EXECUTIVE SUMMARY

Business as usual

In line with the trend over the last decade, coal was once again the largest growing source of primary energy in 2011, with incremental consumption over 50% higher than oil and gas incremental demand combined. Coal demand grew by 4.3% from 7 080 million tonnes (Mt) in 2010 to 7 384 Mt in 2011. Consequently, coal strengthened its position as the second most important source of primary energy behind oil, accounting for approximately 28% of total primary energy consumption. Growth in coal consumption is almost exclusively determined by non-OECD countries, particularly China and India, where demand continued to surge in 2011. Population growth and rising per-capita electricity consumption – fuelled by strong economic performance – are key drivers of coal consumption among these emerging economies. In contrast, coal demand among OECD countries decreased in 2011, falling below consumption levels reached in 2000.

China is coal. Coal is China. China is by far the world's largest producer and consumer of coal, and accounts for more than 45% of both global totals. China accounted for more than three-quarters of incremental coal production in 2011 and domestic consumption was more than three times that of global trade in the same year. Domestic coal transport by rail was more than twice as high as consumption in the United States, the world's second-largest consumer of coal. Domestically shipped coal in China comprises more than half of the global seaborne trade. Yet, this also works the other way round: as China's primary supply of energy, coal dominates power generation, power capacity and indigenous energy production. Therefore, development of the global coal market will largely be driven by China through its economic growth, investments in infrastructure, energy diversification and energy efficiency programmes and policies, coal-electricity pricing policy and developments in the Chinese coal mining sector.

The winds of change …

China replaced Japan as the largest coal importer in 2011. Similarly, Indonesia replaced Australia as the largest coal exporter in the same year on a tonnage basis. Japan and Australia both held top place for nearly three decades. However, China now drives development of the global coal trade on the demand side and Indonesia is an important player on the supply side. Since the turn of the 21st century, Indonesian coal exports increased on average by 18.4% per year. Due to abundant reserves, cost competitiveness, transport infrastructure availability and, in particular, its proximity to coal importing countries in Asia, Indonesia accounted for almost half of the total seaborne coal market growth over the last 11 years. In 2011, both Japan and Australia experienced natural disasters which hampered their coal consumption and supply. The Great East Japan Earthquake destroyed part of the Japanese fleet of coal-fired power generation plants, while heavy floods in Australia cut exports from Queensland for several months.

The global trade of off-spec coal gained more importance in 2011, with trade volumes exceeding 200 Mt. So-called off-spec coal was increasingly traded in 2011. This includes sub-bituminous Indonesian coal and high-sulphur coal from the Illinois basin in the United States, as well as low calorific value coal from traditional exporters such as Australia, South Africa and Colombia. Triggered by low freight rates, flexible boilers, increasing blending practices and utilities struggling to avoid financial losses in countries with low regulated electricity prices, the demand for off-spec coals

increased further in 2011. Utilities in China, India and Korea, for example, can often burn these coals without losing much in terms of efficiency, and thus take advantage of the relative price discount this lower-quality coal usually incurs.

US shale gas switches on coal in Europe

The shale gas revolution in the United States has resulted in a significant gas-to-coal switch in Europe. The abundance of natural gas in United States (an increase of 127 billion cubic metres from 2006 to 2011) put downward pressure on US natural gas prices, with monthly Henry Hub prices dropping below the USD 2/MBtu line in April 2012. This has caused a marked switch from coal to natural gas in power generation in the United States over the past two years. As a consequence, miners announced production cuts and layoffs, and some mines in the United States were mothballed. At the same time, large quantities of thermal coal found their way into European markets. With US coal exports to Europe rising, the Atlantic market, particularly Europe, faced a situation of oversupply, which caused coal prices in Europe to plummet from USD 130/tonne (t) in March 2011 to USD 85/t in May 2012. Subsequently, low coal prices, supported by a low CO_2 price, resulted in a significant gas-to-coal switch in Europe.

While a gas-to-coal switch in Europe is a rather short-term phenomenon according to projections, the coal-to-gas switch in the United States is a sustained trend. Our price assumptions for coal and gas price development offset the current imbalance in favour of coal in Europe, with gas recovering its position by 2017. Coal demand among OECD countries in Europe is projected to increase on average by a mere 0.4% per year during the outlook period (from 2012 to 2017), with the bulk of this increase from growth in coal demand in Turkey. This figure is lower than the projected growth of natural gas consumption among European OECD countries in the IEA *Medium-Term Gas Market Report 2012*. In the United States, however, the decline in coal consumption is projected to continue as a consequence of the relative price of both gas and coal, and the retirement of coal-fired power plants due to environmental regulation.

From Beijing to New Delhi?

In the Base Case Scenario (BCS), India is the second-largest coal consumer by 2017 and the largest seaborne coal importer by 2016. Coal consumption increases strongly over the outlook period in India, driven by rising power generation. Together with a decline in US consumption, India surpasses the United States as the world's second-largest coal consumer. However, this surge in coal consumption is not matched by production growth from domestic mines, causing strong growth in imports. This trend is consistent with the expectation that Coal India Limited, India's largest coal producer, is not likely to significantly improve its operational efficiency. As a result, India's imports are projected to grow faster than in any other country. Yet, in terms of total import volume, *i.e.* overland imports from Mongolia, China holds its position as the world's largest importer in the BCS. In the Chinese Slow-Down Case (CSDC), India is by far the world's top importer of coal by the end of the outlook period.

Australia is the world's largest exporter of coal in the BCS. With energy adjusted exports, Australia remains the world's largest exporter of coal and will hold onto its top position until the end of the outlook period in the BCS. Australia's export strength is underpinned by investments in both existing mining regions, such as the Hunter Valley, Bowen and Gunnedah basins, and in new basins, such as the Surat and Galilee basins. Hence, export growth in Australia is projected to outperform Indonesian

export growth if China's import demand remains strong. In the CSDC, some high-cost operations in Australia are expected to become extramarginal, and hence, Australian exports decrease relative to the BCS. In contrast, Indonesian coal exports profit from a lower cost structure throughout the entire coal value chain and, consequently, are less affected by the CSDC.

Only China can stop the traffic

In the BCS, Chinese coal consumption is projected to account for more than 50% of global coal demand by 2014. In this scenario, global coal demand grows from 5 279 million tonnes of coal equivalent (Mtce) in 2011 to 6 169 Mtce in 2017 (17%) and is driven by non-OECD countries over the outlook period with an annual growth rate of 3.9%. China leads this growth in absolute terms with additional coal use of 638 Mtce. Remarkably, this figure is just 5 Mtce lower than demand in India in 2017, which is the second-largest consumer and has the fastest growth in demand over the outlook period (6.3% per year). In the CSDC, total coal use in China grows on average by 2% per year over the outlook period to reach 2 881 Mtce in 2017. Total Chinese coal use is 309 Mtce lower in 2017 in the CSDC than in the BCS.

We have built a CSDC to assess the effect of a potential slow-down in Chinese economic growth on the global coal market. In this scenario, seaborne coal trade peaks in 2016 and declines thereafter**.** Yet, total seaborne coal trade still grows on average by 2.3% per year over the outlook period, whereas coal demand is projected to increase on average by only 1.8%. After three decades of near continuous growth (with a minor exception in 2008), the seaborne coal trade is projected to decline in the CSDC, as a consequence of falling Chinese imports in 2017 to one-third of their 2011 levels. Supply of metallurgical coal on the international market is significantly more concentrated than for steam coal, with Australia, the United States and Canada accounting for more than 80% of total trade volumes, although Mongolia and Mozambique are projected to increase their exports significantly.

Two steps forward, one step back

Recent years of high coal prices and high margins have triggered mergers and acquisitions, as well as healthy investments throughout the coal value chain. The global coal market has experienced increased buying activity in recent years. Chinese and Indian companies have played an important role in merger and acquisitions in order to ensure secure coal supply. As a result of this activity and fuelled by high prices in recent years, particularly in the metallurgical coal market, mining and port expansions projects are sufficient to meet demand and import needs in the BCS. Australia and Indonesia lead investments, with Colombia and, to a lesser extent, Russia and South Africa completing the picture. Yet, Indonesia is not likely to continue its recent ramp up over the coming years.

However, current low prices and big uncertainties make investors cautious. Some companies have already announced the possibility of layoffs and the slow-down of investments. Investment has been particularly hampered by uncertainties surrounding the European sovereign debt crisis, concerns about the development of the Chinese economy and the fall in US coal prices. Considering the significant lead time needed to ramp up supply, through simultaneous mine and transport infrastructure development, decelerating development projects might lead to tightened international coal markets during the outlook period.