



# SHOW BULLETIN

## CHINA COAL & MINING EXPO 2011

Organizer: China Coal Consultant Internatioal; Together Expo Limited.

Organizing partner & Publisher : *Mining Equipment magazine*, Beijing Promonion Publishing Co.,Ltd



### General Information

#### China Coal & Mining Expo 2011

**Host:** China National Coal Association

**Co-host:** China National Coal Group Corp.

**Organizers:** China Coal Consultant Internatioal  
Together Expo Limited

**Venue:** National Agriculture Exhibition Center

**Date:** October 28-31, 2011

### GUIDE

4P Wonderful Expectation for "12<sup>th</sup> Five-year Plan" of China Coal Industry

6P Technical Development And Market Analysis for China Coal Mining Equipment

8P List of Top 50 Enterprises of China Coal Mining Machinery Industry 2010

12P Key Words 2011

### FYI

*China Coal & Mining Expo 2011 Show Bulletin* is the only official publications, including Chinese version A, Chinese version B and English version. This volume is the English Version.

please contact  
*Mining Equipment magazine*  
for detailed information.

Translator & Editors:  
Yan Xiaoling, Zhang Rui  
Tel: 86-10-64867088  
13911905360, 18618185969  
Fax: 86-10-64853699  
Email: kyzb2007@126.com

# CCME 2011 GRANDLY OPENNING AS PLANED

□ By Chi Yu, Reporter of *Mining Equipment* magazine

The end of October is another harvest time. Once more, the biennial CCME (China Coal & Mining Expo) is around the corner as planned. China's coal mining machinery industry will present us with brilliance again in CCME 2011, which will surely be a platform of "green new world and brilliant coal mining industry".

Exhibition content of this CCME covers multiple fields relating to coal mining industry. A pageant, highlighted by integration, giant volume and intelligence of coal mining machinery equipment, is a magnificent review for China's coal mining machinery industry under such a special macro-economic situation, and it also is a "wildfire" that might be lighting the renaissance torch of world mining industry.

### Exhibition Brand

CCME, as the largest exhibition in China's coal industry and also an international mining equipment exhibition with large dimensions, is very famous at home and abroad. As one of the international top-level grand

exhibitions, CCME has high degree of internationalization. Statistical data of last exhibition shows that 50% exhibitors and 10% viewers are from overseas.

### Exhibition Scale

Exhibitors of this CCME make a record again. More than 400 coal mining machinery enterprises and related manufacturing enterprises from home and abroad participate in the exhibition. Area of the exhibition ground exceeds 38,000 square meters. Professional visitors exceed 50,000. Such an optimistic figure fully indicates that China's manufacturing industry on coal mining machinery equipment has infinite potential of exploration, and China is the focus of the whole world.

### Exhibition Range

CCME exhibition converges large-scale mining, transport and grading equipment from home and abroad, showing the most advanced services and technologies in coal industry. This CCME focuses the latest achievements and the development tendency

of technologies, equipment and solutions for many issues, including safety production, gas extraction, integration of mining and excavation, in-mine rescue equipment and comprehensive utilization of resource, of coal mine production enterprise in a more outstanding way.

### Exhibition Organization

Organization and management of CCME are more scientific and systematic. Extraordinarily convenience and more humanized service are provided for exhibitors and spectators by committee of CCME. This CCME exhibition mainly consists of two parts, including exhibition and technology exchange. Exhibition area is classified into indoor part with 5 pavilions and outdoor part.

### Exhibitor Quality

During the short period of 4 days, all enterprises strive to show their most brilliant parts to the whole world, and all boutiques and new products from home and abroad are onto are-

nas. Many enterprises put forward various highlights in good order, and the enterprise includes China Coal Equipment Group, Shenyang North Traffic Heavy Industry Group, North Heavy Industry Group, Sunward, Taiyuan Heavy Machinery Group Co., Ltd, Sany, Zhengzhou Coal Mining Machinery Group Co., Ltd, Datong Coal Mine Group Co., Ltd, Shandong Mining Machinery Group Co., Ltd, Dadi Technology & Engineering Group Co., Ltd, IMM (International Mining Machinery) and CCRI Shanxi Coal Mining Machinery Equipment Co., Ltd; international giant, including Caterpillar, Joy, Sandvik and TAKRAF, also have full confidence on China's coal mining machinery market. Moreover, international manufacturers, including Metso, Thyssen Krupp, Kennametal, Voith, Bosch Rexroth, MMD, Pfeifer, Schramm and KHD Humboldt Wedag Machinery Equipment Co., Ltd also express that they will pay much attention to China coal mining machinery market.



# Jiang Zhimin, Vice President and Secretary General of China National Coal Association: COAL INDUSTRY MAY ENTER INTO “GOLDEN AGE”

□ By Chi Yu, Reporter of *Mining Equipment* magazine



China is the country with the maximum coal production and consumption in the world. In 2010, the national coal production is 3.24 billion ton, and the coal production of a single mine increased averagely from 96,000 ton to over 200,000 ton. The development of science and technology promotes the stability and improvement of safety production situation of coal mine, and as a result, the profitability of such industry increases continuously. The following five years will be a key period for the transformation of China coal industry. Jiang Zhimin, Vice President and Secretary General of China National Coal Association told the reporter that China coal industry will enter into its historical “Golden Age”.

## Coal industry undergoes sound development

Coal mining technology in China is of the world advanced level. Many advanced technologies are widely popularized and applied, including information communication, multimedia, and visual coal mine automation and informatization network systems. Breakthroughs have been made in the research of coal mine disasters; and progresses have been achieved in coal bed gas drainage, fire and flood prevention and treatment, automatic mine inspection & monitoring and early warning technologies. At the same time, each technology research and development has progressed into experiment stage, and substantial prog-

ress has been made in coal gasification technology. Breakthroughs have been made in coal conversion technology, and the world largest coal chemical project with an annual production of 600,000 t olefin has been completed and put into production.

## Coexistence of opportunity and challenge for energy industry

The “12<sup>th</sup> five-year plan” for technological development of coal industry instructs as follows: endeavour to study on the three basic theories of coal mine disaster prevention and treatment, efficient exploitation of coal mining and coal conversion; promotion of the development in technologies in fields like geological guarantee in coal resource development, large-scale mine construction in special stratum, efficient coal extraction, coal mine informatization and management modernization, coal and coal bed gas exploitation, coal mine disaster forecasting as well as prevention and treatment, coal mine safety and harmavoidance, emergency rescue, coal occupational hazard prevention and treatment, coal processing and conversion, energy conservation and emission reduction and comprehensive resource utilization; make important and key technological breakthroughs in multi-source coal geologic hazard prevention and treatment, large-scale mine construction under special conditions, efficient auxiliary transportation, efficient backfill coal mining, safe and efficient open-pit coal mining, coal mine safety and harmavoidance, emergency rescue settlement and ten-million-ton efficient coal preparation.

## Coal machinery manufacture becomes a new and hot industry

The “11<sup>th</sup> five-year plan” witnessed the all-round and high-speed development in coal machinery manufacture, and great improvement in industry scale, industrial structure, product level and

international competitiveness. In 2010, the total assets of large and medium-size coal mine machinery manufacturing enterprises reached RMB 105.264 billion, total industrial output value RMB 87.597 billion, sales revenue RMB 89.121 billion, profits RMB 6.825 billion and factory total weight 3,109,200 ton. 772 coal mining machines, 1,905 development machines, 4,733 scraper chain conveyers, 74,907 hydraulic supports, 3,512 taping machines and 600 reversed loaders were produced. Moreover, full localization had been achieved in coal preparation equipment with an annual production capacity of 4 million ton, and research and development of some coal preparation equipment is in the front rank of the world.

During the “12<sup>th</sup> five-year plan”, the coal industry in China will keep the basic conditions for steady and rapid development and the trend to better state unchangeable, and the total demands for coal mine products will keep increasing. At the end of “12<sup>th</sup> five-year plan”, the coal production in China will reach 4.0 billion ton, and such policy is an opportunity for the continuous and rapid growth of coal machinery industry. The coal machinery manufacture will keep developing during the next 4 or 5 years, and equipment update will reach the peak in the coming years, which lays a solid foundation for the future growth of coal machinery.

## Competitiveness improves remarkably

With respect to the development of coal machinery industry, the gross national coal mine machinery output value will exceed RMB 150 billion by 2015. Breakthroughs made in the upgrade of coal machinery industry to high-end industry: 3~4 conglomerates are with annual sales revenue over RMB 10 billion; 4~5 key enterprises are with annual sales revenue of RMB 5~10 billion; one enterprise of the coal machinery industry is among the top 100 manufacturers of China, and 2 enterprises are among the top 500 manufacturers of China. Annual sales revenue

of the above enterprises will take up over 60% of the total coal mine machinery revenue nationwide.

Independent innovation capacity will strengthen remarkably; technology level of key coal mine machinery will be improved comprehensively to meet the requirements of coal mine modernization, and to automatize the mechanized mining face equipment, the complete equipment for 10 million ton coal preparation and the complete equipment for new coal chemical industry.

## Annexation and reorganization of enterprises exist throughout demand

Accelerating the annexation and reorganization of coal enterprises is a must for the healthy, stable and sustainable development of Chinese coal industry. By the end of 2010, there have been 13 enterprises with coal production over 50 million ton nationwide, the production of which is 1.327 billion ton, taking up 40.96% of the total production in China; among such 13 enterprises, 5 enterprises were with coal production over 100 million ton, the production of which takes up 25.1% of the total production in China.

## Safe, green and circular mine construction

In the following 5 years, coal enterprises shall speed up the construction of green mining demonstration projects, including coal mine backfill and water retention, strengthen the protection of mining area, treatment of mining subsidence area and construction of ecological mines, and try their best to promote the coal resource development, ecological environment protection in mining area and coordinated development of regional economy and society. They shall strengthen basic works for coal mine safety, establish long-term mechanism for coal mine safety production and increase the inputs in coal mine safety for the purpose of improvement in coal mine safety capability and effective prevention of serious coal mine accidents.



# Interview of Liu Xinzhong, General Manager of China Coal Consultant International Co., Ltd

## GREEN, SCIENCE & TECHNOLOGY, AND SAFE WELCOME TO CHINA COAL & MINING EXPO 2011

□ By Tang Yi, Reporter of *Mining Equipment Magazine*



China Coal & Mining Expo (hereinafter referred to as "CCME") is a large international event for exhibiting coal mining equipment. It is approved by Ministry of Science and Technology, sponsored by China National Coal Association with the assistance China National Coal Group Corp., and undertaken by China Coal Consultant International Co., Ltd and Together Expo Ltd

Since 1980s, CCME has been held for 14 times, developing into one of the largest international mining equipment expos. CCME is regarded at home and abroad as influential as "Las Vegas International Mining Expo in America", "International Mining Equipment Expo in Australia", "Munich bauma in Germany" and "International Mining and Electricity Expo in South Africa". Meanwhile, CCME is a platform for domestic and foreign coal mining equipment manufacturers to promote themselves and to demonstrate new equipment and technologies, as well as an important place to meet old friends, make new friends, exchange new technologies, develop new market and seek for new cooperation.

In recent 30 years, CCME has been reflecting and witnessing the development of China coal mining industry and coal equipment manufacturing industry. Several years ago, the expo was dominated by foreign products shown by display boards and pictures, and the variety of equipment was not rich enough. But now, both domestic and foreign exhibitors are eager to take part in the expo, the scale and area are expanded, and exhibited equipment become complete and large. These years were a period when the domestic coal production and engineering machinery, especially coal equipment manufacturing industry, were forging ahead. According to statistics, in 2005, CCME covered a net area of about 10,000 m<sup>2</sup>, with only about 4,500 m<sup>2</sup> occupied by domestic exhibitors, and about 5,500 m<sup>2</sup> by foreign counterparts; in 2007, the same covered about 20,000 m<sup>2</sup>, with about 6,000 m<sup>2</sup> occupied by foreign exhibitors, and about 14,000 m<sup>2</sup> by domestic counterparts, signaling the coverage area of domestic exhibitors exceeded that of foreign counterparts; in 2009, CCME further expanded to a total net area of about 26,000 m<sup>2</sup>, with

about 20,000 m<sup>2</sup> and 6,000 m<sup>2</sup> occupied by domestic and foreign exhibitors respectively; in 2011, according to current statistics, the expo will cover a total net area of about 38,000 m<sup>2</sup>, with about 32,000 m<sup>2</sup> and 6,000 m<sup>2</sup> occupied by domestic and foreign exhibitors respectively. These numbers indicate that facilitated by the tremendous development of domestic coal production, domestic coal equipment manufacturing industry has flourished, with its technical innovation, production and manufacturing capacities improved at a rapid speed, and its product lines gradually becoming complete. The numbers also shows that the awareness of advertising, branding and expanding among domestic coal equipment manufacturers has become stronger dramatically. Besides, the net exhibition areas of several domestic coal equipment manufacturers have all exceeded 1,000 m<sup>2</sup>.

More than 400 exhibitors have enrolled in CCME 2011 and foreign pavilions from Germany, America, Australia, etc. will successively come on stage, breaking the record of number of participants in previous expos. During CCME, special new product and technology presentation, over 10 technical communication conferences and lectures as well as numerous site equipment demonstrations will be held. It is noteworthy that besides lots of traditional coal mining technologies and equipment, CCME scope will be expanded over the industrial limit, attracting new technologies and equipment from the coal chemical, coal security and other periph-

eral industries. Thus, the expo will become more colorful and unusually brilliant.

As CCME scale is increasing unprecedentedly, and companies are eager to participate, the organization of the exhibition is confronted with huge challenges. China Coal Consultant International Co., Ltd, an undertaker of CCME, will be engaged in developing the scale and quality of CCME by making efforts in many aspects, with strong sense of responsibility and wholehearted service attitude. Though only with a small number of personnel, the undertaker's team of CCME has formulated a detailed plan for preparation of CCME, and optimized the process and carefully carried out every detail by taking CCME as a huge and systematic project. For example, we have started to stress the promotion and exhibitor invitation in the early stage by learning experience from other exhibition, and conducted the promotion campaign approximately 1 year in advance so as to offer ample time for exhibitors to formulate the exhibition plan, and manufacture exhibits, etc. and to avoid they temporarily scratch up something. We have also established a website, on which visitors can register in advance and free entrance tickets are provided, making it convenient for professionals to visit the expo, to create the site exhibition conditions for complete, large and electrical equipment, the undertaker, along with staff of exhibition pavilions, has strained every nerve to develop potential space at the site, to explore new exhibition areas and to provide sound power supply and distri-

bution services. The team has shown their rich experiences and originalities in serving the coal industry in many aspects such as allotment of exhibition area, coordination of infrastructure, and transportation and hoisting of large exhibits, etc. (there will be about 14,000 ton equipment to be transported and assembled).

Many exhibitors have been returned with real value from the expo, and meanwhile CCME, as the most important stage of the industry, has become a motive power driving the customer to innovate and progress by showing ever renewing technologies and equipment.

Certainly, compared with bauma China, BICES, etc. at home as well as construction machinery and mining expos with larger scale and scope at abroad, there is still a huge gap for CCME to bridge. The company's weaknesses are in various aspects, such as limited exhibition area, relatively inconvenient transportation and need for more detailed preparation. In the future, CCME undertaker will continually explore the potential of CCME, comprehensively cooperate with professional media in the mining industry, attract more enterprises in relevant industry, and further develop the follow-up value of the influence of the expo.

I sincerely hope CCME will be crowned with complete success, and all exhibitors and visitors can leave with fruitful results. Let us work together to realize the glorious vision of building environmental-friendly, safe and technology-advanced mines."



# WONDERFUL EXPECTATION FOR “12<sup>th</sup> FIVE-YEAR PLAN” OF CHINA COAL INDUSTRY

□ By Chi Yu, Reporter of *Mining Equipment* magazine

In recent years, demand of China coal market has increased rapidly, which promotes changes in economic coordinates of the coal industry. It is estimated that by the end of “12<sup>th</sup> five-year plan” period, total demand of coal in China will reach 3.8 billion ~ 4.2 billion tons. In addition, the government will enhance changes in economic development style and intensity of energy conservation and emission reduction. If the development of non-fossil energies including nuclear power, hydroelectric power and wind power are increased, total coal demand will be reduced to some extent.

As another five-year period of economic development, the “12<sup>th</sup> five-year plan” period is not only the key period of reconstruction for global economic structure after the international financial crisis and also the period fighting for transformation development and leapfrog development of the overall industry. During “12<sup>th</sup> five-year plan”, China coal industry will strive to reach the new highland of development.

## Expectation I: market scale will reach RMB 150 billion

Total output value of coal machinery of China reached RMB 87.2 billion in 2010. It is estimated that total output value of coal equipment of China will exceed RMB 150 billion by 2015. There has been some breakthrough for coal machinery industry's upgrading to advanced level: currently there are 3~4 enterprise groups with annual sales revenue more than RMB 10 billion; 4~5 key enter-

prises with annual sales revenue more than RMB 5 billion~10 billion; 1 enterprise which is cultivated to be one of top-100 Chinese manufacturing enterprises; 2 top-500 enterprises. Annual sales revenue of these enterprises accounts for more than 60% of revenue of coal equipment of China. In addition, 3~5 coal enterprises are promoted to be listed companies.

## Expectation II: creation of super-large coal enterprises

According to “12<sup>th</sup> five-year plan” period for coal industry, China will construct large coal bases in a steady way to make them become an important guarantee for stable supply of energy and a major supporter for adjusting of coal industry structure. 14 large coal bases including north Shanxi, east Shanxi, north Shaanxi, Huanglong, east Inner Mongolia, Shandong, Yunnan-Guizhou, Xinjiang, west Shandong, Huainan and Huaibei, middle Hebei coal bases, etc. will transfer major energy for national economic lifeline. By 2015, China will have super-large coal enterprises including ten 100,000,000 ton enterprises and ten 50,000,000 ton enterprises, and the degree of mechanization for coal mining



will reach above 75%, and number of 10,000,000 tonnage coal mines will reach 60.

## Expectation III: “low carbon” mode of coal industry

In the next five years, coal machinery industry market will continue to be popular. In addition, high demand will certainly lead to more emission of carbon dioxide. It has been indicated explicitly by European and American countries by 2014 that international society will adopt Stage IV emission standard mandatorily. However, the current system used in China is only equivalent to Stage II emission standard used by European and

American countries. It was reported by the industry that China will collect “carbon emission tax”; this means coal machinery with low productivity level will be abandoned by people. As high-end coal machines are widely used by internal-combustion engines, under the situation that low-carbon economy is highly valued by international society, it is irreversible that the whole industry will shift to the mode of low carbon economy.

## Expectation IV: breakthroughs are needed urgently in single core technology equipment

It is pointed out by “12<sup>th</sup> five-year plan” period that “Advanced equipment manufacturing industry shall be developed firstly to promote manufacturing industry to become more competitive; perfect the policy that develops significant technical equipment with the support of national major projects”. China is the largest coal-producing and the largest coal machinery manufacturing country in the world. Promoting coal machinery equipment is the important task for promoting China equipment manufacturing industry.

During “12<sup>th</sup> five-year plan” period, China will increase special national fund to support research on basic theory of science and technology for coal industry; support research and development of universal and key technologies; encourage enterprises to enhance cooperation with research institutions and conduct technical innovation; establish system for introduction, digestion, absorption and re-innovation for significant coal technical equipment so as to facilitate localization. Substantial breakthrough related to significant technical equipment is the key point for modernizing exploitation upon resource integration. Trying to reach the target that by 2015, degree of mechanization for coal mining in China will reach above 75%; promote improvement of coal science and technology and reach 45% of contribution rate of industrial science and technology; increase capacity for independent innovation and promote establishment of safe, highly-efficient and modernized coal mines, and reach the objective that scientific and technical investment of large and medium coal enterprises will equal to 3% of operation revenue of the current year.”



## Expectation V: western China will become the core of coal production

During “12<sup>th</sup> five-year plan” period, according to national arrangement and layout of coal production, striving to develop coal resources in western China and connecting them with central and eastern China becomes a new task of coal production and dispatching; carrying out national coal production arrangement with the layout of “eastern, central and western China”, and implement fundamental strategic vision of “controlling eastern China, stabilizing central China

and developing western China”. In recent 30 years, the proportion of coal production volume of western China has increased 26% from 23% in 1980 to 49% in 2010. However, coal production volume of the central China which is the traditional coal dispatching area has become less. It is estimated that during “12<sup>th</sup> five-year plan” period, newly-added production volume assigning to western China will account for more than 70% of total newly-added production volume.

## Expectation VI: complete equipment will become core competence

During “11<sup>th</sup> five-year plan” period, comprehensive mechanistic exploitation for coal mines increased significantly and comprehensive complete equipment technology and manufacturing industry developed rapidly, ordinary comprehensive exploitation equipment have realized overall localization.

Accelerating building of equipment development and integration capacities for high-end coal mining, digging, washing and mine establishment as well as building of production and manufacturing capacity are the important aspects of development of coal equipment manufacturing industry during “12<sup>th</sup> five-year plan” period. Strive to promote industrial restructuring for coal equipment industry; develop a batch of competitive large coal machinery equipment manufacturing enterprise groups in priority; enhance development & manufacturing capacity and technical service capacity for significant technical equipment with proprietary intellectual property rights; transform to the industry structure of informatization, product package and centralization; cultivate leading enterprises in the industry.



## Expectation VII: coal industry plays “black-white and golden concerto”

Since global crude oil price continues to increase in recent days, coal chemical industry, of which the products can probably replace petroleum, attracts people’s attention once again to become hot investment destination of investors. It is indicated in coal industry development planning that technological innovation must achieve new progress during “12<sup>th</sup> five-year plan” period. How to realize development of coal industry in a safe, clean and economic way? Coal technological innovation capacity plays an

important role. Utilization of clean coal has been listed under the category of development of ten newly-developed energy industries and will gain certain development space during “12<sup>th</sup> five-year plan” period. On the other hand, although existing coal chemical technologies of China have already become advanced, from the perspective of current situation of China, development scale of coal chemical industry shall also be controlled to achieve rational development.

## Expectation VIII: break through bottlenecks of “death rate”

From the perspective of ensuring safety, reducing death rate and increasing exploitation efficiency, increase of coal comprehensive mechanical exploitation is a good solution and a true development direction. Death rate per 1,000,000 tons decreased to 0.749 in 2010 in China, much lower than average level of advanced coal producing countries of 0.1%; safety situation of coal mines in China is still serious. Therefore, there is large space for increase of mechanical coal exploitation in China and the demand so brought can be ensured.

By the end of “12<sup>th</sup> five-year plan” period, mechanical exploitation degree for large coal mines in China

shall reach above 95% and that for medium coal mines shall reach more than 80%; the mechanical and semi-mechanical exploitation degree for small coal mines shall reach 50%. Number of coal mines with safety and high efficiency will increase significantly. The number of coal mines with safety and high efficiency will reach 600 and the production volume will account for 65% of total volume in China. Among the 600 coal mines, the number of coal mines above 10,000,000 tonnage will reach 25 and the number of mine shafts with safety and high efficiency will double that by the end of “11<sup>th</sup> five-year plan” period.

## Expectation IX: coal machinery manufacturing industry will enter the “boom period”

Comprehensive mechanization degree will reach above 85% in China in 2015. During “12<sup>th</sup> five-year plan” period, demand for comprehensive exploitation equipment will reach 300 ~ 500 sets per year with estimated value between RMB 50 billion to RMB 70 billion; among these, the proportion of high-end comprehensive exploitation equipment will increase from 20% at present to more than 50%.

On the other hand, coal machinery manufacturing industry will strive to develop highly-efficient, reliable, energy-saving and environmental-friendly complete equipment which can replace imported equipment, with increasing integration capacity of significant coal equipment as main line, and to realize breakthrough in core technologies and systems depending on major project.

According to coal industry development planning, regional integration for 100,000,000 tonnage super-large coal mines will be completed during “12<sup>th</sup> five-year plan” period, and the newly-built coal mines will generate huge newly-added demand for coal machinery. In the next five years, it is estimated that increase rate of production volume of raw coal in China will be about 10%, and increase rate of investment of fixed assets for coal mining industry will not be less than 20%, and annual increase rate of demand for coal machinery shall be more than 20%; coal machinery manufacturing industry will enter a “boom period”.





# TECHNICAL DEVELOPMENT AND MARKET ANALYSIS FOR CHINA COAL MINING EQUIPMENT

□ By Chi Yu, Reporter of *Mining Equipment* magazine



As the “10th five-year plan” and “11th five-year plan” of national economy were fulfilled in an all-around manner, energy demands of the leading industries in economic development grew significantly, and this resulted in vast increase of investment in coal development, continuous expansion of mine scale, and quick improvement of production efficiency. In recent decade, the average annual growth rate of coal output was 13%, and the total coal output of 2010 reached 3.24 billion tons, roughly accounting for 40% of the coal output worldwide. During the period of “11th five-year plan”, the total energy consumption of China rose by 118% year on year, and the coal consumption approximately accounted for 73% of the output of primary energy sources. China has substantially become a major country of coal production and consumption.

## I. Current technical development of “three machines and one support” used for coal mines

The coal-mining machine, scraper conveyor, tunneling machine, and hydraulic support (three machines and one support) are major production equipment used on underground coal mining faces. Their technical level is directly related to the production efficiency, safety, and environmental protection, and so they are key points for development of coal mining equipment.

### 1. Technical level of coal-mining machine

At present, coal-mining machines mainly used on mining faces of coal mines both at home and abroad include drum shearers and coal plows. In China, drum shearers are used in most cases on fully-mechanized mining faces of medium and large-sized coal mines, most of which are electrical traction shearers; the mining process and equipment technology of coal plows are not widely used.

Today, overall technical parameters of domestic electrical traction shearers are very close to those of the advanced foreign electrical traction shearers. The maximum installed power of coal-mining machines is 2,560kW, and voltage is 3.3kV; the power of single cutting motor is above 750kW, with the maximum at 900kW; the drum diameter is 2.5~3.1m, and cutting depth is 800~1000mm; the maximum cutting height of coal-mining machines is 6.3m; the maximum traction speed is 28~30m/min; the cutting speed of drum is 0.4~0.6m/s.

It can be seen that China has made outstanding achievements in development of high-power coal-mining machines, but there is some gap between the domestic high-power coal-mining machines and the most advanced foreign ones in terms of structure design, drive technology and electrical performance, overall technology and advancement.

### 2. Current technical status of scraper conveyor

In the fully-mechanized mining equipment system, scraper conveyor is not only the coal carrying equipment on coal mining face, but also the running track of

coal-mining machine as well as the moving pivot of hydraulic support. During the operation of fully-mechanized mining equipment, the cables, water pipes and signal network cables of working equipment should be hanged. Therefore, stable, reliable and efficient operation of scraper conveyor has a direct impact on the production capacity and economic benefit of coal mining enterprises.

At present, there are three types of scraper conveyors developed in China: twin side chain, twin center chain and single chain; twin side chain is widely employed on a heavy scraper conveyor.

In recent years, along with the continuous improvement of mining equipment technology, some new technology has been applied in the scraper conveyor. For example, soft starting technology of hydraulic coupler, torque-limiting friction clutch and speed-regulating coupler is used for overload protection of equipment; mechatronics of hydraulic chain tensioner, automatic expansion tail is used for automation control of equipment; moreover, speed, temperature, current and flaw detection, etc. modern monitoring devices are also continuously used for scraper conveyor.

### 3. Development level of tunneling machine

Stoping and tunneling are the important links of underground coal production; rapid roadway tunneling technology and its equipment level have direct relation with the process rationality and

capacity of coal production. Advanced tunneling equipment and supporting technology is an essential condition to ensure high output and high efficiency of coal. Therefore, the policy for underground coal proposed by China is: laying equal stress on mining and tunneling.

Coal roadway tunneling machine is used for underground coals tunneling in coal seam; mixed coal-rock roadway tunneling machine is used for tunneling in coal-rock paragenetic ore bed; rock roadway tunneling machine is used for tunneling in surrounding rock bed. In the fully-mechanized mining equipment system, cantilever type tunneling machine and mixed coal-rock roadway tunneling machine are used most and they are operated together with monoblock anchor drill rig.

### 4. Technical level of hydraulic support

At present, the variety and type of hydraulic supports for underground coal mining are relatively complete and can meet the coal production requirements under different geological conditions in different areas. The hydraulic support has a maximum supporting height up to 6.5m and center distance of 2m; the maximum working resistance is 13000kN and supporting strength 1.0 ~ 1.1MPa, and most hydraulic supports are of two-leg and four-leg shield type; the cycle index (service life) of the support exceed 35000; hydraulic system for fast moving hydraulic supports has successfully cut the cycling duration for “descending, moving, and ascending” down to





10 ~ 12s; the work requirement for 800 ~ 1000mm cutting depth by coal-mining machine can be met.

The design and manufacturing technologies of domestically produced hydraulic supports for medium-thick coal seam are relatively mature; such supports have many characteristics such as simplified structure of the entire top beam, comparatively large working resistance, reliability, relatively good performance of electrohydraulic control, etc. Especially for the longwall mining process with a dip angle exceeding 35° and a large mining height in the medium-thick coal seam, the equipment technology for fully-mechanized mining has been in the leading position of the world.

## II. Technical development trend of underground coal mining equipment

A consensus view has been reached in the industry that the underground fully-mechanized coal mining process and its equipment are the most effective means for the enterprises to realize high output, high efficiency, safety and environmental protection; all the main coal production countries in the world are continuously increasing the proportion of underground fully-mechanized coal mining production. Currently, the proportion in Russia is 85.9%, that in Poland is 92.3%, while that in the U.S., the U.K., Germany and Japan is above 98%. However, the proportion of underground fully-mechanized coal mining production in China is still relatively

low, the proportion of state-owned coal mines is only 52.5%, and that of the local coal mines is further lower; according to statistics, the proportion of underground fully-mechanized coal mining production only occupies around 28% based on the total output calculation of the nationwide underground coal mines. This lagging production technical level fails to be commensurate with our country's position of worldwide big coal country.

### 1. Technical development trend of electrical traction shearer

- Increase the total installed power of coal-mining machine reasonably according to the matching specification requirements.

- Perfect and improve cutting drum. Improve the strength of drum shaft, bearing and rocker arm and other structural members accordingly for increasing cutting depth, and the service life of gear, shaft and bearing shall be over 30,000 h.

- Electric traction mode adopts reliable multi-motor AC variable frequency speed control. The AC variable frequency speed control electric traction mode has the characteristics of advanced technology, high reliability and simple maintenance and management, etc; however, for the mode of "one frequency converter drives two motors", frequency converter cannot test the performance parameters of motor accurately, and control and protection functions cannot be fully realized.

- Accelerate the development of the machine types used in the coal seams that

are hard to exploit. The extra-thin seam, extra-thick seam and high spud angle coal seam occupy relatively large proportion in our country, so applicable special type coal-mining machine shall be developed.

- Make monitoring and protection system become more intelligent.

### 2. Development and innovation directions of scraper conveyor

- Make scraper conveyors have large power, long distance and high speed.

- Reduce traditional bolt connection and improve the reliability and service life of chute.

- Improve the strength and wear-resisting property of main parts.

- Adopt soft start technology to buffer start overload.

- Realize working condition monitoring and self-operated failure diagnosis.

### 3. Technical development direction of tunneling machine

- Increase cutting power and improve cutting ability.

- Improve operational reliability and strengthen adaptability to all kinds of complex geological conditions.

- Optimize arrangement of components of the complete machine and apply well-knit design.

- Make research and development on new-type tunneling and anchoring machine to realize high-speed roadway tunneling.

- Develop technology of automatic monitoring control and loading feedback speed regulation.

### 4. Development tendency of hydraulic support

- Develop structural model which has relatively wide scope of application and high reliability.

- Increase support strength and working resistance and manufacture more large-scale and heavy-duty supports.

- Apply high-grade steel products and intensify indicators of test items.

- Develop liquid supply system to high pressure and flow

- Extend application functions of electrohydraulic control system, enhance reliability and prolong its service life.

However, it shall be noted that it is a complex system engineering in implementation of fully-mechanized mining process by "three machines and one support" at the underground coal mine stope. Equipment arrangement and operation are interrelated and inter-restricted, therefore, dependence of "advanced structure and good performance" of only one kind of equipment (optimization of subsystem) cannot achieve optimization of fully-mechanized mining process on the working face (whole system); high efficiency and high yield of the fully-mechanized mining process can only be achieved through quickly "cutting coal seam block—timely transporting of coal flow—fast support moving and pushing chute—advanced tunneling in coal roadway". Therefore, requirement on the underground production coal machine by fully-mechanized mining process is that "three machines and one support" must be kept together and manufacturing of coal mining equipment shall be developed and strengthened with the guidance of system engineering viewpoints.

Production of the coal enterprises is one of pillar industries in China. Advanced mining equipment is an important mean to achieve high efficiency and high capacity of the coal mines; therefore, the government has formulated the basic policies to develop the coal mining equipment manufacturing industry, which is closely related for China to become an economic giant and an economic power. Support for the coal production and mining equipment manufacturing industry from the government will not be weakened but strengthened; mining equipment technical development and product market development enjoy a broad space. Both the coal production enterprises and the mining equipment manufacturing industry should seize such an opportunity, size up the situation, develop scientifically and work out feasible plans to achieve better economic benefits and social benefits.



# LIST OF TOP 50 ENTERPRISES OF CHINA COAL MINING MACHINERY INDUSTRY 2010

□ By Chi Yu, Reporter of *Mining Equipment* magazine

Currently, the list of Top 50 Enterprises of China Coal Mining Machinery Industry 2010 that were chosen by China Coal Machinery Industry Association based on the statistical data on the sales of its member enterprises following the principle of “openness, equality and fairness”, has been officially released. Zhengzhou Coal Mining Machinery Group Co., Ltd, Sany Heavy Equipment Co., Ltd and China Coal Zhangjiakou Coal Mining Machinery Co., Ltd still took the leading positions in the industry.

Zhongping Energy and Chemical Group Machinery Manufacture Co., Ltd, with a sales revenue of over 2,000 million Yuan, improved its ranking from the 7<sup>th</sup> in 2009 to 4<sup>th</sup> in 2010, which was astounding; Yankuang Group Electromechanical Equipment Manufacturing Plant, Shenyang North Traffic Heavy Industry Group Co., Ltd and Linzhou Heavy Machinery Group Co., Ltd appeared among the top 30 for the first time, so their potential for growth can not be neglected. Shijiazhuang Coal Mining Machinery Co., Ltd, Jincheng Jinding Coal Mining Machinery Industry Development Co., Ltd, and Jiaozuo Shenhua Heavy Machinery Co., Ltd, with the sales growth rates of 160.48%, 104.55% and 67.44% respectively ranked the top 3 in the list according to growth rate.

The total sales revenue of the top 50 enterprises in 2010 was 50,880 million Yuan, 12,283 million Yuan more than the 38,597 million Yuan in 2009, realizing a growth rate of 31.82%; the average revenue of the top 50 enterprises was 1,018 million Yuan, 246 million Yuan more than the 772 million Yuan in 2009. Among the top 50 enterprises of 2010, there were 19 enterprises with sales revenue over 1,000 million Yuan, which was 6 times than the number in 2009. The total revenue of 19 enterprises was 34,927 million Yuan, accounting for 68.65% of the total revenue of the top 50 enterprises.

The threshold for top 50 enterprises of 2010 was also raised. In 2009, the revenue of Xuzhou Coal Mining Machinery Factory, the last on the list was only 196.5 million Yuan while that of Shanxi TZ Coal Mine Whole-set Equipment Co., Ltd, the last on the list of 2010 was 279.8 million Yuan, which would have made it rank the 44<sup>th</sup> on the list of top 50 enterprises of 2009.

## List of Top 50 Enterprises of China Coal Mining Machinery Industry of 2010

Since 2002 China Coal Machinery Industry Association has released the “Annual National Top 100 Coal Enterprises” for 8 successive years and the “Annual Report on Analysis of Top 100 China Coal Enterprises” for 6 successive years, which provided helpful references for the reform and development of coal enterprises and important information for people from all circles concerning coal industry and enterprises. It is reported that China Coal Machinery Industry Association, after the enterprises that applied independently being approved by relevant authorities, listed the National Top 100 Coal Enterprises of 2010 based on their 2009 operating revenue and the National Top 50 Coal Enterprises of 2010 based on their 2009 coal output.

List of Top 50 Enterprises of China Coal Machinery Industry 2010

| No. | Enterprise Name   | Sales Revenue (1,000 Yuan) |
|-----|---|----------------------------|
| 1   | Zhengzhou Coal Mining Machinery Group Co., Ltd                                  | 6,645,686                  |
| 2   | Sany Heavy Equipment Co., Ltd   | 2,683,461                  |
| 3   | China Coal Zhangjiakou Coal Mining Machinery Co., Ltd                           | 2,588,360                  |
| 4   | Zhongping Energy and Chemical Group Machinery Manufacture Co., Ltd              | 2,003,597                  |
| 5   | China Coal Beijing Coal Mining Machinery Co., Ltd                               | 2,002,307                  |
| 6   | Pingdingshan Coal Mining Machinery Co., Ltd                                     | 1,920,905                  |
| 7   | Ningxia Tiandi Benniu Industrial Group Co., Ltd                                 | 1,832,115                  |
| 8   | Zhengzhou Siwei Electromechanical Equipment Manufacture Co., Ltd                | 1,540,639                  |
| 9   | Shanxi Pingyang Industry Machinery Co., Ltd                                     | 1,496,450                  |
| 10  | Shandong Tiansheng Mine Equipment Co., Ltd                                      | 1,449,987                  |
| 11  | Shijiazhuang Coal Mining Machinery Co., Ltd                                     | 1,436,820                  |
| 12  | Yankuang Group Electromechanical Equipment Manufacture Plant                    | 1,380,024                  |
| 13  | Shandong Mining Machinery Group Co., Ltd  | 1,274,822                  |
| 14  | Jinding Coal Mining Machinery Manufacture Center of Jincheng Anthracite Group   | 1,266,309                  |
| 15  | CITIC Heavy Industries Co., Ltd   | 1,154,242                  |
| 16  | CCRI Shanxi Coal Mining Equipment Co., Ltd                                      | 1,133,010                  |
| 17  | Jiamusi Coal Mining Machinery Co., Ltd  | 1,086,403                  |
| 18  | Chongqing Dajiang Xinda Vehicle Company Limited                                 | 1,027,720                  |
| 19  | Shanxi Coal Mine Machinery Manufacturing Co., Ltd                               | 1,004,168                  |
| 20  | Taiyuan Mining Machinery Group Co., Ltd   | 978,860                    |
| 21  | Shenyang North Traffic Heavy Industry Group Co., Ltd                            | 887,151                    |
| 22  | Linzhou Heavy Machinery Group Co., Ltd  | 814,735                    |
| 23  | Kailuan Tietuo Heavy Machinery Co., Ltd   | 762,080                    |
| 24  | Shanghai Chuangli Mining Equipment Co., Ltd                                     | 742,140                    |
| 25  | Hebei Tianze Heavy Machinery Co., Ltd   | 630,835                    |
| 26  | Xi'an Coal Mining Machinery Co., Ltd  | 627,135                    |
| 27  | Fushun Coal Mining Motor Manufacturing Co., Ltd                                 | 623,832                    |
| 28  | Xuzhou Huadong Machinery Plant  | 610,131                    |
| 29  | Ningxia Northwest Junma Motor Manufacturing Co., Ltd                            | 579,766                    |
| 30  | Jixi Coal Mining Machinery Co., Ltd   | 538,665                    |
| 31  | Shandong Xinmei Machinery Equipment Co., Ltd                                    | 537,686                    |
| 32  | Central Machinery Plant of Datong Coal Group Co., Ltd                           | 525,624                    |
| 33  | Shandong Laiwu Coal Mining Machinery Co., Ltd                                   | 521,456                    |
| 34  | Shandong Tai'an Coal Mining Machinery Co., Ltd                                  | 512,970                    |
| 35  | Yankuang Group Continent Machinery Co., Ltd                                     | 504,210                    |
| 36  | Dongguan Longtai Industrial Co., Ltd  | 502,553                    |
| 37  | Huainan Zhengmeiji Shunli Machinery Co., Ltd                                    | 441,253                    |
| 38  | Henan Wanhe Machinery Co., Ltd  | 432,272                    |
| 39  | Anhui Pandeng Machinery Co., Ltd  | 426,270                    |
| 40  | Shanxi Fenxi Mining (Group) Equipment Repair and Manufacture Factory            | 408,409                    |
| 41  | Zhejiang Quzhou Coal Mining Machinery General Plant Co., Ltd                    | 403,442                    |
| 42  | Shanxi Xinzhou General Machinery Co., Ltd                                       | 403,273                    |
| 43  | Jiaozuo Shenhua Heavy Machinery Manufacturing Co., Ltd                          | 383,924                    |
| 44  | Electromechanical Repair Factory of Huozhou Coal Electricity Group Co., Ltd     | 341,736                    |
| 45  | Triumph Heavy Industry Co., Ltd   | 330,080                    |
| 46  | Mechanical Manufacturing Company of Guizhou Shuicheng Coal-Electricity Co., Ltd | 321,110                    |
| 47  | Shandong Xianhe Ruixin Electromechanical Equipment Co., Ltd                     | 312,694                    |
| 48  | Hebi Yuxing Coal Mining Machinery Co., Ltd                                      | 288,478                    |
| 49  | Inner Mongolia North Heavy Machinery Co., Ltd                                   | 280,756                    |
| 50  | Shanxi TZ Coal Mine Whole-set Equipment Co., Ltd                                | 279,837                    |



On October 28, 2011, on the topic of “leading industrial development, integrating technical innovation and promoting industrial upgrading”, China Coal Equipment Co., Ltd, the biggest domestic manufacturer of coal mining machinery, has a grand exhibition of a series of coal mining machinery equipment which could fully reflect customer value and were possessed with latest technology in China's 14<sup>th</sup> International Technology Exchange & Equipment Exhibition on Coal & Mining. The area of exhibition booth is 2000 square meters which is the largest exhibition booth in all previous ones. The exhibition shows extraordinary strength of China's coal mining machinery equipment to the world.

## CHINA COAL EQUIPMENT CO., Ltd

# THE “BACKBONE” OF CHINA COAL MINING MACHINERY EQUIPMENT

Before long, China Coal Equipment Co., Ltd successfully merged and purchased British Parsons Mining Chain Co., Ltd owning over one hundred years of history, which excited Chinese very much. Production capacity of China's first complete set of top coal equipment and technology developed by China Coal Equipment Co., Ltd to be exported to Russia is successfully achieved, which symbolizes that export item of coal mining machinery involving the largest number of enterprises and the largest scale is crowned with complete success; and made-in-China coal mining machinery products will be exported to foreign country in large scale and appear in world markets.

When looking back, we can find that China Coal Equipment Co., Ltd grows out of nothing, and it starts from manufacturing to innovation, and its business starts from Chinese market to world market, and it is an enterprise of coal mining machinery equipment that bears mission of being “backbone” of China's coal mining machinery industry. How does China Coal Equipment Co., Ltd become the “biggest domestic coal mining machinery enterprise”?

### Establishment of coal mining machinery “national team”

At the right time of October 19, 2004, four best-known enterprises in domestic coal mining machinery market merged into China Coal Equipment Co., Ltd, forming a new “national team” of coal mining machinery equipment. The four enterprises are Zhangjiakou Coal Mining Machinery Co., Ltd, Beijing Coal Mining Machinery Factory, China Coal Overseas Development Co., Ltd and China Coal Equipment Set Headquarter. After reorganization, China Coal Equipment Co., Ltd orientated its enterprise development pattern to be “five product chains of coal-winning machine, drag conveyor, hydraulic support, entry-driving machine and electronic control products, and realiza-

tion of supply of whole set of fully mechanized mining and excavating equipment”.

### Perfection of industrial chain

As of 2006, China Coal Equipment Co., Ltd, enclosing the strategic thought of “integration of production”, completed strategic deployment of opening up industrial chain of coal mining machinery in a series of integration, merging and reorganization.

In 2006, China Coal Equipment Co., Ltd purchased British Parsons Co., Ltd which was the worldwide well-known and owned over one hundred years of chain manufacturing history; in 2007, it reorganized Fushun Coal Mining Electrical Machinery Manufacturing Co., Ltd and Shijiazhuang Coal Mining Machinery Co., Ltd; in 2008, it reorganized Xi'an Coal Mining Machinery Co., Ltd

At present, China Coal Equipment Co., Ltd has 15 subsidiaries covering all over the country, and the subsidiaries include wholly-owned company, holding company, joint stock company and branch company.

### Innovation and leading of industrial development

China Coal Equipment Co., Ltd has formed a scientific and technical innovation system. It also has cooperated with 12 universities and 2 scientific research institutes to research on 32 projects. Moreover, it has cooperated with many universities, enterprises and research institutes to sign 7 agreements of strategic alliances, developing many milestone products with epoch-making significance.

In July, 2010, China Coal Equipment Co., Ltd cooperated with China University of Mining and Technology to establish “National R&D (Laboratory) Centre for Excavating Machinery Equipment of Energy and Coal Mine”.

### Standing on the industry peak

Each leap contains passion, and each

leading demonstrates power. After China National Coal Group Corp. drew up five-year development goal of “22255” for the future, China Coal Equipment Co., Ltd bears the development task of establishing pillar industry for coal mining machinery manufacturing. In recent years, with the increasing expansion of market, service network of China Coal Equipment Co., Ltd is expanded simultaneously, and service stations or branch companies are established at many coal bases, including Shendong, Datong, Yanzhou, Lianghuai and Yulin, and large-scale maintenance

centres are established in Pingshuo and Ordos. Goal of delivering products to customers and in-place service and maintenance is achieved. The uniquely owned China Coal Overseas Development Co., Ltd even has the networks covering five continents. Only bona fides service can help us to seek common development. China Coal Equipment Co., Ltd indeed puts the service into core value of product. It promotes enterprise development by relying on credit operation and creates honest brand based on optimal service!

### Anhui Sunward Mining Equipment Co., Ltd.

## New Product Show of Mining Equipment and Underground Emergency Refuge System

Anhui Sunward Mining Equipment Co., Ltd (hereinafter referred to as “Shanhe Mining Equipment”), as a new force in the coal equipment manufacturing industry, ceremoniously promoted its high-end tunnel boring equipment and underground safety refuge system on the opening day of China's 14<sup>th</sup> International Technology Exchange & Equipment Exhibition on Coal & Mining. The main exhibits include four EBZ series (EBZ132, EBZ160, EBZ200 and EBZ260) TBMs, three MG series coal mining machines, two movable mining rescue capsules (KJYF 120/12 and KJYF 120 Q/10), etc. EBZ series TBMs are made by domestic sophisticated technologies and have the advantages such as good configuration, high reliability, low gravity and good stability. So far, it has been successfully used by Anhui Huabei Mining (Group) Co., Ltd and other companies and has achieved good effects.

KJYF 120/12 and KJYF 120 Q/10 removable mining rescue capsules, the fruit of Shanhe Mining Equipment's hard work, was another highlight at this exhibition. This series of products not only have functions of safety protection, oxygen supply, air purification, video monitoring, survival guarantee, etc., but also have been highly praised and widely concerned by leaders of State Administration of Work Safety, State Administration of Coal Mine Safety, etc. for excellent safety protection capability, high-reliability intelligent environment monitoring, humanized video monitoring system, unique and flexible setting based on temperature control technology, etc. For these reasons, we have won a high reputation among users.

Sunward Mining Equipment insists on Shanhe Group's concept of “precise design and elaborate production”. Concentrating on the thoughts of refining and JIT production technologies, it tries best to promote competitive products from four aspects, that is, development orientation, hardware construction, completion of process system and enhancement of management mode, so as to form a manufacturing system with core competitiveness. Within three to five years, Sunward Mining Equipment will strive for a professional mining machinery manufacturer with most advanced technologies, best product quality, optimal service and largest manufacturing scale in the nation and for one of international suppliers for complete mining equipment with first-class quality.



## N. TRAFFIC ACCELERATES DEVELOPING SPEED OF COAL MINE INDUSTRY

Shenyang North Heavy Mining Machinery Co., Ltd (N. TRAFFIC for short) is the chief company of the North Traffic which was established in 2006. It specializes in R&D, Manufacturing and Sales of Road header, U/G Drilling machine, Mining Truck, Shearer, Wash-dressing machine and so on.

### Roadheader

#### Applications

North Traffic Roadheaders are the advanced, self-propelled, extremely powerful coal-cutting and rock-cutting machines. They are designed using in coal mine tunnel, roadway tunnel and other underground construction projects.

#### Specification

- With strong cutting ability on each single cutting tooth.
- The cutting tooth adopts the famous brand such as Kennametal and Sandvik,
- With strong excavating ability in the coal, semi-coal, rock tunnel.
- Excellent shockproof capability of the system.



- Using the International renowned PLC program-mable controller can receive the alarm for all the problems.

### Drilling machine

#### Scope of application

Drilling machine is mainly used for drilling hole to discharge gas and water in the coal seam and also use for other engineering drilling.

#### Functional characteristics

- With the ability of drilling holes for

1,000 m deep.

- Drilling into several internal branch holes.
- Guarantee to fit trajectory of holes.

#### Performance advantages

- High precision of inclinometer measurement.
- Have the big output torque.
- High configuration of system.
- Strong ability of transitions.

### Joy Global Displays Leading Mining Solutions at China Coal & Mining Show 2011

20 October, 2011 - Joy Global's two organisations, P&H Mining Equipment Inc. (P&H MinePro Services) and Joy Mining Machinery join forces at China Coal & Mining exhibition to showcase their wide range of new technologies that improve efficiencies in underground and surface mining in China.

On Display will be one of the largest shearers in the world, the Joy 7LS8. The shearer is capable of cutting 7 meters of coal. One such machine is already working underground in the country. Interactive training simulators will allow customers to experience the latest in training aids the company has to offer.

P&H and Joy offer a single source solution for both surface and underground mining system needs through an array of products, such as; electric mining shovels, longwall shearers, roof supports, walking draglines, IPCC systems, feeder breakers, sizers, conveyor systems, drills, wheel loaders, shuttle cars, bolting products, motors, parts, technology upgrades, service support, training and many more products and services.

Joy Global Inc. is a worldwide leader in manufacturing, servicing and distributing equipment for surface mining through P&H Mining Equipment and underground mining through Joy Mining Machinery.

## TECHNICAL ADVANTAGES OF "MYC-1200 ANCHOR BOLT FORMING MACHINE" AND ITS PRODUCTS OF "ANCHOR BOLTS" AND ITS "BEARING PLATES AND NUTS"

1. This equipment is manufactured with double-layer yarn taking, double layer cement dipping, and automatic temperature control forming technologies and independently developed patented technologies of automatic threading, stepped cooling and auxiliary circulating screw. The equipment is scientific and reasonable in integral structure and highly efficient in production. The continuous production time may be as long as 36 hours, which effectively reduces the internal stress, saving the cement consumption by 1/3 compared to other domestic equipment of the same type. With high automation level, reliability and safety, easy operation and good economy, the equipment takes a leading

position among domestic products of the same type.

2. According to the test by Beijing Test Center of Mine Shaft Equipment and Mine Oil, State Administration of Work Safety, the torque, anchorage force, tail bearing capacity and other indices of the FRP anchor bolts produced by the equipment are superior to the national mandatory requirements for type approval test and mandatory test items and the FRP anchor bolt has obtained the certificate of safety signs for mining products.

3. The "MYC-1200 anchor bolt forming machine", FRP anchor bolts and its bearing plates and nuts have obtained as many as 17 national patents during the R&D.

## TECHNICAL SEMINAR PROGRAMME

| Date/Time              | Exhibitor  | Topic  |
|------------------------|--|--|
| 2011.10.28 13:30-14:30 | Roger Shanghai Co., Ltd  | Ground-Fault Protection and Coordination for Mining Equipment                |
| 2011.10.28 14:45-15:45 | Anhui SUNWARD Mining Equipment Co., Ltd                        | New Products Launch Show of High-end Mining Equipment and Mine Refuge System |
| 2011.10.29 09:30-10:30 | CMM  | Introduction of CMM New Shearer & Road Header                                |
| 2011.10.29 10:45-11:45 | Beijing Tiandi-marco Electro-hydraulic Control System Co., Ltd | Longwall Automation Situation and Development Trend                          |
| 2011.10.29 13:30-14:30 | Andritz Technologies Ltd                                       | Andritz New Technologies and Products on Coal Dewatering Application         |
| 2011.10.29 14:45-15:45 | JOY Mining Machinery   | Increasing Safety & Drivage Rates In Chinese Entry Development               |
| 2011.10.30 09:30-10:30 | AmerCable Incorporate  | Mining Cable Solution and Maintenance  |
| 2011.10.30 10:45-11:45 | Permco (Tianjin) Hydraulic Inc., Ltd                           | Application & Related Matters for High-Performance Gearpumps in Coal Mines   |
| 2011.10.30 13:30-14:30 | Ruichy Minova Synthetic Material Co., Ltd                      | Contrast of Polymer Materials Business Standard by SAWS & Europe             |
| 2011.10.30 14:45-15:45 | Parker Hannifin Motion & Control (Shanghai) Co., Ltd           | MDG41 Introduction and Its Application in Australian Mining Industry         |



## NORTHERN HEAVY INDUSTRIES GROUP CO., LTD

Northern Heavy Industries Group (NHI for short) is a state-owned company reshuffled and established on the basis of Shenyang Heavy Machinery Group Co., Ltd and Shenyang Mining Machinery Group Co., Ltd. In 2007, NHI became a transnational enterprise after acquisition of WIRTH Holding Company (Germany) and NFM Company (France). In 2008, NHI becomes Top 500 enterprise in both Chinese machinery industry and international machinery industry.

NHI is located in Shenyang Economic and Technology Development Zone with area of 1,300,000m<sup>2</sup>, 10800 employees and total asset value of 12.7 billion yuan.

Its main products are tunnel engineering equipment, power equipment, building material equipment, metallurgy equipment, mining equipment, coal machinery, port equipment, environment protection equipment, forging equipment, construction machinery and transmission machinery, total about 500 types and 7000 models.

NHI has complete facilities for design, test, inspection, measurement and complete manufacturing system. NHI is equipped with about 5000 sets of various large-scale machines. Some of its products are exported to more than 80 countries and regions in the world.

NHI has obtained four authentications respectively in recent years, that is, ISO9001 "Certificate of Conformity of Quality Management System", ISO14001 "Certificate of Environment", GB/T28001 "Certificate of Occupational Health and Safety" and ISO10012 "Certificate of Measurement System".

NHI extended its industrial chain towards comprehensive exploration and mining of coals several years ago.

In these years, tunnel boring machinery products produced by the company have been widely used by Shenyang Coal Trade Group, Shandong Xinwen Coal Industry Group, Henan Pingding-

shan Coal Group, Shanxi Lu'an Mining Industry Group, Datong Coal Mine Group, etc. The company has established long-term cooperation relationships with customers, accumulated precious experiences and developed a large number of new products. By now, tunnel boring products of the company have obtained 8 patent certificates. 12 tunnel boring products have obtained coal safety certificate.

In the future, NHI will focus on reform, innovation and breakthrough and take heavy equipment and high-class complete equipment as main development direction.

### MG180/420-BWD AC HAULING COAL WINNING MACHINE MADE BY JIXI COAL MINE MACHINERY CO., LTD

MG180/420-BWD AC hauling coal winning machine developed by Jixi Coal Mine Machinery Co., Ltd is the latest product developed specially for relatively thin coal bed to meet the urgent demand for mining in each bureau or mine. MG180/420-BWD AC hauling coal winning machine is designed to originate the pass bridge layout pattern which is characterized by low machine surface height, large installed capacity, large coal passing space, and high coal mining efficiency. The cutting part is of C-shaped structure with good stability of coal cutting. The technical parameters are reasonable and the structure is advanced to ensure reliable operation. It performs well in thin coal bed mechanized mining and its general technology meets the international advanced level.

MG180/420-BWD AC hauling coal winning machine breaks through the conventional design concept of the coal winning machine. Integrating the characteristics of the extremely thin coal bed and floor-based coal winning machine at home and abroad, the whole machine is laid out in a bridge manner. The main unit body and cutting part of the coal winning machine are laid out at the outer side of the conveyor coal wall. The pass bridge is right above the conveyor. The installed capacity can be increased on the premise that the machine surface height is not raised. The upper surface of the pass bridge is an inclined plane which adapts to fully the geometry of the self-contained support. It allows much more inferior limit of mining height at the same machine surface height. In order to shorten the length of the whole machine and increase the rigidity, the main case is of integral cast structure. The medium-voltage variable-frequency box of the electric control part and the left and right hauling parts are in the same integral case. Thus the machine adapts to the thin coal bed very well. The height regulating oil tank is laid out at the cutting part, in which the planetary gear is between the gearing chains. It is the first time that 1140V machine-borne frequency converter is applied to the thin coal bed winning machine. The main control system is of modularized structure. CAN bus communication with high reliability, good interference immunity and real-time performance is used among the modules, to serve segmented relay remote control, memory cutting, three-unit linkage and remote communication.

### COMPLETE SET OF FULLY AUTOMATIC TECHNOLOGY FOR COAL MINING IN THIN COAL BED FROM CHINA NATIONAL COAL MINING EQUIPMENT CO., Ltd

China National Coal Mining Equipment Co., Ltd (hereinafter referred to as China Coal) is subordinate to China National Coal Group Corporation. It is the largest domestic enterprise for manufacturing of heavy-load coal mining equipment including comprehensive mechanized coal mining and digging equipment. With top level of technical equipment and most powerful comprehensive strength, it ranks the 93<sup>rd</sup> among Top 500 Chinese Machinery Companies in 2011. The company has more than 20 types of leading products and over 1300 types of single-unit products. The products are exported successively to the USA, Australia, Russia, India, Turkey, Vietnam, etc.

The thin coal bed winning machine of China Coal to be exhibited is designed specially for the geological condition of the thin coal bed surface to ease the workload of downhole coal mine operators and realize unmanned mining or mining using very few miners. The system of the product consists of coal winning machine MG2X160/710-AWD, hydraulic support ZY6000/10/21D, scraper conveyor SGZ730/400, elevating conveyor

SZZ730/200, self-advancing tail ZY2300, electric-hydraulic control system of hydraulic support, working surface CCTV system, working surface automatic integrated control system, and working surface voice communication and locking system.

The complete set of products has made a breakthrough in key technologies such as "positioning and working condition monitoring technology of coal winning machine", "memory cutting technology of coal winning machine", "φ26×92 high-strength broadband flat chain design and manufacturing technology", etc. The product is designed to enable memory cutting of coal winning machine, electric-hydraulic control and automatic machinery tracking of hydraulic support, real-time working condition monitoring, failure diagnosis and remote control of complete set of equipment, etc. It improves greatly the automatic mining level of thin coal bed drum coal winning machine in China, realizes unmanned mining or mining using very few miners in thin coal bed and promotes construction of safe and high-efficiency coal mine in thin coal beds in China.





# Key Words 2011

## Overseas M & A

By implementing the strategy of overseas coal resource development, it is able to extend the supply chain of coal resource of China, resulting in consolidation of the national energy security system and mitigation of the tight situation of energy in China. With effort in positively seeking and developing overseas coal resources, as well as under the background of economic globalization and shrinking of domestic coal resource development space, China's coal enterprises have found new ways to realize leapfrog development and sustainable development.

Yanzhou Coal Mining Company Limited, China Shenhua Group Corporation Limited, China Metallurgical Group Corporation, China Huaneng Group have successively participated in the mergers and acquisitions of overseas coal mines.

## Coal Base in West China

The coal resources in West China accounts for 78% of the coal resources throughout the country, with the exploitable reserve taking up 62% of the national coal reserve. The total proved rate of coal in West China is less than 4%, far less than the total proved rate of the whole country (18%). West China not only has abundant in coal resources, but also has the advantage of possessing various quality coals, superior mining conditions and high output. In the future, by supplying coal to the Middle and East China, West China will consolidate its status in China's energy supply and its role in implementing China's general energy strategy will become more and more significant.

## Coal Reserve Base

In the following decades, China's energy consumption pattern dominated by coal will not change greatly. Under such a circumstance, it is imperative to establish a system to implement strategic coal reserve and make such coal reserve become an important factor in reducing and preventing the hazard caused by energy supply failure.

The first national emergency coal reserve enterprises include 10 large-scale coal and electric power enterprises and 8 port enterprises in Qinhuangdao Port, Huangye Port, Zhoushan Port, Guangzhou Port, Wuhan Port, Wuhu Port, Xuzhou Port and Zhuhai Port. Besides, the construction of China coal reserve bases is being started up; the planning for constructing strategic coal reserve bases in Beijing, Shanxi, Shandong, Hubei, Jiangsu, Anhui and Liaoning has been proposed; the construction work of part of the coal reserve base projects have been started and some of such projects have been put into operation.

## Resource Integration

Merger and restructuring of coal enterprises is the fundamental solution to reshape coal industry and make it develop in the brand-new environment. The key to and difficulty of coal resource integration is how to guarantee the interests of all parties. As a major coal producing province of China, Shanxi Province has gained remarkable results in leading coal resource integration. By the end of 2010, Shanxi Province had almost complete the merging, restructuring and integrating work of coal mines; the number of coal mines in this province decreased from 4278 at the end of the 10<sup>th</sup> five-year plan period to 1053; and the number of mining enterprises decreased from more than 2200 to 130. Of the 583 mines undergoing restructuring in the entire province, the construction of 303 mines has been commenced.

## Coal-bed Methane

In recent years, coal-bed methane has become a kind of widely used as clean energy with high quality and as a chemical raw material in the world. China has abundant coal-bed methane, ranking third in the world. According to the statistics, the shallow coal-bed methane with the burial depth of 2000 m has a geological energy amount around 36 trillion m<sup>3</sup>, mainly distributed in North China and the Northwest regions, where the amount of coal-bed methane accounts for 56.3% and 28.1% respectively of the total geological energy amount of national coal-bed methane. In China, the total amount of exploitable resource of coal-bed methane is about 10 trillion m<sup>3</sup> and there are 15 basins (group) with volumes of more than 1 trillion m<sup>3</sup>.

## Mine Rescue Capsule

In October 2010, all the 33 miners were rescued after they were trapped 624 m underground in San José Copper Mine in Chile for 69 days and the rescue process shocked the whole world. It was the mine rescue capsule, the core equipment of emergency refuge system, which played the key role in the rescue. Later, 11 coal mine enterprises, i.e. Shenhua Group Corporation Limited, China National Coal Group Corp., Jincheng Anthracite Mining Group Co., Ltd and Yanzhou Coal Mining Company Limited etc. were approved to be the first pilot enterprises for developing mine rescue capsules. The JYC-100/8 movable coal mine rescue capsule researched and developed by Shenyang North Traffic Heavy Industry Group has successfully rolled off the production line and been gradually used for trials in mines.

## Coal Chemical Industry

The new coal chemical industry projects are flourishing everywhere in China. At present, the production capacity of projects making olefin from coal that are under construction and to be constructed reaches 20 million ton in the whole country; the production capacity of projects making liquid from coal that are under construction and to be constructed reaches 40 million ton; the production capacity of projects making natural gas from coal that are under construction and to be constructed is about 150 billion m<sup>3</sup>; the production capacity of projects making glycol from coal that are under construction and to be constructed exceeds 5 million ton; Based on the capacity of modern coal chemical projects under construction and planning, the consumption of raw coal will be close to 628 million ton and the discharged carbon dioxide will be 738 million ton by 2020.

## Intelligent Mine

Intelligent mine construction is a typically interdisciplinary new field and covers the whole process of production and operation of mining enterprises, with the purpose of realizing automatic, intelligent, highly-efficient and safe mining with high informationization till the realization of remote controlled mining and unmanned mining modes.

In order to gain competitive advantage in mining industry, improve production efficiency and lower the cost, many countries in the world have made great efforts in introducing high and new technology adopted by other industries to make further automation of mining equipment and move forward to intelligent mining.