Investors should note that CRU, a consultant with over 40 years' experience in the metals and mining industry, has been engaged by the Company to prepare an industry report for use, in whole or in part, in this prospectus. CRU prepared its report based on CRU's in-house database, independent third-party reports and publicly available data from reputable industry organisations. Where necessary, CRU contacted companies operating in the industry to gather and synthesise information about market, prices and other relevant information. CRU has assumed that the information and data which it relied on are complete and accurate.

CRU has provided part of the statistical and graphical information contained in this Industry Overview. CRU has advised that (i) some information in CRU's database is derived from estimates from industry sources or subjective judgments; and (ii) the information in the database of other mining data collection agencies may differ from the information in CRU's database.

Investors should also note that no independent verification has been carried out by the Company, the Sole Sponsor, the Underwriters or any other party involved in the Global Offering on any facts or statistics that are directly or indirectly derived from official government and non-official sources. The Directors believe that the sources of the information in this section are appropriate sources for such information and have taken reasonable care in extracting and reproducing such information. The Directors have no reason to believe that such information is false or misleading or that any part has been omitted that would render such information false or misleading but no representation is made as to the accuracy of the information from official government and non-official sources, which may not be consistent with other information compiled within or outside Russia or the PRC.

The Directors and the Sponsor confirm that, having made due diligence inquiries in relation to the data presented in this section, including of CRU in relation to the fairness and reasonableness of the methodology, the source data and the assumptions used and referred to herein, the data in this section pertaining to future periods has been given after due and careful consideration.

SOURCE OF INFORMATION

CRU, a consultant with more than 40 years of commercial project experience in the mining and metals industry, has been engaged by the Company to provide an industry report (the "CRU Report") for use in whole or in part in this document. Unless otherwise indicated, information contained in this section headed "Industry Overview" (including Appendix X — "Overview of Cost Benchmarking Conducted by CRU" to this prospectus) is derived from the CRU Report.

The research and writing of the CRU Report was a desktop exercise carried out by experienced CRU professionals who have extensive knowledge of the iron ore sector. CRU utilised its in-house database, independent third-party reports and publicly available data from reputable industry organisations to prepare the CRU Report. Where necessary, CRU's researchers contacted companies operating in the industry to gather and synthesise information about the market, prices and other relevant information. CRU applied its own professional judgment and analysis to the data from third party sources to form the statistics and data used in the report.

In preparation of the CRU Report, CRU has assumed the completeness and accuracy of the information and data that CRU has relied on. CRU has confirmed that it is not aware of anything which could possibly lead it to believe that this assumption is unfair, unreasonable or incomplete. The CRU Report was last updated in August 2010.

The terms of engagement in respect of the CRU Report are primarily standard terms including consulting fees, payment method, timing of completion of the report and confidentiality terms. The consulting fees, amounting in aggregate to not more than £44,400, were paid by the Company. Such fees were determined under normal commercial terms after arms' length negotiations. CRU operates at strict international standards of moral, legal and professional conduct. CRU guards its reputation for independence and confidentiality with great care.

Third party sources used in this report:

USGS . . . . The United States Geological Survey, a fact-finding research organisation of the United States Government which engages in four major science disciplines concerning biology, geography, geology and hydrology.

CISA . . . . China Iron and Steel Association, an independent third party.

South African Minerals Bureau . . . A fact finding agency of the South African Government.

CRU did not engage the South African Minerals Bureau, CISA or USGS when preparing data quoted in this report. Data from these sources were not prepared on a commissioned basis by CRU. Similarly, neither the Company nor the Sponsor paid for the preparation of any information by the South African Minerals Bureau, CISA or USGS when preparing the data quoted in this report.

THE IRON ORE MARKET

Iron ore is used primarily as a raw material in the steel making process. Generally iron ore is produced from two types of iron ore mineral, haematite and magnetite. The amount of iron (Fe) contained in iron ore varies. Haematite ores are generally high grade (>60% Fe) and magnetite ores are generally lower grade (<30% Fe). Sometimes deposits can be a mixture of the two ores. Haematite ores typically produce lump and fines through crushing and screening. Magnetite ores require upgrading so are almost always beneficiated in addition to crushing and screening. This process decreases the grain size of the material and usually produces a pellet feed or concentrate product.

Titanomagnetite contains levels of titanium and vanadium that are too high for use in a conventional steel making operation and may only be processed by specialised furnaces. The presence of these other metals in the ore increases the cost of iron production by approximately 50 per cent. and to counter this cost, the vanadium rich slag will often be sold.

It is almost always the case that only one of the metals (titanium or vanadium) can be recovered from the slag. Vanadium slag can be processed into either vanadium pentoxide for chemical applications or into ferrovanadium used to produce high strength steels. It is rare for titanium slag to be sold as the economics are less favourable.

Iron ore and its main uses

Over 98 per cent. of iron ore is used in the steel industry. Iron ore is one of the key raw materials in the iron making process, with the other raw materials being coke and limestone in a blast furnace ("BF") and natural gas in a direct reduction furnace ("DRI Furnace"). Iron smelting or making is the conversion of primary iron units (ore), usually refined ore or unrefined ore if the Fe content is high enough to a product that is around 96 per cent. Fe. In a blast furnace, this is known as hot metal/pig iron and, in a direct reduction furnace, Direct Reduced Iron ("DRI")/Hot Briquetted Iron ("HBI") is produced. A short description of these processes is given below:

- **Blast furnace:** iron ore, coke and limestone are charged into the top of the furnace. Coke provides structure to the furnace, and draws the oxide out of the ore, while the high porosity of the material allows the hot metal to drip to the bottom of the furnace to be collected in the hearth. Hot air (usually heated by gas) is blown in at the bottom of the furnace causing the iron ore to melt, producing hot metal/pig iron with an Fe content of approximately 96 per cent. and impurities as slag.

- **Direct reduction furnace:** uses a tall cylinder, known as a shaft furnace. Iron ore is dropped in at the top and on the way down volatiles, such as carbon dioxide and chemically bound moisture, are driven off by hot reducing gases (hydrogen and carbon monoxide). The iron does not become molten which means that no slag is produced, hence low impurity iron ore (with combined silica and alumina levels of less than 2 per cent.) must be used. The resulting DRI, or HBI (HBI being DRI that is pressed into a larger brick), product drops out the bottom of the furnace and can either be cooled for later use or hot charged into an Electric Arc Furnace ("EAF").

Steel making is the second step after iron making and involves the refining of the products from the iron making stage into liquid steel. This process can be accomplished in a Basic Oxygen Furnace ("BOF") or an EAF. A short description of the processes is provided below:

- **Basic Oxygen Furnace:** The BOF is based on the interaction of process oxygen (nearly pure oxygen) with impurities in liquid hot metal. Scrap and hot metal are charged into the vessel, and oxygen is then blown via a lance into the vessel, oxidising carbon and other impurities (silicon, manganese, etc.). Metallurgical lime and fluor-spar are fed into the vessel to form slag, which absorbs impurities during the steel making process. The BOF is generally the most modern and efficient means by which to produce large volumes of high-quality steel.

- **Electric Arc Furnace:** EAFs produce steel by applying heat generated by electricity arcing between graphite electrodes and a metal bath. The main components of the EAF are a furnace shell with a tapping device and work opening, a removable roof with electrodes and a tilting device. The steps in the EAF production process consist of charging, melting, oxidising or purifying and, lastly, deoxidising or refining. The charge includes scrap, HBI/DRI, fluxes (lime, fluorspar), reducing agents (carbon) and ferroalloys. Further scrap may be added after the ignition of the EAF and melting. Temperatures in the EAF may reach as high as 3,500°C in order to melt alloying components that are otherwise difficult to melt. During the refining stage, iron oxides contained in the slag react with the carbon of the bath, in effect rinsing away impurities. The metallurgical process of the oxidisation and reduction phases can be replaced by secondary metallurgical treatment further downstream in the production process.

The resulting liquid steel is then cast into a 'slab' of cast steel. The slab is often left to cool and when it is required the slab is heated up and rolled, first through a reversing mill and then through a series of continuous rollers. Cast steel is a relatively weak mass of coarse uneven metal crystals or "grains". Rolling the steel makes this coarse grain material re-crystallise into a much finer grain structure, increasing toughness, shock resistance and tensile (stress) strength. Rolling is also the main method used to shape steel into different products. The rolling process consists of passing the steel between two rollers revolving at the same speed but in opposite directions. The gap between the rollers is less than the thickness of the steel being rolled, resulting in the steel being reduced in thickness and, at the same time, lengthened. In addition to hot rolling, in which the steel is rolled at a high temperature, steel may also be rolled at ambient temperatures, resulting in a different set of properties.

Introduction to iron ore products

A description of the products obtained from iron ore deposits, and their relative values, is given below. Typical size intervals are given for the diameter of each product in brackets.

- **Fines (150µm – 6.8mm):** The baseline product in the iron ore market, from which other products are priced. Fines are agglomerated into pebble-sized balls of ore called 'sinter' at the sinter plant of a steel mill before use in a furnace. This process involves mixing the fines with a flux and baking; the resultant operating cost causing fines to have a lower relative value than lump ore and pellets, as the latter two can be directly charged to a furnace. Sinter is not commonly a traded product, although one merchant sinter plant exists in the Philippines.

- **Lump (6.8mm – 15mm):** Irregularly sized lumps of iron ore which can be charged directly into a furnace, enabling a steel producer to avoid the cost of sintering iron ore fines. Lump therefore is sold at a premium to fines, in order to account for this cost saving. Generally this product is not obtained from magnetite ore.

- **Pellets (10mm):** Uniform size and composition give pellets the highest value in use, meaning they provide the most efficient source of iron units to a furnace, and as such they command a strong value position. The pellet premium is strongly linked to this value in use figure, but can be far greater in a tight market. Pellets are manufactured by the agglomeration of pellet feed in a pelletising plant, so the premium must be set against the cost of pelletisation.

- **DR grade pellets (10mm):** This grade of pellet contains lower than 2 per cent. combined silica and alumina, making it suitable for conversion to DRI, a high value product used in certain types of steelmaking furnace. As such, it commands a 5-10 per cent. premium, as of 2010, over conventional (normally referred to as blast furnace or BF grade) pellets to account for superior quality.

- **Pellet feed (60µm[1]-150µm):** This product is the lowest value form of iron ore, as the pelletising process required to convert the pellet feed into useable pellets is more costly than the sintering process required for fines. DR grade pellets can only be produced from DR grade pellet feed, and therefore command a premium over BF pellet feed. CRU understands that this premium is the same percentage as commanded by DR pellets over BF pellets. Approximately 1.02 tonnes of pellet feed are required to make one tonne of pellet.

- **Concentrate:** In addition to the terms in this list, it is worth noting that some iron ore products are referred to as 'concentrate'. Strictly speaking, this is a term used to describe a material that has undergone beneficiation at the mine, and can refer to either pellet feed or fines.

As 98 per cent. of mined iron ore is used as a raw material in the fabrication of steel, the value chain is dictated by the amount of processing each product must undergo before it can be used to make steel. The remaining 2 per cent. is used in marine-grade concrete, and in chemical and industrial applications.

Iron ore demand

Iron ore demand in 2009 was 1,912 million tonnes, a fall of 6.84 per cent. compared with 2008, but a 31.46 per cent. increase above 2005 levels. The reason for the decrease was the impact of the global economic crisis on levels of industrial production and consequently crude steel production. Demand would have dropped further if it were not for a 1.04 per cent. growth in consumption in the PRC. In 2010, demand is forecast to expand by 13.53 per cent., a function of growth of the PRC at 10.92 per cent. and a recovery in developed economies, such as the U.S. (where iron ore demand is forecast to grow by 30.71 per cent. from 2009 to 2010) and Europe (where iron ore demand is forecast to grow by 22.50 per cent. from 2009 to 2010).

Sinter fines account for the majority of iron ore consumption, comprising 69.70 per cent. of iron ore consumption in 2009 at 1,333 million tonnes. In comparison, pellet and lump commanded a 17.29 per cent. and a 13.01 per cent. share respectively. The reason for this is that almost all steel mills are built with a sinter plant to provide material for the blast furnace; this is a large capital investment and will always be run at capacity, even during a downturn. Lump and pellet, on the other hand, are mostly purchased from external sources as a product ready to charge into the furnace and hence are purchased in lower quantities.

Lump consumption in 2009 was 248 million tonnes globally, an increase of 10.06 per cent. above 2008 levels, driven by increased consumption in the PRC, which increased from 88 million tonnes in 2008 to 145 million tonnes in 2009. Lump consumption is highest in Asia

1 Pellet feed with a diameter of less than 60µm can present handling issues and increase transportation costs. Furthermore, pellet plants often prefer coarser grade pellet feed, as it can be ground to their own specifications.

due to the close proximity of Australian and Indian lump supply, while other iron ore producing countries produce little lump in comparison.

World pellet consumption was 330 million tonnes in 2009, a global decrease of 12.66 per cent. on 2008 levels. As mentioned above, pellets are the most expensive source of iron units in the majority of furnaces, hence were the first to experience a decline in demand during the recent downturn. However, in countries with large amounts of pellet capacity, this was not the case: the PRC saw a 12.97 per cent. rise in pellet consumption and the Middle East saw a similar rise of 10.51 per cent.

Global consumption of pellets, fines and lump is forecast by CRU to increase to 2,542 million tonnes in 2015. Pellet consumption is forecast by CRU to grow by an average of 10.09 per cent. per year, to reach 589 million tonnes in 2015. It is expected that most of the demand growth will come from the PRC, where pellet consumption is expected to increase by 81.45 million tonnes between 2009 and 2015, but India, the CIS and the Middle East will also experience strong consumption growth. Global consumption of lump ore is forecast to rise by an average of 5.42 per cent. per year to reach 331 million tonnes in 2015, while the consumption of fines in sinter production is forecast to increase by 3.32 per cent. per year, on average, and is expected to reach 1,622 million tonnes by 2015.

The following table shows the 10 countries or regions with the largest consumption levels of pellet, lump ore and fines in 2009:

Total consumption of iron ore in 2009, top 10 countries (million tonnes)

Pellets		Lump		Sinter/DRI fines	
PRC	140.0	PRC	145.3	PRC	976.6
CIS	34.3	India	34.5	CIS	86.7
U.S.	26.2	Japan	25.1	Japan	75.8
Middle East	22.2	South Korea	12.1	India	34.5
India	19.2	Brazil	10.1	South Korea	24.0
Mexico	10.9	South Africa	5.3	Brazil	21.6
Canada	8.6	Taiwan	1.9	Germany	20.9
Eastern Europe	6.8	Venezuela	1.6	France	15.3
Other Africa	6.4	Argentina	1.5	Taiwan	12.5
Germany	6.3	Australia	1.1	Eastern Europe	11.0
Rest of World	49.8	Rest of World	10.3	Rest of World	54.3
Total World	330.8	Total World	248.8	Total World	1,333.2

Data: CRU

The following table sets forth total actual and estimated iron ore consumption by country or region for 2005 through 2015:

Total consumption of iron ore by country or region, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
PRC	687.7	897.7	1,069.9	1,248.9	1,261.9	16.4%
Rest of Asia (ex. PRC, CIS, Middle East)	251.5	261.4	289.0	294.1	257.4	0.6%
Europe	168.0	175.4	177.7	167.4	121.7	(7.7)%
CIS	136.8	145.2	148.6	137.7	121.4	(2.9)%
North America	86.6	87.1	88.3	84.1	51.9	(12.0)%
South America	72.2	70.1	72.7	69.9	48.7	(9.4)%
Middle East	20.0	19.7	22.3	23.1	25.9	6.7%
Africa	23.0	22.9	21.2	19.0	17.5	(6.7)%
Oceania[3]	9.2	9.6	9.5	9.0	6.4	(8.7)%
Total	1,455.0	1,689.1	1,899.2	2,053.1	1,912.8	7.1%

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
PRC	1,399.7	1,511.1	1,556.9	1,579.5	1,504.3	1,529.0	1.8%
Rest of Asia (ex. PRC, CIS, Middle East)	301.0	323.5	354.5	374.4	392.4	407.1	6.2%
Europe	149.1	156.7	162.5	169.0	173.5	175.2	3.3%
CIS	131.3	145.3	157.2	162.0	166.8	170.6	5.4%
North America	67.8	74.6	80.3	83.6	85.5	88.3	5.4%
South America	61.7	70.3	75.7	79.7	83.4	86.1	6.9%
Middle East	32.2	37.2	40.6	42.8	44.0	47.0	7.8%
Africa	20.0	22.5	23.7	25.0	26.0	27.5	6.6%
Oceania[3]	8.9	9.3	9.8	10.3	10.8	10.9	4.1%
Total	2,171.6	2,350.5	2,461.2	2,526.3	2,486.7	2,541.7	3.2%

Data: CRU

1 "E" means that the figures for this year are estimated.
2 "CAGR" refers to Compound Annual Growth Rate.
3 Oceania consists of Australia, New Zealand and the Pacific Island nations.

The following table shows actual and estimated consumption in the five largest markets from 2005 until 2015:

Consumption of iron ore in the largest five markets, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
PRC	687.7	897.7	1,069.9	1,248.9	1,261.9	16.4%
CIS	136.8	145.2	148.6	137.7	121.4	(2.9%)
Japan	132.2	134.2	138.2	137.3	106.5	(5.3%)
India	57.8	63.4	82.9	86.6	88.2	11.1%
South Korea	41.1	41.5	44.6	47.2	41.4	0.2%
Rest of world	399.3	407.0	414.9	395.5	293.4	(7.4%)
Total	1,455.0	1,689.1	1,899.2	2,053.1	1,912.8	7.1%

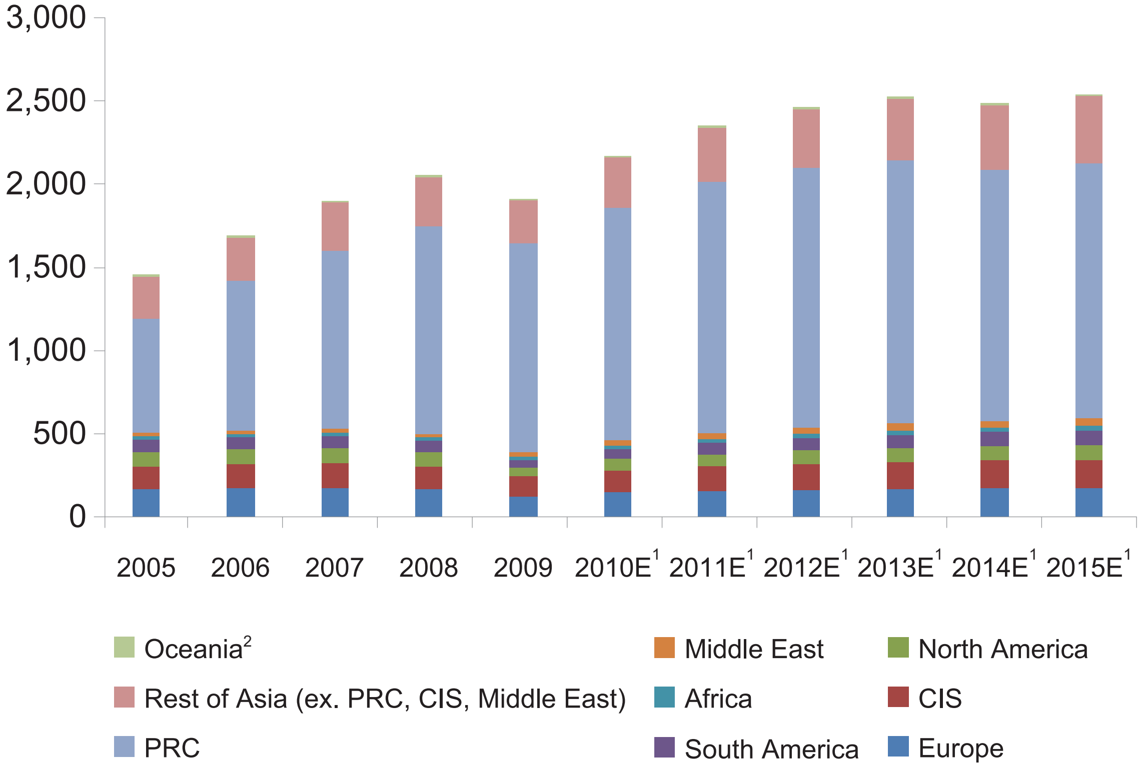
	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
PRC	1,399.7	1,511.1	1,556.9	1,579.5	1,504.3	1,529.0	1.8%
CIS	131.3	145.3	157.2	162.0	166.8	170.6	5.4%
Japan	128.4	133.6	145.6	148.5	149.3	149.5	3.1%
India	98.0	106.3	117.6	130.0	143.5	155.1	9.6%
South Korea	49.0	54.4	58.1	59.9	61.7	63.8	5.4%
Rest of world	365.3	399.7	425.8	446.5	461.1	473.8	5.3%
Total	2,171.6	2,350.4	2,461.2	2,526.4	2,486.7	2,541.8	3.2%

Data: CRU Iron Ore Market Service March 2010

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

Total actual and estimated consumption of iron ore by country or region, 2005 – 2015 (million tonnes)



Source: CRU

1 "E" means that the figures for this year are estimated

2 Oceania consists of Australia, New Zealand and the Pacific Island nations

Iron ore supply

The global iron ore industry is highly consolidated, with Vale, Rio Tinto (which owns Hamersley Iron and the majority of shares in Robe River Iron Associates ("Robe") and Iron Ore Company of Canada ("IOC")) and BHP Billiton, accounting for 30 per cent. of world iron ore production and at least 60 per cent. of world seaborne supply in 2009.

The table below presents the actual and estimated top ten major iron ore exporters from 2005 until 2015:

Global exports of iron ore, top ten major companies, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
Vale	207.6	229.0	244.5	238.8	207.7	0.00%
Rio Tinto	143.1	150.1	160.7	160.6	183.4	6.41%
Hamersley Iron (100%)[3]	90.1	98.1	109.5	110.3	128.8	9.36%
Robe River (53%)[3]	53.0	52.0	51.2	50.3	54.6	0.75%
Hope Downs (50%[3]	0.0	0.0	0.0	0.0	0.0	N/A
BHPB	100.5	102.6	106.7	124.4	128.7	6.38%
Kumba	21.8	21.2	23.7	25.0	34.2	11.95%
FMG	0.0	0.0	0.0	14.8	32.8	N/A
CSN	0.0	0.0	5.5	14.3	21.6	N/A
Samarco	15.5	16.0	16.4	17.3	18.8	4.99%
LKAB-Sweden	17.8	18.2	19.7	17.6	13.1	-7.46%
Total	**506.2**	**537.2**	**577.3**	**612.8**	**640.2**	**6.05%**
% of total exports	**71%**	**70%**	**70%**	**69%**	**68%**	

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Vale	265.0	286.0	303.5	334.5	351.5	375.0	7.19%
Rio Tinto	229.0	244.0	255.0	257.0	257.0	257.0	2.33%
Hamersley Iron (100%)[3]	135.0	142.0	150.0	150.0	150.0	150.0	2.13%
Robe River (53%)[3]	65.0	72.0	75.0	77.0	77.0	77.0	3.45%
Hope Downs (50%)[3]	29.0	30.0	30.0	30.0	30.0	30.0	0.68%
BHPB	139.6	154.6	165.6	185.6	200.6	210.0	8.51%
Kumba	36.4	35.8	39.1	44.1	44.1	45.0	4.35%
FMG	40.0	47.0	52.0	55.0	60.0	65.0	10.20%
CSN	22.0	28.0	37.0	37.0	35.0	35.0	9.73%
Samarco	20.3	20.8	21.3	22.8	22.8	23.0	2.53%
LKAB-Sweden	16.6	20.2	21.7	22.7	22.7	23.0	6.68%
Total	**768.9**	**836.3**	**895.2**	**958.7**	**993.7**	**1033.0**	**6.08%**
% of total exports	**71%**	**72%**	**71%**	**71%**	**70%**	**71%**	

Data: CRU Iron Ore Market Service March 2010

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

3 The percentages listed next to each of Hamersley Iron, Robe River and Hope Downs refer to the percentage shareholding held by Rio Tinto in each of these mining projects.

In 2009, global iron ore production totalled 1,909 million tonnes, which is 8.04 per cent. lower than in 2008, but 28.27 per cent. higher than in 2005. The three largest iron ore producing countries in 2009 were the PRC, Australia and Brazil, together accounting for over two-thirds of apparent production (consumption plus imports, minus exports).

The major iron ore exporting countries include Australia, Brazil and India, and the major importers are major steel producing countries such as the PRC, Germany, Japan and South Korea.

Production of lump ore in quantities greater than 1 million tonnes per year was confined to Australia, Brazil, the PRC, the CIS, India, South Africa, Turkey and Venezuela in 2009. Of these, the CIS and the PRC produced lump ore only for domestic consumption.

The following table shows the iron ore production by country or region in 2009, splitting between pellets, lump ore and fines. It should be noted that concentrate material, which requires beneficiation, effectively becomes either fines or pellets and, in order to avoid double counting, is not reported separately in the table below. All pellet feed is used in pellet production and has therefore also been excluded from the table below to avoid double counting.

Apparent production of iron ore in 2009, top 10 countries (million tonnes)

Pellets		Lump		Sinter/DRI Fines	
PRC	110.4	Australia	108.4	PRC	560.9
CIS	59.5	India	53.4	Australia	286.6
Brazil	34.8	South Africa	31.1	Brazil	187.4
U.S.	26.9	Brazil	29.7	India	129.5
Canada	25.1	PRC	5.2	CIS	93.9
India	19.6	Venezuela	2.4	South Africa	22.7
Middle East	15.2	Turkey	1.1	Canada	12.1
Sweden	12.0	Mauritania	1.0	Mauritania	9.3
Mexico	11.7	Chile	0.8	Middle East	8.0
Venezuela	5.5	Other Africa	0.4	Indonesia	6.5
Rest of World	9.8	Rest of World	1.0	Rest of World	27.0
Total World	330.5	Total World	234.4	Total World	1,344.0

Data: CRU

CRU forecasts that global production of pellets, fines and lump will increase by 14.3 per cent. in 2010, to 2,181 million tonnes, and expects it to increase to 2,542 million tonnes by 2015. However, during the period 2010-2015, the PRC's domestic iron ore production is forecast by CRU to level off (starting in 2011), and then decline. The PRC's ore is low-grade (<30 per cent. iron on average, with some deposits believed to be as low as 20 per cent.), and thus costly to mine and process. As tightness in the iron ore market eases, PRC steelmakers are expected to rely increasingly on imported ore, particularly from Australia and Brazil. Australian production of pellets, fines and lump is expected to increase by 6.2 per cent. per year, on average, between 2010 and 2015, while production in Brazil is expected to grow by 6.84 per cent. per year.

The following table sets forth actual and estimated total apparent iron ore production by country or region for 2005 through 2015:

Total apparent production of iron ore by country or region, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
Europe	32.7	32.8	37.3	36.9	27.7	(4.1)%
CIS	171.9	182.9	184.8	169.7	153.8	(2.7)%
North America	99.5	102.4	103.5	99.6	77.2	(6.1)%
South America	278.8	296.2	318.5	322.7	272.3	(0.6)%
Africa	54.7	54.4	57.5	56.7	66.7	5.1%
Middle East	16.3	19.4	21.0	21.8	23.2	9.3%
PRC	427.0	588.0	708.7	824.0	676.5	12.2%
Rest of Asia (ex. PRC, CIS, Middle East)	148.8	161.4	188.7	204.6	214.1	9.5%
Oceania[3]	258.5	271.9	293.5	339.8	397.3	11.3%
Total	1,488.1	1,709.4	1,913.5	2,075.8	1,908.9	6.4%

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Europe	36.9	42.6	44.0	45.8	46.1	47.5	5.2%
CIS	166.1	176.7	186.9	190.1	200.2	204.3	4.2%
North America	89.7	100.1	109.5	115.1	116.8	118.2	5.7%
South America	344.9	382.0	414.5	448.5	466.2	481.4	6.9%
Africa	71.8	73.4	78.8	84.4	85.1	92.2	5.1%
Middle East	25.7	29.8	38.1	40.3	40.3	42.5	10.6%
PRC	766.5	816.5	816.5	786.5	671.5	671.5	(2.6)%
Rest of Asia (ex. PRC, CIS, Middle East)	235.4	241.4	248.5	259.2	270.7	283.9	3.8%
Oceania[3]	444.4	487.9	524.4	556.2	589.9	600.8	6.2%
Total	2181.4	2350.5	2461.2	2526.4	2486.8	2542.2	3.1%

Data: CRU

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

3 Oceania consists of Australia, New Zealand and the Pacific Island nations.

The table below shows the actual and estimated top five iron ore producing countries from 2005 until 2015:

Total production of iron ore by the five largest producers, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
PRC	427.0	588.0	708.7	824.0	676.5	12.2%
Australia	258.5	271.9	293.5	339.8	397.3	11.3%
Brazil	248.1	268.5	290.8	296.0	252.0	0.4%
India	140.7	150.7	173.5	187.6	202.5	9.5%
CIS	171.9	182.9	184.8	169.7	153.8	(2.7%)
Rest of world	241.9	247.5	262.1	258.7	226.8	(1.6%)
Total	1,488.1	1,709.4	1,913.5	2,075.8	1,908.9	6.4%

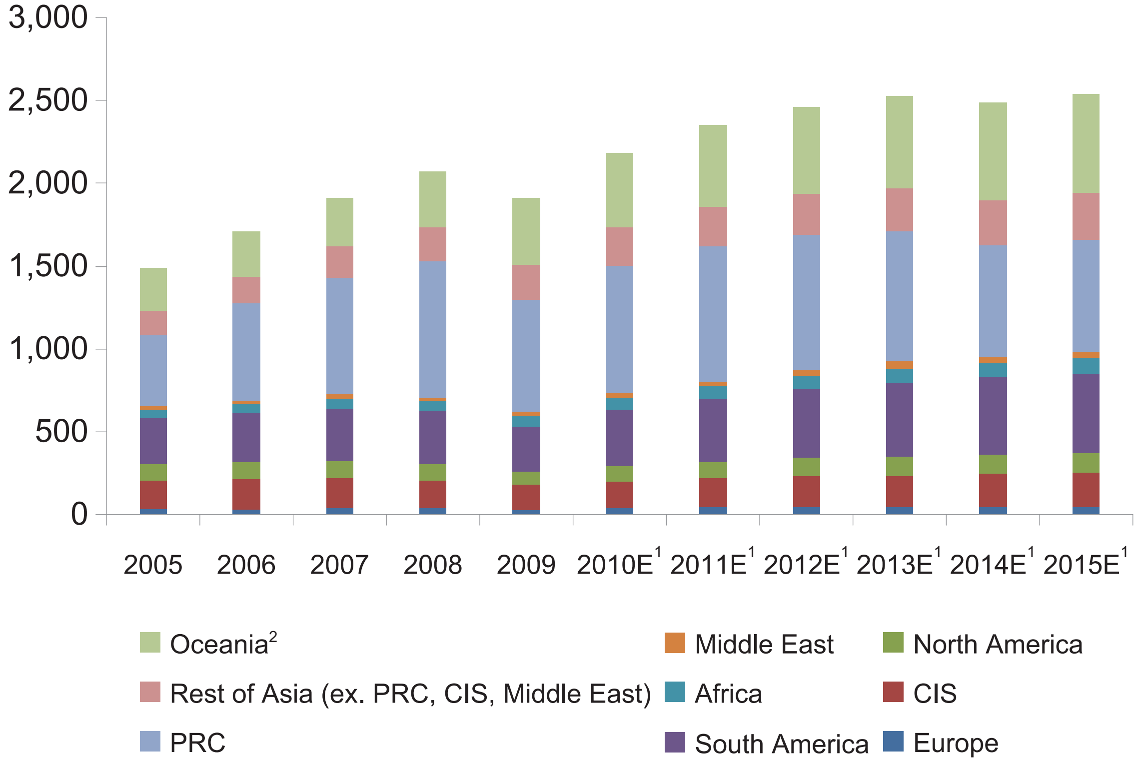
	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
PRC	766.5	816.5	816.5	786.5	671.5	671.5	(2.6%)
Australia	444.4	487.9	524.4	556.2	589.9	600.8	6.2%
Brazil	322.9	355.4	384.3	417.5	435.2	449.5	6.8%
India	222.0	226.6	234.0	242.6	254.6	266.1	3.7%
CIS	166.1	176.7	186.9	190.1	200.2	204.3	4.2%
Rest of world	259.4	287.4	315.1	333.4	335.5	350.0	6.2%
Total	2,181.4	2,350.5	2,461.2	2,526.4	2,486.8	2,542.2	3.1%

Data: CRU Iron Ore Market Service March 2010

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

Actual and estimated total production of iron ore by country or region, 2005 – 2015 (million tonnes)



Source: CRU

1 "E" means that the figures for this year are estimated.

2 Oceania consists of Australia, New Zealand and the Pacific Island nations.

The traded market for iron ore

Global trade in pellet, pellet feed, fines and lump was 944.4 million tonnes in 2009, with Australia and Brazil being the leading exporters according to Global Trade Information Systems ("GTIS"). The PRC imported approximately 67 per cent. of all iron ore traded globally and Japan accounted for a further 11 per cent.. Vale, Rio Tinto and BHP Billiton together accounted for at least 60 per cent. of the seaborne traded market in 2009.

In 2010, global trade in pellet, pellet feed, fines and lump is forecast to rise by 14.2 per cent., to 1,078 million tonnes. Of this, the PRC is expected to import 679 million tonnes — six times the volume of any other single country and accounting for 59 per cent. of global seaborne trade. Japan is expected to import 128.4 million tonnes, or 12 per cent. of the world's seaborne trade. Global seaborne trade is forecast to rise to 1.45 billion tonnes by 2015, an average increase of 6.15 per cent. per year from 2010. According to CRU, the PRC's imports are expected to rise to 948 million tonnes, or 65 per cent. of global seaborne trade, by 2015.

The table below summarises actual and estimated global imports, by country and region, for 2005 through 2015:

Global imports of iron ore by country or region, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	2010
Europe	156.5	164.3	164.6	152.2	109.9	(8.4)%
CIS	—	—	0.1	—	—	N/A
North America	28.4	26.0	27.2	27.1	12.0	(19.3)%
South America	6.7	7.2	6.6	7.1	4.5	(9.8)%
Africa	7.1	7.4	7.1	6.8	6.6	(1.5)%
Middle East	14.2	12.0	12.6	15.3	15.1	1.5%
PRC	275.2	326.3	383.7	444.1	628.3	22.9%
Rest of Asia (ex. PRC, CIS, Middle East)	194.5	198.4	206.9	207.5	169.2	(3.4)%
Oceania[3]	2.3	2.8	2.6	2.6	2.4	1.2%
Total	684.8	744.4	811.4	862.6	948.0	8.5%

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Europe	133.1	139.0	145.4	151.1	155.3	155.8	3.2%
CIS	—	—	—	—	—	—	N/A
North America	17.7	21.0	23.2	24.2	24.7	26.4	8.2%
South America	5.5	6.0	6.6	7.1	7.2	7.4	6.4%
Africa	7.9	9.2	9.8	10.4	10.7	11.7	8.2%
Middle East	20.2	25.6	37.5	42.6	43.2	47.7	18.7%
PRC	678.7	748.6	796.8	862.9	921.2	947.7	6.9%
Rest of Asia (ex. PRC, CIS, Middle East)	202.5	216.4	235.4	245.4	250.6	253.3	4.6%
Oceania[3]	2.6	2.6	2.6	2.6	2.6	2.7	0.5%
Total	1,068.1	1,168.3	1,257.5	1,346.4	1,415.5	1,452.6	6.3%

Data: CRU

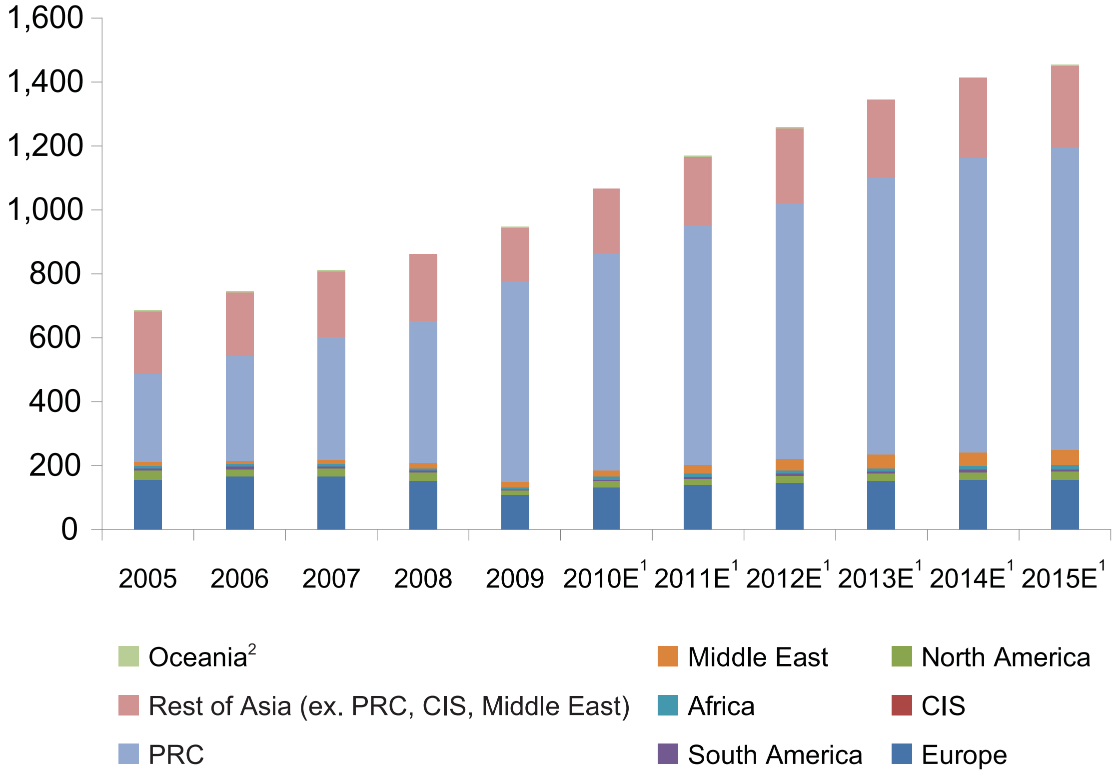
1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

3 Oceania consists of Australia, New Zealand and the Pacific Island nations.

Note: Global import figures are not equal to global export figures, due to differences in the respective volumes in transit at a given point in time, which means that some exports are not reflected in the figures for imports for a particular year, and *vice versa*, and also due to reporting errors at various ports.

Actual and estimated total imports of iron ore by country or region, 2005 – 2015 (million tonnes)



Source: CRU

1 "E" means that the figures for this year are estimated.
2 Oceania consists of Australia, New Zealand and the Pacific Island nations.

The table below shows the top exporters by iron ore product in 2009:

Top iron ore exporters 2009 (million tonnes)

Pellets		Lump		Sinter/DRI Fines		Pellet Feed	
Brazil	32.4	Australia	107.3	Australia	283.8	Brazil	40.3
CIS	25.2	South Africa	25.8	Brazil	165.8	Chile	5.6
Canada	19.5	Brazil	19.6	India	95.0	Peru	2.0
Sweden	9.3	India	18.9	South Africa	19.5	Venezuela	2.0
USA	3.8	Mauritania	1.0	Canada	11.7	Mexico	1.1
Middle East	3.6	Venezuela	0.8	Mauritania	9.3	Norway	0.2
Chile	2.1	Chile	0.3	CIS	7.2	USA	0.2
Australia	1.6			Indonesia	6.5	Australia	0.1
Peru	1.3			Middle East	5.4		
Mexico	1.0			Other Asia	4.1		
India	0.7						
Venezuela	0.2						

Data: CRU Iron Ore Market Service March 2010

The table below summarises the actual and estimated global exports, by country or region, for 2005 through 2015:

Global exports of iron ore by country or region, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
Europe	17.5	18.4	19.8	17.3	13.6	(6.1)%
CIS	35.1	37.7	36.4	32.0	32.4	(2.0)%
North America	38.1	37.9	39.1	40.0	37.2	(0.6)%
South America	244.1	266.0	290.3	294.9	277.9	3.3%
Africa	38.7	39.0	43.4	44.5	55.9	9.6%
Middle East	5.9	7.2	7.9	8.7	9.0	11.1%
PRC	—	—	—	—	—	N/A
Rest of Asia (ex. PRC, CIS, Middle East)	87.4	94.0	102.6	114.9	125.7	9.5%
Oceania[3]	251.1	264.6	286.2	333.0	392.8	11.8%
Total	718.0	764.8	825.7	885.3	944.4	7.1%

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Europe	17.3	20.8	22.4	23.4	23.4	23.5	6.3%
CIS	34.8	31.3	29.7	28.2	33.4	33.7	(0.6%)
North America	39.6	46.9	52.7	56.1	56.3	55.8	7.1%
South America	342.2	380.7	416.6	459.2	486.2	501.5	7.9%
Africa	59.7	60.1	64.9	69.9	69.9	76.3	5.0%
Middle East	9.1	11.1	18.6	20.6	19.9	21.6	18.8%
PRC	—	—	—	—	—	—	N/A
Rest of Asia (ex. PRC, CIS, Middle East)	136.8	134.2	129.3	127.1	124.8	125.4	(1.7)%
Oceania[3]	438.6	483.2	523.3	562.1	601.7	615.4	7.0%
Total	1,078.1	1,168.3	1,257.5	1,346.4	1,415.5	1,453.1	6.2%

Data: CRU
1 "E" means that the figures for this year are estimated.
2 "CAGR" refers to Compound Annual Growth Rate.
3 Oceania consists of Australia, New Zealand and the Pacific Island nations.

Note: Global import figures are not equal to global export figures, due to differences in the respective volumes in transit at a given point in time, which means that some exports are not reflected in the figures for imports for a particular year, and *vice versa*, and also due to reporting errors at various ports.

The table below shows actual and estimated exports from the top five exporters from 2005 until 2015:

Top five iron ore exporting countries and regions, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
Australia	251.1	264.6	286.2	333.0	392.8	11.8%
Brazil	224.5	247.8	270.5	277.8	258.1	3.5%
India	83.4	87.2	91.1	101.0	114.7	8.3%
South Africa	27.7	28.0	31.4	33.2	45.3	13.1%
CIS	35.1	37.7	36.4	32.0	32.4	(2.0%)
Rest of world	96.2	99.4	110.1	108.3	101.2	1.3%
Total	**718.0**	**764.8**	**825.7**	**885.3**	**944.4**	**7.1%**

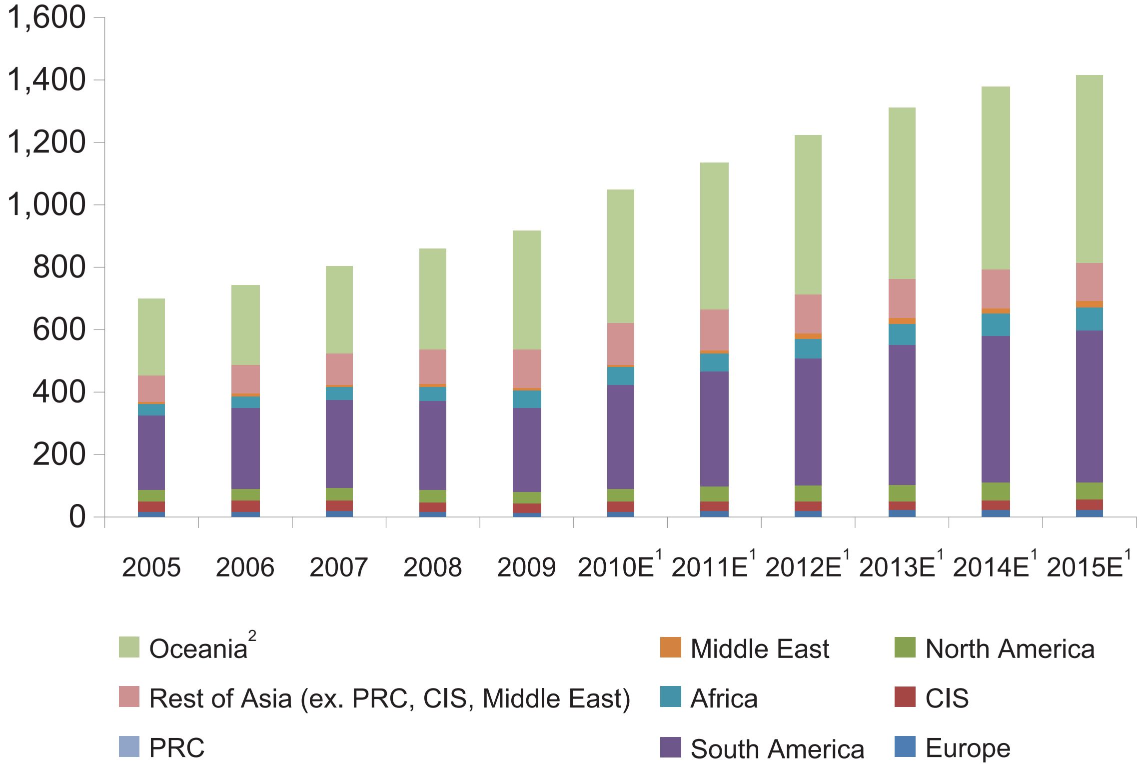
	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Australia	438.6	483.2	523.3	562.1	601.7	615.4	7.0%
Brazil	322.5	357.5	390.9	432.9	459.9	475.1	8.1%
India	124.5	121.0	117.2	113.6	112.1	112.0	(2.1%)
South Africa	48.4	47.8	51.6	56.6	56.6	61.3	4.8%
CIS	34.8	31.3	29.7	28.2	33.4	33.7	(0.6%)
Rest of world	109.3	127.5	144.8	153.1	151.8	155.7	7.3%
Total	**1,078.1**	**1,168.3**	**1,257.5**	**1,346.5**	**1,415.5**	**1,453.2**	**6.2%**

Data: CRU Iron Ore Market Service March 2010

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

Total actual and estimated exports of iron ore by country or region, 2005 – 2015 (million tonnes)



Source: CRU

1 "E" means that the figures for this year are estimated

2 Oceania consists of Australia, New Zealand and the Pacific Island nations.

Resources comparison

The table below presents a comparison between the resources of the K&S project and other deposits at a similar stage of development and that will serve a similar market. Vertically integrated iron ore mines owned by steel companies have been excluded as these operations will not compete with those of the Group. The data is taken from publicly available information and was collated in July 2010.

Resources comparison

Project	Resources (Measured + indicated + Inferred)	Product Iron Grade	Owner
K&S	741.1 mt[1]	65.80%	IRC
CIS			
Belanovskoye	1,664 mt	>65%	Ferrexpo
Yeristovskoye	861 mt	>65%	Ferrexpo
GPL Mine	3,704 mt	>65%	Ferrexpo
Sokolov-Sarbai	4,256 mt	>65%	SSGPO (ENRC)
Australia			
Cape Lambert	1,915 mt	65.00%	MCC
Sino Iron	4,504 mt	Unknown	Citic
Karara	1,854 mt	68.30%	Gindalbie/ Ansteel
Southdown	654 mt	67.70%	Grange
Ridley	2,010 mt	68.30%	Atlas Iron
Brazil			
Pedra de ferro	~2,400 mt[2]	67.00%	Bamin
Minas Rio	4,996 mt	69.00%	Anglo/MMX
Jucurutu	3,800 mt (not JORC)	>65%	MHAG
Viga	4,500 mt	>67%	Ferrous
Africa			
Simandou	2,225 mt	65.97%	Rio Tinto

Data: company reports, collated by CRU

1 K&S comprises 195.7Mt *Measured*, 396.9Mt *Indicated* and 148.6Mt *Inferred* Resources. For a description of the categories of JORC-Compliant *Measured, Indicated and Inferred* Mineral Resources, and the level of confidence attributable to each category, please refer to the sub-section headed "Cautionary Note to Investors Concerning Measured, Indicated and Inferred Resources" of the section headed "Classification of Geological Resources and Reserves" of this prospectus.

2 *Inferred* only. Source: Company website

The PRC's iron ore market

Iron ore production in the PRC is highly disparate, with approximately 1,340 individual mines operating in 2009. The 10 largest iron ore miners in the country produced 156.4 million tonnes in 2008, 19 per cent. of the total production in the PRC. Many of the largest miners are also vertically integrated with steel mills, meaning that the merchant mining sector has little or no consolidation.

The Angang Mining Company, by far the largest iron ore miner in the PRC, is an arm of Angang Iron and Steel Group. Angang Iron and Steel Group produced 15 million tonnes of steel in 2008, in the form of both long and flat products. The company sells finished steel both internally and also in export markets.

The Hebei Iron and Steel Group Company was established in 2008 as a merger of Tangsteel and Hansteel. It is currently the largest steel producer in the PRC, and produced 33.3 million tonnes in 2008.

The Pangang Group Chengdu Steel & Vanadium Co. Ltd, is a producer of both steel and vanadium. The company mines a titanomagnetite ore body and extracts the vanadium during the steel making stages for further processing. This is essential as the cost of processing a titanomagnetite ore is approximately twice that of processing a standard magnetite or haematite ore. Vanadium can be processed into either vanadium pentoxide for chemical applications or into ferrovanadium used to produce high strength steels.

The following table presents crude ore and post-beneficiation iron ore production, by the ten largest producers in the PRC in 2008:

Top 10 iron ore producers in the PRC 2008 (million tonnes)

	Province	Ore Production	Concentrate Production
Angang Mining Company	Liaoning	43.9	15.8
Hebei Iron and Steel Mining Company	Hebei	20.6	5.2
Pangang Mining Company	Sichuan	18.0	6.9
Bengang Mining Company	Liaoning	16.8	6.4
Taigang Mining Branch	Shanxi	13.8	5.4
Baotou Iron and Steel Group	Inner Mongolia	13.0	4.9
Magang Group Company	Anhui	9.6	2.7
Shougang Mining Company	Hebei	9.1	4.9
Handan and Xingang Metallurgical Management Bureau	Tianjin	6.7	2.8
Hainan Mining United Corporation	Hainan	4.8	0.5
Total		156.4	55.5

Data: CRU

The table below shows iron ore production, trade and consumption in the PRC from 2005 until 2015:

The PRC's iron ore production, consumption and trade, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
Production	427.0	588.0	708.7	824.0	676.5	12.2%
Imports	275.2	326.3	383.7	444.1	628.3	22.9%
Exports	0.0	0.0	0.0	0.0	0.0	N/A
Consumption	687.7	897.7	1069.9	1248.9	1261.9	16.4%

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Production	766.5	816.5	816.5	786.5	671.5	671.5	(2.6)%
Imports	678.7	748.6	796.8	862.9	921.2	947.7	6.9%
Exports	0.0	0.0	0.0	0.0	0.0	0.0	N/A
Consumption	1399.7	1511.1	1556.9	1579.5	1504.3	1529.0	1.8%

Data: CRU

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

Japan, South Korea and Rest of Asia (excl. the PRC, CIS and the Middle East) iron ore market

The table below shows actual and estimated iron ore production consumption and trade for Japan, South Korea and the Rest of Asia (excl. the PRC, CIS and the Middle East) from 2005 – 2015:

Japan South Korea and Rest of Asia (excl. the PRC, CIS and the Middle East) iron ore production, consumption and trade, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
Production total	**148.8**	**161.4**	**188.7**	**204.6**	**214.1**	**9.5%**
Japan	4.0	4.0	3.7	2.8	0.1	(61.7%)
South Korea	0.0	0.0	0.0	0.0	0.0	N/A
Rest of Asia (ex. PRC, CIS, Middle East)	144.8	157.4	185.0	201.8	214.0	10.3%
Imports total	**194.5**	**198.4**	**206.9**	**207.5**	**169.2**	**(3.4%)**
Japan	133.6	135.2	139.6	138.4	106.6	(5.5%)
South Korea	41.1	41.5	44.6	47.2	41.4	0.2%
Rest of Asia (ex. PRC, CIS, Middle East)	19.8	21.7	22.7	21.8	21.2	1.7%
Exports total	**87.4**	**94.0**	**102.6**	**114.9**	**125.7**	**9.5%**
Japan	0.0	0.0	0.0	0.0	0.0	N/A
South Korea	0.0	0.0	0.0	0.0	0.0	N/A
Rest of Asia (ex. PRC, CIS, Middle East)	87.4	94.0	102.6	114.9	125.7	9.5%
Consumption total	**251.5**	**261.4**	**289.0**	**294.1**	**257.4**	**0.6%**
Japan	132.2	134.2	138.2	137.3	106.5	(5.3%)
South Korea	41.1	41.5	44.6	47.2	41.4	0.2%
Rest of Asia (ex. PRC, CIS, Middle East)	78.1	85.7	106.2	109.6	109.5	8.8%

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Production total	**235.4**	**241.4**	**248.5**	**259.2**	**270.7**	**283.9**	3.8%
Japan	0.1	0.1	0.1	0.1	0.1	0.7	54.1%
South Korea	0.0	0.0	0.0	0.0	0.0	0.0	N/A
Rest of Asia (ex. PRC, CIS, Middle East)	235.3	241.4	248.4	259.1	270.6	283.2	3.8%
Imports total	**202.5**	**216.4**	**235.4**	**245.4**	**250.6**	**253.3**	4.6%
Japan	128.4	133.6	145.6	148.5	149.3	149.7	3.1%
South Korea	49.0	54.4	58.1	59.9	61.7	63.8	5.4%
Rest of Asia (ex. PRC, CIS, Middle East)	25.1	28.3	31.7	37.0	39.6	39.8	9.7%
Exports total	**136.8**	**134.2**	**129.3**	**127.1**	**124.8**	**125.4**	(1.7%)
Japan	0.0	0.0	0.0	0.0	0.0	0.0	N/A
South Korea	0.0	0.0	0.0	0.0	0.0	0.0	N/A
Rest of Asia (ex. PRC, CIS, Middle East)	136.8	134.2	129.3	127.1	124.8	125.4	(1.7%)
Consumption total	**301.0**	**323.5**	**354.5**	**374.4**	**392.4**	**407.1**	6.2%
Japan	128.4	133.6	145.6	148.5	149.3	149.5	3.1%
South Korea	49.0	54.4	58.1	59.9	61.7	63.8	5.4%
Rest of Asia (ex. PRC, CIS, Middle East)	123.6	135.5	150.8	166.0	181.4	193.8	9.4%

Data: CRU Iron Ore Market Service March 2010

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

CIS Iron Ore Market

Iron ore production in the CIS is highly concentrated. The largest eight producers (Metinvest, Evraz, SSGPO (ENRC), Severstal, NLMK, Ferrexpo, Mechel and the Metalloinvest group) accounted for approximately 74 per cent. of total iron ore production in 2008.

In 2008, the Metalloinvest group was the largest iron ore producer in the CIS. The Metalloinvest group produced 41 million tonnes of concentrate and sintering ore in 2008. The Metalloinvest group's iron ore producers are Lebedinsky GOK ("LGOK") and Mikhailovsky GOK ("MGOK").

Metinvest is the second largest producer of iron ore in the CIS. Based in Ukraine, the company produced 44.7 million tonnes of iron ore in 2008. The company also owns steelmaking assets and produced 9.8 million tonnes of crude steel in 2008.

Evraz is a vertically integrated steel company, with assets in the Russian Federation, Ukraine, the PRC, Czech Republic, Italy, Romania, South Africa and the US. The company owns two iron ore complexes in the Russian Federation and produced approximately 15.1 million tonnes of iron ore products from its CIS assets in 2008.

ENRC is a public company, although the Government of Kazakhstan holds a stake. It is the country's main energy provider and also the world's third largest ferroalloys producer. Through its subsidiary Sokolov-Sarbai Mining Production Association (SSGPO) the company produced approximately 14.8 million tonnes of iron ore in 2008.

Severstal is a leading international steel producer. Severstal Mining consists of four high-quality mining complexes in northwest and northeast of the Russian Federation producing iron ore and coking coal and is the second largest producer of pellets and coking coal in the Russian Federation. The company produced 14.0 million tonnes of iron ore in 2008 from its CIS assets.

For reference, the Group intends to produce 3.4 million tonnes per annum initially, increasing to 10 million tonnes per annum in the long term.

The following table presents post beneficiation iron ore production, including sintering ore, by the eight largest CIS producers in 2008 (in most instances pellets are produced from the company's concentrate):

Eight largest CIS iron ore producers 2008 (million tonnes)

	Product			
	Concentrate	Sinter Fines	Pellet	Lump
Metinvest	**31.5**	**—**	**13.2**	—
InGOK	12.6	—	—	—
SevGOK	13.4	—	11.0	—
CGOK	5.5	—	2.2	—
Evraz	**3.6**	**7.1**	**5.3**	**2.7**
SSGPO (ENRC)	**7.8**	**—**	**7.0**	**—**
Severstal	**4.7**	**—**	**9.4**	**—**
OAO Karelsky Okatysh	—	—	9.4	—
OAO Olkon	4.7	—		
NLMK	**11.5**	**1.6**	**—**	**—**
Ferrexpo	**10.5**	**—**	**8.6**	**—**
Mechel	**4.7**	**—**	**—**	**—**
Korshunov	4.7	—	—	—
Metalloinvest	**31.0**	**10.0**	**—**	**—**
MGOK	20.0	—	—	—
LGOK	11.0	10.0	—	—

Source: Company annual reports

The table below shows actual and estimated iron ore production, trade and consumption in the CIS from 2005 until 2015:

Actual and estimated CIS iron ore production, consumption and trade, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
Production	171.9	182.9	184.8	169.7	153.8	(2.7%)
Imports	—	—	0.1	—	—	N/A
Exports	35.1	37.7	36.4	32.0	32.4	(2.0%)
Consumption	136.8	145.2	148.6	137.7	121.4	(2.9%)

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Production	166.1	176.7	186.9	190.1	200.2	204.3	4.8%
Imports	—	—	—	—	—	—	N/A
Exports	34.8	31.3	29.7	28.2	33.4	33.7	(1.0%)
Consumption	131.3	145.3	157.2	162.0	166.8	170.6	6.2%

Data: CRU Iron Ore Market Service March 2010

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

The following table shows the market share of the top five global iron ore exporters, top five PRC iron ore producers and top five CIS iron ore producers:

Top five market share for global iron ore exporters, PRC and CIS producers 2009 (million tonnes)

Top 5 Exporters	2009	Market Share	PRC Producers	2009	Market Share	CIS Producers	2009	Market Share
Vale	207.7	22.0%	Angang Mining Company	43.9	6.5%	Metinvest	31.5	20.5%
Rio Tinto	183.4	19.4%	Hebei Iron and Steel Mining Company	20.6	3.0%	Metalloinvest	31.0	20.2%
BHPB	128.7	13.6%	Pangang Mining Company	18.0	2.7%	NLMK	11.5	7.5%
Kumba	34.2	3.6%	Bengang Mining Company	16.8	2.5%	Ferrexpo	10.5	6.8%
FMG	32.8	3.5%	Taigang Mining Branch	13.8	2.0%	SSGPO (ENRC)	7.8	5.1%
Total	**944.4**			**676.50**			**153.8**	

Data: CRU

THE DRI/HBI MARKET

Once mined, crude iron ore is generally concentrated or beneficiated to upgrade the iron content, before being reduced to metallic iron (hot metal, pig iron or DRI/HBI). Reducing the iron into a metallic product ready for steelmaking can be achieved in two ways. Firstly, in a blast furnace, where the iron is charged in combination with limestone flux and coke and is heated with air to produce hot metal or pig iron. Alternatively the iron ore may be directly reduced by having the oxygen removed from ferrous oxide by means of reducing gases. This process is called direct reduction and produces DRI/HBI.

Introduction to DRI/HBI and its main uses

DRI is a premium iron metallic product made from iron ore. It is used for steelmaking with 62.1 million tonnes produced worldwide in 2009, according to Midrex Technologies Inc. (the leading technology providers for DRI plants, and publisher of statistics on DRI/HBI markets). HBI is a compacted form of DRI designed for ease of transportation and storage.

During direct reduction, oxygen is removed from iron ore in a solid state. This procedure results in a structure with a high porosity. Hot briquetting has become the most reliable process for making DRI denser immediately after reduction. Together with pig iron and ferrous scrap, DRI/HBI makes up the steel raw materials sector called metallics. Products that have already been, or do not need to go, through a blast furnace are turned into steel in a BOF or an EAF.

Hot briquetting of DRI closes internal pores, lowers the accessible surface, increases the density, and improves thermal conductivity — all of which reduce reactivity. Re-oxidation and overheating of HBI are very unlikely, and this results in considerable improvements in storage and transport characteristics. The physical characteristics of HBI are higher density, improved handling, uniform product shape and size, as well as reduced fines production.

The largest component of operating costs for producers of DRI/HBI is iron ore. Midrex plants require DR grade pellet (pellet with a combined silica and alumina content of <3 per cent.), produced from size-graded fines. The majority of large producers depend on imported iron ore from seaborne producers. The second biggest component of costs is natural gas. With the exception of Western India, all of the plants are located in regions where gas is available at a low cost. Labour and electrical power are minor elements of cost. The other main elements, sustaining capital and maintenance, are not strictly correlated to scale due to the modular nature of HBI technology.

DRI/HBI supply and demand

In 2009 the world produced 62.1 million tonnes of DRI/HBI, down 8.7 per cent. from 2008; but an increase of 8.7 per cent. from 2005. DRI/HBI is produced in several countries and regions, the largest in 2009 being India (20.7 million tonnes), followed by the Middle East (15 million tonnes), Venezuela (5.5 million tonnes), North Africa (4.5 million tonnes), Russia (4.5 million tonnes) and Mexico (4.1 million tonnes). Together, these countries/regions accounted for 88 per cent. of global DRI/HBI supply.

Most DRI/HBI is consumed in EAFs; in 2009, 96 per cent. of all DRI/HBI produced was consumed in an EAF. DRI/HBI is consumed mainly where high quality metallics are required, such as steel sheet production. India and Middle East/North Africa are the largest consuming regions, accounting for 70 per cent. of consumption in 2009. Much of this is captive consumption. North America was the second largest consuming region in 2009, at 8.1 per cent. of global consumption, closely followed by South America at 7.7 per cent..

Most international trade in HBI takes place over a limited geographic range. Russian HBI is consumed mainly in other CIS countries, Asia and Europe. Trinidadian HBI is consumed mainly in the Western Hemisphere, especially North America. African HBI is exported to Europe. Asian HBI remains almost entirely within Asia and rarely leaves its country of origin. Only Venezuelan HBI is exported to a wide range of destinations around the world. HBI is traded on a limited basis as the market for the product is small. It is used in some EAF furnaces as a source of iron, but most EAF's use scrap for this as it is more abundant than HBI, and normally if they use DRI/HBI, a vertically integrated unit will be constructed to provide feed.

The following table details the levels of global DRI and HBI production from 2005 through 2009:

Global DRI/HBI production by country or region, 2005 – 2009 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[1] 2005-2009
Europe	0.4	0.6	0.6	0.5	0.4	(5.6)%
CIS	3.3	3.3	3.4	4.6	4.5	7.7%
North America	9.0	8.9	10.9	9.8	5.9	(10.0)%
South America	11.3	11.0	10.0	9.1	6.4	(13.2)%
Africa	6.4	6.6	6.4	5.7	5.9	(2.0)%
Middle East	11.3	11.4	13.1	13.6	15.0	7.4%
PRC	0.5	0.6	0.6	0.6	0.6	6.6%
Rest of Asia (ex. PRC, CIS Middle East)	14.8	17.6	22.4	24.2	23.4	12.0%
Oceania	0.0	0.0	0.0	0.0	0.0	0.0%
Total	57.1	60.0	67.3	68.0	62.1	2.1%

Data: CRU

1 CAGR refers to Compound Annual Growth Rate

ITmk3 iron nuggets

ITmk3 is a technology developed by Steel Dynamics of the U.S. and Kobe Steel of Japan (Kobe Steel holds the trademark) to process iron ore concentrates at 60-65 per cent. Fe to iron nuggets with an Fe content of between 96 per cent. and 97 per cent.. According to Steel Dynamics, the process is designed to produce an alternative to HBI and pig iron (solidified hot metal) for EAFs.

There is currently only one plant utilising ITmk3 technology in operation at Hoyt Lakes in Minnesota, owned by Steel Dynamics. The iron nuggets are produced by rotary hearth furnace iron making technology using iron ore and coal to produce the finished product. The iron ore and coal are mixed and made into pellets before being charged into the furnace. As the hearth rotates, the iron ore pellets melt and form pebble sized nuggets of iron. This creates a pig iron product without the need for a hot metal stage.

Kobe Steel and Steel Dynamics state that the product can be used in a conventional EAF or BOF as a replacement for high quality metallics (pig iron and HBI).

ITmk3 iron nuggets are not currently sold on the open market and have no price series; the Steel Dynamics plant is vertically integrated with an EAF. Therefore, indicative pricing can only be determined by analysis of similar products (in this case pig iron, DRI and scrap). The following table shows the specification of each product:

Metallic iron product specifications

	ITmk3® iron nuggets	Standardised pig iron	Standardised HBI
Iron	96.0%-97.0%	96%	90.0%-94.0%
Carbon	2.5%-3.0%	3.5%-4.5%	0.5%-2.5%
Sulphur	0.05%-0.07%	0.05% max	0.001%-0.03%
Sizing	5 mm - 25 mm	8 kg - 10 kg ingot	110 mm x 50 mm x 30 mm
Source	Steel Dynamics	Stenametall	Midrex®

Data: as stated above, collated by CRU

The chemical composition and sizing parameters stated in the table above indicate the product would have a similar value to pig iron in the market. It has similar iron content, but a lower carbon content (carbon is required to turn molten iron into molten steel) and similar sulphur content. In certain applications, its sizing will be a benefit as the product has a larger surface area for heat transfer; however metallics are also used for cooling in a BOF so its sizing may be a disadvantage as well. A pig iron price series from 2005 until 2009 is presented below:

Pig iron prices 2005 – 2009 (nominal US$/t)

	2005	2006	2007	2008	2009	CAGR[1] 2005-2009
Pohang (South Korea)	287.6	318.8	407.7	641.3	325.4	3.1%
New Orleans (U.S.)	275.5	304.9	370.1	601.9	313.5	3.3%
Brazil	249.2	277.2	333.6	558.4	286.5	3.5%

Data: CRU
1 CAGR refers to Compound Annual Growth Rate

The steel market

As one of the most adaptable and cost-effective bulk materials, steel is widely used in infrastructure development, construction, and manufacturing industries such as automotive, shipbuilding, railway, machinery and domestic appliances. The global finished steel consumption volume has been increasing steadily, expanding to 1.2 billion tonnes in 2009 according to CRU finished steel figures, and has been largely driven by economic and industrial growth in the PRC.

The steel industry is affected by a combination of factors, including periods of economic growth or recession and the associated changes in global and regional levels of industrial production, worldwide production capacity and the existence of, and fluctuations in, steel imports and protective trade measures. Steel prices tend to respond to supply and demand and fluctuate in response to general and industry-specific economic conditions.

Steel products can be divided into two categories: long products and flat products.

Long products are so called because they come off the mill as long bars of steel. These products come in a vast range of shapes and sizes. They can have cross-sections shaped like an H or I (joists, beams and columns), a U (channel) or a T. These types of steel section are primarily used in the construction industry. Some long products are in the form of bars and have cross-sections the shape of squares, rectangles, circles, hexagons and angles. Other types of long products include railway rails, piling and reinforcing bars for concrete.

Flat products are so called because they come in flat shapes (sheets or plates). These products are typically made by rolling steel through sets of rollers to produce the final thickness. Flat products include plates, hot-rolled strips and sheets, and cold-rolled strip and sheets. These products come with a great variety of thickness and surface conditions. Hot-rolled sheets are one of the most widely used steel products and many other downstream products are made from it. Hot-rolled sheets are also the substrate material for cold-rolled sheet, galvanised steel, silicon steel and other products. Flat products have applications in construction, transportation, pipe manufacture and domestic appliances.

The following table sets forth actual and estimated crude steel production data by region for 2005 through 2015:

Crude steel production by country or region, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
PRC	349.4	419.1	489.3	500.3	567.8	12.9%
Rest of Asia (ex. PRC, CIS Middle East)	234.8	252.9	267.5	270.7	230.2	(0.5)%
Europe	219.8	234.3	239.5	229.4	168.0	(6.5)%
CIS	113.8	120.5	124.7	114.9	98.1	(3.6)%
North America	127.6	131.7	132.7	124.5	82.5	(10.3)%
South America	45.3	45.3	48.2	47.4	37.8	(4.4)%
Middle East	15.2	15.4	16.5	16.6	17.3	3.4%
Africa	18.0	18.8	18.7	17.1	15.2	(4.1)%
Oceania[3]	8.6	8.7	8.8	8.4	6.0	(8.7)%
Total	1,132.6	1,246.6	1,345.9	1,329.4	1,223.0	1.9%

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
PRC	636.0	696.4	745.1	793.6	837.2	854.8	6.1%
Rest of Asia (ex. PRC, CIS Middle East)	265.7	282.1	304.3	318.2	331.4	345.4	5.4%
Europe	190.4	202.7	212.1	221.2	227.6	231.8	4.0%
CIS	106.3	116.0	123.9	128.0	132.1	134.3	4.8%
North America	104.8	116.3	125.8	131.6	134.8	137.2	5.5%
South America	44.4	50.5	54.2	57.4	60.1	61.9	6.9%
Middle East	20.3	23.1	26.2	28.7	31.2	32.9	10.1%
Africa	17.6	19.7	21.4	23.0	24.0	25.2	7.5%
Oceania[3]	8.0	8.3	8.7	9.1	9.5	9.6	3.6%
Total	1,393.4	1,515.0	1,621.7	1,710.7	1,787.8	1,833.0	5.6%

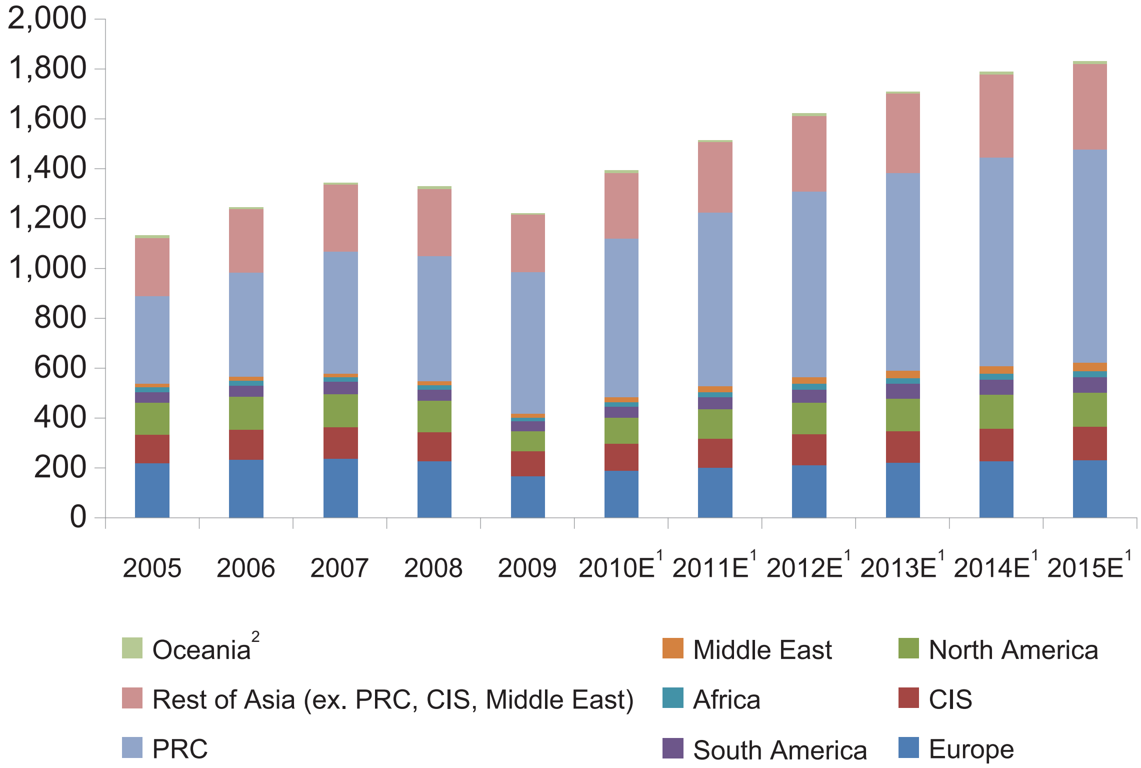
Data: CRU

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

3 Oceania consists of Australia, New Zealand and the Pacific Island nations.

Actual and estimated crude steel production by country or region, 2005 – 2015 (million tonnes)



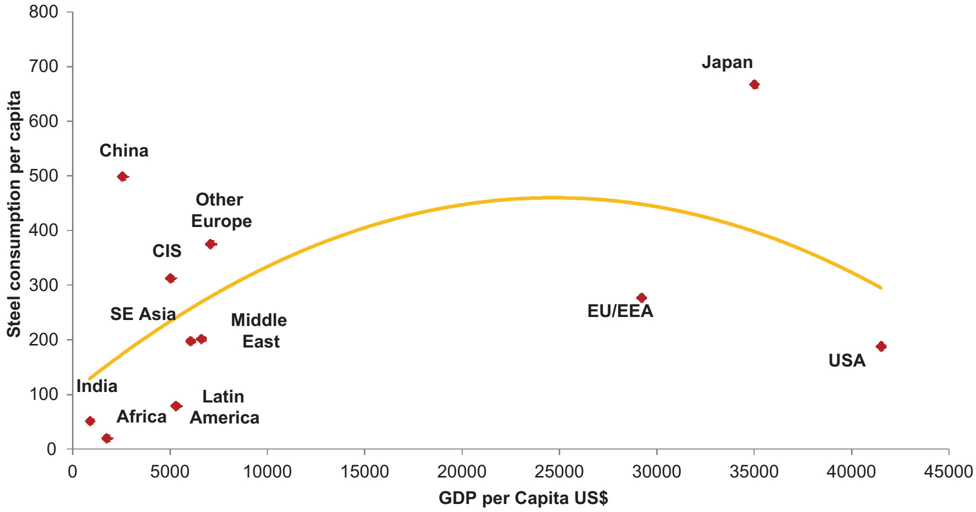
Source: CRU

1 "E" means that the figures for this year are estimated.

2 Oceania consists of Australia, New Zealand and the Pacific Island nations.

Steel consumption by country can be compared using a crude steel s-curve to show a country's GDP per capita against steel consumption per capita. What can be seen in the s-curve is that when a range of economies at different stages of development are considered as a group, there is a clear trend of increasing steel consumption per capita as GDP per capita increases. If this trend is maintained for developing countries, such as India, it implies that there is significant potential for future demand growth.

Crude steel s-curve 2009



On a global level, the steel industry is fragmented compared with other commodity industries. In 2008, the top 10 steel firms worldwide accounted for roughly 28 per cent. of total crude steel production. This is in contrast to the seaborne iron ore trade, where at least 60 per cent. of total iron ore was accounted for by the leading three producers. (Note: only seaborne trade is used in this calculation as the non-seaborne market does not have sufficient transparency for such a statement.)

The top 10 steel producers by size for 2008 are shown below:

Top 10 steel producers by size 2008 (million tonnes)

Company name	Location	Markets served	Production (million tonnes)
ArcelorMittal	International	Global	103.3
Nippon Steel	Japan	Asia/Global	35.7
Baosteel Group	PRC	Asia/Global	35.4
POSCO	South Korea	Asia/Global	34.7
JFE Steel	Japan	Asia/Global	33.3
Hebei Iron and Steel Group	PRC	Asia/Global	33.3
Wuhan Iron and Steel Group	PRC	Asia/Global	27.7
Tata Steel	International	Global	24.4
Jiangsu Shagang Group Ltd.	PRC	Asia/Global	23.3
U.S. Steel	International	North America/Global	23.2
Top Ten Total			374.3
Global Total			1,329.4
Top Ten %			28.2%

Data: CRU

The steel industry operates on a predominantly regional basis for a number of reasons. Firstly, consumption of steel is often seen as an integral part of a nation's economic development, and its production is often regarded as strategic. This can lead to developing economies each building up their own domestic industry. Secondly, freight costs are typically high in relation to the product's value, reducing its competitiveness the further it travels. Finally, potential trade routes for steel can be blocked by import quotas, anti-dumping duties and countervailing duty orders.

The merger of two leading participants in the steel industry midway through 2006, namely Arcelor and Mittal Steel, led to the formation of the first steel company with an annual production in excess of 100 million tonnes. However, while high profile integrations like this have increased industry concentration levels in certain regional markets, especially in the European Union and the United States, the rapid growth of small and medium-sized steel producers in the PRC, and to a lesser extent in some other emerging markets, has continued to keep these markets fragmented.

The following table sets forth actual and estimated finished steel consumption data by country or region for 2005 through 2015:

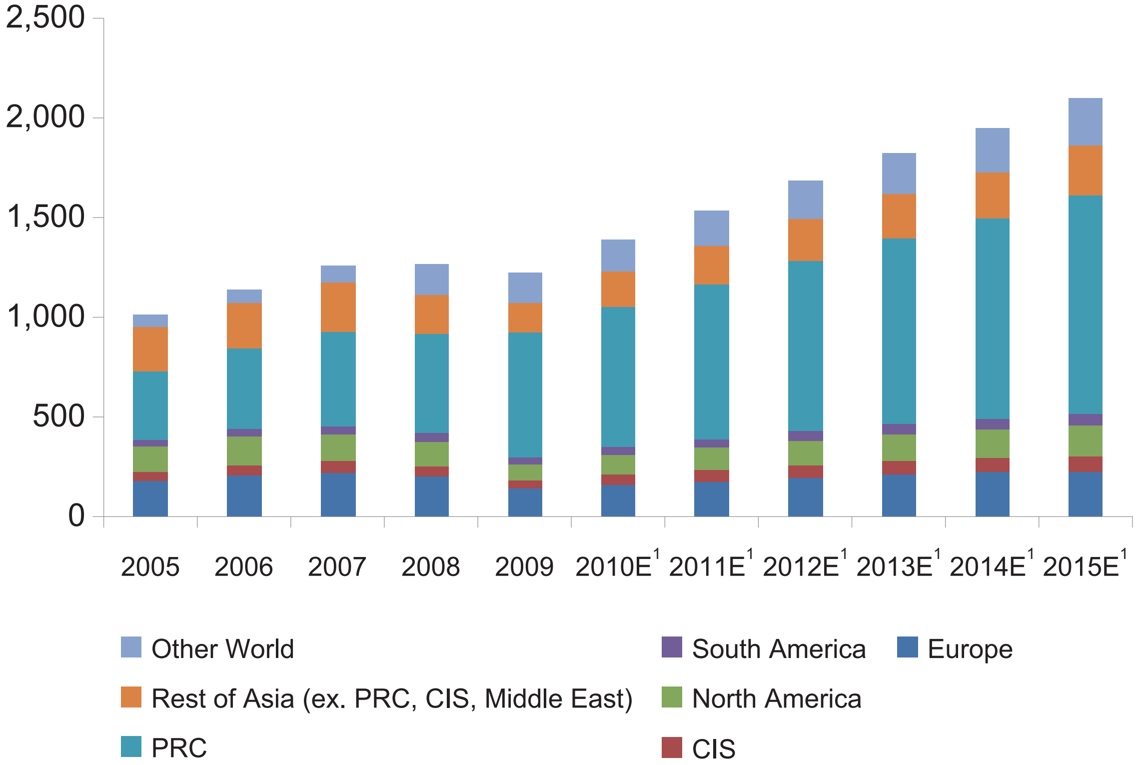
Finished steel consumption by country or region, 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
						(%)
PRC	342.5	402.4	475.0	496.1	623.9	16.2
Rest of Asia (ex. PRC, CIS Middle East)	223.6	229.2	246.6	193.5	147.8	(9.8)
Europe	180.7	208.9	222.4	201.1	142.1	(5.8)
CIS	42.6	48.5	57.7	52.5	41.5	(0.7)
North America	130.2	146.0	133.6	123.3	80.4	(11.4)
South America	32.3	36.2	39.1	44.1	33.9	1.2
Other World	62.4	65.6	82.0	155.1	150.4	24.6
Total	1,014.2	1,136.9	1,256.4	1,265.8	1,220.0	4.7

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
							(%)
PRC	702.6	775.0	852.9	929.8	1,000.8	1,093.3	9.2
Rest of Asia (ex. PRC, CIS Middle East)	174.9	192.0	207.7	220.7	231.5	248.3	7.3
Europe	160.8	177.9	195.6	210.8	223.5	223.6	6.8
CIS	49.9	55.8	62.2	67.7	72.1	79.0	9.6
North America	99.3	112.6	124.6	133.9	141.8	155.0	9.3
South America	39.2	43.2	47.3	51.1	54.5	59.1	8.5
Other World	161.4	176.1	191.7	206.2	219.3	236.8	8.0
Total	1,388.1	1,532.5	1,681.9	1,820.3	1,943.4	2,095.2	8.6

Data: CRU
1 "E" means that the figures for this year are estimated.
2 "CAGR" refers to Compound Annual Growth Rate.

Actual and estimated finished steel consumption by country or region, 2005 – 2015 (million tonnes)



Source: CRU

1 "E" means that figures for this year are estimated

Steel in the Russian Far East and north-east region of the PRC

The only significant steel producer in the Russian Far East is the Amurmetall Group, which is located in Khabarovsk, approximately 400 km from the PRC border, and is run by LLC Siberian-Amur Steel. 96.8 per cent. of the Amurmetall Group is controlled by six firms owned by Alexander Shishkin. The group's main asset is the OJSC Amurmetall steel facility in Komsomolsk-na-Khabarovsk. Steel is produced by an EAF, meaning that the plant's main feedstock is scrap metal, rather than iron ore. It should be noted that the Amurmetall Group filed for bankruptcy in May 2009 and, as at March 2010, was awaiting a stimulus package from the Russian State bank.

In Heilongjiang province, located in the north-east region of the PRC, crude steel production has grown by 5.32 per cent. per year since 2005, despite the economic downturn. This, however, accounts for just 1 per cent. of the PRC's total production of approximately 5.7 million tonnes in 2009. The volume of steel production in neighbouring Jilin province is slightly higher, and represents 1.4 per cent. of the PRC's output.

Crude steel production in the north-east region of the PRC, 2005 – 2009 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[1]
			(million tonnes)			*(%)*
Heilongjiang	4.6	5.34	6.04	4.75	5.66	5.3
Share of total PRC	*1.32%*	*1.27%*	*1.23%*	*0.95%*	*1.00%*	
Jilin	2.46	3.15	4.25	6.42	7.93	34.0
Share of total PRC	*0.70%*	*0.75%*	*0.87%*	*1.28%*	*1.40%*	
Liaoning	31.71	37.98	41.40	40.56	40.56	6.3
Share of total PRC	*9.08%*	*9.06%*	*8.46%*	*8.11%*	*7.14%*	
Total PRC	349.4	419.1	489.3	500.3	567.8	12.9

Source: CISA

1 "CAGR" refers to Compound Annual Growth Rate

Angang Iron and Steel Group, located in Liaoning Province, is one of the largest steel producers in the PRC, producing 16 million tonnes of steel in 2008. The company sells finished steel both internally and also in export markets. The Angang Mining Company, a subsidiary, is also by far the largest iron ore mining company in the PRC.

Xilin Iron and Steel Group ("Xilin") is Heilongjiang Province's largest steel company, and is located about 500km from the Province's capital, Harbin. The group was formed in 2001 via a complex restructuring process, and operates on the site of the former Yichun City Xilin Iron and Steel Factory. Xilin's finished steel output reached 2.6 million tonnes in 2009, up from 2.0 million tonnes in 2008.

Jianlong, with whom the Group has a joint venture, is a subsidiary of the PRC's second largest private steel company, Jianlong Iron and Steel Group. It was formed in 2003, and is located in Shuangyashan. It is reported to be developing plans that will increase its crude steel capacity to 2.0 million tonnes per year. Further information on the Group's joint venture with Jianlong is set out in the sub-section headed "Joint ventures" of the section headed "Business" in this prospectus.

The table below shows the CRU estimated iron ore requirement for four provinces in the north-east region of the PRC assuming a 33 per cent. Fe grade for domestic production and a 65 per cent. grade for imported material:

Iron ore requirements in Northeast PRC 2009 (million tonnes)

	Crude Steel Production	Estimated Iron required in crude steel production	Iron Ore Production	Iron produced @ 33% Fe	Iron unit balance	Iron ore required @65% Fe
Heilongjiang	5.7	5.6	0.8	0.3	(5.3)	8.2
Jilin	7.9	7.9	10.1	3.3	(4.5)	7.0
Liaoning	47.8	47.4	130.8	43.2	(4.2)	6.4

Source: CRU

Steel in Japan, South Korea and the Rest of Asia (excl. the PRC, CIS, Middle East)

The table below shows actual and estimated crude steel production in Japan, South Korea and the Rest of Asia (excl. the PRC, CIS, Middle East) from 2005 until 2015:

Crude steel production in Japan, South Korea and the Rest of Asia (excl. the PRC, CIS, Middle East), 2005 – 2015 (million tonnes)

	2005	2006	2007	2008	2009	CAGR[2] 2005-2009
Total	**250.0**	**268.3**	**284.0**	**287.4**	**247.5**	**(0.3)%**
Japan	112.5	116.2	120.2	118.7	87.5	(6.1)%
South Korea	47.8	48.5	51.5	53.6	48.6	0.4%
Rest of Asia (ex.the PRC, CIS, Middle East)	89.7	103.6	112.3	115.0	111.3	5.5%

	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]	CAGR[2] 2010-2015
Production total	**286.0**	**305.2**	**330.5**	**346.9**	**362.5**	**378.3**	**5.8%**
Japan	104.2	108.3	118.1	120.4	121.0	121.2	3.1%
South Korea	55.4	59.6	62.5	64.4	66.3	68.5	4.3%
Rest of Asia (ex.the PRC, CIS, Middle East)	126.4	137.3	149.9	162.0	175.1	188.6	8.3%

Data: CRU Iron Ore Market Service March 2010

1 "E" means that the figures for this year are estimated.

2 "CAGR" refers to Compound Annual Growth Rate.

PRICES AND COSTS

Iron ore pricing mechanism

- **c/dmtu:** Iron ore is priced in cents per Dry Metric Tonne Unit (c/dmtu). Effectively, this is the same as US$ per tonne of contained iron, divided by 100. This method accounts for different iron concentrations and free moisture contents, in the ore produced from different mines.

  Example: to change a price in c/dmtu into $/tonne of wet ore, first multiply the price in c/dmtu by the iron content of the ore (as a percentage), and divide by one plus the moisture content. So, if an ore with an Fe content of 70 per cent. and a free moisture content of 10 per cent. were valued at 100c/dmtu, then the equivalent price in $/tonne of (wet) ore would be:

  $$\frac{100\text{ c/dmtu x }70\%}{(1 + 10)\%} = \$63.64\text{/tonne}$$

  Conversely, to convert a price in $/tonne into c/dmtu, using the same parameters given above — the following calculation would be made:

  $$\frac{\$63.64\text{/tonne x }(1 + 10)\%}{70\%} = 100\text{ c/dmtu}$$

- **Benchmark prices:** Prices were historically set on an annual basis, after several months of negotiations between the three major iron ore producers, and major steel customers. Brazilian (Vale) iron ore is represented by the Itabira fines and Tubarao pellet benchmarks, and Australian (BHP Billiton and Rio Tinto) iron ore by Hamersley lump and fines.

- **Quarterly pricing:** In the last year, there has been a shift towards quarterly pricing. In addition, a spot market has developed, based on exports of Indian ore to the PRC, with daily quotations. CRU expects this trend to continue with the end result being an established quarterly pricing mechanism linked formally or informally to spot prices.

- **Netback value:** Iron ore producers, other than Vale, BHP Billiton and Rio Tinto, have little control over pricing. Consequently, their prices are set using "benchmark prices" and adjusting for "value-in-use" and freight costs. This calculation is called a netback.

- **Value-in-use ("VIU"):** This is a term used to describe the adjustments made to benchmark prices to account for differences in chemistry between a particular product and the relevant benchmark product against which it is being priced. Different ore chemistries may lead to differing costs at the steel mill. For example, an ore with higher levels of silica and/or alumina may incur a larger coke consumption cost and slag formation in the blast furnace, and this additional cost may be accounted for in the form of a discount from the benchmark price.

- **Titanomagnetite Ores:** This type of ore can only be used by specially adapted furnaces. The ore produces large amounts of viscous slag, requiring frequent tapping of the furnace. This and other factors contribute to a processing cost at the iron production stage of approximately 50 per cent. more than conventional iron ores. To recover the additional operating cost the slag is processed, either by the furnace operator or by a third party, in order to recover either titanium or vanadium (only one product is recovered). Due to the need for dedicated furnaces and the relatively small size of the market, in comparison to other types of iron ore, titanomagnetite ore and products are typically sold on by way of an off-take agreement where price will be determined in individual negotiations. Due to the inherent trade-off between added production cost and saleability of by-products there is no published benchmark for titanomagnetite prices that CRU is aware of. Titanomagnetite ore is included in CRU's analysis of iron ore consumption and production.

Benchmark prices

Iron ore prices increased strongly between 2005 and 2008; the Hamersley fines price (given by Rio Tinto for their Australian ore sales), for example, exhibited a 134 per cent. increase. Historically the price of iron ore has been set at four benchmark locations on an annual basis, usually in April. Since the advent of the spot market, spot prices tend to dictate the level of the benchmark settlement. The increase was driven by increased demand from the PRC following a period of underinvestment in iron ore mining due to prolonged low prices. This led to a very tight market and enabled iron ore miners to push through larger price increases each year.

Iron ore prices collapsed after the global financial crisis in 2008 as a result of depressed steel demand caused by the reduction in spending and fixed asset investment worldwide. This reduction led to a drop in iron ore prices; the price of Hamersley fines dropped by 33 per cent., whilst lump and pellet dropped by 44 per cent. and 48 per cent. respectively. The reason for the larger drop in lump and pellet prices is that these are premium products purchased over and above the sinter fines base load in a steel mill.

As the global economy recovered in late 2009 and 2010, the spot price for iron ore increased and as spot prices are an indicator of the quarterly contract price, this led to an increase of around 90 per cent. in the benchmark contract price for the April-June quarter of 2010. CRU expects that the spot price will continue to lead the quarterly contract price throughout 2010 and into the first half of 2011, at which point prices should reach an equilibrium level.

The table below presents CRU's iron ore price series from 2005 until 2009:

Benchmark iron ore prices, 2005 – 2009 (Nominal c/dmtu)

	Year end 31 March					April-June 2010	July-September 2010
	2005	2006	2007	2008	2009		
				(c/dmtu)			
Hamersley Fines	61.7	73.4	80.4	144.7	97.0	192.2	216.2
Hamersley Lump	78.8	93.7	102.6	201.7	112.0	n/a	n/a
Itabira Fines	62.5	74.4	81.5	134.4	96.5	170.4	198.1
Vale Pellets	115.5	112.0	118.0	220.2	113.8	n/a	n/a

Data: CRU

Valuing different iron ores

Iron ore prices are determined to a large extent by the seaborne market. For the purposes of determining what price should be paid for a particular ore, a standard methodology is used by both miners and steel mills. In calculating prices through this method, three main factors should be taken into account:

- Freight costs
- Iron content and mineralogy
- Chemical impurities

The central premise of this methodology is that an ore with the same chemical composition will be worth the same amount, on a delivered basis, to the same location. However, two iron ores will rarely, if ever, have the same chemical composition, or come from the same point of origin.

Therefore, to determine the fair free-on-board ("FOB") price of an ore, the difference in freight cost and difference in ore value must be accounted for. When examining this, international conventions of pricing ore in cents per dry metric tonne unit (c/dmtu) are used. The calculation used to obtain an FOB price in this instance is given below.

Benchmark price (Hamersley Fines sales to the PRC)

+ Freight cost to deliver ore to the customer from the benchmark mine or location

+ / - Iron content and chemical impurities, known as "value in use", as this will affect how much the ore is worth to the customer

- Freight from the delivery location to the seller's shipping or rail point

= The free-on-board price for the ore.

In the case of the Group, the seller's shipping point is understood to be the Russian border with the PRC.

This methodology can be applied to any ore type from any location. Normally freight is the largest consideration when calculating relative ore prices; since iron ore is a low value high volume bulk product, the cost of shipping the product can often be more than the price of the product itself.

In the case of the Group, it is highly likely that the lower freight cost to a steel mill in the PRC, in comparison to the freight cost of ore from Hamersley in Western Australia, will result in a freight differential/premium being paid by the steel mill to the Group.

Value in use

The algorithm calculates the value in use differences between a specific ore and the benchmark ore. The benchmark ore varies depending on product form and location as follows:

- in the Far East, Hamersley lump and fines, Hebei concentrates, Vale pellets and MBR pellet feed;
- in Europe, Kumba lump, Itabira (SSF) fines and Vale Pellets; and
- in North America, IOC pellets.

The algorithm makes adjustments for productivity, carbon purchases, flux purchases, dephosphorisation costs and, in the case of pellet feed, energy costs.

The productivity adjustment is based on the notion that a blast furnace is volume constrained. Thus we calculate the extent to which the iron content of the burden of specific ore differs from the iron content of the burden of benchmark ore.

The energy adjustment for pellet fines is made by comparing the magnetite content of the ore being valued with the magnetite content of the benchmark ore. The difference is then valued by assuming that an additional 0.61 GJ of thermal energy is required for every tonne of pure haematite as compared with pure magnetite.

IRON ORE LOGISTICS AND TRANSPORTATION

Infrastructure review: the PRC and Russian Far East

Almost all rail operations in the PRC are handled by the Ministry of Railways. At the end of 2009, the PRC's rail network spanned approximately 86,000 km of track. This network handles around 33,000 freight train movements per day. Considering a typical freight train would be around 500 meters in length and a bulk freight train (such as those transporting iron ore) longer still, this indicates that the rail network could require expansion. This conclusion is supported by news reports of congestion along key routes.

The PRC's rail network links to the Russian network at Zabaikalsk/Manzhouli and Grodekovo/Suifenhe; these connections have existed since the construction of the Trans-Siberian Railway in the early 1900's. In November 2008, the transport ministries of Russia and the PRC signed an agreement to construct another link, to be built across the Amur/Heilongjiang River that will connect an area near Tongjiang city in the PRC with Nizhneleninskoye in Russia. This link is in the same area as the Group's operations.

In October 2008, the Chinese State Council approved a US$300 billion expansion plan for the national railway network, which will be completed in 2020 when the country expects to have 120,000 km of track in operation, an increase of 34,000 km. A primary motivation for this is believed to be the increase in freight traffic and the resulting congestion of the country's rail network.

Russia and the ex-USSR states have a different rail gauge to the rest of the world, therefore when a train crosses the border it must either unload, or switch bogeys (the part of a rail carriage that the wheels are attached to). The cost of this operation is dependent upon the facilities available at the rail terminus and the preference of the parties involved.

Transport cost review: seaborne supply to North East PRC

Iron ore is a low value high volume commodity; hence the freight cost makes up a large component of the price on a delivered basis. The customer of an iron ore mine, in this case a steel mill, will in theory pay the same price for the same specification of ore delivered to its plant. If an iron ore mine is closer to the customer, freight costs should be lower (assuming similar methods of transportation are used), hence the mine gate price for the ore will be higher. The amount should be consistent with the difference in the freight cost. This is important as the steel mill purchasing the ore has to pay for the freight, therefore a price premium can be obtained for material that is closer to the mill.

An analysis of the seaborne and inland freight costs which will impact the Group are given below:

Actual and estimated seaborne and PRC internal freight costs (c/dmtu)

	Unit	2008	2009	2010E[1]	2011E[1]	2012E[1]	2013E[1]	2014E[1]	2015E[1]
Freight Hamersley to North East PRC — Distance modelled, 7,491 Km									
Ocean freight (Australia-NE PRC)	c/dmtu	45.6	18.1	19.9	17.3	17.7	18.2	18.4	18.0
Rail freight 750 km (Port-Inland PRC)	c/dmtu	21.2	20.5	23.2	25.7	28.8	32.0	35.5	38.7
Total	c/dmtu	66.8	38.6	43.2	43.0	46.5	50.2	53.9	56.7
Freight Brazil to North East PRC — Distance modelled, 22,065 Km									
Ocean freight (Brazil-NE PRC)	c/dmtu	103.7	39.9	43.2	37.6	38.8	40.0	40.5	39.3
Rail freight 750 km (Port-Inland PRC)	c/dmtu	20.6	19.9	22.6	24.9	28.0	31.1	34.5	37.6
Total	c/dmtu	124.3	59.8	65.8	62.5	66.8	71.0	75.0	76.9
Freight India to North East PRC — Distance modelled, 9,019 Km									
Ocean freight (India-NE PRC)	c/dmtu	66.6	32.3	41.7	34.9	35.0	35.8	36.4	35.1
Rail freight 750 km (Port-Inland PRC)	c/dmtu	21.2	18.4	21.0	21.8	23.3	24.6	26.1	26.4
Total	c/dmtu	87.8	50.8	62.7	56.6	58.2	60.4	62.5	61.5
Freight South Africa to North East PRC — Distance modelled, 14,529 Km									
Ocean freight (South Africa-NE PRC)	c/dmtu	79.4	27.5	27.5	23.1	24.7	25.8	26.3	25.8
Rail freight 750 km (Port-Inland PRC)	c/dmtu	20.4	19.7	22.3	24.7	27.7	30.7	34.1	37.2
Total	c/dmtu	99.8	47.2	49.8	47.7	52.3	56.6	60.4	63.1
IRC to North East PRC — Distance modelled, 400 Km									
Rail freight border to Inland PRC (400km)	c/dmtu	13.2	12.8	14.4	16.0	17.9	19.9	22.1	24.1
Total	c/dmtu	13.2	12.8	14.4	16.0	17.9	19.9	22.1	24.1
Difference (IRC — Hamersley)	c/dmtu	(53.6)	(25.9)	(28.7)	(27.0)	(28.6)	(30.3)	(31.8)	(32.6)
Difference (IRC — Brazil)	c/dmtu	(111.1)	(47.0)	(51.3)	(46.6)	(48.9)	(51.2)	(52.9)	(52.9)

Source: CRU

1 "E" means that the figures for this year are estimated

Benchmarking: K&S vs. seaborne concentrate projects

The table below shows a sample of Australian, Brazilian and African projects and existing mines in comparison to the Group's K&S project. The table indicates, where publicly available, the projects' and mines' reserves, resources, product grade, estimated full production capacity, capital expenditure and major infrastructure requirements.

Selected Iron Ore Projects

Project	Resources *(Measured + Indicated + Inferred)*	Product Iron Grade	Stated Prod. At full cap.	Infrastructure required	Estimated Capex (US$m)	Estimated Capex/ tonne	Majority owner
K & S and Garinskoye	1,117 mt[1]	65.80%	8.3 mt	Rail bridge (to the PRC)	$753	$90.72	IRC
Australia							
Cape Lambert	1,915 mt	65.00%	15 mt	Port + rail	$2,660	$177.30	MCC
Sino Iron	4,504 mt	Unknown	27.6 mt	Port + pipeline	$3,710	$134.90	Citic
Karara	1,854 mt	68.30%	8-12 mt	Port + rail	$1769	$147.42	Gindalbie/ Ansteel
Southdown	654 mt	67.70%	6.6 mt	Port + pipeline	$1,600	$242.40	Grange
Ridley	2,010 mt	68.30%	15 mt	Port + pipeline	$2,100	$140.00	Atlas Iron
Brazil							
Pedra de ferro	~2,400 mt[2]	67.00%	19.5 mt	Port	$1,850	94.87	Bamin
Minas Rio	4,996 mt	69.00%	26.5 mt	Port + pipeline	$3,796	$143.25	Anglo/ MMX
Jucurutu	3,800 mt (not JORC)	>65%	3.2 mt	Existing	Unknown	Unknown	MHAG
Viga	4,500 mt	>67%	25 mt	Port + pipeline	~$3,000	120.00	Ferrous
Africa							
Simandou	2,225 mt	65.97%	70 mt	Port + rail	>$6,000	$85.71	Rio Tinto

1 K&S and Garinskoye comprise 195.7Mt *Measured*, 616.8Mt *Indicated* and 304.6Mt *Inferred* Resources. For a description of the categories of JORC-Compliant *Measured, Indicated and Inferred* Mineral Resources, and the level of confidence attributable to each category, please refer to the sub-section headed “Cautionary Note to Investors Concerning Measured, Indicated and Inferred Resources” of the section headed “Classification of Geological Resources and Reserves“ in this prospectus.

2 *Inferred* only

Data: CRU, company websites, publicly available information

Using CRU’s Iron Ore Cost Model 2010, CRU has benchmarked estimated aggregated costs for delivering iron ore fines and pellet feed to Heilongjiang Province, PRC in 2018. The benchmarking analysis below shows the estimated cost of iron ore from the Group’s operations at K&S and Garinskoye on a delivered basis compared to the estimated delivered cost of iron ore from new and existing mines in Brazil, Australia, West Africa and the PRC.

Rather than modelling a delivered cost to a specific steel mill, CRU has modelled delivered costs to a central location in the steelmaking region of Heilongjiang Province, PRC. Indicative rail freight journeys to a central location within Heilongjiang Province are from the Khabarovsk Bridge border between Russia and the PRC (in the case of iron ore from the Group’s operations at Kimkan and Garinskoye), and from Dalian port in Liaoning Province, PRC (in the case of seaborne iron ore from Brazil, Australia and West Africa). The respective distances are 400km from the Khabarovsk Bridge and 750km from Dalian port to the central location in Heilongjiang Province.

The attention of investors is drawn to Appendix X — “Overview of Cost Benchmarking Conducted by CRU” to this prospectus which contains an explanation of the benchmarking analysis and the methodology and assumptions adopted by CRU to prepare the benchmarking analysis.

Benchmarking 2018 delivered costs to Heilongjiang Province (c/dmtu)

	Estimated Site Costs to Delivery Point	Estimated Ocean Freight Cost	Estimated Delivered Liaoning Cost	Estimated PRC Rail Freight Cost	Estimated Delivered Heilongjiang Cost
Kimkan and Garinskoye Average (aggregate assumed production of 8.3 mtpa given by the Group)					
Concentrate	**83.72**			**31.60**	**115.32**
Brazil Existing Mines Average (operational as of 2009)					
Fines (DSO)	28.65	58.63	87.28	49.30	136.58
Pellet feed	28.32	51.94	80.26	49.30	129.56
Brazil New Mines Average (due to begin operation post-2009)					
Fines (DSO)	N/A	N/A	N/A	N/A	N/A
Pellet feed	62.30	47.86	110.16	49.30	159.46
Australia Existing Mines Average (operational as of 2009)					
Fines (DSO)	36.17	27.20	63.37	50.80	114.17
Pellet feed	N/A	N/A	N/A	N/A	N/A
Australia New Mines Average (due to begin operation post-2009)					
Fines (DSO)	41.39	33.31	74.70	50.80	125.50
Pellet feed	61.08	30.90	91.98	50.80	142.78
West Africa New Mines Average (due to begin operation post-2009)					
Fines (DSO)	47.23	66.75	113.98	49.30	163.28
Pellet feed	N/A	N/A	N/A	N/A	N/A
Estimated PRC National Weighted Average					
Fines	166.39				
Estimated PRC Weighted Average Delivered Cost					168.64
Pellet feed	N/A	N/A	N/A	N/A	N/A

Notes: CRU's Iron Ore Cost Model 2010 has been used to estimate delivered iron ore costs to Heilongjiang Province, PRC in 2018. Costs listed above represent an aggregate of all existing and forecast mines and projects contained within the Cost Model. Ocean freight figures are produced using time charter rate forecasts and in this respect it should be noted that companies may have a contract of affreightment or own ships which could affect ocean freight costs. Costs are CRU estimates which are based on information provided by individual companies as well as CRU's in-house economic assumptions and thus may not reconcile exactly to numbers published by individual companies. Please refer to Appendix X — "Overview of Cost Benchmarking Conducted by CRU" to this prospectus for further details.

Data: CRU

INTRODUCTION TO ILMENITE

Ilmenite is one of five titanium mineral concentrate products; the other four are leucoxene, rutile, synthetic rutile and titanoferrous slag. Primary mining is normally accomplished by either dredging or open pit mining of mineral sand deposits. Titanoferrous slag originates from steel blast furnaces which process titanomagnetite ores and can be used to produce ilmenite. Ilmenite as a product is a titanium mineral which will be present in various geological formations in various concentrations.

Synthetic rutile is a secondary product produced from ilmenite. There are many technologies and process routes but nearly all rely upon the selective leaching or thermal reduction of the impurities in the ilmenite ore.

Ilmenite in pigments

According to the USGS "Minerals Yearbook 2008", 95 per cent. of titanium mineral concentrates are used to produce titanium oxide pigments. Titanium oxide pigment is produced by two processes:

- **Chloride process:** rutile is converted to titanium chloride by chlorination in the presence of petroleum coke. This is then oxidised and calcined to remove any chlorine or hydrochloric acid formed during the initial processing. Aluminium chloride is then added to ensure that almost all the titanium is in the form of pure rutile crystals.

- **Sulphate process:** ilmenite or titanium slag is mixed with sulphuric acid; precipitation of titanium hydroxide is then accomplished. The resulting product is calcined to remove impurities. This produces anatase crystals.

The finished product of both processes is then milled and coated to produce a product with consistent sizing and handling characteristics.

Rutile pigments are less reactive when exposed to sunlight, a key consideration in the outdoor paint market. Anatase is softer and more sensitive to light so is used primarily in indoor paints and paper manufacture.

According to the USGS "Minerals Yearbook 2008" titanium pigments (in the U.S.) are mostly used in the paint industry (59.2 per cent.), plastics and rubber (24.5 per cent.) and paper (10.1 per cent.). Other uses are ceramics, fabrics, flooring, ink and roof granules.

Pigments will continue to dominate the market for the foreseeable future. Demand for pigments is broadly expected to track total GDP growth on a country by country basis, as the pigments are used as coating or colourant in a range of applications, from children's toys to car paint.

Ilmenite in titanium metal

Production of titanium metal requires the chlorination of titanium-containing concentrates, to produce titanium tetrachloride. Titanium tetrachloride is then reduced with magnesium and sodium to form pure titanium metal. The metal formed by this process has a porous appearance and is referred to as sponge.

Ingots and slabs of titanium are produced by melting sponge or titanium scrap, and alloying the resultant molten metal with various elements; commonly vanadium and aluminium. The commercial methods used to accomplish this are called, electron beam ("EB"), plasma arc melt ("PAM") and vacuum arc re-melting ("VAR"). The slab can then be processed into various sizes and shapes for consumption by the end user.

The alloys produced are utilised in applications where their high strength to weight ratio is crucial, for example in aircraft parts, or armoured vehicles.

Titanium metal can also take the form of ferro-titanium, produced by introducing titanium scrap into a BOF or EAF. This product is commonly either 40 per cent. or 70 per cent. titanium.

Ilmenite prices and supply

Ilmenite prices are determined by a number of factors including market demand; production costs substitute material prices; distance to consumer and chemical composition/grade of the material. As such prices are determined through buyer-seller negotiation rather than by reference to a benchmark price.

Ilmenite is produced by both mining companies and vertically integrated chemical or paint operations. Integrated production is often not fully reported and it is therefore not possible to unequivocally state the identities and respective market shares of the largest producers in this market.

The table below shows the production of ilmenite concentrates from 2004 until 2008. As there is no data available for ilmenite consumption it is assumed that consumption of ilmenite equals production. The data is sourced from the USGS "Minerals Yearbook 2008" and in the U.S. includes production of all titanium concentrate types.

Ilmenite concentrates production, 2004 – 2008 (thousand tonnes)

	2004	2005	2006	2007	2008
			(thousand tonnes)		
Total production	5,850.0	6,050.0	6,790.0	6,940.0	6,790.0
Australia	1,965.0	2,080.0	2,508.0	2,503.0	2,199.0
PRC	840.0	900.0	1,000.0	1,100.0	1,100.0
Norway	860.0	860.0	650.0	650.0	910.0
India	621.0	686.0	690.0	700.0	720.0
Vietnam	550.0	523.0	605.0	550.0	550.0
Ukraine	370.0	375.0	470.0	500.0	500.0
Mozambique	—	—	—	140.5	328.9
United States	500.0	500.0	500.0	400.0	300.0
Brazil	75.0	75.0	87.0	92.0	90.0
Malaysia	61.5	38.2	45.6	59.3	50.0
Kazkahstan	11.7	10.0	25.0	25.0	25.0
Sierra Leone	—	—	13.8	15.8	17.5
Other/balance	(4.1)	2.8	195.5	204.4	(0.4)

Source: USGS Minerals Yearbook 2008: Titanium

Note: negative numbers are due to other titanium concentrate production included in ilmenite by the USGS to avoid disclosing confidential information.

INTRODUCTION TO VANADIUM

Vanadium demand

Approximately 85-90 per cent. of global vanadium production is consumed in the steel industry. Other uses include vanadium-containing titanium alloys, accounting for 5-10 per cent. of demand, and various chemical and battery applications, which make up around 1-3 per cent. of demand. The proportion of total world vanadium consumption represented by each of these industries has remained largely unchanged over recent years, although cyclical variations in the steel and titanium industries result in small changes from year to year.

The greatest demand for vanadium is as an additive in microalloy steels. Under certain conditions, small amounts of vanadium increases the tensile strength and high-temperature properties of carbon steel. Vanadium also has a grain refining and dispersion hardening effect in tempering steels.

During the steel production process, vanadium is mainly added in the form of ferrovanadium, although some is added as vanadium-nitrogen alloys.

Given the dominance of steelmaking as the main consuming application, there is a strong correlation between the consumption of vanadium and the global production of crude steel. Other uses of vanadium, such as in the production of titanium alloys and chemicals, are minor markets, and their market shares are not expected to increase significantly between the date of the CRU Report and 2015.

Vanadium supply

Vanadium is one of the most widely distributed elements in the Earth's crust, although it is rarely found in sufficient concentration to allow economic extraction. Its average concentration in igneous rock is 0.015 per cent. and approximately 0.012 per cent. in both slate and shale. Recoverable vanadium concentrations are found in vanadium-rich titanomagnetite iron ores, iron sands, phosphorus and uranium ores, crude oil, oil-shale and tar sands.

Vanadium is usually recovered as a co-product of iron or steel production, or as a by-product from the refining and burning of vanadium-containing oils or other industrial processes. Only around 20 per cent. of vanadium is produced as a primary product, but this is expected to increase once new mining operations are commissioned. Demonstrated world resources are therefore not fully indicative of potential world supplies. World resources are typically calculated on the basis of currently exploited sources of vanadium and on this basis, estimates of world resources vary from 27 million tonnes[1], to over 38 million tonnes[2]. All sources are agreed that available resources of vanadium are sufficient to meet global demand at current levels for several hundred years.

Vanadium trade

Vanadium is widely traded in various forms, but most prevalently as vanadium pentoxide (V_2O_5) and ferrovanadium. Vanadium units may be traded several times, in different forms, before being consumed as a final product. It is therefore difficult to avoid some double counting of vanadium units when analysing trade flows. In addition, there are significant inaccuracies in the reporting of trade flows from several countries.

The major trade flows of V_2O_5 are from vanadium producing countries, such as South Africa, the PRC, Russia and the USA, to countries with ferrovanadium conversion facilities, such as the Czech Republic, South Korea and Japan. In some cases, conversion facilities are strategically located in order to avoid trade barriers and anti-dumping duties.

1 South African Minerals Bureau
2 USGS

Major flows of ferrovanadium are between vanadium producing countries and vanadium consuming regions, i.e. regions with large steel industries and limited vanadium resources, such as the USA, or regions with conversion facilities such as Europe.

In recent years the PRC has emerged as a major net exporter of vanadium. The PRC government is attempting to discourage the export of vanadium (and other ferroalloys) to prevent environmentally damaging exploitation of their resources and to conserve energy as the production of ferrovanadium and other ferroalloys is a highly energy-intensive process.