

● JULY 2020

CHINA ENERGY POLICY NEWSLETTER

Boosting Renewable Energy as Part of China's Energy Revolution

1. Energy transition updates

NEA issues the 2020 Energy Work Plan

On 22 June 2020, the National Energy Administration (NEA) issued the *2020 Energy Work Plan*.¹ The government sets up both quantitative and qualitative targets from five aspects covering energy consumption, energy security, quality and efficiency, people's benefit and marketization and innovation. In 2020, the indicative target of China's total energy consumption is within five billion tonnes of standard coal equivalent, of which the share of coal drops to about 57.5%. Oil production is expected to reach about 193 million tonnes, and natural gas production to reach about 181 billion cubic meters. The installed power generation capacity of non-fossil fuel aims to reach 900 GW. The newly increased heating area supplied by the updated heating systems² is about 1.5 billion square meters, and the power replacement program may increase the annual electricity consumption by 150 TWh, making the share of electricity in final energy consumption to reach 27%. Major qualitative targets include:

- Increase of the overall energy system efficiency especially for clean energy
- Complete the retrofit of ultra-low-emission equipment for coal power units in western regions considering local conditions
- Promote PV poverty alleviation projects and rural grid retrofit
- Keep removing non-power relevant businesses from TSOs, facilitate pilot run of continuous transaction in spot power markets and improve oil and gas operational mechanisms
- Make major breakthrough in key energy technology equipment and promote hydrogen energy industrial development
- Speed up the legislative process of the *China Energy Law* and carry out the research of *China Power Law* and *China Coal Law*

¹ "Notice on Issuing the Guidance on Energy Work Plan in 2020," National Energy Administration, 22 June 2020, accessed at http://www.nea.gov.cn/2020-06/22/c_139158412.htm.

² Updated heating systems include heat supply from natural gas, electricity, geothermal, biomass, solar, exhaust heat from industry, coal power plants qualified with ultra-low emission standard, and nuclear.

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The 2020 PV project tendering results issued

On 28 June 2020, NEA published the 2020 PV project tendering results.³ It covers 15 provinces and Xinjiang Corp region with 25.97 GW of solar PV projects that are qualified to receive the national subsidy, accounting for 77.5% of total tendering capacity. Among them, 25.63 GW (98.7%) is utility-scale PV, 300 MW (1.3%) is distributed industrial and commercial PV that is 100% connected to grids, and 8 MW (0.03%) is self-consumed distributed industrial and commercial PV. As in Guizhou province, the difference between the local benchmark coal power feed-in tariff (FiT) and the guiding PV FiT is relatively big compared to other provinces, 20% of subsidized PV projects are located in Guizhou. This is followed by Ningxia, Hebei, Zhejiang, Jiangxi and Qinghai, each has more than 2 GW of capacity. From a price perspective, the weighted average FiT nationwide is RMB 0.3720/kWh, 14.8% less than that of 2019; the weighted average subsidy which would be paid is RMB 0.03/kWh, 49.2% less than that of 2019.

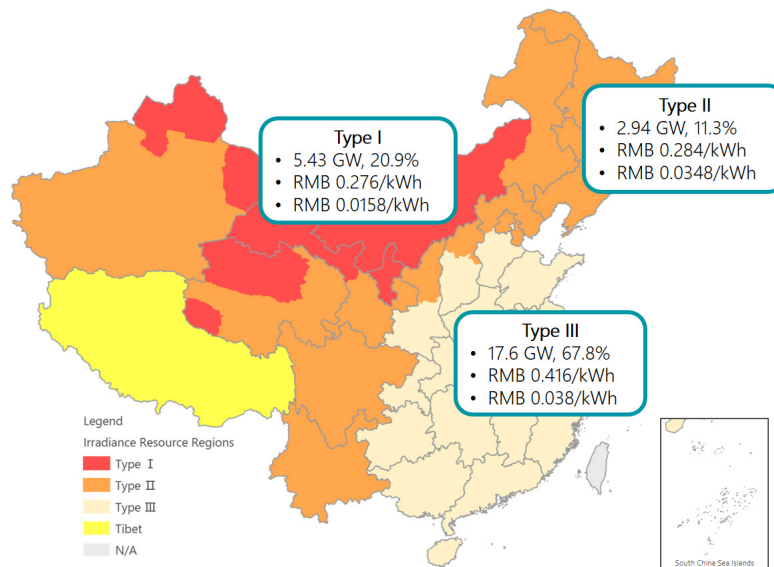
In overall, the design of the PV tendering mechanism becomes more mature in 2020. Local governments and bidders both have more time to prepare, making the tender sufficiently competitive and tendering prices are reasonable. A prominent feature is that a certain number of bid winners are large-scale developers who have capital strength and are experienced in project construction and operation. They take advantage of single project capacity, equipment procurement, financing and project operation and maintenance. This trend is expected to continue after the subsidy is completely phased out.

2020 PV tendering results by project type

	Utility-scale PV	Distributed industrial and commercial PV that 100% connected to grids	Self-consumed distributed industrial and commercial PV
Installed capacity	25.63 GW	330 MW	8 MW
Weighted average FIT	RMB 0.3720/kWh		RMB 0.2895/kWh
Weighted average subsidy	RMB 0.033/kWh		RMB 0.03/kWh

Source: National Energy Administration (NEA), June 2020

2020 PV tendering results by solar irradiance resource region



Source: NEA, June 2020

³ “2020年光伏发电项目国家补贴竞价工作总结情况,” National Energy Administration, 28 June 2020, accessed at http://www.nea.gov.cn/2020-06/28/c_139172962.htm.

The government clarifies the 2020 renewable power installed capacity targets

In order to secure energy supply, the Chinese government proposes key measures for 2020.⁴ The coal mining sector should continue to shut down outdated and polluted small-scale coal mines, controlling the number of coal mines within 5,000 nationwide. Large-scale coal mines should provide 96% above annual coal production. Power sector should continue to diversify the power mix. The government will strictly control the incremental coal power capacity and strongly promote clean power sources provided there is sufficient consumption capacity, especially prioritizing inter-provincial clean power transmission and carrying out wind and PV energy storage pilots. By 2020, the installed capacity of general hydropower should reach 340 GW, wind and PV power should reach 240 GW each. In addition, domestic oil and gas production should have a steady growth.

The government aims to control the coal power installed capacity in 2020

The government announced that it aims to control the total installed capacity of coal power plants in 2020 to be within 1,100 GW, implying the 2020 target issued the *13th Five-Year Plan for Power Sector Development* remains.⁵ By 2019, coal-fired power capacity has reached 1,040 GW.⁶ The government will continue to clean up illegal coal power plants and shut down outdated coal power units in 2020. New coal power plants shall be approved according to local power demand, which means the government intends to increase the coal power capacity moderately and orderly. The coal power sector should give efforts on providing emergency reserve and peak load regulation services, as well as continue to carry out retrofit programs to achieve low emission and energy saving.

The policy also emphasizes that local governments should carry out approval and construction of new projects based on the *2023 Early Warning Results of Coal Power Planning and Construction*. The results consist of three indexes, capacity adequacy, resources restriction and project economy by province (region). If the capacity adequacy of the province is marked red or yellow, the approval and construction of new local-consumed projects should be postponed except combined heat and power (CHP) projects for people's livelihood. For provinces marked green in capacity adequacy, new projects are allowed provided they are following the land use, environmental protection and water conservancy requirements. Among these provinces, if the resource restriction is marked red, additional requirements in the *Three-Year Blue Sky Protection Plan* should be followed, implying to strictly control the incremental coal power capacity.

Local governments require new wind and PV projects to install storage systems

Application of energy storage systems could help to smooth the intermittent output of wind and solar power. The Chinese government encourages diverse renewable energy assembled storage solutions including electricity, heat and hydrogen storage systems. In 2019, the *2019-2020 Action Plan to Guide the Technological and Industrial Development of Energy Storage Sector* determines six major development tasks.⁷ They are promoting technical research and development, improving policy environment, adjusting the planning of pumped hydro storage site selection, launching demonstration projects, promoting the application of energy storage in new energy vehicle industry and improving the standard system. Responding positively, in 2020, local provinces have issued a few policies, requiring new wind and PV power projects to install energy storage facilities.

⁴ “国家发展改革委 国家能源局关于做好2020年能源安全保障工作的指导意见,” National Development and Reform Commission, 12 June 2020, accessed at http://www.gov.cn/zhengce/zhengceku/2020-06/18/content_5520311.htm.

⁵ “关于做好2020年重点领域化解过剩产能工作的通知，发改运行〔2020〕901号,” National Development and Reform Commission and Ministry of Industry and Information Technology, etc., 12 June 2020, accessed at https://www.ndrc.gov.cn/xxgk/zcfb/tz/202006/t20200618_1231503.html.

⁶ “中电联发布2019-2020年度全国电力供需形势分析预测报告,” China Electricity Council, 21 January 2020, accessed at <http://www.cec.org.cn/guihuayutongji/gongxufenxi/dianligongxufenxi/2020-01-21/197090.html>.

⁷ “关于印发《贯彻落实<关于促进储能技术与产业发展的指导意见>2019-2020年行动计划》的通知,” National Development and Reform Commission, 25 June 2019, accessed at http://www.gov.cn/xinwen/2019-07/02/content_5405225.htm.

Nevertheless, there is a debate on whether and how to apply energy storage systems in the power sector. On the one hand, a storage system will help to consume wind and PV power, but on the other hand, installing a storage system on the power generation side will increase the project's capital cost, which will bring new challenges on cost reduction especially during the current period of phasing out subsidies.

Local policies issued in 2020 require to install energy storage system on power generation side

Document	Province/ Company	Issued time	Requirement
<i>Opinions on Consumption of Newly Built PV Projects in 2020</i>	State Grid Shanxi Electric Power Company	2 June 2020	New PV project should prior to serve consumers covering the whole industry chain with certain power load, installing energy storage system with 15%-20% of projects' installed capacity and implementing the consumption proposal.
<i>Notice on Carrying Out Primary Frequency Response Retrofit of New Energy Power Plants</i>	Shanxi	26 May 2020	Wind and PV plants connected to grids of 35kV and above should be retrofitted with primary frequency response capability. The solution includes installing energy storage systems.
<i>Construction Plan of Wind Power Projects</i>	Liaoning	14 May 2020	The government will give priority to new wind power projects with energy storage facilities to provide peak load regulation services.
<i>Notice on Organizing the Construction of Wind and PV Power Projects in 2020</i>	Henan	7 April 2020	The government will prioritize subsidy-free wind projects with energy storage systems.
<i>Notice on Management Measures for Energy Storage at Power Generation Side of Xinjiang Power Grid (draft for comments)</i>	Xinjiang	1 April 2020	Power generation companies, electricity selling enterprises, consumers and independent ancillary service providers that invest in energy storage facilities will receive a subsidy of RMB 0.55 per kilo-watt-hour of electricity charged.
<i>Notice on Tendering Plan for PV Projects in 2020</i>	Inner Mongolia	27 March 2020	The government will prioritize PV-energy storage projects. For general utility-scale PV projects, the energy storage system should apply to the standard of 5% and above of installed capacity/1hr+.

Source: ERI of NDRC, accessed in June 2020

2. Power spot markets can be important drivers for promoting renewable energy, if the design is right

China is determined on developing power spot markets as the future set-up for power system operation. At the same time, China has ambitious goals for the deployment of wind and solar as an integrated part of the power system. International experience shows that it is possible to obtain efficient power markets and successful integration of renewables if the market design is right. Renewable energy needs to have a level playing field with other sources for power production. Market transparency is vital for the efficiency of the market and flexibility shall be promoted as part of the market set-up.

This is some of the findings from a new report “Spot market models for renewable energy integration – international experience”, which is a result of the ongoing, close cooperation between the Danish Energy Agency (DEA) and the China National Renewable Energy Center (CNREC) within Energy Research Institute.

The report targets Chinese stakeholders including energy producers and power system operators. Please download the full English report [here](#). The Chinese version is under translation.



Different market designs with different advantages and disadvantages for RE

There are different ways to set up a spot power market. Since China has not yet found its target model structure, it is useful to discuss the market features in the European and the U.S. market models. The report describes to what extent different market designs (i.e., centralised/decentralised) and pricing mechanisms (i.e., nodal/zonal) affect renewable participation and pricing in the market. Europe approaches a decentralized power market with zonal pricing, whereas the U.S. markets generally consist of centralized markets characterized by nodal pricing.

From the report, it emerges that market participants in a decentralised power market gain more decision-making power and better control over hedging unforeseen costs and price spikes, although high technical requirements are imposed on market participants. Zonal pricing allows electricity trading as a standard product in secondary markets, but is less efficient in handling congestion. A centralised power market is more efficient in congestion management, although may lead to greater price fluctuation. Nodal pricing reflects the temporal and spatial value of electricity, but requires complicated calculation and might allow market manipulation.

How to mitigate risk for renewable energy projects

The report also discusses how to obtain an enabling framework for renewable deployment. It examines selected risk factors for renewable producers when participating in liberalized power markets and how these are mitigated in the European context. The main outcomes include:

- 1 Market transparency is necessary to achieve fair competition, providing the same information to all market participants.
- 2 Feed-in-Tariffs, Feed-in-Premium, Contract for Differences and Power Purchase Agreements can help reducing the risk of renewable operators.
- 3 Detailed and common rules about connection shall be available to all prospective new generators in due time, to ensure non-discriminatory treatment.
- 4 In the Day-Ahead market, the width of price span between minimum and maximum prices should be based on the trade-off between reducing risks of inflexible generators/consumers and providing incentives for flexibility and reserve capacity.

3. Policy monitoring

17 June 2020

<http://yss.mof.gov.cn/2020zyys/>

MoF issues the 2020 renewable power subsidy budget plan

In 2020, the Ministry of Finance (MoF) plans to issue RMB 92.355 billion of the central government budget to subsidize renewable power enterprises and individuals, a 7.5% year-on-year increase. In which RMB 88.352 billion is from electricity surcharge income in 2020 and the rest RMB 4.03 billion is the surplus budget of 2019. According to the policy issued jointly by MoF, NDRC and NEA earlier in March 2020, grid operators should prioritize the subsidy settlement for poverty alleviation PV, residential PV, renewable projects to participate in green certificate trading or which voluntarily opt to be subsidy-free.⁸

28 May 2020

https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/202006/t20200608_1230930_ext.html

NDRC issues the regulatory rules on grid planning and investment

The national power planning should focus on proposing construction plans of inter-provincial and inter-regional power transmission lines and 500kV and above intra-provincial power transmission projects. NEA and provincial energy administrative departments will revise the Five-Year Plan for power sector development two to three years after it is published according to the implementation status and change of local economic conditions. Formulation of power grid planning should adopt market-oriented principles, considering the business opportunities of incremental power distribution business. Economically, the plan also should calculate the total investment and evaluate the impact of increasing amount of power transmission and distribution on the transmission and distribution tariffs. This policy is effective for five years since 28 May 2020.

⁸ “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.