

SOUTH AFRICAN STEEL PRODUCERS HANDBOOK

2011

DIRECTORATE: MINERAL ECONOMICS



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SOUTH AFRICAN STEEL PRODUCERS HANDBOOK

2011

DIRECTORATE: MINERAL ECONOMICS

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1. INTRODUCTION

The primary steel industry contributes significantly (directly and indirectly) to the economic development and industrialisation of South Africa. It is also positioned to continue to be a major contributor to the country's GDP, a significant foreign exchange earner and vital supplier of raw materials and employment creator to the downstream industries in the manufacturing sector.

The industry has undergone major changes in the past decade as a result of both local and international developments. Trade liberalization and diminishing levels of government collaboration together with falling real steel prices as well as global over-capacity in the second half of the 1990s were important pressures for cost-cutting and rationalization. Such restructuring involved both new investment and closure of some old production capacity. There were also major new investments in the relatively more advanced production operations of Saldanha Steel and Columbus Stainless Steel.

One of the greatest challenges to the long term viability of the primary steel industry in South Africa is to ensure a broad based sustainable economic growth rate at a sufficiently high level in order to stimulate production capabilities in downstream industries. This would provide a strong growth in demand for primary steel products as part of a coherent growth strategy, which will generate sustainable employment and growth in an increasingly competitive world economy.

Globally, the industry is relatively matured, characterized by intense competition and consolidation, continual pressure to cut costs and extensive government intervention with respect to trade measures aimed at protecting local producers from the potential impacts of dumping.

The South African steel industry is highly export orientated with the international norm for steel exports around 20 percent. This reflects the relatively immature state of the downstream manufacturing and engineering industries. The South African steel industry has consistently exported in excess of what was imported over the past 25 years.

The global steel industry is currently showing signs of recovery, following the global crisis of 2008. This is after the industry enjoyed the commodity boom, which saw unsurpassed demand for steel, driven by demand from Asia, in particular China.

The performance of the South African iron and steel industry has been influenced by both international steel market trends and the general performance of the South African economy. The industry is faced new challenges linked to global restructuring, with specific emphasis on capacity rationalization, consolidation and re-engineering of operations. This has resulted in cost savings, improved product quality, flexible operations and quicker delivery, in line with contemporary international standards. However, although most of

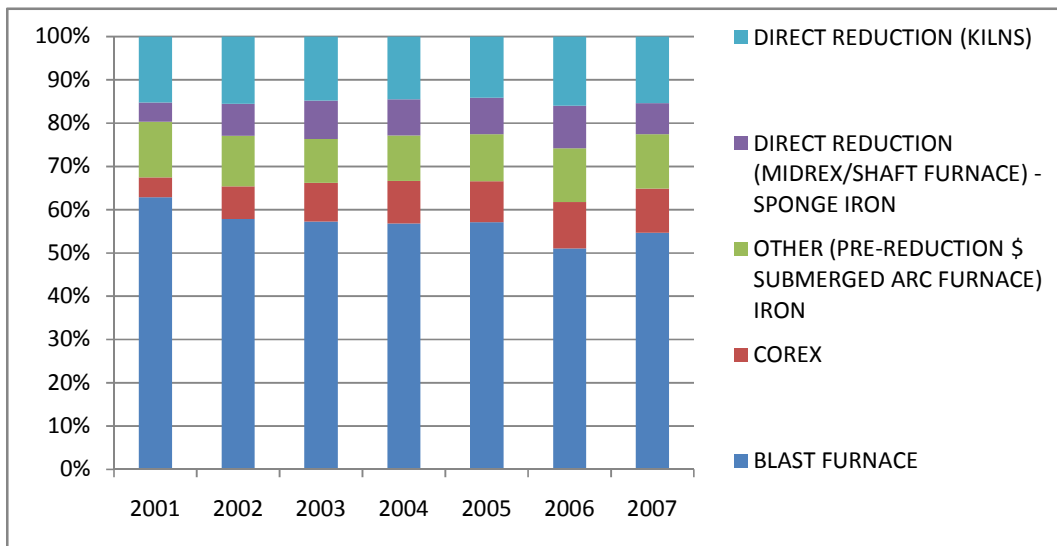
these measures helped maximize profits, affected many jobs negatively and disrupted the process of job creation and poverty alleviation.

2. STEEL MAKING IN SOUTH AFRICA

2.1 Technology

Steel is a metal composed of iron and varying amounts of carbon as well as other elements such as chromium, nickel, molybdenum, zirconium, vanadium, tungsten, and so on. The steel making process comprises two key steps, the one step being iron making which is followed by the actual steel making. In South Africa, iron is produced by five technologies, ie. Blast Furnace, Corex, Direct Pre-reduction and Submerged Arc Furnace, which produce liquid iron, as well as Reduction processes i.e. Midrex, Direct Reduction and Kiln technology which produce sponge iron. Key input materials are iron ore, dolomite, as well coal/coke in varying proportions per technology. The blast furnace and direct kiln reduction processes makes use of coke as the key energy input while three other processes utilize coal. Between 50 and 60 percent of iron was produced through the Blast furnaces between 2001 and 2007. (fig 1)

FIGURE 1: SOUTH AFRICA'S IRON MAKING CAPACITY BY PROCESS/TECHNOLOGY, 2004 - 2007



Source: SAISI

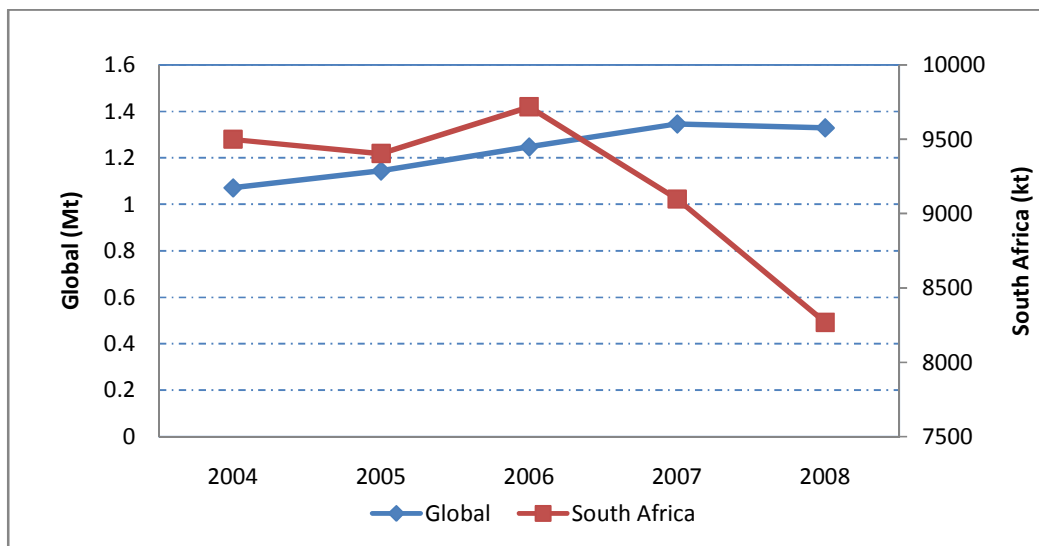
NB: 2003-2007 based on projections, actual figures are not available.

During the period 2001 to 2003, approximately 60 percent of iron and 7 percent was produced through the Corex technology. The relative importance of Blast Furnace production was subsequently decline to approximately 57 percent for the period 2004 to 2006 and thereafter to 55 percent in 2007. The contribution of iron produced via the Corex route increased to 10 percent during 2004 and it was expected to remain on much the same level as from 2005. The relative importance of the Pre-reduction and Submerged

Arc furnaces decreased marginally from 13 percent in 2001 to 11 percent during 2004 and remained on much the same level as from 2005.

South Africa's steel production declined at an average rate of 3 percent per annum between 2004 and 2008 as it, while the global steel production grew at an average of 6 percent in line with the global demand (fig 2). During the same period, South Africa accounted for an average of 0.8 percent of global steel production. Global production grew consistently from 1 071 Mt in 2004 to 1 346 Mt in 2007 and dipped to 1 329 Mt in 2008 on the back of the financial crisis, while the only growth recorded for South Africa was in 2006 where SA Steel production reached 9 718 kt, followed by a steep decline in 2007 and 2008.

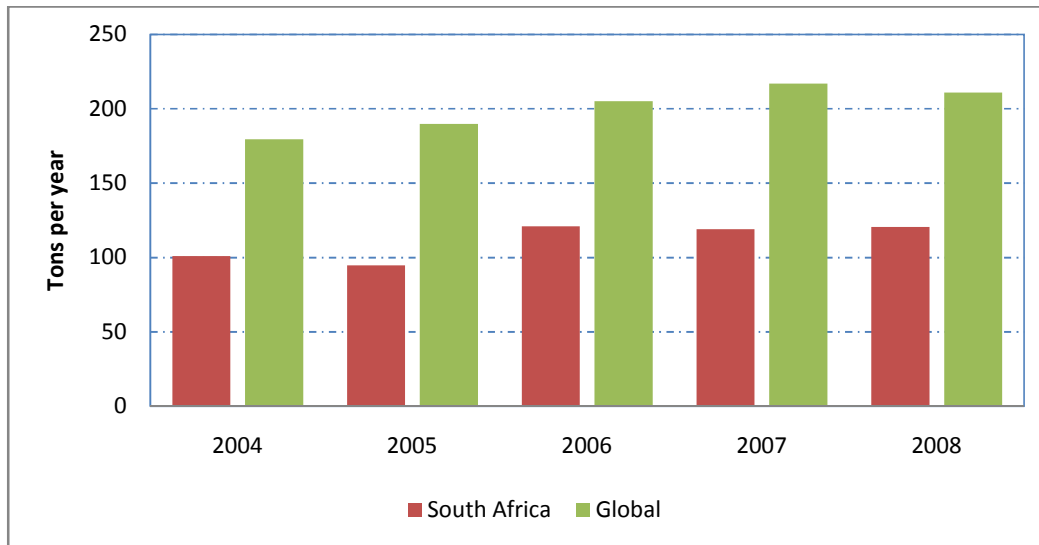
FIGURE 2: STEEL PRODUCTION, 2004 - 2008



Source: World Steel Association

Steel use in any country is closely linked to its economy and therefore serves a barometer for economic development, with the largest consumption in the wealthiest countries of the world. Steel consumption of finished steel products ranges from approximately 20 kilograms per person per year in Africa to around 340 kg in Europe, 420 kg in the North America and 635 kg in Japan. The largest consumers are in Asia: Singapore (1 200 kg), Taiwan (over 970 kg) and Republic of Korea (830 kg). At 340 kg of crude steel per person against the global average of 212 kg, China's per capita consumption of crude steel exceeds that of the world average. Within the African continent, Libya is the most competitive with consumption which almost equals the world average, due to a combination of lower population levels and accelerated infrastructural developments, which influenced local consumption of local steel products. South Africa's steel consumption per capita averaged 111 kg per person, 45 percent less than the world average of around 200 kg per person (fig 3), indicative of lack of development in the country.

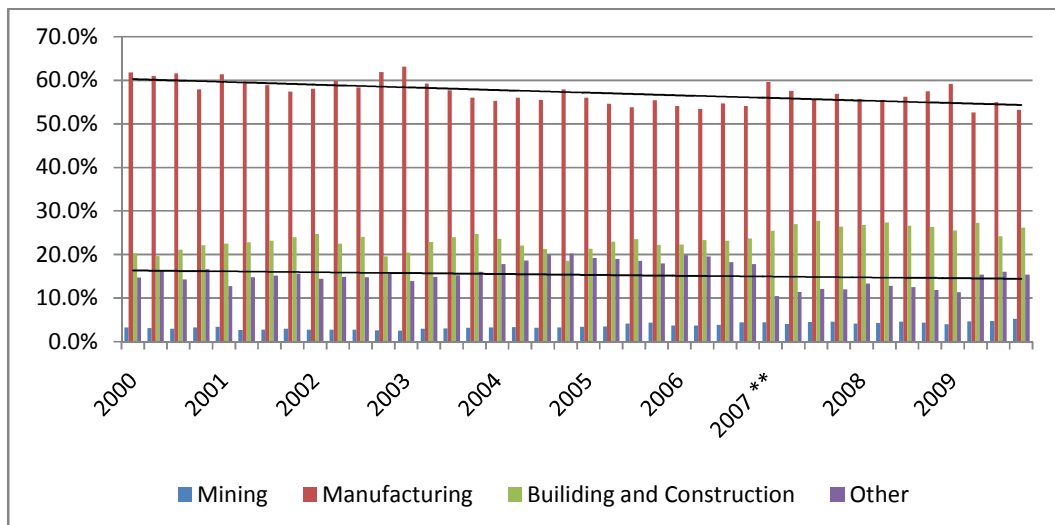
FIGURE 3: STEEL CONSUMPTION PER CAPITA, 2004 - 2008



Source: World Steel Association

South Africa's manufacturing sector is the largest consumer of steel, accounting for an average of 60 percent of consumption per annum (Fig 4). The second largest consumer of steel products is the building and construction sector, consuming between 20 and 25 percent of South Africa's annual steel consumption, followed by mining sector which consumes between 5 and 6 percent of annual consumption. The balance is consumed by other small sectors clustered together.

FIGURE 4: STEEL CONSUMPTION PER SECTOR, 2000 - 2009



Source: SAISI

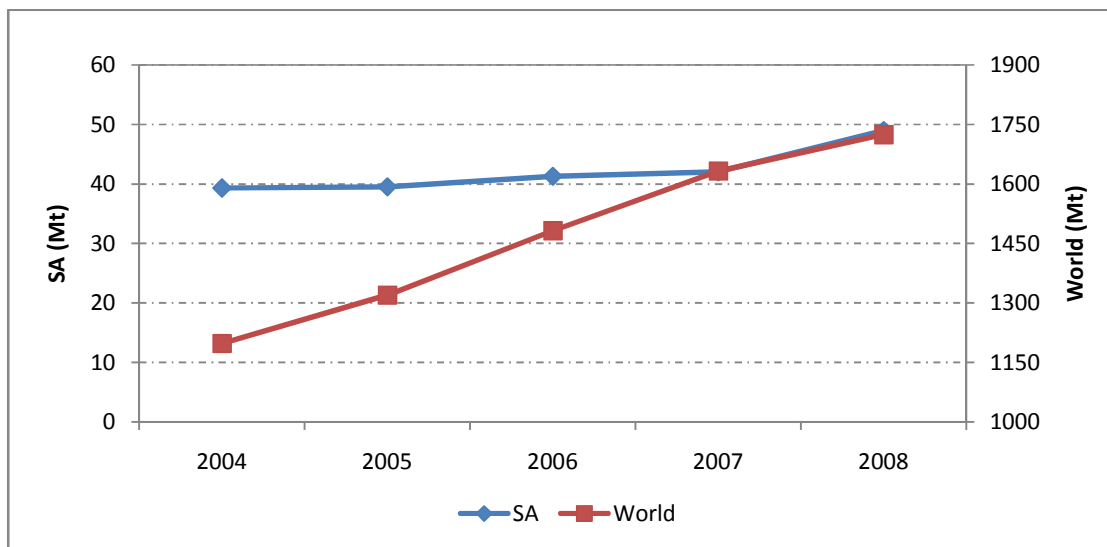
2.2 Other Important Input Raw Material

Steel has proven not to be strong, tough and resistant enough on its own, therefore other ingredients in major steel products include various contents of ferrous minerals, most of which are found in abundance in South Africa. South Africa is the world's largest producer of chromium ore, 90 percent of which is used in a form of ferrochrome by stainless steel making, the country is the second largest producer of vanadium and its alloys, 90 percent of which is consumed in steel making. South Africa is also a significant producer of iron and manganese ores, ferromanganese, ferrosilicon as well as silicon metal, all of which are necessary in steel making. Different types of steel i.e. steel with different properties and characteristics are produced by adjusting the chemical composition and adapting any of the different stages of the steelmaking process, such as rolling, finishing and heat treatment.

2.2.1 Iron Ore

The global production of major input material into steel making, iron ore, has grown at an average of 9 percent per annum between 2004 and 2008, while local production grew at 5 percent per annum, with an average of 42 431 per annum, showing a disconnect between the local and international trends in terms of iron ore production. (fig 5)

FIGURE 5: IRON ORE PRODUCTION , 2004 – 2008



Source: DMR, Mineral Economics

Closely in line with the global steel production, which determines the global iron ore demand, the SA iron ore exports grew at the rate of 4.4 percent between 2004 and 2008, while domestic sales appeared to be stagnant up to 2007, marginally declining in 2008 (fig 6). This further shows a contrast between the local consumption of iron ore against the international consumption. The local iron ore production clearly thrives on the global steel production, while demand from local steel industry is relatively small.

FIGURE 6: SOUTH AFRICA'S IRON ORE SALES, 2004 - 2008



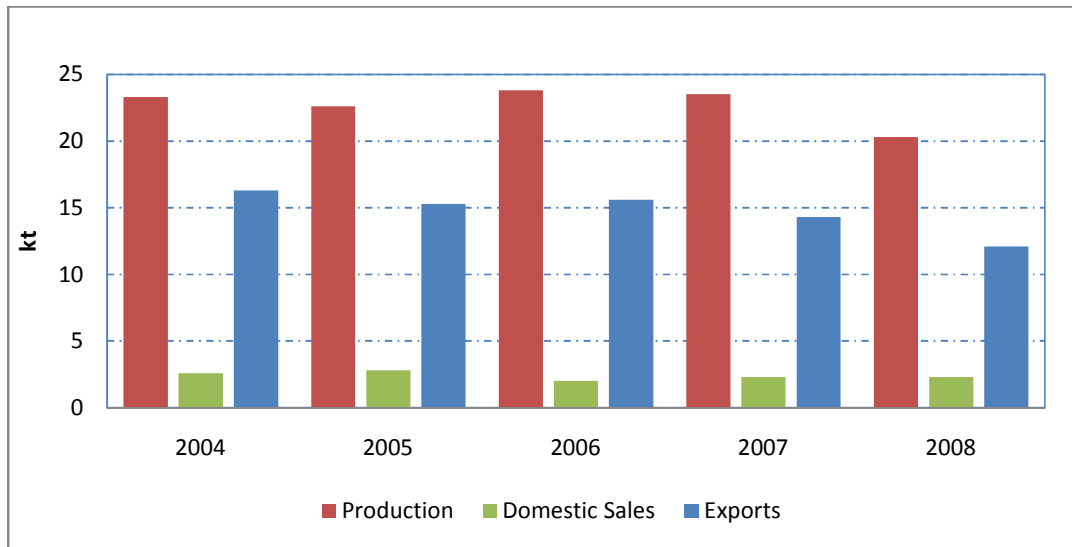
Source: DMR, Mineral Economics

2.2.2 Vanadium

Another important ingredient in steel making is vanadium which imparts strength in steel. Being the second largest vanadium producer, since being surpassed by China in 2007, South Africa has a significant role to play, particularly, in the production of high strength steel. As the leading steel producer, China's usage of vanadium lags that of its peers. It is estimated that unit vanadium usage in China grew by 50 percent to 0.038 kg per tonne in 2009, some 24 percent less than the global average of 0.05kg per tonne. The buildup of China's high speed railway network, the potential driver of global vanadium demand, requires high strength steel bars of 500 Megapascals (MPa), instead of the usual 335 to 400MPa rebars used in construction activities, which provides considerable room for growth in vanadium demand.

South Africa's vanadium production and domestic sales volumes declined at the rate of 2 percent and 4 percent per annum, respectively due to global oversupply between 2006 and 2007. Export sales declined by 6 percent during the same period. (fig 7)

FIGURE 7: SOUTH AFRICA'S VANADIUM PRODUCTION AND SALES, 2004 - 2008

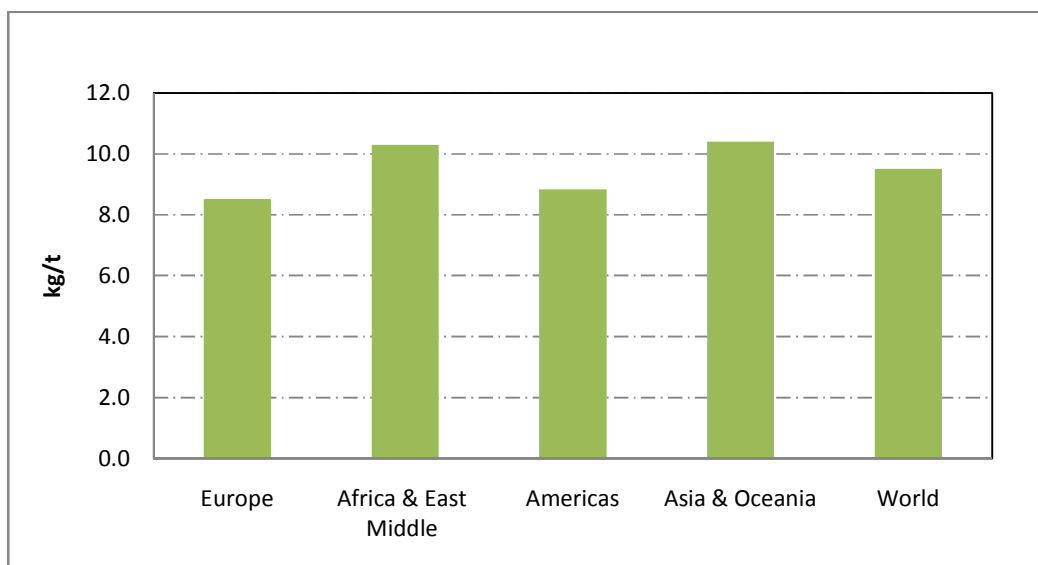


Source: DMR, Mineral Economics

2.2.3 Manganese

It is estimate that about 30 kg of manganese ore or 10 kilograms of manganese alloy is required to make 1 ton of steel (fig 8). This consumption rate may grow very slow as compared to steel production, due to new technological developments which provide for reduced manganese content in steel. In 2008, South Africa produced largest volumes of manganese ore amounting to 6 807 kt, about 15 percent of global manganese production, despite being home to more than 80 percent of the resource. With only less than one percent of the global steel production capacity, the local manganese industry is evidently driven by the export market.

FIGURE 8: MANGANESE ALLOY PER TON OF STEEL, 2007



Source: ENRC

3. COMPETITIVENESS OF THE INDUSTRY

In order to survive and ensure a high level of competitiveness the South African Steel Industry has undertaken the following:

3.1 Restructuring

The industry has aggressively re-engineered its steel operations. Such re-engineering included:

- Restructuring as addressed in detail in section 6 of this report;
- Rationalization of product lines and steel grades produced;
- Improvement in efficiencies throughout all operations;
- Improvement of adherence with environmental standards, and
- Significantly raising the level of customer satisfaction in terms of quality and on-time delivery.

3.2 Benchmarking

The industry benchmarks the key operating indicators at all its operations against international best practice norms and has succeeded in achieving lowest quartile status in the global steel industry cost curve. However, concerns have been raised that despite the benefit of being the lowest quartile producer, the industry tends to charge its local customers import parity price.

3.3 Consolidation

There is a clear correlation between the degree of consolidation in a market and the returns on capital employed. The extent to which an industry can succeed in consolidating depends on several factors such as the ownership and geographical concentration of the commodity and its attractiveness to new entrants. Since the steel industry is far behind the mining industry in terms of consolidation, it has had to play catch up. Consolidation within South Africa has taken a step forward with the incorporation of Saldanha Steel into Ispat Iscor which later became Arcelor Mittal South Africa (AMSA) in line with the global trend of pursuing economies of scale and market clout in international markets.

3.4 The Dilemma of Value Destroying Exports

This refers mainly to the tendency of local steel producers to charge their local customers higher prices than their other clients elsewhere. As this can be seen as local consumers subsidizing steel exports, this practice amounts to the exporting of the competitive advantage that could be derived from the abundance of our mineral resources. The value destroying impact of exports, which generate only marginal returns, can only be resolved by a further step reduction in costs. The industry is addressing this through a combination of interventions including:

- Value adding capital projects;
- Further restructuring; and
- Refocusing on the continuous improvement drive to improve efficiencies and move up the value chain.

3.5 Employment

The SA steel industry has gone through considerable and drastic restructuring which has now positioned it to compete in the global steel market. The continued decline in formal full time steel production related employment in the primary steel industry has persisted since the 1980s. This reflects the concerted ongoing actions of the steel producers to restructure their businesses to be globally competitive.

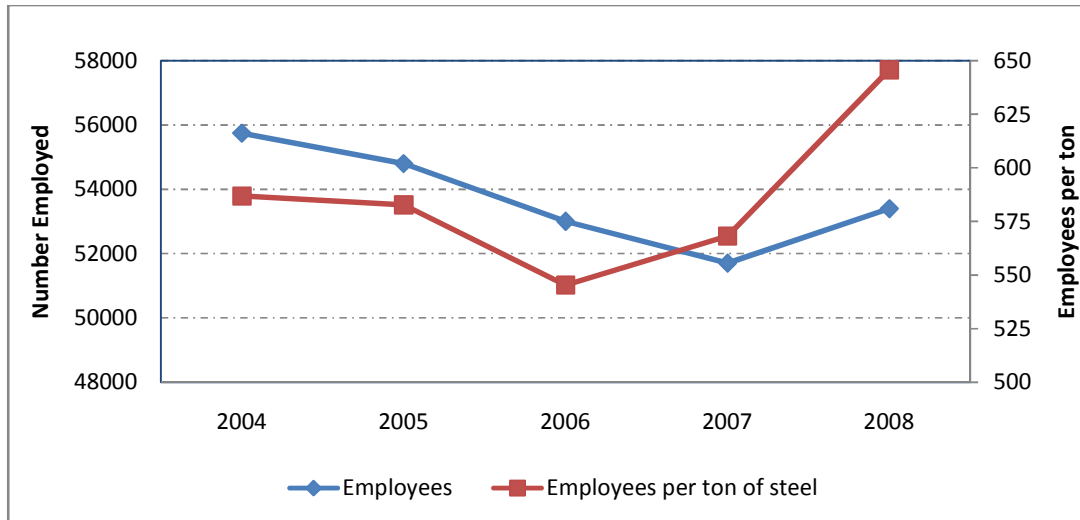
Since the late 1980's and throughout the 1990's, the South African steel industry underwent a product facility rationalisation of inefficient capacity to the tune of approximately 2,5 million tons. These inefficient capacities were gradually reduced over time. The rationalisation process is ongoing and productivity levels continue to rise in concert with global continuous improvement, which is achieved by raising plant efficiencies.

One of the results of several restructuring initiatives has been job losses as categorized below;

- Iscor Vanderbijlpark closure of Blast Furnaces A and B
- Closure of Hot Strip Mill South at Vanderbijlpark
- Closure of the Ingot casting route
- Electric arc furnace operation of only 2 out of 3 at Iscor Vanderbijlpark
- Hot dipped galvanising lines 1 & 2 at Vanderbijlpark (120 000 tons)
- Consequently, Iscor Vanderbijlpark reduced its production capacity by approximately 1 million tons
- Closure of the Iscor Pretoria Works (\pm 800 000 tons).
- Reduction from 1,8 million tons per annum to 1,4 million tons per annum in production at Iscor Newcastle.
- Closure of Iscor Dunswart production facilities in Boksburg (300 000 tons)

A combination of declining employment in domestic steel industry and almost stagnant growth in steel production has led to apparent increase in a ton output per employee, which grew at 1 percent per annum between 2004 and 2008. (fig 9)

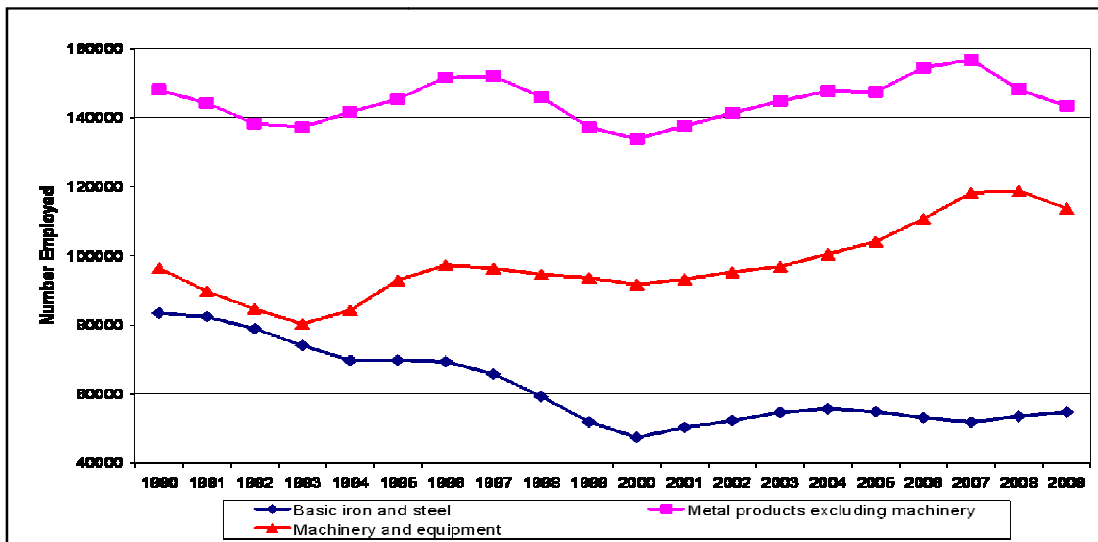
FIGURE 9: EMPLOYMENT IN SOUTH AFRICA'S STEEL INDUSTRY, 2004 -2008



Source: Various

While steel volumes have not risen substantially in the recent years, there has been a growing divergence between the relative performance of the basic iron and steel sector and the two main downstream sectors i.e. metal products and machinery and equipment (fig 10). It is important to note that there were very significant job losses (more than 30 thousands) in the primary steel industry during the 1990's as part of the difficult restructuring of the sector.

FIGURE 10: EMPLOYMENT IN SOUTH AFRICA'S BASIS IRON AND STEEL, AND MANUFACTURING INDUSTRIES: 1990-2009



Source: dti

Global over-capacity, competitive pressures, trade actions and threats of actions (particularly from the US), and the international trend towards industry consolidation have contributed to lower employment levels in the local steel industry. The South African

industry has supported the global initiatives to limit excess steel production capacities on a world-wide basis.

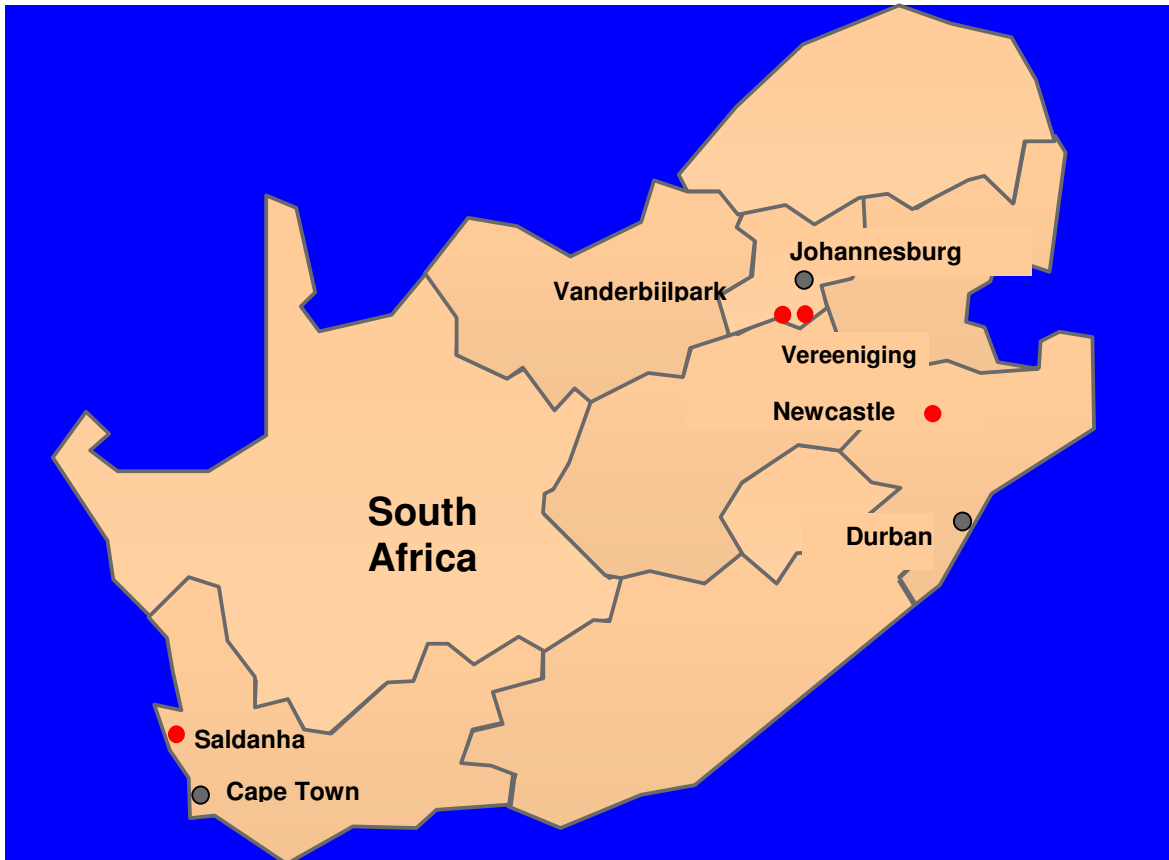
As a result of the above-mentioned restructuring, SA now has efficient and low-cost plants which produce quality steels that are competitive on the export and domestic markets. According to the internationally renowned CRU publication, some South African producers have been ranked amongst the world's lowest cost producers.

The steel industry has been characterized by a considerable amount of consolidation both locally and internationally. This has tended to take the form of mergers, which are aimed at reducing excess capacity while enhancing competitiveness. Examples of these moves towards consolidation include the merger between Acerinox and Columbus Stainless steel. Acerinox currently has a 76 percent stake in the Columbus Joint Venture. Approval for this merger was given on the basis that it would not lessen competition while improving the company's competitiveness in international markets. Other important acquisitions include the recent case of Ispat Iscor, in which foreign partner Arcelor Mittal increased its stake to 52 percent and Anglo American sold 24.9 percent of its shareholding in Highveld Steel to Evraz Group SA and Credit Suisse.

4. LOCAL STEEL PRODUCERS

The consolidation of the South African steel industry throughout history as indicated in section 7 of this report has resulted in the formation of a very dominant local producer, Iscor which later became Ispat Iscor and finally Arcelor Mittal South Africa (AMSA), the merger of Arcelor and Mittal Steel in 2007. The dominance of this company has been a subject of investigation by the Competition Tribunal at the request of its local clients particularly the gold mining industry who alleged that AMSA is abusing its dominant position by charging local consumers excessive prices. In addition to AMSA, a list of producers with their product line is attached in table 1 while the location of most of steel plants is shown in figure 11.

FIGURE 11: GEOGRAPHICAL LOCATION OF SOME STEEL PLANTS



Source: South African Steel Producers Handbook, 2008

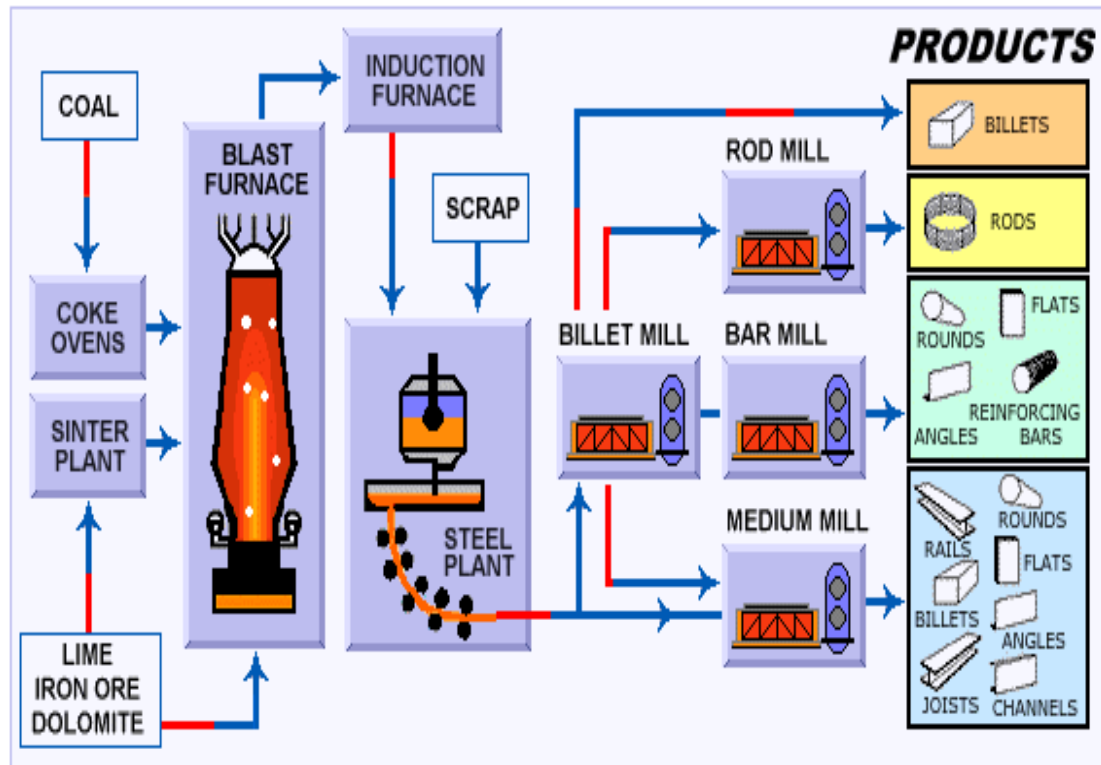
4.1 The Production Process

Raw material used in the production process (iron making) includes iron ore, scrap, sinter mix, coal and dolomite and the product (iron metal) is fed into the steel making process as shown in annexure 1 followed by rolling annexure 2. Annexure 3 gives a comprehensive overview of all these stages while Annexure 4 shows a process flow and a mass and process flow shown in Annexure 5.

4.2 Some Steel Products (Fig 12)

- **Billets**
- **Rod**
- **Reinforcing bars**
- **Rounds**
- **Rails**
- **Channels etc are some of the final products**

FIGURE 12: STEEL PRODUCTS



Source: South African Steel Producers Handbook, 2008

4.3 General uses of Primary Steel Products

- **Plates**

Plates are generally used for the manufacturing of structural components for buildings, bridges, ship building and mining equipment.

- **Hot-rolled sheet**

It is suitable for many applications where surface imperfections are not objectionable. Typical end use includes truck body panels, bulk shipping containers, shovels and agricultural equipment.

- **Cold-rolled sheet**

Cold-rolled sheet has a uniform surface and is ideal material for end use requiring painting. Typical end use includes motor vehicle panels, kitchen utensils, furniture and electronic component chassis.

- ***Galvanized sheet***

Sheet with a zinc coating bonded to the steel substrate. Various applications where corrosive conditions prevail e. g. roof sheeting & cladding and also increasingly popular for motor vehicle components.

- ***Coated products***

Steel products treated and painted before being fabricated into usable products. Applications include architectural and industrial building products, road signs, office furniture. Electrolytic-tinplating also falls under this heading for which typical applications include cans, aerosol containers and toys.

- ***I-sections, H-sections, Angles & Channels***

Building and construction industry

- ***Bars***

Used for concrete reinforcement in civil engineering and construction. Specialised bars used in vehicle construction, drilling equipment etc.

- ***Wire rod***

Manufacture of wire and wire products.

- ***Rails, window sections, fencing material***

Self explanatory.

5. SOUTH AFRICAN MANUFACTURERS OF PRIMARY STEEL PRODUCTS

5.1 CARBON STEEL PRODUCTS

Tables 2 and three below outline South Africa's flat and long steel products, respectively.

TABLE 1: CARBON STEEL FLAT PRODUCTS

PRODUCTS*	MANUFACTURERS	
	Mittal Steel South Africa	Highveld Steel
Slabs	X	X
Hot-rolled plate in coils and lengths	X	X
- Quenched and tempered plate	X	
- Patterned floor plate		
Hot-rolled sheet in coils & lengths	X	X
- Ultra-thin hot-rolled steel sheet	X	
Cold-rolled steel sheet	X	
Electrogalvanised steel sheet	X	
Hot-dip galvanised steel sheet		
steel sheet (cold-rolled and galvanised substrate)	X	
Electrolytically coated tinplate and DWI	X	

Source: South African Steel Producers Handbook, 2008

TABLE 2: CARBON STEEL LONG PRODUCTS

PRODUCTS	MANUFACTURERS				
	Mittal Steel South Africa	Highveld Steel	Scaw Metals Group	Cisco	Cape Gate
Blooms	X	X			
Billets	X	X	X	X	X
Round ingots	X				
Forgings	X				
Heavy structural sections		X			
Medium structural sections	X	X	X		
Light structural sections	X		X		X
Heavy and medium size round bar in lengths	X	X	X		
Light round bar in lengths and coil	X		X		X
Tools steels	X				
Hollow drill steel	X				
Automotive spring steels	X				
Flat bar	X	X	X		X
Grinding - Balls			X		
- Bars	X	X	X		
Window sections	X				
Fencing poles and droppers	X		X		
Wire rod	X		X		X
Railway sleepers		X			
Seamless line pipe, casing & tubing	X				

Source: South African Steel Producers Handbook, 2008

6. STAINLESS STEEL

6.1 *Input Materials*

Virtually all of Columbus Stainless' input raw materials are sourced from South Africa:

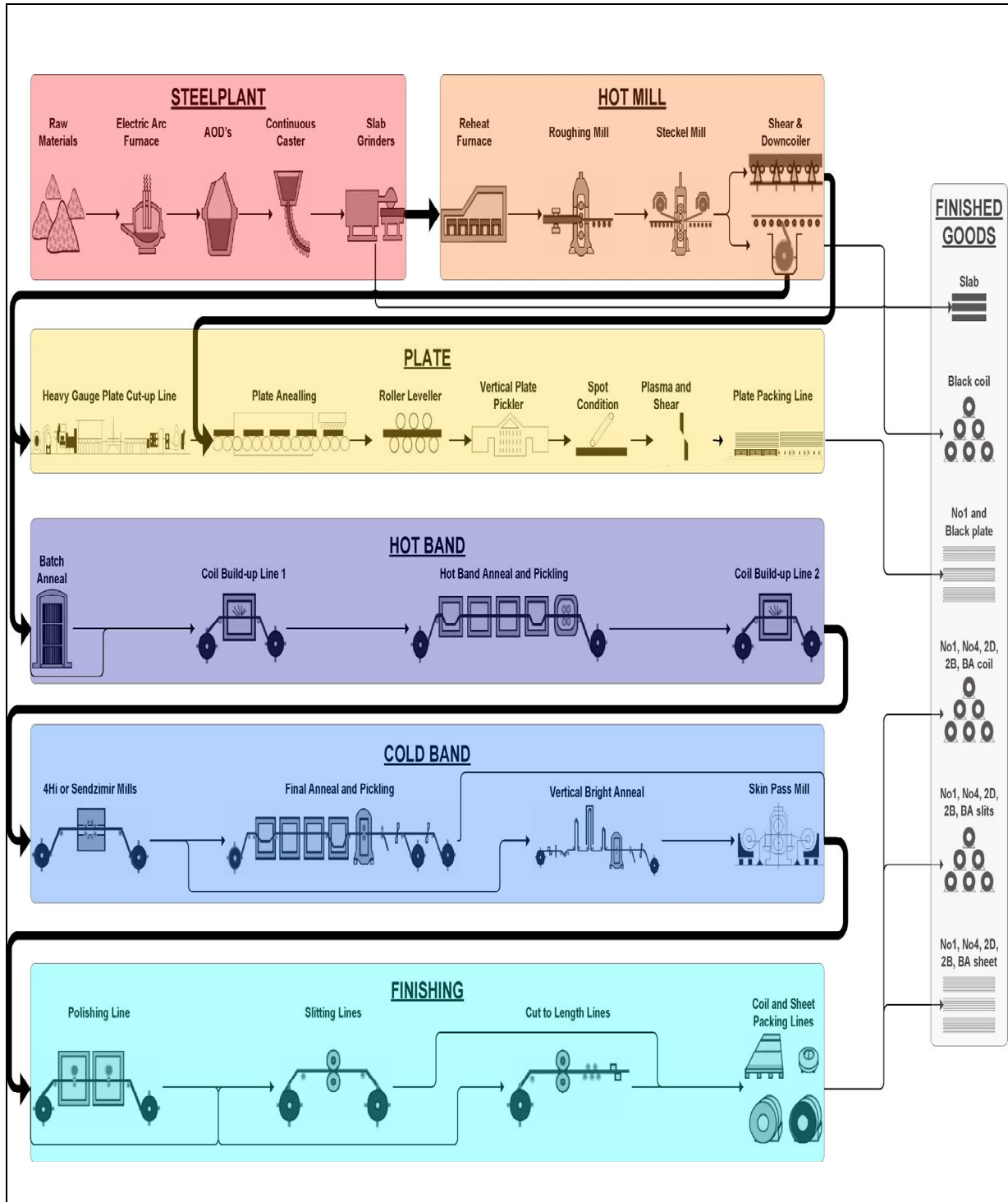
- Mild Steel scrap, the primary source of iron units is sourced from the local scrap trade
- Ferrochrome, the primary source of chromium is produced locally in South Africa which is the largest producer of ferrochrome in the world, and has some 80 percent of global reserves of this key component of stainless steels.
- Nickel, which is by value, most costly of raw materials, is sourced primarily as a by-product of South African Platinum industry and the only nickel mine in Nkomati.
- Some raw materials like molybdenum, titanium and niobium are imported.

Further processing

- Cold rolled stainless if further processed (cut into blank or slit) to form tubes or draw to kitchen sinks, pots and pans etc. Stainless steel is used where one wants to retain a bright finish or in food applications where hygiene is very critical for example Hospitals, Clinics or Restaurant kitchens.
- Hot rolled material is typically formed and welded into process vessels for chemical, petrochemical, nuclear, etc. plants. The reason for use is usually related to corrosion performance.

6.2 Stainless Steel Production Flow

FIGURE 13: STAINLESS STEEL PROCESS FLOW



Source: South African Steel Producers Handbook, 2008

6.3 *Stainless Steel Products*

The following grades of Stainless Steel are produced:

- Austenitic
 - 304/L, 316/L, 321, 316Ti, 309, 310, 202
- Ferritic
 - 3CR12/410, 409, 430, 434, 439, 441, 444
- Martensitic
 - 420
- Duplex
 - 2205

6.4 *General Uses of Products*

Approximately 80 percent of output is exported to a wide variety of end users. Of the product sold in South Africa, the most goes into transport applications, followed by heavy engineering, as well as full spectrum of end-use applications like.

- Transport Applications – Catalytic converters, flexible couplings, automotive exhaust systems, bull bars, bus chassis, rail car bodies, coal wagons
- Heavy Engineering – Chemical and petrochemical equipment, wine tanks, beer brewing equipment, piping, flanges and fittings, process equipment for mining and tank containers.
- Architectural – lift and escalator cladding, shop fronts, fire doors, kitchen and catering equipment, sanitary and washroom applications
- Domestic – stove tops, counter tops, extractor systems, cutlery, cooking pots, light fittings and switches, general kitchen accessories and cutlery.

6.5 *Stainless Steel Producers and Products*

Table 3 below outlines the products of stainless steel.

TABLE 3: STAINLESS STEEL FLAT PRODUCTS

Slabs	X
Plate	X
Hot-rolled sheet and coil	X
Cold-rolled sheet and coil	X

Source: *South African Steel Producers Handbook, 2008*

7. HISTORY OF SOUTH AFRICAN STEEL INDUSTRY

Selected important events in the development of South Africa's primary steel industry: 1882 - 2010

- 1882 - Prospectus of the South African Coal and Iron Company is published.
- 1901 - Mr Samuel Light Green produces the first pig iron from a rudimentary blast furnace in Pietermaritzburg to European methods.
- 1909 - The Transvaal government awards a tender to Mr HH Wright for erection of a furnace to transform railway scrap to steel.
- 1911 - Mr Wright and Mr Sammy Marks establish the Union Steel Corporation (USCO).
- 1913 - USCO starts production from a 10 ton open hearth furnace in Vereeniging - later acquired by Iscor.
- 1916 - Mr C F Delfos is granted a license to mine ferrous ores near Pretoria West.
- 1918 - Mr Delfos constructs a blast furnace and produces 4 000 tons of pig iron in three campaigns up to 1921.
- 1918 - Mr Marks constructs a blast furnace at USCO producing a total of 700 tons of pig iron.
- 1919 - Construction of a blast furnace at Newcastle commences and production starts in 1926 as the Newcastle Iron and Steel Works. The works is renamed Armcor Iron works and later acquired by Iscor.
- 1924 - A German company, Gutehoffnungshütte, publishes a positive report on the potential of the South African steel industry. The report is pioneered by Mr Delfos, who then starts to canvas government support for the expansion of the local steel industry.
- 1924 - SCAW Metals starts operations in Johannesburg as a steel ceilings and aluminium window frames manufacturer. SCAW moves to Germiston in 1939.
- 1927 - Legislation is tabled in parliament that effectively leads to the founding of the South African Iron and Steel Industrial Corporation - Iscor.
- 1929 - Cape Gate Fence & Wire Works (Pty) Limited is founded in Parow, Western Cape by the Kaplan / Kushlick families as a wire netting manufacturer.
- 1934 - State-owned Iscor starts production in Pretoria.
- 1943 - Iscor commissions a heavy plate mill at Vanderbijlpark.
- 1947 - Iscor expands by establishing a green field integrated steel works and flat products mill in Vanderbijlpark completing the first phase in 1953. Major expansions followed during 1964 to 1968 and during 1973 to 1977.
- 1957 - Minerals Engineering of Colorado opens a plant in Witbank designed to produce approximately 1,4m kg of vanadium pentoxide annually.
- 1959 - In November 1959 Anglo American Corporation of South Africa acquires a two-third share in Minerals Engineering and in August 1960 the company's name is changed to Transvaal Vanadium Company (Proprietary) Limited.
- 1960 - The Highveld Development Company Limited is established on 19 May 1960 to investigate the viability of processing titaniferous magnetite ore for the production of liquid pig iron and vanadium-bearing slag.
- 1962 - Cape Gate (Pty) Limited is established by the purchase by the Kaplan family of a small wire netting plant on 15 hectares in Vanderbijlpark, Gauteng Province.
- 1963 - RMB Alloys Ferrochrome Pilot Project is launched in Middelburg.
- 1964 - In November 1964 the Highveld Development Company embarks on a programme to build an integrated iron and steel works near Witbank.
- 1964 - The stainless steel Southern Cross Steel Co (Pty) Ltd is established. In 1968 it becomes the Steel Division of Middelburg Steel and Alloys (Pty) Ltd and in 1990 MS&A Stainless (Pty) Ltd is established. Columbus Stainless (Pty) Ltd is formed in 1991 when the initial partners, Samancor and Highveld Steel, acquire the stainless steel facility of MS & A Stainless from the Barlow Group.

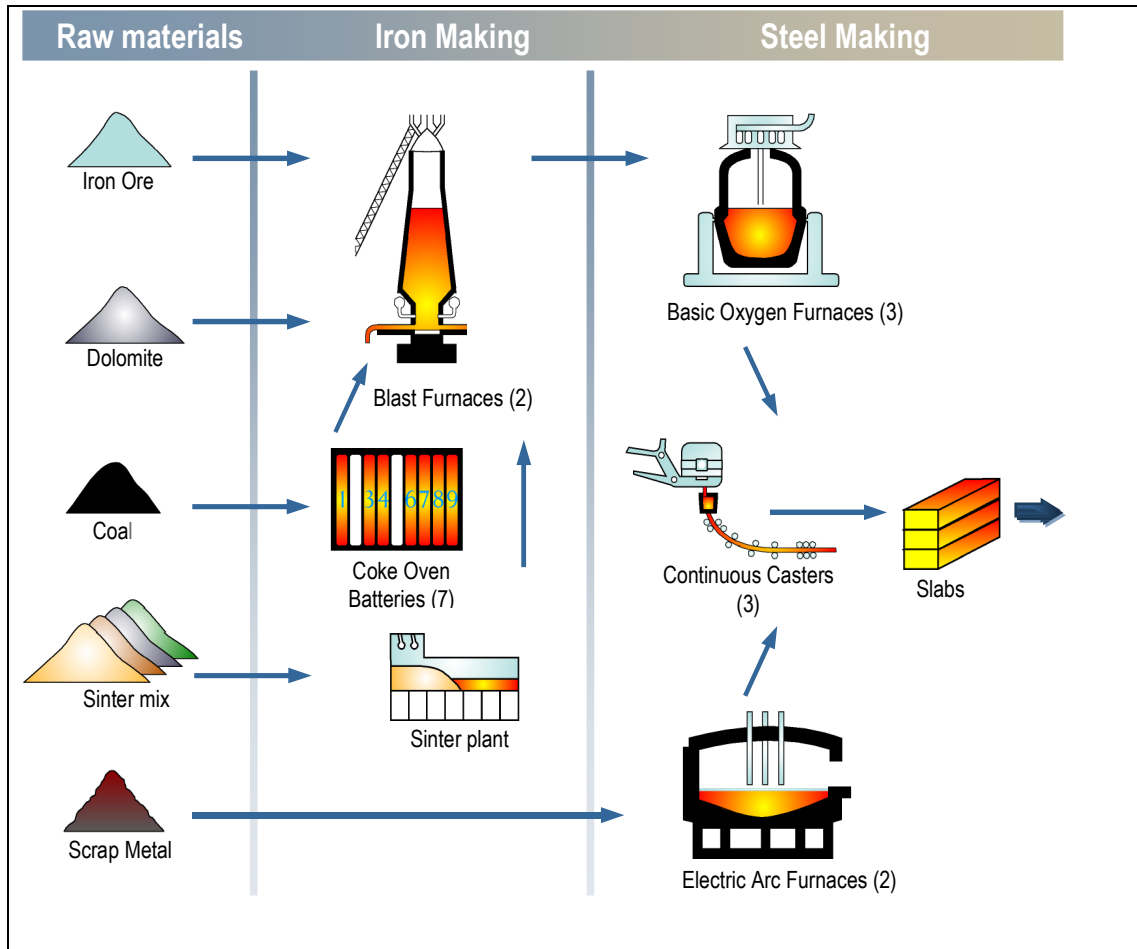
- 1965 -The name of the Highveld Development Company Limited is changed to Highveld Steel and Vanadium Corporation Limited ("Highveld") on 11 June 1965.
- 1965 - Cape Town Iron and Steel Works (Pty) Ltd - CISCO is established.
- 1966 - Following the acquisition of the remaining shareholding of Transvaal Vanadium Company (Proprietary) Limited, this company, in August 1966, becomes a division of Highveld, the largest vanadium producer in the world.
- 1967 - Cape Gate (Pty) Ltd - The Sharon Wire Mill division is established to produce uncoated and galvanized wire, welded mesh, diamond mesh, barbed wire, field fence and other products.
- 1971 - Iscor starts erecting an integrated steel works and long products mill at Newcastle. Blast furnace produces first iron in 1976.
- 1973 - Iscor takes ownership of CISCO.
- 1975 - Cape Gate (Pty) Ltd - The Davsteel division is established, and rolling mills for the production of wire rod, re-bar and rounds is commissioned in Vanderbijlpark.
- 1976 - Highveld Steel acquires a 65percent share in Transalloys (Proprietary) Limited. The remaining interest is acquired in 1985 and Transalloys now operates as a division of Highveld, producing manganese alloys.
- 1978 - Highveld Steel acquires the total issued share capital of Rand Carbide Limited, which was founded in 1918 in Germiston. The plant moved to Witbank in 1926 and Rand Carbide now operates as a division of Highveld, producing ferrosilicon and various carbonaceous products.
- 1980 - Cape Gate (Pty) Ltd - An EAF meltshop consisting of a 45 ton electric arc furnace, casting machine and associated plant for steel manufacturing is commissioned.
- 1981 - Cape Gate (Pty) Ltd - The Oren Wire division, to produce specialist wire products, is established.
- 1985 - Highveld Steel - The group acquires Rheem South Africa (Proprietary) Limited, a company involved mainly in the manufacture of drums, pails and crown closures, in 1985. It operated as a division of Highveld until the various parts were sold partly effective from 1 January 2002 and the rest early 2003.
- 1988 - First commercial Corex unit in the world is commissioned at Iscor Pretoria.
- 1989 - Iscor privatizes and is listed on the Johannesburg Securities Exchange on 8 November 1989.
- 1991 - Highveld Steel - the group expands its activities into stainless steel with the acquisition of the stainless steel operation of Middelburg Steel & Alloys (Proprietary) Limited in partnership with Samancor Limited resulting in the formation of the Columbus Joint Venture.
- 1991 - Iscor gains full control of the USCO steel works south of Johannesburg and renames the facility Iscor Vereeniging Works.
- 1993 - Highveld Steel - Highveld and Samancor each sell a one-sixth share of the Columbus Joint Venture to the Industrial Development Corporation.
- 1994 - Highveld Steel acquires the vanadium producer, Transvaal Alloys (Proprietary) Limited, on 1 January 1994.
- 1994 - Iscor Pretoria works is upgraded to produce stainless steel.
- 1995 - CISCO formed a JV with Reinforcing Steel Contractors, known as RSH.
- 1996 - Construction of the Saldanha Steel plant, a joint venture between Iscor and the Industrial Development Corporation, commences.
- 1998 - Highveld Steel - Hochvanadium Holding AG and a wholly-owned subsidiary Hochvanadium Handels GmbH commences business in Austria on 1 December 1998 for the purpose of processing and selling vanadium products.
- 1998 - Iscor Pretoria works is decommissioned.
- 1999 - The Saldanha Steel plant is commissioned.
- 1999 - Murray & Roberts Limited acquires full ownership of CISCO.
- 2001 - Iscor transfers its mining companies and businesses to Kumba Resources Limited, save a portion of the mineral rights at Sishen mine entitling it to delivery of 6,25 Mtpa of iron ore. Kumba is successfully unbundled and separately listed on the Johannesburg Securities Exchange on 26 November 2001.

- 2002 - Acerinox of Spain acquires a 64percent stake in Columbus Stainless with effect from 1 January 2002 from the three founding partners of Columbus i.e. Highveld Steel, Samancor and the IDC.
- 2002 - With effect from 1 January 2002 Highveld Steel disposes of 64percent of its interest in Columbus Stainless, thereby retaining a 12percent interest in Columbus and acquiring a 2.9percent interest in the share capital of Acerinox, S.A.
- 2002 - Iscor acquires the IDC's 50 percent shareholding in Saldanha Steel and fully integrates Saldanha Steel into Iscor's flat steel products division as from April 2002.
- 2003 - The Highveld Steel corporation acquires a 50 percent shareholding in South Africa Japan Vanadium (Proprietary) Limited with a plant situated at the steel works, which produces ferrovanadium specifically for the Japanese market.
- 2004 - LNM acquires more than 51 percent of Iscor Ltd and the LNM subsidiary's name is changed to Ispat Iscor Limited as from September 2004.
- 2005 - On 14 March 2005, Ispat Iscor Limited is officially renamed Mittal Steel South Africa Limited. This development follows the December 2004 merger of Ispat International and LNM Holdings, the parent company, to form Mittal Steel Company N.V.
- 2005 - Highveld Steel - Half the Acerinox S.A. interest is sold on 7 January 2005 and the balance together with the investment in Columbus Stainless (proprietary) Limited on 13 May 2005.
- 2005 - Columbus Stainless - Acerinox increases its shareholding in Columbus Stainless by 12 percent from 64 percent to 76 percent on 13 May 2005.
- 2006 - Following Anglo American's announcement on 26 October 2005 that it had decided to rationalise its portfolio and increase the focus on its controlled mining businesses, Anglo American reduced its 79percent interest in Highveld Steel & Vanadium Corporation Ltd. On 13 July 2006 Evraz and Credit Suisse have each acquired 24.9percent of Highveld's share capital from Anglo American. Anglo American retains a 29.2percent interest in Highveld.
- 2007 - Anglo American plc disposed of its remaining 29.2percent shareholding in Highveld Steel and Vanadium Corporation Limited to the Evraz Group S.A. As of May 4, 2007, Evraz owns approximately 54.1percent of all outstanding shares in Highveld.
- 2007 - Evraz executed the option to acquire the remaining Credit Suisse shares in Highveld Steel and Vanadium Corporation. As of 28 September 2007 Evraz owns 80.9percent of the entire issued share capital of Highveld.
- 2007- Following the merger between Arcelor and Mittal Steel to form the world's largest steel company, formerly Mittal Steel South Africa Limited is known as Arcelor Mittal South Africa Limited.
- 2008 - The conditions set by the Commission of the European Communities for Evraz Group S.A. in relation to the divestment of Highveld's vanadium-related assets were met.
- 2010 - Dispute over Acerlor Mittal shares in Kumba Iron Ore Mining

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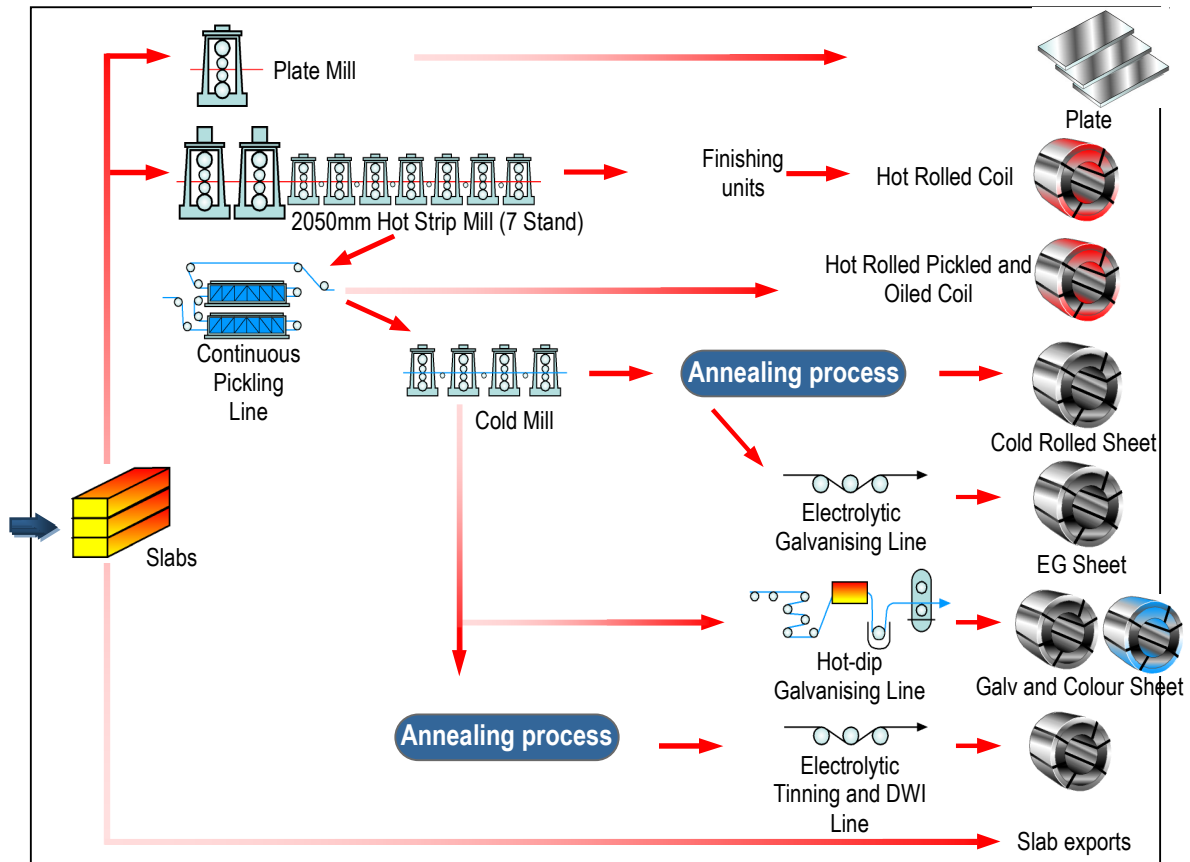
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ANNEXURE 1: IRON AND STEEL MAKING



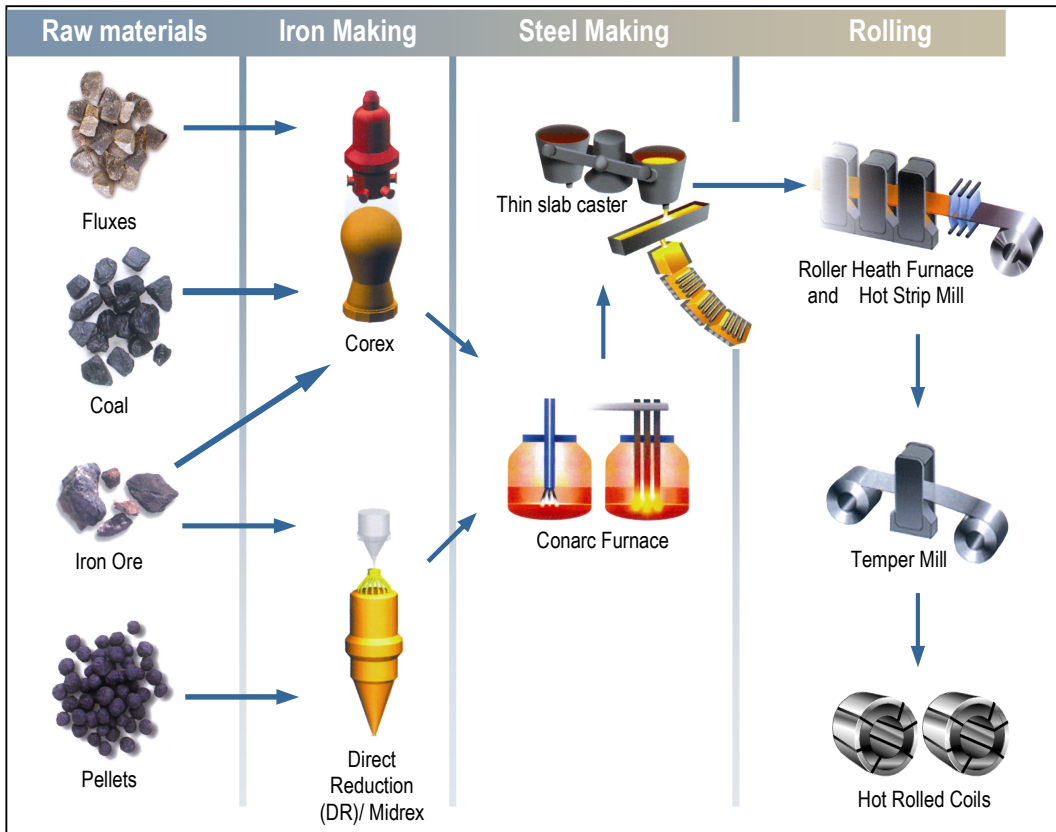
Source: South African Steel Producers Handbook, 2008

ANNEXURE 2: ROLLING



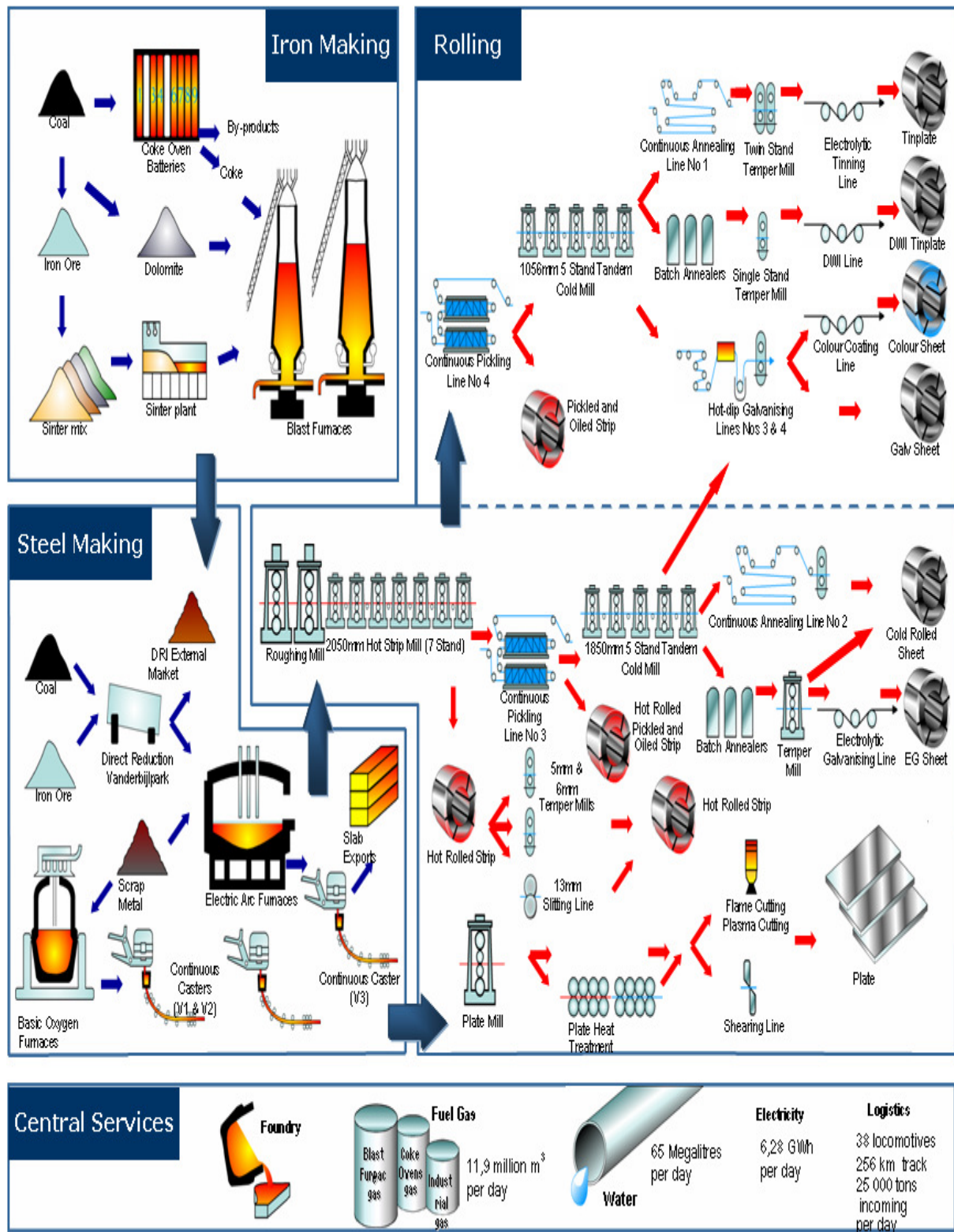
Source: South African Steel Producers Handbook, 2008

ANNEXURE 3: STEEL MAKING PROCESS



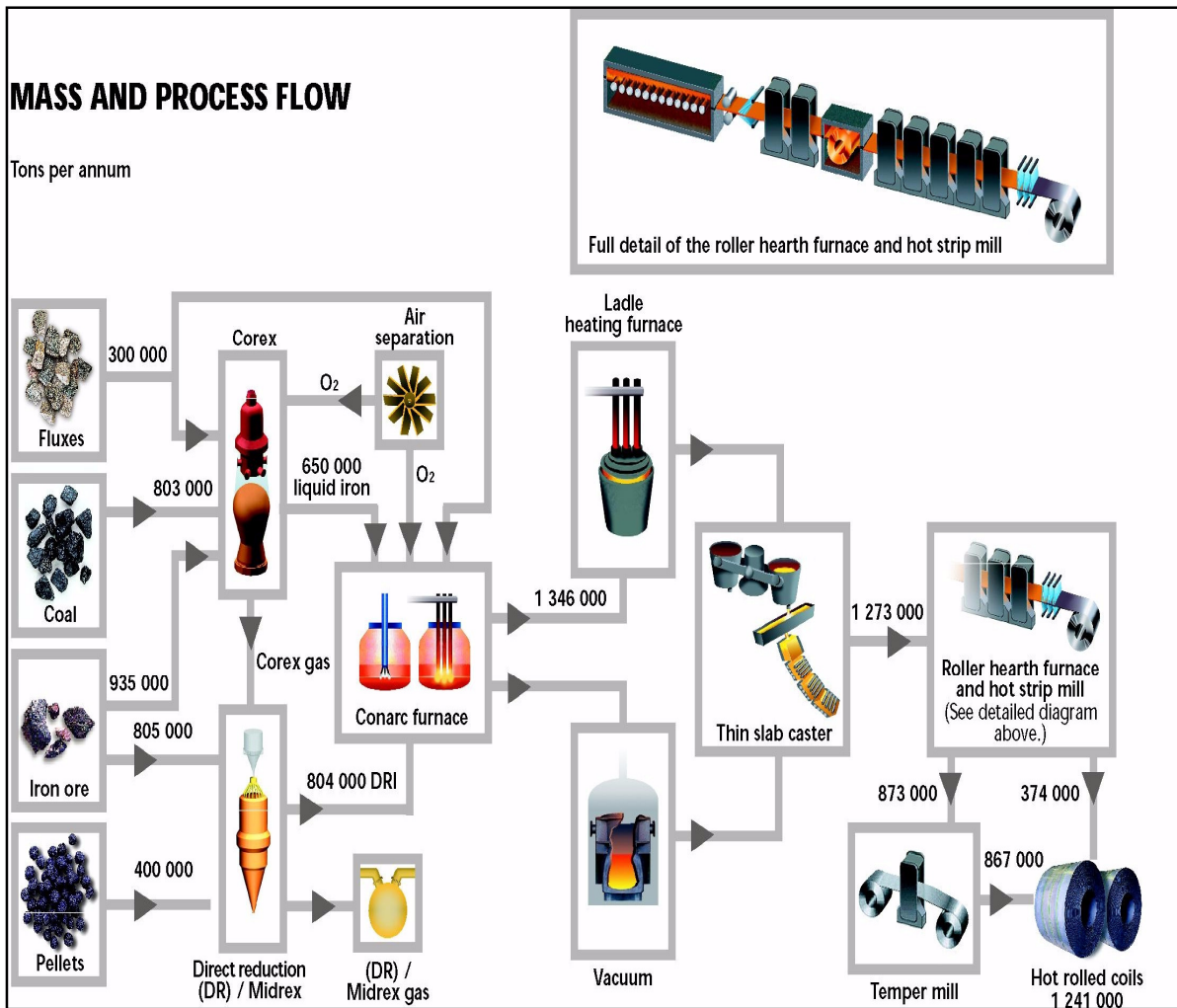
Source: South African Steel Producers Handbook, 2008

ANNEXURE 4: STEEL PROCESS FLOW



Source: South African Steel Producers Handbook, 2008

ANNEXURE 5: MASS AND PROCESS FLOW



Source: South African Steel Producers Handbook, 2008

ANNEXURE 6: SA PRIMARY STEEL PRODUCERS DIRECTORY

<i>PRODUCERS OF PRIMARY STEEL PRODUCTS</i>			
PRODUCER	OWNERSHIP	PRODUCT	MARKETING& CONTACT PERSON
1. Cape Gate (Pty) Ltd PO Box 54 Vanderbijlpark 1900 Tel:+27 (0)16 980 2121 Fax:+27(0)16 980 2088	Private (Kaplan Family)	Billets and Wire	coetzees@capegate.co.za
2. Cape Town Iron and Steel Works (Pty) Ltd- CISCO PO Box 121 Kuilsrivier 7579 Tel:+27 (0)21 903 2141 Fax:+27 (0)21 903 9495	Murray & Roberts	Billets, Rebars.	xavier.coetzee@murrob.com
3.Highveld Steel and Vandium Corporation P.O Box 111 Witbank 1035 Tel: +27 (0)11 663 0280 Fax: +27 (0)11 454 0576	Evraz Group	Billets and slabs	johne@hiveld.co.za
4. Arcelor Mittal South Africa (Pty) Ltd PO Box 2 Vanderbijlpark 1900 Tel: +27 (0)16 889 3419 Fax:+27 (0)16 889 2429	Arcelor Mittal	Liquid steel cast into various forms	charles.dednam@arcelormittal.com

5. Scaw Metal Group PO Box 61721 Marshaltown 2107 Tel:+27 (0)11 842 9364 Fax:+27 (0)11 842 9705	Anglo American	Billets	millsales@scaw.co.za
6. SA Steelworks PO Box 373 Eppindust 7475 Tel:+27 (0) 21590 3916 Fax:+27(0 21 534 7180	SA Steel Works	Steel Billets	trading@sametal.co.za

ANNEXURE 7: STAINLESS STEEL PRODUCER

<i>PRODUCERS OF STAINLESS STEEL PRODUCTS</i>			
PRODUCER	OWNERSHIP	PRODUCT	MARKETING & CONTACT PERSON
1. Columbus Stainless PO Box 133 MIDDELBURG 1050 Tel: +27 13 247 2020 Fax: +27 13 247 2771	Acerinox	Slabs, Coils, Plates and sheets	commercial-enquiries @columbus.co.za