Iron Ore Market Report
for Beowulf Mining Plc.

Raw Materials Group
October 2011

Executive summary

Iron ore is the main raw material used to make steel. 98 % of all iron ore goes into steelmaking by being reduced by coal to make up hot metal (or pig iron) which is subsequently converted into steel. In this report, we assume that world crude steel production, including blast furnace iron production; will continue its high growth mode both in the short run and in the long run. By 2025 we assume that the world will produce some 2160 Mt of steel. China will be the main producer as it progresses towards 700 Mt output during 2011. We do, however, foresee a relative drastic decline in Chinese steel growth (albeit from exceptional numbers) and that by the end of the upcoming decade and a half, China will produce (and consume as we do not foresee China as a major exporter) some 1040 Mt of steel, a steel intensity close to that of South Korea, presently the world's most steel intensive economy. Besides China, India and the rest of the emerging markets on the Pacific Rim will be the drivers of growth in the upcoming decade. The OECD area and other emerging markets will not contribute to growth in any major degree (with Brazil as a possible exception).

The growth of steel demand in Pacific Asia will translate into a solid growth of iron ore demand where we foresee a demand close to 2950 Mt of iron ore in 2025.

In iron ore supply, Australia (primarily Western Australia) and Brazil will be the main supplier for the foreseeable future. China produces today around 320 Mt of iron ore (recalculating it's production to a comparable grade, 63 % Fe) and this will most likely decline in the upcoming years. India is well endowed with iron ore but in an expansion of the Indian steel industry, we foresee the Indian exports declining and most of the ore use domestically.

The iron ore needed will, given that present trends continue, be produced in mines with a 60-40 split between big mines (output above 10 Mt/a, or super big, above 100 Mt/a of output) and medium size mined with an output between 1 and 10 Mt/a and small mines, with an output of less than 1 Mt/a. Accordingly, the Kallak deposit with a possible output around 10 Mt/a will be positioned in the lower part of the large mines with possible economies of scale in output.

Ore traded will increase and the present major actors in the seaborne trade, the "Big 3", i.e. Vale, BHP Billiton and Rio Tinto will see its market share decline but will still maintain their grip of the market.

On the basis of this scenario, we expect prices for fines to be stable or possibly move upwards slightly during the next few years but then decline as more iron ore projects come on stream and more material hit the market. Still, declining grades and output in China, and thus higher cost of producing, coupled with a wage inflation will mean that we foresee long term prices between 110 and 130 USD/t iron (62 %), thus up from previous assessments. With reasonable assumption of premium for higher iron content in the ore (3 to 6 USD/ Fe-unit) and freight cost (40 USD/t), an iron ore product from Beowulf could fetch a FOB price (shipped from Norway) between 88 USD/t to 126 USD/t product.

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Introduction

Beowulf Mining Plc. (Beowulf) has requested a report on the iron ore market with forecasts of iron ore prices. This Iron Ore Market Report is a part of the work Raw Materials Group (RMG) does for Beowulf in updating several studies for Beowulf on its iron ore assets.

In this report we have taken a conservative view but still try to avoid becoming either too pessimistic due to the ongoing economic crises in Europe or to optimistic due to the on-going strong economic development in emerging Asia.

This report is based on the conditions prevailing in August 2011.

The report has been researched and written by Per Storm, Magnus Ericsson and Anton Löf from RMG.

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RMG has prepared this report at the request of Beowulf and will receive a fee for its services. No portion of RMG's fee is contingent upon the conclusion expressed in this report. Other than this engagement, during the two years preceding the date of this report, RMG has done several assignments for Beowulf as well as for several of Beowulf's potential competitors and will, given opportunity, do so in the future. None of these relationships have influenced the outcome of this report in any material way.

Beowulf's iron ore deposits

The Kallak deposit[1].

The Kallak Iron Ore Deposit is located north of the Arctic Circle within the municipality of Jokkmokk in the Norrbotten County in northern Sweden. The deposit benefits from excellent infrastructure with a network of local forestry roads within the project area located very close to the main paved road between Kvikkjokk and Jokkmokk. A major hydroelectric plant with associated electric power lines is located only a few kilometres away.

The Kallak deposit was originally discovered in 1947 and was assessed by the Geological Survey of Sweden ("SGU") in the early 1970s during which time detailed ground geophysics, diamond drilling and trenching were completed. The deposit is made up of two mineralised bodies, internally within Beowulf defined as the Kallak North and Kallak South deposits respectively, both of which are outcropping and being up to 300 metres wide with the confirmed extension for the Kallak North deposit being more than one kilometre.

The Kallak North deposit is today by far the largest known magnetite deposit of the so called "quartz banded iron ore type" that is still awaiting commercial exploitation in northern Sweden. SGU has historically generated an estimated tonnage for the Kallak North deposit of 92 Mt and 29 Mt for the Kallak South deposit. The deposits are located very close to each other and may be geologically connected at depth with grades varying between 35-42 % of iron. Low background values have been noted for titanium (< 0.1 %), phosphorous (0.04 %) and sulphur (<0.6 %). The drilling programme completed by Beowulf Mining in 2010 has confirmed the presence of a much larger resource at Kallak North.

The mineralisation in Kallak North consists of a typical fine grained, quartz banded magnetite ore type, with only minor hematite noted. Only low background levels of titanium, phosphorous, sulphur and manganese are noted with tungsten and vanadium contents at less than analytical detection limits.

Metallurgical bench scale tests by Minpro AB with Davis Tube Recovery (DTR) of Kallak iron ore material completed in 2010 have been directed towards the production of a high grade magnetite pellet feed product for use by potential clients. Traditional treatment of the ore material by fine grinding and wet magnetic separation have resulted in a clean magnetite pellet feed product containing 68.0 % iron corresponding to a recovery of 85.1 %.

Besides the Kallak north deposit, Beowulf has also acquired a deposit know as Kallak South. The background is the following. The Beowulf investigation permits Parkijaure 1 and 2, which cover the main Kallak South deposit are located directly on the southern extensions of the Kallak North Deposit. The permits were acquired by the company from Tasman Metals Limited in September 2010 in consideration of CAD 40,000 in Beowulf

[1] The description of the Kallak deposit, including statements of contained iron was presented to RMG by Beowulf using internal working papers of Beowulf. Hence, resource estimates are not yet compliant with international standards but are based on the best appreciation possible by Beowulf as of late August 2011.

shares. In addition, Tasman will retain a 1.5% Net Smelter Royalty on any future production in the these permit areas.

The Parkijaure permits are known as Kallak South within Beowulf. The information available of the southern permit extensions adds iron ore tonnages of significant volumes to the earlier defined Kallak North deposit.

An independent report produced in May 2009 by ReedLeyton Consulting states that the two permits at Parkijaure have an anomaly with an estimated 34 Mt of 38-39% iron ore. This was based on limited historic drilling but also ground magnetic and geophysical work and 3D magnetic modelling. The same report also stated that "the source of the anomaly is not only bigger in volume than that of the Kallak (North) deposit but also significantly higher in magnetic susceptibility".

The two sets of permits, Kallak North and Kallak South will hence in this report be referred to jointly as Kallak or the Kallak deposit.

The Kallak iron ore deposit are of similar quartz banded magnetic ore type and the two parts are located in close proximity to each other, being separated by only some few hundred metres on strike, within the same highly altered, Proterozoic volcanic bedrock structure. As such, the deposits are interpreted to possibly be geologically connected at greater depth to form one very large iron ore resource of more than 600 Mt with a total extension of more than four kilometres. With this deposit, Kallak could become a 10 Mt/a independent high grade (68 to 70 % Fe content) iron ore product supplier.

The Ruoutevare deposit

Besides the Kallak deposit, Beowulf has drilled a deposit know as Ruoutevare. For this market update, little work was carried out on the site since the previous updated but in order to give a better depiction of the Beowulf iron ore work, Ruoutevare is presented shortly below.

The Ruoutevare deposit is located in northern Sweden in the county of Norrbotten. Distance to Stockholm, the capital of Sweden, is approximately 1 100 km. The project site is in the Jokkmokk municipality and 13 km north west of the small village of Kvikkjokk and 130 km north west from the municipality centre. Ruoutevare is 55 km north of the Arctic Circle.

The exploration permit held by Beowulf Mining is centred on latitude 67º03' N and longitude 17º35' E and the altitude varies between 420-610 m above sea level. The exploration permit covers an area of 850 hectares.

The deposit is located in a region with very few inhabitants, only approximately 20 persons are permanently living at Kvikkjokk the year around. There are however quite a number of cottages in and around the village used by people who enjoy hiking and fishing in the mountains mainly during the spring, summer and autumn seasons. Kvikkjokk is the most important entrance for hikers to access the two largest national mountain parks in Sweden, the Sarek and Padjelanta national parks. From May to

September Kvikkjokk acts as a base for numerous tour and helicopter operators catering for the influx of tourists visiting these national parks.

Beowulf Mining has provided the data and information to an independent external consultant group specialized in iron ores for interpretation and to obtain updated resource estimates of the Ruoutevare deposit.

Based on total available data and completed by geological consultants Runge Limited of Perth, Australia, (2008), a JORC classified Inferred Mineral Resource of Ruoutevare has been estimated at 140 Mt holding 39.1 % iron (Fe), 5.7 % titanium (Ti) and 0.2 % vanadium (V) at a cut-off grade of 30 % Fe. This updated resource estimate is approximately 20 % higher than the original estimate of 117 Mt by SGU in the 1970s.

Based on these data the consultant group Mining Technical Solutions (MTS) of Australia in 2008 estimated that there is an additional resource potential of the Ruoutevare deposit of 72-107 Mt. The additional resources are indicated in near surface extensions in both directions to the current resource model as well as of an interpreted deeper zone below the Ruoutevare resource. Thus the total tonnage of the Ruoutevare deposit as outlined by the Australian consultant groups Runge and MTS respectively, can be close to 250 Mt. These results compares well with a geophysical report in 1975 by the Geological Survey of Sweden, based on the interpretation of detailed gridline based, gravimetric data, which suggested that the total tonnage of the Ruoutevare iron ore deposit can be as high as 250 Mt

Summary of the Beowulf deposits.

A summary of the Ruoutevare and Kallak deposits is found in **exhibit 1** below. The calculations are based on the assumption that a mine with a production capacity of 10 Mt/a of run of mine ore is built at each site. At the Kallak deposit there are a resource that could sustain a mine of that magnitude for 60 years. However in our calculations we have only taken into account the first 15 years. Beyond this time frame there will be further investments needed to sustain mining capacity. However the investments needed will be considerably lower than the initial investments into the mine and thus the potential profit will be considerable higher for the next 45 years than for the first 15 years.

Presently, in the spot market, there is a premium per iron unit (% Fe content in ore) between 58 and 62 % Fe which has varied between 2 and 12 USD/% Fe. Presently, the average is 6 USD/% Fe. In the forecast for prices out of Ruoutevare and Kallak we have assumed a premium for a possible Beowulf concentrate between 3 - 6 USD/t due to high iron content 6 %-units of Fe difference (average 68 % Fe cp to 62 % in TSI).

In the calculation, we have assumed that the concentrate will be shipped out of Norway. Based on experience we have assumed freight rates long term will be slightly higher than the level existing presently, summer 2011 or approximately 40 USD/t, dry weigh. We have assumed that the cost for bunker oil has gone down, compared to an earlier assessment by RMG these changes are minor and will even out. We also assume that these levels will prevail for the forecasted time horizon.

Finally, we present two cases, one high price and one low price case with matching assumptions for iron ore premium. Accordingly, the FOB price for Beowulf products could range between 88 USD per ton to 126 USD per ton giving a pay-back time of the Ruoutevare deposit somewhere in the vicinity of 2 years.

Exhibit 1. Ruoutevare and Kallak deposit summary.

Calculations based on the first 15 years.

	Units	Ruoutevare	Kallak
Total Ore Mined	Mt	150	600
Total Waste Mined	Mt	225	900
Life of Mine	years	15	60[1]
Ore Grade Average, ROM	Fe %	39	35
Strip Ratio	t Waste/t Ore	1.5	1.5
Total Ore Processed	Mt	150	600
Iron Recovery	%	84	84
Total Iron recovered	Mt	49	176
Total Fe Concentrate Produced (Dry)	Mt	72	256
Concentrate Grade	Fe %	68	69

Investments: Mining	MUSD	97	97
Processing, infrastructure	MUSD	446	446
Transport, port handling	MUSD	231	315
Owner's cost, closure	MUSD	24	24
Total	MUSD	798	882
Operating costs Mining	USD/t ROM	9.3	9.3
Mining	USD/t conc	19.4	21.8
Processing	USD/t ROM	6.5	6.5
Processing	USD/t conc	13.4	15.2
Transport, port handling	USD/t ROM	2.1	2.4
Transport, port handling	USD/t conc	4.4	5.7
G & A	USD/t ROM	2	2.0
G & A	USD/t conc	4.2	4.7
Total	USD/t ROM	19.9	20.2
Total	USD/t conc	41.4	47.4

Market price forecast, long term - high	USD/t	130	130
Market price forecast, long term - low	USD/t	110	110
Iron ore premium - high	USD/%Fe	6	6
Iron ore premium - low	USD/%Fe	3	3
Freight - Norway - China	USD/t	40	40
Beowulf Product price FOB – high	USD/t	126	132
Beowulf Product price FOB – low	USD/t	88	91

Gross Revenue - market price high[2]	MUSD	9,072	8,437
Gross Revenue - market price low[3]	MUSD	6,336	5,816
Total Operating Costs	MUSD	2,981	3,030
Capital Costs	MUSD	798	882
Pay Back Period- market price high	Years	2.0	2.4
Pay Back Period- market price low	Years	3.6	4.7

1) The potential life of mine is 60 years, for these calculations only the first 15 have been considered.
2) Gross revenue – market price high for the entire life of mine according to these assumptions are 33 748 MUSD.
3) Gross revenue – market price low for the entire life of mine according to these assumptions are 23 264 MUSD

Possible products in relation for existing standards.

At present, the Kallak deposit is forecasted by Beowulf, to be mined at a rate of 10 Mt/a. The products intended are either a sinter feed or a more finely ground pellet feed. In the present prising scheme for iron ore, three main industry consultant price index exist. From one of these, TSI, it is easy to calculate the premium received for higher iron ore content. A comparison between a composition of a possible Kallak iron ore sinter feed with the major iron ore prices index is found in **exhibit 2** below.

Exhibit 2. comparison between specifications of leading iron ore indices and a possible iron ore product from Beowulf Mining

	MBIO	TSI 58	TSI 62	Platts IODEX	Beowulf
Price	USD/dry metric tonne, CFR China	USD/ dry metric tonne, CFRFO China		USD/ dry metric tonne CFR main Chinese ports	
Fe content	Base 62 %, range 56 – 68 %	58% range 55 – 60 %	62% range > 60 – 66 %	62% range 60 – 63.5 %	70%
Silica	Base 3.5 %, Max. 6.0 %	4.00% Max. 8.0 %	4.00% Max. 6.0 %	4.50%	1.50%
Alumina	Base 2.0 %, max. 4.0 %	3.50% Max. 5 %	3.50% max. 4 %	2.00%	n.s.
Combined Si+Al	Max. 8.0 %	n.s.	n.s.	n.s.	n.s.
Phosphorus	Base 0,05 %, max 0.1 %	0.07% max. 0.125 %		0.08%	0.03%
Sulphur	Base 0.02 %, max 0.05 %	0.05% max. 0.07 %		0.02%	0.01%

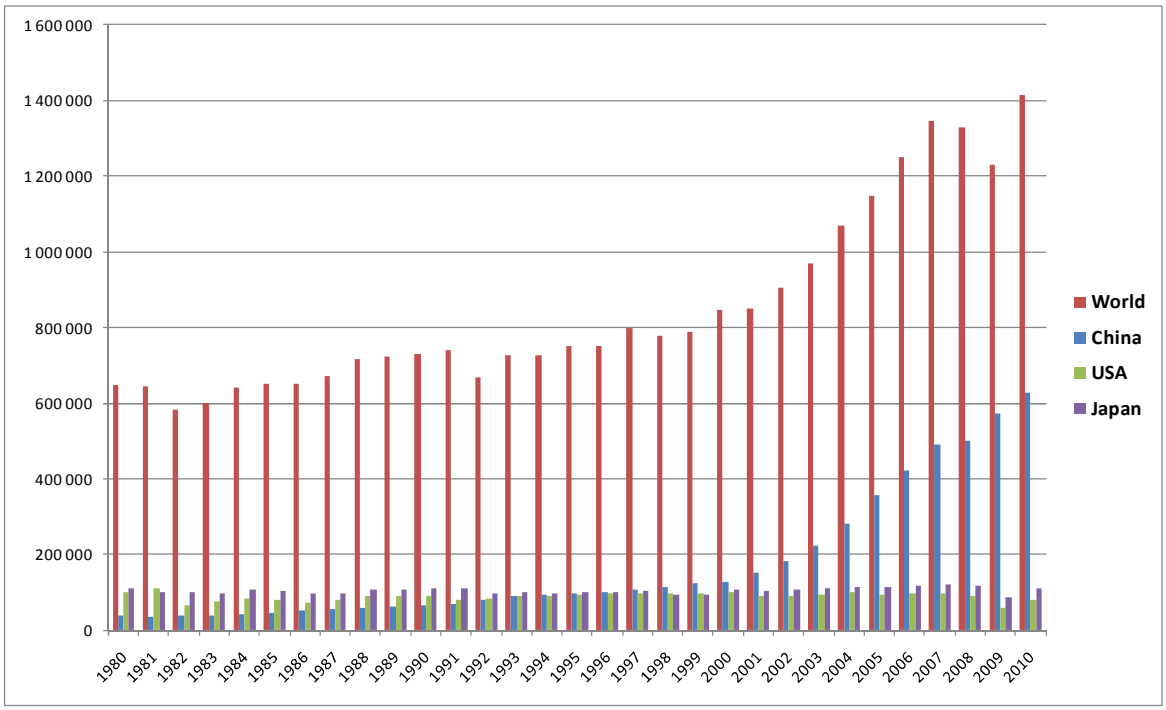
The world steel market and iron ore demand

World steel market

The world steel industry consumes more than 98 % of all iron ore produced. Over the years, it shifted from a high growth mode (post World War II until the mid-seventies) into a slow- growth mode with annual growth ranging between 1 and 2 % (from the mid-seventies to the late 1990s). At that point the rebuilding of infrastructure in the West (including Japan) was essentially completed and annual crude steel consumption levelled off slightly below 800 Mt. During this period, the "terrible twenties" for the metal market (roughly 1975 to 1995), only revamping of old investments and the exceptional growth of South Korea led to any form of increased metal use.

Upon entry into the 21st century all this changed. China, which had been growing virtually unnoticed became the world's leading steel country in 1996 (overtaking Japan) ushered in a period of exceptionally robust growth (6-7 % annually) from 2000 with global crude steel production having grown from 750 Mt in 1996 to 1400 Mt in 2010. Over the same fifteen-year period crude steel production in China grew more than six-fold from 101 Mt to 626 Mt. (see the **Exhibit 3** below).

Exhibit 3. Global steel production 1980 - 2010



Source: World steel Association

In the second half of 2008 the world steel market experienced an unexpectedly sharp downturn, primarily as a result of the global financial crisis. The drop continued during 2009 but has since been reversed with a surge during 2010 and the first half of 2011.

As we enter the second decade of the 21st century, the on-going growth phase seems to be continuing and as several other populous countries such as India and Brazil are also showing strong growth, it is reasonable to assume that this growth phase extends.

Steel demand by region

The forecast in **Exhibit 4** below is based on a set of realistic macroeconomic assumptions by region. Future steel demand scenarios have been defined for the medium and long term. In the developed world, no growth or slow growth is expected for the foreseeable future. Growth in steel demand as shown in **Exhibit 3** above takes place very largely in the emerging markets and medium-term mainly in China and India. Worldwide, it is expected that this will result in a steady growth in steel demand through 2025.

Chinese developments

In the foreseeable future China's economic development is the most significant factor determining iron ore demand. With China already accounting for about half of the world's pig iron production we expect the rate of economic growth in China will continue to exceed that of most of the rest of the world. In addition, RMG expects Chinese growth to continue to be steel intensive which is to say each additional dollar of Chinese GDP will cause a higher increase in steel use than in other major countries such as the United States.

Nevertheless, the high growth rate in steel use that China has experienced so far cannot continue indefinitely and indeed, there are signs that growth is abating. We believe it is safe to assume that the very high growth rates experienced in the early stages of the expansion of Chinese exports of manufactured goods cannot be sustained much longer. While Chinese exports replaced output from other countries' producers, it was relatively easy to maintain high growth. At present, however, the limits of growth for Chinese exports are set by the rate of growth of the world market itself, that is, by the growth of other countries. Growth rates will therefore most likely decline eventually. In order to maintain economic growth at a higher rate than that of the rest of the world, albeit lower than in the recent past, Chinese growth will have to be refocused from exports towards private and public domestic consumption. At the same time, the share of output going to investment will fall as domestic consumption increases, although investment in housing and domestic infrastructure will partly compensate for a fall in investment in export-oriented infrastructure and capital equipment.

As China approaches an annual production of 700 Mt in 2011, we assume that the rate of growth will begin to decline in the coming years from 9 % p.a. (during 2009/2010) to an annual average of 3.5 % until 2025, and lower still during the following 5 years. In 2025 China will produce some 1 billion tonnes of steel.

The development in India and in the emerging pacific rim economies

China no longer being the only growing populous country in the world today, it is also necessary to factor in Indian growth. At present, Indian GDP is assumed to grow at 8 %

p.a. from 2010 to 2015 and, most likely, at the same rate in the succeeding 10 years. India's demographic situation is better positioned for high long-term high growth than China's with India's urban population increasing by about 35 % in 2020. However, as the economic growth and industrialization of India has other prominent features (e.g. 65 % of India's GDP comprises services and manufacturing while construction makes up only 18 %) it is likely that the ongoing economic development in India will be less steel-intensive than that in China. However, India has committed a large part of its upcoming GDP growth to infrastructure and, accordingly, the lesser steel intensity of India's growth should not be over-emphasised as India will consume a substantial amount of steel and iron ore in the coming years.

We assume that economic growth in India will continue, and that it may surpass that of China. Converted to steel tonnes produced, we assume that in 2025 India will produce more than 200 Mt of steel. While this seems like a high figure it remains lower than production in China at comparable levels of economic development. The main driver for Indian demand is, in the short term, committed infrastructure spending.

Over the past 20 years, Japan has had a lacklustre steel growth and we feel that that will continue. Accordingly, Japan will have the same slow growth scenario as the rest of the OECD area. In the short run, Japan will have a major revamp of the Tsunami-stricken area and growth will most likely pick up. However, in the long run growth will only be slightly above zero making Japan only a 115 Mt producer in 2025.

South Korea has been one of the success countries in terms of steel production growth over the last decades. Growing from relative obscurity to a major world class player producing almost 60 Mt of steel in 2010. For the forthcoming decade, however, we expect that South Korea's robust growth will ease to 1.5 % in 2025. South Korea is already and will remain the most steel intensive country.

Besides South Korea, Taiwan stands out from the crowd. In fact, in a short term discussion it is essential to separate South Korea and Taiwan from other developing Asian countries for several reasons. For example, a significant share of crude steel output in these two countries is blast furnace-based with 56 % and 51 % in South Korea and Taiwan respectively, whereas there are no blast furnace-based steel plants in other developing Asian countries. These two countries have no resources in respect to steelmaking energy and raw material requirements, while several of the countries in the group have moderate to significant energy and raw material resources including natural gas (Indonesia, Malaysia), iron ore (Indonesia), and coal (Indonesia). It is worth noting that South Korea's and Taiwan's operating, capital, labour, land and environment-compliance costs have increased significantly during the last 15-20 years.

Besides Taiwan, the Emerging Pacific Rim includes Indonesia, Malaysia, Thailand, Singapore, Philippines and Vietnam. As noted previously, these aggregate region increase steel production at a CAGR of 8.6 % from 2000 to 2008 (latest available figures).

Apart from South Korea and Taiwan almost, 100 % of this region's steel output is EAF-based with significant use of DRI plant and related raw material and energy inputs.

This region is likely, to some extent, to replicate China's economic success of the 1990s and the first decade of this century since the starting level for their export expansion is much lower.

However, we believe that the rest of the emerging Pacific rim will outgrow South Korea in its steel development and average around or above 4 % growth over the period producing some 65 Mt in 2025 and 70 Mt in 2030.

Development in mature economies and the rest of the world

In the OECD-area fiscal restraint and deficit reduction efforts will inhibit growth for the next decade. However, we assume that eventually social spending will somewhat alleviate the impact of fiscal austerity and maintain growth within a narrow (low) range. In the east, structural need to reinvest in infrastructure and general economic growth will result in a higher growth in Eastern Europe and CIS and these areas can be expected to perform better than the rest of Europe and North America. Part of this is also due to growing commodity exports.

Development in the Americas, Europe and the CIS countries

In North America the outlook for steel has been depressed for quite a while. Only a handful of integrated steel companies exist and several of these also run the risk of being shut down for cost reasons. The steel industry in the United States has, accordingly, become more and more EAF based and as energy cost are increasing, the overall outlook for all mature industries in terms of steel is bleak. Specifically in North America we do not assume that the industry will reach the 2000 figures in the time frame dealt with in this report. The growth will be slow and from 2010 only 0.5 % on average to 2025.

The outlook for South America is more uplifting. The region has several important characteristics as the steel industry is about 70 % BF-based and 30 % EAF-based. Only the EAF-based plants in Venezuela and Trinidad are heavily based on DRI, the rest are based on scrap and conventional and charcoal pig iron. Brazil has the highest quality and lowest-cost iron ore in the world, although it lacks coal and scrap. Among the largest new oil and gas reserves in the world have been discovered off the coast of Brazil. Previously, only Venezuela and Trinidad had abundant cheap natural gas. All this indicates a high growth in Brazil (and Chile) but uncertain political and economic policy issues linger in the rest of the region.

In Europe the development of the steel industry has been depressed as of late. Europe actually contracted with 0.5 % annually from 2000 to 2010. We think that the depressed trend will continue and the region will have a measly 0.3 % growth until 2025. As in the US the area will not get back to the levels of steel production reached in 2000.

The CIS countries will have a slow growth, averaging 1.5 % growth between now and 2025 adding 40 Mt to 2025. In this area, the Russian steel market do seem to have recovered from a decade of bust and boom development. Over the upcoming years, the outlook is better than most areas as the underlying low per-capita consumption is low and the availability of low-cost raw materials, power and energy is good. However, the

present uncertainties in the economic framework in all of the CIS countries may dampen development.

Outlook for the MENA region including Turkey and the rest of the world

Albeit the political unrest over the last months, we believe that once this uncertainties are overcome, the MENA region including Turkey is one of the driver of future growth. Including Turkey, the MENA region hit a record high production in 2010 with 29 Mt and the MENA region output in 2010 was around 57 Mt – more than 25 % larger than South America. In the MENA region five countries account for 93 % of regional output, Turkey with 29 Mt or 51 % of the output, Iran is second with 12 Mt (21 %) followed by Egypt with 6.7 Mt (12 %) and Saudi Arabia at 5 Mt (9 %).

Crude steel production in the region is to a large extent EAF/DRI-based, and to a lesser extent blast furnace based. Middle East North Africa region (including Turkey) has been growing at a high rate of 9 % annually for the most of the past 10 years. Overall, we think a 6 % average growth p.a. is a reasonable expectation for future growth in this region thus producing more than 130 Mt of steel in 2025.

We further assume that Africa (today in essence South Africa) will have a slow growth (an average of less than 0.5 % p.a.) and only produce less than 20 Mt in 2025. This will also be the case for Oceania where the major economic powers, Australia and New Zeeland will monitor the development of the rest of the OECD countries.

The discussion above is summarized in **Exhibit 4**.

Exhibit 4. Steel growth until 2025

			Av. Growth, %			Av. Growth, %
Country/Region	**2000**	**2010**	**2000 - 2010**		**2025**	**2010 - 2025**
China	127 236	625 658	39.17		1 041 468	3.50
India	26 924	66 848	14.83		211 782	8.00
Japan	106 444	109 600	0.30		112 933	0.20
South Korea	43 107	58 453	3.56		73 064	1.50
Emerging Pacific Rim	28 169	40 304	4.31		72 538	4.00
North America	135 353	111 798	-1.74		120 456	0.50
South America	39 110	43 775	1.19		58 915	2.00
Europe	184 925	176 982	-0.43		182 364	0.20
C.I.S	98 489	108 425	1.01		135 533	1.50
MENA incl. Turkey	30 074	57 413	9.09		133 665	5.80
RoW (Africa & Oceania)	16 690	16 839	0.09		17 613	0.30
Total World	836 521	1 416 095	6.10		2 160 331	3.50
Of which China, %	15	44			48	

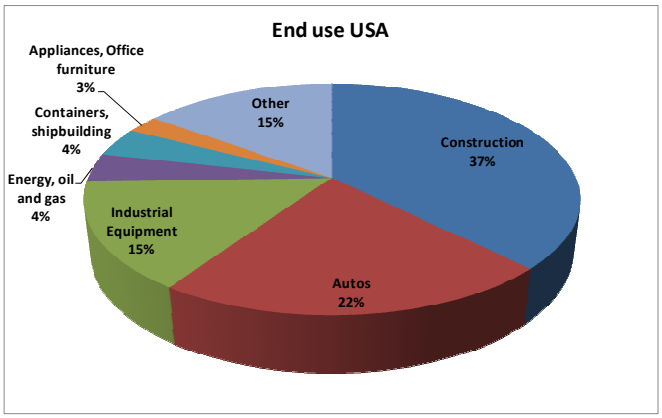
Sources: World Steel association (2000 – 2010); RMG forecast

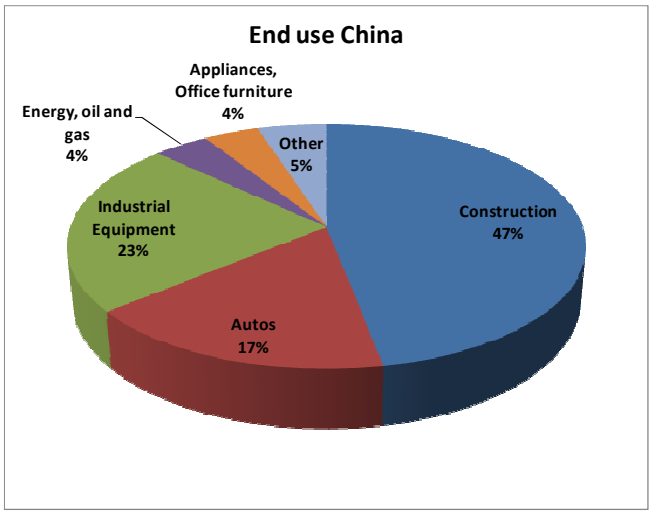
Steel production and iron ore demand – conclusions.

With a steel production 2010 of just above 1400 Mt, the iron ore production was 1831 Mt, up from 1695 in 2009. Historically, iron ore demand has grown slightly more rapidly than steel production as the scrap to crude steel ratio has gone down from over 40 % to roughly 35 % in 2010. We think that this trend will continue for some years (until roughly 2020) and that iron ore demand will increase with 1 % unit more than steel production growth, i.e. with 4 %.

As can be seen in **exhibit 5** Chinese steel demand is heavily tilted towards infrastructure where as the western world, shown as US consumption is more tilted towards applications which have shorter life spans. Taken together, we assume that the amount of scrap based steel being decreased (relatively) as Chinese demand grows over the coming decade and the amount of scrap in Chinese steelmaking will start to grow only after the forecasting period.

Exhibit 5 Steel use break-down in USA and China

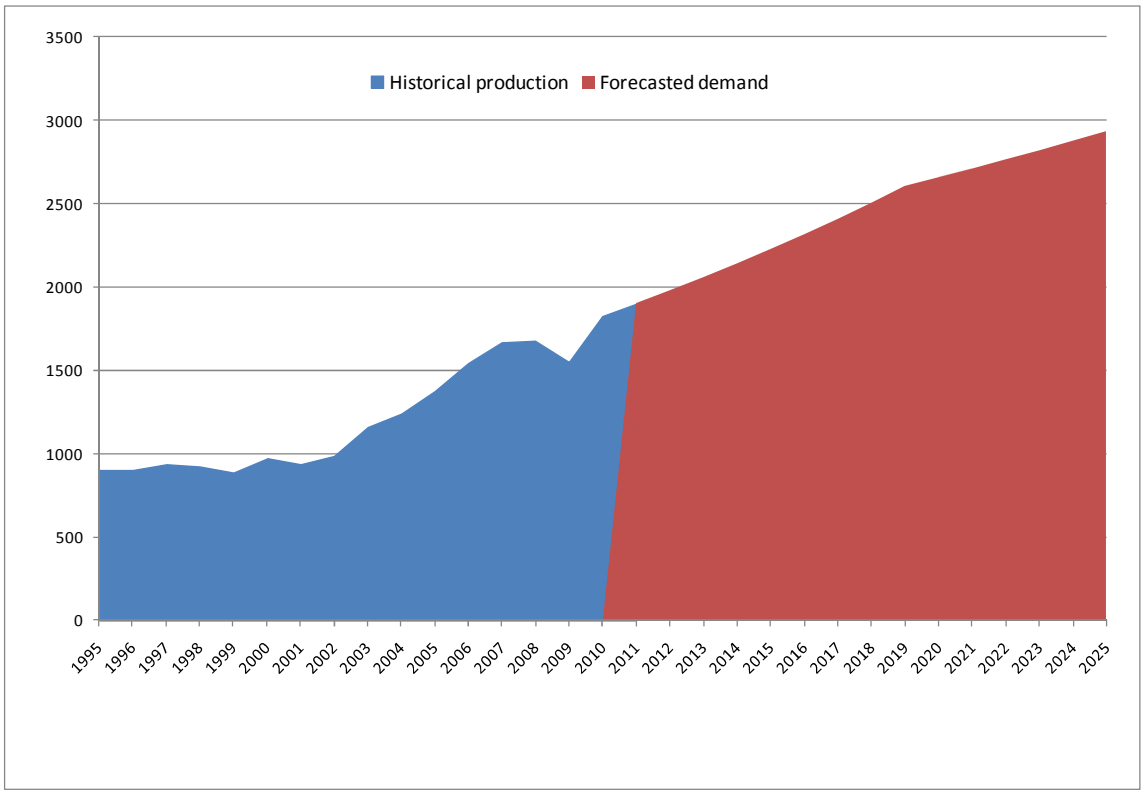




Source: Metal Strategies, PWC, RMG

As large volumes of scrap becomes available in China (mainly), we think that this trend will be reversed and turn towards a higher degree of scrap usage. From 2020 to 2025, we assume that the iron ore demand growth will be slower than that of steel production growth, i.e. iron ore demand will be 2 % for that period. The forecasted demand is shown in **Exhibit 6** below.

Exhibit 6 Iron ore demand forecast



Sources: RMD Iron ore, RMG forecast

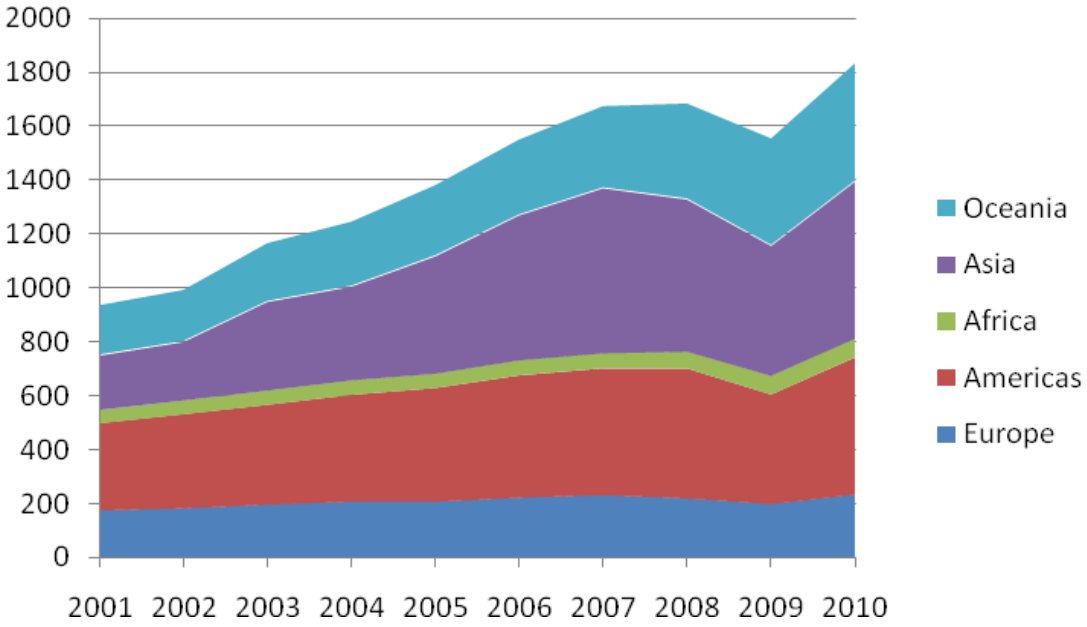
World iron ore supply

Production

In 2010 the world iron ore market recovered from the recession in 2009. As discussed above, a new all time high was reached at 1831 Mt. The unexpected and fast bounce back is quite remarkable. Output increased in most regions and countries except Africa and Asia excluding China, where production in 2010 remained constant. Europe and North America experienced the highest growth rates approaching 50 %. Among the major producers Australian, Brazilian and Chinese production was increased by 10, 23 and 44 % respectively. Indian production remained at just above 210 Mt a slight decrease. Production in the CIS countries grew by 14 %. Due to problems of consistency between different statistics on the Chinese iron and steel industry, we revised our method for estimating Chinese iron ore production in 2009. Whereas we have in the past based our estimates on Chinese data for run-of-mine ore production, converting this to a standard of 63 % iron content, we are now basing our estimates on data for pig iron production and iron ore imports. Chinese production, on a comparable grade basis, was 319 Mt, or 17 % of total world production in 2010, up from 14 % in 2009 but below the top level of 20 % in 2007.

Developing countries accounted for 60 % of world iron ore production in 2010 (up a few percent from 2009), the CIS republics for just over 11 % and the industrialised economies for almost 30 %. The increase in the share of the developing countries was due mainly to growth in Brazil up over 70 Mt and China up 96 Mt. An outline of the world production of iron ore by region is found in **exhibit 7**.

Exhibit 7. Iron ore world production by region, 2001 to 2010 (Mt).



Source: UNCTAD; RMD Iron ore

Generally, over time, we expect that Australia and Brazil to dominate iron ore production world-wide. Production in India, which has been a large resource of iron ore and land use, will be hampered by red tape and ongoing internal struggles regarding iron ore. Over time, as the Indian steel industry grows, most of its iron ore will be used domestically. We also foresee a slow decline in Chinese output. If prices fall, Chinese output will decline more rapidly and major closures of Chinese producers, specifically high cost producers will begin.

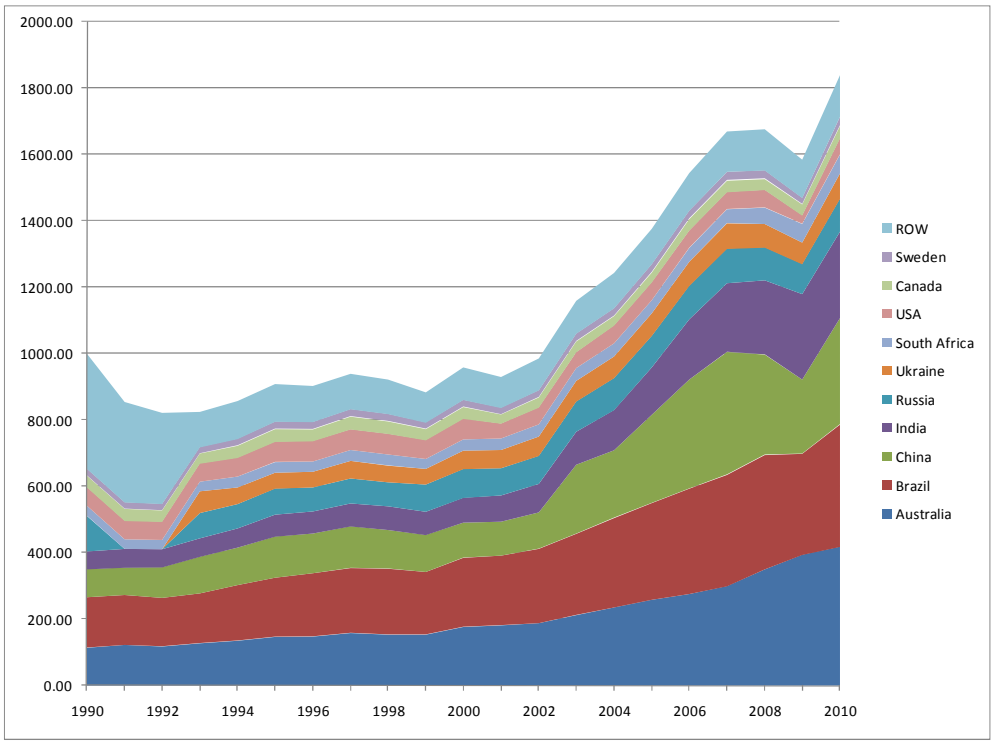
By type, world consumption of iron ore is currently split roughly 69 % fines, 24 % pellets and 7 % lump. The market is showing a slow, but clear, trend toward the increased use of pellets as a share of total consumption after a period of decline in the 1990s and early 2000s. At the same time, the share of lump ore has been declining slightly. There are several reasons for these trends:

- Recovery of North American integrated steel industry, which uses primarily pellets, in last several years.
- Periodic closure of sinter plants primarily due to environmental concerns (e.g. Rautaruukki's decision to close its remaining sinter plants as of 2011).
- Declining average quality of iron ore, especially in China.
- Declining relative availability (depletion) of lump, e.g. in Brazil and a lower lump quality in Australia.

As can be seen in the **Exhibit 8** below, Australia and Brazil are the major iron ore producers in the world followed by China. The impact from the global financial crises had a limited impact on the production in Australia and Brazil. However, the output from China was heavily influenced as iron ore price fell below 100 USD/t (62 % Fe, CFR NW China). Several of the smaller countries followed suit but as price recovered during 2010, production was back up again.

If the output is examined in more detail, it is clear that the absolute majority of the world's iron ore output comes from open pit mine, actually more than 90 % is produced in open pit operations.

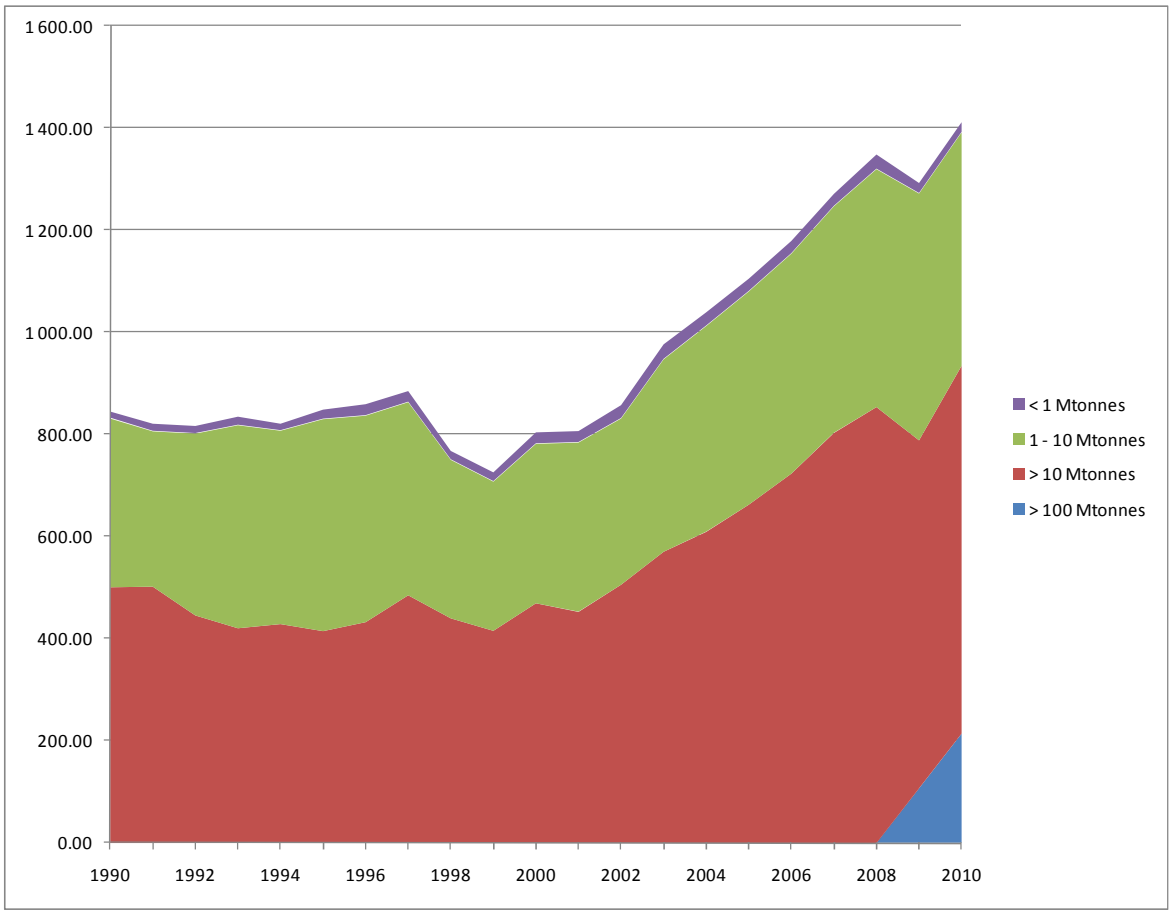
Exhibit 8. Production of iron ore 1990 to 2010 by country



Source: RMD Iron ore

However, when it comes to size distribution of mines, the picture becomes more varied. As can be seen in **exhibit 9** big mines with an annual production capacity between 10 Mt/a to 100 Mt/a account for roughly 60 % of all iron ore production. Of late, a new category of mines, the super big mines with a production of more than 100 Mt/a (presently only Hamersley and Carajas) has developed but they only entered this size bracket during the last couple of years. The closest in size, Robe River, currently produces around 60 Mt/a which means that the super big mines will be alone in their bracket for quite a while. What is interesting is the relative strength of medium size mines (1 to 10 Mtonnes). The vast majority in numbers (137 versus 28 > 10 Mtonnes) they comprise around 40 % of all iron ore output. It is also in this size bracket that we shall expect the bulk of new capacity coming on stream. Mines in this size bracket shall, accordingly, not be considered marginal but, at least approaching 10 Mt, as mainstream production sites.

Exhibit 9 Iron ore production 1990 to 2010 divided by mine size



Source: RMD Iron ore

Trade

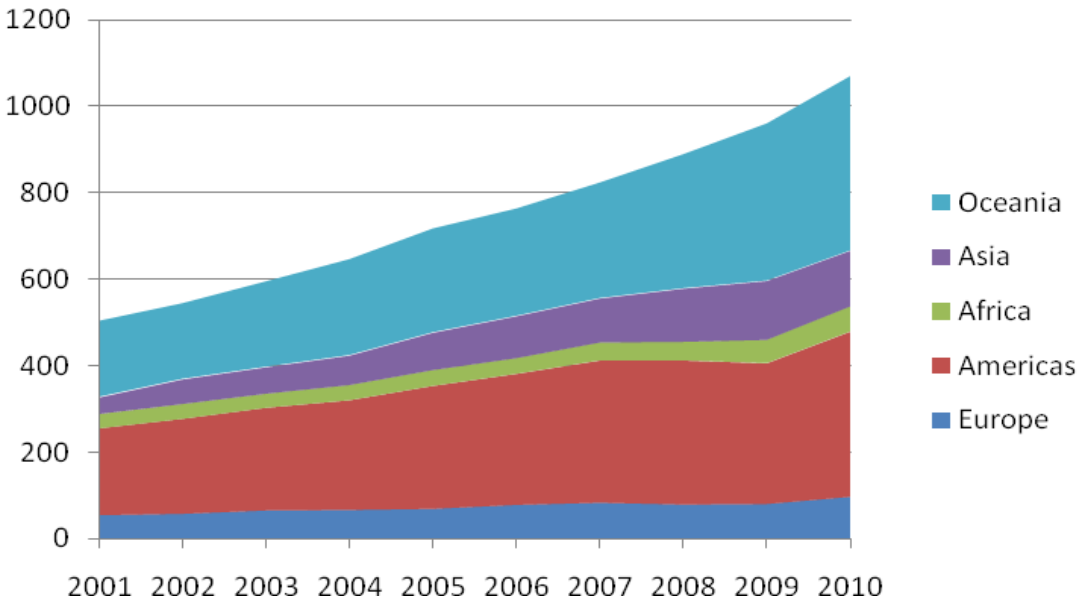
In 2010, international iron ore trade reached a new record level as exports increased for the ninth year in a row and reached 1053 Mt, up 12 %. The increase was the result of higher demand from most countries in the world in the wake of the recession. However, most countries have not reached their import levels of 2008. These figures include all export trade including intra-CIS trade, while re-exports have been removed as far as possible

The major developments in iron ore exports and imports from 2001 to 2010 are shown in **exhibit 10** and **exhibit 11**.

World total iron ore exports have increased by 113 % since 2001. Developing countries accounted for 49 % of total in 2010, and their exports have grown by 114 % since 2001. Developed countries accounted for 51 %, including CIS republics (with about 6.8 % of total world exports).

Australia's exports increased by 11 % to 403 Mt in 2010 compared to 2009. With important markets in Europe and the Americas picking up pace, Brazilian exports, which fell in 2009, turned around and increased 17% in 2010 to 311 Mt up from 266 Mt.

Exhibit 10. Iron ore world exports (Mt).



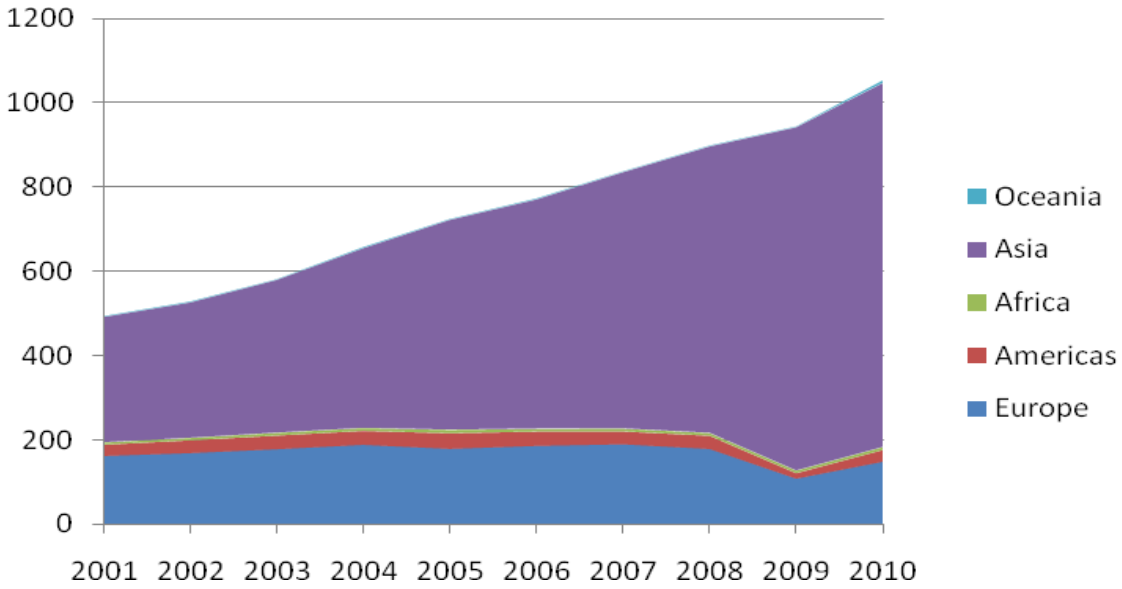
Source: UNCTAD; RMD Iron ore

Exports from India fell for the first time in twelve years but the country is still, at 96 Mt down 18 % from 117 Mt, the third most important exporter. In 2010 the Ukraine, Kazakhstan and Russian Federation increased their exports. China has become an important market for all three countries. Transport capacity has been a limiting factor for further expansion.

In 2003, China passed Japan to become the world's largest iron ore importer. In 2010, its imports were 619 Mt, a slight decrease by 1.8 % compared to 2009. In 2009, China accounted for almost 67 % of total world imports. In 2010, this figure had decreased to 59 %. Almost everywhere else, imports rose: in Japan by 27 % to 134 Mt, and in the Republic of Korea by 34 % to 56 Mt. European imports (excluding the CIS countries), increased by 40 % in 2010, reaching 134 up from 96 Mt, corresponding to just under 13 % of world imports. In Europe, Germany, France, Italy and the United Kingdom are the largest importers, all were hit by the crisis in 2009 with falling imports, but all have seen increases in 2010, however imports are still lower than 2008 levels. As a group, developing countries accounted for almost 66 % of total iron ore imports in 2010 (72 % in 2009) Due to a strong growth in imports of China, the developing world's share of total imports increased from only 31 % in 2002 to 46 % in 2005, 50 % in 2006 and 55 % in 2008. The CIS republics do not yet import iron ore from outside the CIS, and their internal trade in 2009 was only 1.4 % of the world total, as steel mills give priority to captive or nearby ore suppliers. Developed economy countries accounted for about 33 % of world imports in 2010..

Seaborne iron ore trade is estimated to have increased by 11 % in 2009 to 895 Mt. The increase was entirely accounted for by Chinese imports, which rose by much more than the increase in total trade. Other importers registered large declines. Steel production in the rest of the world is now picking up as a result of the unexpectedly strong economic recovery while Chinese demand for iron ore continues to increase. Accordingly, large increases in seaborne trade can be expected in 2010, probably by more than 10 %. Factors affecting the growth include the ban on low grade iron ore imports in China and possibly raised export taxes in India.

Exhibit 11. Iron ore world imports (Mt).



Source: UNCTAD; RMD Iron ore

Iron ore supply forecast

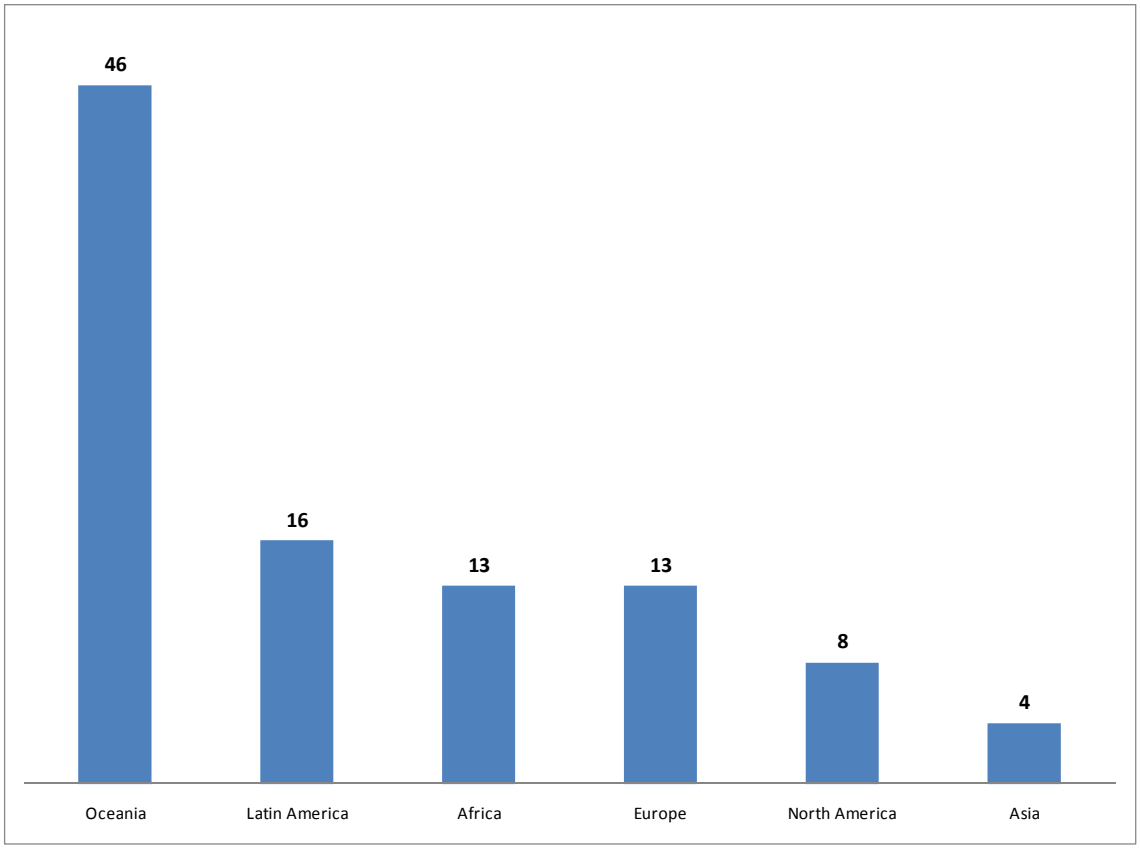
Projects

At the end of 2010 iron ore projects at all stages of development with a total projected investment of some 162 billion USD (29 % of all mining projects in the world) were in the pipeline globally. During the year iron ore had consolidated its position as the most important metal in the total mining investment pipeline of an estimated 562 billion USD. Iron ore distanced itself further from copper - although still not by a large margin - only 7 billion USD up. The iron ore boom manifested itself in 28 billion USD of new projects being announced in 2010 or 47 % of the total value of all new projects, by far the most important metal in this respect. The impressive growth trend over the previous years with ever increasing number of projects and also investment volumes, which was broken during 2009, was hence resumed in 2010. For several years, iron ore was under-represented in the project pipeline. When the prices started rising and demand increased, the situation was reversed and during the last couple of years iron ore has become more and more important. In 2002, iron ore projects accounted for 4 % of the total amount of investment (in USD) planned for new mines globally. In 2003, the figure had almost doubled to reach 7 % and that trend continued when in 2004 the share of planned investment doubled again to 14 %. Since then the growth has flattened – 18 % in 2005, and 17 % in 2006. In 2007, there was another increase and the figure reached 23 % to grow further in 2008 and 2009 – 26 % and 27 % respectively. The total amount of project USD in the pipeline also increased during these years and this development has continued unabated through to 2008. In absolute terms there were 3 billion USD earmarked for iron ore developments in 2002, 14 billion in 2004, 25 billion in 2005, 34 billion in 2006, 70 billion in 2007, 106 in 2008 and 127 billion USD in 2009.

New iron ore mining capacity taken into operation in 2010, as identified at the individual project level, reached almost 90 Mt globally. This is slightly higher than the 2009 figure of some 74 Mt and almost exactly the same as in 2008. However, it is a considerably lower figure than in 2007 when some 130 Mt of new capacity was recorded. The year preceding that saw some 70 Mt of added capacity and prior to that only 30-40 Mt was reported. These figures include known brown field (expansion) projects. However, the figures for both years exclude many small, locally owned projects, mostly in China and in India, but also a few in Brazil, which are not announced in the same way as projects run by listed companies. Neither do the figures include incremental capacity increases in existing mines, such as de-bottlenecking or capacity increases due to reorganisation, which are sometimes called "capacity creep". The “creep” is difficult to monitor and impossible to predict. It can only be inferred at the end of the year when the production increases by more than the sum of all new projects. In contrast to the highly publicized green field projects, many brown field expansion projects pass unnoticed until they come into operation. All of the incremental iron ore projects, from half a million ton to one million ton, add up to considerable tonnages, however. The driving forces for refilling the pipeline with new projects have increased considerably in the years of high prices. The fall in the new projects estimated in 2009, and which seemed to be confirmed even in late 2009, does however seem to be wrong. There is once again a strong optimism in the iron ore sector which of course coincides with the high prices and strong demand from China and which surprised most observers all through 2010.

If an end of the mining boom looked obvious in late 2008, the mood in 2010 and early 2011 is again optimistic, perhaps overly so. The period of strong demand growth seems only to have been interrupted by a little dip in 2009 and not by any serious crisis, as was expected one year ago. The sudden end of the boom in 2008 has been turned into an equally sudden restart of many of the projects that were mothballed and postponed in 2009.

Exhibit 12. World iron ore projects by region, percent of all projects.



Source: UNCTAD; RMD Iron ore

The significant growth in iron ore demand over the next decade provides a strong basis for iron ore producers on which to expand. The high concentration of the seaborne iron ore supply market implies that the iron ore capacity expansions will be largely controlled by the large producers (i.e., Vale, BHP Billiton, Rio Tinto, the “Big 3”). They can be expected to carefully manage the expansions, thereby avoiding overcapacity coming in and putting pressure on prices. Their combined (controlled) market share is projected to remain above 65 % to 2025. They also control over 80 % of the relevant port and rail capacity. This evolution is supported by several factors.

The Big 3 have the scale and resources to sustainably add capacity and thereby keep up with the growth in the seaborne market, with 200 Mt of announced capacity additions. Most of these expansions are modular in nature and significant timing flexibility exists. Beyond the expansion of these existing systems, the Big 3 are also expected to participate

in the development of new mining systems that we expect to come on stream over this period (e.g., in Brazil, Canada, the Pilbara, in West Africa, and in India). The Big 3 have long-term volume contracts with major customers. This means that new entrants must convince buyers that their products carry an advantage compared to those of the Big 3 – and they must do so before initiating their investment projects in order to raise financing. This creates a significant entry barrier.

As for China, despite the ongoing expansion of the Chinese steel industry, we assume that domestic ore production will gradually decline (although a temporary increase 2009 to 2010 from 222 Mt to 319 Mt (converted to comparable grades) and China will become even more dependent on iron ore imports.

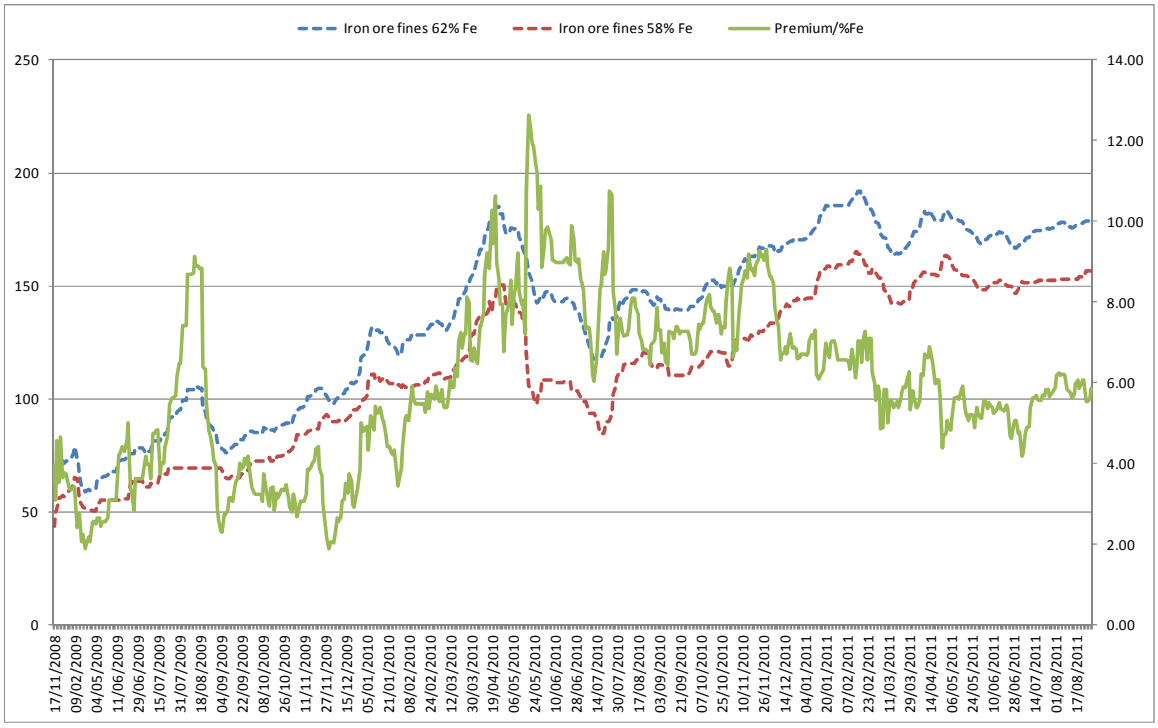
The specific geological parameters of China, with few and small high grade deposits, have to a large extent determined the structure of the Chinese iron ore industry. The major and medium size mines often have higher grades, producing concentrates of a quality comparable to the imported ores. The small and medium mines in general have inferior deposits and less stringent quality controls. Not only is the number of iron ore mines in China huge, the number of corporate entities is also high. Most major and medium sized mines are operated as captive mines and are owned by the major steel companies. These are in turn still mostly state owned. Only a few of the major or medium mines are independent.

Iron ore price mechanism and price development

During the financial crises, the price mechanism for iron ore shifted from a long term benchmark price system to a shorter term spot or quarterly termed price system. The breakdown of the benchmark system was due to several factors. One major factors was the rise of a spot market for iron ore out of India. Albeit small volumes initially it clearly indicated levels of willingness to pay for iron ore far above the benchmark agreements. A high and increasing demand for iron ore from the Chinese steel industry during the height of financial crises, combined with the inability of domestic Chinese suppliers to deliver as prices fell below 100 USD/t facilitated the break-down. The pricing power of the dominant miners in seaborne iron ore resulted in major price hikes and a movement to a shorter, more spot market aligned, pricing system. At present, we do not assume that the benchmark system will make a comeback and we see that a spot-based short term pricing system will be the dominant pricing mechanism for the time being.

After the benchmark system, three generally available indices of spot market transactions are published. The publishers are Metal Bulletin, The Steel Index and Platts. They vary slightly in construction but, by and large, reflect the markets for low grade (i.e. 58 % Fe) and medium grade (62 % Fe) iron ore. There is a premium paid for higher grade ore which is presently above what would have been achieved under the old system. The premium for high grade ore (i.e. around or over 66 % Fe) is not to be expected to be linear to the premiums achieved by medium grade above low grade. An outline of The Steel Index prices are found in **Exhibit 12**. The average premium so far is close to 6 USD/Fe-%.

Exhibit 12, development of TSI indices and indicated premium 2008 - 2011



Source: TSI, RMG

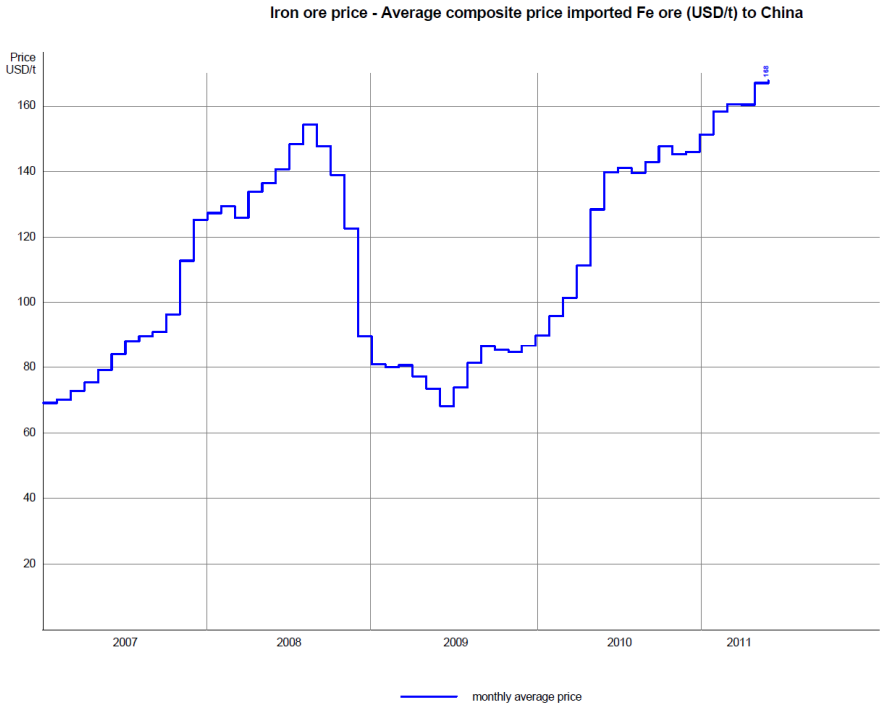
Other iron ore products e.g. lump and pellets will command a premium to sinter fines. The size of this premium is not constant but is in the vicinity of 50 USD/t.

When looking at both short term and long term prices, several factors will influence the nature and results of future price setting:

- First we believe that the level of consolidation in iron ore mining is important and will continue to be important for future price developments.
- Secondly, an increased consolidation, or backwards integration of the steel industry could influence its buying power. However, the steel industry is far less consolidated than the iron ore producers. The slight tendency on the part of steel mills to look for captive mines – partly to diversify sources of supply, and to secure stable long term relationships - would signify a return to a situation that was much more common 30 to 40 years ago but we do not see this as a major trend in the upcoming years.
- Thirdly, the actions of the Chinese, mainly the Chinese authorities can influence prices. Although the Chinese authorities have continued various administrative programs aimed at preventing steel companies from making their own agreements without waiting for the central negotiations we have seen little of this bear fruit. A drastic price cut would also create massive close-down of Chinese mines and increased unemployment, a little wanted scenario by the Chinese authorities.

Taken together, short term prices will stay high for as long as the upcoming five years, see **Exhibit 13** for spot price development. As more and more materials enters the market, we foresee the prices will decline. However, as we are fairly certain on the increasing cost of bringing more Chinese material into the market and combined with increasing Chinese wage inflation, we see a long term price in the range of 120 to 130 USD/t (62 % Fe).

Exhibit 13 Spot price development 2007 to 2011



Source: RMD Iron ore

Price outlook for a Kallak concentrate

Presently, in the spot market, there is a premium per iron unit (% Fe content in ore) between 58 and 62 % Fe (exhibit 12) has varied between 2 and 12 USD/% Fe. Presently, the average is 6 USD/% Fe. In the forecast below, we have assumed a premium for a possible Beowulf concentrate between 3 - 6 USD/t due to high iron content 6 %-units of Fe difference (average 68 % Fe cp to 62 % in TSI).

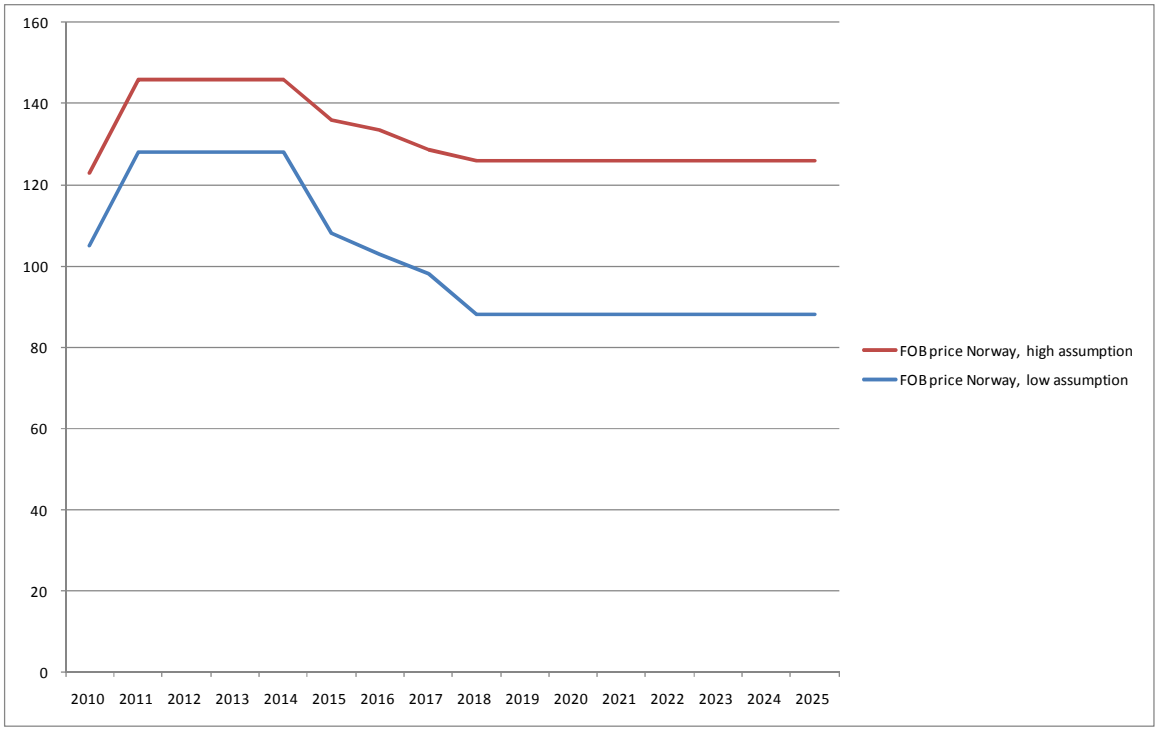
In the calculation, we have assumed that the concentrate will be shipped out of Norway. Based on experience we have assumed freight rates long term will be slightly higher that the level existing presently, summer 2011 or approximately 40 USD/t, dry weigh. We have assumed that the cost for bunker oil has gone down, compared to an earlier assessment by RMG these changes are minor and will even out. We also assume that these levels will prevail for the forecasted time horizon.

The development of freight rates is important since prices are equal for all in the main Chinese market, meaning that nearby suppliers enjoy an advantage. During the last decade, freight rates have varied dramatically, from lows of 5 USD/t to highs of 100 USD/t from Brazil to China. At present, they are influenced by a very large excess supply of shipping capacity, and although they recovered from the very low levels reached in late 2008/early 2009, they have again edged closer to those rates in recent months. We assume that there may be some upward movement as the world economy recovers and the excess supply of shipping capacity is eventually worked off, although that will take at

least four years, assuming that new orders do not increase significantly. However, we do not see a return to the extremely high freight rates of 2007-2008 and we believe that it is reasonable to expect rates to stay at levels just above the present.

The resulting net back prices ranges from 88 USD/t to 126 USD/t in 2025. An outline of a possible development for a Beowulf concentrate is shown in **exhibit 14**.

Exhibit 14 Forecast price development 2010 – 2025 a possible Beowulf concentrate shipped from a Norway port



Sources: TSI (2010), RMG forecast