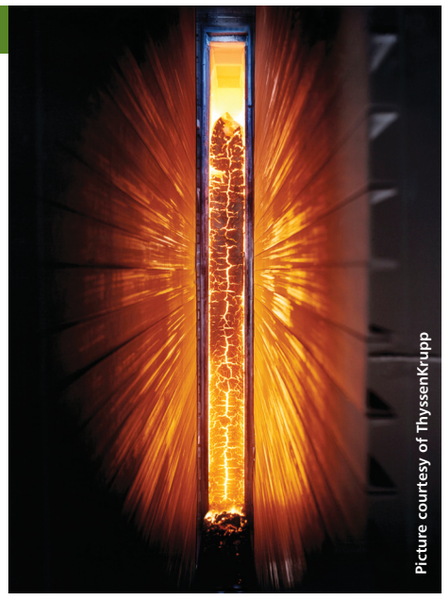
Eurocoke Summit 2011 – Vienna

Rising raw material prices and the state of the industry were among the topics at the annual Eurocoke Summit 2011 organised by IntertechPira.

By Greg Morris Deputy Editor


Picture courtesy of ThyssenKrupp

137 DELEGATES attended the 7th Eurocoke Summit 2011 organised by IntertecPira at the Hotel Savoyen, Vienna, Austria where they heard 15 presentations over two sessions.

The opening overview heard Helen O'Malley, team leader for steel raw materials of CRU Analysis, discuss recent production developments for steel, coal and coke.

She said steel production was back to a positive growth trend following two years of recession. However, the industry has not quite returned to normal yet, with volatile raw material prices and demand uncertainty overriding factors within the industry at the present time.

The price of metallurgical coke had staged a spectacular recovery from a bottom in early 2009 to a recovery by April 2010, followed by a stall and then a gathering of momentum in 2011. Prices had been boosted by the flooding in Queensland in early 2011, which had tightened the market. Global coke consumption had surged in 2010 on the back of a recovery in hot metal output, which had triggered a revival in the merchant coke market (**Fig 1**). However, taking China out of the equation, consumption was lower than 2007.

The downturn had caused a number of permanent coke battery closures leading to about 9.7Mt of closures worldwide. The largest single loss was at ArcelorMittal's Galatai site in Romania, where the 2.23Mt plant closed in July 2009. This has also caused a tightening in supply of merchant coke. There is no longer a buffer of coke stocks so excess inventory has been run down to normal levels.

China is no longer an exporter to the international market due to an export tax impossed in 2008 which coincided with a collapse in demand. By March 2010 prices were high enough for China to export again – its exports balanced the market and sets a floor price for coke at a rate much higher than pre 2008. The only relief to steel mills is the price of sea freight, which had risen to 30% of the total cost but has since dropped to 5% today (**Fig 2**).

The metallurgical coal trade recovered swiftly due to Chinese imports, with Australia and Mongolia the main exporters, followed by USA, Russia and Canada.

Australian hard coking coal exports reached new highs in 2010, despite no major capacity expansions. As a result of blending coals and process optimisation it became more efficient recording a 20% increase in exports from 2009 to just over 100Mt. Meanwhile the USA also recorded export levels not seen since the 1990s thanks to the opening of smaller, new operations and more rolling (rail) stocks.

In terms of the Queensland, Australia floods, Ms O'Malley said they had devastated the market with exports from the state falling 40% in January and 30% in February. Many mines were damaged so the effects could be long lasting. Prices rose steeply, and re-iterated just how exposed the market is to Australian supply.

Looking ahead, GDP is set to grow modestly in developed countries, but bullish in the developing world. Steel production growth may moderate but will remain significant. BOF production growth will continue to outpace EAF gowth on a global basis pointing to a substantial increase in global coke demand with China the main consumer. Coke consumption will expand to 750Mt by 2015. While previous levels of international coke trade are not expected to be reached in the medium term, Chinese exports will nevertheless have to remain active, implying that coke prices will remain elevated.

China

ThyssenKrupp Minenergy China general manager Catherine Luo gave an update on the coke market in China. She said independent coke plants were in a sandwich between steel mills and coal mines partly due to environmental controls from the government, excess coke production and the government export tax. She believes Chinese coke will remain expensive in the immediate future for those reasons.

China produced 388Mt of coke in 2010, a 9.1% increase from 2009. Its coke capacity is 440Mt putting the industry in an 'oversupply' situation.

She believes 2011 will be challenging year for the Chinese coke market due to high inflation, an uncertain rate of GDP growth and the raw material situation worldwide.

In her forecast for the year Ms Luo stated coke production will be 400Mt, exports will account for about 4Mt. Independent coke producers, caught between high steel and high raw material prices, will remain in a tight situation throughout the year.

Russia

Mechel Carbon CEO Benoit de Meulemeester discussed Russian coke and said all exports depend on the railway system. Recent years had seen improvements to the railways and rolling stock. This co-incided with a port capacity expansion. However, every winter the rail plan cannot be fulfilled because the the severe cold. The railway system has gone from being government owned to privately owned and is now in the hands of six to eight companies. Not only do they restrict inland destinations but railway costs have become some of the highest in the world, up to $65/t in some parts.

In terms of coking coal, some of the major producers are steelmakers including Mechel, Evraz, Belon (MMK) and Severstal. Others are KRU, SDS, Raspadskaya and Sibuglemet with a combined production of about 317Mt. Exports account for 96.5Mt mainly to Ukraine and China, with South Korea, but India and Taiwan are increasing their share imports each year.

MMK was the largest coke producer in 2010 producing 5.31Mt followed by Severstal at 3.90Mt (**Fig 3**). The Altai Koks company is the largest exporter with Kazakhstan and India the largest markets.

Mr de Meulemeester stated that Russia can expand its coke production but requires more washing plant facilities, new railways and loading capacity. Once it has these it can become a major supplier to Europe, but this will not happen for at least four years.

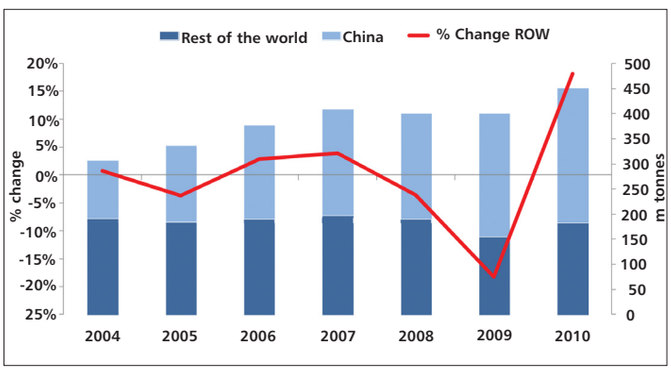
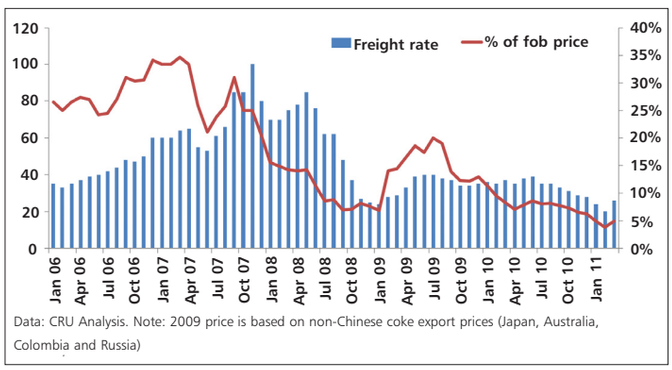


Fig 1 Consumption of coke surged in 2010 on the back of a recovery in hot metal output (Source CRU Analysis – Helen O'Malley)



Data: CRU Analysis. Note: 2009 price is based on non-Chinese coke export prices (Japan, Australia, Colombia and Russia)

Fig 2 Only low freight costs offer some relief to steel mills (Source CRU Analysis Helen O Malley)

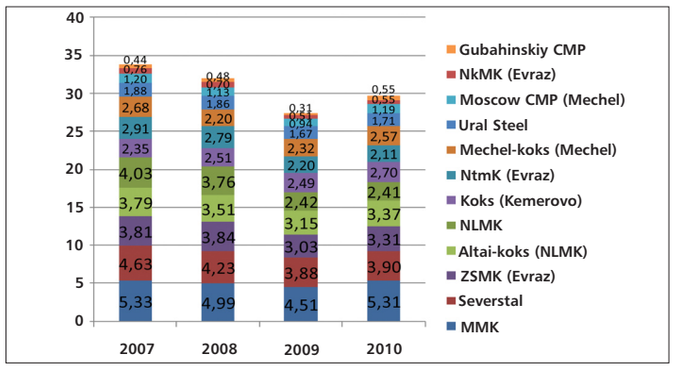


Fig 3 Coke production by Russian companies (Mt)
(Source Mechel and Metall Courier)

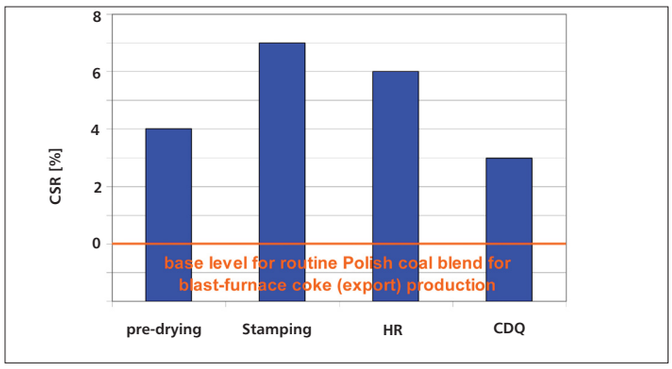


Fig 4 Effectiveness comparison – selected technologies for coke quality improvement
(Source: Sobolewski Institute for Chemical Processing of Coal, Poland)

Diary Date

Met Coke World Summit 2011 will take place October 31-November 2 in Pittsburgh, USA. Date and venue for the 2012 Eurocoke Summit have not yet been announced.

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Method	Disadvantages	Advantages
Stamping	High investment cost	Proved coke quality improvement
	Need significant modernisation	Possibility to use weaker coals
	of existing technological lines	Battery capacity increase
		Technology positively verified
Heat Recovery	Need to built new coke oven plant	Possibility to use weaker coals
	Need to provide heat consumer	Lower air emission
	Lower coke yield	Simple technological operation
	No references in EU	
Coke Dry Quench	High investment and operational cost	Battery capacity increase
	Short CDQ chamber refractory life	Heat consumption decrease
	Need for excess gas utilisation	Lower amount of waste water

Table 1 Coke quality improvement by different coke production technologies
(Source: Sobolewski Institute for Chemical Processing of Coal, Poland)

Mechel is investing in the Elga mine, which produces type B coking coal and has a 27Mt estimated reserve. All this will be for export through Port Posiet, a port on Russia's far eastern coast which will have its capacity increased from 10Mt/y to 18Mt/y. It will be connected via a 315km railway line of which 200km has been completed so far. The coal will be exported to Japan, South Korea and Taiwan.

USA

Jim Truman, of US group Wood Mackenzie, said total US coke production was back to about 15Mt/y. Imports accounted for about 3Mt, while exports are about 1.4Mt, which go to Canada and Mexico.

Key activities at US coke plants have been the building of new coke ovens at several sites. US Steel is to introduce a new C battery at its Clairton plant in 2013 which will have 960kt/y capacity. Batteries 7, 8 and 9 were closed in April 2009 while batteries 19 and 20 are being repaired. Batteries 1, 2 and 3 are in compliance.

Meanwhile SunCoke has been successful in placing new builds of its non-recovery by-product ovens and has seen its capacity grow from 1.3 to 5.5Mt/y.

Construction started at AK Steel's Middleton site in August 2010 for a 550kt/y battery and SunCoke has secured a 20-year supply contract. AK has also agreed a 12-year-deal with SunCoke's Haverhill plant, which allows it to take up 550kt/y.

ArcelorMittal is reopening its 500kt/y Warren plant, which it idled in 2008 due to the downturn.

Renco has bought Severstal's US integrated mill operations. The $1.2bn deal saw it buy Sparrows Point, Severstal Warren and Severstal Wheeling and also includes a 50% interest in Mountain State Carbon (coke plant) and Ohio Coatings.

Severstal had bought the operations for $2.4bn in 2008 but sold them to Renco for $1.2bn in March this year.

Technical session

In the opening presentation of the technical session – Technical Innovations in Coke Ovens and Steelmaking, Aleksander Sobolewski of the Institute for Chemical Processing of Coal, Poland, posed the question 'How to Produce a High Quality Blast furnace Coke from Poor Quality Blends?'

He stated Polish coke production had risen to just under 10Mt/y in 2010 with exports making up about 60% of this total. Importers in EU15 countries require at least a 70% share of 'hard' coal type in the blend. About half of Polish batteries were built before 2000 so require modernisation. There is a need to implement technological solutions to improve the quality of coke/production of coke from poor blends.

He listed possible solutions to improve quality such as stamping, heat recovery and the use of coke dry quench (CDQ) technology. Each has its advantages and disadvantages (**Table 1** and **Fig 4**) but the over-riding disadvantage was cost. Stamping and CDQ require a high investment cost while heat recovery requires a new coke oven plant and a customer for the heat captured. Advantages include lower emissions, lower amount of waste water as well as the opportunity to use weaker coals.

Mr Sobolewski said it was not easy to select the best solution without battery scale testing and in a time of tightened budgets who would be prepared to take a risk?

Hatch Senior Director Ian Cameron's paper explored opportunities for heat recovery coke plants. His presentation came in three parts, which looked at strategic considerations for coke supply to an integrated steel works. One of the themes was a case study into how to develop niche opportunities that use the surplus energy from a heat recovery coke plant (HRCP).

He suggested that heat recovery paired with an EAF and the ITmk3 rotary hearth iron nugget plant offers financial and environmental advantages. Compared to the traditional by-product coke plant with a blast furnace oxygen steelmaking operation, combining the HRCP with ITmk3 and an EAF reduces operating costs by $74/t of hot rolled coil for a steel plant located in Europe, provides a better return on investment and lowers CO_2 emissions. Further advantages would be the EAF steel could eventually displace a BF process in the EU, reducing greenhouse gas emissions. The coke sold by the HRCP could allow closure of an outdated by-product coke plant in the EU and CO_2 tax credits may further increase the financial attractiveness.

Two metallic plants have already been studied in Europe – a Norwegian DRI plant sponsored by LKAB and Statoil, and an ITmk3 plant to treat concentrate from a proposed Scandinavian iron ore mine. (At present, the only ITMk3 plant in operation is owned by Steel Dynamics in USA and has suffered a slow start-up).

Mr Cameron stated that combining the various technologies would succeed when coal and iron ore is available at a competitive long-term price and there is a regional need for purchased coke. ■

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