

"14th Five-Year" Modern Energy System Planning

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Energy is an important material basis and driving force for the progress of human civilization, and it is related to the national economy and people's livelihood and national security. In today's world, the impact of the new crown pneumonia epidemic is far-reaching and far-reaching, which has not been seen in a century. The great changes have accelerated the evolution, and a new round of technological revolution and industrial transformation has developed in depth. Climate governance presents a new situation, new energy and information technology are closely integrated, production and life The transformation to low-carbon and intelligentization is accelerating, and the energy system and development model are entering a de- A new stage dominated by stone energy. Accelerating the construction of a modern energy system is the guarantee of national energy Safety, striving to achieve the inherent requirements of carbon peaking and carbon neutrality as scheduled, is also to promote the realization of Important support for high-quality economic and social development. This plan is based on the "People's Republic of China The Fourteenth Five-Year Plan for National Economic and Social Development and Outline of Vision 2035 The compilation, mainly to clarify my country's energy development policy, main goals and tasks and measures, is the "ten The overall blueprint for accelerating the construction of a modern energy system and promoting high-quality energy development during the Fourth Five-Year Plan period Diagram and program of action.

## Chapter 1 Development Environment and Situation

After years of development, the world's energy transition has shifted from a start-up period to an all-round acceleration In this period, the global energy and industrial system is being promoted to accelerate the evolution and reconstruction. my country's energy revolution In the ascendant, the energy structure has been continuously optimized, and a multi-wheel drive supply system has been formed. The development of electricity and renewable energy is at the forefront of the world, and it has the foundation to accelerate the development of energy transformation. However, the problem of unbalanced and insufficient development is still prominent, supply chain security and production The modernization level of the industry chain needs to be improved, and the construction of a modern energy system faces new opportunities and challenges war.

### 1. Profound changes in the global energy system

The low-carbon transformation of the energy structure has been accelerated. Since the beginning of this century, the global energy structure

Accelerate adjustment, new energy technology level and economy are greatly improved, wind energy and solar energy are beneficial

With the realization of leap development, the scale has increased dozens of times. Global response to climate change opens a new era

journey, the Paris Agreement has received extensive support and participation from the international community, and can be renewed in the past five years.

Bioenergy provides about 60% of the world's new electricity generation. China, EU, US, Japan

More than 130 countries and regions have proposed carbon neutrality goals, and the world's major economic volume

It greatly promotes green economic recovery, green industry has become an important investment field, clean and low-carbon

Energy development ushered in new opportunities.

Diversified and iteratively evolving energy systems. The form of the energy system is accelerating the change, divided into

The trend of decentralization, flattening, and decentralization is becoming more and more obvious, and distributed energy is fast

development, energy production has gradually shifted to both centralized and decentralized, and the system model has changed from large to large.

The main network of the base is gradually transformed into parallel with the micro-grid and smart micro-grid to promote new energy

Source utilization efficiency is improved and economic costs are reduced. New energy storage and hydrogen energy are expected to be developed on a large scale

develop and drive fundamental changes in the form of the energy system, and build a new energy system with a gradually increasing proportion of new energy

The new power system is poised for development, and energy transition technology routes and development models tend to be diversified

change.

The intelligent upgrading process of the energy industry has been accelerated. Internet, big data, artificial intelligence

and other modern information technology to accelerate the deep integration with the energy industry. smart power plant

Rapid popularization of applications such as network, intelligent robot exploration and mining, unattended, fault diagnosis

The informatization and intelligence level of other energy production and operation technologies continued to improve. industrial park, city

A large number of comprehensive energy services and smart energy use models in towns, communities, public buildings and other fields

At present, the energy system is developing in the direction of intelligent and flexible adjustment and real-time interaction of supply and demand.

Profound changes in the way of source production and consumption.

The multi-polar pattern of energy supply and demand has undergone in-depth evolution. In-depth adjustment of global energy supply and demand map

In the past ten years, the center of consumption has been tilted eastward and the center of production has moved westward.

The proportion of energy consumption in the Asia-Pacific region in the world continues to increase, and crude oil, natural

The increase in gas production reached more than 80% and 30% of the global increase, respectively. Low-carbon energy transition

To promote the reshaping of the global energy pattern, many countries are actively developing new energy and accelerating fossil energy

The replacement of clean energy sources brings new changes in global energy supply and demand.

2. my country has entered a new stage of building a modern energy system

Energy security has entered a critical period. The foundation of energy supply guarantee is continuously consolidated

In fact, the resource allocation capacity has been significantly improved, and the overall balance of supply and demand has been more than maintained for many consecutive years.

Since the "13th Five-Year Plan", domestic crude oil production has steadily rebounded, and natural gas production has grown rapidly.

The average increment exceeded 10 billion cubic meters, and the total mileage of oil and gas pipelines reached 175,000 kilometers.

The installed capacity of electricity has reached 2.2 billion kilowatts, and the power transmission capacity from west to east has reached 270 million kilowatts.

Guarantee the needs of economic and social development and people's livelihood. However, at the same time, the old and new winds of energy security

Risks are intertwined, and energy security guarantee in the "14th Five-Year Plan" period will enter a solid foundation, enhance advantages, and make up for shortcomings

A new stage of board, strong and weak items.

The low-carbon energy transition has entered an important window period. During the "Thirteenth Five-Year Plan" period, my country's energy structure

Continuous optimization, the low-carbon transformation has achieved remarkable results, and the proportion of non-fossil energy consumption has reached 15.9%.

The proportion of coal consumption dropped to 56.8%, conventional hydropower, wind power, solar power, nuclear power

The installed capacity reached 340 million kilowatts, 280 million kilowatts, 250 million kilowatts, and 50 million kilowatts respectively.

The installed capacity of non-fossil energy power generation ranks first in the world. During the "14th Five-Year Plan" period, Wei Li

The key to achieving carbon peaking by 2030 and laying the groundwork for carbon neutrality by 2060

During this period, it is necessary to coordinate the promotion of low-carbon energy transformation and supply guarantee, and speed up the adjustment of the energy system.

To adapt to the large-scale development of new energy, promote the formation of green development and lifestyle

Mode.

The modern energy industry has entered a period of innovation and upgrading. Significant improvement in energy technology innovation capabilities

industry development capacity continues to increase, and new energy and power equipment manufacturing capacity leads the world

First, new breakthroughs have been made in low wind speed wind power generation technology and photovoltaic cell conversion efficiency.

Breakthrough, fully master the third-generation nuclear power technology, coal-to-gas, Sino-Russian eastern natural gas pipeline,

Major projects such as  $\pm 500$  kV flexible DC grid and  $\pm 1100$  kV DC transmission were put into operation.

The practical experience of ultra-large-scale power grid operation control is constantly enriched. In general, my country's energy technology

The technical equipment has formed a certain advantage. Focusing on carbon peaking and carbon neutrality, the Department of Energy

The system is faced with the need for new changes, and it is urgent to further strengthen the leadership and strategy of scientific and technological innovation

Support, and comprehensively improve the level of advanced energy industry foundation and industrial chain modernization.

Universal energy services have entered a period of consolidation and improvement. During the "Thirteenth Five-Year Plan" period, energy benefits the people and benefits the people

Fruitful results have been achieved, the general energy service level has been significantly improved, and "everyone has access to electricity" has achieved certain benefits.

To ensure the full protection of rural power grids, a new round of rural power grid transformation and upgrading has been fully completed, and the poverty-stricken areas covered by large power grids

The proportion of power and electricity connected to villages has reached 100%, and the overall reliability rate of rural power supply has reached 99.8%.

The installed capacity of the photovoltaic poverty alleviation power station is about 26 million kilowatts, and the service level of "access to electricity" has been greatly improved

Energy consumption costs continue to decrease, and the business environment continues to optimize. Clean heating in northern regions

rate of more than 65%. But at the same time, urban-rural disparities in energy infrastructure and service levels

It is still obvious that the quality of energy supply needs to be further improved. To focus on better satisfying people's increasingly

The growing need for a better life will help consolidate and expand the achievements of poverty alleviation and rural revitalization.

Effective connection, and further improve the level of energy development and sharing.

Box 1 Main achievements in energy development during the 13th Five-Year Plan			
index	2015	2020 annual average	change/cumulative
Total energy consumption (100 million tons of standard coal)	43.4	49.8	2.8%
Proportion of energy consumption structure	63.8	56.8	[-7.0]
Of which: Coal (%)			
Oil (%) Natural gas	18.3	18.9	[0.6]
(%) Non-fossil energy	5.9	8.4	[2.5]
(%) Primary energy production	12.0	15.9	[3.9]
(100 million tons of standard coal) Power generation installed	36.1	40.8	2.5%
capacity (100 million kilowatts) Including: hydropower (100	15.3	22.0	7.5%
million kilowatts) Coal power (100 million kilowatts) Gas power	3.2	3.7	2.9%
(100 million kilowatts) Nuclear power (100	9.0	10.8	3.7%
million kilowatts) Wind power (100 million	0.7	1.0	8.2%
kilowatts) Solar power (100 million kilowatts)	0.3	0.5	13.0%
Biomass power generation (100 million kilowatts)	1.3	2.8	16.6%
West-to-east power transmission capacity (100	0.4	2.5	44.3%
million kilowatts) Total mileage of oil and gas	0.1	0.3	23.4%
pipelines (10,000 kilometers)	1.4	2.7	13.2%
	11.2	17.5	9.3%

Note: [ ] is the cumulative number for five years. y Hydropower includes conventional hydropower and pumped storage power stations.

## Chapter 2 Guidelines and Main Objectives

### 3. Guiding ideology

Guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, fully implement the Party's

The spirit of the 19th National Congress of the Communist Party of China and the 19th plenary sessions, and thoroughly implement Xi Jinping's thinking on ecological civilization

Thinking, adhere to the general tone of seeking progress while maintaining stability, based on the new stage of development, complete, accurate,

Fully implement the new development concept and accelerate the construction of a new development pattern to promote high-quality development

with the theme of deepening the supply-side structural reform as the main line, with reform and innovation as the fundamental action

power to meet the economic and social development and the people's growing needs for a better life

To further promote the energy consumption revolution, supply revolution, technological revolution and institutional reform

We will strengthen international cooperation in an all-round way, do a good job in carbon peaking and carbon neutrality, and coordinate and stabilize growth.

Long-term and structural adjustment, properly handle development and emission reduction, overall and partial, long-term goals and short-term goals

Objectives, government and market relationships, with a focus on enhancing energy supply chain security and stability

focus on promoting green and low-carbon transformation of energy production and consumption, and focus on improving energy production

The modernization level of the industry chain, accelerate the construction of a clean, low-carbon, safe and efficient energy system, increase

Quickly build an energy-powerful country, and provide solid and reliable resources for building a socialist modern country in an all-round way.

energy security.

#### 4. Basic principles

Ensure safety, green and low carbon. Coordinate development and safety

plan, build a modern energy system on the premise of ensuring safety, and continuously enhance risk response

ability to ensure national energy security. Practice the concept that lucid waters and lush mountains are invaluable assets,

Adhere to the ecological priority, green and low-carbon development path, speed up the adjustment of the energy structure, coordinate

At the same time, we will promote energy supply security and low-carbon transformation.

Innovation-driven, intelligent and efficient. Adhere to innovation as the first move to lead development

focus on enhancing the innovation capability of energy science and technology, and speed up the digitization and intelligence of the energy industry

Upgrade, promote quality change, efficiency change, power change, and promote the modernization of the industrial chain

change.

Deepen reform and expand opening up. Give full play to the decisiveness of the market in resource allocation

role, better play the role of the government, and remove the institutional mechanisms that restrict the high-quality development of energy

Obstacles, adhere to the implementation of a wider range, wider field, deeper level of opening up, open

Open up a new situation in energy international cooperation.

People's livelihood first, shared development. Adhere to the people-centered development philosophy, continue to

Improve the universal service level of energy, strengthen the guarantee of energy demand in the field of people's livelihood, and promote energy

More development achievements will benefit the masses of the people better, in order to realize the people's pursuit of a better life.

Yearning to provide strong energy security.

#### V. Development Goals

The main goals of building a modern energy system during the "14th Five-Year Plan" period are:

——Energy security is more secure and powerful. By 2025, comprehensive domestic energy

The production capacity has reached more than 4.6 billion tons of standard coal, and the annual crude oil output has rebounded and stabilized at 200 million tons.

level, the annual output of natural gas has reached more than 230 billion cubic meters, and the total installed capacity of power generation has reached 230 billion cubic meters.

To about 3 billion kilowatts, the energy reserve system will be more perfect, and the independent energy supply capacity will be further improved.

step enhancement. Power emergency security guarantee capability for key cities, core areas, and important users

Significantly improved.

——The low-carbon transformation of energy has achieved remarkable results. Carbon dioxide emissions per unit of GDP for five years

fell 18%. By 2025, the proportion of non-fossil energy consumption will increase to about 20%,

The proportion of non-fossil energy power generation has reached about 39%, and the level of electrification has continued to improve.

It can account for about 30% of the terminal energy consumption.

——The efficiency of the energy system has been greatly improved. Remarkable effect of energy saving and consumption reduction, unit GDP

Energy consumption has decreased by 13.5% in five years. The allocation of energy resources is more reasonable, and the nearby efficient development

The utilization scale was further expanded, and the transmission and distribution efficiency was significantly improved. Power coordinated operation ability is not

By 2025, the proportion of flexible adjustment of power supply will reach about 24%, and the power demand

The side response capability reaches 3% to 5% of the maximum electrical load.

——The ability of innovation and development has been significantly enhanced. The level of new energy technology continues to improve, and new

Phased progress has been made in the construction of a large-scale power system, safe and efficient energy storage, hydrogen energy technology innovation

The capacity has been significantly improved, and the promotion and application of pollution reduction and carbon reduction technologies has been accelerated. Initial digitalization of the energy industry

Effective, important progress has been made in the construction of the smart energy system. Energy research during the "14th Five-Year Plan" period

The average annual growth rate of development funds is more than 7%, and the number of new key technological breakthrough areas has reached 50

about.

——The level of universal service continued to improve. Convenience and protection of energy consumption for people's production and living

The barrier capacity has been further enhanced, and the availability of diversified clean energy such as electricity, gas, cooling, and heat has

Significant improvement, the per capita annual domestic electricity consumption has reached about 1,000 kWh, and the natural gas pipeline network

Coverage is further expanded. Balanced development of urban and rural energy supply infrastructure, clean energy in rural areas

The power supply capacity has been continuously enhanced, and the gap in the quality of power supply between urban and rural areas has been significantly narrowed.

Looking forward to 2035, decisive progress will be made in high-quality energy development, and the current

generation energy system. The ability to guarantee energy security has been greatly improved, and green production and consumption patterns

Widely formed, the proportion of non-fossil energy consumption will be increased on the basis of reaching 25% in 2030.

Step by step, renewable energy power generation has become the main power source, and new power system construction

Substantial results have been achieved, and the total carbon emission has stabilized and declined after reaching its peak.

### Chapter 3 Enhancing Energy Supply Chain Stability and Security

Strengthen bottom-line thinking, adhere to the domestic base, make up for shortcomings, provide multiple guarantees, and strengthen

Reserve, improve the production, supply, storage and sales system, continuously enhance the ability to respond to risks, and ensure the industrial chain

Supply chain stability and steady economic development.

#### 6. Strengthening strategic security

Enhance oil and gas supply capacity. Increase domestic oil and gas exploration and development, adhere to the combination of extraordinary and extraordinary

Equal attention should be paid to both land and sea, and the basic geological survey and exploration of oil and gas in key basins and sea areas should be strengthened.

Consolidate the foundation of resource continuity. Accelerate the production of reserves

reduce" and "enhanced oil recovery", promote stable production in old oil and gas fields, and increase capacity building in new areas

to ensure continuous and stable production and increase in production. Actively expand the exploration and development of unconventional resources, speed up the pace

The development of rock oil, shale gas and coalbed methane. Oil production on the rise, striving for 2022

The annual rebound to 200 million tons and stable production for a long period of time. Rapid growth in natural gas production

Strive to reach more than 230 billion cubic meters in 2025.

Strengthen the technical reserve of security strategy. Do a good job in the planning and layout of coal-based oil and gas strategic bases and

Management and control, under the premise of overall consideration of environmental carrying capacity, etc., the steady progress has been included in the plan

The project will be implemented in an orderly manner, the production capacity and technical reserves will be established, and the research and promotion of Erdo, Inner Mongolia will be carried out.

Coal-based oil and gas strategies in Sri Lanka, Shaanxi Yulin, Shanxi Jinbei, Xinjiang Zhundong, Xinjiang Hami, etc.

Base construction. In accordance with the principle of not competing with food for land and food, improve fuel ethanol

Comprehensive benefits, vigorously develop cellulosic fuel ethanol, biodiesel, bio-aviation kerosene

and other non-food biofuels.

#### 7. Improve the level of operational safety

Strengthen the guarantee of coal safety. Optimize the layout of coal production capacity, build Shanxi, Mongolia

Five coal supply guarantee bases in West China, East Mongolia, North Shaanxi and Xinjiang, and improve coal cross-regional

The transportation channel and the collection and distribution system will enhance the ability to guarantee the supply of coal across regions. Continuous optimization

Change the coal production structure, focus on developing advanced production capacity, and lay out a number of resource conditions

Large-scale modern coal mines with good quality, strong competitiveness and high safety guarantee, strengthen intelligent

safety and high-efficiency mine construction, prohibit the construction of high-risk mines, and accelerate the promotion of backward production

Coal mines with energy, ineffective production capacity and unsafe production conditions will be closed and withdrawn. Establish and improve

Taking corporate social responsibility reserves as the main body, local government reserves as supplements, product reserves and

A coal reserve system that organically combines production capacity reserves.

Play the supporting and regulating role of coal power. Coordinate power supply guarantee and pollution reduction and carbon reduction, root

According to the development needs, the advanced coal-fired power plants are reasonably constructed, and the necessary equipment to maintain the safe and stable operation of the system

To manage the margin, accelerate the promotion of coal power from the main power source to the provision of reliable capacity, peak regulation and frequency regulation

The basic guarantee and system regulation power transformation of auxiliary services, and give full play to the existing

The emergency peak-shaving capacity of coal-fired power units will be promoted in an orderly manner, and the construction of supporting and regulated power sources will be promoted in an orderly manner.

Improve natural gas reserves and regulation capabilities. Coordinate the promotion of underground gas storage and liquefaction

Construction of gas storage facilities such as natural gas (LNG) receiving stations. Build a gas supply enterprise and national management

Network, urban gas companies and local governments to coordinate the implementation of the new mechanism to promote all parties to implement the new mechanism

Real gas storage responsibility. Simultaneously improve the regulation capacity of tube storage and the regulation capacity of underground gas storage

and LNG gasification and export regulation capacity, and improve the seasonal peak regulation level of natural gas pipeline network. Complete

To implement the management of natural gas purchase and sales contracts, adhere to the contractual guarantee of supply, and strengthen the market adjustment of supply and demand

to strengthen the protection of residential gas consumption, optimize the direction of natural gas use, and increase the use of natural gas

Priority should be given to ensuring the living needs of residents and clean heating in winter in northern regions. By 2025,

The national intensive distribution of gas storage capacity reaches 55 billion to 60 billion cubic meters, accounting for

The proportion of the fee is about 13%.

Maintain energy infrastructure security. Strengthen the safety protection and protection of important energy facilities

protection, improve the joint prevention and control mechanism, and focus on ensuring nuclear power plants, hydropower plants, and hub substations

Stations, important converter stations, important transmission channels, large-scale energy and chemical projects and other facilities

All, strengthen the protection of oil and gas pipelines. Comprehensively strengthen nuclear power safety management and implement the strictest

Safety standards and the strictest supervision, always implement the policy of "safety first, quality first"

Through all aspects of nuclear power construction, operation, and decommissioning, the entire chain of safety responsibilities will be implemented

To people, continue to improve the safety level of units in operation and under construction to ensure foolproof. continue

Through the special investment in the central budget to support the safety transformation of coal mines, improve the safety and security capabilities of coal mines force.

8. Strengthen emergency safety management and control

Strengthen power security in key areas. According to the "key protection, local toughness, fast

The principle of "speedy recovery", focusing on municipalities directly under the Central Government, provincial capital cities, and cities under separate state planning,

Emergency power supply and accident recovery capability. Coordinate local grid structure optimization and interconnected transmission

Electric channel construction, reasonably improve related lines and substations in core areas and important users

Construction standards, and strengthen the mutual support of power grids in the event of an accident. Promote local emergency support

Power supply construction, encourage important users who have the conditions to develop distributed power and microgrids,

Improve the configuration of users' emergency self-provided power supply, and make overall arrangements for urban black-start power supply and public utilities

Urgent mobile power construction. During the "14th Five-Year Plan" period, a number of strong localities will be deployed in key cities

grid.

Improve energy network security management and control. Improve the safety prevention and control body of the power monitoring system

To strengthen the security protection capacity building of key information infrastructure in the power and oil and gas industries.

Promote the application of the Beidou global satellite navigation system in the energy industry. Strengthen network security

Research on key technologies to promote the establishment of energy industry, enterprise network security situational awareness and monitoring

A monitoring and early warning platform has been developed to improve risk analysis, judgment and early warning capabilities.

Strengthen risk management and emergency management. Develop important facilities and key links

Troubleshooting and management, strengthening equipment monitoring and inspection and maintenance, and improving the prevention of earthquake and geological disasters,

Prediction, early warning and defense response capabilities of security risks such as extreme weather and fire. electric propulsion

Strengthen the construction of emergency response system, strengthen the main responsibility of local governments and enterprises, and establish power security

The entire emergency command platform, training and exercise base, emergency rescue team and expert database. Complete

Emergency plan system, formulate emergency response plans in emergency situations, and carry out practical emergency response

Drills to improve quick response capabilities. Establish and improve construction standards for electrochemical energy storage, hydrogen energy, etc.

Standards, strengthen key supervision, improve product intrinsic safety level and emergency response capabilities. combine

Reasonably improve the security and defense standards in the energy field, and improve the protection of power facilities, safety protection and

Anti-terrorism prevention and other institutional standards.

Box 2 Key projects for energy security
<p>Oil and gas exploration and development. Based on the Sichuan Basin, Tarim Basin, Ordos Basin, Junggar Basin, Songliao Basin, Bohai Bay Basin, Qaidam Basin and other key basins, strengthen risk exploration in the central and western regions and sea areas, strengthen</p> <p>Fine exploration in the eastern old area. Promote Mahu and Jimsar shale oil in Junggar Basin and shale in Ordos Basin</p> <p>Oil, tight gas, Daqing Gulong shale oil in Songliao Basin, Central Sichuan paleo-uplift, South Sichuan shale gas in Sichuan Basin, Tali</p> <p>Shunbei, Fuman, Bozi-Dabei in the Mu Basin, shale gas in western Hubei, southern Shaanxi, northern Yunnan and Guizhou, Bozhong, Kenli,</p> <p>Enping oil and gas production project. Accelerate the promotion of "Qingdaqing of gas" in the Sichuan Basin and "deep oil and gas development" in the Tarim Basin.</p> <p>Qing", Ordos 100 million-ton "Oil and Gas Super Basin" and other landmark projects. Strengthen Qinshui Basin, Ordos</p> <p>Coalbed methane exploration and development in the eastern margin of the basin. Carry out test production of natural gas hydrate in the South China Sea and other regions.</p>
<p>Gas storage and LNG terminal. Build tens of billions of cubic meters of underground gas storage groups in North China, Northeast China, Southwest China and Northwest China.</p> <p>Priority will be given to the LNG receiving terminal projects that have been built, under construction and planned at important port sites.</p> <p>coal reserves. Support qualified enterprises to fulfill their social responsibilities and build coal reserves in coal production areas, consumption areas, railway transportation hubs, and major transit ports.</p>
<p>Network security control. Accelerate the improvement of the safety protection system of the power monitoring system and the password of the power information system</p> <p>Infrastructure construction project, Beidou space-time infrastructure application and intelligent operation system project construction, carry out Beidou</p> <p>Time-frequency network construction, and promote the construction of the Beidou comprehensive service platform and terminal application pilot for key enterprises. built power</p> <p>Industry network security situational awareness platform and full-service, distributed, highly simulated power industry network security simulation experience</p> <p>certification environment.</p> <p>Risk and emergency management. Preliminary completion of the basin hydropower safety and emergency management information platform, hydropower station (dam) safety</p> <p>Full and emergency management platform. Build a power safety emergency command platform.</p>

#### Chapter 4 Accelerate the promotion of green and low-carbon transformation of energy

Adhere to ecological priority and green development, expand the clean energy industry, and implement renewable energy

Energy substitution action, promote the construction of a new power system, and promote the gradual increase in the proportion of new energy

high, driving the optimized mix of coal and new energy. Adhere to a national game of chess, scientific and orderly push

To achieve carbon peaking and carbon neutrality goals, and continuously improve green development capabilities.

##### 9. Vigorously develop non-fossil energy

Speed up the development of wind power and solar power generation. Comprehensive promotion of wind and solar power generation

Scale development and high-quality development, give priority to local and nearby development and utilization, and speed up the load center

Distributed wind power and distributed photovoltaic construction in and surrounding areas, and promote the application of low wind speed wind power

Technology. In the wind and solar energy resource endowment is better, the construction conditions are superior, and the sustainable

Areas that are fully equipped for development conditions and meet the requirements of regional ecological environment protection, etc., will be promoted in an orderly manner

Centralized development of wind power and photovoltaic power generation, accelerating the development of desert, Gobi, and desert areas

Focus on the construction of large-scale wind power photovoltaic base projects, actively promote the upper reaches of the Yellow River, new

Construction of multi-energy complementary clean energy bases in Xinjiang and northern Hebei. Actively promote industrial parks, economic

Economic development zones and other rooftop photovoltaic development and utilization, and promote the application of photovoltaic power generation and building integration

use. Carry out demonstration of hydrogen production by wind power and photovoltaic power generation. Encourage the construction of offshore wind power bases, promote

The offshore wind power will be distributed to the deep-water and far-shore areas. Actively develop solar thermal power generation.

Develop hydropower according to local conditions. Adhere to ecological priority, overall consideration, moderate development,

Ensure the bottom line, actively promote the construction of hydropower bases, and promote the upper reaches of the Jinsha River and the middle of the Yalong River

The construction of hydropower projects in the upper reaches of the Yellow River and other rivers started. Implementation of the lower reaches of the Brahmaputra

Electric power development and other major projects. Implement small hydropower clean-up and rectification, and promote green transformation and modernization

Enhancement. Promote the synergy and complementarity of hydropower, wind power, and solar power generation in the southwest region. arrive

In 2025, the installed capacity of conventional hydropower will reach about 380 million kilowatts.

Actively, safely and orderly develop nuclear power. On the premise of ensuring safety, actively and orderly push

Promoting the construction of coastal nuclear power projects, maintaining a stable construction pace, and rationally deploying new coastal nuclear power plants

electricity project. Carry out demonstrations of comprehensive utilization of nuclear energy, and actively promote high-temperature gas-cooled reactors, fast reactors,

Demonstration projects of advanced reactor types such as modular small reactors and offshore floating reactors to promote the development of nuclear energy

Comprehensive utilization of clean heating, industrial heating, seawater desalination and other fields. Do a good job of nuclear power

Site resource protection. By 2025, nuclear power operating installed capacity will reach 70 million kilowatts

about.

Develop other renewable energy sources according to local conditions. Promote the diversified utilization of biomass energy.

Steady development of urban household waste incineration power generation, orderly development of agricultural and forestry biomass power generation and biogas

Gas power generation, and the development of biomass energy for clean heating according to local conditions, in the main grain-producing areas and livestock and poultry

Overall planning and construction of biological natural gas projects in aquaculture concentration areas to promote advanced biological liquid combustion

material industrialization development. Actively promote heating and cooling with geothermal energy, where high-temperature geothermal resources are available

Demonstration of geothermal power generation will be carried out in an orderly manner in areas with suitable conditions. Develop and utilize the ocean according to local conditions

energy, promote ocean energy power generation in offshore islands, deep-sea development, and offshore energy supplementation

For applications in other fields.

10. Promote the construction of a new power system

Promote the evolution of the power system to adapt to large-scale and high-proportion new energy sources. Overall planning

Proportional new energy development and safe and stable operation of power, and speed up the digital upgrade of the power system

and iterative development of new power system construction, comprehensively promote the application and operation of new power technology

Innovate the mode of operation and deepen the reform of the power system. Grid-based platform to enhance power

The ability to optimize the allocation of system resources, improve the intelligent level of the power grid, and promote the active adaptation of the power grid.

Large-scale centralized new energy and large-scale distributed energy should be developed. Intensify

The planning and construction is based on a large-scale wind and photovoltaic base, and its surroundings are clean, efficient, advanced and energy-saving.

The new coal-fired power generation is supported by stable, safe and reliable UHV power transmission and transformation lines as the carrier.

Energy supply and consumption system. Build an intelligent and efficient dispatching operation system, explore power,

A joint dispatch mechanism for heat, natural gas and other energy sources to promote coordinated operation. user

As the center, strengthen the two-way interaction between supply and demand, and actively promote the integrated development of source, network, load and storage.

Innovative grid structure and operation mode. Accelerate the transformation and upgrading of the distribution network, promote

Smart distribution network, active distribution network construction, improve distribution network acceptance of new energy and diversification

The carrying capacity and flexibility of the load promote the development and utilization of new energy in the local area. product

Develop a smart microgrid that mainly consumes new energy, and realizes compatibility and mutuality with the large power grid.

repair. Improve the main grid structure of the regional power grid, promote flexible and controllable interconnection between power grids, structure

Build a safe and reliable power system with reasonable scale, hierarchical partitions, and improve the adaptability of the power grid to new

Dynamic stabilization level of energy. Scientifically promote the transmission of new energy power across provinces and regions, steadily

Promote flexible DC transmission, optimize transmission curves and price mechanisms, and strengthen power grids at the sending and receiving ends

Coordinate peak shaving operation to improve the ability of the entire network to absorb new energy.

Enhanced power coordination and optimized operation capability. Improve wind and photovoltaic power forecasts

level, improve the grid-connected standard system, and build system-friendly new energy stations. comprehensive

Flexibility transformation of coal-fired power units, giving priority to the deep peak shaving of 300,000-kilowatt coal-fired power units

capacity, and promote the participation of coal-fired self-provided power plants in the system peak shaving. Construct natural according to local conditions

Gas peak shaving power stations and the development of heat storage solar thermal power generation to promote gas power and solar thermal power generation

Integrated development and joint operation of electricity, wind power and photovoltaic power generation. Accelerate the promotion of pumped storage power

station construction, implement a new round of national mid- and long-term development plans for pumped storage, and promote the inclusion of

Construction of large-scale pumped-storage power stations with mature planning and conditions started. Optimizing power-side multi-energy

Complementary scheduling operation mode to fully tap the potential of power peak regulation. Strive to 2025, coal

The scale of flexible transformation of power units has exceeded 200 million kilowatts, and the installed capacity of pumped storage has reached

To more than 62 million kilowatts, the installed capacity under construction reaches about 60 million kilowatts.

Accelerate the large-scale application of new energy storage technologies. Vigorously promote the development of power-side energy storage,

Reasonably allocate the scale of energy storage, improve the output characteristics of new energy stations, and support distributed new energy

Reasonably configure the energy storage system. Optimize the layout of grid-side energy storage to give full play to energy storage and consumption of new energy

It has multiple functions such as power supply, peak shaving and valley filling, enhancement of power grid stability and emergency power supply. positive support

Support the diversified development of user-side energy storage, improve the reliability of user power supply, and encourage electric vehicles

User-side energy storage such as vehicles and uninterruptible power supplies participate in peak regulation and frequency regulation of the system. Broaden energy storage applications

scenarios, promote electrochemical energy storage, cascade power station energy storage, compressed air energy storage, flywheel energy storage

Diversified applications of energy and other technologies, exploring new models such as energy storage aggregate utilization, shared utilization, etc.

business format.

Vigorously improve power load flexibility. Strengthen the construction of power demand side response capacity,

Combine distributed demand response resources, guide users to optimize electricity storage and consumption models, and release a high proportion of residential

The elasticity of electricity load for civil and general industrial and commercial use. Guide large industrial loads to participate in auxiliary services

In the market, encourage electricity price-sensitive high-energy load changes such as electrolytic aluminum, ferroalloy, and polysilicon.

Improve the production process and process, and play the functions of interruptible load and controllable load. carry out work

industry adjustable load, building air conditioning load, big data center load, user-side energy storage,

A virtual power plant that aggregates various resources such as new energy vehicles and grid (V2G) energy interaction

demonstration. Strive to achieve the power demand side response capacity of the maximum load by 2025

3% to 5%, among which East China, Central China, South China and other regions reach about 5% of the maximum load

right.

Box 3 Energy Green and Low-Carbon Transformation Project
<p>Hydro. Completed and put into operation Jinsha River Wudongde (completed and put into operation), Baihetan (some units have been completed and put into operation), Ya Longjiang two estuaries (some units have been completed and put into operation) and other hydropower stations. Promote Jinsha River Rawa, Dadu River Shuangjiangkou, etc.</p> <p>Construction of hydropower station. Strive to start the construction of Gangtuo, Xulong, Yalong River Yagen II, and Mengdigou (approved to open)</p> <p>Construction), Dadu River Danba, Yellow River Yangqu (approved to start) and other hydropower stations. In-depth development of Benzilan, Longpan, Guxue and other hydropower stations in the early stage of demonstration. Implement major projects such as hydropower development in the lower reaches of the Yarlung Zangbo River.</p>
<p>nuclear power. Completed and put into operation Liaoning Hongyanhe No. 5 and No. 6 (No. 5 has been completed and put into operation); Shandong Shidaowan high temperature gas-cooled reactor, "Guohe No. 1" demonstration project; Jiangsu Tianwan No. 6 (completed and put into operation); Fujian Fuqing No. 5 and No. 6 (No. 5 has been completed and put into operation) completed and put into operation), Zhangzhou Phase I No. 1 and 2; Guangdong Taipingling Phase I No. 1 and 2; Guangxi Fangchenggang No. 3 and 4, etc.</p> <p>motor unit.</p>
<p>Wind and photovoltaic power generation. Actively promote the construction of distributed wind power and distributed photovoltaics in the eastern and central regions, optimize Promote Xinjiang, Qinghai, Gansu, Inner Mongolia, Ningxia, northern Shaanxi, northern Shanxi, northern Hebei, Liaoning, Jilin, and Heilongjiang</p> <p>Onshore wind power and photovoltaic power generation base development in other regions, focusing on Guangdong, Fujian, Zhejiang, Jiangsu, Shandong and other offshore wind power bases.</p>
<p>Biomass and geothermal energy. Steady development of urban household waste incineration power generation, orderly development of agricultural and forestry biomass power generation and biogas power generation, and construction of tens of millions of cubic meters of biological natural gas projects. In Beijing-Tianjin-Hebei, Shanxi, Shaanxi, Henan, Lake North and other regions vigorously promote the heating and cooling of mid-deep geothermal energy, and high-temperature geothermal resources are abundant in Tibet, western Sichuan, Qinghai and other regions.</p> <p>A number of geothermal power generation demonstration projects will be constructed in rich areas.</p>
<p>Flexible power adjustment. Promote the construction of Tongcheng, Pan'an, Tai'an Phase II, Hunyuan and other pumped storage power stations, and start the construction He, Shangzhi, Luanping, Xushui, Lingshou, Meidai, Wuhai, Taishun (approved to start), Tiantai (approved Construction started), Jiande, Tonglu, Ningguo, Yuexi, Shitai, Huoshan, Lianyungang, Hongping Phase II, Damushan, Ping Tanyuan (approved to start), Ziyun Mountain, Anhua, Liziwan (approved to start), Warang, Niushou Mountain (approved quasi-start), Guiyang (Shichangba), Nanning (approved to start), Qiannan (Yellow Silk), Yanglin, etc.</p> <p>stand. Carry out research on large-scale energy storage projects for cascade power stations in the upper reaches of the Yellow River. In Qinghai, Xinjiang, Gansu, Inner Mongolia and other places</p> <p>The district promotes the development of solar thermal power generation, wind power and photovoltaic power generation. Focus on coal-fired motors of 300,000 kilowatts and below</p> <p>Flexibility transformation of the 600,000-kilowatt subcritical coal-fired power generation units in areas with difficulty in peak shaving</p>

Retrofit. 11. Reducing the carbon footprint of the energy industry

Promote carbon emission reduction in the development and production of fossil energy. Promote green and low-carbon fossil energy

Mining, strengthen green coal mining and washing and processing, and increase the recovery and utilization of methane in oil and gas fields

Efforts should be made to accelerate the promotion and application of carbon dioxide flooding technology. By 2025, coal mine Wasley

The consumption amounted to 6 billion cubic meters, and the raw coal selection rate reached 80%. Promote advanced energy mining

technical equipment, speed up the electrification transformation of fuel, gas and coal-fired equipment, improve the sea level

The proportion of electricity in the energy supply of the oil and gas platform.

Promote efficiency and carbon reduction in energy processing, storage and transportation. Promote the transformation and upgrading of the refining and chemical industry,

Strictly control new refining capacity, promote the exit of backward and inefficient production capacity in an orderly manner, and extend the industry

chain, increase the proportion of high value-added products, improve the comprehensive utilization of resources, and speed up green

Construction of refineries and smart refineries. Promote the utilization of coal by grades and grades. Orderly phase out coal

30 million will be phased out during the "14th Five-Year Plan" period (including expired decommissioned units)

watt. New coal mine projects are given priority to adopt clean coal transportation methods such as railway and water transportation.

Strengthen energy-saving and waste energy recovery and utilization of energy processing, storage and transportation facilities, and promote waste heat and pressure,

Comprehensive utilization technology of LNG cold energy and other surplus energy.

Promote the coordinated development of the energy industry and ecological governance. Strengthening the management of ecological environment in mining areas

Repair and carry out comprehensive utilization of coal gangue. Innovate the development model of circular economy in mining areas, explore

Utilize coal mining subsidence areas, open-pit mine dumps, abandoned open-pit mines, and shut down high-polluting mines

The district develops wind power, photovoltaic power generation, ecological carbon sink and other industries. Develop "photovoltaic" according to local conditions

"+" comprehensive utilization model to promote photovoltaic desertification control, forest-photovoltaic complementarity, agriculture-photovoltaic complementarity, animal husbandry-photovoltaic mutual

Supplementary supplementation, complementation of fishery and light, to achieve synergy between solar power generation and ecological restoration, agriculture, forestry, animal husbandry and fishery, etc.

developing.

12. Greater efforts to strengthen energy conservation and carbon reduction

Improve the energy consumption "dual control" and carbon emission control system. Strictly control the energy consumption intensity,

The energy consumption intensity target will be assessed in a coordinated manner during the "14th Five-Year Plan" period, and appropriate elasticities will be reserved.

The new renewable energy and raw material energy consumption are not included in the total energy consumption control. strengthen

The industrial layout and the energy consumption "dual control" policy are connected to promote the local implementation of energy consumption budget management

system, strictly implement the energy-saving assessment and review system, and resolutely curb high energy consumption, high emissions and low emissions

Blind development of horizontal projects, giving priority to the protection of residents' lives, modern service industries, and high-tech production

energy demand for industries and advanced manufacturing. Accelerate the construction of the national carbon emission trading market,

Promote the transition from "double control" of energy consumption to "double control" of total carbon emissions and intensity.

Vigorously promote the clean and efficient utilization of coal. During the "14th Five-Year Plan" period, coal was strictly and reasonably controlled

Carbon consumption growth. Strictly control coal consumption in major coal-using industries such as iron and steel, chemical industry, cement, etc.

fee. Vigorously promote the transformation of coal power energy saving and carbon reduction, flexibility transformation, and heating transformation "three reforms"

Linkage", the scale of energy-saving renovation during the "14th Five-Year Plan" period shall not be less than 350 million kilowatts. New coal-fired power

All units are constructed in accordance with ultra-low emission standards, and coal consumption standards have reached the international advanced level.

Continue to promote clean heating in winter in northern regions, promote cogeneration transformation and industrial waste heat

Comprehensive utilization of residual pressure, phasing out small coal-fired boilers and radiators within the coverage of the heating pipe network

Coal, encourage public institutions and residents to use non-coal-fired high-efficiency heating products. Strive to 2025

In 2018, the bulk coal in key areas for air pollution prevention and control was basically cleared, and 35 tons of steam per hour were basically eliminated.

The following coal-fired boilers.

Implement energy conservation and carbon reduction actions in key industries. Enhancing energy conservation and energy efficiency in the industrial sector

Improvement, in-depth implementation of energy-saving monitoring, energy-saving diagnosis, and promotion of energy-saving and low-carbon process technology equipment

equipment, promote energy-saving transformation in key industries, and speed up the development of industrial energy-saving and green manufacturing standards

To carry out energy efficiency benchmarking and energy efficiency "leader" action, and promote green manufacturing.

Continue to improve energy-saving standards for new buildings, accelerate the promotion of ultra-low energy consumption, near zero energy consumption, low energy consumption

Large-scale development of carbon buildings, vigorously promoting energy conservation of existing buildings and municipal infrastructure in cities and towns

Retrofit. Accelerate the electrification and low carbonization of building energy, and promote solar energy and geothermal energy

energy, air energy, biomass energy and other renewable energy applications. Building green and low-carbon transportation

transport system, optimize and adjust the transport structure, vigorously develop multimodal transport, and promote bulk cargo

Medium- and long-distance transportation of "revolutionary rail" and "revolutionary water", encourage heavy-duty trucks and ships to use

Substitute clean fuels such as LNG to strengthen the supply guarantee of clean energy in the transportation industry.

Implement energy efficiency improvement projects for public institutions. Promote new types of data centers, 5G communication base stations, etc.

Energy conservation and energy efficiency improvement in the infrastructure sector will promote the construction of green data centers. actively push

Centralized cooling in the southern region and combined cooling and heating in the Yangtze River Basin. Avoid "one size fits all" power cuts

Limited production or sports "carbon reduction".

Improve the level of low-carbon electrification of end-use energy. Comprehensive and in-depth expansion of electric energy replacement,

Promote the expansion of electric boilers, electric kilns, electric power and other applications in the field of industrial production, strengthen cooperation with

The connection of backward production capacity replacement. Actively develop electricity drainage and irrigation, agricultural product processing, breeding, etc.

Agricultural production and processing methods. Promote air source heat pumps, water source heat pumps and thermal storage according to local conditions

Electric boilers and other new electric heating equipment. Promote commercial electric cookers, smart home appliances and other facilities,

Improve the electrification level of end-use energy fields such as the catering service industry and residents' life. port of implementation

Port power, airport land power transformation. Actively promote new energy vehicles in urban public transportation and other fields

By 2025, the sales volume of new energy vehicles will account for about 20%. optimization

The layout of charging infrastructure, comprehensively promote the coordinated development of vehicle piles, and promote the development of electric vehicles and intelligent

The two-way interaction of energy and information between energy grids, and the combination of light, storage, charging and exchange

Pilot demonstration of a new charging and swapping station.

Implement green and low-carbon action for all. Advocate energy conservation in the whole society, strengthen the national

Conservation awareness, environmental protection awareness, ecological awareness, guide the formation of simple, moderate, green and low-carbon

lifestyle, and resolutely curb unreasonable energy consumption. Deeply develop a green and low-carbon society

Create action demonstrations to create a new fashion for green and low-carbon life. Vigorously advocate bicycles, public

Green travel methods such as public transport. Vigorously develop green consumption and promote green and low-carbon

products, and improve the certification and labeling system for energy-saving and low-carbon products. Improve energy-saving home appliances, high efficiency

Promotion mechanism for lighting products, focusing on Beijing-Tianjin-Hebei, Yangtze River Delta, Guangdong, Hong Kong and Macao and other regions

To encourage the establishment of an intelligent management system for household energy consumption.

#### Chapter 5 Optimizing Energy Development Layout

Coordinate ecological protection and high-quality development, strengthen the connection between regional energy supply and demand, and optimize

The layout of energy development and utilization, improve the efficiency of resource allocation, and promote the transformation of rural energy.

to promote rural revitalization.

##### 13. Rational allocation of energy resources

Improve the pattern of energy production and supply. Give full play to the role of strategic security support in energy-rich regions

use, strengthen the construction of comprehensive development and utilization bases of energy resources, and improve the domestic energy supply guarantee

barrier level. Increase the development and utilization of energy nearby, actively develop distributed energy, encourage

Excited wind power and solar power generation are given priority to local consumption. Optimizing energy delivery patterns and reducing energy

The source flow is crossed and detoured to improve the utilization rate of the conveying channel. Promoting large-scale clean energy in an orderly manner

Power transmission from the source base, increase the proportion of renewable energy power delivered by the stock channel, and build a new

In principle, the proportion of renewable energy power transmitted by the channel shall not be less than 50%, and priority shall be given to planning the transmission

Channels with a higher proportion of electricity from renewable energy sources. Strengthen the guarantee of energy supply in key regions and

Mutual aid capacity building, focusing on solving the problem of Northeast China and "two lakes and one river" (Hubei, Hunan, Jiangxi

West) and other regions, the supply and demand of coal and electricity are temporarily tense.

Strengthen the construction of inter-provincial and inter-regional transmission channels for electricity and oil and gas. Steady progress in resource enrichment

District power delivery, speed up the production of the supporting power supply of the established channels, and focus on the construction of the Jinsha River.

Downstream, Yalong River Basin, Upper Yellow River and "Ji" Bend, Xinjiang, Hexi Corridor, etc.

Clean energy base transmission channels, improve the structure of the power grid at the sending and receiving ends, and improve the efficiency of the AC power grid.

The support of the DC transmission channel. During the "14th Five-Year Plan" period, the transmission capacity of the existing channels will be improved

More than 40 million kilowatts, and newly started construction of inter-provincial and inter-regional power transmission channels of more than 60 million kilowatts

The average utilization hours of inter-provincial and inter-regional DC transmission channels will strive to reach more than 4,500 hours.

superior. Improve the construction of long-distance pipelines for crude oil and refined oil products, and optimize the refinery

Oil supply, improve the layout of refined oil pipelines, and increase the proportion of refined oil pipelines. speed up natural

Construction of long-distance natural gas pipelines and regional natural gas pipeline networks, to promote the interconnection of pipeline networks, and to improve

LNG storage and transportation system. By 2025, the national oil and gas pipeline network will reach about 210,000 kilometers

right.

#### 14. Coordinate and improve the level of regional energy development

Promote the green and efficient development of clean energy bases in the west. Promote the Yellow River Basin and Xinjiang

Green mining and clean and efficient utilization of coal and oil and gas in resource-rich areas such as

Intensity and scale of coal development in river basins. Take the upper reaches of the Yangtze River Economic Belt in Sichuan, Yunnan and West China

Tibet and other regions as the focus, adhere to ecological priority, optimize the layout of large-scale hydropower development, and promote

West-East Power Transmission Continuing Hydropower Project Construction. Actively promote a multi-energy complementary clean energy base

Construction, scientifically optimize the power supply scale ratio, give priority to the use of existing conventional power supply to implement "wind power"

Multi-energy complementary projects such as "Light-Water (Storage)" and "Wind-Wind Fire (Storage)", vigorously develop wind power,

New energy sources such as solar power generation, maximize the use of renewable energy. During the "14th Five-Year Plan" period, the West

The annual comprehensive production capacity of the Ministry of Clean Energy Base increased by more than 350 million tons of standard coal.

Improve the level of clean and low-carbon energy development in the eastern and central regions. Beijing-Tianjin-Hebei and Zhou

The border areas, the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area, etc. as the focus, give full play to the regional advantages

We will accelerate the adjustment of the energy structure and carry out demonstrations of green transformation of energy production and consumption. Safety

Promote the construction of nuclear power projects in coastal areas in an orderly manner, and coordinate the promotion of large-scale development of offshore wind power.

Actively develop new energy sources such as wind energy, solar energy, biomass energy, and geothermal energy. vigorously

Develop the integration of source, network, load and storage. Strengthen the supply guarantee of clean energy such as electricity and natural gas,

Steady expansion of the scale of imports from outside the region. Strictly control coal consumption in key areas for air pollution prevention and control

We will optimize the production capacity structure on the basis of strictly controlling the scale of refining capacity. During the "14th Five-Year Plan" period,

The eastern and central regions will increase the annual production capacity of non-fossil energy by more than 150 million tons of standard coal.

Box 4 Regional energy development priorities and infrastructure projects

Large clean energy base. Coordinate and promote the comprehensive development of scenery in Yunnan, Guizhou, Sichuan, Tibet and Qinghai, focus on building clean energy bases in the upper and lower reaches of the Jinsha River, the Yalong River basin, and the upper reaches of the Yellow River, and implement major projects such as hydropower development in the lower reaches of the Yarlung Zangbo River.

Relying on the stock and the new inter-provincial and inter-regional transmission channels and thermal power "point-to-network" delivery channels, the

Water, fire, storage and multi-energy complementary development, focusing on the construction of clean energy bases such as the "Ji" bend of the Yellow River, the Hexi Corridor, and Xinjiang. Focus on local consumption, and promote the construction of clean energy bases in Songliao and northern Hebei. Actively promote the cluster development of offshore wind power in the southeastern coastal areas.

A leading area for low-carbon energy transformation. Beijing-Tianjin-Hebei and surrounding areas, vigorously develop distributed photovoltaics, promote the green development and utilization of geothermal energy resources, increase the scale of clean power supplied by Mengxi, Shanxi and other regions, and improve the Bohai Rim region

LNG storage and transportation system, and promote pilot demonstrations of green and low-carbon development such as the Low-Carbon Winter Olympics Demonstration Zone and Xiongan Smart Energy City.

In the Yangtze River Delta region, steadily promote the construction of nuclear power plants in Tianwan and San'ao, and vigorously develop onshore distributed wind power and distribution systems.

Distributed photovoltaic power generation, actively develop offshore wind power, promote the expansion of coastal LNG receiving stations, and strengthen the connection of natural gas pipelines between

Zhejiang and Shanghai, Zhejiang and Jiangsu, and Jiangsu and Anhui. The Guangdong-Hong Kong-Macao Greater Bay Area and surrounding areas will steadily advance the construction of nuclear power in Huizhou

Actively develop offshore wind power, explore the development of ocean energy, speed up the construction of pumped storage power stations in Yangjiang and Meizhou, encourage

Increase the scale of natural gas power generation, improve the LNG storage and transportation and natural gas pipeline network system, and actively promote the application and demonstration of energy

storage batteries. In other areas, promote the central region to increase the development of renewable energy and the scale of external introduction, carry out the clean-up and rectification of small hydropower,

promote the transformation of green small hydropower, develop distributed photovoltaic power generation according to local conditions, and build the middle of the Yellow River.

Downstream green energy corridors, and support various regions to carry out green and low-carbon transformation demonstrations according to local conditions. Key areas for energy supply security. "Two lakes and one river" area, give priority to the development of local renewable energy, expand the scale of energy transfer in an orderly manner, and build power transmission from northern Shaanxi to Hubei (completed and put into operation), Yazhong to Jiangxi (completed and put into operation), and the upper reaches of the Jinsha River to Hubei, etc. Channels, relying on the Haoji Railway and its transportation system, rationally distribute coal power at intersections, enhance energy security reserve capacity, and build a number of coal reserve bases. In the northeast region, actively promote the development and diversified utilization of non-fossil energy, improve the supporting branch pipeline network of the Sino-Russian east line, slow down the decline of coal production in the three northeastern provinces, build a coal supply guarantee base in eastern Mongolia, and improve the coal transportation of the Binzhou line and Jitong line. The construction of coal-fired power projects shall be arranged in an orderly manner according to the demand for electricity and heat, and the guarantee of coal-use electricity consumption in winter shall be strengthened. In other areas, strengthen the connection between energy supply and demand, and effectively solve the problems of regional and periodical shortage of supply and demand.

transmission channel. Combined with the development of clean energy bases and the power supply and demand situation in the central and eastern regions, a batch of Work to build a batch, research and demonstrate a batch of multi-energy complementary transmission channels.

Power grid main grid. Improve the structure of UHV AC grids in North China, East China and Central China to provide UHV DC transmission

Provide support for electricity input, build the main grid of Sichuan-Chongqing UHV, and improve the main grid of China Southern Power Grid.

natural gas network. Construction of the southern section of the Sino-Russian East Route Pipeline, the second Sichuan-East Gas Pipeline, the middle section of the Third West-East Gas Pipeline, the Fourth West-East Gas Pipeline, and the Shandong Longkou-Zhongyuan 23 Gas Storage Pipeline.

#### 15. Actively promote rural energy reform

Accelerate the improvement of energy infrastructure in rural and remote areas. Improve rural energy base facilities and public services, implement rural power grid consolidation and upgrading projects, and continue to strengthen Construction of rural power grids in poor areas, improve rural power security, and promote rural energy use

Gasification upgrade. Improve the ability of power transmission and distribution to remote areas, in qualified rural areas

Exploring the construction of high-reliability renewable energy microgrids in districts and remote areas. Guaranteed at the gas source

In the case of barriers and affordable, the extension of gas supply facilities to rural areas will be promoted in an orderly manner. support

The construction of major energy infrastructure projects in the old revolutionary base area will be started as soon as possible after the conditions are met.

Assume.

Strengthen rural clean energy security. Improve rural green power supply capacity and implement thousands of households

Thousands of households and thousands of villages and thousands of villages to harness the wind, actively promote rooftop photovoltaics, agricultural and photovoltaic mutual

Distributed photovoltaic and decentralized wind power construction such as supplementary, fishing and solar complementary, etc., and develop and benefit according to local conditions

Use biomass energy and geothermal energy to promote the formation of new energy industries that enrich the people. Adhere to local conditions

Promote clean heating in winter in rural areas in the northern region, and increase the cleanliness of electricity, gas, and biomass boilers.

The promotion and application of clean heating methods, in rural areas with decentralized heating, local materials are used to promote

A wide range of households use bio-plastic fuel stoves for heating.

Implement rural pollution reduction and carbon reduction actions. Actively promote the green transformation of rural production and lifestyle

promote agricultural energy-saving technologies and products, accelerate agricultural production, agricultural product processing, production

It is a clean replacement for energy in heating, cooking and other fields. Strengthen rural production and domestic waste,

Resource utilization of livestock and poultry manure, comprehensive utilization of straw, and improvement of rural living conditions

environment and ecological space. Actively and prudently promote the treatment of scattered coal, and strengthen the clean coal

use. Carry out the construction of green and low-carbon development demonstration zones in counties, and explore the construction of "zero carbon"

Village" and other demonstration projects.

## Chapter 6 Improving the Modernization Level of the Energy Industry Chain

Accelerate the research on key core technologies and equipment in the energy field, and promote green and low-carbon technologies

Make major breakthroughs, accelerate the digital and intelligent upgrade of the entire energy industry chain, and make overall plans to make up for shortcomings

Plates and forged long plates, and accelerate the construction of first-mover advantages to support energy transformation and reform.

16. Enhancing the innovation capability of energy science and technology

Forged Energy Innovation Advantage Longboard. Consolidate the excellence of technology and equipment in the field of non-fossil energy

potential, and continuously improve wind power, solar power, biomass, geothermal, ocean energy, etc.

The technical level and economy of development and utilization, carry out the optimization research on the third-generation nuclear power technology, and increase the

Strong and high proportion of renewable energy system technology innovation and application. Based on the development of green and low-carbon technology

develop the foundation and advantages, and accelerate the promotion of new power systems, new generation of advanced nuclear energy, etc.

Technological breakthrough. Improve the technical level of clean and efficient utilization of fossil energy and strengthen coal intelligence

Green mining, flexible and efficient coal-fired power generation, modern coal chemical industry and ecological environmental protection technology

Research and implement onshore conventional oil and gas efficient exploration and development and refining and chemical technology research.

Strengthen the research on cutting-edge technologies such as energy storage and hydrogen energy. Develop new energy storage key technology collection

In tackling key problems, accelerating the realization of the autonomy of core energy storage technologies, and promoting the continuous reduction of energy storage costs

and large-scale applications, improve energy storage technical standards and management systems, and improve safe operation

flat. Deploy a batch of hydrogen energy projects moderately ahead of schedule, and focus on overcoming renewable energy production and hydrogen production

Energy storage and transportation, application, fuel cell and other core technologies, and strive for key technologies in the entire hydrogen energy industry chain

breakthroughs in technology to promote the development and demonstration applications of hydrogen energy technology. Strengthen cutting-edge technology research

Research, accelerate the promotion and application of pollution reduction and carbon reduction technologies.

Implement scientific and technological innovation demonstration projects. Relying on the large space of my country's energy market and practical engineering

Take advantage of more opportunities to practice, increase financial and policy support, and focus on advanced renewable energy

Energy generation and comprehensive utilization, small reactor and nuclear energy comprehensive utilization, onshore conventional and unconventional

and efficient exploration and development of offshore oil and gas, gas turbines, clean and efficient development and utilization of coal, etc.

Build a number of innovative demonstration projects in key core technology areas. Targeting new power systems,

Safe and efficient energy storage, hydrogen energy, new generation nuclear energy system, carbon dioxide capture, utilization and sealing

In the frontier fields such as storage, natural gas hydrate, etc., a number of forward-looking and strategic

National Major Science and Technology Demonstration Project.

Box 5 Science and Technology Innovation Demonstration Project

Advanced renewable energy power generation and comprehensive utilization technology. R&D and demonstration applications of technologies such as offshore wind power development in far-reaching seas, high-efficiency photovoltaic cells, building-integrated photovoltaics (BIPV), advanced biomass fuels, geothermal energy, large-scale variable-speed pumped storage and seawater storage, and large-scale development and utilization of ocean energy. Energy ecological environmental protection technology.

Advanced nuclear energy technology. Demonstration and application of optimization and upgrading of key technologies of the third generation of nuclear power, technological breakthroughs and demonstration applications of modular small reactors, (ultra) high temperature gas-cooled reactors, low temperature heating reactors, fast reactors, molten salt reactors, and offshore floating nuclear power platforms. Support the R&D and application of new technologies such as new fuels and new materials. Support the early research and development of controlled nuclear fusion, and actively carry out international cooperation. New power system technology. New energy power generation grid connection and active support, large-capacity offshore wind power friendly transmission, flexible DC, DC distribution network, flexible transformation of coal-fired power units, V2G, virtual power plants, microgrids and other technology research and development and

Demonstration

application. Safe and efficient energy storage. Technical breakthroughs and large-scale demonstration applications such as electrochemical energy storage, cascade power station energy storage, flywheel energy storage, compressed air energy storage, and thermal and cold storage, as well as new energy storage safety prevention technology research and demonstration applications. hydrogen energy. Key technologies such as high-efficiency renewable energy hydrogen production, storage and transportation, application, and fuel cells, as well as diversified demonstration applications. Demonstration and application of hydrogen energy in scenarios such as renewable energy consumption and power grid peak regulation. Demonstration of interconnection and interoperability of heterogeneous energy sources such as hydrogen energy, electric energy, and thermal energy. Oil and gas exploration and development technology. Exploration, development and demonstration applications of deep shale gas, shale oil, marine deepwater oil and gas, and coalbed methane to enhance onshore oil and gas recovery. gas turbine. Key technologies such as gas turbine design, testing, manufacturing, operation and maintenance, and demonstration applications. Clean and efficient coal development and utilization technology. Green and intelligent coal mining, advanced coal-fired power generation, supercritical carbon dioxide power generation, life extension and upgrading of old coal-fired power units, coal-to-oil, coal-to-gas, advanced coal chemical technology research and development and demonstration applications, and construction in Shanxi, Shaanxi, Mongolia, Xinjiang and other regions Carbon dioxide capture, utilization and storage demonstration project.

#### 17. Accelerate the digital and intelligent upgrading of the energy industry

Promoting the digitization of energy infrastructure. Accelerate the development of information technology and energy industry integration

to promote the digital upgrading of the energy industry, strengthen the new generation of information technology, artificial intelligence

The promotion of new technologies such as energy, cloud computing, blockchain, Internet of Things, and big data in the energy field

Widely used. Actively develop power plants, power grids, oil and gas fields, oil and gas pipeline networks, and oil and gas reserves

Intelligent upgrading of equipment, facilities and technological processes in warehouses, coal mines, terminal energy consumption and other fields,

Improve the flexible perception and efficient production and operation of the energy system. Adapt to digital, automatic

meet the development requirements of energy infrastructure and network, build an intelligent dispatching system, and realize the

Network-load-storage interaction, multi-energy synergy and complementation, and intelligent regulation of energy demand.

Build smart energy platforms and data centers. Facing the connection of energy supply and demand, production services

business and other businesses, support various market players to develop enterprise-level platforms, and promote the park according to local conditions

District-level, city-level, and industry-level platform construction, strengthening platform-based services for common technologies and

Business model innovation, and promote the integrated development of various platforms at all levels. Encourage the construction of various types of

Energy data center, formulate relevant systems for data resource confirmation, opening, circulation, and transaction

improve the data property rights protection system, strengthen the openness and sharing of energy data resources, and give full play to

The service support role of energy big data in industry management and social governance.

Implement smart energy demonstration projects. A clean energy base and source network that complement each other with multiple energies

Load-storage integration projects, integrated energy services, smart microgrids, virtual power plants and other new models

Relying on new business formats, carry out intelligent scheduling, energy efficiency management, intelligent load regulation and other intelligence

Demonstration of energy system technologies. Promote the condition maintenance of power equipment, intelligent operation of plants and stations, and

Industrial robot replacement, big data-assisted decision-making and other technical applications, speed up "smart fans",

"Smart photovoltaic" and other industrial innovations and upgrades and industry-specific applications, promote "smart wind"

Electricity" and "smart photovoltaic" construction, promote the digitalization and unmanned management of power stations, and develop new

Demonstration of a generation scheduling automation system. Implement the coal mine system optimization project and develop it according to local conditions

Expand the construction of coal mine intelligent demonstration projects, and build a number of small and unmanned demonstration coal mines. add

Strong oil and gas intelligent completion technology research, speed up intelligent seismic interpretation, intelligent geological modeling and

Development and application demonstration of core technologies in key scenarios such as reservoir simulation. Building a large number of energy

Data, digital management demonstration platform.

Box 6 Smart Energy Demonstration Project

Smart energy new model and new business format. Regional (provincial) level, city (county) level, park (residential area) level source network load storage integration demonstration, multi-energy complementary construction of wind-solar storage, wind-solar water (storage), wind-solar fire (storage) integration demonstration, smart city , smart parks, beautiful villages and other smart energy use demonstrations.

Smart energy platforms and data centers. Demonstration of platforms and data centers such as multi-energy complementary integration and intelligent optimization, intelligent regulation of energy demand, intelligent energy production services, and digital twin of intelligent energy systems. Smart wind power. Demonstration applications such as intelligent operation and maintenance of wind power, fault warning, refined control, and farm group control. Smart PV. Demonstration applications such as digital and unmanned management of photovoltaic power plants, interconnection and mutual inductance among devices, collaborative optimization, and intelligent scheduling, operation and maintenance of photovoltaic power plants. Smart Hydro. Demonstration applications such as intelligent construction of hydropower, multi-objective operation management, intelligent monitoring and inspection, and integrated intelligent management of watershed hydropower. Smart Power Plant. Demonstration applications such as digital 3D collaborative design, intelligent construction control, digital handover, advanced control strategies, big data, cloud computing, Internet of Things, artificial intelligence, and 5G communications. Smart grid. Demonstration applications such as new generation dispatching automation system, distribution network transformation and intelligent upgrade. Intelligent oil and gas pipeline network. Demonstration applications such as full digital handover, full intelligent operation, and full life cycle management of oil and gas pipeline networks

use.

Smart oil and gas fields. Exploration and development integrated intelligent cloud network platform, above-ground and underground integrated intelligent production management and control platform, oil and gas field surface green technology and intelligent construction optimization platform and other technical equipment and demonstration applications. Intelligent coal mine. Demonstration applications such as intelligent and efficient mining of coal mines, intelligent coal preparation, mine Internet of Things, and robot replacement for dangerous jobs.

#### 18. Improve the energy technology and industrial innovation system

Integrate and optimize the allocation of scientific and technological resources. Promote innovation based on national strategic needs

Optimize the combination of systems, strengthen the construction of energy technology innovation platforms, and accelerate the construction of the energy sector

National laboratory, reorganized state key laboratory, optimized national energy R&D innovation platform

Construction management. Promote the optimal allocation and deployment of scientific research forces in scientific research institutes, universities and enterprises

Resource sharing, deepening the collaborative innovation of military and civilian science and technology. Give full play to the socialist market economy

The advantages of the new national system under the conditions of

mechanism. Improve the industrialization capacity of energy core key technology products, and improve the market of technical factors

market, strengthen the connection between the innovation chain and the industrial chain, and improve major independent and controllable core technological achievements

Promote the application mechanism, promote the demonstration and promotion of the first (set) of major technical equipment, and promote

Industrialization and large-scale application of new energy technologies.

Stimulate the innovation vitality of enterprises and talents. Improve the market-oriented mechanism of energy technology innovation system, strengthen the main role of enterprises in innovation, give play to the leading and supporting role of large enterprises, and build a technological innovation system with the enterprise as the main body, the market as the orientation, and the deep integration of production, education and research. Improve the intellectual property protection and utilization system, and implement a strict intellectual property protection system. healthy The evaluation system of scientific and technological talents in the whole energy field, and improve the income that fully reflects the value of innovation elements Benefit distribution mechanism, untie scientific research personnel in an all-round way, optimize energy innovation and entrepreneurship ecology, Stimulate innovation in the energy industry.

#### Chapter 7 Enhancing Energy Governance Efficiency

Deepen the reform of power and oil and gas systems and mechanisms, and continue to deepen the "decentralization of control" in the energy field reform, strengthen interim and ex post supervision, speed up the construction of a modern energy market, and improve energy source laws, regulations and policies, rely more on market mechanisms to promote energy conservation, emission reduction and carbon reduction, and improve energy service level.

##### 19. Stimulate the vitality of energy market players

Easing access to the energy market. Implementing foreign investment laws and regulations and negative market access List system and revise relevant regulatory documents in the energy sector. Support various market players in accordance with the law Equal access to energy fields outside the negative list. Promote the market in the field of oil and gas exploration and development to implement the competition and transfer system for exploration blocks and a stricter block exit mechanism. Fast oilfield service market construction. Actively and steadily deepening the mixed ownership of state-owned enterprises in the energy sector system reform, and further attract social investment into the energy sector.

Optimize the organizational structure of the energy industry. Building an energy enterprise with creative and innovative vitality Industry. Further deepen the reform of the separation of main and auxiliary power grid enterprises and the separation of plant and grid, and promote pumped storage

The main body of investment in energy power plants is diversified. Promote equipment manufacturing, engineering construction, technology in the oil and gas field

Market-oriented reform of competitive businesses such as technology research and development and information services. Deepening the construction of oil and gas pipeline network

Reform of the operation mechanism, guide the local pipeline network to integrate into the national pipeline network company in a market-oriented way,

Support various types of social capital to invest in oil and gas pipeline networks and other infrastructure, and formulate and improve the operation of pipeline networks

Scheduling rules to promote the formation of a national "one network". Promote oil and gas pipeline network facilities to third-party cities

fair and open market entities, improve oil and gas intensive transportation and fair service capabilities, and compact all parties

Guarantee responsibility.

Support the development of new models and new formats. Improve the new mechanism of distributed power development, promote

Equitable access to the grid. Cultivate and expand comprehensive energy service providers, electric energy storage enterprises, load collectors

Emerging market players such as Chengshang. Eliminate new energy models and new business formats in market access and investment

Institutional and institutional barriers in operation and participation in market transactions. Innovative power grid

Load-storage integration and multi-energy complementary project planning and construction management mechanism to promote project planning,

Integration of construction implementation, operation adjustment and management. Cultivate and develop carbon dioxide capture and utilization

New mode with archive.

## 20. Building a modern energy market

Optimize the market-oriented allocation of energy resources. Deepen the reform of the power system, speed up the construction and

Improve the electricity market in which the medium and long-term market, the spot market and the auxiliary service market are organically connected

system. According to supporting provinces, encouraging regions, and promoting the establishment of a national unified market system

direction to promote the construction of the electricity market. Deepen the reform of electricity distribution and sales, and further release the power to social capital

Electricity sales and incremental power distribution businesses were launched to stimulate the vitality of existing power supply enterprises. Innovation benefits non-

Power dispatch and trading mechanism for fossil energy power generation and consumption to promote non-fossil energy power generation

Participate in electricity market transactions in an orderly manner, expand consumption space through market-based methods, and conduct pilot projects

Development of green power trading. Guide and support energy storage facilities and demand-side resources to participate in the power market

transactions, and promote system flexibility. Accelerate the improvement of the top-level design of the natural gas market,

Build a natural gas market system with orderly competition and efficient supply guarantee, and improve the natural gas trading balance.

tower. Improve the crude oil futures market, and promote futures transactions such as refined oil and natural gas in a timely manner.

Promote the coordinated development of national and regional coal trading centers, accelerate the construction of unified development

A modern coal market system with open, clear layers, complete functions and orderly competition.

Deepen the market-oriented reform of the price formation mechanism. Further improve the provincial power grid and regional

The price formation mechanism of power grids, inter-provincial and inter-regional special projects, and incremental distribution grids will speed up the rationalization

Transmission and distribution price structure. Continue to deepen coal-fired power generation, gas-fired power generation, hydropower, nuclear power, etc.

The market-oriented reform of grid electricity prices, and the improvement of price formation mechanisms for wind power, photovoltaic power generation, and pumped storage

to establish a new energy storage price mechanism. Establish and improve the agency power purchase mechanism of power grid enterprises,

Orderly promote the direct participation of industrial and commercial users in the electricity market, and improve the tiered electricity price system for residents

Spend. Research and improve the pricing mechanism of refined oil products. Steadily promote the marketization of natural gas prices

Reform and reduce the gas distribution level. Implement clean heating electricity price, gas price, heat price and other policies.

#### 21. Strengthen the construction of energy governance system

Promote energy governance in accordance with the law. Improve the energy laws and regulations system, establish an energy law

In order to lead, the individual laws in the fields of coal, electricity, oil and natural gas, and renewable energy

A system of energy laws and regulations supported by laws and regulations and supplemented by relevant supporting regulations. add

Strengthen the construction of a new energy standard system, and formulate and revise the key points to support and lead the low-carbon transformation of energy

Field standards and technical specifications, improve the international level of energy standards, organize energy

Demonstration of resource measurement and carbon emission accounting services. Deepen the reform of the law enforcement system in the energy industry

reform, further integrate the law enforcement team, innovate law enforcement methods, standardize discretion, improve

High law enforcement efficiency and level.

Strengthen policy coordination and guarantee. Based on the promotion of green and low-carbon development of energy, safety and security to implement key tasks such as obstacles and technological innovation, improve policy formulation and implementation mechanisms, and improve And implement fiscal, tax, financial and other support policies. Implement relevant preferential tax policies, increase Renewable energy and energy saving and carbon reduction, innovative technology research and development and application, low-grade oil and gas that is difficult to produce Reserves, tight oil and gas fields, shale oil, and tailings exploration, development and utilization. fall Implement the tax-free policy for importing major technical equipment. Build a green financial system and increase energy conservation Financial support for environmental protection, new energy, carbon dioxide capture, utilization and storage, etc. Improve the green financial incentive mechanism. Strengthen the guidance of energy, ecological and environmental protection policies, and Development and construction planning of energy bases, environmental impact assessments of key projects, etc., and improvement of land use Sea use policy, strictly implement the regional "three lines and one single" (ecological protection red line, environmental quality Bottom line, resource utilization online and environmental access negative list) ecological environment zoning management and control requirements beg. Establish a guide mechanism for the weight of renewable energy consumption responsibility, and implement a consumption responsibility test Nuclear, research and formulate incremental incentive policies for renewable energy consumption, and promote green power certificates Trade and strengthen the guarantee of renewable energy power consumption.

Strengthen energy regulation. Optimize energy market supervision, strengthen administrative law enforcement, maintain Protect the legitimate rights and interests of market players, and promote fair market competition, transaction norms and information transparency to continue to optimize the business environment. Strengthen the supervision of the energy industry and ensure the national energy regulations Plans, policies, standards and projects are effectively implemented. Improve the power safety supervision and law enforcement system, Promote the rationalization of the supervision system, build a long-term supervision mechanism, and strengthen the construction and operation of projects. Conduct safety supervision. Improve the supervision system and mechanism of natural monopoly links in the energy industry, strengthen public Supervision of level and opening, operation scheduling, service price, social responsibility, etc. Innovation Supervisor

management methods, build a unified regulatory system, information sharing, collaborative linkage, comprehensive

Implement the "double random, one open" supervision model, and promote the construction of a new type of credit-based supervision

management mechanism.

Box 7 Key reform tasks in the power and oil and gas fields

Continue to deepen the construction of medium and long-term electricity trading mechanism. Promote the formulation and revision of mid- and long-term electricity trading rules in all regions. pusher

Eligible various market players participate in the transaction. Enrich the variety of transactions, optimize the transaction organization process, and shorten the transaction week period, increase the frequency of transactions, establish a contracted transaction mechanism in different time periods, and improve the deviation assessment mechanism.

Steadily promote the construction of the electricity spot market. Promote qualified pilot areas to shift to long-term operation and expand in an orderly manner

Spot pilot range. Encourage the integrated development of spot markets in adjacent provinces (autonomous regions and municipalities) with close grid connections.

Improve the market mechanism for electric auxiliary services. Enrich the variety of auxiliary service transactions, promote energy storage facilities, virtual power plants,

Users can interrupt the load and other flexible resources to participate in auxiliary services, and study trading varieties such as climbing. Establish source network load storage

Integrated and multi-energy complementary projects coordinate operations and benefit-sharing mechanisms. Establish and improve the cross-provincial and cross-regional auxiliary service market

Mechanism to promote the sharing of auxiliary service resources at both ends of the sender and receiver.

Accelerate the construction of a unified national electricity market system. Optimize the overall design of the power market and improve the multi-level unified power market

We will explore the construction of regional power market pilot projects in the South, Yangtze River Delta, Beijing-Tianjin-Hebei, and Northeast regions.

Step-by-step release of cross-provincial and cross-regional power generation and consumption plans, and explore the development of non-fossil energy power generation companies and power sales companies or large users

Cross-province and cross-regional point-to-point transactions.

Actively promote the market-oriented transaction of distributed power generation. Support distributed generation and electricity users in the same distribution network area

In recent years, the price policy and market rules to support the market-oriented transaction of distributed generation will be improved.

Deepen the reform of electricity distribution and sales. Promote the implementation of incremental power distribution companies to have the same rights as power grid companies in the distribution area

and obligations, to study and improve the formation mechanism of the distribution price of the incremental distribution network. Improve the access and exit mechanism of electricity sellers,

Promote electricity sales entities to participate in various market transactions, and rationalize the settlement relationship between electricity purchases and sales.

Open up the upstream exploration and mining market. Fully implement the competitive transfer of mining rights. Strict block exit. Promote the collection and utilization of oil and gas geological data. Promote the professional reorganization of engineering technology, engineering construction and equipment manufacturing businesses, and participate in competition as independent market players. Deepen the reform of oil and gas pipeline network.

Promote the separation of transportation and sales of provincial pipeline networks. Improve the rules for dispatching and operation of the pipeline network, and establish and improve systems such as management and capacity allocation and shippers. Promote urban gas compression pipeline transmission and gas supply level.

Promote the reform of downstream competitive links. Support large users to sign direct supply or direct sales contracts with gas source companies to reduce gas consumption costs.

Chapter VIII Building a New Pattern of Open and Win-Win Energy International Cooperation

Guided by the joint construction of the "Belt and Road", actively participate in global energy governance, adhere to the

Green and low-carbon transformation and development, strengthen international cooperation in addressing climate change, and implement a wider range of

Open energy cooperation in a wider area and at a deeper level to realize energy under open conditions

Safety.

22. Expand the new situation of diversified cooperation

Consolidate and expand overseas energy resources security capabilities. Improve the cooperation of major overseas oil and gas producing areas

to optimize asset allocation. Continue to consolidate and promote cooperation with key oil and gas resource countries, increase

Strengthen exchanges with key oil and gas consuming countries to promote the healthy and sustainable development of overseas oil and gas projects

To promote common development with resource countries through pragmatic cooperation in the oil and gas field.

Enhance import diversification and security capabilities. Consolidate and expand with oil and gas and other energy sources

Mutual benefit and win-win cooperation between major resource exporting countries. Enhance the operation capacity of oil and gas international trade. strengthen

Cross-border oil and gas channel operation and facility connectivity to ensure safe and stable supply and smooth operation of oil and gas

Row. Strengthen communication and coordination with relevant countries to jointly maintain energy market security.

23. Deeply participate in the global energy transformation and reform

Promote energy transformation and low-carbon cooperation. Building the Green Silk Road, Deepening and Developing

China's national green capacity cooperation actively promotes wind power, solar power, energy storage, smart

Power grid and other fields of cooperation. Interconnection and upgrading of power grids with neighboring countries and regions

Strengthen cooperation. Promote international cooperation in nuclear power. Vigorously support developing countries with green energy

Carbon development, no new overseas coal power projects. Actively explore with developed countries and host countries

An effective way to carry out tripartite and multi-party cooperation with multinational companies, and build a number of economic benefits

Good and demonstrative green energy best practice projects.

Strengthen scientific and technological innovation cooperation. Strengthen cooperation with relevant countries in advanced energy technologies and solutions

pragmatic cooperation in projects, focusing on high-efficiency and low-cost new energy power generation, advanced nuclear

Advanced technologies such as electricity, hydrogen energy, energy storage, energy saving, carbon dioxide capture and storage, etc.

cooperation in the domain. Actively participate in the formulation of international energy standards, accelerate my country's energy technology,

Standard international fusion.

24. Actively participate in the reform and construction of the global energy governance system

Promote the improvement of the global energy governance system. Operate the "Belt and Road" energy partners well

A platform for relationship and cooperation, and a successful International Forum on Energy Change. In China—Arab League, China—

AU, China-Central and Eastern Europe, China-ASEAN and other relevant energy cooperation platforms and APEC

Under the guidance of APEC Sustainable Energy Center, strengthen joint research and expand training

training exchange. Strengthen cooperation with the International Energy Agency, the International Renewable Energy Agency, the Group of Petroleum Exporting Countries

Organization (OPEC), International Energy Forum, Clean Energy Ministerial Conference and other international organizations and institutions

system cooperation, actively participate in and guide in the United Nations, the G20, APEC,

Energy cooperation under multilateral frameworks such as BRICS and SCO.

Strengthen international cooperation in the field of energy to address climate change. stick to common but differentiated

Responsibility principle, promote Sino-US clean energy cooperation, deepen Sino-European cooperation in energy technology innovation

work together to form a joint force in the energy field to address climate change and promote green development, and promote the implementation of

The United Nations Framework Convention on Climate Change and its Paris Agreement. Actively develop energy

South-South cooperation on climate change in the region, and further strengthen cooperation with other developing countries in energy green development

cooperation, support developing countries in implementing the United Nations 2030 Agenda for Sustainable Development, and

enhance the ability of the energy sector to address climate change, demonstrating my active participation in global climate governance

Great powers.

#### Chapter IX Strengthening Plan Implementation and Management

Strengthen the organization, coordination and supervision of the implementation of this plan, and establish and improve the implementation of the plan

Monitoring and evaluation, assessment and supervision mechanism.

##### 25. Strengthen organizational leadership

Strengthen the overall leadership of the party, enhance the "four consciousness", strengthen the "four self-confidence",

To achieve "two maintenance", fully implement the decisions and arrangements of the Party Central Committee and the State Council, strengthen

Supervise implementation, work coordination and coordination. Strengthening energy planning and economic and social development

and other planning, coordinate nature reserves, ecological protection red lines and energy development

Layout, and give full play to the national energy plan to the national energy development, the layout of major projects,

The strategic guiding role of public resource allocation and social capital investment, improving planning and guiding

bundle mechanism.

##### 26. Implementing the Division of Responsibilities

According to the unified deployment of the Party Central Committee and the State Council, establish and improve the unified national energy commission

Coordination, coordinated promotion of relevant departments, detailed implementation of provincial governments and key energy companies

Real planning and implementation working mechanism. The National Development and Reform Commission and the National Energy Administration should formulate this

Plan the implementation plan, determine the annual goal and strengthen the annual comprehensive balance. Rooted in each region

According to the important goals, key tasks, major projects and key projects determined by the national plan,

Formulate specific work plans, refine timetables, roadmaps, and priorities, and propose annual rollouts

Action work plan. All relevant departments should refine tasks and measures according to the division of responsibilities, and increase

Strengthen the support and guarantee of major energy projects such as funds and land use, and study and solve them in a timely manner

problems encountered in implementation. The Office of the National Energy Commission must earnestly perform its duties and ensure that the

Ensure that the plan is vigorously promoted and effectively implemented.

27. Strengthen monitoring and evaluation

The National Development and Reform Commission and the National Energy Administration take the lead in organizing the implementation of the plan

Annual monitoring analysis, mid-term evaluation and summary evaluation. Establish a dynamic planning evaluation mechanism and

Major situation reporting system, strict evaluation procedures, through entrusting third-party agencies to carry out evaluation

make recommendations on the rolling implementation of planning, sum up experience and analyze problems in a timely manner

issues, and formulate countermeasures. Strengthen the application of the evaluation results of the implementation of the plan, and improve the adjustment of the plan

Amendment mechanism. Important situations are reported to the State Council in a timely manner.