China’s Coal Questions

Ligang Song and Jie Tang*

Coal questions are not new. In his 1865 book on *The Coal Question*, William Stanley Jevons anticipated that Britain’s supremacy over global affairs was transitory, given the finite nature of coal, its primary source of energy at that time. While Jevons’ prediction about Britain’s supremacy proved correct, coal, together with other sources of energy especially oil, continued to fuel waves of industrialisation in major world economies for another 145 years. With China now at the centre stage of global industrialisation, it faces its own coal questions not only with respect to its sustainability but also, importantly, with respect to its impact on the environment. This additional dimension raises significant issues about the way coal is used from now on as an important source of energy.

China’s modernisation drive represents the latest case where growth potential at the frontier will be tested against the finite supply of natural resources. The current phase, scale and future trajectory of China’s industrialisation all indicate that China’s future demand for resources is unprecedented in terms of both quantities and varieties. China itself is rich in resources, but its levels of major resource endowments on a per capita basis are much lower than world averages, except for coal (and iron ore). For example, China’s petroleum resources on a per capita basis are just above 10 per cent and natural gas less than five per cent of the world average, but its average level for coal is above 50 per cent of the world average level. China’s coal reserves are believed to be nearly 14 per cent of the total world reserves, and its annual production (about three billion tonnes) in 2008 accounted for as high as 41 per cent of the total world coal production in that year. Despite producing large quantities of coal, China’s domestic supply of coal is still not sufficient to meet rising demand and China became a net importer of coal for the first time in 2009, with Australia as the largest source of coal imports.

This trend of increasing demand for coal in such magnitude raises a number of important questions. First, is the issue of the nature of obligations present generations have to future generations in the face of resource depletion. The large scale of domestic supply mean China’s proved coal reserve/production ratio at merely 41 now is much lower than the world average of 122. (BP Statistical Review) This timeframe may be long enough to see the completion of China’s industrialisation, at least in the traditional sense, but is rather short considering the need for meeting the demand for resources for future generations - unless of course some alternative sources of energy are made available or new reserves of coal continue to be found in future.

Second, prices will adjust to the rising demand. Surges in coal prices have occurred in recent years, with the thermal coal price in Australia increasing from about US$25 per tonne in early 2003 to almost US$200 per tonne in July 2008. This increase in prices happened when China was still a net exporter of coal. Coal prices plummeted during the economic crisis (2008-2009), but recovery is under way and growing demand from China will strengthen the trend of increasing coal prices which in turn will stimulate supply capacity in the world market for coal.

Third, rising coal prices could also encourage technological change and resource substitution in terms of changing energy mix, and in combination with resource scarcity. Coal accounts for 70 per cent of China’s energy consumption now, compared with the world average of 29 per cent. The significance of coal for China now is similar to that for Britain in 1865. China will not substantially reduce the share of coal in its total energy consumption unless it is economical to do so. The changes in relative prices of coal over other sources of energy could be the key determinants for China to begin making the adjustment which eventually leads to the shift of its energy consumption towards renewable resources. In the period of transition, it is also important to develop and put into practice elements of clean coal technology out of concern for the environment.

Fourth, both production and consumption of coal have strong impacts on the environment. Coal production causes land subsidence, which in China totaled to thousand hectares at the end of 2006. Land subsidence destroys buildings and underground water systems, leading to dramatic changes in the ecological
environment. Enormous waste left after coal production is one of the major forms of solid waste. Combustion of coal has been the major source of increasing carbon emissions in China whose total emissions surpassed the United States and accounted for 21.8 per cent of global emissions in 2008. China has made progress in reducing sulphur dioxide emissions, which have declined from 25.9 million tonnes (the peak) in 2006 to 23.2 million tonnes in 2008 despite the fact that coal consumption grew by 15.7 per cent over this period. The decline of soot and dust emissions was much larger. China needs to make greater efforts to reduce carbon dioxide emissions.

Fifth, the way in which coal resources are used also relates to China’s domestic market reform and structural changes. For example, the electricity sector consumed more than 50 per cent of China’s total coal output. China’s coal prices have been relatively liberalised, now closely aligned with changes in international prices, while the prices for the downstream electricity sector are still controlled by the government. Although the surge in coal prices benefits coal producers, it causes huge losses for the power plants. Reforming the pricing system for electricity in line with changes in the upstream coal prices should be high on agenda.

Finally, industrial reorganisation and ownership transformation also affect the way coal is produced in China. Private mines are generally small in scale and often criticised for making insufficient investment in safety and for incurring low recovery rate of coal resources. These are rationales for reforms planned to start in Shanxi province at the end of 2008. The stated purpose of the reform is to enhance industrial concentration and through which to increase the economy of scale and efficiency in coal production and improve the safety and the environment. The actual result is that most private small-sized mines have been merged into or taken over by large-sized state-owned mines increasing the already dominant position of state-owned enterprises in the sector. However, an excessively high proportion of state-owned mines risks a return to the command economy in the energy sector as well as inefficient resource allocation. China could tackle the long-term problems of coal mine safety and environmental degradation through more stringent regulations rather than by increased state ownership.

China’s coal production increased from 0.5 billion tonnes in 1977 to 3.1 billion tonnes in 2009 with an annual growth rate of 5.5 per cent. According to the US Energy Information Administration’s forecast, China’s coal production will reach 4.3 billion tonnes in 2030. Strategies addressing China’s coal questions will make a significant difference to the way in which coal is produced, traded and consumed in China in the next phase of its industrialisation and development.

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**Events**

15 April  Trevor Swan Distinguished Lectures in Economics: Can “No Excuse” Charter Schools substantially reduce “Racial School Achievement Gaps?”

Professor Joshua Angrist, Massachusetts Institute of Technology

Weston Theatre, JG Crawford Building 132, Lennox Crossing, ANU, 3.30-5pm

15 April  H. W. Arndt Memorial Lecture

‘Rehabilitating the Unloved Dollar Standard’

Ron McKinnon Professor of International Economics

Stanford University

Finkel Theatre, Bldg 131 Garran Road, ANU. 5.30 - 7.00pm

**Seminars**

1 April  RMAP Research Seminar ‘The costs of stopping deforestation’

Dr Colin Hunt, School of Economics, The University of Queensland

Seminar Room B (Arndt Room), Coombs Building 12.30 - 1.30 pm

1 April  China and the US-Japan Alliance: Comparing 1960 and 2010

Amy King, Oxford University.

Lecture Theatre 2, Hedley Bull Centre, ANU 12.00 - 1.30pm

Contact: Shiro.Armstrong@anu.edu.au
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8 April  RMAP Research Seminar ‘Mostly harmless? The state of GRI reporting in the Melanesian mining sector at the release of the Mining and Metals Sector Supplement’

Dr John Burton, Resource Management in Asia-Pacific Program (RMAP), ANU Seminar Room B (Arndt Room), Coombs Building 12.30 - 1.30pm

14 April  ‘The Debate on China’s Exchange Rate Policy: An Analytical Approach’

W Max Corden, University of Melbourne

Seminar Room B (Arndt Room), Coombs Building 12.30 - 2pm

**Conference News**

China Update 2010: China’s Next Twenty Years of Reform and Development

14 July 2010, Australian National University

**Publications**

Asia Pacific Economic Papers

No 386, Interaction between trade, conflict and cooperation: the case of Japan and China, Shiro Armstrong March 2010

No 387, Internal Promotion and the Effect of Board Monitoring: A Comparison of Japan and the United States, Meg Sato March 2010

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