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CHINA ENERGY POLICY NEWSLETTER

China Energy Transformation Program

1. China energy transition updates

High-quality development action plan of new energy released

China's energy sector has shifted from high-speed development to high-quality development. Under the carbon neutrality target, the National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) recently released the latest implementation plan for the high-quality development of new energy, aiming to tackle the outstanding issues such as inadequate adaptability of the power system to high-penetration renewable power grid connection and consumption, and land resources constrains. The *Plan* proposed four innovative models including large-scale wind power and solar PV power bases, rural distributed wind power and solar PV projects, green power consumption in the industrial and building sectors and green power consumption in the whole society.¹

- 1) Encourage the substantial joint ventures between coal power plant developers and large-scale wind power and solar PV base developers, because coal power is an important regulating power source and provides key support for the operation of large-scale wind power and solar PV power bases in key areas such as deserts and Gobi;
- 2) Combine new energy development and rural economic development, through the establishment of innovative models such as revenue sharing mechanisms to improve farmers' enthusiasm for installing rooftop solar PVs in their own houses, and to promote the development of rural distributed wind power stations;

¹“国务院办公厅转发国家发展改革委国家能源局关于促进新时代新能源高质量发展实施方案的通知,国办函〔2022〕39号,” State Council, National Development and Reform Commission, National Energy Administration, 14 May 2022, accessed at http://zfxgk.nea.gov.cn/2022-05/30/c_1310608539.htm; “《关于促进新时代新能源高质量发展的实施方案》政策解读,” National Energy Administration, 30 May 2022, accessed at http://www.nea.gov.cn/2022-05/30/c_1310608538.htm.

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- 3) Increase the proportion of green power used in industrial and building sectors, accelerate the development of distributed wind power and solar PV projects, green microgrids and generation-grid-load-storage integration projects in qualified industrial enterprises and parks, and adopt innovative models such as constructing direct transmission lines connecting renewable power generators and industrial parks to achieve new energy power supply;
- 4) Guide the whole society to consume green power, carry out green power trading pilots with priority², strengthen its effective connection with the carbon market, and encourage enterprises and users to purchase products and services provided using green power.

Carbon neutrality "1+N" top-level fiscal policy released

On May 30, 2022, the Ministry of Finance (MoF) issued the *Opinions on Financial Support for Carbon Peaking and Carbon Neutrality*, which is the top-level policy document for the financial part of "N" in the carbon neutrality "1+N" policy system. It aims to guide financial departments at all levels to clarify key tasks, and to give full play to the synergy of various policy tools such as financial funds, taxation, and government procurement to support the realization of carbon neutrality. By 2025, China will initially establish a fiscal and taxation policy framework conducive to green and low-carbon development; by 2030, China, will gradually establish a relevant long-term fiscal and taxation mechanism; by 2060, the policy system will be mature and sound.

The *Opinions* clarifies six key directions that finance will support, including energy transition, key industry transition, technological innovation, circular economy, enhancement of carbon sinks and carbon market development. It simultaneously proposes five specific fiscal measures³:

- 1) Optimize the structure of fiscal expenditures, strengthen the support of key areas and improve accuracy;
- 2) Establish a national low-carbon transition fund to support the transition of traditional industries and regions, and encourage PPP projects and social capital to set up investment funds;
- 3) Implement preferential tax policies, research on tax policies related to carbon emission reduction, and optimize the import tariff structure;
- 4) Improve the government procurement standard of green products, increase the procurement of new energy official service vehicles/boats, and promote green building materials;
- 5) Strengthen international cooperation, stabilize climate financing channels, carry out the green Belt and Road Initiative, and actively participate in the formulation of international standards.

² Demonstrate priority in transaction organization, power dispatch, and price formation mechanisms.

³ "关于印发《财政支持做好碳达峰碳中和工作的意见》的通知,财资环〔2022〕53号," Ministry of Finance, 25 May 2022, accessed at http://zyhj.mof.gov.cn/zcfb/202205/t20220530_3814434.htm; "财政部有关负责人就出台《财政支持做好碳达峰碳中和工作的意见》答记者问," Ministry of Finance, 30 May 2022, accessed at http://zyhj.mof.gov.cn/zcfb/202205/t20220530_3814460.htm.

11 provinces released the 14th FYP capacity targets for new-type energy storage

As of May 2022, 11 provinces across the country have clarified the new energy storage installation targets in the 14th Five-Year Plans (2021-2025), with a total scale of 39.2 GW⁴, which is more than 6 times the national total installed capacity of new-type energy storage in 2021⁵. Among them, Qinghai and Gansu in the northwest region have the highest targets, whose total installed capacity is expected to reach 6 GW respectively by 2025. This is related to the two provinces' ambitious development plans of large-scale wind power and solar PV bases and the strategy of building big data centers.

The total installed capacity target of new-type energy storage by province in the 14th Five-Year Plans (as of May 2022)

Region	Province	Target	Region	Province	Target
North	Inner Mongolia	5 GW	Central	Henan	2.2 GW
	Shanxi			Hubei	2 GW
	Hebei	4 GW		Hunan	
	Tianjin	0.5 GW		Chongqing	
	Beijing			Jiangxi	
	Shandong	4.5 GW		Sichuan	
Northwest	Xinjiang		East	Jiangsu	
	Shaanxi			Anhui	3 GW
	Ningxia			Zhejiang	3.5 GW
	Gansu	6 GW		Fujian	
	Qinghai	6 GW		Shanghai	
Northeast	Liaoning		South	Guangdong	2 GW
	Heilongjiang			Guangxi	
	Jilin			Hainan	
				Guizhou	
			Yunnan		

Source: Provincial energy authorities, accessed in June 2022

⁴ "39.2GW新型储能！17省市“十四五”储能规划汇总," in-en.com, 25 May 2022, accessed at <https://www.in-en.com/article/html/energy-2315968.shtml>.

⁵ "一年新增2GW！中国新型储能累计达5.73GW," China Energy Storage Alliance, 28 April 2022, accessed at <https://sthjt.henan.gov.cn/2022/04-28/2440581.html>.

Overview of the 14th Five-Year Plan (2021-2025) for Renewable Energy Development in China

In June 2022, the National Development and Reform Commission (NDRC) united eight ministries to release the *14th Five-Year Plan (2021-2025) for Renewable Energy Development* (hereinafter referred to as the Plan), which clarified the renewable energy (hereinafter referred to as "RE") development targets, key tasks and supporting measures from 2021 to 2025.⁶

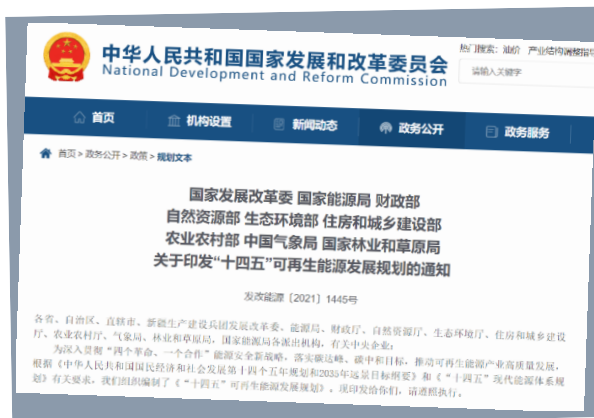
At the strategic planning level - the development of RE in China will adhere to the basic principles of *five simultaneous development*: 1) utility-scale and distributed projects; 2) onshore and offshore deployment; 3) local consumption and export; 4) Single-energy source and multi-energy complementation; 5) Single-application scenario and multi-application scenarios.

At the implementation level - the *Plan* puts more emphasis on optimal development by region. According to the resource characteristics of different regions, seven onshore new energy bases and five offshore wind power bases with different technical paths are proposed; the demonstration projects as the guide for technological and model innovation, 18 specific demonstration projects are proposed; and nine action plans are proposed for urban and rural areas.⁷

In addition, it is worth noting that the development of RE in the 14th Five-Year Plan period has put forward higher requirements for resources, the use of the land and ocean, meteorological services, ecological environment, and finance. Therefore, this is the first time that the *Plan* adopted the form of joint issuance by nine departments, which is more conducive to integrating the forces of all parties to achieve the targets.⁸

Jointly released by the following nine ministries

1. National Development and Reform Commission
2. National Energy Administration
3. Ministry of Finance
4. Ministry of Natural Resources
5. Ministry of Ecology and Environment
6. Ministry of Housing and Urban-Rural Development
7. Ministry of Agriculture and Rural Affairs
8. China Meteorological Administration
9. State Forestry and Grassland Administration



Please download the original policy document [here](#).

FOUR New features

The theme of RE development in the 14th Five-Year Plan period is high-quality leap-forward development, including four distinctive features: large-scale development as the foundation, high-level consumption as the key support, market-oriented development as the driving force, and high-quality development as the result.⁹

Large-scale - Accelerate to increase the share of RE in total installed power generation capacity

High-level consumption - RE becomes the dominant source of supply in incremental energy and power consumption

Market-oriented - Transfer from policy-driven to market-driven under the price parity environment

High-quality - Guarantee power supply security in parallel with scaled-up development and high-level consumption

EIGHT

Key indicative targets

The Plan sets indicative targets (i.e. non-mandatory) for RE on total consumption, power generation, power consumption, and non-electricity utilization. It is worth noting that the Plan no longer proposes the target of installed RE power capacity. According to the interpretation of the China Renewable Energy Engineering Institute (CREEI), this is because the amount of RE consumption is also affected by the power generation efficiency and utilization rate besides the installed capacity, so it is not appropriate to over highlight the installed capacity targets. At the same time, wind power and solar PV, which are the main body of incremental power sources, have entered the stage of price parity. Therefore, in the future, the amount of installed capacity and where to install requires the market to play a decisive role. The main role of the government is to create a good policy environment and guide the realization of planning goals.¹⁰

From 2021 to 2025

Over
50%

Share of RE in incremental primary energy consumption

Over
50%

Share of RE in incremental power consumption

By 2025

1 billion
tce

Annual RE energy consumption (680 million tce in 2020)

Doubled

Annual wind and solar power generation (728 TWh in 2020)

Around
33%

Share of RE in annual power consumption (28.8% in 2020)

> 60 mn
tce

Annual RE energy consumption in non-power sector

3300
TWh

Annual RE power consumption (2210 TWh in 2020)

Around
18%

Share of non-hydro RE in annual power consumption (11.4% in 2020)

Supply-side revolution

Technological roadmaps by region

North, Northwest, Northeast (Three-North)

Large-scale wind power and solar PV bases

Southwest

Hydro-wind-solar integrated utilization projects

Central, East, South

Nearby wind power and solar PV projects

East-costal

Offshore wind power clusters

Engineering project driven

Vigorously promote large-scale onshore wind power and solar PV bases

Onshore projects with dessert and Gobi as key target regions
Offshore projects with orderly developing manner

Actively promote distributed wind power and PV projects

Roof-top PV in public buildings and industry parks
PV+ projects (i.e. integrated with other industries such as fishery and agriculture)
County-wide distributed wind power and solar PV projects and roof-top PV in rural areas
Wind power and solar PV project repowering
Road-side small-scale and distributed solar PV projects (e.g. railway, highway)

Coordinately promote hydro-wind-solar power integrated bases

Rely on southwest hydropower bases



Steadily promote diverse utilization of biomass energy

Biomass power, biomass heating, biogas, and non-grain liquid biofuel projects



Actively promote scaled-up development of geothermal energy

Geothermal power, shallow geothermal comprehensive utilization, and medium-deep-depth heating and cooling projects



Reliably promote marine energy demonstrative projects

Tidal and wave power, and island multi-RE energy integrated demonstrative projects



Consumption-side revolution

Storage capacity improvement & high-level consumption

*To improve the adaptability of the power system to a high proportion of RE, the government will strengthen the construction of **RE storage facilities** and **flexible power sources**, and strengthen the support capability of the **power grid infrastructure**.*



In terms of energy storage facilities, during the 14th Five-Year Plan period, all six major power-grid regions have made it clear to start the construction of a new batch of large-scale pumped hydropower stations, and carry out pilot demonstrations of distributed small and medium-sized pumped hydropower stations in the Central, East and South regions. At the same time, the government will conduct a new round of research on pumped storage resources and formulate a new medium and long-term development plan. Large-scale energy storage for cascade hydropower stations, long-time thermal storage CSPs and new-type energy storage are also key technology paths.



In terms of flexible power resources, based on continuing to carry out the flexibility retrofit of coal power units, the government will promote captive power plants (autoproducers) to participate in peak-load regulation, deploy dispatchable gas power plants, and explore the joint dispatch of various power sources.



In terms of power grid support, power grid enterprises (TSOs) will build more backbone transmission lines in RE-rich areas. Currently, 12 Ultra-High-Voltage (UHV) transmission lines have been planned for the 14th Five-Year Plan period and in principle, the proportion of RE in the newly built inter-regional transmission lines shall not be less than 50%. At the same time, the TSOs will continue to increase the proportion of RE in the existing transmission lines through the coordinated planning, construction and operation of large-scale wind-solar bases and integrated wind-solar-thermal-storage energy bases. In addition, the technical retrofit and intelligent upgrade of the distribution grids will be promoted in parallel to improve the ability to access large number of distributed projects and the ability to resist disturbances.

*The 14th Five-Year Plan will strengthen the diversified direct utilization of RE, that is, increase the **direct utilization of RE power on end-user side**, expand the scale of **direct utilization of RE in non-electric fields**, improve the **comprehensive utilization of RE in rural areas** and carry out **large-scale hydrogen production using RE**.*



Industry sector - The government encourages the construction of RE captive power plants (autoproducers), green micro-grids, or transmission lines directly connecting RE generators with industrial parks, large-scale production enterprises and big data centers.



Heating sector - With the northern regions as the core, carry out large-scale RE heating in areas where conditions permit, especially in new urban areas to promote the coupling mode of RE with natural gas and electric heating, and to study the integration of geothermal energy into the urban heating pipeline model.



Transportation sector - Expand the large-scale substitution of gasoline and diesel by fuel ethanol and biodiesel in heavy-duty road transportation and aviation sectors.



Gas supply sector - Explore the integration of biological natural gas into urban and rural gas pipelines.

RE consumption in rural areas has great potential for development. The main means include: 1) using vacant land and roofs to build distributed wind power and solar PV projects; 2) building a multi-energy complementary clean heating system relying on biomass, geothermal energy, solar energy and electricity; 3) Utilizing rural waste resources to develop biological natural gas and biogas.

RE large-scale hydrogen production is the key innovation field during the 14th Five-Year Plan period. First, in areas with low RE power generation costs and good storage and transportation conditions, build grid-connected and off-grid wind-solar power hydrogen production demonstration projects; Second, to promote the use of fuel cells and green hydrogen in key end-use sectors such as chemical industry, coal mines and transportation to reduce the direct consumption of fossil energy.



Mechanism revolution

Market-driven and institutional reform

To build a market-based RE development model, the government will improve the **market-oriented mechanism** through four aspects.

- 01** | Further relax market access restrictions, optimize project approval and recording procedures, and establish a credit rating system for market entities.
- 02** | Take the *Mandatory RE Power Consumption* policy as the guidance to decide the minimum newly added RE capacity by province each year, and establish a guarantee consumption mechanism centered on guaranteed grid-connection capacity by TSOs, spot power market transactions and the power market for distributed power sources.
- 03** | Improve the tendering mechanism for newly added RE power plants, and improve the transaction mechanism, price formation mechanism and compensation mechanism for RE to participate in power markets.
- 04** | Improve the green certificate mechanism, establish a green product certification and consumption evaluation system, and guide green product consumption especially in end-use sectors and public facilities.

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⁶ “国家发展改革委 国家能源局 财政部 自然资源部 生态环境部 住房和城乡建设部 农业农村部 中国气象局 国家林业和草原局 关于印发“十四五”可再生能源发展规划的通知, 发改能源〔2021〕1445号,” National Development and Reform Commission, National Energy Administration, et al., 1 June 2022, accessed at

https://www.ndrc.gov.cn/xxgk/zcfb/ghwb/202206/t20220601_1326719.html?code=&state=123.

⁷ “权威发布| 刚刚，九部委首次联合发布《“十四五”可再生能源发展规划》，” China Reform Daily, 1 June 2022, accessed to

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⁸ “权威解读《“十四五”可再生能源发展规划》！,” National Development and Reform Commission and National Energy Administration, 1 June 2022, accessed at

<https://www.in-en.com/article/html/energy-2316138.shtml>.

⁹ “【“十四五”可再生能源发展规划解读之三】 彭程：锚定碳达峰碳中和目标 推进可再生能源新时代新作,” China Renewable Energy Engineering Institute, 1 June 2022,

accessed at https://www.sohu.com/a/554928477_120235844.

¹⁰ “【“十四五”可再生能源发展规划系列解读文章之一】 彭程：坚定推动可再生能源高质量跃升发展,” China Renewable Energy Engineering Institute, 2 June 2022,

accessed at https://www.sohu.com/a/553331594_120235844.

3. Policy monitoring

2022-05-24

https://www.ndrc.gov.cn/xgk/zcfb/tz/202206/t20220607_1326854.html?code=&state=123

Generator-equipped energy storage can independently participate in power markets

Notice on Further Promoting the Participation of New-Type Energy Storage in the Electricity Market and Dispatching Application, NDRC Office Operation [2022] No.475

The government encourages the generator-equipped new-type energy storage facilities to participate in power markets in two forms. One, the facilities that are installed with independent metering and control devices can be converted into independent energy storage projects to participate in power markets, except for the wind-solar-hydro-thermal-storage integrated projects. Two, they can participate in power markets together with the generator as a whole after completing technical retrofit of metering and software control. With a more mature power market system in the future, it is encouraged to explore the simultaneous participation of the same energy storage facility in the market in the form of partial capacity independent and partial capacity combined.

2022-04-28

http://www.gov.cn/zhengce/content/2022-05/19/content_5691116.htm

CMA will strengthen the wind and solar meteorological data system

Notice on Issuing the Outline of High-quality Development of Meteorology (2022-2035), State Council Development [2022] No.11

Meteorological data is an important reference index to support the development and operation of wind power and solar PV. In the future, China Meteorological Administration (CMA) plans to establish a system for the census, zoning, monitoring and information publication of wind and solar energy resources; conduct a comprehensive survey and evaluation of available wind power and solar PV resources across the country; build a climate resource monitoring and forecast system to improve the accuracy of wind power and solar PV output forecast; build wind power and solar PV meteorological service bases to provide high-quality meteorological data for the planning, construction, operation and dispatch of related power plants.



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