Global development of the energy markets: coal perspectives

18th Handelsblatt Annual Conference – Energy Industry 2011

Intercontinental, Berlin – 18-20 January 2011

Brian Ricketts – Secretary General
Overview

- The European Association for Coal and Lignite.
- Types of coal.
- Worldwide availability of coal and other fuels.
- Coal consumption trends around the world.
- Coal price trends, including shipping costs.
- Security of energy supply.
- The climate protection challenge.

EURACOAL – serving the interests of the European coal industry.
EURACOAL: 33 members from 19 countries

- COALPRO - Confederation of UK Coal Producers (GBR)
- DEBRIV - Deutscher Braunkohlen-Industrie-Verein (DEU)
- GVSt - Gesamtverband Steinkohle (DEU)
- Mini Maritza Istok (BGR)
- PPC - Public Power Corporation (GRC)
- PPWB - Confederation of the Polish Lignite Producers (POL)
- ZPWGK - Polish Hard Coal Employer´s Association (POL)
- ZSDNP - Czech Confederation of Coal and Oil Producers (CZE)
- APFCR - Coal Producers and Suppliers Association of Romania (ROU)
- BRGM - French Geological Service (FRA)
- CARBUNIÓN - Federation of Spanish Coal Producers (ESP)
- Coallmp - Association of UK Coal Importers (GBR)
- D.TEK (UKR)
- EPS - Electric Power Industry of Serbia (SRB)
- GiG - Central Mining Research Institute (POL)
- HBP - Hornonitrianske bane Prievidza (SVK)
- ISFTA – Institute for Solid Fuels Technology & Applications (GRC)
- Mátrai Kraftwerke (HUN)
- PATROMIN - Federation of the Romanian Mining Industry (ROU)
- Premogovnik Velenje (SVN)
- RMU Banovici D.D. (BIH)
- Swedish Coal Institute (SWE)
- TKI - Turkish Coal Enterprises (TUR)
- Ukrvuglerobotodavtsy - All-Ukrainian Coal Employer’s Association (UKR)
- Vagledobiv Bobov dol EOOD (BGR)
- VDKI - Verein der Kohlenimporteure (DEU)
- Coaltrans Conferences Limited (GBR)
- EMAG (POL)
- Finnish Coal Info (FIN)
- Golder Associates (GBR)
- ISSeP - Institut Scientifique de Service Public (BEL)
- KOMAG (POL)
- University of Nottingham (GBR)
### Types of coal and peat

<table>
<thead>
<tr>
<th>Coal Types and Peat</th>
<th>UN-ECE</th>
<th>USA (ASTM)</th>
<th>Germany (DIN)</th>
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<td>Sub-bituminous Coal</td>
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<td>High Volatile Bituminous Coal</td>
<td>Glanzbraunkohle</td>
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<td>Low Vol. Bitumin. Coal</td>
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<td>Anthracite</td>
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<td>Anthracite</td>
<td>Anthracite</td>
<td>Fettkohle</td>
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Fuel resources and reserves, 2007

Reserves

- Hard coal 46.7%
- Lignite 8.0%
- Uranium 1.9%
- Thorium 2.3%
- Conv. oil 17.0%
- Unconv. oil 5.7%
- Conv. natural gas 18.0%
- Unconv. natural gas 0.5%

38,695 EJ

Resources

- Hard coal 69.1%
- Lignite 6.5%
- Uranium 1.0%
- Thorium 0.2%
- Conv. oil 1.6%
- Unconv. oil 2.3%
- Conv. natural gas 1.6%
- Unconv. natural gas 18.5%

571,711 EJ

source: Annual Report 2009 – Reserves, Resources and Availability of Energy Resources, Bundesanstalt für Geowissenschaften und Rohstoffe
World coal & lignite resources/reserves, 2009

- Asia + Australasia: 307Gt / 70Gt
- Europe: 19Gt / 66Gt
- CIS: 124Gt / 94Gt
- Africa: 33Gt / 0Gt
- Latin America: 9Gt / 5Gt
- North America: 238Gt / 33Gt

resources
of which
reserves

source: Annual Report 2009 – Reserves, Resources and Availability of Energy Resources, Bundesanstalt für Geowissenschaften und Rohstoffe
Coal reserves are super abundant

- 997 billion tonnes or 144 years.
- Distributed in many countries.

Developing countries will rely on coal to build their economies.

North Antelope Rochelle Mine, Wyoming, USA: 98.3 Mt annual production

source: Bundesanstalt für Geowissenschaften und Rohstoffe, 2010
Coal in world energy supply, 2008

**Global Total Primary Energy Supply (TPES)**

- **World**: 12,267 Mtoe (27.0%)
- **EU-27**: 1,759 Mtoe (18.5%)
- **USA**: 2,284 Mtoe (23.9%)
- **China***: 2,116 Mtoe (66.3%)
- **India**: 621 Mtoe (42.1%)

**Global Electricity Generation**

- **World**: 20,181 TWh (41.0%)
- **EU-27**: 3,341 TWh (30.5%)
- **USA**: 4,344 TWh (49.1%)
- **China***: 3,457 TWh (78.9%)
- **India**: 830 TWh (68.6%)

* inc. geothermal, solar, wind and heat.
** inc. geothermal, solar, wind, combustible renewables and waste, and heat.
*** inc. Hong Kong.

Sources: IEA Key World Energy Statistics 2010 and IEA databases (© OECD/IEA, 2010)
World coal production (to 2009) and CO₂ emissions from fossil fuel use (to 2008)

Coal use in EU-27, China and USA, 1970-2010

Tong Mei Datang Tashan coal mine: 15 Mt annual production

China joins WTO

source: Coal Information 2010, OECD/IEA (with 2010 estimate for China)
China’s incremental demand over the last two years equals TOTAL EU-27 coal use and is not far off TOTAL consumption in the USA.
China’s coal imports surpassed 126 Mt in 2009 when it became a net importer for the first time. In 2010, imports will reach 160 Mt.
Primary energy sources

- Coal: relatively high emissions, but readily available and inexpensive.

- Oil: easy to handle, but resources are limited and concentrated. Transport and offshore extraction carry risks.

- Gas: less emissions, but rather expensive in the long term. Supply security is a concern given the EU’s dependence on imports.

- Nuclear: cheap and reliable, but waste issue.

- Wind/sun: “sexy”, but expensive and intermittent.

All primary energy sources have their pros and cons.
The use of coal helps to reduce import dependence.
Major advantages of coal

- Almost **80% of EU-27 domestic fossil fuel reserves**.
- Hard coal and/or lignite are available in most EU Member States.
- Coal balances the EU energy mix and avoids security of supply and price risks.
- **Coal mining and value chain create wealth** in the EU, particularly in a number of disadvantaged regions.
- The EU coal industry employs around 280,000 people.
To 2020 – how to achieve lower emissions

- Coal-fired power plant technology still has substantial potential for development.

- Cost-efficient climate protection is already possible today by replacing old, less efficient coal-fired power plants built in the 60s by new highly efficient installations based on BAT which can save one third of the emitted CO₂.

- Decision-makers should increase the potential for new coal-fired power plants by creating a stable, long-term framework.

The use of coal can be compatible with EU environmental targets.
Modernisation and CO₂ capture & storage (CCS)

Continuous power plant modernisation and new CCS-ready plants.

Source: VGB PowerTech e.V.

Photo courtesy of Vattenfall.

Nordjyllandsværket, Denmark

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Carbon dioxide capture and storage (CCS) is important for international climate protection policies; it is expected to deliver one-fifth of very ambitious GHG reductions by 2050.

For CCS to become commercial in the next decades, an EU CCS demonstration network has to be created in the current decade.

The demonstration network does not need high CO₂ prices – it has to be financed by other means.

CCS is needed for all fossil fuels: oil, natural gas and coal.
The way forward

**Competitiveness**
Coal prices are lower and less volatile than oil and gas prices

**Sustainable Development**
Clean coal and CCS must be part of the solution

**Security of Supply**
Indigenous coal plus diverse and well-functioning world markets give security
Thank you!

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