

POLICY WATCH:

Coal resists pressure

Calls to curtail exploitation of coal reserves are rife, but the industry has other ideas — **Sonja van Renssen** explores the issues.

Coal consumption is under pressure the world over, from air pollution and climate policies to slowing economic growth in China and growing competition from renewables, to a persistent oversupply that keeps prices low. Yet in 2013 more new energy entered the system from coal than any other fuel and increases in use outpaced oil and gas¹. “With current policies and investments, the next five years are most consistent with the first five years of a six-degree [temperature rise] scenario,” says Laszlo Varro, Head of Gas, Coal and Power Markets at the International Energy Agency (IEA) in Paris. There are still over 100 years of coal reserves left in the ground (<http://go.nature.com/p87sFX>).

One country is pivotal to the future of coal: China. It drove most of the over 50% growth in global coal demand — almost half the world’s increase in energy needs — in the decade to 2013². The IEA predicts that Chinese coal demand will continue to increase by 2.6%, or more than 100 million tonnes, per year from 2015 to 2019¹. This is

far from the double-digit growth of the past decade. “But this is not peak coal,” warns Varro. “Globally, we still see quite robust growth and significant new investments.” In its baseline scenario up to 2040, however, the IEA expects global demand for coal to grow by just 0.5% a year on average, finally making up about a quarter of global energy supply. This scenario — the one that current and planned policies put us on track for — could result in 3.6 °C of global warming².

The IEA expects coal use in China to peak by 2030. Other experts expect it earlier. “We see peak thermal coal in China by 2016,” says Tim Buckley, Director of Energy Finance Studies for Australasia at the US-based Institute of Energy Economics and Financial Analysis. “And when China peaks, the world peaks³.” Buckley identifies slowing Chinese economic growth, greater energy efficiency (breaking the link between growth and electricity consumption) and a big push to diversify away from coal as the main reasons. (Thermal coal is used mostly in power production but also in industries such as

cement. Only the iron and steel sector uses a different kind of coal called ‘coking coal.’)

Varro says different predictions stem first and foremost from different assumptions about the Chinese economy. A significant slow-down in construction could bring peak coal consumption forward, for example. Half of Chinese coal goes to industries such as steel and cement (versus 90% to the power sector in developed countries).

“In China, to control air pollution means to control coal,” says Sylvie Cornot-Gandolphe, an associate research fellow at the French Institute of International Relations in Paris. “It’s really a revolution.” In September 2013, China released a plan to curb air pollution with the first-ever provincial coal consumption caps⁴. If all goes as planned, these measures should also cut CO₂ emissions by 700 million tonnes below business-as-usual by 2017 (more than the entire EU’s Kyoto Protocol reduction) and bring China “almost” in line with a 2 °C scenario, says Li Shuo, a campaigner with Greenpeace China⁵ (Fig. 1).

Last November, China also issued a new national energy strategy for 2014–2020 that caps coal consumption at 4.2 billion tonnes in 2020, up from 3.8 billion tonnes today⁶. It proposes to grow the share of non-fossil fuels (renewables and nuclear) in the primary energy mix to 15% from 10% in 2013. These goals are expected to be incorporated into China’s 13th Five Year Plan for 2016–2020, which could also extend the local air pollution measures. “Capping coal consumption will definitely be in it — it almost made it into the 12th plan,” says Changhua Wu, China Director for The Climate Group, an international non-profit group that promotes a low-carbon future. “From the perspective of climate policy, it’s the biggest piece of the puzzle.”

A peak in coal use does not equal a peak in CO₂ emissions, however. “If China really wants to peak CO₂ emissions by 2030, they have to peak coal use by 2020,” says Cornot-Gandolphe. She believes this is possible, as do Li, Buckley and others. But the international coal industry has a different idea. Demand has gone up and down in the past and they believe this is

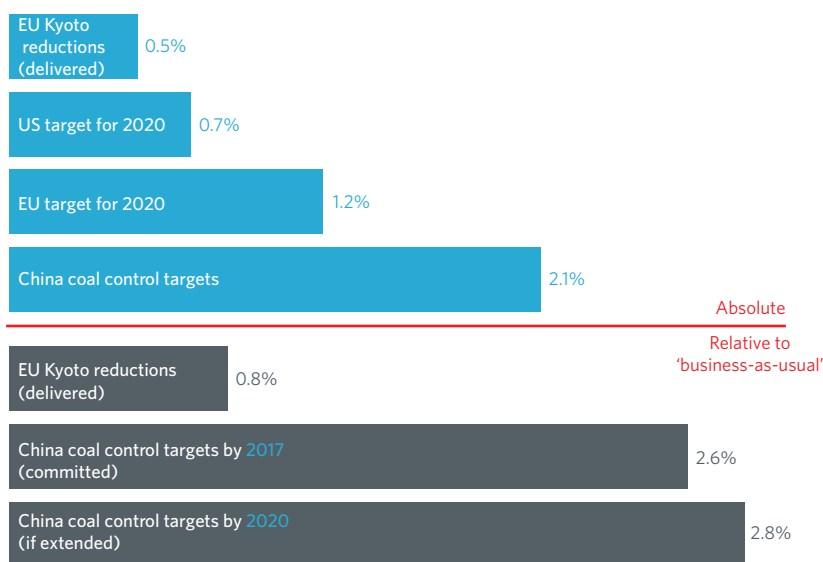


Figure 1 | Potential CO₂ reductions from China’s coal control measures compared with EU and US climate targets per year. The CO₂ cuts foreseen in the provinces covered by China’s coal consumption targets compare with or exceed efforts by the EU and US. Figure reproduced with permission from ref. 5, © 2014 Greenpeace East Asia.

another cycle. “Our view is that the current supply overhang will wash out and a supply gap will open up in the next 3–5 years,” says Brendan Pearson, CEO of the Minerals Council of Australia. “We see no problem with demand.”

Coal suppliers have struggled with an oversupplied market since 2011. Locked into take-or-pay contracts for infrastructure use, “many producers operate with negative margins,” reports the IEA. Yet Pearson looks to a new up swell in demand, also from China. “China has exceeded its projections on coal use every time,” he says. “It’s rapidly developing one of the most modern coal generation fleets in the world.” China’s air pollution policy is targeting local, low-grade coal mainly used in heating — if anything, this is good news for Australia’s high-quality exports, Pearson says. Cornot-Gandolphe sees China shutting down small, old, dirty power plants in the east and opening up big, new, efficient plants in the west.

After China, India and Southeast Asia are set to become the biggest drivers of coal demand. “India’s coal mining plans may represent the biggest obstacle to a global climate pact,” reported the New York Times in November 2014⁷. The IEA predicts that India will become the second largest coal consumer, overtaking the US, within the next five years. “There will be a gap [between electricity demand and supply] that has to be met with fossil-fuel power generation,” says Krishnan Pallassana, India Director at The Climate Group. “But the issue is what type of coal and is it efficient enough?”

The big problem in India is poor-quality coal and old power plants. Pallassana believes that coal will remain the main source of electricity generation for the next 20 years, but that there is “huge scope” to use it more efficiently — and curb CO₂ emissions. Like China, India is also pursuing alternatives to coal. The latest government doubled an existing tax of 50 rupees (US\$0.80) per tonne of coal mined or imported, to further finance a national Clean Energy Fund. It also increased India’s solar target for 2020 fivefold from 20 to 100 GW.

Yet there persists a firm belief that however alternatives develop, coal is essential: “If you want to improve access to energy, the alternatives take time. Coal-based power generation has idle capacity,” explains Nitya Nanda, a fellow at The Energy and Resources Institute (TERI) in New Delhi. Some argue that for initial energy access, local renewables and micro-grids are much cheaper than building grid connections to a coal-fired plant⁸. Varro points out that for the later stages of access, however, decentralized solar power is unlikely to suffice in a country such as India.

The two parts of the world where coal is in irreversible structural decline according to the IEA is the US and Europe. Half of US power generation came from coal until 2008, when the tide turned: an old fleet of coal-fired power stations, higher production and transport costs, new competitors (shale gas and renewables) and tougher air pollution standards drove a decline in coal use. “Half the 30% cut in greenhouse-gas emissions from power plants [envisaged by the draft Clean Power Plan] has already been achieved,” says Jeff Deyette, Assistant Director for Energy Research and Analysis at the Union of Concerned Scientists in the US. Deyette and his colleagues calculate that 65 GW of power from coal is “economically vulnerable”, on top of the 70 GW of power capacity already closed or announced for closure since 2009 (J. Defeyette, personal communication). Together, all this adds up to well over a third of the country’s coal-fired capacity.

Developments in the US displaced coal to Europe, where it enjoyed a brief upsurge in use, helped by the German nuclear phase-out, high gas price and low carbon price. But after 2012, the IEA charts a decline in demand, which it attributes among others to energy efficiency gains, more renewable energy production and coal plant retirements. A wave of the latter is expected in the next decade due to new air quality rules. European state aid for coal mining is supposed to end in 2018. The EU carbon price is likely to go up. Carbon capture and storage (CCS) remains a distant dream. And Europe has committed to cut its greenhouse-gas emissions by 40% by 2030.

No wonder EURACOAL, representing the European coal industry, has issued a position paper¹⁰ entitled ‘Why less climate ambition would deliver more for the EU’. It argues that coal can enhance security of supply, deliver cost-effective emissions reductions (30% at older plants), and be just as flexible a partner to variable renewables as gas. But it is telling that German utility E.ON is spinning off its conventional power generation business, while Swedish utility Vattenfall has put its entire German lignite operations up for sale. Why? “We want to decrease our exposure to CO₂” explains new Vattenfall CEO Magnus Hall.

“Lower [CO₂] emissions and coal use are not mutually exclusive,” argues Pearson from Australia. Current technologies such as ultra-supercritical boilers can already cut coal’s emissions by 30–40%, he says, with the promise of even greater reductions to come. For coal, CCS is the holy grail — and its proponents point to the Boundary Dam project in Canada, the first large-scale CCS project in the power sector — but costs

remain in the billions, projects thin on the ground and the CO₂ is often pumped back into old wells to get fresh oil out¹¹.

US-based Ceres, which mobilizes investors to act on climate change, sees coal bearing the brunt of the stranded assets debate fallout¹². “There are indications that larger, diversified mining companies such as BHP Billiton are likely to sell their coal assets,” says Dan Bakal, director for Electric Power at Ceres. Unlike for oil in transport, the alternatives to coal — think solar or wind — are better developed. Bakal’s advice is simple: “They really should consider becoming energy companies. I don’t see why coal companies couldn’t get involved in geothermal energy for example, in addition to advancing CCS for coal.”

Coal has received huge subsidies in the past and, in Europe, public support for it still equalled that for onshore wind in 2012¹³. But development banks are ending funds for coal projects, the IEA believes fossil-fuel subsidies fail to help the poor, and air pollution and climate policies are curbing coal and boosting its competitors. “There’s too much demand for energy and too much interest among exporters and consumers to solve the [air and CO₂] emissions problem for coal to go away,” believes Pearson. Certainly in the developed world, coal is as much a social as an energy issue. “There are no high profits like those for oil and gas but there are a lot of jobs,” says Cornot-Gandolphe. In the emerging economies, most notably China, any peak in coal consumption would most probably be followed by a long plateau. □

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