中国煤炭发展现状及展望

Status Quo and Prospect of Coal Industry in China

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第一部分 Part One

中国煤炭发展现状

Status quo of Coal Industry in China

1.1 中国是世界最大的煤炭生产和消费国

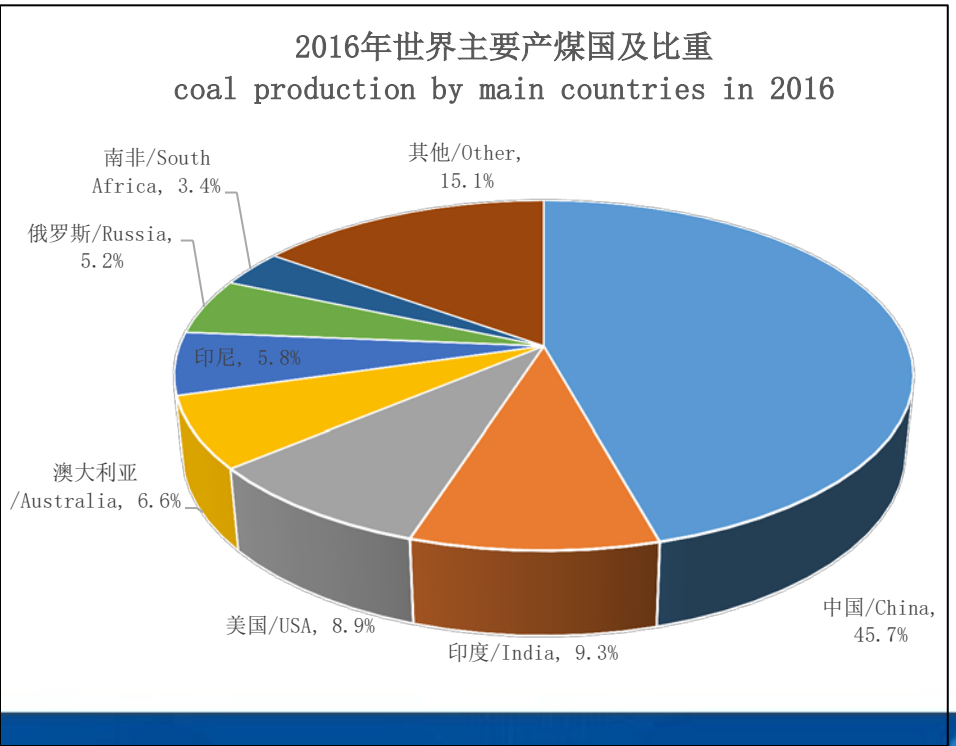
China is the biggest coal producer& consumer in the world

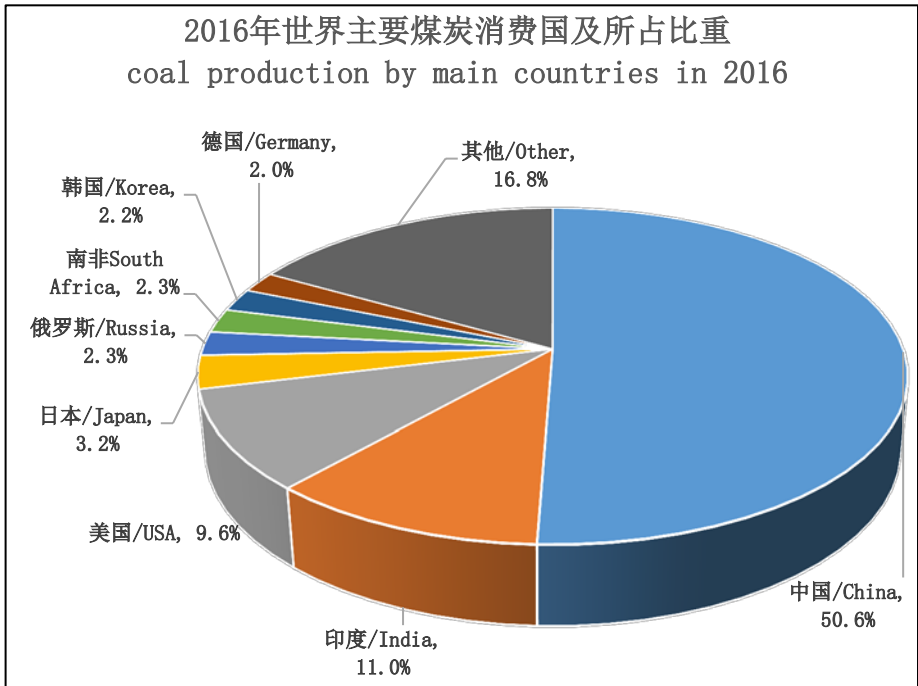
2016年：

- 中国煤炭产量34.1亿吨，占世界煤炭总产量的45.7%
- 中国煤炭消费量37.8亿吨，占世界煤炭消费总量的50.6%。

In 2016:

- Coal production in China is 3.41 billion tons, 45.7 percentage of that in the world.
- Coal consumption in China is 3.78 billion tons, 50 percentage of that in the world.

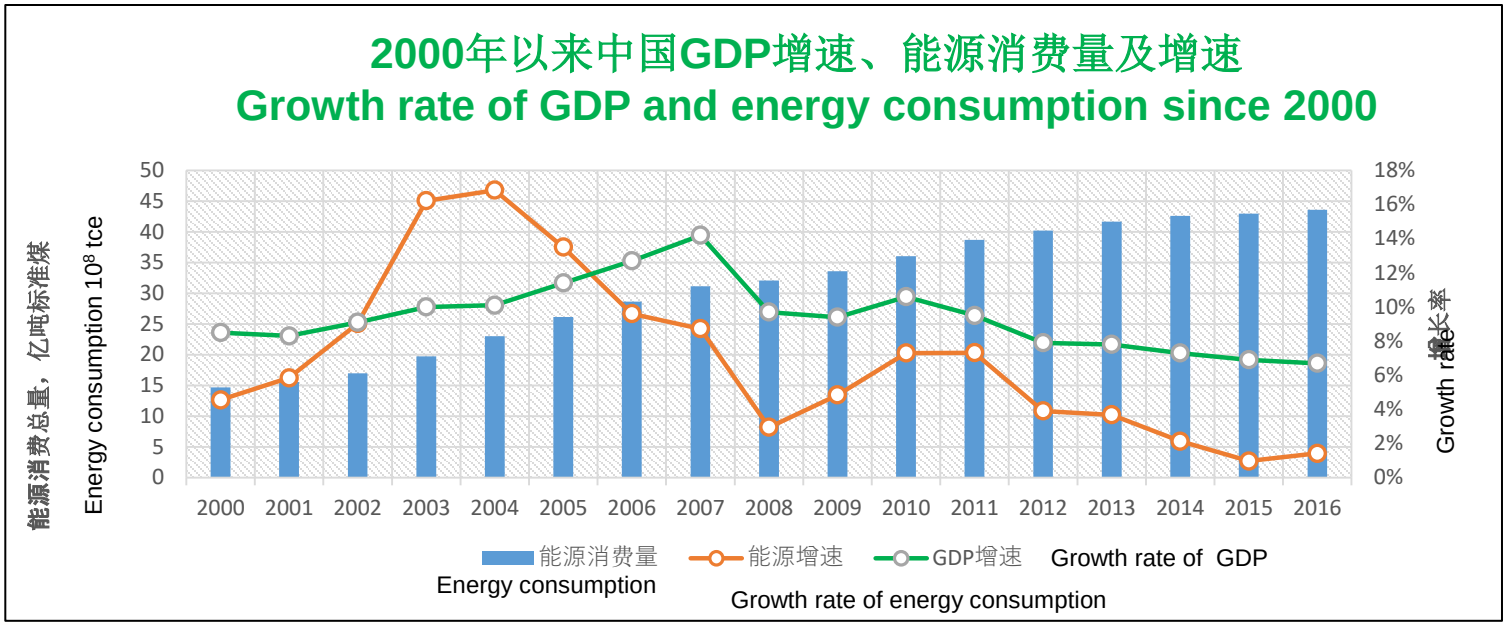




1.2 煤炭是中国主体能源
Coal Remains the Dominant Energy in China

- 进入2002年后，中国工业化、城镇化步伐进一步加快，能源消费快速增长，2012年达到40.2亿吨标准煤，年均增速高达9%。
- 2012年以来，在经济发展增速放缓、增长动力持续转化等因素共同作用下，能源消费增速下降，2012-2016年年均增长仅3%。

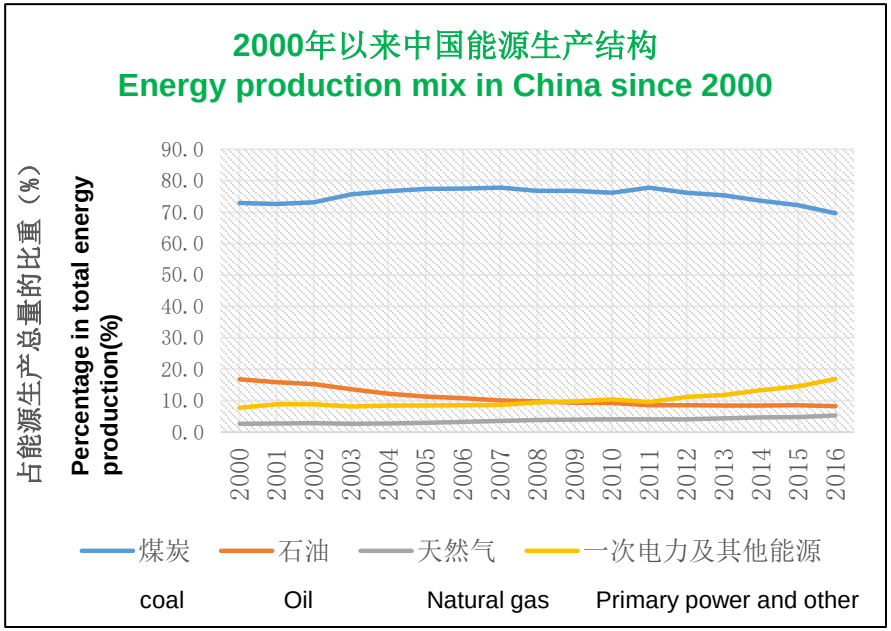
- Energy consumption had see rapid growth along with the accelerated industrialization and urbanization in China since 2002, which reached 4.02 billion tce with an average growth rate up to 9%.
- The growth rate of energy consumption has dropped since 2012 due to slow down of economic development and continuous transformation of growth impetus, with an average rate of only 3% from 2012 to 2016.

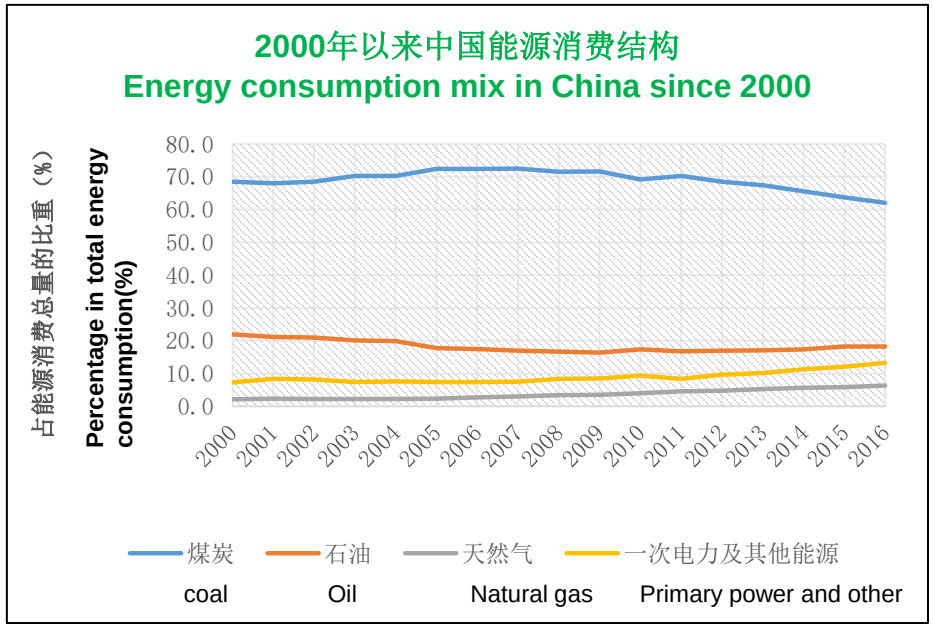


1.2 煤炭是中国主体能源
Coal Remains the Dominant Energy in China

- 一直以来煤炭占中国能源生产总量的70%以上，直到2016年下降到69.6%。
- 一直以来煤炭在中国一次能源消费结构中占70%左右，近年来随着能源结构战略性调整加快，天然气和非化石能源等清洁较快发展，煤炭所占比重逐步下降，2016年占62%，比2005年下降10.4个百分点。

- Coal has always accounted for over 70% in China's energy production mix until 2016, which dropped to 69.6%.
- Coal had remained about 70% in China's energy consumption mix for a long time. While this has seen gradual drop in recent years due to acceleration of energy mix restructuring and rapid development in natural gas and non-fossil energy. In 2016, the rate was 62%, a drop of 10.4% compared to that in 2005.





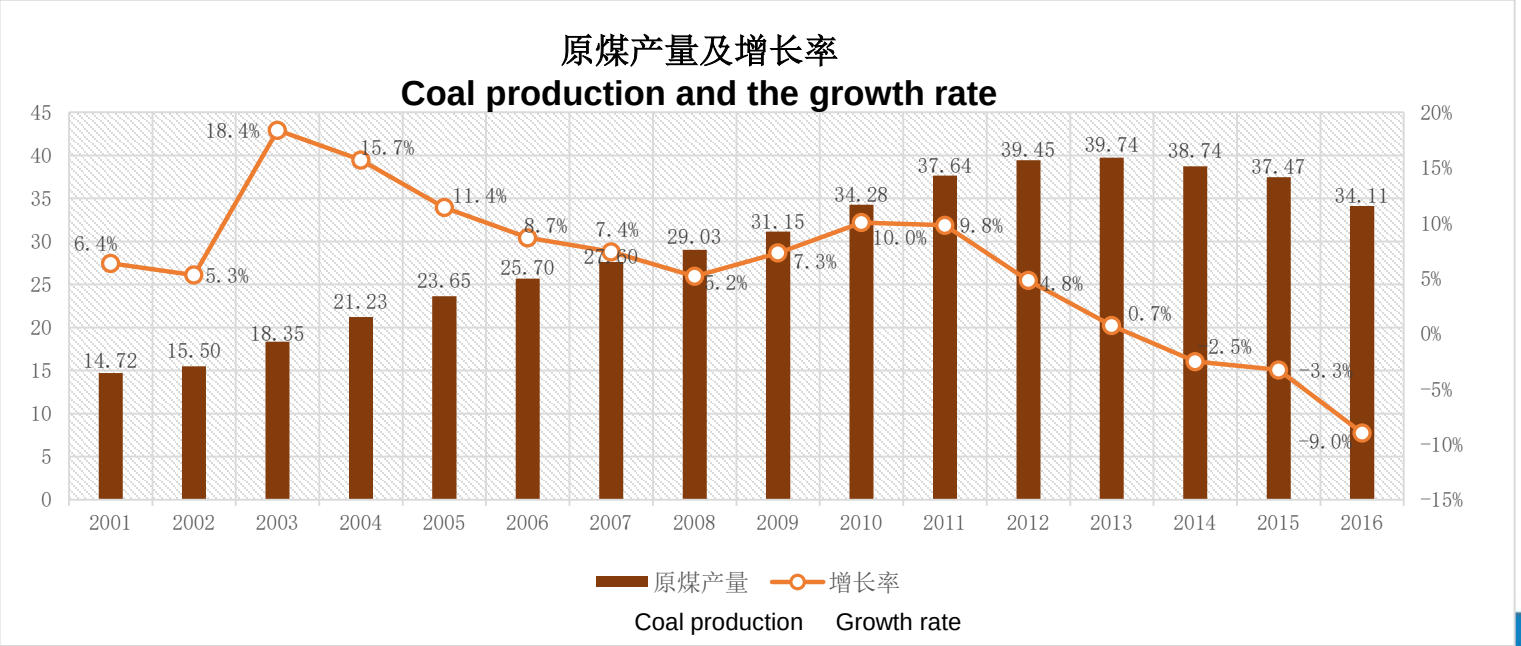
1.3 煤炭生产
Coal Production

中国煤炭产量：高速增长 → 持续下降 → 恢复性回升

- 2002-2012年，中国煤炭产量年均增长2.2亿吨，年均增速9.4%。
- 2013-2016年，中国煤炭产量年均减少1.3亿吨，年均下降3.7%。
- 2017年1-10月份，中国煤炭产量同比增长4.8%，预计全年煤炭产量恢复性上升到36亿吨左右。

Coal production in China: rapid growth → continuous declination → restorative increase

- Average growth of coal production was 220 Mt from 2002 to 2012 with an average growth rate of 9.4%.
- Average declination of coal production was 130 Mt from 2013 to 2016 with and average declination rate of 3.7%
- There was a growth of 4.8% from January to October 2017 compared to the same period in 2016. It is anticipated that coal production will pick up to 3.6 billion tons in 2017.



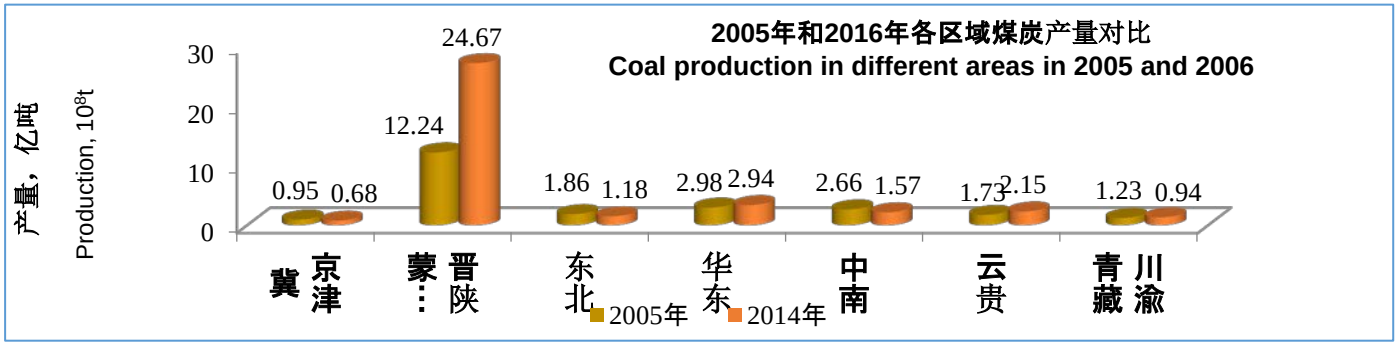
1.3 煤炭生产
Coal Production

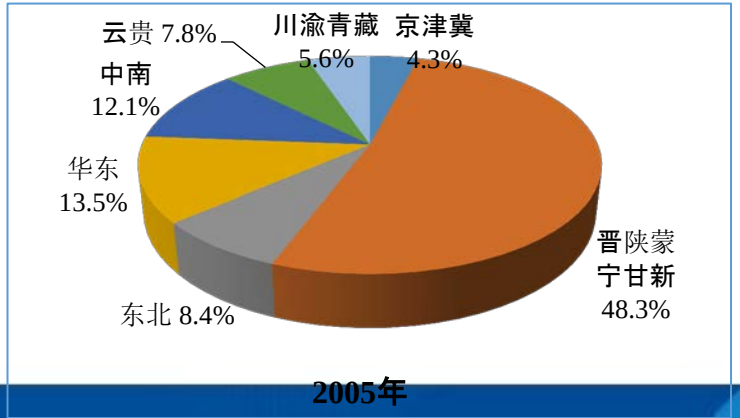
煤炭生产开发布局加速西移：

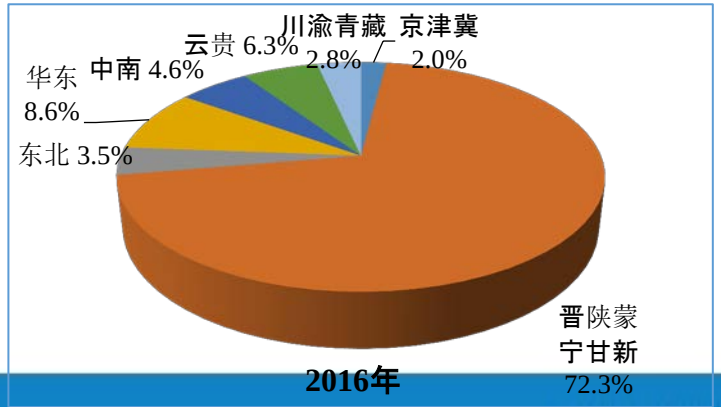
- 2005-2016年，晋陕蒙宁甘新地区煤炭产量增加12.4亿吨，占同期中国煤炭产量增量的119%，所占比重由48.3%上升到72.3%。

Layout of coal production in the western areas has speed up

- Coal production had increased by 1.24 billion tons in Shanxi, Shaanxi, Inner Mongolia, Ningxia, Gansu and Xinjiang, accounting for 119% of the total production growth during the same period. And the percentage in total increased from 48.3% to 72.3%.







1.3 煤炭生产
Coal Production

大型煤炭企业成为中国煤炭供应的中坚力量：

- 2016年，煤炭产量5000万吨以上的企业14家，产量16.3亿吨，占全国煤炭产量的47.8%。其中，煤炭产量1亿吨以上的企业6家，产量10.5亿吨，占全国的30.8%；5000万吨－1亿吨的企业8家，产量5.8亿吨，占全国的17%。

Large-scale coal mine companies have become main coal suppliers:

- In 2016, there were 14 coal mining companies of coal production over 50 Mt/a with a total production of 1.63 billion tons, accounting for 47.8% of total production in China, thereinto, 6 companies of 100 Mt/a scale with a production of 1.05 billion tons, accounting for 30.8% of the total production in China; 8 companies of 50-100 Mt/a scale, 0.58 billion tons and 17% respectively.

1.3 煤炭生产
Coal Production

2016年煤炭产量5000万吨以上的企业（万吨）

Companies of coal production over 50 Mt/a in 2016 (10^4t）

序号/No.	企业名称/Company	产量/Production	序号/No.	企业名称/Company	产量/Production
1	神华集团/Shenhua Group	43149	8	冀中能源集团/Jizhong Energy Group	8009
2	中煤能源集团/China Coal Energy Group	13323	9	潞安矿业集团/Lu'an Group	7433
3	山东能源集团/Shandong Energy Group	13050	10	晋能集团/Jinneng Group	7136
4	陕西煤业化工集团/Shaanxi Coal and Chemical Industry Group	12593	11	开滦集团/Kailuan Group	7022
5	大同煤矿集团/Datong Coal Mine Group	11786	12	河南能源化工集团/Henan Energy and Chemical Group	6658
6	兖州矿业集团/Yankuang Group	11415	13	阳泉煤业集团/Yangquan Coal Industry Group	6300
7	山西焦煤集团/Shanxi Coking Coal Group	9151	14	晋城无烟煤矿业集团/Jincheng Anthracite Mining Group	6116

1.3 煤炭生产
Coal Production

煤矿技术装备水平显著提升：

- 2012-2016年，煤矿数量从1.3万多处减少到8000处以内，单井生产规模从30万吨/年增加到50万吨/年。
- 年产120万吨以上的1200多座，产量占全国的75%以上。
- 千万吨级特大型现代化煤矿59处、产量8亿吨；
- 建成智能化开采工作面47个。

Significant Improvement in technology and equipment

- Number of coal mines has decreased from more than 13,000 to less than 8,000 with the growth in average single well production capacity from 0.3 Mt/a to 0.5 Mt/a during the period of 2012 to 2016.
- There are more than 1,200 coal mines with annual production capacity over 1.2 Mt/a, producing 75% of the nation
- There are 59 super-huge modern coal mines with 10-million-ton scale with a total annual production of 0.8 billion tons.
- 47 Intelligent mining faces have been built.

1.3煤炭生产
Coal Production

煤炭清洁生产水平不断提升：

- 2016年，全国选煤厂原煤入选能力26亿吨，原煤入选率68.9%，煤矸石综合利用率、土地复垦率分别达到64.2%和48%。

Improvement of clean coal production

- In China, the tonnage of raw coal preparation was 2.6 billion tons of the total coal preparation plant in China, and the rate of raw coal preparation was 68.9 percents, the comprehensive utilization rate of gauge and land reclamation rate was 64.2 percents and 48 percents respectively in 2016.

4× 200MW Yili gauge power plant of Shenhua Group

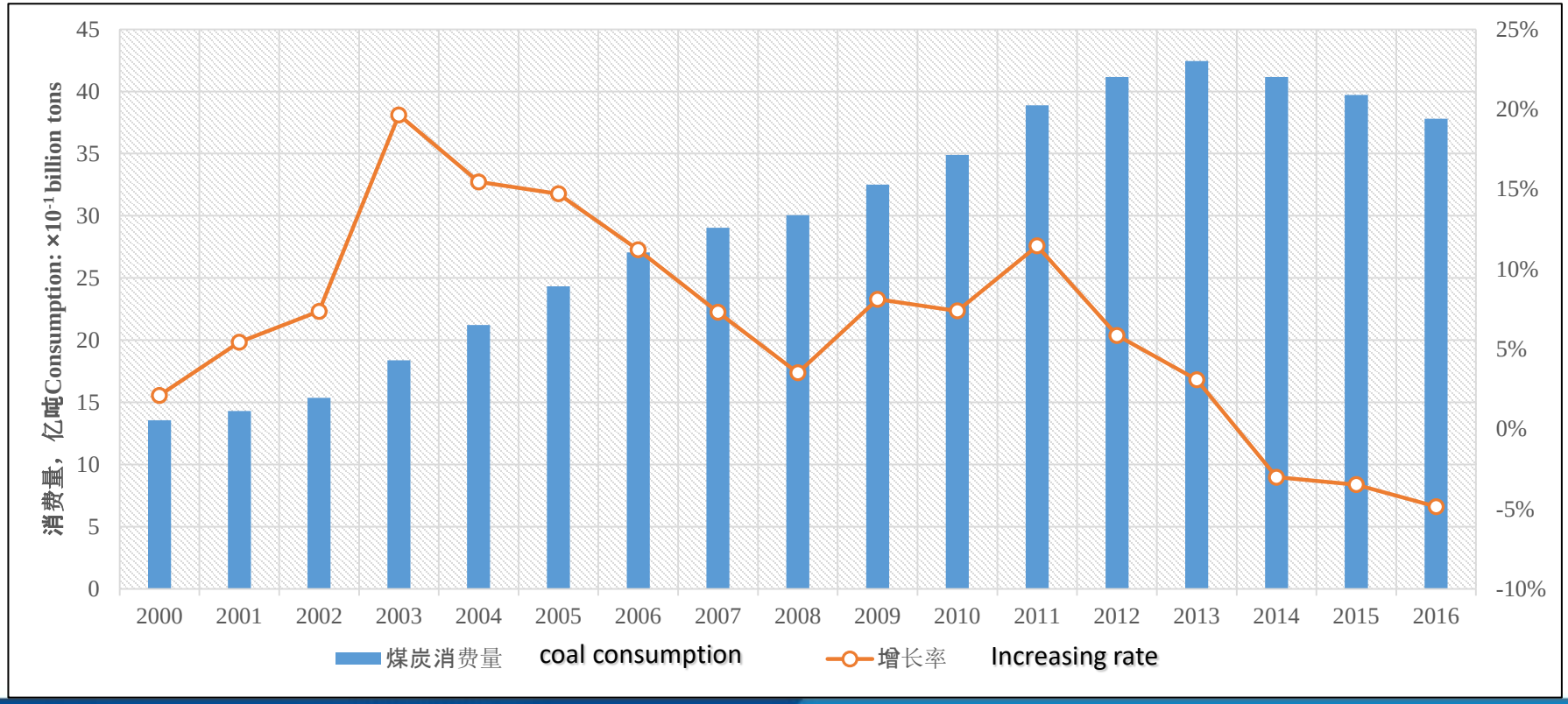
1.4 煤炭消费
Coal Consumption

中国煤炭消费量：高速增长 → 持续下降 → 恢复性回升

- 2002-2013年，中国煤炭消费量年均增加约2.3亿吨，年均增长9.5%。
- 2014-2016年，中国煤炭消费量年均减少约1.5亿吨，年均下降3.8%。
- 2017年，中国煤炭消费量呈现出恢复性回升，预计全年达到39亿吨左右。

Coal consumption in China : Rapid growth → Continuous decline → Restorative recovery

- The coal consumption increased by 230 million tons with 9.5 percents average per year during 2002 to 2013.
- The coal consumption decreased by 150 million tons with 3.8 percents average per year during 2014 to 2016.
- The coal consumption recovers restoratively, and it will reach 3.9 billion tons of the whole year in 2017.



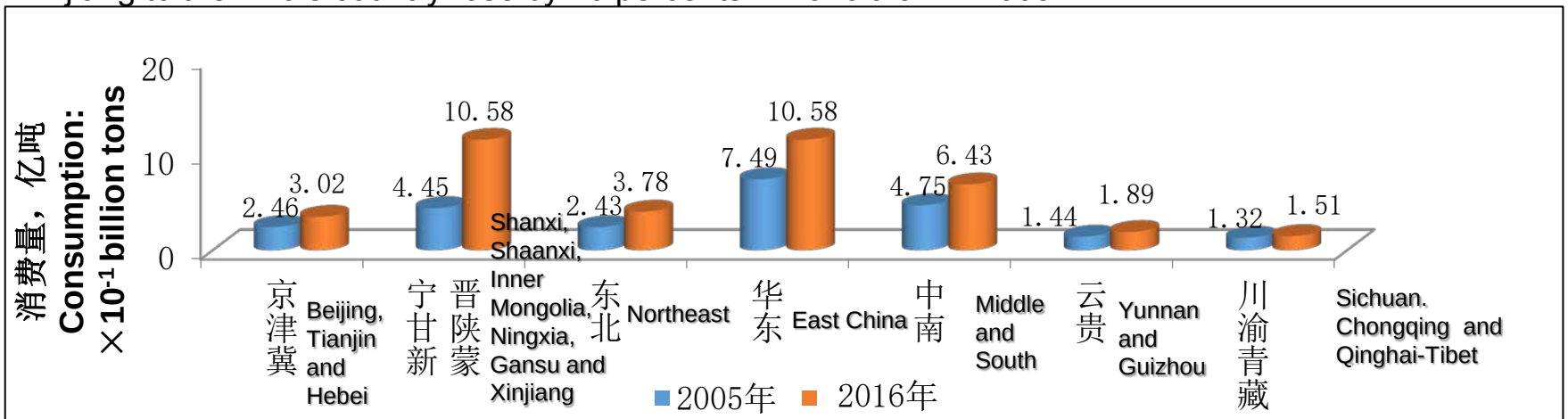
1.4 煤炭消费
Coal Consumption

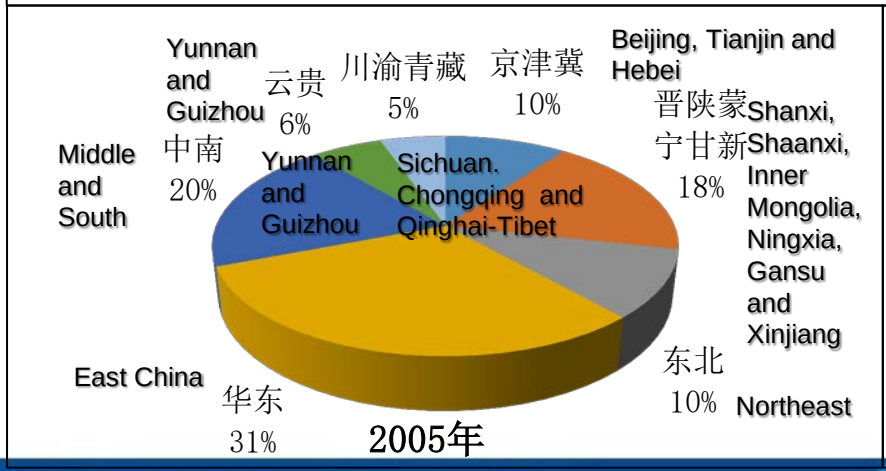
煤炭消费重心逐步向中西部地区转移：

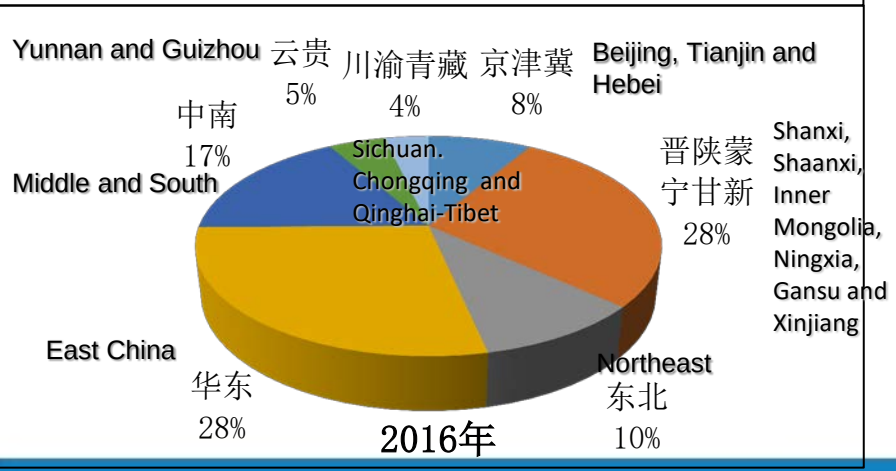
- 2016年晋陕蒙宁甘新地区煤炭消费量占全国的比重比2005年上升10个百分点。

The coal consumption switches focus to middle and western area gradually.

- The ratio of coal consumption of Shanxi, Shaanxi, Inner Mongolia, Ningxia, Gansu and Xinjiang to the whole country rose by 10 percents in 2016 than in 2005.







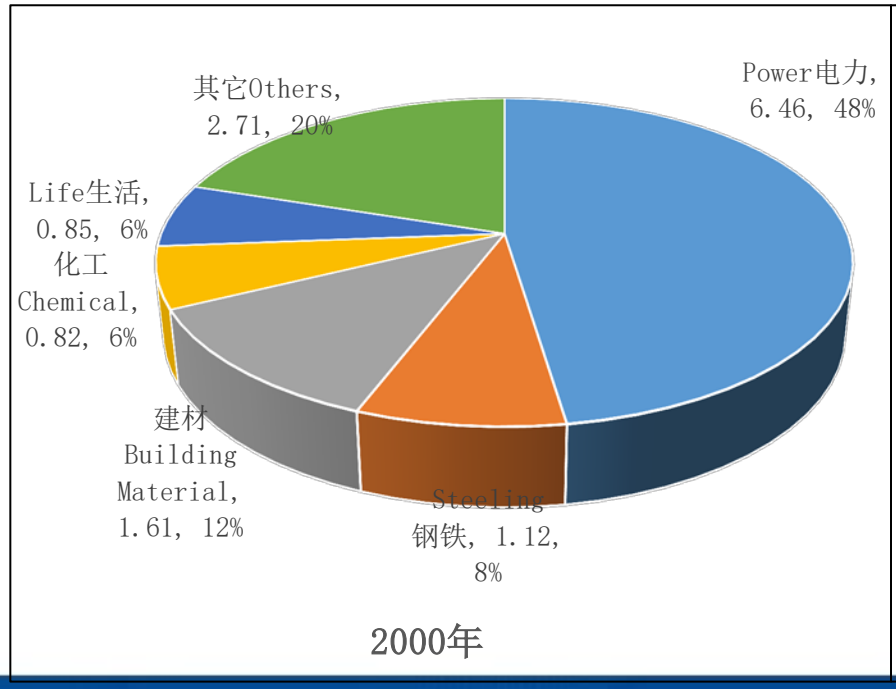
1.4 煤炭消费
Coal Consumption

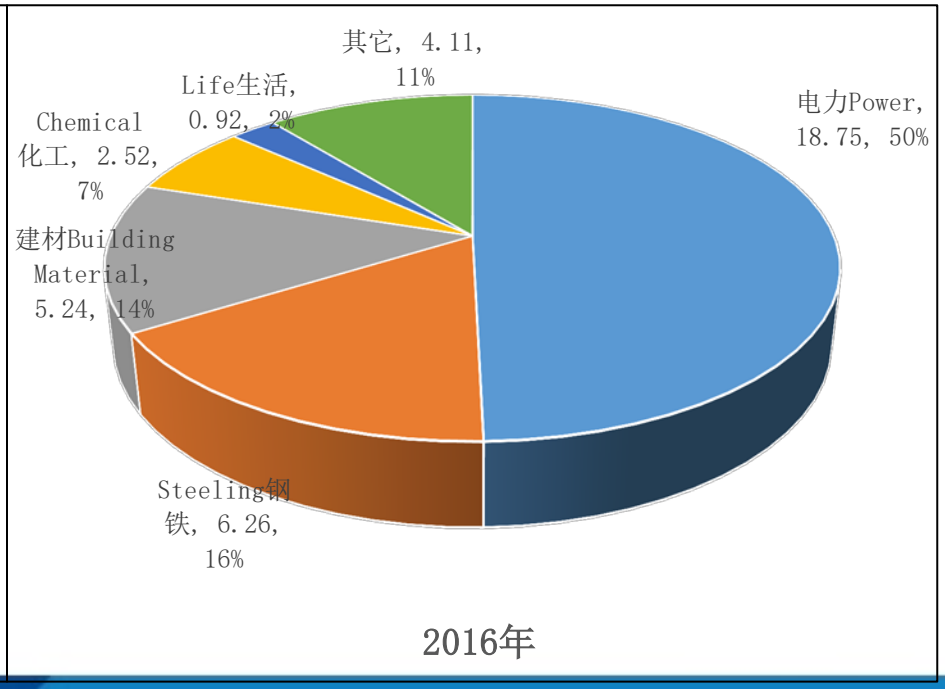
中国煤炭消费主要集中在电力、钢铁、建材、化工四个行业：

- 2016年，电力、钢铁、建材、化工四个主要耗煤行业消费煤炭32.8亿吨，占全国煤炭消费总量的86.8%，比2000年上升14.4个百分点。
- 目前，电力行业耗煤约占全国煤炭消费总量的一半。

The coal consumption mainly focused on power, steeling, building material and chemical industry.

- The coal consumption of power, steeling, building material and chemical industry reached 3.28 billion tons , which accounted for 86.8 percents of total in 2016, which increased by 14.4 percents than in 2000.
- The coal consumption of power industry accounted for about half of the whole country at present.

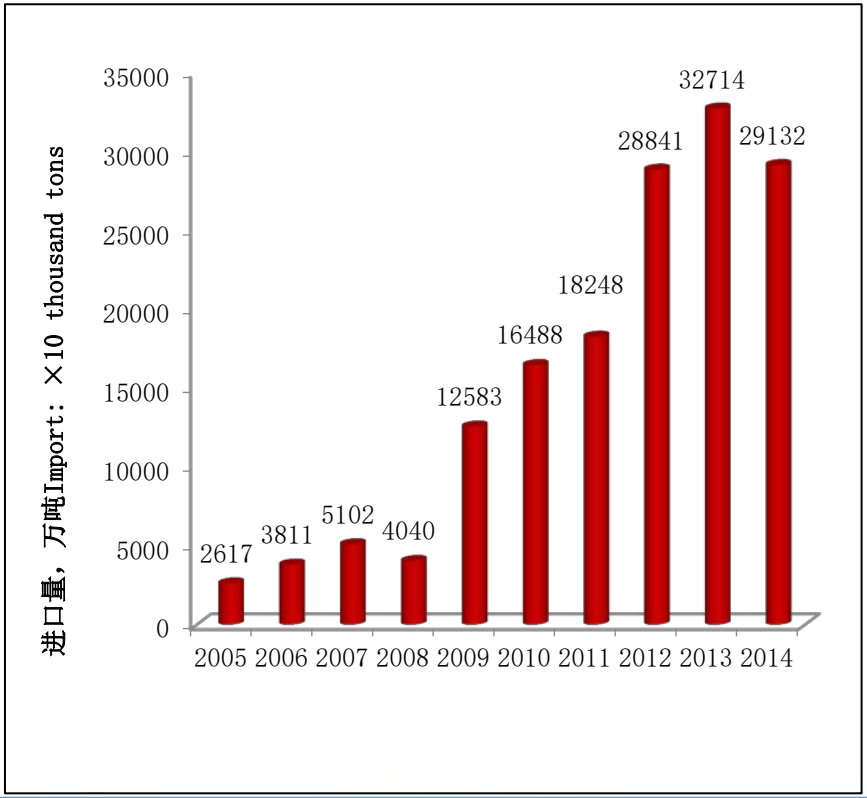


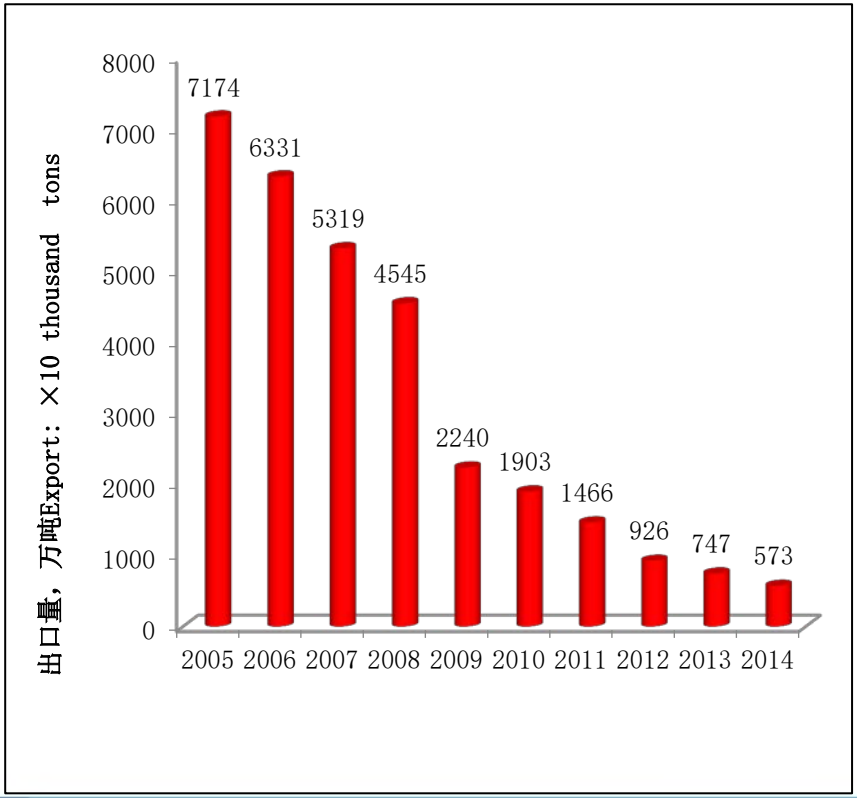


1.5 煤炭进出口
Coal Import and Export

- 2013年中国煤炭进口量达到历史峰值3.27亿吨，之后有所下降，但仍维持在2亿吨以上。
- 中国煤炭出口量在2003年达到最高峰9388万吨，之后逐年大幅下滑，近几年基本维持在500万吨左右。

- The coal import reached the peak to 327 million tons in 2013, then decreased, however keeping more than 200 million tons.
- The coal export reached the peak to 93.88 million tons in 2003, then decreased sharply annually, keeping 5 million tons or so in recent years.





第二部分 Part Two

中国煤炭发展形势判断

The Development Situation of China’s Coal

2.1 中国煤炭需求已进入峰值平台期
China's Coal Demand has Entered the Peak Plateau Period

中国经济增长对能源依赖程度下降：

- 未来高端装备制造、信息网络、集成电路、新能源、新材料、生物医药等战略性新兴产业，工业互联网、互联网金融、电子商务、物流快递等新兴业态，将成为中国经济转型发展的主要驱动力，能源需求强度和增速下降。

China's economic growth has declined in dependence on energy:

- The strategic emerging industries which include the future high-end equipment manufacturing, information network, integrated circuits, new energy, new materials, bio-medicine and the emerging formats which include industrial internet, internet baking, e-commerce and logistics will become the main driving force of the transformation of China's economy. As a result, the intensity and growth of energy demand has declined.

2.1 中国煤炭需求已进入峰值平台期

China's Coal Demand Entered the Peak Plateau Period

清洁能源替代作用日益增强：

- 多元互补的能源供给体系建设步伐加快，能源结构不断优化，非化石能源正以前所未有的速度增长，预计2020 年核电装机达到5800万千瓦，水电、风电、太阳能、生物质能发电装机将达到6.75亿千瓦。

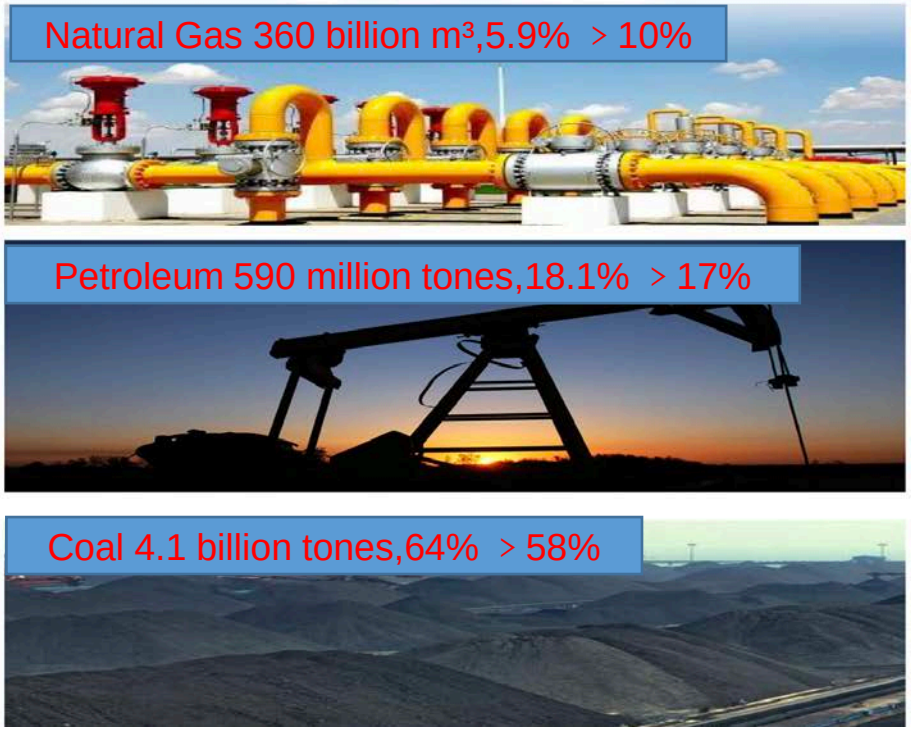
The function of clean energy substitution has increased:

- The energy supply system with multi-complementaritay is accelerating, the energy structure is constantly optimized, and non-fossil energy is growing at an unprecedented rate. By 2020, a total of 58 million kw of nuclear power and 675 million kw of hydropower, wind, solar and biomass will be installed.

2.1 中国煤炭需求已进入峰值平台期

China's Coal Demand Entered the Peak Plateau Period

- 煤炭在一次能源结构中的比重逐步下降， 2020年煤炭消费量占一次能源的比重由目前的62%下降到58%。
- The share of coal in the primary energy structure has been gradually declining. By 2020, the share of coal consumption in primary energy has dropped from the current 62% to 58%.



2.1 中国煤炭需求已进入峰值平台期
China's Coal Demand Entered the Peak Plateau Period

主要耗煤行业煤炭需求将发生明显分化：

- 电力工业用煤比重将进一步上升。未来中国煤炭消费将越来越向电力工业集中，2020年煤电装机容量将达到11亿千瓦，若发电利用小时数5000小时/年，发电和供热耗煤需求将达到26亿吨左右。
- 钢铁和建材工业煤炭需求缓慢下降。未来铁路、公路、机场、农田水利、区域治理等重大基础设施和人民生活福利设施等对钢铁和建材等产品需求将逐步下降。

The coal demand in major coal consuming industries will be differentiated:

- The proportion of coal used in power industry will be further increased. In the future, China's coal consumption will be more and more concentrated to the power industry. By 2020, the coal-fired power generation capacity will reach 1.1 billion kw. If the power generation hours are 5000 h/y, the demand for power generation and heating will be about 2.6 billion tons.
- The demand for coal in the steel and building materials industry is declining. In the future, demand for steel, building materials and other major infrastructure such as railways, highways, airports, farmland water conservancy and regional governance and welfare facilities for people's living will gradually decline.

2.1 中国煤炭需求已进入峰值平台期

China's Coal Demand Entered the Peak Plateau Period

- 新型煤化工煤炭需求尚有较大增长潜力。新型煤化工尚处于规模化发展初期，“十三五”期间在水资源有保障、生态环境可承受的地区，以建设升级示范项目为主预计2020年煤制油、煤制天然气、煤制烯烃产量将分别达到1000万吨、100亿立方米、700万吨。
- 散煤治理力度进一步加大。预计2016-2020年将减少散煤利用量1亿吨左右。

- The new coal chemical industry has great growth potential for coal demand. The new coal chemical industry is still in the initial stage of large-scale development. During the "13th Five-Year Plan", it is estimated that the output of major projects of coal-to-gas, coal-based natural gas and coal-to-olefin will reach 10 million tons, 10 billion m^3, 7 million tons respectively in the regions with guaranteed water resources and sustainable ecological environment.
- The treatment of scattered Coal has been further intensified. It is estimated that the utilization of scattered coal will be reduced by 100 million tons from 2016 to 2020.

2.2 生态环保和气候变化对中国煤炭发展约束增强

Environmental Protection and Climate Change Increase Constraints on China's Coal Development

- 中国对清新空气、清澈水质、清洁环境等生态产品的需求迫切。
- 国家将保护环境确定为基本国策，推进生态文明建设。
- 中国已提出2030年左右二氧化碳排放达到峰值的目标。
- 中国国务院已经公布了《大气污染防治行动计划》，明确提出控制煤炭消费总量。
- 绿色低碳发展正在成为未来能源发展的主流，绿色开发、低碳生活已经在中国全社会形成了广泛共识。

- China's demand for fresh air, clear water, clean environment and other ecological products is urgent.
- The Chinese government established environmental protection as a basic state policy, promoting the construction of ecological civilization.
- China has set a target of reaching its peak in CO_2 emissions by 2030.
- China's State Council has announced the "Air Pollution Prevention and Control Action Plan", explicitly proposed to control the total amount of coal consumption.
- Green low-carbon development is becoming the mainstream of future energy development. Green development and low-carbon life have formed a broad consensus in China's society as a whole.

2.3 中国煤炭有效产能供给保障能力强

China's Coal Effective Capacity Supply Guarantee Ability Strong

- 2006~2015年，全国煤炭采选业固定资产投资总额3.67万亿元，新增煤炭产能31.67亿吨/年，在建设煤矿产能13.6亿吨/年。
- 只要合理释放先进产能，给已具备生产能力的现代化煤矿发送许可，煤炭供应是有保障的。

- 2006-2015, the total investment in fixed assets of the national coal mining and mining industry is 3.67 trillion yuan, and the new coal production capacity is 3.167 billion tons/year, and the capacity of coal mines that are constructing is 1.36 billion tons/year.
- As long as the releasing advanced production capacity reasonably, and issuing the permission for the modernized coal mines which own the production capacity, the supply of coal are enough.

2.4 进口煤成本优势对国内市场影响将长期存在

The Influence of Cost Advantage for Imported Coal on Domestic Market Will Exist for a Long Time

- 从世界煤炭供应看，主要产煤国家加大了煤炭及出口基础设施投资，全球煤炭产能和贸易量大幅增加。
- 从世界煤炭需求看，发达经济体的经济发展对高能耗重工业依赖逐步减少，煤炭需求量继续呈下降趋势。
- 从供需关系看，未来国际煤炭市场供大于求的态势仍将延续，主要产煤国家将利用其成本优势积极拓展海外市场，未来进口煤对中国国内煤炭市场的冲击将长期存在。

- From the perspective of world coal supply, the major coal producing countries have increased the investment on coal and export infrastructure, and the global coal production capacity and trade volume have increased substantially.
- From the perspective of world coal demand, the economic development of the developed economies has gradually reduced their rely on the heavy industry with high energy consumption, and the demand for coal continues to decline.
- From the perspective of supply and demand, in the future, the trend of supply exceeding demand at international coal market will continue, and the main coal producing countries will actively expand overseas markets with their cost advantages, and the impact of imported coal on China's domestic coal market will exist for a long time

第三部分　Part Three

中国煤炭发展展望

Prospect of Coal Development in China

3.1 煤炭主体能源地位较长时期内不会改变
Coal as Main Energy Will not Change for a Long Time

- 从中国能源资源禀赋看，中国已探明煤炭资源储量占化石能源的95%，富煤、贫油、少气的能源资源赋存特点决定中国能源安全必须依靠煤炭。

- From the perspective of energy resources in China, China's proven coal reserves account for 95% of fossil energy, occurrence characteristics of energy resources which is rich in coal, but poor in oil and gas determines that China's energy security must rely on coal.

3.1 煤炭主体能源地位较长时期内不会改变
Coal as Main Energy Will not Change for a Long Time

- 从中国发展阶段看，中国仍是世界上最大的发展中国家，经济不平衡不充分问题依然突出，中国现在和未来依然要紧紧依靠煤炭，未来较长一段时期内煤炭仍将是我国重要的基础能源，煤炭在一些行业、一些领域、一些地区仍然不可替代，仍然有市场空间。
- 煤炭仍是中国稳定、经济、自主保障程度最高的能源，在相当长时期内，煤炭主体能源地位不会变化，推动煤炭清洁高效利用是我国能源转型发展的立足点和首要任务。

- From the stage of China's development, China remains the world's biggest developing country, the problem of economic imbalance is still a serious problem, China now and in the future will still rely on coal, which still be an important basic energy in China for a long time, Coal is still irreplaceable in some industries and some places, and it still has market.
- Coal is still the most stable, economic and independent guarantee energy in China. In a considerable period of time, coal as the main energy status will not change. Promoting clean and efficient utilization of coal is the primary task of energy transformation and development in China

3.2 煤炭消费峰值平台期将持续至2025年左右

The Peak Plateau Period of Coal Consumption Will Last Until 2025

- “一带一路”建设、京津冀协同发展、长江经济带发展三大国家战略的实施，给经济增长注入了新动力。
- 中国经济进入新一轮增长周期，带动能源需求较快增长。
- 从水电发展潜力，以及风电、太阳能等可再生能源现有总量和能源特性看，短期内尚不能实现对煤炭的大规模存量替代。
- 预计2025年之前中国煤炭消费总量将维持在40亿吨左右的峰值平台期

- "The Belt and Road" construction, the coordinated development of Beijing Tianjin Hebei, Yangtze River economic belt development of the three national strategy has injected new impetus to economic growth.
- China's economy has entered a new round of growth cycle, leading to rapid growth of energy demand
- From the potential of hydropower development, as well as the total amount and energy characteristics of renewable energy such as wind power and solar energy, it is not possible to achieve large-scale stock replacement of coal in the short term.
- It is estimated that China's total coal consumption before 2025 will remain about 4.0 billion tons

3.3 煤炭产业结构将进一步优化
Coal Structure Will Be Further Optimized

到2025年：

- 煤炭产量维持在40亿吨左右。
- 煤矿数量控制在5000处左右。
- 120万吨/年及以上大型煤矿产量占85%以上，30万吨/年及以下小型煤矿产量占5%以下。

Till 2025:

- Control coal production around 4 billion tons.
- Control quantity of coal mines around 5,000.
- 85% of mines are big ones with annual production of more than 1.2 million tons, while 5% mines are small mines with annual production of 0.3 million tons or less.

3.3 煤炭产业结构将进一步优化
Coal Structure Will Be Further Optimized

到2025年：

- 煤炭生产开发进一步向大型煤炭基地集中，大型煤炭基地产量占97%以上。
- 产业集中度进一步提高，煤炭企业数量2000家以内，5000万吨级以上大型企业产量占65%以上。

Till 2025:

- More centralized big coal production bases account for 97% of total coal production.
- Increase Industry concentration degree, control quantity of coal companies to less than 2000, more than 65% production from big companies with annual production of more than 50 million tons.

3.4 中国煤矿生产技术水平将大幅提升
Highly Improve Coal Producing Technology Level

到2025年：

- 煤矿安全生产长效机制进一步健全，安全保障能力显著提高，建成安全高效矿井1400处。
- 煤矿机械化程度进一步提高，煤矿采煤机械化程度达到90%，掘进机械化程度达到70%。
- 科技创新对行业发展贡献率进一步提高，煤矿信息化、智能化建设取得新进展，建成先进高效的智慧煤矿50座，智能化无人开采工作面200个。

Till 2025:

- Set long-term mechanism of coal mines safety, remarkably improve capability of safety guarantee, build 1,400 safe and efficient coal mines.
- Increase mechanization level of coal extraction to 90%, and Coal lane driving to 70%.
- Technology advancement contribute more to industry development, coal industry makes new progress in informatization and smartization, build 50 high efficient smart mines and 200 intelligent unmanned working faces.

3.5 生态文明矿山建设将迈上新台阶
New Step of Ecological Mine Construction

到2025年：

- 建成绿色矿山800座。
- 煤矸石综合利用率85%左右。
- 矿井水利用率85%左右。
- 土地复垦率70%左右。
- 原煤入选率85%以上，煤炭产品质量显著提高。

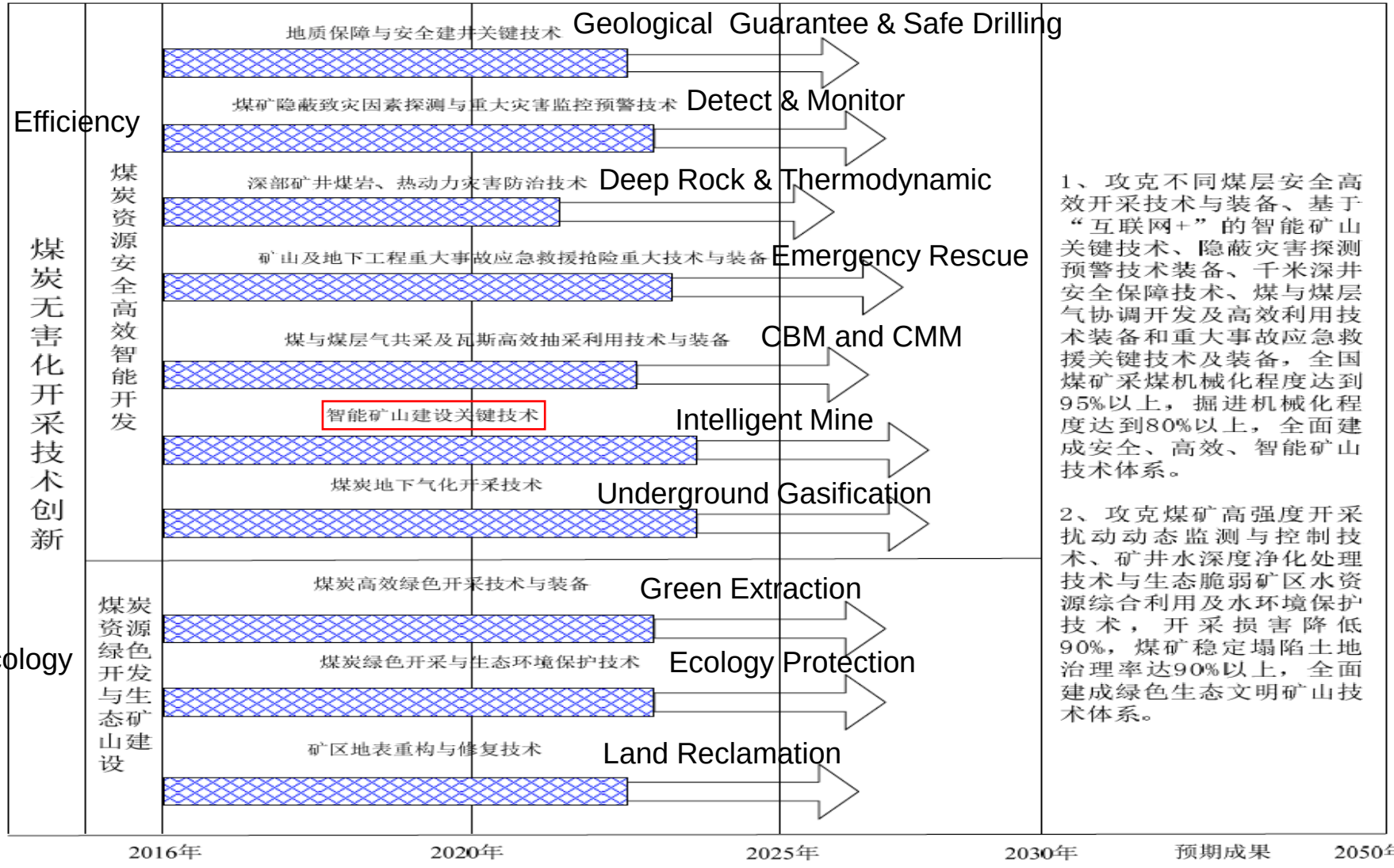
Till 2025:

- Build 800 green mines
- Integrated utilizing percentage of coal gangue reaches 85%.
- Utilizing percentage of mine water reaches 85%.
- Land reclamation percentage reaches 85%.
- Raw coal selection percentage reaches 85%, remarkably improve quality of coal product.

能源技术革命创新行动计划（2016-2030年）

Energy Technology Revolution and Innovation Strategy(2016-2030)

煤炭无害化开采技术创新路线图 Road Map of Harmless Coal Extraction Technology



3.6 煤炭清洁高效利用将取得显著成效

Remarkable Progress in Clean & Efficient Utilization

- 目前，中国燃煤电厂在技术上特别是超低排放技术已走在了世界前列，集中排放的二氧化硫、氧化氮、细颗粒物，通过排放尾气的收集处理，经过脱硫、脱硝、除尘装置，已能控制到和天然气燃烧排放水平相当。
- 全面推广超低排放和世界一流水平的能耗标准，是促进中国能源清洁高效发展最直接、最行之有效的举措，中国已加快现有燃煤电厂技术改造。
- 中国已加大散煤治理力度，重点在京津冀、长三角、珠三角等大气污染防治重点地区，通过采用天然气、电力等清洁能源替代散煤燃烧，以及通过发展集中供热、推广高效粉煤锅炉和余热余能回收利用技术等对散煤实施减量替代。

- China had advanced technology in super low emission of coal fired power plant with centralized SO_2, NOx and small particles scrubber, which can control emission level the same as natural gas fired plant.
- Comprehensively promote super low emission and world-class energy consumption standards. China is now accelerating technology renovation of coal fired power plants.
- Control scattered coal burning with focus in Jing-Jin-Ji, Yangtze River Delta and Pearl River Delta. Replace scattered coal by natural gas, electric power and other clean energy, as well as central heat supply, high efficient pulverized coal boiler and waste heat capture and utilization.

谢谢

Thank You!