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CHINA ENERGY POLICY NEWSLETTER

Boosting Renewable Energy as Part of China's Energy Revolution

1. China energy transition updates

The paths to achieve the carbon neutral target gradually become clear

The energy and environmental administrative departments, research institutes, industry associations, universities and enterprises responded actively to formulate specific targets and plans after the Chinese government made the new commitment on climate change in September 2020. The central government will promote to establish a green, low-carbon, circular and sustainable economic system for the next step. In order to achieve it, the Ministry of Ecology and Environment (MEE) is now researching and compiling several specific plans, including the *14th Five-Year Plan for Tackling Climate Change*, the *2030 Carbon Dioxide Emissions Peaking Action Plan*, and the *2050 Low-carbon Development Strategy*.¹ The MEE is also incorporating the work related to the carbon emissions peaking action into the local ecological and environmental protection inspection, and will carry out assessment and evaluation of the progress around the country.² Renewable energy enterprises suggest that to strengthen the guiding role of the plans and targets, the government is expected to decompose the targets of emission reduction by province and industry as soon as possible, as well as investigate and formulate targets of total energy consumption and optimization of energy structure for 2030 and 2060.³

Research institutes have put forward suggestions for specific implementation paths. In October 2020, the *Research on China's Long-term Low-Carbon Development Strategy and Transition Path*, led by Tsinghua University and jointly participated by 18 research institutes including the Energy Research Institute of the National Development and Reform Commission (ERI of NDRC), was released. The research pointed out that to achieve carbon neutrality by 2060, China needs to stay with the path of long-term deep decarbonization transition, striving to make carbon dioxide emissions reaching nearly the peak after 2025, and basically achieving zero net carbon dioxide emissions and reducing all greenhouse gas

¹ “可再生能源行业落实碳中和目标座谈会”在京召开,” China Renewable Energy Industry Association, 19 October 2020, accessed at <http://www.tanjaoyi.com/article-32139-1.html>.

² “应对气候变化 | 我国加速推进碳减排 碳排放达峰行动将纳入中央生态环保督察 (人民日报),” the China Daily, 30 October 2020, accessed at <https://baijiahao.baidu.com/s?id=1681975869388365188&wfr=spider&for=pc>.

³ “可再生能源行业落实碳中和目标座谈会”在京召开,” China Renewable Energy Industry Association, 19 October 2020, accessed at <http://www.tanjaoyi.com/article-32139-1.html>.

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emissions (GHGs) by about 90% by 2050. After 2050, China should further strengthen the reduction of non-carbon dioxide GHGs, increase carbon sinks and adopt measures on negative emission. Many experts in the energy industry believe that energy energy and electrification in the end-use sectors such as industry, building, and transportation, will effectively reduce fossil fuel consumption and carbon dioxide emissions.⁴

Specifically in the energy sector, the MEE has stated⁵:

1. More effective measures will be taken to control fossil fuel consumption, especially strictly controls over coal consumption;
2. Rationally control coal power capacity, strongly promote the use of electricity to replace the use of coal and gas, and restrict the use of loss coal (*sanmei*);
3. Strongly facilitate the development of non-fossil fuel and build a high-penetration renewable energy adaptable industry;
4. Promote low-carbon transition work in non-power sectors including new energy vehicles, as well as low-carbon transportation, technologies, buildings, production processes and lifestyles;
5. During the 14th Five-Year period, the government aims to make the national carbon market becoming fully functional, which will gradually incorporate more industries other than power sector, and achieve continuous and stable operation of the carbon market.

In the *China Renewable Energy Outlook 2018* (CREO 2018) published by the ERI of NDRC in 2018, the Below 2 Degrees Scenario has suggested that China would have 2,700 GW of wind power capacity in 2050. A few experts commented that this is extreme. However, the Chinese wind power industry vowed to install 3,000 GW of wind power capacity in China by 2060 in October 2020.⁶ It implies the value of CREOs and long-term energy scenarios for policy decision making.

MEE solicits opinions on carbon allowance allocation approaches

The MEE issued two important policy drafts to solicit public opinions, aiming to promote the construction of the national Emissions Trading System (ETS). These two documents are the *National Regulations on the Management of Carbon Emissions Trading System (Trial) (draft for comments)* (CHN: 《全国碳排放权交易管理办法（试行）》（征求意见稿）) and the *National Regulations on the Management of Registration, Transaction and Settlement of the Carbon Emissions Trading System (Trial) (draft for public comments)* (CHN: 《全国碳排放权登记交易结算管理办法（试行）》（征求意见稿）).⁷ The MEE will be responsible to build up and manage the transaction system of the national ETS and will also formulate and publish allocation methods of carbon allowance for key emission units.

- **Carbon allowance allocation methods:** The allocation of carbon allowance would be mainly free of charge during the initial period, considering factors such as national GHG control targets, economic growth, industrial structure adjustment, and air pollutant emission control. The government would introduce paid carbon allowance in due course and gradually increase its proportion. The MEE may reserve a certain amount of carbon allowance for market regulation. The provincial-level ecological and environmental authorities would allocate carbon allowance to key emission units within their administrative regions in accordance with the regulations formulated by the MEE, and the amount of free allowance is allowed to be adjusted if there is a major change in the emissions of key emission units.

⁴ “问道碳中和，这份报告勾画出的路线图很明确，” China Urban Energy Weekly, 28 October 2020, accessed at https://www.sohu.com/a/428100446_825950.

⁵ “生态环境部：“十四五”期间将深化重点领域低碳行动，” the Ministry of Ecological Environment, 28 October 2020, accessed at http://www.xinhuanet.com/fortune/2020-10/29/c_1126670820.htm.

⁶ “风电企业联合发布《风能北京宣言》：2030年总装机容量至少达8亿千瓦，” China Wind Energy Association, 14 October 2020, accessed at https://www.sohu.com/a/424613259_115362.

⁷ “关于公开征求《全国碳排放权交易管理办法（试行）》（征求意见稿）和《全国碳排放权登记交易结算管理办法（试行）》（征求意见稿）意见的通知，” the Ministry of Ecological Environment, 2 November 2020, accessed at http://www.gov.cn/xinwen/2020-11/05/content_5557519.htm.

- **National Certified Voluntary Emission Reduction (CCER):** Key emission units can use the CCER or achievement of other emission reduction targets announced by the MEE separately to offset their verified carbon allowance by no more than 5%. One unit of CCER can offset one ton of carbon dioxide equivalent emission. The CCER used for offset should come from emission reduction projects such as use of renewable energy, carbon sinks, methane utilization, etc., and should be generated other than the key emission units in the national ETS.
- **The interaction of the national ETS and local ETS pilots:** The key emission units participating in the national ETS should not repeatedly participate in the distribution and clearing of emission allowance activities in the relevant provincial (municipal) ETS pilots since the effective date of these policies. It has not yet been finalized that whether the surplus allowance in local ETS should be transferred to the national ETS after the key unit is transferred to the national ETS, nor if the surplus permits can be transferred, how to determine the carbon price.⁸

The subsidised life-cycle utilization hours of renewable power projects determined

In January 2020, the Ministry of Finance (MoF), the National Development and Reform Commission (NDRC), and the National Energy Administration (NEA) jointly issued the *Notice on Suggestions to Facilitate Non-hydro Renewable Power Development* (CHN: 《关于促进非水可再生能源发电健康发展的若干意见》), clarifying that only a certain number of utilization hours of renewable power projects can obtain national financial subsidies.⁹ Later in September 2020, the three ministries jointly made clear regulations on the total number of utilization hours that can be subsidized by the central government for wind power, solar PV, and biomass power projects during their entire life cycle.¹⁰ Electricity generation exceeding this number will no longer receive subsidies, but can participate in green certificate transactions. In addition, no more subsidies will be provided after 20 years from the date when wind power and solar PV projects are connected to the grid, and 15 years for biomass power projects, regardless of whether the total subsidising hours are reached. For solar PV projects, an additional 10% of the full life cycle hours will be approved for Top-runner PV projects as well as utility-scale and distributed solar PV projects that participated in tenders in 2019 and 2020.

Life-cycle utilization hours of wind power, solar PV and biomass power projects that can be subsidized by the central government

	Resource regions			
	Type I	Type II	Type III	Type IV
Onshore wind power	48,000	44,000	40,000	36,000
Offshore wind power	52,000			
Solar PV	32,000	26,000	22,000	N/A
Biomass	825,000			

Source: Ministry of Finance (MoF), September 2020

⁸ Cai Yixuan, “《全国碳排放权交易管理办法（征求意见稿）》的六个看点,” Energy Observer, 3 November 2020, accessed at <https://mp.weixin.qq.com/s/zZtx8pwJBoLRsCUACLvZag>.

⁹ “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,” the Ministry of Finance, the National Development and Reform Commission and National Energy Administration, 20 January 2020, accessed at http://jjs.mof.gov.cn/zhengcefagui/202001/t20200122_3463379.htm.

¹⁰ “关于《关于促进非水可再生能源发电健康发展的若干意见》有关事项的补充通知，财建〔2020〕426号,” the Ministry of Finance, the National Development and Reform Commission and National Energy Administration, 29 September 2020, accessed at http://www.gov.cn:8080/zhengce/zhengceku/2020-10/21/content_5552978.htm.

The researcher at the ERI of NDRC, Ms Shi Jingli, commented on the impact of the policy.

1. This policy formally clarifies the total amount and effective period of renewable energy subsidies, resolves the policy gap of uncertain subsidy amounts, and clarifies boundary conditions for enterprises and financial institutions in defining income expectations of project, which is helpful for the evaluation and transfer of projects and helps enterprises with business decisions. For example, without a clear subsidy boundary, it is difficult for wind power enterprises to decide whether to retrofit or apply for decommissioning when the operating efficiency of some of their equipment have dropped significantly or the decommissioning limit is approaching. In addition, this also provides a policy basis and a workable solution for the grid companies to pay subsidies under the principle of proportionality.
2. The announced subsidised utilization hours of each renewable power generation technology basically reflect the premise of reaching a reasonable income level for renewable power projects when determining the guiding feed-in tariffs. It has no effect on the estimated income of the wind power and solar PV projects. Although the actual income of some projects with higher annual utilization hours will decrease, it will still be higher than that of projects with relatively low hours in the same period, meaning a reduce in the income gap between different projects.
3. Though the national subsidy is withdrawn after the life-cycle utilization hours or year limits of the national feed-in tariff subsidies are reached, the subsequent operation of the projects can still obtain green certificates and participate in relevant transactions, which reflects the continuous support from the government for renewable power projects.

The automobile industry is expected to basically achieve electrification in 2035

On 27 October 2020, the *Roadmap 2.0 for the Energy-saving and New Energy Vehicle Technology* (CHN: 《节能与新能源汽车技术路线图2.0》) compiled under the guidance of the Ministry of Industry and Information Technology (MIIT) and led by the China Automotive Engineering Society (CAES) was released.¹¹ This roadmap proposes the main goals for the development of China's automobile industry in 2035. The carbon emissions of auto industry would peak around 2028, two years ahead of the national commitment on carbon emission reaching the peak; followed by 2035, the total carbon emissions would drop by more than 20% from the peak. In the meantime, energy-saving vehicles and new energy vehicles is expected to each account for 50% of annual sales, implying energy-saving vehicles is fully hybridized, and the auto industry is basically achieve electrification. In addition, the total stock of hydrogen-based fuel cell vehicles would reach about 1 million and fully cover commercial vehicles on the street.

China's first automatic VPP commissioned in Shenzhen

Shenzhen commissioned China's first automatic virtual power plant (VPP) system, which can achieve functions equivalent to a large-scale power plant in load regulation and voltage control.¹² After connecting the flexible power supply resources to the VPP, the control platform will visually present the power output patterns of these resources and to make dispatch decisions based on their features. Then the intelligent terminal accepts and executes the tasks (decisions) assigned by the control platform, enabling the entire system to achieve an automatic closed-loop management. With the joint support of the NDRC, the Shenzhen Government, and China Southern Power Grid (CSG), the project was launched in 2016, entered key technological research in 2018, and started trial operation in November 2020. It is estimated that about 20 MW of flexible power supply from end-use side in Shenzhen will be connected to this VPP.

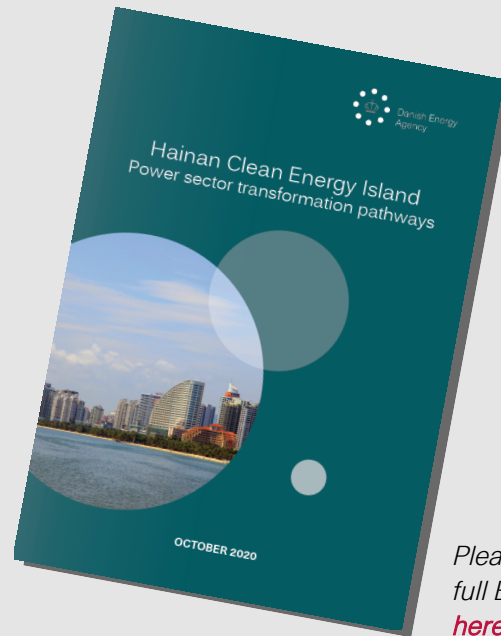
¹¹ Wang Mingyou, "《节能与新能源汽车技术路线图（2.0版）》正式发布," DIEV.com, 27 October 2020, accessed at <https://www.d1ev.com/news/zhengce/130546>.

¹² "占地不足1平方米 全国首套自动化虚拟电厂系统在深圳试运行," Shenzhen News, 26 October 2020, accessed at http://www.sznews.com/news/content/2020-10/26/content_23663556_0.htm.

2. Hainan Province can become a Clean Energy Island by 2030

Hainan Province can become a Clean Energy Island by 2030 at the least cost, if the decisions are right. Development of wind and solar would be the least-cost path for Hainan to achieve a low-carbon energy system.

These are some of the findings from a new report "Hainan Clean Energy Island - Power sector transformation pathways", which is a result of the ongoing, close cooperation between The Danish Energy Agency (DEA) and the China National Renewable Energy Centre (CNREC) within the Energy Research Institute of the National Development and Reform Commission (ERI of NDRC). The study is based on the China Renewable Energy Outlook (CREO) reports, which gives a detailed picture of the main development scenarios for the Chinese energy system based on comprehensive energy system modelling. The report targets Chinese decision makers including national and provincial governments as well as power system operators.



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Background

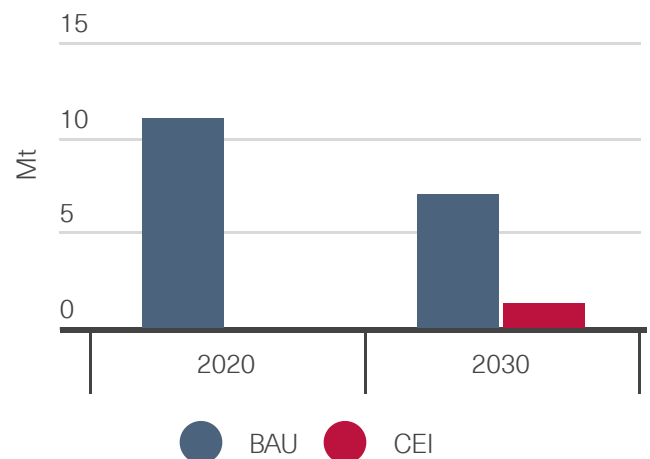
In May 2019, the Chinese government issued the *Implementation Plan of the National Ecological Civilisation Experimental Area (Hainan)*, therethrough planning to build a demonstration zone of clean energy development by 2030 and make of Hainan a Clean Energy Island (CEI). In order to support the decarbonisation of the energy system in Hainan, the plan promotes renewable energy integration as well as the sale ban of internal combustion engine vehicles by 2030. The CEI development for Hainan is closely related to the overall strategy for China to build a clean, low-carbon, safe and efficient energy system as part of constructing the Ecological Civilisation and linked to, China's ongoing power market reform.



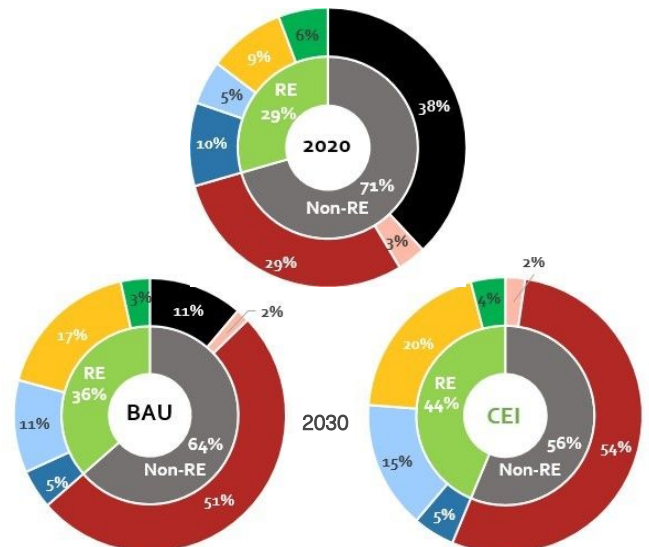
Main Conclusions

International experience shows that a clean energy development pathway for Hainan can be implemented by reducing exports and increasing generation from renewable sources (solar and wind), which will remove coal from the electricity generation mix with the least cost. The clean energy development of Hainan allows the province to reach 44% of its electricity generation mix from renewable energy by 2030. Such a pathway will just have a 2% higher annual cost compared to the business-as-usual scenario, reducing the annual CO₂ emissions of the power sector in 2030 to 12%.

Power sector CO₂ emissions in Hainan in the Business-as-Usual (BAU) and CEI scenarios



Power sector CO₂ emissions in Hainan in the Business-as-Usual (BAU) and CEI scenarios





01

Policy coordination and market design coordination are key for Hainan to achieve its clean energy targets

The report discusses how the power sector of Hainan reforming and contribute toward the CEI policy target. Hainan Province is part of the China Southern Power Grid and currently exports coal-based electricity to neighbouring provinces. A clean energy development pathway can be implemented by reducing exports and increasing generation from renewable sources, which will remove coal from the electricity generation mix. Moreover, the report reveals that, for Hainan's CEI policy to have a genuine impact on the broader energy system, there must be policy coordination and market design coordination with neighbouring provinces.



02





Wind and solar represent the least-cost path for Hainan to achieve its ambitious clean energy targets

The report analyses what is the least-cost approach for Hainan and the different alternatives. From the report, it emerges that, among alternative pathways to meet the target of reducing coal consumption, wind and solar provide the least cost path. Natural gas, is expensive, must be imported and is not free of carbon. Nuclear is clean and carbon free, but with a price tag. Power transmission with the mainland will be important but can be overbuilt, requires continued analysis, and does not ensure that the energy imported is emission free.



03

Alternative pathways for achieving Hainan's Clean Energy Island

	 Renewable	 Natural gas	 Nuclear	 Transmission
CO2 free				
Least cost				
Securing supply				
Easy to integrate				
Environmentally friendly				

Pros and cons



Key recommendations for the future steps

- Conduct a local power system analysis with a broader regional context including other provinces.
- Prepare comprehensive and systematic analysis to ensure efficient balancing resources in the power system and cost-efficient energy transition.
- Analyse how policy mechanisms supporting the CEI target can be efficiently coordinated with electricity market reforms.
- Conduct a more in-depth energy systems analysis to meet the short-term target of 50% primary energy consumption in Hainan from non-fossil energy by 2025.

3. Policy monitoring

2020-10-20

http://www.gov.cn/zhengce/content/2020-11/02/content_5556716.htm

The State Council decides new energy vehicle developing targets in 2035

Notice of New Energy Vehicle Industrial Development Plan (2021-2035), the State Council Development [2020] No. 39

The Plan proposes that in 2025, the average power consumption of passenger EVs should be reduced to 12.0 kWh/100 kilometers, the sales of new energy vehicles aims to reach about 20% of the total sales of new vehicles, and highly-automated driving vehicles should be commercialized in specific regions under specific scenarios. By 2035, EV should become the mainstream of new sales vehicles, public vehicles should be fully electrified, fuel cell vehicles will be commercialized and highly-automated driving vehicles should be applied on a large scale. In terms of renewable energy, the government will promote the information sharing and integration of new energy vehicles with meteorological and renewable power forecasting systems, and will coordinate the overall dispatching of new energy vehicles and the wind power and solar PV power sources, as well as encourage the development of multi-functional integrated stations for solar PV-storage-charge and discharge.

2020-10-14

https://www.ndrc.gov.cn/xxgk/zcfb/tz/202010/t20201023_1248824.html

China supports private enterprises engaging specific energy transition businesses

Implementation Suggestions on Speeding up Reform, Development, Transition and Upgrade of Private Enterprises, NDRC Institutional Reform [2020] No. 1566

The document clearly states that the government will accelerate the divestiture of competitive businesses such as equipment manufacturing by grid companies, and further liberalize energy saving and environmental protection businesses in the petroleum, chemical, electric power, natural gas fields. Moreover, it will actively explore ways to bring a number of rights into the scope of financing pledge guarantee, including rights over energy use, carbon emission, pollutant emission, future benefits of energy management by contract, and franchise fees. In addition, subject to the requirements of market access, new energy vehicle industry shall be granted fair qualification, certification and recognition for new production capacity, and no additional preconditions shall be imposed.

2020-09-30

http://www.gov.cn/zhengce/zhengceku/2020-10/16/content_5551757.htm

NEA announces a new batch of subsidy-free solar PV projects

Notice to Publish the PV Project List that Transfer from Subsidized Projects through Tenders to Subsidy-free Projects, NEA Comprehensive and New Energy [2020] No. 107

There is a total of 1,229 solar PV projects with installed capacity of around 8.0 GW opt to become subsidy-free projects. Among them, 3.89 GW belongs to the solar PV projects that have won the right to receive national subsidies through tenders in 2019 but suffering an overdue connecting to the grid, and 4.11 GW belongs to solar PV projects that have lost in the 2020 tenders. Ranked by region, the top three are Guangdong (1.93 GW), Shanxi (1.31 GW), and Jiangxi (980 MW). Accordingly, in 2020, the NEA has approved two batches of subsidy-free solar PV projects with a total capacity of 41 GW, which will be the main force in the newly added solar PV capacity in 2021.