

Jayanta Roy, Senior Vice President, Group Head, Corporate Sector Rating, ICRA, opined that making predictions for the next 10-12 years is always difficult. "Currently, we are at around 135 MnT of installed capacity. The country has become the second largest steel producer in the world with production of 106.5 MnT, overtaking Japan, with a growth rate of 4.9% year-on-year in 2018. The increase in capacity in the next three years is estimated at 18-19 million tonnes (roughly, SAIL – 4.3 MnT, NMDC – 3 MnT, JSW – 6.7 MnT, Tata Steel – 5 MnT). That would include the ramp-up of capacities which are changing hands through the NCLT process as well as brownfield expansion projects of JSW Steel, Tata Steel and the greenfield project of NMDC, and a full ramp-up as far as the Steel Authority of India Limited (SAIL) is concerned. Broadly, these would be some of the large projects. Thereafter, there will have to be new capacities, because, through the NCLT process, we are not adding to the capacity. Essentially, these capacities are changing of hands. Hopefully, capacity utilisation will improve. But the installed base will not."

Investment

As per the steel industry thumb-rule and depending upon the project scope and structure, roughly 1 MnT of greenfield steel capacity would require a USD 1 billion of investment. Even if we take a ballpark figure of USD 800 million at a conservative estimate, assuming that the cost of setting up the plant becomes cheaper, we are talking of adding another 150 MnT of capacity in the next 11 years. This, in effect, would mean setting up additional capacity of 150 MnT at a rate of USD 800 million per ton, which, in turn, would require USD120 billion till 2030-31. "Is the steel industry in a position to invest that kind of money, considering that the overall scenario is still quite tepid at present, although, going forward, things may improve," asks Roy.

Of course, the WSA SRO says that continuing infrastructure projects are likely to support growth in steel demand above 7% in both 2019

and 2020. So, let us hope for the best.

Roy continues that 7% is not a modest growth considering the global growth prognosis. "7-8% growth is not a bad number," he says. But he emphasises that USD120 billion is a very large investment amount, indeed. "My key concern is that who has this kind of investment ability? Some of the large players would have their hands full. They may have deep pockets and balance sheet strength to talk about greenfield capacity. But they would be busy with their existing NCLT acquisitions as well as their existing greenfield projects till FY21-22. And since NCLT cases are readily available on ground, the primary focus would be to acquire companies which have a strategic fit with the acquiring company. But this approach will not increase the installed base in the country," he insists. The amount of USD 800 million has taken as a ballpark figure because investments depend on the project scope. It is not that every project will require USD1 billion investment per 1 million tonne of capacity. Some projects may require additional investment in terms of infrastructure related to port and connectivity etc while others may not. Another source also corroborated Roy. "But who can invest that kind of money or a substantial portion of that quantum? Even if a player wants to invest, and assuming a capex gearing of 1:2, we are talking of USD 40 billion of equity and USD 80 billion of debt. Would Indian capital markets and the banking sector have that kind of money available to invest in the steel segment? And let us not forget that steel remains a cyclical industry. In the last cycle, steel had the dubious distinction of having the second largest pie in the overall non-performing assets (NPA) portfolio," he stresses. So, would banks be generous enough to lend once again? They may do so to strong companies but not to the others who are not batting on a strong pitch.

An official from a leading technology provider observes that investment-wise, in the current scenario, previously placed contracts are all coming to an end. For instance, Bhilai Steel Plant, RINL's Vizag Steel Plant and more. This wave of contracts had been awarded some time ago and now have been fully effected and some of those installations are at present in operation. However, the source says that although the

next wave of 300-MnT by 2030 is coming up, at the moment it is only being talked about. "We are not seeing it yet, with a few exceptions. Very few concrete projects are being talked about. But, for 2030 to become a reality, the planning will have to start soon," the source insists. The source feels that the execution of plans should start sooner than 2026, because, he says, if the steel mills wait until the next seven years, the financial expenditure will all happen at the end of the period leading to 2030. From a business point of view, the steel companies should spread their costs over some years and for that to happen they need to start planning soon, he insists.

Over-production

The third, and an equally important, factor is related to over-production. Steel 360 has access to research based on government data which denotes that consumption is really not a factor in India but over-production is.

2017-18	Excess Production (Production for Sale less Consumption)	Imports	Exports	JPC Retail Prices in March 2018, Kolkata	Landed Cost in March 2018	Exports Price in INR/Tonne	Lost Revenue in Excess Production in INR Crores=Excess Production x Domestic Prices	Imports in INR Crores	Exports in INR Crores	Net Loss in INR Crores =Loss of Revenue in Excess Production less Imports plus Exports
Pig Iron	539	16	518	35575	37349	28996	1917	60	994	2842
Sponge Iron	599	78	395	25500	17125	14846	1527	134	579	1973
Semis	803	917	1994	44956	45918	30234	3630	4128	6029	5911
Bars and Rods	2404	243	2042	47526	48719	36729	13423	1184	7500	17749
Structurals	101	37	134	48944	49330	35690	944	182	621	504
Railway Materials	71	29	43	45909	49130	56279	326	142	242	425
Plates	41	574	491	49525	51952	101053	203	2992	5001	1816
HR Coils	1016	1701	2820	52538	54590	32234	5338	9559	9372	5151
HR Sheets	121	19	98	49788	51110	38421	602	97	69	574
CR Coils	1635	343	1230	55500	59104	46171	9074	3209	4941	13864
CR Sheets	105	840	1086	47500	46678	51703	2253	5621	5615	2247
Total	7281									48882

Dr. Susmita Dasgupta, Joint Chief Economist, Economic Research Unit, Joint Plant Committee, Ministry of Steel, tells Steel 360 that the problem is typically Schumpeterian or Krugmanian or even Galbraithian. "This is known as the problem of over-production. Typically, this means that when technology of a sector becomes standardised then it is very easy to bring in fresh capacities to production. Whatever the consumption of steel is, more production capacity will rush in because technology of steel production is easy," she emphasises, adding, "So, the problem is not of failed consumption but of over-production... just because people know how to make steel and yet know very little of how to do things, they will continue to bring in

more capacities even with responses to small increases in consumption."

She backs up her thesis with data which reveals that in 2017-18 there was excess production (which is equal to production for sale minus consumption) of a whopping 7.281 MnT with a value of INR 48,582 crores. This amounts to INR 67,000 per tonne of loss due to excess production. This is almost three times the worth of capital expenditure per tonne of steel produced through the blast furnace-basic oxygen furnace (BF-BOF) route!

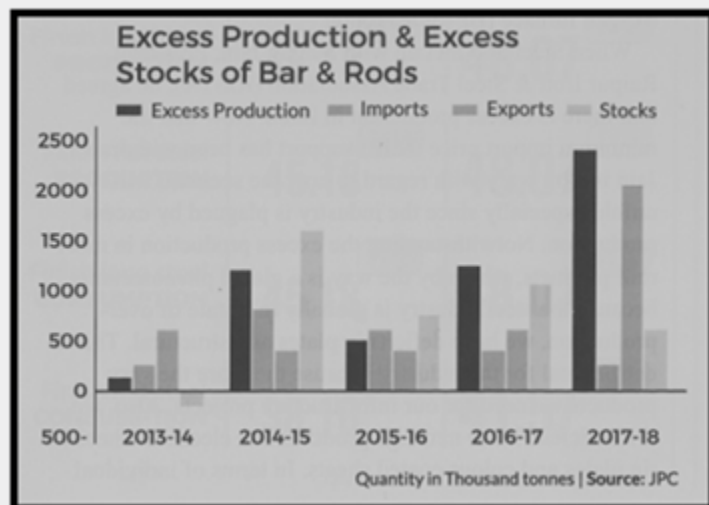
When Steel 360 met up with Sanjay Jain, President, Raipur Iron & Steel Trade Association (RISTA), he agreed that there is excess production in India. Now that the minimum import price (MIP) support has been withdrawn, Jain is a bit wary with regard to how the scenario will unfold especially since the industry is plagued by excess production. Notwithstanding the excess production in most mill products, which by the way is a global phenomenon because the steel industry is globally in a state of over-production, we have deficits in plates and structural. This is detrimental for the industry because these are the very products we need for our infrastructure projects. Also, we are deficit in the new-age products like electrical sheets, tin plates and colour-coated sheets. In terms of individual product classes, we see that over-production hit the hardest in the bars and rods, cold rolled (CR) coils and semis categories. For instance, in 2017-18, excess bars and rods production was to the tune of 2.404 MnT and in CR coils, the surplus was at 1.635 MnT. "Let us not imagine that over-production is temporary or fleeting because as per the JPC data, it appears that overproduction is as endemic to the Indian steel industry as it is anywhere else in the world," says Dasgupta. And she makes a startling point in saying that "the culprit behind excess stocks is neither imports nor frail consumption but excess production of steel owing to wrong signals of the 300 MnT".

Exports a de-stocking activity

She further says that excess production and not imports is the key to excess stocks and that exports are only a destocking activity.

"Unfortunately, the large producers seem to have bloated the capacity in the bars and rods segment. We clearly observe (see graph)

that unsold stocks have something to do with production and consumption rather than with imports and exports," she says.



In case of the HR products, we see very clearly that though stocks have been managed very well, most probably due to hectic exports at very low prices, excess production stays on. Dasgupta says the stocks of HR coils are again related to consumption rather than to imports and exports. "It seems that first production plans are put in place through anticipation of consumption and then exports are planned. Imports may be rather specific to some grades within a product class," she adds.

"In the case of CR coils, the excess production is driven up almost entirely by the large plants. Indeed, many of these plants may have been small scale but have now expanded in scale due to efforts at accommodating new technologies which are more comfortable in the large scale," she says.

Opportunities

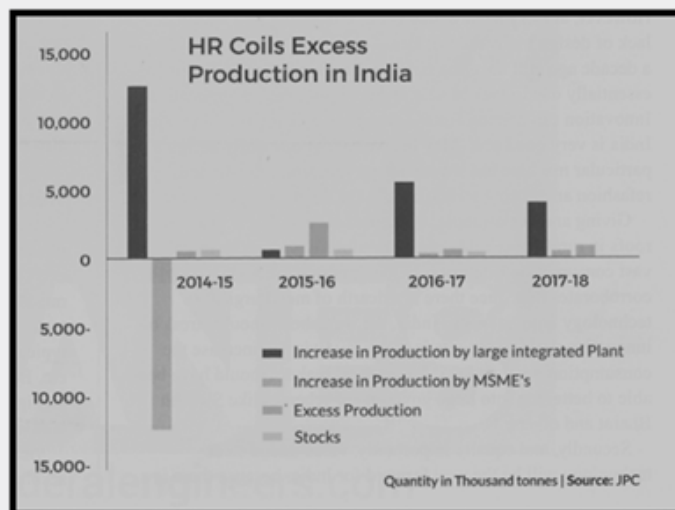
But, despite the impending obstacles, various sections of the industry are upbeat about achieving the 300 MnT target, even perhaps before the 2030 deadline. Officials from many leading steel mills have sounded confident too, basing their optimism on India's burgeoning infrastructure requirement.

Earlier, in December 2018, Steel Minister Chaudhary Birender Singh had told media persons at a conclave in Bhubaneswar that in view of the proposed additional capacity in the next 10-12 years, the Indian steel industry is

expected to invest USD 128 billion and that India will have to import a large number of critical plants and equipment valued at almost USD 25 billion to meet the needs of its steel industry by 2030-31.

	Gross production	Downstream production	Production for sale	Consumption	Excess production
2017-18					
Bars & rods	35791	0	35791	33387	2404
Structurals	8029	0	8029	8230	-201
Railway materials	1279	0	1279	1208	71
Plates	5143	0	5143	5184	-41
HR coils	38027	22464	15563	14547	1016
HR sheets	2436	0	2436	2315	121
CR coils	15620	7626	7994	6359	1635
GP/GC sheets	7044	818	6226	5891	335
Colour-coated sheets	1636	0	1636	1899	-263
Electrical sheets	244	0	244	728	-484
Tin plates	433	0	433	588	-155
Pipes	2230	0	2230	2006	224
TMBP	0	0	0	1	-1
Total mild steel	117912	30908	87004	82343	4661

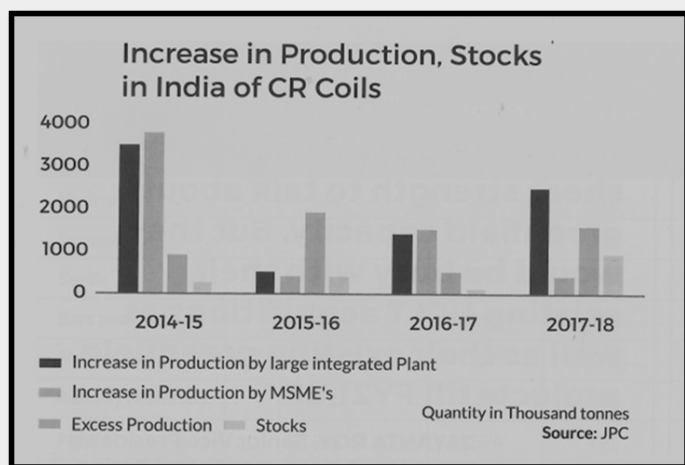
A technology expert too observes that there is, on paper, huge demand potential for steel consumption to warrant 300 MnT. However, at this juncture, that is not translating into reality due to lack of design innovations. "For instance, why would a road built a decade ago still have the same look and feel today? This is essentially due to lack of new and emerging design applications. Innovation can happen around designing existing machines since India is very good at it. May be, we cannot originally design a particular machine but we can adapt, reinvent, retro-fit and refashion an existing technology," says the tech expert.



Giving another example, the source reveals that if thatched roofs in rural households can be

reinforced with steel, there is a vast consumption catchment hidden in there. Another source corroborates that since there is a dearth of metallurgical technology innovations in India, the way ahead should stress on innovative design concepts in everyday living to increase the consumption base, and that Indian steel makers should have been able to better tap into huge government schemes like Swachh Bharat and others.

Secondly, and equally importantly, value-added steel technology will be the way forward for India, because there is a paradigm shift in the demand pattern. New and emerging



sectors are coming up. Except for auto grade steel, which requires immense value-addition, all major producers are trying hard to make those grades of steel where the maximum imports are taking place, especially in CR products. For instance, there is a gap in CRGO steel. There is also demand for some high-grade non-grain oriented sheets which are not indigenously available. Thirdly, there is scope in terms of specialised steel in underground tunnels, high-speed trains and robotics. In fact, many say that robotics is the way forward and is not too expensive a technology either. India could do with robotics' help in low-rung jobs like garbage cleaning etc. space missions will be an area where steel will find huge applications, say industry circles. That apart, many say, there is a tremendous gap in quality ship-building plates because our producers don't make that grade in India. Special bar quality (SBQ) grade is required for ship-building and a source says that SAIL is capable of producing it. However, the problem lies in the fact that

in order to build a ship of average capacity, there is a requirement of 4,000-5,000 tonnes of steel, that mainly go into making the hull and platform and where pieces of steel with varying widths and lengths are involved which does not make it viable for any steel manufacturer to produce at such a niche level and keep in stock. "Materials ranging from 50-100 tons of width, thickness and length are required and so it is better to import this dimension. Moreover, merchant shipping has had its own issues and demand was also not high," reasons a source.

Tailpiece

Overall, there are emerging sectors like wind power, solar, defence, space missions etc which need to be tapped and demand created. And India must be able to produce these grades since the technology is available. Some of the grades require typical alloying elements with vanadium, niobium etc. But then the order positions will also have to be high to warrant production domestically, conclude sources. Meanwhile, it's an open field where primary and secondary players must take positions.

Source: Steel 360

STEEL INDUSTRY TO FACE RAW MATERIAL SHORTAGE, SAYS MINISTRY REPORT

The Steel Ministry foresees a raw material supply crunch due to environmental constraints, mining caps, inadequate infrastructure to move iron ore, and the strain on overall reserves position. A Ministry report 'Long-Term Perspectives for the Indian Steel Industry' says that if the target of 300 million tonnes of crude steel making capacity by 2025-26 is to be achieved, the country will have to work towards greater exploration, raising mining capacities and developing infrastructure, or else brace up for significant exports. The report also says the supply crunch will hit producers without captive mines, who will have to depend on small merchant markets.

"In the absence of an export market and continued policy push for value addition, the merchant iron ore mining industry will go for value addition and consume much of the iron ore themselves. This will complicate the supply

line further," the report stated. As per Ministry estimates, the projected ore demand by 2025-26 will be 346 mt, assuming an 8 per cent growth in GDP. The Ministry has thus recommended a relook at the policy framework to enable the steel industry to capitalise on the domestic resources and turn it into a competitive advantage. "Given that exploration efforts have been limited due to various constraints there are not enough mines to be allocated on captive basis to the new generation of steel producers," the report states.

"Further, with the State Governments holding priority in allocating mines either to their own PSUs, the aggregate benefits from this policy framework will be limited." Similar concerns have also been raised about the shortage of coking coal in the country. But, despite the supply concerns of raw material for the steel industry, the Ministry said mega steel projects need to be set up in States such as Jharkhand, Chhattisgarh and Odisha to reach the 300 million tonne production target by 2025-26. "For realising the national mission of having steel capacity of 300 mt by 2025-26 an additional steel production capacity of 176 mt per annum in the eastern sector and 26 mt a year in the rest of the country is required," the report said. The additional capacity will generate 3.15 lakh of direct employment, the report added.

Source: Metal Junction...

CONSTRUCTION SECTOR TO LEAD RECOVERY IN STEEL DEMAND: ICRA

While the performance of domestic steelmakers is likely to be lower in the first quarter of the current financial year as compared the previous year due to several headwinds, the construction sector will be at the forefront of demand recovery in the second half, according to investment information and credit rating agency ICRA. The new government's thrust on infrastructure creation will be known when it presents the full Union Budget for 2019-20 in July, it said.

According to an ICRA report, domestic steel consumption growth eased to 7.5 percent in FY19 from 7.9 percent in FY18 due to liquidity

and fuel price related headwinds faced by the auto sector during the second half.

The demand growth moderated further to 6.4 percent in April and is likely to remain lower than the FY19 levels in the first quarter due to continued weakness in the auto sector and reduced construction-related activities during the general election period. This, coupled with elevated coking coal prices, is likely to affect the financial performance of domestic steelmakers, said the report.

Spot price of seaborne premium hard coking coal, which accounts for 40 to 45 percent of the steelmaking cost for a domestic blast furnace operator, has remained above \$200 per ton, supported by a healthy 10.1 percent growth in Chinese crude steel production during January to April of 2019. Given that domestic steel hot rolled coil prices have weakened sequentially from Rs 41,250 per ton in January to March to Rs 40,500 per ton in April to June, elevated coking coal prices are likely to keep the profitability of domestic blast furnace operators under pressure in the current quarter.

"We have already seen a contraction in gross contribution levels of a domestic blast furnace operator by around Rs 3,000 per ton in Q4 FY19," said Jayanta Roy, ICRA's Senior Vice-President and Group Head for Corporate Sector Ratings. "In the current quarter, with coking coal prices remaining firm and steel prices under pressure, we see a further contraction in gross contribution levels by about Rs 400 to 500 per ton over Q4 FY19," Roy said.

However, in the case of iron ore the other key steelmaking ingredient Indian mills have benefited from the domestic supply glut due to a significant ramp-up in mining activities in Odisha where a large number of iron ore mines would witness lease expiry in March 2020. "This has helped partly insulate domestic ore prices from the steep rally in sea-borne prices following the supply disruptions from Brazilian Miner Vale," Roy said. Despite expectations of reduced imports, domestic steel production growth is likely to remain modest in the second quarter of current fiscal due to the seasonal weakness in demand and will recover in second half mirroring steel consumption trends.

Unlike elevated coking coal prices, price of

thermal coal, an important cost driver for secondary steelmakers producing steel through the sponge iron route, have seen significant easing in the last few months. Coal India's spot e-auction premiums declined to 69 percent in April 2019 against 92 percent in April 2018 and 100 percent during October- March of FY19. The decline in seaborne thermal coal prices have been even steeper, with thermal coal from South Africa having gross calorific value (GCV) of 6,000 kcal/kg correcting by around 30 percent in the last six months. Consequently, the gross contribution for a secondary steel producer has been more resilient to softening steel prices compared to blast furnace operators largely due to lower thermal coal prices.

Despite flat and negative production growth rates reported by large steel producing regions such as India and the EU respectively, global steel production growth during four months of 2019 stood at 4.8 percent, largely supported by a healthy growth registered by China. China's steel production growth stood at 10.1 percent in four months of 2019 on the back of improved domestic demand, which in turn was aided by a pick-up in real estate and infrastructure related activities post the Chinese New Year. However, escalation of trade tensions between China and the US in May 2019 points to possibilities of moderation in Chinese economic activities in the coming months, which would keep its steel production growth and in turn global steel production growth under check in the near term. While the World Steel Association in April 2019 revised upwards its forecast for Chinese steel demand to 1 percent for 2019 from 0 percent estimated in October 2018, China's commitment towards infrastructure spending would be crucial to achieve this demand growth.

On the domestic front, says ICRA, softening demand and a 34 percent dip in steel exports kept the domestic crude steel production growth low at 3.3 percent in FY2019. While the steel imports grew by 4.7 percent in FY2019 and kept India a net importer of steel during that year, imports are expected to go down in the coming months as the domestic hot-rolled coil (HRC) prices are currently trading at a 6 percent discount to imported offers. Despite

expectations of reduced imports, domestic steel production growth is likely to remain modest in Q2 FY2020 due to the seasonal weakness in demand, and would recover in H2 FY20 mirroring steel consumption trends.

"While there is a scope for an immediate price hike due to the current disparity between the domestic and imported steel prices, ICRA expects that any meaningful price improvement would happen only in H2FY20, when the infrastructure spending is likely to gain momentum and the auto sector is expected to do well on the back of pre-buying ahead of the BS-VI rollout. International steel prices would also remain a strong determinant of domestic prices.

Source: Steel Insights

STEEL MINISTRY COMES UP WITH DRAFT STEEL SCRAP POLICY

The government has come out with draft steel scrap policy, which is aimed at curtailing import dependency and make India self-sufficient by producing high-quality ferrous scrap. The draft steel scrap policy, on which the Ministry of Steel has sought comments from the stakeholders by July 14, 2019 aims to promote resource efficiency in the steel sector. "The policy envisages to set up environmentally sound management system for ferrous scrap which can encourage processing and recycling of ferrous scraps through organised and scientific metal scrapping centres across India to minimise dependency on import of scrap and make India self-sufficient in scrap availability," said the draft steel scrap policy.

As per the draft dated June 28, 2019, the ministry or its appointed agency or other designated statutory bodies shall ensure that the policy is implemented in accordance with the state of the art environmental friendly technologies and in compliance with applicable acts, rules and regulations. The draft policy aims to promote circular economy in the steel sector and produce high-quality ferrous scrap for quality steel production thus minimising the dependency on imports. Other objectives are to decongest the Indian cities from end-of-life vehicles (ELVs) and reuse of ferrous scrap,

processing and recycling of products in an organised, safe and environment friendly manner and to evolve a responsive ecosystem by involving all stakeholders among others.

In 2017, the government had launched the National Steel Policy 2017 with an aim to develop a globally competitive steel industry by creating 300 million ton per annum steel production capacity by 2030 with a contribution of 35-40 percent from Electric Arc Furnaces (EAFs)/ Induction Furnaces (IFs) Route – used by secondary players. “Although, ferrous scrap is the main raw material for secondary sector but primary sector also uses scrap in the charge mix of Basic Oxygen Furnace (BOF) to the tune of 15 percent to improve efficiency minimize cost of production and other process needs,” it said. It said availability of raw materials at competitive rates is imperative for the growth of the steel industry and to achieve the NSP-2017 target. Thus, the availability of quality scrap in adequate quantity is one the critical factors for future growth for both secondary as well as primary sector. “Keeping this objective in view and in order to develop a globally competitive steel industry by adopting state of art environment friendly technologies, Ministry of Steel has prepared a draft steel scrap policy envisaging a framework to facilitate and promote establishment of ferrous/ steel scrapping centres in India,” it said.

The draft policy said there is a worldwide trend to increase steel production using scrap as the main raw material as recycling of scrap helps in conservation of vital natural resources besides other numerous benefits. The use of every ton of scrap shall save 1.1 ton of iron ore, 630 kg of coking coal and 55 kg of limestone, it added.

Availability of right quality of scrap, in adequate quantity, is one of the critical factors for future growth for both EAF/IF sector. Keeping this objective in view and in order to develop a globally competitive steel industry by adopting state of art environment-friendly technologies, Ministry of Steel has prepared a draft steel scrap policy envisaging a framework to facilitate and promote the establishment of ferrous scrap/ steel scrapping centers in India. All stakeholders are requested to submit comments latest by July 14, 2019.

Responsibilities of dismantling & Scrap Processing Centres

Scrap processing centers shall have:

- Appropriate equipment and use best available technology in shredding, shearing, baling, slitting etc.
- Radioactive detection equipment
- Provisions for storing segregated scraps to cater to downstream units
- Best available technology/ disposal plans in place for processing residue
- Adequate space for equipment, storage and handling of aggregated waste streams
- Adequate competent and trained manpower to operate facility in a safe and environment-friendly manner
- Centres shall be in consonance with the Factory rules and as per the Industrial norms
- Manpower development through continuous training and evaluation
- Quality norms as being followed for imported scraps in line with the guidelines issued MoEF/ other statutory bodies.
- Facilities, to segregate the processed scrap, based on its composition or chemical analysis, which would facilitate the downstream industries with quality scraps.

Duties of processing centres

- Will verify with the credentials of vehicles received for recycling with the Vahan Database (National Register e-services of registered vehicles).
- Engine parts arising out of the end of life vehicles should be defaced or drilled with 6 inch hole, by the scrapping centres, such that the same may not be reused in secondary market.
- Vintage vehicles (prior to 1930s) or an older vehicle with enough historical interest to be collectable and worth preserving or restoring rather than scrapping, kept in a proper and environmentally sound manner

may be excluded from the purview of this guidelines, unless a proper governmental mandate prescribes scrapping it.

- Treat obsolete spare parts may be as per Guidelines for environmentally sound management of ELVs, Nov' 2016 laid down by Central Pollution Control Board (CPCB) AIS 219

Get RIOS (Recycling Industry Operating Standards) certified (established by ISRI, The Institute of Scrap Recycling Industries) to provide a systematic framework to achieve measurable continual improvement in their Quality, Environmental, Health and Safety performance.

Roles of Aggregators

- Get reverse supply chain for collection of scraps through long term suitable mechanisms to facilities continuous and regular supply of scraps to authorized scrapping centers.
- May assist in initial segregation and sorting of scraps. The aggregators may work closely with the scrap processing centers for segregation and compliance to BIS scrap specifications and codes.
- To setup value yards for systematic and segregated collection and treatment of scraps.
- Suitable weighing machines/ weighbridge to ensure systematic collection and weighment of scraps.
- May involve peddlers as partners, for collection of scraps, who belong to the unorganized and informal sector. They shall support and assist them in adopting safe and environmentally sound practice.

Government's Responsibility

- Steel ministry to be the focal ministry to deal with all the issues arising from scrap.
- Shall take lead role in facilitating Ministry of Environment and Forest clearances to develop standard operating procedures for handling and processing of scrap

- Promote R&D activities in consultation with all the stakeholders to improve capacity building for capital equipment's indigenously and adoption of state-of-the-art technologies. Support the industry in organizing special training needs through new vocational courses.
- Work with Ministry of consumer Affairs and Bureau of Indian Standards to address issues related to quality of scrap and ensure that international standards, wherever acceptable are followed and domestic standards of quality formulated.
- Consider special status for eco parks that are to be set up for recycling and scrapping purposes and consider introducing targeted recycling-based tax, both direct and indirect tax.
- Encourage development of competitive markets for recycled materials. Recycled/reusable materials to be sold in the market post collection and recycling, may be done through a dedicated e-commerce platform, to bring transparency and provide fair opportunity.

Role of automobile OEMs

- Should design vehicles keeping in mind the recyclability of the vehicle at the end of life. This would mean that the use of hazardous materials and Substances of Concern (SOC) shall be avoided to the extent possible so that risks associated during disposal & recycling are taken care.
- Adhere to Extended Producer Responsibility (EPR) guidelines/draft Regulations.
- Undertake responsibility to make adequate provisions relating to the classification, packaging, labelling and colour scheme for dangerous substances. They should ensure proper component and material coding standards to facilitate the identification of those components and materials which are suitable for reuse and recovery.
- The use of lead, mercury, cadmium and hexavalent chromium should be avoided.

- Shoulder responsibilities to use increased quantity of recycled material there by creating a market for recycled products, and the percentage use of such recycled materials in vehicles should be periodically audited to ensure compliance.
- Provide dismantling information for each type of new vehicle within six months of the launch and should assist/ guide the recycling centers to expand the technological knowhow for segregation and recycling.
- Facilitate collection of old vehicles/ ELVs/ recyclable spare parts of old automobiles either through its take back schemes or through set up of scrapping center of its own or through tie ups with such facilities, thereby acting as an aggregator for the collection for vehicles.
- Provide incentives to those purchasing a new vehicle in lieu of exchange of ELVs.
- Apprise consumers of environmentally sound management of wastes and inform them about special incentives provided by manufacturers on new vehicles upon exchange or scrapping of end of life products/ vehicles.

Role of White Goods OEMs

- Designing products to contain safer materials so they do not need to be managed separately or designing products that are easier to recycle and reuse in efficient and environmentally sound manner and set a minimum level for generic identification by labelling/ marking of plastic products, if used.
- Promoting the usage of recycled materials in new products and avoid toxic and hazardous substances while packaging.
- Provide dismantling information for each type of new product within six months of its launch and should assist/ guide the recycling centers to expand the technological knowhow for segregation and recycling.
- Facilitate collection of white good either

through its take back schemes or through set up of scrapping center of its own or through tie ups with such facilities, thereby acting as an aggregator for the collection of white goods.

- Apprise the consumers of environmentally sound management of wastes and inform them about special incentives provided by manufacturers
- Provide incentives to those purchasing a new vehicle in lieu of exchange of white goods.

Owner's Responsibility

- Hand over for scrapping vehicles that do not meet the fitness criterion for the vehicles
- Right to authorize some other person, on his behalf, to handover the ELVs for scrapping.
- Owner should take the responsibility of handing over the end-of-the-life vehicles only to authorized collection cum dismantling centers.

Need for scrap

While iron ore remains the primary source of steel making, used or re-used steel in the form of Scrap is the secondary raw material for the steel industry. Indian steel industry is characterized by the presence of a large number of small steel producers who utilize scrap with other inputs in Electric Arc Furnaces (EAFs)/ Induction Furnaces (IFs) for steelmaking. As on March 2019, 1128 EAFs & IFs are operating in the country and largely depend upon scrap as a raw material to produce steel. The steel scrap policy will ensure scientific processing and recycling of ferrous scrap generated from various sources and a variety of products. The policy framework shall provide standard guidelines for collection, dismantling and shredding activities in an organized, safe and environmentally sound manner.

The availability of scrap is a major issue in India and in 2017 the deficit was to the tune of 7 million tons. The gap between demand and supply is likely to be reduced in the future and the country may be self-sufficient by 2030. The efficient use of scrap for steel production

becomes very crucial for India as 35-40 percent share has been envisaged from scrap-based steel production in the journey of 300 million tons per annum by 2030. This shall increase requirement of steel scrap from present level of around 25 million tonnes to more than 50 million tons by 2030.

This is mainly because with the increase in consumption of steel in the recent past and ELVs, the generation of scrap is likely to be increased considerably. This scrap has to be channelized so that the same can be utilized for steel production in an environmental friendly manner. The increased production of vehicles and increased use of consumer durable white goods in the last two decades and their rapid obsolescence shall generate large quantities of end of life products. This shall result in the generation of a continuous flow of large ferrous scrap for recycling in steel production. The collection and dismantling center should either setup by or be associated with a scrap processing center. Logistics may be one of the main challenges for safe and cost-effective system for inbound unprocessed products/ scrap and outbound processed scraps too the melting shops. Thus, scrapping centres (Collection cum dismantling centre and recycling centre) need to be supported by an adequate logistic facility in consonance with the National Logistic Policy.

Source: Steel Insights

METAL RECYCLING MARKET LIKELY TO SURPASS \$125 BN BY 2024

Recycled metal market size is forecast to exceed \$125 billion by 2024, as per a new research report by Global Market Insights.

North America electrical & electronics industry is on the rise which is due to consistently changing consumer's preferences and continuous technology upgradation. For instance, the electrical & electronics industry was valued more than USD 900 billion in 2016 and accounted for a total of 21% of the global electrical & electronics industry. These trends will drive reprocessed metal demand owing to its widespread applications in metal plating electronics via electro deposition. It provides

improved corrosion resistance, enhanced electrical conductivity and improved solderability which helps in protecting against wear. Furthermore, precious metals such as gold, silver, platinum, rhodium, etc. are also widely applicable in the electronics industry owing to its unique physical and chemical properties which provides reliability to the electronics sector. It will help attain significant gains to the global recycled metal market share by 2024.

Ineffective metal reprocessing is a key constraint which is probable to impede the global reprocessed metal market size by 2024. For instance, only 40% of the total copper produced is attained from recycling and 33% of the total aluminium produced is attained from recycling process. Nevertheless, rising emphasis on metal processing and reusability to reduce carbon footprint and impact of hazardous waste will generate plentiful opportunities for the reprocessed metal market size by 2024.

Recycled non-ferrous metal market size was valued more than USD 90 billion in 2017. Non-ferrous metals such as aluminium, copper, lead, precious metals and other metals such as nickel, zinc, tin, palladium, etc find wide-ranging applications across construction, electrical & electronics, transport, consumer goods, industrial machinery, nuclear, military and several other end-user industry. For instance, lead is widely used in electronics in batteries, ammunition, cable sheathing, etc. Lead batteries are used in transport industry and constituted approximately 35% of the total industry share in terms of volume in 2017. These trends will help boost the global recycled metal market share by 2024.

In terms of volume, recycled metal market share for building & construction constituted close to 45% of the total business share in 2017. It is mainly due to comprehensive recycled metal applications in the building & construction industry. For example, ferrous metals (iron and steel) are broadly used in the construction of large steel frameworks in the building, bridges, drainage components and various other architectural frameworks. Furthermore, non-ferrous metals including aluminium, copper and lead are also utilized in the building & construction sector. Lead sheets

are used for roofing, cladding of vertical walls, sound proofing in partitions and ceilings in office, school and hotel buildings. These trends will help make considerable contribution to reprocessed metal market size by 2024.

Europe recycled metal market share is projected witness gains of more than 4% during the forecast timeframe. This is primarily due to stringent laws and legislations imposed by environment regulatory bodies in Europe, which has triggered metal recycling to reduce the carbon footprint and help save the environment from hazardous waste generated. For instance, Directive 2008/98/EC imposed by European Commission defines basic concepts related to waste management. It signifies terms and conditions related to waste, recycling and recovery. Moreover, Directive 2012/19/EU prevent the generation of electrical & electronic waste and to promote reuse, recycling and other forms of recovery to reduce the quantity of waste to be eliminated, whilst also improving the environmental performance. These trends are likely to make significant impact on the reprocessed metal market size by 2024.

Source: MMR

SAIL KEEN ON JV FOR AUTO GRADE STEEL

State-run Steel Authority of India Limited (SAIL) is in talks with Japanese and Korean steel-makers for a possible joint venture to manufacture auto grade steel. A similar deal with ArcelorMittal reportedly got stuck, with Mittals chasing the purchase of bankrupt Essar Steel. "A steel ministry delegation has visited Japan and we have met Japanese steel-makers like Nippon, TFE and Mitsubishi Steel," said SAIL Chairman Anil Kumar Chaudhury. The talks are expected to be taken forward by officials who may accompany Prime Minister Narendra Modi on a trip to Japan later this month.

SAIL started looking for potential alternative partners in manufacturing auto grade steel, which it wants to sell to the booming Indian automobile industry after ArcelorMittal indicated that they were keener on gaining control of Essar Steel rather than on investing in a joint venture with SAIL, where the inputs

would be controlled by the state-run firm.

Tata Steel, already has an auto grade steel plant, 51:49 JV with Sumitomo.

According to Chaudhury, SAIL has also reached out to POSCO for talks on auto-grade steel. Most foreign car makers in India are Japanese, followed by Korean and European. Usually, these car makers use the steel issued by their parent company back home and hence it makes sense for SAIL to try and tap a Japanese partner for auto-grade steel. SAIL has been keen on technical and equity tie-ups with global steel makers in order to access high-end technology for value-added steel such as auto-grade steel as well as certain types of electrical grade steel. However, issues such as percentage of equity holdings, access to technology and royalties to be paid have so far bedevilled many such tie-ups talks. Quite naturally, SAIL wants a majority holding as it would be providing land, investment as well as a marketing network.

SAIL and ArcelorMittal signed a Memorandum of Understanding in 2015 to set up the joint venture and since had several years of hard bargaining over the terms, including prices to be paid for raw material to be given by SAIL, equity structure, non-exit and non-compete clauses etc. In 2017, SAIL, however, managed to get plans finalised and approved. "When we talk to them they are open, but then they are too busy in the process of acquiring Essar," Chaudhary said, adding that SAIL is still waiting for a reply to a letter written to ArcelorMittal in February.

Meanwhile, SAIL's production expansion capacity to 50 million ton per annum will be done in two phases, Chaudhary has said. In December 2018, Chaudhary announced an expansion plan for the company. He had said that by 2030-31, the PSU would ramp up production capacity to 50 MTPA from about 21.4 MTPA at present.

"The expansion will be in two phases. In the first phase, we intend to reach 35 MTPA by 2025-26, and the rest 15 MTPA in the second phase will be completed by March 31, 2031," he said. He further said the country needs steel over a period of time and as demand grows the supply grows too.

"In steel industry, 100 percent capacity utilisation takes time. It takes at least three years for the capacity to be ramped up. In first year 50 percent can be achieved, in second year 70 percent, in third year 90 percent and then may be in fourth year you see 100 percent capacity utilisation," the chairman said. According to an industry expert, to add 1 million ton of capacity, it would cost around Rs 6,000 crore. SAIL, under Ministry of Steel, is the country's largest steel producer. The PSU has set 17.5 million ton steel production as target for the new financial year. The company produced 16.3 MT of crude steel during 2018-19 financial year, registering a rise of 8 percent over the previous year.

Source: Steel Insights

SAIL BOUNCES BACK INTO BLACK IN FY'19

SAIL has staged an impressive turnaround by clocking a net profit during the financial year 2018-19 after 3 consecutive years of losses. Declaring its annual results, the company said it posted a net profit of Rs 2178.82 crore in FY2018-19 as against a net loss of Rs 481.71 crore in FY2017-18. During the financial year 2018-19, intensive efforts on improving physical performance throughout the year in tandem with the market conditions made it possible to achieve higher volumes, improve the product-mix and increase the share of value-added steel. Anil Kumar Chaudhary, chairman, SAIL, dedicated the turnaround to organizational synergy and team work.

"The entire SAIL Collective worked in mission mode to achieve this turnaround. Together we have done it and it has strengthened our resolve to perform better in coming times. We all are committed to put SAIL into a higher orbit of performance. The performance during the last year gives us confidence to aim higher and we shall put in even greater efforts to ramp-up production from our sophisticated mills while focusing on augmenting production of special & valued added steels and niche products," he said.

SAIL's operating margin grew by more than 100 percent in FY19 over corresponding period last year indicating an overall improvement in the

performance. The production from new mills of SAIL plants has recorded marked improvement in FY'19, giving an enriched product basket. A dedicated logistics set-up has been created by the Company to smoothly handle the increased dispatches from higher level of production. In FY'19, SAIL had the highest ever production of 9.85 lakh tons of UTS-90 Rail.

In Q4 FY'19, SAIL posted a net profit of Rs 468 crore. During this period, the EBITDA stood at Rs 2461 crore and the turnover was Rs 18,323 crore, a growth of 9 percent over corresponding period last year. The Q4 FY'19 recorded growth of 10 percent, 8 percent and 14 percent in respect of production of hot metal, crude steel, and saleable steel respectively while sales grew at 13 percent.

FY20 production target 17.5 MT

SAIL has set 17.5 million ton (mt) steel production target for the new financial year. The company had produced 16.3 mt of crude steel during the fiscal ended March 31, 2019, registering a rise of 8 percent over the year-ago period, Chaudhary said. In 2017-18, the company and produced 15 mt of crude steel, he said.

SAIL launches SAIL SeQR TMT bars for safe homes

SAIL has launched a new brand of TMT bars named SAIL SeQR (pronounced as SAIL secure), which is safer and has the unique combined features of higher strength with better ductility which will provide enhanced safety to the construction.

Item	FY 2018-19	FY 2017-18	% Growth
Turnover	Rs 66,267 Crore	Rs 58,297 Crore	14 %
EBITDA	Rs 10,267 Crore	Rs 5,102 Crore	101 %
EBITDA per tonne saleable steel sales	Rs 7273.82	Rs 3623.32	101 %
Hot Metal Production	17.5 Million Tonnes	16 Million Tonnes	10 %
Crude Steel Production	16.3 Million Tonnes	15 Million Tonnes	8 %
Saleable Steel Production	15.1 Million Tonnes	14.1 Million Tonnes	7 %

The production of these TMT bars began in the new state-of-the art mill of SAIL's IISCO Steel Plant on May 1 and the first consignment was flagged off on May 6, 2019. Chaudhary said, "The Company is committed to make products, which are best in class and superior in quality so that our customers get the best value. The Company's concern for safety in any

construction is paramount and SAIL SeQR, our new brand of TMT, has the superior properties of higher strength and improved ductility, offering assurance. These improved characteristics are top class in the market making it a preferred choice for the users."

He further added, "SAIL, in all its new mills, is ramping up production to cater to emerging requirements of the market. This innovative product is an outcome of the technological superiority of our mills and commitment to give the best to our customers." SAIL SeQR TMT bars possess the unique combination of higher strength with better ductility that surpass the minimum specified level mentioned for this class by BIS. Characterized by the best UTS/YS (Ultimate Tensile Strength / Yield Strength) ratio of 1.18 in this class, these bars can absorb more energy when stressed beyond yielding point without any catastrophic failures due to sudden occurrences such as earthquake/ tsunami etc.

Produced through advanced manufacturing process, this combination is achieved through automated and sophisticated cooling and following stringent process control. The highly clean steel for these TMT bars are made by adopting primary steel making route with secondary refining process resulting in lower levels of sulphur and phosphorous as well as gaseous content. It brings in marked improvement in the quality of the TMT bars. SAIL SeQR TMT bars, having prominent and uniform rib pattern, provides stronger bond with concrete. Moreover, this has superior bendability allowing easier bending with less effort. SAIL SeQR bars will also be available in corrosion-resistant variety under the name SAIL SeQR-CR.

SAIL SeQR TMT bars will be available in the length of 12 meters initially in sized with 8 mm – 20 mm diameter. The Company is primarily focusing the segment of individual house builders through its retail marketing channel, which is also being strengthened concurrently to maximize the reach of this brand. Initially this would be available through the retail channels primarily in the eastern states and thereafter rolled out to the other areas as production increases steadily at ISP and later from Bhilai Steel Plant as well.

Source: Steel Insights

INFRASTRUCTURE, HOUSING AND EVS KEY FOCUS OF UNION BUDGET

With an aim to become a \$5-trillion economy in the next few years, the Union Budget 2019-20 has stressed upon the need for heavy investment in infrastructure, housing, digital economy and job creation in small and medium firms.

Support to steel sector

In a bid to provide level playing field to domestic industry, customs duty of 5 percent has been hiked to 7.5 percent for stainless steel products, other alloy steel, wire of other alloy steel other than Invar. Reduction in customs duty rates from 5 percent to 2.5 percent on inputs for the manufacture of CRGO steel like MgO coated cold rolled steel coils, Hot Rolled coils, Cold-rolled MgO coated and annealed steel, Hot Rolled annealed and pickled coils, Cold rolled full hard. Duty on Amorphous alloy ribbon has also been brought down from 10 percent 5 percent.

Duties have been waived for capital goods used for manufacturing of electronic items like Populated PCBA, Camera module of cellular mobile phones, Charger/ Adapter of cellular mobile phone, Lithium Ion Cell, Display Module, Set Top Box and Compact Camera Module. To promote electrical mobility, duties on Electric vehicles components like E-drive assembly, on-board charger, E Compressor and Charging Gun have been waived.

A section of the steel industry had asked the government to increase export duty on iron ore with more than 58 percent iron content by 20 percent. In a letter to the Prime Minister's Office, Pellet Manufacturers Association of India has asked for an increase in export duty on iron ore of +58 plus Fe content from current 30 percent to 50 percent.

Indian Stainless Steel Development Association had sought an immediate custom duty relief on importing key raw materials that can help boost domestic stainless steel production.

ISSDA had apprised that Ferro-Nickel and stainless steel scrap attract an import duty of 2.5 percent each and are unavailable in the country; hence need to be necessarily imported. Major steel players have already filed

a safeguard duty petition against the threat of cheap imports in the face of trade wars and a new wave of protectionism sweeping across the world.

Infrastructure

To take physical connectivity to the next level, with a likely push to the core sector including steel, Union Minister of Finance and Corporate Affairs Nirmala Sitharaman, inspired by the nation-wide power grid, proposed 'One Nation, One Grid' and promise to make available a blueprint this year for developing gas grids, water grids i-ways, and regional airports. Infrastructure sector would also be given a push on the financing side to support government's intention to invest Rs 100 lakh crore in infrastructure over the next five years.

"To this end, it is proposed to set up an expert committee to study the current situation relating to long-term finance and our past experience with development finance institutions, and recommend the structure and required flow of funds through development finance institutions," she announced. An action plan to deepen the market for long term bonds including for deepening markets for corporate bond repos, credit default swaps, with specific focus on infrastructure sector, will be put in place.

To deepen the corporate tri-party repo market in corporate debt securities, government will work with regulators RBI/SEBI to enable stock exchanges to allow AA rated bonds as collaterals. User-friendliness of trading platforms for corporate bonds will be reviewed, including issues arising out of capping of International Securities Identification Number. These steps would further deepen bond markets, which is crucial for the infrastructure sector.

Underlining the importance of "Make in India" for fulfilling this goal, the Finance Minister proposed a number of initiatives as part of a framework for kick-starting the virtuous cycle of domestic and foreign investments. In the civil aviation sector, the Minister said that the Government will implement the essential elements of a regulatory roadmap for making India hub for aircraft financing and leasing activities. She also said that the Government will adopt suitable policy interventions to create

a congenial atmosphere for the development of Maintenance, Repair and Overhaul (MRO) industry in the country.

Housing

Currently, interest paid on housing loans is allowed as a deduction to the extent of Rs 2 lakh for self-occupied property. In order to provide a further impetus, FM propose to allow additional deduction of up to Rs 1,50,000 for interest paid on loans borrowed up to March, 2020 for purchase of an affordable house valued up to Rs 45 lakh. Therefore, a person purchasing an affordable house will now get an enhanced interest deduction up to Rs 3.5 lakh. This will translate into a benefit of around Rs 7 lakh to the middle class home-buyers over their loan period of 15 years. The limit of carpet area for affordable houses has been raised from 30 square meters (sqm) to 60 sqm in metropolitan regions and from 60 sqm to 90 sqm in non-metropolitan regions.

"Overall, Union Budget is a balanced one with more of a long-term vision as a follow-on of the Interim Budget. It has obviously been formulated to restore confidence in the India growth story as a whole, and more importantly within India Inc. Infrastructure stayed at the top of the government's agenda. This is of course significant, since infra development is one of the main propellers for economic growth and real estate benefits both directly and indirectly. The new FM had an uphill task of balancing priorities in Modi 2.0's maiden budget. Most sectors – including real estate – stridently sought concessions to kick-start stagnant consumption and investments. Steering the country out of the stranglehold of economic slowdown and creating employment were also high on the priorities list," Anuj Puri, Chairman, Anarock Property Consultants said.

Support to Electric Vehicles

With government moving GST council to lower the rate on electric vehicles from 12 percent to 5 percent, the FM has proposed additional income tax deduction of Rs 1.5 lakh on the interest paid on loans taken to purchase electric vehicles. This amounts to a benefit of around 2.5 lakh over the loan period to the taxpayers who take loans to purchase electric vehicle. To further incentivise e-mobility, customs duty

is being exempted on certain parts of electric vehicles.

Disincentivising petrol/ diesel consumption

Special additional excise duty on petrol has been hiked from Rs 7 per litre to Rs 8 per litre and diesel from Rs 1 per litre to Rs 2 per litre. Additionally, road and infrastructure cess on petrol and diesel raised from Rs 8 to Rs 9 per litre. Again, excise duty of Rs 1 a ton has been levied on petroleum crude. Society of Indian Automobile Manufacturers appreciated measures announced to promote EVs like reducing the GST to 5 percent, exemption in customs duty on EV parts and specially the Income Tax deduction on the interest component paid for loans taken for purchasing EVs. "All these were recommendations given by SIAM and we are grateful to the FM for having accepted them. These measures will certainly help in making EVs more affordable and attractive to the consumers, which is in line with the recommendations made in the Economic Survey," SIAM president Rajan Wadhera said but added that the FM has not recognized the distress in the auto sector and not come out with any kind of support or stimulus.

Railways

For the Railways sector, the Budget has proposed using Public-Private Partnership to unleash faster development and completion of tracks, rolling stock manufacturing and delivery of passenger freight services. "It is estimated that Railway Infrastructure would need an investment of 50 lakh crores between 2018-2030. Given that the capital expenditure outlays of Railways are around 1.5 to 1.6 lakh crores per annum, completing even all sanctioned projects would take decades. It is therefore proposed to use Public-Private Partnership to unleash faster development and completion of tracks, rolling stock manufacturing and delivery of passenger freight services," Sitharaman said.

Economic Survey

RE turning viable but coal to provide base load

Progressively declining costs, improved efficiency and reliability have made renewable energy an attractive option for meeting the energy needs in a sustainable manner but

it is unlikely that thermal power can be easily replaced as the main source of energy for a growing economy like India, the Economic Survey Report has pointed out. The report, tabled in Parliament on Thursday said the government shouldn't effect a sudden abandonment of coal based power plants without complete utilisation of their useful lifetimes as it would lead to stranding of assets that can have further adverse impact on the banking sector.

"A comprehensive energy policy should take into consideration the economies of both coal and renewables as they are interdependent. They are substitutes for each other as a source of energy but are complementary in keeping the flow to the grid stable as coal generation represents a stable source of power while renewable energy may be variable," the report said adding that base load power would have to be continued to be provided by the thermal power plants. The report called for building capacity for cleaner and more efficient coal technologies and improving economy's ability to generate greater output from available energy resources and its resource endowments.

Source: Steel Insights

HEAT TREATMENT INDUSTRY POISED FOR GROWTH

Prem Kumar Aurora Born in 1953, graduated in Mechanical Engineer from SP College of Engineering Mumbai in 1975. He then proceeded to USA for his M.S. (Mech); and returned to India in 1981 to join his family business of manufacturing heat treatment furnaces in which he continues till date. Has been part of various projects in designing and manufacturing furnaces for BARC, DMRL, MIDHANI, ISRO, HAL, AIR INDIA, so on so forth. At present he is also involved in marketing of fire protection systems (Aerosol Technology) and Electrical Safety Products.

He has been the Chairman of ASM International India chapter, Indian Institute of Metals GMC, Institute of Indian Foundrymen Mumbai and Western region.

Presently he is the trustee of ASM International USA and Immediate Past Chairman ASM India National Council.

Speaking to Sanjay Singh, Assistant Editor of Metalworld, Prem Kumar Aurora says that India is a fast growing market for heat treating industry Excerpts:

Q. How is the market condition for Heat treatment furnaces in India and worldwide?

A. Heat treating as we all are aware is an industrial process used to modify and improve mechanical properties of materials such as wear, fatigue and surface hardness. India is a fast growing market for heat treating industry and can be analysed into various segments such as materials (Steel, cast iron, aluminium, copper brass), process (case hardening, annealing, tempering, hardening, etc.) equipment (fuel fired, electric, etc), application (automobiles, aerospace, machinery etc.)

The market is poised for a major growth of 7.5% by 2028 from a share of 3.8% in 2016.

South and west parts of our country will be the major contributors to this growth due to soaring presence of auto and ancillary manufactured in these parts of the country both from indigenous and foreign players.

Hardening and tempering are the most commonly used processes and make upto 28% of the requirements of the auto sector and second in line is the case hardening sector which accounts for around 24%.

As far as equipment's fuel fired furnaces were dominating in the past, and due to high energy and maintenance costs it is less attractive now. Of late due to environmental concerns and cost of fossil fuel rising the electric furnaces are gaining importance.

Q. How has technology evolved over the years in the making of heat treatment furnaces?

A. The auto industry and aerospace industry play a major pivotal role in driving the requirements for technical improvements in the heat treating industry as the components used undergo heavy stresses and requirement is of high durability such as crankshafts, fasteners, panels, transmission gears.

Efficient heat treatment is the need of the

hour which enhances in improving the microstructure and hardness of components used.

Significant growth in auto sector and the government support such as Make in India, start-up India and FDI inputs has attracted significant players to enter this segment, thus encouraging major auto manufacturers to set shops in India enabling growth in the heat treating sector and also requirement for improvement in technology.

Rank	Top 10	Qty (mt)	% change
1	China	314.96	10.1
2	India	36.12	0.2
3	Japan	33.62	-4.3
4	USA	29.59	6.7
5	South Korea	24.39	2.8
6	Russia	22.41	-6.1
7	Germany	13.80	-4.9
8	Brazil	11.28	-2.5
9	Turkey	11.23	-10.5
10	Iran	8.39	5.9
	Total:10	505.78	5.6
	World	599.86	4.8

Source: worldsteel; *prov.

Over the years, the industry was facing significant challenges owing to various environmental issues, technological, and social factors. Till date as we know, furnaces require significant amount of energy to basically reach required temperatures. Until recently, due to lack of energy recovery systems in the country contrary to those available in Europe and North America, was a factor which restrained the markets growth.

Lack of energy efficient systems also impose a challenge and the use of old technology has acted as a constraining factor in the growth of this industry.

Many players and users still refrain from using advanced technologies owing to various reasons like lack of skilled labour etc.

This brings us to major technological changes which have been introduced over the years to enhance the productivity and reliability of the process.

Temperature control plays an important role in heat treating. The manufacturers and the

users are now focussing on use of natural gas fired, and electric furnaces to reduce the consumption of fossil fuel.

They are also focussing on furnace models to improve thermal profile in the systems. Use of induction, plasma and laser are expected to increase at a rapid pace.

Also to enhance productivity hybrid methods are used due to improved performance requirements of industry. Energy audits are projected to engage as a tool to energy savings.

Numerical modelling systems are being introduced to simulate the process. Various software's are available including process heating assessed tools (PHFST), have been developed which enhance thermal efficiency.

Use of automation in temperature control through use of programmable controllers, thyristor's etc and eco ventilation systems for hot air exhaust and installation of automatic power factor controllers (APFC) are expected to be introduced.

Q. As a manufacturer what support you look from the government in terms of incentives to make the industry more viable?

A. We would need to have better environmental control and less of red tapism. We need single door for getting place energy clearances, environmental clearances etc.

We need to have regular power supply for the plants, and we need government to promote skill development in the area of practical heat treatment which is lacking at the moment.

There is a need to have a friendly approach to controls as it has been seen that the environmental department creates a lot of hassles for the user industry thus people are reluctant to start new businesses.

Q. Can you give a brief profile of your company's activities?

A. We at Aurora Engineering Company manufacture laboratory, batch type industrial furnaces and continuous furnaces for industrial applications.

These are supplied to various industry in R&D sector, industries and defence and aerospace government agencies like BARC, NPCIL, HAL, AIR, INDIA, DMRL, MIDHANI etc.

Our sister concern has now entered the sale of safety equipment's in the field of electric and fire sectors and also specialized earthing systems for electronic industry.

Source: Metal World

INDIAN GOVERNMENT FUNDS TECHNOLOGY TRANSFER FOR TRANSITION TO ALUMINIUM RAIL COACHES

India's government has taken steps to obtain technology for producing all-aluminium railway coaches, phasing out heavier and less efficient conventional rolling stock. Commenting to India's Lok Sabha last week, Railways Minister Piyush Goyal said that, from the current fiscal year forward, Indian Railways would produce exclusively Linde-Hofmann-Busch (LHB) aluminium-body coaches. "Action has also been initiated for acquiring technology for manufacture of aluminium body coaches in railway factories," Goyal explained to parliament in a written report.

Ultimately Indian Railways intends to construct 500 aluminium-bodied coaches at Modern Coach Factory Rae Bareilly. As Railways only constructs stainless-steel coaches at present, a global tender is needed in order to obtain the technology and equipment for such a transition. However, the Indian government has already begun working toward obtaining such funds. "To ensure timely completion of the project, funds for the project have been arranged through Extra Budgetary Resources (institutional financing)," Goyal reported.

Indian Railways plans to eventually produce all-aluminium coaches for overseas transport. Aluminium-bodied rail coaches represent a significant improvement over all-steel rail coaches largely due to lighter weight, as they weigh in at up to 3 metric tons lighter than their steel counterparts. All-aluminium coaches can sustain speeds of up to 155 mph and are cheaper to maintain due to increased resistance to

corrosion. In addition, all-aluminium coaches feature a lifecycle of four decades, besting stainless-steel coaches by up to 15 years.

Source: www.aluminiuminsider.com

SUBSIDY FOR EVS ONLY FOR COMMERCIAL VEHICLES, NOT PERSONAL USAGE:GOVT

"Proposals are invited from cities that intend to develop charging infrastructure in million-plus cities as per 2011 census. Initially, 1,000 EV charging stations are earmarked for development through the EOI (expressions of interest). These charging stations will be sanctioned in different cities after evaluation of the proposals received under the EOI, "the minister said.

The government Friday asserted that subsidies for the promotion of electric mobility in India will be only for commercial vehicles, and automobiles for personal usage will not be included. Speaking at an event here, Minister of State for Heavy Industries and Public Enterprises Arjun Ram Meghwal said the government expects India to adopt electric vehicles (EV) in "all natural course" - be it for bikes, cars, trucks, buses and e-rickshaws, while emphasising that the transition was necessary in order to reduce carbon emissions as per the Paris Agreement.

"The government has made clear its intention to promote electric mobility through commercial fleet owners and incentives will be only offered to them," Meghwal said here at India UK Electric Mobility Forum 2019. Under the Rs 10,000-crore FAME scheme, subsidy on EVs are given to three- and four-wheelers for commercial and fleet applications. However, in two-wheelers it is also extended for personal usage.

Various industry players have been asking the government to also provide support to EVs for personal usage four-wheelers in order to make them affordable and popularise the eco-friendly technology. Reiterating the significance of EVs, the minister said this was the only way to provide smoke-free environment to the future generations.

"We will have to move towards the EVs to reduce carbon emissions as per the Paris

Agreement... It is the right of future generations to have a smokeless environment... It is our goal," Meghwal said. Elaborating on the plans to promote EVs, Meghwal said that his ministry has invited proposals from entities to develop charging infrastructure in big and smart cities.

"Proposals are invited from cities that intend to develop charging infrastructure in million-plus cities as per 2011 census. Initially, 1,000 EV charging stations are earmarked for development through the EOI (expressions of interest)," he added. These charging stations will be sanctioned in different cities after evaluation of the proposals received under the EOI, the minister said. "We also plan to connect all charging stations with grid-connected solar power plant of required capacity as per new renewable energy guidelines so as to ensure grid stability and green energy for EVs," he added. "The government also wants to have an electric highway. We are working on that front. The shift towards EVs will not only tackle air pollution, but also reduce import bill," Meghwal said. He added that the Niti Aayog has recommended making electric two- and three-wheelers mandatory from 2025 and all new four-wheelers for commercial use within city limit by April 2026.

The government think tank has also recommended even phase-wise introduction of commercial four-wheelers by fleet owners including taxi aggregators from 2.5 per cent in 2020-21 to 40 per cent usage in 2025-26, he said. "Moreover, it was recommended that 30 per cent of new intra-city buses should be electric by April 2026," Meghwal said. He said the government has put in statutory safeguards to promote green mobility in the country.

Source: www.asiainsurancepost.com

NON-FERROUS SCRAP METAL OUTLOOK

In the last two years, global scrap industry witnessed structural changes that has forced most global players to implement changes to the quality & pricing of the material apart from searching new outlets. China has been the biggest consumer of all the hard commodities since decades, consuming 40 to 50 percent

of total world output of different metals and its related products. The entire global scrap business model was built on the hunger, adaptability and processing capability of Chinese users.

Last year China banned Mixed Metal Scrap i.e. category 7 item and imposed much stricter quality standards on the grades that could be exported there. This year from July, they have imposed a licencing and quota system for the category 6 grades. Most importantly, with retaliatory tariff imposed on US goods coming into Chinese territory, Chinese buyers had to look out for other countries to feed their factories, while US suppliers had to explore the new territory including India and South East Asia. This imbalance in value chain also gave incentive to overseas suppliers for exploring the forward integration in their home country.

In summary, the trade disruption triggered by the above two issues, created opportunities for ambidextrous organisations and the country as a whole to capitalise on their ability to respond to the change.

India remained confused in its ability to handle this global trade disruption and mostly worked in silos. We must understand that scrap generation is directly related with wealth of the country. With highest poor population and our habit of preservice, India remained the scrap deficit country. We hardly remember our family car or applications going for end of life. Though millennials have been now on track of adopting the new theme of discarding goods 'Poorana Jayega tabhi tho Naya Aayega'. But its going to take at least a decade before we have our own scrap generation to feed significant industrial need.

The truth remains, we are compulsorily import dependent on aluminium scrap, which is majorly consumed in automotive and related industries. Needless to mention, globally, every single organisation uses only scrap in different forms to produce cost efficient aluminium alloy ingot, which is then traded on few hundred-dollar discount from primary aluminium. With exorbitant trade tariffs on American aluminium scrap, the Chinese buyers have to discount the price while buying the American stuff or shift the supply point. And American suppliers have

to move to other geographical location like India, at relatively cheaper rate than what they were selling earlier, creating a breathing space for both suppliers and buyers.

For few grades, India responded well by accepting and creating the infrastructure, while for some other grades, other countries over marched Indian consumer and responded much faster and efficiently. The lower price bids from Indian market may also have potential to re-think whether India is actually a buyer of certain product and give incentive to foreign scrap producers for forward integration and producing the finished product and component.

Today expansion in India's secondary aluminium market is sitting on doldrum with limited facilitation, support & capital. A well-planned strategy along with appetite for entrepreneurship can turn the country into an exporting hub of alloy ingots and foundry products. The domestic secondary market is relatively silent with the temporary issue in automotive and industry as a whole. For short terms, the secondary Indian aluminium market is facing slight distress owing to liquidity & demand issue. In mid and long terms, the demand has to grow considering the huge middle-class population and other positive factors.

Global conditions coupled with poor domestic appetite has done away the co-relation of scrap prices with terminal prices and has moved more towards information based trade rather than intrinsic based trade. I personally feel, this will continue till global supply side finds consistent outlets or create processing capability and confidence in the market as a whole.

Major volume of alloy industry raw material like Zorba, Twitch and Tense are expected to remain relatively slow or flat for this quarter followed by little improvement before the festive season. The last quarter of the current financial year is also expected to be flat because of changed emission norms. However, global perspective will be more dominant than local factors when analysed for price behaviour of these products. The other product segment such as extrusion & conductors are expected to perform better

but only at moderate levels considering scope of liquidity improvement & government's plan in affordable housing or building & construction segment as a whole. The utensil segment may be expected to slow till next quarter considering rural distress & delayed monsoon. India as a country has picked up really well in some commodities like aluminium scrap, stainless steel scrap, Copper scrap, and others, which indirectly helped Indian copper consumers procure a cost-effective substitute for their copper scrap consumption.

In the past India has never been competitive in procuring these products considering the higher willingness to pay by their Chinese consumers considering their scale and labour efficiency apart from creating small entrepreneurs and generating huge employment in terms of processing these products before they reach to the actual users. The emergence of new processors in these categories has also helped in stabilising the global prices and putting competitive bids against their Southeast Asian competitors. I feel, these products shall put strong demand and price strengthening as they garner the more efficient way of processing the products.

Lead remains the diminishing commodities and the scrap supplies remained tight. Now even battery scrap prices have further strengthened up. Even though it will have some seasonality effect, but more or less the secondary scrap prices will have very strong support and will find the discounts narrowing or stable. Whether it is India or any other country is today's volatile world of secondary market, key to success is capturing the new opportunity, trends and organisation's ability to respond quickly to the changing scenario.

Source: MMR

IIT MANDI TEAM OBSERVES ZERO RESISTANCE AT HIGH TEMPERATURES IN GOLD-SILVER NANOSTRUCTURES

New results from IIT Mandi indicate that nanostructures made of gold embedded with silver show zero resistance to the flow of electric current through them. Interestingly, this happens at the relatively high temperatures, between

240 K and 275 K, that is, approximately between -33 degrees Celsius (minus 33 degrees C) and 2 degrees Celsius. "The resistance fluctuated as we lowered the temperature and suddenly fell below the limit of resolution of the apparatus on cooling below a critical temperature. As we repeated the heating and cooling, this critical temperature varied between 240 K and 275 K," says C.S. Yadav from School of Basic Sciences, IIT Mandi. This poses the interesting question of whether the group has fabricated structures that are superconducting at relatively high temperatures. A superconductor is a material that, for one, allows electricity to pass through it with zero resistance.

Though six gold-silver nanostructure samples were studied, the team was able to see such a fall in resistance only in one sample. They also did not observe the other important property of superconductors, namely, when a superconductor is cooled below the critical temperature in the presence of a magnetic field, it suddenly expels the magnetic flux from its interior below the critical temperature. This is because it turns into what is called a diamagnet at this temperature. A perfect diamagnet does not allow magnetic fields to penetrate its bulk.

The team was inspired by the work of Anshu Pandey and Dev Kumar Thapa of the Indian Institute of Science, Bengaluru, who had posted on ArXiv their observations on carefully fabricated nanostructures of silver embedded in gold. They observed a transition with resistance dipping to zero as the samples were cooled, and also a diamagnetic transition. Even as their preprint is under review, the IIT Mandi researchers bring to the public forum these observations on gold-silver nanostructures, albeit differently fabricated. "We started the work last year after the first report by Thapa et al," says Dr Yadav.

Viswanath Balakrishnan, from the School of Engineering at IIT Mandi, who led the study along with Dr. Yadav, explains the lack of diamagnetism as follows: "Our film was of thickness approximately 55 nanometre, so back-calculating, the amount of material must be just a few micrograms. It is very unlikely this can give a good signal of diamagnetism." He agrees that their plans include fabricating the nanostructure in bulk form: getting at least 1 square centimetre sample, get detailed

characteristics and study the variations in microstructure. "The structure needs to be stabilised," he adds.

The group also observed that the transition temperature was unaffected when they cooled the sample in very high magnetic fields, such as 14 tesla. "This is puzzling because normally the magnetic field is detrimental to the transition," says Dr. Yadav.

As for the reason for observing zero resistance in only one sample, Dr. Balakrishnan explains, "We speculate this has to do with spatial inhomogeneity and instability issues associated with the particular phase. We could not observe this in other samples of same batch."

The reason for this, according to them, could be that microstructural and compositional distribution in the sample plays an important role in the transition. Dr. Balakrishnan adds, "Nevertheless our repeated measurements on this sample did show zero resistance transition over multiple cycles which are presented in our paper."

The researchers found that the control and stabilization of the correct phase of Au-Ag nanostructure present in thin film was the most challenging part of the work. But they are excited that their results will generate further interest in Au-Ag and other nanostructure systems in the quest of superconductivity at ambient conditions (that is, room temperature and normal pressure).

"Consistent efforts are required for the identification and stabilization of superconducting phase in these materials which will pave the way for room temperature superconductivity," says Dr. Yadav.

While there are questions, such as difficulty in reproducibility of the microstructure, it is undeniably an interesting phenomenon that the IIT Mandi researchers have come up with.

"We did not observe room temperature superconductivity but observed zero resistance in Au-Ag thin films. In the light of recent report from IISc, our study surely provides some evidence and strengthens the need for the further exploration in these systems," says Dr. Balakrishnan.

Source: The Hindu
(Courtesy: Shri L Pugazhenthay)

STEEL POWDER DEVELOPED FOR ADDITIVE MANUFACTURING

At TU Graz a steel powder has been developed for additive manufacturing which decisively simplifies the production of complex components. In a spin-off funding programme, work is now being done on market maturity. For more information see the IDTechEx report on 3D Printing Materials 2019-2029: Technology and Market Analysis.

Shorter production times, lower costs and fewer production faults. These are just some of the reasons why the metalworking industry is using additive methods more and more frequently. This is also reflected in the market for stainless steel powder used in additive manufacturing. According to estimates, this is increasing by more than 30 per cent per year. Nevertheless, there is still room for expansion in 3D metal printing technology. Especially in selective laser melting (SLM), in which the component is built up in layers, the scope for design is limited with regard to construction and design. The more complex the component, the more extensive support structures are necessary, for example to prevent possible overhangs from sinking during the printing process or other component deformations.

More design scope and lower printing costs

This is where the work of Mateusz Skalon starts, a researcher at TU Graz's Institute of Materials Science, Joining and Forming. He has modified the particles' surfaces of conventional 316L stainless steel powder so that the metal liquefied by laser beam behaves in more stable way during 3D printing process. This allows greater freedom of design since components with low angles of inclination do not collapse during printing. This so-called NewGen SLM powder requires fewer supporting structures, which account for up to 20 percent of total printing costs. Savings in production are considerably reduced, as Skalon has calculated: "Cost savings of up to 114 euros can be achieved per each kilo of printed metal." In this context Skalon refers also to the sustainability aspect. Surplus stainless steel powder can be easily recycled at the end of production, which creates additional material savings.

Processing system for innovative metal powder

Now Skalon wants to implement the research results in business with the support of TU Graz. In the framework of the current Spin-Off Fellowship of the Austrian Research Promotion Agency (FFG), he is scaling the modification process to bring it to market maturity. "We'll be testing the powder on the most common laser melting systems in the next 16 months. Basing on this, we want to establish a production company in Austria directly after the Fellowship where purchased 316L stainless steel powder will be modified and sold. Target groups will include manufacturers of highly complex metal parts, manufacturing companies in the automotive, aircraft and mechanical engineering sectors as well as research institutions dealing with additive manufacturing methods. We have already had expressions of interest from business and industry."

Skalon is confident that more will follow in the next few months. With his spin-off, he would like to become an important part of the supply chain in additive manufacturing. The young academic is supported by a top-class team. Christof Sommitsch, head of TU Graz's Institute of Materials Science, Joining and Forming, has taken on the role of supervisor in the project, and the chairman of Junge Wirtschaft Steiermark, Christoph Kovacic, is a mentor. Skalon receives help in the business development from the head of TU Graz's Institute of General Management and Organisation, Stefan Vorbach, as well as from institute staff Martin Glinik and Elisabeth Poandl.

Source: Metaljunction

PER CAPITA STEEL CONSUMPTION IN INDIA A THIRD OF GLOBAL FIGURE: STUDY

India may have catapulted to the second spot in global steel production but its consumption betrays the strides made in output. Figures released by World Steel Association (WSA) show India languishing at the bottom rungs of the consumption ladder with a per capita consumption of only 70.9 kilogram (kg), marking a notable chasm with the global figure of 224.5 kg. India's per capita finished steel consumption

grew by seven per cent in calendar 2018, over 66.2 kg in 2017 though the modest growth was not enough to bridge the gulf with the global growth.

In contrast, China, the biggest steel producer, stunned with a whopping per capita consumption of 590 kg. In India, the usage of the alloy has been rising only moderately- from a per head consumption of 58.8 kg in 2014 to 61.3 kg in 2015 and 63.2 kg in 2016. The country is only solaced by Venezuela and Other Africa (barring South Africa & Egypt) which lag in steel consumption.

During 2018, the world's total finished steel usage stood at 1712 million tonnes (mt). However, India's share was an unimpressive 5.6 per cent. China continued its hegemon status in steel consumption, accounting for 48.8 per cent share of the pie. Other Asian nations (excluding China, India, Japan, South Korea & Taiwan) contributed 10 per cent to the global consumption with the European Union perilously close at 9.9 per cent. The triumvirate of United States, Canada and Mexico forming the trade bloc- North American Free Trade Agreement (NAFTA) comes next with 8.3 per cent share.

Still trailing heavily in consumption, India, back in 2018, had usurped Japan as the second largest steel producing nation. China, though, is the largest producer of crude steel, accounting for more than 51 per cent of all production, according to Worldsteel, a consortium with representative members in every major steel making country. In calendar 2018, India's crude steel output inched up 4.9 per cent to 106.5 mt, up from 101.5 mt in 2017.

In its report titled 'Short Range Outlook April 2019', WSA had prophesied Indian steel demand to grow in upwards of seven per cent in 2019 and 2020. Weathering the shocks of demonetisation and the Goods & Services Tax (GST) implementation, the Indian economy is now expected to step on the higher growth trajectory beginning the second half of 2019. While fiscal deficit might weigh on public investment to an extent, the wide range of continuing infrastructure projects could support growth in steel demand above seven per cent in both 2019 and 2020, the association noted.

Source: Business Standard

HCL TO ENHANCE COPPER PRODUCTION

Hindustan Copper Limited (HCL) is currently implementing an ambitious mine expansion plan to enhance its mine production from current level of 3.8 million tonnes to 20 million tonnes of copper ore in next 5 to 6 years with a capital layout of Rs 5,500 crore, said Arun Kumar Shukla, Director (Operations) in HCL.

Speaking at the ICDC Copper Conference 2019, held in Mumbai, he said that with the proposed expansion, HCL will cater to about 30% of refined copper demand of the country from the current level of 5%.

Rank	Country	Qty (mt)	% change
1	India	11.04	2.1
2	Iran	9.31	17.7
3	Egypt	2.19	14.8
4	Mexico	1.93	-2.7
5	Saudi Arabia	1.44	-7.5
	Top 5	25.91	7.2
	World	29.41	5.5
	%Share: Top 5	88	-

Source: worldsteel

He commented that the strategy of the HCL mine expansion scheme includes expansion of the existing mine; reopening of closed in the State of Jharkhand and development of new mines.

"The company is concurrently implementing seven mine expansion projects in the State of M.P. Jharkhand and Rajasthan. 8.0 million Malanjkhand underground mine below the existing open cast mine which is the flagship mine expansion project of the company, the work has commenced and the copper ore production will commence by Oct/Nov 2019.

"During the year 2017, we have completed two projects namely Banwas in Khetri area and reopened Kendadih mine in Ghatsila area. The production ramp up from these mines has started and will be competed to capacity level in this year."

Shukla noted that in India, the composition of copper reserves is such that around 40% of

the copper reserves are in single pocket at Malanjkhand in the State of Madhya Pradesh where the investment can be more capital intensive.

"There are about more than 40% deposit are small and not amendable for large capital and is more labour intensive. The mine expansion projects of HCL are that we investing both in technology which is capital intensive and labour intensive as well.

"Apart from the efforts in the mining sector, manufacturing of value added products of copper and recycling of scrap with appropriate technology is required immediately. At the same time the copper industry needs to focus on recovery of by-product such as gold and selenium, tellurium for ensuring optimum utilization of resources.

Shukla said that with regards to copper, the global reserves in terms of copper metal content stood at 790 million tonnes, out of this, India possess only around 2.73 million tonnes. The copper reserves in the country are not very high compared to other countries of the world. India reserves are around 0.4% of the global reserves. Thus there exist a distinct scope of exploitation of its untapped reserves of copper in India.

"In terms of the global reserves, mineral like iron ore, aluminium zinc and lead, the world is better placed in terms of availability and price. Stock of the above minerals will carry through next 100 years. However, at the current consumption level, the global reserves of copper will be exhausted in next 30 years.

"This has made the mining in copper attractive investment opportunity not only in India but also in other geographies which have exploitable copper mines."

Elaborating further he mentioned that India's exploration to date have been confined to obvious extension of old working of base metals minerals. Detailed exploration has been carried out on only 10% of the obvious geological potential area of the country. With regards to copper mineral 40,000 sq. km area is still awaiting detailed exploration. Thus there exist a distinct scope of exploration of its untapped reserves of copper in India.

Shukla said that in the early years, the exploration was supported by surface geological mapping and high quality interpretations mostly based on surface signatures that has resulted in large but shallow deposits. However, in the present context, the challenges lies in finding deep seated mineral deposit in the potential areas and in thickly weathered terrain.

There exists a huge gap between the available reserves in the country vis-à-vis the production in the mining sector, which leaves cope for investment and augmentation of production in the mining sector.

He said that as far as Indian copper mineral sector is concerned, there is high level of deficiency in copper ore production and exploration of copper deposits is the need of the hour. At present India is not self-sufficient in the resources of copper ore, and relies mostly on imports of copper concentrate for its smelters.

"Considering the fact that there is very high potential for growth of copper consumption due to Government of India thrust in urbanization infrastructure and transport, the copper sector needs to gear up their production capacities

in value added segment as no new major green field units have come up in the last ten years, but also look at innovation for addressing concerns on cost of power, control of emissions and recycling.

"With abundant supply of refined copper, the industry should position as a manufacturing hub for export of value added productions. Government of India in its export policy has provided for incentive for value added products 2015.

"As per Merchandise Exports from India Scheme (MEIS) under Foreign Trade Policy 2015 a reward of 2% of FOB value will be given by Gol on export of value added products of copper viz. foils, tubes, pipes and HDGC contact wire."

He concluded by saying that copper industry has to gear up to meet growing demand in the country in terms of both quantity and quality. Industry should stress on quality and making products more cost competitive. With the opening up of the market beyond country barriers it is necessary for the industry to look globally for their market.

Source: Metal World