DECEMBER 2020

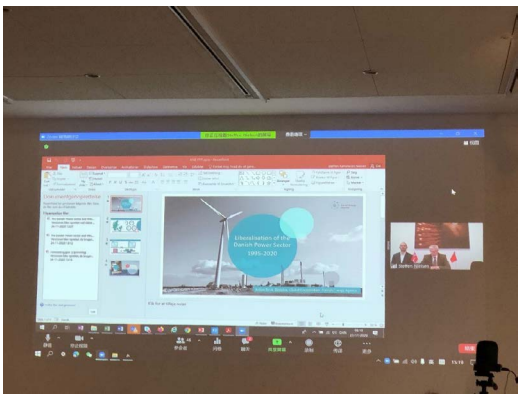
CHINA ENERGY POLICY
NEWSLETTER

Boosting Renewable Energy as Part of China's Energy Revolution

1. Project activities

Danish power market liberalisation experiences

The Danish Energy Agency (DEA) together with the Royal Danish Embassy in Beijing and the EU China Energy Cooperation Platform (ECECP) jointly organized the workshop of *Carbon Neutrality and Unbundling of the Electricity Sector* on 25 November 2020 in Beijing, China. Approximately 70 guests and audience participated, partly online and partly on-site. The Danish Ambassador Thomas Østrup Møller opened the webinar and expressed great satisfaction with President Xi Jinping's announcement of China's efforts to achieve carbon neutrality by 2060. The Director of DEA's Centre for Global Cooperation, Anton Beck, gave a keynote speech about the Danish experience on power sector liberalisation. He emphasized the ambitious Danish 2030 and 2050 targets for renewable energy development while maintaining a high level of the security of power supply. This was followed by a presentation given by the Special Advisor of DEA, Loui Algren, on how unbundling can support achieving these goals. The presentation was based on the main conclusion of the report *Liberalisation of the Danish Power Sector 1995-2020 - An International Perspective on lessons learned*. The subsequent discussion focused on how Denmark has managed to maintain a high security of power supply with an increased share of VRE in the electricity system and how China can learn from the Danish experiences. The full English report can be downloaded **here**, and it will also soon be available in a Chinese version.



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Danish Energy Agency

可再生能源推动能源革命研究
Boosting Renewable Energy
As part of China's energy revolution

国家发展和改革委员会
能源研究所
Energy Research institute, NDRC, P.R.C

2. China energy transition updates

China puts forward the proposals for the 14th Five-Year Plan for economic and social development

On 3 November 2020, the Central Committee of the Communist Party of China (CPC) issued proposals on formulating the *14th Five-Year Plan for National Economic and Social Development and the Long-Term Vision Objectives Through the Year 2035* (CHN: 《国民经济和社会发展第十四个五年规划和二〇三五年远景目标》).[1] Many topics of the published *Proposal* relates to energy transition and low-carbon development. The CPC requires the energy sector to secure power, oil, and gas infrastructures, to formulate an action plan for peaking carbon emissions in 2030, and to support qualified regions to take the lead in peaking carbon emissions. By 2035, China would have extensively established green production approaches and form green lifestyles, the carbon emissions would decrease steadily after reaching the peak, and the ecological environment would be fundamentally improved.

The 14th Five-Year plans should aim to achieve the 2035 objectives, realizing the optimisation of energy resources allocation, greatly increasing the energy utilization efficiency, and reducing the total discharge of major pollutants constantly. New energy and new energy vehicles are two of China's strategic emerging industries; thus, the government will encourage the merger and reorganization of related enterprises to prevent low-level redundant competition. For infrastructure construction, the government will optimize the layout of power generation assets and power transmission channels, improve the capacity of renewable energy consumption and storage, and enhance the ability of power transmission and distribution in remote areas. In addition, the government will continue to promote market-based reforms in the competitive sectors of the energy industry.

The Ministry of Ecology and Environment (MEE) intends to translate the requirements related to ecological and environmental protection into a specific implementation roadmap. With the goal of peaking carbon dioxide emissions by 2030, it will force the energy system to undergo a green and low-carbon transition and will collaboratively improve the ecological environment. In addition to the compilation of the *14th Five-Year Plan for Climate Change*, the MEE will focus on the governance of carbon emission sources. In terms of improving the ecological environment, the MEE will adopt top-down approaches to reduce total emission and emission sources, as well as to promote the optimisation of the structures of industry, energy, transportation and agriculture sectors.[2]

MEE solicits opinions on the allocation method of carbon allowances in the power industry

The MEE recently published the *2019-2020 National Carbon Emission Trading Allowance Setting and Distribution Implementation Plan (Power Generation Industry) (draft for comments)* (CHN:《2019-2020年全国碳排放权交易配额总量设定与分配实施方案（发电行业）》（征求意见稿）), which basically clarifies the major entities in the power sector that should participate in the national ETS and the allocation approach of the carbon allowances.[3] According to the criteria of companies (including captive power plants) with emissions of no less than 26,000 tons of carbon dioxide equivalent or energy consumption is about 10,000 tons of standard coal in the power generation industry in any of the year from 2013 to 2018, the key emission units required to participate in the national ETS including 2,267 power generation companies. The State Council will allocate all carbon allowances from 2019 to 2020 free of charge and use the benchmark method to calculate the allowances. The finalization of the policy document indicates that the national ETS has entered a substantive implementation stage.

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[1] "中共中央关于制定国民经济和社会发展第十四个五年规划和二〇三五年远景目标的建议," Xinhua News Agency, 3 November 2020, accessed at **http://www.gov.cn/zhengce/2020-11/03/content_5556991.htm**.

[2] "生态环境部明确"十四五"生态环保规划五大着力点，将以碳排放达峰倒逼能源结构绿色低碳转型," the Ministry of Ecology and Environment, 21 November 2020, accessed at **https://www.sohu.com/a/433329514_722664**.

[3] "关于公开征求《2019-2020年全国碳排放权交易配额总量设定与分配实施方案（发电行业）》（征求意见稿）及相关文件意见的通知，环办便函〔2020〕416号," Ministry of Ecology and Environment, 20 November 2020, accessed at **http://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202011/t20201120_809087.html**.

Total allowance of power generation units = Power supply benchmark value × Actual power supply × Correction factor + Heating benchmark value × Actual heat supply.

Category of unit	Category of unit/capacity	Power supply benchmark value (tCO_2/MWh)	Heat supply benchmark value (tCO_2/GJ)
I	Conventional coal-fired units above 300 MW	0.877	0.126
II	Conventional coal-fired units of 300 MW and below	0.979	0.126
III	Unconventional coal-fired units such as coal gangue and coal water slurry（including Coal-fired circulating fluidized bed unit）	1.136	0.126
IV	Gas unit	0.392	0.059

Source: The Ministry of Ecology and Environment

MoF determines the scope of renewable power projects to receive national subsidies

The government clarifies that all renewable power generation projects that have been approved and connected to the grid with full capacity since 2006 can receive state national subsidies, including onshore and offshore wind power, utility-scale and non-natural person distributed solar PV, CSP, geothermal power and biomass power in specific. The time of full capacity grid connection determines the subsidy intensity. The projects need to commit three deadlines when applying for subsidies, the promised full-capacity grid-connection time, the full-capacity grid-connection time specified in the power business license, and the full-capacity grid-connection time in the power dispatch agreement. If the three deadlines are inconsistent, the project will receive the corresponding subsidy at the last full-capacity grid-connection time.[4] Ms. Shi Jingli, researcher at the Energy Research Institute of the National Development and Reform Commission (ERI of NDRC), comments on the policy:

- The central government cancels the previous requirements on grid connection time of renewable power projects to apply for subsidies (wind power before the end of 2019, solar PV before the end of July 2017, and biomass power before the end of February 2018), and defines the right to receive subsidies for all compliant projects, making the subsidy policies integrated.
- It will effectively ease the pressure on cash flow for compliance projects. On the one hand, it provides the basis for the power grid enterprises to pay the subsidy in proportion; on the other hand, it makes clear of the boundary conditions of project's return on investment, providing information for project transfer and transaction.
- The elaboration on the definition of "full-capacity grid-connected time" clarifies the intensity of subsidies that each project will receive, and can eliminate long-term delays in the construction of some wind power and solar PV projects.

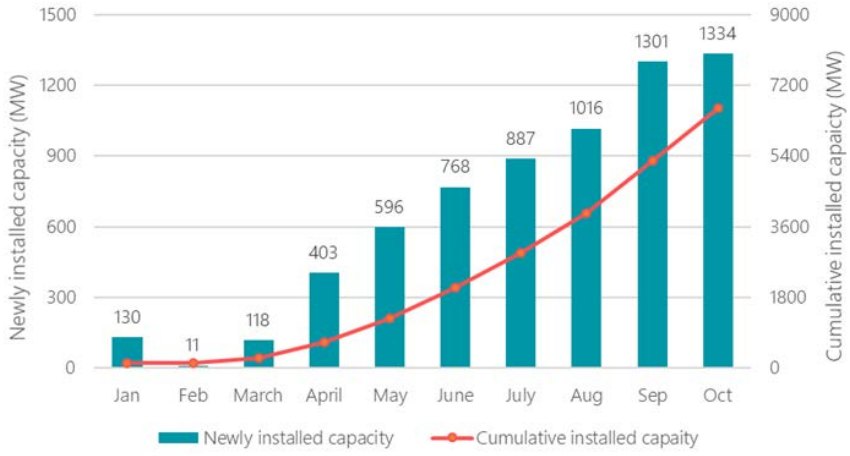
After the promulgation of the policy, the proportion of subsidies paid in equal proportions will decrease due to an increase in the number of projects to be subsidized. Some projects will see a postpone in the approval of "full-capacity grid-connection time" and consequently reductions in subsidy intensity. Nevertheless, in overall this policy regulates the management of subsidy approval and is conducive to the development of the renewable energy industry.

[4] "关于加快推进可再生能源发电补贴项目清单审核有关工作的通知，财办建〔2020〕70号," Ministry of Finance, 18 November 2020, accessed at http://www.gov.cn/zhengce/zhengceku/2020-11/25/content_5564021.htm.

The capacity of national subsidized household PV in 2020 determined

According to the data released by the National Energy Administration (NEA), the cumulative installed capacity of household PV projects receiving national subsidies in 2020 has reached 6.61 GW as of October 2020.[5] Earlier in March, the NEA issued the 2020 solar PV subsidy plan which clarified that household PV projects adopt a first-come, first-served approach. When the total capacity of the projects applied for subsidies reached 6.0 GW in that month (e.g. October), as of the next month (e.g. November), all eligible applications will receive central financial subsidies. Therefore, the application deadline for subsidies is 30 November 2020. The total subsidy for each project each year is RMB 0.08 per kWh multiplied by the project capacity and then multiplied by 1,000 hours.[6]

Newly installed and cumulative household PV capacity from January to October 2020



Source: National Energy Administration (NEA), accessed in November 2020

The first offshore wind power project in Northeast China is connected to the grid

On 30 November 2020, the 300 MW Dalian Zhuanghe III offshore wind power project in Liaoning Province connects to the grid with full capacity, which is the first offshore wind power project put into operation in the Northeast China. The China Three Gorges Renewables (Group) Co., Ltd. is the project owner, investing RMB 5.14 billion in total. In addition to the 3 MW and 3.3 MW wind turbines, the project installed the first batch of low-temperature, large-diameter 6.45 MW wind turbines, laying the foundation for the commercial operation of this level of wind turbines. The project is expected to generate 714 GWh of electricity annually, with an average annual utilization of 2,379 hours. It can save about 230,000 tons of standard coal each year, reduce carbon dioxide emissions by 637,000 tons, and save 208,400 tons of water. The city of Dalian plans to put into operation of five more offshore wind power projects during the 14th Five-Year period.[7]

[5] "户用光伏项目信息（2020年11月）," the National Energy Administration, 16 November 2020, accessed at **http://www.nea.gov.cn/2020-11/16/c_139519900.htm**.

[6] "国家能源局关于2020年风电、光伏发电项目建设有关事项的通知，国能发新能〔2020〕17号," National Energy Administration, 5 March 2020, accessed at **http://zfxxgk.nea.gov.cn/2020-03/05/c_138862190.htm**.

[7] "东北地区首个海上风电场全容量并网," CCTV, 27 November 2020, accessed at **https://new.qq.com/rain/a/20201127A04U7Q00**; "东北首个海上风电项目正式全容量并网," China Three Gorges Renewables (Group) Co.,Ltd, 30 November 2020, accessed at **https://new.qq.com/omn/20201130/20201130A05C9H00.html**.

3. How *Mandatory Renewable Power Consumption Mechanism* play its role under the carbon neutrality target

SHI Jingli

Professor,
Energy Research Institute, National Development and Reform Commission (ERI of NDRC)

Professor Shi started to work in ERI since 1995. Her research focuses on renewable energy policies, regulations, planning and strategy. Shi's latest projects include assessment of the *Renewable Energy Law*, study and draft of the *13th Five-Year Plan for Renewable Development*, improvement of renewable pricing and incentive policies and establishment of green certificate trading mechanism. She holds a master's degree in electrical engineering from the North China Electric Power University and a bachelor's degree in the same major from the Tsinghua University.

**This is amended from Ms. Shi Jingli's article that published in the Energy magazine on 13 November 2020.*

Policy overview

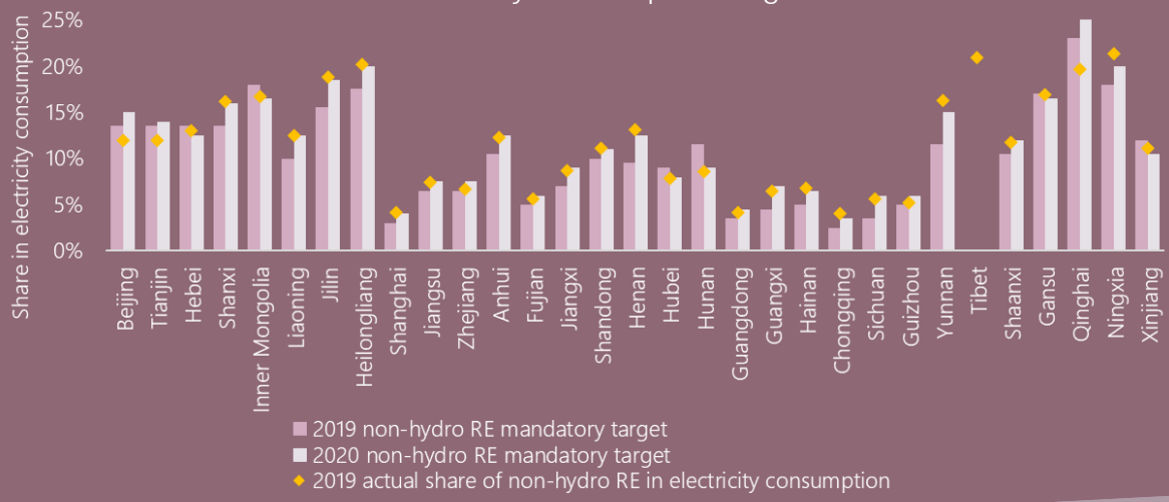
In May 2019, the National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) jointly issued the Notice on the Establishment and Improvement of Safeguard Mechanism for Renewable Power Consumption (CHN:关于建立健全可再生能源电力消纳保障机制的通知) (hereafter referred to as the *Policy*). It is a compulsory and binding policy, that every year the central government sets a quota for each province, which stipulates a certain percentage of electricity consumption is renewable energy. By combining the policy of mandatorily purchasing minimum full load hours of renewable power by TSOs on the power supply side, China has established a dual-track development mechanism for renewable power paralleling on the power supply side and the power consumption side.

After the renewable power such as wind power and solar PV are completely phased out national feed-in tariff subsidies, the development of renewable power will transit from government planned and incentive-oriented mechanism to market-based operation with consumption-side responsibility. The *Policy* focuses to establish a long-term mechanism to ensure the realization of the 2025, 2030 and 2050 targets for share of non-fossil fuel and renewable energy in total energy consumption and power mix. The *Policy* will be a feasible operational measure for guiding the healthy development of the renewable energy industry, especially after wind power and solar PV has become subsidy-free available and fully de-subsided in the early phase of the 14th Five-Year period.

The first-year anniversary of the policy

In the first year of implementation, the Policyeffectively promoted the consumption of renewable electricity across provinces and regions, which allows power grids and power systems in a bigger region be optimized to facilitate renewable power consumption. In 2019, the provincial energy authorities were responsible to assess the implementation of the *Policy* in the province, and 2020 is the first year of the centralized assessment by the NEA. At the provincial assessment level, the implementation of the *Policy* has effectively motivated local governments, TSOs, and entities that are undertaking obligations, encouraging them to consume renewable energy, and especially increases the pressure on the obligational entities on consuming renewable electricity. From the perspective of quantitative data, the wind power curtailment rate dropped from 7% in 2018 to 4% in 2019, and solar PV dropped from 3% to 2%; the proportion of renewable energy in annual Ultra-high-voltage (UHV) power transmission nationwide increased by 12.8%, reaching 52.4%; the proportion of non-hydro renewable power in inter-provincial electricity transactions has increased significantly.

Comparison of 2019 actual non-hydro renewable power consumption with 2019 and 2020 mandatory consumption targets



Policy implementation under the new targets

China has established the new energy security strategic goals and climate change commitments. Back to 2014, the central government proposed the concept of *Four Revolution and One Cooperation*, meaning to control irrational energy consumption, diversify energy supply system, carry out technological innovation and institutional reform, as well as to enhance international cooperation in order to ensure the national energy security. Later in September 2020, the president Xi Jinping announced that China will strive to reach its carbon emissions peak by 2030 and achieve carbon neutrality by 2060. From the perspective of renewable energy, the new strategic goals for energy security and new climate change commitments serve as the top-layer design to define the five-year plans as well as the mid-term and long-term strategic goals related to renewable energy. These are used as the basis for determining and distributing the quotas for renewable power consumption, and the provincial quotas should be increased each year in principle.

In addition, as an important support for determining the provincial quotas, although NEA issues newly added consumption capacity of renewable power by province in the current year, it is not enough. The energy authority is expected to gradually establish a rolling evaluation mechanism and announce the renewable power consumption capacity of the next three to five years. In this way, if the consumption capacity of a province is insufficient, the local government can plan ahead and take effective measures to expand the consumption capacity. The feasible measures include thermal power plant retrofits, inter-provincial power transmission expansion, improvement of power market operation mechanism, the configuration of energy storage facilities and the increase of demand side response.

The 14th Five-Year expectations for the policy development

Given the different development conditions of renewable energy by province during the 13th Five-Year period, the 2020 renewable power consumption quota assigned for each province is quite different. However, in the long run, the government should consider allowing the provinces to share the responsibilities of renewable power consumption in a relatively fair and balanced way. The quotas in economic developed provinces in the central, eastern and southern regions of China need to be increased, which means that there is a need to increase the capacity of subsidy-free renewable power projects in these regions, with an increasing import of renewable electricity.

Market-based electricity trading and green certificate transactions are also important ways to achieve the goal of renewable power consumption. The NDRC and the NEA require that green certificate transactions should be implemented under the *Policy* from 2021. In 2019 and 2020, the subsidy-free on-grid wind power and solar PV projects approved by the central government, as well as the renewable power projects that have reached the life-cycle hour limits to receive national subsidies, can obtain green certificates through power generation. Therefore, it is expected that the number of green certificates will increase in the next few years, and the green certificate trading market will sell them at a few cents of RMB per MWh. The integration of the green certificate mechanism and mandatory renewable power consumption mechanism can create favorable conditions for China to gradually move towards a system with balanced consumption responsibilities nationwide.

4. Sharing Denmark's experiences on liberalising the power sector

A 50 percent share of wind and solar energy was a reality in Denmark - in 2019. The liberalisation of the Danish power sector is the foundation of the transformation. The Danish Energy Agency (DEA) published a report regarding lessons learned and recommendations for other countries standing on the verge of the same path, in order to secure a competitive power system with a high share of renewable energy. Please download the full English report here.

In the report, DEA presented the Danish journey towards a liberalised power system, as an important prerequisite to integrate large shares of renewable energy. The journey started back in 1995, where the EU opted to include electricity trade in the internal market. The new report explains the benefits of the Danish and European power markets and describes some of the challenges that the power sector faced in order to get where it is today.

The liberalisation of the power sector has been a key ingredient in the Danish green power transition, allowing ever-larger shares of renewable energy to compete against traditional fossil fuels hour by hour in the spot market.

Unbundling the power sector

A key component of the successful Danish liberalisation has been to divide the transmission and production activities in separate entities. Denmark established the independent transmissions system operator (TSO), Energinet, in 2005 responsible for the transmission of electricity and gas. This gave producers and developers equal access to the power grid and opened up for new actors to step into the market.

The spot market settling the power prices hour by hour has also been an effective way to ensure a cost-efficient use of production capacity.

While the Danish experience can be of help for other countries and the regulation of their power sectors, it will rely on country-specific adoption. Unfortunately, there is not one solution proficient to transform any power sector. However, the Danish experiences set an example of the potential benefits and proves how the liberalisation as a whole successfully has facilitated the Danish green transition.

5. Policy monitoring

2020-11-25
https://www.ndrc.gov.cn/xxgk/zcfb/tz/202012/t20201202_1252094.html

NDRC clarifies requirements of medium to long-term power contract in 2021

Notice on Signing the Medium and Long-term Contract in Power Industry in 2021, NDRC Operation [2020] No. 1784

When signing the mid-to long-term power contracts, local governments should encourage market entities to promise an amount of power of no less than 80% of the average power consumption of the previous three years, and to ensure the contracted power of no lower than 90% to 95% of the average consumption in the previous three years by signing subsequent monthly contracts. Moreover, the time-phased electricity in the *Contract* relevant to priority dispatch plans should be clear, and for power output that are difficult to accurately predict, such as wind power, solar PV and hydropower, the time-phased power generation targets are allowed to settle down before arranging the monthly power dispatch plan. In terms of pricing, local governments should formulate guiding electricity prices by time-phase in the initial stage of the market, and the peak-to-valley price difference should not be lower than that of in the existing benchmark electricity prices determined by governments.

2020-11-17
https://www.ndrc.gov.cn/xwdt/tzgg/202011/t20201125_1251167.html

The capacity of subsidized biomass power projects in 2020 determined

Notice on Publishing the Results of the 2020 Central Financial Subsidized Biomass Power Generation Projects, NDRC Energy [2020] No. 865

In 2020, a total of 1.71 GW of biomass power generation projects will be able to receive the central financial subsidies. Among them, agricultural and forestry biomass power projects account for 530 MW, accounting for 31%, and are mainly distributed in 11 provinces with abundant agricultural and forestry biomass resources. Waste incineration power projects account for 1.16 GW, accounting for 68%, and are mainly distributed in 14 provinces with larger populations. Biogas power projects account for 21 MW, accounting for 1%, and are distributed in nine provinces. The NDRC announced the 2020 biomass power generation subsidy policy earlier in September, clarifying that the Ministry of Finance (MoF) will provide a total subsidy budget of RMB 1.5 billion in 2020. These projects will receive subsidies in the order of the timing of all units connected to the grid.[8]

2020-10-30
http://jjs.mof.gov.cn/zxzyzf/jnjpbzzj/202011/t20201120_3626829.htm

MoF releases the first batch of subsidies for new energy vehicles in 2021

Notice on the Early Release of the 2021 Energy Conservation and Emission Reduction Subsidy Fund Budget (First Batch), MoF Construction [2020] No. 473

In 2021, the MoF will arrange the first batch of RMB 37.6 billion in subsidies for new energy vehicles, of which RMB 15.7 billion in the operation new energy bus, accounting for 41.7%; RMB 21.9 billion in the promotion and application of new energy vehicles from 2016 to 2018 (RMB 1.2 billion in 2016, RMB 6.4 billion in 2017 and RMB 14.4 billion in 2018). The top three provinces receiving subsidies are Guangdong, Henan and Shandong, which together account for 36.8% of the total amount.

[8] "完善生物质发电项目建设运行的实施方案，发改能源〔2020〕1421号," National Development and Reform Commission, 11 September 2020, accessed at https://www.ndrc.gov.cn/xxgk/zcfb/tz/202009/t20200916_1238868.html.