OECD/SOUTH AFRICA WORKSHOP ON STEELMAKING RAW MATERIALS
Cape Town, 11 December 2014

Background document

RECENT DEVELOPMENTS IN STEELMAKING RAW MATERIAL MARKETS

1. Introduction

The OECD Steel Committee has been monitoring steelmaking raw material market and policy developments in recent years, and has issued several internal reports for discussion amongst its members. Other parts of the OECD, namely the Trade Committee, have also worked actively on raw material trade policies. A recent publication entitled *Export Restrictions in Raw Materials Trade: Facts, Fallacies and Better Practices* brings together different strands of analysis carried out by the OECD since 2009 on the use of export restrictions in the trade of raw materials.[1]

This background note summarises recent developments pertaining to steelmaking raw material markets and policies, and is provided to participants of the OECD/South Africa Workshop on Steelmaking Raw Materials that will take place in Cape Town, South Africa on the 11 December 2014. The workshop aims to bring together industry and government representatives to discuss major trends in raw material markets and policies that affect global trade in these materials. This note reviews recent changes in raw material prices, trade flows, mining activity in Africa and globally, and reports a few statistics on trade policies affecting steelmaking raw material markets drawing from the aforementioned OECD publication.

2. The global steel industry depends on many raw materials

The steel industry is reliant on a number of raw materials, particularly iron ore, coal, coke, ferrous scrap and various alloying elements for the steelmaking process (Table 1). Iron ore provides the ferrous content for steel, and is used almost exclusively by the steel industry. Coking coal is used to produce coke, which is an essential element that provides heat and the carbon required to remove oxygen from the ore. Ferrous scrap is the key ingredient in the electric-arc furnace (EAF) route, where recycled steel is melted and subsequently rolled into new steel products. Scrap is also used along with iron in basic oxygen steel furnaces (BOF), to reduce levels of heat in the furnace. Many other metals listed in Table 1 are also used in the steelmaking process, albeit in smaller quantities, either to improve the chemical properties of steel or to remove impurities from it.

[1] See http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf.

Table 1. The main steelmaking raw materials, their properties, and usage in steel and other applications

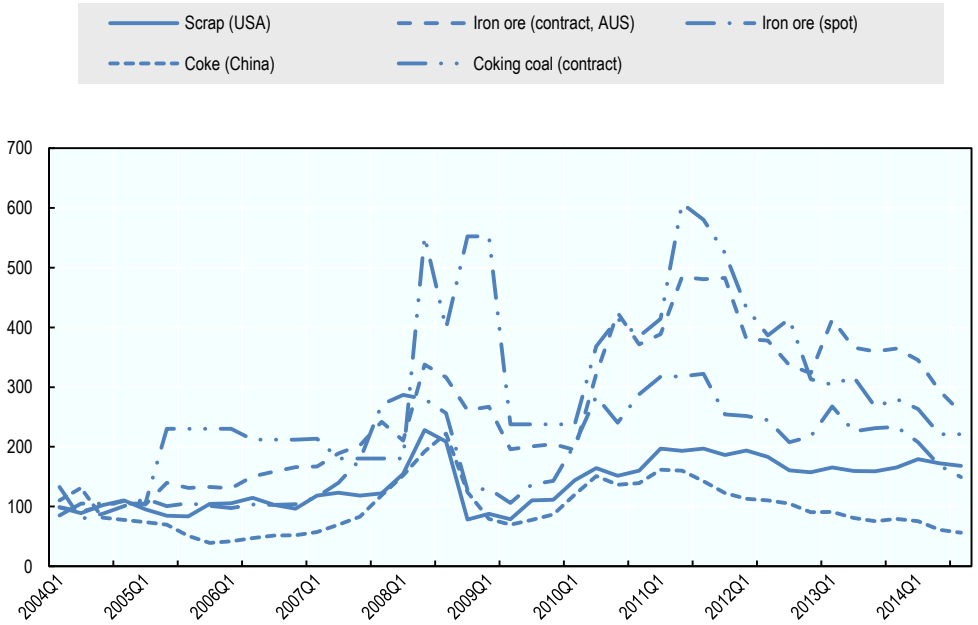
Raw material	Properties in steel	Steel industry's share of use, %	Other applications
Iron ore	Provides the ferrous content in the steel	98%	Metallurgy, medicine, paints
Coking coal	Produces coke, heat source and reducing agent in BF	>80%	Energy generation
Ferrous scrap	Main elements for EAF-steel, combined with iron in BOF to reduce levels of heat	100%	
Manganese	Desulpherises and as alloying element for strength	90%	Batteries
Silicon	Used to de-oxidise steel	60%	Construction materials and glass
Nickel	Anti-corrosion (nickel content in stainless steel 8-10%)	60%	Aerospace and batteries
Chromium	Anti-corrosion (in stainless steel, average content 18%)	75%	Aerospace, iron castings
Zinc	Used to galvanise steel (enhances corrosion resistance)	60%	Die-casting, brass and bronze
Tin	Brings protective coating to steel (food and drink cans)	20%	Solder
Molybdenum	Resistance to heat, corrosion (high-end steel). Brings weldability to steel (construction steel)	60%	Aircraft engine parts, chemicals and alloys
Vanadium	Brings extreme hardness to steel (high-strength steel)	85%	Longer-range electric car batteries
Tungsten	Brings extreme hardness to steel (high-speed steel)	20%	Abrasives, knives and armaments, and in fluorescent lighting

Source: OECD (2014b).

3. Raw material price developments

Between 2004 and 2007, there were moderate fluctuations in prices of steelmaking raw materials. As steel demand hit its peak right before the financial crisis, there was a significant price surge in all steel-related raw material prices but sharp declines in the aftermath of the crisis (Figure 1). In 2010 and 2011, steelmaking raw material prices recovered due to strengthening demand in emerging economies, particularly China. Since 2012, however, prices have generally declined in line with sluggish steel production growth in many economies.

Figure 1. Prices of steelmaking raw materials quarterly indices, 2004=100



Source: OECD calculations based on data from CRU and American Metal Market

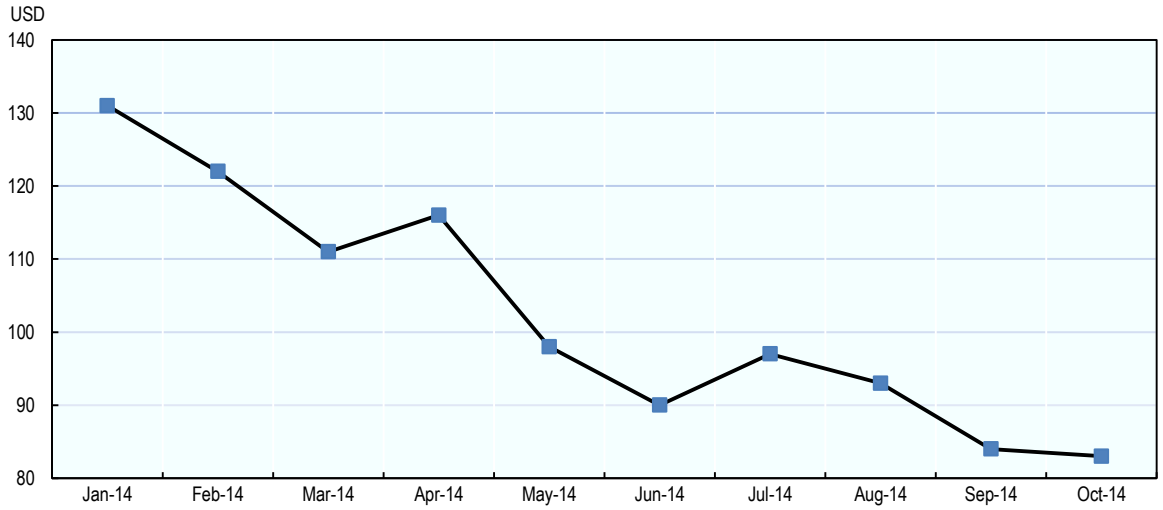
Looking at more recent developments in 2014, raw material prices have generally weakened owing to increasing output and weak growth in demand. Steelmaking raw material markets were affected by lacklustre economic news from emerging economies in the beginning of 2014. Entering the second quarter of the year, however, raw material prices recovered somewhat in response to positive expectations regarding a seasonal recovery in steel demand in China. However, the seasonal recovery was below expectations leading to lower prices in June.

Demand from some emerging economies started to show some improvements in July. In August, due to instability in the steel market, however, there was a drastic fall in the Shanghai Future Exchange (SHFE) rebar future price, which functions as a key indicator influencing sentiment and the direction of some raw material markets. The prices of important steelmaking raw materials such as iron ore, coking coal, coke and scrap are currently at substantially lower levels compared to where they stood at the beginning of 2014.

3.1. Iron Ore

Iron ore prices have generally declined during the course of 2014, despite brief price upticks in April and July (Figure 2). Market observers note that price weakness is due to increases in supply from major supplying countries (which has exceeded demand) and weak steel market fundamentals. Indeed, several experts have noted oversupply issues in their assessments of raw material markets. World Steel Dynamics (WSD) has noted that, due to an increase in iron ore capacity outside of China and output expansions by the major iron ore producers, there is a considerable amount of oversupply in the global market. The Commodity Research Unit (CRU) expects that, given the excess supply in the iron ore market, prices are likely to stay at relatively low levels in the near future (CRU, 2014).

Figure 2. Price of iron ore in recent months

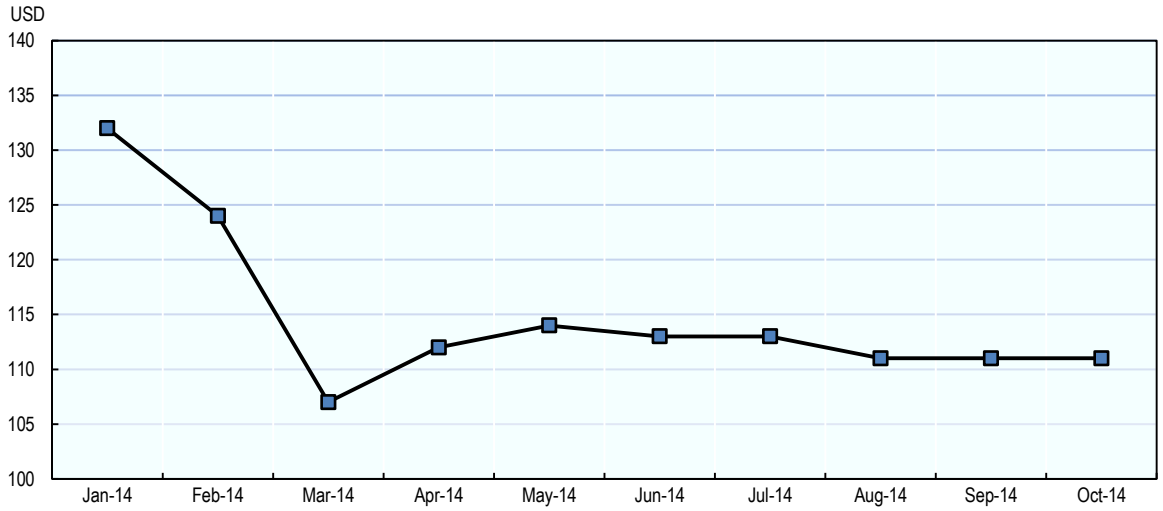


Source: CRU Raw Materials Monitor (62% Fe Fines, CFR China).

3.2. Coking coal and coke

Coking coal prices have fallen in 2014 in response to increased supply and lower import demand from China. However, prices have been less volatile than iron ore, because the market is relatively less over-supplied (BREE, 2014). In March 2014, coking coal prices fell to their lowest level in seven years. CRU (2014) noted that coking coal stocks in China decreased by 20% between the end of January and March, indicating weakened demand. After increasing slightly in April and May 2014, coking coal prices remained relatively stable until September (Figure 3). Recent reports indicate that buying activities have not been significant and major steel mills have been lowering their stocks.

Figure 3. Price of hard coking coal in recent months

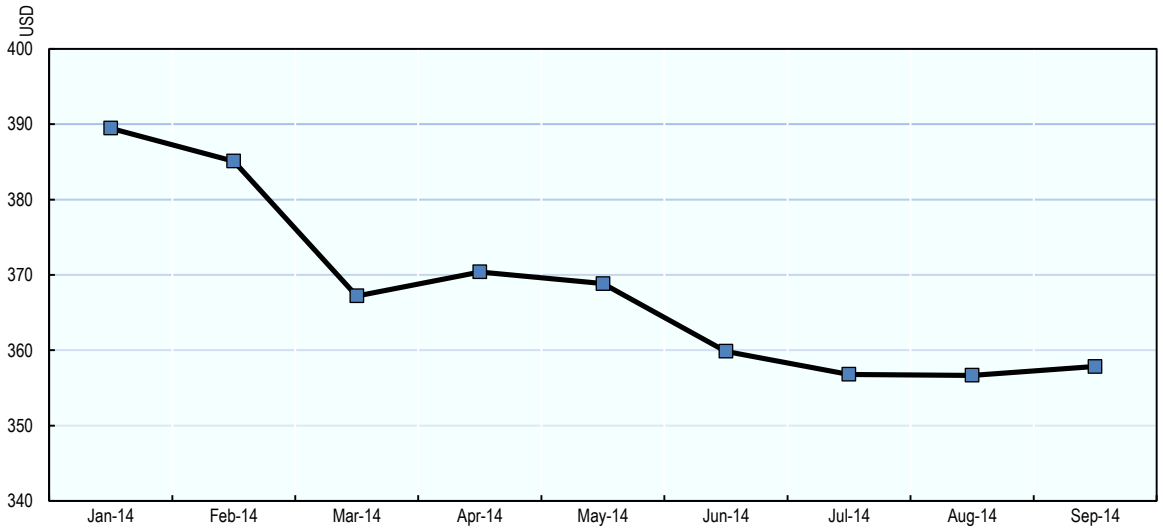


Source: CRU Raw Materials Monitor (FOB Australia spot).

3.3. Ferrous scrap

Global scrap prices have declined during the course of 2014. There were some periodic price increases, however; according to CRU's scrap price indicator; for example, the price rose by 3.4% in April compared to the previous month due to growing demand in the U.S. and Turkey. In June, the price dropped by 0.9% due to weaker demand in finished steel products, lower steelmaking raw material costs (substitutes for scrap) and rising market uncertainty. The price of scrap deteriorated further and in June was roughly 8% lower than in the beginning of the year. North East Asia and the CIS regions showed stability in prices amid continuous price declines in all other regions (CRU, 2014). From July until September, scrap prices showed some degree of stability. Figure 4 displays the evolution of a reference price for scrap (U.S. no. 1, heavy melt) during 2014.

Figure 4. Price of scrap in recent months



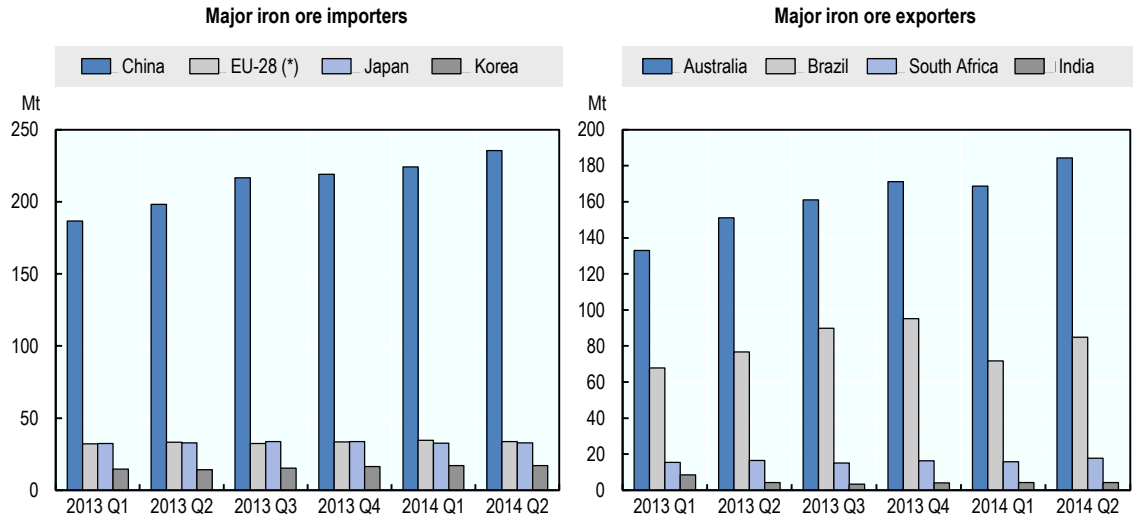
Source: American Metal Market (US No.1 Heavy Melt).

4. Trade in steelmaking raw materials

4.1. World trade in iron ore

During the first half of 2014, Australia was the largest iron ore exporter in the world, with outward shipments amounting to 353 million tonnes, followed by Brazil with 157 million tonnes, South Africa with 33 million tonnes, Canada with 19 million tonnes and India with 8 million tonnes of iron ore exports, as shown in Figure 5. During the first six months of 2014, the major iron ore importers were China (457 million tonnes), the EU (68 million tonnes), Japan (65 million tonnes) and Korea (37 million tonnes).

Figure 5. Quarterly trade data for selected major iron ore exporters and importers



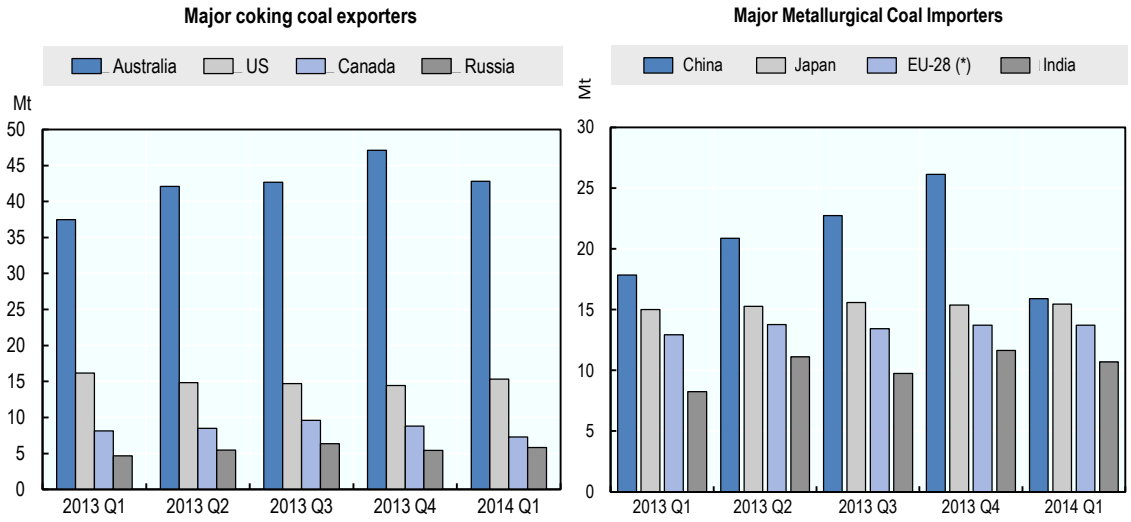
Source: CRU International.

4.2. World trade in coking coal

After growing throughout 2013, there was a considerable fall in Chinese coking coal imports from 26.1 to 15.9 million tonnes in the first quarter of 2014 (Figure 6). The drop was caused by increased supply and decreased import demand in China, the world's largest importer, which contributed to a decline in coal spot prices during the first eight months of 2014 (BREE, 2014). China is the world's largest producer of coking coal in volume, but domestic output is typically higher cost and lower quality than imported coking coal. Japan and the EU are the following largest importers, but their inward shipments have remained relatively stable at approximately 15.4 mmt and 13.5 mmt per quarter on average in the year to the 2014Q1 (Figure 6). India and Korea are also major importers.

Meanwhile, Australia's exports (Australia is the world's largest exporter) rose by 17% to 181 million tonnes during the 2013/2014 financial year. Exports from the U.S. and Canada declined by 5% and 10%, respectively, in the first quarter of 2014, to 15.3 mmt and 7.3 mmt. Russia's exports have increased, reaching a level of nearly 6 mmt in the first quarter of 2014.

Figure 6. Major coking coal exporters and importers in recent quarters



Source: CRU International.

4.3. World trade in ferrous scrap

In 2012, China and the European Union were the largest scrap generators, generating approximately 125 million tonnes and 107 million tonnes of ferrous scrap, respectively. In 2013, China's scrap generation grew to 143 million tonnes, according to data from the Japanese Ferrous Raw Materials Association (2014).

China's reservoir of heavy obsolete iron and steel scrap is still likely to grow in the future (Platts, 2012). Some industry analysts note that China could become a net exporter of scrap in the future and may eventually emerge as the world's largest scrap supplier (e.g. Hatch, 2012; Metal Bulletin, 2013). However, this is likely to take time because in the future the country may experience a slight increase in the share of its EAF production, thus consuming more of its domestic scrap. In addition, scrap rates in China are the lowest among major steel producers, implying that there is room for significant growth in domestic scrap consumption.

According to the World Steel Association (Worldsteel, 2014), the U.S. remained the largest scrap supplier, exporting 18.4 million tonnes of ferrous scrap in 2013. Turkey was the biggest importer in 2013, with 19.7 million tonnes of inward scrap shipments (accounting for more than 20% of global scrap imports). Developing economies have generally become increasingly dependent on scrap imports from developed countries in response to relatively rapid growth in steel production (OECD, 2012). A notable development this year has been the sharp, 49% decline in Chinese imports of scrap during the first six months of 2014 from levels a year earlier (CMN, 2014), resulting in a reduction of scrap exports from Japan and the U.S. to China.

5. Raw materials in Africa

A number of African economies rely on the mining sector. Based on data from the African Development Bank (AfDB, 2014), the mining and quarrying sector in Congo and Gabon contributed as much as 63.2% and 44.3% of their GDP, respectively. Given their large mining potential, African economies could play an increasingly important role in the coming decades. In terms of the main steelmaking raw materials, South Africa is a key producer and exporter of these materials; the country

accounted for 74% of Africa's total production of iron ore and 80.4% of its exports of iron ore in 2012 (UNCTAD, 2014). Mozambique is one of the largest coking coal producers. Annex 2 provides a number of steel-relevant indicators for African countries.

Other raw materials used in the steelmaking process found in Africa include manganese (an alloying element for strength and tenacity), chromium (for anti-corrosion), nickel (for anti-corrosion) and vanadium (for hardness). The consumption pattern of manganese closely tracks that of world steel output. China consumes a significant amount of manganese ore, mostly imported from South Africa, Australia, Gabon and Ghana. During the first half of 2014, South African manganese ore exported to China accounted for 35.6% of total Chinese manganese imports (CMN, 2014). Indeed, South Africa is the largest manganese ore producer in the world followed by Australia, China and Brazil. South Africa accounts for 75% of identified world resources of manganese, and it is expected that additional manganese deposits could be discovered in other African countries.

South Africa also dominates world chromium mining, with exports heading mostly to China (there is very little chromium ore available in China). Chromium ore imports from South Africa accounted for 60.7% of total Chinese chromium imports, (corresponding to more than 3 million tonnes) during the first half of the year (CMN, 2014). However, impurities and lower chromium content of ferro-chrome could result in future challenges for the region.

Nickel production is rather geographically dispersed compared to other metals. Zimbabwe was the fifth largest exporter of nickel ore and ferro-nickel to China from January to June in 2014 (CMN, 2014). Vanadium is also produced in substantial quantities in South Africa, in a mixture of both primary and secondary vanadium production. South Africa exports to countries where smelting of ferro-vanadium takes place. Export prospects are promising because world demand for vanadium is expected to increase significantly in the near future.

The recent outbreak of the Ebola virus in West African countries such as Liberia, Guinea and Sierra Leone, where the mining industry represents a significant share of the economy, has seriously affected their mining activities (The Guardian, 2014). The mining industry in Guinea accounts for 16.3% of its GDP, 15.8% in Sierra Leone and 2.17% in Liberia (Annex 2).

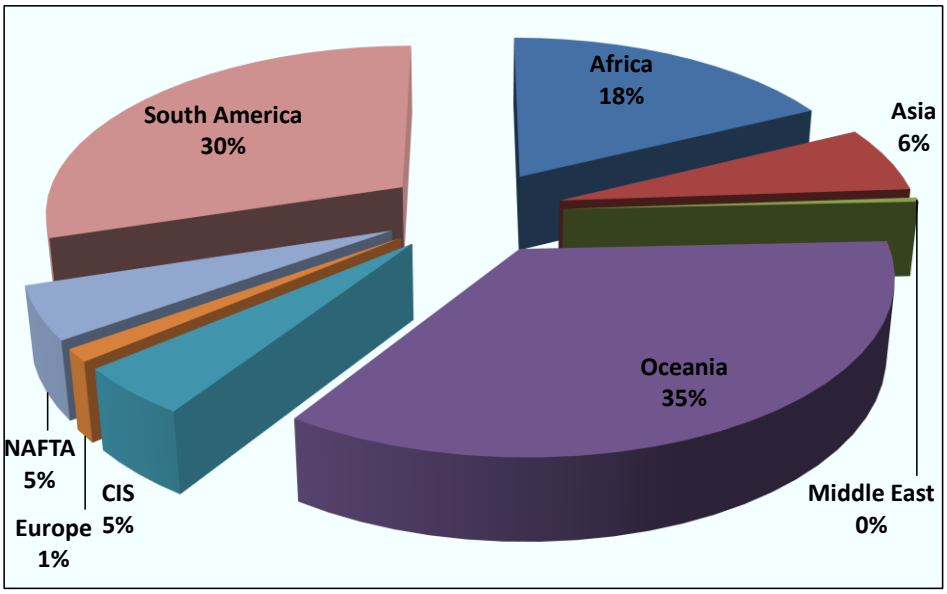
6. Investments in raw material industries and future prospects

6.1 Investments by mining companies

6.1.1. Iron ore projects

There are in total 121 iron ore projects at present each with a capacity to produce more than 10 million tonnes (Annex 1 provides details on these investment projects). Figure 7 below shows the geographical distribution of the projects, indicating that 35% are taking place in Oceania, 30% in South America, 18% in Africa, 6% in Asia, 5% in NAFTA and only 1% in Europe.

Figure 7. Ongoing world iron ore projects by region



Note: The underlying data focuses on iron ore projects with a capacity greater than 10 million tonnes.

Source: BREE (2014), MBR (2014), UNCTAD (2013).

While major iron ore producers such as Australia and Brazil remain active in terms of investment, hosting most of the new exploration activities, other South American and West African economies are emerging as important iron ore mining regions. Table 2 shows a list of the 10 largest iron ore projects. As the short-term growth prospects for the steel industry have weakened, some observers think that the gap between supply and demand for iron ore will increase. Nonetheless, some mining companies appear optimistic about the longer-term prospects for steel demand.

Table 2. The ten largest iron ore projects

#	Country	Company	Location	Start-up / Completed Year	Capacity (Mt)	Capex ($m)
1	**Brazil**	Vale	Serra Sul	2016	90	8039
2	**Guinea**	Rio Tinto, Chalco	Simandou	2015	70	10000
3	**Australia**	Rio Tinto	Koodaideri, Pilbara	2018	70	3500
4	**Australia**	BHP Billiton	Jinidi, Pilbara	n/a	60	5000+
5	**Australia**	Fortescue Metlas Group	Pilbara Solomon Hub, stage I	2013	60	3100
6	**Australia**	Rio Tinto	Pilbara 360 Expansion	n/a	60	599
7	**Australia**	Hancock Prospecting	Roy Hill, Pilbara	2015	55	10700
8	**Guinea**	Vale	Zogota, Simandou	2020	50	7000
9	**Australia**	Fortescue Metlas Group	Pilbara Solomon Hub, stage II	n/a	50	2500-5000
10	**Uruguay**	Minera Aratiri (Zamin Ferrous)	Valentines project	2015/2016	50	2100

Source: BREE (2014), MBR (2014), UNCTAD (2013).

6.1.2. Coking coal projects

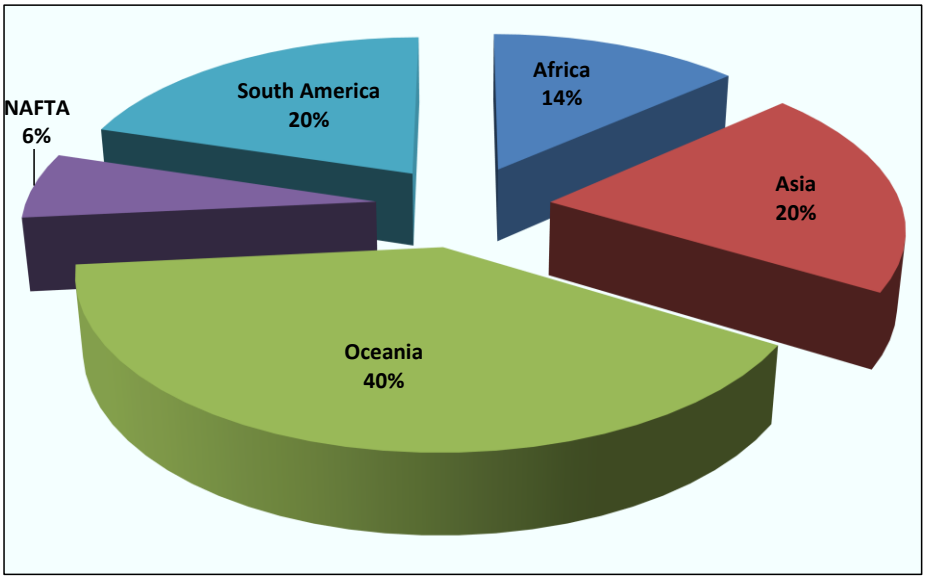
BREE (2014) notes that lower prices and high operating costs have reduced incentives to invest heavily in developing new capacity around the world. However, Table 3, which shows major ongoing coking coal projects each with more than 5 million tonnes of capacity, suggests that emerging economies such as Mozambique and Mongolia are expected to experience a significant increase in mining capacity as a result of their projects. Figure 8 shows the geographical distribution of ongoing coking coal projects with more than 5 million tonnes of capacity. Oceania accounts for about 40% of ongoing projects, followed by South America and Asia, each accounting for 20%, Africa for 11% and NAFTA for 6% of ongoing projects.

Table 3. Major ongoing coking coal projects

Region	Country	Company	Location	Start-up / Completed Year	Capacity (Mt)	Capex ($m)
Africa	**Mozambique**	Anglo American	Revuboe	2016	9	1000
		Vale	Moatize, Tete	2014	14.3	1,800
Asia	**Mongolia**	Aspire Mining	Ovoot project	2016	12	n/a
		Mongolian Mining	Tavan Tolgoi	2014	15	1,300
		Mongolian Energy	Khushuut	2014	8	202
Oceania	**Australia**	Anglo American	Moranbah	2017	12	n/a
		Bandanna Energy	Springsure Creek, Bowen Basin	2015	5.5	n/a
		BMA	Caval Ridge	2015	5.5	4,200
		Hancock, International Coal	Bundaberg, Queensland	2017	30	n/a
		Qcoal	Byerwen	2015	10	n/a
		Rio Tinto	Hail Creek	2014	6	n/a
NAFTA	**Canada**	Teck Resources	Various, BC	2015	5	850
	Mexico	Ahmsa	Mina IX, Coahuila	2014	6	620
South America	**Colombia**	CCX	San Juan,Canaverales,Papayal	2017	35	5,500

Source: MBR (2014).

Figure 8. Ongoing world coking coal projects by region



Note: The underlying data focus on iron ore projects with a capacity greater than 5 million tonnes. The number of projects with capacity above 10 million tonnes was very limited.

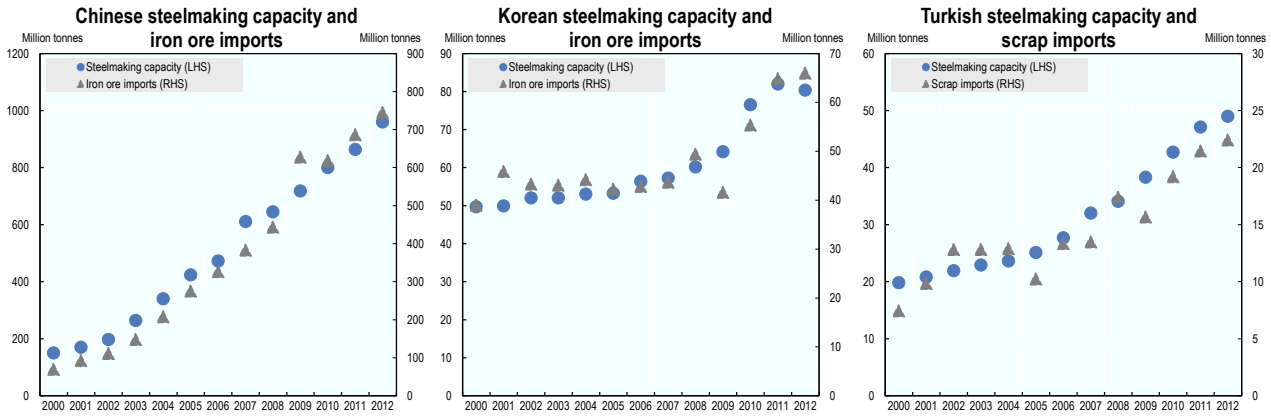
Source: MBR (2014).

6.2. Steel capacity developments are linked closely to demand for raw materials

Demand for raw materials increases more or less in line with developments in steelmaking capacity, as indicated in Figure 9 below. With the recent boom in integrated steel mill projects over the past decade mainly in Asia (and notably in China), raw material demand has grown significantly. As a result, China has become the largest iron ore importer in the world. Data from the World Steel Association shows that Chinese iron ore imports increased from 111.4 million tonnes in 2002 to 745.4 million tonnes in 2012, accounting for 61.8% of global iron ore imports that year. With the commissioning of two large-scale blast furnaces in 2010, Korean iron ore imports rose by 55.9% to 64.9 million tonnes between 2009 and 2011, and the country has become the third largest importer of iron ore in the world. As a third example of the link between capacity growth and raw materials demand, in Turkey, the largest scrap importer in the world, scrap imports increased to 22.4 million tonnes in 2012, up 9.6 million tonnes from levels 10 years earlier, in line with rapid growth in steelmaking capacity.

Figure 9. The link between capacity additions and raw materials demand

Steelmaking capacity and raw material imports in selected economies



Source: OECD (for capacity), the World Steel Association (for iron ore and scrap imports).

7. Trade-restrictive policies in the area of steel-related raw materials[2]

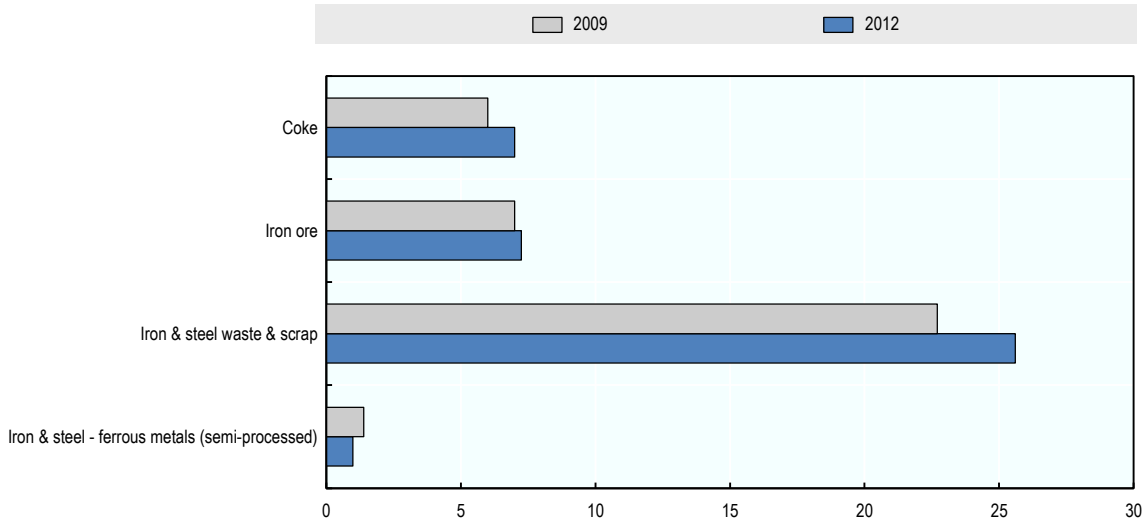
Most steel-producing countries are not self-sufficient in all the raw materials used by their steel industries. The last few years have seen an expansion in government efforts to regulate export flows of steel-related raw materials through the use of export restrictions in many countries. Export restrictions have contributed to price volatility and uncertainty in markets, and have become a considerable source of trade friction. For these reasons, export restrictions in steel-related raw materials are a global challenge that requires well-informed and coordinated responses. Indeed, open and well-functioning raw material markets are crucial to the health of the global steel industry, and refraining from such measures would reduce distortions in raw material markets and in broader global markets for steel.

Figure 10 shows that raw material export policies for iron ore, coke and ferrous scrap, the three main steelmaking raw materials, became more restrictive in 2012 when compared to 2009 (OECD, 2014c).

2 This section draws from a recent publication by the OECD entitled *Export Restrictions in Raw Materials Trade: Facts, Fallacies and Better Practices*. See http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf.

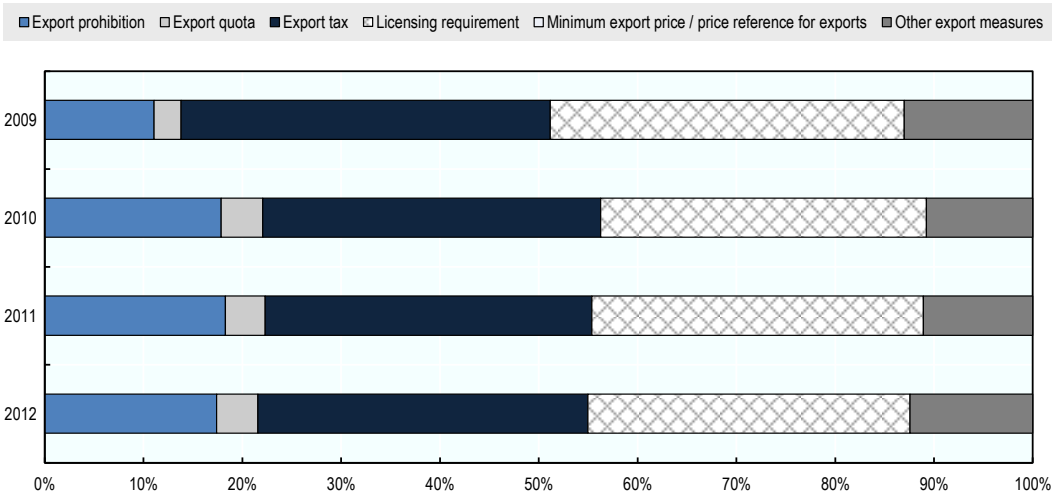
Various types of measures are used to restrict exports of steelmaking raw materials. For iron ore, coke and ferrous scrap, export licensing requirements have been the most frequently used measure in recent years. Such licensing requirements were applied by 20 governments on ferrous scrap exports in 2012, by five governments on their iron ore exports and by two governments on coke exports, according to the OECD Inventory data. As shown in Figure 11, export taxes were the next most frequent measure. In 2012, 14 countries imposed taxes on ferrous scrap exports, five countries on iron ore exports, and two countries on coke exports. Over the period surveyed, the incidence of export prohibitions for steel scrap increased noticeably.

Figure 10. Count of measures restricting exports of steelmaking inputs and iron and steel products (2009, 2012)



Note: A count of measures was made per HS6 product line. As many products comprise more than one HS6 line and the number of lines per product varies, the simple count was adjusted by dividing counts at the product level by the number of HS lines constituting each product.
Source: Export Restrictions in Raw Materials Trade: Facts, Fallacies and Better Practices. See http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf.

Figure 11. Restrictions on exports of core steel making inputs in 2009-2012, by share of types of measure



Note: The calculation covers the following products: coke, iron ore, iron and steel waste and scrap and iron and steel ferrous metals (semi-processed). Based on counts adjusted for the number of lines per product.
Source: Export Restrictions in Raw Materials Trade: Facts, Fallacies and Better Practices. See http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf.

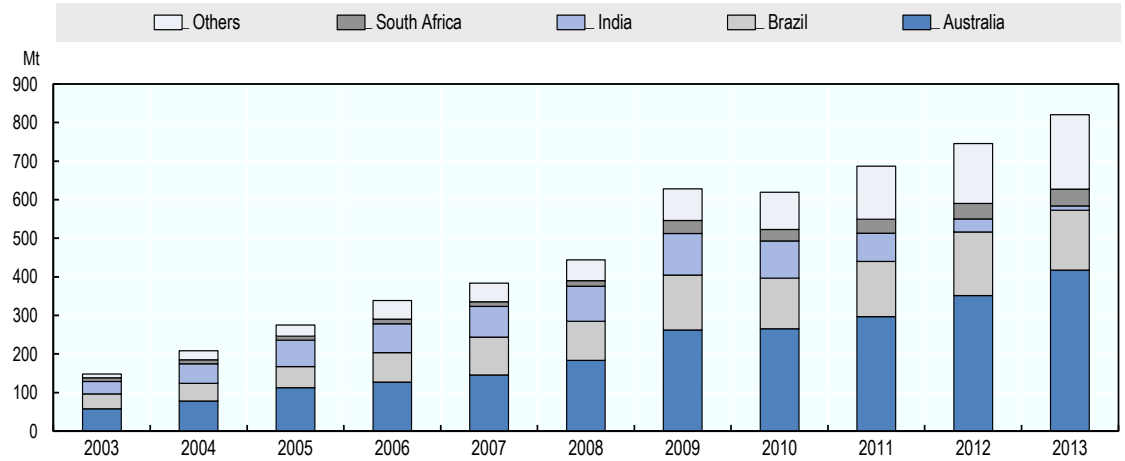
The economic consequences of export restrictions have received much attention in recent years and have raised in-depth debate about the merits and demerits of such policies. Export restrictions on raw materials usually drive up the prices in the global market, when the supplying country is large. Restrictions also raise input costs for production and ultimately push up the final prices of the finished products. The steel industry, therefore, has been hampered by supply disturbances and input price volatility, to some extent due to restrictive measures on raw material trade.

Some governments control raw material exports to avoid foregoing the processing margin, which otherwise accrues to the importers of the raw materials who process them into steel and other downstream products. Indeed, the OECD's Inventory of raw material export restrictions indicates that a common rationale used for the imposition of export restrictions on steelmaking raw materials is to "safeguard inputs for the domestic industry." By limiting exports of iron ore, coke or scrap, a country may hope to reduce steelmaking production costs and raise steel production to meet the requirements of downstream industries and to support economic development and growth. Alternatively, countries may apply export restrictions in the hope of producing more steel for export, thereby boosting export earnings compared to what they would earn by exporting unprocessed raw materials.

Such export measures may promise demonstrable benefits to the downstream steel industry. However, this would appear to be the case only if a given restriction is imposed in isolation from similar policies applied by other countries. However, it is more likely that the imposition of a restriction in one country can create pressure on trading partners to do the same, thus raising the possibility of "beggar-thy-neighbour" effects as other countries do the same to protect their own steel industries. Given the steel industry's trade dependency on raw materials, because most countries are not self-sufficient in all of the steelmaking raw materials, such effects could be expected to raise the production costs of most steel producers, even those operating in countries that restrict their raw material exports (OECD, 2014b).

The global steel industry is raising concerns about the possible implications of recent export restrictions on prices and quantities. For example, India's taxes on iron ore exports have been associated with a decline in iron ore exports. South Africa has recently replaced India as the third largest supplier of iron ore to China, exporting more than 40 million tonnes annually to China since 2012 (Figure 12). China's iron ore imports from India amounted to only 11.7 million tonnes in 2013, compared to 107.5 million tonnes in 2009.

Figure 12. Chinese iron ore imports



Source: China Customs Statistics.

Another example is what happened to nickel prices following a ban on ore exports. Nickel is an important raw material used in the production of stainless steel. The Indonesian government's ban on raw mineral ore exports including nickel ore in early 2014 led to surging nickel prices in the spring of 2014. Bloomberg (2014) reported that the policy change was part of a wider plan to expand state revenue, by positioning itself as a manufacturer of higher-value products rather than an exporter of raw materials.

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ANNEX 1: Major ongoing and announced world iron ore projects

Region	Country	Company	Location	Start-up / Completed Year	Capacity (Mt)	Capex ($m)
Africa	**Cameroon**	Affero Mining	Nkout	2017	25	n/a
		Sundance Resources (Hanlong Mining)	Mbalam	2016	35	4700
	Congo	Core Mining	Avima	2016	35	n/a
		Exxaro	Mayoko Project	2018	10	n/a
	Gabon	State of Gabon	Belinga	n/a	30	707
	Guinea	Rio Tinto, Chalco	Simandou	2015	70	10000
		Vale	Zogota, Simandou	2020	50	7000
		Vale, BSG	Simandou South	2012	15	1260
	Liberia	ArcelorMittal	Buchanan expansion	2015	15	1500
		Severstal / African Aura	Putu range	2018	24	2500
	Mauritania	SNIM, Arcelor Mittal	El Agareb	n/a	25	n/a
	Senegal	Arcelor Mittal	Faleme	on hold	20	200
	Sierra Leone	African Minerals, Shandong I&S	Tonkolili iron ore mine, 1st stage	n/a	20	n/a
		African Minerals, Shandong I&S	Tonkolili iron ore mine, 2nd stage	2016	35	3000
		African Minerals, Shandong I&S	Tonkolili iron ore mine, 3rd stage	2018	45	5000
		Cape Lambert Resources, phase II	Marampa	n/a	15	1927
	South Africa	Anglo American	Sishen expansion 2	2019	10	n/a
		Anglo American	Sishen concentrate	2018	20	n/a
	Tanzania	NDC :: Sichuan Hongda Corporation	Liganga	2018	10	3000
Asia	**China**	n/a	Dataigou	n/a	30	n/a
		Wugang	Exi	2015	25	2120
		TISCO	Yuanjiacun	2012	22	1520
		Hebei Iron & Steel	Sijiaying mine, Tangshan	2015	20	n/a
	India	NMDC	Bailidala & Kumaraswarmy	2015	20	3400
		Rio Tinto	Orissa	2017	15	2000
		SAIL	Gua iron ore mine	2014	10	600
		SAIL	Chiria & Rowghat	2015	12	998
	Malaysia	Vale	Telek Rubiah	2014	25	900
Middle East	**Saudi Arabia**	London Mining, State of Saudi Arabia	Wadi Sawawin	2012	11.6	2000

Oceania	**Australia**	AMCI, Aquila Resources, Cullen	Mt Stuart, West Pilbara	2014	30	2864.1
		API	Australian Premium Iron	2016	25	n/a
		Aquila Resources	Pilbara	2015	30	7500
		Asia Iron Holdings	Extension Hill (330 km SE of Geraldton)	2015	10	2900
		Atlas Iron	Horizon 2, Pilbara	2017	31	1500-2500
		Atlas Iron	Pardoo (Ridley)	n/a	10	1400
		Atlas Iron	Pilbara	2014	15	994.4
		Australasian Resources	Balmoral South (100 km NE of Onslow)	2017	12	3300
		BHP Billiton	Jimblebar Mine Expansion	2014	21	3400
		BHP Billiton	Jinidi, Pilbara	n/a	60	5000+
		Braemar Infrastructure	Braemar Basin	2018	25	1900
		Brockman Resources	Marillana (100 km NW of Newman)	2016	18.5	1900
		Carpentaria Exploration	Hawsons (60 km SW of Broken Hill)	n/a	10	2900
		Chongqing Iron & Steel	Extension Hill	2015	10	2000
		CITIC Pacific Mining	Sino Iron Magnetite Project (Cape Preston)/Balmoral Central Magnetite Mine	2014	27.6	6318.6
		Clive Palmer	Balmoral South	2017	39	4039.8
		Flinders Mines (MMK)	Pilbara (70 km NW of Tom Price)	2015	15	1163
		FMG	Solomon		40	3200
		Fortescue Metlas Group	Nyidinghu (100 km NW of Newman)	n/a	30	1500-2500
		Fortescue Metlas Group	Pilbara Solomon Hub, stage I	2013	60	3100
		Fortescue Metlas Group	Pilbara Solomon Hub, stage II	n/a	50	2500-5000
		Golden West	Wiluna West	n/a	10	n/a
		Grange Resources, Sojitz Resources, Kobe Steel	Southdown project	2016	10	3000
		Hancock Prospecting	Roy Hill, Pilbara	2015	55	10700
		Iron Road Ltd	Central Eyre (150km N of Port Lincoln)	2018	21.5	3980
		Iron Ore Holding	Buckland Hills (Bungaroo South)	n/a	15	n/a
		Jupiter Mines	Mount Ida (230 km NW of Kalgoolie)	n/a	10	1500-2500
		Macarthur Minerals	Moonshine Magnetite (150 km NW of Kalgoorlie)	n/a	10	2500-5000
		MCC	Cape Lambert	2015	15	3832.6
		Mindax	Mt Forrest, 2nd stage	2016	10	1810.6
		Mitsubishi	Jack Hills	2013	21.6	3809.3
		Pluton Resources	Irvine Island	2016	17	700
		Rio Tinto	Brockman 4	2014	12	750

		Rio Tinto	Koodaideri, Pilbara	2018	70	3500
		Rio Tinto	Nammuldi	2014	16	600
		Rio Tinto	Nammuldi expansion	2014	26	2140
		Rio Tinto	Pilbara 360 Expansion	n/a	60	599
		Sentient	Central Eyre (Warrambo)	n/a	12.4	1808.6
		Shougang	Extension Hill Magnetite	2014	10	3107.5
		Sinosteel	Weld Range	on hold	15	2000
		Venus Metals	Yalgoo	n/a	11.4	1310.3
		Wugang, Centrex	Carrow	n/a	10	n/a
CIS	**Ukraine**	Ferrexpo	Belanovskoye	n/a	45	n/a
		Ferrexpo	Yeristovskoye	2013	27	267
		Metinvest	Ilyich Iron & Steel Works	2017	16	1500
	Russia	MMK OJSC, Ural	Prioskolskoye	on hold	35	3475
		Petropavlovsk	Garinskoye	2015	10	500
Europe	**Greenland**	London Mining	Isua	2015	15	2350
	Sweden	Northland Ressources	Pellivuoma, Norrbotten Province	n/a	20	n/a
NAFTA	**Canada**	Cliffs Natural Resources	Bloom Lake phase II	2015	16	470
		Cliffs Natural Resources	Lamelee-Peppler Lake	n/a	22	1363.8
		New Millenium Iron	Newfoundland/Labrador	2018	22	n/a
		Tata Steel	LabMag	n/a	35	2750
		Wugang, Adriana	Lac Otelnuk	n/a	49	13032
South America	**Bolivia**	JSPL	El Mutun	on hold	20	2100
		ALL, Vetorial	Mato Grosso do Sul	2016	10	3860
	Brazil	ALL, Vetorial, Triunfo	Vetria	2017	19	5540
		Anglo American	Minas Rio	2014	26.5	8800
		Bahia Mineração	Pedro Ferro	2014	15	2500
		Bahmex	Bahia and Minas Gerais	2016	20	n/a
		Batista fam, Wugang	Bom Sucesso	2015	10	870
		Bemisa	Piaui	2016	15	876
		Cabral Resources	Morro do Gergelim	2015	15	n/a
		Camaleão Mineração	Bahia	2016	30	9
		CSN	Casa de Pedra/Namisa	2014	40	6000
		ENRC PLC	Pedra de Ferro	2013	19.5	1850
		Ferrous Resources do Brasil	Viga	2015	25	5200
		Ferrous Resources do Brasil	Jacuipe, Bahia	2016	12	n/a
		Manabi Brasil	Morro do Pilar, Minas Gerais	2016	25	2900
		Mineração Usiminas	Minas Gerais	2015	17	1200
		Samarco Mineracao	Germano	2014	30.5	3200
		SPG Mineracao	Amapa	2017	15	196
		Sul Americana de Metais (SAM)	Grão Mongol, Minas Gerais	2015	25	3000
		Talon Metals	Trairão	n/a	25	n/a

		Vale	Conceição Itabiritos, phase I	2013	12	1174
		Vale	Conceição Itabiritos, phase II	2014	19	1189
		Vale	Itabiritos Caue, Minas Gerais	2015	24	1500
		Vale	Vale Northern System (Carajas)	2013	40	3475
		Vale	Vargem Grande	2014	10	1910
		Vale	Apolo	2014	24	4000
		Vale	Serra Sul	2016	90	8039
		Vetria Mineracao	Corumba	2017	27.5	8000
		Zamin Ferrous	Greystone project, Bahia state	2014	20	n/a
	Chile	CMP	Various	2015	10.5	1500
		MMX :: Codelco	Desierto	2017	20	n/a
	Colombia	MMX	Various	2016	10	n/a
	Peru	Apurimac Ferrum	Colcabamba	2016	20	n/a
		Jinzhao Mining Peru	Arequipa	2015	15	n/a
		Shougang Hierro Peru	Marcona	2015	10	1200
		Strike Resources	Apurimac project	2017	27	2300
	Uruguay	Minera Aratiri (Zamin Ferrous)	Valentines project	2015/2016	50	2100
	Venezuela	FMO	Orinoco River	2014	18	470

Source: BREE (2014), MBR (2014), UNCTAD (2013)

ANNEX 2: Key steel-relevant statistics for African countries

Country	Real GDP growth	Mining sector (as % of GDP)	Electricity and power infrastructure	Railways	Seaports and harbours	Crude steel production	Apparent finished steel consumption	Apparent finished steel consumption per capita	Steelmaking raw material deposits
Year	**2013**	**2010-2013**	**2010**	**2014**	**2014**	**2013**	**2013**	**2013**	**2014**
Source	**AfDB**	**AfDB**	**AfDB**	**Metal Bulletin, CIA**	**Metal Bulletin, CIA**	**WSA**	**WSA**	**WSA**	**UNECA**
	%	**%**	**Millions kilowatt hours**	**Km**	**Port name**	**Thousand tonne**	**Thousand tonne**	**Thousand tonne**	**Raw material name**
Algeria	2.7	33.5	45560	3,973	Algiers, Annaba, Arzew, Bejaia, Djendjene, Jijel, Mostaganem, Oran, Skikda	440	5601	151.4	Zinc, iron
Angola	5.1	46.3	5256	2,764	Cabinda, Lobito, Luanda, Namibe	n/a	n/a	n/a	Nickel, chromium, iron, zinc, manganese
Benin	5.6	0.2	150	438	Cotonou	n/a	n/a	n/a	n/a
Botswana	5.4	22.4	532	888	Landlocked	n/a	n/a	n/a	Nickel, coal
Burkina Faso	6.9	10.09	565	622	Landlocked	n/a	n/a	n/a	Zinc, manganese
Burundi	4.6	0.52	144	n/a	Landlocked/Lake port: Bujumbura (Lake Tanganyika)	n/a	n/a	n/a	Tin, nickel, vanadium, tungsten
Cabo Verde	1	0.41	319	n/a	Porto Grande	n/a	n/a	n/a	n/a
Cameroon	5.3	7.6	5899	1,245	Douala	n/a	232	11.1	Nickel, iron, tin, manganese
Central African Republic	-9.2	1.74	160	n/a	Landlocked/River ports: Bangui (Oubangui), Nola (Sangha)	n/a	n/a	n/a	Tin, iron, manganese

Chad	2.3	25.8	200	n/a	Landlocked/Chari and Legone rivers are navigable only in wet season	n/a	n/a	n/a	n/a
Comoros	3.5	0	43	n/a	Moroni, Mutsamudu	n/a	n/a	n/a	n/a
Congo	3.4	63.26	559	795	Pointe-Noire	n/a	n/a	n/a	Zinc, iron, manganese
Congo, Democratic Republic of	8.7	4.4	7884	987	Pointe-Noire	30 e	127	1.6	Zinc, tin, nickel, tungsten, coal, manganese
Côte d'Ivoire	8.2	6.8	5993	660	Pointe-Noire	n/a	266	12.6	Nickel, iron, manganese
Djibouti	5.5	0.28	349	100	Djibouti	n/a	n/a	n/a	n/a
Egypt	3	16.58	150486	5,083	Alexandria, Damietta, El Dekheila, Port Said, Suez	6754	7591	88.9	Tin, iron, zinc, manganese, coal
Equatorial Guinea	-12.1	87.81	100	n/a	Bata, Luba, Malabo	n/a	n/a	n/a	n/a
Eritrea	n/a	1.69	311	317	Asseb, Massawa	n/a	n/a	n/a	Zinc, iron, nickel
Ethiopia	10.4	1.21	4980	681	None	n/a	n/a	n/a	n/a
Gabon	5.5	44.32	1847	649	Libreville, Owendo, Port-Gentil	n/a	n/a	n/a	Iron, manganese
Gambia	5.6	3.23	245	n/a	Banjul	n/a	n/a	n/a	n/a
Ghana	7.4	7.3	10167	947	Takiradi, Tema	25 e	721	27.6	Manganese
Guinea	2.5	16.3	952	1185	Boké, Conakry, Port Kamsar	n/a	n/a	n/a	Iron, nickel, manganese
Guinea-Bissau	0.3	0.02	32	n/a	Bissau, Buba, Cacheu, Farim	n/a	n/a	n/a	n/a
Kenya	4.9	0.69	6867	2,066	Kisumu, Mombasa	20 e	1317	30	Iron
Lesotho	3.8	6.88	701	n/a	Landlocked	n/a	n/a	n/a	Coal
Liberia	4.6	2.17	353	1067	Buchanan, Greenville, Harper, Monrovia	n/a	n/a	n/a	Iron
Libya	-12.1	65.58	31613	n/a	Marsa al Burayqah, Tripoli	712	1621	249.2	Iron
Madagascar	2	0.26	1360	854	Antsiranana, Mahajanga, Toamasina, Toliara	n/a	n/a	n/a	Chromium, nickel, iron, coal

Malawi	n/a	1.01	2020	797	Landlocked/Lake ports: Chipoka, Monkey Bay, Nkhata Bay, Nkhotakota, Chilumba	n/a	n/a	n/a	Nickel, coal
Mali	2.2	7.1	520	593	Landlocked/River port: Koulikoro (Niger)	n/a	n/a	n/a	Nickel, tin, iron, chromium, tungsten, manganese
Mauritania	6.7	27.56	818	728	Nouadhibou, Nouakchott	5 e	n/a	n/a	Iron
Mauritius	3.1	0.28	2690	n/a	Port Louis	n/a	n/a	n/a	n/a
Morocco	n/a	4.87	22852	2,067	Casablanca, Jorf Lasfar, Mohammedia, Safi, Tangier	558	2038	61.9	Zinc, nickel, tin, iron, coal, manganese
Mozambique	6.8	2.14	16666	4787	Beira, Maputo, Nacala	n/a	n/a	n/a	Iron
Namibia	4.2	11.3	1488	2626	Luderitz, Walvis Bay	n/a	n/a	n/a	Zinc, tin, manganese
Niger	3.6	10.59	291	n/a	Landlocked	n/a	n/a	n/a	Tin, coal
Nigeria	7.3	14.33	26121	3,505	Bonny Inshore Terminal, Calabar, Lagos	100 e	2282	13.4	Tin, zinc, iron, tungsten, coal
Rwanda	4.6	1.91	283	n/a	Landlocked/Lake ports: Cyangugu, Gisenyi, Kibuye (Lake Kivu)	n/a	n/a	n/a	Tin, tungsten
Sao Tome and Principe	4.3	0.42	57	n/a	Sao Tome	n/a	n/a	n/a	n/a
Senegal	4	2.69	2368	906	Dakar	n/a	313	23.2	Iron
Seychelles	3.5	0	301	n/a	Victoria	n/a	n/a	n/a	n/a
Sierra Leone	13	15.8	171	n/a	Freetown, Pepel, Sherbro Islands	n/a	n/a	n/a	n/a
Somalia	n/a	0.59	327	n/a	Berbera, Kismaayo	n/a	n/a	n/a	n/a
South Africa	1.9	8.26	259601	20192	Cape Town, Durban, Port Elizabeth, Richards Bay, Saldanha Bay	7160	5392	105.8	Zinc, nickel, iron, chromium, vanadium, coal, silicon, manganese
South Sudan	n/a	n/a	n/a	248	Landlocked	n/a	n/a	n/a	n/a
Sudan	3.6	5.01	7842	5,978	Port Sudan	n/a	382	8.1	n/a
Swaziland	3.5	0.29	561	301	Landlocked	n/a	n/a	n/a	Coal
Tanzania	7	3.45	4440	3,689	Dar es Salaam, Zanzibar	n/a	725	14.7	Nickel, coal

					OECD Steel Committee				
Togo	5.6	3.63	130	568	Kpeme, Lome	n/a	n/a	n/a	Zinc, iron, manganese
Tunisia	2.6	6.65	16096	2,165	Bizerte, Gabes, Rades, Sfax, Skhira	150 e	937	86.6	Zinc, iron
Uganda	5.2	0.33	2107	1,244	Landlocked/Lake ports: Entebbe, Jinja, Port Bell (Lake Victoria)	30 e	n/a	n/a	Tin, nickel, tungsten, iron
Zambia	6.5	2.12	11307	2922	Landlocked/River ports: Mpulungu (Zambezi)	n/a	n/a	n/a	Zinc, tin, nickel, manganese, coal
Zimbabwe	3.7	10.57	8091	3,427	Landlocked/River ports: Binga, Kariba (Zambezi)	n/a	n/a	n/a	Nickel, iron, chromium, coal

Note: "e" indicates estimated production. n/a information not available.

Sources: African Development Bank (AfDB), Central Intelligence Agency (CIA) World Factbook, International Energy Agency (IEA), Metal Bulletin, World Steel Association (WSA), United Nations Economic Commission for Africa (UNECA), United States Geological Survey (USGS).