

● SEPTEMBER 2022

# CHINA ENERGY POLICY NEWSLETTER

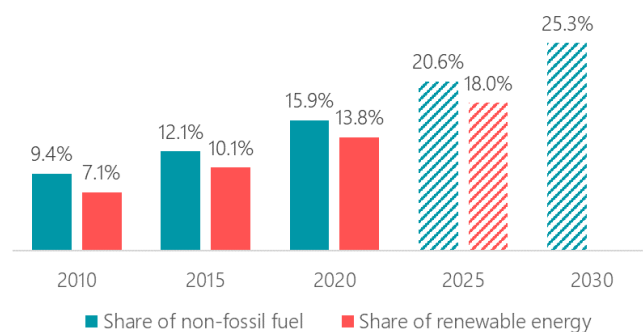
China Energy Transformation Programme

## 1. China energy transition updates

### NEA looks ahead to non-fossil and renewable energy development to 2030

By 2021, non-fossil energy has accounted for 16.6% of total primary energy consumption (TPEC) in China. The National Energy Administration (NEA) expects this proportion to continue to grow at an average rate of 1 percentage point per year until 2030, i.e., 20.6% by 2025 and 25.6% by 2030, completing the established goals of 20% and 25%, respectively. By the end of 2021, renewable energy has accounted for 14.3% of TPEC, and the total installed capacity of renewable power has exceeded 1,000 GW, with more than 50 GW added in the first half of this year. It is estimated that by 2025, the proportion of renewable energy in TPEC will reach 18%.<sup>1</sup> The State Grid predicts that by 2030, China's total installed capacity of new energy, such as wind power and solar PV, will surpass coal to become the dominant power source.<sup>2</sup>

2010-2030 The proportion of non-fossil energy and renewable energy in total primary energy consumption



Source: National Energy Administration (NEA), Energy Research Institute of the National Development and Reform Commission (ERI of NDRC), August 2022

<sup>1</sup> “国家能源局章建华：健全能源领域法律法规体系，加快推进能源立法”，National Energy Administration, 28 July 2022, accessed at <http://www.eptchina.com/news/dnews202207285084.html>.

<sup>2</sup> “国家电网董事长辛保安：2030年新能源装机超煤电成第一”，State Grid, 14 August 2022, accessed at <https://baijiahao.baidu.com/s?id=1741135514286865306&wfr=spider&for=pc>.

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## Extreme weather and loss of water flow cause all-day power shortage in Sichuan

This summer, all of China's 32 provinces except Heilongjiang experienced high temperatures above 35°C, of which 28 provinces even reached 40°C.<sup>3</sup> The continuous high temperature has led to a surge in power load. According to statistics, nearly half of the provinces in the country have experienced regional short-term power restrictions<sup>4</sup>, of which Sichuan is the most severe.

Extreme hot weather and loss of water flow are the main reasons. The primary power source in Sichuan is hydropower, accounting for more than 80% of its power generation in 2021. However, from July to August this year, the water flow in Sichuan dropped by 50% year-on-year, while the peak power load increased by 25% year-on-year, and residents' maximum daily electricity consumption increased by more than 260%. At the same time, Sichuan plays an essential role in inter-provincial power transmission. There's a fixed ratio for local power consumption to the power export of its power generation (about 2:1 in 2020), which means that it does not give priority to the power supply in the province, Sichuan still needs to deliver power to other provinces to fulfil the contract in the case of its power shortage.

Based on the reasons above, the "power shortage" issue in Sichuan is not about the lack of electricity during peak hours but a shortage of both electricity and power (i.e. valuable power generation capacity is less than the peak load at a specific time) throughout the day. Sichuan is the second largest producer of solar PV and semiconductor silicon wafers in the country; it is also a cluster area for upstream and downstream industries of lithium batteries. Power restrictions have caused these enterprises to stop production. Nevertheless, factory inventories can still guarantee supply in the short term, and business operation has not been significantly affected.<sup>5</sup>

To quickly solve the "power shortage" problem in the country, the NEA requires coal enterprises to increase production, ensure the stable and full production of coal power units, and strengthen inter-provincial power mutual assistance. From August 1st to 17th, the average daily production of coal across the country increased by nearly 20% year-on-year, providing strong support for the supply of coal and electricity.<sup>6</sup> Sichuan has put into operation the first national-level coal reserve base, which will supply coal for eight surrounding large coal power plants.<sup>7</sup> In mid-August, the government of Sichuan launched the first-level emergency response for energy supply security, implementing 100% production shutdown measures for six days for all industrial power users participating in the *Orderly Power Consumption Plan*. Some commercial lighting in the city, such as landscape lights and advertising light boxes, were also temporarily turned off to ensure residential power supply. The State Grid also dispatched 50 generators outside the province to provide emergency power to Sichuan's communities, schools, and hospitals.<sup>8</sup>

By the end of August, local rainfall had significantly recovered the hydropower generation in Sichuan, and the electricity shortage had been effectively alleviated. General industry and commerce have resumed electricity use, and large industries are gradually recovering except for energy-intensive industries. It is expected that after the subsequent water flow improves, all large industries will resume normal electricity consumption.<sup>9</sup>

<sup>3</sup> "48天！截至昨天，今年无锡35℃以上高温天数突破历史纪录！" Wuxi Daily, 22 August 2022, accessed at <https://baijiahao.baidu.com/s?id=1741845077613345919&wfr=spider&for=pc>.

<sup>4</sup> "2022年哪些地方限电," www.q2d.com, 20 August 2022, accessed at <http://www.q2d.com/life/74277.html>.

<sup>5</sup> "四川今年为啥这么缺电？" Global Times, 26 August 2022, accessed at <https://baijiahao.baidu.com/s?id=1742177226562393642&wfr=spider&for=pc>; "最高电力负荷同比增25%破纪录！四川今夏为何缺电？" Southern Metropolis Daily, 28 August 2022, accessed at <https://finance.eastmoney.com/a/202208282493775678.html>.

<sup>6</sup> "能源早新闻 | 煤炭日均产量1233万吨，同比增19.4%" China Energy News, 22 August 2022, accessed at <https://baijiahao.baidu.com/s?id=1741830255826487034&wfr=spider&for=pc>.

<sup>7</sup> "四川省首座国家级煤炭储备基地投用，年吞吐量600万吨," The Paper, 22 August 2022, accessed at <https://baijiahao.baidu.com/s?id=1741848063838536927&wfr=spider&for=pc>.

<sup>8</sup> "最高电力负荷同比增25%破纪录！四川今夏为何缺电？" Southern Metropolis Daily, 28 August 2022, accessed at <https://finance.eastmoney.com/a/202208282493775678.html>.

<sup>9</sup> "四川用电紧张缓解，一般工商业用电全部恢复！" The Paper, 29 August 2022, accessed at [https://m.thepaper.cn/baijiahao\\_19660631](https://m.thepaper.cn/baijiahao_19660631).

## Progress on the spot power market development in China

Since 2017, China has established 14 provincial spot power market pilots, of which five pilots in the South Region (i.e., Guangdong), Shanxi, Shandong, Sichuan, and Gansu have achieved continuous settlement throughout the year. In August 2022, the South Region took the lead in launching a regional power market, that is, spot trading has been expanded from trading within Guangdong Province to inter-provincial trading in the five provinces covered by China Southern Power Grid. Currently, coal power generation enterprises and industrial and commercial users are mainly involved in spot power trading.

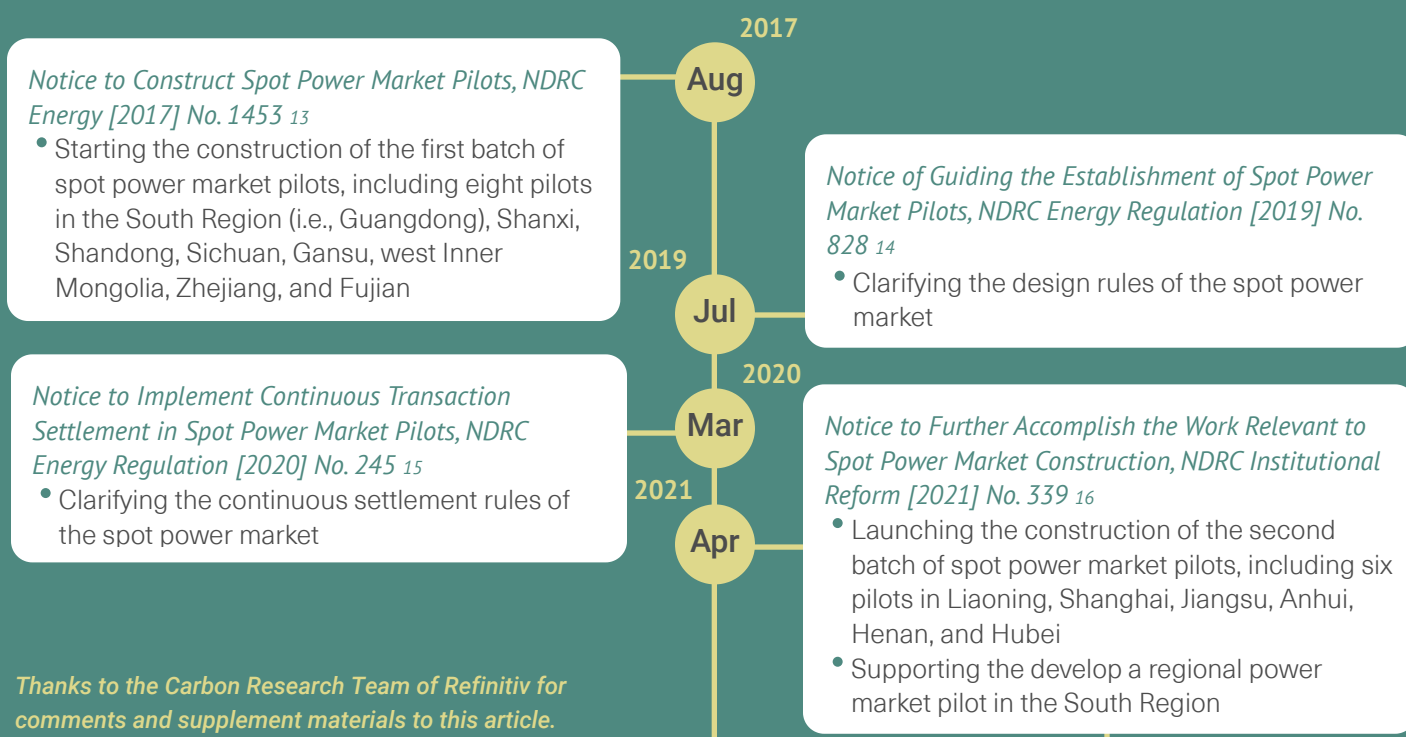
Due to the different power source and load characteristics, the spot power market presents different characteristics in various places. For example, Inner Mongolia has better wind and solar irradiance resources, thus the average price of the spot market in western Mongolia is relatively low, which can attract more production enterprises to settle down. Solar PV power generation accounts for a large proportion in Shandong, and its spot power market sees a period of negative electricity price during the day. The peak-and-valley price difference widens, fully reflecting that the supply and demand of the spot market determine the electricity price.

### Progress of construction of 14 provincial spot power market pilots

|   | Province                                | The share of thermal power generation in 2021 | Current development status   |
|---|---|---|--|
| The first batch of the pilot (Started in August 2017) | Southern (Guangdong)                    | 76%   | The continuous settlement of spot transactions throughout the year (trial operation); among which the South Region has launched a regional spot power market, covering cross-provincial spot transactions in Guangdong, Guangxi, Yunnan, Guizhou, and Hainan |
|   | Shanxi                                  | 86%   |  |
|   | Shandong                                | 90%   |  |
|   | Sichuan                                 | 15%   |  |
|   | Gansu                                   | 58%   |  |
|   | Western Inner Mongolia (Inner Mongolia) | 82%   | The continuous settlement of spot transactions (trial)   |
|   | Zhejiang                                | 76%   | Rules of the spot market are updated, and the simulation and settlement of spot transactions (trial) will be carried out after the approval  |
|   | Fujian                                  | 61%   |  |
| The second batch of the pilot (Started in March 2021) | Jiangsu                                 | 84%   | Spot transaction simulation and settlement (trial)   |
|   | Liaoning                                | 69%   | Spot transaction simulation (trial)  |
|   | Anhui                                   | 92%   |  |
|   | Henan                                   | 87%   |  |
|   | Shanghai                                | 98%   |  |
|   | Hubei                                   | 47%   |  |

Source: National Bureau of Statistics (NBS) <sup>10</sup>, Sichuan Energy Internet Research Institute Tsinghua University <sup>11</sup>, shoudian.bjx.com <sup>12</sup>, accessed in August 2022

### Policy dynamics of spot power market construction



2022

Feb

*Notice on Accelerating the Construction of Spot Power Market, NDRC General Office Institutional Reform [2022] No. 129*<sup>18</sup>

- By the end of June 2022, to start the trial operation of inter-provincial spot trading, to launch the South regional spot power market, to carry out the preparation of regional spot power market construction plans for the Beijing-Tianjin-Hebei and Yangtze River Delta regions
- By the end of 2022, the first batch of eight provincial spot power market pilots should achieve long-term continuous settlement of spot transactions (trial operation)

Oct

*Notice on Further Deepening the Marketization Reform of Coal Power Feed-in Tariff Mechanism, NDRC Pricing [2021] No. 1439*<sup>17</sup>

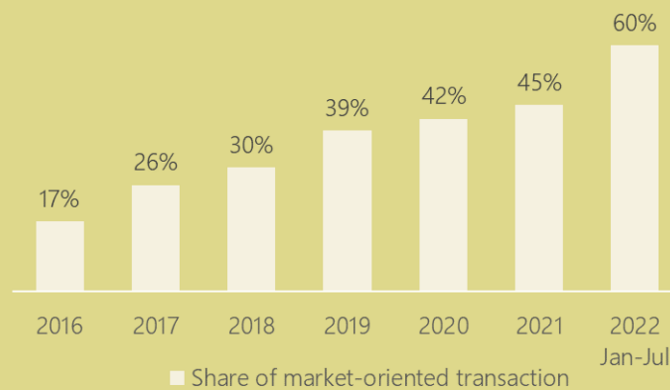
- 100% coal power generation and all industrial and commercial users above 10kV must participate in market-based transactions
- No upper or lower limit on the price formed by the spot power market

## The performance of market-oriented transactions

**As the government mandates that all coal power generation and industrial and commercial users participate in market-oriented transactions, the number of participants in market-oriented transactions and its scale continue to expand.**

According to the requirements of the *NDRC [2021] No. 1439* document, from October 2021, all industrial and commercial users must purchase electricity from the market directly or through the agency of power grid enterprises, the number of market participants has increased rapidly afterwards. The main participants in the power market include direct trading users, retail users without electricity retailing companies, and electricity retailing companies. Within half a year after the issuance of the policy, the number of market players in the State Grid's operating area increased by 50%, of which 12% were direct trading users, and 88% were retail users without electricity retailing companies, mainly general industrial and commercial users and small and micro businesses. Still, the number of new users was lower than expected. This is because there are less than 100 newly registered electricity retailing companies, which means that private capital is still taking a wait-and-see attitude towards the construction of the power market.<sup>19</sup> At the same time, the monthly traded electricity in each province increased by leaps and bounds. From January to July 2022, the cumulative electricity transacted nationwide exceeded 2,900 TWh, a year-on-year increase of 44%, accounting for 60% of the electricity consumption of the whole society.<sup>20</sup>

### The proportion of market-oriented transactions in the national total electricity consumption from 2016 to July 2022



Source: China Electricity Council (CEC), accessed in August 2022

## The performance of spot power markets

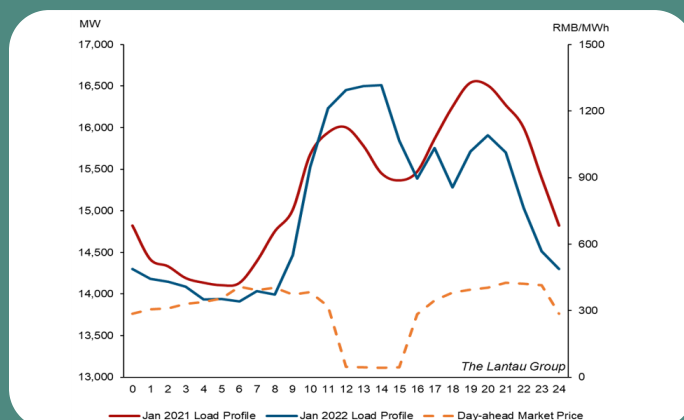
**The spot power market reflects the relationship between power supply and demands more realistically and in real-time, and initially realizes the transmission of primary and secondary energy prices.**

### Reflect real-time power supply and demand changes

Also, by the requirements of the *NDRC [2021] No.1439* document, the government imposes no upper or lower limit on the price formed through the spot power market. Spot transactions reflect the power supply and demand relationship in a timelier manner, and different time-of-use and regional prices are formed through market competition. Taking the spot power market in Gansu as an example, from May to December 2021, its monthly average spot price increased by 87%, providing a significant reference for subsequent medium and long-term contract transactions. At the same time, affected

by market-oriented price fluctuations, more users have changed from "demand-based electricity consumption" to "price-based electricity consumption", and the new user-side peak shaving capacity reaches nearly 2 GW, accounting for about 12% of the peak load in January 2022. Comparing the load curves of the Gansu Power Grid on a particular day in January 2021 and 2022, its peak load is shifted from 18:00 to 11:00, which not only reduces the pressure of the evening peak load hours but also increases the consumption capacity of renewable energy.<sup>21</sup>

### The load curve and day-ahead power price of the Gansu Power Grid on a particular day in January 2022, and the load curve of the same day in 2021



Source: The Lantau Group, the State Grid, accessed in August 2022

### Initial realization of energy cost transmission

According to the requirements of the *NDRC [2021] No. 1439* document, starting from October 2021, all coal power generation will be priced through market-oriented transactions, to more flexibly and truly reflect changes in the cost of coal power generation. In the winter of last year, affected by the tight coal supply, the medium and long-term coal prices in the State Grid's operating areas rose sharply, and the spot prices of electricity in Shanxi and Gansu rose accordingly, with the maximum increases of the monthly average day-ahead and intraday prices exceeded 60%, preliminarily realized the primary and secondary energy price transmission.<sup>22</sup> This summer, the spot power price in many places has risen due to factors such as high temperature and increased demand for electricity. For example, the real-time clearing price of the Shanxi spot power market once reached 1,600 RMB/MWh on August 26th, which truly reflected the cost of local gas power units participating in peak shaving when the power supply was tight.<sup>23</sup>

## References

- 10 "2021年中国内地省市发电量排行榜：23个省市发电量超1000亿千瓦时," chyxx.com, 17 June 2022, accessed at [https://gov.sohu.com/a/558055931\\_120950077](https://gov.sohu.com/a/558055931_120950077).
- 11 "智库之声|陈启鑫：电力中长期合约与现货市场交易实现有效衔接," Sichuan Energy Internet Research Institute Tsinghua University, 17 August 2022, accessed at [https://mp.weixin.qq.com/s/NCqr0Co99qP8ed\\_0lCn\\_A](https://mp.weixin.qq.com/s/NCqr0Co99qP8ed_0lCn_A).
- 12 "第二批电力现货试点全部启动试运行," China Energy News, 11 August 2022, accessed at <https://m.bjx.com.cn/mnews/20220811/1247692.shtml>.
- 13 "国家发展改革委办公厅 国家能源局综合司关于 开展电力现货市场建设试点工作的通知,发改办能源〔2017〕1453号," National Development and Reform Commission and National Energy Administration, 28 August 2017, accessed at [http://www.nea.gov.cn/2017-09/05/c\\_136585412.htm](http://www.nea.gov.cn/2017-09/05/c_136585412.htm).
- 14 "国家发展改革委办公厅 国家能源局综合司印发《关于深化电力现货市场建设试点工作的意见》的通知,发改办能源规〔2019〕828号," National Development and Reform Commission and National Energy Administration, 31 July 2019, accessed at [https://www.ndrc.gov.cn/xxgk/zcfb/gxwj/201908/t20190807\\_960970.html?code=&state=123](https://www.ndrc.gov.cn/xxgk/zcfb/gxwj/201908/t20190807_960970.html?code=&state=123).
- 15 "关于做好电力现货市场试点连续试结算相关工作的通知,发改办能源规〔2020〕245号," National Development and Reform Commission and National Energy Administration, 26 March 2020, accessed at [https://www.ndrc.gov.cn/xxgk/zcfb/gxwj/202004/t20200403\\_1225133\\_ext.html?from=timeline&isappinstalled=0](https://www.ndrc.gov.cn/xxgk/zcfb/gxwj/202004/t20200403_1225133_ext.html?from=timeline&isappinstalled=0).
- 16 "国家发展改革委办公厅 国家能源局综合司关于进一步做好电力现货市场建设试点工作的通知,发改办体改〔2021〕339号," the National Development and Reform Commission and National Energy Administration, 26 April 2021, accessed at <https://finance.sina.com.cn/esg/ep/2021-05-08/doc-ikmxfmm1265202.shtml>.
- 17 "国家发展改革委关于进一步深化燃煤发电上网电价市场化改革的通知,发改价格〔2021〕1439号," National Development and Reform Commission, 11 October 2021, accessed at [http://www.gov.cn/zhengce/zhengceku/2021-10/12/content\\_5642159.htm](http://www.gov.cn/zhengce/zhengceku/2021-10/12/content_5642159.htm).
- 18 "关于加快推进电力现货市场建设工作的通知,发改办体改〔2022〕129号," National Development and Reform Commission and National Energy Administration, 21 February 2022, accessed at <https://baijiahao.baidu.com/s?id=1732039557268953970&wfr=spider&for=pc>.
- 19 "电力市场运行情况及对下一步市场建设的思考," Beijing Electricity Exchange Center, March 2022.
- 20 "2022年1-7月全国电力市场交易简况," China Electricity Council, 26 August 2022, accessed at <https://cec.org.cn/detail/index.html?3-312879>.
- 21 "甘肃电力现货市场建设成效," the State Grid, accessed in August 2022.
- 22 "电力市场运行情况及对下一步市场建设的思考," Beijing Electricity Exchange Center, March 2022.
- 23 "山西电力交易中心市场信息 (2022.08.26)," Shanxi Electricity Exchange, 27 August 2022, accessed at [https://mp.weixin.qq.com/s/\\_MPJkYISiwAKiPrTQ7gzNq](https://mp.weixin.qq.com/s/_MPJkYISiwAKiPrTQ7gzNq).

## 4. Policy monitoring

2022-07-07

[https://www.miit.gov.cn/zwqk/zcwj/wjfb/tz/art/2022/art\\_df5995ad834740f5b29fd\\_31c98534eea.html](https://www.miit.gov.cn/zwqk/zcwj/wjfb/tz/art/2022/art_df5995ad834740f5b29fd_31c98534eea.html)

### Carbon peaking action plan for industrial sector promulgated

*Notice on Issuing the Implementation Plan for Carbon Peaking in the Industrial Sector, MIIT Joint Energy Saving [2022] No.88*

From 2021 to 2025, the energy consumption per unit of the added value of industrial enterprises above the designated scale is to decrease by 13.5%, and the decline in carbon dioxide emissions per unit of industrial added value will be greater than that of the whole society. From 2026 to 2030, the industrial structure and layout will be further optimized, and a modern industrial system featuring high efficiency, greenness, recycling, and low carbon will be basically established. Critical tasks include in-depth adjustment of the industrial structure, active promotion of green manufacturing, vigorous development of the circular economy, acceleration of low-carbon technology reform, and promotion of digital transition. The action plan also proposes specific quantitative targets for the steel, building materials, petrochemicals, non-ferrous metals, consumer goods, equipment manufacturing, and electronics industries.

2022-06-24

[https://www.most.gov.cn/xgk/xinxifenlei/fdzdgknr/qt\\_wj/qtwj2022/202208/t20220817\\_181986.html](https://www.most.gov.cn/xgk/xinxifenlei/fdzdgknr/qt_wj/qtwj2022/202208/t20220817_181986.html)

### Carbon peak action plan for science and technology issued

*Notice on Issuing the Implementation Plan of the Scientific and Technological Support of Carbon Peaking and Carbon Neutrality (2022-2030), MoST Social Development [2022] No.157*

The government aims to make major breakthroughs in core low-carbon technologies in key industries by 2025, to form a batch of low-carbon technology solutions and comprehensive demonstration projects with significant influence by 2030, and to establish a complete low-carbon technology innovation system. The plan proposes to drive the transformation and upgrading of the energy structure with digitalization and intelligence, such as focusing on the research and development of high-precision renewable power generation forecasting, and collaborative planning and peak shaving technologies for coal power and large-scale renewable energy. At the same time, develop high-efficiency energy storage technologies; improve renewable energy, green industry/construction/transportation, CCUS, energy storage, and other cutting-edge low-carbon technology standards; strengthen the construction of national key laboratories.

2022-04-22

[https://www.ndrc.gov.cn/wdt/tzgg/202208/t20220819\\_1333233\\_ext.html](https://www.ndrc.gov.cn/wdt/tzgg/202208/t20220819_1333233_ext.html)

### NDRC requires the development of a national unified carbon emission statistical accounting method

*Notice on Issuing the Implementation Plan for Accelerating the Establishment of a Unified and Standardized Carbon Emission Statistical Accounting System, NDRC Environmental Data [2022] No.622*

By 2023, a unified and standardized carbon emission statistical accounting system will be initially established. By 2025, the accounting methods will be more scientific, and the data quality will be improved all-round. The National Bureau of Statistics (NBS) will uniformly formulate the national and provincial carbon emission statistical accounting methods, and organize the national and provincial annual total carbon emission accounting. The document encourages all regions to formulate statistical accounting methods for carbon emissions below the provincial level concerning national standards. The Ministry of Ecology and Environment (MEE) and the State Administration of Market Regulation (SAMR), together with industry authorities, will organize the formulation and revision of carbon emission accounting methods and relevant national standards for key industries.