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Competitiveness of Indian Steel Industry

Background

Indian Steel Industry has witnessed lower growth, stagnancy in exports (27% decline in 2015-16) and declining profits (loss in 2015-16 except in case of Tata Steel) during last few years. Table-1 shows production, consumption and exports between 2011-12 and 2015-16.

Sluggish domestic demand and surge in cheap imports are main reasons for the unsatisfactory performance. World over there is excess capacity and negative growth in consumption. The biggest producer, China, is experiencing economic downturn and is virtually dumping steel everywhere at low price. Japan, South Korea, Russia and Ukraine are also exporting considerable quantities of steel. Total exports by these five countries were 230.7 MT in 2015 (source: world steel association).

Due to above factors, Indian steel companies had to curtail production resulting in lower capacity utilisation and drastically lower the prices, adversely affecting bottom lines. Prices of raw materials like iron ore and coking coal also declined during this period. However, this was not sufficient to cover declining steel prices. The balance sheets are stressed and several of them have huge debt burden. Government of India have taken several measures like increasing basic customs duty, imposing safe guard duty, fixing minimum import price etc. to help the steel industry. There has been some improvement in Q4 FY 16, but there is a long way to go.

Decline in exports is worrisome. In 2006-07, exports were 10% of production and they have declined to 4.5% in 2015-16. In CY 2015, total world exports formed 30.7% of production. In earlier years, the proportion of exports was even more. Therefore, sluggish international market is not the only reason for low export volumes. Indian steel is not competitive both quality and price wise. This paper examines the competitiveness of the Indian steel industry.

Measurement of Competitiveness

World Steel Dynamics regularly measures competitiveness of major steel companies of the World. The latest assessment was done in 2015 and results were announced in June same year (36 companies and 23 parameters were considered). As per this assessment, POSCO, South Korea is the most competitive steel company in the world with a score of 7.91 out of 10. The next four companies are Nucor Corporation USA, Nippon & Sumitomo Japan, Gerdau Brazil and Severstal, Russia. Others with reasonable score are Thyssen Krupp Germany, Arcelor Mittal, CSN Brazil, JFE Steel Japan and Bao Steel, China. The main parameters considered for assessment are: production volumes, profitability, technological innovation, cost cutting, pricing capacity, financial soundness, acquisition of raw materials, environmental & safety

TABLE-1

PARTICULARS	2011-12	2012-13	2013-14	2014-15	2015-16 (P)
Crude Steel Capacity, MT	91	97	102	110	118
Capacity Utilisation, %	81	80	80	81	76
Finished Steel Production for Sale, MT	75.7	81.7	87.8	92.2	90.4
Growth in Production, %	22.5	7.9	7.5	5.0	-1.9
Finished Steel Consumption, MT	71.0	73.5	74.1	77.0	80.4
Growth in Consumption, %	14.3	3.5	0.8	3.9	4.4
Export of Finished Steel, MT	4.59	5.37	5.89	5.60	4.08
Export as % of Production	6.06	6.57	6.71	6.07	4.51

(Source : JPC)

performance etc. (source: www.english.donga.com). Tata Steel and JSW steel appear to be better among Indian companies.

In India today, most of the steel companies are having low capacity utilisation due to excess capacity and low demand. They are making losses due to surge in cheap imports and they do not have pricing capacity. Major companies like JSW, Essar and RINL do not have captive mines for raw materials.

However, regarding technological innovation and cost cutting, to improve competitiveness, they do not have any problem and hence should concentrate on these issues together with improving environmental performance.

Technoeconomic Performance

Techno economic performance of Indian steel industry does not match up to world standards. Existing and desirable levels of performance are shown in Table-2.

TABLE-2

PARAMETER	UNIT	EXISTING	DESIRABLE
Coke Oven Productivity	TPA/Oven	15000-20000	25000-50000
Coke Oven Battery Life	Years	~20	30-50
Sinter Plant Productivity	$T/M^2/Hr$	1.2-1.5	1.8
Blast Furnace Productivity	$T/M^3/D$	1.5-2.5*	3.0
Agglomerates in Blast Furnace Burden	%	60-80	80-90
Of Which, Pellets	%	Up to 20 in a Few Plants	20-30
Blast Furnace Coke Rate	Kg/THM	400-550	300-350
Blast Furnace Campaign	Kg/THM	400-550	300-350
Feed of Small Coal Based DRI		90%-100% Ore & Up To 10% Pellets	30% Ore & 70% Pellets
Feed of Gas Based DRI Plants		30% Ore &70% Pellets	90% Pellets & 10% Ore
BOF Productivity	No of Heats / Converter / Year	9000-10000	12000
BOF : Tap to Tap Time	Minutes	45-60	30-40
BOF Lining Life	No of heats	5000-10000	10000-15000
EAF Productivity	T/hour/MVA	0.5-0.7	1.0 (min)
EAF : Tap to Time	Minutes	60-90	50-70
EAF : Specific Power Consumption	Kwh/T	400-800	~300
Share of Continuous Casting	%	80-85	100
DRI/HBI Charge in EAF	%	~50	~75
Solid Waste Utilisation	%	80-90	98

Yield of Finished Steel From Liquid Steel	%	80-85	88-90
Specific Raw Material Consumption	T/TLS	3.0 to 4.0	3.0 max
Specific Refractory Consumption	Kg/TLS	~15	10
Material Efficiency	(Products + By Product) / Raw Materials, %	93-94	96-98
Specific Energy Consumption	G Cal/TCS	5.5-7.0	5.0
Steel Cleanliness : Sulphur Phosphorous Oxygen Nitrogen	ppm	10-100 50-200 10-50 30-60	5-100 10-150 5-40 10-40
Carbon Dioxide Emissions	T/TCS	2.5	2.0 BF- BOF 1.5 DRI- EAF
Specific Dust Emissions	Kg/TCS	0.5-1.5	0.3 max
Water Pollutant Discharge	Kg/TCS	0.075-0.125	Zero
Specific Make Up Water Consumption Excluding Power Plant	M^3/TCS	2.3-5.0	2.0
Land Acquisition	Acres/million Tonne	300-9000	500 Max
Fatality Rate	No of Deaths Per Million Tonnes of Steel	0.5-2.5	0.3
Lost Time Injury Frequency Rate (LTIFR)	No of Lost Time Injuries Per Million Man Hours	0.4-1.2	0.3
R&D Expenditure/Turn Over	%	0.2	1.0
Manpower Productivity	Tonnes/Person/Year	200-500	600
Per Capita Consumption of Finished Steel	Kg/Per Person	60.6	100 Minimum

***(Source :** www.steel.gov.in and www.meconlimited.co.in) * Generally productivity does not exceed 2.0.*

Environmental and safety performance has also been included in the above table since good performance in these areas improves the credibility of the company. Indian Steel industry should strive to achieve the desirable levels of performance at the earliest, say by 2020, so that the cost of production could be reduced and competitiveness improved. Since most of the companies have adopted latest technologies, this target is achievable. Indian steel industry can no longer be content with the advantages, if any, in respect of cheap labour and raw materials. Logistics cost and energy cost are quite high in India.

Apart from techno-economic performance, following areas also need urgent attention. These will help use of raw materials available locally & reduce cost of production (Source: www.performance.gov.in).

- Undertake exploration of hematite iron ore reserves with Fe content in the range of 45% to 55% and utilise the same after beneficiating to 65% Fe. The beneficiation process should be such that Alumina to Silica ratio is kept at maximum 1. In respect of magnetite deposits, + 35% Fe ore should be beneficiated to 65% Fe.
- Complete utilisation of iron ore slime which forms about 20% of run of mine ore.
- Beneficiation of high ash coking coal to produce clean coal with 10% ash content.
- Use of stamp charging in Coke Ovens to enable use of some proportion of inferior quality of coking coal.
- To sort out technical and other issues to achieve 200 Kg/THM pulverised coal injection in blast furnaces.
- To adopt alternate processes of iron making like FINEX and ITmk3 (apart from COREX) to utilise iron ore fines and non-coking coal fines.
- To improve efficiency of small (<200 TPD) coal based sponge iron plants.
- To increase production of gas based DRI through coal synthesis gas, Corex & Finex off gases and coke oven gas, if available.
- To complete the process of acquisition of coking coal, low silica limestone and manganese ore mines abroad at the earliest.

Product Development

Apart from reducing cost of production through improved techno-economic performance, Indian companies have to substantially increase production of following high end products (illustrative and not exhaustive) to be able to increase exports.

1. CRGO steel for electrical industry
2. API grade steel for pipes
3. High strength steel for construction (Fe 600), transportation, auto body

4. Creep resistant, fatigue resistant and crack resistant steels for Nuclear power, Space, Oil & Gas, Aviation, Defence and other sun rise sectors

5. High end ERW Pipes with higher weld toughness

6. High speed rails and rails for metro rail

7. Coated steel for appliances

8. Heavy structural including universal beams and columns

9. Manufacture of tire cord, tire bead and Cold heading quality wire rods

10. Ship building quality, boiler quality and other superior grades of plates for capital goods sector

Chemical consistency, dimensional accuracy, surface finish, non-metallic inclusions etc. also need to be improved. With improved techno-economic performance and production of high end products together with improvement in general quality parameters, export competitiveness will improve. Wherever possible, employee strength should be reduced. India should fix targets of exporting 10% of production by 2020 and 20% of production by 2025.

Help Needed from Government

Government intervention in the following areas will go a long way in reducing cost of production and improving competitiveness.

1. To fully exempt raw materials like iron ore, coal, limestone and ferrous scrap from import duty. Manufactured products like metallurgical coke, sponge iron, Ferro alloys etc. which are also inputs, should not attract more than 2.5% import duty.

2. There is an urgent need to reduce taxation on minerals. Total tax on iron ore in India works out to about 55% against 39% in Australia, 35% in Brazil, 35% in Russia and 32% in China (Source: Report titled 'The Indian Steel Industry-Key reforms for a brighter future' submitted by NCAER in September, 2015). Total tax on iron ore should be reduced to a maximum of 35%.

3. A transparent policy based on sealed bids and reserve prices (fixed by independent, credible third party evaluations) may be formulated for allotment of captive iron ore mines to major companies like JSW Steel, Essar Steel, and RINL.

4. To re-impose export tax on iron ore pellets and chrome ore.

5. Presently, coal is the main fuel for the Indian Steel Industry. Both natural gas and oil are not available in India. Hence a clean energy cess of Rs 400/T on coal is a big burden for steel industry. Either this should be fully exempted for steel industry or at least reduced to Rs 200/T.

6. All Greenfield Projects proposed in the public sector should be put on hold till at least 90% utilisation is achieved in respect of capacity already commissioned or on the verge of commissioning.