

Optimizing the Allocation of Coal Production Capacity through Supply-Side Structural Reform¹

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Abstract: In 2015, the output of China's coal reached 3.75 billion tons, with consumption 3.96 billion tons, net import of 199 million tons and the whole social stock 300 million tons. The number of China's coal industry enterprises is too many, as many as 6390. Overcapacity has become crux of the plight of China's coal industry development. Under the strategic plan of the Central Committee of the Communist Party of China to push forward Supply-Side Structural Reform, coal industry has begun to solve the problem of excess capacity as scheduled. This paper analyzes the formation mechanism and characteristics of coal overcapacity in China, and puts forward the policy suggestions to optimize coal production capacity allocation in China, including strictly controlling increment, optimizing stock, enhancing industrial concentration, developing advanced production capacity and deepening the capacity management system and mechanism innovation.

Keywords: Coal industry; Overcapacity; Supply-side structural reform; Production capacity allocation

JEL Classifications: L51, L52, P41, P48

1. Introduction

The coal industry, as the basic energy and important industrial raw material industry of China, has been plagued by a series of problems such as the global economic downturn, slowdown of domestic economic growth, insufficient effective demand and the industry itself in recent years. The problem of coal industry supply-side structural problems, especially the problem of excess

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production capacity, is the biggest crux. Supply-Side Structural Reform and optimization of the coal production capacity allocation has become the key for China's coal industry to get out of trouble and achieve healthy, stable and sustainable development.

Focusing on the problems of excess capacity as well as China's coal overcapacity, scholars elaborated the views as following. Karley and Squires (1999) argued that overcapacity occurs when production capacity exceeds expectations or target production. Wang Xinyang (2007) pointed that overcapacity refers to an industry can achieve the production capacity beyond the market demand capacity in a certain period of time and definite technical conditions. Justin Lin (2010) states that the prevalence of investment in developing countries is the key reason to overcapacity and it is a common phenomenon. Geng Qiang and Jiang Feitao (2011) believe that China's overcapacity is not only focused on infrastructure construction, but also the emerging industries which may also have excess capacity. The fundamental way to solve the problem is improving local government incentives mechanism. In view of China's coal production capacity, Xie Heping (2012) proposed the concept of scientific production capacity. Scientific production should be a safe, efficient and environmentally friendly way to maximize the production capacity. Yue Fu-Bin (2015, 2016) points that establishing a withdrawal mechanism of China's coal production capacity is a breakthrough to deal with the problem. It is the high time to implement an innovation of resource allocation system based on market-oriented.

This paper will introduce the situation of overcapacity in China's coal industry in detail, analyze the causes, characteristics as well as the crux of formation of China's coal production capacity. Based on analyzing the status of China's coal industry and the formation mechanism of overcapacity, the paper gives the ideas of defusing China's excess capacity of coal in the context of China's supply-side structural reform.

2. Overcapacity: Crux of the Problem of China's Coal Industry

2.1 Production capacity and coal production capacity

Production capacity is the actual capacity to produce a product. It is the maximum output that the main production organization can achieve under the condition of established organizational structure, production technology, full use of productive capital investment and the production factors in full load operation conditions. The concept of capacity was first used to reflect the production capacity owned by the micro-production subject, and it is the total production-type indicators to reflect the enterprise production scale. With the rapid economic increase and the increase of development, resources and environmental conditions of carrying capacity constraints, the concept of production capacity has transformed from the main application of micro-production to the industry level. According to the relevant theory, industrial production capacity should be equal to the sum of production capacity of all enterprises in an industry, namely, the largest number that all the productive fixed assets of the industry can produce in a certain period of time (usually the annual cycle) with a certain technical organization of conditions, reflecting the level of industry productivity and development status.

According to specific research objects, China's coal production capacity can be divided into coal mine production capacity, enterprise production capacity, base production capacity, regional production capacity and total industrial production capacity. Coal mine production capacity refers to the coal production capacity that coal mine owns in a certain period of time. Enterprise productivity is the sum of coal products produced by coal enterprises under a certain technical organization of

conditions in a given period of time. Base capacity deals with the current 14 China Coal Bases in terms of capacity. Regional capacity refers to different regions divided by economic development level, geographical topography and administrative divisions. Total capacity is the sum of production capacity of the whole coal industry at a national level, and it is an important research and analysis indicator of industrial economy and industry management.

2.2 Overcapacity and China's coal production capacity surplus

Overcapacity usually appears as total surplus. However, as Liu Ye (2007) pointed, in the process of industrial development, when the supply structure cannot adapt to changes in demand structure, some of the production capacity cannot meet the actual demand thus form the surplus production capacity and structural surplus. According to the formation of overcapacity, it can be divided into "cyclical excess capacity" and "non-cyclical overcapacity". In general, when the economy moves towards recession, demand will shrink and it may lead to the increase of excess capacity in most industries and when it comes to a certain extent, it will form overcapacity. This kind of overcapacity caused by the economic cycle is called "cyclical overcapacity." Except for the impact of the economic cycle, the excess capacity caused by other factors is called "non-cyclical excess capacity". According to the dynamic relationship between supply and demand, excess capacity can also be divided into "absolute surplus" and "relative surplus." In the industrial development process, the overheated investment will lead to excessively rapid growth in the unilateral supply side resulting in capacity redundancy. That is the "absolute surplus" of productivity. The other kind of excess capacity due to the reduction in demand is called "relatively surplus."

The overcapacity problem in China's coal industry is very prominent since 2011. According to the analysis of China's coal supply and demand as well as import and export situation between 2011 and 2015, the contradiction between the actual supply and demand of coal production capacity gradually intensified, and the overcapacity surged to 8%, 14%, 20.7%, 24.3% and 30.4% respectively. Among them, in 2015 the output of China's coal reaches 3.75 billion tons, consumption 3.96 billion tons, net imports 199 million tons and the whole social stock 300 million tons. In accordance with the necessary inventory standards of 150 million tons, or 2.5% as a buffer capacity factor, the actual demand for coal production capacity in China can be considered as 3.45 billion tons in 2015 while the capacity supply has reached 4.5 billion tons and nearly 1/3 capacity is in a state of excess, therefore, the situation is very grim².

Table1. The contradiction of China coal production capacity supply and demand, 2011 to 2015

Year	2011	2012	2013	2014	2015
Capacity Supply (million tons)	36.5	39.0	42.0	43.0	45.0
Actual demand (million tons)	33.8	34.2	34.8	34.6	34.5
Supply and demand gap (%)	8.0%	14.0%	20.7%	24.3%	30.4%

Source: China Energy Administration. Website link: www.nea.gov.cn

² The data are from China Coal Economic Research Institute.

3. Formation of China's Coal Production Capacity and Its Characteristics

3.1 Formation of China's coal production capacity surplus

Overheated social investment is an important promoter of China's excess coal production capacity. At the beginning of the 21st century, especially after 2002, the Asian financial crisis ended and the social economy developed rapidly. The energy demand accelerated quickly and the supply of coal in China continued to be tight. The coal market prices and the corporate profits continued to rise. The intensified market signal and non-rational incremental expansion of the development of thinking are formed and thus the coal project approval, investment in the project of coal mine, and construction of the Great Leap appeared. A number of non-coal industry have also been actively infiltrating the coal industry, like "first construct without approval", "ratify small industries and build large ones". Unauthorized expansion and other illegal constructions have occurred a lot. According to the statistics data of China National Bureau, in the period of "1995-2000", "2001-2005" and "2006-2010", the fixed assets investment of China's coal mining and washing industry are 100.1 billion yuan, 281.3 billion yuan and 1,250.4 billion yuan respectively showing the great-leap-toward increase and the average annual growth rates reach 40.6% and 26.6% in "2001 ~ 2005" and "2006 ~ 2010" respectively. During the Ten years of gold development period (2002 ~ 2011), the coal industry total fixed asset investment reached 2 trillion yuan, which is equivalent to the reconstruction of the two coal industry based on the year of 2001. The total investment of "2011 ~ 2015" has reached 2418 billion yuan, which surpasses the total investment in the ten-year gold development.

The regulation and control of the relevant departments to over investment is not scientific, which is an important reason for the intensified situation of coal overcapacity in China. First, it is too optimistic to judge the situation when planning. In the post-financial crisis, the world economic growth is weak; the upward pressure on the domestic economy is intensified; the downstream coal industry is stagnant and the pace of energy restructuring speeds up and the environmental constraints strengthen. In such a background, the related departments still believe that coal consumption will continue to increase and take the increase in coal supply as the planning focus. Second, the planning is not rigid and binding is not enough. some small enterprises do the technical transform to the coal mines and increase production capacity arbitrarily without authorization. Third, the production capacity management mechanism is backward, lacking of supervision in and after events. The relevant departments did not take a resolute attitude to control production capacity in dealing with the oversupply problem, did not investigate and punish the illegal construction and overcapacity problems, especially hesitated to take actions against the mines constructed by large enterprises illegally and overcapacity production problems. Fourth, they did not make adequate efforts to eliminate the backwardness. Due to the problems of long-standing monopoly of coal mining rights, local protectionism, scattered industrial management functions and other reasons, it is difficult to form a joint effort in the backward coal production capacity. There is a big gap between the promoting work and the objective requirements. Under the influence of these factors, the superposition of contradictions between a large expansion of coal production capacity and stock structure optimization is formed, which leads to a serious excess of coal production capacity in China.

3.2 The characteristics of China's coal production capacity surplus

China's coal overcapacity is a "cyclical excess capacity", but also contains "non-cyclical overcapacity" attribute, presenting the superposed characteristics of total amount and structure, absoluteness and relativity, advance and backwardness, compliance and violation.

Cyclical excess and non-cyclical excess co-exist. The US subprime crisis was burnt out in 2007 and resulted in global financial crisis. The turning point appeared in the world economy and thus the world economy entered its fifth long decline cycle. Due to the cyclical adjustment of the world economy, China's economic development has entered a new normal. The growth rate transformed from high-speed to middle-high-speed and energy demand growth slowed down. The thermal power, steel, building materials, chemicals and other coal downstream industry are generally insufficient; The effective coal demand is not enough; The coal industry is being a state of periodic overcapacity. At the same time, the energy structure goes through accelerated restructuring, making the proportion of China's coal consumption declining. The proportion of primary energy consumption in China fell from 70.2% in 2010 to 64% in 2015³. With accelerating environmental constraints, China intensified the control of total coal consumption, accelerated the replacement of clean energy and required to gradually reduce the proportion of coal consumption. However, for a period of time, Chinese coal supply did not make scientific adjustments timely according to the situation, aggravating the coal overcapacity.

The total surplus and structural surplus co-exist. It is undoubted that China's total coal production is surplus. In 2015, the utilization rate of China's coal production capacity is only 69.4%⁴. However, according to internationally accepted standards, capacity utilization rate less than 75% is considered as a serious excess capacity. Under the background of surplus total amount, the structural problem is also very prominent, mainly reflected in the structural imbalance of the main production, too much low-end production capacity and the relative lack of high-end production capacity. The number of China's coal industry enterprises are too many, as many as 6390; Concentration is relatively low: CR4 (the percentage of first four coal production enterprises accounted for the total national coal output) in 2015 was 23.6% and CR8 was 35.5%⁵. According to the data provided by the China National Energy Administration and the CITIC Securities Research and Development Department, the coal mines with a capacity of over 3 million tons (oversize) accounted for only 2.5% and the coal production capacity accounted for 36.1%; while the capacity below 300,000 tons (small) accounted for 74.2% and the production capacity accounted for 14.3%⁶. There are too many backward production capacity represented typically by small coal mines, leading to China's surplus coal production capacity. This cannot meet the requirements of economic and social development to safety, environmental protection and efficient coal production capacity.

Absolute surplus and relative surplus coexist. Under the impetus of investment, China's coal production capacity increased from 1.5 billion tons in 2000, 2.5 billion tons in 2005, 3.5 billion tons in 2010 to 4.5 billion tons in 2015⁷. The rapid growth of production capacity eventually evolved

³ China Energy Statistical Yearbook, 2016

⁴ Annual report on coal industry in China(2015) by China Coal Economic Research Institute

⁵ China Energy Administration

⁶ CITIC Securities Research and Development Department

⁷ China Energy Administration

into capacity absolute surplus. From the situation of coal consumption in China, the coal demand pull effect slowed down influenced by the economic slowdown and downstream downturn. With the technological progress and concept change, China's renewable energy has made rapid development and there is a downward trend in the percentage that coal accounts for the primary energy consumption structure. A series of environmental policies on coal consumption has also formed a strong constraint and actual reduction effect. From 2012, China's coal consumption growth has dropped significantly. After reaching the stage consumption peak in 2013, the negative growth of coal consumption occurred twice in 2014 and 2015. The shortage of effective coal demand is significant and the coal consumption comparatively decreases, while the production capacity supply has an absolute increase. So that China's coal production capacity shows the characteristics of the relative surplus to a certain extent.

Advanced production capacity and backward production capacity coexist. The advancement of coal production is largely reflected on the scale. Large coal mines have obvious advantages on capital, technology, equipment, personnel, management and other aspects, which is the representative of advanced production capacity; however, small coal mines are the typical backward production capacity. They are the groups with high security incidents and serious damage of resources and ecology, due to backward mining technology and equipment and management philosophy. According to the data released by China Coal Industry Association, by the end of 2015, the number of coal mines in China reached 10,800, of which the large coal mines with more than 120 tons are only 1050 but those with an annual output of less than 300,000 tons are still more than 7,000 (9 Million tons of small coal mines more than 5400). From the mining age, the old coal mines that China has been mining for 20 years can produce 960 million tons, accounting for 37%⁸. Most of these coal mines are facing the problems of resource depletion, low yield and high cost, and has become a typical backward production capacity. Therefore, under the background of overall surplus in China's coal production capacity, there are contradictions of coexist of advanced production capacity and backward production capacity. The backward production capacity is very dispersed, and it accounts for the advanced production capacity development space. But what should be objectively seen is that advanced production capacity is a relative concept, and in the current stage, China's advanced coal production capacity still lacks endogenous development impetus.

Compliance capacity and illegal capacity coexist. China has set up a strict, standard and systematic examination and approval system in the construction of coal mine projects; however, there are still some deficiencies in the construction project management and production project supervision. An effective constraint and regulation on illegal construction and production cannot be formed, which also makes the conflict between the compliance capacity and illegal capacity in the excess coal capacity become more prominent. According to statistics provided by Lian Weiliang, the deputy director of the China's National Energy Administration and the National Development and Reform Commission, by the end of 2015, China's total coal production capacity has reached 5.7 billion tons. The legal coal mines are 6588 with the total production capacity of 3.9 billion tons; The coal mines which have been shut down has reached 310 million tons and the coal mines which have been rebuilt and expanded has reached 1.5 billion tons of coal. Among them, the illegal mines are 180 with the production capacity of 800 million tons; the mines with safety hazards are 225 with production capacity of about 350 million tons; the mines of super capacity produced 280 million

⁸ China Coal Industry Association

tons of coal. The production of the country's low-quality coal of about 400 million tons⁹. Therefore, illegal production accounts a large proportion in China's total coal production capacity.

4. Ideas of Resolving the Problem of China's Coal Overcapacity

Decided by the formation mechanism of China's coal production overcapacity and the outstanding structural problems in excess capacity, in order to resolve the problem of excess capacity in China's coal, we must make efforts to optimize the allocation of production capacity through leveraging supply side structural reform.

The difficult point of the reduction of productivity is to solve the problems of “where do people go to” and “where does money come from”, namely, how to properly settle the resettlement of the diversion workers, the implement of the needed funds and dealing with the debt. To solve these problems, Chinese government have published supporting policies, from the land supply and disposal, mining rights approval, staff placement, production safety and supervision, environmental access and supervision, financial support, special fund awards, capacity replacement and control and other aspects to provide the specific requirements and supporting measures for the excess coal production capacity.

4.1 Strictly control the increment

The series of documents of national coal industry supply side structural reform make a comprehensive deployment on reducing production capacity of the coal industry, specially emphasizing control new capacity from the source. Before the obvious mitigation of the overcapacity problem, the coal industry planning departments should timely adjust objectives under the guidance of the series of reform documents, taking reduction as the priority, strict controlling coal resource allocation and in principle and no longer implementing the incremental allocation of coal resources. If necessary, temporarily stop the transfer of coal mining rights and the suspension of coal mining right to transfer mining rights. The industrial management departments need strictly to control the approval of coal projects and new coal projects, and take careful approval and examination of the new production capacity transformation projects and nuclear projects. Besides, the approved projects should be promoted orderly and steadily; the temporary suspended projects should be supported by procedures; and the projects violating the rules must be shut down.

4.2 Effectively optimize the stock

The supply side structural reform of the coal industry requires the combination of excess capacity and structural adjustment, and put forward specific requirements to eliminate the backward production capacity. Coal industry should seize the reform opportunity, combine administrative and market means, increase the reduction of backward production capacity and intensity the closure of small coal mines; make and improve standers backward coal mine production capacity and the behavior rules of dropping out; change the limitations of a single "size" standard and improve the system taking safety, resources, environment, energy, and technology as the main standards and implement the elimination policy for the backward coal production capacity. The coal production capacity allocation mechanism should be innovated, the capacity trading market should be established, and the backward production capacity should be standardized and linked to new capacity, and the capacity reduction of replacement transaction should be implemented. In addition,

⁹ The China's National Energy Administration and the National Development and Reform Commission.

the traditional industries should be transformed and upgraded, the supply level of coal industry should be enhanced from both the quality and efficiency sides, the development of new industries should be vigorously fostered, and the pace of industrial transformation and upgrading should be accelerated.

4.3 Intensity the industrial concentration

To promote the upgrading of industrial concentration is one of the important contents of the supply side structural reform of coal industry. The relevant parties should speed up the restructuring of coal enterprises, broaden the financing channels for reorganization of enterprises, encourage social capital to participate in mergers and acquisitions as well as restructuring of coal enterprises, solve the problem of regional division of resources and eliminate local protectionism of cross-regional mergers and acquisitions. We should also break the restriction of ownership, region and industry, eliminate the institutional obstacles that restrict the enthusiasm, initiative and creativity, guide enterprises to realize trans-regional, cross-industry and cross-ownership development and encourage coal enterprises to implement coal, electricity, roads, chemistry and other related industries to develop integrated. Moreover, we need to strengthen the combination of exterior and inner coal enterprises and actively promote the construction of regional and even cross-regional collective coal enterprise formation.

4.4 Make efforts in developing advanced production capacity

Developing advanced production capacity an important part of the key tasks for the coal industry supply side structural reform to "fill the short board". Relevant departments should further develop incentive policies, actively promote the safe and green mining industry and clean and efficient use of coal industry. We need to promote the advanced coal mining technology according to local conditions, attach importance to the safety management and scientific utilization of coal mine methane (CMM), intensify the support of modern coal chemical industry such as coal oil and gas, encourage the development of a batch of small and medium-sized coal technology and service enterprises with strong independent innovation capability and obvious technology advantages. Meanwhile, we need to strictly control the scale of coal production capacity, adopt a policy of "one width and one tight" to encourage the advanced and eliminate the backward. For the coal enterprises with competitiveness and advanced production capacity, we need to meet their reasonable funding needs and provide comprehensive credit services to support its transformation and upgrading.

4.5 Deepen the innovation of capacity management system and mechanism

Capacity management, especially in and after event management is the weak link in China's coal industry, which should be promoted as an important part of the supply side structural reform. Coal industry management departments need to fully perform the functions of planning, guiding and supervising, and do the necessary intervention when the market fails. We also need to coordinate the distribution of resources, regional economy, social development and other factors, scientifically plan the coal production capacity and rationally allocate coal resources. Besides, we should further improve the information registration system of coal mine production capacity management, timely disclose the coal production capacity, and deal with the illegal construction projects severely. It is also necessary to carry out daily inspection of coal mines by the law and strictly deal with super-capacity production behavior. We also need to pay close attention to the entire release process of coal production capacity, strengthen forecast and early warning, control the timing, size and structure of the release of production capacity according to market signals, and properly arrange the withdrawal of recession and backward production capacity.

5. Concluding Remarks

The overcapacity problem in China's coal industry is very prominent with the characteristics like cyclical excess and non-cyclical excess co-exist, total surplus and structural surplus co-exist. China's coal industry should focus on optimizing the allocation of coal production capacity by taking advantages of the supply side structural reform policy. It is the key for China's coal industry to get out of trouble and achieve healthy, stable and sustainable development. It is high time for China's government to regulate and control the industry base on scientific Supply-Side Structural Reform. The industry policy should strictly control the increment and effectively optimize the stock at the same time. Intensity the industrial concentration is a direct way to solve coal industry overcapacity in China. Make efforts to develop advanced production capacity and deepen the innovation of capacity management system and mechanism is the root for coal industry sustainable development.

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