



Coal sector reform and its implications for the power sector in China

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ABSTRACT

Coal is the major primary energy which fuels the economic growth in China. The Soviet-style institution of the coal sector was adopted after the People's Republic was founded in 1949. But since the end of 1970s there have been major changes: the market mechanism was introduced to the coal sector and the Major State Coal mines were transferred from central to local governments. This paper explains these market-oriented and decentralized reforms and explores their implications for the power sector, now the largest single consumer of coal. The argument of this paper is that the market-oriented and decentralized reforms in the coal sector were influenced by the changes in state energy investment priority as well as the relationship between the central and local governments in the context of broader reforms within China's economy. However, these market-oriented and decentralized reforms have not equally influenced the power sector. Even though initial coal sector reform spurred power generation, the subsequent fragmented reforms raise concern about electricity shortages.

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Introduction

Coal is the major primary energy source which fuels the economic growth in China. China has abundant coal but much less oil and gas resources. Other alternatives, like hydro and nuclear power, cannot keep up with the pace of economic growth due to their higher cost and controversial issues like residential reallocation, ecological degradation or safety concerns. Therefore, about 70% of primary commercial energy in China comes from coal.

When the People's Republic of China was founded in 1949, its annual coal production was only 32.4 million metric tons. China's coal production has since grown into the largest in the world. In 2008, coal production was approximately 2.72 billion metric tons, accounting for about 40% of the world's production of coal.

Soviet-style central planning of the coal sector was adopted after the People's Republic was founded in 1949. But since the end of 1970s there have been major changes to the institution in the coal industry: the market mechanism was introduced to the coal sector and the Major State Coal mines were transferred from central to local governments. In 1985, the central government initiated a general contract system to regulate the input and

output of unified distribution coal mines, which are under central planning and have access to railway transportation.¹ Construction of key mines by the Shenhua Group,² the largest coal company in China, also started in 1985. During the same period, the permitting procedure for small-sized coal mines was transferred from central to the local governments and much simpler than before. In 1993, except for power generation and agricultural use, the coal price was liberalized, and the unified distribution coal mines were pushed to market competition. In 1995 the Shenhua Group was founded as a central firm under the direct administration of the State Council. In 1998 the administration of the unified distribution coal mines was transferred from central to the local governments with further decentralizing control of the coal sector. By 2002, all the prices of coal, even for power generation, were relaxed. In about twenty years the coal sector had shifted from a central planning to a market-based and decentralized system.

This paper explains these remarkable market-oriented and decentralized reforms in the coal sector and explores their implications for the power sector, now the largest single

¹ The central government delegated power to and shared profit with state-owned enterprises through general contract system.

² As a major state coalmine, Shenhua Group does not belong to the unified distribution coal mines because it has captive rail lines. The share of coal production of Shenhua Group in the coal sector was about 10% in 2007.

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consumer of coal. There is much research on China's coal sector outside China, but little on the reform of the coal sector within China. World Bank Energy Sector Management Assistance Program (ESMAP, 2004, 2008) introduced many of the problems that China's coal mining industry needs to address on the path towards sustainability, for example, safety, health and environmental problems. The International Energy Agency (IEA, 2007, 2009) has addressed the coal supply and clean coal technology in China. The China Energy Group in Lawrence Berkeley National Laboratory has researched energy efficiency and strategy (Sinton et al., 2005; Zhou Nan et al., 2007). The Industrial Performance Center in MIT published several working papers relevant to China's coal sector (Lester and Steinfeld, 2006, 2007) with an emphasis on the pattern of coal uses. Australian Bureau of Agricultural and Resource Economics and Japanese Institute of Energy Economics have done a series of research on China's coal, with a focus on China's coal import and export projections (Ball et al., 2003; Schneider, 2004; Sagawa and Koizumi, 2007, 2008). Thomson (2003) used the coal industry in China as a case study of the country's economic development as a whole. Rui (2005) analyzed different types of Chinese coal mining enterprises in the context of global change in coal industry and their implications for China. Wang (2007) explored the imbalanced development of coal and power sectors, and proposed that the imbalance was caused by government intervention. Zhang and Heller (2007) explained the phenomenon that China's power sector reform stalled. Rosen and Houser (2007) analyzed China's energy demand and supply system and its global impacts.

There is some research regarding the coal sector inside China. Pan et al. (2002) compared the coal market concentration between China and the USA and argued that the market concentration in China was too low. Yu and Yu (2006) proposed the vertical regulation model between coal and power to solve the conflict between the two sectors. Lin et al. (2007) estimated the long-term coal demand in China and proposed that the coal supply capacity should expand rapidly to match the demand. Xiao et al. (2008) used a Vector Auto Regression (VAR) model to analyze the effect of coal mine safety regulation, and found the long-term effect is significant. Shi (2008) evaluated the opening up and reform program of energy industry in China, but did not explore the driving forces and implications of the reforms. Most of the research inside China has emphasised on coal mine safety, coal demand projection and vertical regulation, but there has been very little on the causes and effects of coal sector reform.

The hypothesis of this paper is that the market-oriented and decentralized reforms in the coal sector were influenced by the changes in state energy investment priority as well as the relationship between the central and local governments in the context of broader reforms within China's economy. However, those reforms have not influenced all related sectors equally. Although the central government had allowed substantial market-oriented and decentralized reforms in coal sector, those reforms have not easily extended to the power sector. These fragmented reforms have had significant implications. Since coal is the primary input into Chinese power generation, and power sector reform has lagged behind coal sector reform, the tension between the power and coal sectors is unavoidable and raises concerns about electricity shortage.

The rest of the paper is organized as follows: Section 2 illustrates the initial conditions of coal sector reform in terms of administration, finance and pricing, and discusses relationship between coal and power sectors under central planning in China; Sections 3 and 4 discuss subsequent stages of reform in the coal sector and their implications for the power sector; Section 5 concludes the study.

Applying central planning to the coal sector (1949–1978)

After the People's Republic of China (PRC) was founded in 1949, Soviet-style central economic planning was adopted. From the beginning of socialism in China, it had been regarded as an unalterable principle to abolish the market system and establish a planned economy characterized by highly centralized administrative coordination, following the example of the ex-Soviet Union. After the outbreak of the Korean War in 1950, China gave top priority to national defense related industries. Chinese leaders chose the institutional arrangement that would mobilize and allocate resources through central planning, so that limited resources could be used to build up heavy industries, especially the military industry.

Under the priority of heavy industry development, all of the energy sectors, like coal, electric power and petroleum, were put under the central planning and given development priority.³

The local governments under the central planning system had little authority, but instead obligations to implement the planned task. In the Soviet economic planning system production was organized hierarchically, with targets set by the central authorities. In the final quarter of each year, the State Planning Commission (SPC)⁴ prepared the following year's preliminary balances for all commodities and capital goods under state control. These goods were referred to as being 'under unified distribution' or simply 'under plan'.

Monopoly administration of the coal sector

In 1949 the new government nationalized most coal mines, and from 1953 the first five-year plan was implemented. As coal was given one of the top priorities to develop it was necessary to set up an independent ministry in charge of the coal sector. So the Ministry of Coal Industry was separated from the Ministry of Fuel Industry as an independent body in 1955 with greater autonomy and coherent planning structure.⁵

Monopoly administration of the coal sector under central planning was used to boost downstream heavy industries. The state tried to tailor both forward and backward economic linkages through the coal industry. The national agencies (State Bureau of Material, Ministry of Railway and others) arranged the supply of input materials, like timber, explosives and electric power, and also directly coordinated the sales, allocation and transport of all coal under plan. The state also tried to balance the total amount of coal produced and consumed by each region.

Unified distribution coal mines⁶ dominated the coal sector during the central planning period. China's coal mines were divided into three main categories according to the type of ownership: the Major State Coal mines, the Local State Coal mines, and Township and Village Coal mines.⁷ The former two were state-owned enterprises. The Major State Coal mines were controlled by the central government through the administration

³ There were 24 coal and 31 power projects within the 156 key projects designed with aid from the former Soviet Union during 1950s.

⁴ The State Planning Commission was later reformed to become the National Reform and Development Commission (NDRC).

⁵ The ministry responsible for the coal industry during this period was variously designated as the Ministry of Fuel Industry (1949–1955), Ministry of Coal Industry (1955–1970), Ministry of Fuel and Chemical Industry (1970–1975), and Ministry of Coal Industry (1975 onwards). For consistency, the Ministry of Coal Industry is used throughout this paper.

⁶ The unified distribution coal was under central planning and usually transported by the railway.

⁷ These three categories were formed under central planning period. For consistency, it will be used throughout this paper even though they are renamed later.

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