

LOW-CARBON AND MORE: CHALLENGES AND SOLUTIONS OF CHINA'S COAL INDUSTRY LEGISLATION

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INTRODUCTION

Although coal has long played a dominant role in China's energy structure, it has gradually changed since entering into the 21st century. Despite new and renewable energy playing a more prominent role, coal remains paramount in China's energy structure. Against this backdrop, the coal industry must, based on science-based legislation and regulation, break the shackle of the traditional energy model to better respond to climate change and promote the construction of a low-carbon society.

I. THE STATUS QUO OF CHINA'S COAL INDUSTRY

A. China's Achievements in the Development of the Coal Industry

1. Abundant Possession of Coal Reserves

China possesses abundant reserves of coal. Their production ranks first in the world. By the end of 2009, China coal reserves totaled 114,500

million tons—ranking third in the world and accounting for 13.9% of the total amount of world-wide proven coal reserves.¹ In 2010, China produced 324 million tons of coal,² accounting for 48.3% of global output. This increased output by nine percent compared to 2009.³ Abundant coal reserves play an important role in China's economy, ensuring energy security and providing an important, inexpensive source of fuel.

2. Steady Growth of Consumption and Promising Prospects

From 2006 to 2009, China witnessed a steady growth of energy consumption. Specifically, from 2006 to 2007, the annual growth rate amounted to 8.4%. Over the next two years, the growth rate increased by 3.9% and 5.2% respectively. As to the specific portion of total energy consumption, the percentage of raw coal remained around 70%.⁴

The average daily amount of coal consumption has also increased alarmingly. In 2000, the average daily coal consumption was 3.855 million tons. In 2006, it soared to 6.352 million tons and 7.68 million tons in 2009.⁵

3. Increased Strategic Position and Strengthened Policy Control

Coal has played a strategic role in the development of the national economy. The coal-dominated energy structure will remain in place for a long time as a result of China's policy choices. China has paid serious attention to the development of the coal industry. China issued a series of industrial control policies including: "State Council's Several Opinions on Promoting Healthy Development of Coal Industry," "Opinions on Issues Related to Strengthening Management of Coal Industry," and "Coal Industry Policy."⁶ These policies provide support to ensure sustainable and

1. BP, BP STATISTICAL REVIEW OF WORLD ENERGY JUNE 2011, 30 (2010), available at http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/pdf/coal_section_2011.pdf.

2. Nat'l Bureau Stat of China, Statistical Communiqué of the People's Republic of China on the 2010 NATIONAL ECONOMIC AND SOCIAL DEVELOPMENT (2010), available at <http://download.chinagate.cn/en/pdf/20110301.pdf>

3. BP STATISTICAL REVIEW OF THE WORLD, *supra* note 1, at 32.

4. *Id.*

5. Tony Jin, *China Consumes 9% More Coal Through September*, THE CHINA PERSPECTIVE, October 27, 2009, available at <http://thechinaperspective.com/articles/chinaconsumes9m-6502/>.

6. State Council, *State Council on Promoting the Healthy Development of Coal Industry*, a Number of Observations, THE CENT. PEOPLE'S GOV'T OF THE PEOPLE'S REPUBLIC OF CHINA, Sept. 08, 2005, available at http://www.gov.cn/zwqk/2005-09/08/content_30251.htm; State Council, *State Council on Strengthening the Management of the Coal Industry Views on the Issue*, THE CENT. PEOPLE'S

healthy development of the coal industry.⁷ With regards to administrative agency reform, the newly established National Energy Bureau and National Energy Coordination Committee have actively tried to change China's energy management, which suffers from overlapping and decentralized management and poor coordination. Their efforts have positively strengthened the management of the coal industry.

4. Construction of Large-Scale Coal Bases Achieved Substantive Results

During the period of the "Eleventh-Five," the National Development and Reform Commission approved a plan to construct 13 large-scale coal bases covering Shen Dong, Shanxi North, Huang Long, Jin Zhong, Jin North, Lu Xi, Liang Huai, Jin Zhong, He Nan, Yun Gui, Meng Dong, and Ning Dong.⁸ In the subsequent "Twelfth-Five" period, China will construct 14 large-scale coal bases, attempting to account for 90% of total production.⁹ These multi-function bases have covered coal transportation, power supply, coal chemical industry, and comprehensive utilization of resources.¹⁰ They contribute to protecting the security of national energy, optimizing coal industrial structure, and promoting economic and healthy social development.¹¹

5. Strengthened Scientific and Technical Support

China constructed a three-pronged technical innovation system. It centered on coal enterprises, relied on preferential policies of government finance and tax, actively implemented international cooperation with advanced countries, and tackled a large number of technical problems in this industry. In 2009, China successfully brought indirect coal liquefaction technology from the laboratory to pilot production and further expanded to

GOV'T OF THE PEOPLE'S REPUBLIC OF CHINA, July 6, 2006, available at http://www.gov.cn/gongbao/content/2006/content_363624.htm; *Coal Consolidation*, Coal World, (Jan. 7, 2008), <http://www.coalworld.net/indexnews/info.jsp?id=60685>.

7. *Id.*

8. Wang Yingchun, *Xinjian will become the 14th Coal Base in China*, CHINA SECURITIES JOURNAL, Jan. 10, 2011, available at <http://www.chinamining.org/News/2011-01-11/1294724548d42535.html>.

9. *Id.*

10. Wenran Jiang & Zining Liu, *Energy Security in China's 12th Five-Year Plan*, 11 CHINA BRIEF 8 (June 17, 2011) available at http://www.jamestown.org/uploads/media/cb_11_08.pdf.

11. *Id.*

industrial demonstration production.¹² On January 7, 2007, the commissioning of the Shenhua direct coal liquefaction demonstration project was successful. This operation made China the only country in the world that owns the key techniques of direct liquefaction of megaton coal.¹³ In 2004, China Huaneng Group first proposed the GreenGen Project to develop, demonstrate, and promote methods for clean coal power generation. These techniques greatly improve efficiency—achieving near-zero emissions of pollutants and carbon dioxide.¹⁴ Ultimately, this project will ensure the sustainable development of coal-generated power in the long run.

B. Challenges Faced by China's Coal Industry

Though China's coal industry has already made significant achievements, a series of problems still plague the country. These include: extensive growth models, relatively low levels of technology, frequently occurring accidents, the waste of resources, out-of-date environmental governance, and historical issues from prior regimes. The following paragraphs outline these issues.

1. Human Health

Security of the coal industry closely relates to human health because of mine production and miner's safety. With the improvement of hardware facilities and strengthened supervision, the number of coal mine accidents has declined. But, generally speaking, the total amount of coal mine accidents in China remains high and lags far behind levels in the developed world. Mortality rates for coal mine workers in "one-million ton coal mines" is 35 times higher than America's, 15 times South Africa's, eight

12. *Inner Mongolia Yitai completes trial of coal liquefaction plant*, CHINA BUSINESS NEWS, Mar. 24, 2009, available at http://www.chinaknowledge.com/Newsires/News_Detail.aspx?type=1&NewsID=22188.

13. *See China Into the World's Only Master the Key Technology Megaton National Direct Coal Liquefaction*, CSNB.CN, Feb. 23, 2009, available at http://www.cnsb.cn/html/news/220/show_220243.html.

14. INTERNATIONAL ENERGY FORUM, GREENGEN PROJECT: UPDATE AND OUTLOOK 1, available at <http://www.ief.org/Events/Documents/Production/Sustainability/1st%20CCS%20Symposium,%20Sep.%202009/Presentations/SongZheng.pdf>.

times Poland's, six times Russia and India's, and is much higher than the world average.¹⁵

2. Resources Utilization

Today, China's coal industry is in the process of extensive development. This development focuses on high input, high consumption, low efficiency, and low input. As a result, China suffers from low recovery rates of coal resources, serious waste of coal and associated mineral resources, potential risks of energy safety (especially safety of energy supply), and gloomy prospects of sustainable development. The average recovery rate of Chinese coal enterprises remains at about 40% and around 15% for small-size coal mines.¹⁶ Compared to the 60% recovery rate of most coal-producing countries, China experiences serious waste of coal resources. In 2005, China consumed 2.1 billion tons of coal. Compared to the international average coal recovery rate, the amount of wasted coal is almost enough to sustain China's consumption for another decade.¹⁷

3. Environmental Protection

Mining activities damage and deteriorate the environment around the mine. Open-pit mining damages the earth's surface and vegetation, changes the forms of landscape, and worsens the process of weathering.¹⁸ Coal mining generates a huge amount of solid waste. Long-term weathering and leaching often contaminates farmland and water sources close to the mining area. As a result, the open-pit mining creates geological disasters including: land subsidence, ground fissures, landslides, collapse, and debris flow. Furthermore, open-pit mining causes water to inundate large areas of land in China's eastern plain mining area and may cause soil salinization. Coal mining in western mining areas has gained more attention as the seriousness of land erosion and desertification has increased.¹⁹

15. Tu Jianjun, *Coal Mining Safety: China's Achilles' Heel*, 3 CHINA SECURITY 36, 37-38 (2007), available at http://www.wsichina.org/cs6_3.pdf.

16. *China 2015 Coal Recovery Rate to Hit 40%*, INTERNATIONAL ENERGY, June 23, 2010, available at <http://en.in-en.com/article/News/Coal/html/2010062316891.html>.

17. Yuan fan, *For the Coal Mining Industry is Concerned about Competition in the Industry Pattern of Tenure Reform*, CHINA COAL NEWS, Dec. 16, 2006, available at <http://www.cwestc.com/ShowNews.aspx?newId=106170>.

18. Michael J. McKinley, *Mining: Pollution A-Z*, ENCYCLOPEDIA.COM (2004), <http://www.encyclopedia.com/topic/mining.aspx>.

19. Zhou Yuhua, Su Yu, Zheng Lei: *Thoughts on Legal Issues of Coal Resources Security*, see *Northern Economy and Trade*, Issue 2, 2007.

Wastewater, gases, and residues have sometimes been improperly handled by coal-mining operations. For example, in Shanxi Province, the annual amount of wastewater discharged from coal mining is about 400 million tons; the average amount of wastewater discharged per ton of coal is 1.62 cubic meters; the amount of wastewater discharged from coal washing is about 5 million cubic meters; and about 50,000 tons of coal slime is discharged every year.²⁰ Mining operations release a significant quantity of untreated wastewater into rivers—83% of the 24 major rivers in the province have been seriously polluted. The air pollution load per square kilometer is 1.6 times the national average, and in some areas as high as six to 10 times the national average.²¹

The ecological restoration of mining areas has not been effectively implemented. For instance, China has not yet established a unified system of ecological compensation and restoration of mining areas. This has caused serious negative impacts on the natural environment.

4. Satisfying Requirements of Low-Coal Economy

Increased concentrations of greenhouse gases cause climate change. CO₂ emissions from coal-burning power plants contribute to this problem.²² Thus, the unrestrained use of fossil fuels directly leads to increased CO₂ emissions. The reasonable and effective utilization of coal resources plays an important role in reducing CO₂ emissions and addressing climate change. China has long instituted a single energy structure that depends on coal. China's coal industry is confronted with the challenge of how to break the shackle of the traditional development model and live up to the requirements of a low-carbon economy.

II. THE LEGAL FRAMEWORK OF CHINA'S COAL INDUSTRY

The legal hierarchy of the legislative system for China's coal industry includes laws, administrative regulations, departmental rules, local regulations, and other standards. The following section outlines the legal framework for the coal industry in China.

20. Wang Rui: *Proposals on Reducing the Impact of Coal Industrial Development on Environment*, see *Market Modernization*, March 2010.

21. *Id.*

22. *Climate Change: Emissions*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/climatechange/fq/emissions.html> (last updated Dec. 3, 2011).

A. Special Laws and Other Related Laws

After several decades of efforts, China has instituted a legal system to ensure the healthy development of its coal industry that promotes the reasonable exploitation and protection of coal resources. In 1996, China promulgated the first special law to regulate the coal industry. This Law's legal objectives included: rationally developing, utilizing, and protecting the coal resources; standardizing the production and marketing of coal; and promoting and ensuring the development of the coal industry.²³ The Coal Law regulates production, exploitation, and management of coal resources. In August 2009, China revised the Coal Law for the first time. In April 2011, China amended the law again to more adequately address issues such as coal production, exploitation, planning and construction of coal mines, safety of coal production and coal mines, management of coal, protection of coal mine areas, supervision and inspection, liabilities, etc.²⁴

In addition to the Coal Law, relevant provisions of other laws help to develop the legal system for coal regulation. For instance, the General Rules of the Civil Law and Property Law contain provisions related to ownership. The Invitation and Submission of Bids Law and Auction Law have articles related to mineral rights. The Law on Prevention and Control of Occupational Disease, Labor Law, Production Safety Law, and Law on Safety in Mines protect human life, safety, and health. The Environmental Protection Law, Law on Environmental Impact Assessment, Clean Production Law, and Prevention and Control of Environmental Pollution by Solid Wastes include several provisions related to environmental protection. Also, the Criminal Law regulates illegal mining and destruction of coal resources.²⁵ Some procedural laws, such as Civil Procedural Law,

23. < Zhonghua Renmin Gongheguo Meitan Fa > (中华人民共和国煤炭法) [Law of the People's Republic of China on the Coal Industry] (promulgated by Standing Comm. Nat'l People's Cong., Aug. 29, 1996, effective Dec. 1, 1996) Art. 1 CHINALAWINFO (China) [hereinafter Coal Law]. These objectives are being followed by other laws and regulations related to the regulation of the coal industry in general.

24. *New Coal Law Submitted to China's Cabinet*, BUSINESS CHINA, Aug. 12, 2010, available at <http://en.21cbh.com/HTML/2010-8-12/coal-law-china.html>.

25. < Zhonghua Renmin Gongheguo Xingfa > (中华人民共和国刑法) [Criminal Law of the People's Republic of China] (promulgated by NAT'L PEOPLE'S CONG., March 14, 1997, effective Oct. 1, 1997) Art. 114. (1997), available at <http://www.lehmanlaw.com/resource-centre/laws-and-regulations/criminal-law/criminal-law-of-the-peoples-republic-of-china-1997-page3.html>. Article 114 provides: "Whoever sets fires, breaches dikes, causes explosions, spreads poisons or uses other dangerous means to sabotage factories, mines, oilfields, harbors, rivers, water sources, warehouses, dwellings, forests, farms, threshing grounds, pastures, important pipelines, public buildings or other public or private property and thereby endangers public security, if serious consequences have not yet resulted, shall be sentenced to fixed-term imprisonment of not less than three years and not more than

Administrative Procedural Law, Criminal Procedural Law, etc., provide significant legal grounds for dispute settlement.²⁶ All of the above-mentioned laws and the Coal Law itself have constituted important parts of China's coal legal system.

B. Administrative Regulations and Rules

Administrative regulations and rules also play an important role in the Chinese coal legal system. They chiefly include: (1) Management of coal

ten years." Further, 343 of the same law states that "Whoever, in violation of the provisions of the Mineral Resources Law, mines without a mining license, enters without authorization and mines in mining areas that the state has planned to develop, in mining areas with ores of significant value to the national economy, or in other's mining areas, or exploits special kinds of minerals that the state has prescribed for protective exploitation, and refuses to stop mining after he is ordered to do so shall, if the offence causes damage to mineral resources, be sentenced to fixed-term imprisonment of not more than three years, criminal detention or public surveillance, and concurrently or independently be sentenced to a fine. If the offence causes serious damage to mineral resources, the offender shall be sentenced to fixed-term imprisonment of not less than three years and not more than seven years and concurrently be sentenced to a fine." *Id.* at Art. 343.

26. [General Civil Law of the People's Republic of China] (promulgated by Nat'l People's Cong. April 12, 1986, effective Jan. 1, 1987) Art. 71–83 Chinalawinfo (China); [Property Law of the People's Republic of China] (promulgated by Nat'l People's Cong. March 16, 2007, effective Oct. 1, 2007) Part II Chinalawinfo (China); [The Auction Law of the People's Republic of China (2004 Revision)] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, Aug. 28, 2004, effective Jan. 1, 1997) Art. 3, 6–7 Chinalawinfo (China); [Labor Law of the People's Republic of China] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, July 5, 1994, effective Jan. 1, 1995) Ch. VI–VII Chinalawinfo (China); [Production Safety Law of the People's Republic of China] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, June 29, 2002, effective Nov. 1, 2002) Art. 1 Chinalawinfo (China); [Law of the People's Republic of China on Safety in Mines] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, Nov. 7, 1992, effective May 1, 1993) Art. 1 Chinalawinfo (China); [Environmental Protection Law of the People's Republic of China] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, Dec. 26, 1989, effective Dec. 26, 1989) Art. 1,4,6, Ch. III Chinalawinfo (China); [Law of the People's Republic of China on Appraising of Environmental Impacts] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, Oct. 28, 2002, effective Sept. 1, 2003) Art. 1, 22, 23, 26 Chinalawinfo (China); [Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, Dec. 29, 2004, effective April 1, 2005) Art. 1,3,4,6,13,25 Chinalawinfo (China); [Civil Procedure Law of the People's Republic of China (Amended 2007)] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, Oct. 28, 2007, effective April 9, 1991) Ch. 8 Chinalawinfo (China); [Administrative Procedure Law of the People's Republic of China] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, April 4, 1989, effective Oct. 1, 1990) Art. 2,22 Chinalawinfo (China); [Criminal Procedure Law of the People's Republic of China] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, March 17, 1996, effective Jan. 1, 1997) Art. 172 Chinalawinfo (China); [Law of the People's Republic of China on the Prevention and Treatment of Occupational Diseases] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, Oct.27, 2001, effective May 1, 2002) Art. 1 Chinalawinfo (China); [Law of the People's Republic of China on Promoting Clean Production] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, June 29, 2002, effective Jan. 1, 2003) Ch. 1–2 Chinalawinfo (China).

mines, including *Regulations on Township Enterprises' Coal Mine Management* (1994), *Interim Management Measures on Coal Resources Recovery Rate of Production Mine* (1998), and etc. (2) Production and management of Coal, including *Measures for Administration of Coal Production License* (1994), *Measures for Supervision and Control of Coal Management* (2004), and etc. (3) Exploitation and management of coal, including *Measures for Registration Administration of Mineral Resources Exploitation* (1998), *Measures for Administration of Auction and Bidding of Mineral Exploration Right and Mining Right (for Trial Implementation"* (2003), and etc. (4) Safety Management, including *Regulation on Safety Supervision of Gas Control of State-owned Coal Mine* (2005), *Interim Measures for Administration of Renovation Projects of Coal Mine Safety* (2007), and etc. (5) Environmental protection and sustainable use of resources, including *Interim Measures for Administration of Environmental Protection of Coal Industry* (1994), and etc.²⁷

C. Local Regulations and Rules

Local coal industry regulations and rules play an important role in practice. Some of them have effectively supplemented and improved above-mentioned laws, and others have further detailed national laws. For instance, Coal Management Regulation of Shanxi Province²⁸ (CMR) has a

27. [Regulations on Township Enterprises' Coal Mine Management (1994)] (promulgated by State Council December 20, 1994, effective December 20, 1994); [Interim Management Measures on Coal Resources Recovery Rate of Production Mine] (promulgated by Ministry of Coal Industry March 9, 1998, effective March 9, 1998); [Measures for Administration of Coal Production License] (promulgated by State Council December 20, 1994, effective December 20, 1994); [Measures for Supervision and Control of Coal Management] (promulgated by National Development and Reform Commission December 27, 2004, effective January 27, 2005); [Measures for Registration Administration of Mineral Resources Exploitation] (promulgated by State Council February 12, 1998, effective February 12, 1998); [Measures for Administration of Auction and Bidding of Mineral Exploration Right and Mining Right (for Trial Implementation") (promulgated by Ministry of Land and Resources June 11, 2003, effective August 1, 2003); [Regulation on Safety Supervision of Gas Control of State-owned Coal Mine] (promulgated by State Administration of Coal Mine Safety 6, 2005, effective January 6, 2005); [Interim Measures for Administration of Renovation Projects of Coal Mine Safety] (promulgated by National Development and Reform Commission and State Administration of Coal Mine September 6, 2007, effective September 6, 2007); [Interim Measures for Administration of Environmental Protection of Coal Industry] (promulgated by Ministry of Coal Industry November 2, 1994, effective November 2, 1994).

28. The Coal Production in Shanxi Province ranked first in terms of coal production in China in 2006. Its legislation related to coal industry management is typical for local regulations and rules. See *China Energy Industry, CHINA KNOWLEDGE ONLINE*, <http://www.chinaknowledge.com/Business/CBGdetails.aspx?subchap=1&content=7> (last visited June 3,

series of more feasible provisions to better regulate the actual situation of the province. Specifically, CMR further details the Coal Law's certificate and licensing system of coal production and management. Additionally, CMR has more detailed provisions for mine managers and other special operations personnel to obtain certificates.²⁹ Also, CMR provides procedural stipulations to the Coal Law, such as increasing the number of application materials to be submitted by a coal enterprise when opening mines and approval times for the administrative departments.³⁰ Furthermore, CMR provides rights for coal workers, entitling them to boycott illegal commands of company management that force them to take risks harmful to human health and safety and the safety of the mine. This brand new system, created by local laws and regulations, undoubtedly plays an important role in protecting coal workers' lives, health, and safety.³¹ In conclusion, local laws effectively supplement national legislation and better regulate the coal industry.

D. Technology Standards

China has two different types of coal technology standards: national and industrial. From a content perspective, some of these national and industrial standards can be divided into the following categories: basic standards for construction and production, construction standards, determination standards, technical standards of production and operation, standards for electricians, coal quality standards, ventilation/dustproof and drainage systems standards, standards for anti-explosion and blast equipment, labor protection standards, mine supporting standards, safety standards, transportation improvement standards, coal dressing standards, technical standards for driving machinery, and related technical standards for analysis and detection of characteristics of coal blending.³² These technology standards comprise the integral parts of China's legal system and coal industry management.

2012) (The Coal Production in Shanxi Province ranked first in terms of coal production in China in 2006. Its legislation related to coal industry management is typical for local regulations and rules).

29. *Coal Management Regulation of Shanxi Province*, Article 29.

30. *Coal Management Regulation of Shanxi Province*, Article 11 and 12.

31. *Coal Management Regulation of Shanxi Province*, Article 28.

32. Info. Tech. Co., Ltd. Shanxi Fenwei, *China's Coal Industry-Standard Systems*, CHINA'S COAL INDUSTRY-STANDARD SYSTEMS, <http://dbzc.sxcoal.com/> (last visited June 3, 2012).

III. CHALLENGES OF CHINA'S LEGISLATION ON COAL INDUSTRY

China's coal industry legislation mostly reflects flaws in the management system, admittance standard of resource exploitation, resource reserves, the design of tax and fee systems, mine safety, environmental protection, and other aspects. Due to these problems, a gap developed between current legislation and the requirements of the low-carbon economy.

A. Supervision and Management

After the dissolution of the Ministry of Coal in 1998, the government formulated China's current coal management system.³³ In its place, the State Council Energy Leading Team (Team) is the highest authority for the management of the coal industry.³⁴ The Team exists under the National Development and Reform Commission and is headed by a prime minister with two deputy prime ministers. Also, the head of the National Development and Reform Commission serves as the director of the Office of Energy Leading Group. Under the National Energy Administration, the government established the Coal Management Department as the administrative body. The Ministry of Land Resource governs coal resource management; State Administration of Production Safety Supervision and Management and National Coal Mine Safety Supervision Bureau oversee safe production; State-Owned Assets Supervision and Administration Commission presides over state-owned assets; Ministry of Commerce, Ministry of Railways, and the Ministry of Transport govern coal transportation and sales management; Ministry of Finance, Ministry of Human Resources and Social Security controls social management; and China Coal Industry Association is responsible for functions of industry intermediary services.³⁵ Most of the local coal management systems are similar to the central system.³⁶ This cooperation and division has played an active role in the promotion and development of the coal industry. However, no department coordinates these different agencies. As a result,

33. Wuyuan Peng, *The Evolution of China's Coal Institutions* 18 (Stan. Program on Energy and Sustainable Dev. Working Paper Series No. 86, 2009), available at http://is-db.stanford.edu/pubs/22612/PESD_WP_86.pdf.

34. *See id.* (stating that the Ministry of Coal transitioned into the National Development and Reform Commission).

35. Yue Fubing & Shao Yibo, *Innovation of Coal Administration System*, 28 ENERGY OF CHINA 26 (2006).

36. *Id.*

officials excessively focus on the division of labor and insufficiently coordinate the functions between the various departments. Therefore, the management system lacks complete governance and supervision.³⁷

B. Admittance Standards for Enterprises' Resource Exploitation

The 2011 Revised Coal Law provides six conditions for the establishment of coal mining enterprises, including "having a rational scale of coal mine production and the funds, equipments and technicians commensurate with such scale."³⁸ Unfortunately, the law remains unclear on several points. What is a "rational" scale of production? What are the standards of "commensurate" funds, equipment, and technicians? Compared to the 1996 Coal Law, this provision has had no revision for more specificity. In reality, when issuing approval, the coal management authorities have had too much discretion and randomness in their choice. Thus, many enterprises and start-up operators entered the coal mining industry with insufficient funds, outdated technical equipment, poor safety conditions, and insufficient environmental capacity. The result has made the number of small coal mines abnormally excessive, which resulted in environmental destruction and waste of resources.³⁹ In the past few decades, vague provisions resulted in broad administrative discretion. This caused many problems with the approval process for the establishment of a coal mine. These administrative problems have not attracted enough attention from the legislature to result in any changes to the mining law.

C. Coal Resources Reserve

China heavily relies on coal production and coal consumption for economic development—especially for the power supply. China's annual production and consumption quantities are the largest in the world.⁴⁰ In this

37. Zhang Shaoran & Xiao Taishou, *Improvement of Coal Management System*, MACROECONOMIC MANAGEMENT 201, at 54.

38. Coal Law, *supra* note 23, at art. 18.

39. Si Posen & Liu Wenge, *The Coal Law Urgently Needs Modification*, 27 ENERGY OF CHINA 32 (2005).

40. See CHINA STATISTICAL YEARBOOK (Sheng Laiyun et al. eds., 2010) available at <http://www.stats.gov.cn/tjsj/ndsj/2010/indexeh.htm> (China's coal production in 1990 was 1.080 billion tons, in 2005 was 2.350 billion tons, and in 2008 was 2.802 billion tons. Availability of coal in 2008 was 2.59 times greater than in 1990. Availability of coal in, increased by 19.3% from 2005 to 2008. China's coal imports surged year after year. China imported only 2.003 million tons in 1990, 26.171 million tons in 2005, and reached 40.341 million tons in 2008. Importation in 2008, compared with 1990, was nearly

case, the proposal of "strategic reserve of coal resources" was put forward by some scholars for a long time.⁴¹ However, the 2011 Revised Coal Law does not create this system. In May 2011, the National Development and Reform Commission and Ministry of Finance jointly issued the Interim Measures of National Emergency Reserves of Coal (Measures). The Measures are designed to regulate the management of national emergency reserves of coal and to improve the capacity of coal supply under a state of emergency.⁴² The Measures define the "national emergency reserves of coal," commissioned by the central government, as locations of major coal distribution, consumption, and transport hubs reserved to respond to a serious coal shortage or supply disruption, or to major natural disasters and emergencies.⁴³ The Measures provide detailed qualifications of coal reserve enterprises, the implementation and size of corporate reserves, and the region and planning of the emergency reserve.⁴⁴

For example, in 2011, China established its first national emergency coal reserves located in Qinhuangdao Port, Huanghua Port, Zhoushan Port, Guangzhou Port, Wuhan Port, Wuhu Port, Xuzhou Port, and Zhuhai Port.⁴⁵ These ports and ten large coal electric power companies are required to reserve 500 million tons of coal.⁴⁶

The emergency reserve remains an important part of the coal reserve system, but lacks a comprehensive scope to include, among other things, a coal resource reserve, production capacity reserve, and a spare reserve.⁴⁷ So, China's coal resource reserve system is still in the exploration stage. As

20 times greater. 2008 imports increased by 54.1% over 2005 figures. Exports in 2005 were 71.724 million tons, dropping to 45.434 million tons in 2008).

41. *Improved Energy Efficiency Key to Sustainable Development*, CHINA SUSTAINABLE INDUSTRIAL DEVELOPMENT NETWORK, <http://www.csid.com.cn/NewsInfo.asp?NewsId=3403> (last visited June 3, 2012).

42. (国家发展和改革委员会, 财政部关于印发“国家煤炭暂行办法应急储备”的通知) [National Development and Reform Commission, Ministry of Finance on the Issuance of "National Emergency Reserves of Coal Interim Measures," the Notice] (Promulgated by the National Development and Reform Commission and the Ministry of Finance, effective May 11, 2011) ChinaCFO.net (China).

43. *Id.* at Art. 2.

44. *Id.* at Art. 12.

45. Jeff Tollefson, *National Coal Contingency Plan Approved*, CHINAHOURLY (Mar. 23, 2011), <http://www.chinahourly.com/bizchina/13680/>.

46. *Wuhu Port is Approved to be One of First National Contingency Coal Reserve Points by the State Council*, FEISHANG (Mar. 25, 2011), <http://www.feishang.cn/English/news/NewsDetail.aspx?menuid=2101&nid=2959>.

47. *Slow to Adopt the Reserve "Coal Reserve" Write New "Coal Act*, 21ST CENTURY BUS. HERALD (Aug. 17, 2010) available at <http://www.21cbh.com/HTML/2010-8-18/0NMDAwMDE5MjY0Nw.html>.

a young government mechanism, this strategic coal reserve system still requires improvement through further legislation.

D. Tax and Fee

China's Coal Law does not provide compensation for the use of coal resources.⁴⁸ According to the Mineral Resources Law, the State practices a system wherein the exploration right and mining right are obtained with compensation.⁴⁹ A mining operation that explores and utilizes coal resources must pay consideration for the exploration and mining rights obtained with the resource compensation fee and resource tax. With respect to the resource compensation fee, the rate remains too low, not reflecting the fair value of coal as an important non-renewable energy source. The low compensation fee fails to encourage coal producers to conserve resources. In respect to the resource tax, the main problem is the tax levies remain fixed by the administrations, regardless of changes of prices, costs, and profits.

E. Coal Mine Safety

One important goal of coal industry legislation is to ensure production safety in coal mines, protecting the life and safety of the miners. China's Coal Law provides safety requirements through an accountability system of production safety, education and training, emergency response, trade union rights, labor protection, equipment safety, and other aspects.⁵⁰ With respect to legal responsibility, the Coal Law stipulates that "where administrators of a coal mining enterprise give directions against regulations and order miners to work at risk, thus causing serious causality, they shall be investigated for criminal responsibility."⁵¹ Correspondingly, the Amendments to Criminal Law (VI) stipulate that:

Where anyone violates the provisions concerning the safety management in production or operations and thus causes any serious casualty or any other serious consequences, he

48. Coal law, *supra* note 23.

49. <Zhonghua Renmin Gongheguo Kuangchan Ziyuan Fa> (中华人民共和国矿产资源法) [Mineral Resources Law of the People's Republic of China (Amended in 1996)] (promulgated by Standing Comm. Nat'l People's Cong. Gaz, Aug. 29, 1996, effective Oct. 1, 1986) Art. 5, Chinalawinfo (China).

50. Coal Law, *supra* note 23, at art. 37–45.

51. *Id.* at art. 78.

shall be sentenced to fix-term imprisonment of not more than three years or detention. If the circumstances are extremely severe, he shall be sentenced to fix-term imprisonment of not less than 3 years but not more than 7 years. Where the facilities or conditions for safe work fail to meet the relevant provisions of the state so that any serious casualty or any other serious consequence is caused, the persons-in-charge who are held to be directly responsible and other directly liable persons shall be sentenced to fixed-term imprisonment of not more than three years or detention. If the circumstances are particularly severe, he shall be sentenced to fix-term imprisonment of not less than three years but not more than seven years. Where, after any safety accident occurs, the person who is obliged to report it fails to report it or makes a false report so that the rescue of the accident is affected and if the circumstances are severe, he shall be sentenced to fixed-term imprisonment of not more than three years or detention. If the circumstances are extremely severe, he shall be sentenced to fixed-term imprisonment of not less than three years but not more than seven years.⁵²

Compared to the serious consequences caused by coal mine accidents, the above punishments fail to deter violations. The high occurrence of mine accidents in China largely relates to the law's weak punishment. Furthermore, the legal responsibilities fail to warn the persons responsible.

F. Environmental Protection

Traditionally, coal is seen as a dirty energy source. Because the development and utilization of coal resources causes negative impacts on water, soil, air, and other aspects, the provisions relating to environmental protection in coal legislation remain highly significant for promoting environmental health. In addition to the provisions on general principles,⁵³ China's Coal Law requires environmental protection for conditions on

52. <Zhonghua Renmin Gongheguo Xingfa Xiuzheng'an (Liu)> (中华人民共和国刑法修正案(六)) [Amendments to the Criminal Law of the People's Republic of China (VI)] (promulgated by Standing Com. Nat'l Peoples Cong. Gaz. June 29, 2006, effective June 29, 2006) Art. 134, Chinalawinfo (China).

53. *See id.* at art. 11 (providing that "anyone who exploits or utilizes coal resources shall abide by the laws and regulations governing environmental protection, prevent and control pollution and other public hazards, and protect the ecological environment").

launching coal mining enterprises,⁵⁴ as well as obtaining coal production licenses.⁵⁵

The Coal Law also provides requirements on implementation of the "three simultaneous" system.⁵⁶ However, these provisions do not put enough emphasis on environmental protection. For instance, the "three simultaneous" system in the Coal Law only copied the articles in the Environmental Protection Law. This failed to combine the characteristics of the development and utilization of coal to make more operational requirements. On the other hand, the law fails to address ecological restoration of coal mining sites.⁵⁷ The Coal Law provides that coal mining enterprises shall be responsible for reclaiming land that is covered by coal, subsides, or is destroyed, and any losses caused to another person shall be compensated according to law.⁵⁸ The law remains ambiguous on how to compensate.⁵⁹ Thus, the role of legislation in environmental protection is limited for ecological protection and restoration.

G. Gap with Requirements of Low Carbon Economy

Since the Intergovernmental Panel on Climate Change's fourth assessment report on climate change, the low-carbon economy has become a growing worldwide concern. The low-carbon economy, as an emerging economic model, is based on market mechanisms. In turn, institutional frameworks and policies promote the development and use of energy-efficient technologies, energy-conserving technologies, renewable energy technologies and greenhouse gas emission reduction technologies. These accelerate a transformation in the social economic model towards energy-

54. *See id.* at art. 18(4) (requiring "a mining design which meets the requirements of safety in coal mine production and of environmental protection," in order to establish a coal mining enterprise).

55. *See* Coal Law, *supra* note 23, at Art. 23(7) (requiring that "facilities to guarantee [sic] coal mine safety in production and environmental protection facilities, which have been proved up to the standard through the acceptance test conducted upon completion of the project").

56. The "three simultaneous" system, China's unique environmental protection system, means that the construction project environmental protection facilities must be designed, constructed and put into use with the main project at the same time. *See* WANG CANFA, ENVIRONMENTAL LAW TEXTBOOK, 93 (China Univ. of Pol. Sci. and Law Press 1997); Coal Law, *supra* note 23, at Art. 21 (requiring that, "[i]n coal mines, coal exploitation and environmental control shall be synchronized. The facilities for environmental protection of a coal mine construction project must be designed, constructed, checked and accepted, and put into use simultaneously with the main project").

57. *See* Coal Law, *supra* note 23, at Art. 11 (requiring protection of ecological environment, however, not in the restoration stage).

58. Coal Law, *supra* note 23, at Art. 32.

59. *Id.*

efficient, low-energy consumption, and low-carbon emissions.⁶⁰ Generally, the transformation from fossil fuels to new and renewable energies constitutes an important way to achieve a low-carbon economy.

In China, considering the current energy structure, coal will remain the main source of energy for a long period of time. Therefore, the question becomes how to reform the traditional high energy-consuming, high carbon-emitting, and highly polluted model of the coal industry to the requirements of a low-carbon economy. To ensure sustained and healthy development of China's coal industry, these reforms are critical to achieve low-carbon development. However, China has not yet introduced specific legislation to promote a low-carbon economy, but there are some existing regulations on the management of the coal industry. For example, the Coal Law states, “[t]he State shall adopt measures to ban coke making by indigenous methods. The construction of kilns for making coke with indigenous methods shall be forbidden, and the existing kilns for making coke with indigenous methods shall be renovated within a time limit.”⁶¹ This provision reflects means of low-carbon technical specifications.

Moreover, the Law on Prevention and Control of Environmental Pollution by Solid Wastes stipulates:

Products shall be packaged with materials that are easy to be recycled or treated, or easy to dissolve or be absorbed in the environment. Producers, sellers and users of products shall, in accordance with the relevant State regulations, recycle the packaging materials and containers of products that can be recycled.⁶²

This provision reflects the comprehensive utilization of resources in a low-carbon economy. In addition, the Energy Conservation Law, Law on Promotion of Clean Production, Circular Economy Promotion Law, Interim Measures on Clean Production Checks, Measures for Administrations of Energy Efficiency Label, Measures for the Operation and Management of Clean Development Mechanism Projects, and other laws and regulations reflect the concepts of energy conservation, energy efficiency, and energy

60. ZHANG KUNMING, ZHANG JIAHUA & CUI DAPENG, *LOW CARBON DEVELOPMENT* 1043 (Chinese Env'tl. Sci. Press, 2009).

61. Coal Law, *supra* note 23, at Art. 36.

62. <Zhonghua Renmin Gongheguo Gutifeiwu Wuranhuanjing Fangzhi Fa> (中华人民共和国固体废物污染环境防治法) [Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes] (promulgated by Standing Com. Nat'l Peoples Cong. Gaz. Dec. 29, 2004, effective April 1, 2005) Art. 18, Chinalawinfo (China).

reductions required by a low-carbon economy. Also, The Renewable Energy Law reflects the means of developing clean renewable energy required of a low-carbon economy.

Generally speaking, gaps still exist between China's current development and existing legislation and the inherent requirements of a low-carbon economy. There are technical (clean coal technology, carbon capture, and carbon capture storage) and institutional (inadequate systems of financial incentives, and chain management) reasons for those gaps. Further legislation would resolve these issues.

IV. COUNTERMEASURES TO IMPROVE CHINA'S LEGISLATION ON THE COAL INDUSTRY

Future legislation should focus on: improving supervision and management, clarifying admittance standards of coal exploitation, improving coal reserve systems, strengthening coal mine safety, improving coal tax systems, strengthening environmental protection, and further promoting a low-carbon economy.

A. Improve Supervision and Management

To improve China's coal management system in a low-carbon economy, the first step is to improve the existing energy management system. The State should separate the functions of energy management and energy supervision by establishing a Ministry of Energy and a Commission of Supervision and Management of Energy.⁶³

First, the Ministry of Energy, as one of the component departments of the State Council, would be in charge of unified management of national energy affairs. The administrative department of energy, under the State Council, formulates the national energy development strategy and plan. The department also creates the national energy policy, and organizes the implementation of various energy governance systems—including the coal legal system.

The Ministry of Energy's specific responsibilities should include: developing a national energy security assessment; establishing an energy

63. Current energy authority is National Energy Administration (NEA) under the National Development and Reform Commission (NDRC). *National Energy Administration (NEA)*, NAT'L DEV. AND REFORM COMMISSION PEOPLE'S REPUBLIC OF CHINA, http://en.ndrc.gov.cn/mfod/t20081218_252224.htm (last visited June 3, 2012).

warning and emergency system; implementing an energy reserves strategy; forecasting energy supply, export, and production capacity; formulating policies to promote development of renewable and new energy; and developing policy measures to ensure energy needs in rural, remote, and other underdeveloped areas are met. Moreover, the Ministry of Energy would aid in developing policies and measures to promote the rationalization of energy use and energy efficiency; formulation and adjustment of governmental fixed or governmental guided prices of energy resources, energy products, and energy services. Finally, the Ministry would establish, improve, and monitor the implementation of the energy impact evaluation index system; organize the research, development, and application of key energy technology; develop standards for energy-related products and services; gather energy statistics; release energy information and data; and provide policy advice on foreign energy matters.

The Commission of Supervision and Management of Energy's, similar to the U.S.'s Federal Energy Regulatory Commission, specific responsibilities would include: development and implementation of energy-related regulations and rules of supervision and management; issuance and management of energy business licenses; monitoring the operation of the energy market; maintaining order in the energy market; promoting fair competition; supervising and managing the implementation of energy impact assessment systems for major projects; supervision and management of energy production safety; participating in accident investigation and treatment; counting and analyzing energy safety and price information from energy companies; supervising and inspecting the implementation of energy price regulations; establishing supervision and management information systems; on-site inspections of energy businesses; investigation of illegal energy companies; and imposing administrative penalties within their authority.⁶⁴

The ministries responsible for supervising the coal industry should implement a strong oversight system to enhance the supervision of coal exploitation, mine safety, and environmental mining pollution. These changes would help the management system to meet the necessary requirements for a low-carbon economy.

64. Center for Environmental, Natural Resources and Energy Law of Tsinghua University, *Expert Proposal and Explanation of China's Energy Law* 12–15 (Tsinghua University Press, Draft, 2008).

B. Clarify Admittance Standards for Coal Resources Exploitation

In the past few years, China punished and rectified several small coal mines, which had a significant effect. These mines had low production efficiency, facilities unqualified for safe production, serious environmental pollution, and failed to meet the requirements of the low-carbon economy.⁶⁵ Based on the above analysis, future legislation should improve detailed admittance standards for coal exploitation. Specifically, rigid guidelines should be established that require funds, facilities, staff quality, and other protocols for easy implementation. In particular, China should force coal mining corporations to increase capital investment. China could establish a risk prevention reserve system with adequate supervision and make corporations pay risk prevention fees in advance. These reforms would cover the risks to safety, health, and environment, and continue to pay in accordance with production cost per ton.

China should also increase the production scale of corporations, which requires approved authorities to examine the applications for coal mining projects. Also, corporations should follow the principles and requirements of intensive, large-scale production. The development of small coal mines should be restricted to encourage the establishment of medium to large sized enterprises, in order to improve the market threshold of the coal mining industry.⁶⁶

C. Perfect Coal Reserve System

Future legislation should incorporate coal reserves, which will help the long-term development of the coal industry. To maximize this development, coal reserves should be divided into government reserves and corporate reserves. Government coal reserves should be determined in accordance with the needs of national economic security and national financial strength. In turn, corporate coal reserves should be in accordance with the requirements of China's national strategy and legislation. As mentioned above, the coal reserve system should include coal resource, coal production capacity, and spot coal reserves.

At present, China only has spot coal reserves to respond to sudden fluctuations of the coal market and maintain the market's stability. Future

⁶⁵ Hu Wangjun, *China Limited Output of Small Coal Mines, Special Rectification of Small Coal Mine Gas was Introduced*, IFENG NEWS (May 11, 2009), http://news.ifeng.com/mainland/200905/0511_17_1149239.shtml.

⁶⁶ Posen & Wenge, *supra* note 39.

legislation should make specific provisions for the purchase and storage of coal reserves and stock rotation, safety, environmental protection, management of reserve capitals, supervision and inspection requirements, and other issues. These measures would further the system of spot coal reserves by continuing to institutionalize them.

In the long-term, China should move quickly to establish sound coal resource and coal production capacity reserves. For example, China should provide a limited number of high-quality coal reserves in storage for emergency situations. Legislations should provide for procedures of selection, protection, management, and usage of reserved coal mines. This policy will ensure a stable annual production of coal. Compared with resource reserves and spot reserves, the production capacity reserve is much more policy-oriented. Future legislation should address procedures for planning and adjusting the quantity of production capacity reserves.

D. Improve Tax and Fee System

Because the government owns the coal reserves, the administrative department of geology and mineral resources levies a compensation fee on start-up operators and enterprises that exploit such resources for economic gain. The sum of the compensation fee is included in the fiscal budget as government non-tax revenue, which reflects the State's property rights over mineral resources. According to The Provisions on Administration of Collection of the Compensation Fee of Mineral Resources (2003), the rate of compensation fee for coal is one percent.⁶⁷ The amount of the compensation fee for coal resources equals sales revenue of minerals multiplied by one percent of the coefficient of the Mining Recovery Rate (MRR). The coefficient of the MRR equals the approved MRR divided by the actual MRR:⁶⁸

Compensation Fee = Sales Revenue × 1% × coefficient of MRR;

Coefficient MRR = Approved MRR ÷ Actual MRR

Despite attempts to raise revenue with the above rate, the amount collected was less than expected and did not reflect the value of coal as a non-

67. <Kuangchan Ziyuan Buchangfei Zhengshou Guanli Guiding> (矿产资源补偿费征收管理规定) [Provisions on the Administration of Collection of the Mineral Resources Compensation] (promulgated by The State Council, Feb. 27, 1994, effective April 1, 1994) ASIAN LII, at Appendix (China).

68. *Id.*

renewable resource. The rate of the compensation fee should be improved to 1.5%. This would place it between the rate of copper, iron, lead, zinc, and the existing rate of coal, oil, natural gas, and other fossil fuels.

The coal resources tax faces similar problems with the compensation fee. The Provisional Regulations on Resources Tax and its implementation rules stipulate that the rate of the coal resources tax is 0.3–5 Yuan per ton.⁶⁹ Since July 1, 2004, the Ministry of Finance and the State Taxation Administration have jointly issued provisions to adjust the rate of the coal resources tax to 3.2 Yuan per ton in Shanxi, Inner Mongolia, Qinghai, and other places. This design remains convenient for an agency to implement. However, with the development of the economy and the coal industry, as well as the government's emphasis on saving energy and reducing emissions, the side effects of the coal resources tax become increasingly apparent. This method of taxation fails to adapt to the price fluctuation of resources. Also, the taxation rate does not encourage reasonable exploitation and utilization of resources.

Over many years, understanding these problems, the government has revised the resource tax to better reflect price fluctuations, but has made slow progress.⁷⁰ Reforming the coal reserves tax will prove challenging, because economic feasibility remains low. Recently, China has faced inflation pressures. Also, a series of uncertainties surround economic development. Against this background, inappropriate tax reform will definitely affect the electricity market because of coal-electricity linkages. Thus, reforms should be implemented when the economy is relatively stable and the price of electricity can be smoothly adjusted.

E. Enhance Coal Mine Safety

In January 2006, the State Administration of Work Safety revised the Guidelines on Coal Mine Safety (Guidelines). The Guidelines contain explicit stipulations on mining safety, ventilation and gas, dust control, special control carbon dioxide (CO₂), fire prevention, water control prevention and treatment, explosive materials and underground blasting,

69. <Zhonghua Renmin Gongheguo Ziyuanshui Zanxing Tiaoli> (中国的人民共和国资源税暂行条例) [Provisional Regulations of the People's Republic of China on Resource Tax] (promulgated by The State Council, Dec. 25, 1993, effective Jan. 1, 1994) Art. 16 Chinalawinfo (China).

70. China once planned to levy "special proceeds" on coal mining enterprises, but, considering the difficulty of management of a large number of small-size privately owned coal mines, this plan was finally dropped. China reformed tax and fee systems of some resource products, the rate of some products was increased by 16 times. But due to global recession, the reform of tax and fee also dropped.

transportation, air compression, electricity, coal mine rescues, stripping and mining, landslide prevention and treatment, equipment maintenance, management and monitoring, and health care of workers. Compared to previous guidelines, this revised version is easier to implement.

To comply with the guidelines, managers should institute a comprehensive security mechanism to strengthen corporate security management, emphasize security supervision, build effective emergency rescue systems, and clearly define objectives of assessments and accountabilities. In order to abide by the Notice on Constructing and Improving “Six Systems” of Underground Mine Safety and Risk Avoidance (2010), formulated by the National Security Administration and State Coal Mine Safety Supervision Bureau, several areas of the mining industry need significant improvements. Potential examples include: the improvement of mine monitoring and supervision systems, people tracking systems, underground emergency systems, mine air pressure self-rescue systems, mine water-supply rescue systems, and communication systems. On the other hand, current legislation governing liabilities for violations of coal safety, mining accidents, and leadership accountability, should be further strengthened—especially under the Criminal Law.

From an administrative point of view, in addition to increasing the punishment imposed on mine accidents, new measures regarding government and corporate response to violations should be written into future legislation. For example, the punishment for illegal exploitation should be to shut down the mine instead of issuing a fine. Thus, any mine with a potential safety hazard should be required to suspend production to rectify the violations, rather than only imposing an economic punishment. Furthermore, the industrial injury insurance system should be improved to protect any injured or dead miners, so that their relatives receive reasonable financial compensation from their employers and enhance corporate precaution.

F. Strengthen Environmental Protection

Relevant laws and regulations for pollution prevention should be applied to protect against negative environmental impacts from coal exploitation and utilization. For instance, the Environmental Impact Assessment (EIA) system⁷¹ and the “three simultaneous” system⁷² stipulated

71. <Zhonghua Renmin Gongheguo Huanjingbaohu Fa> (中华人民共和国环境保护法) [Environmental Protection Law of the People’s Republic of China] (promulgated by Standing Comm. Nat’l People’s Cong. Gaz, Dec. 26, 1989, effective Dec. 26, 1989) Art. 13 Chinalawinfo (China).

in the Environmental Protection Law should apply to exploitation and utilization of coal. When applying the "three simultaneous" system, future legislation should consider characteristics of exploitation and utilization of coal resources. Future legislation should require coal mines to provide a detailed EIA as a condition to operation. In so doing, the government can utilize existing environmental legislation for the healthy and sustainable development of the coal industry.

Another important issue is ecological restoration and environmental compensation. A newly-established ecological restoration and environmental damage compensation fund would be funded by collections from active coal-mining enterprises. When ecological damage or environmental pollution accidents occur, the fund will pay for ecological restoration and environmental compensation costs. To avoid uncertainty, the government should define the principles and methods of collection and the management and usage of funds. The new laws would require the government and coal-mining operations to effectively manage, contribute to, and distribute the ecological fund.⁷³

G. Promote Development of Low Carbon Economy

The previous six sections played a crucial role in narrowing the gap between management of China's coal industry and the development of a low carbon economic model. In order to strengthen the low carbon legal system, particular attention should be paid to industrial restructuring, the management of small-scale mines, and further promotion of low-carbon technology innovation.

1. Guide for Industrial Transformation

On the one hand, the macro energy policy should gradually adjust the proportion of coal entering the energy consumption structure. This alteration would increase investment in the development of new energy sources and actively promote the use of these new sources. On the other hand, the government should promote the improvement of the coal industry chain and improve the utilization of coal resources through legislative reforms or improved technical standards.

Some of China's major coal companies have made efforts for a low-carbon economy. For example, China's largest coal company, Shenhua

72. *Id.*, at Art. 26.

73. Jiang & Liu, *supra* note 10, at 83.

Group, proposed a strategy for the "integrated development of coal, electricity, road, port and oil; and one-stop management of production, transportation and selling".⁷⁴ Another coal company, the Shanxi Coking Coal Group, proposed the construction of a high energy chain, "coal, electricity, wood;" a high value-added chain, "coal, coke, chemical;" and an environmentally friendly closed-cycle economic chain, "resources, products, waste utilization."⁷⁵ These development strategies of coal-based industrial chains not only contribute to the high added value of coal products, but also improve the competitiveness of coal enterprises and sustainable development capability. Also, the corporate strategies help to improve the utilization of coal resources and reduce carbon emissions, thus transitioning China's coal industry to a low-carbon economy.

2. Strengthen Management of Small-Scale Mining

Many small mines in China adopted the extensive growth model. As a result, these small mines routinely waste resources, use relatively backward technology and equipment, negatively affect the environment and its resources, reflect a significant "carbon consumption" feature, and fail to adhere to the development of a low-carbon economy.

The government realizes the scope of this problem and has taken active measures to deal with it.⁷⁶ In turn, the government coordinates the relationship between small, medium, and large-scale coal enterprises. The government also promotes mergers among small coal mining enterprises, encourages improvement of single-well mines, controls the number of small coal mines, and closes small coal mines without qualifications of exploitation.

Future legislation should increase coal production and accelerate industrial upgrades to promote sustainable development of the coal industry. China should actively foster large-scale coal enterprises, and improve energy security and market competitiveness. China should accelerate the construction of new mines to improve coal supply capacity—especially in the areas with rich storage of coal resources, proper infrastructure, and updated equipment.⁷⁷

74. Niu Kehong, *Trends of China's Current Coal Industry Development*, 8 CHINA COAL 8, 9 (2009).

75. *Id.*

76. Zhang Jiajun & Zhang Xiangyang, *Analysis of Development Status and Future Trend of Coal Industry*, 4 SHAANXI COAL 133 (2010).

77. *Improving the Energy Supply Capacity*, Govt. White Papers, CHINA.ORG.CN, <http://www.china.org.cn/english/whitepaper/energy/237112.htm> (last visited June 3, 2012).

3. Promote Innovation of Low-Carbon Technology

To decrease carbon emissions for coal, China should actively promote clean coal technology, carbon-capture, and carbon-capture storage technology. These technologies would help decrease the pollution caused by extracting, refining, and consuming coal resources.

With respect to mining technologies, mining corporations should utilize the best available technologies and the most advanced equipment. This would allow corporations to effectively and efficiently extract coal and other minerals, water, and land. Also, the government should focus on developing coal washing, dressing, processing, and conversion technologies in order to improve industry chains, as well as reduce waste and pollution of coal resources. The government should research advanced coal combustion technology to promote the efficient and clean burning of coal.⁷⁸

CONCLUSION

Future legislation should strengthen the combination of environmental protection measures, and require the development and implementation of clean coal technologies. Ultimately, these reforms would increase the efficiency of coal conversion, optimize terminal energy structure, and control mining pollution.⁷⁹

78. Jeff Tollefson, *China: Stoking the Fire*, NATURE NEWS (Jul. 23, 2008), <http://www.nature.com/news/2008/080723/full/454388a.html>.

79. Wang Weijun, *The Development of Coal Circular Economy Law and Policy Safeguards*, 3 Business Economy 126, 127 (2011).

