

“Important Developments in International Coke Markets”

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Introduction to Presentation

“**Resource-Net**” produces monthly research reports on world markets for metallurgical coke, coking coal and anthracite, i.e. about pricing, supply and demand.

Today, we will discuss:

- 1. Coke Production*
- 2. World Coke Trade*
- 3. Metallurgical Coal Supply*
- 4. Coke Price Development*
- 5. Summary & Conclusions*

Influences on Coke Market

Chinese Prices: The export price from China acts as an upper limit on markets around the world. Non-Chinese suppliers tend to use this price as basis for their own sales.

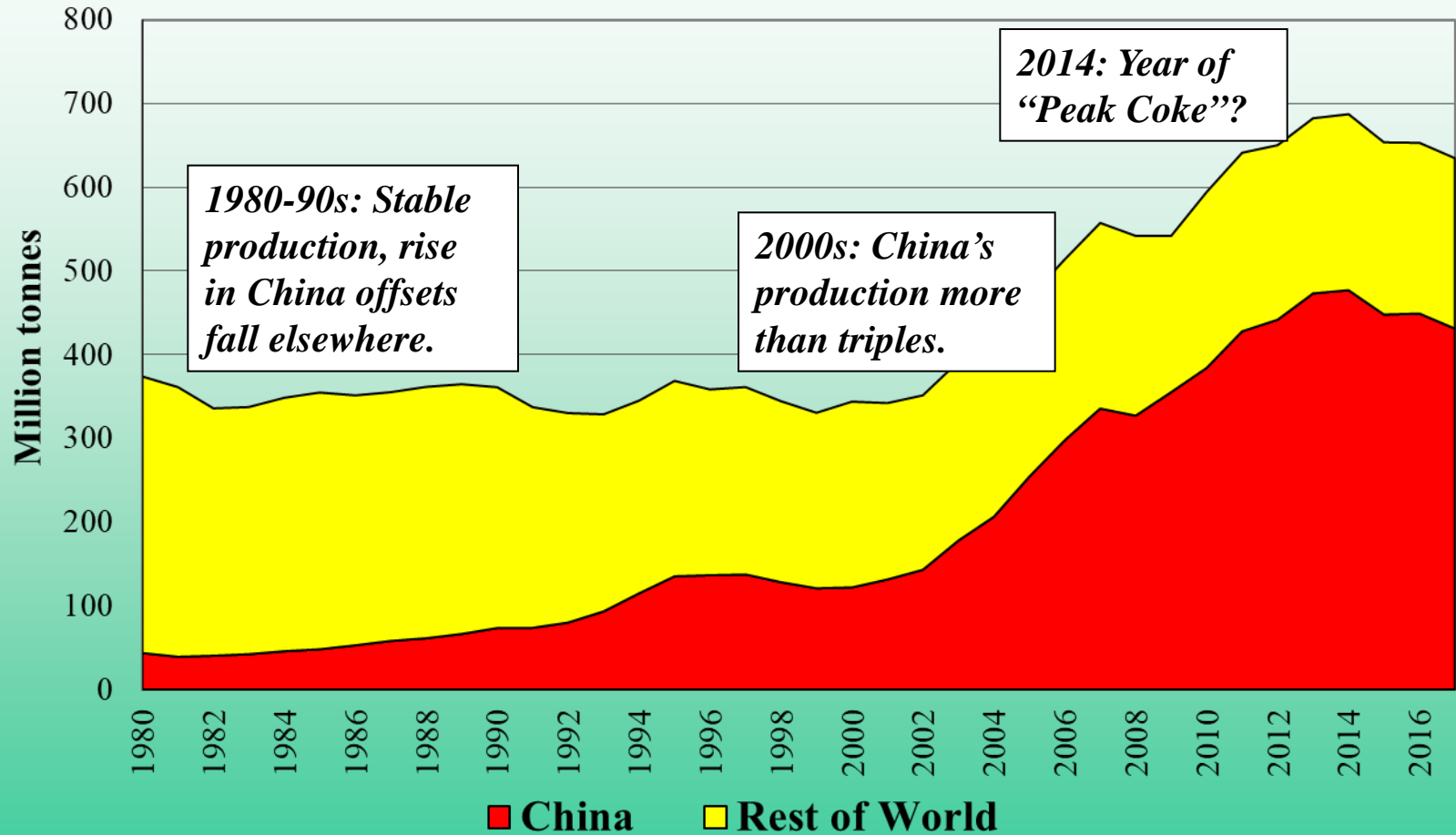
Demand for Coke: Unlike other process plants, by-product recovery batteries cannot be allowed to go cold without risk of damage to their structure. Hence, in a severe market downturn the production of coke continues at a rate above that required by the market.

Battery Constructions & Shutdowns: Rebuilds (needed every 30-40 years) are expensive due to environmental regulations. In Europe and other areas, the low coke prices of last few years made such investments un-economic.

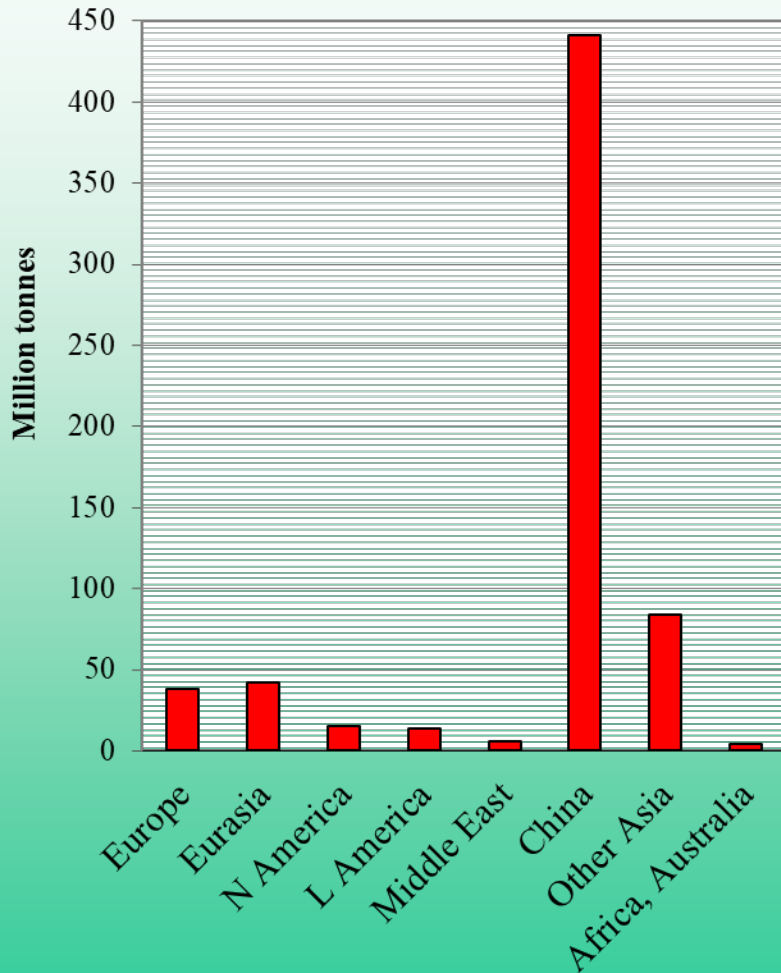
Coking Coal Prices: To produce coke economically, the market coke price needs to be at least 1.8-2 times the hard coking coal price (approximate rule). Increasingly, daily indices are using for coking coal, which follow through into coke pricing.

Coke Production

World Coke Production



Coke Production by Region - 2017



Region	Avg Annual Change % (10 years)
Europe	-1.6%
Eurasia (Former Soviet Union)	-1.9%
North America	-1.9%
Latin America	+1.6%
Middle East	+1.1%
China	+3.0%
Other Asia	+1.9%
Africa, Australia	-2.8%
World	+2.0%
<i>World without China</i>	<i>-0.1%</i>

Coke Production Outlook

China accounts for major share of world coke production; its share has risen from 35% in 2000 to almost 70% in past few years. Since 2015 Chinese production has been in decline.

In most other countries, coke production is in long-term decline due to:

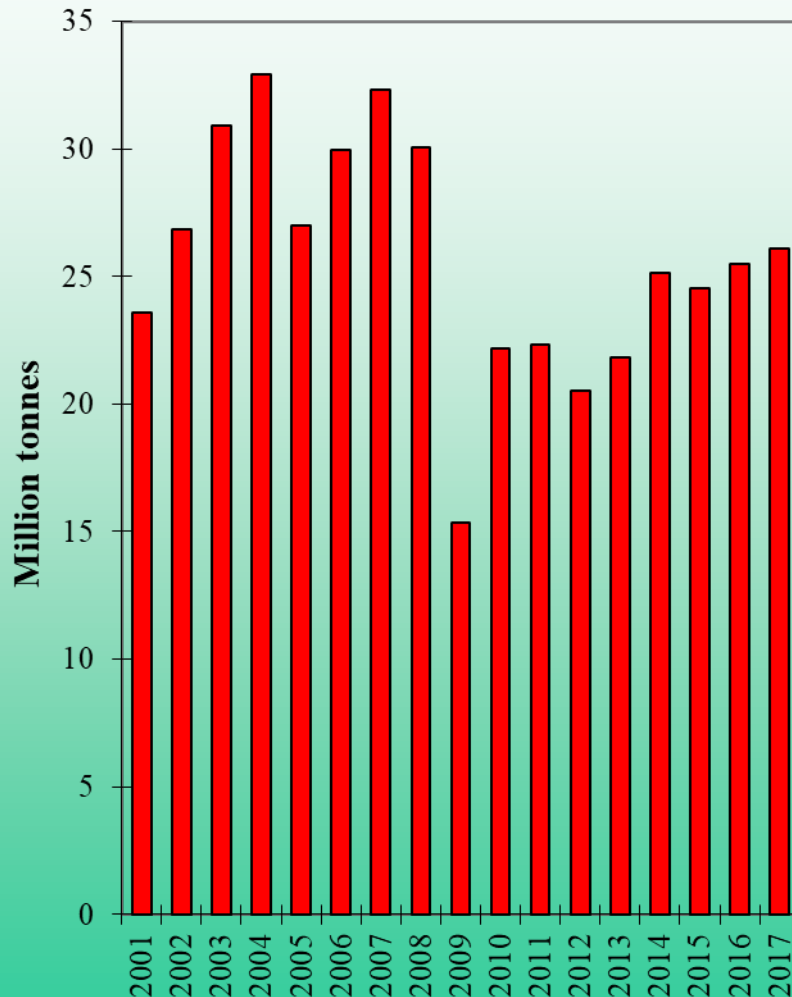
- Lower integrated steel production due to slow world economy, plus shift to EAF (some countries, not universal trend);
- Environmental legislation.

Few regions with positive trend in coke production over **past ten years**, China excepted:

- India, Korea, Taiwan, plus developing Asian economies;
- Brazil, Colombia;
- Europe – “core” EU economies such as Germany;
- Middle East countries - Iran, Turkey.

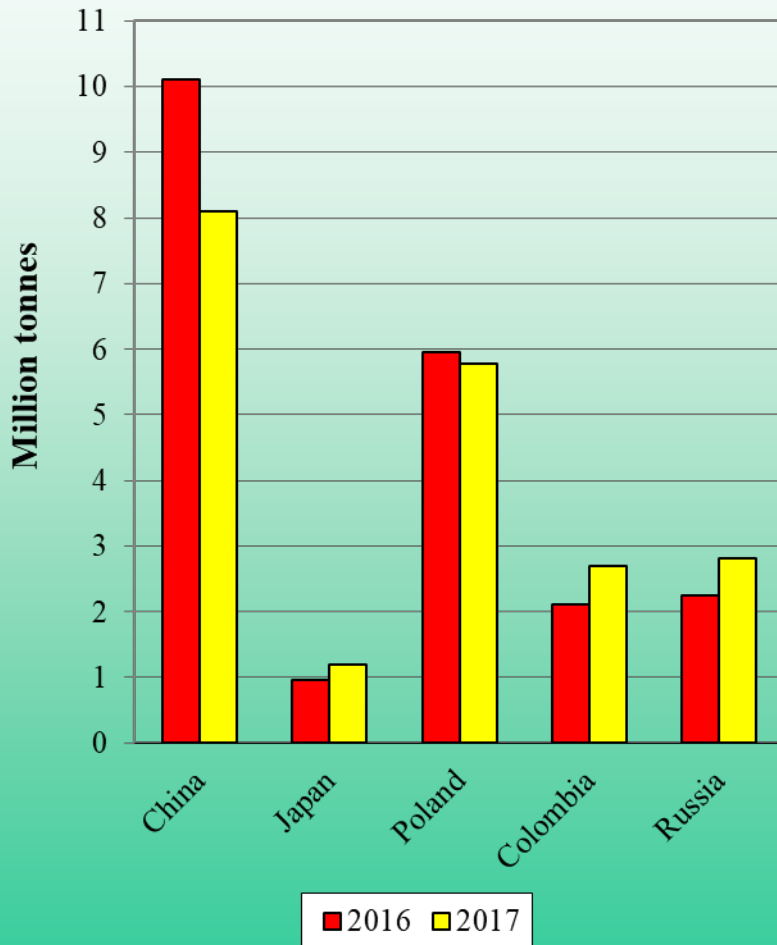
World Coke Trade

World Cross-Border Coke Trade



- By adding imports of all economies, we obtain the figures for global coke trade since 2001.
- From 25-30m tonnes/year until 2008, the volume declined to only 15m tonnes in 2009 due to the “economic crisis” of that period.
- Since then, coke trade has recovered to reach 26m tonnes last year. But we do not expect trade volume to grow from this level.
- China remains major supplier of coke to world market (31% of total trade last year), but Colombia, Japan, Poland, Russia and others are also active.

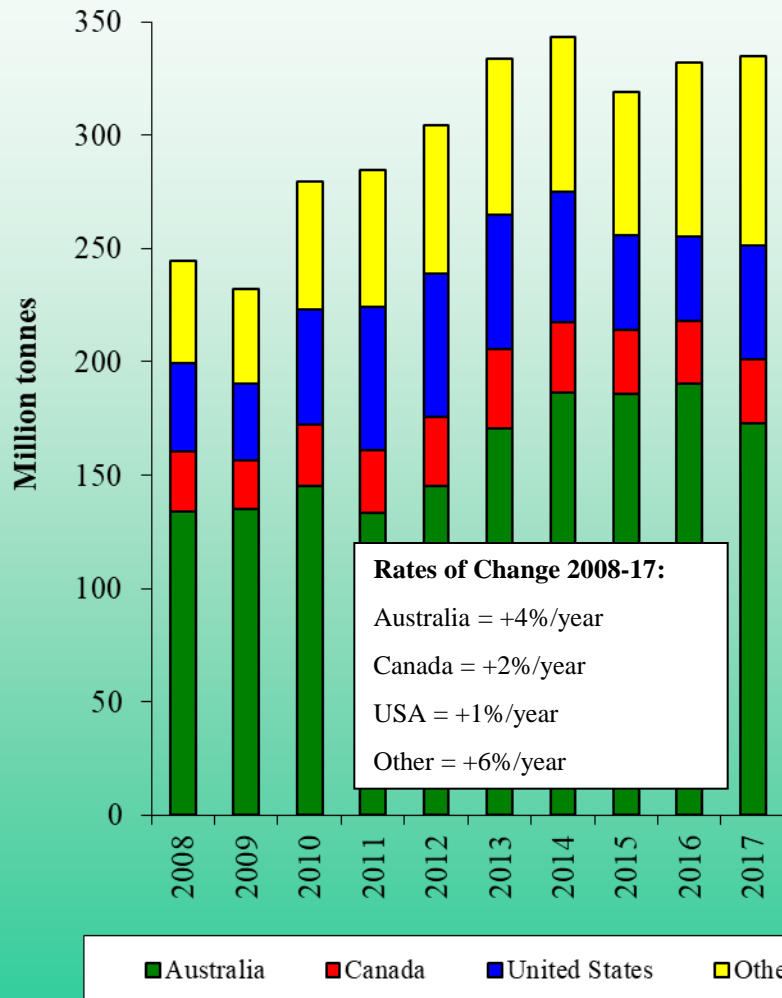
Leading World Coke Exporters



- **China:** Exports last year were 2m tonnes down on 2016. This was due to lower demand in India and Japan, its major markets.
- **Japan:** Recently, Japan's exports have gone mainly to India and UK. There has been rise since 2014-15.
- **Poland:** It supplies other European countries primarily. The volumes have been stable.
- **Colombia:** Coke supply from Colombia has risen in recent years. It supplies Brazil, Mexico and also Europe. Much is nut-size coke.
- **Russia:** Its main markets are Europe, Ukraine and Kazakhstan.

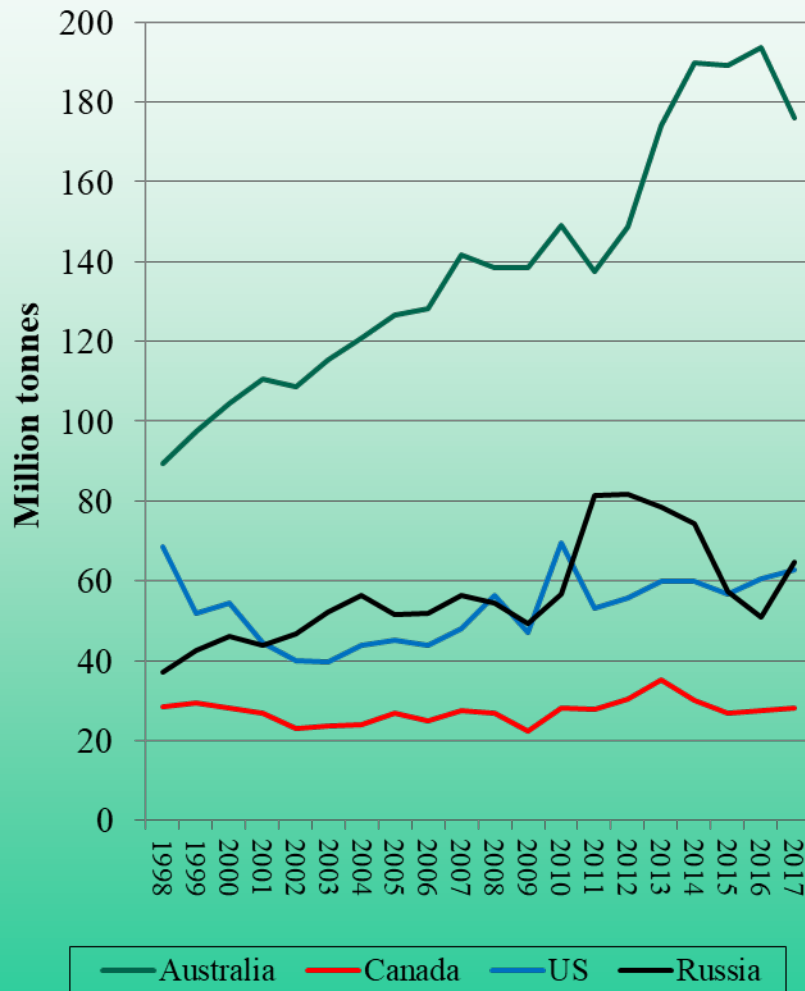
Metallurgical Coal Supply

Metallurgical Coal Exports



- Combined, Australia, Canada and the United States account for approximately 80% of world trade. Australia remains the largest supplier with highest growth rate.
- Total volume stopped rising after 2014, due to lower coke production after this year.
- “Other” countries has grown at 6% per year, primarily due to supply from Mongolia (by land to China) and Mozambique.

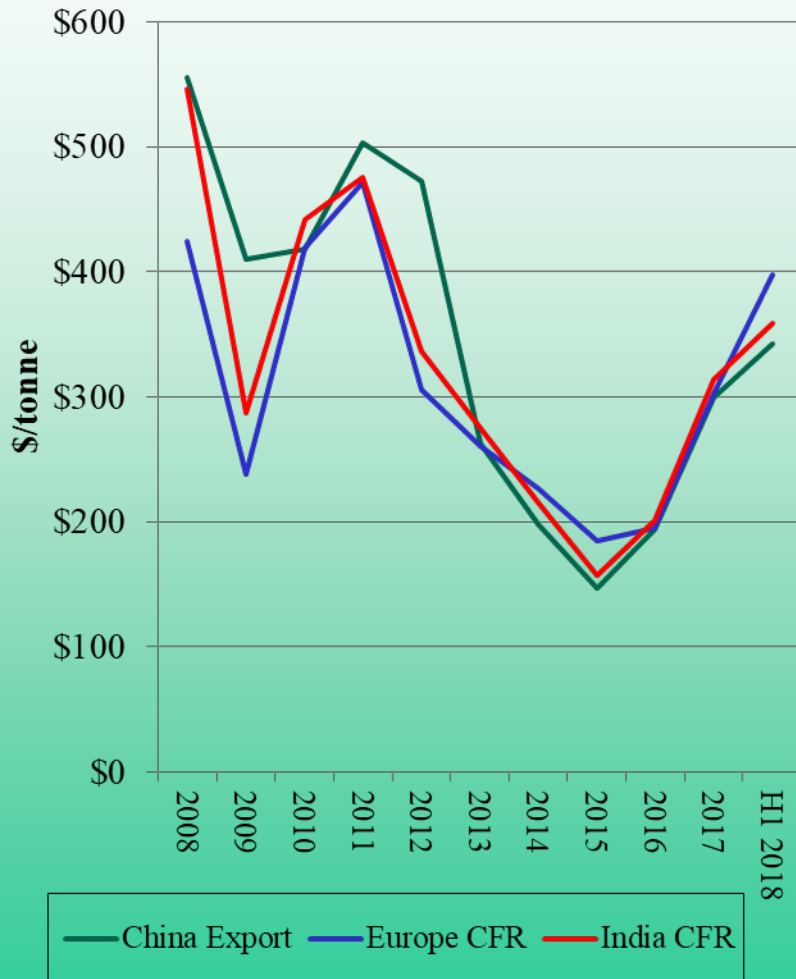
Metallurgical Coal Production



- For the four major exporters, production over past 20 years are estimated using trade data and coke production.
- **Australia:** By far the highest growth rate as well as the largest volume. But last year, its production was lower.
- **Canada:** Competitive exporter, able to sustain its production even when prices are low.
- **US:** Swings in production dependent on the market, currently in downtrend.
- **Russia:** Growth over last two decades, led by exports to Asia and Ukraine.

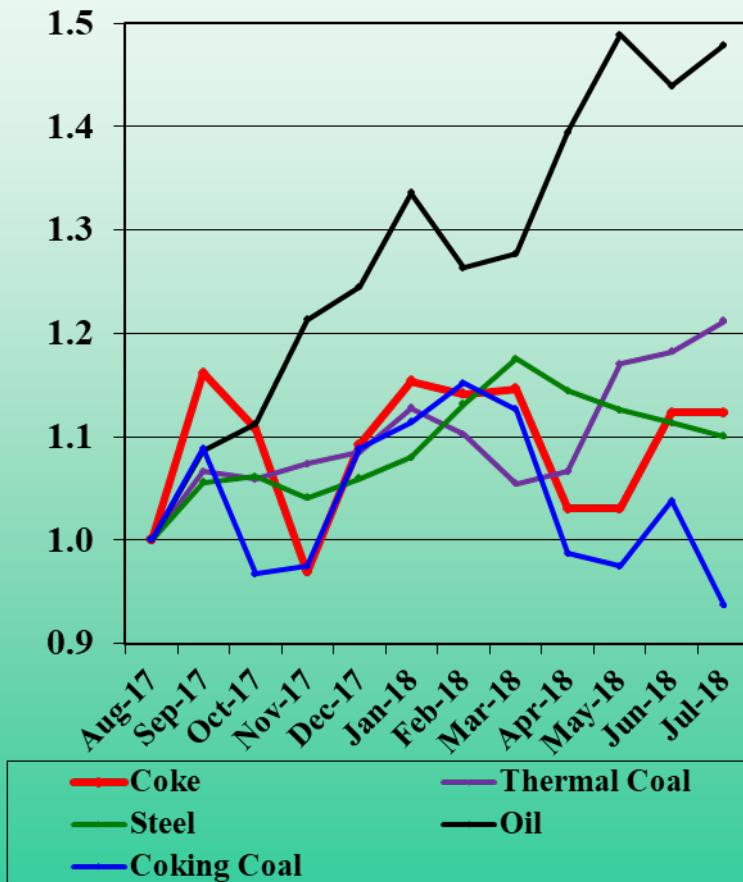
Coke Price Development

Blast Furnace Coke Pricing



- Shown are the annual averages of the BF coke prices researched each month by “Resource-Net”. It is important to note that our prices are not equivalent to the daily indices produced by various companies.
- The price upturn from 2016 continued into last year; this followed four years of price declines. Prices also rise in first half, but there looks little possibility of further rises.
- Prices in Asia and Europe have been in close correlation over the past two years.

Pricing for Coke Indexed vs Steel & Other Raw Materials



- Here, we index relative strength of various commodity markets over past year: coke, steel, coking coal, thermal coal and oil.
- Oil continues its upward movement. A high oil price is generally bad for the world economy.
- Coke and steel are stable, but coking coal is lower this month.
- Usually, a strong dollar leads to commodity price weakness, as over-production is encouraged. (Prices made in USD, costs in local currency.)

Summary & Conclusions

Coke Market – Current Situation & Future Outlook

World coke production reached its maximum in 2014 and is likely to be lower from now on. Cyclical upturns may occur, of course. Coking coal trade may also have peaked.

World coke trade has been on higher trend over past three years following severe downturn of 2009. This has been due to lack of spare coke capacity in Europe and other regions. Investment in coke capacity has been un-economic in past few years.

Coke prices have been on the rise in past two years, due to combination of factors. In current cycle, prices may have reached a maximum. But in longer term (i.e. the 2020s) we expect shortages of coke to emerge as it cannot be easily replaced in existing applications (steel, non-ferrous).