



● OCTOBER 2023

CHINA ENERGY POLICY NEWSLETTER

China Energy Transformation Programme

1. China energy transition updates

Renewable power consumption by province in 2022 announced

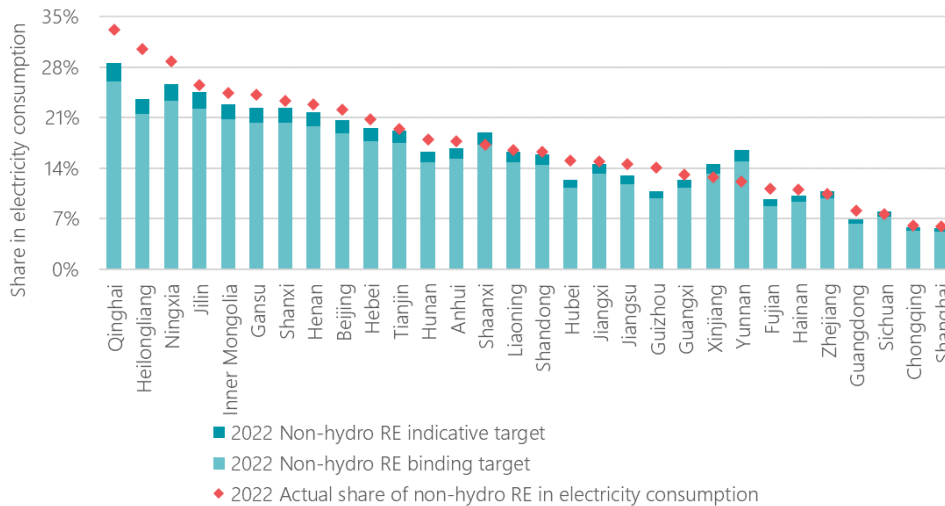
The National Energy Administration (NEA) recently released the *Renewable Energy Power Monitoring and Evaluation Report 2022* (CNH: 国家能源局关于2022年度全国可再生能源电力发展监测评价结果的通报), summarizing the development of renewable power in 2022. In 2022, renewable energy accounted for 31.6% of the total electricity consumption nationwide, a year-on-year increase of 2.2 percentage points. Among the 30 assessment provinces (Tibet is exempt), 26 reached the binding targets, and 17 of them reached the incentive targets, that is, 10% to 11% higher than the binding targets; Xinjiang failed to meet the binding target, with a difference of 0.3 percentage points; Shanghai, Chongqing, and Shaanxi failed to meet the standards due to force majeure, and the unfinished amount was exempted by the government. Non-hydro renewable energy accounted for 15.9% of the whole society's electricity consumption, a year-on-year increase of 2.2 percentage points; only Yunnan (-2.9pct) and Xinjiang (-0.5pct) failed to meet the binding targets, while Shaanxi and Gansu achieved their goals by obtaining excess renewable power consumption transferred from other provinces; 24 provinces reached incentive targets.¹

Xinjiang failed to achieve the binding target due to limited local power consumption conditions; Yunnan was unable to achieve the target due to insufficient non-hydro renewable energy power generation. In 2022, Yunnan's wind power generation decreased by 7.7% year-on-year, and solar PV power generation increased by 8.3% year-on-year, far lower than the national average of 30.8%.

¹ "国家能源局关于2022年度全国可再生能源电力发展监测评价结果的通报," National Energy Administration, 7 September 2023, accessed at http://zfxxgk.nea.gov.cn/2023-09/07/c_1310741874.htm.

If you would like to subscribe to the newsletter, please send your full name, organization and title to china@ens.dk

Completion status of non-hydro renewable power consumption by province in 2022



Source: National Energy Administration (NEA), September 2023

Solar PV power generation efficiency improved significantly in 2022

The *Renewable Energy Power Monitoring and Evaluation Report 2022* also released data on renewable power utilization rates, wind power and solar PV full load hours, and the proportion of renewable energy in ultra-high-voltage (UHV) transmission lines. In 2022, the national average utilization rate of wind power was 96.8%, the same as the previous year; the national average utilization rate of solar PV power generation was 98.3%, an increase of 4.9 percentage points year-on-year. The full load hours of solar PV increased year-on-year in the region of "Three Norths" except Xinjiang, Shaanxi, and parts of Qinghai and Gansu.

By the end of 2022, 20 DC UHV lines have been built across the country, and the annual power transmission of renewable energy increased by 10.3% year-on-year, accounting for 56.2%. Among them, the annual power transmission of renewable energy accounted for 48.6% of the 16 lines operated by the State Grid and accounted for 100% of the lines by China Southern Power Grid. The previously released *14th Five-Year Plan for Renewable Energy Development* stated that the proportion of renewable power transmission in newly built key lines during the 14th Five-Year Plan period should be at least 50%.²

China's power supply reliability indicators in 2022 released

In 2022, the average power supply reliability rate for users nationwide was 99.896%, a year-on-year increase of 0.025 percentage points. Among these, urban grid users reached 99.974% and rural grid users reached 99.883%, which was 0.091 percentage points lower than that of urban grids. Among the 31 provinces, the average power supply reliability rate of users in Beijing, Tianjin, Shanghai, Zhejiang, Jiangsu, Guangdong, and Shandong was higher than 99.95%; Inner Mongolia and Heilongjiang both declined year-on-year; and Tibet was the lowest at 99.80%. The average power outage time for users across the country was 9.10 hours per household, a year-on-year decrease of 2.16 hours per household. Among 31 provinces, 24 provinces decreased by more than 10% year-on-year. The power outage situation was further improved overall.³

² "国家能源局关于2022年度全国可再生能源电力发展监测评价结果的通报," National Energy Administration, 7 September 2023, accessed at http://zfxxgk.nea.gov.cn/2023-09/07/c_1310741874.htm.

³ "2022年度全国电力可靠性指标," National Energy Administration, 9 October 2023, accessed at <https://baijiahao.baidu.com/s?id=1779278708327798808&wfr=spider&for=pc>.

Green hydrogen industry achieved production expansion and cost reduction in 2022

In September 2023, the China Hydrogen Alliance released the *China Hydrogen Energy and Fuel Cell Industry Development Report 2022* (CHN: 中国氢能源及燃料电池产业发展报告2022).⁴ The *Report* points out that China's hydrogen production capacity reached 48.82 million tons/year in 2022, a year-on-year increase of 1.2%. With the intensive implementation of green hydrogen projects in the "Three North" regions, green hydrogen production capacity increased by more than 140% year-on-year. In 2022, 23 green hydrogen projects were put into production across the country, and the total number of projects in operation reached 36. Green hydrogen production capacity increased from 23,000 tons/year to 56,000 tons/year. More than 300 green hydrogen projects have been planned across the country, with Inner Mongolia and Ningxia being key development areas.

In areas with better wind and solar resources, such as Ordos in Inner Mongolia and eastern Ningxia, green hydrogen production costs dropped to 20 RMB/kg in 2022. At the same time, affected by the overall increase in fossil fuel prices, the national average cost of hydrogen production from natural gas reached 25 RMB/kg, and the average cost of hydrogen production from coal reached 13 RMB/kg. This means that green hydrogen already has cost advantages in specific local areas, providing strong support for the future development of the green hydrogen-coupled chemical industry. Despite this, China's current cost of green hydrogen application is still high. The *Report* believes that subsidy policies can be formulated around electricity prices and other aspects to reduce the operational costs of green hydrogen projects. At the same time, it is to explore the application of hydrogen production in the wind and solar PV bases and deep-sea offshore wind power plants, and continue to optimize hydrogen energy infrastructure, including hydrogen pipeline networks, hydrogen liquefaction facilities, and hydrogen refuelling stations.

The basic rules for the spot power market released

In September 2023, the National Development and Reform Commission (NDRC) and the NEA jointly issued the *Basic Rules for Spot Power Market (Trial)* (hereinafter referred to as the *Basic Rules*)⁵, aiming to standardize the construction and operation of the spot power market. It is expected to guide the current spot power markets to achieve healthy and sustainable development; provide reference experience for regions that still need to launch spot power markets, and reduce trial and error costs. The *Basic Rules* put forward clear requirements for the development path, mechanism design, market operation, and related terminology of the spot power market.

The critical tasks in the short-term future include: 1) Constructing inter-provincial, provincial (also autonomous regions, municipalities) and regional spot power markets, and improving day-ahead, intra-day, and real-time markets; 2) Clarifying the time-of-use trading curve and transaction price for medium and long-term transactions; 3) Promoting joint clearing of the spot power market and the ancillary service market; 4) Smoothing the cost transfer mechanism within wholesale power prices and retail electricity prices; 5) Designing a mechanism to adapt to the participation of new energy in the spot power market, including distributed power generation, load aggregator, energy storage and virtual power plant (VPP); 6) Ensuring equal transactions and fair responsibilities for users, electricity retailing enterprises and power grid enterprises performing as purchasing agents that directly participate in market transactions; 7) Opening inter-provincial transactions to all types of power generation enterprises, users and electricity retailing companies.⁶

The NEA believes that the spot power market has established a market-based electricity price mechanism that can better reflect market supply and demand changes and primary energy prices. Time-of-use price signals are used to effectively encourage thermal power and users to participate in peak shaving and promote independent participation in transactions of new energy sources such as energy storage facilities and VPPs, which also helps to achieve lower-cost new energy consumption while significantly improving the ability to ensure power supply.⁷

⁴ “我国制氢路线正在变“绿”,” China Energy News, 24 September 2023, accessed at <https://cpu.baidu.com/pc/1022/275122716/detail/83335934954824461/news?chk=1>.

⁵ “国家发展改革委 国家能源局关于印发《电力现货市场基本规则（试行）》的通知,” National Development and Reform Commission, National Energy Administration, 7 September 2023, accessed at https://www.ndrc.gov.cn/xxgk/zcfb/gxwj/202309/t20230915_1360625.html.

⁶ “权威发布 | 国家发改委、国家能源局：推动分布式发电、储能和虚拟电厂等新型经营主体参与电力现货市场交易,” National Development and Reform Commission, National Energy Administration, 18 September 2023, accessed at <https://mp.weixin.qq.com/s/TgF5mqYcz1n3ShACoNWRHg>.

⁷ “国家发展改革委、国家能源局有关负责同志就《电力现货市场基本规则（试行）》答记者问,” National Development and Reform Commission,

Pumped storage equipment deliveries under pressure

In September 2023, the Machinery Industry Power Generation Equipment Center released the *Development Status and Outlook of China's Power Generation Equipment Industry in the First Half of 2023* (CHN: 2023年上半年我国发电设备行业发展情况及形势展望). The *Report* points out that China's pumped storage equipment enterprises are currently facing the risk of insufficient production capacity. The NEA released the *Medium and Long-term Development Plan for Pumped Hydro Storage (2021-2035)* in 2021, which clearly stated that pumped storage will be vigorously developed; since then, the NDRC further issued a document to improve the pumped storage pricing mechanism and solve the profitability problem of pumped storage projects. The support of a series of policies has set off a wave of investment in the pumped storage industry. As of the end of 2022, the total installed capacity of pumped storage in the country reached 46 GW, with the installed capacity under construction reaching 121 GW and an additional 177 GW of projects entering the pre-feasibility study stage.

Based on the current speed of project development, the *Report* believes that between 2023 and 2025, pumped storage equipment manufacturing enterprises need to significantly increase equipment production capacity based on meeting normal order production. It is expected that 2028-2030 will be the peak of equipment delivery, with an average annual delivery capacity of over 30 GW. Thus, the task is arduous. Experts pointed out that pressure on equipment delivery may cause problems. For example, delayed delivery of equipment will affect construction progress and increase costs; manufacturers may sacrifice some product quality standards to speed up production. Therefore, although China's pumped storage technology is already mature, the pace of approval of pumped storage projects should be based on the actual production capacity of equipment, and both insufficient production capacity and waste of production capacity should be avoided. At present, a certain degree of blindness in project approval happens in some places, with the subsequent project development not being fully considered.⁸

China launches first inland river fuel cell ship

In October 2023, China's first inland river ship powered by hydrogen fuel cells completed its maiden voyage in the water area of Yichang, Hubei. The ship was invested and built by China Three Gorges Corporation and is equipped with a 500 kW fuel cell, with a top speed of 28 km/h and a range of up to 200 km. In the future, it will undertake transportation, inspection, and emergency work in the Three Gorges Reservoir area (covering 20 counties). It can reduce fuel use by 103.16 tons and carbon dioxide emissions by 343.67 tons every year, demonstrating significance for the green development of inland shipping. China Three Gorges Corporation also put into operation a wharf-type integrated hydrogen production and refueling station. The project has a 200 standard cubic meter/hour proton exchange membrane (PEM) hydrogen production system, a 500 kg/day hydrogen refueling system, and marine and vehicle fueling facilities, which can refuel 240 kg of hydrogen per hour. The replenishment of the fuel cell ship will be completed at this wharf.⁹

National Energy Administration, 18 September 2023, accessed at https://www.ndrc.gov.cn/xgkj/jd/jd/202309/t20230918_1360663_ext.html.

⁸ “抽水蓄能发展过热现隐忧,” China Energy News, 24 September 2023, accessed at <https://cpu.baidu.com/pc/1022/275122716/detail/83341721886384909/news?chk=1>.

⁹ “中国首艘氢燃料电池动力船完成首航,” China News, 11 October 2023, accessed at <https://www.chinanews.com/cj/shipin/cns/2023/10-11/news972490.shtml>.

CCER relaunch is imminent with methodologies under review

The contents are authorised by the Carbon Research Team of Refinitiv under the CET programme partnership.

Background of CCER

The Chinese Certified Emission Reduction (CCER) scheme has been designed to complement to China's allowance-based carbon market through the use of offset credits generated by emissions reduction or removals projects. Under this scheme, credits generated from projects such as renewable energy, afforestation, reforestation, methane utilization, etc., would potentially qualify as CCER credits, which could then be used to either offset up to 5% a company's compliance obligation under national ETS or to offset on a voluntary basis by nationally regulated entities within China. CCER could also be used in pilot carbon market with a certain limit and condition or offset on a voluntary basis by companies. In this respect, both a CCER credit and an emission allowance are equal to 1 metric ton, as issued by the environmental regulator. However, amid concerns about carbon credit project integrity within the CCER scheme, the issuance of new CCERs was suspended in 2017, with the idea that it would relaunch following a review.

The current demand for CCERs in China is substantial, largely because there haven't been any new ones to hit the market since 2017. Demand for these credits has far exceeded supply in recent years, which has been bullish for prices: in June 2023, CCERs were traded as high as 129 RMB/t (~€16), compared to 60 RMB/t (~€7.5) for CEAs during the same period. But as the price range was also wide, the lowest could be as low as 12.5 RMB/t (~€1.5).

On June 29, 2023, China's Ministry of Ecology and Environment (MEE) held its monthly press conference and announced that it is planning the long-awaited CCER market relaunch before the end of the year and major preparatory works are underway. According to the MEE's spokesperson, three key preparatory works need to be completed before the relaunch can go ahead: 1) The publication of the legal rules; 2) The setting of methodologies; 3) The launch of trading facilities including a new trading platform and accounting registry.

CCER methodology

Earlier in April 2023, the MEE issued a call for methodology proposals under the CCER. Each methodology will set the technical standard for accounting for emissions reductions or removals, as well as the process by which credits will be issued by different projects. This is the first policy has been updated under CCER after the scheme was shelved six years ago.

CCER trading facilities

The announcement followed the formal acceptance of the new trading platform and CCER registry on June 27. Beijing Green Exchange has been managing the construction of both the new registry and the trading platform since 2021. It is set to maintain management of the trading platform, the National Centre for Climate Change Strategy and International Cooperation (NCSC) – a government-backed think tank – will manage the CCER registry when it is formally put into use. The completion of the registry is key to the relaunch of CCER program in order to manage the issuance and retirements of CCERs to ensure no double-counting.

CCER legal rules

On September 15, 2023, the MEE held an internal meeting, approving in principle the *Measures for the Administration of Trading on Voluntary Greenhouse Gas Emission Reduction (Trial)* (CHN: 温室气体自愿减排交易管理办法 (试行)), according to [MEE's regularly updated news](#). This regulation is a key policy document and marks the most important step in the official re-launch of the CCER market after a six-year suspension of issuances. This regulation is the overarching document for the CCER scheme. The version for public consultation was released on July 7 and the consultation period closed one month later. Nevertheless, there are still a few outstanding things that need to be ironed out before the program can officially relaunch before the end of the year.

CCER's current status and next steps

The methodology documents for eligible projects have still not been published and will go through a public consultation phase before formal adoption. These will set the standards by which projects can be considered CCER projects and how the emission reduction credits are calculated. At least four types of projects will be included in the relaunched scheme: **offshore wind farms, solar thermal power plants, mangrove restoration** and **forestry**. Demonstration of additionality remains a sticking point, with potential projects able to apply for either an additionality exemption or a general demonstration. Projects aiming to use the general demonstration of additionality will be able to use an official tool to demonstrate and assess it, but it is not yet available.

Following the publication of the methodologies, the MEE will release implementation rules to guide both project development and eventual trading of CCERs. The MEE update mentions three implementation rules: project validation and verification rules, project design and implementation rules, and registry and trading rules. In order to officially issue credits, rules related to project design and development must come out to ensure project integrity and data quality.

The registry organization is still to be established, which is necessary to operate the registry system underpinning the CCER market. While the new CCER registry has been announced under the NCSC. It appears that the center is planning to deploy a dedicated management staff to manage the CCER registry, which will take time to establish and train.

3. Policy monitoring

2023-10-11

https://www.gov.cn/zhengce/zhengqceku/202310/content_6908243.htm

China actively deploys research and development of key technologies for hydrogen aviation

Notice on Issuing the Development Outline of Green Aviation Manufacturing Industry (2023-2035), MIIT Joint Heavy Industry [2023] No.181

The Ministry of Industry and Information Technology (MIIT) issued the *Development Outline of Green Aviation Manufacturing Industry (2023-2035)* (CHN: 工业和信息化部等四部门关于印发绿色航空制造业发展纲要（2023-2035年）的通知), requiring active deployment of key technology research and development of hydrogen energy aviation, to accelerate the research on core key technologies such as hydrogen storage devices and power units, to research new structural layout technology suitable for hydrogen energy aircraft. To Promote theoretical research and technical verification of fuel cells and hydrogen internal combustion engines, hydrogen turbines, and hydrogen turbine hybrid aircraft, and to open up a technology application model for collaborative innovation with the upstream and downstream of the hydrogen energy industry.

2023-09-15

https://www.ndrc.gov.cn/xgk/zcfb/ghxwj/202309/t20230927_1360902.html

NDRC revised the power demand side management measures for the second time

Notice on Issuing the Power Demand Side Management Measures (2023 Edition), NDRC Operation Regulations [2023] No.1283

Power demand side management refers to strengthening the management of power consumption in the whole society by adopting reasonable technical, economic, and management measures. The government released two versions of the *Power Demand Side Management Measures* (CNH: 电力需求侧管理办法) in 2020 and 2017 respectively. However, with an increasing amount of emerging demand-side entities such as virtual power plants and load aggregators, the government released the *Measures (2023 version)*. The new Measures require real-time power conservation, demand response, green power use, fuel substitution by power, intelligent power use, and orderly power use on the load side to promote safe carbon reduction and consumption reduction in the power system. It is worth noting that demand response is an added chapter in the new Measures. The government has made it clear that orderly power consumption will not be implemented until the power balance is still unable to be met after prioritizing demand response measures.¹⁰ At the same time, encourage the promotion of new energy storage, distributed power generations, EVs, air conditioning loads, and other multiple entities to participate in demand response, and build a demand response database.

¹⁰ “国家发展改革委有关负责同志就《电力需求侧管理办法（2023年版）》答记者问,” National Development and Reform Commission, 27 September 2023, accessed at https://www.ndrc.gov.cn/xgk/jd/jd/202309/t20230927_1360906.html.

2023-09-07

https://www.ndrc.gov.cn/xgk/zcfb/ghxwj/202309/t20230927_1360904.html

NDRC revises the power load management regulation

Notice on Issuing the Power Load Management Measures (2023 Edition), NDRC Operation Regulations [2023] No.1261

In 2011, in response to the tight electricity supply across the country, the NDRC issued the *Measures for the Management of Orderly Power Consumption* (CHN: 有序用电管理办法). In recent years, with the large-scale integration of volatile renewable power into the grid, power load management has faced new connotations and requirements, so the government revised and issued the *Power Load Management Measures (2023 Edition)*. The new *Measures* clarify that power load management should promote the consumption of renewable energy and improve energy efficiency while ensuring the security of the power grid and the stability of power supply and consumption through the adoption of demand response, orderly power use, and other measures. Demand response has become an important measure to ensure power supply among them. The *Measures* clarify the division of responsibilities, implementation procedures, and funding sources of demand response.