

Steel Industry

1. Profile of the Steel Industry

The Indian integrated steel industry consists of nine major plants located mostly in the eastern areas rich in both iron ore deposits and coal. The location of the plants was conceived with the intention of having them close to raw material sources. In the days of supply driven market which was also hedged from external competition, the emphasis was mostly on production and not on cost cutting or energy efficiency. With the change in the business environment where market driven forces became stronger and in view of the integration of global environment concerns with the national concerns a marked shift towards incorporating energy efficiency and environment protection in the business activities has taken place. Initially focus was on production technology and it was only recently in this process that energy efficiency concerns were seeded into the thinking of the respective managements. The plants have a wide range of facilities and this reflects in the energy consumption of the individual plants as well. Overview of the plants is given below:

	Unit	Process	Installed capacity (mtcs)	Production (mtcs)	SEC (GJ/tcs)
1	TISCO	BF-BOF-CC	3.540	3.434	32.57
2.	BSP-SAIL	BF-BOF/THF-IC/CC	3.925	3.743	29.49
3	BSL-SAIL	BF-BOF-CC	4.360	3.353	33.96
4	DSP-SAIL	BF-BOF-CC	1.802	1.500	31.39
5	RSP-SAIL	BF-BOF-CC	1.900	1.190	41.77
6	IISCO-SAIL	BF-OHF-IC	0.380	0.292	39.71
7	VSP-RINL	BF-BOF-CC	2.900	2.576	33.22
8	JSPL	DRI-EAF	0.650	0.400	26.00
9	JVSL	COREX-BOF-CC	0.800	0.670	-

2. Salient features of Indian Steel Industry

- Installed capacity 34 MT of finished steel
- 42% of finished steel production in integrated steel sector
- 58% of installed production in secondary steel sector
- SEC ranges from 29.5 GJ/tcs to 41.8 GJ/tcs
- Average SEC of Indian industry (33 GJ/tcs) is slowly approaching that of US industry (26 GJ/tcs)
- Most efficient steel making countries are Japan (18 GJ/tcs) and South Korea (19 GJ/tcs)
- Over the years, a number of energy conservation measures taken by each plant.

3. Quantitative Details

3.1 Installed capacity and capacity utilisation

The integrated Iron and Steel industry in India has a total installed capacity of 19.5 MT of crude steel. However the production from these plants totals 16.5 MT for the year 1999-2000. Thus we can see that there is unutilized capacity in the integrated steel industry. The unutilized capacity has a bearing on the energy efficiency and is correlated to the energy efficiency. The coefficient of correlation was found to be -0.85 . Thus one important part of the respective energy management policies of the plants should be to ensure full utilisation of capacities.

3.2 Energy from waste

The utilisation factors are inversely correlated to the SECs. However an important off-lier in the above analysis is the JSPL plant which is mostly dependent on the Scrap / DRI-EAF route for steel making. Even though the utilisation factor for the plant is only 66% the SEC is only 26 GJ/tcs implying that the use of new routes of steel making with optimal capacities could be used to harness energy for better purposes. The plant uses the DRI off-gases for electricity production.

3.3 Technological status

Major technological improvements in production facilities have been made in many of the integrated steel plants. The effect of technological improvements is manifested best in the low SEC for the DSP which has been able to bring down the energy consumption in a short duration. Thus technological improvements in the production facilities can have far reaching consequences as far as the energy consumption scenario is concerned.

3.4 Fuel usage

All encouraging trend of declining energy consumption is evident in the integrated steel sector. The decreasing trends of coking coal usage per tonne of ore processed indicates better resource efficiency for the steel industry as a whole. The same is evident from the trends for limestone consumption per tonne of ore processed. A similar trend is also visible in the gaseous and liquid fuel consumption for the integrated steel plants. Even though there has been a trend of enhanced energy efficiency and resource efficiency in the India Steel sector, the best is yet to be achieved.

Reference:

Energy Management Policy – Guidelines for Energy Intensive Industry in India,
Chapter 8, pp 162-188 by Bureau of Energy Efficiency