

DECEMBER 2024

CHINA ENERGY POLICY

NEWSLETTER

China Energy Transformation Programme

1. China energy transition updates

MEE releases the 2023 annual report on China addressing climate change

In November 2024, the Ministry of Ecology and Environment (MEE) released the annual report of *China's Policies and Actions to Address Climate Change 2024* (CHN: 中国应对气候变化的政策与行动2024年度报告), summarising China's major achievements in addressing climate change in 2023 and reviewing new deployments and policy actions. From 2013 to 2023, the energy consumption mix in China has been further decarbonised. The share of non-fossil fuel in total primary energy consumption has increased from 10.2% to 17.9%, and the share of coal has decreased from 67.4% to 55.3%. The energy consumption per unit of added value of industrial enterprises above 20 million RMB of annual income has reduced by more than 36%, and the carbon emission intensity has reduced by more than 34%. By the end of 2023:

- Renewable power generation capacity reached 1,516 GW, accounting for 51.9% of total power generation capacity, and the share of coal power fell below 40% for the first time;
- Renewable power generation accounted for about 1/3 of the total electricity consumption;
- The installed capacity of new-type energy storage ² reached 31.39 GW, nearly 10 times the installed capacity at the end of the 13th Five-Year Plan period (2020);
- The number of new energy vehicles (NEV) reached 20.41 million, accounting for 6.1% of the total number of vehicles, and the cumulative charging infrastructure exceeded 8.5 million units;
- The economic added value of new industries, new business formats, and new business models (the *Three New*) increased by 6.4% year-on-year, accounting for 17.73% of GDP;
- The combined export of electric vehicles, lithium batteries, and solar PV products (the *Three New Products*) increased by nearly 30% compared with 2022.

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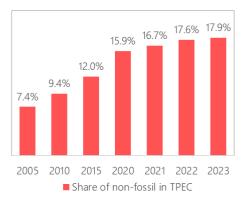


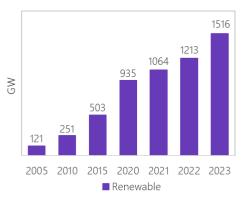
¹ "生态环境部发布《中国应对气候变化的政策与行动2024年度报告》," Ministry of Ecology and Environment, 12 November 2024, accessed at https://www.gov.cn/lianbo/bumen/202411/content 6986237.htm.

² New-type energy storage refers to energy storage technologies other than pumped hydro that are primarily based on the output of electricity. New-type energy storage mainly includes electrochemical storage (i.e. battery), compressed air energy storage, flywheel energy storage, hydrogen and ammonia energy storage, and heat and cooling energy storage.

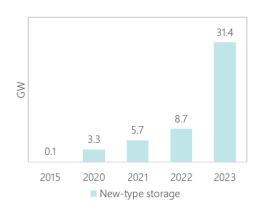
China has made significant breakthroughs in establishing carbon emission management systems at the policy level. The government has issued the *Interim Regulations on Carbon Emission Trading Management* ³ (CHN: 碳排放权交易管理暂行条例), *Action Plan for Further Strengthening the Construction of Carbon Peaking and Carbon Neutrality Standard Measurement System (2024–2025)* ⁴ (CHN: 关于进一步强化碳达峰碳中和标准计量体系建设行动方案(2024—2025 年)), and *Work Plan for Accelerating the Construction of Carbon Emission Dual Control System* ⁵ (CHN: 加快构建碳排放双控制度体系工作方案), further improving carbon emission standards and technical specifications, improving carbon emission evaluation and assessment systems, and promoting the implementation of carbon emission dual control (i.e. control of total carbon emissions and control of carbon emission per RMB 10,000 of GDP). The reform of electricity price policies and power markets has been further deepened. The government has issued the *Basic Rules for Electricity Market Operation* (CHN: 电力市场运行基本规则), establishing a capacity price mechanism for coal power, and expanded the coverage of green certificate issuance and trading.

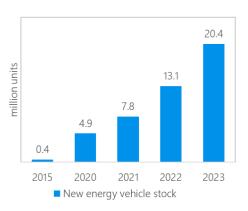
2005-2023 The share of non-fossil energy in total primary energy consumption (left) and the total installed renewable power generation capacity (right)





2015-2023 The total installed new-type energy storage capacity (left) and the new energy vehicle stock (right)





Note: The non-fossil fuel share is calculated using the coal substitution method. Source: National Bureau of Statistics (NBS), National Energy Administration (NEA), China Energy Storage Alliance (CESA), Ministry of Ecology and Environment (MEE), accessed in December 2024

⁵ For the policy summary, please refer to the newsletter of August 2024, https://www.cet.energy/2024/08/21/china-energy-policy-newsletter-august-2024/.









³ For the policy summary, please refer to the newsletter of February 2024, https://www.cet.energy/2024/04/16/china-energy-policy-newsletter-april-2024/.

⁴ For the policy summary, please refer to the newsletter of September 2024, https://www.cet.energy/2024/09/13/china-energy-policy-newsletter-september-2024/.

The Energy Law officially released

The Chinese government began drafting the *Energy Law of the People's Republic of China* (hereinafter referred to as the *Energy Law*) in 2006. After 18 years, the *Energy Law* was officially released on November 8, 2024, and will be implemented on January 1, 2025. The *Energy Law* is a law enacted by the *Constitution*. It is a fundamental and leading law in China's energy field. It is an important legal guarantee and strategic support for ensuring the safe and stable operation of the energy system and low-carbon development. The *Energy Law* has nine chapters, including general principles, energy planning, energy development and utilisation, energy market system, energy reserves and emergency response, energy science and technology innovation, supervision and management, legal liability, and supplementary provisions.

The General Principles firstly clarify the definition of energy resources, including coal, oil, natural gas, nuclear, hydro, wind, solar, biomass, geothermal and ocean energy, as well as electricity, heat and hydrogen; secondly clarify that the country will improve energy conservation policies, strengthen energy conservation management, and prevent energy waste; thirdly emphasis that the country will actively promote clean and low-carbon energy development and accelerate the construction of a dual control system for carbon emissions; fourthly clarify that the country will improve the energy standard system and promote the development of new energy technologies, new industries, and new business formats.

The *Energy Law* also prioritises the development and utilisation of renewable energy. Chapter 3, *Energy Development and Utilisation*, clarifies that the country supports the priority development and utilisation of renewable energy, the rational development and clean and efficient use of fossil energy, the promotion of safe, reliable, and orderly replacement of fossil energy with non-fossil energy, and the increase of the share of non-fossil energy consumption. In addition, this chapter describes the development direction and pace of various types of renewable energy and new energy.⁷

Development and utilisation of renewable energy	 Develop, construct, and retrofit hydropower stations, and strictly control the development of small hydropower stations; Promote the development and utilisation of wind and solar energy, adhere to the development of both utility-scale and distributed projects, accelerate the construction of large-scale wind power and solar PV bases, support locally consumed distributed wind power and solar PV applications, reasonably and orderly develop offshore wind power, and actively develop CSP; Encourage the rational development and utilisation of biomass energy, develop biomass power generation, biomass clean heating, bio-liquid fuels, and biogas by local conditions; Promote the large-scale development and utilisation of ocean energy, and develop geothermal energy according to local conditions;
Power grid	 Accelerate the construction of a new-type power system and strengthen the coordinated construction of power sources and power grids; Promote the intelligent retrofit of power grid infrastructure and the construction of smart microgrids, and improve the power grid's ability to access, configure, and regulate renewable power generation;
Energy Storage	 Rationally plan, actively and orderly develop and construct pumped hydro stations; Promote the high-quality development of new-type energy storage and give full play to the balancing role of various types of energy storage in the power system;
Hydrogen Energy	 Actively and orderly promote the development and utilisation of hydrogen energy and promote the high- quality development of the hydrogen energy industry;
Demand side	 Actively promote market-based energy-saving services such as energy management contracts; Establish a green energy consumption promotion mechanism through the implementation of green certificates, etc., and actively participate in energy demand response; Promote energy conservation and improve energy efficiency by improving cascade pricing and time-of-use pricing mechanisms.

⁶ "中华人民共和国能源法," National People's Congress, 8 November 2024, accessed at https://www.gov.cn/yaowen/liebiao/202411/content_6985761.htm.

⁷ "收藏 | 《能源法》审议稿与表决通过稿对照表," China Electricity Council, 9 November 2024, accessed at https://mp.weixin.qq.com/s/itZEqwzVcYNdlbufx-gZQQ; "中华人民共和国能源法》表决通过 能源领域基础性统领性法律落地," National Energy Administration, 9 November 2024, accessed at https://baijiahao.baidu.com/s?id=1815223684973572155&wfr=spider&for=pc.









China implements 2030 renewable energy substitution action

In October 2024, the National Development and Reform Commission (NDRC) and six other departments jointly issued the *Guiding Opinions on Vigorously Implementing Renewable Energy Substitution Actions* (CHN: 关于大力实施可再生能源替代行动的指导意见), proposing the action goals for the *14th Five-Year Plan* period (2021-2025) and the *15th Five-Year Plan* period (2026-2030). In 2025, the national renewable energy consumption will reach more than 1,100 Mtce and increase to more than 1,500 Mtce in 2030. The policy proposes key tasks from three aspects: renewable energy (RE) substitution capacity, key substitution applications, and substitution innovation pilots.⁸

Comprehensively improve the RE supply capacity, accelerate the construction of large-scale bases and distributed applications, develop green fuels, RE hydrogen production, and RE integrated heating systems; optimise power dispatch and control, strengthen the construction and retrofit of heating, gas, and hydrogen pipeline infrastructures; diversify the power system regulation capabilities, strengthen the application of pumped hydro and a new-type energy storage, and promote long-term heat storage power generation, power-heat sector coupling, and medium and high-temperature heat utilisation.

Promote the replacement application of RE in key areas. In the industry sector, promote green microgrids, mid to low-temperature heat utilisation of RE, and wind-solar-hydrogen-ammonia integrated bases; in the transport sector, promote PV-storage-charging integrated stations, electric ships and aircraft, sustainable aviation fuels, and vehicle fuels; in the building sector, promote the installation of solar PV systems in existing buildings, new factories and public buildings, full electrification of new public buildings, and RE for heating and cooling; in rural areas, actively develop distributed wind power and solar PV, energy infrastructure retrofit and upgrading, and RE heating to replace scattered coal (*sanmei*); in the development of new infrastructure, promote the integrated development of 5G base stations, data centres with solar PV, heat pumps, and energy storage, support green electricity direct supply projects, and promote new data centres to increase the share of RE use year by year.

Actively promote innovative pilot projects for RE substitution, carry out pilot projects on new technologies for deep-sea offshore floating wind power, green direct power supply, hydrogen metallurgy, and the hydrogen-based chemical industry, and support new business formats such as digital energy, virtual power plants (VPP), and rural energy cooperatives.

The consumption of renewable power in 2023 is announced

The National Energy Administration (NEA) recently released the *Renewable Energy Power Monitoring and Evaluation Report 2023* (CHN: 2023年可再生能源电力监测评价报告), which summarised the status of renewable power consumption on provincial level in 2023. In 2023, renewable power accounted for 32.0% of the national electricity consumption, an increase of 0.4 percentage points year-on-year. Among the 29 assessed provinces (Tibet and Xinjiang were exempted), 25 completed the binding targets (i.e. minimum share). Hunan, Chongqing, Guangdong, and Guangxi failed to meet the targets due to the reduction in water inflow, and the government exempted the unfulfilled amount. After the exemption, Guangdong still had a gap of 1 percentage point with its binding target. Non-hydro renewable power accounted for 18.1% of the national electricity consumption, an increase of 2.2 percentage points year-on-year. All provinces completed the binding targets, among which Qinghai, Ningxia, and Heilongjiang completed more than 8% of the binding targets.

⁹ "关于印发2023年度全国可再生能源电力发展监测评价结果的通知, 国能发新能〔2024〕80号," National Energy Administration, 10 October 2024, accessed at https://zfxxgk.nea.gov.cn/2024-10/10/c_1310787115.htm.



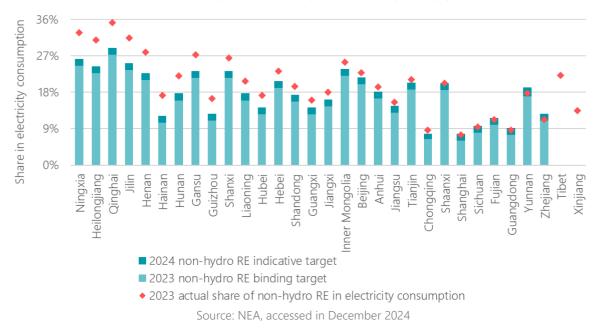






^{8 &}quot;国家发展改革委等部门关于大力实施可再生能源替代行动的指导意见, 发改能源(2024)1537号," National Development and Reform Commission, Ministry of Industry and Information Technology, Ministry of Housing and Urban-Rural Development, Ministry of Transport, National Energy Administration, National Data Administration, 18 October 2024, accessed at https://www.gov.cn/zhengce/zhengceku/202410/content_6983959.htm; "《关于大力实施可再生能源替代行动的指导意见》 政策解读," National Energy Administration, 31 October 2024, accessed at https://www.ndrc.gov.cn/xxgk/jd/jd/202410/t20241031_1394141_ext.html.

Completion status of non-hydro renewable power consumption by province in 2023



Wind and solar power generation utilisation remains stable in 2023

The *Report* also released data on renewable power utilisation rates, wind power and solar PV full load hours, and the share of renewable energy in ultra-high-voltage (UHV) transmission lines. In 2023, the national average utilisation rate of wind power was 97.3% (i.e. wind curtailment rate 2.7%), an increase of 0.5 percentage points year-on-year, of which Hebei, western Inner Mongolia, and Qinghai were below 95%. The national average utilisation rate of solar PV power generation was 98.0% (i.e. solar curtailment rate 2.0%), a decrease of 0.3 percentage points year-on-year, of which Qinghai and Tibet were below 95%. By the end of 2023, 20 DC UHV lines have been built in China, with annual renewable power transmission increasing by 3.6% year-on-year, accounting for 52.5%. Among them, the share of renewable power transmission in the 16 DC UHV lines operated by the State Grid was 48.3%, and that of the Southern Grid was 85.8%. The previously released 14th Five-Year Plan for Renewable Energy Development (CHN: "十四五"可再生能源发展规划) proposed that the share of renewable power transmission in new key lines during the 14th Five-Year Plan period should be at least 50%.

Wind and solar curtailment rates from 2015 to 2023



Source: NEA, accessed in December 2024









The largest CSP project in the desert area of China put into operation

At the end of November 2024, the 750 MW concentrated solar power (CSP)-solar PV coupling power generation project invested and constructed by SDIC Power was put into operation in Jiuquan, Gansu. This is one of the first batches of large-scale wind and solar bases in China's Gobi and desert area, and it is also the largest tower CSP currently put into operation in the desert area. The project comprises a 110 MW CSP project and a 640 MW solar PV project. During the daytime, the solar PV system generates electricity, and the CSP system converts solar energy into thermal energy and stores it in the molten salt heat storage equipment; at night, when the solar PV power generation is intermittent, the CSP system continues to generate electricity, thus realising 24-hour green electricity supply. After the project is put into operation, the annual power generation is expected to reach 1.7 TWh, reducing carbon dioxide emissions by about 1.45 million tons. In addition, sand-fixing plants are planted under the PV panels, and the washing water will promote their growth, helping to carry out land desertification control.¹⁰



Gansu Jiuquan 750 MW CSP-PV coupled power generation project

The first zero-carbon port in China is complete

Shandong Weifang Port is a Class I open port in China, with an annual cargo throughput of more than 40 million tons. Benefiting from good wind and solar conditions, the power supply source of Weifang Port has gradually shifted from a backbone power grid dominated by thermal power to a distributed wind-solar-storage integrated system. Weifang Port has built a 26.8 MW distributed wind power project and a 3.3 MW rooftop solar PV project. The annual power generation can cover the power demand of wharf equipment and shore power, and the surplus power can be connected to the grid to generate income. The port has also built 46 charging piles and a hydrogen refuelling station with a total storage capacity of 300kg of compressed hydrogen. This can meet the charging and hydrogen refuelling needs of the port collection-and-distribution vehicles and machinery and accelerate the promotion of port electricity and hydrogen substitution.

Through the measures mentioned above, combined with the use of compliant carbon credits to mitigate the remaining greenhouse gas emissions (GHGs), in October 2024, Weifang Port completed the neutralisation of 90 Mt of CO₂-equivalent GHGs, certified by the China Classification Society, becoming the first zero-carbon port in the country. Recently, Weifang Port launched a 200 Nm³/h green hydrogen production-transport-storage-refuel-use integrated demonstration project to enhance the green electricity consumption capacity. At the same time, the port is establishing a smart management and control platform, which will further improve energy efficiency and reduce energy costs in the future.¹¹

[&]quot;全国首个"零碳港口"在山东港口潍坊港建成," .www.wfbinhai.gov.cn, 21 October 2024, accessed at http://www.wfbinhai.gov.cn/hzfzcjj/zsdt/202410/t20241021_6391895.html; "全国首个"零碳港口"潍坊建成," Ministry of Transport, 18 October 2024, accessed at https://www.mot.gov.cn/jiaotongyaowen/202410/t20241018_4157986.html.









¹⁰ "喜报丨国家首批,规模最大——国投阿克塞汇东光热+光伏项目全容量并网发电," State Development and Investment Corporation, 29 November 2024, accessed at https://m.sohu.com/a/831610806_120093798/.



2. Special column - Power market reform

China to build a unified national power market by 2029

In November 2024, the NEA led more than 20 units, including the China Electricity Council (CEC), to jointly formulate the Blue Book on the Development Plan of the National Unified Power Market (CHN: 全国统一电力市场发展规划蓝皮书), which proposed for the first time a three-step roadmap for the construction of a unified national power market. The Blue Book proposes that China will initially build a unified national power market by 2025, with basic trading rules and technical standards unified and orderly connection between inter-provincial/regional markets and provincial/regional markets. By 2029, a unified national power market will be fully built, provincial spot power markets will be covered nationwide, and new energy will fully participate in market transactions. By 2035, the unified national power market will be improved, with a full range of trading varieties, free competition among trading entities, and a price mechanism that fully reflects the value of various resources so that a high share of the new energy power market can operate effectively and stably.

According to the interpretation of the NEA, large differences exist in the framework, rules, and transaction varieties of the current provincial and regional power markets. Inappropriate administrative intervention still exists in some markets, creating barriers to transactions between markets. In addition, some regions have not yet carried out transactions and settlements by time interval for medium- and long-term contracts, resulting in the inability to effectively connect the medium and long-term markets with the spot market. These problems require the continuous improvement of the power market mechanism. The CEC states that setting the target year for the full completion of the national unified power market in 2029 will ensure that power market reform and reforms in other sectors are promoted in parallel and connected with *China's 15th Five-Year Plan for the Power Sector Development*. Based on this, the *Blue Book* proposes eight key tasks.¹²

- 1. Multi-level market structure, clarify the functions of the provincial, regional, and inter-provincial/regional power markets and establish an effective connection mechanism, expand the inter-provincial/regional market entities;
- 2. Complete trading varieties, deepen and optimise the medium and long-term contract market, spot market, ancillary services market, and capacity market, and explore the transmission rights and futures markets;
- 3. Adaption to the green transition, improve the trading mechanism of large-scale wind and solar bases, explore the joint participation of multiple types of entities in the market; improve the green certificate trading mechanism and enhance its liquidity;
- 4. Safety and sufficiency, flexibility and interaction, incentivise conventional units, pumped hydro, new-type energy storage and other regulating power sources, increase the scale of demand-side response (DSR) and promote DSR to participate in the market;
- 5. Open and fair market operation, unify basic trading rules and technical standards, strengthen settlement management, and build a standardised information disclosure system;
- 6. Connection between the wholesale and retail markets, optimise the price transfer mechanism, enrich the retail trading varieties, and simplify the administrative process;
- 7. The connection between policies and management, establish a feedback mechanism between power markets and power planning, and strengthen the support of power markets for power supply security;
- 8. For scientific and efficient supervision, conduct digital supervision and establish a market credit system and evaluation feedback mechanism.

¹² "《全国统一电力市场发展规划蓝皮书》在京发布," China Electric Power News, 29 November 2024, accessed at https://mp.weixin.qq.com/s/TTL4frDNp0tBireqnYo8w; "2029年全面建成全国统一电力市场!," National Energy Administration, China Electricity Council, etc., 29 November 2024, accessed at https://mp.weixin.qq.com/s/URQMhEsbAjZruQ1EJEhsUw.





The inter-provincial spot power market officially starts its operation

The inter-provincial spot power market refers to the day-ahead and intra-day electric energy transactions based on inter-provincial medium and long-term transactions. In August 2017, China launched inter-provincial spot transactions for surplus renewable electricity, which became the inter-provincial spot power market prototype. In November 2021, the State Grid issued the *Inter-Provincial Power* Spot *Trading Rules (Trial)* (CHN: 省间电力现货交易规则(试行)), which established the fundamental rules for inter-provincial spot power market. In January 2022, the inter-provincial spot power market was launched. After the simulation trial operation and settlement trial operation, the market turned to official operation on October 15, 2024.

The inter-provincial spot power market is currently being carried out in the administrative areas of the State Grid and Inner Mongolia Power Co. Ltd., and a complete market system has been formed, including inter-provincial medium and long-term transactions, day-ahead and intra-day transactions, and ancillary services. As of June 2024, the cumulative transaction volume was about 75 TWh, with thermal power, hydropower, wind power, and solar PV accounting for 53%, 21%, 19%, and 7%, respectively; the average transaction price was 0.77 RMB/kWh, 0.24 RMB/kWh, 0.3 RMB/kWh and 0.23 RMB/kWh, respectively. Inter-provincial spot power markets enable efficient real-time transactions in various regions while promoting new energy consumption, bringing more opportunities for new market players such as energy storage and VPPs.¹³

China's first regional power market completes full-month settlement trial operation

The southern regional power market is China's first regional power market, covering five provinces: Guangdong, Guangxi, Yunnan, Guizhou, and Hainan. It has been in trial operation for over two years and has completed multiday and multi-week settlements. In November 2024, the southern regional power market completed its first full-month settlement trial operation, marking that it has the conditions for long-term settlement operation. When the renewable power output of any province fluctuates, the southern regional power market can automatically find the best solution within 15 minutes. During the full-month settlement trial operation, the market added nearly 900 GWh of unplanned hydropower in Yunnan and wind power in Guangxi, effectively avoiding the curtailment of clean energy.¹⁴

¹⁴ "全国首个区域电力市场完成首次全月结算试运行," China Electricity Council, 4 December 2024, accessed at http://www.cepca.org.cn/news/show-27068.html.



¹³ "省间现货市场正式运行——我国电力体制改革再上新台阶," Economic Daily, 18 October 2024, accessed at https://www.nea.gov.cn/2024-10/18/c_1310786781.htm; "一文读懂丨省间电力现货市场如何参与?," bjx.com, 13 November 2024, accessed at https://mp.weixin.qq.com/s/EOGeFBWsJl1gUPJZMO_MA.

3. Policy monitoring

2024-11-21

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NEA releases the fourth batch of the first key equipment list in the energy sector

Notice on the Publicity of the Fourth Batch of the First Major Technical Equipment in the Energy Sector

NEA includes 77 new technologies and equipment in the list of the first major technology equipment in the energy sector. Among them, 12 new-type energy storage projects involve compressed air energy storage, carbon dioxide energy storage, lithium-ion battery energy storage, grid-forming energy storage, liquid air energy storage, flow battery, flywheel energy storage, and intelligent centralised control platform. In addition, six hydrogen energy projects were selected, covering the entire supply chain, including one production, three storage, one application, and one testing equipment.

2024-11-18

https://www.ehctc.com/html/web/gongsixinwen/toutiaoxinwen/1859415101392

NDRC lowers the performance ratio of medium and long-term power coal contracts in 2025

Notice on the Signing and Fulfillment of the 2025 Medium and Long-term Power Coal Contracts

Medium and long-term power coal contracts are one-year or longer contracts signed between coal production enterprises and coal-using units such as unified dispatched public power plants and residential heating power plants. The government also encourages signing long-term contracts of three to five years. In 2024, the yearly production of coal enterprises should be at least 80% of their annual resources, and NDRC has reduced the ratio to 75% in 2025; in 2024, the annual performance rate of medium and long-term power coal contracts should in principle reach 100%, and in 2025, NDRC reduces the performance rate to at least 90%. These changes indicate that the supply and demand environment in China's coal market in 2025 will be easier than in 2024.

2024-10-08

https://www.ndrc.gov.cn/x xgk/zcfb/tz/202410/t20241 024 1393879.html

NDRC clarifies the key tasks of carbon emission statistics and accounting

Notice on Issuing the Work Plan for Improving the Carbon Emissions Statistical Accounting System, NDRC Environment and Resource [2024] No. 1479

Carbon emission measurement and analysis are essential for implementing the dual control system of carbon emissions. NDRC has issued documents to address the current shortcomings. Establishing a national and provincial annual CO₂ report and express report system; carrying out CO₂ accounting work for key industrial sectors such as power and steel, as well as key areas such as urban and rural areas and transport sector to solve unclear issues; promoting CO₂ reporting and verification of key enterprises, studying the calculation method of CO₂ emission of non-fossil energy electricity, and offset methods such as CCUS and carbon sinks; setting CO₂ access levels for key investment projects; and improving the product carbon footprint management system. By 2030, a systematic and complete CO₂ statistics and accounting system will be established.







