

● MARCH 2020

CHINA ENERGY POLICY NEWSLETTER

Boosting Renewable Energy as Part of China's Energy Revolution

1. China energy transition updates

China's energy consumption continues to transform

The National Bureau of Statistics (NBS) published the *2019 China National Economic and Social Development Statistic Report*.¹ According to the preliminary calculations, China's GDP grew 6.1% in 2019 - 0.5 percentage points less than in 2018. The share of tertiary industry in the national industrial added value further increased from 52.2% in 2018 to 53.9% in 2019, while primary and secondary industries both continued to drop. In the energy sector, China experienced a total primary energy consumption of 4.86 billion tons of coal equivalent (tce) in 2019, representing an annual growth of 3.3%. The share of coal decreased from 59.2% to 57.7% although coal production increased by 4.2%. Crude oil consumption increased by 6.8% and natural gas consumption increased by 8.6%. In addition, China's carbon dioxide emission intensity (CO₂ emission per RMB 10,000 GDP) fell by 4.1% in 2019.

NDRC issues incentive policies to tackle the effects of COVID-19

Since the coronavirus outbreak began by the end of 2019, it has made a large impact on China's economic development and industrial production. In the power sector specifically, new renewable projects faced delays in approval and grid connection, curtailment increased significantly in certain regions, and factories and service providers experienced a huge cut down in revenue. According to the China Photovoltaic Industry Association (CPIA), only 10% to 50% of the new PV installed capacity will be able to connect to the grid in March as planned. Furthermore, the solar PV curtailment rates in Shandong, Shaanxi and Anhui increased to between 5% and 14% in February, which was much higher compared to the 2% of the national average in 2019.² On the consumer side, due to the postponement of production, NDRC announced a 5% of reduction on the monthly electricity bill for all industrial and commercial consumers except energy-intensive industries. The policy is in effect from 1 February to 31 June 2020, and may save RMB 36.4 billion for electricity consumers.³

¹ "中华人民共和国2019年国民经济和社会发展统计公报," National Bureau of Statistics, 28 February 2020, accessed at http://www.stats.gov.cn/tjsj/zxfb/202002/t20200228_1728913.html.

² "王勃华:光伏行业2019年回顾与2020年展望、及疫情影响," China Photovoltaic Industry Association, 14 February 2020, accessed at https://www.sohu.com/a/373404940_357198.

³ "国家电网坚决贯彻阶段性降低用电成本政策八项举措支持大工业和一般工商业企业," State Grid, 22 February 2020, accessed at http://www.sgcc.com.cn/html/sgcc_main/col2017021449/2020-02/22/20200222184807773105186_1.shtml.

Renewable subsidy application process simplified

In the newsletter issued in **February 2020**, we introduced the 2020 subsidy policy for offshore wind and CSP. The document also announced the simplification of the subsidy application process for new renewable projects.⁴ New projects should complete an online application, followed by grid operators (TSOs) publishing the list after the approval of provincial energy and pricing administrative departments. MoF will pay the subsidies annually to TSO's and local financial departments, and TSO's should prioritize the settlement for poverty alleviation PV, residential PV, renewable projects to participate in green certificate trading or which voluntarily opt to be subsidy-free in the future. The new process will greatly shorten the subsidy payment period, aiming to relieve the cash flow pressure of project developers.

NEA renews the evaluation standard of PV market monitoring system

China published the annual monitoring results for PV market environment since 2017. The provincial results are categorised in red, orange or green, of which if the result is red, the government will not approve new utility and Top-Runner PV projects.⁵ In January 2020, NEA renewed some of the evaluation criteria.⁶ In this hundred-mark evaluation mechanism, NEA changed the weight of land use cost from 15 to 10, consumption risks (renewable curtailment rates combined with utilization rates) from 10 to 5, and canceled the category of subsidy reduction which used to be worth 10. Project construction status took over the gap, which aims to evaluate the actual time for grid connection. This index reflects the overall coordination of local governments on supporting project approval, environmental impact assessment and grid connection processes, which is seen to be more important compared to subsidy from now on to the near future. Besides, the document refined the weight assigned to different curtailment rates by each 0.5% to 1%. Provinces with a 10% and above curtailment rate will be marked red directly.

NEA publishes the 2023 coal power early warning results

In February 2020, NEA published the forecast results of the Chinese coal power market environment in 2023, named *2023 Early Warning Results for Coal Power Planning and Construction*.⁷ This is a government-based annual forecast regarding the coal power overcapacity, resources restriction and project economy status by province, aiming to guide their next five-year development.

- Regarding the capacity adequacy index, only Gansu, Shaanxi and Ningxia may still have surplus coal power over the required reserve to cover its one-year incremental power demand, i.e. marked red, meaning they are not allowed to build new coal power plants except for emergency units. Furthermore, the coal overcapacity in the Three-North Region (North, Northwest and Northeast) is expected to be reduced in 2023. Such change will bring a higher risk of power supply shortage in specific areas or specific periods of time, and the key solution is to optimize the operation of existing coal power resources, such as optimization of power dispatch mechanism and improvement of thermal power plant flexibility, but not adding large amounts of coal power capacity.
- The resource restriction category is a quantitative interpretation of the condition of local resources including pollutant emissions, water resources and coal consumption, reflecting the feasibility to build new coal power plants. The 2023 result show the approval of new projects in North and East China to be difficult.
- The economic index predicts the profitability of new coal power projects. There are 10 provinces marked red, indicating the rate of return will be less than 8%, so that it is necessary for these provinces to facilitate energy transition.

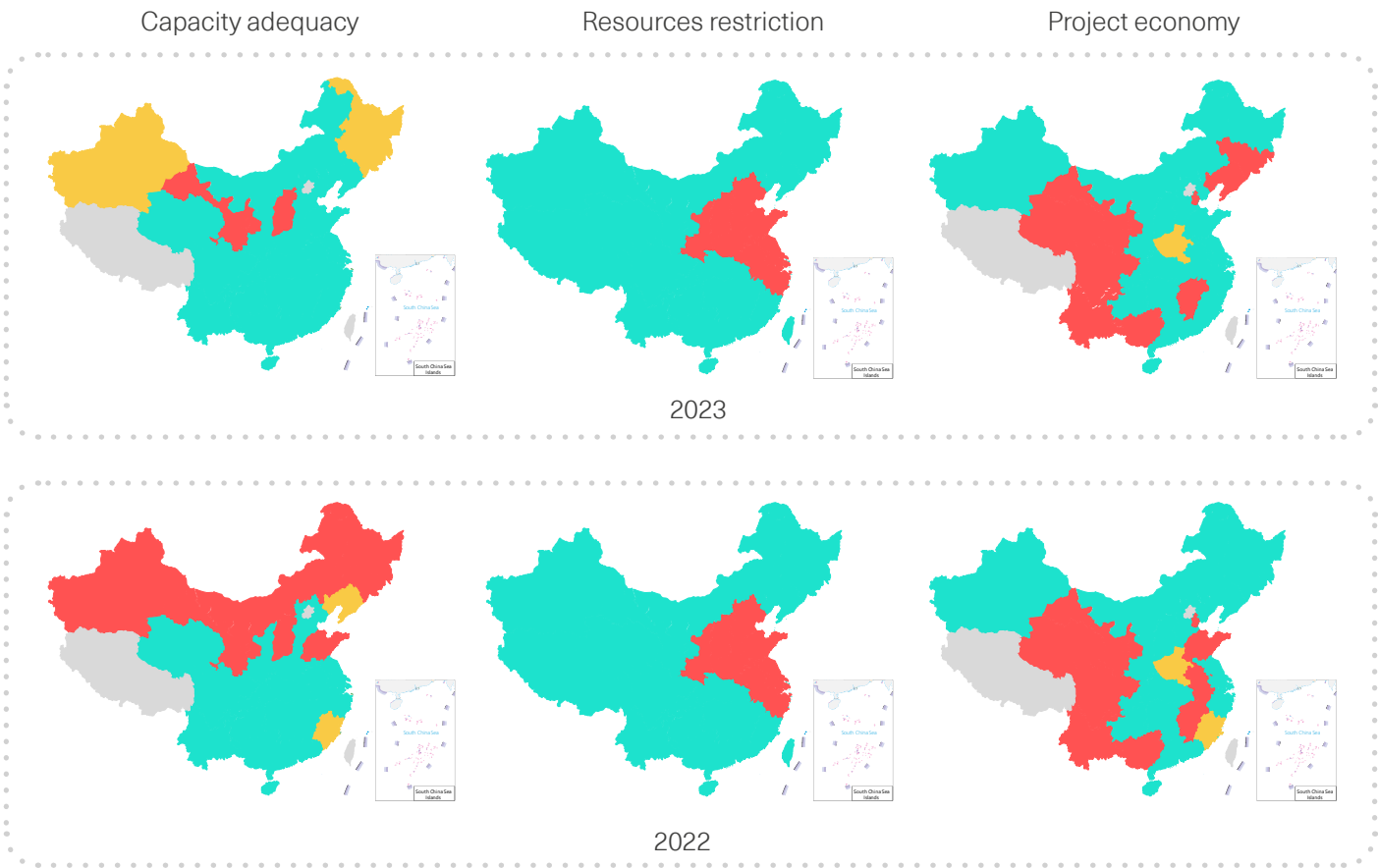
⁴ "财政部 国家发展改革委 国家能源局 关于促进非水可再生能源发电健康发展的若干意见, 财建[2020]4号," Ministry of Finance, National Development and Reform Commission and National Energy Administration, 20 January 2020, accessed at http://jjs.mof.gov.cn/zhengcefagui/202001/t20200122_3463379.htm.

⁵ Top-Runner PV projects has two categories, Commercialized Technology Top-Runners and Merging-Technology Top-Runners. The former for mature, large-scale PV modules which have higher polysilicon conversion efficiency compared to general utility-scale PV plants, while the later focuses on fostering the cutting-edge technology for the future.

⁶ "国家能源局关于印发《光伏发电市场环境监测评价方法及标准（2019年修订版）》的通知," National Energy Administration, 7 January 2020, accessed at http://zfxgk.nea.gov.cn/auto87/202001/t20200121_3974.htm.

⁷ "国家能源局关于发布2023年煤电规划建设风险预警的通知, 国能发电力〔2020〕12号," National Energy Administration, 11 February 2020, accessed at http://www.nea.gov.cn/2020-02/26/c_138820419.htm.

2023 (top) and 2022 (bottom) coal power construction warning index



Source: NEA, accessed in February 2020

2. The impact of increased coal power capacity in Chinese power system



Author

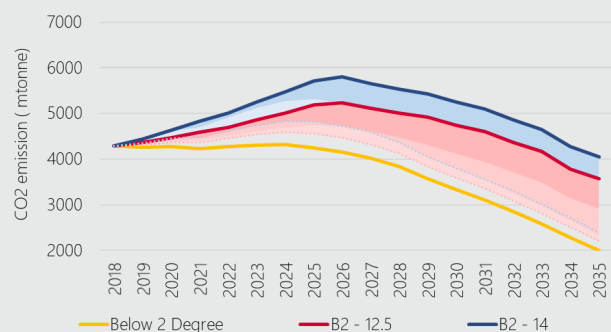
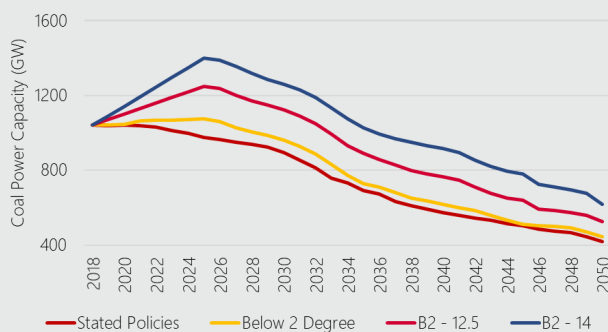
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Background

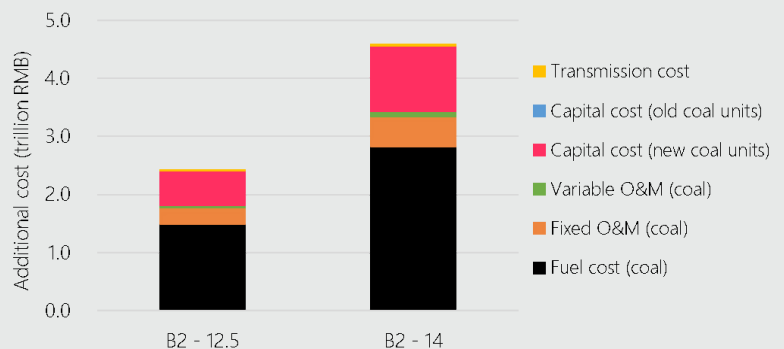
The installed coal power capacity in China amounted to 1,040 GW by 2019. Although China's coal-fired plant fleet is among the most efficient, cheapest and new in the world, the government has clear goals to control the coal consumption under 4.2 billion tonnes by 2020, as well as to comply with the CO₂ emissions reduction commitment in the Paris Agreement. The report *China Renewable Energy Outlook 2019* (CREO 2019) is the flagship publication of the China National Renewable Energy Centre, and analyses the 2050 transition roadmap to achieve a clean, low-carbon, safe and efficient energy system. This present study is complementary to CREO 2019, aiming to investigate the impacts of adding more coal power capacity during the 14th Five-Year period under the four different scenarios:

- Stated Policies: Coal power peaks by 2020; ~30 GW new coal power capacity installed annually in 2021-2025
- Below 2 Degree: Coal power peaks by 2025 at ~1,100 GW; higher power demand compared to Stated Policies
- B2 - 12.5: Coal power reaches 1,250 GW by 2025; rest the same as Below 2 Degree
- B2 - 14: Coal power reaches 1,400 GW by 2025; rest the same as Below 2 Degree

Modelling results



"The figure at the right hand side shows the additional investments from 2019 to 2050 in the power sector with 12.5/14 GW coal capacity in 2025. As more coal power is installed in the system, more capital needs to be invested. In addition, more fuel cost is spent on ensuring profitability of the power plants."



Conclusion and suggestions

- A larger 14th Five-Year target for coal power will postpone the national carbon emission peak from 2024 to 2026, implying China will face bigger stress to fulfill its commitment to the Paris Agreement, i.e. peak by 2030.
- CO₂ emissions of the power sector in B2-14 will increase by 20% compared to B2 from 2021 to 2030, provided the annual utilization hours of coal power plants are between 3,000 and 4,000. In overall, the additional emissions will potentially last until the new plants retire which will increase CO₂ emissions by 40% from 2018 to 2050.
- Adding large amounts of coal power further intensifies competition among all the coal power plants.
- It will also create/result in overcapacity, and investments might end up stranded in the magnitude of RMB 1 to 5 trillion. Considering how wind and solar power will be more cost efficient compared to coal in the future, the coal power fleet would need substantial subsidies to survive in such a situation.
- Hence, the analysis suggests to maintain the total coal power capacity within the 13th Five-Year target, i.e. 1,100 GW, and to strictly control the investment of new coal power plants.

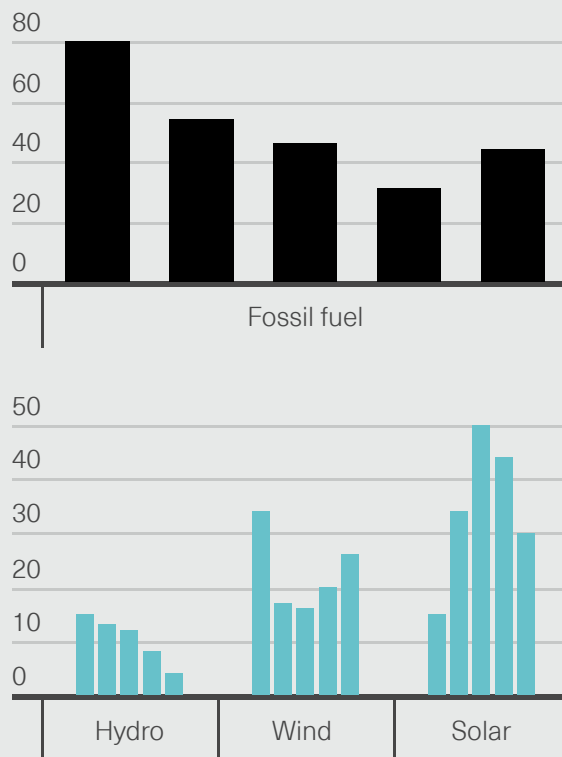
3. Power capacity expansion in China - status and scenarios analysis

2015 - 2019 development

During the 13th Five-Year period (2016 to 2020), so far, the new installed fossil fuel power plant capacity has decreased from 80 GW in 2015 to 44 GW in 2019. The amount of new installed capacity is, however, still very high when taking into account the need for new capacity, the risks related to investments in fossil fuel capacity, and the need to reduce carbon emissions from the power sector.

Investments in new hydro power capacity have decreased throughout the period, while new wind and solar PV capacity has fluctuated. New wind capacity increased in 2019 compared to the previous years while new solar PV capacity decreased for the second year in a row after the record-high peak in 2017, with 52 GW new capacity.

Annual newly installed power capacity 2015 - 2019 (GW)



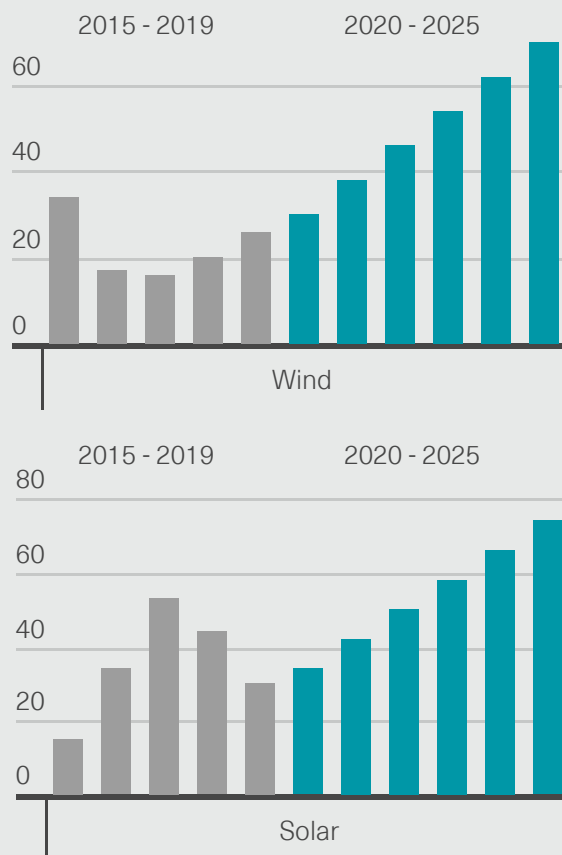
2020 - 2025 - scenarios in CREO 2019

For the 14th Five-Year period (2021 to 2025), the analysis in China Renewable Energy Outlook 2019 (CREO 2019) shows little need for new fossil fuel capacity. For wind and solar PV, the amount of new capacity should increase steadily in order to develop a clean and low-carbon power system.

According to the CREO 2019 analysis, the total wind power capacity should increase from 210 GW in 2019 to 507 GW in 2025, while total solar PV capacity should increase from 205 GW in 2019 to 532 GW in 2025. This would ensure that the Chinese power system would be on track to a Below 2 °C development.

Compared with new installations in the 2015 to 2019 period, a gradual expansion of new wind and solar capacity to reach the 2025 targets would be feasible, provided that the right policy measures are in place.

Annual newly installed power capacity 2015 - 2025 (GW)



4. Policy monitoring

18 February 2020

https://www.ndrc.gov.cn/xxgk/zcfb/tz/202002/t20200224_1221078.html

A new rule for shareholding structure in electricity exchanges has been published

Notice to Issue the Implementation Suggestions on Facilitating Power Exchanges Operating Independently and Normatively, NDRC Reform [2019] No. 234

China aims to open power markets for all business-featured power consumers.⁸ Therefore, NEA requires electricity exchanges in Jing-Jin-Ji, Yangtze River Delta and Pearl River Delta to integrate with each other by 2020; China should be able to establish a national organization system for electricity trading by 2025. The document also requires electricity exchanges to be more independent, implying by 2020, the shareholding ratio of a single stakeholder in all provincial and regional electricity exchanges should be less than 50%.

10 February 2020

http://jjs.mof.gov.cn/tongzhigonggao/202002/t20200224_3473549.htm

11 GW of new poverty alleviation PV projects announced

Notice to Announce the Third Batch of Poverty Alleviation PV Projects Under the Renewable Energy Surcharge Funding List, MoF Construction [2020] No. 13

The government published 11 GW of the third batch of poverty alleviation PV projects, and MoF will prioritize the subsidy payment of these projects. From 2016 to 2019, China had previously issued 11 GW of poverty alleviation PV projects.

19 January 2020

https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/202002/t20200205_1219960.html

https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/202002/t20200205_1219961.html

Provincial and regional T&D pricing mechanisms settled

Notice to Issue the Transmission Tariff Pricing Mechanism for Regional Power Transmission Grids, NDRC Institutional Reform [2020] No. 100

Notice to Issue the Transmission and Distribution Tariff Pricing Mechanism for Provincial Power Transmission Grids, NDRC Institutional Reform [2020] No. 101

The two mechanisms are the amendment of the trial versions issued between 2016 and 2017, which improve the institutionalization and standardization of the T&D pricing mechanism and mark the establishment of the preliminary policy framework of China's T&D supervisory and regulatory system. In the Regional Pricing Mechanism, NDRC focuses to improve four major content, pricing principle, methods and calculation formulas, as well as the service prices of grid sharing. A clear pricing T&D principle is important to reflect the real cost of grid operation, and it improves the fairness, practicality and transparency of the T&D cost distribution.

31 December 2019

<http://openstd.samr.gov.cn/bz/gk/gb/newGbln-fo?hcn=1D988D54A-435E864E67CAA1321-7E8A99>

New code on security and stability for power system issued

Code on Security and Stability for Power System, GB 38755-2019

The *Code on Security and Stability for Power System* is a national compulsory standard in China, the GB 38755-2019 version will replace the DL 755-2001 version after 1 July 2020. In the past two decades, grid structure and power mix both changed significantly in China. Due to the increased Ultra-High-Voltage transmission lines and renewable power integration, the transmission capacity expanded and grid characteristics became more complex. The new code is designed to focus on new challenges to the safety and stability of the power system.

⁸ Business-featured power consumers all electricity consumers except residents, agriculture, major utility and public welfare facilities, and mandatory power consumers to serve power generators.