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Capitalizing on energy supply: Western China's opportunity for development

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ABSTRACT

Two kinds of disparities pervade China and threaten its well-being. The first, regional disparities focus on levels of economic development, which vary considerably across China. The second is largely a corollary of the first, referring to mismatch in energy supply and demand, with some places suffering severe shortages while others are blessed with significant surpluses. Western China enjoys the dubious distinction of recording the country's lowest levels of economic development while, paradoxically, being blessed with plentiful reserves of energy and non-energy minerals. Turning those surplus resources to good account through transferring them to minerals and energy-hungry Eastern China is seen by policy-makers as something of a panacea. Not only will such a strategy significantly boost Western China's economic prospects, but it will eliminate the resource shortages currently constraining the East's vibrant growth. The issues of regional disparities, energy mismatches and transfers of these resources are discussed, with attention given to both spatial and time perspectives. The paper concludes with a cautious endorsement of the policy initiatives that promote the strategy of mineral transfers.

Introduction

China is one of the world's top mineral economies, ranking among the major producers (and owners of reserves) of a host of mineral resources (US Department of the Interior US Geological Survey, 2007). A broad term, mineral resources, encompasses metallic minerals, nonmetallic minerals and energy minerals. They are distinguished from each other primarily on the basis of the major material extracted from them. Thus energy minerals, the chief concern of this paper, differ from the others simply on account of their energy-valued material content (China National Committee for Terms in Sciences and Technologies, 2003a, 2003b, 2003c).[1] Eleven kinds of energy minerals occur in China, eight of which boast sizeable reserves.

Collectively, the exploitation of these mineral riches has proved beneficial to China's overall development, but their role in promoting the development of particular regions within the country has been much more questionable (Fan et al., 2005; Shen, 1998; Zhang, 1995; Zhang, 2002). To take just the instance of iron ore, the existence of magnetite deposits in remote Sichuan province triggered the formation of the Panzhihua iron and steel complex (which rolled its first steel in 1985), but subsequent resource and transport limits have severely curtailed its developmental impact

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[1] The table below shows the situation of mineral resources in China in 2003:

	Kinds	Examples (available reserves, position in the world)
Metallic minerals	54	Iron (46.3 Bt, 5), manganese (0.57 Bt, 3), titanium (0.36 Bt, 1), antimony (2.78 Mt, 1), rare earths (90 Mt, 1), tin (4.07 Mt, 2), tungsten (25.29 Mt, 1) and vanadium (25.96 Mt, 3)
Nonmetallic minerals	88	Sulfur (1.49 Bt, 2), phosphorus (15.2 Bt, 2), Glauber's salt (10.5 Bt, 1), barium sulfate (0.36 Bt, 1) and steatite (0.25 Bt, 1)
Energy minerals	11/8[a]	Coal (1002.5 Bt, 1), oil (18.14 Bt, 1), natural gas (70,000 Billion stere, 21), uranium (0.07 Mt, beyond 10), thorium (0.29 Mt, 2), geothermal resources (1371.1 Btce, –), oil shale (31.5 Bt, –) and stone-like coal (4.26 Bt, –)

[a] There are 11 kinds of energy-mineral resources in China, eight of which are proved by reserves. There are three states of energy-mineral resources, solid, liquid and gaseous. Coal, stone-like coal, oil shale, uranium, thorium, oil sand and bitumen constitute the solids; oil is liquid; while natural gas and coal-bed methane are gaseous. Geothermal resources, for their part, occur in both liquid and gaseous states.

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on the host district. Similar circumstances arose at Baotou in equally remote Inner Mongolia, which produced its first rolled steel in 1969. As with the later Panzhihua venture, the advantage forthcoming from locally accessible ore and coking coal (150 and 80 km from the complex) was exaggerated, since constraints on expansion have reduced development benefits (Liu, 1995). Thus ''remote'' China contrasts vividly with ''remote'' Australia, for example, where the exploitation of iron ore – albeit as part of an export strategy rather than one geared to local industrialization – has led to profound developmental effects in Western Australia (Topp et al., 2008).

In view of the less than impressive returns occurring from metallic mineral exploitation in ''remote'' China, regional development planners there see much more promise in the exploitation of energy minerals. They are reinforced in this conviction because 92% of the country's primary energy in 2008 came from energy minerals. However, to appreciate the merits of their case it is necessary to address the relationship between energy supply and regional development in China.

The country, despite its phenomenal aggregate growth in recent years, continues to experience decidedly different levels of development within its huge land mass. For all practical purposes, it adheres to a two-fold division: first, a vibrant heartland located in the east and oriented around the big port conurbations of Beijing–Tianjin, Shanghai and Guangzhou; and secondly, a hinterland occupying the vast interior of China still marked by low *per capita* GDP despite experiencing – in parts – rapid recent economic growth. The dichotomy extends to energy usage, for the dynamic heartland is forever clamoring for more, whereas the hinterland has largely escaped the crises attending energy shortages. Besides, the hinterland can take some comfort from its rich endowment of energy resources; for example, Western China, with only 24% of the national population, held title (in 2008) to no less than 56% of the country's entire stock of primary energy-mineral (coal, oil and natural gas) resources (National Bureau of Statistics of China, 2009).

This invites an economic complementarity wherein an energy-surplus Western China supplies an energy-deficient heartland. This prospect has not escaped the notice of government officials over the years (Golley, 2007; Huang and Luo, 2008), but the persistence of shortages in the heartland has made its implementation even more pressing. Testimony to the value of Western China as an energy supplier is readily apparent: in 2007, for instance, its net exports to the rest of China amounted to 0.32 billion tonnes of coal equivalent (tce), approximately 13.8% of China's energy output and about one-third of the energy produced in the region itself (National Bureau of Statistics of China, 2009). This significant position is a recent phenomenon that has become especially noticeable since the ''China Western Development Program'' was implemented in 2000. With the object of transforming Western China's resource advantage into an economic benefit, the program gave rise to two symbolic initiatives: the West–East natural gas transmission project and the West–East power transmission project. Together, they had major implications for energy-mineral exploitation in the region. Many observers have debated the merits and shortcomings of this program, with the majority subscribing to the view that Western China should emerge as a net beneficiary (China Energy Strategic Research Group, 1996; Fan and Cao, 2001; Zheng, 2000; Zhu, 2001). Subsequent evidence of relatively fast GDP growth in Western China lends support to this view. Unfortunately, some problems became more acute, not the least evidence of a widening gap in living standards between Western China and other parts of China. Equally worrying was evidence pointing to environmental degradation (Liu et al., 2010; Zhang and Huang, 2009). Alarmed at these trends, some observers have urged the academic community to devote more attention to devising ways for ensuring energy-minerals exploitation that is compatible with Western China's sustainable development (Byrne et al., 2007; Fan et al., 2010; Huang and Todd, 2010; Jin et al., 2010; Liu et al., 2010; Zhang and Huang, 2009; Yao and Ren, 2007; Zhang and Kumar, 2011). Political priorities remain paramount, however. For example, President Hu Jintao has recently declared that the time is now ripe for Western China to assume first importance as an energy supplier to the rest of the country (China Daily, 07/07/2010, p. 3). Furthermore, he promised to galvanize the authorities into action, pledging that they would do all in their power to bring about such an outcome.

Granted that enthusiasm for promoting Western China as a leading energy source is running high, the object of this paper is to consider the worthiness of that strategy as an instrument of regional development. To begin with, justification for this strategy of export promotion is explored from the two standpoints of "Export Base Theory" and the "Resource Curse Hypothesis", concepts maintaining opposite views on how natural resources affect regional development and which need to be reconciled before proceeding with the case of Western China. The theory must be cognizant of the supposed benefits accruing to both parties: the region exporting its energy surplus and the region receiving the said supplies. Clearly, any force in the central government's argument in favor of energy-minerals shipments from Western China must rest on benefits that the region can reasonably expect to capture, benefits that are judged credible according to the tenets of established theory. By the same token, demonstrable benefits must be forthcoming in the heartland receiving region, for failure to significantly redress energy shortages there will prove costly in terms of forfeited development. The regional disparities question is the second theme that the paper addresses.

It stands to reason that the presumed benefits of future energy-minerals flows must be set against what has gone before, making necessary an examination of historical movements of these minerals in and out of Western China and consideration of the infrastructure provided to render these movements possible. Issues of this nature constitute the third and fourth themes informing the paper. They are the necessary prerequisites for a final section that reiterates the importance of Western China to both China's energy future and its overall development path.

Alternative theoretical standpoints

Two opposing concepts, as mentioned, have relevance for the relationship between the extraction of energy minerals and the regional development that can be expected to result from it. The Resource Curse Hypothesis argues for detrimental outcomes, claiming that the sheer abundance of non-renewable resources like minerals and fuels will condemn a place to a slower pace of development than places less well-endowed (Sachs and Warner, 2001). The reason for this inferior performance is unclear, although all of the following have a role to play: currency appreciation, inflation, a propensity to import rashly in boom conditions and the so-called ''Dutch Disease'' effect wherein commercial agriculture and manufacturing are made uncompetitive (Auty and Mikesell, 1998; Corden, 1984). Moreover, and perhaps of even greater significance, the reliance on mineral exports may induce a fatal laxity in which other aspects of development are ignored and enterprise or ''learning by doing'' outside the mining sector becomes non-existent. This last effect is regarded as an ''indirect transmission'' (Papyrakis and Gerlagh, 2004, 2007), and it may be joined by others such as the consequences of the relative absence of manufacturing (fewer technological spillovers and diminished need for quality education) and the increasing likelihood of corruption (the result of factions fighting over resource rents).