

CHINA ENERGY POLICY NEWSLETTER

Boosting Renewable Energy as Part of China's Energy Revolution

1. China energy transition updates

NEA publishes the timeline of the Renewable Energy 14th Five-Year Plan

In the *14th Five-Year Plan for Renewable Energy Development*, market orientation and cost efficiency will be the keynote strategies.¹ In order to increase the share of renewables in the regional energy supply, the government will prioritize the exploitation of distributed renewable energy sources and facilitate direct use of them in power, heating and gas sectors in the *Plan*. It will also require energy sector to integrate renewable energy with new technologies such as hydrogen energy and energy storage. In the heating sector, the target is to increase the share of updated heating systems² significantly by expanding the utilization of solar, biomass and geothermal energy depending on the availability of local resources. The China Renewable Energy Engineering Institute (CREEI) will lead the drafting process under the commission of the National Energy Administration (NEA). Experts from other think tanks, institutes and companies such as Energy Research Institute of National Development and Reform Commission (ERI of NDRC), China Electric Power Planning and Engineering Institute (EPPEI) and State Grid Corporation of China (SGCC) will participate.

Timeline of the 14th Five-Year-Plan for Renewable Energy Development

Date	Progress
Early April 2020	1st draft research report of the <i>Plan</i> complete
June 2020	2nd draft research report of the <i>Plan</i> complete
	- Coordinate with provincial plans and other energy plans - Collect comments from workshops and discussion
September 2020	Final research report of the <i>Plan</i> complete
	- Continue to coordinate provincial plans and other energy plans - NEA will organize evaluation workshops
November 2020	Policy draft of the <i>Plan</i> published for public comments
March 2021	Final <i>Plan</i> approved and published

Source: National Energy Administration (NEA), April 2020

¹“国家能源局综合司关于做好可再生能源发展“十四五”规划编制工作有关事项的通知,国能综通新能〔2020〕29号,”National Energy Administration, 9 April 2020, accessed at http://zfxxgk.nea.gov.cn/2020-04/09/c_138978661.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.

NDRC determines the 2020 solar PV subsidies

The National Development and Reform Commission (NDRC) issued the 2020 solar PV feed-in tariffs (FiTs) and feed-in premiums (FiPs) on 31 March 2020.³ The guiding FiTs (upper limits) decrease by 12.5% in Type I, 11.1% in Type II and 10.9% in Type III irradiance resources regions. The FiP for household PV is reduced from RMB 0.18/kWh to RMB 0.08/kWh. Most importantly, the bid-winning FiTs of all distributed commercial and industrial PV projects should not exceed the guiding FiTs, and in the meantime, the amount of subsidy should not be over RMB 0.05/kWh. The subsidy per kilo-watt hour of poverty alleviation PV projects remains. The new standard will become effective on 1 June 2020.

Irradiance resources regions	Utility-scale solar PV			Distributed commercial and industrial PV			Self-consumption*	Household PV
	Type I	Type II	Type III	100% connected to grids				
				Type I	Type II	Type III		
2019 guiding FiTs	0.4	0.45	0.55	0.4	0.45	0.55	FiP 0.1	FiP 0.18
Tendering Results	0.3281	0.3737	0.4589	0.3429	0.4027	0.4817	FiP 0.0404	N/A
2020 guiding FiTs	0.35	0.4	0.49	0.35	0.4	0.49	FiP 0.05	FiP 0.08
Tendering FIT upper limit	Utility-scale solar PV			Distributed commercial and industrial PV			Household PV	
	Type I	Type II	Type III	Type I	Type II	Type III		
	0.35	0.40	0.49	0.35 and subsidy ≤0.05	0.40 and subsidy ≤0.05	0.49 and subsidy ≤0.05		N/A

Notes: *If the PV guiding FiTs are lower than local benchmark coal power FiTs, then the benchmark coal power FiTs will be the FIT upper limits instead (i.e. no subsidy). Source: Energy Research Institute of National Development and Reform Commission (ERI of NDRC), March 2020

All utility-scale and distributed industrial and commercial PV projects should participate in the national tender together, implying the NDRC will rank all projects with corrected bidding prices.

Corrected bidding prices of utility-scale PV and distributed industrial and commercial PV that 100% connected to grids:

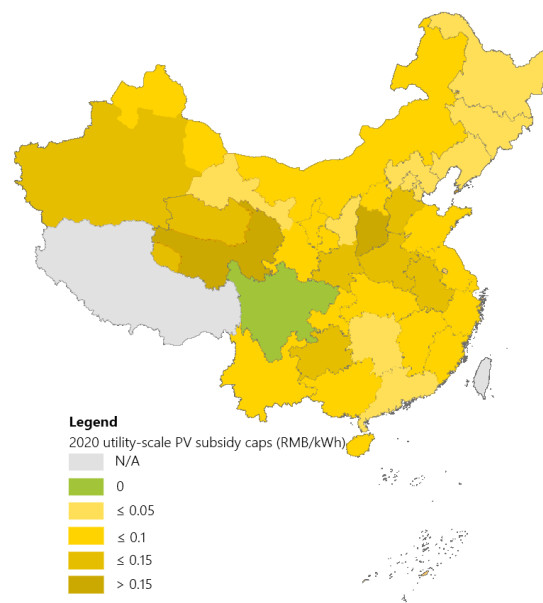
- Type I region = bidding FiTs
- Type II region = bidding FiTs – RMB 0.05/kWh
- Type III region = bidding FiTs – RMB 0.15/kWh

Corrected bidding prices of self-consumption commercial and industrial distributed PV:

- All regions = bidding FiPs + RMB 0.3/kWh

A short assessment from ERI of NDRC

According to the analysis of Professor Shi Jingli from the ERI of NDRC, under the 2020 ranking system design, utility-scale PV will be more competitive compared to distributed PV in most of the provinces, i.e. the regions having subsidy caps more than RMB 0.05/kWh in the map. Among them, she expects that new tendering projects in Sichuan are subsidy free as its average benchmark coal power FIT is higher. Moreover, as the subsidy caps in Northeast China and north Hebei province are expected to be lower than RMB 0.03/kWh, so that project developers will be more likely to do subsidy-free projects.



Source: Drawn based on the data provided by ERI of NDRC, May 2020

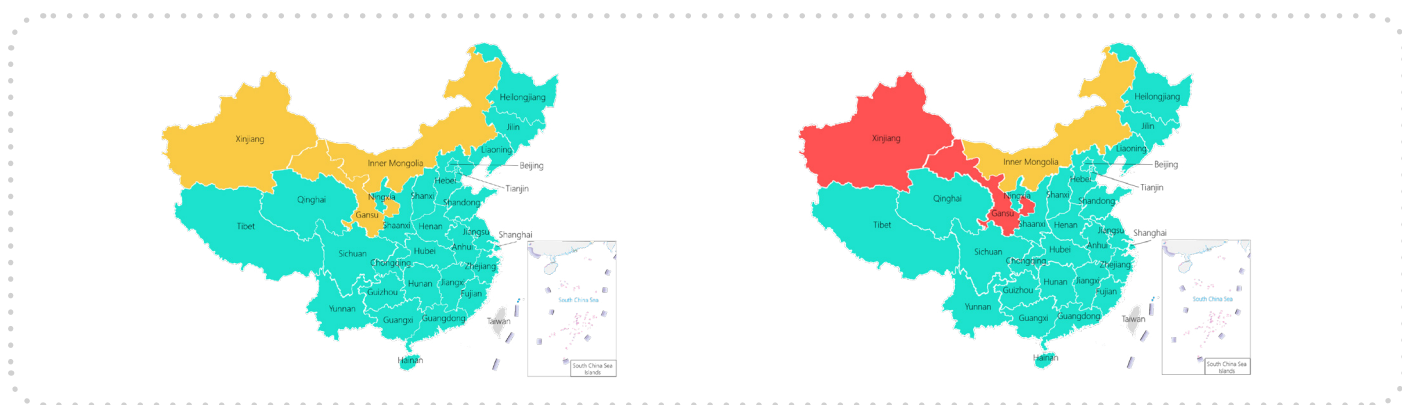
³ “国家发展改革委关于2020年光伏发电上网电价政策有关事项的通知，发改价格〔2020〕511号，” National Development and Reform Commission, 31 March 2020, accessed at https://www.ndrc.gov.cn/xxgk/zcfb/tz/202004/t20200402_1225031.html.

2020 wind environment and 2019 solar PV market monitoring results issued

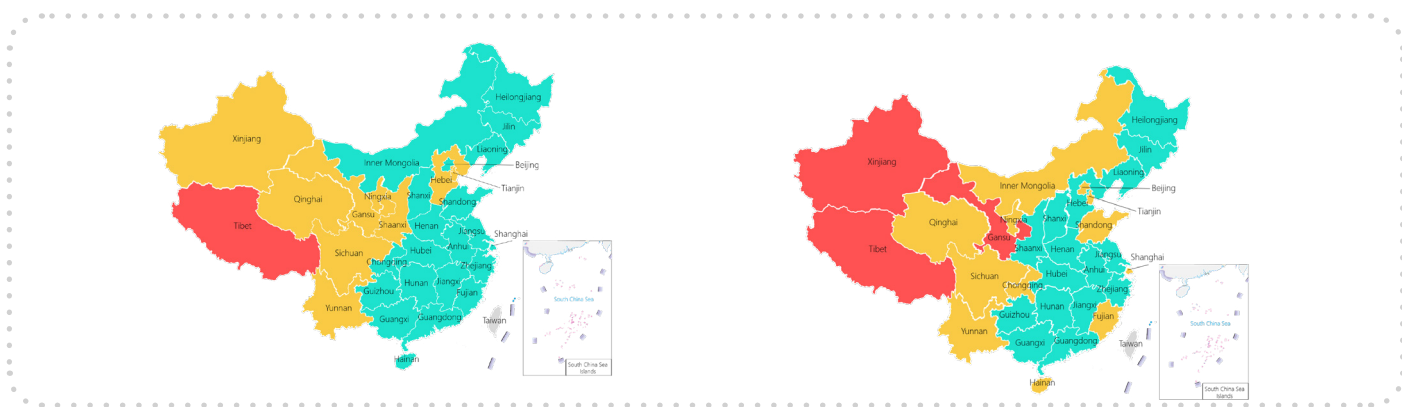
NEA published the *2020 Wind Power Investment Early Warning Results* and the *2019 Solar PV Market Evaluation Results* together in the end of March.⁴ In 2020, there will be no “red-alert” wind power provinces as the curtailment rates of Xinjiang (14%) and Gansu (7.6%) in 2019 were both lower than the 2020 control target of 15%. Both of them could resume the processing of wind power projects that have been integrated into the 2019 and previous plans. More than that, East Gansu is allowed to plan for new projects as its curtailment rate was maintained under 3% in the past few years.⁵

PV market in 2019 was also lifted from investment restrictions. Xinjiang and Gansu changed from “red” to “yellow”, implying new PV projects within the provinces are allowed to participate the national tender in 2020.

2020 (left) and 2019 (right) Wind power investment environment early warning results



2019 (left) and 2018 (right) Solar PV market environment evaluation results



Source: NEA, March 2020

⁴ “国家能源局关于发布《2020年度风电投资监测预警结果》和《2019年度光伏发电市场环境监测评价结果》的通知，国能发新能〔2020〕24号。” National Energy Administration, 30 March 2020, accessed at http://zfxxgk.nea.gov.cn/2020-03/30/c_138944089.htm.

⁵ “权威解读 | 2020年风电投资监测预警结果解读,” China Renewable Energy Monitoring Centre, 14 April 2020, accessed at <http://news.bjx.com.cn/html/20200414/1063260.shtml>.

2. Overview of China Energy Law for Public Comments

The National Energy Administration (NEA) published the *China Energy Law* (hereafter referred to as 'the Law') for public comments on 10 April 2020.⁶ This is the second round of public consultation although the first draft was issued 13 years ago in 2007. The Law will provide legal regulations covering energy exploitation, utilization, monitoring and management processes in order to ensure energy security, optimize energy mix, improve energy efficiency and facilitate high-quality energy development. 9 May 2020 is the deadline for receiving comments.

Definition of energy

Resources that can produce heat, mechanical, electric, nuclear or chemical energy. It consists of coal, oil, gas (incl. shale gas, coal-bed methane, biogas), nuclear, **hydrogen**, wind, solar, hydro, biomass, geothermal, marine, electricity, heat and other resources that can produce usable energy through processing or conversion process. This is the first time that hydrogen has been listed as a type of energy in a national law.

Timeline ⁷

- 1979: proposed the idea of energy law legislation
- 2006: kicked off the drafting process
- 2007: published the Law (for public comments) the first time
- 2008: reported the Law (for approval) to the State Council
- 2010: organized the expert verification meeting of the Law (for approval)
- 2015: the State Council required National Development and Reform Commission (NDRC) and National Energy Administration (NEA) to further amend the Law (for approval)
- 2017: amendment of the Law (for approval) complete
- 2020: published the Law (for public comments) the second time

Legislative purpose

China has established a Five-Year-Plan planning system for energy development and issued 14 energy-specific plans since 2006. However, the fundamental legislation has long been absent. Based on the energy security strategy of "Four Revolutions and One Cooperation" ⁸ and the strategy to build a clean, low-carbon, safe and efficient energy system, China is eager to promote high-quality energy development and modernize managing systems and capabilities. As the legal document, *China Energy Law* aims at clarifying the targets and top-layer design for the energy revolution, which will guarantee the consistency of future developing direction and the fundamental supporting mechanisms.



Legal mechanisms to be established ⁹

1. Energy utilization strategies and plans
2. Energy exploitation activities and infrastructure construction
3. Affordable and equal energy service system
4. Energy technological innovation and standardization
5. Liberalization of the energy system
6. Energy reserve system
7. Energy monitoring and management system



⁶ "国家能源局关于《中华人民共和国能源法（征求意见稿）》公开征求意见的公告," National Energy Administration, 10 April 2020, accessed at http://www.nea.gov.cn/2020-04/10/c_138963212.htm.

⁷ "三位专家深入解读新《能源法》," China Wind Energy Association, 24 April 2020, accessed at <https://www.in-en.com/article/html/energy-2290299.shtml>.

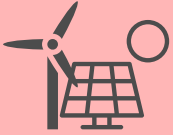
⁸ Energy consumption, supply, technological and institutional revolutions and international cooperation.

⁹ "重磅 | 《能源法（征求意见稿）》发布," China Energy Daily, 10 April 2020, accessed at https://www.sohu.com/a/386845244_468637.

About energy transition



The government aims to optimize the structure of the energy system and energy consumption mix by prioritizing renewable energy development, developing high-efficient nuclear power, increasing the share of non-fossil fuel and facilitating low-carbon transition and efficient use of fossil fuels. Utility-scale and distributed energy resources exploitation should be carried out in parallel.



The State Council should evaluate the non-fossil share in primary energy consumption annually and the government aims to set up mid-to-long-term quantitative targets for renewable resources exploitation and penetration in primary energy consumption. These targets will be included into the *National Economic and Social Development Plan* and divided into annual provincial binding targets. The law draft specifically mention four renewable energy supporting measures: the mandatory renewable consumption mechanism, incentive policies, prior grid access and minimum hours of non-hydro renewable power guaranteed by grid operators.

Comments and suggestions by experts

China Wind Energy Association (CWEA) organized an online webinar on 23 April 2020.¹⁰ It invited three experts to interpret the *China Energy Law* (for public comments), of which two guests participated directly in the legislative process. They are Professor Li Yanfang – the Director of Energy Law Centre, Renmin University of China Law School, and Doctor Sun Youhai – the former Director of the Law Division, Environment and Resources Protection Commission in National People's Congress. The third expert is Professor Xia Qing, the Director of Energy Internet Strategy and Operation Research Centre, Energy Internet Research Institute of Tsinghua University.

Comments



- The *Law* seems to provide stronger policy signals rather than showing legally binding features. However, it will effectively change public minds and behaviours to make things happen.
- The content of renewable energy shows consistency and upgrades of the *Renewable Energy Law*. Market is the guidance, tax policies are the incentive and consumption requirements are the constraint.
- Power grids and oil and gas pipelines are natural monopoly industries that especially require monitoring with standards.
- There are three specific mechanisms to interpret low-carbon development, energy relevant taxes, eco-compensation of energy resource exploitation, and effective use of coal with low carbon emissions.

Amendment suggestions



- The legislative strategies could be more focused on solving the major problems in energy resource exploitation rather than aiming to cover all perspectives.
- It would be effective to set up quantitative targets in the *Law* to achieve the legal targets. It could be followed by making a list of supporting laws and regulations and propose a timeline for the drafting process.
- The subject of law enforcement is absent. The *Law* adopts the word “country” as the subject in numbers of sections, which is not clear about which level of government it refers to and which authority it should be.
- Market tools are not suitable for all the cases. It is necessary to have a basic agreement on when to allow market access, when to encourage competition, and when to carry out anti-monopoly measures.

3. Introduction to sector coupling technology in Denmark

For several years, the Danish and Chinese governments have worked together on numerous energy initiatives. One of these initiatives has revolved around heating and energy efficiency, especially in relation to heat planning. Through this work, it has become clear that there is significant overlap between the thermal and power systems that would benefit from increased sector coupling, and a deeper discussions of this topic in a Chinese context. Through the cooperation, sector coupling has been identified as one of the areas that offers great potential for environmental and socioeconomic benefits. This one-page small document is an excerpt from a larger overview that will give the reader a good grasp on what sector coupling is, and what it can do for an energy system.

CHP and sector coupling

Combined heat and power (CHP) plants has been a cornerstone in the Danish sector coupling and in many cases the first step in sector integration. CHP plants are more efficient compared to heating and electricity produced in separate units operating on the same fuel type, due to better utilization of the fuel. This simultaneously ensuring lower costs of production and fewer emissions while improving security of supply. The pollution is also decreased with the same environmental restrictions as in non-CHP plants, and in the longer term, a transition with increased environmental restrictions or alternative fuel sources is easier to implement with fewer units in operation.

Overview of sector coupling

Sector coupling is the integration of different types of energy production. The most common example is CHP plants, where heat and power are produced simultaneously with improved efficiency. Another example is heat pumps, which produce both heating and cooling. sector coupling has a few major advantages, outlined below:



Flexibility: Coupling the electricity and heat sector improves the flexibility of the energy system and lead to fuel savings and a higher utilization of existing renewable energy production. When the electricity production from renewable energy sources are high compared to the consumption, the electricity can be used for heat production through heat pumps and electric boilers. The electricity system is then able to draw on the heat storage capacity in the district heating system offered by the building mass and the distribution grid.



Integration of renewable: Sector coupling enables the utilization of more renewable electricity production as the heating sector can contribute to balancing variable power production. Combining the heat and electricity sectors will make the energy system capable of handling a higher share of renewable sources in both sectors. For the electricity sector, wind farms and solar PV plants are promoted, while the heating sector benefits from the integration of large heat pumps utilizing excess heat from data centers and industries connected to the district heating system.



Use of surplus heat: In many ways, the use of surplus heat from the industry is a similar concept to CHP. Surplus heating, not utilized in the production is harvested and utilized in district heating networks. Instead of being a surplus product where resources are spend on removing it, the heat becomes a resource for the district heating and potentially a source of income for the industry.



Heat Storage: A storage unit at a CHP plant is one of the most important tools for responding to changes in both the heating and electricity market. This is because they allow excess heat to be stored, thereby decoupling the production from the demand and allowing for a flexible production. There are different kinds of storage units available for a district heating plant, such as a steel tank, pit storage, aquifer, borehole thermal energy storage (BTES) etc.



District Cooling/combined H&C: Another possibility for coupling heating, cooling and electricity is heat pumps combing heating and cooling production. The potential is mainly seen in large commercial buildings that have both a cooling demand, for air condition or process cooling, and a heat demand, for heating or process heating at low temperature. The cooling plant can be combined with a heat pump using the cooling plant as heat source.

4. Policy monitoring

10 April 2020

https://www.ndrc.gov.cn/xxgk/zcfb/tz/202004/t20200414_1225639.html

NDRC provides a guideline to promote gas storage industry

Implementation Suggestions on Improving the Construction of Natural Gas Storage Facilities, NDRC Pricing [2020] No. 567

The pricing department of NDRC announced guidelines concerning planning, operation, institutional mechanisms and supporting policies in order to solve the specific problems in gas storage industry such as lack of planning, standards and pricing signals. Local governments should increase the installed capacity target of gas storage facilities in regions with rapid growth of gas demand and big difference in time-of-use gas prices. Moreover, the prices of gas supply services, gas storage and gas purchase and sales of independent gas storage facilities should be formed by markets. The oil and gas exchanges should improve the trading systems and accelerate research of developing new products such as reservoir capacity trading. In addition, the central government will continue to provide subsidies to key regions that should have a daily storage capacity to ensure three-day gas supply.

26 March 2020

https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/202004/t20200403_1225133_ext.html?from=timeline&isappinstalled=0

Trial transaction settlement rules in spot power market pilots have been determined

Notice to Implement Continuous Transaction Settlement in Spot Power Market Pilots, NDRC Energy Regulation [2020] No. 245

In the mid-to-long term contracts of the spot power market pilots, power generators and consumers should jointly clarify and agree on the electricity transaction settlement prices by time divisions. The settlement price should consist of market price, power transmission and distribution price, price to provide ancillary services and government funding surcharges. Moreover, the pricing methods of the market price can include but not limited to fixed price, time-of-use price and hourly price. The last point is, the production curve with the quoting settlement prices by time divisions should be reported before the day ahead market start to operate.

23 March 2020

http://zfxgk.nea.gov.cn/2020-03/23/c_138960403.htm

NEA exempts power business license of 6 MW below power generation projects

Notice to Implement the Idea of Power Delegation, Administrative Procedure Simplification and Service Optimization in Management of Power Business License

NEA updated the *Regulation Rule of Power Business License (2014 version)*. In order to encourage the development of distributed power and renewable power sources, NEA exempts larger scope of projects that have to apply for the *License*. The 2020 version added 6 MW below residual gas power plants, coal-mine gas power plants, non-coal-fired fossil fuel captive power plants and off-grid captive power plants. For renewable power, the list of exemption remains the capacity of 6 MW below non-hydro renewable power projects unchanged, while expanding the capacity of hydropower plants from 1 MW below to 6 MW below.