March 2009
PF 09-03

Profiles

Future coal supply prospects

'Coal is found and used in more than 70 countries'

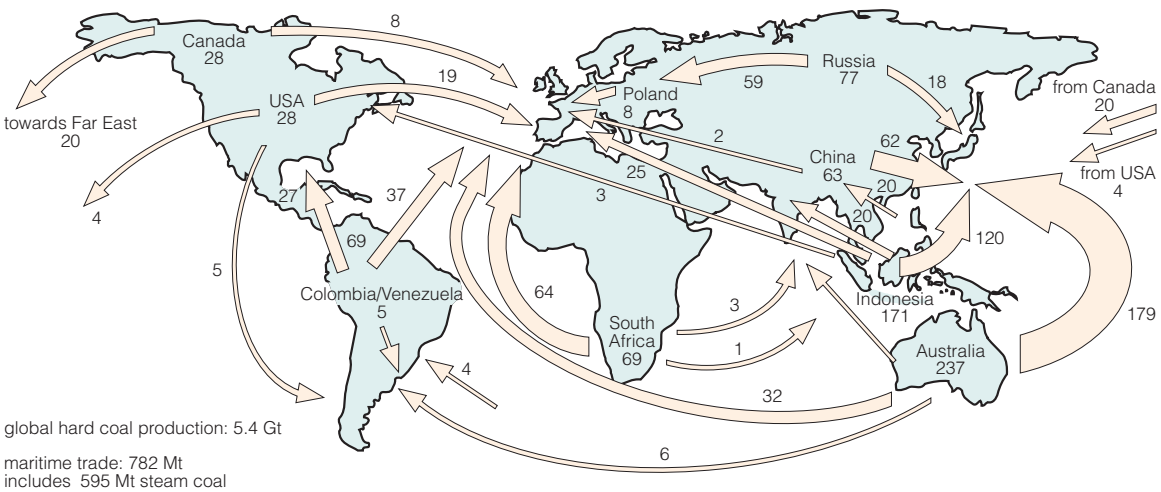
'Australia has the potential to increase production significantly'

'Commercially proven reserves may not be sufficient to meet coal demand in 2030'

This report examines national and international coal supply prospects, to determine that there will be sufficient proven reserves to meet the likely medium to long term demand. Coal is found and used to varying extents in over seventy countries although, at present, the bulk of coal production is concentrated in about ten countries while the hard coal export market is dominated by Australia, Indonesia, Russia, South Africa, Colombia, and, until recently, China and the USA. However, the latter two countries are increasingly becoming net importers due to internal coal production pressures arising from long distance coal transportation problems.

Under current economic conditions, the proven coal reserves are being used at an increasing pace as global demand for coal continues to rise. This is reflected in the increased rate of coal production to meet internal demand and in the higher prices currently being achieved in the global coal market, the latter in part being due to rail and ship infrastructure limitations that are creating bottlenecks and supply constraints. Without such constraints, there is an adequate level of overall operational mining capacity, either for internal supply or for export, to meet current global needs. However, for the future with the expectation of a very significant upturn in demand, it does not appear that the declared commercially proven exploitable reserves will be sufficient to meet the likely coal demand in 2030. At the same time, while it should be possible to bring sufficient additional proven reserves into production, there are many warning signs that, because of time lags within the production process, supply and demand are unlikely to be balanced at certain times during that period of time.

Thus there are short-term limitations in the ability of the major exporting nations, such as Australia, to get additional coal to end users, due to their need to first address the infrastructure limitations. There is also considerable uncertainty as to whether Indonesia and Russia will either be able to, or wish to, maintain their current export output levels, due to their intentions to ensure adequate supplies for internal use. In Asia, the two major nations that are likely to increase imports significantly are China and India, this situation being compounded by China also choking off exports. This will result in a major perturbation within the region, with supplies to other importers such as Japan and Korea possibly being under threat. Also in Europe, which has a level of dependency on imports from Russia, there is a possibility of a shortfall that may prove difficult to make up by increased supplies from the other traditional providers.



Major hard coal flows by sea in 2006

In due course, these short-term limitations are likely to recede. For the longer term many, but not all, of the current major exporters have sufficient indicative reserves together with high expectations of establishing further new reserves, as their mining industries are relatively immature and earlier geological surveys were limited in scope. Consequently, it is very probable that such exporters will be able to expand their mining operations to meet future growth in international trade. In particular, Australia certainly has the potential to increase its production significantly, with some estimates suggesting it can at least triple production by 2050, with Asia being its major market. Colombia and probably Venezuela are expected to become major exporting nations, with a rising share of the market, especially in Europe, assuming that the ongoing regional political unrest can at least be contained. Should supplies from Russia and Indonesia either stagnate or decline, there is also significant potential in countries and states not yet recognised as major coal producers. These include Botswana, Mozambique (exports should commence in 2010), Nigeria, Zimbabwe, Mongolia (assuming a deal is reached with China) and Alaska.

The provision of additional coal supplies will depend on the necessary investment being made both in overall coal production and in expansion of the export market supporting facilities to ensure such coal's timely transportation to the end users. Such investment will be significant. However, except for State controlled organisations, most suppliers do not have an obligation to increase their investment levels, and they will not do so unless a certain measure of return can be achieved. Presumably, the market mechanism will see coal prices rise to an appropriate level. The related point is that many of these suppliers are international traders in a range of commodities. As such, potential coal investments will need to be not only attractive in their own right but also when compared to alternatives. The high coal prices in recent years have not yet spurred major investments in new reserves capacity and supporting infrastructure. This uncertainty regarding investments in coal exploration and production makes it difficult to predict long-term coal market impacts. This is a result of the uncertainties inherent within the global system, which is industrially led and short-term market dominated, that are not conducive to meaningful long-term planning. Given the overriding importance of coal as a key energy source for the foreseeable future, a reliable and transparent basis for taking long-term decisions regarding the future structure of the coal-based component of the global energy system is required.

Until now, the coal production sector has operated with very short term horizons. If coal is to be established as a longer term fuel of choice, there is a need for a change of approach. In order for national governments to prepare robust energy strategies for the longer term, it will be necessary to provide information that firmly supports this expectation. In particular, there is a strong need to firm up information on proven reserves through extensive geological mapping of the existing reserves and the resource base. Linked to this is the need for improvement of existing underground coal mining technologies; and research and development to establish novel coal exploitation technologies, which can give access to non-conventional coal sources that otherwise might not be available.

All of this is expected to have important implications for coal supply and demand patterns in the future. Some traditional suppliers may not remain in the global export business as they will need to first meet internal and local demands. Others may expand their market share significantly while there could well be new entrants to the market, although some of these may not be as reliable as the previous providers. Last but not least, coal production costs are likely to rise in the coming decades, which will be reflected in the price to the end user.

Each issue of *Profiles* is based on a detailed study undertaken by IEA Clean Coal Centre, the full report of which is available separately. This particular issue of *Profiles* is based on the report:

Future coal supply prospects
Andrew Minchener
CCC/146, ISBN 978-92-9029-465-8, 59 pp, March 2009, £255*/£85†/£42.50‡

* non-member countries
† member countries
‡ educational establishments within member countries

IEA Clean Coal Centre is a collaborative project of member countries of the International Energy Agency (IEA) to provide information about and analysis of coal technology, supply and use. IEA Clean Coal Centre has contracting parties and sponsors from: Australia, Austria, Brazil, Canada, China, Denmark, the European Commission, Germany India, Italy, Japan, Republic of South Korea, the Netherlands, New Zealand, Poland, Russia, South Africa, Sweden, Spain, Thailand, the UK and the USA.

IEA CLEAN COAL CENTRE

Gemini House
10-18 Putney Hill
London SW15 6AA
United Kingdom

Tel: +44 (0)20 8780 2111
Fax: +44 (0)20 8780 1746
e-mail: mail@iea-coal.org
> Internet: www.iea-coal.org