Steel In India & Asia - An Indian Perspective

- By Amit Majumdar
Managing Director
Minmet Resources International
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Historical Evolution

- Iron and steel occupy an important place not only in India, but the world
- India has been amongst the pioneers in ancient iron making
  - Ashoka Iron Pillar
  - Damascus Sword
- New era dawned in 1947
- 1947 – at independence 3 units (2 in the private sector), capacity 1 million tones
- 1779 – first recorded effort in Bengal
- 1830 – successful manufacture in Madras
- 1875 – iron making through blast furnace route in Bengal
- 1904 – first attempt to manufacture steel
- 1902 – Jamsetji Tata's vision to set up iron and steel industry in mineral rich Bihar
- 1911 – first blast furnace commissioned in Jamshedpur
- 1912 – steel manufactured
- 1918 – Burn & Co. promoted Indian Iron and Steel Co. Ltd. with works in Bengal
- 1923 – charcoal blast furnace set up in Bhadravati by Sir M.Visvesvaraya
- 50's to 60's – 3 plants set up in public sector

Durgapur	English
Rourkela	German
Bhilai	Russian

- 70's to 80's – 2 plants set up in public sector
  - Bokaro – Russian
  - Vishakapatnam – Russian
- Presently 7 ISP's – 6 in public sector, 1 in private sector
- Loss of leadership in 1970's / 80's due to
  - Financial Constraints
  - Interventionist Policies
- Liberalization and reforms in 1991 transformed the scenario
- Industry delicensed and opened up for investment by private sector in 1991

Reforms & Economy

- Reforms were thrust on India when FE reserves dwindled to just US $ 1 billion in 1991
- India had to mortgage its gold reserves to bail out of the fiscal situation
- While reforms had begun as a matter of compulsion, mainstream intellectual opinion had comprehensively rejected the regime better known as 'License Permit Raj'
- This was finally dismantled by the government in July 1991
- With this the steel industry , amongst others, was de-licensed
- There were many doom-sayers who were proved wrong
- Economic reforms created a new world that simply did not exist before
- 15 years ago queues would be seen for getting gas connections, two-wheelers and cars, even a telephone connection
- Today, farmers, vegetable vendors, electricians, plumbers can be seen moving about with a cell phone
- There have been some areas of neglect : agriculture, healthcare, education etc.
- These are being addressed now
- Till 1993, there was rapid growth at around 8 %
- Slackened in the latter half of the 90s
- The steel industry was adversely affected
- There is new dynamism in India today
- The Indian economy is sizzling
- Post industrial delicensing on July 4, 1991, Indian economy has moved into an accelerated mode
- The last four years have witnessed high growth rates with GDP at over 8 %
- Current year FY 2007 GDP is estimated at 9.2 %
- 1950 – 70s GDP growth averaged 3.5 %
- 1980s and 90s GDP growth averaged 6 %
- The economy has been largely driven by a sustained upturn in industry in general and manufacturing sub-sector in particular
- Favourable demand conditions have encouraged investments across industries
- Contributing factors include availability of credit, improved corporate results, improved external demand, capacity additions and improved competitiveness
- However, growth hampered by high oil prices, high import duties, low operational efficiencies, high transaction costs, restrictive labour laws, high cost of capital and inadequate infrastructure.
- Now reaping the rewards of reforms – eg., total trade in goods and services has leapt to 45 % of GDP from 17 % in 1990
- China's rise is already here and palpable having grown10 % since 1980
- India's is still more a tale of the future that is coming into sharp focus
- Study by Goldman Sachs projects that over the next 50 years India will be the fastest growing of the world's major economies
- Indian companies are growing at a staggering pace
- The Tata group, the country's largest business house – is a far-flung conglomerate having everything from cars and steel to software and consulting systems – recently aquired the European steel giant CORUS in the largest ever Indian acquisition abroad
- Tata's revenues grew from US $ 17 billion to US $ 24 billion last year – strong growth projected this year too
- In the auto parts business, to cite an example, revenues totalled US $ 4 billion five years ago , today it exceeds US $ 10 billion with General Motors alone importing components valued at US $ 1 billion
- Global confidence in the Indian economy and its global competitiveness is leading to greater inflows of FDI backed by technology transfers
- FDI in FY 2006 - US $ 5.56 bn (+48 %)
- FDI in FY 2007 - US $ 10.00 bn (+80 %) est
- India is today a proven global outsourcing destination
- India has attracted a large share of global outsourcing for IT enabled services
- Brand " Made in India " is gaining strong ground in the global community in industrial and service sectors by virtue of its costs, quality and service related commitments.
- Export revenues have grown from US $ 44.6 bn in FY 2001 to US $ 120 bn (est) in FY 2007
- Foreign exchange reserves have grown from a measly US $ 1 bn in 1991 to approx US $ 170 bn by end 2006
- Steel consumption is positively linked to real GDP growth
- In India for every 1 % rise in GDP, there is 0.96 % increse in steel consumption
- With industrial progress, particularly investment in infrastructure, a healthy growth in steel consumption can be expected in the short to medium term
- Steel consumption is expected to grow at 8 – 9 % per annum during the next 5 years – increasing from 50 mn tonnes in FY 2006 to 65 mn tonnes in FY 2011 could even reach 80 mn tonnes.
- currently India's steel consumption is 40 kg compared to global average of 185 kg

Roads	: US $ 40 bn	Real Estate	: US $ 50 bn
Power	: US $ 32 bn	Others	: US $ 64 bn
Water Resources	: US $ 38 bn	Total	: US $ 224 bn

The Scenario Today

- In terms of world crude steel production, India with production of 50 MT of crude steel annually ranks 5th in the world.
- The Indian steel industry is categorized broadly into following
  - Seven large plants :
    - Six in the public sector
    - One in the private sector
  - Based on conventional BF – BOF route
  - Three newer plants set up in the post liberalization period.
  - Merchant Pig Iron and Sponge Iron plants.
  - Large number of EAF / IF units
  - Large no. of down -stream steel processing units.

Structure of the Indian Iron and Steel Industry

Iron Making	MBF Units Producing Pig Iron Only
Sponge Iron / DRI	Coal / Gas Based Units
BOF – BOF / OH	Sail Plants, RINL (VSP), Tata
Corex / DRI / BOF	JSW Steel
DRI / MBF / EAF	Ispat , Jindal Steel & Power, Usha
DRI / EAF	Essar Steel
MBF / EOF	Jsw Steel / Kalyani – Mukand
Scrap – DRI / EAF	Other EAFUnits
Scrap - DRI / IF	All IF Units
Steel Processors	Re-rolling / HR / CR / GP / GC / Colour Coated / Tin Plate Units

- About 67% crude steel production is through BF – BOF route.
- Older plants have continuously upgraded and modernized technology
- Tata Steel is today one of the finest plants and the lowest cost producer of steel in the world
- State–of-art technology has been used in setting up two COREX units
- JVSL with the revolutionary COREX process (and co-generation of power) has set up a bench mark in the world
- Per capita consumption of steel is only 40 kg - dwarfed by 270 kg in China and 400 kg in developed countries

Tata Steel – India's oldest and most modern plant with all its greenery

Raw Materials

India is well endowed with all the basic raw materials required for the iron and steel industry – the raw materials being iron ore, coal and fluxes like limestone and dolomite. Good reserves of other raw materials like manganese ore, silica, chromite, magnesite etc. are available.

India is well endowed with basic raw materials

- Iron Ore • Manganese Ore • Coal • Fluxes etc.
- Good reserves of other raw materials like silica, chromite, magnesite etc. are available.

Iron Ore

The total reserves of iron ore in the country are estimated as below

Hematiite Ore	10.3 billion tonnes
Magnetite Ore	1.7 billion tonnes
Total	**12.0 billion tonnes**

Domestic requirement fully met

Exports increasing – 95 million tonnes in 2006-07

Massive investments in mining and infrastructure are needed which take 5-6 years to fructify

Growth in the steel sector is at a much faster pace

- Limestone deposits are estimated at 170 billion tonnes
- Dolomite reserves are around 735 million tonnes

- Manganese ore reserves are estimated at around 406 million tonnes most of which are suitable for blast furnace use.
- The reserves of ferro manganese grade ore are limited to about 20% of the total reserves.

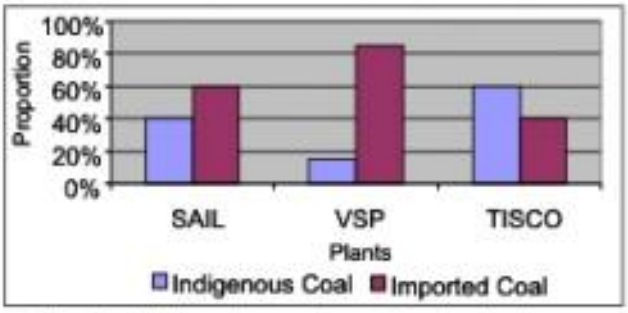
Coal and Coke

- Coal reserves are estimated at around 246 billion tonnes
  - coking coal 32 billion tonnes of which
    - prime : 5 billion tonnes
    - medium : 25 billion tonnes
    - semi : 2 billion tonnes
  - non coking coal 214 billion tonnes
- With coal reserves of 246 billion tonnes, amongst the highest globally, the country's coal production is in deficit and imports have been increasing
- While India has abundant reserves of coal not all coal is of suitable quality to meet the requirements of blast furnace operations. Indian coking coals are categorized as :

Grade	Ash (%)	Remarks
Steel Grade 1	< 15	Not Available
Steel Grade 2	15 - 18	Not Available
Washery Grade 1	18 - 21	Scarcely Available
Washery Grade 2	21 - 24	Limited Availability
Washery Grade 3	24 - 28	Linked to ISP'S
Washery Grade 4	28 - 35	Linked to ISP'S

- ISP's linked to coal mines/washeries
- ash is high (18 to 21%) even after washing
- different plants blend indigenous coal with imported low ash coal

Plant	Indigenous	Imported
SAIL	40%	60%
VSP	15%	85%
TISCO	60%	40%



- Considerable dependence on import of coal and coke
- Merchant pig iron producers almost totally dependent on import of coke - 4 mt annually mostly from china
- Problems of availability
- Problems being addressed on priority
  - Long-term tie-ups
  - JVS
  - Acquisition of coal mines abroad
  - Setting up captive coke units

Mini Blast Furnaces

- Relatively newer plants
- Set up in 90s (post liberalisation)
- Plans to have captive coke plants
- Imports in the interim period
- Continued imports of chinese coke
- Faced severe coke crisis due to volatility in prices of chinese coke in mid 2004
- Alternatives – captive/dedicated tie-ups

Global Scenario

- World crude steel production during 2006 at 1.24 billion tonnes was 8.8 % higher than 2005
- Production of steel (mn tonnes) by the top 10 nations is as under :

Rank 2006	Rank 2005	Country	2006	2005	% Change
1	1	China	418.8	355.8	17.7
2	2	Japan	116.2	112.5	3.3
3	3	USA	98.5	94.9	3.8
4	4	Russia	70.6	66.1	6.0
6	5	S. Korea	48.4	47.8	1.3
7	6	Germany	47.2	44.5	6.1
5	7	India	50.0	46.0	7.6
8	8	Ukraine	40.8	38.6	5.7
9	10	Italy	31.6	29.4	7.5
10	9	Brazil	30.9	31.6	-(2.2)
		ASEAN	17.6	16.5	6.6

- China's share of production stands at 37.7 %
- Chinese steel industry is scaling back steel output by 100 mn tonnes in the next five years with 26 outdated steel units being scrapped and small bfs under 300 cubic meter capacity and convertors less than 20 tonnes to be phased out
- Another two lists being issued of obsolete capacity to be eliminated by end of next year
- Global steel demand is expected to rise by 4.9 % a year till 2010
- Steel exports totalled 370 mn tonnes in 2006 with exports up five-fold since 2003 – mostly in flat products, which are up nearly ten-fold

- During last five years world steel consumption has increased by approx. 338 mn tonnes to 1,113 mn tonnes.
- This represents an annualised growth rate of 7.5% against a meagre 1% in the previous three decades upto 2000.
- China is expected to be a net exporter of steel at 32 mn tonnes in 2006 from being a net importer of 33 mn tonnes in 2003
- Steel consumption in russia is growing strongly
- Steel prices in european markets have started to look weaker
- Credit suisse forecast is that india will overtake china as the faster growing economy in asia in 2007 driven by increasing consumer demand and public investment in infrastructure. It predicts that indian economy would grow by 10 % in 2007 and 10.5 % in 2008
- US economy is slowing down with construction and consumer spending declining

Crude Steel Output (mn Tonnes)

Year	2001	2002	2003	2004	2005	2006
China	150.9	182.2	220	272.5	349.4	418.8
Japan	102.9	107.7	110	112.7	112.5	116.2
S. Korea	43.8	45.4	46.3	47.5	47.7	48.4
India	27.3	28.8	32	32.6	38.1	45
Asia	353.9	363.8	411.7	471.4	566.1	647.5
World	850.3	903.8	964	1056.5	1129.4	1239.2

India's growth rate has accelerated after 2004 and is expected to continue. China is the world leader and will remain so.

Indian Scenario

- India is the world's 5th largest producer of steel. Output of crude steel in 2006 was 50 mn tonnes signifying a growth of 7.6 % over 2005.
- India is the world's largest producer of DRI with an output of 15 mn tonnes in 2006
- Steel production is expected to grow from this level to 65 mn tonnes , possibly 80 mn tonnes on the basis of massive capacity additions , by 2011
- Steel pricing is anticipated to be stable in 2007 with consolidation in the industry over the last few years which has brought in some discipline on the supply side
- Indian domestic demand is set to grow exponentially driven by massive investments in infrastructure, construction, automobiles, white goods amongst others
- These sectors will further give a boost to the optimism within the domestic industry due mainly to the attractiveness in investing in India with its strategic location and strong raw material base
- In view of the fundamental advantages, the Indian steel industry is attracting several international players to set up large greenfield steel projects in India.
- Existing domestic players plan expansions through brownfield and greenfield projects.
- This may create an overcapacity situation but considering the fast growing economy the oversupply can be absorbed
- Production of crude steel is est. at 45 MT in 2006 – 07.
- India is witnessing a massive investment drive in augmenting steel capacities – through both greenfield as well as brownfield routes - due largely to its abundant mineral resources, high calibre human resources and growing domestic demand

SWOT Analysis of Indian Steel Industry

Strengths

- growing economy
- availability of mineral resources
- skilled human capital
- low wage cost
- high technical and managerial capability
- knowledge of english
- large consumer base

Weaknesses

- high cost of finance
- high cost of energy
- inadequate infrastructure
- high reliance on services sector
- inadequate availability of suitable quality of coal
- socio – political conditions
- restrictive labour laws

SWOT Analysis of Indian Steel Industry

Opportunities

- low per capita steel consumption
- poised to become global manufacturing hub
- growing working age demography
- large investments in infrastructure

Threats

- Environmental regulations and unabated rise in input prices power scarcity
- Increasing export of mineral resources, particularly iron ore high energy costs
- It is evident that the strengths and opportunities far outweigh the weaknesses and threats with the reform process having opened up newer avenues to overcome them
- The national steel policymakers are contemplating a target of:

  60 million tonnes by 2010 and

  110 million tonnes by 2020

this is planned through :

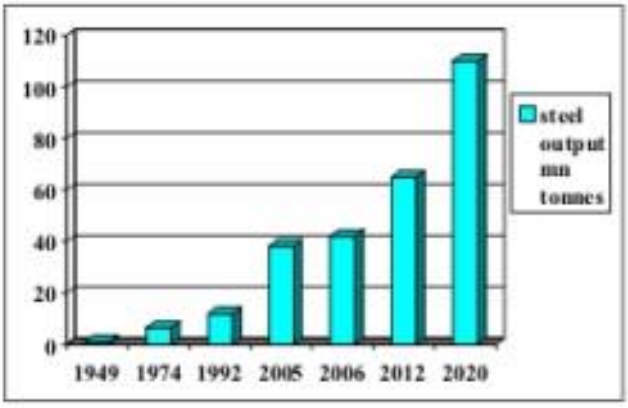
- expansions / technological up-gradation
- new capacities
- acquisitions

Additional Crude Steel Capacity on the Anvil

SAIL	8.5
TATA STEEL	28.0
VIZAG	3.0
MITTAL	12.0
POSCO	12.0
ESSAR	11.0
JINDAL	20.6
BHUSHAN	3.1
OTHERS	2.0
TOTAL	**100.2**

MN Tonnes

The Road Ahead



- After a prolonged period of stagnation the Indian steel industry has witnessed a dramatic turn-around during the last five years
- It has emerged far more resilient and stronger
- It has been a great learning experience on how to manage an industry under trying and adverse conditions
- Most producers took this opportunity for
  - restructuring business and financial portfolios
  - effective cost cutting
  - techno-economic improvements
  - becoming lean and efficient
- Today the Indian industry has slowly but steadily moved to become globally competitive
- The industry lapped up opportunities thrown open by globalisation
- India is well entrenched in international steel trade
- There is a sea change in improving infrastructure
- Power reforms have accelerated
- Greater focus on rail, roads, ports etc
- Expansions planned on raw materials resources

In short, India is today globally well placed to produce steel at competitive prices this is backed by :

- strong raw material base
- strong technical and managerial manpower
- high level of absorption of technology
- low manpower cost
- reducing cost of capital
- improved infrastructure

ASEAN comprises of the following nations :

- Indonesia
- Malaysia
- Philippines
- Singapore
- Thailand
- Vietnam

- The steel industry has come a long way since its formative years of 1950's
- The 60's saw emergence of EAF's which intensified in the 70's with focus on long products
- The 80's witnessed some maturity with investments in flat products
- EAF's remained most prevalent technology – necessitating larger import of ferrous steel scrap
- The 90's was a period of high growth for steel production and consumption saw a peak of 33.4 million tonnes in 1996
- Imports of HR, CR, EG grew manifold
- Sharp decline to 18.6 million tonnes in 1998 during the fiscal crisis
- Recovery commenced in 2000 when consumption was 22 million tonnes which recorded an all-time high of 39.6 million tonnes in 2006
- Crude steel production has witnessed an annualized growth of 14 % between 2000 and 2006 with Malaysia dominating the scene with a contribution of 30 % of the total steel produced of 17.6 mn tonnes

Year	Crude Steel	Fin Steel	Scrap Import	Steel Import	Steel Export	ASC
2000	9.93	22.54	4.15	24.29	6.03	22.20
2006	17.63	31.40	6.25	35.27	10.06	39.69

Unit: mn Tonnes

- Crude steel by EAF route is estimated to reach 38 mn tonnes by 2011 (IISI est)
- Thailand is fast catching up and Vietnam too has many capacity additions
- Only two countries, Indonesia and Malaysia have iron making facilities as of now (DRI and HBI)

- In other words, ASEAN has greater capacity for rolling / finishing than steel making
- The focus so far has been on long products required for infrasructure facilities

Some Influencing Factors

- Surge in exports from China
- Indian companies buying companies across ASEAN
- Surge in investments, particularly through the blast furnace iron making route, making it less dependent on steel scrap in future

ASEAN Steel Industry is Vulnerable

- highly vulnerable
- state-owned in some economies
- highly dependent on import of raw materials and semi-finished products
- can be swamped by exports from China

But ……,

There is Huge Potential for Growth in Demand

➢ Across the region, apparent steel consumption (finished steel consumption per capita) remains low , sure signs of potential for growth :

Indonesia	36 kg
Malaysia	335 kg
Philippines	40 kg
Singapore	592 kg
Thailand	251 kg
Vietnam	78 kg
ASEAN	80 kg

ASC in Some Other Countries

Taiwan	874 kg
Japan	610 kg
Korea	1079 kg
China	270 kg
India	40 kg
Global	185 kg

- So, the industry needs to re-invent itself – not only for survival but to have sustainable growth.
- The ASEAN steel industry is moving into an exciting period of growth, like India, backed by growing consumption of steel.
- Most countries have several projects on the anvil and there is a shifting trend from long products to flat products , though the dominance of long products remain

Some New Realities Today

- Steel companies are getting bigger
- A borderless industry is emerging
- Government focus is moving from steel industry to raw materials
- A de-integrated value chain is emerging

What could be Possible Strategies ?

- Develop and encourage the consumption of steel
- Grow horizontally across borders
- Grow vertically across borders
- Invest in customer relationships

Marriage Made in Business Heaven

- Tata Steel and NatSteel Asia is a marriage made in business heaven and is only the beginning of what promises to be a great relationship and a forerunner of what can be expected in future
- ASEAN has a population of approx. 500 million
- Infrastructure needs in the region are huge
- Demand for steel can only rise in the long-term
- Growth foreseen at least for the next two decades
- Local conditions favour local finishing operations
- Acquisition of finishing mills in metallic deficient ASEAN countries are ready market for semis to be produced in India

Strategies of Indian Companies

- De-integrated concept
- Country specific
  - Manufacturing (M & A or Greenfield)
  - Export potential
- Evaluation of opportunities for M & A, JV, Alliance
- Steel making near raw material resources
- Finishing near customers
- Increasing presence in domestic market
- Establishing global footprints
  - Establishing primary capacities at locations offering competitive advantages in factors of production
  - Expanding finished steel capacities in growing markets and connecting with primary capacities
- Build up a strong position in value added products and solutions in mature and developing markets

Challenges Ahead

- Cultural divide and possible differences
- Integration of different aspects like knowledge, operations, process, financial, etc.
- Attracting and retaining human talent
- Raw material security
- Timely execution of greenfield projects