

● JUNE 2023

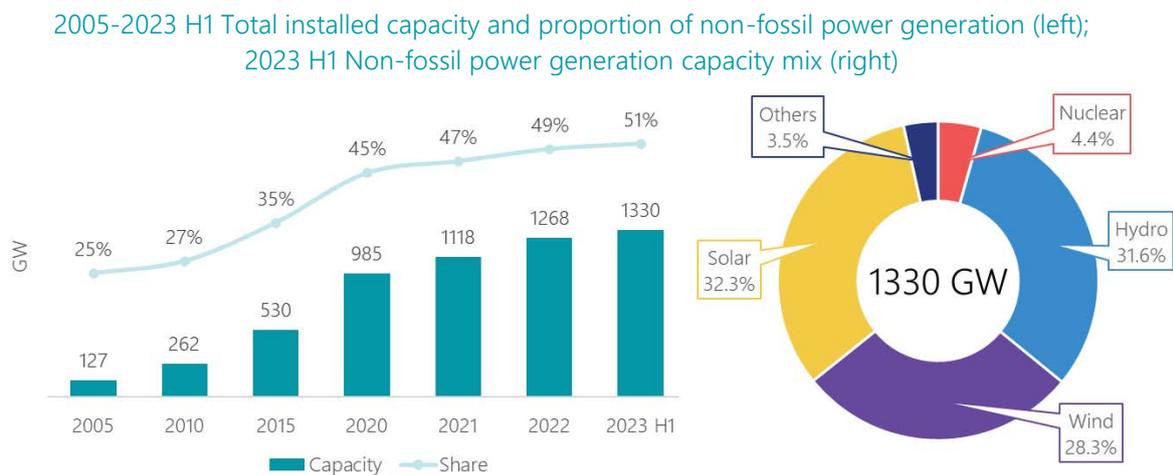
CHINA ENERGY POLICY NEWSLETTER

China Energy Transformation Programme

1. China energy transition updates

China's installed non-fossil power generation capacity accounts for more than 50%

According to the latest data released by the China Electricity Council (CEC), by the end of the first quarter of 2023, China's total installed power generation capacity has reached 2,620 GW, of which non-fossil energy accounts for 50.5%, exceeding 50% for the first time. Among these, 58 GW of nuclear power, 420 GW of hydropower, 376 GW of wind power, and 430 GW of solar power.¹



Source: China Electricity Council (CEC), accessed in May 2023

¹ "2023年1-3月份电力工业运行简况," China Electricity Council, 27 April 2023, accessed at <https://cec.org.cn/detail/index.html?3-320252>.

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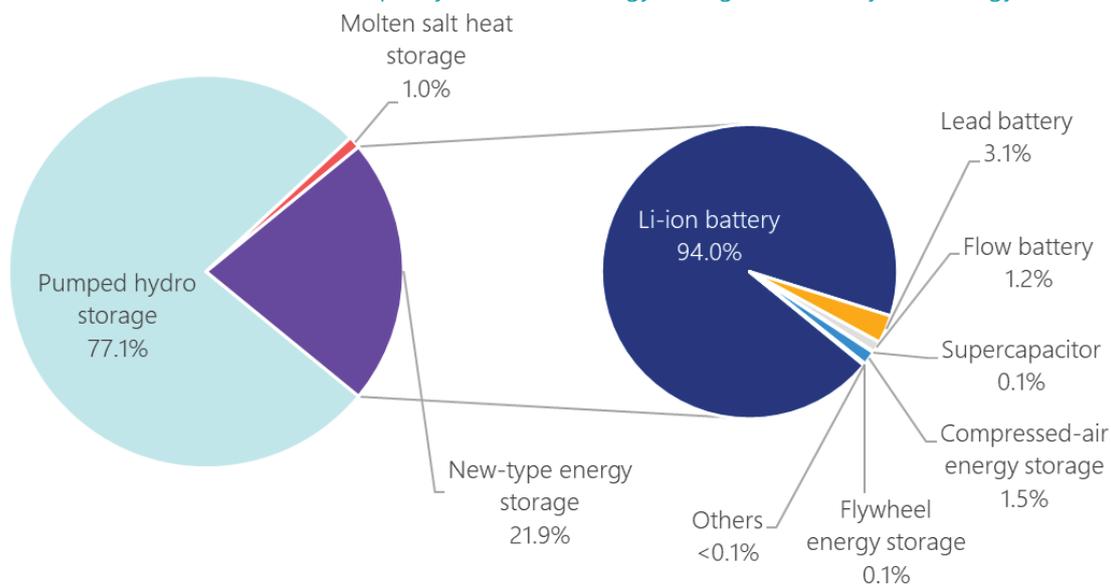
CNESA released the development status of the energy storage industry in 2022

China's energy storage industry entered a new stage of large-scale development in 2022, and the new-type energy storage industry continues to grow rapidly. The China Energy Storage Alliance (CNESA) recently released *the 2023 White Paper on Energy Storage Industry Research*. According to CNESA statistics, by the end of 2022, China has operated 59.8 GW of electric energy storage projects, accounting for 25% of the global market, an increase of 3 percentage points year-on-year. Among these, the proportion of new-type energy storage exceeded 20% for the first time, reaching 13.1 GW²/27.1 GWh.

In terms of technology, lithium-ion batteries still occupy an absolutely dominant position, accounting for 94.0%. Judging from the scale, projects over 100 MW have become the norm. In 2022, more than twenty 100 MW-level new-type energy storage projects were connected to the grid nationwide, five times that of the year before. Compressed air energy storage and liquid flow battery technology routes have commissioned the first 100 MW projects. More than 400 hundred-mega-watt-level projects are planned and under construction, including seven giga-watt-level projects.

Currently, 24/31 provinces across the country have clarified the capacity targets of new-type energy storage facilities during the 14th Five-Year Plan period, with a full scale of 64.9 GW. Most projects will be connected to the grid within one to two years. Its pace of development far exceeds the country's target of reaching 30 GW in 2025. New-type energy storage is expected to maintain rapid growth by 2025, and the scale of newly installed capacity will keep hitting new highs³.

2022 Cumulative installed capacity of electric energy storage facilities by technology



Source: China Energy Storage Alliance (CNESA), May 2023

² This figure is higher than the cumulative grid-connected installed capacity of 8.7 GW of new-type energy storage released by the National Energy Administration in February 2023. "国家能源局举行新闻发布会，发布2022年可再生能源发展情况等," National Energy Administration, 14 February 2023, accessed at <http://www.rmzxb.com.cn/c/2023-02-14/3291928.shtml>.

³ "储能产业研究白皮书2023（摘要版）," China Energy Storage Alliance, 7 April 2023, accessed at <https://wenku.solarbe.com/p-27885.html>.

China's first deep-sea floating wind turbine connected to the grid

On May 20, 2023, the China National Offshore Oil Corporation (CNOOC) commissioned the country's first deep-sea floating wind turbine. The wind turbine is located in the oilfield area of Wenchang 136 kilometres offshore, Hainan. It is China's first floating wind power platform that is more than 100 kilometres from the coastline and stands at a water depth of more than 100 meters. The wind turbine has an installed capacity of 7.25 MW and is connected to the power grid of the oilfield cluster through a 5-kilometre submarine cable, with an expected annual power generation of 22 GWh. All its power generations supply green electricity for Wenchang oilfields, saving nearly 10 million m³ of natural gas annually and reducing CO₂ emissions by 22,000 tons.⁴

Currently, offshore oil fields in China mainly rely on fossil energy for power supply. CNOOC's Wenchang oilfield cluster plans to create a new integrated power supply model of wind power-gas power-smart grid, to form a dual guarantee of active control and passive response through unified control and management of fuel power stations and offshore wind platforms within the oilfield cluster, and to reduce carbon emissions based on the safe and stable operation of oilfield micro-grid. This project provides a reference for China to build offshore zero-carbon oil and gas fields and promote the integration of oil and gas and new energy.⁵

China's first deep sea floating wind turbine



Source: CCTV News, May 2023

⁴ “我国首座深远海浮式风电平台“海油观澜号”成功并网投产,” China National Offshore Oil Corporation, 20 May 2023, accessed at <https://finance.sina.com.cn/jjxw/2023-05-29/doc-imyvkyrk8705804.shtml>.

⁵ “我国首座深远海浮式风电平台“海油观澜号”成功并网投产”, China National Offshore Oil Corporation, 20 May 2023, accessed at <https://baijiahao.baidu.com/s?id=1766475025776483616&wfr=spider&for=pc>.

China's power system institutional reform: Development and optimization of transmission and distribution tariff

In May 2023, the National Development and Reform Commission (NDRC) issued the *Notice on the Third Supervision Cycle of the Provincial Power Grid Transmission and Distribution Tariff and Related Matters* (CHN: 关于第三监管周期省级电网输配电价及有关事项的通知).⁶ Establishing transmission and distribution tariffs (T&D tariffs) is important to China's power system institutional reform. This is the third time the government has approved the T&D tariffs of various provinces. On the one hand, from October 2021, the government requires all industrial and commercial users to participate gradually in the power market, so the classification and structure of end-use electricity prices must be further optimized. On the other hand, China is building a new-type power system with new energy as the main body. Electricity prices need to reflect the multiple values of power resources more accurately, such as capacity reserve and ancillary services. This revision aims to fully address the problems mentioned above.



Background of transmission and distribution tariff reform

In March 2015, the Central Committee of the CPC and the State Council jointly issued *Opinions on Further Deepening the Reform of the Electric Power System*⁷ (referred to as *Document No. 9*, CHN: 关于进一步深化电力体制改革的若干意见), which officially opened a new round of institutional reform of China's power system. The NDRC and the National Energy Administration (NEA) subsequently issued supporting policy documents that identified six key reform areas⁸, including transmission and distribution tariff (T&D tariff) reform, the key of which is to realize direct transactions between power generators and electricity sellers/users, and power grid enterprises to charge T&D tariff as service providers. The verification of transmission and distribution costs to form the T&D tariff has become a vital issue. T&D tariffs include inter-provincial transmission tariffs and provincial transmission and distribution tariffs. This document mainly focuses on provincial transmission and distribution tariffs. The NDRC issued three documents in 2017, 2020, and 2022, taking three years as a cycle, and progressively optimized the provincial power T&D tariff verification system according to the development of China's power system marketization.



Main contents of provincial power T&D tariff reform

Provincial T&D tariff reform mainly includes two parts: 1) clarifying the electricity price structure of users participating in market transactions; 2) clarifying the pricing principles, price structure, and calculation methods of T&D tariff.

Key contents of the three pricing cycles of provincial power T&D tariff

	Period I (2017~2019) ⁴	Period II (2020~2022) ⁵	Period III (June 2023 ~ June 2026) ⁶
Classification of user electricity price	Large-scale industrial, general industrial and commercial, residential, agricultural		Industrial and commercial , residential, agricultural
Structure of user electricity price	<ul style="list-style-type: none"> Market-oriented users: feed-in tariff + T&D tariff (including grid loss) + government fees and surcharges Non-market users: fixed electricity prices approved by the government 	<ul style="list-style-type: none"> Market-oriented large-scale industries, general industrial and commercial users: feed-in tariff + T&D tariff + ancillary service fee + government fees and surcharges Non-market large-scale industrial, general industrial, and commercial users, all residential and agricultural users: fixed electricity price approved by the government 	<ul style="list-style-type: none"> All industrial and commercial users: feed-in tariff + feed-in grid loss + T&D tariff + system operating cost (ancillary service fee + capacity tariff of pumped storage, etc.) + government fees and surcharges All residential and agricultural users: fixed electricity price approved by the government
Pricing Principles for T&D tariff	<ul style="list-style-type: none"> Allowable costs + reasonable profits By voltage level and user type 		<ul style="list-style-type: none"> Allowable costs + reasonable profits By voltage level only
T&D tariff structure	<ul style="list-style-type: none"> Single electricity price or two-part electricity price (capacity tariff + electricity tariff) The capacity tariff for a certain of users is the same 		<ul style="list-style-type: none"> Single electricity price or two-part electricity price (capacity tariff + electricity tariff) The capacity tariff of a specific type of user is accounted according to the voltage level

Source: Sorted according to the NDRC policies.

01 | The first pricing cycle (2017~2019):

Initially establishing a framework for the pricing of T&D tariff

NDRC clarified that the electricity price structure for market-oriented users keeps to the *feed-in tariff + T&D tariff + government fees and surcharges*. Among these, the T&D tariff adopts the basic principle of allowable cost + reasonable profit and is determined according to the voltage level. The T&D tariff structure adopts a single electricity price or a two-part electricity price which includes capacity tariff and electricity tariff. The capacity tariff standard is fixed regardless of the voltage level for a specific type of user.

02 | The second pricing cycle (2020~2022):

Improving the pricing rules for T&D tariff

With the increasing proportion of renewable energy power generation, the demand for flexibility services in the power system is increasing. Accordingly, NDRC has added ancillary service fees to user electricity prices, clarifying the cost transmission principle. At the same time, the government requires the cancellation of fixed electricity prices for industrial and commercial users, that is, all industrial and commercial users with consumption above 10 kV must gradually participate in power market transactions. Therefore, the accounting of T&D tariff has covered all provincial power grids (according to voltage levels) for the first time, laying the foundation for comprehensive market-oriented power transactions.

03 | The third pricing cycle (June 2023~June 2026):

Optimizing the T&D tariff pricing system

NDRC gradually merges large-scale industrial users and general industrial and commercial users into industrial and commercial users, that is, all industrial and commercial users of the same voltage level to implement the same user electricity price (including T&D tariff). Previously, the T&D tariff of general industrial and commercial users was higher than that of large-scale industrial users. The change is conducive to creating a fairer market environment and further promoting the participation of all industrial and commercial users in the electricity market.

In the electricity price structure, NDRC listed the feed-in line loss and system operation costs separately, making it more explicit that costs unrelated to power transmission and distribution services should not be included in the T&D tariff. Listing the grid line loss separately makes it easier for users to see grid loss cost change more intuitively, and promotes the efficiency and loss reduction of the power grid; listing the system operating cost separately, and dividing the ancillary service fee and the capacity tariff of pumped storage, helps to more clearly reflect the flexibility resources in the power system and clarifies the cost transmission mechanism. In addition, for the first time, NDRC has accounted for the capacity tariff of the T&D tariff according to the voltage level, which more scientifically reflects the actual power supply capacity cost.¹²



References

⁶ “关于第三监管周期省级电网输配电价及有关事项的通知, 发改价格〔2023〕526号,” National Development and Reform Commission, 9 May 2023, accessed at https://www.ndrc.gov.cn/xxqk/zcfb/tz/202305/t20230515_1355747_ext.html.

⁷ “中共中央国务院关于进一步深化电力体制改革的若干意见, 中发〔2015〕9号,” State Council, 15 March 2015, accessed at http://fjb.nea.gov.cn/pufa_view.aspx?id=31434&wd=&eqid=d0c14b790000f4e2000000066437c393.

⁸ “国家发展改革委国家能源局关于印发电力体制改革配套文件的通知, 发改经体〔2015〕2752号,” National Development and Reform Commission, National Energy Administration, 26 November 2015, accessed at https://www.ndrc.gov.cn/fzqgw/jqsj/tgs/sjdt/201511/t20151130_1021524.html.

⁹ “国家发展改革委关于核定河南等12个省级电网2017-2019年输配电价的通知, 发改价格〔2017〕1261号,” National Development and Reform Commission, 4 July 2017, accessed at https://www.ndrc.gov.cn/xxqk/zcfb/tz/201905/t20190529_962999.html.

¹⁰ “国家发展改革委关于核定2020~2022年省级电网输配电价的通知, 发改价格规〔2020〕1508号,” National Development and Reform Commission, 28 September 2020, accessed at https://www.ndrc.gov.cn/xxqk/zcfb/ghxwj/202009/t20200930_1243682_ext.html.

¹¹ “【中电联发布】第三监管周期省级电网输配电价文件解读,” China Electricity Council, 16 May 2023, accessed at <https://mp.weixin.qq.com/s/wAqFeUIGkKylN4SmiUB9EO>; “坚持问题导向、守正创新, 输配电价改革迈出新步伐、取得新突破,” China Electric Power Planning & Engineering Institute, 15 May 2023, accessed at <https://mp.weixin.qq.com/s/>

[biz=MjM05TY4NjAwMQ==&mid=2650130028&idx=3&sn=626c916c6e091ac134e0ccd0b6cd1f8d&chksm=bf36dc72884155644850a2afd6665fe0e88fa6dcc9002f3747e6aa51dd4c6e092aa1a154b1c6&mpshare=1&scene=24&srcid=05153sCCovBzpkUSjdfEdV7&sharer_sharetime=1684143078561&sharer_shareid=8706f07e3531b2b33fbe293a566a3c4a#rd](https://mp.weixin.qq.com/s/biz=MjM05TY4NjAwMQ==&mid=2650130028&idx=3&sn=626c916c6e091ac134e0ccd0b6cd1f8d&chksm=bf36dc72884155644850a2afd6665fe0e88fa6dcc9002f3747e6aa51dd4c6e092aa1a154b1c6&mpshare=1&scene=24&srcid=05153sCCovBzpkUSjdfEdV7&sharer_sharetime=1684143078561&sharer_shareid=8706f07e3531b2b33fbe293a566a3c4a#rd).

¹² “国家发展改革委关于第三监管周期省级电网输配电价及有关事项的通知, 发改价格〔2023〕526号,” National Development and Reform Commission, 9 May 2023, accessed at https://www.ndrc.gov.cn/xxqk/zcfb/tz/202305/t20230515_1355747_ext.html.

3. Policy monitoring

2023-05-19

<https://yyglxbsgw.ndrc.gov.cn/htmls/article/wap-article.html?articleId=2c97d16c-86787ed5-0188-31d2844c-0027#frameHeight=868>

NDRC is revising the demand-side management measures

Announcement on Public Consultation on Electricity Demand Side Management Measures (Draft for Comments) and Electricity Load Management Measures (Draft for Comments)

This document proposes the definition of demand side response (DSR) at the national level for the first time, that is, in response to situations including short-term power supply shortages, difficulties in the consumption of renewable energy power, to guide users voluntarily adjust their electricity consumption behaviour according to the needs of power system operation through economic incentive measures. All commercial electricity users can participate in DSR, including new-type energy storage, distributed power sources, electric vehicles, and air-conditioning loads. The government will fully promote the regular operation of demand-side resources in the power market and ancillary service market. By 2025, provincial-level demand response capabilities should reach 3%-5% of the peak power load, and provinces with a maximum peak-to-valley load difference of more than 40% should reach 5% or more; by 2030, to form large-scale real-time demand response-ability.

2023-05-17

https://www.volpower.com/download/gf/1_1.pdf
https://www.mnr.gov.cn/dt/d/202305/t20230517_2786670.html

MEE releases new land use standard for solar PV projects

Land Use Control Index of Solar PV Power Plant Projects

This standard aims to regulate the land use of solar PV projects, and it applies to new construction, reconstruction, and expansion of utility-scale PV plants on construction land and unused land. The government calculates the overall land use index for solar PV power generation projects, the land use index for solar PV square arrays, the land use index for substations and operation management centres, based on the overall area efficiency of solar PV modules, the terrain type, and the access voltage level. These projects' general land use principles should uphold the protection of arable land, economical use of land, and overall land use planning.

2023-05-14

https://www.ndrc.gov.cn/xgk/zcfb/tz/202305/t20230517_1355814.html

NDRC pushes for better charging infrastructure in rural areas

Opinions on Accelerating the Construction of Charging Infrastructure to Better Support New Energy Vehicles in the Countryside and Rural Revitalization, NDRC General [2023] No. 545

The lack of public charging facilities and the difficulty in installing charging facilities in residential communities restrict the sales potential of new energy vehicles (NEV) in rural areas. NDRC issued a document requiring rural areas to build charging facilities ahead of schedule moderately and optimize the environment for purchasing NEV. In terms of charging facilities, supporting county and township governments in planning public charging networks, and giving priority to public charging piles in institutions, commercial buildings, and transportation hubs; reserve interfaces for charging piles in newly built residential communities, and promote models such as sharing charging parking spaces; increase efforts in rural distribution grid retrofit, and the construction of distributed PV-energy storage-charging integrated facilities in areas with low charging efficiency. Regarding purchasing NEV, developing more economical and applicable vehicle models, especially new energy light cargo vehicles; improving the evaluation system for second-

hand NEV and providing high-quality second-hand NEV.

2023-05-11

https://www.ndrc.gov.cn/xgk/zcfb/tz/202305/t20230515_1355744.html

NDRC releases capacity tariffs for national pumped storage

Notice on Capacity Tariff of Pumped Storage Power Station and Related Matters, NDRC Pricing [2023] No. 533

In April 2021, the NDRC clarified that all pumped storage projects should implement a unified two-part electricity pricing mechanism from 2023, which included capacity tariff and electricity tariff. Recently, the NDRC issued a document to determine the capacity tariff of 48 pumped storage power stations across the country, including all projects in operation and new projects planned to be implemented by the end of 2025. This policy is implemented from June 1, 2023. The document released a clear signal of electricity prices, which is conducive to forming stable expectations for the pumped storage industry. For the development of pumped storage and the price mechanism, please refer to the [CET website](#) for details.

2023-05-04

http://zfxgk.nea.gov.cn/2023-05/04/c_1310719213.htm

NEA will carry out systematic supervision on flexible resources

Notice on the Comprehensive Supervision of the Construction and Operation of the Regulatory Power Supply of the Power System, NEA Development Supervision [2023] No.39

With the increasing renewable energy proportion, the development of power system flexibility shows a trend of large-scale and diversification. Therefore, NEA has incorporated flexibility resources into key regulatory tasks in 2023. The government will supervise pumped storage, coal power flexible retrofit units, gas power generation, dispatchable hydropower, and new-type energy storage. The government will focus on the four main aspects of planning and construction, dispatching and operation, market transactions, and price mechanism, to comprehensively know about the situation, and make suggestions for focused problems.

2023-04-23

http://zfxgk.nea.gov.cn/2023-04/23/c_1310717984.htm

NEA requires an argumentation of the development needs of the 2035 provincial pumped storage

Notice on Further Improving the Planning and Construction of Pumped Storage Energy, NEA General Division New Energy [2023] No.47

After the release of the *Medium and Long-term Development Plan for Pumped Hydro Energy Storage (2021-2025)* in 2021, China clarified the goals for pumped storage installations in 2025 (62 GW) and 2030 (120 GW), and proposed a project reserve list of 726 GW. Recently, the NEA requested to further carry out the argumentation of the development needs of provincial pumped storage in 2030 and 2035, and conduct a preliminary analysis and outlook for 2040. All provinces shall confirm the reasonable construction scale according to the argumentation results. For provinces with a demand gap, new projects will be included in the construction plan in an orderly manner; for provinces with no demand gap, no new projects will be added for the time being, and adjustments will be made subsequently.