国家能源局
National Energy Administration

China Medium and Long Term Strategies and Action for Green Development and Clean Utilization of Coal

Coal Department of China National Energy Administration

August 25, 2015

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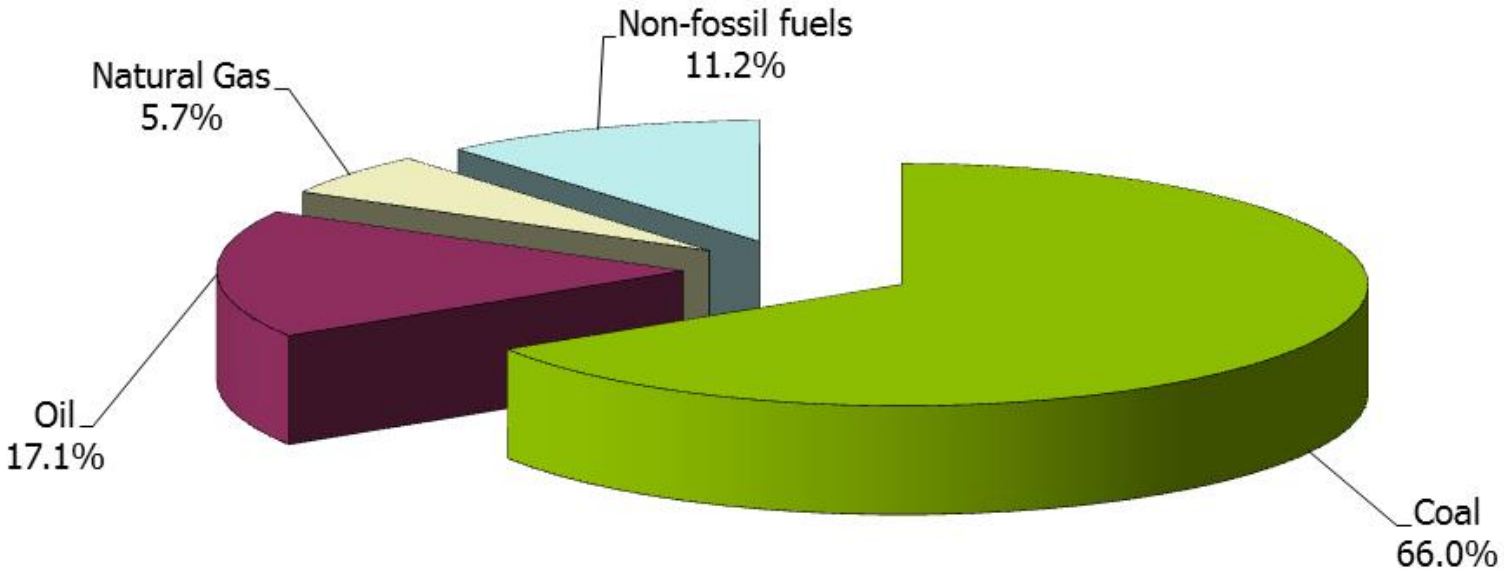
I. Current situations of energy development in China

The coal-based energy production and consumption structure in China is decided by occurrence situations of fossil energy resources;

Promoting coal clean and efficient development and utilization is an important content to realize energy production and consumption revolution.

I. Current situations of energy development in China

✓ **Coal is the pillar for China energy consumption**



2014 China Energy Consumption Structure (Source: Statistical Data of National Energy Administration)

I. Current situations of energy development in China

✓ Inevitable requirements based on domestic situations

From consumption, the coal consumption in China is 4.12 Billion tons, crude oil consumption is 510 Million tons and natural gas consumption is 184.52 Billion tons;

From import, the imported volume of coal in China is about 291 Million tons, imported crude oil is 308 Million tons and imported natural gas is 59.3 Billion m^3;

一、中国能源现状

- ✓ **Inevitable requirements based on domestic situations**

The strategy of Four Revolutions and One Cooperation, aiming to promote energy production and consumption revolution, was raised in the sixth meeting of the Central Leading Group on Finance and Economic Affairs in 2014.

The new opening session of National Energy Commission established the energy strategic guideline focusing on Saving, Cleaning and Safty, and proposed the energy development strategy of giving priority to energy saving, relying on domestic demand, green with low carbon, and driven by innovation.

II. Current situations of coal development and utilization in China

- ✓ **Chinese government actively promotes green development and clean utilization of coal**

In 2014, The Central Leading Group on Financial and Economic Affairs proposed to “give great impetus to clean and efficient utilization of coal” in the 6th session;

To “give great impetus to clean and efficient utilization of coal” was proposed in both *Action Plan for Air Pollution Control* (GF [2013] No.37) and *Strategic Action Plan for Energy Development (2014-2020).*

II. Current situations of coal development and utilization in China

(i) Green development of coal

1. Study and application of domestic comprehensive mining equipment unmanned technology to thin seam

The thin seam unmanned mining technology not only liberates employees from heavy labor work, but also reduces hazards of water, fire, gas, coal dust and roof on mental and physical health of employees. Moreover, the technology effectively improves work efficiency, coal mining rate and field safety management level.

II. Current situations of coal development and utilization in China

(i) Green development of coal

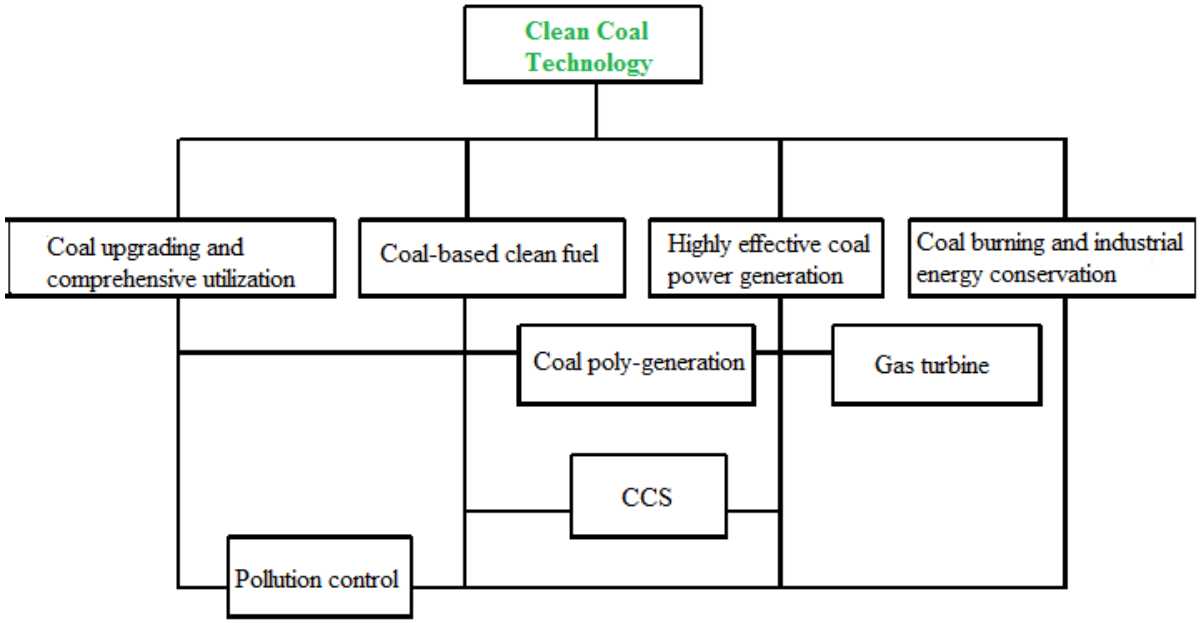
2. Filling mining leads the direction of green development in coal industry

The success of working face solid filling mining technology realizes synchronization of mining and filling, solves multiple key technological problems of transferring ground gangues underground under conditions of large mining depth;

II. Current situations of coal development and utilization in China

(ii) Development of coal clean utilization technology

Coal clean utilization technology is a technical system with coal preparation and processing as sources, coal gasification and pyrolysis as orientation, coal efficient and clean combustion power generation as core, and coal transformation and pollution control as important contents



II. Current situations of coal development and utilization in China

(ii) Development of coal clean utilization technology

1. Coal preparation technology

Some coal preparation equipment such as three-product dense medium cyclone, fire drying equipment, rapid filter press and others have reached the advanced international level.

Large scale and automatic coal washery and equipment is the main trend

Characteristics of non-pressure feeding three-product dense medium cyclone:

The selected raw coal is not classified and not desliming;

Qualified clean coal, middling and gangue selected at one time;

Raw coal crushing degree is small;

Secondary slime amount is little.

II. Current situations of coal development and utilization in China

(ii) Development of coal clean utilization technology

2. Coal-fired power plant “near-zero emission” control technology

- The technical transformation such as high standard dedusting, desulfurization, de-Nox and demercuration in some power plants in Zhejiang, Shanghai, Jiangsu, Guangdong and Shandong realized ultra-low emission, reached emission standards of gas-fired power plant. The power plants adopting advanced technologies can even realize near-zero emission.

II. Current situations of coal development and utilization in China

(ii) Development of coal clean utilization technology

3. Key demonstration project of new coal chemical industry

From the Tenth Five-year Plan to the Eleventh Five-year Plan, the new coal chemical industry in China has developed rapidly. Particularly through development in the Twelfth Five-year Plan, a large batch of technologies with proprietary intellectual property rights gained large breakthrough. At present, it is in industrial demonstration stage, but there are still some engineering problems to be solved.

- Mt Coal Direct Liquefaction Demonstration Project
- 180,000T Indirect Liquefaction Demonstration Project
- 600,000T Coal-to-Olefin Demonstration Project
- 2 Billion m^3 Coal-to-Gas Demonstration Project

III. Strategic objective of green development and clean utilization of coal in China

Strategic objective by 2020

- Try to save coal consumption of over 160 Million tons;
- Substantial increase raw coal preparation rate;
- Modern coal chemical industry demonstration will gain partial results, and form more integrated proprietary technology and equipment system;
- Promote quality coal processing, gradient utilization by different qualities, and coal waste resource utilization, and build a batch of coal clean and effective utilization demonstration projects;

III. Strategic objective of green development and clean utilization of coal in China

Strategic objective by 2020

- Average operating efficiency of industrial coal-fired boiler should be 8% higher than that in 2013;
- Average power coal consumption for existing coal-fired power generation units after transformation shall be lower than 310g/kWh.

IV. Key work of green development and clean utilization of coal in China

(i) Scientifically plan the development and utilization scale of coal

1. Overall plan coal resources conditions, geological environment of mine, water resource carrying capacity and ecological environment capacity to confirm reasonable scientific capacity;

2. Mainly build 14 large-scaled coal bases such as Shendong Mine with abundant resource reserve, favorable mining technologies and large development potential, and optimize coal production and development layout.

IV. Key work of green development and clean utilization of coal in China

(i) Scientifically plan development and utilization scale of coal

3. Reasonably plan and construct the main coal consuming projects such as coal power generation and coal deep processing, and energy transportation channels, and optimize coal consumption layout. Strictly control total coal consumption in key regions such as Beijing-Tianjin-Hebei, Yangtze River Delta and Pearl River Delta.



IV. Key work of green development and clean utilization of coal in China

(ii) Vigorously promote safe and green coal mining

1. Actively support planning, design, construction and reform of coal mine according to ecologically civilized mining zone; built new coal mine from designed source, adopt high and new technology and advanced and applicable green mining technology and realize equipment modernization, system automation and management information;

2. For production coal mine, optimize expansion deployment, simplify and optimize production system, reduce work face number, build reliable and energy-saving production system, improve productivity and resource recovery rate and realize efficient and intensive production;

3. Promote the application of green mining technologies such as “filling mining”, “water protection mining” and “coal-gas mining”.

IV. Key work of green development and clean utilization of coal in China

(ii) Vigorously promote safe and green coal mining

4. Encourage the implementation of filling mining of coal resources, coal pillar and corner residual coal below buildings, railways, water and above pressure bearing water body;

IV. Key work of green development and clean utilization of coal in China

(iii) Deeply develop circular economy in mining zone

Scientifically use byproducts such as mine water, gangue, slime, and pulverized fuel ash to comprehensively develop and use associated resources of coal;

Greatly promote reconstruction of mining machines, build coal-based circular economy industry chain, and improve added value of product and resource comprehensive utilization rate;

Carry out ecological treatment and land reclamation for depression area, and develop suitable industries such as ecological agriculture and tourism;

Actively probe intensive and high efficient management mode for large-scaled mining parks, and encourage building the mining zone circular economy park according to local conditions;

IV. Key work of green development and clean utilization of coal in China

（iv）Accelerate CBM development and utilization

The “extraction before mining” and “coal-gas mining integration” was implemented in the coal production zone to improve gas extraction and utilization rate;

Transport CBM by pipeline, use locally and transport remaining gas; systematically build CBM transmission pipeline, and properly develop CBM compression and liquidation;

Support power generation with low concentration gas and cooling heating power supply or concentrated utilization and encourage power generation or heating by ventilation air methane to improve gas utilization rate.

IV. Key work of green development and clean utilization of coal in China

（v）Improve the coal product quality and utilization standard

Carry out construction and operation demonstration, improve raw coal selection proportion in the underground coal preparation plant , and actively promote advanced coal and water slime technology;

Develop high-performance, highly reliable, intelligent and large-scaled (coking coal above 6 Mt/year and power coal above 10 Mt/year) coal preparation equipment;

Build large-scale coal storage and distribution base and large-scale modern coal logistic parks, and realize fine processing and distribution of coal;

Restrict use of bulk coal with ash content higher than 16% and sulfur content higher than 1% in key regions such as Beijing-Tianjin-Hebei and nearby area, Yangtze River Delta, and Pearl River Delta, build clean coal distribution center, and encourage the use of clean coal in the north China area;

IV. Key work of green development and clean utilization of coal in China

（vi）Greatly develop the clean and efficient coal-fired power generation

Gradually improve proportion of power coal in coal consumption, and promote coal power energy saving, emission reduction and upgrading reform;

Promote the construction of nine 100 Million kw clean and efficient large-scale coal power bases orienting power transmission in Erdos and Xilin Gol League according to the advanced energy saving, water saving and environmental protection standard;

Further accelerate energy saving and emission reduction of coal fuel power station, improve efficient and clean utilization level of coal power and create upgrading of coal power industry.

IV. Key work of green development and clean utilization of coal in China

（vii）Improve the technological level of coal-burning kiln

Implement kiln reconstruction project, and encourage developing co-generation and centralized heating;

Promote advanced and applicable industrial kiln waste heat and supplementary energy recovery and utilization technology, and realize efficient recovery and gradient utilization of waste heat and supplementary energy;

Install efficient desulfurization and dedusting facilities for newly built and installed coal-fired boilers;

Accelerate promoting efficient, energy saving and environmental boilers such as efficient pulverized coal boiler, and accelerate eliminating outdated equipment such as low efficient grate firing boiler.

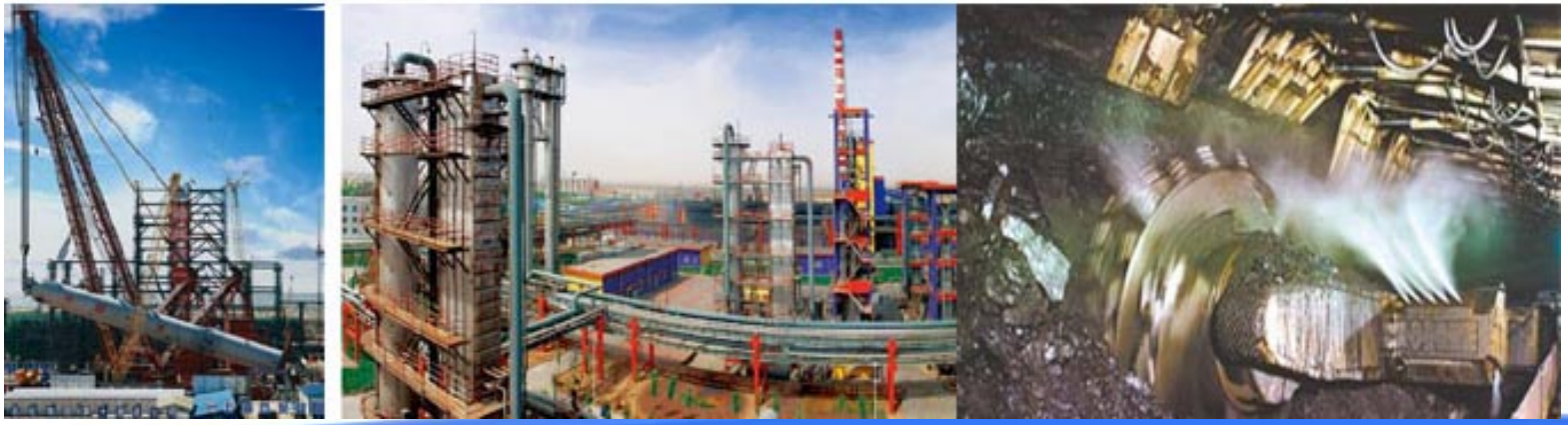
IV. Key work of green development and clean utilization of coal in China

（viii）Actually improve the processing and transformation level of coal

Accelerate the transformation from single fuel to both raw materials and fuel;

Properly develop modern coal chemical industry, improve modern coal chemical level and energy transformation effect and reduce negative impact on ecological environment;

Actively promote coal gradient utilization by different qualities.



IV. Key work of green development and clean utilization of coal in China

（ix）Reduce the discharge of coal utilization pollutants

Strictly implement pollutant discharge license system, implement discharge standard and total amount control requirements, and strengthen control over fine particle discharge;

Put great efforts into promoting the recycled fuel gas desulfurization and de-Nox technology, and carry out study and application of cooperative control technology for multiple pollutants such as PM2.5, sulfur oxide, nitric oxide, and heavy metal, etc.;

Study treatment technology for waste generated by coal deep processing.

V. Policy guidance of green development and clean utilization of coal in China

（i）Establish the perfect implementation and supervision system

Perfect the coal safe, green development and clean, efficient utilization management system, and establish coordinated, unified and effective supervision mechanism.

Formulate the development plan and action plan, and promote the safe, green development and clean, efficient utilization of coal by steps and with emphasis.

V. Policy guidance of green development and clean utilization of coal in China

（ii）Establish the perfect standard and evaluation mechanism

Accelerate formulating the relevant standards for technologies and standards, and issue directory of advanced technologies and equipment;

Study and formulate the evaluation standards for safe and green coal mining area;

V. Policy guidance of green development and clean utilization of coal in China

（iii）Perfect the incentive policies and measures

Policies for normalization access, tax reduction and exemption and loan support;

V. Policy guidance of green development and clean utilization of coal in China

（iv）Greatly promote the scientific and technological innovation

Strengthen the support of relevant technology research, demonstration and application project by scientific and technological plan;

Carry out study and demonstration of carbon dioxide capture, utilization and sealing technology

V. Policy guidance of green development and clean utilization of coal in China

（v）Strengthen the international cooperation

Make full use of international and domestic markets and their resources, enhance technological exchange and promote cooperative scale and level.


Thank You