

The outlook for the global coking coal markets

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James Ley - Consultant

Hatch Beddows

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- Hatch, Hatch Consulting and Hatch Beddows
- Overview of the global coking coal markets
- Overview of the supply of hard coking coal
- Overview of the PCI market
- Outlook for the global demand for coking coal
- Where will this additional supply come from?
- What will be Russia's future role in the global coking coal markets?
- Conclusions

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- Established 1955 and employee owned
- 8,500 highly skilled people serving clients worldwide
- US\$20BN of projects now under management in 80 countries

Our values

- Safety
- Quality
- Innovation
- Sustainable development
- Effective risk management

We deliver unprecedented and sustained results for our clients

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Hatch Consulting is the leading management consultancy dedicated to the mining and metals industries

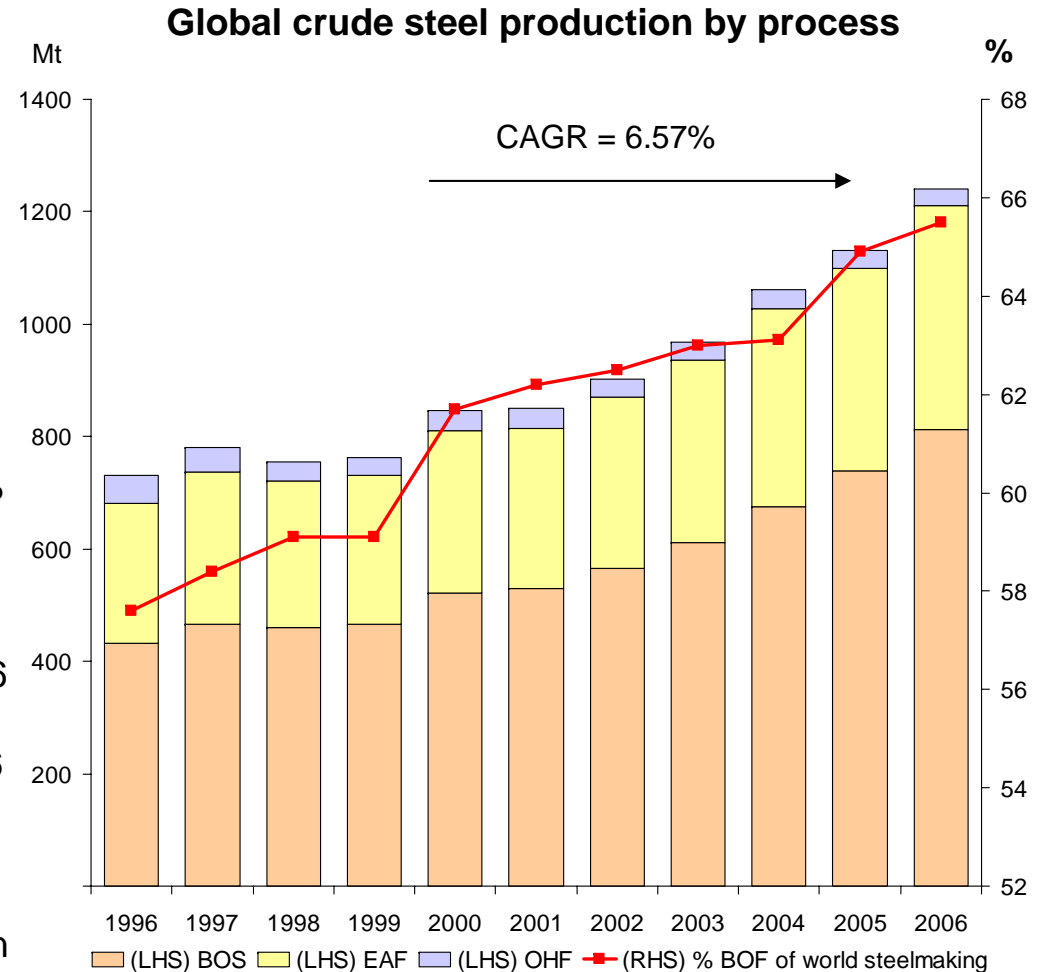
- **Hatch Consulting** is the world's leading management consultancy specialising in the mining and metals industries and provides high level support services, ranging from corporate and business strategy development through strategic market studies to implementation of new technologies, management and operating practices
- Hatch Consulting is organised into specialised practices by industry and service, combining to provide precise solutions, expertly delivered to the exact needs of each individual client
- **Hatch Beddows** is the strategy and market development practice, specialising in steel and raw materials, and providing strategy development and implementation services
- **Investment and Business Planning (IBP)** provides economic, environmental and technical evaluations of minerals properties and processing facilities, due diligence, pre-feasibility and feasibility studies and related investment planning and appraisal services
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Asia is driving demand for steelmaking raw materials

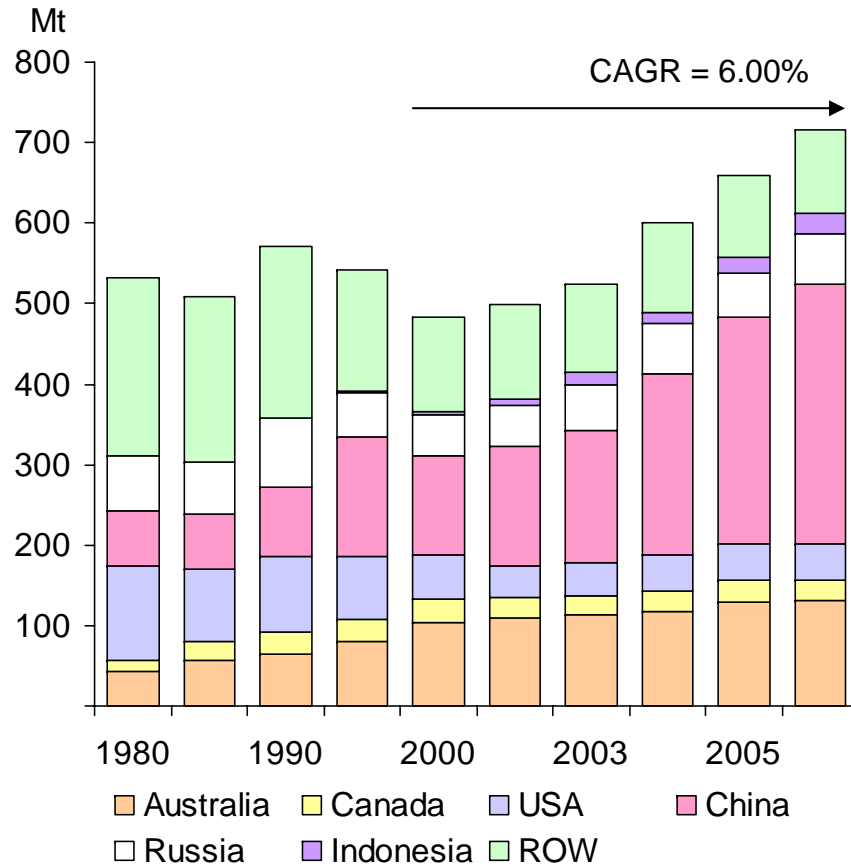
- BOF share of steelmaking is increasing (65.5% in 2006, compared to 57.6% in 1996)
- A lack of scrap + higher steel demand is driving key Asian steelmakers to rely more on the BOF steelmaking
- Asia in 1996 BOF steelmaking = 56.1%, by 2006 = 76.5%:
 - China – 1996 = 51.6%, by 2006 = 87.0%
 - Japan – 1996 = 66.7%, by 2006 = 74.0%
- North America & Western Europe have seen an increase in EAF as a % of steel production
 - North America – 1996 = 44.9%. By 2006 = 57.3%
 - EU (25) – 1996 = 32.6% - 1996. By 2006 = 40.5%
- However, Asia produces over 60% of the world's crude steel. Consequently, demand on steelmaking raw materials has risen



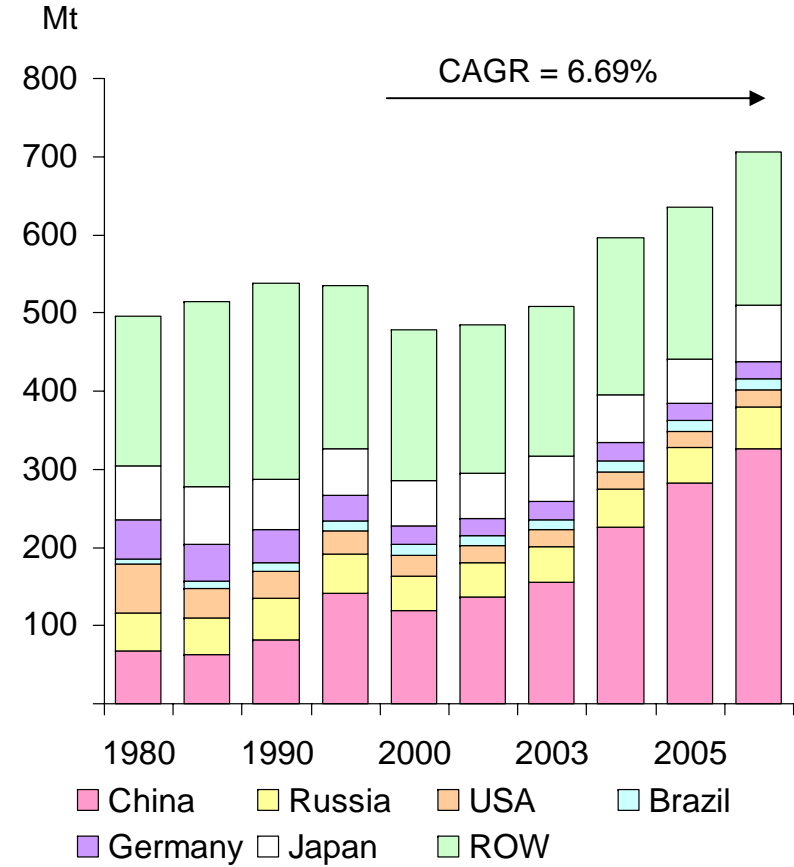
OVERVIEW OF THE GLOBAL COKING COAL MARKETS

Coking coal production growth has lagged consumption. Key production regions from the 1980's such as USA and Germany have seen declining production rates. BRIC countries and Japan dominate consumption

Global Coking Coal Production 1980-2006



Global coking coal consumption 1980-2006

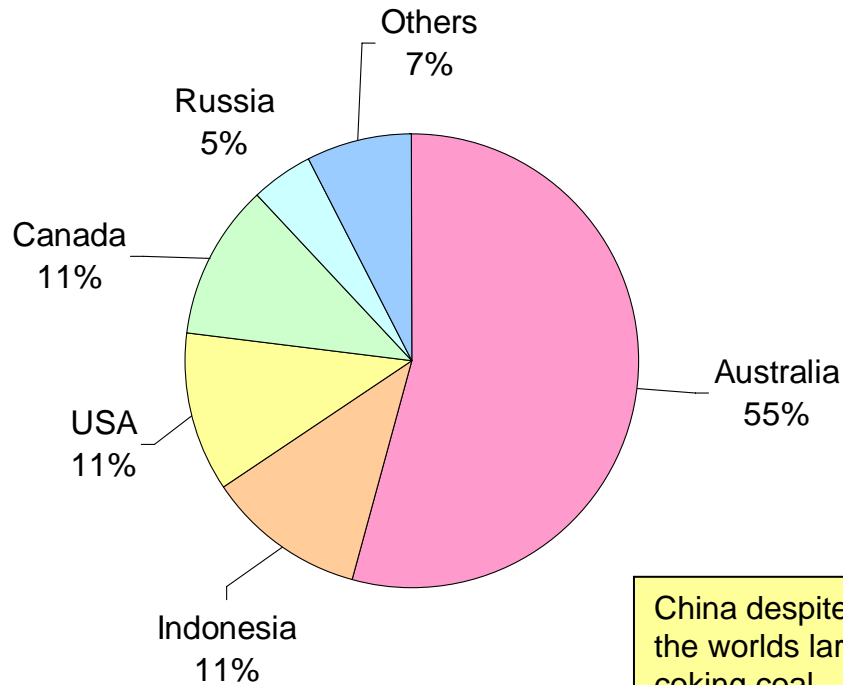


Source: IEA, HatchBeddows

OVERVIEW OF THE GLOBAL COKING COAL MARKETS

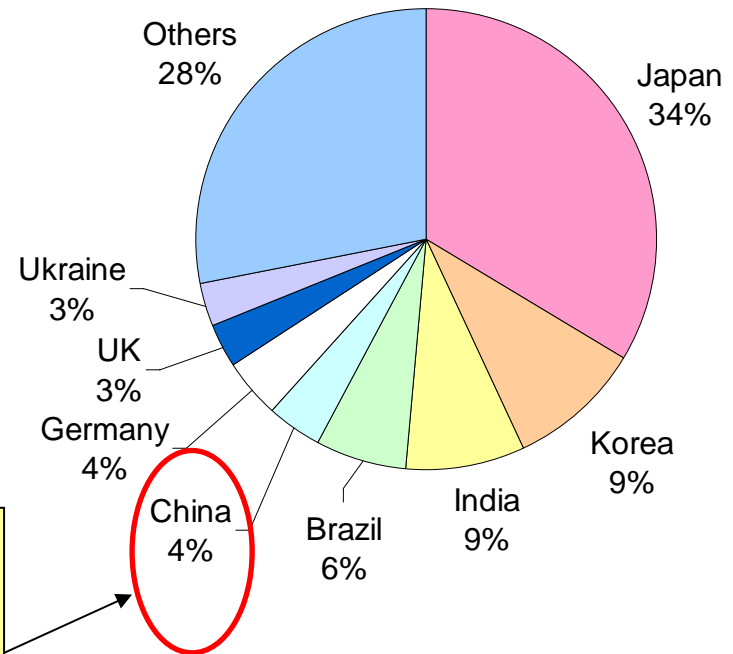
With Australia producing 18% of the global coking coal tonnage in 2006 it's the biggest exporter in the world. Japan is completely reliant on imports

Coking coal exports (all grades) by country in 2006



Total coking coal exports = 222M tonnes

Coking coal imports (all grades) by country in 2006



Total coking coal imports = 216.6M tonnes

China despite being the worlds largest coking coal producer, still needs to import high coking coal grades for its steelmaking

Source: IEA, HatchBeddows

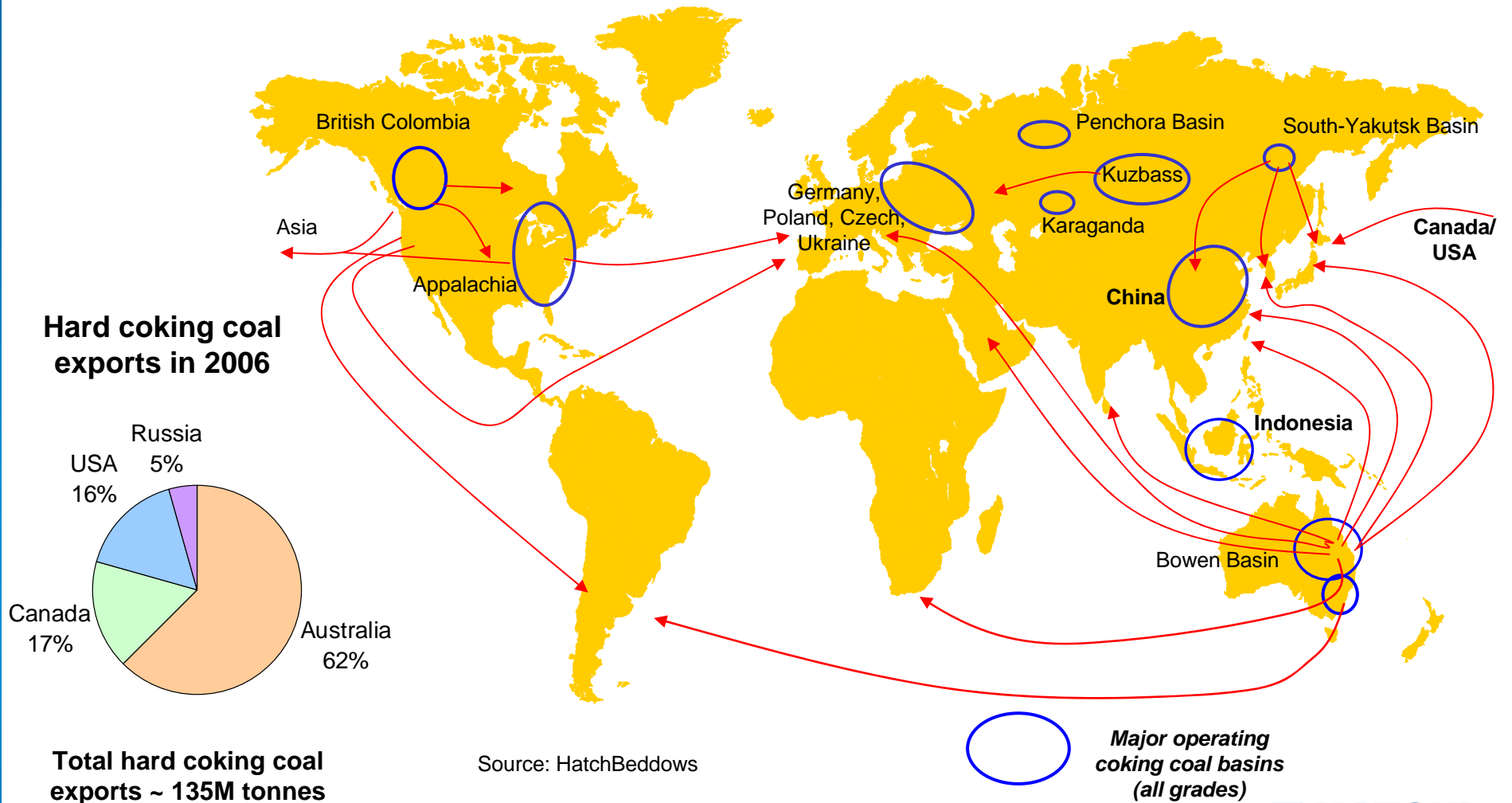
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OVERVIEW OF THE SUPPLY OF HARD COKING COAL

Hard coking coal accounts for ~ 60% of all coking coal exports. Australia dominates the seaborne supply of this material

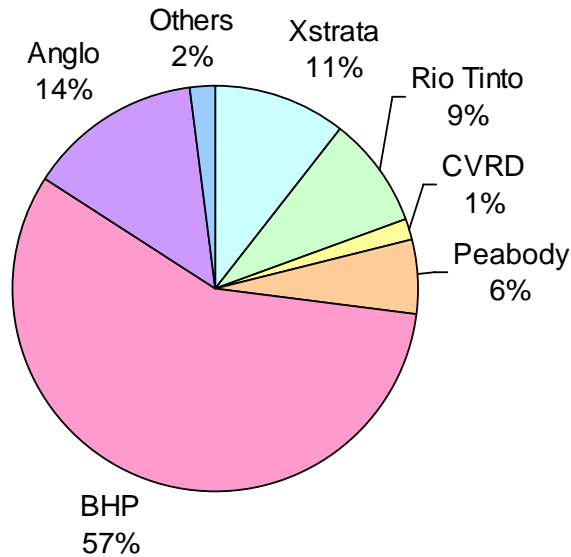
Location of major active coking coal mines in 2006 and key hard coking coal trade routes



OVERVIEW OF THE SUPPLY OF HARD COKING COAL

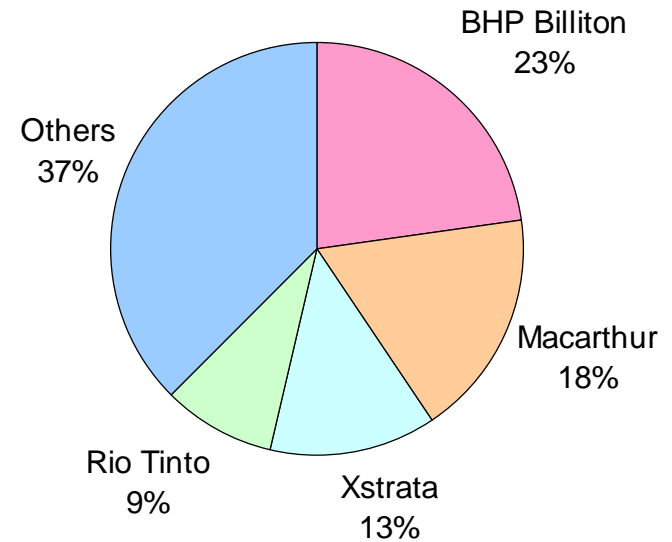
Over two thirds of Australia's coking coal exports are hard coking coal grades, and BHPB is the No.1 hard coking coal exporter, ahead of Canada's Elk Valley

Australian Hard Coking Coal exports in 2006



Total exports ~ 82M tonnes

Australia semi-soft and PCI coking coal exports in 2006



Total exports ~ 38.5M tonnes

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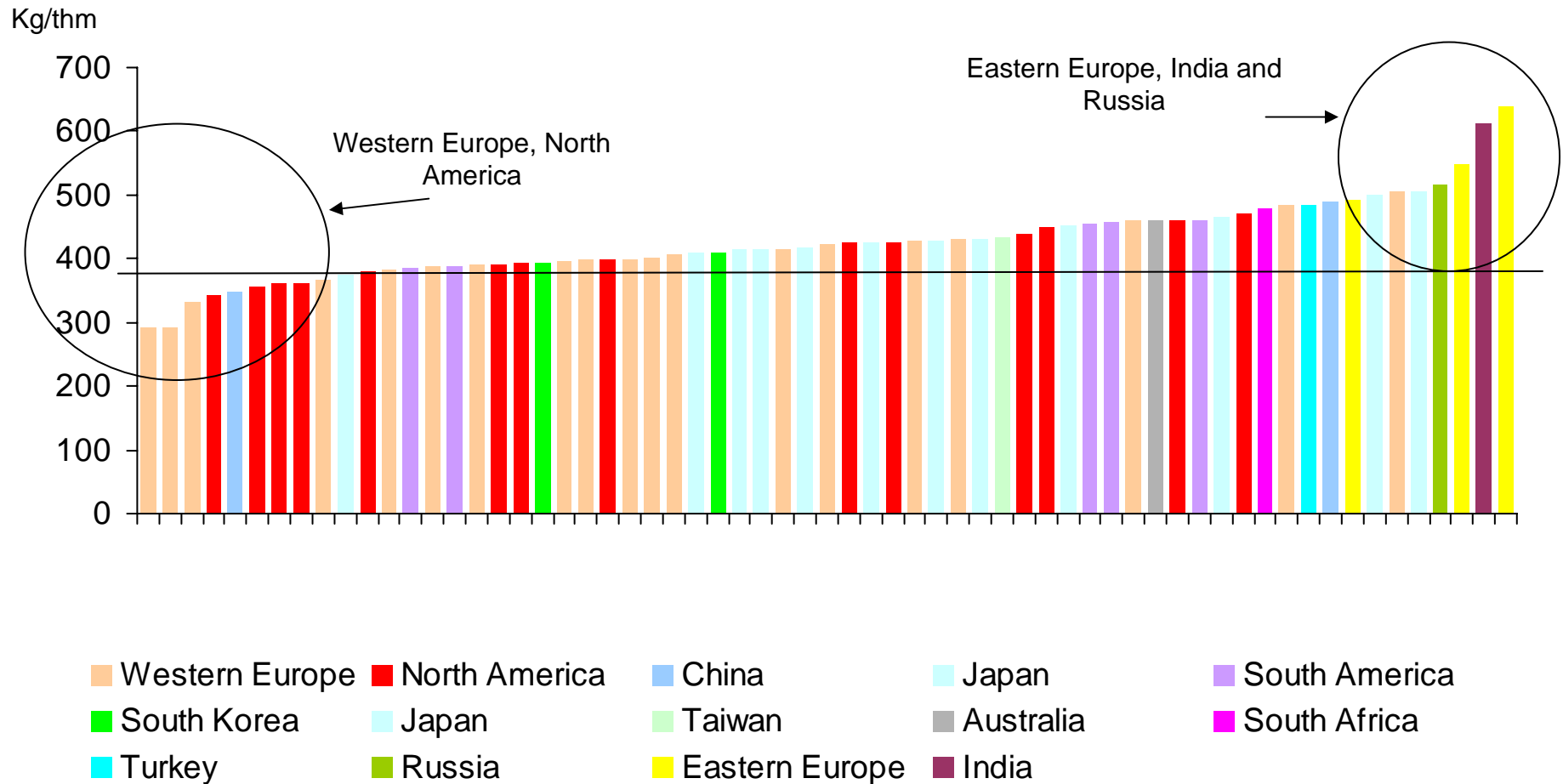
Mills in Western Europe have achieved coke rates under 300Kg/thm (hot metal), by increasing PCI rates above 200Kg/thm

- Hard coking coal grades remain at strong price levels due to high demand and bottleneck problems in Australia, they are likely to rise in 2008
- Current price differentials between hard coking coal and semi-soft coking coal grades are ~ \$55-60/tonne, and between hard coking coal and PCI low volatile coal ~ \$50/tonne
- Due to the price differential steelmakers are increasingly look at methods of reducing hard coking coal consumption
- One is to increase the PCI rate into the blast furnace
- Typical coke inputs into a blast furnace are ~ 400-510Kg/thm
- One Western European blast furnace has achieved a PCI rate in excess of 200Kg/thm. This has reduced it's coke rate to ~ 280-290Kg/thm
- This results in a metallurgical coal saving of ~ 286Kg/thm
- However, the blast furnace must use prime grades of hard coking coal for it's coke input to give coke with sufficient strength to cope with the high PCI rates. No blending with semi-soft grades (and hence cheaper) can occur

OVERVIEW OF THE PCI MARKET

It tends to be blast furnaces in the BRIC regions that have higher coke rates, although some Chinese blast furnaces have low coke rates

Coke rate of known blast furnaces around the world



Source: HatchBeddows

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FORECAST OUTLOOK FOR THE GLOBAL DEMAND FOR COKING COAL

The inherent potential for long-term growth in steel demand is substantial...maybe ~ 500Mt in the next ten years or so

Long term perspective on potential steel demand, Mt ¹

	2005	LT CAGR ²	~ 2015	
North America	140	1.5%	162	
South America	32	4.0%	48	
Europe	170	1.5%	197	
CIS	44	4.0%	64	
China	327	6.0%	586	259
India	38	8.5%	86	48
Japan	78	0.5%	82	
Other Asia ³	144	4.0%	211	67
M East	34	5.5%	58	
Africa	22	3.0%	32	
Total	1,029		1,525	496

Data: Hatch Beddows, Strategic examination of the future of steel and steelmaking raw materials, IISI

Note: 1. Finished steel consumption, 2. Long-term compound annual growth rate, 3. Includes Oceania

FORECAST OUTLOOK FOR THE GLOBAL DEMAND FOR COKING COAL

Current forecasts suggest ~ 200Mt of extra coking coal will be needed by the steel and merchant pig iron industry by 2015

Forecasts for world coke and coking coal requirements

	2005	~2015	Assumptions
Finished steel demand	1,029	1,525	12% yield loss from crude to finished steel
Crude steel production	1,130	1,710	
Pig Iron Production 1	786	1,170	65% of crude steel output by the BF/BOF route
Sized coke consumption	334	468	~ coke rate of 400kg/thm (2005 average ~ 425kg/thm)
Required coke production	371	520	~10% fines produced in coke making
Required met. coal production	493	692	~1.3 tonnes met coal for 1 tonne of coke

Data: Hatch Beddows, IISI. Note:1. Includes Merchant Pig Iron

Sensitivity Analysis

Change	Coke consumption	Coke production	Met coal production
± 1% in BOF share of steel production	± 8Mt	± 9Mt	± 11Mt
± 10Kg in coke rate	± 12Mt	± 13Mt	± 17Mt

Highly unlikely, but if all blast furnaces by 2015 achieved a 290Kg/thm coke rate – additional required Met coal = 8Mt

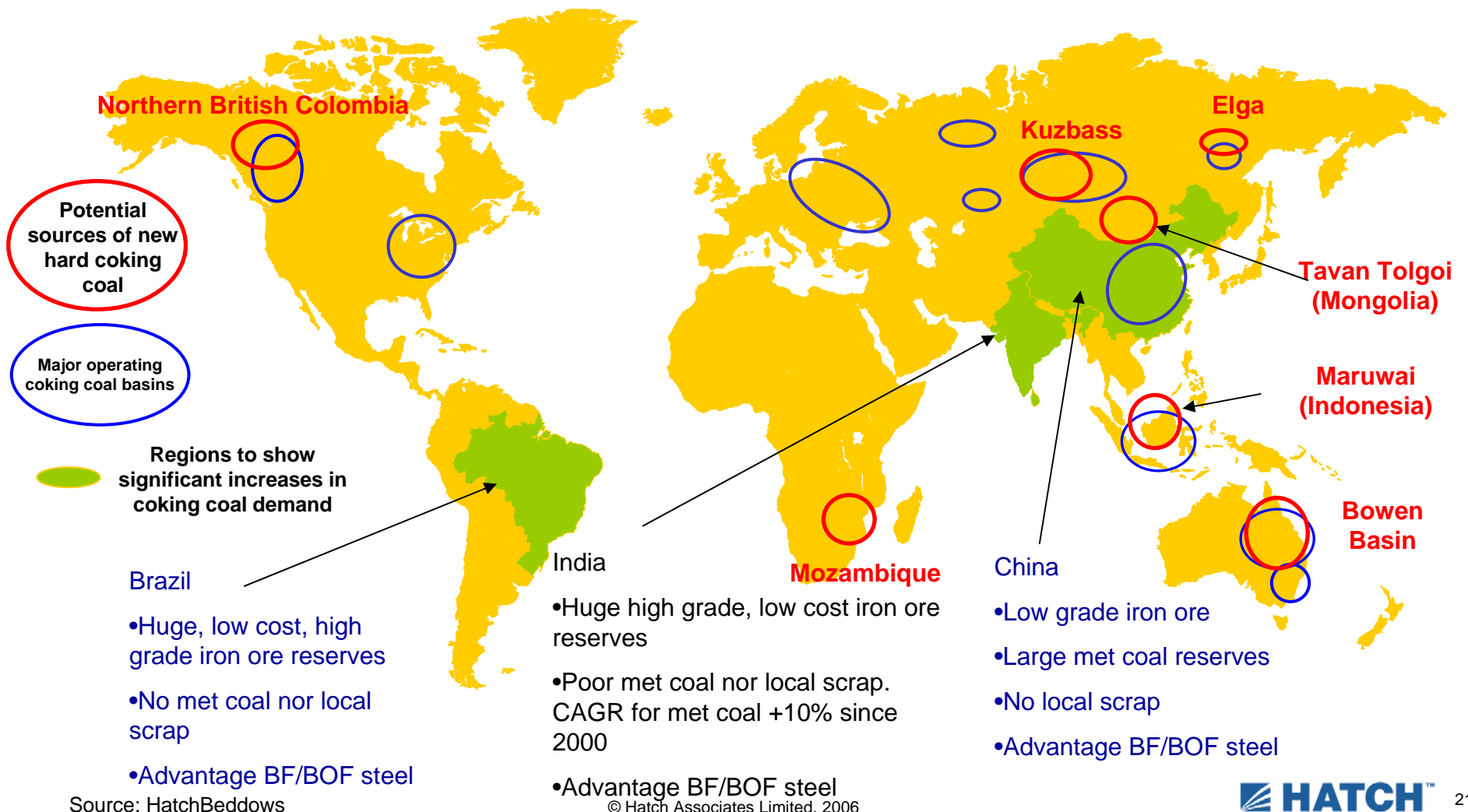
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WHERE WILL THIS ADDITIONAL SUPPLY COME FROM?

The hard coking coal market is likely to remain dependent on Australia in the immediate future to meet the bulk of additional requirements...

Map showing location of undeveloped hard deposits and greatest growth regions for coking coal



WHERE WILL THIS ADDITIONAL SUPPLY COME FROM?

...but Canada should be able to lift output, and Indonesia, Mongolia and Mozambique also offer longer-term opportunities

- **Tavan Tolgoi (Mongolia)**
 - World's largest undeveloped coking coal deposit
 - 1.8bn tonnes of high-value metallurgical coal
 - Needs an investment of \$1.5bn to develop (roads, railways etc.)
 - China's InvestmentTrust & Investment Corporation, CVRD, Itochu Corp, Mitsubishi Corp and BHP all thought to be interested in developing the site
- **Northern British Columbia**
 - Western Canadian Coal and Anglo are set to expand coking coal operations in Northern British Columbia
 - Both should add 3-5M tpy of coking coal into the market in the next few years.
 - 40M tonne infrastructure already in place in Northern British Columbia
- **Australia & Indonesia:**
 - Australia could add at least 40Mtpy of coking coal into the market by 2010
 - Port constraints at Dailrymple (DBCT) and Hay have caused delivery problems;
 - DBCT expand cap from 60Mtpy to 85Mtpy in next couple of years
 - Hay's to expand from 40 to 55Mtpy in next couple of years
 - BHPB has some 11bn tonnes of resources and reserves of coking coal
 - BMA will add 13Mtpy to the Bowen Basin
 - Beyond 2010, CVRD's Belvedere will add 12Mtpy hard coking coal into the market on its own
 - BHPB is also developing Maruwai in Indonesia. Hard coking coal expected in 2010 – 5Mtpy
- **Mozambique**
 - CVRD are developing this mine. First hard coking coal expected by 2010 ~2-3Mtpy per year

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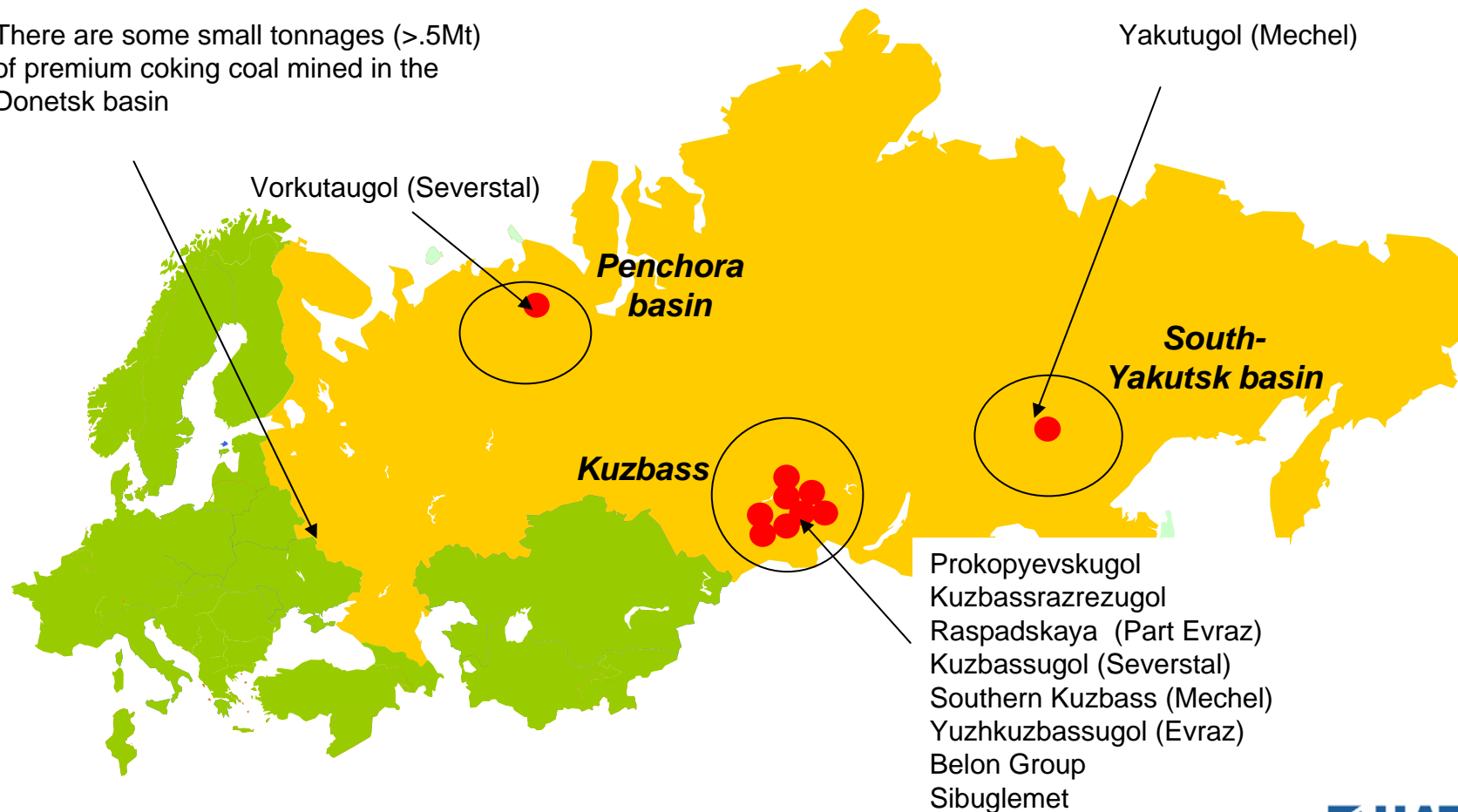
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WHAT WILL BE RUSSIA'S FUTURE ROLE IN THE GLOBAL COKING COAL MARKETS?

Russian coking coal extraction occurs primarily in three regions - the Kuzbass region accounted for 85% of all Russian coking coal production in 2006

Location of major Russian coking coal mines

There are some small tonnages (>.5Mt) of premium coking coal mined in the Donetsk basin



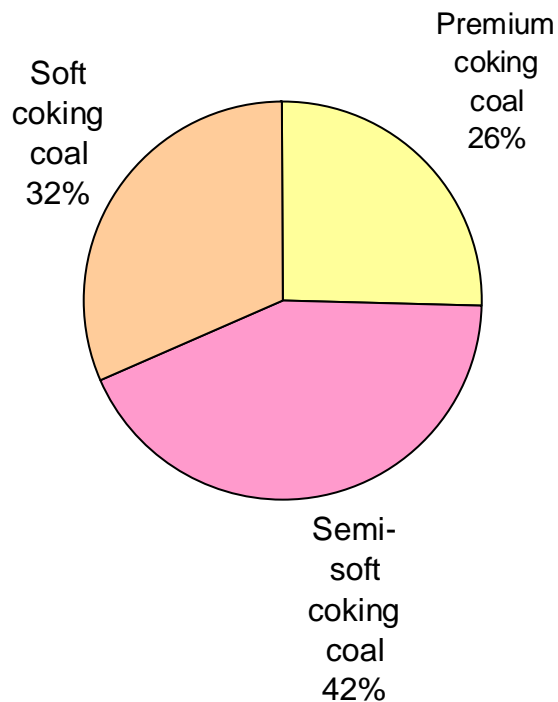
Source: Hatch Beddows

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WHAT WILL BE RUSSIA'S FUTURE BE IN THE GLOBAL COKING COAL MARKETS?

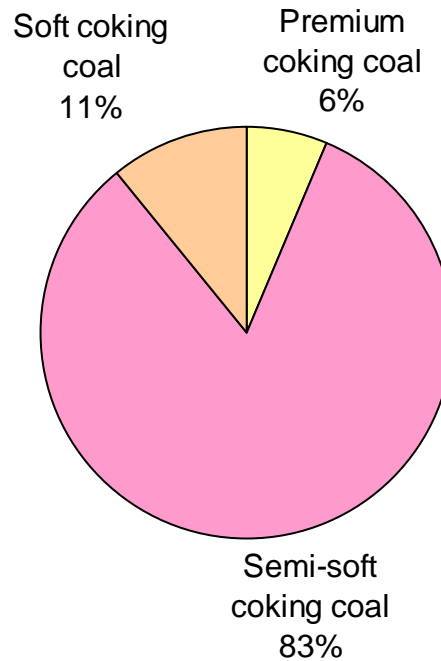
The Kuzbass regions' main type of coking coal being mined are semi-soft grades – South Yakutsk in the Far East is currently exclusively mining hard coking coal grades

Coking coal by grade from the Kuzbass region in 2006



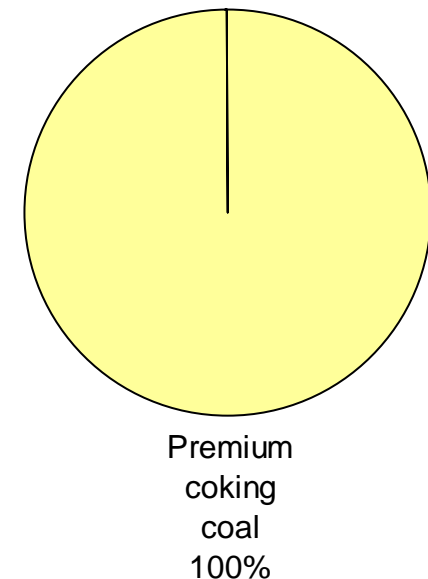
Total production = 55.7 Mt

Coking coal by grade from the Penchora basin in 2006



Total production = 8.5 Mt

Coking coal by grade in the South Yakutsk basin in 2006



Total production = 5.4 Mt

Note: The Donetsk basin mined 448Kt of premium hard coking coal grades in 2006

WHAT WILL BE RUSSIA'S FUTURE BE IN THE GLOBAL COKING COAL MARKETS?

Based on announced expansion plans, 30 Mt of all coking coal grades, could be added to the Russian market in the next 5 years. This does not include Elga

- Current forecasts place Russian coking coal production rising up to 100 Mt by as early as 2010
- Assuming no significant declines in current coking coal production at existing mines, with announced capacity expansions, even if the Elga coal mine does not come into operation, it is still feasible for an additional 30Mt of coking coal to be produced in Russia out to 2010
- *Raspadskaya* plan to add 7Mt to current production
- *Severstal* could also add 7Mt to current production (Zhernovsky and Konyukntusky Zapadny)
- *NLMK* could add 6Mt(Zhernnovskoe)
- *Sibuglemet* – 5Mt (Mine Siberia and South Company)
- *Belon Group* could add 5Mt into the market
- Russian steel production through the BOF route is not expected to rise by more than 6M tpy out to 2010
- This could suggest around 25M tonnes of coking coal could be made available for export. However, with the bulk of this additional coking coal coming from the Kuzbass, it is uncertain how much of this additional mined coal would be hard grades

The Elga coal mine, as with neighbouring Yakutugol, could add substantially to Russia's exports of hard coking coals

- Russia exported ~ 10M tonnes of coking coal in 2006. Around half of this was hard coking coal grades. Yakutugol is Russia's biggest hard coking coal exporter (~2.3M tonnes)
- Mechel controlled Elga coal, is also in the premium rich hard coking coal basin of South Yakutsk. This planned mine has coking coal reserves of 558 Mt (also 1,615 Mt of steam coal reserves)
- Mechel purchased its share in Elgaugol along with a 100% share in Yakutugol for some \$2.3bn. A further \$2bn will be needed to develop the Elga coal mine. This \$2bn, in part, is required to finish the branch railway line of some 320km and the construction of a 200 MW power station at the facility
- Mechel is expected to need partners to help develop this mine. NLMK has been suggested as a front runner, MMK is also another possible partner
- Elga coal mine has run into several delays in the past due, in part, to the cost of development:
 - Initially targeted to commercially produce coal in 2007. This is now impossible.
 - The speed of production is likely to depend on Mechel's success at attracting investment for the facility considering their current \$2.3bn purchase for these assets and Yakutugol
- Mechel already is expected to source a \$1bn loan to fund it's recent complete purchase of Yakutugol and its now controlling share in Elga. Japan's Sumitomo bank is a possible group that could arrange the loan.
- The mine will have a waiting list of buyers from Japan and South Korean steel industry, keen to reduce their complete reliance on Australian and Canadian imports

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CONCLUSION

Australia will be relied on to provide increased supplies of hard coking coal to the industry. If coking coal contract prices pick up for 2008, the development of mines in Mongolia, Mozambique and Elga will become far more attractive

- With current forecasts the steel and merchant pig iron industry could require ~ 200Mt by 2015
- Australia has a critical role to play in providing increased coking coal requirements for the steel industry
- To a lesser extent Canada as well as new developments in Indonesia and Mozambique could help
- China, the worlds largest coking coal producer, is now an importer of high grade coking coal for its coastal steel mills. India and Brazil are both likely to see significant growth in coking coal imports
- There is a concern that US exports will continue to fall. 50% of the country's operations come from mines with high cash costs (\$80-100/tonne) and this has helped it to become a "swing" supplier – having the ability to add several Mt into the global market when the prices are high
- Russia is well positioned to supply to major growth markets such as China and India:
 - Around 25M tonnes of extra coking coal could be added to the export market in the next 5-10 years, even if Elga is not developed (although the breakdown of this coking coal between hard, semi-soft, PCI etc. can not be determined)
- If coking coal prices pick up again in 2008, the development of mines such as Elga and Mongolia's Tavan Tolgoi, which both require \$1-2bn investments is likely to become an attractive option. Supply of coking coal from these mines will help to ease pressure on Australia

Thank you for your attention



For further information please contact:

James Ley

Consultant

Hatch Beddows

9th Floor, Portland House, Bressenden Place

London. SW1E 5BH

UK

Tel: +44 20 7906 5127

Fax: +44 20 7963 0972

jley@hatch-europe.com