

Iron ore and DRI – An old and new conference topic

In this article Dr Joe Poveromo reports on two recent iron ore related conferences organised by Metal Bulletin: The 1st World DRI & Pellet Congress held in Abu Dhabi, and the 19th International Iron Ore Symposium held in Munich.

It was the inaugural meeting of Metal Bulletin's 1st World DRI & Pellet Congress, held in Abu Dhabi, April 29-30, 2013. Previously, this topic had been covered marginally at both the large MB Middle East Steel Conference usually held in December in Dubai and the MB Iron Ore Symposium usually held in Europe in May or June. The Conference Organiser collected input from key players in this area and put together an outstanding programme. Attendance of over 250 well exceeded the expectations of the organisers and included all major DR pellet suppliers and Middle East DR plant operators as well as key technology providers in pelletizing and DRI production along with traders, shippers and consultants.

Supply & demand of DR pellets

A presentation by LKAB – the Swedish state-owned company that accounts for 90% of the EU's iron ore production and is a major supplier of DR grade ore pellets to the MENA (Middle East North Africa) region, said their deliveries in 2012 totalled 26.3Mt of which pellets – both blast furnace and DR grade – were 22.0Mt. They supply about 40% of the EU's annual blast furnace pellet consumption. On the likely impact of shale gas developments on DRI production – as evidenced by the return of proposed and actual DRI projects in USA since the development of shale gas plays there – the presenter listed estimated shale gas reserves as of 2012, although as some further investigations have shown in Poland, not all are technically

winnable or politically acceptable (Table 1).

The first of two presentations by Anglo American, Brazil focused on the DRI market. They projected an average 6.2% CAGR in the DRI market globally noting that DRI production growth is steady but restricted to traditional producer regions (Table 2).

Growth is supported by lower natural gas prices (less linked to oil) and the intrinsic advantages of direct reduction mainly lower CO₂ emissions, smaller plant area required and no coke or sinter plant needed, as well as market factors. Growth for steel in MENA is driven mainly by the construction sector while in India – the world's largest producer of DRI – growth is driven by overall economic development. Decreasing DR lump ore availability and technology will increase to play key roles. In the USA the development of shale gas based projects can massively accelerate growth. Projections showed that pellet supply will grow at 7.7% CAGR noting that key suppliers can readily switch between blast furnace (BF) and DR grades of pellet.

Country	Reserve	Country	Reserve
China	36.1	Canada	11.0
USA	24.4	Libya	8.2
Argentina	21.9	Algeria	6.5
Mexico	19.3	Brazil	6.4
South Africa	13.7	Poland	5.3
Australia	11.6		

Table 1 Global shale gas reserves (trillion cubic meters)

Region	CAGR 2013-2017	CAGR 2013-2020
Middle East	5.5	6.1
India	6.7	7.6
North America	29.3	14.6

Table 2 Forecast growth of DRI production by region

A presentation by GIIC (Gulf Industrial Investment Co), Bahrain, outlined the company which operates two pellet plants with a total capacity of 11Mt/y that mainly feed the Gulf region and also a steel plant based on Midrex DRI technology. All ore is imported and the Minas Rio project in Brazil operated by Anglo American will be the leading future source of pellet feed.

Session two dealt with DR pellets and DRI in the context of the wider steel and iron ore markets.

Gavin Montgomery of Wood Mackenzie provided an excellent overview of the iron ore market and the trends which are driving increased pellet demand including:

- Productivity (furnace performance, ease of handling),
- Mine depletion (need to upgrade lower grade ores),
- DRI demand (lack of scrap in key growth regions such as MENA)
- Environmental (threats to sinter plant operations).

Existing pellet plant capacity, led by China at over 200Mt/y, is focused on BF grades, but growth will come from the DR sector, led by growth of the DRI-EAF route in the MENA region as well as growth in India and the shale gas revolution in the USA. The role of DR grade ore in the global iron ore market is shown in Figs 1 & 2. In summary:

- China has large magnetite resources but declining run-of-mine ore grades;
- India underutilises BF and DR pellet capacity;
- Middle East – Iran is second to India in DRI production and also has merchant DR pellet using imported pellet feed from Oman and Bahrain;
- South America – Brazil is a major exporter to Europe and Asia, also to Chile and Peru;

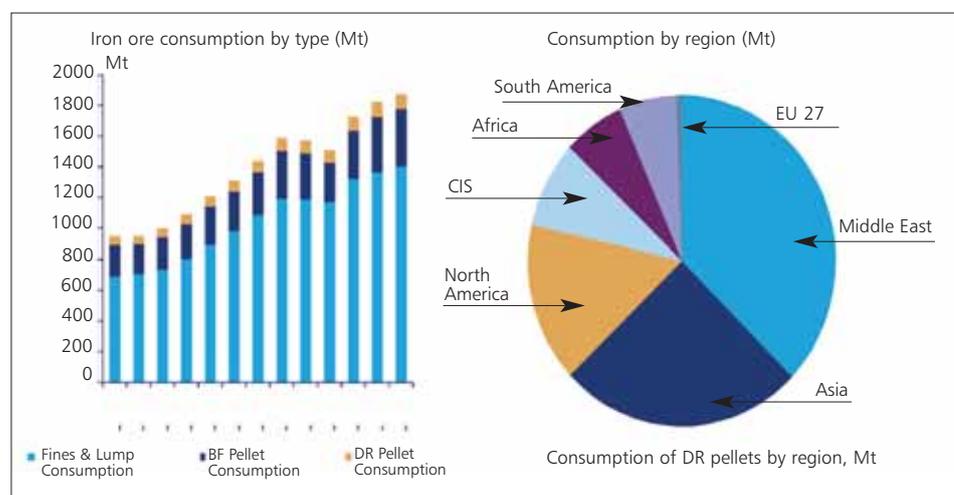


Fig 1 The DR pellet market in the context of the global iron ore market

Source: Wood Mackenzie Iron Ore Market Service

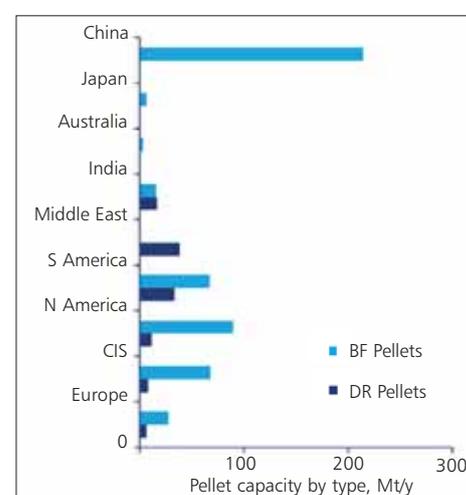


Fig 2 Existing pellet capacity focused on the blast furnace sector (Mt/y)

Source: Wood Mackenzie Iron Ore Market Service

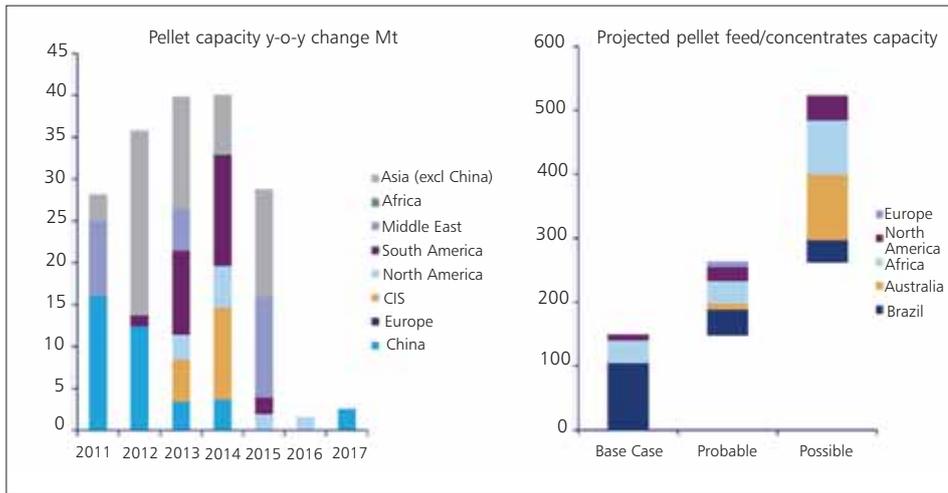


Fig 3 A large number of sea borne pellet feed projects are in the pipeline
 Source: Company Reports, Wood Mackenzie

- North America – USA has taconite ore in the Midwest focused on domestic markets, Canada supplies overseas. Mexico has DRI production capacity.
- CIS has huge magnetite resources and large intra-regional trade. Ukraine exports.
- Europe – Most supply is focused in Sweden which is major exporter of pellet.

Ample pellet feed capacity is coming on line, leading to a problem of potential oversupply so expensive pellet feed projects might not offer good financial returns. The focus of pellet supply and the potential overhang in pellet feed supply is shown in **Fig 3**.

The next Anglo American presentation focused on their Minas Rio project in Brazil. This ambitious project will produce 26.5Mt/y of high quality (68% Fe) pellet feed upon completion next year with ultimate expansion possible to 90Mt/y, backed by vast reserves. The opportunities (high growth and size) and challenges (infrastructure, labour, taxes, and land rights) of building in Brazil were noted. The project scope includes a mine, beneficiation plant and a pipeline leading to a coastal shipping port.

Hadi Hami, a consultant in the UAE, provided an informative overview of world metallics (scrap and ore based: pig iron, HBI, DRI) markets:

- HBI/DRI market in 2012 was 70Mt/y and the world's production capacity was 90Mt/y of installed capacity and 20Mt/y under construction.
- 7Mt/y of international trade in DRI/HBI took place in 2012. The main exporters were Trinidad &Tobago, Venezuela, Russia,

Main products	Million tonnes 2012
Ore	101.0
Concentrate	38.2
Pellets	19.0
HBI	2.5

Table 3 Ore and HBI production by Metalloinvest in Russia

Malaysia, Libya, Qatar Oman & Iran (recently). The major importers were NAFTA, China, South Korea and Turkey.

Turning to the pig iron market in 2012, Mr Hami said there was 10Mt/y of international trade and 60Mt/y of domestic trade including Chinese merchant pig iron. The main exporters of pig iron were:

- China, Russia, Brazil and Ukraine.
- The major importers were:
- USA, Italy, Spain, China, Japan and South Korea.

Considering all metallics trades (DRI, HBI, pig iron) the sub total for global trade is about 90Mt/y.

Addressing the scrap market, the forecast scrap supply is expected to increase by 60Mt between 2010 to 2015 and probably by another 100Mt by 2020.

Major exporters of metallics are USA, Japan, EU, CIS and the main importers are Turkey, China, Korea, EU.

Some countries depend on scrap imports for more than others. In Turkey, Belarus, Egypt, Malaysia, and Thailand 30-35% of steel produc-

tion capacity is from imported metallics.

- Options to cover scrap shortage are:
- Bringing capacity expansion in line with scrap supplies;
 - Switch to alternative iron units;
 - Increase domestic recycling to grow domestic scrap supply;
 - Restrict exports of available steel scrap.

A production forecast for DRI was given by Siddhartha Sengupta of Hatch Beddows Strategy Consulting, that summarised the factors driving DRI production growth as: low gas prices, scrap shortages, growing steel demand, EAF production and environmental benefits. He noted the role of shale gas discoveries and other factors promoting DRI growth globally such as EAF growth and technology trends, predicting global growth of EAF production by 360Mt by 2030.

He presented an interesting scorecard of factors promoting competitiveness of each steel-making route: BF/BOF and DRI/EAF on a global regional basis concluding that China and India come out on top for the BF/BOF route while MENA, CIS, and NAFTA are favoured for DRI/EAF production (**Fig 4**).

He believes that shale gas exploitation globally will lag behind USA largely due to environmental concerns.

He also believes that China's future huge scrap potential will retard DRI production growth there while looming scrap shortage will promote DRI growth in CIS.

Metalloinvest outlined their iron ore, DRI/HBI and steel assets in Russia. Ore is mined at Lebedinsky GOK and Mikhailovsky GOK (**Table 3**).

Their steelmaking arm consists of Oskol Electro-Metallurgical Co, (OEMK) integrated steel works, based on DR technology and has a DRI capacity 2.8Mt/y and a steelmaking capacity 3.3Mt/y. It produces Special Bar Quality (SBQ) long products. Their other works is Ural Steel, an integrated works using BF/BOF technology which has an ironmaking capacity of 2.1Mt/y, and a crude steel capacity of 2.3Mt/y. It produces flat and long products.

Shipping

Phoenix Bulk Carriers, provided details on the dangers, costs and precautions needed when shipping DRI, as opposed to HBI, and noted the reluctance of shippers to transport DRI and even HBI due to fears of spontaneous combustion should the cargo become wet.

Clarksons Dubai, provided a comprehensive overview of the global shipping market by vessel type noting that freight rates are under pressure due to over ordering of new shipping

		North America	South America	Europe	CIS	China	India	Japan & S. Korea	Other Asia	MENA	Rest of world
BF	Captive iron ore	√	√√		√√	√	√√				√
	Captive coking coal				√	√	√				√
	Close proximity to raw materials	√	√√		√	√	√				
	Quality of captive raw materials	√	√√		√√	√	√				√
EAF	Likelihood of avoiding carbon taxes	√	√		√√	√√	√√	√	√√	√	√
	Proximity to scrap pool	√√	√	√√	√	√	√	√√			√
	Low electricity costs	√	√		√					√	
EAF & BF	Low gas costs	√√			√√					√√	
	Both										
Score	Low labour costs				√	√	√√		√√	√	•
	BF integrated	4	7	0	9	7	9	1	4	2	5
	EAF steelmaking	5	2	2	5		3	2	2	4	2

Fig 4 Key factors impacting cost competitiveness in crude steel production, BF & EAF routes, major regions, 2012 Source: Hatch

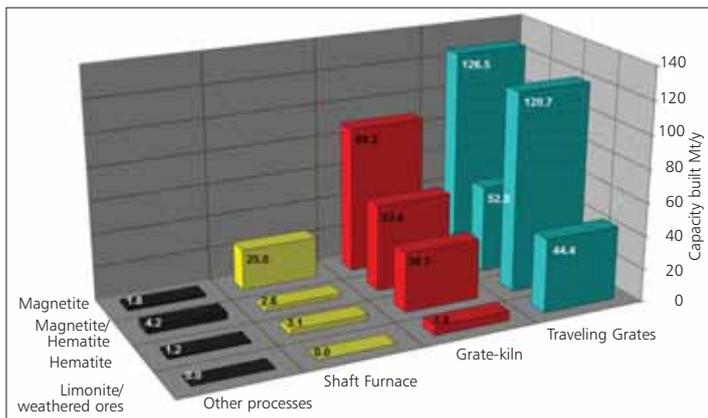


Fig 5 Global Pelletising capacity ever built (Mt/y) (China not fully shown) Source: Outotec



Fig 6 Potential African iron ore projects (Mt/y) Sources: Kumba; Andrewjohns; CRU; African-Minerals; African Iron; Resource Capital Research; ICON; Morgan Stanley; Bryanston

capacity prior to the financial crash, but over-building has now peaked and is headed downward.

DR pellet procurement

In the session on DR pellet procurement, Emirates Steel, UAE described how they blend pellets of different strengths to achieve good overall pellet properties. GIIC, Bahrain is currently sourcing DRI pellet feedstock globally while awaiting the start-up of Minas Rio as their main future pellet feed source.

RMI Global Consulting, USA, outlined DR pellet quality requirements and value-in-use in DRI/EAF applications; noting that MENA operations typically use 3-4 pellet brands at one time; also the MENA market is attractive for pellet producers due to both its reliance upon 100% pellet charge and its high growth rate.

Gohar Zamin Iron Ore Co, located in southern Iran, is currently producing 4Mt/y of concentrate and is aiming for 10Mt/y of concentrate by 2015 and 10Mt/y of DR pellets by 2018. It is using flotation and HPGR to reduce ore sulphur levels; otherwise their quality is very good: 67.1%Fe, SiO₂ + Al₂O₃ of 2.3%.

Pelletizing technology

Outotec, with works in Finland and Germany, is a global leader in pellet plant installations. Their straight grate technology dominates globally especially for haematite ore applications (Fig 5).

Siemens VAI, Austria & Germany has introduced a circular pellet plant for small scale (about 1.0Mt/y) applications; the first plant is being built in India.

Miguel Sabanero of Danieli, Italy provided an excellent technical presentation emphasising the importance of maintaining permeability during pelletizing and provided much detail on key technologies: carbon addition, double-deck roller screens, deep beds, and the hearth layer bin.

Metso Minerals Industries of USA, is now able to offer both straight grate and grate kiln technology. They compared the two methods and provided some details of new projects.

Global game changers

A representative of India's Ministry of Steel provided an overview of the Indian steel industry including forecasts outlining how the government mining and export restrictions are affecting the domestic market while also listing planned pelletizing increases.

Amit Chatterjee, formerly technical director

Process Route	2005-06	2009-10	2010-11
BOF	53	45	44
EAF	18	24	24
Induction Furnace	29	31	32
Total	100	100	100

Table 4 Indian crude steel production by process (%)

	Consumption	Unit Cost	US\$
Screened Pellet	1.4-1.42 (t)	170	241.00
Natural Gas	2.5 (net Gcal)	4*	10.00
Electricity for prod	110 (kWh)	0.03	3.80
Oxygen	15 (Nm ³)	0.1	1.50
Make-up water	1.3m ³		
Labour & Maint	0.12 man-hrs		~6.0
Manpower	0.12 man-hrs		
Total			262.3

*Gas prices based on MENA region

Table 5 Midrex plant OPEX (US\$/t)

Tata Steel and now Chief Editor Steel Tech, India, summarised the status of global steel production and opportunities for growth in steel production in India. He emphasized the strengths of India: iron ore and coal (but little coking) reserves. He expects DRI production based on local iron ore and coal or gasified coal to increase in India. DRI production decreased from a peak of 27 to 20Mt from 2011 to 2012 due to ore shortages and the economic slow-down, but India remains the world's largest producer of DRI. In 2010-11, 17.06Mt of DRI production was from coal based kilns and 6.19Mt from gas based shaft furnaces.

Dr Chatterjee summarised the changing steel process routes in India as increasing use of electric steelmaking (by arc and induction furnaces) and declining use of the BF-BOF route (Table 4).

India is unusual in relying heavily on small induction furnaces used to melt coal based DRI and scrap, the only refining possible being by blending the charge mix.

A presentation by Cliffs Natural Resources (USA) outlined the dramatic recent and future projected growth of shale gas in the USA indicating how low natural gas prices increase both the competitiveness of steel producers (EAF and BF/BOF) as well as sparking a comeback in USA manufacturing that increases steel company customer base. Cliffs is trying to produce DR grade pellets to capitalise on growth of gas based DRI production in USA.

Iran's activity was summarised in an informa-

tive joint presentation by Gol-e-Gohar Mining and Mobarakeh Steel. The Golgohar Mining and Industrial Company produces 9Mt/y of concentrate while the Pelletizing Plant produces 5Mt/y of DR and BF pellets. They are located in southern Iran around 340km from the Persian Gulf. By 2030 they expect to produce 22 and 20Mt/y of concentrate and pellets, respectively.

Tenova HyL and Danieli outlined the merger of Danieli's DRI technology with long standing HyL technology to form the current EnergIron suite of techniques that include HyTemp (pneumatic conveying of hot DRI to EAF), reformer-less shaft reduction using a self-reforming technique to 'crack' the nature gas within the shaft furnace and a range of module sizes (MegaMod and micro module) with and without reformers. The first micro module is operating at Gulf Sponge Iron in UAE producing 200kt/y. EnergIron has captured a number of new contracts including some high profile ones: Nucor Louisiana, Emirates Steel UAE, Suez and Ezz Steel in Egypt and Jindal Steel & Power Ltd at Angul in NE India, where a set of four modules is to be fed by coke-oven gas and gasified coal. Here, JSPL are also building Midrex modules to use syngas and a Lurgi coal gassifier which could supply syngas to both projects. They cited the benefits of hot charging of DRI to the EAF as a 20% reduction in electrical energy consumption and a 21% decrease in tap to tap time.

The presentation by Midrex outlined current Midrex projects including new plants in Pakistan, Egypt, Russia, Bahrain, India – the latter a plant for Jindal Steel & Power at Angul, Odisha state, fed with gasified coal – and a plant for Jindal South West (JSW) fed with Corex off-gas, and, most recently, a plant in Texas, USA to produce BF grade HBI to ship to voestalpine in Austria. They emphasised higher utilisation of the Midrex process as compared to the competing technology (HyL Energiron) in the MENA region. Typical Midrex Plant OPEX are given in Table 5.

The Midrex process dominates shaft furnace production of DRI producing 44.76Mt in 2012 or 79% of the 56.4Mt produced in shaft furnaces. A further 17.06Mt was produced in rotary kilns using coal and 530kt in fluidised bed processes.

Emirates Steel introduced its new steel plant in 2009 with a 1.6Mt/y HyL EnergIron HyTemp plant conveying hot DRI to a Danieli EAF and a second module and EAF was added in 2011. Total DRI production is summarised

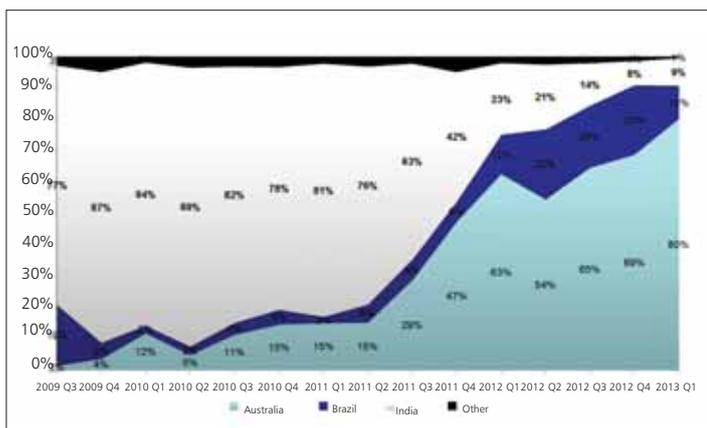


Fig 7 Changing ore suppliers to China Source Metal Bulletin

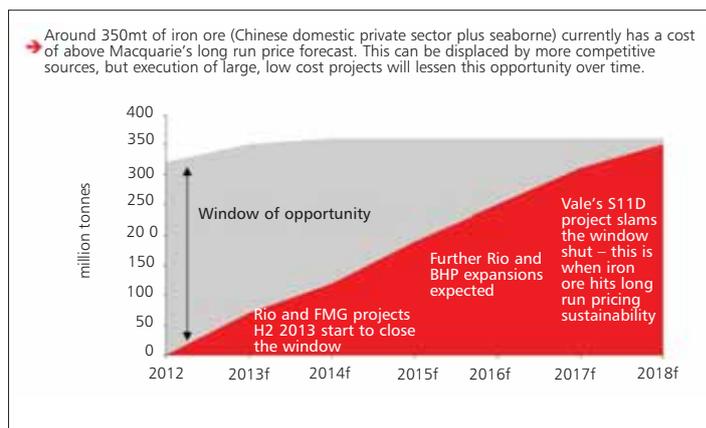


Fig 8 Window of opportunity for iron ore projects Source: Company Data, Customs Statistics, Macquarie Research, June

for the first and second phases of the project as indicated in Table 6.

Qatar Steel outlined its direct reduction plants (two modules, a 400 series and a MegaMod that produces both DRI and HBI) with an emphasis on the outstanding performance of direct reduction modules in 2012 when total DRI production reached 2.4Mt to support steel production of 2.2Mt. DRI #1 plant operates at 152% of rated capacity with an availability of 92.5% and reliability of 99.6%. DR #2 operates at 108% of original rated capacity after 5 years of operation. DRI quality is 95% metallisation at 1.8% carbon content using only high quality DR grade pellets sourced from Vale, Samarco, LKAB, QCM and GIIC.

The Mobarakeh Steel Company provided a comprehensive overview of its steel production, DRI production and pelletizing in Iran including new projects. Iran is the second largest DRI producer in the world and the largest using gas based shaft furnaces making 11.58Mt in 2012. It is blessed with plentiful natural gas and iron ore reserves. Iran uses a number of gas based shaft furnace DR technologies: Midrex, HyL and Ghaem, and has a current capacity at 18Mt/y from 22 modules. An additional 13.4Mt/y capacity mainly of Midrex modules is under construction. This is supported by an ore pelletizing capacity of 20Mt/y with another 40Mt/y of pelletizing capacity either under construction or planned.

The Schmidt + Clemens Group of Spain provided details on their new alloy generation to reduce catalytic coke formation in steam crackers and its application in HyL heaters and to increase capacity in Midrex reformers.

An optional field trip to the Emirates Steel complex was available to attendees.

Event Two – Metal Bulletin Iron Ore Symposium

Metal Bulletin's 19th International Iron Ore Symposium was held in Munich, June 9 -11, 2013. Metal Bulletin had been organising this symposium every other year for the past three decades but switched to annual meetings three years ago. The venue moves around Europe. Overall attendance at around 220 continues to decline from the 300+ before the fiscal crisis when nearly all iron ore producers and European steel producers attended. However, a change in the programme focus and reduction in depth probably contributes equally to this decline.

At one time the programme focused strongly on iron ore producers and steel company users;

Year	Phase 1	Phase 2
2012	1.44	1.20
2011	1.28	0.89
2010	1.10	-
2009	0.14	-

Table 6 Emirates steel DRI Production Phases 1 & 2 (Mt/y)

the current event included only three iron ore producers while the consumption side included only a speaker from the German Steel Federation VDEh. Nevertheless, the programme did feature some excellent presentations from analysts and shippers. The former global attendance spread is now European focused with very few attendees from Asia, the current centre of gravity of the iron ore world.

Delegates are still led by iron ore producers (37%) but with traders (21%) now the second largest group while steel producers (15%) are less prominent. Some of the leading European steel producers did not register for the conference but were participating in meetings at the hotel but outside the Symposium meeting area. Financiers (15%) are another prominent group while the balance of the attendees included technology providers, shippers, consultants and journalists.

Keynote presentations

Vale's Market Outlook was presented by Fidel Blanco who gave an upbeat view of the world steel and iron ore markets, counting on not only continued urbanisation drives in developing countries including China but also evidence of economic recovery in the developed world. He touted key Vale projects: a 40Mt/y expansion of Carajas costing \$3.5bn coming on at year end and replacement capacity at Conceição Itabirito costing \$1.2bn that also adds 12Mt/y of capacity. Additional Carajas South and other (S11D, CLN) projects could add 150Mt/y of capacity. The Valemax (400kt) vessels and trans-shipment facility in Malaysia improves Vale's logistics to China.

Future of European steelmaking

Challenges and Opportunities arising was the topic addressed by Jürgen Kerkhoff of the German Steel Federation VDEh.

He reviewed current EuroZone economic problems including increasing disparity between countries with strong steel industries such as Germany and others such as Greece.

He advocated revision of EU emissions and

CO₂ policies based on more realistic benchmarks.

He illustrated the high costs of electricity and natural gas in EU versus the rest of the world and complained about the still high iron ore prices while also pointing out global restrictive trade practices (export restrictions on raw materials, import restrictions on steel products) outside of the developed world.

In conclusion he extolled the virtues of EU-led technical progress in steel technology and utilisation.

Pricing

The panel moderator for the session on pricing, Benedikt Sobotka of Bryanston Resources, predicted iron ore oversupply starting in 2014 will driving prices down to \$100/t. China will continue to increase traded iron ore consumption as high cost domestic production declines but eventually an increasing scrap reservoir in China will decrease iron ore demand. Global iron ore pricing is moving to shorter indexing periods while quality differentials are decreasing. Some new iron ore projects feature different types of ore. He listed all the potential projects in eight African countries totalling 343Mt/y of new capacity (Fig 6), but acknowledged that delays and cancellations are likely.

The role of India in the global iron ore trade is a major wildcard. GlobalORE will now offer ore brands by name. Northern Iron Marketing disclosed that their shareholders dismiss hedging and want full exposure to maximise gains in the iron ore market. Credit Suisse noted that steel producers are not natural hedgers.

Christopher Ellis reported that Metal Bulletin started their iron ore fines index in 2008 based on 62% Fe fines; in 2011 they added other products: fines at different Fe levels, concentrates and pellets. He presented an interesting plot showing the evolution of spot iron ore trading; initially dominated by India; now dominated by Australia with Brazil playing a role (Fig 7).

Value in use of iron ore

David Tucker of Hatch provided a method of calculating the impacts of changes in sinter chemistry and/or use of concentrates on the impact on sinter plant, blast furnace and steel-making costs showing how plant constraints and assumptions affect value in use calculations.

Supply/demand balance

Yuri Mishin of Metalloinvest gave a comprehensive presentation starting with the global iron

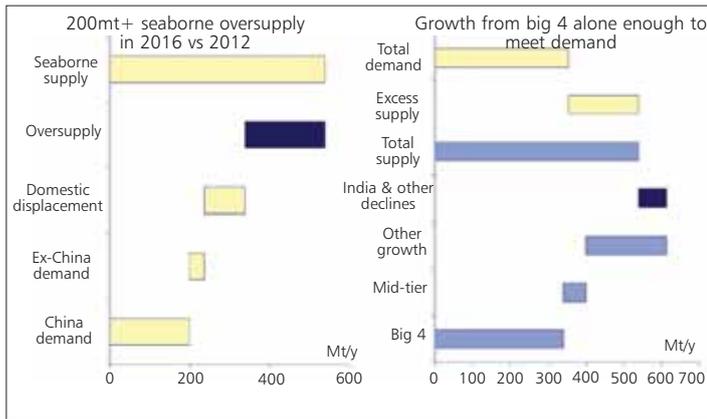


Fig 9 Potential iron ore oversupply
Source: Company reports, CLSA Asia-Pacific Markets



Fig 10 Capesize fleet growth vs ship earnings
Source: SwissMarine Services SA

ore market indicating declining ore grades followed by a detailed look at the steel and iron ore sectors in Russia and concluding with a review of the Metallinvest Mikhailovsky and Lebedinsky iron ore mines and DRI/HBI facilities (details in previous DRI-Pellet Symposium).

Paul Gray of Wood Mackenzie, provided a thorough look at the future of ore supply and demand:

- Chinese iron ore demand levels off but import dependency actually increases as marginal, small scale private iron ore mines are closed;
- Australia's role as the lead importer is further enhanced as non-traditional iron ore exporters such as SE Asia, Iran, etc, are squeezed out,
- New iron ore projects face a capex surge that diminishes returns,
- Listing of cancelled and deferred projects is growing;
- New projects are spread along the cost curve but what really matters are margins as margins are highest for the 'Big Three's' expansion projects.

Colin Hamilton of Macquarie commented that:

- iron ore price volatility has increased, driven mainly by China destocking and restocking;
- non-traditional ore suppliers have gained market share in China mainly at the expense of India;
- much current iron ore capacity lies above long range price on the cost curve;
- capital costs restrain iron ore expansions but much new capacity comes on in the next two years;
- Ultimately the Vale Carajas S11D project will

crowd out expansions by junior miners (Fig 8).

- Junior miners have been successful in Australia but less so elsewhere.

Around 350Mt of iron ore (Chinese domestic private sector plus seaborne) currently has a cost above Macquarie's long run price forecast. This can be displaced by more competitive sources, but execution of large, low cost projects will lessen this opportunity over time.

China

A session was devoted to China. Ian Roper, CLSA, (Credit Lyonnais Securities Asia) noted that as supply increases in the second half of the year we may see prices test US\$100/t for a period in 3Q13, but by 1Q14 he believes supply will tighten again on the lack of Indian exports, sustaining prices above US\$100/t through 2Q14. The CLSA long-term view remains unchanged predicting prices falling as low as US\$75/t by 2015 when the market sees severe oversupply (Fig 9). Chinese steel demand will peak later this decade at about 800Mt and as scrap generation in China accelerates, this will reduce demand for iron ore. Imports will continue to take a share from domestic Chinese ore, but the expansion of supply from State owned mines means China can sustain 200Mt/y of domestic ore output at US\$75/t.

Hadi Hami, UAE, provided an overview on the scrap and metallics markets similar to his presentation at the DRI-Pellet Symposium but he went on to summarise the main challenges facing the global steel industry including overcapacity and slower than expected economic growth in the developing world and economic stagnation in the developed world. The MENA region faces near term political and stability problems but long term growth prospect look good.

Shipping

In a session on the shipping market a presentation by Simpson Spence & Young, noted that spot capesize rates continue to trend downward from peaks at the height of the boom, and are now at below \$20/t, Brazil to China and below \$10/t, Brazil to Rotterdam. Given changes in the fleet size, in 2014 they expect to see the rate of growth in sea borne dry bulk trade outpacing increases in carrying capacity, reversing the trend of the past five years. This will add to potential freight rate volatility and increase freight's share of delivered iron ore prices, all of this is dependent on (1) historically high scrapping of ships, (2) slower deliveries to conserve fuel and (3) sustained trade growth. However, the premature ordering of new eco-type vessels has the potential to blunt a recover in the freight market, given the massive overhang of surplus ship building capacity.

The presentation from Swiss Marine showed how earnings of shippers have decreased with increase in fleet size (Fig 10). They plotted increases in the volumes of coal and iron ore movements over the next four years and projected growth to be 8% per year. They also provided insight into methods shippers use to save money such as sailing at slower speeds but these efforts are countered by increased ballasting as fewer backhaul cargoes are available. They expect supply/demand to swing to tightness over the next 1-2 years so freight costs will rise. ■

Contact

Copies of the presentations are available for £300 for each conference (UK applications should add VAT)
From Metal Bulletin Events, Nestor House, Playhouse Yard, London, EC4V 5EX, UK
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Diary Date

5-6 November Metal Bulletin 2nd African Iron Ore Conference Johannesburg, South Africa
<http://www.metalbulletin.com/EventDetails/0/5925/2nd-African-Iron-Ore-Conference.html>