

The 14th Five-Year (2025-2030) and mid-to long-term policy trends for energy storage development in China

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The 14th Five-Year Plan for New-Type Energy Storage Development released

The government requires that by 2025, new-type energy storage [1] should enter the stage of large-scale development from the initial stage of commercialization, and has the conditions for large-scale commercial application. The system cost of electrochemical energy storage technology should be reduced by more than 30%, and hydrogen energy storage and thermal (cold) energy storage to make breakthroughs in long-time storage technology. By 2030, new-type energy storage will develop in a fully market-oriented environment, including the realization of independent and controllable key technical equipment, as well as the establishment of mature market mechanisms, business models and standard systems. Key tasks include [2]:

- In areas rich in new energy resources, such as Inner Mongolia, Xinjiang, Gansu and Qinghai, focus on the deployment a number of energy storage assembled new energy power plants
- In Northeast China, North China, Northwest China and Southwest China, support the power exports and local consumption of renewable energy power bases, relying on active and new inter-provincial power transmission channels through the integration project of "wind-solar-hydro-thermal-storage"
- Exploration of hydrogen production technology, reasonable energy storage scale and operation mode of energy storage in large-scale wind and solar bases in the Gobi and desert areas
- Conduct research on new-type energy storage for large-scale offshore wind power bases in Guangdong, Fujian, Jiangsu, Zhejiang and Shandong to reduce capacity requirements for transmission channels
- Explore the use of retired thermal power plants and supporting power substations to build new-type energy storage projects or wind-solar-storage facilities
- Encourage new energy power plants to configure energy storage capacity through self-construction, lease or purchase

References

[1] *New-type energy storage refers to energy storage technologies other than pumped storage.*

[2] “关于印发《“十四五”新型储能发展实施方案》的通知,发改能源[2022]209号,” National Development and Reform Commission and National Energy Administration, 22 February 2022, accessed at https://www.sohu.com/a/525162072_120112874.



NEA determines the pumped storage development targets towards 2035

By 2025, the cumulative operating capacity of pumped storage aims to be doubled, reaching 62 GW compared to 2020 - to be further increased to about 120 GW by 2030. Before the end of 2035, the pumped storage industry should be able to support the development of high-share new energy power system and to establish batches of leading enterprises. In addition, the government makes a mid-to-long term pumped storage project list consisting of key projects and reserve projects. Of which 421 GW are key projects with mature construction conditions and qualify for ecological red-line requirements, the other 305 GW of reserve projects are yet to be qualify for the ecological red-line requirements, but with potential to breakthrough the environmental constraints in the future. [3]

References

[3] “《抽水蓄能中长期发展规划（2021-2035年）》印发实施,” National Energy Administration, 9 September 2021, accessed at http://www.nea.gov.cn/2021-09/09/c_1310177087.htm; “能核尽核、能开尽开！国家能源局发布4.21亿千瓦抽水蓄能进入中长期发展规划,” National Energy Administration, 9 September 2021, accessed at https://m.thepaper.cn/baijiahao_14438771.



The 2035 roadmap for hydrogen industrial development is clear

On March 23, 2022, the NDRC and the NEA jointly issued the Medium- and Long-term Development Plan for Hydrogen Energy Industry (2021-2035), which put forward the strategic positioning of hydrogen energy in the future, as well as the industrial development targets for 2025, 2030 and 2035. The hydrogen energy industry will be an important part of China's energy system, an important carrier for end-use side to achieve green and low-carbon transition, and a key developing direction of national strategic emerging industries. Its development will focus on three aspects: safety, greenness, and technological breakthroughs.

By adhering to the principle of "safety first", the government requires to strengthen the risk prevention and control of the entire industry chain of hydrogen energy production, storage, transportation, filling, and application. Besides, the development of hydrogen energy should be based on the premise of not adding new carbon emissions. At present, 80% of China's annual hydrogen production comes from coal and natural gas, and nearly 20% comes from industrial by-products. While in the future, hydrogen production from renewable energy (i.e. green hydrogen) will be the focus of its development. By 2025, the incremental hydrogen energy consumption should mainly be green hydrogen; by 2030, green hydrogen should be widely used; by 2035, the proportion of green hydrogen in total final energy consumption aims to increase significantly. Breakthroughs in core technologies are also the key. At present, China's hydrogen energy industry has obvious shortcomings in terms of technical level and infrastructure. Therefore, the pace of its development should not be too fast, and multi-dimensional factors such as industrial foundation, resource conditions, cost, and market space must be considered.

Key development targets for 2025-2035 include [4]:

- 2025 – Preliminarily establish a hydrogen power supply system based on nearby utilization of green hydrogen and industrial by-product hydrogen, green hydrogen production to reach 100,000-200,000 tons per year, and ownership of hydrogen fuel cell vehicles to be about 50,000
- 2030 – Form a relatively complete clean energy based hydrogen production and application system and technology innovation system
- 2035 – Build a multi-functional hydrogen power application system covering transportation, energy storage, industry, and other fields

References

[4] "《氢能产业发展中长期规划（2021-2035年）》," National Energy Administration, 23 March 2022, accessed at http://zfxgk.nea.gov.cn/2022-03/23/c_1310525630.htm; "一图读懂 | 氢能产业发展中长期规划（2021-2035年）," National Energy Administration, 23 March 2022, accessed at http://www.nea.gov.cn/2022-03/23/c_1310525887.htm; "国家发改委专题介绍“氢能中长期规划”," National Development and Reform Commission, 23 March 2022, accessed at <https://baijiahao.baidu.com/s?id=1728137366208262498&wfr=spider&for=pc>.