



Coal: A bet that could go either way?

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The global coal industry has experienced an incredible decade, with demand growth for this one fuel alone nearly matching the aggregate growth seen across gas, oil, nuclear and all forms of renewables – including hydro, wind biofuels, solar, etc (Figure 1). Even in percentage terms, growth in coal use over the decade outpaced growth in renewables, although this was a time of take-off for many and they started from a low base. The importance of coal in the global energy mix is now the highest since 1971. It remains the backbone of electricity generation and has been the fuel underpinning the rapid industrialisation of emerging economies, helping to lift hundreds of millions of people out of energy poverty.

But, when looking to the horizon, many questions remain and the outlook may well have some uncertainties. This is because coal is a carbon-intensive fuel and the environmental consequences of its use can be significant, especially if it is used inefficiently and without effective emissions and waste control technologies. Government decisions reflecting their judgements as to the balance between the relevant social, economic and environmental considerations, particularly their success in encouraging the development and deployment of clean coal technologies, are crucial to the future pattern of coal demand.

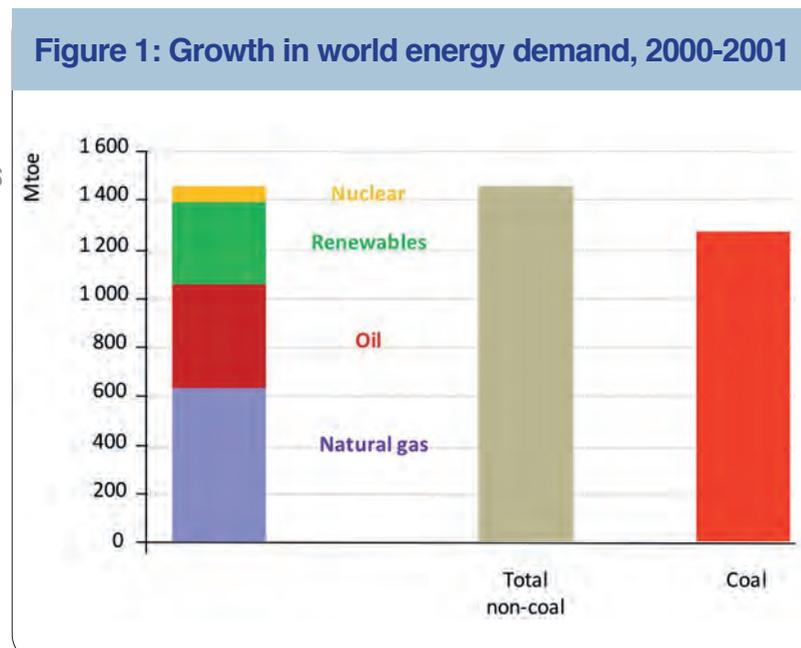
This is reflected by the wide difference in projections for coal demand across the three scenarios presented in the IEA's *World Energy Outlook 2011* (Figure 2). Maintaining current policies would see coal use rise by a further 65 per cent by 2035, overtaking oil as the largest fuel in the global energy mix. In the central scenario for the Outlook – in which recent government policy commitments are assumed to be implemented in a cautious manner even if they are not yet backed up by firm measures – global coal use rises for the next ten years, but then levels off to finish 25 per cent above current levels. In the 450 Scenario, which assumes much stronger policies to achieve the goal of limiting the long-term global temperature increase to 2°C, coal demand peaks before 2020 and then falls sharply.

One factor, however, is constant: non-OECD Asia, especially China and India, are set to dominate the global picture of future coal use, whatever its level. China is by far the world's biggest coal producer and has massive resources. Its consumption of coal is almost half of global demand and its Five-Year Plan for 2011 to 2015, which aims to reduce the energy and carbon intensity of the economy, will be a determining factor for world coal markets. China has long been a net exporter of coal, so the speed and magnitude of its emergence as a net importer in 2009 –

which in some ways could be seen as analogous to Saudi Arabia becoming an oil importer – had a major impact on traded coal markets. It contributed to rising prices and new investment in exporting countries, including Australia, Indonesia, Russia and Mongolia. But it would take only a relatively small shift in domestic demand or supply for China to become a net-exporter again, competing for markets against the countries that are now investing to supply its needs.

India – currently the third-largest coal user worldwide behind China and the United States – is likely to see continued rapid expansion in coal demand in the absence of radical policy change. India's coal use, which increased by about 80 per cent between 2000 and 2010, is expected to more than double by 2035 as it displaces the United States as the world's second-largest coal consumer. Over 60 per cent of the rise comes from the power sector, reflecting the enormous latent demand for electricity across the subcontinent. Consequently, India is poised to become the

Source: World Energy Outlook 2011



world's biggest importer of coal soon after 2020, as rapid demand growth is likely to outstrip domestic supply. In other words, India is set to become the new China as far as coal imports are concerned.

So it is clear that energy and environmental policy will play a decisive role in future coal use. In some countries, its use may be deliberately encouraged for economic, social or energy security reasons. For instance, if action were taken to provide electricity access by 2030 to the 1.3 billion people in the world without it today, coal would be expected to account for more than half of the fuel required to provide additional on-grid connections. In other countries, policies may be designed to encourage switching away from coal to more environmentally benign or lower carbon sources, such as through air quality regulations or carbon penalties. While a global agreement on carbon pricing has been elusive, a growing number of countries are taking steps to put a price on carbon emissions, including China where there are several pilot schemes underway.

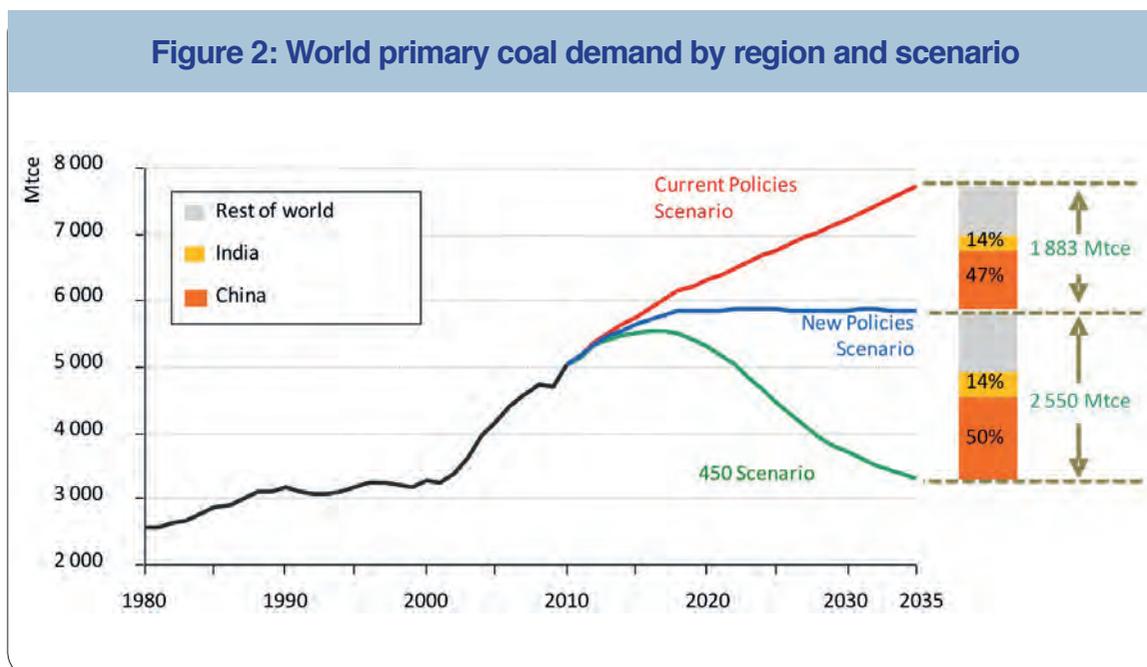
In terms of technology, the widespread deployment of more efficient coal-fired power plants is an essential first step for the longer term use of coal. This needs to be a high priority, especially where power plant fleets are being rapidly expanded. If the global average level of efficiency of coal-fired power plants were 5 per cent higher than expected, such an accelerated move towards more efficient technologies would lower global carbon dioxide emissions from the power sector by 8 per cent. In reality, the penetration of the most efficient coal-fired power generation technologies is constrained by barriers such as financing, the absence of a

carbon price and technical considerations.

In the longer term, the deployment of carbon capture and storage (CCS) technology on a significant scale is another potential “game-changer” for coal. If widely deployed, CCS technology could potentially reconcile the continued widespread use of coal with the need to reduce carbon dioxide emissions. While the technology exists to capture, transport and permanently store these emissions in geological formations, it has yet to be demonstrated on a large scale in the power and industrial sectors and so costs remain uncertain. The current picture is still one in which many legal, regulatory and economic issues need to be resolved. The experience yet to be gained from the operation of large-scale demonstration projects will be critical to driving down the costs and reducing efficiency losses and, hence, the prospects for widespread deployment of CCS.

Taken together, the widespread adoption of more efficient coal power plants and of CCS would help secure the position of coal in our future energy mix and make an important contribution to tackling climate change. But without these technologies, the world will need to move gradually away from coal towards low-carbon technologies, seeing global coal demand and coal's share of the energy mix decline in the process. □

Figure 2: World primary coal demand by region and scenario



Source: World Energy Outlook 2011