Jeremy Carl and Richard K. Morse, Program on Energy and Sustainable Development, Stanford University, US, argue that the role of Government is set to transform the 21st century coal market.
The coal market is in the midst of radical change, with coal now the world’s fastest-growing source of fossil fuel. But the forces shaping this growth are about to change the rules. In Europe and America a new regime around carbon, which alters the economics of power generation to coal’s disadvantage, is emanating from the highest offices of Washington, Brussels and the UN.

Climate policy is set to play a leading role in determining who uses coal and where. Meanwhile China and India, themselves not immune to these environmental debates, are poised to reshape the next three decades of the coal trade through aggressive growth in their coal consumption. The rules that these countries play by are different—Governments, not markets, are going to determine the growth patterns of the new coal market. Coal has become such a critical component of each country’s development strategy that decisions on the future direction of each country’s market are increasingly being made by the highest levels of Government. At the Program on Energy and Sustainable Development at Stanford University, the authors are conducting a wide-reaching examination of the rapidly evolving global market and the potentially disruptive trends that may dramatically change the market’s trajectory. What follows is a discussion of each of these four primary coal markets (EU, China, India and the US) and the dramatic changes that could affect their future.

The EU
Europe’s long love affair with coal is on the precipice: the carbon vice is tightening; gas is cleaner and now cheaper; and favourable renewables policies are knocking coal plants out of the merit order. The decline of coal in Europe would be almost inevitable if not for one great wildcard: CCS. In fact, more than just preventing coal’s decline, CCS could usher in the greatest coal era in European history. Existing carbon capture technology is a burden for generators, but a boon for coal producers. It boasts an energy penalty estimated between 20–30%, meaning that around 20–25% more coal will be required to generate the same amount of electricity produced from coal today if CCS were widely deployed. Thus the future of coal in Europe is now confronting two extreme and opposite scenarios: either coal dies a slow death of attrition, or the business of burning coal in Europe undergoes a spectacular renaissance. And it all hinges on a complete unknown: the commercial viability of capturing CO₂ from coal-fired plants and storing it underground.

The future of CCS in Europe is opaque, but one thing is clear: if there is one critical actor it is Government. European Governments must deliver on two particular fronts to reduce CCS risks, if the technology is to have a future beyond PowerPoint presentations in Brussels. First, they must provide better economic incentives. The difference between volatile EU emission allowance (EUA) prices and the cost of CO₂ abatement with CCS is on the order of €20–55/t of avoided CO₂, and neither the private sector nor the carbon market can close that gap on their own any time soon. Second, Governments must bypass the regulatory gridlock and come up with coherent policy around the regulation and liability for CO₂ storage. Vattenfall’s Schwarze Pumpe CCS plant, intended to be the world’s first fully integrated CCS facility, has ended up venting the CO₂ it spends so much money capturing straight into the atmosphere, because local communities are blocking underground storage. Even if the financial challenge could be met, regulation must still confront the sizable challenge of overcoming profound ‘numbyism’ (not UNDER my back yard) in Europe.

On paper, Governments seem to be stepping up to the plate. The EU’s official target is to develop 10–12 CCS plants by 2015. Dedicated finance from the eventual sale of 300 million EUAs (at market price) and €1.05 billion in stimulus money has been made available for CCS funding. The UK has said it intends all new coal plants to have CCS capability and is holding a contest to provide CCS funding to early investors. Germany has drafted a CCS law (but not passed it). These are all credible first steps. But all of these efforts are behind schedule and the financial commitments are woefully short of the €350–600 billion the IEA suggests it will likely require to deploy CCS in European power markets widely enough to hold warming to two degrees. Whether Governments can rise to the occasion and find credible solutions to these issues will largely determine the future of CCS—and coal—in Europe.

China
In the first half of 2009, China imported a record 48.2 million t of coal. Many analysts are now predicting the world’s largest coal producer is on the verge of becoming a net-importer—a shift that could radically alter the Asian coal trade. Forget the export quotas: going forward, traders need to watch CIF Guangzhou sourced from Qinhuangdao, Newcastle, and Kalimantan. At the most basic level, China’s spike in imports was driven by a favourable Qinhuangdao-Newcastle spread that everyone in power-hungry South China was eager to profit from. Global trade flows in the coming decades will be directly impacted by this longer-term relationship between China’s domestic market (which is 42% of global production) and the rest of the world. And the terms of this relationship are likely to be dictated from inside China by the complex web of China’s coal and power sector governance.
The coal price in China has only been fully liberalised since 2002, and already Beijing cannot control the consequences. Key provinces like Shanxi are increasingly flexing their muscles in dictating coal prices from the provincial level, shutting in production and stepping up safety regulations in order to boost prices along the major supply chain routes to Qinhuangdao. The decentralisation of regulatory power is shifting where coal prices come from inside of China. This is becoming a problem for Beijing, which maintains a tight grip on coal’s biggest consumer, the state-owned Big 5 power generators, by keeping power tariffs artificially low to promote top political goals of social stability and GDP growth. In 2008 the Big 5 lost 40 billion because coal was worth more than power. This fundamental imbalance drove Chinese buyers to the international market, after generators refused to pay the domestic coal price and national coal negotiations broke down in late 2008. For the foreseeable future, China’s energy markets are partially a function of Beijing’s political priorities. And as China’s role in the international market becomes ever larger, the politics of China’s transitional economy are shaping up to play an ever larger role in how the rest of the world buys and sells coal.

India

Indian steam coal imports are set to break another record in 2009 as domestic producers struggle to keep up with demand growth despite increasing market-oriented reforms. State-run Coal India Ltd, which produces 85% of India’s coal, will likely soon be listed on public markets in the culmination of a years-long reform process. Captive mining by private companies for their own usage is also at long last taking off. Both processes are being driven by India’s staggering power deficits (currently over 16% at peak demand), which are largely driven by potentially crippling nationwide coal shortages.

While India’s official long-term coal production growth projections are rosy, in reality, domestic growth is powerfully constrained by environmental and security difficulties, and especially by land rights issues in an extremely land scarce country. The antiquated state-run railway system may also prove to be a major bottleneck in a significant production expansion. If India cannot overcome these problems, the longer-term “400 million tpa imports” scenario occasionally whispered about by Government officials is a real possibility.

Meanwhile, five coastal ultra mega power projects (4000 MW each) at various stages of approval or construction will by themselves lock in additional imports of 60 – 75 million tpa for decades. These projects alone, which were approved by the highest levels of the Indian Government as a strategic decision to increase power production, will ensure that India will be a major coal importer for more than a generation.

India’s power and coal shortages and the intense political pressures they create are leading to an unprecedented shift in power from the coal ministry to the top levels of the Government, exemplified by Prime Minister Manmohan Singh’s takeover as acting coal minister during the latter half of his first prime-ministerial term. While at one time developing good relations with the Coal Ministry and a select group of well-connected firms was sufficient to be a successful player in the Indian marketplace, the new Indian market will be dominated by a radically different set of players. At this point, key policy decisions taken at the highest levels of India’s Government (often on matters not explicitly related to coal, e.g. port and rail infrastructure, nuclear power, natural gas imports, and environmental protection and land rights) will likely determine whether India’s longer-term import future is a 100 million t or a 400 million t one. If the latter occurs, India will change the entire balance of trade in the Atlantic and Pacific basins. The recent rerouting of reliable South African exports from Europe to India offers a potential foretaste of this dynamic.

The US

As in Europe, the authors believe that without the development of commercially viable CCS technology, the era of substantial coal power expansion in the US is over. The Massachusetts vs. EPA Supreme Court case of 2007 (which gave the EPA the power to regulate CO₂ as a pollutant) was a crippling blow to the industry that ensures that, whether a climate bill passes in the US or not, burning coal is going to get much more expensive.

The US, like Europe, is holding its breath and waiting to see if CCS is a reality. But so far the American funding commitment to CCS totals about US$ 5 billion – less than the European commitment and still without a carbon market to back it up. At the same time, the Sierra Club and other environmental groups have managed to kill nearly every new proposed coal plant in the last several years by playing to both local and global environmental fears, and even more importantly, using constant legal threats and lawsuits to effectively tie up new coal projects.

Even for existing plants, coal’s long-safe position in the merit order of American power production is in jeopardy. Massive new supplies of inexpensive natural gas are displacing large amounts of coal. In May 2009, coal burn was down a record 14.8% year-on-year (the fifth consecutive month of historic declines). The increasing mainstreaming of alternative power sources and continued subsidies have made the US the world’s leader in installed wind capacity. And regulatory uncertainty around carbon only accelerates these trends towards a less coal-dependent America.

But US coal could have an “escape route” through Asia, and major Powder River Basin (PRB) producers have started to hint that they are actively developing this contingency plan. For US coal producers, the equation may be that “carbon constraints + abundant and cheap natural gas = sending PRB coal to Asia”, especially if rail infrastructure to expanded Western ports is improved. The fact that this once outlandish idea is gaining credence is a telling indication of where the future of American coal is headed.

The global coal market is poised to see phenomenal growth in the next twenty years. But this growth is likely to be geographically uneven, and those who assume that the new coal market will play by the old rules are sure to be left behind. Governments, especially acting through environmental and development policy, are now in the driver’s seat. Market players who can skillfully navigate the hybrid market-Government terrain will be the winners in the 21st century coal market.