Company

Deutsche Bank Global Markets Research

Deutsche Bank

October 2010

Global Research

Global Metals & Mining Sector - Infrastructure is the Key

Global Report

Global Metals & Mining Analyst Team

Theme

The engine of global growth has shifted from developed to developing economies with increased dependence on commodity consumption. This shift is driving the transformation of the bulk (coal and iron ore) commodity market from predominantly regional to global in nature. While these commodities are abundant, methods for getting them to market are not. Winners and losers will be determined not just by total delivered cost and quality, but more by infrastructure capacity and constraints. Lead-times are long. Which supply basins and associated corporates will best reap the rewards?

Deutsche Bank AG/London

Research Team

North America

Jorge Beristain
+1(203)863-2381
jorge.beristain@db.com
David S Martin
+1(212)250-5580
david.s.martin@db.com
Wilfredo Ortiz
+1 (212) 250 3251
wilfredo.ortiz@db.com
Paul Cheng
+1 (212) 250 2760
paul.cheng@db.com

Latin America

Rodrigo Barros
+55 (11) 2113 5964
rodrigo.barros@db.com
Silvia Baracaldo
+55 (11) 2113-5187
silvia.baracaldo@db.com

UK/Europe

Robert Clifford
+44 (20) 754 58339
robert.clifford@db.com
Grant Sporre
+44(20) 754 58170
grant.sporre@db.com
Daniel Brebner
+44 (20) 754 73843
daniel.brebner@db.com
Michael Lewis
+44 (20) 754 52166
michael.lewis@db.com
Mathias Carlson
+33 (1) 449 56585
mathias.carlson@db.com
Bastian Synagowitz
+49 (69) 910 36126
bastian.synagowitz@db.com

Asia

Nam Nguyen
+852 2203 5928
olga.okuneva@db.com
James Kan
+886-2-2192-2821
james.kan@db.com
Abhay Laijawala
+91 (22) 6658 4205
abhay.laijawala@db.com
Chanwook Park
+82 (2) 316 8940
chanwook.park@db.com
Steven Tao
+852 2203 6160
steven.tao@db.com
Cherie Khoeng
+62 (21) 318 9542
cherie.khoeng@db.com
Yvonne Tsai
+886-2-2192-2824
yvonne.tsai@db.com
Nora Min
+852-2203-6130
nora.min@db.com
Elizabeth Lee
+852-2203-6158
elizabeth-tp.lee@db.com
Anuj Singla
+61 (3) 9270-4241
anuj.singla@db.com

Japan

Masayuki Nagano
+972 (3) 710-2046
masayuki.nagano@db.com

Australasia

Paul-D Young
+61 (2) 8258 2587
paul-d.young@db.com
Brendan Fitzpatrick
+61 (2) 8258 1519
brendan.fitzpatrick@db.com
Ben-G Wilson
+61 (2) 8258 1424
ben-g.wilson@db.com
Levi Spry
+61 (2) 8258 2611
levi.spry@db.com

CEEMEA

Tim Clark
+27 (11) 775 7268
tim.clark@db.com
Olga Okuneva
+7 (495) 933 9239
olga.okuneva@db.com
George Buzhenitsa
+7 (495) 933 9221
george.buzhenitsa@db.com
Erik Danemar
+7 (495) 933 9219
erik.danemar@db.com
Tomasz Krukowski
+48 (22) 579 8732
tomasz.krukowski@db.com
Shilan Modi
+27 (11) 775 7282
shilan.modi@db.com
Vedat Mizrahi
+90 (212) 319 0327
vedat.mizrahi@db.com

CROCI Team

Janet Lear
+44-207-545-9946
janet.lear@db.com
Francesco Curto
+44-207-545-3201
francesco.curto@db.com
Richard Clarke
+44-207-547-1628
richard-j.clarke@db.com
Virginie Galas
+33-1-4495-6605
virginie.galas@db.com
Colin McKenzie
+44-207-545-2117
colin.mckenzie@db.com
Doug Walters
+1-212-250-1347
doug.walters@db.com
Chris Wane
+44-207-545-1871
christopher.wane@db.com

Contents

Table of Contents

Fundamental Theme: Globalisation of bulk coal and iron ore is straining rail capacity.

The engine of global growth has shifted from developed to developing economies with increased dependence on commodity consumption. This shift is driving the transformation of the bulk (coal and iron ore) commodity market from predominantly regional to global in nature. While these commodities are abundant, methods for getting them to market are not. Winners and losers will be determined not just by total delivered cost and quality, but more by infrastructure capacity and constraints. Lead-times are long. Herein, we attempt to determine which supply basins and associated corporates will best reap the rewards.

Industry Factors/Drivers

1. **Seaborne bulk demand should continue to ramp.** Over the next 3 years, the bulk seaborne market will need to provide 165Mt (24% increase) of thermal coal and 251Mt (27% increase) of iron ore of capacity to meet DB projected forecasts.
2. **Driven by insufficient indigenous production growth**. These increases are driven by rising demand but more tellingly by the increasing inability of demand economies to meet their own needs from indigenous reserves. China lost the ability to keep up with domestic iron ore demand growth around 2005 and coal demand growth 3 years later in 2008.
3. **Coal and iron ore abundant, but infrastructure is not**. Coal and iron ore is abundant and relatively well distributed. The initial surge in demand was met by latent global capacity at existing mines, rails and ports. The previous pricing peak in 2007 was achieved when the global ship capacity became a bottleneck (bulk freight rates increased five-fold in a 2-year period). Freight capacity is not an issue now with the largely private market efficiently correcting. 294 capesize vessels were completed in the last 2.5 years, a 37% increase and requiring 27Mt of steel to construct. The current capesize order book for the next 2.5 years is for 589 vessels (54Mt of steel…~17% of the expected iron ore increase). Rail capacity (to get the product to port) is likely to be the clear bottleneck to supply in all regions of the globe.
4. **Rail increases are the largest global bottleneck**. The key issues driving this are: 1) Most rail is controlled by government or parastatal groups with capital constraints and multiple demands on restricted capital. 2) Sovereign intervention slowing development (tax increases, permitting delays, mineral rights uncertainties). 3) Multiple users with differing growth, demand and cost expectations slow the rail development process. Key rail bottlenecks include; 1) Queensland (Aus) coal rail development, 2) China 3rd rail development, 3) SA coal rail and 4) an aging Russian network.

Source: Deutsche Bank

Key Thinking:

1 **Bulk markets to continue to globalise.** One of the impacts of an increasing trade in a commodity is homogenization of regional prices due to additional demand sinks and supply sources. This has become manifest in changes in the price discovery mechanism for both coal and iron ore – a process that is still ongoing.

2 **Higher average achieved prices likely for producers**. We expect higher average achieved prices through two mechanisms 1) We would expect steady state benchmark and spot based pricing to ultimately be the same; however during periods of shortage and price spikes, spot based pricing should enable the miners to get better advantage from the rises. 2) Increased access to the international market is likely to enable producers to more readily achieve international price parity (or at least closer to it) on domestic product.

3 **New supply markets opening**. Higher achieved prices offer the potential for a number of supply basins to supply more readily into the global market. The US, Russia and Central Europe are potential examples of this.

4 **Supply risk to the downside means bulk pricing could remain elevated for longer**. Total export capacity for thermal coal and iron ore over the next three years is planned to increase by 147mt and 285mtpa, respectively, which would meet our estimated iron ore demand increase but not quite thermal coal expectations at that time. However, planned export increases have fallen short by anything up to 50% over the last few years and we see no reason why planned expansions should now have a better chance of being delivered on time. The market continues to look tight.

Source: Deutsche Bank

Thematic Winners & Underperformers:

The key beneficiaries should fall into two categories.

1. Those that have access to the fastest expanding infrastructure and can gain market share in the export market.
2. Those that will have increased "achieved" pricing from access to international pricing parity.

The largest beneficiaries of coal export growth potential in the next 2-3 years should be the US (109% thermal coal export increase potential) from existing latent infrastructure assuming coal prices are high enough (would need US$115-US$120/tCIF, which is where we forecast 2012 thermal prices to be). In coking coal, Russia (+83% potential in 2-3 years), Australia (+38% potential in 2-3 years) and Canada (+31% potential in 2-3 years) are the regions that look likely to have the largest incremental change.

The largest iron ore export growth potential is from Canada (100%) and Brasil (37%), but we only forecast the natural European market for these two to increase by 12Mt over the next three years, leaving South Africa and Australian suppliers with their proximity to the largest demand market (China) as likely beneficiaries.

Within this context we believe the companies likely to be the largest beneficiaries of the shift in market dynamics and remain of key value globally are: Alpha Natural Resources, ARM, BHP Billiton, Vale, and Rio Tinto.

Source: Deutsche Bank

Global beneficiaries

We have looked at the likely global miner beneficiaries in context of the tightening market. In our view, miners that should be beneficiaries will have;

1) Good growth prospects capability

2) Control of infrastructure (helping ensure growth is more likely)

3) Regionally priced product that may be able to be priced at higher levels if pricing becomes more globalised.

The best growth plans

The top five growth companies in the bulk sector from 2010 to 2012 based on company plans are: Raspadskaya, Whitehaven Coal, CSN, Cliffs Natural Resources and Fortescue.

Figure 1: Top 10 companies under coverage by 2-year growth potential

			production growth over 2 years			
	Priced	Market cap (US$m)	Thermal	Coking	Iron ore	Average Growth
Raspadskaya	USD	4,496		88%		88%
Whitehaven Coal	AUD	3,010	61%	111%		86%
CSN	USD	26,508			50%	50%
Cliffs	USD	9,297		92%	2%	47%
Fortescue Metals	AUD	19,256			37%	37%
Macarthur Coal Ltd	AUD	3,728		30.6%		31%
Centennial Coal Co Ltd	AUD	2,397	31%			31%
Vale	USD	174,627			29%	29%
MMX	BRL	14,672			28%	28%
Mechel	USD	11,476	10%	41%		26%

Source: Deutsche Bank, company data.

Control of Infrastructure

Of the bulk producing stocks under DB coverage, nine have control of their infrastructure, so will be more likely to be able to deliver growth. They are: Adaro Energy, Indika, Bumi, Ferrexpo, Fortescue, BHP Billiton, Rio Tinto and Vale.

Pricing uplift potential

The DB mining team believes that 11 of the stocks that we have under coverage have the potential to benefit from achieved pricing uplift if the bulk market prices continue to globalize: Alpha Natural Resources, Arch Coal, Centennial Coal, Cliffs, ENRC, Ferrexpo, Mechel, MMX, New World Resources, Raspadskaya and Semirara Mining.

A full breakdown for all the companies covered is included in Figure 30.

Regional outcomes – Rail is the common issue

We examine each of the following regions in more detail through the report but have summarized our view of the key characteristics of each of these markets relative to the bulk commodity market.

Figure 2: Regional characteristics

Region	Key bulk characteristics
North America	Large reserves of bulk commodities, but generally "land-locked". It has the largest amount of ready-made export infrastructure, but needs prices to be high enough to justify the export costs.
China	Significant producer of both coal and iron ore, but has not been able to keep up with its demand needs. Increasing net importer.
India	A big unknown and potentially the most influential region on the near-term supply and demand balances for the bulk commodities. – large iron ore and coal deposits offer the potential for significant production increase, but its own rapid development may more than consume this with the potential to actually reduce exports.
Russia	Abundant coal and iron ore reserves, but they are located significant distances from ports. Aging rail infrastructure will hamper significant increases in export capability in the near to medium term
Australia	Best positioned bulk reserves close to the coast and close to the main Asian growth region. Currently rail and port constrained with large infrastructure spend needed.
Brasil	Best quality developed iron ore reserves - far from the main growth market, but quality premiums and larger ships provide opportunities for growth.
Europe	A net importer of bulk commodities.
South Africa	Large reserve base, reasonably positioned to supply both Europe and Asia but is suffering from significant infrastructure constraints (power, rail and port).

Source: Deutsche Bank

Global Comparative Valuations

Figure 3: Global Comparative Valuations

Ticker by region	Company	Type	Price	Target	Rec	Priced	M Cap $m	P/NPV	P/E			EV/EBITDA		Free Cash flow Yield			ROE			Net debt to eq %		Div Yield	
									2010	2011	2012	2010	2011	2010	2011	2012	2010	2011	2012	2010	2011	2010	2011
BHP.AX	Bhp Billiton	Diversified	2215.0	2200.0	Buy	GBP	217,572	1.01	13.2	9.5	7.6	6.8	5.4	5.3	5.0	8.1	52.1	165.0	38.3	6.7	0.5	3.0	2.6
NCM.AX	Newcrest Mining Ltd	Gold & Silver	42.5	47.5	Buy	AUD	31,544	1.72	21.2	19.7	13.1	11.4	11.0	3.2	1.5	5.6	16.8	13.1	15.1	(4.3)	(2.9)	0.8	0.9
FMG.AX	Fortescue Metals	Iron ore	6.4	4.5	Sell	AUD	19,743	1.48	15.0	18.7	10.1	10.7	8.0	4.8	8.4	5.9	68.3	43.3	44.6	117.8	1.2	0.0	0.0
OZL.AX	Oz Minerals	Copper	1.7	1.3	Hold	AUD	5,175	1.26	12.5	11.6	9.5	7.6	6.9	12.3	12.6	13.6	14.7	13.3	14.0	(45.9)	(51.4)	5.7	5.2
AWC.AX	Alumina	Aluminium	2.1	2.0	Hold	AUD	5,006	1.04	75.5	14.5	10.9	60.9	14.7	2.5	6.9	9.2	2.3	12.0	14.3	15.1	9.7	1.9	1.9
EQN.AX	Equinox Minerals	Copper	6.2	5.0	Sell	AUD	4,367	1.24	13.9	8.5	8.0	9.7	5.1	9.3	17.2	18.0	33.6	34.5	23.0	3.8	(36.8)	0.0	0.0
BSL.AX	Bluescope Steel Ltd	Steel	2.2	3.9	Buy	AUD	3,958		45.0	11.3	8.7	10.4	6.1	1.4	3.6	1.2	2.0	6.0	7.5	14.5	14.4	1.8	6.0
OST.AX	Onesteel Ltd	Steel	2.9	3.1	Hold	AUD	3,787	0.92	17.9	9.4	8.1	8.4	5.5	11.0	5.5	6.3	5.5	8.9	9.8	21.5	22.9	3.4	5.3
MCC.AX	Macarthur Coal Ltd	Coal	13.0	13.0	Hold	AUD	3,786	1.21	18.6	11.4	8.8	11.1	6.9	6.3	4.1	6.5	13.3	21.1	23.0	(22.0)	(20.3)	2.4	4.4
SGM.AX	Sims Group Ltd	Steel	17.4	16.9	Hold	AUD	3,464		34.3	15.6	8.2	9.9	6.9	NM	5.6	5.2	4.1	6.7	12.1	(0.5)	(3.1)	1.5	3.3
AND.AX	Andean Resources Ltd	Gold & Silver	6.4	6.8	Hold	AUD	3,425	1.92	NM	NM	19.5	(141.8)	(324.6)	NM	NM	0.5	(13.2)	0.2	41.8	(43.7)	(41.3)	0.0	0.0
WHC.AX	Whitehaven Coal Limited	Coal	6.4	6.0	Hold	AUD	3,121	1.12	38.5	24.4	12.8	16.8	14.0	NM	NM	7.8	5.9	12.0	20.7	(4.5)	(0.6)	1.3	2.0
ILU.AX	Iluka Resources	Diversified	6.9	5.4	Hold	AUD	2,877	1.31	150.6	20.4	18.3	12.3	8.9	0.5	6.0	6.6	1.8	12.1	12.6	34.5	22.7	0.0	2.9
PDN.AX	Paladin Energy Limited	Uranium	4.0	2.9	Sell	AUD	2,859	1.37	NM	55.5	27.3	282.8	20.6	NM	0.5	5.2	(6.0)	5.7	10.6	39.9	39.5	0.0	0.0
LYC.AX	Lynas Corporation Ltd	Minor metals	1.7	1.8	Buy	AUD	2,819	0.95	NM	NM	NM	(7.5)	(128.4)	NM	NM	NM	(10.5)	(1.6)	(0.1)	(65.5)	(19.5)	0.0	0.0
ERA.AX	Era	Uranium	13.4	16.7	Buy	AUD	2,553	0.81	31.0	16.5	11.4	13.0	8.3	1.3	6.6	8.2	8.6	14.7	18.7	(22.2)	(31.7)	1.1	1.2
CEY.AX	Centennial Coal Co Ltd	Coal	6.2	6.2	Hold	AUD	2,438	1.50	26.8	15.6	11.8	9.7	8.1	NM	4.1	7.5	7.5	20.2	24.1	41.3	32.6	2.2	3.4
PNA.AX	PanAust Limited	Copper	0.8	0.7	Buy	AUD	2,381	1.25	17.5	11.2	7.8	9.3	6.4	8.3	6.8	15.8	20.9	23.9	25.5	(20.3)	(27.4)	0.0	0.0
EXT.AX	Extract Resources	Uranium	6.2	7.3	Buy	AUD	1,506	0.77	NM	NM	NM	(36.1)	(243.3)	NM	NM	NM	(27.7)	(2.6)	(0.9)	(45.8)	(22.5)	0.0	0.0
KCN.AX	Kingsgate Consolidated	Gold & Silver	12.2	12.5	Hold	AUD	1,210	1.24	11.5	11.4	6.5	8.2	8.9	2.1	NM	15.6	26.9	31.0	44.3	(12.0)	4.8	4.1	4.4
WSA.AX	Western Areas	Nickel	6.4	6.6	Buy	AUD	1,151	0.98	62.9	8.1	6.0	19.1	4.7	NM	18.6	26.9	9.2	48.2	33.2	133.7	12.3	1.2	2.3
MML.AX	Medusa Mining	Gold & Silver	5.6	6.1	Buy	AUD	1,046	0.92	7.5	9.1	6.6	6.4	8.1	5.7	9.0	13.3	51.2	52.3	48.5	(18.5)	(35.7)	0.0	1.8
MRE.AX	Minara Resources	Nickel	0.80	0.72	Hold	AUD	930	1.11	10.7	6.6	6.0	3.9	2.3	18.6	18.1	18.6	10.5	15.9	15.2	(38.6)	(44.9)	2.0	6.1
AVO.AX	Avoca Resources	Gold & Silver	3.2	3.5	Hold	AUD	920	1.10	10.0	7.5	5.6	4.0	4.2	13.8	15.9	19.6	24.9	36.2	34.4	1.7	(29.9)	0.0	0.0
MBN.AX	Mirabela	Nickel	1.8	1.8	Hold	AUD	873	0.99	NM	16.4	6.2	170.6	8.3	NM	14.4	26.0	(6.4)	6.7	14.9	24.0	12.0	0.0	0.0
SBM.AX	St Barbara	Gold & Silver	0.4	0.4	Hold	AUD	865	1.27	34.5	10.4	4.8	5.1	5.1	NM	4.9	22.1	3.9	21.8	34.5	(24.7)	(27.0)	0.0	0.0
IGO.AX	Independence Group	Nickel	7.2	6.8	Buy	AUD	813	1.05	17.9	19.6	11.0	6.5	9.4	12.0	7.0	12.1	14.0	17.5	24.3	(67.0)	(62.8)	1.1	0.8
PAN.AX	Panoramic Resources	Nickel	2.8	2.9	Buy	AUD	577	0.97	8.5	8.2	4.7	3.0	3.3	27.8	18.8	28.8	19.3	20.9	27.9	(45.6)	(51.7)	7.1	3.5
MCR.AX	Mincor Resources	Nickel	2.0	1.9	Hold	AUD	398	1.06	13.9	11.6	8.2	3.3	3.0	17.8	10.5	15.6	13.9	16.4	20.8	(61.4)	(66.5)	4.6	2.0
JML.AX	Jabiru Metals Ltd	Zinc	0.56	0.62	Buy	AUD	305	0.90	18.4	8.9	4.4	10.2	5.0	13.8	1.1	5.6	14.4	33.3	44.6	(35.0)	(34.3)	0.0	0.0
BANP.BK	Banpu	Coal	720.0	842.0	Buy	THB	6,561	1.22	6.9	9.1	8.2	12.0	5.3	NM	11.8	9.7	46.7	26.8	24.8	93.6	53.1	2.5	3.3
SSI.BK	Sahaviriya Steel Industries	Steel	1.8	2.2	Hold	THB	769		6.5	7.0	6.9	7.1	6.4	14.1	8.0	11.0	18.9	14.7	13.2	83.6	65.8	0.0	3.6
SAIL.BO	Steel Authority Of India	Steel	224.4	245.0	Buy	INR	21,015		13.7	11.3	9.2	9.4	7.1	NM	2.2	1.9	22.1	22.6	23.3	(16.6)	(16.8)	1.5	1.8
STRL.BO	Sterlite Industries	Diversified	181.9	200.0	Buy	INR	14,214		55.4	10.0	7.3	35.6	5.4	NM	6.0	18.0	11.9	15.4	17.6	13.0	2.9	0.1	0.4
TISC.BO	Tata Steel Limited	Steel	650.6	720.0	Buy	INR	13,708		327.1	8.9	6.8	11.6	6.0	9.2	15.4	12.4	(3.3)	22.6	24.9	180.6	136.6	2.3	3.3
SESA.BO	Sesa Goa	Iron ore	373.5	421.0	Buy	INR	7,037		12.8	6.4	4.2	9.1	3.8	7.3	13.6	13.4	39.0	49.1	50.8	(56.2)	50.8	0.8	1.5
NALU.BO	Nalco	Aluminium	407.1	126.0	Sell	INR	5,947		25.8	18.0	-	14.5	11.2	NM	0.4	-	10.1	13.3	-	(19.2)	(15.3)	1.2	1.5
JSTL.BO	Jsw Steel	Steel	1347.9	1500.0	Buy	INR	5,716		10.0	16.2	9.1	7.6	7.2	7.4	NM	20.3	19.3	16.9	19.1	175.6	79.8	1.2	0.7
NYR.BR	Nyrstar Nv	Zinc	10.7	12.0	Buy	EUR	1,472	0.90	10.7	4.8	3.1	6.4	3.2	NM	6.4	16.3	12.9	36.9	44.8	63.9	45.5	0.9	3.7
TKAG.DE	Thyssenkrupp	Steel	26.2	31.0	Buy	EUR	17,120	1.75	21.5	10.5	7.5	7.2	5.3	NM	11.3	12.6	6.7	12.1	15.2	32.6	20.0	1.5	3.1
SZGG.DE	Salzgitter	Steel	53.0	72.0	Buy	EUR	4,163		32.2	9.4	6.7	6.1	3.7	NM	2.2	11.9	1.6	7.7	10.0	(31.7)	(32.0)	0.9	1.3
NAFG.DE	Aurubis	Copper	37.2	45.0	Buy	EUR	2,142	0.83	14.6	8.8	7.1	5.5	5.2	NM	6.0	23.7	15.1	14.3	16.1	39.1	31.7	2.7	4.3
OUT1V.HE	Outokumpu	Steel	14.5	17.5	Buy	EUR	3,701		40.7	6.2	6.2	12.1	5.2	NM	NM	17.6	2.7	16.6	15.0	73.9	72.6	2.4	4.8
RTRKS.HE	Rautaruukki	Steel	15.6	18.0	Buy	EUR	3,055		40.9	13.1	8.5	9.6	6.1	0.7	1.0	10.3	1.9	10.9	15.6	25.9	27.4	3.2	4.6
EREGL.IS	Erdemir	Steel	5.7	5.8	Buy	TRY	6,437		13.6	10.0	13.5	8.2	6.6	2.5	15.2	11.3	10.9	13.4	9.4	46.9	32.0	0.0	0.0
BILJ.J	Bhp Billiton	Diversified	240.0	270.0	Buy	ZAR	217,572	1.01	13.2	9.5	7.6	6.8	5.4	5.3	5.0	8.1	52.1	165.0	38.3	6.7	0.5	3.0	2.6
AMSJ.J	Angloplat	PGM	716.0	845.0	Hold	ZAR	27,809	1.04	32.1	18.8	12.8	14.2	9.6	1.1	3.9	6.8	22.6	32.4	43.2	13.7	8.2	0.8	2.7
KIOJ.J	Kumba Iron Ore Ltd	Iron ore	394.9	350.0	Hold	ZAR	18,679	1.72	8.9	10.3	7.3	5.1	5.6	3.1	2.9	7.6	131.8	76.9	80.6	8.6	6.0	7.5	6.5
IMPJ.J	Impala Platinum	PGM	195.0	230.0	Buy	ZAR	17,285	1.10	25.9	12.5	8.7	13.5	7.3	1.0	4.6	7.7	17.5	31.8	40.5	(0.6)	(0.8)	2.0	4.4
EXXJ.J	Exxaro Resources Ltd	Diversified	129.5	145.0	Buy	ZAR	6,617	0.90	7.9	6.4	4.3	8.0	5.6	4.8	2.4	15.8	38.4	35.5	40.2	9.1	12.6	4.1	5.3
ARIJ.J	ARM	Diversified	178.5	230.0	Buy	ZAR	5,598	0.77	20.8	8.0	6.0	7.6	3.6	0.1	8.1	13.3	10.7	24.1	26.0	1.7	(9.1)	1.2	3.2
NHMJ.J	Northam	PGM	46.9	53.5	Buy	ZAR	2,497	1.30	30.6	17.6	13.1	19.9	11.4	2.3	0.5	NM	37.0	63.3	82.7	(10.8)	(7.6)	1.1	1.9
MVLJ.J	Mvelaphanda Resources	Diversified	46.2	53.0	Hold	ZAR	1,468	0.78	44.1	32.2	27.0	NM	NM	4.3	3.0	4.0	7.2	24.6	3.2	0.6	(2.2)	0.0	0.0

Source: Deutsche Bank estimates; pricing data as of 15 October, 2010

Figure 4: Global Comparative Valuations (Contd…)

Ticker by region	Company	Type	Price	Target	Rec	Priced	M Cap $m	P/NPV	P/E			EV/EBITDA		Free Cash flow Yield			ROE			Net debt to eq %		Div Yield	
									2010	2011	2012	2010	2011	2010	2011	2012	2010	2011	2012	2010	2011	2010	2011
MTXJ.J	Metorex Ltd	Diversified	4.4	6.0	Buy	ZAR	565	0.71	8.5	4.2	2.7	2.2	2.1	35.7	7.1	25.7	28.8	24.8	30.8	9.9	(8.7)	0.0	0.0
MRFJ.J	Merafe Resources	Minor metals	1.5	1.9	Buy	ZAR	527	0.76	10.7	4.0	6.3	6.3	2.5	NM	11.1	4.4	13.6	29.7	15.9	4.8	(4.3)	0.8	5.0
ADRO.JK	Adaro Energy	Coal	2175.0	2700.0	Buy	IDR	7,797	0.81	17.3	9.8	7.1	6.8	4.3	4.8	7.9	11.7	21.2	30.7	34.2	27.3	10.6	2.9	5.1
INCO.JK	Pt Inco	Nickel	4950.0	5200.0	Buy	IDR	5,512		27.2	20.4	12.2	14.2	10.7	2.1	4.3	NM	11.5	13.9	6.8	(16.6)	(23.5)	1.1	0.0
BUMI.JK	Bumi	Coal	2400.0	2000.0	Hold	IDR	5,219	1.70	14.5	7.6	5.5	6.2	3.7	5.4	10.1	17.9	25.0	31.6	31.7	193.3	121.6	0.0	2.0
PTBA.JK	Pt Bukit Asam	Coal	20200.0	22200.0	Buy	IDR	5,216	1.27	18.8	9.8	7.7	12.8	6.2	3.4	8.2	12.3	39.1	54.6	49.3	(71.8)	(71.8)	2.7	5.1
ANTM.JK	Antam	Nickel	2500.0	2900.0	Buy	IDR	2,673		19.5	12.0	-	9.5	6.0	3.7	6.5	-	13.6	19.0	-	(34.8)	(40.8)	1.8	2.9
005490.KS	Posco	Steel	497000.0	644000.0	Buy	KRW	39,004	0.77	9.7	9.3	9.3	4.4	4.0	0.5	3.0	2.4	13.3	12.7	11.5	11.4	10.3	1.6	1.6
004020.KS	Hyundai Steel	Steel	116500.0	126000.0	Buy	KRW	8,903	0.92	10.6	7.7	7.3	9.9	5.5	NM	13.0	8.4	14.0	15.8	14.2	76.1	44.6	0.4	0.4
001230.KS	Dongkuk Steel	Steel	27700.0	28000.0	Hold	KRW	1,542	1.02	6.7	8.5	8.5	3.8	3.7	NM	1.0	5.1	6.3	6.7	6.4	31.4	28.7	2.1	2.1
BLT.L	Bhp Billiton	Diversified	2215.0	2200.0	Buy	GBP	217,572	1.01	13.2	9.5	7.6	6.8	5.4	5.3	5.0	8.1	52.1	165.0	38.3	6.7	0.5	3.0	2.6
RIO.L	Rio Tinto	Diversified	4134.5	4150.0	Buy	GBP	136,838	1.00	9.3	8.7	7.3	5.6	4.6	8.3	9.1	11.7	69.5	186.7	24.4	14.2	(2.5)	1.4	1.6
XTA.L	Xstrata	Diversified	1342.0	1605.0	Buy	GBP	62,342	0.84	11.2	6.8	5.4	6.7	4.1	3.5	5.8	16.6	15.9	22.3	22.6	19.3	9.0	0.6	0.9
AAL.L	Anglo American	Diversified	2863.5	3400.0	Buy	GBP	55,258	0.84	10.7	7.6	5.2	5.2	3.8	4.7	7.0	8.3	18.9	23.1	26.5	21.9	9.0	1.3	1.1
NLMKq.L	Novolipetsk Steel	Steel	38.3	34.0	Hold	USD	22,954	0.94	18.8	11.4	9.7	9.9	7.2	NM	2.7	7.6	13.8	20.8	21.3	22.4	19.1	1.6	2.6
ANTO.L	Antofagasta Plc	Copper	1313.0	1000.0	Hold	GBP	20,730	1.31	19.4	13.5	11.1	7.5	4.3	2.6	12.3	16.3	18.7	22.7	23.6	(18.0)	(26.6)	1.6	2.4
ENRC.L	ENRC PLC	Diversified	941.0	1321.0	Buy	GBP	19,421	0.71	9.2	6.2	5.3	5.7	3.8	4.4	8.5	6.2	24.0	28.7	27.1	(0.9)	(6.9)	1.6	3.2
CHMFq.L	Severstal	Steel	15.2	17.7	Buy	USD	15,309	1.06	NM	9.6	11.5	6.3	5.0	2.3	8.4	8.1	(0.2)	20.5	14.7	58.1	33.6	(0.0)	2.6
FRES.L	Fresnillo	Gold & Silver	1311.0	1260.0	Hold	GBP	15,057	1.94	34.6	20.1	16.9	17.2	10.8	1.4	4.9	6.4	33.7	42.7	39.0	(20.6)	(34.8)	1.5	2.4
HK1q.L	Evraz Group	Steel	30.6	30.0	Hold	USD	13,399	0.63	262.0	17.5	16.0	8.9	6.2	7.0	15.7	16.8	0.5	7.3	7.5	67.0	46.4	0.0	1.8
KAZ.L	Kazakhmys Plc	Copper	1417.0	1444.0	Hold	GBP	12,146	0.98	10.6	6.1	5.6	5.8	3.9	2.2	NM	4.0	18.0	27.0	26.2	6.4	6.7	0.9	1.6
PLZLq.L	Polyus Gold	Gold & Silver	31.9	34.4	Buy	USD	11,464	1.71	21.7	13.6	9.9	13.1	8.7	1.1	3.0	7.2	16.4	22.8	26.1	(4.5)	(7.1)	1.2	1.8
MAGNq.L	Magnitogorsk Steel	Steel	12.7	17.0	Buy	USD	10,839	0.85	10.8	9.0	9.8	5.0	3.8	6.1	10.1	10.9	10.2	11.3	9.5	8.4	1.1	1.8	2.2
VED.L	Vedanta Resources	Diversified	2302.0	2150.0	Hold	GBP	9,880	0.91	17.0	9.2	4.5	7.9	10.7	NM	NM	26.3	16.9	26.3	42.7	8.0	104.2	1.4	1.3
RRS.L	Randgold	Gold & Silver	6595.0	6350.0	Hold	GBP	9,569	2.11	60.5	22.2	14.6	37.0	12.9	NM	0.3	3.2	9.8	21.5	26.1	(16.8)	(13.7)	0.2	0.3
PMTLq.L	Polymetal	Gold & Silver	17.6	17.0	Hold	USD	6,282	1.46	29.4	11.3	7.7	17.2	8.0	NM	3.7	10.5	20.9	39.5	38.9	62.3	27.8	0.0	0.0
LMI.L	Lonmin Plc	PGM	1836.0	1800.0	Hold	GBP	5,941	1.34	39.6	25.8	15.0	18.1	11.3	NM	NM	0.4	11.6	17.5	29.6	11.2	7.2	0.0	0.7
TRMKq.L	Tmk	Steel	18.4	25.0	Buy	USD	4,014		19.0	10.7	7.3	7.7	6.2	19.8	15.3	20.6	13.8	21.1	25.2	179.0	136.5	1.3	2.3
ABGL.L	African Barrick	Gold & Silver	564.0	730.0	Buy	GBP	3,704	1.10	16.4	9.6	7.2	7.6	4.7	4.5	6.0	4.7	14.1	13.9	16.0	(15.8)	(18.9)	0.5	1.0
FXPO.L	Ferrexpo Plc	Iron ore	350.1	393.0	Buy	GBP	3,277	0.89	7.9	6.0	4.5	5.8	4.1	7.5	12.0	8.4	64.6	53.1	44.8	6.7	(22.9)	1.2	1.2
AQP.L	Aquarius Platinum Limited	PGM	398.8	370.0	Buy	GBP	2,900	1.28	61.3	30.1	12.4	15.4	10.9	0.7	2.3	6.4	4.9	12.4	25.6	(14.6)	(16.5)	0.9	1.3
ACX.MC	Acerinox Sa	Steel	12.8	20.0	Buy	EUR	4,502		9.3	7.0	5.7	7.1	5.0	1.3	7.6	13.2	20.9	23.6	24.0	70.4	53.3	3.7	3.9
TUBA.MC	Tubacex	Steel	2.5	4.0	Buy	EUR	466		20.4	14.2	-	9.2	7.6	NM	NM	-	6.5	8.5	-	62.7	62.3	2.0	2.9
GMEXICOB.MX	Grupo Mexico	Copper	41.8	40.0	Hold	MXN	26,250	0.87	16.0	8.4	6.9	7.0	4.0	9.1	12.3	14.2	29.0	42.2	38.2	10.4	(7.9)	1.7	3.1
VALE.N	Vale	Diversified	32.8	42.0	Buy	USD	174,414	0.94	11.2	9.0	6.3	8.1	6.4	0.3	8.3	12.8	24.8	25.0	28.9	20.2	3.6	1.5	1.6
MT.N	Arcelor-Mittal	Steel	35.3	38.0	Hold	USD	53,303	0.80	16.9	12.7	9.2	8.4	6.4	0.2	4.3	4.9	5.3	6.8	8.9	29.3	25.9	2.1	1.7
ABX.N	Barrick Gold	Gold & Silver	48.7	58.0	Buy	USD	48,582	1.39	16.0	11.7	9.6	9.3	6.5	2.6	6.8	8.9	18.4	21.0	21.1	15.8	2.1	0.9	1.0
FCX.N	Freeport-Mcmoran	Copper	99.0	90.0	Hold	USD	46,822	1.14	11.6	9.9	8.6	5.3	4.4	9.8	11.6	12.8	37.0	32.5	29.4	2.5	(20.9)	1.1	2.0
SCCO.N	Southern Copper	Copper	41.3	40.0	Buy	USD	35,131	1.38	21.7	11.2	9.5	11.8	6.6	4.2	7.8	8.6	40.7	70.9	74.3	15.5	12.8	3.9	7.2
GG.N	Goldcorp	Gold & Silver	45.0	46.0	Hold	USD	33,061	1.13	25.1	19.7	14.8	16.6	10.8	NM	3.4	5.1	8.3	9.8	11.8	1.1	(4.2)	0.4	0.4
NEM.N	Newmont Mining	Gold & Silver	62.5	77.0	Buy	USD	30,754	0.74	16.2	11.4	9.9	6.1	4.2	8.8	11.5	13.4	16.3	18.7	16.9	(1.4)	(19.5)	0.8	1.0
SID.N	CSN	Steel	17.6	24.0	Buy	USD	26,705	0.78	11.6	8.5	5.9	7.9	7.1	5.2	6.3	12.2	55.6	62.6	75.9	92.1	94.4	6.6	9.2
KGC.N	Kinross Gold	Gold & Silver	19.3	20.0	Hold	USD	21,904	0.77	29.3	17.6	12.3	12.6	7.0	0.4	3.7	4.7	8.3	14.8	17.9	(9.2)	(14.7)	0.5	0.5
GGB.N	Gerdau	Steel	13.3	17.0	Hold	USD	18,858	1.45	13.1	11.8	10.5	8.0	7.0	9.0	2.2	4.0	11.9	12.7	13.3	35.8	33.5	3.0	2.2
AA.N	Alcoa	Aluminium	13.1	14.0	Hold	USD	13,755	1.09	68.8	9.9	7.5	9.2	5.6	5.0	9.3	12.7	1.7	10.4	12.5	50.6	39.3	0.9	0.9
BTU.N	Peabody Energy	Coal	51.5	55.0	Hold	USD	13,737	1.13	17.3	11.3	7.8	8.7	6.5	0.8	1.3	9.9	19.6	24.1	27.1	38.2	28.5	0.5	0.5
NUE.N	Nucor	Steel	39.6	45.0	Buy	USD	12,516	0.91	61.9	19.6	10.5	13.9	8.7	NM	3.5	6.7	2.8	8.8	15.5	29.4	29.0	3.6	3.6
MTL.N	Mechel	Steel	24.8	26.1	Hold	USD	11,700		18.8	9.7	8.8	9.4	6.2	NM	7.5	5.8	15.3	25.9	24.9	124.3	97.3	1.6	3.1
CLF.N	Cliffs	Iron ore	68.2	95.0	Buy	USD	9,282	0.78	8.7	6.9	6.0	5.1	3.7	NM	13.1	15.4	34.3	31.0	26.9	12.2	(13.8)	0.6	0.5
TX.N	Ternium	Steel	35.8	47.0	Hold	USD	7,187	1.96	10.1	7.9	12.0	3.9	2.9	17.9	14.0	12.9	12.7	14.2	8.5	(26.4)	(32.7)	1.4	1.7
X.N	Us Steel	Steel	43.9	54.0	Buy	USD	6,874	0.74	NM	14.8	8.5	10.3	6.6	NM	4.0	7.0	(2.8)	10.6	16.3	56.7	46.8	0.5	0.5
ANR.N	Alpha Natural Resources	Coal	46.8	55.0	Buy	USD	5,618	0.94	15.7	10.0	7.0	6.7	4.6	NM	8.0	12.1	9.5	18.2	21.3	12.5	(2.7)	0.0	0.0
ATI.N	Allegheny Technologies	Steel	48.6	47.0	Hold	USD	4,726	1.29	35.6	15.6	12.0	13.0	7.6	NM	NM	2.1	6.7	15.3	17.5	30.9	32.4	1.5	1.5
ACI.N	Arch Coal	Coal	26.9	32.0	Buy	USD	4,371	1.11	27.2	12.0	7.3	8.7	5.9	2.2	9.0	13.4	8.1	15.4	21.5	76.6	54.5	1.4	1.5
TC.N	Thompson Creek	Minor metals	11.7	13.0	Hold	USD	1,981	1.17	9.7	8.8	17.8	9.2	5.3	NM	NM	NM	15.0	15.1	6.5	(7.2)	9.9	0.0	2.3

Source: Deutsche Bank estimates; pricing data as of 15 October, 2010

Figure 5: Global Comparative Valuations (Contd…)

Ticker by region	Company	Type	Price	Target	Rec	Priced	M Cap $m	P/NPV	P/E			EV/EBITDA		Free Cash flow Yield			ROE			Net debt to eq %		Div Yield	
									2010	2011	2012	2010	2011	2010	2011	2012	2010	2011	2012	2010	2011	2010	2011
CDE.N	Coeur D'Alene Mines	Gold & Silver	20.8	22.0	Hold	USD	1,842	1.30	NM	11.5	6.9	10.9	4.9	NM	9.8	15.0	(1.1)	7.3	11.1	12.0	5.4	0.0	0.0
AKS.N	Ak Steel	Steel	14.3	15.0	Hold	USD	1,560	0.75	52.3	16.1	7.2	6.9	5.2	NM	3.9	10.8	(0.7)	11.0	21.2	47.1	39.1	1.4	1.4
NHY.OL	Norsk Hydro Asa	Aluminium	37.5	36.6	Hold	NOK	9,338	1.02	28.8	11.1	10.7	7.2	5.6	NM	0.8	7.9	3.6	8.1	11.4	(9.9)	(6.3)	0.9	1.6
ARLP.OQ	Alliance Resource L.P.	Coal	60.9	57.0	Hold	USD	2,234	1.31	8.5	8.9	8.1	5.2	5.1	9.1	9.8	13.5	66.9	48.3	43.8	86.0	74.6	5.3	6.6
NWRS.PR	New World Resources	Coal	222.8	300.0	Buy	CZK	3,382		8.5	8.1	-	4.9	3.9	7.5	15.8	-	40.4	32.0	-	29.8	1.0	5.9	6.1
PX.PS	Philex Mining	Copper	14.6	8.2	Sell	PHP	1,661		18.7	16.6	-	11.4	9.7	4.9	6.0	-	23.0	21.6	-	8.1	30.1	0.5	1.2
SCC.PS	Semirara Mining	Coal	157.9	150.0	Buy	PHP	1,303	1.05	14.3	10.3	6.0	9.5	7.5	NM	7.9	16.2	30.8	38.4	50.4	84.8	60.6	3.2	5.1
GMKN.RTS	Norilsk Nickel	Diversified	178.0	210.0	Buy	USD	31,333	0.86	6.4	5.3	5.2	4.0	3.1	10.6	13.2	17.4	32.2	31.0	25.6	1.1	(11.9)	3.9	4.7
RASP.RTS	Raspadskaya	Coal	5.8	7.2	Buy	USD	4,512	0.76	21.5	8.8	6.0	11.8	5.5	0.5	6.1	13.9	14.9	30.6	38.5	18.2	0.4	0.0	2.8
CHEP.RTS	Chelpipe	Steel	1.7	0.0	Hold	USD	779		6.3	7.7	4.6	6.1	6.2	NM	NM	NM	101.8	43.0	45.4	NM	778.2	0.0	0.0
MMXM3.SA	MMX	Iron ore	12.9	17.0	Buy	BRL	14,662	0.92	246.2	21.2	32.2	130.7	43.1	NM	NM	0.4	7.5	26.5	14.3	60.7	78.1	0.0	0.0
USIM5.SA	Usiminas	Steel	21.1	32.0	Hold	BRL	12,559	0.53	18.4	16.9	9.1	7.9	8.4	NM	NM	5.7	7.1	7.1	12.2	7.3	16.1	2.3	1.1
SSABa.ST	Ssab	Steel	110.3	115.0	Hold	SEK	5,454		13.9	8.5	6.7	10.7	6.6	NM	11.3	11.6	5.1	9.4	11.8	49.7	37.4	2.3	4.5
BOL.ST	Boliden Ab	Zinc	109.5	83.4	Hold	SEK	4,572	1.31	8.3	5.9	4.2	5.3	3.8	NM	10.6	18.8	20.7	24.5	28.2	40.8	24.5	3.7	5.5
SSO.TO	Silver Standard	Gold & Silver	24.2	24.0	Hold	CAD	1,897		NM	34.7	18.0	106.5	14.0	NM	1.7	NM	(2.5)	8.2	14.1	10.7	5.8	0.0	0.0
2002.TW	China Steel	Steel	31.4	30.0	Hold	TWD	13,403		11.6	12.0	11.6	6.5	6.0	NM	10.3	NM	13.7	12.5	12.4	38.0	34.1	6.0	5.9
VOES.VI	Voestalpine	Steel	29.7	27.0	Hold	EUR	6,997	1.65	19.0	11.3	9.3	7.8	6.6	27.2	2.2	9.2	3.4	11.6	13.5	123.2	113.9	2.2	2.5
KGHM.WA	Kghm	Copper	131.5	135.0	Buy	PLN	9,505	1.08	6.6	5.1	4.4	3.6	2.6	13.2	15.2	17.0	33.0	33.6	31.9	(17.2)	(25.6)	7.6	9.8

Source: Deutsche Bank estimates; pricing data as of 15 October, 2010

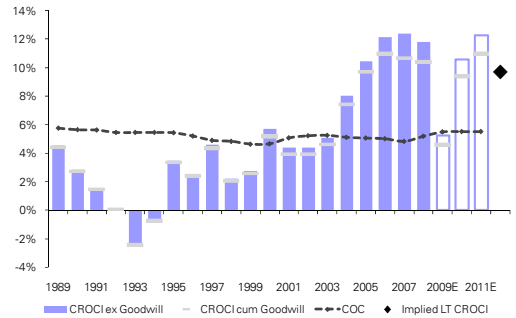
C.R.O.C.I. Industry View:

Mining's EV/NCI (adjusted price-to-book) is at 2.1x, which is a premium to the pre-commodity bubble ten-year average of 1.4x (the past five year average has been closer to 2x). We infer from this that **the market is therefore pricing a significant structural improvement from a long-run COC-plus sector.** The sector's strong performance since the beginning of July has pushed market-implied long-run returns up by 120bps to 9.7%, even if they are 80bps below 2010E consensus forecasts (Figure 1).

In the Mining sector, cash tends to accumulate fast, given the high level of CROCI, which brings the EV/NCI down over time as the cash pays down debt. However, Figure 2 shows that it would now take 6 years of high commodity prices to reduce the EV/NCI to its long-term average of 1.4x (the line on the chart is 1.2x, the level that historical profitability would suggest as sustainable). We have also backed out a fade profile (Figure 3) which tells a similar story, namely that the market is now pricing high returns to 2019, after which there can be a decline to below the returns of the past five years. [comparison with world ex M&M] *This mirrors the commodity team's expectations for prices to remain at or improve from current levels over this period.*

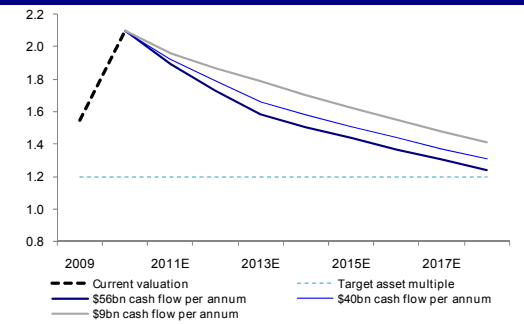
The value opportunity that we observed in the Mining sector in July has closed now, in our opinion, with the sector looking fair value if investors are comfortable with the sustainability of the 2011E forecast cash flows. Diversified miners also look less cheap relative to the sector than they did in July and although we still find value in Xstrata, Rio at over £40 no longer seems like a value proposition.

Figure 6: CROCI (market-implied level in grey)



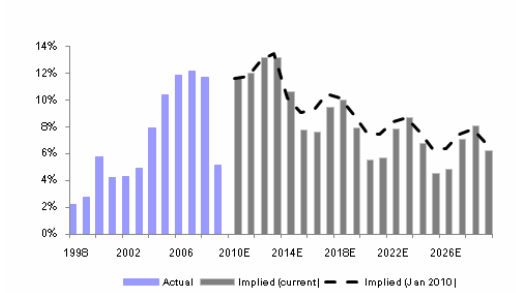
Source: Company data, Deutsche Bank

Figure 7: EV/NCI falls as cash accumulates



Source: Company data, Deutsche Bank

Figure 8: CROCI (market-implied level in grey)



Source: Company data, Deutsche Bank

Paradigm shift in the bulk commodity market

Exec summary

The emergence of China as a significant consumer of bulk commodities – more than it can produce - continues to increase the demand for seaborne supply of iron ore and coking coal. This has driven a number of significant changes to these markets that are still transforming them today. The transformation of these markets offers significant opportunities for companies globally. In this study, we investigate the changing nature of the iron ore and coal supply markets and which regions and companies should benefit the most. Key points from the study include:

- Coal and iron ore markets have historically been predominantly regional markets. The increased demand for seaborne product increases the need for highly capital-intensive infrastructure to supply it (rail, ports and ships) and will require higher long-term prices to ensure adequate returns on this additional infrastructure are made – current incumbents benefit significantly from existing infrastructure.
- With many supply regions now able to supply into the international markets, there is increased opportunity for pricing parity of regional prices with international market prices.
- Iron ore demand growth acceleration, which drove iron ore price rises over the last five years is yet to be seen in the coal markets with China's per capita energy consumption levels remaining very low (but increasing). The potential for a ramp in coal imports into China offers significant volume upside potential for any producers who can meet the increasing demand.

We remain constructive on the pricing environment for bulk commodities and believe that there are significant volume growth opportunities for well-positioned suppliers.

While supply issues vary by region, rail constraint is a common theme among them all. Regional supply characteristics include:

North America: The US is the "800lb Gorilla" in coal (29% of world reserves/ 14% of supply), but focused on the home front with both iron ore and coal generally "land-locked" – the main exception being bulks barged or railed from the Northeast to Canada. Higher prices could unlock this potential and with the greatest latent export capacity, North America offers the best global opportunity for short-term supply increases if the prices are high enough.

China: A significant global producer of both iron ore and coal, but has been unable to keep up with its own demand. Its coal deposits in particular are significant, rail infrastructure is insufficient to get coal from the Northern rovinces to the coast and is likely to stay that way for three to four years.

India: The big unknown and potentially the most influential region on the near-term supply and demand balances for the bulk commodities. – large iron ore and coal deposits offer the potential for significant production increase, but its own rapid development may more than consume this with the potential to actually reduce exports.

Russia: Abundant coal and iron ore reserves, but they are located significant distances from ports. Aging rail infrastructure will hamper significant increases in export capability in the near to medium term.

Australia: Australia is arguably in the best position to supply the bulk seaborne market; it has large reserves of both coal and iron ore located relatively close to the coast and close to the growing Asia Pacific demand market. The growth constraints will be both port and rail expansions. Australia is challenged with large infrastructure expansions that are impacted by: multi-user issues (mines, rail, port), environmental approvals, and government intervention such as proposed tax changes (MRRT). Iron ore infrastructure is largely owner operator whereas coal is multi-user. Both have their separate challenges

Brasil: Brasil has the best-quality deposits of large, developed iron ore. Despite its vast amount of reserves, Brasil has struggled to increase its iron ore production in recent years due to logistics bottlenecks. We estimate that

92% of iron ore exported from Brasil last year used ports that belong to either Vale or CSN, and in our view this lack of port alternatives is a major barrier to the entry of junior iron ore mining companies in the export market

Europe: Europe remains and should continue to be a net importer of the bulk commodities; however, demand growth is likely to remain muted and existing infrastructure more than capable of meeting demand in coming years. Local suppliers are likely to benefit from increasing achieved prices and ability to achieve closer to parity with international prices.

Southern Africa: While southern Africa has a multitude of mineral resources (coal, manganese, chrome), its commodity export growth has been constrained by lack of infrastructure development (power, rail and port) and we believe will continue to be restricted for the next few years. We believe for the region to become a true global player in the seaborne bulk commodities market, significant additional capital will need to be invested in infrastructure (in particular rail). We also believe that in order to grow infrastructure sufficiently and within a reasonable time frame (say 5-10 years), the region will require private participation, currently a possibility but not yet a given.

Globalisation of the bulk commodities brings price and volume opportunities

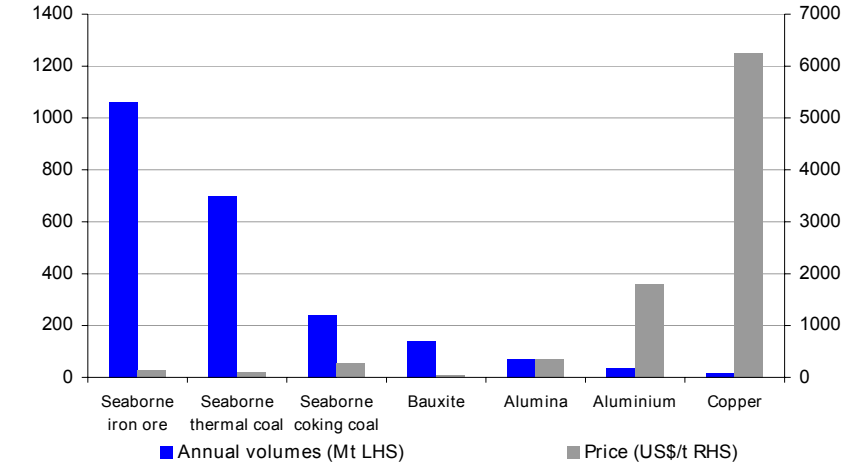
The recent moves towards spot, or indexed based pricing have been hailed as the movement of "an archaic pricing mechanism into the 21st century". However, in our view, the old benchmark pricing mechanism suited these commodities at the time. What really drove the change was that these commodities became globalised, and this process of globalisation continues to offer opportunities for a number of companies.

The historical benchmark system consisting of annual pricing negotiations was driven by the nature of the bulk commodities:

- There were few global buyers – Japan dominated.
- The bulk commodities are not homogeneous. Customers (steel mills) wanted consistency of feed to ensure low costs and preferred a single supply source (hence long-term off-take agreements).
- Capital costs for infrastructure are large, which drove producers to also want long-term off-take agreements to guarantee a return on the investment (worse than a low price is no price!).
- Coal and iron ore are relatively abundant commodities and available in many parts of the world.
- Pricing systems were set up primarily for the benefit of the end consumer as this was historically the provider of capital for resource export projects. This has shifted with the emergence of non-captive suppliers and the mergence of a major non-integrated client (China)
- The bulk commodities are relatively cheap and so could not be shipped very far before losing their profitability (see relative volumes and prices of common commodities in Figure 9 below). This drove local markets and local pricing for iron ore and coal.

Figure 9 below shows the relative price per tonne and volumes shipped for key mined commodities. Almost by definition, the more common a commodity is, the more it is used and the cheaper it is. It is also of note that the commodities to the right of the chart have much higher levels of processing required to produce than the bulk commodities on the left.

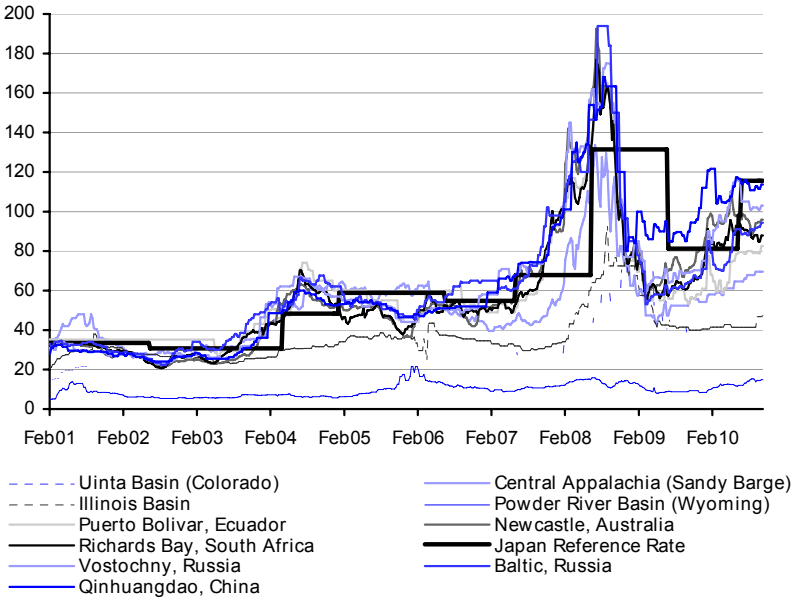
Figure 9: Commodity volumes and prices



Source: IISI, Deutsche Bank, Reuters, Bloomberg Finance LP, AME, Brook Hunt

As mentioned in the points above, quality, but also distance, has driven a significant amount of regional pricing in the bulk commodities, with shipping costs becoming a significant arbitrage hurdle. By example, we show a number of coal prices in the chart in Figure 10. While it may prove difficult to separate out some of the individual series in this chart, it serves to show the spread of prices and variation over time of various thermal coal products globally.

Figure 10: Regional coal prices (US$/t)

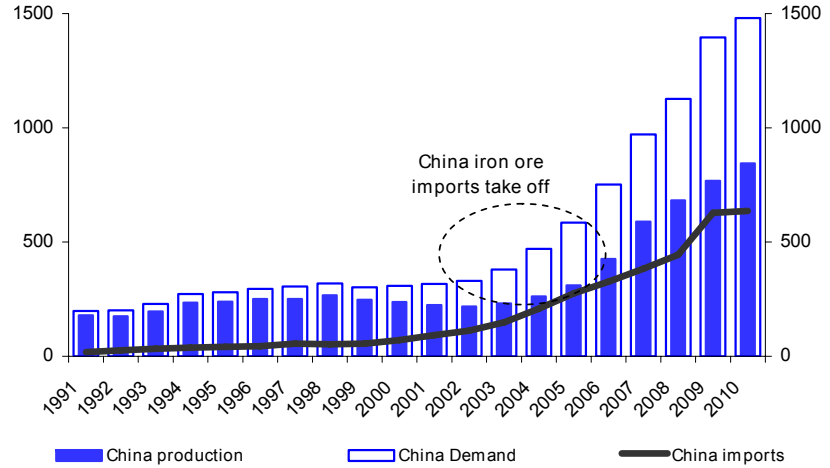


Source: Deutsche Bank, Reuters, Bloomberg Finance LP, AME, Tex Report

The key change to the benchmark pricing of bulk commodities was the emergence of China, or more correctly, China had grown to the point where it was unable to meet its own iron ore and coal demands internally (it moved from a significant net exporter of coal to a net import position and from a minor importer of iron ore to become the largest global importer).

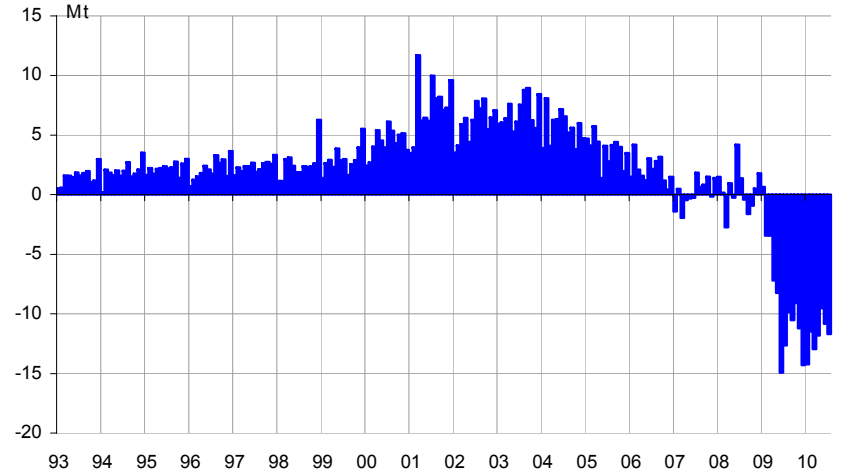
Figure 11 below shows China had been tracking right through the 90's at around 50Mtpa of iron ore imports. This started accelerating in the first half of this decade and is currently running at around 640Mtpa. China's monthly net coal exports are shown in Figure 12 and show dramatically the change from being a 5-10Mt per month exporter to neutral position in 2007/2008 to a significant net importer of around 10 to 15Mt per month now.

Figure 11: Ramping Iron ore import demand from China



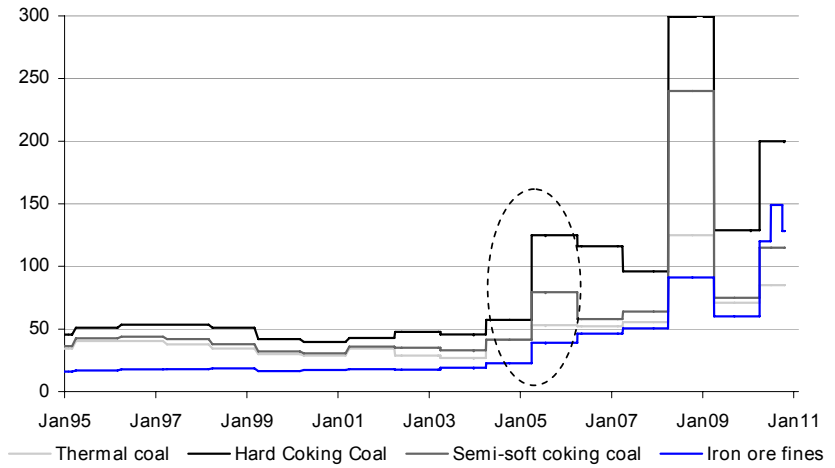
Source: Deutsche Bank, Reuters, Bloomberg Finance LP, AME, Tex Report

Figure 12: Net coal exports from china have become net coal imports (Mt)



Source: Deutsche Bank, China trade statistics

Figure 13: International contract Bulk commodity prices (US$/t)



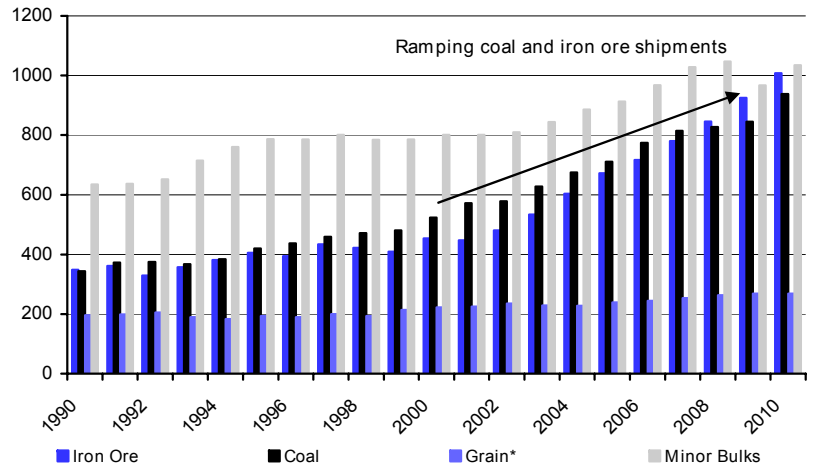
Source: Deutsche Bank estimates, Tex Report, company releases.

The result of this change in demand was a significant increase in the international bulk commodity prices as shown in Figure 13. In April 2005, the contract price movements were unprecedented; the thermal coal price rose 27%, semi-soft coking coal 91%, hard coking coal 119% and iron ore fines 72%.

The rise in the achieved price brought with it a substantial rise in the margins achieved by the miners and the potential to profitably ship these "low value" products from further away – producers ramped up production as much as possible to feed the new global requirements and demand for bulk shipping rose in line with this increase.

Figure 14 shows the impact on the global bulk freight shipments and highlights the sharp increase in coal and iron ore shipments. For example, in the decade from 1990 to 2000, annual seaborne iron ore shipments rose 30% from 349Mt to 453Mt; in the next decade it rose 122% to 1008Mt.

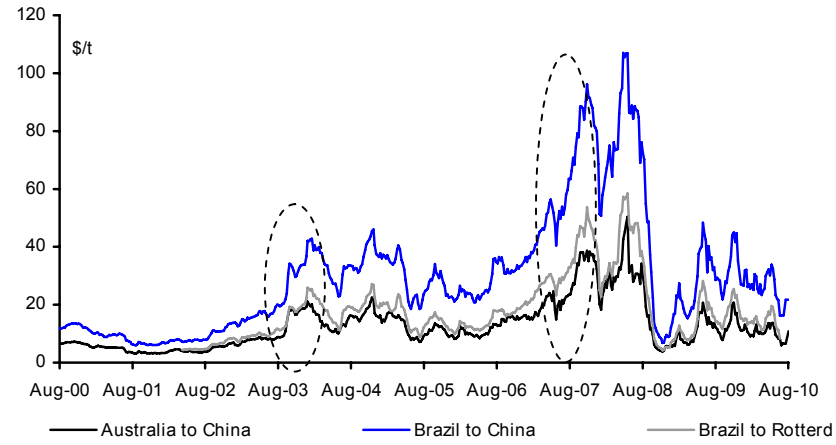
Figure 14: Bulk freight shipments over time (MDWT)



Source: IISI, Deutsche Bank

The increasing freight demand highlighted the first bottleneck, shipping, and had a predictable impact on global freight rates.

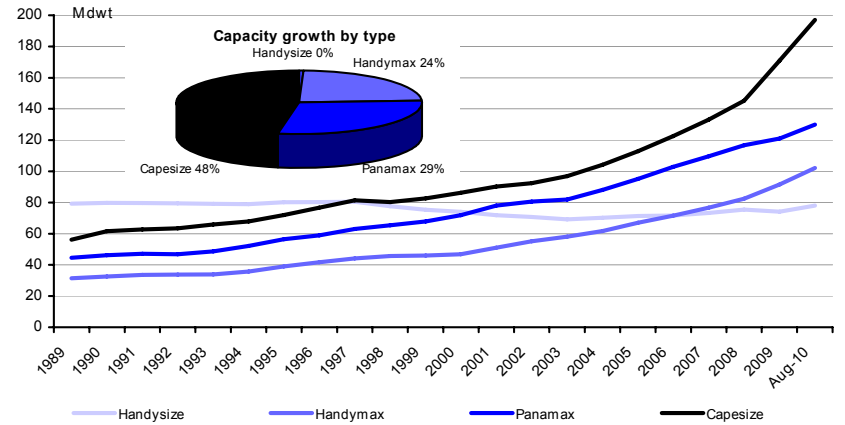
Figure 15: Key capesize route freight rates



Source: SSY, Deutsche Bank, Reuters, Datastream

The desire to keep freight rates as low as possible drove increased demand for the largest ships (with the lowest unit costs). Figure 16 shows the biggest increase has occurred in the largest, capesize, vessel types.

Figure 16: Bulk freight capacity by type



Source: SSY, Deutsche Bank

Of the current global bulk freight fleet of 507mdwt, the majority of the capacity sits with the capesize vessels, at 39% of the total. This is up from 28% of the fleet in 1990.

Figure 17: Makeup and changes in the global bulk fleet

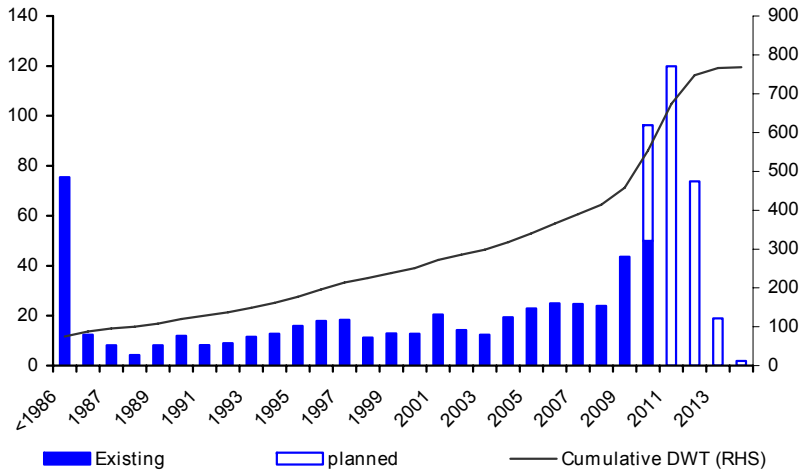
Vessel type	Vessel weight	Current global fleet Capacity	% of global fleet	Growth since 2000
	kt	mdwt		
Handysize	10-40	78.0	15%	5%
Handymax	40-60	102.1	20%	118%
Panamax	60-100	130.0	26%	81%
Capesize	<100	197.1	39%	128%
Total		**507.2**	**100%**	**82%**

Source: SSY, Deutsche Bank

The increase in the largest of the bulk freight vessels and the inclusion of a new, heavier class (VLOC, Very Large Ore Carrier, >300kt) means that international freight in the bulk commodities should continue into the future and has become an intrinsic part of the market for these commodities.

The capacity growth in the international shipping fleet looks set to continue. Figure 12 shows the year of construction of the current global fleet. Despite the pullback in freight rates, the ship order book remains very strong with planned capacity deliveries over the next three years equivalent to 51% of the current fleet capacity – much greater than our expectations of bulk cargo growth. **In our view, shipping is not going to be a capacity constraint again for bulk product delivery into the medium term.**

Figure 18: Current bulk shipping capacity by year of construction (DWT)

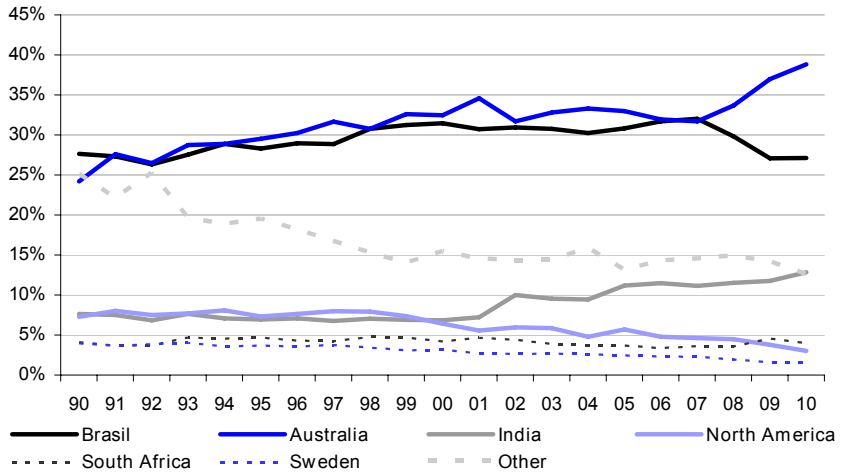


Source: SSY, Deutsche Bank

Dynamics of the bulk market...feeding Asia

Given the importance of the emergence of the Chinese raw material import market, it is not surprising that the Asian region has dominated the seaborne import demand with China, Japan and South Korea all significant sinks for both iron ore and coal. Supply to these regions has had to come from deposits that are relatively close to the coast and has been dominated over the past five years by the current incumbents that had the advantage of having infrastructure (rail and ports) in place, as shown in Figure 19 where both India and Australia have continued to grow market share over the past two decades. Brasil has not managed to significantly increase its market share in iron ore over that period into its key demand market, Europe, with low growth and its significant distance from the key demand growth region of Asian.

Figure 19: Iron ore export share by region



Source: AME, Deutsche Bank

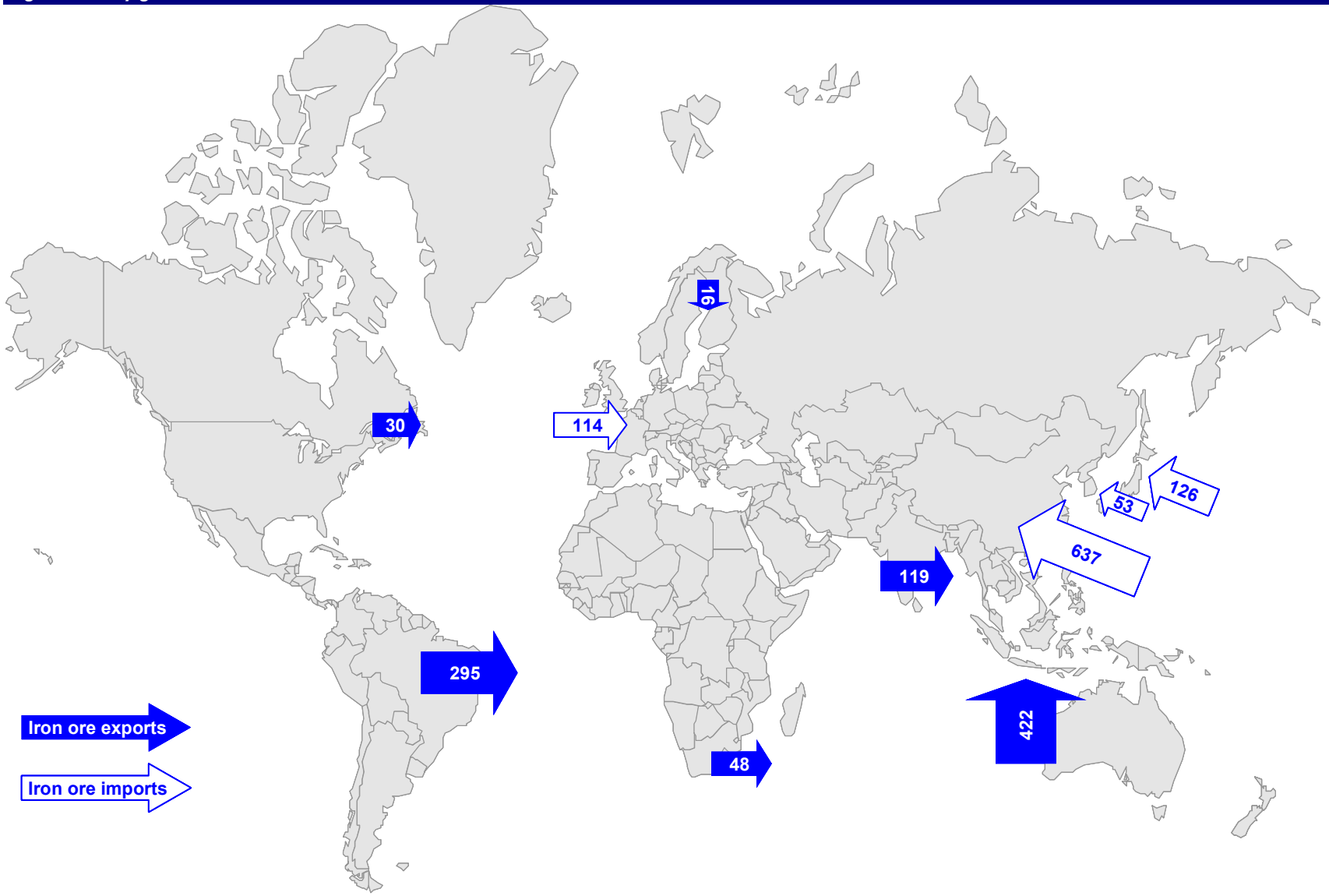
The following two pages show the key dynamics for seaborne iron ore and coal. For iron ore, the market is characterized as follows:

Figure 20: Characteristics of seaborne bulk markets

	Iron ore	Coal
Pacific and Indian Ocean basin	Supply almost exclusively to meet Asian demand	Supply to meet Asian demand with South African coal going to both Asia and European markets
Atlantic basin	Dominated by Brasil to Europe trade with some ore out of Canada into Europe. Excess Brazilian ore is shipped to the Asian markets.	Colombian and North American coal shipped into Europe
North America	Predominantly self sufficient	Net exporter of coal
Eastern Europe	Self sufficient	Net exporter with excess coal shipped out of Eastern Russia to the Asian markets

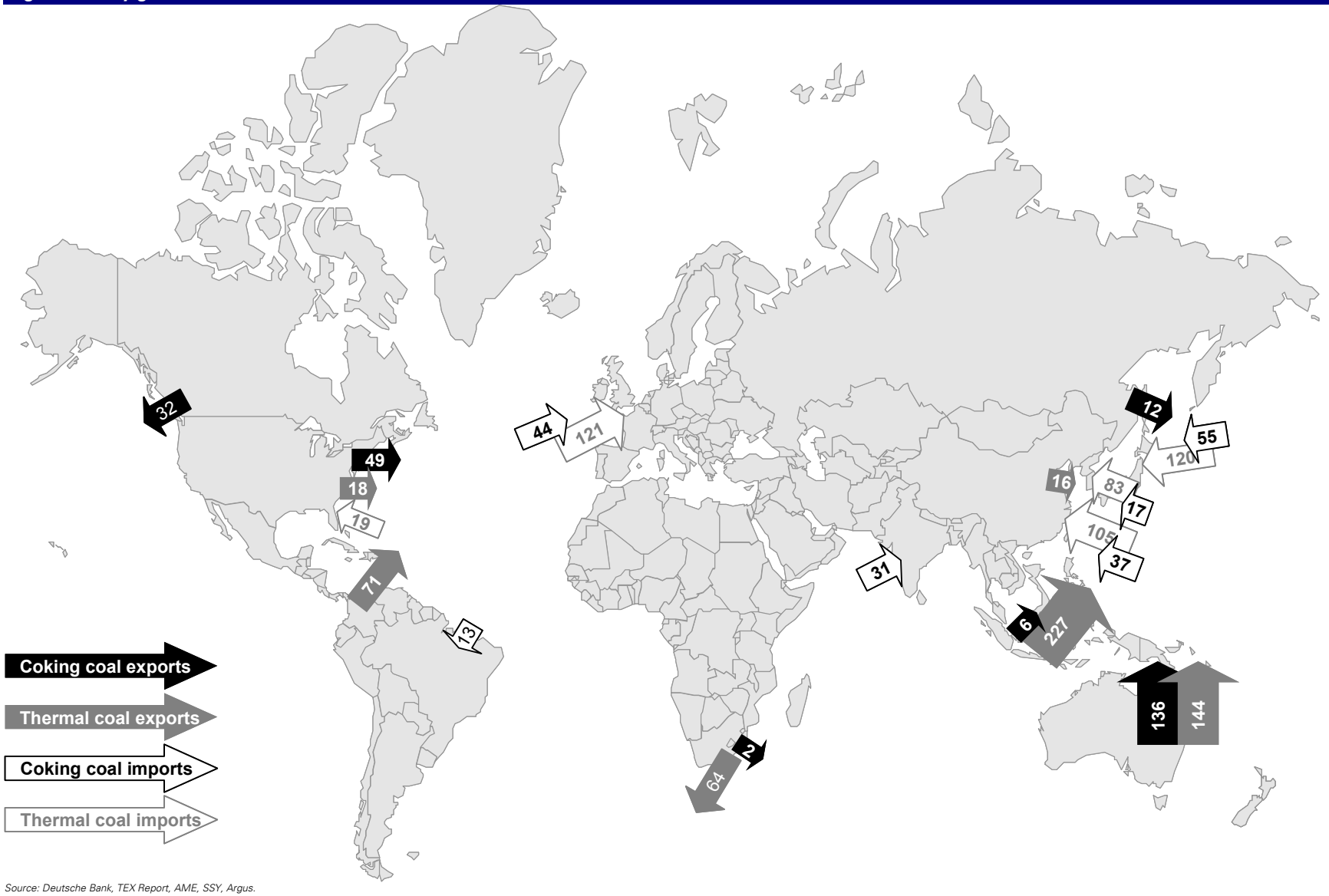
Source: Deutsche Bank

Figure 21: Key global iron ore movements 2010 (Mt)



Source: Deutsche Bank, AME, SSY, Argus, Tex Report

Figure 22: Key global coal movements 2010 (Mt)



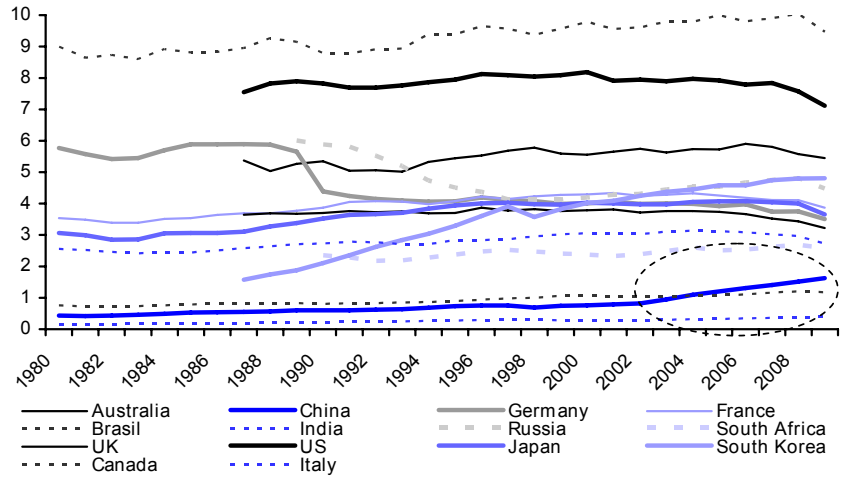
Source: Deutsche Bank, TEX Report, AME, SSY, Argus.

A key point to take from the preceding commodity movement maps is that while Asia dominates seaborne demand for both iron ore and coal, its dominance is much more acute for iron ore. Iron ore imports for China, Japan and South Korea are seven times those of Europe, but only two times Europe for coal demand. This is due to two reasons:

- China has more coal relative to its current demand needs than iron ore (however, decreasing quality will increasingly be a issue as it targets higher-value steel products in the future).
- China is in a more commodity-intensive growth phase and less energy-intensive stage per capita than Europe.

The lower energy intensity is shown in Figure 23. Note that China has begun to increase its energy consumption – if it follows the path of other economies (eg South Korea), we would expect to see a significant increase in energy consumption over the next 10 years. We expect this to translate into significant increases in coal consumption and imports by China.

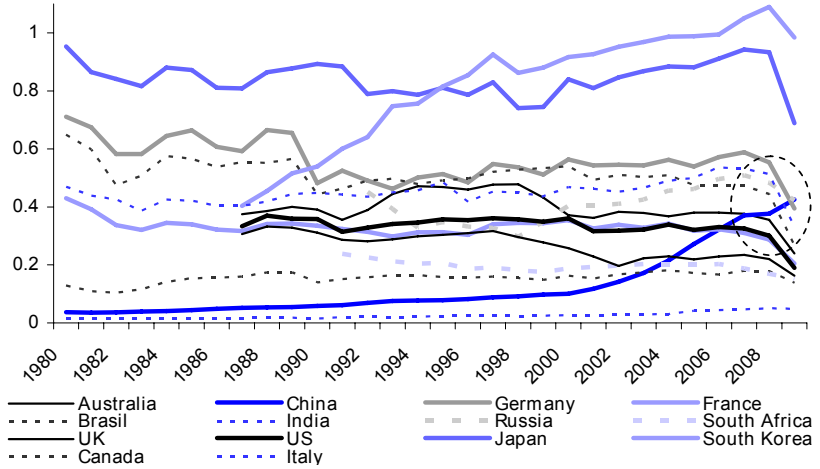
Figure 23: Energy consumption per capita (tonnes oil equivalent/capita)



Source: Deutsche Bank, BP, Datastream

In contrast with coal, China is well advanced with increasing its steel production intensity and did in fact continue to increase it in 2009 despite significant reduction in other regions of the world as shown in Figure 24.

Figure 24: Steel production intensity (t/person)



Source: Deutsche Bank, Datastream, IISI

In the near term we believe that demand growth for seaborne coal will outstrip demand growth for seaborne iron ore. Mining companies that can grow coal supply to the international coal market will be significant beneficiaries of this trend, in our view.

Where will the iron and coal come from?

The following two pages show the major known resources of iron ore and coal in billions of tonnes and the expected annual demand increase over the next three years.

Iron ore – an Asia-Pac game

The biggest import demand increase over the next three years likely comes from the Asian region where we expect China, Japan and South Korea to increase imports by 186mt, 16mt and 13mt, respectively. By contrast, we expect Europe's import demand increase over the same period to be just 13mt. This is good news for the Australian and Indian producers with large resource basins in the region. Brasil's distance from the market will continue to be an issue, in our view – a view clearly shared by Vale, which is commissioning the construction of Very Large Ore Carriers (VLOCs) to reduce the shipping cost and is considering constructing a holding point in the region to enable product management into the region.

Coal - a case of Sino-sighters

The demand picture for coal is not as clear as the iron ore situation, with two of the larges sources of demand, China and India, also having significant reserves of their own coal. The question becomes whether internal infrastructure will enable the two countries to meet their increasing demand in the near term. We do not believe so. Our views on the growing coal import requirements of a number of the large importers are summarised in Figure 25. Over the next three years, we forecast China's coal imports to grow by 80Mtpa (23Mtpa of coking coal and 57Mtpa of thermal coal). We expect the next-largest import demand increase to come from India, with the country forecast to import 42Mtpa more in 2013 than it should do this year.

Like iron ore, those producers that can ramp-up production and get it to the markets the quickest will be the beneficiaries of this changes, in our opinion.

Figure 25: Annual import increase by 2013 (Mt)

	Coking coal increase	Thermal coal increase	Total
China	23	57	80
Japan	7	4	12
Taiwan	2	4	6
South Korea	6	4	10
Western Europe	7	5	12
India	9	33	42
Brasil	5	0	5
Total	59	107	167

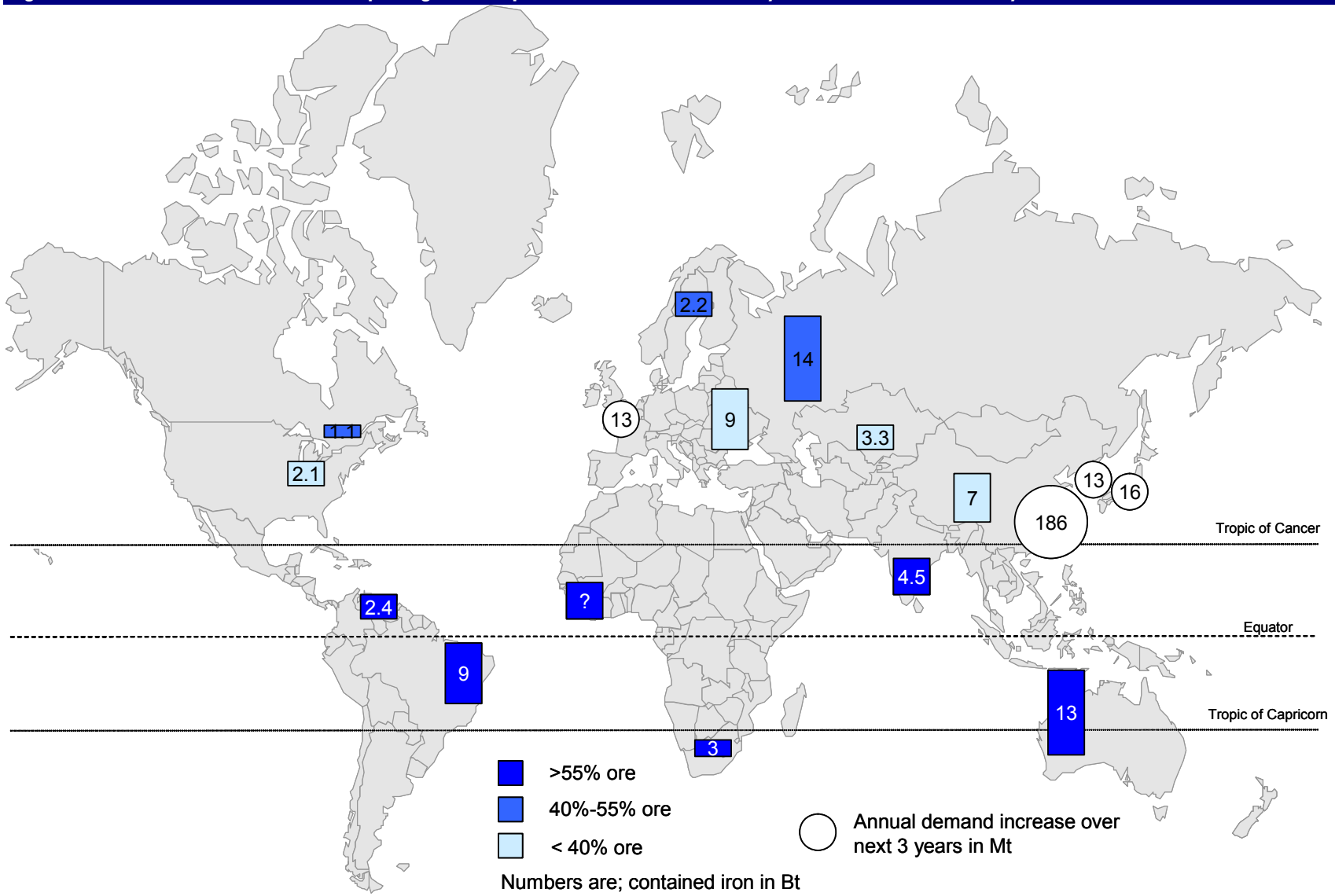
Source: Deutsche Bank estimates, AME, TEX report.

Northern Africa remains the unknown quantity, but not deliverable in the near term

It is clear that more resource definition work in Africa would likely yield significantly more resources. The high-quality iron ore in Guinea and Liberia is yet to be fully defined and is unlikely to be the only high-quality iron ore on that continent (the global high-quality iron ore deposits tend to exist in the tropics – and with most of Africa's land mass sitting in the tropics, it is unlikely that its total resources of iron ore are restricted to only a few small locations).

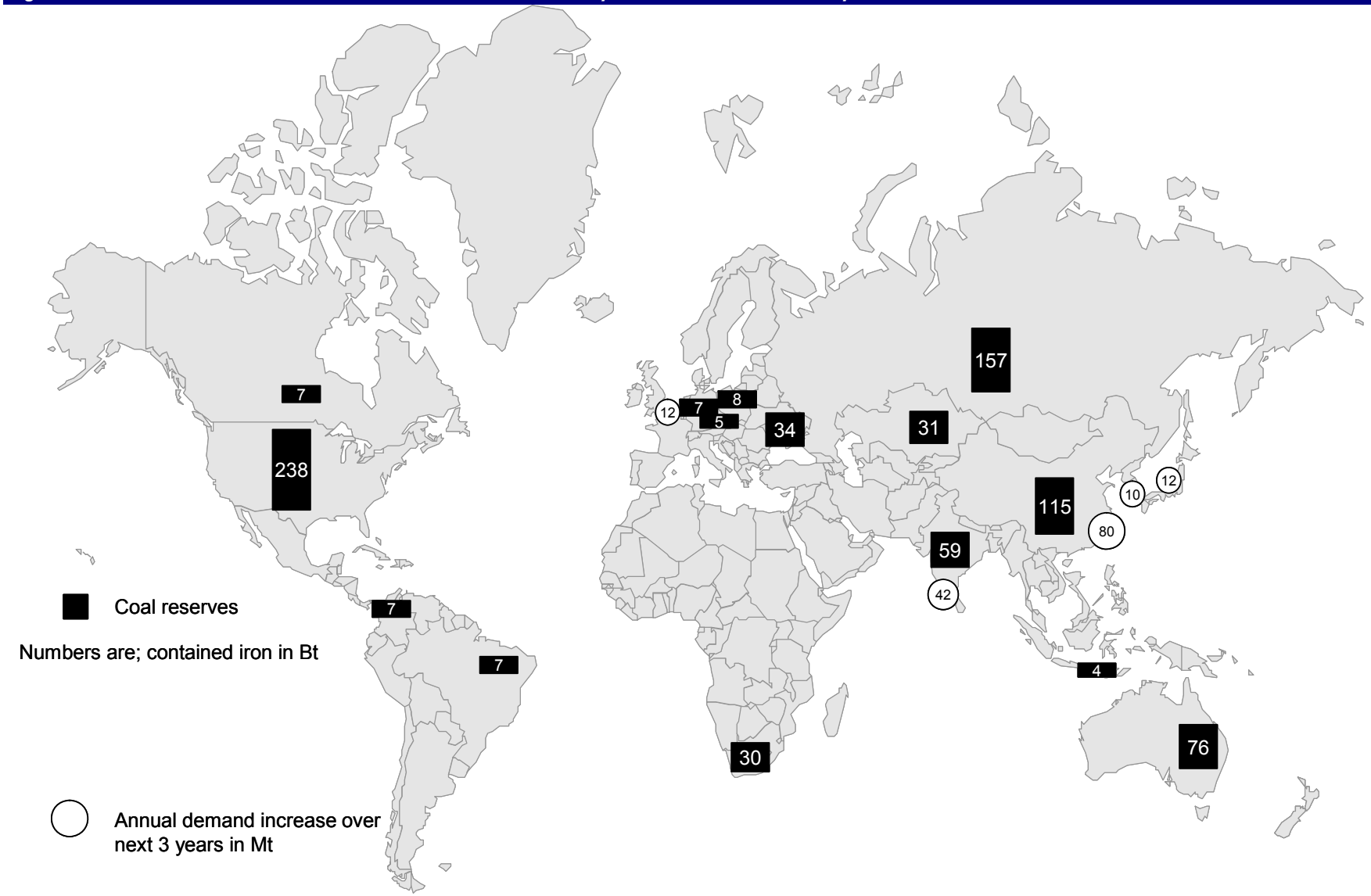
Despite the potential richness of Africa's iron ore resources, lack of infrastructure and lack of political stability suggest that significant exploitation of iron ore within the next five years is very unlikely.

Figure 26: Iron ore reserves and consumption growth expectations in the next three years (units listed in the key)



Source: Deutsche Bank, USG, AME, Tex Report, Datastream

Figure 27: Coal reserves and demand increase over the next three years (units listed in the key)



Source: Deutsche Bank, BP, Tex Report, AME, Argus

Rail and then ports to determine supply winners

While seaborne freight capacity has been an issue, as discussed previously, we do not think that it will be a constraint for bulk commodities over coming years. The constraints will be having ports large enough to dispatch the increasing bulk commodity demand and internal infrastructure large enough to get it to the ports. We discuss specific regional issues and supply growth potential in the coming sections, but a few common themes from these include:

- Governments or parastatal groups control many parts of the infrastructure chain globally. These entities are often capital constrained and have multiple demands on their restricted capital bases. Projects that are unlikely to deliver returns in the near term (or the government tenure periods) have found it difficult to get full approval and have led to and continue to lead to delays in the supply response.
- Government intervention is also delaying expansion decisions globally. There are numerous examples of this including: 1) proposed tax changes in Australia slowing down project approvals, 2) changing mineral rights requirements and ownership structure changes in South Africa, and 3) elongated licensing process in Brasil is slowing development.
- There is latent port capacity in many parts of the world (eg Canada, Russia Richard's By SA) and more capacity is on its way. It appears that ports are unlikely to cause any immediate constraints, but it is worth noting that the "easy" port locations have already been claimed. Growth beyond current levels will require additional levels of capital intensity with feeder jetties being required to be extended many kilometres to reach deep water and existing harbours having to extend beyond their natural boundaries to accommodate additional tonnes.
- Rail capacity appears to be the biggest issue facing increasing supply-side response and is driven by a number of factors including: 1) large capital requirements, 2) rail often operated by third parties with the desire to extract the economic rent from the commodity prices, 3) rail usually serves multiple users with different requirements and ability/desire to contribute to expansions (too many cooks spoil the broth).

We examine the detail of the supply potential by region over the coming pages; however, the summary of our expectations is shown in the table below. Points of note include:

- A significant proportion of the world's growing demand for iron ore is likely to come from the traditional Australian and Brazilian markets.
- North American coal producers are potential beneficiaries of the globalisation of coal (assuming third-party transporters do not extract all the additional rent) with infrastructure already in place – this will be price dependent.

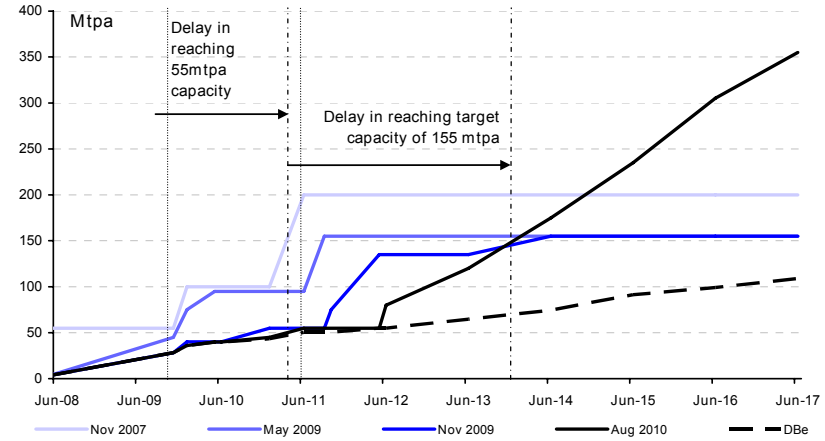
Figure 28: Discussed potential regional capacity increases over the next three years and % increase from current levels (Mt)

	Coking coal		Thermal coal		Iron ore	
Australia - Rest	3	20%	36	30%	102	24%
Australia- Queensland	48	41%	14	30%		
Brasil					110.5	37%
Canada	10	31%	0		30	100%
Europe	0		0		5	31%
India	0	0%	0	0%	-10	-10%
Indonesia	1.2	20%	47	20%	0	
Mozambique			5		0	
Russia	10	83%	0		10	18%
South Africa	1	50%	15	22%	15	31%
USA	10	20%	20	109%	0	0%
Total	**83.2**		**136.9**		**262.5**	

Source: Deutsche Bank, AME, IISI, USG, Tex Report.

While these planned numbers for capacity increases should satisfy our expectations for global bulk demand by 2012/2013, we expect that many of these targets/plans are unlikely to be met to the full extent given the size and complexity of delivery large infrastructure systems. A clear example of this is the planned delivery by the Australian iron ore miner Fortescue of greenfield mine, rail and port systems. As the following figure shows, actual capacity is currently less than 50% of the capacity that was planned three years ago and this divergence is likely to be greater in coming years.

Figure 29: Changes in FMG planned iron ore exports



Source: Deutsche Bank, Company data.

Global beneficiaries

We have looked at the prospective global miner beneficiaries in the context of the tightening market. In our view, miners that will be beneficiaries will have:

- Good growth prospects capability
- Control of infrastructure (helps ensure growth is more likely)
- Regionally priced product that may be able to be priced at higher levels if pricing becomes more globalised.

In the table on the following page, we look at these factors for each of the bulk producing companies under coverage.

Figure 30: Bulk producer benefits

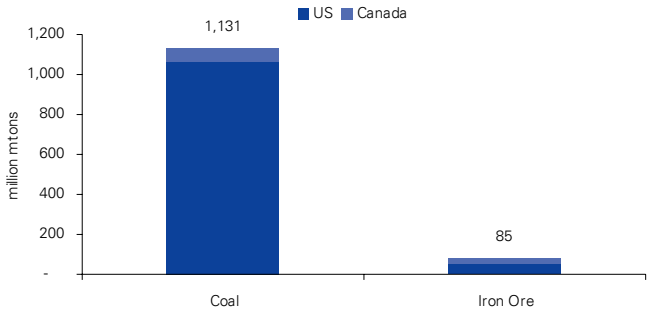
		Market cap	production growth over 2 years				Rail/infrastructure	
Company	**Priced**	**US$m**	**Thermal**	**Coking**	**Iron ore**	**Average Growth**	**ownership**	**Can benefit from price globalisation**
Raspadskaya	USD	4,496		88%		88%	No	Yes
Cliffs	USD	9,297		92%	2%	47%	No	Yes
Fortescue Metals	AUD	19,256			37%	37%	Yes	No
Centennial Coal Co Ltd	AUD	2,397	31%			31%	No	Yes
Vale	USD	174,627			29%	29%	Yes	No
MMX	BRL	14,672			28%	28%	No	Yes
Mechel	USD	11,476	10%	41%		26%	Yes	Yes
Bhp Billiton	GBP	213,362	11%	23%	19%	18%	Yes	No
ENRC PLC	GBP	18,982	5%		24%	14%	No	Yes
Bumi	IDR	5,155	12%			12%	Yes	No
Rio Tinto	GBP	131,738	10%	19%	4%	11%	Yes	No
Indika	IDR	1,924	11%			11%	Yes	No
Adaro Energy	IDR	7,513	10%			10%	Yes	No
ITMG	IDR	5,430	10%			10%	Yes	No
Arch Coal	USD	4,319	5%	15%		10%	No	Yes
New World Resources	CZK	3,318	10%	10%		10%	No	Yes
Alpha Natural Resources	USD	5,442	7%	11%		9%	No	Yes
Ferrexpo Plc	GBP	3,231			9%	9%	Partial	Yes
Semirara Mining	PHP	1,289	0%			0%	No	Yes
Whitehaven Coal Limited	AUD	3,010	61%	111%		86%	No	No
CSN	USD	26,508			50%	50%	No	No
Macarthur Coal Ltd	AUD	3,728		31%		31%	No	No
Xstrata	GBP	59,527	12%	31%		21%	No	No
Kumba Iron Ore Ltd	ZAR	17,672			20%	20%	No	No
Sesa Goa	INR	6,678			19%	19%	No	No
Sterlite	INR	14,120			19%	19%	No	No
Pt Bukit Asam	IDR	5,309	18%			18%	No	No
Exxaro Resources Ltd	ZAR	6,310	15%			15%	No	No
Vedanta Resources	GBP	9,962			15%	15%	No	No
Anglo American	GBP	55,039	10%	6%	23%	13%	No	No
Alliance Resource L.P.	USD	2,259	12%			12%	No	No
Peabody Energy	USD	13,801	7%	5%		6%	No	No
ARM	ZAR	5,403	-4%		9%	3%	No	No

Source: Deutsche Bank, company data

Key Thinking – North American Bulks

The US and Canada contain sizable bulk commodity resources, with coal and iron ore reserves of ~245 and 3 billion metric tons (mtons), respectively, or 29% and 4% of world-wide reserves, while Mexico is immaterial. At current production, the US is estimated to contain over 240 years of coal reserves and Canada may hold around 100 years. In iron ore, both countries have 35-40 years. The US functions as a swing player for export of both Eastern thermal and metallurgical coal, while Canada exports ~90% of its met production, but imports thermal. At ~50m mtons of capacity, the semi-captive US iron ore industry services the needs of its steel industry, but has limited ability to reach world markets due to constraints of exporting via Great Lakes/St. Lawrence Seaway. Canada's 30m mton iron ore industry has historically serviced US market, but new projects, which could top 100m mtons over the next decade, are squarely aimed at world markets

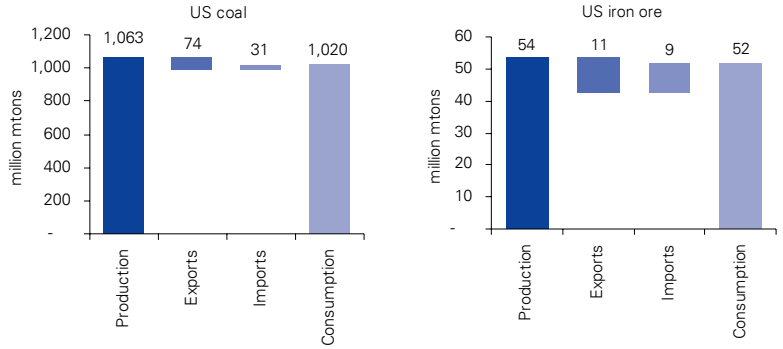
Figure 31: North American bulks production



Source: USGS, Natural Resources Canada and Deutsche Bank

The US stands out as the "800lb Gorilla" in coal at 1.1bn mtons of annual production (16% of world total) compared to Canada's 68m mtons. However, as can be seen in the following figures, US coal and iron ore production is domestically focused, with net exports (production less consumption) of only 4% for both. If coal prices remain elevated, US Eastern exports could recover to prior 1980's peak levels, adding ~50m mtons to seaborne supply. Longer term, US Powder River Basin (PRB) coal could represent a meaningful new export source if new Western US bulks terminals are built.

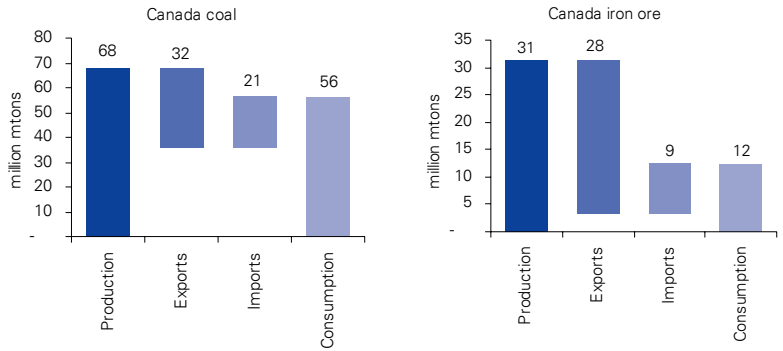
Figure 32: US production versus apparent consumption



Source: EIA, World Steel Association, USGS and Deutsche Bank

Both Canada's coal and iron ore industries are export-focused, with 17% of net coal production exported and 61% of iron ore. Canada's iron ore exports could rise five-fold from 20m to 100m mtons over the next decade if numerous brownfield and greenfield projects are ultimately successful, which would lead to a net export ratio of nearly 90% of production.

Figure 33: Canada production versus apparent consumption



Source: USGS, Natural Resources Canada and Deutsche Bank

North American Coal

North America (NA) has some of the most abundant coal reserves in the world (30% of global total), with the US and Canada possessing roughly 29% and 1% of global share, respectively (Mexico does not have significant reserves). While the US consumes most of the coal it produces and exports roughly 5-7% of its annual production, Canada exports nearly half of the coal it produces (~45%), and imports ~18m mtons (~32% of consumption) from Eastern US due to proximity to its Eastern manufacturing hub. Western met coal comprises most of Canada's exports (~80%).

NA coal market drivers and challenges

Largest driver for regional coal consumption is GDP growth. Generally, power demand in the US tends to be roughly one-half of the GDP growth rate. Because the US is predominantly a service economy with 2-4% GDP growth, GDP is less energy-intensive per unit of growth than in developing countries (eg, China), which require higher coal consumption per unit of GDP.

Export business mainly driven by rising Emerging Markets demand. In recent years, India and China have invested in steelmaking and coal-fired power generating plants and imported more coal to feed this demand. These trends should continue and provide NA coal producers the opportunities to export more coal to these regions, particularly if supply constraints persist in certain global regions, the dollar remains weak and freight rates remain low.

Output under pressure from key US basin, Central Appalachia (CAPP) has dwindled over the years, decreasing to 176m mtons in 2009 from 213m mtons in 2005, due to reserve degradation and other factors.

US regulatory framework challenging, impacting operating costs and demand. Various legislation aimed to improve air quality (eg, Clean Air Act, Clean Air Interstate Rule) have clearly impacted the coal industry, requiring states to source more energy from more renewable/non-polluting energy sources or requiring utilities to install scrubbers to reduce emissions. In CAPP, policies limiting mountain top mining (404 permitting) are raising production costs, as well as posing structural challenges as the elimination of mountaintop mining results in lower production. Additionally, elevated safety monitoring from MHSA (Mine Health Safety Administration) has had similar impacts. Producers in the CAPP are likely to consolidate over time primarily due to higher structural costs, as well as mine depletion.

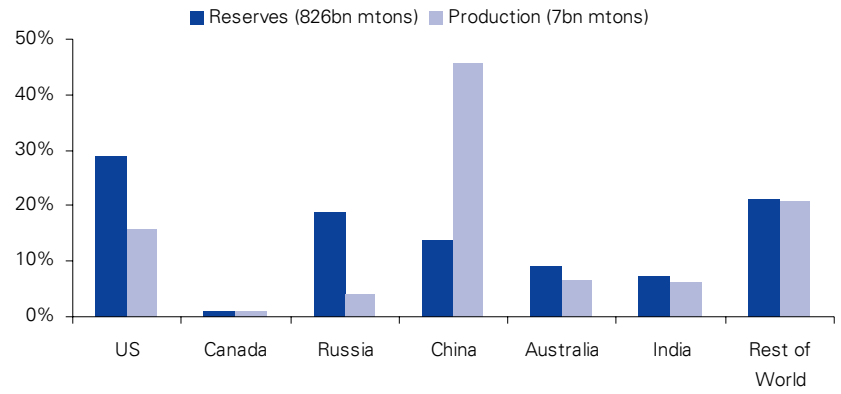
Competition from natgas (switching) and renewables growth. While coal accounted for 48% and 45% of electricity generation in 2008 and 2009, respectively, it is in structural decline relative to natural gas (natgas) and renewable energy, mainly due to environmental reasons. Whereas coal accounted for 52% of power generation in 1996, it declined to 45% by 2009, while natgas grew from 13% to 23%. Industry experts often note that below US$5/mmBTU, utilities begin to switch to natgas as it improves their margins. Additionally, DB remains quite cautious on natgas and recently lowered its 2011 outlook to US$4.50/mmBTU from US$6.00/mmBTU previously. While challenges like subsidies and power distribution are obstacles to renewable energy gaining critical mass near term, it has seen share rise from 2% in 1995 to 4% in 2010. Given rising in investments in alternative energy, we anticipate its share to grow in coming years.

Rising costs pose margin risk. According to consultant AME, operating costs have increased 90+% since 2003 throughout the broader coal industry due to many of the above-mentioned challenges. As an example, average stripping ratios in the industry have increased 20%, which translated to higher labor, maintenance and equipment costs.

US coal market overview

The US is a major producer (16% of 6.4bn mtons of global annual output) and holds significant reserves of 238bn mtons, 29% of proved global reserves at the end of 2009. At current production rate, the US's coal reserve life is ~240 years, among the longest in the global industry. Despite abundant reserves and annual production of +1bn mtons, the US is viewed as a marginal or swing export supplier to the world, as most production is consumed domestically. Elevated coal exports in the past 40 years often coincided with spikes in crude oil prices/inflation (late 1970s-early 1980s), geopolitical tension (early 1990s), and Emerging Markets (EM) demand (2008). Exports exceeded 91m mtons in 1981-82 and again in 1989-1992. In the early 1980s, some coal bulls predicted 181m mtons exports by 2000, but that bull case never materialized as exports in 2000 totaled only 53m mtons.

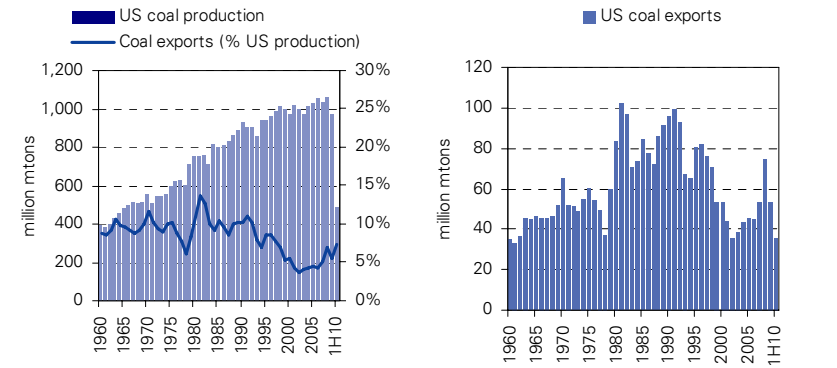
Figure 34: Global coal reserves and production



Source: BP's 2010 Statistical Review of World Energy, EIA and Deutsche Bank

In 2008, US exports exceeded 73m mtons due to a worldwide spike in commodity prices, supply disruptions in key regions, and strong EM demand. Once again, coal bulls predicted exports would exceed 91m mtons. However, the global financial crisis of 2008-09 led to a 28% decline in coal exports to 53m mtons (6% of Seaborne market). Through 1H10, exports recovered to 36m mtons (+34% YoY on an annualized basis) on improved demand for both met and thermal coal globally.

Figure 35: US coal production and exports



Source: EIA and Deutsche Bank

US coal basins

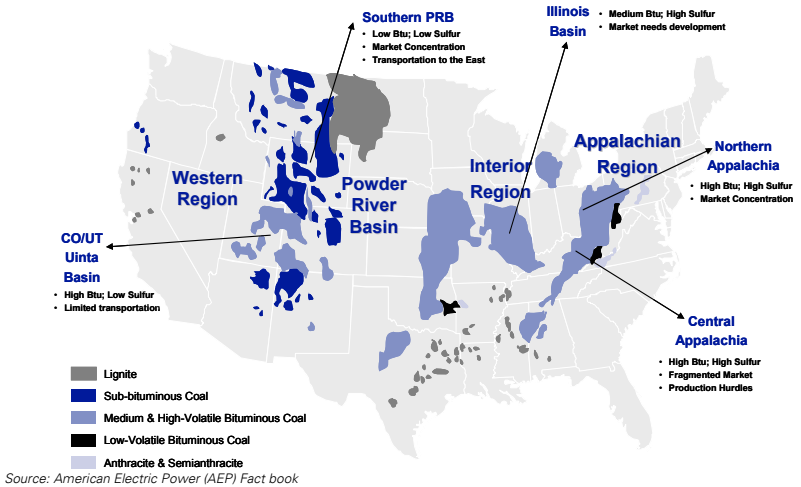
Although coal is produced in over 20 states, the majority of coal production occurs in 11 states grouped in five major regions, or coal basins – Central Appalachia (CAPP), Northern Appalachia (NAPP), Illinois, (ILB) Powder River (PRB), and Western Bituminous (WBIT). Though met coal is predominantly produced out of Appalachia and thermal coal from all regions, the coal from each region has its own set of unique characteristics.

Figure 36: US coal key basins summary

Basins	Key producing States	Coal type	Coal Quality
CAPP	Kentucky, Tennessee, Virginia, W. Virginia	Thermal, Met	12,500 BTU, med sulfur
NAPP	Pennsylvania, W. Virginia	Thermal, Met	12,500 BTU, high sulfur
ILB	Illinois, Indiana	Thermal	11,800 BTU, high sulfur
PRB	Wyoming, Montana	Thermal	8,400 / 8,800 BTU, low sulfur
WBIT	Colorado, Utah	Thermal	13,300 BTU

Source: EIA, industry reports, company reports and Deutsche Bank

Figure 37: US coal market by basin

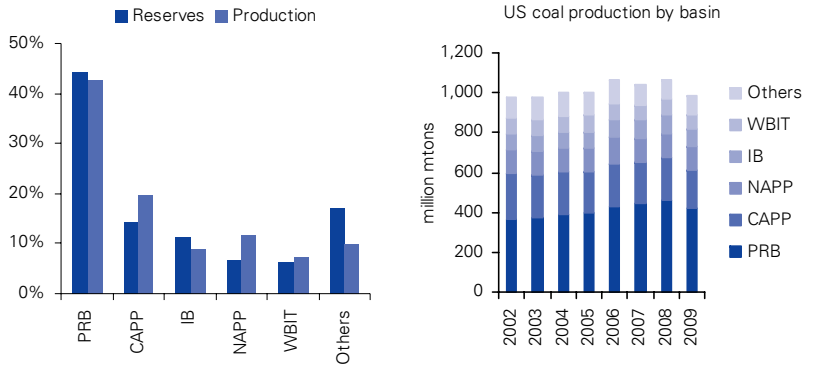


Source: American Electric Power (AEP) Fact book

- **CAPP.** Though mines are in structural decline due to age (some +100 years old) and regulatory challenges, the region is known for its higher costs and deep underground mining.

- **NAPP.** Although mines rely on underground mining and are advanced in age, they do not face the same regulatory hurdles that CAPP mines face.
- **ILB.** Primarily supplies the US utility and industrial sectors due to high energy content and low operating costs; usage has risen on increased scrubber implementation.
- **PRB.** Low sulfur quality makes it attractive to states with higher emission criteria, despite having lower energy content. PRB continues to grow production given its relatively younger life and open pit mining method.
- **WBIT.** Due to proximity to PRB, basins considered as "Western" region.

Figure 38: US coal reserves and production by basin

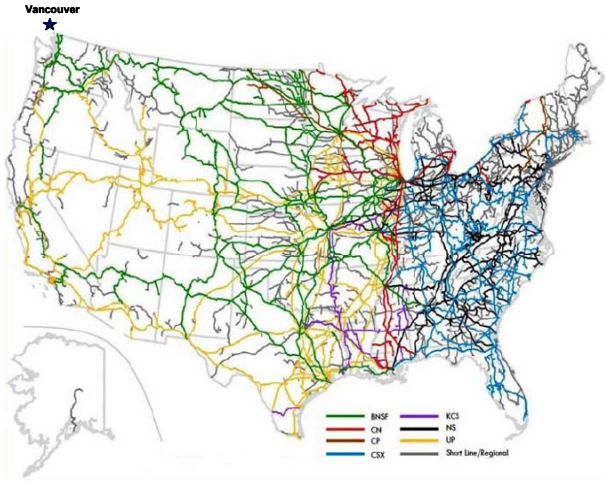


Note: According to EIA, the recoverable reserves at current producing mines are 17.8bn tons. The % breakup in the above figure is based on these reserves. Source: BP Energy Review June'09 and Deutsche Bank

US coal "supply chain"

In the US, the majority of coal travels from mine mouth to destination via rail. From the mine mouth, coal is usually transported by a producer's own transportation (conveyor belts, trucks, rail) to a centralized location run by one of the major railroads – Norfolk Southern, CSX Corp, Canadian National, and Burlington Northern – to be transported to its intended destination. In 2009, railroads transported 713m mtons of coal domestically, according to the American Railroad Association, making it the largest product by volume railed in the US.

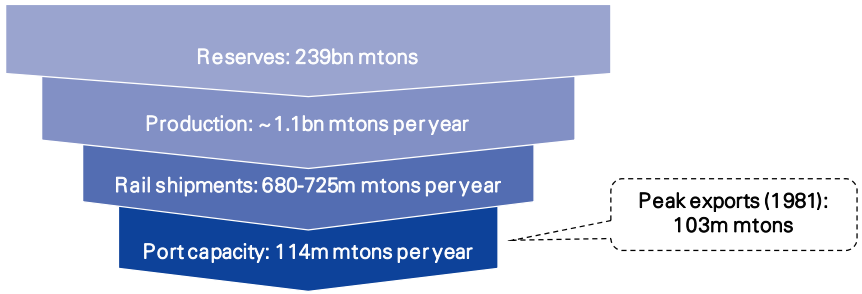
Figure 39: US rail network



Source: Mobilebayregion.com and Deutsche Bank

Most US coal destined for Europe leaves out of the Mid-Atlantic and Gulf ports, with the Lamberts Point (VA), Dominion Terminals (VA), KMT-Pier IX (VA), Baltimore (MD) and McDuffie (AL) ports handling most shipments. While most met coal for export is shipped from CAPP to Hampton or Newport News, Virginia, thermal coal is primarily shipped out of Mid-Atlantic ports in Maryland and Virginia, as well as out of Louisiana. Industry sources note that at sufficiently attractive price levels, ILB coal has been transported down the Mississippi bound for South America, Europe, and even Asia.

Figure 40: US coal "supply chain" illustration

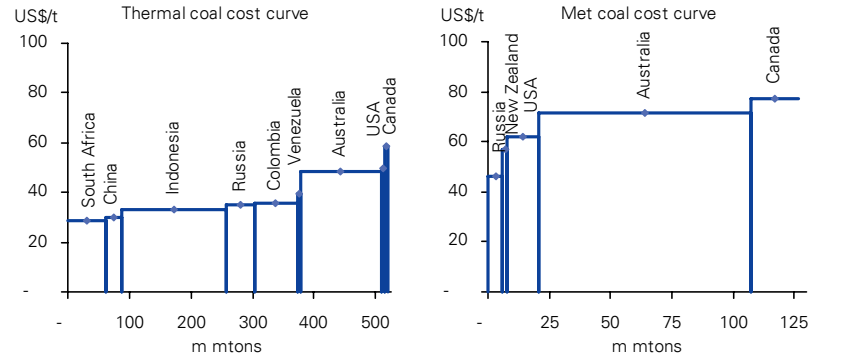


Source: BP, EIA, American Railroad Association and Deutsche Bank

Delivered coal costs and mine cash cost curves

Coal production costs are only part of the story, as customer costs are highly contingent on rail/logistic costs. Though costs vary by region, the key components are energy (diesel, natgas and electricity), labor, royalties/taxes and "others" (eg, compliance, dynamite, equipment and steel). Generally, US companies are at the higher end due to older mines and higher compliance costs. The figures below highlight that US operating costs are competitive, but logistics (domestic and international) can account for a large component of overall delivered costs for customers. We currently estimate it can cost as much as US$40/mton to ship coal from an Eastern basin mine to a port compared to a ~US$60 mine cost. Additionally, US coal costs another US$30/mton to ship to Asian markets, illustrating sensitivity to both domestic and international logistics rates.

Figure 41: Coal mine cash cost curves (2009) – FOB port



Source: AME and Deutsche Bank

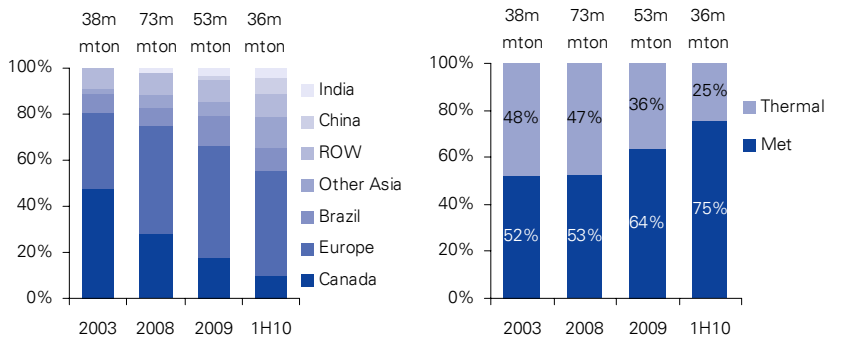
US coal exports by destination and type

Canada and Europe have been the largest coal trade partners with the US. In 2003, 2008 and 2009, Canada comprised 48%, 28% and 17% of the export market for the US. Although Canada possesses its own coal reserves, it imports coal from the US because most of its coal is located 2,300km from Eastern Canada, where much of its industrial base is situated. As such, it is economically and logistically advantageous for it to source coal from the US. During the same periods, Europe accounted for 33%, 48% and 48% of the export market.

During the same years, Brasil's share was 8%, 8% and 13%. Not surprisingly, China and India saw their share grow modestly over time. China went from 0.3% in 2008 to 7.4% in 1H10, and India's consumption grew from 2% in 2008 to 3.9% in 1H10. Over time, we believe that there is potential for more exports into the Asia-Pacific region, provided supportive economics and the needed logistical infrastructure (rail, ports) is developed.

In 2008, US met and thermal coal exports were nearly evenly split, while in 1H10, met coal comprised 75% of exports and thermal declining to 25%. Almost all met coal exports originate from the Appalachia. Most met coal for export is shipped from CAPP to Hampton or Newport News, Virginia before loaded unto a ship destined for Seaborne markets. The largest US met coal producers are Alpha Natural (ANR), Cliffs Natural Resources (Cliffs), CONSOL (CNX), Massey (MEE), Patriot Coal (PCX) and Walter Energy (WLT).

Figure 42: US coal exports by destinations and by type



Source: EIA and Deutsche Bank

US coal export facilities

The proximity between Appalachian mines to developed rail systems and the Mid-Atlantic seaports partially explain why Europe has been a key export market. Other major port facilities near the Gulf States provide additional alternatives due to availability of river barges. Most port facilities are owned by

coal producers, railroad companies, or a partnership involving a combination of these entities. At one point, the coal industry intended to build coal export capabilities on the West Coast, including Los Angeles, Long Beach and Sacramento. As exports declined in the 1980s, there was less urgency to build out the needed infrastructure to support export growth. Some coal shipments came out of the LAX (shipping port) but that capacity has been idled since the mid-2000s. Discussions to expand West & East Coast coal export capabilities have again emerged but no definitive plans have been introduced.

Figure 43: US coal export facilities

Port	Owner	Rail
Eastern Seaboard		
Lamberts Point (VA)	Norfolk Southern (NS)	NS
Dominion Terminals (VA)	Virginia Gen Partnership	CSX
Baltimore - CNX (MD)	CONSOL Energy	NS/CSX
KMT-Pier IX (VA)	Kinder Morgan	CSX
Baltimore - Chesapeake Bay (MD)	Private	CSX
Shipyard (MD)	Private	NS/CSX
Gulf Coast		
McDuffie (AL)	Alabama State Port Authority	CN/CSX/BN/NS
IC Marine (LA)	Private	CN
IMT (LA)	Kinder Morgan	Barge only
TECO (Davant)	Teco	Barge only

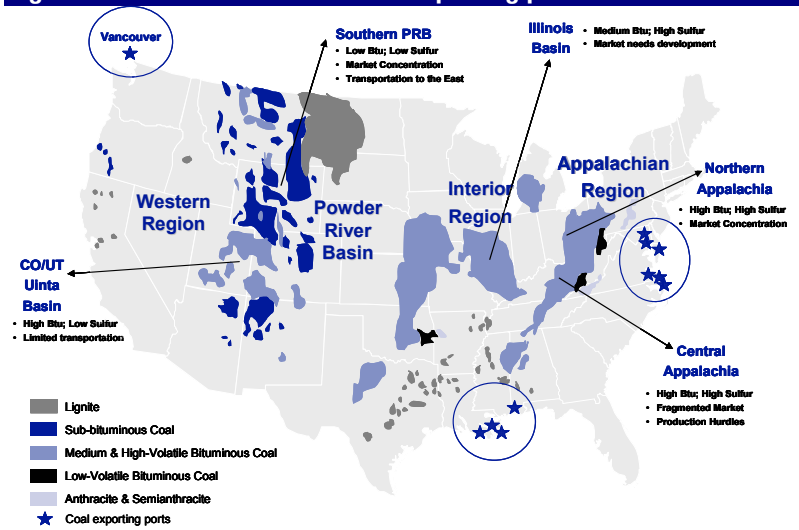
Note: NS = Norfolk Southern, CSX = CSX Corp, CN = Canadian National Railway, BN = Burlington Northern Santa Fe, Virginia Gen Partnership is owned by Alpha Natural (41%), Peabody (37.5%), Arch (21.5%); Source: Kinder Morgan Energy Partners, Platts, Natural Resources Canada, Peabody Energy and Deutsche Bank

Figure 44: US coal export districts

	Exports (m mtons)		District %	
Districts	**2008**	**2009**	**2008**	**2009**
Eastern	38.7	32.0	52%	60%
Southern	16.4	12.3	22%	23%
Western	0.8	1.2	1%	2%
Northern	17.7	8.0	24%	15%
Others	0.4	0.1	1%	0%
Total	74.0	53.6	100%	100%

Note: Eastern includes districts in these states - MD, NY, VA, PA, ME, VT; Southern includes districts in these states - SC, TX, FL, AL, LA, GA, FL, NC; Western includes districts in these states - AK, MT, CA, AZ, WA; Northern includes districts in these states - IL, OH, MI, MN, ND; Source: EIA and Deutsche Bank

Figure 45: US Coal basins and coal exporting ports



Source: Deutsche Bank and American Electric Power (AEP) Fact book

Case study: global coal exports – price parity analysis

Once a predominantly national market, coal is increasingly becoming a global commodity. Supply disruptions, logistical constraints and government policies that cause imbalance can contribute to arbitrage opportunities. Currently, export opportunities for US met coal are attractive. Low-vol export prices today are near US$220-225/mtons in the US, and after considering transportation costs this can be a profitable option for US suppliers. Thermal coal export opportunities are more limited, and in figure below, we provide a price parity analysis for thermal coal in Europe using API #2 CIF prices after adjusting for energy content, transportation and carbon costs.

Figure 46: ARA thermal coal export opportunity – parity analysis

API #2 (CIF)
$97
Cal'11

PRB	
CIF	$73
Trans.	$72
Netbacks	$1
Market	$16
Export profit/loss (Est)	**-$15**

CAPP	
CIF	$104
Trans.	$40
Netbacks	$64
Market	$79
Export profit/loss (Est)	**-$15**

Note: Data as of September 1, 2010; Source: Peabody Energy, Deutsche Bank

Future of US coal exports

Through 1H10 US exports totaled 36m mtons (72m mtons annualized) representing a 34% YoY increase. While coal companies understandably effuse over the potential of Asian seaborne markets, data suggest that Canada and Europe will continue to be key markets. Discussions have again emerged about expanding US West and East Coast coal export capabilities, but no definitive plans have been introduced. We believe that there is good potential for coal, especially from the Appalachia and ILB, to be shipped to South America, Europe, and even Asia via existing East Coast ports, as well as river barges down the Mississippi River and into the Gulf of Mexico. Industry players suggest that US export capability to be near 114m mtons per year, versus decade peak export of 73m mtons in 2008.

Should US coal export market returns to prior peak levels, we believe that Arch Coal, Alpha Natural and Peabody could benefit. Alpha Natural has the most upside because of its ~14m mtons annual capacity and majority ownership of Dominion Terminal (DTA) and its exposure to the seaborne met coal markets. Arch Coal and Peabody could benefit because of their joint ownership of DTA, the abundance of PRB coal and their interest in expanding Western Port capacity. Also, we'd note that Peabody has significant leverage to higher exports from its Australian operations, where it plans to increase output from ~25m mtons in 2010 to ~34m mtons by 2014 (75-80% export).

Figure 47: DB NA coal coverage export capacity (2009) (m mtons)

Company	Shipments	Exports	Capacity	Exports/capacity
Alliance Resources LP (ARLP)	23	na	-	-
Alpha Natural Resources (ANR)	43	6.0	13.6	44%
Arch Coal (ACI)	113	6.8	9.1	75%
Cliffs Natural Resources (CLF)	2	1.1	5.0	22%
Peabody Energy (BTU)	221	2.0	9.1	22%
Others	572	37.6	76.7	49%
Total	**973**	**53.5**	**113.4**	**47%**

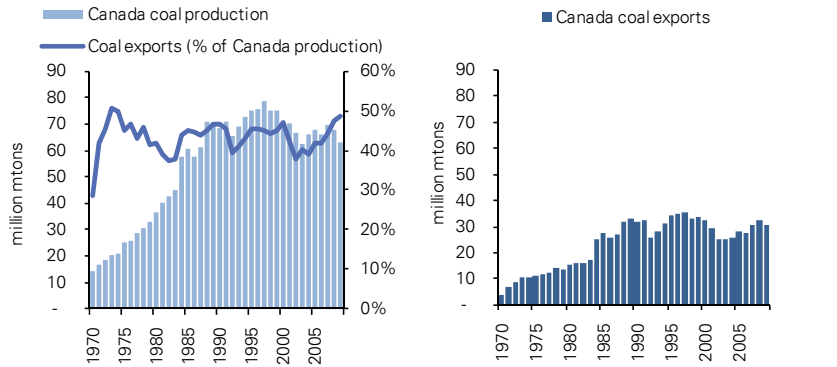
*Note: *2009 has the most recent full-year data. For CLF, future exports are expected to grow due to acquisition of INR. Industry-wide, exports declined 27% YoY due to the global financial crisis; Source: Company reports and Deutsche Bank*

Canada coal market overview

Canada holds 7bn mtons of proven coal reserves, ~1% of the world's reserve base, which at current production rates equals to a ~100 years of mine life. Though Canada's annual coal production of ~70m mtons is dwarfed by the +1bn mtons produced in the US, Canada's exports +30m mtons (mostly met coal) are nearly half of the US's exports. Eastern Canada imports ~18m mtons annually of thermal coal from nearby mines in the US in order to satisfy the energy needs from industrial Central/Eastern Canada, as most large-scale coal mines are located in Western Canada (~2,300km distance). This creates a symbiotic relationship in NA for thermal coal between Canada and the US, and results in met coal availability from Western Canada for world markets.

Canada's coal production has remained fairly stable at ~65m mtons over the past decade. In 2009, production of 63m mtons declined by 8% YoY as global demand waned following the 2008 financial crisis. About 26m mtons of the production (41% of the total) was met coal for export, 5m mtons (8%) was thermal coal for export, and the remaining 32m mtons (51%) was thermal coal destined for domestic coal-fired power generation. In sum, Canada exported 31m mtons of coal in 2009 (49% of its total coal output), with met coal representing 84% of total exports and thermal, 16%. Hence, despite small coal production overall, Canada is a leading international Seaborne met coal, with almost all of met coal produced in Western Canada destined offshore.

Figure 48: Canada coal production and exports

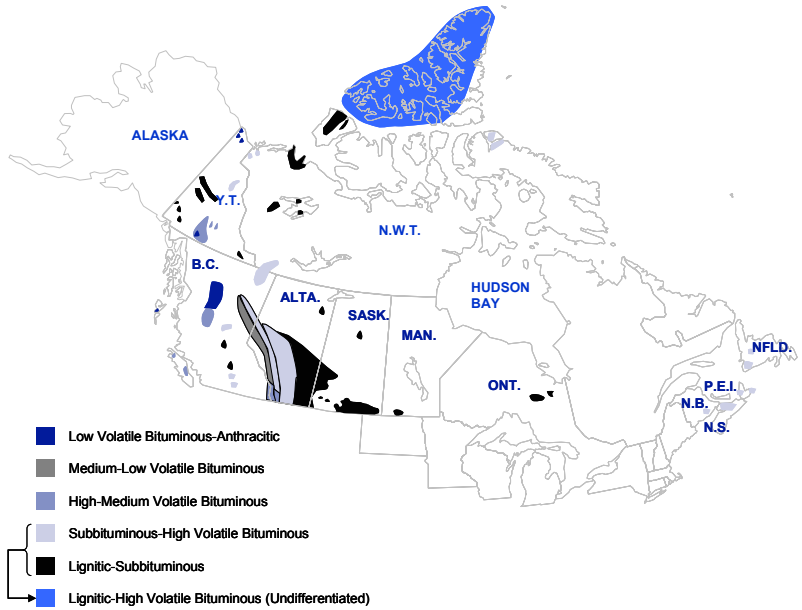


Source: Natural Resources Canada, AME, BP's 2010 Statistical Review of World Energy and Deutsche Bank

Canada coal basins

Canada' coal abounds in the three Western provinces, and northward towards the Arctic Circle. In the West, coal is found in the plains and Rocky Mountain range and foothills. Also, undersea deposits exist off Cape Breton Island in the East Atlantic Provinces and have been exploited for over 100 years via underground mines. However, since the 1960s, surface mining has become the primary coal extraction method, accounting for ~95% of output. Coal is produced primarily Alberta and British Columbia (BC) producing ~85% of the total (46% and 39%, respectively), followed by Saskatchewan with ~15%. Atlantic Provinces, New Brunswick and Nova Scotia produce small amounts.

Figure 49: Canada coal basins distribution



Source: Natural Resources Canada and Deutsche Bank

Four companies produce met coal or Pulverized Coal Injection (PCI) for export: Teck Resources (Teck) (with 6 mines), Western Canadian Coal Corporation (2), Grande Cache Coal Corporation (2), and Peace River Coal (1). Two companies export thermal coal: Sherritt International Corporation (Sherritt) and Hillsborough Resources Limited (Hillsborough), and three produce thermal for domestic power: Sherritt (9 mines), Pioneer Coal Limited and NB Coal Limited.

Figure 50: Canada's coal mines

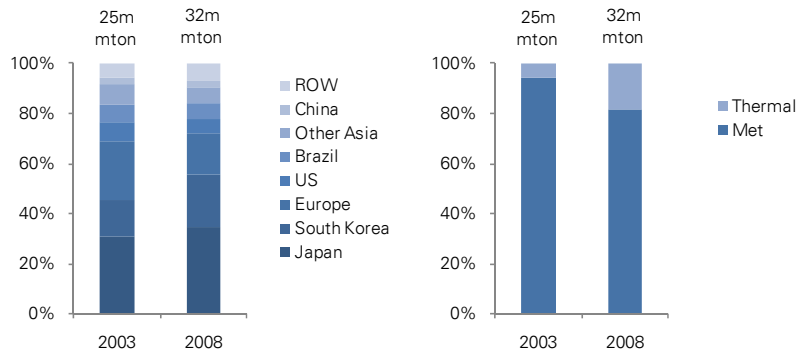
Mine	Owner	Location	Production (m mtons)	Coal type
Bienfait	Sherritt	Saskatchewan	3	Lignite
Boundary Dam	Sherritt	Saskatchewan	7	Lignite
Brule	Western Canadian Coal	BC	2	PCI
Cardinal River	Teck	Alberta	2	Met
Coal Mountain	Teck	BC	3	Met
Coal Valley	Sherritt	Alberta	4	Thermal
Elkview	Teck	BC	6	Met
Fording River	Teck	BC	8	Met
Genesee	Sherritt	Saskatchewan	6	Subbituminous
Grande Cache	Grande Cache Coal Corp	Saskatchewan	2	Met
Greenhills	Teck	BC	5	Met
Highvale	TransAlta Corp	Alberta	13	Subbituminous
Line Creek	Teck	BC	2	Met
Paintearth	Sherritt	Alberta	4	Subbituminous
Poplar River	Sherritt	Saskatchewan	4	Lignite
Quinsam	Hillsborough	BC	1	Thermal
Salmon Harbour	NB Power	New Brunswick		Thermal
Sheerness	Sherritt	Alberta	4	Subbituminous
Stellarton	Pioneer Coal Ltd	Nova Scotia		Thermal
Trend	Peace River Coal	BC	2	Met, PCI
Whitewood	TransAlta Corp.	Alberta	3	Subbituminous
Wolverine	Western Canadian Coal	BC	3	Met, PCI

Note: All, except Quinsam, are surface type mines, Grand Cache has surface and underground mines; Source: Natural Resources Canada and Deutsche Bank

Canada coal "supply chain"

Roughly 50% of Canada's coal is transported by rail, making it the largest commodity railed by volume (rest is by truck to mine-mouth energy plants). Coal mined in Eastern BC and Western Alberta travels ~1,100km to West coast ports or 2,300km east to Thunder Bay for shipment by Lake Ontario to the US. Nearly half of Canada's production is exported (world's No. 3 met coal exporter) to more than 50 countries. Japan is Canada's largest coal buyer (~34% of exports), followed by South Korea (~21%), Europe (~17%), the US and Brasil (~6% each).

Figure 51: Canada coal exports by destination and type



Source: Natural Resources Canada and Deutsche Bank

About 80% of Canada's seaborne coal exports are shipped through coal terminals in Vancouver, BC, and the rest is through the Ridley Terminals (Northern BC). Approximately 34m mtons of coal is hauled by rail and ~53m mtons of coal handled by ports. Ports in Western Canada have the capability to handle ~65m mtons per year and expansions could be considered if needed, but these currently do not seem to be bottlenecks.

Figure 52: Western Canada's port handling facilities for coal

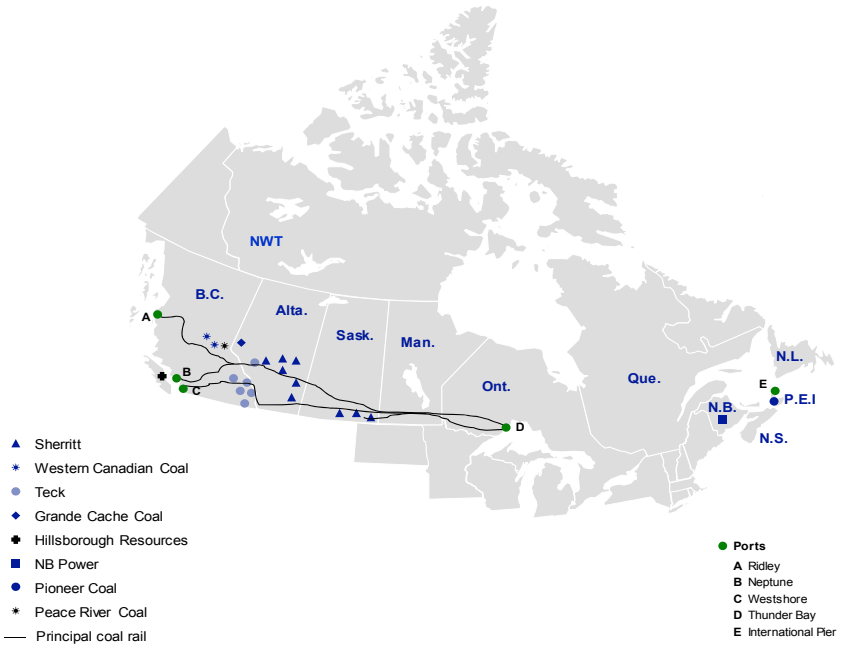
Port	Owner	Location	Capacity (m mtons/y)	Rail
Neptune	Teck Resources	BC	15	CN, CP
Ridley	Prince Rupert Port Authority	BC	12	CN
Thunder Bay	Thunder Bay Port Authority	Ont.	9	CN, CP
Westshore	Westshore Terminals Ltd. Partnership	BC	29	CP, CN, BNSFe
Total			**65**	

Note: CN = Canadian National Railway, CP= Canadian Pacific Railway and BNSFe = Burlington Northern Santa Fe; Source: Canadian Minerals Yearbook, industry and company reports, and Deutsche Bank

Collectively, Sherritt and Teck produce 70% of Canada's coal output, with the former primarily supplying the domestic market with thermal coal, and the latter supplying the met coal seaborne market. Sherritt is Canada's largest coal producer, with nine surface mines in Alberta and Saskatchewan. Sherritt produces more than 94% of the thermal coal mined in Canada, supplying both domestic utilities (primarily) and international companies. Sherritt's coal operations produced ~35m mtons in 2009.

Teck is Canada's second-largest coal producer (~24m mtons produced in 2009). Westbound coal from five mines in BC originates on the Canadian Pacific railway system (CP) and the one mine in Alberta originates on the Canadian National railway system (CN) and head to Vancouver. The CP and CN lines meet in Kamloops, where Teck transfers up to 4m mtons from CP to CN for furtherance on to Vancouver. Teck uses its own Neptune terminal (8m mtons/y of capacity can be expanded to 10-12m mtons/y if necessary). Teck also uses ~75% of the Westshore Terminal's capacity (29m mtons/y capacity) to handle the rest of its coal. Should the Quintette mine (BC) re-start, Teck would use the 12m mtons capacity of the Ridley Terminal in Prince Rupert, which is currently underutilized and can be expanded to 24m mtons/y.

Figure 53: Canada coal mines, rails and ports



Source: Natural Resources Canada and Deutsche Bank

North America Winners and Losers in Coal

Below is a description of potential winners in the global coal export market. In the event that coal exports from NA increase and prices more closely track international levels, the domestic steel industry could be adversely impacted. Strong international demand for met coal would raise domestic raw material costs for steelmakers; as well, higher thermal prices would raise energy costs. The transition to Seaborne and shorter contracts for met coal is a negative for the steel industry, which has traditionally benefited from longer-term and "collared" contracts.

Alliance Resource Partners L.P. (ARLP, HOLD, PT US$57/share)

- Fifth-largest Eastern coal producer; one of the few coal miners incorporated as a Master Limited Partnership
- Sold 23m mtons of coal in 2009 (100% thermal); 78% of volume comes from ILB

Alpha Natural Resources (ANR, BUY, PT US$55/share)

- 3rd largest coal producer in the US (after merger with Foundation Coal; FCL); controls 2.1bn mtons of reserves (~64% is low sulfur and ~54% meets highest Clean Air Act requirements)
- #1 producer and exporter of met coal in the US
- Sold 78.1m mtons (pro-forma) of coal in 2009 (90% thermal, 10% met)
- Exported 6m mtons in 2009 (96% met, 4% thermal).
- Produces steam and met coal from 61 active mines, 14 coal prep plants and 6 loading facilities
- Exposure to PRB (~45% of 2009 production), CAPP (~37%) and NAPP (~17%)

Arch Coal (ACI, BUY, PT US$32/share)

- 2nd largest publicly traded coal producer in US, with an ~11% share of 2009 US production; controls ~3.5bn mtons of coal reserves following recent acquisitions of Jacobs Ranch and Otter Creek reserves - which ~85% is low sulfur. 19 active mines from 11 mining complexes
- Sold 114.4m mtons of coal in 2009, including third parties purchases (98% thermal, 2% met)
- Has 9.1m mtons of export capacity and shipped 3.6m mtons overseas in 2009 (68% thermal, 32% met)
- Exposure to PRB (~77% of 2009 sales volumes), WBIT (~13%) and CAPP (~10%)

Cliffs Natural Resources (CLF, BUY, PT US$95/share)

- Coal production capacity to reach ~11m mtons by 2012 (primarily met), from current annualized production of ~7m mtons, due to recent INR Energy transaction
- Coal could represent 30% of total revenues by 2012E

Peabody Energy (BTU, HOLD, PT US$55/share)

- World's largest private-sector coal company with operations primarily in the US and Australia; controls 8.2bn mtons of coal reserve base in the US and Australia
- Largest coal producer in the US, with a 2009 market share of ~18%
- Sold ~221.4m mtons of coal in 2009 (97% thermal, 3% met)
- Has 9.1m mtons of export capacity in the US and shipped ~2.0m mtons overseas in 2009; shipped 8.7m mtons of thermal coal and 6.3m mtons of met coal out of Australia
- Operates 28 coal facilities that consist of three principal operating segments: Western US Mining (66% of 2009 sales volume), Midwestern US Mining (13%) and Australian Mining (9%)

North American Iron Ore

NA has iron ore reserves of 3bn mtons, or roughly 4% of world's reserves, and at current production levels represents ~3% of the world's total production and ~4% of the world's seaborne trade (with Canada comprising nearly 75% of NA's total exports). At current production, the US and Canada have 35-40 years of reserves. At ~60m mtons of capacity, the semi-captive US iron ore industry services the needs of the US steel industry, but has limited ability to reach world markets due to constraints of exporting via the Great Lakes/ St. Lawrence Seaway. Conversely, Canada's 30m mton iron ore industry has historically serviced US and Europe. Iron ore exports from Canada could rise five-fold from 20m to 100m mtons over the next decade if numerous projects are successful, leading to a net export ratio of ~90%.

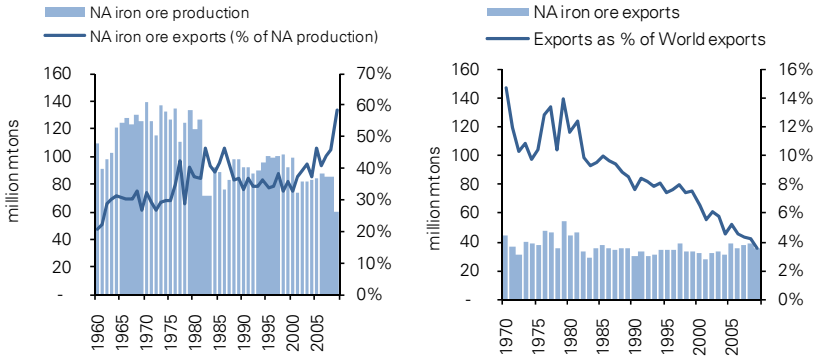
Figure 54: NA iron ore mines, steel mills and ports – fairly concentrated

Source: USGS, Natural Resources Canada, industry and company reports and Deutsche Bank

Though iron ore production in US represented a meaningful share of the world's production until after World War II, production shifted since then to the high-grade deposits that were discovered and put into production in Brasil, Australia and Canada. In the US, high-grade hematite (50-60% iron content) ores have declined and instead have resulted in a usage increase of chert-magnetite (taconite) ores (25-30% iron content) for pellet production. This has resulted in the need to upgrade iron content through pelletizing and by the mid-1980s pellets made up over 95% of US production.

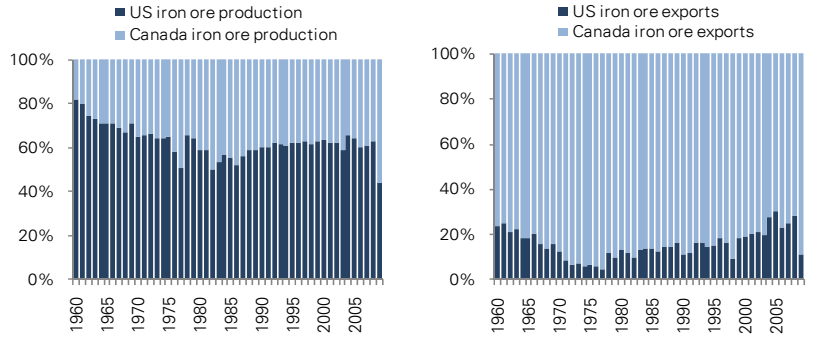
Canada's largest iron ore mines, on the other hand, were brought into production after 1950 and with slightly better grades (40-55%) allows for some non-pelletized production. Due to proximity, the majority of Canada's production is destined for the US. While Canada also services the European Seaborne trade via Atlantic Coast ports (and increasingly Asia), US-based production is largely "land-locked" and consumed domestically. Furthermore, approximately half of US iron ore production is "captive" and owned by a steel industry that sees little benefit in exporting a key raw material. Ownership of merchant iron ore mines is less prevalent in Brasil and Australia.

Figure 55: NA iron ore production and exports



Source: World Steel Association, AME, USGS, Natural Resources Canada and Deutsche Bank

Figure 56: US and Canada share of NA production and exports



Source: World Steel Association, AME, USGS, Natural Resources Canada and Deutsche Bank

NA iron ore production landscape evolving

A number of iron ore development projects could potentially change the production landscape and trade dynamics of NA, as most of them are coming from Canada, which de facto would supply the seaborne market. While in total these projects could double NA's iron ore capacity and possibly surpass the 200m mtons, NA would still only produce ~5% of the world's production, when considering all other major iron ore expansions worldwide. The NA iron ore industry also includes a number of projects (some of which are at very early stages) that still require funding, environmental assessments, permitting, as well as the proper logistics in order to become a reality (see Canada new iron ore projects on the horizon section).

Figure 57: NA iron ore capacity potential

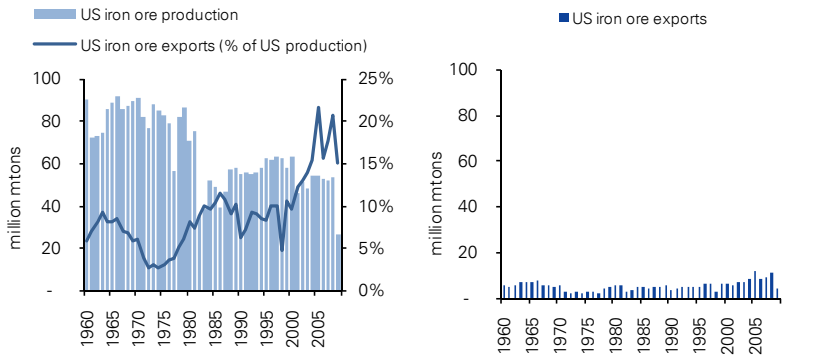
(m mtons)	2010E	+2016E	Potential increase
Canada			
Rio Tinto (IOC)	17	25	8
ArcelorMittal (QCM)	15	24	9
Cliffs (Wabush)	6	6	-
Consolidated Thompson	4	16	12
Other	2	87	85
Total Canada	**44**	**158**	**114**
US			
Cliffs (at 100% mine capacity)	33	33	-
US Steel	21	21	-
ArcelorMittal	3	3	-
Other	-	3	3
Total US	**57**	**60**	**3**
Total Mexico	**1**	**1**	**-**
NA Iron Ore	**102**	**219**	**117**

Note: Other includes green-field projects at various development stages to denote potential, so highly speculative; Source: Deutsche Bank

US iron ore market overview

The US holds ~2.1bn mtons of iron ore reserves (3% of the world's total), and produces nearly 55m mtons on a yearly basis (dropped to 29m tons in 2009 due to market conditions). Iron ore production in the US translates to 2% of the world's total. US iron ore production is mostly consumed domestically, with 10-20% of production exported (mostly via the Great Lakes trade, not seaborne). While the US currently imports 5-10m mtons of ore (mostly from Canada), the figure has dramatically declined versus the higher levels imported in the 1960s (~40-50m mtons, when half was imported from Canada and the remainder from South America) as high-grade ores became exhausted and US taconite ores began to be mined.

Figure 58: US iron ore production and exports



Source: World Steel Association, AME, USGS and Deutsche Bank

From 1890 to 1980, higher-grade iron ore (50-60% iron content) was mined in the US. The US began to gradually transition to low-grade formations (25-30% iron content) beginning in the 1950s and now account for virtually all of the iron ore presently mined (95%), requiring beneficiation and agglomeration in order to upgrade to higher-grade target iron content (ie, 65%).

Up until 1982, most US iron ore mines were owned by steel companies, but then divested as non-core by financially pressured steel companies. However, in the wake of China's growing appetite for iron ore (that brought prices to new highs), integrated steel producers in the US (ie, those that own iron ore mines) have fared better. Steel companies around the world have reassessed benefits of controlling a key feedstock.

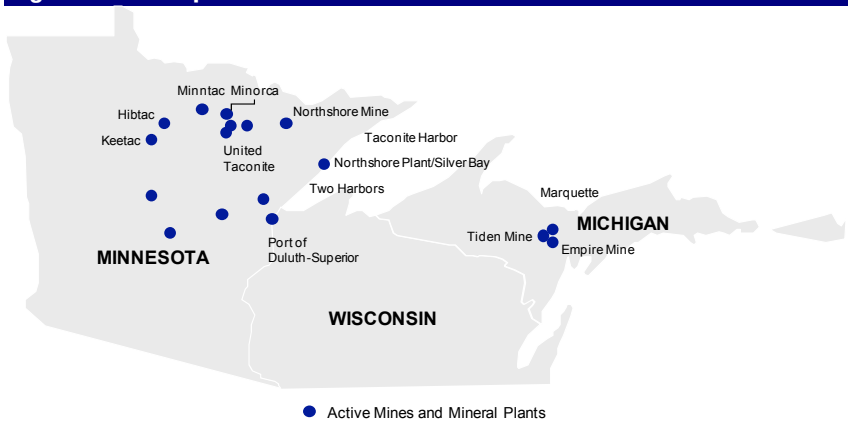
US iron ore ranges

Of the principal iron ore ranges, the Mesabi Iron Range in Minnesota accounts for nearly 70% of US reserves, and Michigan's three major ranges (Marquette,

Menominee and Gogebic) amounting for most of the remainder. The Menominee and Gogebic ranges extend to Wisconsin. The Mesabi Iron Range, responsible for all of Minnesota's iron ore production for the past 20 years is roughly 4.8km wide iron-rich sedimentary rocks and extends in a Northeasterly direction for ~195km from West of Grand Rapids to the Eastern edge of St. Louis County.

Mines in Minnesota and Michigan ship nearly all of the usable iron ore, with Minnesota representing nearly 75% of total US production. Domestic US production is comprised of 12 iron ore mines (11 open pits and 1 dredging operation), 8 concentration plants and 8 pelletizing plants (in operations last year). Due to the lower iron ore content mined today (compared to decades ago) nearly all of the ore is concentrated before being shipped, capping exports potential as it is not always economic to ship processed pellets long distances as product can decay. Cliffs (with 33m mtons mine capacity in the US), US Steel Corp (21m mtons) and ArcelorMittal (3m mtons) operate eight of the mines that account for virtually all US production.

Figure 59: Principal US iron ore mine locations



Source: USGS and Deutsche Bank

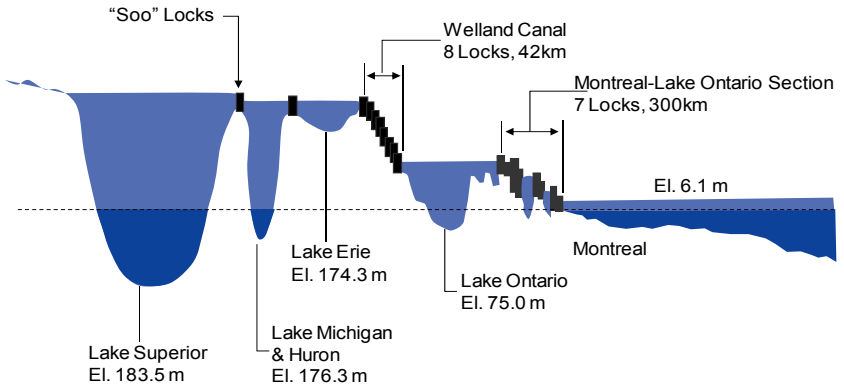
Within Minnesota, there are additional iron ore resource areas that offer additional possibilities, from deposits that could contain 1.5bn mtons of potential high-grade iron ore for pellet production. These include the Mesabi Nugget with a nameplate production capacity of 0.5m mtons and a US$1.6bn fully-integrated (on-site mining through steel-making) project by Minnesota Steel Industries, which could produce 2.5m mtons. However, similar to most US iron ore production currently, additional tonnage would be primarily consumed domestically.

US iron ore "supply chain"

The majority of iron ore pellets produced in the US is transported via railroads to loading ports for shipment via Lake freighters ("Lakers", which are bulk carrier vessels with ~60,000 DWT capacity that ply the Great Lakes) to steelmakers in the US or Canada.

The opening of the St. Lawrence Seaway in 1959 provided a route into the Great Lakes for international maritime trade. At present, almost all iron ore is moved through the Great Lakes (Lake Superior ports to Lower Lakes ports in Ontario, Canada), and Ohio, Indiana, and Michigan in the US. The distance from Duluth (westernmost point of Lake Superior) to the mouth of the St. Lawrence is ~3,700km. There are 15 locks on the St. Lawrence Seaway (eight locks at the Welland Canal and seven (two in US, five in Canada) on the St. Lawrence Seaway) that raise ships 174 meters from sea level to the level of Lake Eire. It is around Lake Superior that all the iron ore that is mined in the US is shipped from, and this is 184m above sea level. The largest steel producing states in the US all border the Great Lakes.

Figure 60: Cross-section of Great Lakes and St. Lawrence Seaway



Source: USGS and Deutsche Bank

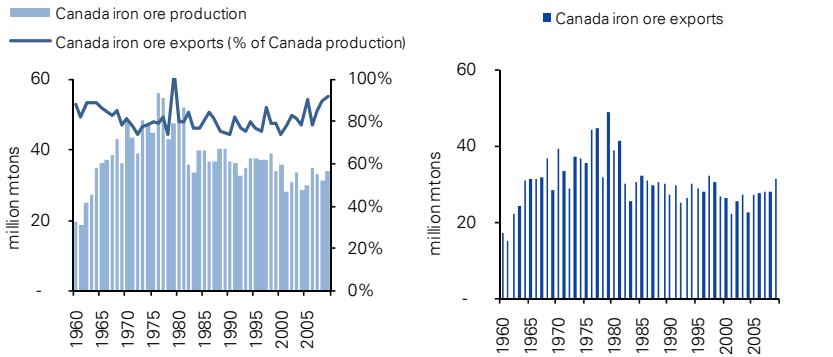
St. Lawrence Locks require smaller vessels of 30,000 DWT, so extra port handling to get to Atlantic and then require a second ship change to reach overseas markets on larger Panamex or capesize ships. Hence, transporting material from Canada to the US is feasible, but not so much from US to Canada. An additional constraint to the shipping infrastructure is weather related, with winter freezing the lakes, rivers and canals and summer droughts limiting vessel draft capacities. From January through to late March, the Soo Locks and the Welland Canal close and maintenance takes place.

The main entry point for iron ore on the Eastern Seaboard is the Port of Sparrows Point located on the outskirts of Baltimore, serving as an unloading point for the area's steel producers and as a transfer point for iron ore heading by rail towards Pittsburgh and Great Lakes. Consumers in the Great Lakes area can be supplied via three different routes: 1) the Great Lakes system for US producers located on the shores of Lake Superior, 2) using the St. Lawrence Seaway to import Canadian iron ore, and 3) using the Mississippi River to barge up iron ore, mostly from South America.

Canada iron ore market overview

Even though Canada only holds 1.1bn mtons of proven iron ore reserves (~1% of the world's total), it is a growing supplier to the international markets. Over the past decade, production has hovered between 30-36m mtons and more than 80% has been exported.

Figure 61: Canada iron ore production and exports



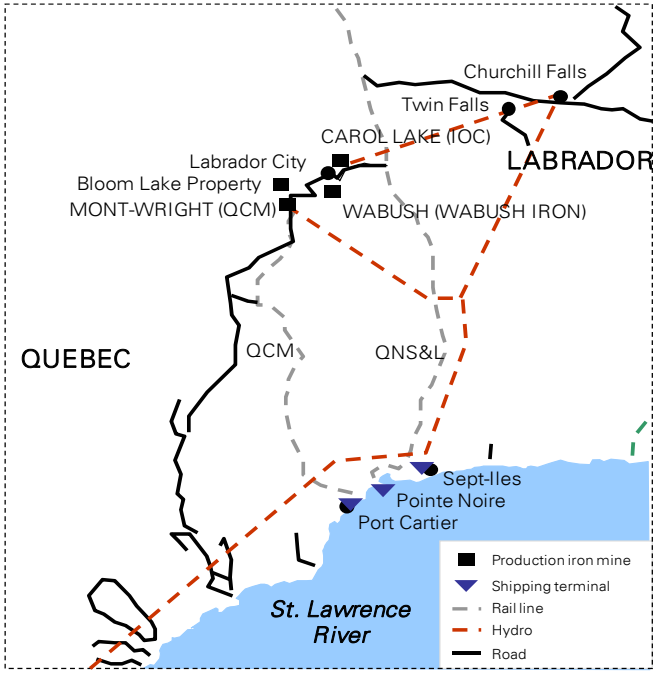
Source: World Steel Association, AME, USGS, Natural Resources Canada and Deutsche Bank

Canada iron ore ranges

Iron ore mining is mainly done in the Labrador Trough area, a major geological belt extending through northern Quebec and Labrador. Production totaled 33.9m mtons in 2009, with Newfoundland and Labrador accounting for 60% of mine shipments, followed by Quebec (40%) and a negligible contribution from BC. Nearly 80% of Canada's iron ore production is exported, whereas the country imports 75% of its 12m mtons needs.

The Labrador Trough contains world-class iron deposits that have been mined since the 1950s. This band extends from about 1,100km Southeast of Ungava Bay through both Quebec and Labrador. Further South, it turns Southwest past the Wabush and Mount Wright areas within 300km of the St. Lawrence River.

Figure 62: Canada iron ore mines concentration



Source: Natural Resources Canada, industry and company reports and Deutsche Bank

The iron ore industry in Canada produces several forms of iron ore, including pellets, concentrates and sinter of different grades and qualities. Most iron ore in Canada is extracted from open-pit, being truck and shovel-type. To improve the iron ore grade in Canadian operations, producers submit their ores to a variety of beneficiations processes to upgrade the iron ore content by extracting the silica content and other impurities from the ores.

The hardness of the ore varies from one deposit to another. But in general, the ore mined by Cliff's Wabush mine is the softest, followed by ArcelorMittal's ore from Quebec Cartier Company of Canada (QCM). Rio Tinto's ore from Iron Ore Company of Canada (IOC) is considered the hardest. Canadian ores are thought to be harder than Brazilian and Australian ores, but are softer than South African, Indian, and US ores. Softer ores are easier to extract reducing "wear-and-tear" on trucks, tires and processing equipment; hence, lowering production costs.

Canada iron ore "supply chain"

Canadian iron ore producers are amongst the lowest-operating-cost suppliers of concentrates and pellets to Lake Ontario and Lake Erie ports, and are cost competitive at Lake Michigan ports and at Baltimore on the US Eastern Seaboard. Notwithstanding, this competitiveness diminishes with an increase in distance to service other markets. Iron ore trade in the Canada-US market is predominantly for pellets.

Canada's production in the Labrador Trough area comes primarily from four mining operations owned by IOC (which came into operation in 1954), QCM (1957), Wabush Mines (Cliffs) (1960s) and more recently, Consolidated Thompson (2010). The remaining production comes from the by-product recovery of magnetite.

- **IOC** (owned by Rio Tinto, Mitsubishi Corporation and the Labrador Iron Ore Royalty Income Fund – 59%/ 26%/ 15%) is Canada's largest iron ore producer and a leading global supplier of iron ore pellets and concentrates. IOC's current mine and processing facilities located near Labrador City are known as the Carol project. Annual capacity at the Carol concentrator is 17m mtons of iron ore concentrate, of which 13m mtons can be pelletized. After processing, the pellets and concentrates are transported 418km south on the IOC-owned and operated Quebec North Shore & Labrador (QNS&L) railway to the company's shipping terminal and year-round deep-water port in Sept-Îles, Quebec.
- **QCM** (now ArcelorMittal Mines of Canada) produces nearly 40% of Canada's total production. ArcelorMittal Mines of Canada operates two large open-pit mines, one in Mount Wright (largest of its kind in North America) and one in Fire Lake. The Mount Wright mining complex includes a concentrator and an automated concentrate train-loading system. The site is linked by company rail to the Port-Cartier industrial complex, which comprises the pellet plant, storage areas, and port facilities for shipping.
- **Wabush.** Cliffs owns and operates a mine and concentrator in Wabush (Newfoundland and Labrador) and a pellet plant and port in Pointe-Noire/Sept-Îles (Quebec). With an estimated annual capacity of 6m mtons, Wabush produces four grades of pellets. The company ships its iron ore via the QNS&L railway from Wabush to Pointe-Noire and then onto US and European markets.
- **Bloom Lake.** Consolidated Thompson is ramping up production at Bloom Lake in Quebec at an estimated 8m mtons/y capacity (producing ~4m mtons in 2010), and plans to double capacity by 2H12. Rail spurs join the processing plant to the QNS&L railway. The ore moves south to Sept-Îles via the QNS&L railway, along with shipments from IOC and Wabush Mines, for international shipment to China.
- **HudBay Minerals** operates Flin Flon 777 Mine in Hudbay, which produced 1.5m mtons in 2009 and the Trout Lake Mine which produced 0.7m mtons in 2009.

Figure 63: Canada's port handling facilities for iron ore

Port	Owner	Location	Capacity (m tons/y)	Rail
Cartier	ArcelorMittal	Quebec	20	Cartier Railways
Pointe-Noire	Port of Sept-Iles	Quebec	8	QNS&L, AR
Sept- Iles	Sept-Iles Port Authority	Quebec	30-35	QNS&L
Quebec	Quebec Port Authority	Quebec	25-30	CN, CP

Note: AR is Arnaud Railways-small railways connecting Point Noire to QNS&L; Source: Natural Resources Canada and Deutsche Bank

Canada is highly dependent on the European steel industry as a consumer of product from its iron ore mines. Europe dominates Canada's concentrate sales and consumes about a third of its pellet production. The US is the second most important market and consumes mostly pellets. The remainder is used domestically and increasingly by the Asian markets.

Canada new iron ore projects on the horizon

A slew of new iron ore projects in Canada could propel production to surpass 100m mtons per year over the next decade, squarely aimed at world markets. Some of these projects are located near Quebec and Labrador, but several are in the Nunavut Territory (north of the Hudson Bay area). While some of the projects are further along in development, others are still at a very early stage. All need to square long-term funding, environmental assessments, permitting, as well as the proper logistics in order to warrant a cost competitive product.

- **New Millenium** currently has iron ore deposits (64.5% iron content) in Quebec, Newfoundland and Labrador and three projects in place: DSO (construction), LabMag (feasibility), Kemag (pre-feasibility) that could produce +40m mtons (sinter and pellets) at full capacity, with as much as 4m mtons starting around 2012.
- **Roche Bay** has iron ore deposits (43% iron content) in the Melville Peninsula in Nunavut has a two-stage project that could add 20m mtons in a number of years. Advanced Explorations Inc has the option to earn a 100% interest in the Roche Bay Magnetite Project.
- **Baffinland Iron Mines** has iron ore deposits (65% iron ore content) in Nunavut that could add 18m mtons at full capacity, ramping up production around 2014. Environmental assessments and permitting are scheduled to be completed by the end of 2012 to early 2013.
- **Labrador Iron Mines** has iron ore deposits (56-69% iron ore content) on the Labrador Trough that could add 6m mtons (fines and lump) at full capacity, ramping up production around 2012. The project has already been approved by the government and mine operations permits were recently granted.

North America Winners and Losers in Iron Ore

Below we highlight one name that could be negatively affected in the context of the global iron ore export market, as NA steel producers expand in-house iron ore production and rely less on third-party iron ore production or face more nearby competition. However, we retain our Buy rating, given the stock's discount to valuation.

Cliffs Natural Resources (CLF, BUY, PT US$95/share)

- Largest producer of iron ore pellets in NA, operating 38m mtons of iron ore production capacity (45% of total NA pellet production capacity), and primarily selling to integrated steel companies in the US and Canada
- Operates 6 NA iron ore mines located in Michigan, Minnesota and Eastern Canada (Wabush)
- Iron ore mines are located near the Great Lakes (nearby other major producers in the US), and near the St. Lawrence Seaway (in the case of Wabush), which is connected to the Great Lakes

Valuation methodology and key risks

We use a blend of forward PE and EV/EBITDA multiples and NPVs as our primary valuation tools in the sector. Given the outlook for a cyclical recovery, we now rely more heavily on PE multiples. Additionally, our Price Targets (PTs) are currently supported by premium multiples to NPV with the understanding that our coverage stocks have historically traded above/below these valuations based on the economic outlook.

Key risks include lower metal prices via changes in the supply and demand dynamics, currency, M&A valuation and integration, raw material costs, geopolitical risks, as well as project delays and costs overruns.

Key Thinking – China

China is a significant consumer of bulk commodities – it currently consumes circa 65% of the seaborne iron ore tonnage (and 67% of the total global tonnage) and 11% of the seaborne thermal coal (but 46% of the total). While the country's iron ore consumption has been in the spotlight, it is its coal S&D that will be critical in coming years; with imports currently only ~6% of its consumption, small deviations in domestic supply can impact the international market significantly. As with other regions, it is the rail requirements to get the coal to where it is needed that is the near- to medium-term constraint and we expect China to continue to be a net importer of coal.

The issues

- China's seaborne coal trade consists of coal transport with rail or truck from the northern producing regions (Shanxi, Western Inner Mongolia, and Shaanxi) circa 650-1000km to the ports (Qinhuangdao and Huanghua) and then to consuming regions (YRD and PRD)
- The rail is a bottleneck: with no medium-term solution in sight; limited by capacity at the two trunk lines (Daqin and Shenhuang)
- Time to correct. The rail needs a third trunk line to provide a sustainable solution; capacity from the third trunk line will not be online until 2013-14 at the earliest. Building small feeder or local lines will at best only relieve rather than solve the bottleneck and could even exacerbate it
- Trucking is an alternative, but is expensive and limited to short-haul

Transportation set to remain tight for the medium term

China coal resources are predominantly in Northern and Northwest China. The top three producing provinces in China are Shanxi, Inner Mongolia, and Shaanxi. All three are in Northwest China - Figure 64

Conversely, the major coal-consuming regions are coastal and far from the coal producing regions. Coastal provinces (Jiangsu, Zhejiang, Shanghai, Fujian and Guangdong) account for ~18% of coal consumption. They are even more important for the seaborne coal trade as the coastal provinces accounted for a much higher portion of net consumption (see Figure 64 for net consumption/export by region).

North-to-South: the basis for transportation bottleneck

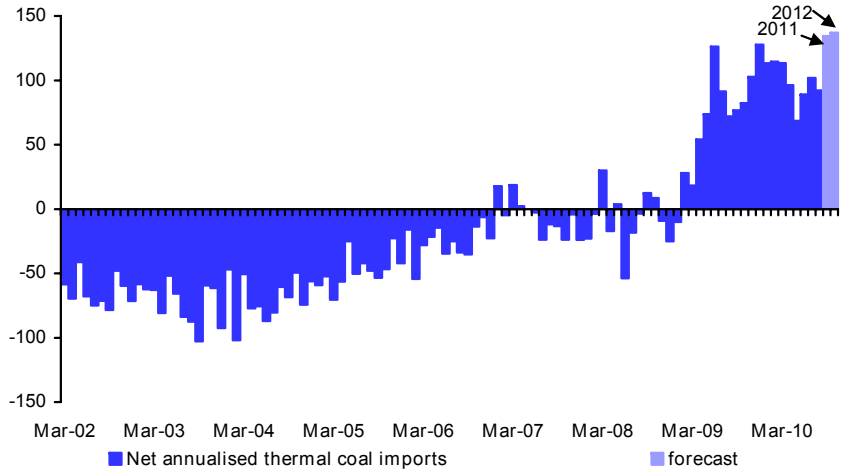
The geographical disparity in production and consumption is the basis of the seaborne coal trade (also called the North-to-South trade). To transport coal from the producing regions to the consuming regions, coal is transported by rail to ports in the Northeast, and then transported by vessels to customers in the Yangtze River Delta and Pearl River Delta.

Figure 64: Seaborne coal trade

Source: CEIC, Deutsche Bank

The key constraint of this transportation network is the rail system. There is very little slack in rail capacity. Rail capacity is very tight in peak seasons and during emergency events. This lack of rail capacity has driven the need for China to increase its coal imports over the last couple of years as shown in Figure 65 below.

Figure 65: China net thermal coal imports (annualised Mt)



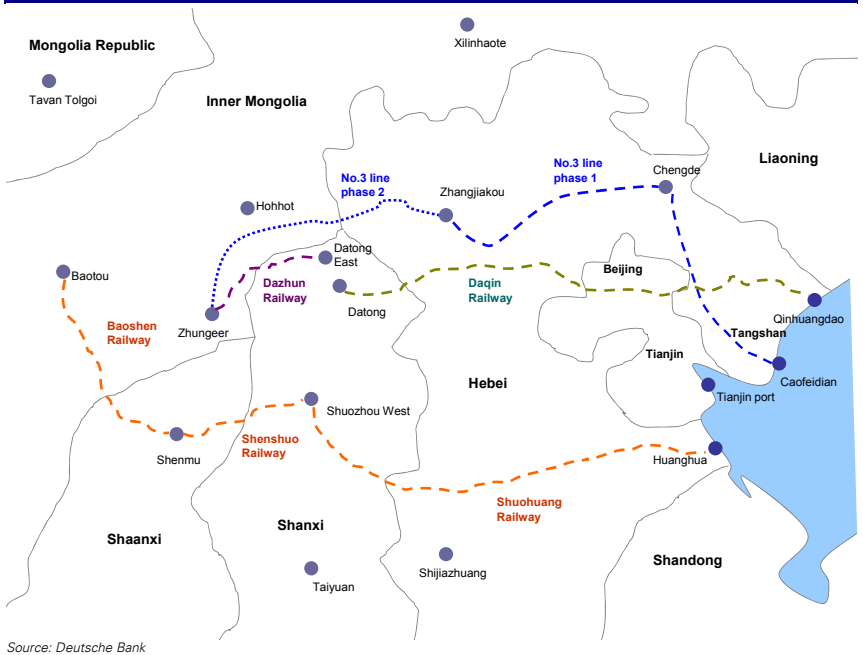
Source: China trade stats, Deutsche Bank

Currently, the Daqin Line and Shenhuang Line are the two main trunk lines that can transport large volumes from the three producing provinces to the ports on the Eastern seaboard.

The total nameplate capacity of the two lines is c.450mtpa. However this is well below estimated state exports of around 900 mt for Shanxi, Shaanxi and Inner Mongolia (based on YTD production numbers annualized and assuming historical share of exports to production). ie, about half the production is railed to the coast, the other half is exported to other provinces in China.

The exceptional growth of the coal trade has clearly strained the rail system. New freight rail development has been slow as the Ministry of Railway (MoR), which is the major operator and regulator of the railway industry, has struggled to meet strong demand for both passengers and cargo. The sheer size of the coal market constantly puts stress on the rail system. The c.450mtpa seaborne coal trade requires annual new capacity of 22.5mt if we assume production grows at 5%, which is Deutsche Bank's 2010 production growth estimate.

Figure 66: China rail network



Source: Deutsche Bank

Daqin Line

The Daqin railway line started operations in 1992 with an initial capacity of 50mt. It has a running length of c.650km and extends from Datong (Shanxi) to Qinhuangdao (Hebei). It is the most important railway line for transporting coal from the Northwest to Qinhuangdao. The line capacity was increased to 350mt in 2008 and again to 400mt in 2009. The current capacity remains 400mt. This compares with traffic volumes of around 407mt (annualized traffic volume for 2010 based on Jan-Jul data).

Shenshuo-Shuohuang line (Shenhuang line)

Shenshuo-Shuohuang Railway is the second-largest coal rail line and runs from Northern Shaanxi through Shanxi to Huanghua ports (Hebei) and Tianjin ports. It is owned and operated by Shenhua. Freight volume reached 134mt in 2008. Shenhua's Shuohuang's line capacity is expected to reach 200mt in 2010 to accommodate its production growth plan.

New rail projects underway but will not come on stream until 2013-14 at the earliest

A third coal rail line to help alleviate the bottleneck, after many years of delays, started construction this year. The project is divided into two phases. The first phase connects Tangshan to Zhangjiakou and started construction earlier this year and has a total designed capacity of 200mtpa and total length of 1,000km. The second phase links Zhangjiakou to Zhungeer and started construction in August 2010. The rail line is expected to be completed by 2013-14. The line is to be jointly owned and constructed by Shenhua, Datang, Huaneng, State Development and Investment Corp and Ministry of Railway.

A fourth coal rail line, according to the local press, has recently started construction and expected to be completed in 4.5 years. The rail is expected to run from Shanxi to Shandong and have capacity of 200 mtpa.

Trucking: high cost option for short-haul

Trucking is another option to transport coal, but it is more expensive than rail and is usually for intra-province shipment. The high cost is a result of lack of scale and toll road charges. For example, the Daqin line can transport 20kt of coal in, while a truck can normally carry 25 tons to 40 tons.

Port network: no constraint at the ports

The Loading ports are concentrated in Northwest China. The major ports are Qinhuangdao, Huanghua, Tianjin, Tangshan and Rizhao. Four are in Hebei/Tianjin and one is in Shandong. These 5 ports account for over 90% of loading capacity in China.

The unloading ports are more spread out on the seaboard to be closer to the ultimate consumers of coal. The largest unloading ports are Guangzhou, Shanghai, and Ningbo.

We do not foresee any port transportation issues due to expansion plans in place. Most port operators are private enterprises.

Outlook: no real solution for rail bottleneck until the third trunk line is built

We believe a sustainable solution will not be found until the third trunk line is built. Construction of regional lines relieves provincial supply-demand, not the seaborne coal trade. Feeder lines only add tonnage into the two existing trunk lines.

.

Key Thinking – India

India is currently a net importer of coal and a net exporter of iron ore. Debate has occurred within India over many years regarding whether it should be an exporter given its likely future needs for commodities as it develops. While India has been extremely flexible in its ability to export iron ore and has stepped in to help fill the gap where the other major producing nations fell short, its systems are not sustainable in their current form. The government is indicating that it will target illegal mining as part of the plans to reduce environmental degradation and we think this will impact 10-15% of the current exports from the country.

Short coal, long iron ore….for now

India is a net importer of coal, and India's appetite for coal imports has increased steadily over the past years due to the constantly widening gap between demand and supply in the coal sector. The Working Group of the 11th Five-Year plan projected a gap between the demand and availability of coal in fiscal 2012 to be 51.0 mn tons, which included a shortfall of 41.0 mn tons and 10.0 mn tons in coking coal and non-coking requirement, respectively. However, the revised projections according to midterm appraisal estimate the shortfall to be much higher at 83.3 mn tons, with shortfall of coking and non-coking coal accounting for 42.48 mn tons and 40.85 mn tons, respectively.

In fiscal 2010 (Mar ending), India imported about 67.74 million tons (provisional) of coal accounting for 11.69 % of its total coal consumption. According to CRISIL Coal Outlook, demand for non-coking coal in India is expected to increase at a rate of 11% to 868mn tonnes by fiscal 2014 driven by rising demand from thermal power and iron and steel industries. Demand for coking coal is likely to increase at the rate of 9.7% in the same period. In contrast, development of new mines is likely to be a slow process given the government's renewed focus on the conservation of ecologically sensitive areas and increased sensitivity to the rights of tribals inheriting the mining land, thus, leading to inordinate delays in the land acquisition and approval process.

Transportation of coal in India is also constrained by domestic logistical bottlenecks, which need to be addressed in order to meet the increased demand requirements. Coal is mostly produced in the Central and Eastern parts of India, while it is consumed all over the country, thus, necessitating transportation over long distances. Rail is the preferred mode of domestic transportation accounting for 46.3% of the total coal volumes. But the railway infrastructure, in terms of line capacity and rolling stock, does not match up with the existing demand for container transportation. Further, there is concern over the expansion plans with regard to the transportation of coal.

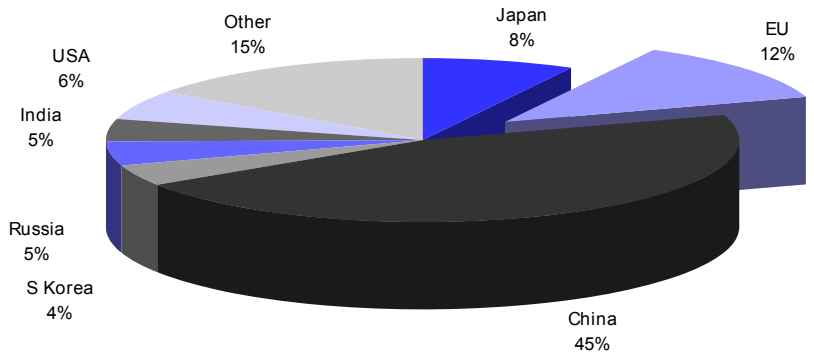
The iron ore supply scenario is India is much more favorable, with India exporting ~50% of its iron ore production in the international markets. Iron ore exports in India has been a contentious issue for a long time with the Indian steel ministry lobbying for a total ban on exports in order to save the reserves for domestic steel industry. With rising domestic steel production capacity and government clampdown on illegal mining, we do expect some moderation in the Indian iron ore exports over the next few years, though a total ban looks an unlikely event for the time being.

Key Thinking – Europe

Europe remains and should continue to be a net importer of the bulk steel-making materials; however demand growth is likely to remain muted and existing infrastructure more than capable of meeting demand in coming years.

The EU currently produces around 12% of the world's steel, but is short raw materials, being a net importer of iron ore and coke/coking coal and thermal coal. Europe does not export coal into the rest of the world, so will not benefit from the increasing global demand of coal. However, in the greater Eastern European region, a small amount of iron is exported from the Ukraine to China and we discuss here the supply side of Iron ore into the European market.

Figure 67: 12 month steel production split



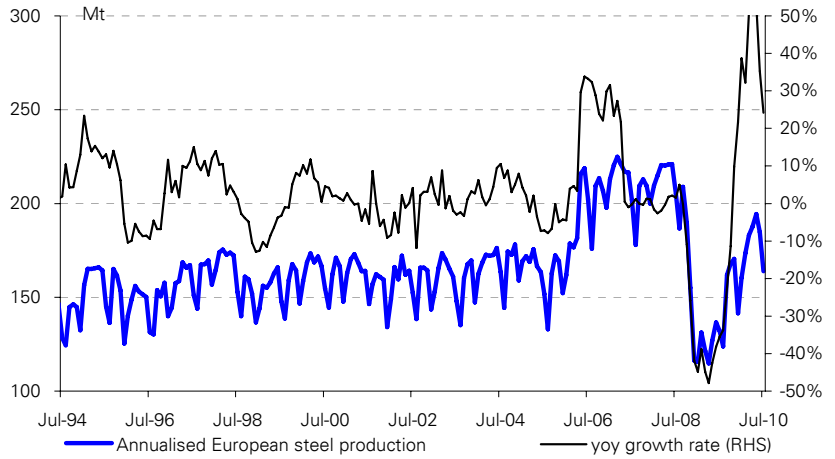
Source: IISI, Deutsche Bank

Import infrastructure not constrained.

EU steel production typically grows at low-single-digit levels, so demands on the import infrastructure build are not as onerous as many other regions in the world.

Steel production levels in Europe nearly halved with the downturn in 2008/2009 as shown in Figure 68. Global recovery has seen a significant recovery in the levels of European steel production, but remains 20% below peak levels of 220Mtpa of annualised production.

Figure 68: European steel production



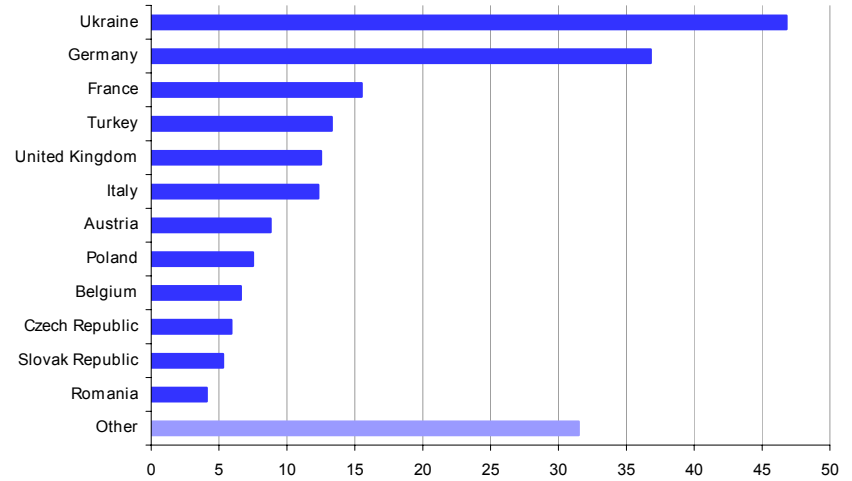
Source: Deutsche Bank, IISI

The infrastructure to supply the raw materials needed for this production remain in place and are unlikely to be a constraint for steel production growth in Europe into the medium term.

Iron ore imports

EU steel production and hence raw material consumption is dominated by Germany with a long tail end of producers. If we look at the greater Eastern European region, Ukraine and Germany consume 40% of the total iron ore. The demand concentration is shown in the map in Figure 70 on the following page.

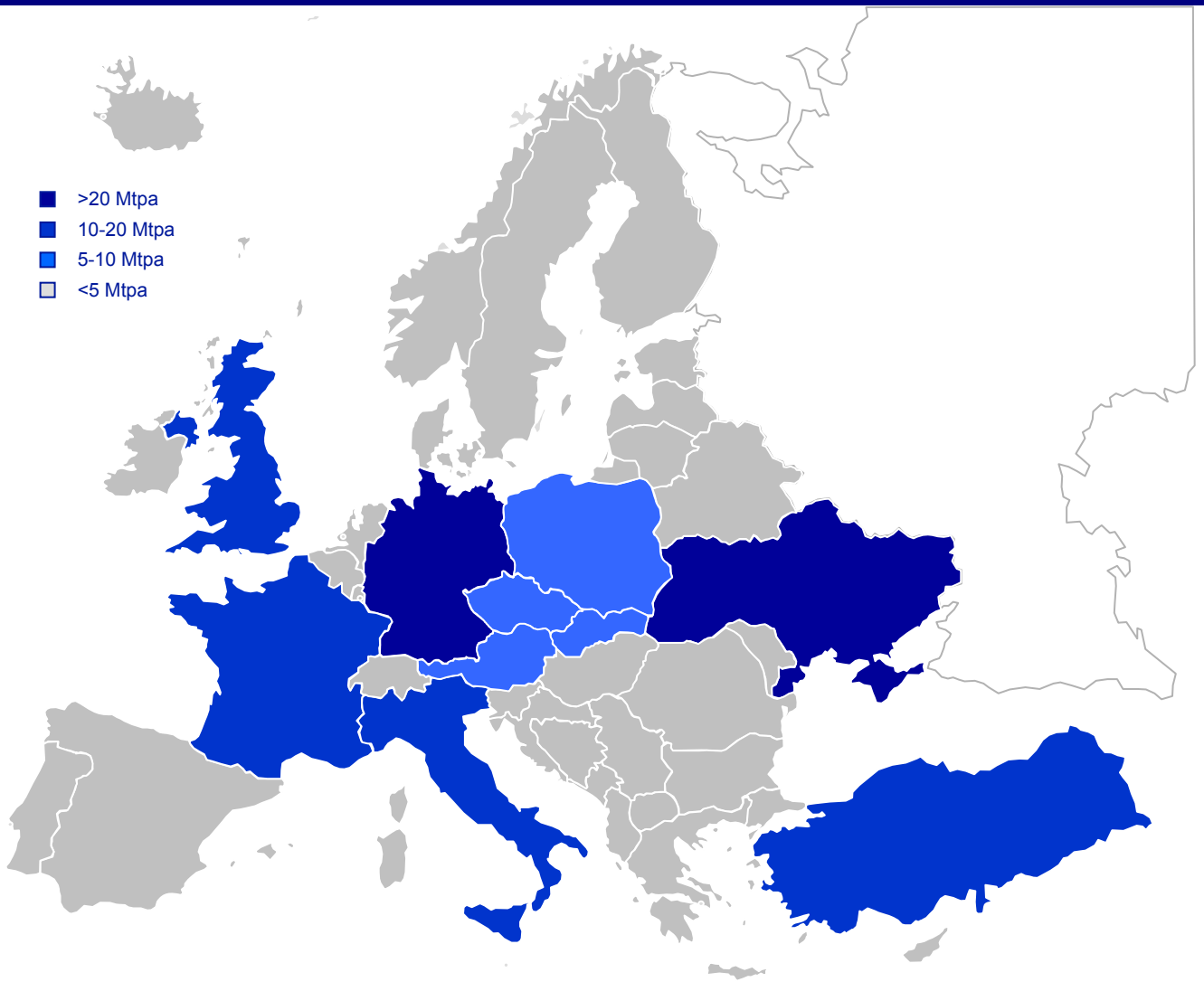
Figure 69: European 2011F iron ore demand by country (Mt)



Source: AME, Deutsche Bank

Greater Eastern Europe is 53% self sufficient in iron ore, but only 22% self sufficient if Ukraine is excluded. The imported iron ore comes predominantly from Brasil and Canada with small amounts coming from Australia.

Figure 70: European iron ore demand.

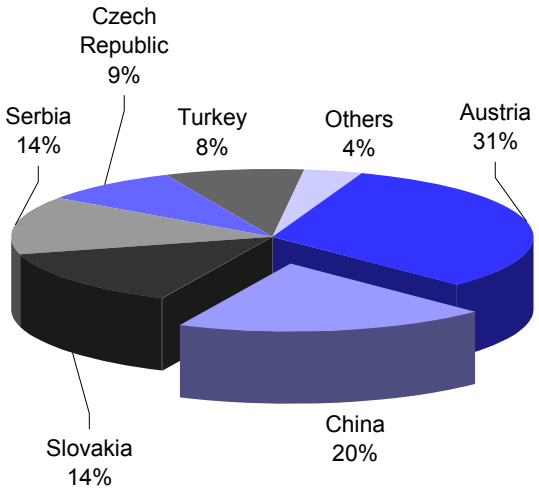


Source: Deutsche Bank, AME, Company data

Iron ore exports from Europe.

While Europe is significantly short iron ore, it still exports a small amount each year to the rest of the world. We expect that this is likely to continue and is critical for the European iron ore producers to maintain pricing parity with the international iron ore prices (ie, the producers have to be able to viably take their business somewhere else). The predominant exporter from Europe is Ferrexpo, which exports some of its pellets to China from its port on the Black Sea (Figure 72).

Figure 71: Ferrexpo 1h10 revenue split.



Source: Ferrexpo, Deutsche Bank

The Yuzhny port has a capacity of 5Mtpa with some potential, but currently no plans to expand. While 5Mtpa is the physical capability, exporting all of this to China puts significant demands on shipping and rates increase dramatically and reduce the margin. The port currently cannot handle the large capesize vessels (although the route to China could manage the smaller capesize vessels).

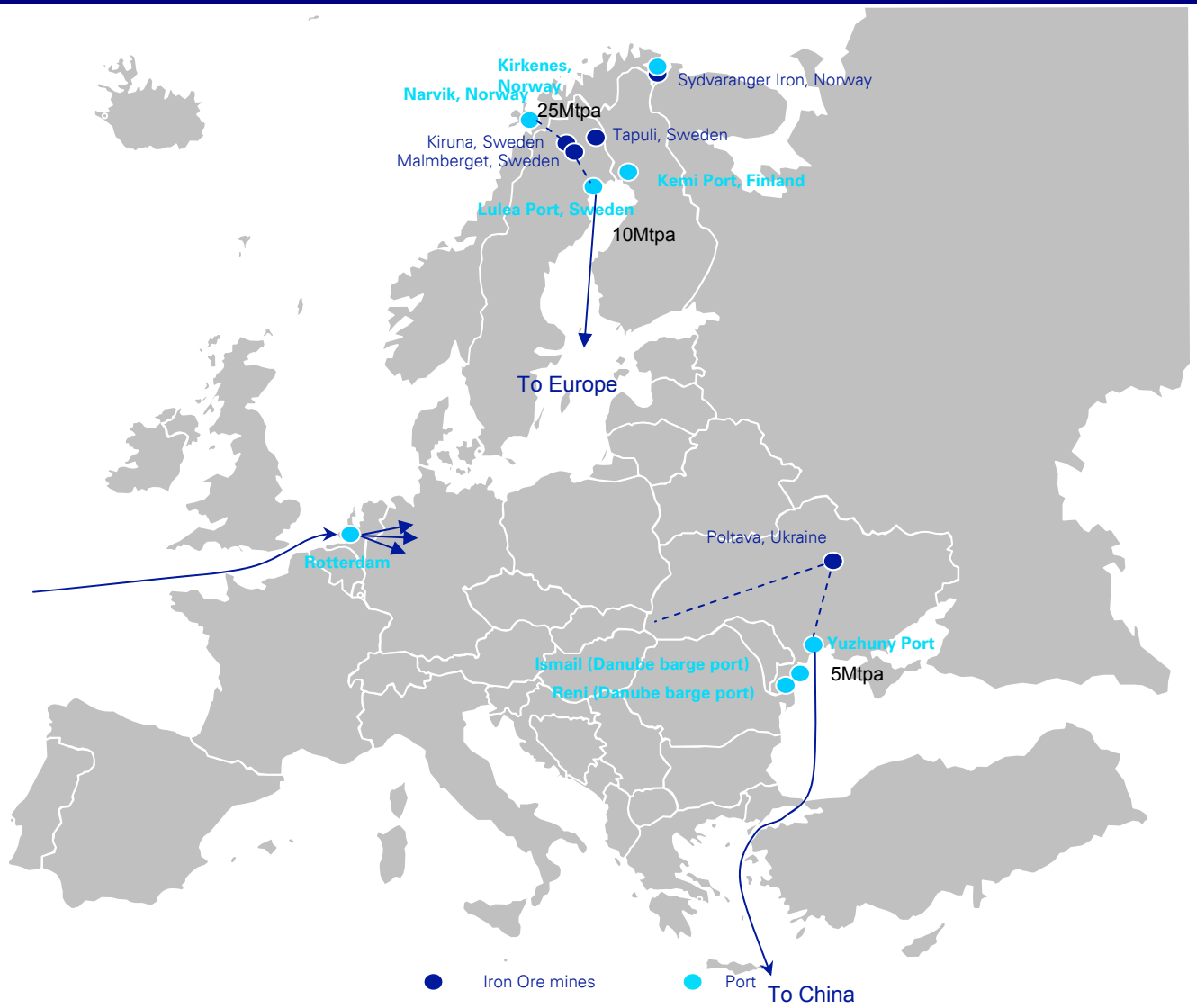
The other significant producer in Europe is Sweden-based LKAB, which ships its production from Sweden into the rest of Europe. It has the potential to expand production at its mines and ports, but like many producers globally is being limited by the rail capability in the region. A recent power failure highlighted the tightness in the rail and a company's press release included the following.

"The Ore Railway is filled to the breaking point with ore traffic and other traffic. There is no way to compensate by running more traffic to make up for the losses. We cannot operate more trains. The meeting places for trains are too few and too short, and the signal system is highly vulnerable,"

Expansion of the rail is in the hands of the government – we do not expect any significant rail capacity increases over the next three years.

While Europe has some capacity to export iron ore, this capacity is currently limited and not likely to grow in the next three to five years.

Figure 72: Major iron ore movements.



Source: Deutsche Bank

Key Thinking - Australia

Conclusions: Infrastructure expansions challenging, owner operator model an advantage

Australia to grow bulk seaborne market share further

Australia is the largest producer of Metallurgical coal contributing +40% of the global seaborne trade, and the second-largest producer of thermal coal, contributing +20% of the global seaborne trade. And since 2008 Australia has overtaken Brasil to be the world's largest iron ore producing and exporting country. We believe Australia will continue to grow its market share in the seaborne bulk commodity markets, leveraging off its +30bt of coal resources and +20bt of iron ore resources. The biggest import demand increase over the next three years should come from the Asian region, where we expect China, Japan and South Korea to increase imports by 186mt, 16mt and 13mt, respectively. This is good news for the Australian and Indian producers with large resource bases in the region. Over the next three years, we forecast China's coal imports to grow by 80Mtpa (23Mtpa of coking coal and 57Mtpa of thermal coal). We expect the next-largest import demand increase to come from India with the country forecast to import 42Mtpa more in 2013 than it will do this year.

Pricing parity between regional markets

Coal and iron ore markets have historically been predominantly regional markets. The increased demand for seaborne product increases the need for highly capital intensive infrastructure to supply it (rail, ports and ships) and will require higher long-term prices to ensure adequate returns on this additional infrastructure are made – current incumbents benefit significantly from existing infrastructure. With many supply regions now able to supply into the international markets, there is increased opportunity for pricing parity of regional prices with international market prices. Australian iron ore receives premium pricing due to high grades (>60%) and thermal coal receives a premium to the Atlantic traded coal (to Europe) due to higher energy content and shorter shipping distances to key customers China, Japan and South Korea.

Australia – infrastructure expansions challenging

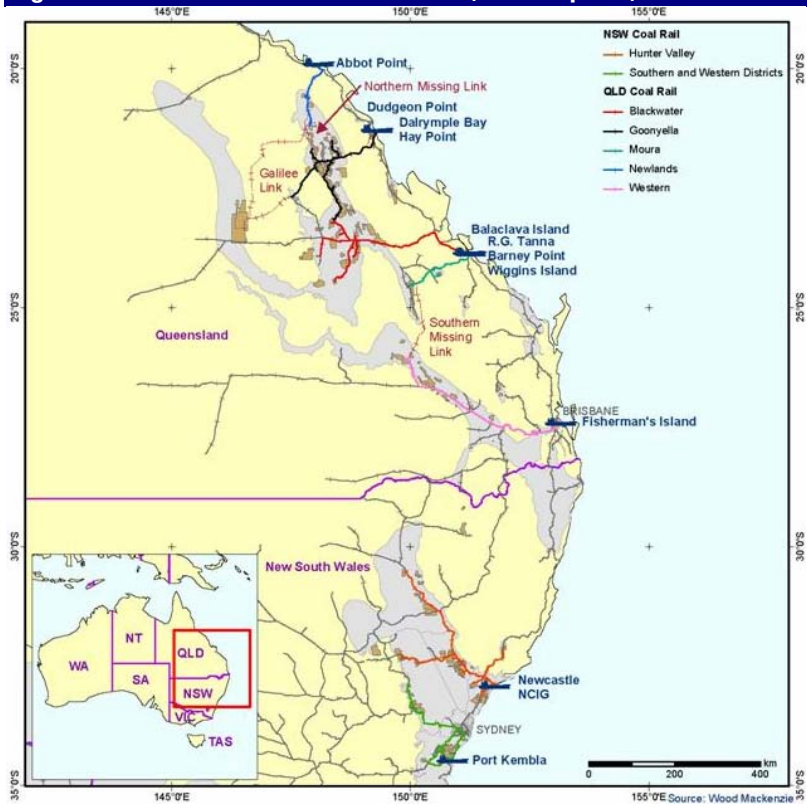
While seaborne freight capacity has been an issue, we do not think that it will be a constraint for bulk commodities over coming years. The constraints will be both port and rail expansions. Australia is challenged with large infrastructure expansions that are impacted by multi user issues (mines, rail, port), environmental approvals, and government intervention such as proposed tax changes (MRRT). Iron ore infrastructure is largely owner-operator whereas coal is multi-user. Both have their separate challenges:

- **Coal** – capacity in Queensland is currently around 160Mt growing to 250Mt by 2015 consisting of the Dalrymple Bay Coal Terminal (DBCT), Abbott Point Coal Terminal (APCT), Hay Point Coal Terminal (HPCT) and Gladstone (RG Tanna, Barney Point & Wiggins Island. NSW is expanding from approx. 150Mt in 2010 to~200Mtpa by 2015. However, the multi-user port arrangement has resulted in Australian coal infrastructure operating at just 85% utilization and we believe this rate will continue going forward.
- **Iron ore** – expanding rail and ports is somewhat constrained due to a tight skilled labour and contractor market. Saying that, the majors (BHP, RIO and FMG) are in the best position to expand production volumes as they own and operate their rail and port facilities. For the junior players, however, access to this critical infrastructure is more difficult. We expect Australian iron ore exports to increase from around 400Mt in 2010 to 685Mtpa by 2015. Major expansions at BHP and FMG's Port Hedland ports and Rio Tinto's Dampier and Cape Lambert ports should drive export growth.

Key Thinking – Australian Metallurgical and Thermal Coal

Australia is the largest producer of Metallurgical coal contributing +40% of the global seaborne trade, and the second-largest producer of thermal coal, contributing +20% of the global seaborne trade. Currently and for the foreseeable future it will be infrastructure that limits its ability to increase exports. Port and rail facilities are being upgraded along the east coast of Australia, but capacities are lagging global demand as evidenced by the long ship queues. It will take several more years to get the upgrades completed, during which time the infrastructure restrictions will contribute to the supply-demand imbalance.

Figure 73: Australian coal infrastructure (rail and ports)



Source: Wood Mackenzie

Queensland's Bowen Basin - Setting and coal type

The black coal inventory totals in excess of 30 billion tonnes of resources in the Bowen Basin; 70%, of the State's inventory. Coal amenable to open-cut mining makes up about 55% of the inventory, with the remaining 45% present at greater depths. The Bowen Basin is 600km long and up to 250km wide.

Coal seams in the Bowen Basin exhibit major variations in rank and quality. A broad trend of increasing rank from west to east exists:

- In the north-east the coal types range from anthracite to low volatile bituminous,
- In the centre there are high volatile bituminous coals – including the best coking coals,
- In the south-west the coal rank typically falls below the coking range.

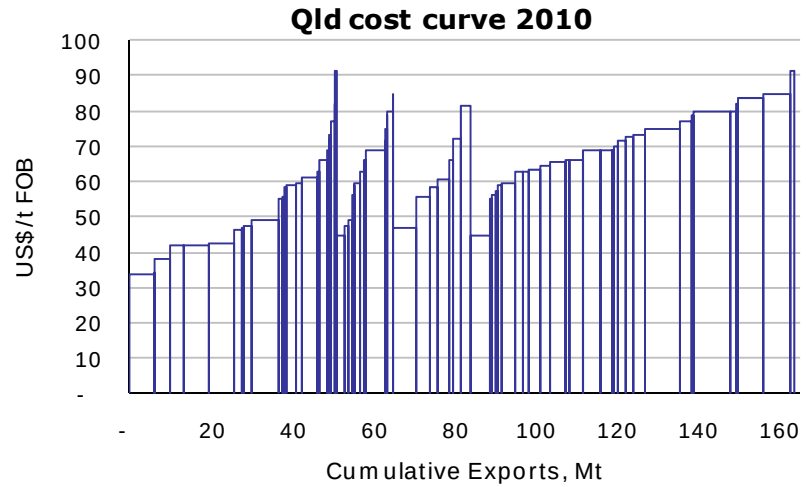
The westerly decrease in rank continues into the Galilee Basin where many aspiring entrants to the market are located.

There are three locations and five ports that handle the majority of Bowen Basin coal exports. Dalrymple Bay and Hay point at Mackay, RG Tanna and Barney Point at Gladstone and Abbot Point at Bowen.

Costs and volumes

Currently cost of production is not the limiting factor for volumes of met coal out of the Bowen Basin. As depicted in the following chart, the FOB costs are well below the current contract prices for the various met coal products. It is the limited infrastructure capacity capping supply volumes out of this major supply region. The Bowen Basin supplies nearly half of the global seaborne met coal volumes. For the mines on which we have data, the chart shows the cumulative Queensland cost curve: Thermal 0-51Mt, Semi-soft 51-65Mt, Low Vol PCI 65-84Mt, Hard coking 84-164Mt.

Figure 74: Queensland cost curve 2010 US$/t FOB



Source: Deutsche Bank, AME

Infrastructure – upgrades coming

Figure 75: Collective volumes in Queensland

COMBINED VOLUMES		2010	2011	2012	2013	2014	2015
Met Coal capacity	Mt	118	127	137	166	173	199
Thermal Coal capacity	Mt	47	53	58	73	69	89
Rail capacity	Mt	177	182	182	228	228	253
Port capacity	Mt	214	214	214	250	250	265
Expected Actual exports	Mt	162	176	182	224	227	252
Max met coal volumes	**Mt**	**118**	**127**	**137**	**166**	**173**	**199**
Remainder Thermal coal volumes	Mt	44	49	45	58	54	54
Met Coal Export Growth			8%	8%	22%	4%	15%

Source: Deutsche Bank estimates.

The Bowen Basin predominantly produces met coal but there is also a sizable thermal coal component. Across the basin the infrastructure, be it rail or port, limits the achievable export volumes over the next few years.

In determining what met coal exports can be expected, we have assumed that the met coal volumes are maximised and thermal coal takes up the remainder of the capacity. The rationale being that met coal has higher margins and therefore will be prioritised. However, we should acknowledge that in some cases there will be coal producers with port quotas that will be used for thermal rather than met coal due to the nature of the mines they are operating. Therefore there is the potential that our interpretations have slightly over estimated met coal export volumes.

Dalrymple Bay Coal Terminal (DBCT)

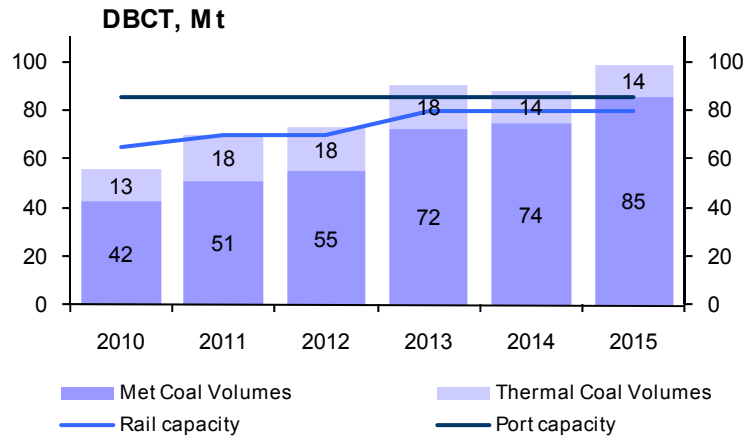
Figure 76: Current and planned throughput

Design	Mtpa	85
Actual	Mtpa	65-70
Target	Mtpa	85

Source: DBCT, Deutsche Bank

DBCT currently has a design capacity of 85Mtpa but rail network can't supply this amount. Rail is limited to ~73Mtpa and may deliver as little as 65Mtpa in 2010. Rail constraints could persist for up to two years; the planned sale of the Queensland Rail network will have a large bearing on the resolution of rail issues. The issues include train shortages near term and maintenance work and upgrades beyond that to match the DBCT throughput. It would appear that it will take two to three years before 80Mtpa of throughput is reached at DBCT. Beyond this additional terminals need to be constructed to provide a step change in export capacity. The three-phase expansion from 59Mtpa to 85Mtpa cost about A$1.2bn to complete and was completed in 2009.

Figure 77: DBCT expansion profile



Source: Deutsche Bank estimates

Hay Point Coal Terminal (HPCT)

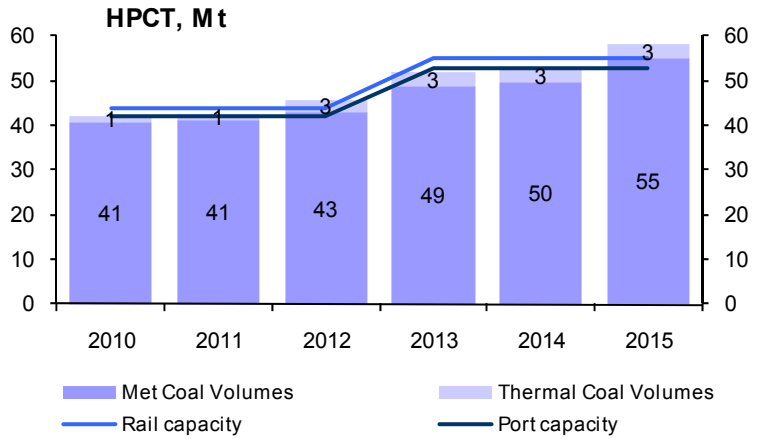
Figure 78: Current and planned throughput

Design	Mtpa	44
Actual	Mtpa	42
Target	Mtpa	55

Source: BHP Billiton, Deutsche Bank

The HPCT has been operational at a stable level for several years; an expansion from 44Mtpa to 55Mtpa is probable once rail capacity is increased. HPCT and DBCT are co-located and share the 'Gooyella Coal Chain' rail link. HPCT is limited to this level by the two in-loaders, each has a maximum 27Mtpa throughput. Adding a third in-loader and associated infrastructure could lift the design through put to 55Mtpa for about 53Mtpa of actual throughput. The cost deliver this increase will likely be ~A$500mn.

Figure 79: Hay Point expansion profile



Source: Deutsche Bank estimates

Abbott Point Coal Terminal (APCT)

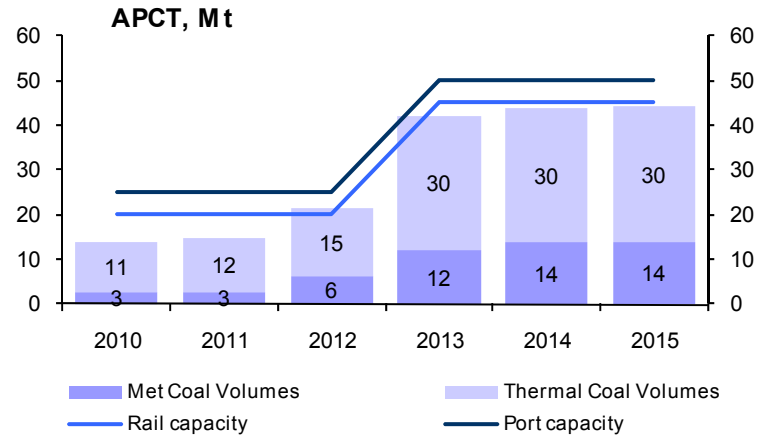
Figure 80: Current and planned throughput

Design	Mtpa	25
Actual	Mtpa	20
Target	Mtpa	50

Source: Deutsche Bank estimates

Abbott Point is still in development mode, but once remaining works are completed it will remain at a design rate of 25Mtpa for a few years. Although work has just begun on the 'missing link' rail connection, it is still about two years from being delivered. It will cost around A$1.1bn to integrate the rail into the Goonyella chain. Then the port expansion work to take APCT up to +50Mtpa (during 2012) will cost another ~A$1Bn. Subsequent expansions at Abbot Point to 80Mtpa and 110Mtpa could cost A$1.8bn each could follow in later years, depending on the development of large thermal coal projects through the Galilee Basin.

Figure 81: Abbot Point expansion profile



Source: Deutsche Bank estimates

Gladstone (RG Tanna, Barney Point & Wiggins Island)

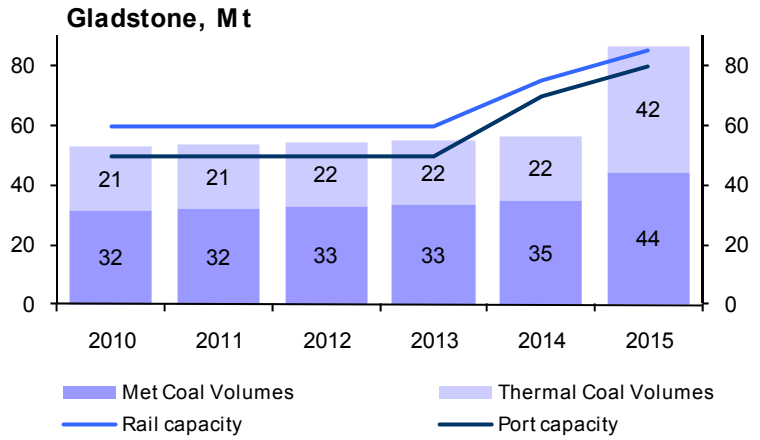
Figure 82: Current and planned throughput

Design	Mtpa	60
Actual	Mtpa	50
Target	Mtpa	85

Source: Deutsche Bank estimates

The RG Tanna and Barney Point terminals combined have a design throughput of 60Mtpa but are delivering about 50Mtpa. The Wiggins Island Stage 1 expansion at Gladstone is now likely to be operational in mid-2014 rather than 2013, so at this time it appears volumes out of Gladstone are limited to ~50Mtpa. The cost of the 30Mt Wiggins Island expansion is A$1.9bn; while subsequent expansion to 50Mt and 70Mt could cost A$1.4bn and A$1bn respectively. One point to note is the port costs: $9.80/t is projected for Wiggins Island, twice the $4.80/t currently being charged at RG Tanna.

Figure 83: Gladstone expansion profile

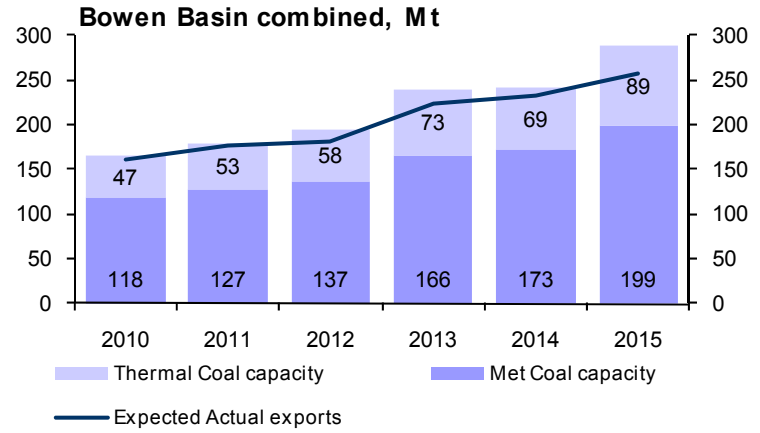


Source: Deutsche Bank estimates

Export growth limited by infrastructure for several years out of Queensland

Assuming the metallurgical coal exports are maximised through the four locations, then collective Bowen Basin exports can increase 68% over the next five years to reach about 200Mtpa, equivalent to 11% CAGR over five years.

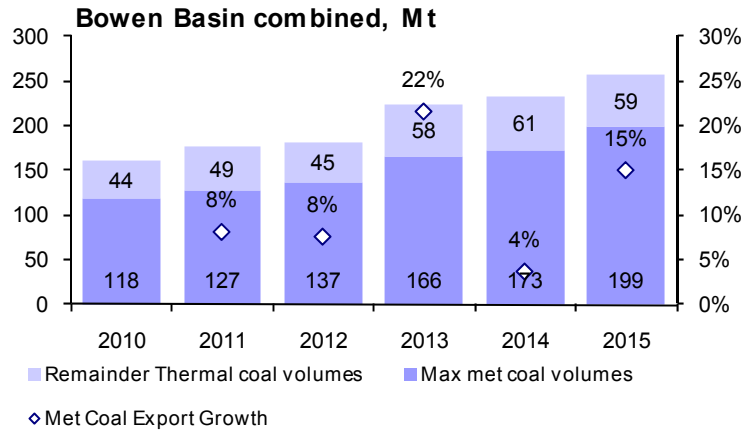
Figure 84: Mine plan vs port capacity



Source: Deutsche Bank estimates

If the demand volume grows at a rate slower than this, the Bowen Basin will likely increase its share of the global seaborne market. However, this may lead to lower contract prices – particularly beyond 2013, when there we expect a step up in exports, due to the generally low cost of volumes on the Bowen Basin cost curve (see earlier chart).

Figure 85: Met coal yoy % exports increases



Source: Deutsche Bank estimates

Infrastructure constraints remain an issue for the market currently

Although there is the potential for increased volumes out of the Bowen Basin to mitigate the supply-demand imbalance, it is clearly an issue in the market at the current time. The queues of ships off Eastern Australia have returned since the GFC, highlighting the demand for coal, particularly through Asia. Some of the queue build up is due to the surplus of vessels in the bulk materials handing fleet - which has recently created low freight rates, allowing coal volumes from locations further from the market to be more cost competitive – but as previously stated, demand is the underlying cause.

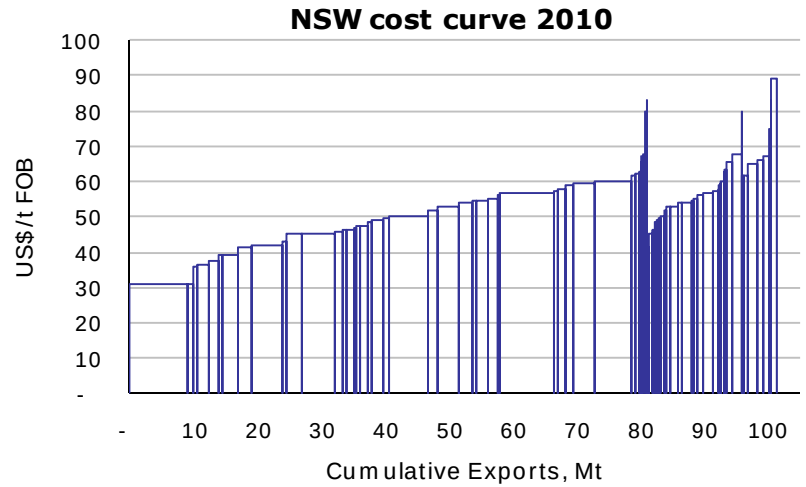
NSW's Hunter Valley - Setting and coal type

The major coal resources of NSW are located in the 500 km long, 150 km wide Sydney-Gunnedah Basin. It extends from south of Wollongong to north of Newcastle and northwesterly through Narrabri into Queensland.

Minor coal resources are located in the Gloucester and Oaklands Basins. The coal measures in the Sydney-Gunnedah Basin are bituminous in rank and Permian in age and consist of a large variety of coal types ranging from low-volatile, hard coking coals to high-quality thermal coals. There are five major coalfields within the basin: Hunter, Newcastle, Southern, Western and Gunnedah.

NSW recoverable coal reserves total over 12 billion tonnes and include those resources where conceptual mine planning has been undertaken, in both Mining Leases and Exploration Licence areas. Coal mines in NSW exported about 105Mt of saleable coal in 2009.

Figure 86: NSW cost curve 2010 US$/t FOB



Source: Deutsche Bank, AME

Costs and volumes

Similarly to the met coal out of Queensland, cost of production is not the primary limiting factor for volumes of thermal and semi-soft coal out of Newcastle. As depicted in the following chart the FOB costs are well below the current contract prices for thermal and semi-soft coal products. It is the limited infrastructure capacity capping supply volumes out of this major supply region. For the mines we have data on, the chart shows the cumulative NSW cost curve: Thermal 0-81Mt, Semi-soft 81-96Mt, Hard coking 96-102Mt.

Port Waratah Coal Services (PWCS) in Newcastle

Figure 87: Current and planned throughput

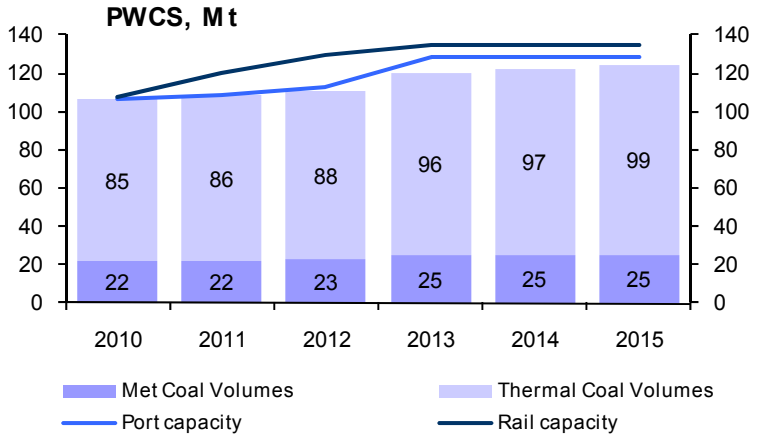
Design	Mtpa	113
Actual	Mtpa	107
Target	Mtpa	128

Source: Deutsche Bank estimates

PWCS comprises the 88Mtpa Kooragang terminal and the 25Mtpa Carrington terminal. While design throughput is 113Mtpa, only 107Mt are scheduled for 2010 to allow for achievable levels. Up to five vessels can be loaded simultaneously. The terminal is owned by a collection of coal miners and coal buyers. The port is run at set rate of return with the port costs per tonne set at a level that returns 12% to the owners.

The next stage of expansion takes export capacity to 113Mtpa by upgrading the in-loaders, conveyors and adding a reclaimer; this will likely be completed by the end of 2011. The capacity can be subsequently increased to 128Mtpa by upgrading the stackers and adding a sixth berth; we assume this is done by the end of 2012. Then there is a conceptual plan to add another coal terminal for a further 25Mtpa but this is unlikely to eventuate until after 2015.

Figure 88: PWCS expansion profile



Source: Deutsche Bank estimates, AME

Newcastle Coal Infrastructure Group (NCIG) in Newcastle

Figure 89: Current and planned throughput

Design	Mtpa	36
Actual	Mtpa	25
Target	Mtpa	66

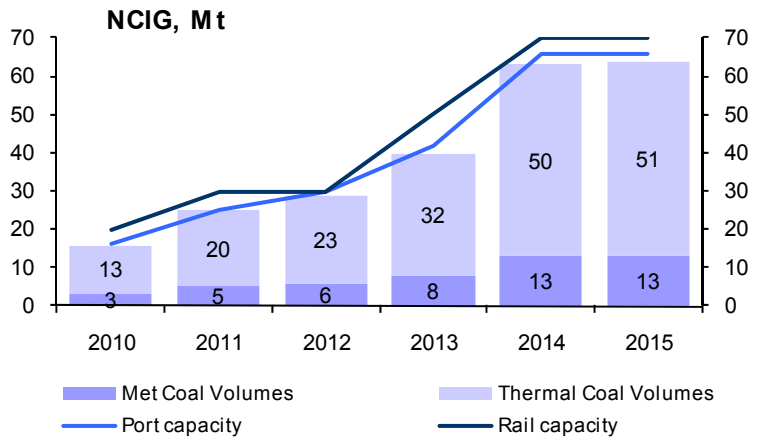
Source: Deutsche Bank estimates

The NCIG terminal has just commenced operations this year. The stage one capacity was designed to be 30Mtpa but it is currently expected to run at 22Mtpa for the next 12 months. One of the primary reasons for this is the dredging of the river and rebuilding of the retaining wall opposite the terminal is behind schedule. We expect the 30Mtpa stage one design rate will be achieved from 2012.

The stage twoexpansion is already underway; it will take the total capacity to 66Mtpa. While the project is owned by a collective of coal mines, it has been obligated to make 12Mtpa of the final capacity available to third parties. Both stage one and two of the development will cost about A$1.3bn to complete.

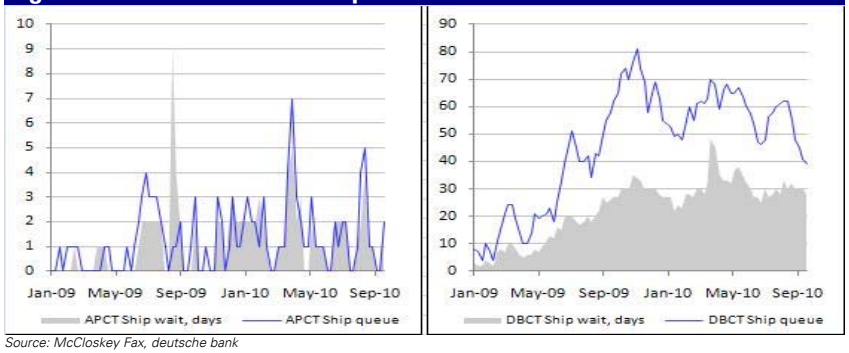
As with the PWCS port capacities we expect the rail volumes to stay ahead of the port volumes, resulting in the mines usually being the limiting factor once the port expansions are complete.

Figure 90: Hay Point expansion profile



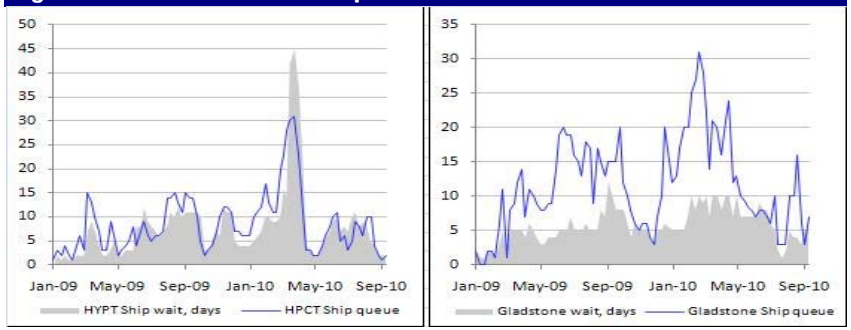
Source: Deutsche Bank estimates, AME

Figure 91: North Queensland queues and wait time



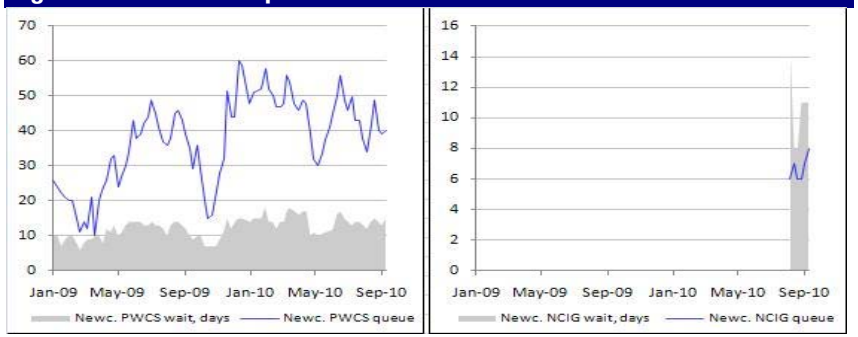
Source: McCloskey Fax, deutsche bank

Figure 92: North Queensland queues and wait time



Source: McCloskey Fax Deutsche Bank

Figure 93: Newcastle queues and wait time



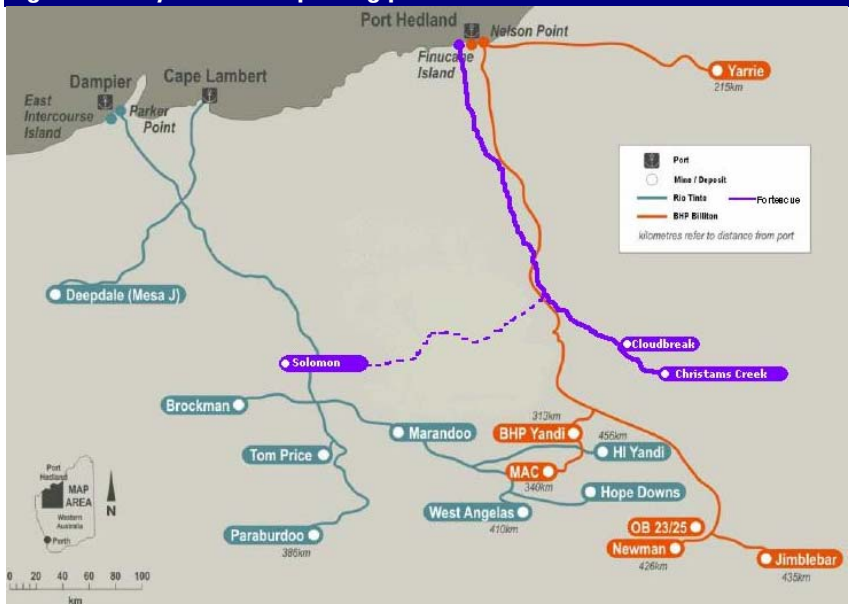
Source: McCloskey Fax Deutsche Bank

Key Thinking – Australian Iron Ore

Australia has, since 2008, overtaken Brasil to be the world's largest iron ore producing country. This has been driven by the expansions of the major producers (Rio Tinto, BHP Billiton and Fortescue Metals), the emergence of a broad junior sector enabled by high iron ore prices, and limited cutback in production on the back of the global financial crisis. Investment is continuing in port and rail infrastructure to enable further capacity expansion.

However, expanding rail and ports is somewhat constrained due to a tight skilled labour and contractor market. Saying that, the majors (BHP, RIO and FNG) are in the best position to expand production volumes as they own and operate their rail and port facilities. For the junior players, however, access to this critical infrastructure is more difficult, and has generally been achieved through: (i) utilisation of alternate transport options (e.g. road trucking to port); (ii) rail and port access agreements with the majors; or (iii) the planned delivery of greenfield open-access facilities (e.g. Oakajee Port and Rail).

Figure 94: Key iron ore exporting ports in Australia



Source: BHP Billiton , Deutsche Bank

Setting and ore iron quality

Over 98% of Australia's iron ore is produced in the State of Western Australia (WA). Historically, this has come almost exclusively from the Pilbara region in the State's northwest, which holds the largest and highest-quality reserves. In recent years, however, the Midwest region of WA has seen an increase in output, although modest, driven in most part by high iron ore prices allowing previously uncommercial projects to be successfully delivered (Murchison, Mt Gibson).

The main two types of iron ore mined globally are hematite and magnetite. Hematite deposits are considered superior as their naturally occurring iron content (~55-65%) is much higher than magnetite deposits, which typically range from 25-40% in Fe content. As a result, many hematite projects require little or no processing prior to export, and are therefore much more cost-effective than magnetite projects, which require a beneficiation process to 'concentrate' the Fe grade, generally to >60%.

Hematite deposits occur in vast quantities in the Pilbara, while magnetite is more frequently occurring in the Midwest and other regions. However, magnetite and hematite are typically found side by side.

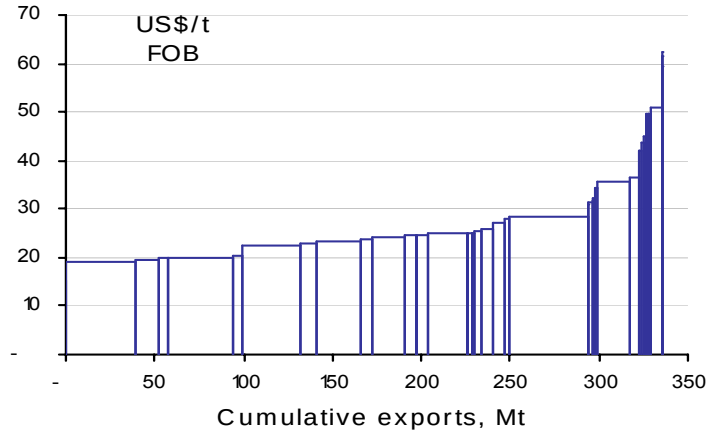
Costs and volumes

With the quantum of new iron ore projects announced or re-commenced since the GFC, cost inflation has crept in unavoidably to most projects across the Pilbara and Midwest over the last six months.

However, with iron ore prices at elevated levels (spot landed China CFR price (62% Fe) has remained above US$100/t since August 2009), cost of production is not the limiting factor for iron ore volumes. Rather, as outlined above, securing access to rail and port infrastructure is the critical determinant in the success of a project.

The cost curve for production out of the Pilbara and Midwest regions is depicted in the following chart.

Figure 95: Western Australia iron ore cost curve 2010 US$/t FOB



Source: Deutsche Bank, AME

As port access is the ultimate barrier to getting iron ore to the customer, we have discussed below the major current and proposed ports servicing the Australian iron ore export trade, the expansions underway or planned at each port and the companies utilising them.

Pilbara region

Port Hedland

Port Hedland is Australia's largest port by both overall mass tonnage and iron ore export volumes. It is an open-access port with current iron ore export capacity of ~210mtpa.

BHPB is the biggest user of capacity at Port Hedland, with output currently ramping up from 129Mtpa to 155Mtpa, across 4 berths, as part of its Rapid Growth Project 4 (RGP4). FMG is the other major user of capacity, with two berths, for a total of 55Mtpa capacity (current FMG output, however, is 40mtpa).

Port Hedland is embarking on several major user-led expansions, increasing the number of dedicated iron ore berths from six to 17, and total capacity from 210Mtpa to ~475Mtpa.

BHPB will use four of these additional berths as part of its RGP5 (50mtpa) and RGP6 (35mtpa) programs, increasing its output from 155Mtpa to 240Mtpa. FMG has been allocated two additional berths, allowing an increase in capacity from 55Mtpa to 120Mtpa. However, FMG has stated that it expects to receive a third additional berth, bringing total capacity to 155mtpa.

Another two berths each have been allocated to Hancock Prospecting (for 55mtpa) and the North-West Iron Ore Alliance (NWIOA, for 50mtpa). Hancock Prospecting's allocation will allow the export of ore from its Roy Hill project, the capacity of which it has stated at 55mtpa. NWIOA comprises a number of mid-tier Pilbara companies (namely Atlas Iron, Brockman Resources and FerrAus).

The final berth is at Utah Point, a multi-user bulk commodity terminal with total initial capacity of ~10mtpa, but ultimate likely capacity of 20+mtpa. The bulk of this capacity has been allocated to Atlas Iron.

We expect BHP's expansions to track roughly to schedule, with RGP5 >60% complete and US$1.93bn in early-stage capex already allocated to RGP6. In addition, we believe Utah Point will achieve its ~10mtpa initial capacity without difficulty, and note that first shiploading was achieved in mid-September.

However, we see delivery risk for the remainder of the planned increase in Port Hedland capacity. We only model FMG achieving its approved allocation of 120mtpa, instead of its publicly stated target of 155mtpa. Further, we expect this run rate to be achieved only by 2018, instead of FMG's target of June 2013. This expansion by FMG involves increasing output from its Chichester mining hub and achieving stage one production from its new Solomon hub. We note that a bankable feasibility study and board approval have not been completed or secured for either aspect of the expansion.

Additionally, we see delivery risk at the Hancock Prospecting and NWIOA berths. In our view, the viability of both sets of berths is dependent on the construction of a new rail line, as each party's port allocation exceeds the potential third-party capacity available for use on other existing railways, principally that of Fortescue Metals. Hancock has announced its intention to construct a 300km railway connecting to Roy Hill. We believe the optimal outcome for NWIOA would be to jointly develop this railway with Hancock. However, we understand that negotiations around this point have historically been fraught, and we see the likelihood of a positive outcome in the near term as low.

Assuming the expansions are achieved, however, Port Hedland will reach full capacity within its Inner Harbour. Any future growth in capacity would require development of an Outer Harbour. Port Hedland Port Authority has outlined

conceptual plans for the Outer Harbour, including 2 jetties, each with up to eight berths, for total additional capacity of ~400mtpa. BHP has in its growth pipeline its Quantum 1 & 2 projects, each of which could produce an additional ~50mtpa of iron ore and utilize the Outer Harbour. However, we do not value these projects, given they are in concept stage only.

Figure 96: Summary of existing and proposed iron ore berths & users at Port Hedland

User	No. berths	Capacity	Details	Announced Timing	DBe full completion
Existing capacity					
BHP Billiton	4	155	Including RGP4 capacity	-	-
Fortescue Metals	2	55		-	-
Proposed capacity[1]					
BHP Billiton	2	50	RGP5	2H 2011	2013
BHP Billiton	2	35	RGP6	n/a	2016
Fortescue Metals	2	65		2013	2018
Hancock Prospecting	2	55	Roy Hill project	n/a	n/a
NWIOA (Ferraus, Borckman and Atlas Iron)	2	50		n/a	n/a
Utah Point (Atlas Iron and Mineral Resources)	1	~10		2010	2010

Source: Deutsche Bank, BHP Billiton

[1] Excludes Outer Harbour potential capacity

Dampier

Dampier port is a multi-commodity port located ~200km southwest of Port Hedland. It handles a range of exports, including iron ore, LNG, petroleum and salt. Iron ore, however, accounts for >80% of volumes, with all of this produced by Rio Tinto.

With a capacity of 140mtpa, Dampier is currently Australia's second-largest iron ore export port. Dampier has historically been RIO's main port for its iron ore exports. However, it will be overtaken by Cape Lambert port following the completion of its planned expansion, expected in 2016.

Cape Lambert

Cape Lambert port is owned by the Robe River JV (Rio Tinto 53%) and operated by Rio Tinto. At its current capacity of 80mtpa, Cape Lambert is Australia's third-largest iron ore export port and RIO's second-largest export port behind Dampier.

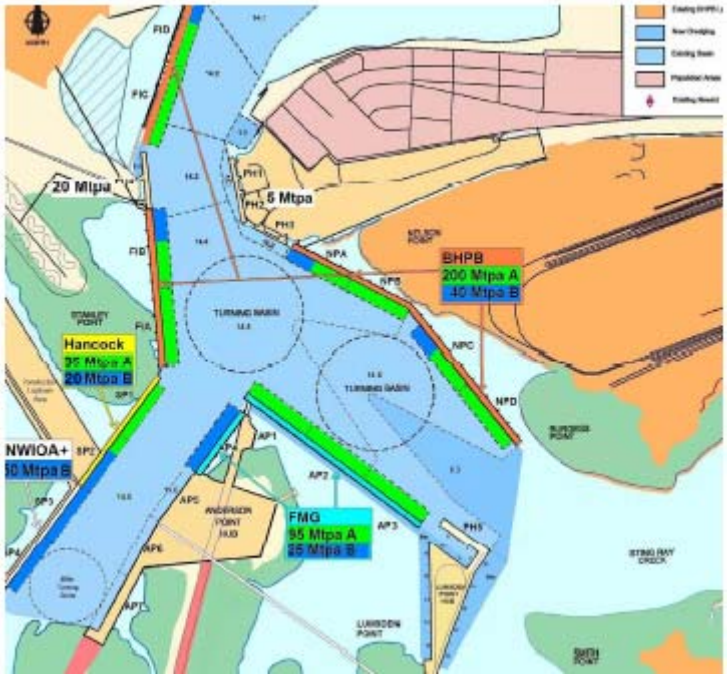
However, RIO is currently finalising a feasibility study for a major (100mtpa) expansion in capacity at Cape Lambert, to increase shiploading capability to 180mtpa. This expansion is part of RIO's project to increase production capacity across its Pilbara operations from 220mtpa currently to 330mtpa by 2016 (100% basis). The expansion at Cape Lambert involves the construction of a second jetty and four-berth wharf to complement the existing jetty and four-berth wharf.

The expansion is expected to be delivered in two stages: the first, 50mtpa expansion, by 1H 2014; and the second, 50mtpa expansion, by 1H 2016. The first stage is in feasibility study mode, with final investment decision expected by the end of 2010. The second stage is currently in pre-feasibility study mode.

RIO has invested US$790m to date in early construction works at the port, including for dredging works, construction of the new wharf and procurement of long-lead items such as pile and marine structure and on-shore earthworks and machines.

Given the advanced state of feasibility study work, together with money spent or committed to date, we are confident that the first stage of expansion at Cape Lambert will be achieved roughly on schedule. Delivery of the second stage will remain subject to a range of factors, including iron ore prices, global iron ore supply & demand balance and the cost-effectiveness of executing the expansion versus other growth options for the company.

Figure 97: Port Hedland Development plan



Source: Port Hedland Port Authority

Anketell Point

Anketell Point is a greenfield port project situated ~15km west of Cape Lambert. The 'Foundation Partners' of Anketell Point include Fortescue Metals, Aquila Resources and China Metallurgical Group Corporation (MCC).

Anketell Point is intended to be commissioned in 2014, ramping up to stage one capacity of 40mtpa by 2014. The Foundation Partners have identified the ultimate capacity of Anketell Point at ~350mtpa.

FMG would be the biggest user of the port, with targeted throughput of 200mtpa by 2017, split equally between its Solomon Hub (stage two) and Western Hub. In addition to Aquila and MCC, we understand that CITIC Pacific's Sino Iron project at Cape Preston (proposed ~28Mtpa magnetite mining operation located 75km south-west of Dampier) is also investigating the use of Anketell Point.

Capex for achieving stage one capacity has been estimated at ~A$4bn (US$3.7bn). Additional capex to bring capacity to the targeted 350Mtpa could be in the order of US$25-35bn. This will present a considerable challenging notwithstanding the collective funding resources of the Foundation Partners.

While we believe that Anketell Point will likely be constructed, we are sceptical about its outlook for achieving full targeted production. FMG's proposed stage two Solomon and Western Hub projects are yet to proceed to Bankable Feasibility Study phase and have not received board approval. Further, FMG has not released any drilling results, or resource or reserve statements, for its Western Hub.

Figure 98: Foundation partner projects utilizing Anketell Point capacity

Company	Project	Location	Announced capacity	Details	Announced first production
Aquila Resources	West Pilbara Iron Ore	~250km SW of AP	Stage 1 ~ 30Mtpa	Haematite (Channel Iron Deposit)	2014
Fortescue Metals	Solomon Hub stage 2	~250km SE of AP	100mtpa	Haematite	2014
	Western Hub	~300km SW of AP	100mtpa	Not yet drilled	2015
MCC	Cape Lambert South	25km E of Karratha	10+mtpa	n/a	n/a

Source: Deutsche Bank, Company Presentations, AME

Midwest region

Port of Geraldton

The Port of Geraldton is a multi-user, multi-commodity port, situated ~420km north of Perth. Currently, Geraldton is the only port servicing the emerging Mid-West iron ore producing region of Western Australia.

While Geraldton was historically dominated by grain exports, iron ore now represents over 50% of throughput. Approximately 4.2mt of iron ore was exported through Geraldton in FY09, and this is set to grow, with the recent completion of a dedicated iron ore berth ('Berth 5', capacity 8mtpa) and a second dedicated iron ore berth to be used exclusively for the output from Gindalbie Metals Group's Karara iron ore project (capacity 10Mtpa).

The construction of the proposed Oakajee Port & Rail (OPR) project 30km north of Geraldton will see a second (and much larger) port servicing the Midwest region. Indeed, an iron ore export 'cap' of 12mtpa will be imposed

on Geraldton from 1 January 2015, to compel the development of OPR. (See OPR section for details.)

There are currently a number of companies with operating or development projects in the Midwest region, which will look to export via either Geraldton or Oakajee. A number of these companies have formed the Geraldton Iron Ore Alliance (GIOA) in an effort to collectively promote the development of infrastructure in the region. The members of GIOA are listed in the table below.

Figure 99: GIOA members & projects

Company	Project	Location	Announced capacity	Details	Announced first production
Asia Iron Holdings	Extension Hill	270km SE of Geraldton	10+mtpa	Magnetite	2011
Crosslands Resources(1)	Jack Hills Extension	350km NE of Geraldton	25-35mtpa	Hematite & magnetite	2014
Gindalbie Metals	Karara	225km ESE of Geraldton	14-36mtpa	3mtpa DSO hematite; remainder magnetite	2011
Golden West Resources	Wiluna West	630km NE of Geraldton	5-10mtpa	Hematite DSO	2011
Sinosteel Midwest	Weld Range	~350km NE of Geraldton	15mtpa	Hematite DSO	2013

Source: Deutsche Bank, Company Presentations, AME

(1) Jointly owned by Murchison Metals Ltd and Mitsubishi Development Pty Ltd

Oakajee Port & Rail (OPR)

OPR is a proposed greenfield integrated port and rail system, with the port to be located 25km north of Geraldton. It is owned 50:50 by Murchison Metals Ltd and Mitsubishi Development Pty Ltd, via direct ownership (25% each) and via their Crosslands JV (50% holding in OPR).

OPR has an initial target of 35mtpa export capacity commencing in 2014, with the potential to expand significantly further. Despite its ownership structure, OPR would be independently operated on an open-access basis, to encourage the further development of the Midwest region.

The main line of the railway would connect to the Jack Hills Extension project, owned by Crosslands, which is targeting a major expansion from the current ~2mtpa at Jack Hills to ~25-35mtpa. Potential spur lines are being considered to connect the Weld Range (Sinosteel Midwest), Karara (Gindalbie Metals) and Extension Hill (Mount Gibson) projects, amongst others.

Other Ports

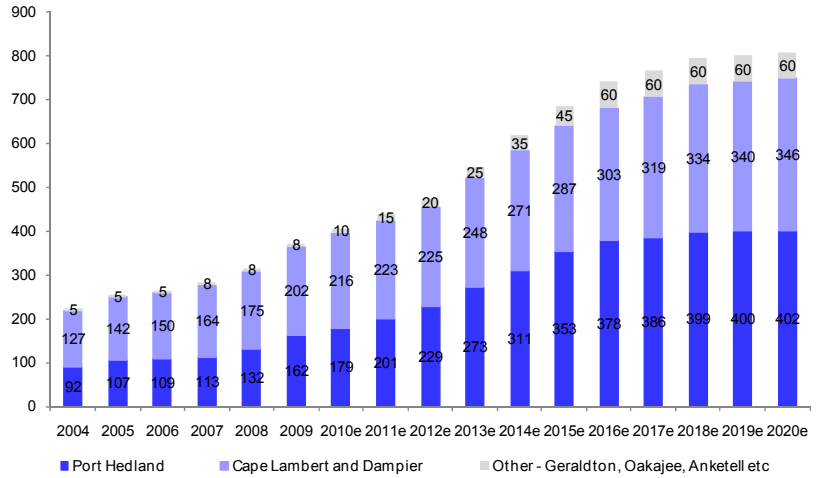
Esperance Port

Esperance is a multi-commodity port located on the south coast of WA. Historically, Nickel concentrates and grains have formed the majority of exports from Esperance. However, investment to deepen the port over the past decade has seen iron ore exports increase from <2mtpa in 2000 to 7.5mtpa in 2009. Current de-bottlenecking initiatives should increase capacity further to 8.5mtpa. Cliffs Natural Resources is the principal user of iron ore export capacity at Esperance, through its Koolyanobbing operation.

Albany Port

Albany, located near the southwestern tip of WA, currently does not export iron ore but rather imports and exports a mix of products including grains, forestry products and foodstuffs. However, it is undergoing a proposed expansion to enable it to export magnetite concentrate from Grange Resources' Southdown project 90km north-east of the port. Southdown is targeting a 10Mtpa magnetite concentrate operation, for premium blast furnace pellets, with first production slated for 2014.

Figure 100: Australian iron ore exports



Source: Deutsche Bank, company data

Key Thinking – Russia

Despite boasting one of the largest bulk commodities reserves globally, Russia remains passive on export markets. According to BP's most recent *Statistical Review of World Energy,* Russia controls 19% of global iron ore reserves and 18.2% of global coal reserves, being responsible for a mere 4% of the world's production and reporting one of the highest R/P ratios globally (in the respective commodities).

We identify at least three major inherent issues that are likely to weigh on the country's expansion in the international bulk commodities markets:

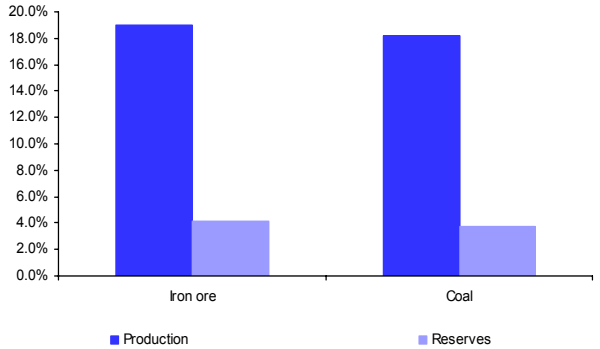
- Near- and medium-term production growth in the main commodities is unimpressive
- Poor state of the transportation infrastructure
- Accessibility of the main new reserve basins and lack of developed infrastructure in place.

We analyze each of these issues to assess the extent of their impact on Russia's planned export expansion.

Export expansion in major bulk commodities faces inherent risks

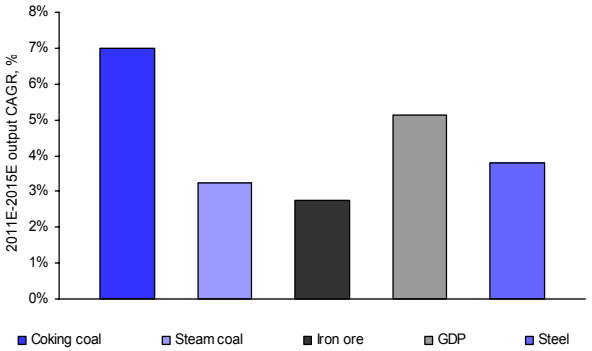
Period of high commodity prices has hardly triggered any major greenfield/brownfield development; therefore, we think that Russia's contribution to the international trade in bulk commodities is unlikely to improve significantly in the short and medium term (next three to five years). We have performed a detailed analysis of all major projects in coal, iron ore and steel sectors, and our findings suggest that only coking coal production in Russia is likely to post higher-than-average growth rates, with most of the output increase coming from Mechel's Elgaugol and recovering volumes at the Raspadskaya mine (following the accident). Other pre-announced projects have either been frozen or remain at a very early stage of the feasibility study.

Figure 101: Russia boasts one of largest reserves globally, but R/P ratio is extremely high



Source: Deutsche Bank, BP

Figure 102: Russia lacks sizeable greenfield/brownfield projects in bulk commodities

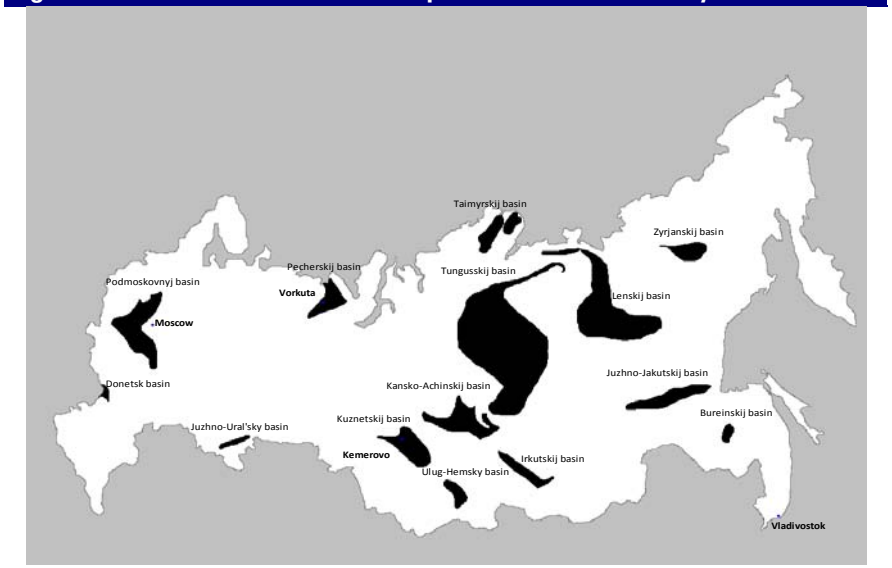


Source: Deutsche Bank

Coal and iron ore

Russian coal basins are spread across the country; however, the bulk of coal mining occurs in the Kuzbass, Komi, and Yakutia regions. Kuzbass is by far the largest basin in terms of proven reserves and is responsible for approximately 55% of all coal mined in Russia, and 75% of the coking coal output. Also, it is located the closest to major Russian steel plants. The geology, however, is difficult; mostly underground mining, implying higher production costs. Primarily, the basin was developed to satisfy domestic demand from steel mills and power plants, but an increasing export orientation has become a strong alternative during the last couple of years, with international coal prices rallying. The area is well connected to a developed railway system. However, remoteness from the key ports, issues with the availability of rolling stock, as well as rising transportation costs are likely to significantly limit the export expansion of the regional producers.

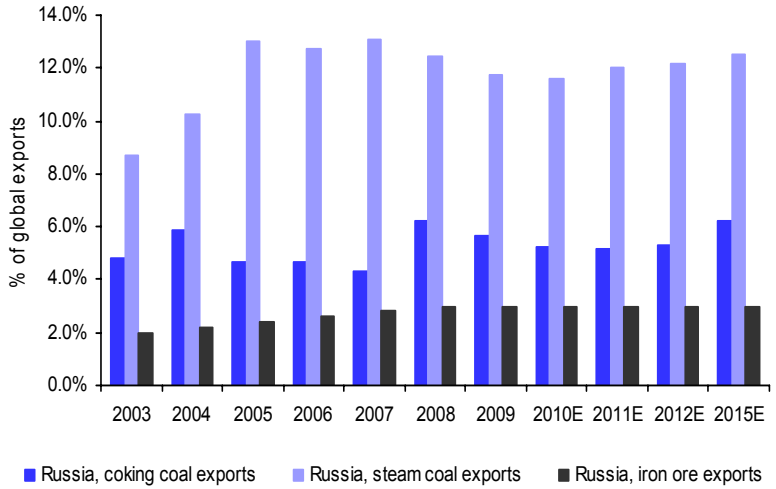
Figure 103: Russian coal basins are spread across the country



Source: Deutsche Bank, Ministry of Natural Resources and Ecology

South Yakutian basin has the most export potential, in our view. The basin is located approximately 2,000km from the Far Eastern ports of Russia, which traditionally specialize in bulk commodities transhipment, specifically coal. Mechel is solely developing the Elga deposit (a part of the basin), preparing the site and building a railroad connection of 313km to the Baikal-Amur Railway (BAM). Initially, 200,000 tons of raw coking coal are expected in November 2010, with production growing to 9m tons in 2015E, potentially reaching 30m tons by 2020E.

Figure 104: Russia's share of the export market is likely to remain flat in the short and medium term

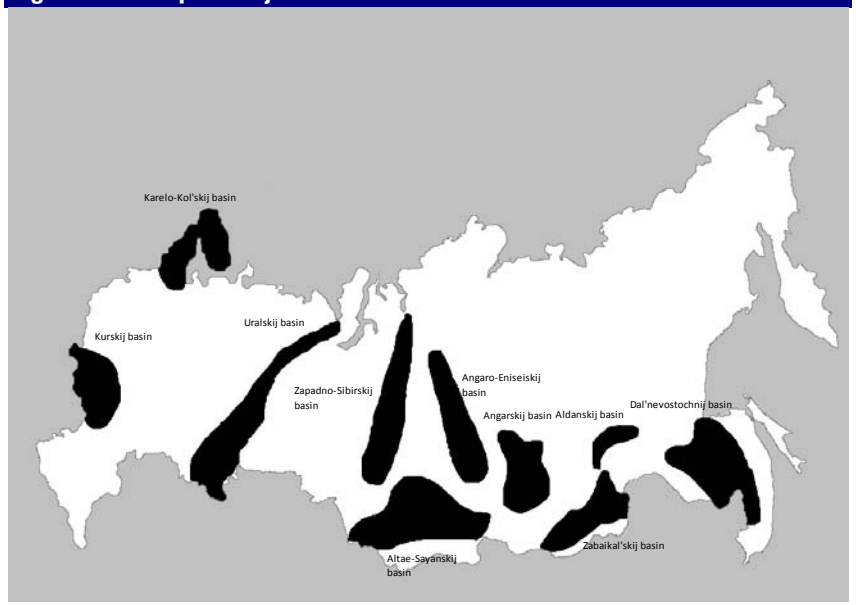


Source: Deutsche Bank estimates, company data

Development of Ulug-Hemsky basin carries an upside risk to our coal export estimates. The basin is located in the Tuva region of Russia, which currently lacks any transportation infrastructure. OPK mining has already started developing the Elegest deposit (a part of the basin); however, the absence of railway connection to Transsib (approximately 460km) makes any sizeable future production very difficult. We believe recent interest from major Russian steel companies in the project, including Evraz and Severstal, could ultimately speed up the process of the basin's development; however, this prospect seems quite remote. The Russian government estimates the potential capacity of the deposit at 30m tons.

Russian iron ore reserve base is also spread across the country, with only 60% of proven reserves currently being developed. The quality of iron ore mined is similar to Chinese and Ukrainian, with Fe content ranging from 17.5% to 43.1%, and only 12% of the reserve base contains rich ore. Local consumption stands at approximately 60% of the iron ore produced, and most of the remainder has been traditionally exported to European markets. Recent data suggest more supplies to China and South East Asia, by railway mostly, in line with growing demand from the region. Recent railway upgrades at Zabaykalsk, the main frontier connection with China, are likely to make this market even more popular in the near future.

Figure 105: Map of major iron ore basins in Russia



Source: Deutsche Bank, Ministry of Natural Resources and Ecology

Metalloinvest is the largest iron ore producer locally, responsible for a third of the country's output, as well as the main exporter, with a 75% share of Russian iron ore exports. Other major producers are mostly vertically integrated steel companies, with insignificant third-party sales. The current ownership structure of the sector suggests a lack of motivation to undertake extensive development capex by the players, given low single-digit steel production growth in Russia. The only two major exceptions could be MMK, which is considering developing the Prioskolskoe iron deposit with potential production capacity of 10m tons by 2020, but this will be largely consumed by the steel plant; and Petropavlovsk, which could add up to 9m tons of iron ore exports (mostly by rail to China).

Port infrastructure

Considering only iron ore and coal projects that can be realistically delivered, we arrive at a conclusion that future nominal capacity at port terminals seems sufficient to handle higher export volumes. In reality, the port infrastructure is quite old and, according to Russian Sea Industry, approximately half of the ports in Russia are shallow; therefore, they cannot take up ships with a deadweight of more than 10,000 tons. We highlight that only ten ports in the country can service 50,000 ton ships, and only Murmansk port is able to handle 150,000 ton carriers.

Our forecasts suggest a 45% increase in coal port terminals' nominal capacity by 2015 to approximately 100m tons (assuming only deliverable expansion plans) versus an expected requirement of 80-90m tons (the rest can be exported by rail). Note that largest Russian ports are directly/indirectly controlled by major industrial groups, which are responsible for a bulk of export activity. This implies that the capacity expansion plans of the ports are likely to match actual commodities' production growth profile.

Figure 106: Russian ports capacity forecast

in 000 tons	2009	2015E	2020E
Liquid cargo	293	364	411
Dry bulk, incl.:	84	133	170
grain	*15*	*24*	*25*
iron ore, coal etc	*69*	*109*	*145*
General cargo	65	106	117
Containers	26	51	90
Other	26	39	47
Total	**495**	**692**	**835**

Source: Deutsche Bank estimates, Russian Association of Sea Ports

Figure 107: Largest Russian ports are controlled by major industrial groups

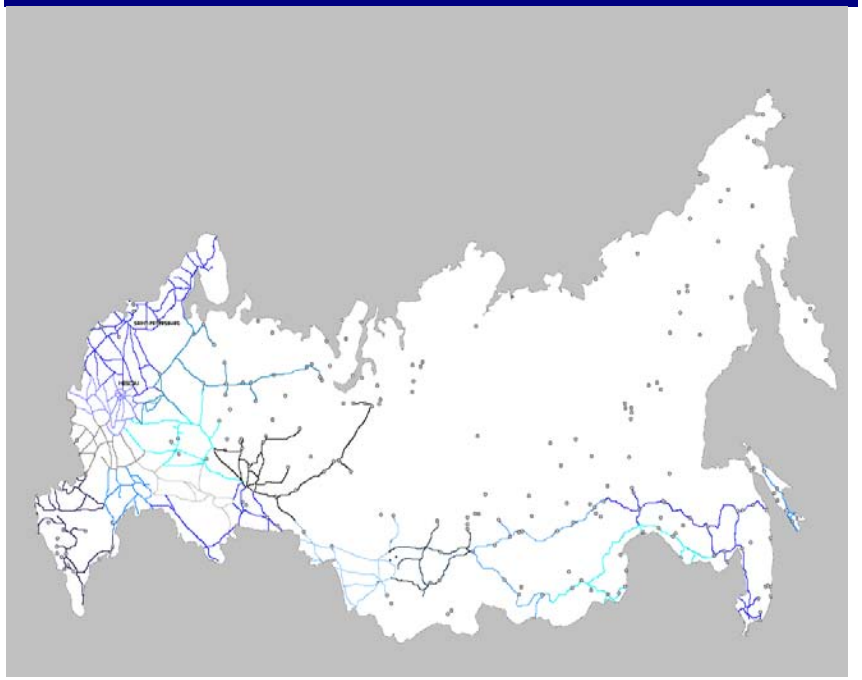
Source: Deutsche Bank, Ministry of Natural Resources and Ecology

Railway infrastructure

For now, access railways to major ports are the main issue... We have recently met with the largest Russian independent railcar operators (including GlobalTrans and TransGarant), which specialize in bulk commodities, to learn about the main bottlenecks in the country's transportation system. Note that industry reports contain contrarian views on this topic, some highlighting port capacity, others railway throughput capacity. Our findings suggest that different directions experience various issues; however, we understand that currently major bulk commodities transportation routes are limited by access paths to the ports. Trains face difficulties in reaching port destinations on schedule, which is also aggravated by antiquated port infrastructure, thus slow transhipment, as well as a limited ability to load large bulk carriers. These issues, coupled with harsh weather conditions in the fastest-growing export direction of the Far East, is another important limiting factor in the country's ability to increase export exposure in the short and medium term.

...however, the lack of a developed railway system is the hurdle to potential export development in the longer term, in our view. The existing transportation system provides little motivation or incentive for private capital to develop a rich reserve base for the country, as spending on infrastructure requires massive investment and significantly delays the payback period on greenfield projects, which is a risk most local producers are reluctant to accept. The state, in its turn, has been generally extremely slow in financing large scale projects.

Figure 108: More than half of the Russian territory lacks railway connections



Source: Deutsche Bank, Ministry of Natural Resources and Ecology

Conclusion

We expect Russian producers of bulk commodities to maintain their market share internationally; however, the issues described above are likely to weigh on the country's export expansion going forward. As such, we estimate supply constraints from Russia to stay in place, putting little pressure on bulk commodities' prices; therefore, we favor local producers with robust growth profiles, which can benefit from the favorable pricing environment. Mechel clearly stands out as a beneficiary of growth in global bulk exports in our universe, mostly due to the Elga deposit development, which is located close to SE Asian markets. Additionally, the company owns and expands nearby port terminals, ensuring additional volumes reach the markets.

Key Thinking – Southern African Bulk Commodities

While southern Africa has a multitude of mineral resources (coal, manganese, chrome), its commodity export growth has been constrained by lack of infrastructure development (power, rail and port) and will, we believe, continue to be restricted for the next few years. For the region to become a true global player in the seaborne bulk commodities market, we believe significant additional capital will need to be invested in infrastructure (in particular rail). We also believe that in order to grow infrastructure sufficiently and within a reasonable time frame (say 5-10 years), the region will require private participation, currently a possibility but not yet a given.

At the current levels of infrastructure growth, it is our opinion that the region can achieve production export growth of c.3% (three-year forward-looking CAGR) for iron ore and c.2% (three-year forward-looking CAGR) for South African export thermal coal. In our view, Moatize will likely experience delays as there are many contingent factors on Mozambique's ability to export coal (thermal and coking), though the rail and port capacity through Beira should reach 6mpta.

South Africa

South Africa is different from the international norm in that Transnet, a parastatal (state-owned company), owns the entire rail and port infrastructure network (with the exception of the Richards Bay Coal Terminal (RBCT)). This means that miners are constrained by the pace of Transnet's growth.

Transnet has limited ability to raise finance as all equity finance needs to come from the state (and hence taxpayers) or debt. The amount of debt Transnet is allowed to raise is also limited as it is required (per its agreement with government) to remain above 3x EBITDA interest cover to retain its balance sheet position and credit rating.

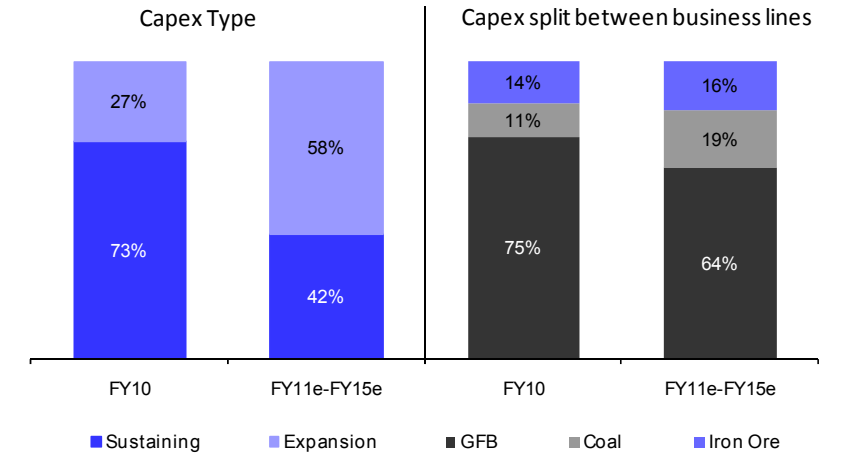
This has constrained infrastructure growth in the past and is likely to be the main factor that will restrict growth in bulk commodity mining in South Africa (iron ore, coal, manganese and chrome) for the foreseeable future.

Infrastructure - Railways

South Africa's resource basins are generally further from ports and at higher altitudes than the other bulk producers globally. Logistics constraints are thus significant.

The long distances have a secondary effect; a greater amount needs to be spent on infrastructure investment. Transnet plans to invest ZAR52.2bn over the next five years (compared to ZAR9.7bn in FY10) to improve the efficiency and capacity of the general freight business (GFB), the iron ore Orex line, and the CoalLink line. Together, these three business lines form Transnet Freight Rail (TFR). Below we have given the planned spilt of TFR's capex spend between the three divisions and between sustaining and expansion capex.

Figure 109: TFR's capex plans



Source: Deutsche Bank, Company Data

TFR reduced expansion capex in FY10 because of revenues and hence EBITDA falling during the recession. TFR plans to increase expansion capex from 27% (FY10) to 58% (FY11-15e). It also plans to increase the proportion of capex on the CoalLink line from 11% of total FY10 capex to 19% (for FY11-15e). We believe much of the change in capex will be for expanding the line and increasing its efficiency.

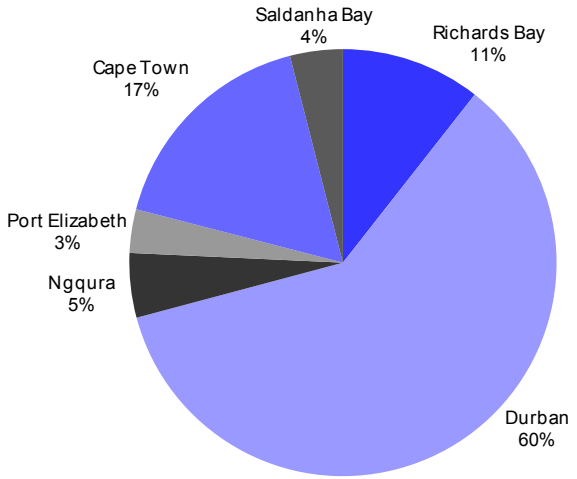
Infrastructure - Port

Currently **the ports are operated by Transnet** (except for RBCT) and have sufficient capacity for both exports and imports.

Transnet plans to spend ZAR18.7bn over the next five years (compared to ZAR3.2bn in FY10) to maintain, increase efficiency and expand the ports to accommodate for future demand.

Future capex spend is to be split between the ports as follows:

Figure 110: Transnet capex split by port



Source: Deutsche Bank, Company Data

Transnet is increasing port capacity (at Durban, Port Elizabeth, Ngqura and Cape Town) by 1.2mTEUs (Twenty-foot Equivalent Units) from 2010-2015 from the current combined capacity of 4.3mTEUs. It is also increasing the capacity of its bulk ports (Saldanha Iron Ore Terminal, Port Elizabeth Manganese Terminal, Richards Bay Dry-bulk and Multi-purpose Terminal, East London Bulk Terminal and Agriport in Durban) by 23mt over the same period. 12mt of this increase is for manganese exports and another 12mt for iron ore. We estimate Transnet charges a fee of c.ZAR5/t for dry-bulk at its ports.

Mozambique

Mozambique has vast coal resources that are estimated at 2.5bnt (according to CoalTrans). Vale estimates the reserve base at 750mt. This means that Mozambique has one of the largest undeveloped coking coal deposits outside of Australia.

Mozambique's infrastructure was almost completely destroyed by the two wars that raged in the country from 1964-1992 – the war of independence and the civil war.

Reconstruction of the rail lines from Tete province to Beira – one of Mozambique's main export ports – only commenced in 2006 after it had been cleared of land mines. The line's reconstruction has just been completed; however, coal freight is only scheduled to begin in mid-2011.

Mozambique also has restrictions on the amount of coal that can be exported as the Sena rail line (from Tete to Beira) has a capacity of 6mtpa while the port is also only capable of handling 6mtpa.

Southern African Coal

South Africa is the largest producer of coal on the continent, producing 250mtpa (98.6%) of African production and 3.6% of world production. South Africa also has the largest coal reserves on the continent (94.9%, 30.4bnt), and accounts for 3.68% of world coal reserves. South Africa uses coal for its primary source of electricity generation and consumes 70.6% of its production (on an oil equivalent basis).

Mozambique is the up-and-coming player in the southern African coal market. It has coal reserves of 750mt (85% coking coal and 15% export grade thermal coal) in the Tete province.

Both these countries face significant infrastructure problems especially relating to rail. South Africa does not have sufficient rail capacity (72mtpa) compared to its export capability (RBCT has port capacity of 91mtpa), while Mozambique is recovering from a two-decade-long civil war and needs to rebuild old railways (the Sena Line) and construct new ones (Moatize-Nacala line). The ports of Beira and Nacala also require infrastructure upgrades to allow the handling of bulk commodity exports.

South African Coal

Ore body size and location

Figure 111: South African coal ore bodies

Source: Deutsche Bank

South Africa has 30.4bnt of **thermal coal** reserves (according to BP's Statistical Review of World Energy), c.50% of which is in the Waterberg region in the northern part of the country bordering Botswana. Export thermal coal is transported 600km from the Witbank/Ermelo area in the Mpumalanga province, to RBCT (on the east coast) via Transnet Freight Rail's (TFR) CoalLink line. We estimate port and rail costs at ZAR150/t (c.US$20-25/t) from Witbank to RBCT.

Production costs

We estimate the FOB cost at roughly US$50/t for coal. Production costs should therefore not affect the decision to increase production. Infrastructure, particularly rail infrastructure, is the limiting factor to production growth. Increased capacity will lead to economies of scale benefits.

Infrastructure – Rail

Thermal coal is mined in four main locations in South Africa: the Witbank, Vaal Triangle, Waterberg and Natal ore bodies. All export coal (main from the Witbank coalfield) is sent to RBCT via TFR's CoalLink line. Although the Waterberg reserves are significant, there is limited export volume given rail constraints.

The following figure illustrates the three major bulk commodity transport corridors: the Orex Iron Ore line (871km), the CoalLink line (580km) and the Manganese general freight (GF) line (c.600km to Port Elizabeth, c.1,000km to Richards Bay and Durban).

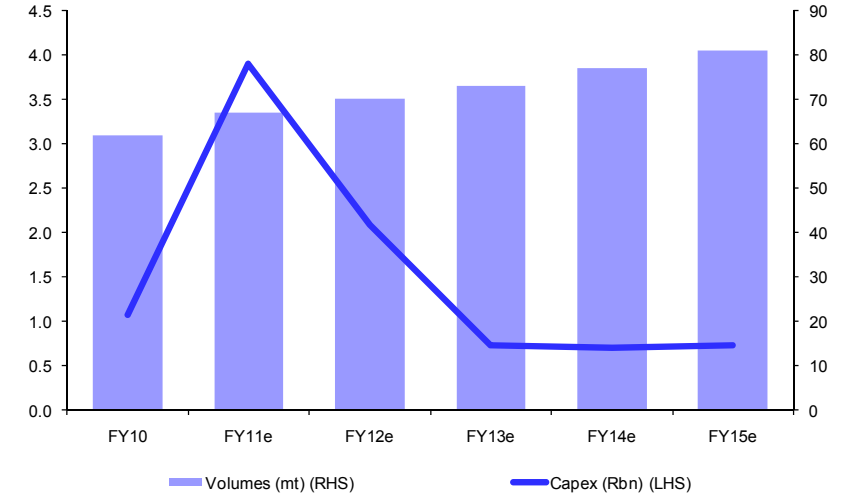
Figure 112: South Africa's major bulk corridors

Source: Deutsche Bank

The CoalLink line is the main constraint on the supply of export coal. In 2010, TFR transported 61mt of coal to RBCT, below capacity of 72mtpa. The line's planned expansion will increase capacity to 81mtpa by 2015. Based on historical performance, we believe TFR will be able to transport 73mtpa when capacity reaches 81mtpa (c.90% efficiency).

Transnet has planned capex of ZAR10.1bn for FY11-15e. This compares to ZAR1.1bn in FY10. Below, is the expected TFR CoalLink capex spend per year (FY11-15e) with the expected volumes to be transported on the line in each year.

Figure 113: Coal rail capex and volume growth

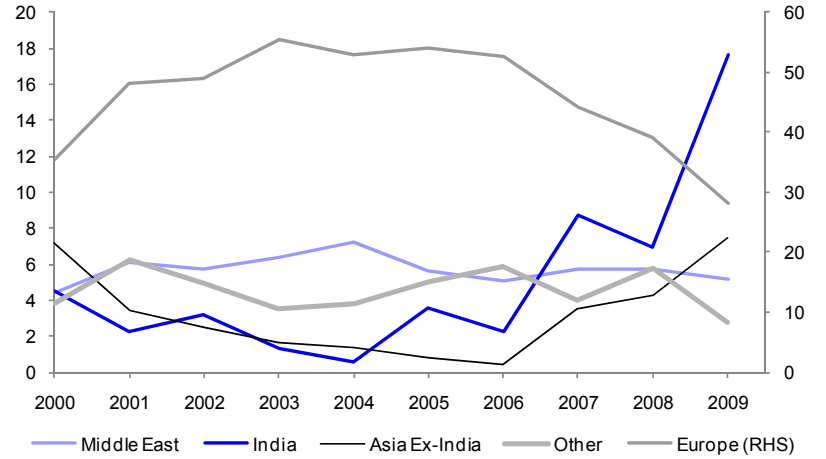


Source: Deutsche Bank, Company Data

Transnet has also stated, in its 2010 annual report, that it may require private partner participation to develop the line to beyond 81mtpa. We believe any participation will potentially come from the producers or from China/India as they increase their demand of South African coal.

In the following figure we have highlighted coal export volumes per destination. Indian demand for South African coal has increased from 3.6mt in 2005 to 17.6mt in 2009; a CAGR of 37%. Indian demand for South African coal is expected to grow and hence it may provide the capital to expand the CoalLink line, as India has already done in Mozambique.

Figure 114: RBCT export destination volumes

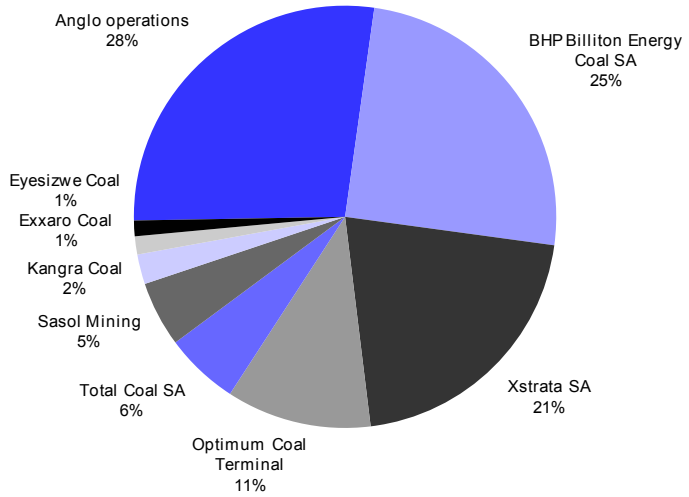


Source: Deutsche Bank, RBCT

Infrastructure - Port

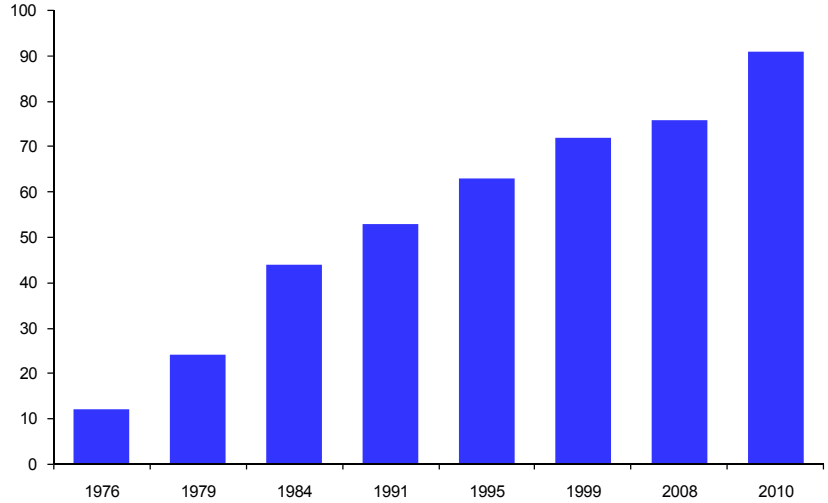
RBCT is the only port in South Africa not owned and operated by Transnet. The Richards Bay port is the general freight terminal. The companies who export from RBCT own the port via capacity allocation.

Figure 115: RBCT ownership and capacity allocation (based on 72mtpa)



Source: Deutsche Bank, Company Data

Figure 116: RBCT capacity growth (mtpa)



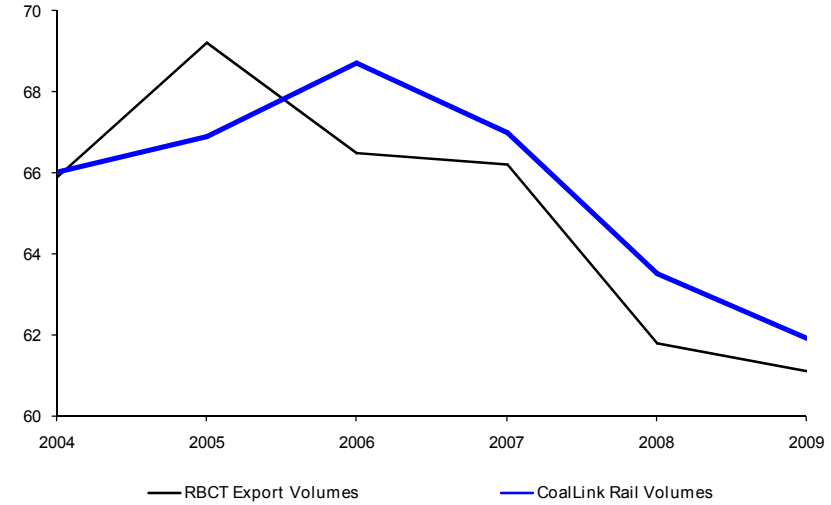
Source: Deutsche Bank, Company Data

RBCT expanded to 91mtpa in 2010. The new capacity above 72mtpa was sold to smaller miners who met empowerment requirements.

RBCT's four largest shareholders own 85% of the allocated capacity. They are Anglo (27.5%, 19.8mtpa), BHP (24.9%, 17.9mtpa), Xstrata (20.9%, 15.1mtpa) and Optimum Coal (11.1%, 8mtpa).

RBCT has not exported more than 69.2mt, the record level achieved in 2005 (96% of capacity (72mtpa)). In our opinion, this was an extraordinary year and was achieved by reducing the stockpiles at the terminal. The volume of coal exported from RBCT is dependent on the amount of coal railed by TFR to the terminal, which has remained at around 60mtpa.

Figure 117: RBCT exports vs TFR CoalLink rail volumes



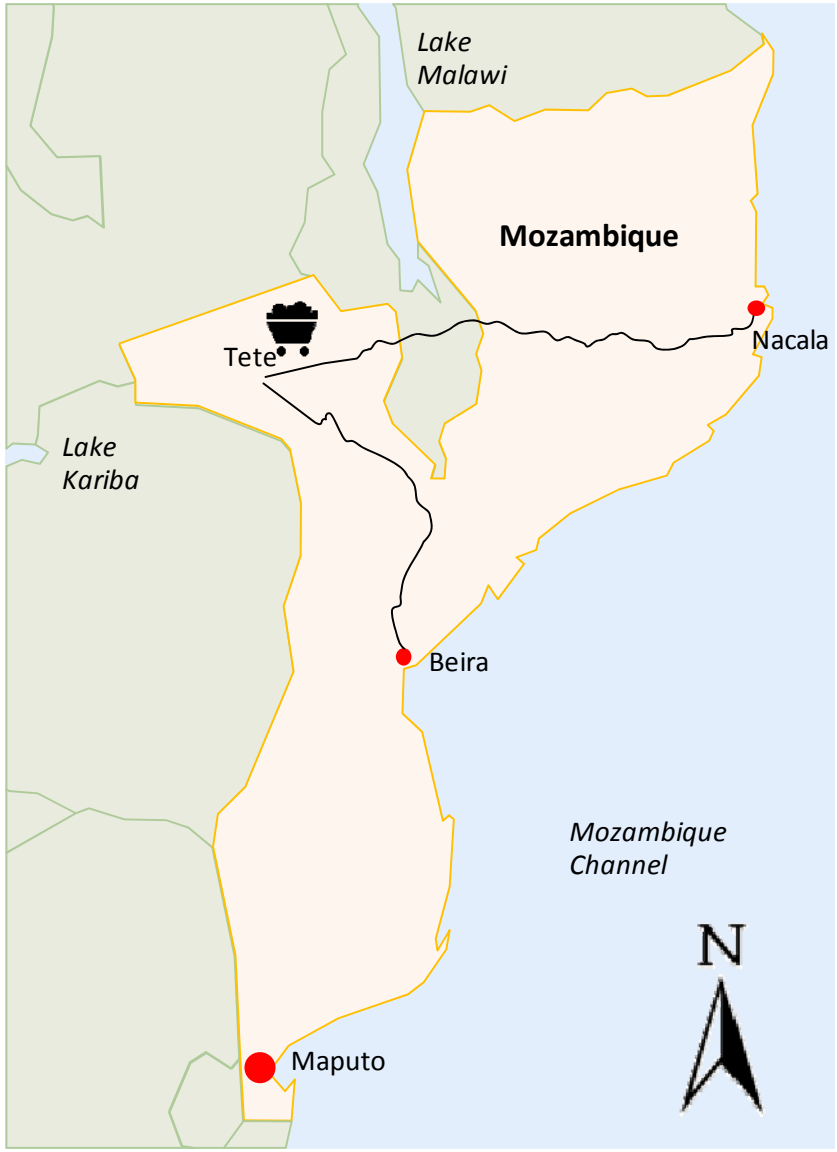
Source: Deutsche Bank, Company Data, RBCT

Mozambican Coal

Ore body size and location

The Moatize coal ore body, in Mozambique's Tete province, near the Malawi and Zimbabwe borders, is one of the largest coking coal deposits outside Australia. The infrastructure around Moatize was damaged in the Mozambican civil war that lasted from 1977-92. The main rail line from the region, the Sena rail line, was only cleared of land mines in 2006. Reconstruction of the rail line could only begin after this date and hence this ore body is only now viable.

Figure 118: Sena line and the Moatize-Nalaca line



Source: Deutsche Bank

This deposit has an estimated reserve of 750mt and resources of over 2.5bnt (CoalTrans). Of this, approximately 75% is coking coal; the remainder is export grade thermal coal.

Vale plans to produce and export up to 8.5mt of coking coal and 2.5mt of thermal coal per year assuming that the rail capacity can be expanded.

Infrastructure – rail to port

The 670km-long Sena railway, from Moatize to the port of Beira, will be used to export the coal. However, the railway needs to be renovated to reach its full export capacity of 5-6mtpa. This renovation is expected to be completed by 2H10/1H11 and will cost c.US$210m; it is c.75% complete. The railway's condition deteriorated due to the civil war in Mozambique, only being cleared of land mines in 2006.

The port of Beira is currently not able to process coal and hence processing facilities are being constructed. The facilities are due for completion in mid-2011. Thereafter, coal can be mined and railed for export.

The Mozambican government has announced it has secured US$500m to build a new Moatize-Nacala railway line. Construction of this line is planned to be completed in 2015 and will increase the Moatize coal field's export capability by c.6mtpa to 11mtpa.

The export coal is destined for Brazil, India, China and Japan.

Riversdale and Vale plan to mine 40mtpa ROM. We believe that given the infrastructure constraints, they will only be able to export up to 11mtpa for the foreseeable future. This means that if they pursue this plan to produce 40mtpa, they will have to achieve significantly higher rail capacity than currently planned; at present this is not planned.

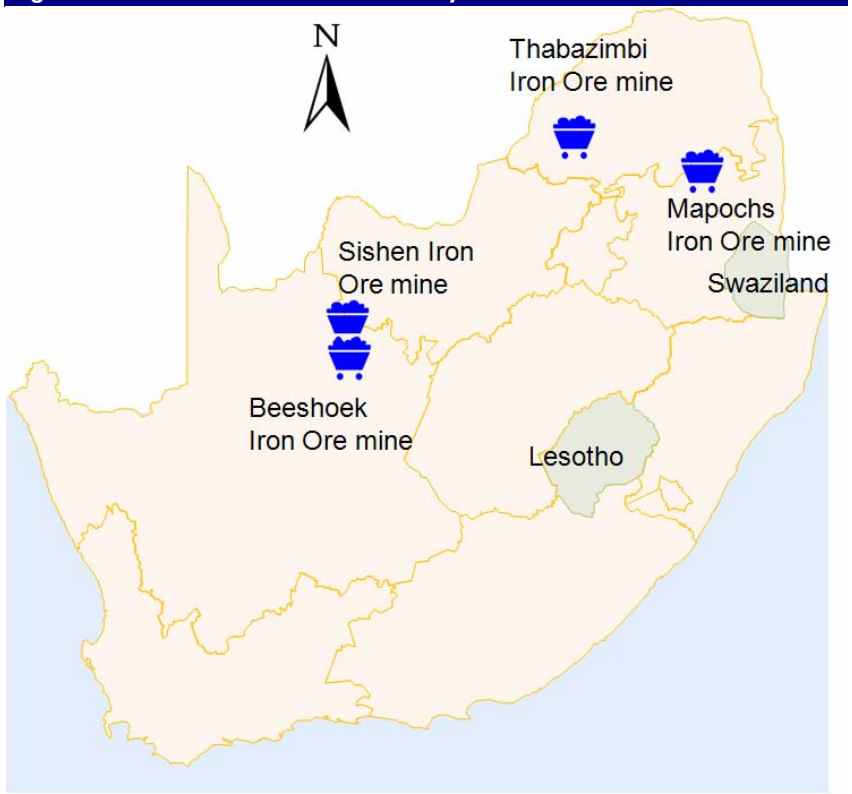
South African Iron Ore

Ore body size and location

South Africa has two main iron ore mining regions – around Sishen in the Northern Cape and Thabazimbi in the Limpopo province.

South African **export iron ore** is primarily mined at the Sishen and Khumani mines in the Northern Cape province. These mines have reserves in excess of 3bnt; 47mtpa of which is currently exported. The ore is transported to Saldanha Bay (on the west coast) via the 870km Transnet Orex rail line. We estimate port and rail costs at approximately ZAR80/t from Sishen to Saldanha.

Figure 119: South African iron ore body locations



Source: Deutsche Bank

Thabazimbi is mainly mined for **domestic** use with the ore being sold to steel makers like Highveld Steel and ArcelorMittal SA. The Thabazimbi ore body has an estimated reserve of 13mt and production of 2mtpa. ArcelorMittal SA also purchases 6.25mt of iron ore from the Sishen mine in the Northern Cape.

Production costs

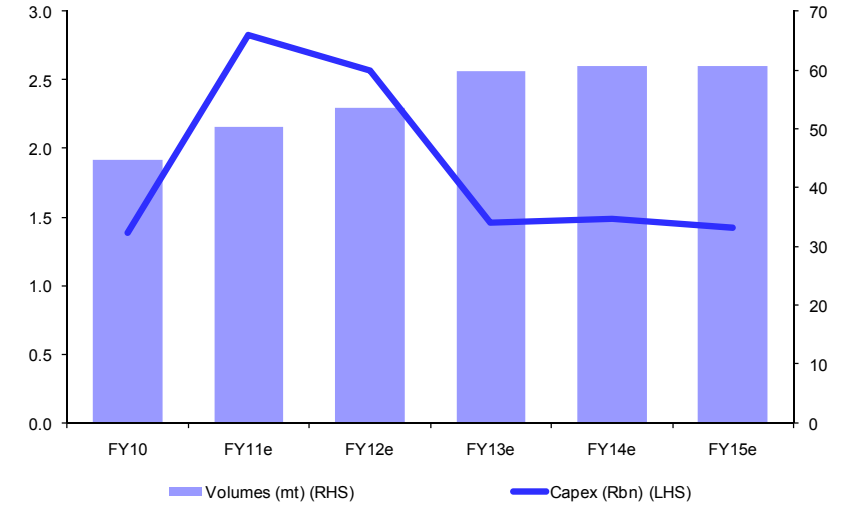
South Africa has the lowest FOB costs for **iron ore (adjusted for high lump ratio),** averaging roughly US$30/t. Production costs should therefore not affect the decision to increase production. Infrastructure, particularly rail infrastructure, is the limiting factor to production growth.

Infrastructure – Rail

Export iron ore is mainly produced at the Sishen and Khumani mines in the Northern Cape. TFR's Orex line was built to transport this iron ore from Sishen to the port of Saldanha in the 1970s. The line is 871km long and has a current capacity of around 47mtpa.

In 2010, TFR transported 44.7mt of ore to Saldanha. It plans to increase this to 60.7mt by 2015e by investing ZAR8.6bn over the period in new equipment. It is also improving the line's efficiency by refining train and load capacity models.

Figure 120: Iron ore rail capex and volume growth



Source: Deutsche Bank, Company Data

Infrastructure – Port

Iron ore is exported from Saldanha Bay. The port has a quayside capacity of 48mtpa that Transnet plans to expand to 60.7mtpa by the end of 2013. The planned capex spend for this expansion is ZAR646m (c.US$92m). This compares to FY10's capex of ZAR51m (c.US$6.8m).

South African Manganese

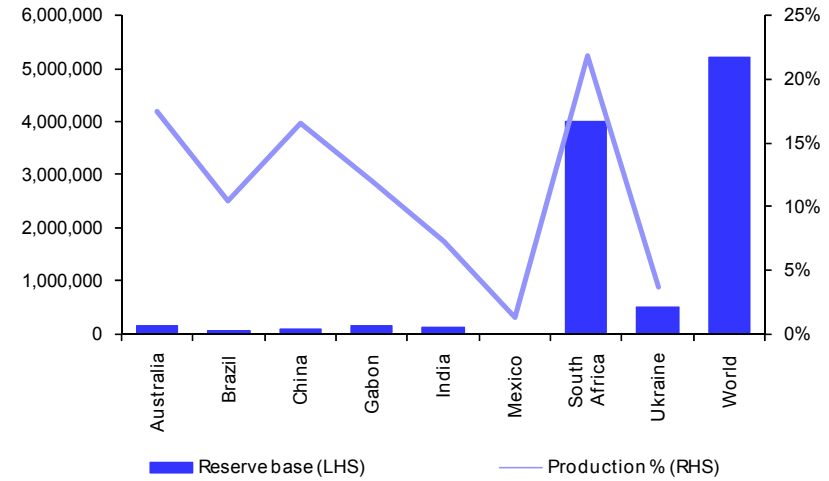
Ore body size and location

Manganese is mined at Hotazel, in the Northern Cape, near the iron ore mines. These resources are estimated at 4bnt with exports currently c.6mtpa. The ore is transported 600-1,000km via Transnet's General Freight Business to the ports of Port Elizabeth, Durban and Richards Bay. We estimate that ore sent on the general freight lines to Port Elizabeth costs ZAR360/t. Ore is also transported by truck to Richards Bay at a cost of ZAR600/t, indicating the lack of infrastructure's marginal cost.

Production costs

South Africa has the largest and highest-grade **manganese** reserves in the world, which helps companies achieve lower production costs/kilogram of manganese. South Africa's average manganese ore grade is higher than the world average.

Figure 121: South African manganese reserves, production share vs other producers 2009



Source: Deutsche Bank, USGS

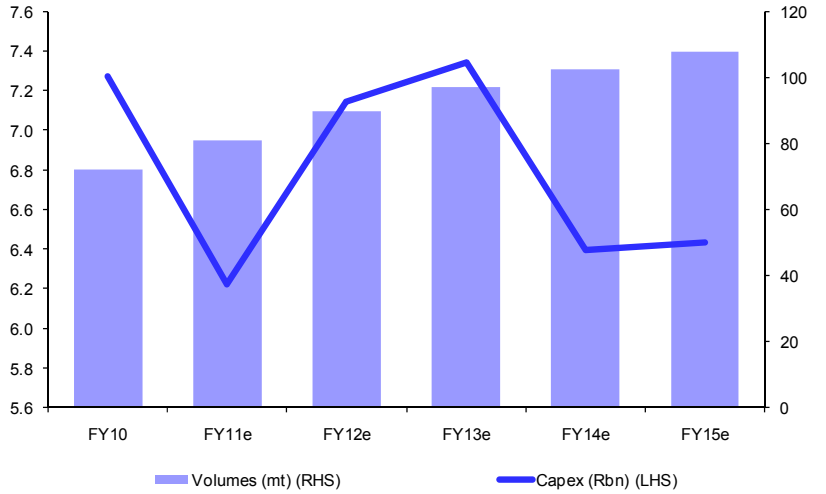
Manganese demand is, however, very dependent on steel demand and is more volatile as the relatively low content results in a greater inventory effect. This implies that both demand stability and infrastructure are growth-limiting factors in this market.

We believe South Africa has a major opportunity to increase supply through infrastructure growth. South Africa has c.80% of global manganese resources and only supplies c.20% of the global supply currently.

Infrastructure - Rail

Transporting manganese from the North West and Northern Cape provinces to port falls under **general freight**. Also included in this business unit is the freight of other dry and fluid materials, and automotive vehicles and parts. It is thus difficult to gauge the exact costs and distances of manganese from the Northern Cape to Port Elizabeth and Richards Bay.

Figure 122: General freight rail capex and volume growth



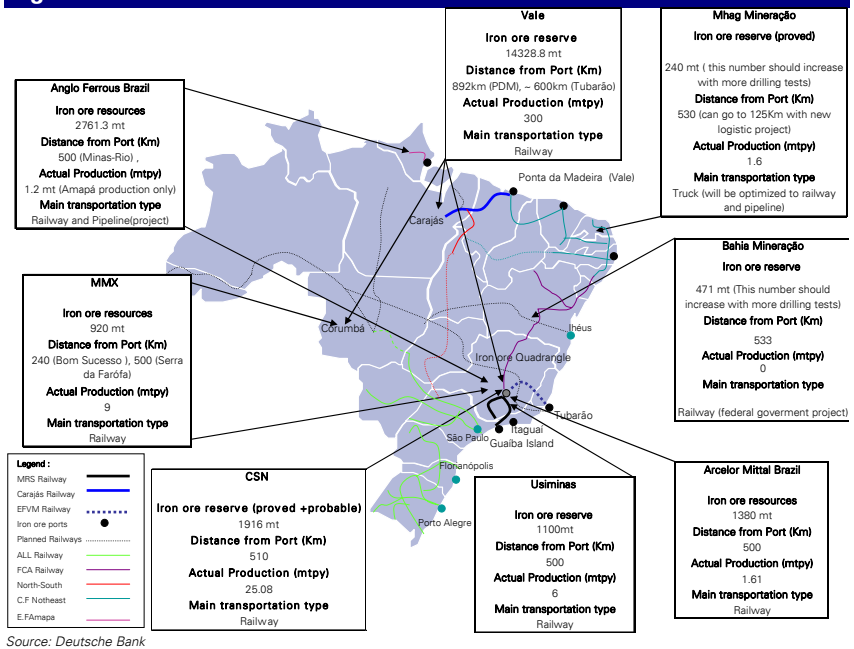
Source: Deutsche Bank, Company Data

Infrastructure - Port

Transnet expects volumes to grow by a CAGR of 5% over the next five years to 4,632kTEUs (20' equivalent unit, a measurement of total container capacity and hence port capacity) from 3,629kTEUs in FY10.

Key Thinking – Brasil

Figure 123: Main Brazilian iron ore assets



Source: Deutsche Bank

Brazilian iron ore: In search of logistics

Brasil has iron ore reserves of 26 billion tonnes, according to Instituto Brasileiro de Mineração, and is the second-largest iron ore exporter in the world. According to CRU, iron ore exports from the country totaled 265 million tonnes (mt) in 2009, second only to Australia with 362 mt.

Despite its vast amount of reserves, Brasil has struggled to increase its iron ore production in recent years due to logistics bottlenecks. We estimate that 92% of iron ore exported from Brasil last year used ports that belong to either Vale or CSN, and in our view this lack of port alternatives is a major barrier to the entry of junior iron ore mining companies in the export market.

The main Brazilian iron ore ports are the following:

Itaguai, CSN

CSN's port is located in Itaguai, Rio de Janeiro. The port has an iron ore loading capacity of 30mtpy and during 2009 it operated at 78% of its capacity, shipping 23.5 million tonnes of iron ore. CSN is planning a series of investments to increase the port's current capacity to 84 million tonnes per annum. The first of these investments, in the amount of USD92m, will increase the port's capacity to 45 million tonnes per annum and is scheduled to be finished by August 2010. The second investment, in the amount of USD250m, will increase the port's capacity to 60 million tonnes per annum and is due to be finished by December 2011. The final investment, in the amount of USD245m, will increase the port's capacity to 84 million tonnes per annum and is due to be finished by April 2013. The port's channel and berth depth support capesize vessels, and the port is equipped with one ship loader that works at an average loading rate of 8,000 tonnes per hour. Additionally, the port has a stockpile capacity of 1 mtpy. The port is connected to the Casa de Pedra and Namisa iron ore plants through the MRS railway.

Itaguai, Vale

Vale's port in Itaguai, Rio de Janeiro, is operated by Vale's subsidiary, CBPS (Cia. Portuaria Báia de Sepetiba). The port's current capacity is 23mtpy and during 2009 it operated at 86% of its capacity, shipping 19.6 million tonnes. Vale's port supports capesize vessels, with a capacity of up to 230,000 tonnes. The port is equipped with one ship loader and has a stockpile capacity of 2 mtpy.

Porto da Madeira, Vale

Vale's Porto da Madeira is located in the state of Para, in the north of Brasil. The port belongs to Vale and it mostly exports Vale's iron ore production from Carajás. The port has an iron ore loading capacity of 105 mtpy and during 2009 it operated at 83% of its capacity, shipping 87 million tonnes. PdM is one of the few ports in Brasil to support Uloc and Vloc vessels with a capacity of up to 400,000 tonnes of iron ore. The port has a stockpile capacity of 5 mtpy, the largest in Brasil. PdM is equipped with four ship loaders and has an average iron ore loading rate of 16,000 tonnes per hour. During 3Q09 the port's exports were lower than expected due to increased rainfall.

Suape
The Suape port is located in the state of Pernambuco and is currently in the process of bidding for an iron ore terminal project. The iron ore project is a priority in the government's infrastructure program for 2010. The port is currently equipped with two ship loaders and has a stockpile capacity of 0.1 mtpy. Currently, Suape only supports Panamax vessels with a capacity of 80,000 tonnes. The port is expected to receive investments in the order of BRL2bn to expand the terminal capacity and repair the railway connecting the port to the state of Alagoas. The port interrupted iron ore shipments at the end of 2008 and is expected to resume shipments later this year after the infrastructure investments.

Guaiba, Vale
Vale's Guaiba port is located in the state of Rio de Janeiro. The port has a loading capacity of 48 mtpy, and during 2009 it operated at 77% of its capacity, shipping 37 million tonnes. The port has a robust infrastructure, supporting capesize vessels. It is equipped with one ship loader and has a stockpile capacity of 3mtpy. The MRS railway connects Vale's iron ore operation with the port. Vale also owns 41.5% of the railway company.

Port of Ubu
Samarco Mineração owns and operates the port of Ubu located in the state of Espirito Santo. The port has a loading capacity of 29 mtpy, and during 2009 it operated at 66% of its capacity, shipping 19 million tonnes. The Ubu port supports capesize vessels. It is equipped with one ship loader and has an iron ore stockpile capacity of 1.8 mtpy.

Tubarão
The port of Tubarão is the largest iron ore port in the world and is located in the state of Espirito Santo. The port operates exclusively for iron ore shipments from Vale. The port has a loading capacity of 105 mtpy, and during 2009 it operated at 75% of its capacity, shipping 78 million tonnes. The port's channel and berth depth of 22 meters allows for the loading of big vessels like capesize and Ultra Large Ore Carriers (ULOCs) The port is accessed through the EFVM (Estrada de Ferro Vitória-Minas), a railway that connects the port to the iron operation over 600km and is also owned by Vale. During 3Q09, the port loaded less iron ore than expected due to a replacement of the old ship loaders; according to the company, this maintenance improved the port's capacity.

Port of Santana, Anglo
Anglo's Santana port is located close to the city of Macapá in the state of Amapá, in the northern part of Brasil. The port exclusively exports Anglo's Macapá iron ore production (ex-MMX operation). The port has a loading capacity of 3.7 mtpy, and during 2009 it operated at 68% of its capacity, shipping 2.5 million tonnes. The port supports Panamax vessels with a capacity of 80,000 tonnes. The port has a stockpile capacity of 0.25 mtpy.

Port regulation in Brasil

Until 1993, Brazilian legislation did not provide the framework for the private sector to participate in the port business. All ports in Brasil were managed by Portobras, a state-owned company.

In 1993, the Ports Law (Law 8,630/93) allowed the private sector to operate public ports managed by a public authority, enabling the creation of private ports with exclusive or mixed use. Through a concession on a public port, a private operator acts as an arm of the government: tariffs are controlled by the government, and infrastructure is owned by the government and is for public use. On the other side, the infrastructure and real estate of private ports usually belong to the operator. Private ports are allowed to offer services to third parties and are free to implement their own tariff system.

Concessions are granted through a public bidding process; however, there is no need for this in the case of an authorization of a private port.

In the following years, some terminals in Brasil were privatized, enabling the country to reach international standards and reduce handling prices. Later in 2001, Law 10,233/01 created the ANTAQ, which is in charge of overseeing and regulating all port operations in Brasil.

In 2008, Decree 6620/08 regulated the concessions granted to private companies in public ports. According to the Decree, port concessions last for 25 years and can be renewed for a period of equal length. Concessions include the leasing of areas in public ports, and the establishment of private terminals in public ports for exclusive use (handling of the private company's own cargo) or mixed use (handling of third-party cargo).

Railroads

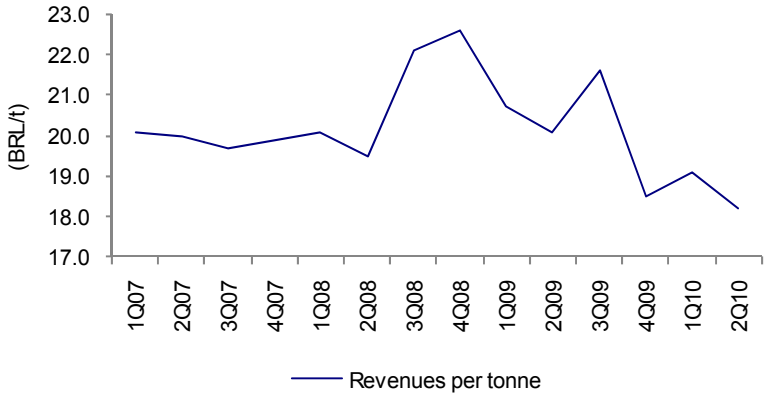
Brasil has an extensive railroad system almost entirely dedicated to iron ore. The main railroad operators in Brasil are Vale and MRS.

Figure 124: Iron ore district railroad system

Source: CVM

MRS (1,643km, 129mt transported in 2009) is owned by different companies including Vale, Usiminas, and CSN, and has operated since 1996. More than 70% of the cargo transported by MRS is iron ore, from which 85% is exported. MRS transports about 25% of the total iron ore exported by Brasil.

Figure 125: MRS revenues per tonne

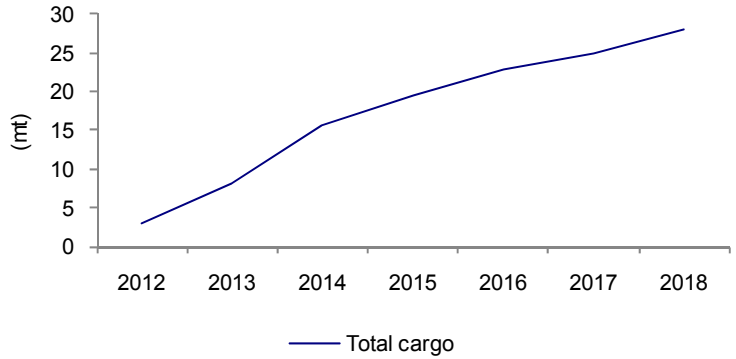


Source: Company data

Vale operates four railroad lines in Brasil: (i) Vitória-Minas (905km, 135mt transported in 2009), (ii) Carajás (892km, 93mt transported in 2009), (iii) North-South (200km, 1.6mt transported in 2009), and (iv) FCA (8,023km, 26mt transported n 2009). More than 80% of the total cargo moved in these lines is Vale's iron ore. Vale is expanding the North-South line and expects it will reach 12.6 mtpy capacity by 2015.

CSN operates a third railroad, Transnordestina, which stretches across the northern part of Brasil. Transnordestina currently extends 4,238km and CSN is expanding the system to cover new regions. The main product transported by Transnordestina will be iron ore (50%). Grains will also have an important share in Transnordestina's capacity.

Figure 126: Transnordestina expected cargo



Source: Company data

Conclusion

Although Brasil has a vast amount of high-quality iron ore reserves, developing its full export potential will require significant investment in logistics. In addition, iron ore producers that do not own the logistics system will face significantly higher total costs than incumbent mining companies. We expect the following trends for Brazilian rail and port systems going forward:

- MRS: We believe that MRS will continue to be the main transportation system for iron ore producers located in the Minas Gerais State – and the most viable alternative for junior mining companies in the region. MRS' future capacity increase is contingent on the take-or-pay contracts it signs with its clients. The average transportation tariff to the ports in the Sepetiba region should be USD13–15 per tonne.
- Vale railways: In our view, Vale's railway network should continue to be used for its iron ore production as the company has an ambitious growth target to reach 450 million tonnes of iron ore production in 2014, which will leave little room for third-party cargo.
- Ports: We expect that more than 90% of the iron ore shipped from Vale and CSN's ports will continue to belong to those companies. Newcomers to the industry are likely to rely on the ports in development by LLX – Porto do Açu in Rio de Janeiro, which will ship iron ore produced by Anglo America's Minas Rio project, and Porto Sudeste, which will have an initial capacity of 50 mt.

S&D expectations and prices

In the following Figures, we outline our forecasts for the global iron ore and thermal coal supply and demand outcomes and our commodity price expectations.

Figure 127: Deutsche Bank Seaborne Iron Ore Supply/Demand Model.

		2007	2008	2009	2010e	2011e	2012e
Brazil exports	Mt	269	282	267	290	346	374
growth	%	*9%*	*5%*	*-5%*	*9%*	*20%*	*8%*
Australian exports	Mt	267	310	366	422	456	507
growth	%	*7%*	*16%*	*18%*	*15%*	*8%*	*11%*
South African exports	Mt	30	33	43	43	45	46
growth	%	*16%*	*8%*	*32%*	*0%*	*4%*	*2%*
India exports	Mt	94	101	117	118	99	80
growth	%	*5%*	*8%*	*16%*	*1%*	*-17%*	*-18%*
Other exports	Mt	120	127	119	130	139	150
Total seaborne iron ore supply	**Mt**	**780**	**853**	**912**	**1,003**	**1,085**	**1,157**
growth	%	*8%*	*9%*	*7%*	*10%*	*8%*	*7%*
Global steel production (BOF)	Mt	901	891	847	1001	1061	1136
growth	%	*11%*	*-1%*	*-5%*	*18%*	*6%*	*7%*
China steel production	Mt	450	455	516	583	613	657
growth	%	*23%*	*1%*	*13%*	*13%*	*5%*	*7%*
China iron ore production	Mt	698	785	875	962	1,010	1,061
China iron ore imports	Mt	383	444	628	645	678	735
growth	%	*18%*	*16%*	*41%*	*3%*	*5%*	*8%*
Japan imports	Mt	139	140	109	132	131	140
growth	%	*3%*	*1%*	*-22%*	*21%*	*0%*	*6%*
S. Korea & Taiwan imports	Mt	62	65	53	69	75	82
growth	%	*5%*	*5%*	*-19%*	*31%*	*8%*	*10%*
European imports	Mt	140	134	87	119	121	123
growth	%	*1%*	*-4%*	*-35%*	*37%*	*1%*	*2%*
Other imports	Mt	57	70	35	75	79	83
Total seaborne iron ore imports	**Mt**	**780**	**853**	**912**	**1,040**	**1,084**	**1,163**
growth	%	*8%*	*9%*	*7%*	*14%*	*4%*	*7%*
Notional market balance	**Mt**	**0**	**0**	**0**	**-37**	**1**	**-5**
China imported fines (62% CFR)	**USD/t**	**124.8**	**149.2**	**79.8**	**139.5**	**125.0**	**135.0**

Source: Deutsche Bank, AME, Company data

Figure 128: Deutsche Bank Global Thermal Coal Supply/Demand Model.

		2007	2008	2009	2010e	2011e	2012e
Indonesian exports	Mt	195	200	233	258	278	292
growth	*%*	*7%*	*3%*	*17%*	*11%*	*8%*	*5%*
Australian exports	Mt	112	125	139	150	159	164
growth	*%*	*1%*	*12%*	*11%*	*8%*	*6%*	*3%*
South African exports	Mt	67	68	67	67	70	73
growth	*%*	*-1%*	*1%*	*-2%*	*1%*	*4%*	*4%*
Columbian exports	Mt	65	69	63	70	75	77
growth	*%*	*11%*	*6%*	*-8%*	*10%*	*7%*	*3%*
US exports	Mt	11	18	12	12	10	20
China exports	Mt	45	36	18	18	16	16
Other exports	Mt	155	143	147	166	185	200
Total seaborne thermal supply	**Mt**	**650**	**658**	**680**	**741**	**793**	**842**
growth	*%*	*6%*	*1%*	*3%*	*9%*	*7%*	*6%*
Japanese imports	Mt	126	131	113	120	122	123
growth	*%*	*6%*	*4%*	*-14%*	*7%*	*2%*	*1%*
Korea & Taiw an imports	Mt	132	139	131	137	140	143
growth	*%*	*8%*	*6%*	*-6%*	*5%*	*2%*	*2%*
European imports	Mt	146	153	143	146	148	149
growth	*%*	*2%*	*5%*	*-7%*	*2%*	*1%*	*1%*
China imports	Mt	45	34	92	117	151	153
growth	*%*	*33%*	*-24%*	*171%*	*27%*	*29%*	*2%*
India imports	Mt	35	35	60	77	90	99
growth	*%*	*44%*	*1%*	*70%*	*27%*	*17%*	*11%*
Other imports	Mt	166	166	142	146	160	177
Total seaborne thermal imports	**Mt**	**650**	**658**	**680**	**743**	**810**	**845**
growth	*%*	*6%*	*1%*	*3%*	*9%*	*9%*	*4%*
Notional market balance	**Mt**	**0**	**0**	**0**	**-2**	**-17**	**-3**
Contract thermal coal (JFY)	**USD/t**	**55**	**125**	**71**	**98**	**110**	**120**
API 4 (Richard's Bay)	**USD/t**	**64**	**121**	**65**	**95**	**110**	**120**

Source: Deutsche Bank, AME, Company data

Figure 129: DB Commodity forecasts

		Current spot	1H2010	2H2010E	FY 2010E	FY 2011E	FY 2012E	FY 2013E	FY 2014E	L-T
Base metals										
Aluminium	¢/lb	108	97	97	97	120	130	100	100	105
Copper	¢/lb	380	324	342	333	375	400	275	250	200
Zinc	¢/lb	108	98	93	96	115	130	100	75	70
Nickel	¢/lb	1,100	965	1,000	983	1,150	1,200	800	700	650
Precious Metals										
Gold	$/oz	1,376	1,153	1,269	1,211	1,450	1,600	1,200	1,000	850
Palladium	$/oz	598	468	515	492	580	650	400	570	530
Platinum	$/oz	1,708	1,597	1,605	1,601	1,750	1,850	1,400	1,530	1,530
Silver	$/oz	24.49	18	21	19	24	28	20	15	14
Bulk commodities										
Alumina spot	$/t	343	318	338	328	413	350	350	250	270
Iron ore fines	(USc/Fe%) JFY	208	145	220	182	182	204	156	112	71
Iron ore lump	(USc/Fe%) JFY		171	236	204	200	221	175	132	93
Iron ore pellet	(USc/Fe%) JFY		219	277	277	230	258	197	141	105
Iron ore fines	Contract change				88%	0%	12%			
Iron ore lump	Contract change				82%	-2%	11%			
Iron ore pellet	Contract change				134%	-17%	12%			
Iron ore fines	US$/t @ 62%	129	90	136	113	113	127	97	69	44
Iron ore lump	US$/t @ 62%		106	146	126	124	137	108	79	56
Iron ore pellet	US$/t @ 62%		136	171	171	142	160	122	84	63
Coking coal	$/t	215	165	215	201	231	250	200	150	120
Energy										
Brent oil	$/bbl	84.5	79.2	73.5	76.3	80.0	85.0	90.0	95.0	100.0
Uranium oxide	US$/lb	48.0	59.0	62.5	60.8	65.0	60.0	60.0	55.0	50.0
Thermal coal	$/t	95.5	84.5	98.0	98	110	120	100	90	80.0
Exchange rates										
$/AUD	x	0.99	0.89	0.90	0.90	0.91	0.87	0.83	0.78	0.75
ZAR/$	x	6.80	7.53	7.47	7.50	7.68	8.66	9.81	10.29	11.41
$/Euro	x	1.41	1.33	1.29	1.31	1.31	1.18	1.16	1.18	1.18

Source: Deutsche Bank, Datastream, company data, Bloomberg Finance LP

Appendix 1

Important Disclosures

Additional information available upon request

For disclosures pertaining to recommendations or estimates made on a security mentioned in this report, please see the most recently published company report or visit our global disclosure look-up page on our website at http://gm.db.com/ger/disclosure/DisclosureDirectory.egsr**.**

Analyst Certification

The views expressed in this report accurately reflect the personal views of the undersigned lead analyst about the subject issuers and the securities of those issuers. In addition, the undersigned lead analyst has not and will not receive any compensation for providing a specific recommendation or view in this report. Jorge Beristain

Equity rating key

Buy: Based on a current 12- month view of total share-holder return (TSR = percentage change in share price from current price to projected target price plus projected dividend yield) , we recommend that investors buy the stock.

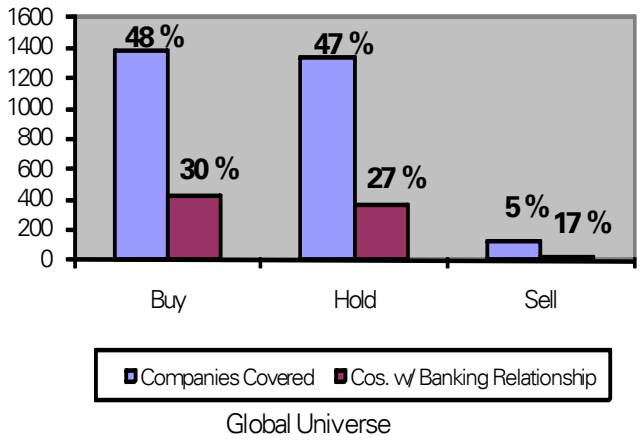
Sell: Based on a current 12-month view of total share-holder return, we recommend that investors sell the stock

Hold: We take a neutral view on the stock 12-months out and, based on this time horizon, do not recommend either a Buy or Sell.

Notes:

1. Newly issued research recommendations and target prices always supersede previously published research.
2. Ratings definitions prior to 27 January, 2007 were:
   Buy: Expected total return (including dividends) of 10% or more over a 12-month period
   Hold: Expected total return (including dividends) between -10% and 10% over a 12-month period
   Sell: Expected total return (including dividends) of -10% or worse over a 12-month period

Equity rating dispersion and banking relationships



Regulatory Disclosures

1. Important Additional Conflict Disclosures

Aside from within this report, important conflict disclosures can also be found at https://gm.db.com/equities under the "Disclosures Lookup" and "Legal" tabs. Investors are strongly encouraged to review this information before investing.

2. Short-Term Trade Ideas

Deutsche Bank equity research analysts sometimes have shorter-term trade ideas (known as SOLAR ideas) that are consistent or inconsistent with Deutsche Bank's existing longer term ratings. These trade ideas can be found at the SOLAR link at http://gm.db.com.

3. Country-Specific Disclosures

Australia: This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act.
Brazil: The views expressed above accurately reflect personal views of the authors about the subject company(ies) and its(their) securities, including in relation to Deutsche Bank. The compensation of the equity research analyst(s) is indirectly affected by revenues deriving from the business and financial transactions of Deutsche Bank.
EU countries: Disclosures relating to our obligations under MiFiD can be found at http://globalmarkets.db.com/riskdisclosures.
Japan: Disclosures under the Financial Instruments and Exchange Law: Company name - Deutsche Securities Inc. Registration number - Registered as a financial instruments dealer by the Head of the Kanto Local Finance Bureau (Kinsho) No. 117. Member of associations: JSDA, The Financial Futures Association of Japan. Commissions and risks involved in stock transactions - for stock transactions, we charge stock commissions and consumption tax by multiplying the transaction amount by the commission rate agreed with each customer. Stock transactions can lead to losses as a result of share price fluctuations and other factors. Transactions in foreign stocks can lead to additional losses stemming from foreign exchange fluctuations. "Moody's", "Standard & Poor's", and "Fitch" mentioned in this report are not registered as rating agency in Japan unless specifically indicated as Japan entities of such rating agencies.
New Zealand: This research is not intended for, and should not be given to, "members of the public" within the meaning of the New Zealand Securities Market Act 1988.
Russia: This information, interpretation and opinions submitted herein are not in the context of, and do not constitute, any appraisal or evaluation activity requiring a license in the Russian Federation.

Special Disclosures

Opinions and recommendations inherent in "Macro Strategy" research (i.e., Economics, Quantitative, Portfolio Strategy, Corporate Activity, Momentum/Money Flows) may conflict with those of our fundamental industry/company analysts. For more information about valuation methods used by our strategists and industry analysts, please visit our website or call your institutional sales representative.

The data presented in our performance data excludes transaction costs.

Past performance may not be a reliable guide to future performance.

The CROCI group provides additional analytics to trading and product structuring groups in Deutsche Bank.

Forward estimates of data used within the CROCI® process are based on consensus numbers, being adjusted as necessary by the CROCI team

International locations

Deutsche Bank Securities Inc.
60 Wall Street
New York, NY 10005
United States of America
Tel: (1) 212 250 2500

Deutsche Bank AG London
1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank AG
Große Gallusstraße 10-14
60272 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG
Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG
Level 55
Cheung Kong Center
2 Queen's Road Central
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.
2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6770

Deutsche Bank Global Research

Global Metals & Mining Sector Report
October 2010

Global Disclaimer