



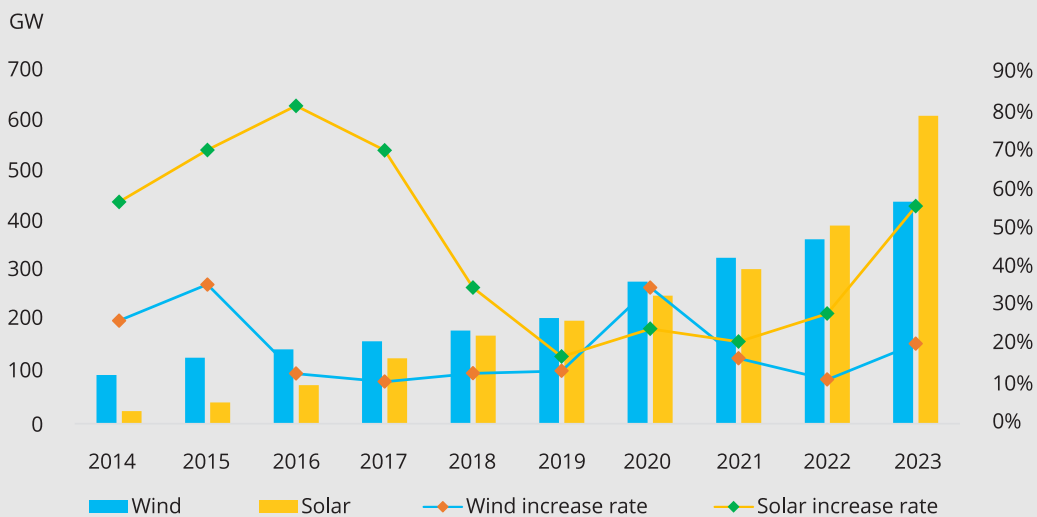
FACTSHEETS SERIES ON CHINA ENERGY TRANSITION UPDATE

WIND POWER AND SOLAR PV CONTINUE TO EXPERIENCE RAPID GROWTH

By the end of 2023, **China's cumulative installed capacity of solar PV reached 610 GW, an increase of 217 GW (55.2%)** y-o-y. Solar has surpassed hydropower and is now the second largest installed power source, accounting for 21% of the total installed power. Newly added solar PV accounted for 60% of China's total added installed capacity in 2023.¹

The cumulative installed capacity of distributed PV has reached 116 GW, double the 2022 figure. The growth rate of distributed solar PV installations in the southern provinces was higher than in the northern provinces. Cumulative distributed solar PV was more concentrated in the eastern and southern provinces, in particular in Shandong, Henan, Jiangsu and Zhejiang.

Figure 1 Wind & Solar cumulated installation and annual increase trend from 2014 to 2023



Source: NEA, 2024, and GIZ analysis, March 2024

In the whole year of 2023, **solar PV power generation was 584 TWh, an increase of 36.4% y-o-y and accounted for 6.2% of China's total power generation.** The top five solar power generation provinces were Hebei, Ningxia, Qinghai, Inner Mongolia and Xinjiang. Hebei was the leading province for solar power generation in 2023, mainly due

to the strong support from the provincial policies. Ningxia, Qinghai, Inner Mongolia and Xinjiang, located in the northwest of China, have superior solar energy resources, but also benefited from the central government's support for the construction of solar PV bases in the Gobi desert.

Figure 2 China cumulative distributed solar installed capacity by province in 2023

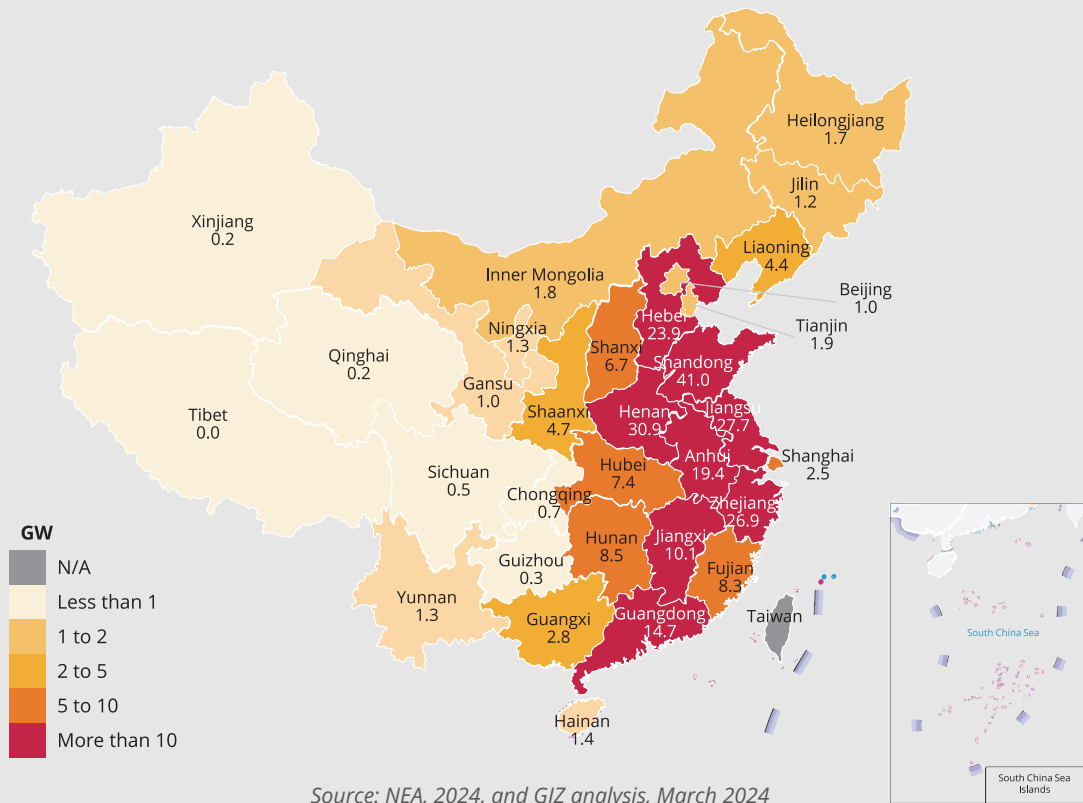
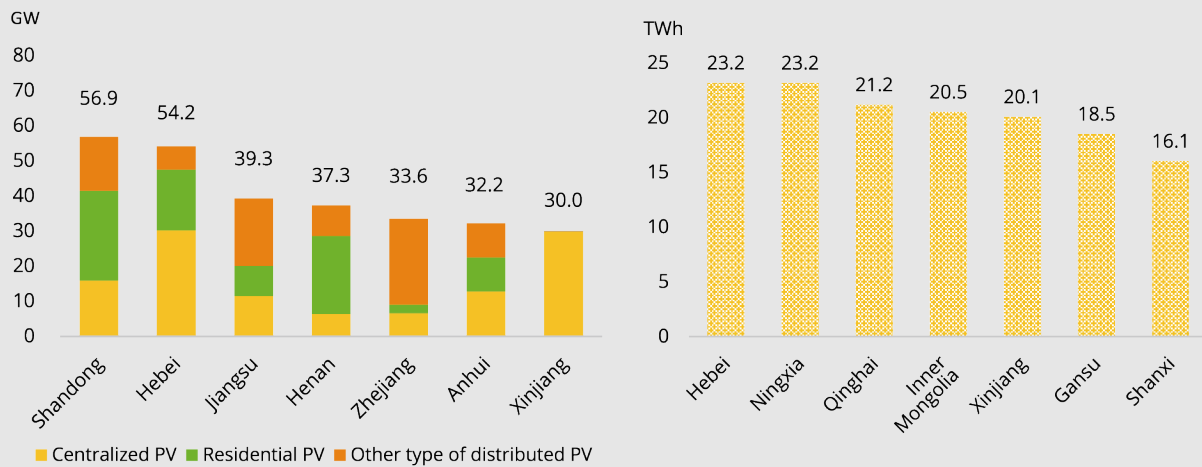


Figure 3 The top 7 provinces in solar power installed capacity(left) and power generation(right) in 2023



By the end of 2023, **China's cumulative installed capacity of wind power was 441 GW, an increase of 20.7% y-o-y.** Wind power thus accounted for 15% of the total installed power, of which 404 GW was onshore and 37.3 GW was offshore wind energy. 470 wind power projects were approved throughout the year, with 75.9 GW of new installed capacity, nearly doubling y-o-y and accounting for 21% of newly installed capacity in 2023 (69.4 GW onshore and 6.5GW offshore). The number of new offshore wind projects has declined compared to the last two years due to insufficient returns on investment.^{2,3}

Wind power generated 886 TWh in the year 2023, up 12.3% y-o-y, accounting for 9.4% of the total power generation. As in the previous year, Inner Mongolia had the largest share of wind energy production, generating 127.1 TWh of electricity, more than twice as much as Hebei Province, which produced the second largest share of wind power. Compared with the other northwestern region, Inner Mongolia is closer to major electricity consumption areas in China, which is conducive to the transmission of wind power.⁴

Figure 4 The top 8 provinces in wind power installed capacity(left) and power generation(right) in 2023



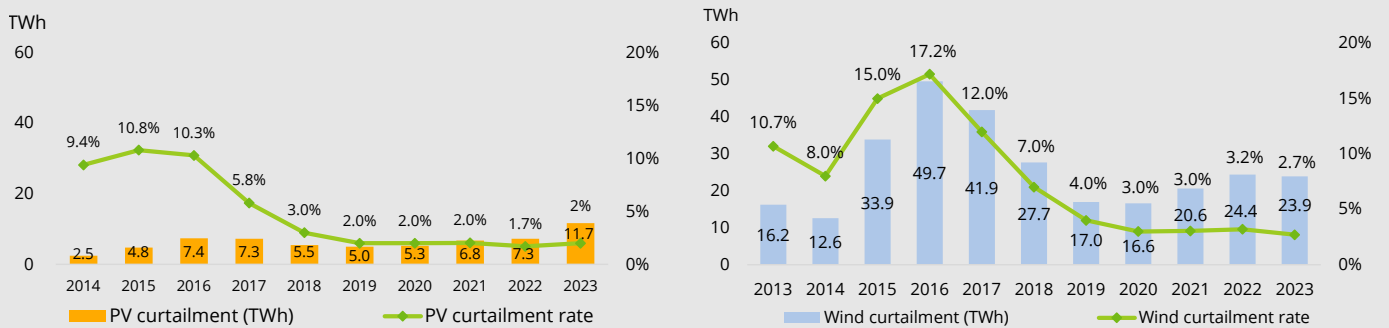
Source: International Energy, 2024

In 2023, China's new energy investment grew rapidly, the investment in solar PV exceeded 670 billion CNY, while the investment in wind power exceeded 380 billion CNY.

In 2023, the average solar PV utilization rate was 98%, while the average utilization rate of wind power was 97.3%.

The northwest of China is rich in wind and solar energy resources, but the region is less economically developed and has lower electricity demand. Therefore, the electricity that exceeds self-consumption must be stored or transported to the eastern high-load areas. However, storage and grid capacities are insufficient, which leads to higher curtailment rates.^{5 6}

Figure 5 Curtailment of solar and wind (TWh) from 2014 to 2023



Source: NEA 2023, and GIZ analysis, March 2024

The development of wind power and solar PV in China is mainly driven by policies. The most important top-level policy documents in the field of renewable energy are the "14th Five-Year Plan for Modern Energy System" and the "14th Five-Year Plan for Renewable Energy Development" released in 2022, which clarify the overall policy roadmap and framework. From 2021 to 2022, a series of measures and action plans were issued by the central government, and the local provinces implemented these accordingly. By 2023, the policy focus has changed significantly: the "Implementation Plan for a New Industry Standardization Pilot Project (2023-2035)" and the "Action Plan for Accelerating the Integrated Development of Oil and Gas Exploration and Development and New Energy (2023-

2025)" both focus on specific implementation approaches or cross-cutting areas. The "Guide to Building Standard Systems for Carbon Peak and Carbon Neutrality", the "Acceptance Code for Photovoltaic Power Generation Projects" and the "Management Measures for the Renovation, Upgrading and Decommissioning of Wind Farms" all focus on the development of standards and specifications, which shows that the related supervision and risk control of wind power and solar PV have become significantly stricter. The policy document "Supporting the Development of the Photovoltaic Power Generation Industry and Regulating Land Use Management" aims to solve the problem of illegal land use of photovoltaic systems and environmental pollution in abandoned

thermal power plants. The "Guidelines for Strengthening the Stability of the Electricity System under the New Conditions" focus on the design of electricity markets and green certificate trading to integrate more renewable energy into the electricity grids.

In 2023, although China's wind power and solar PV industry has achieved expansion and technical improvements, it also faces many challenges such as overcapacity and price

fluctuations due to the imbalance between supply and demand and declining subsidies.

According to the National Energy Administration's forecast, **the share of installed capacity of non-fossil energy will increase to about 55% in 2024, and the share of wind and solar power generation will increase by more than 17%.**⁷

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Note: All the data quoted in this paper are from official sources to the extent possible. Due to different statistical methods, some data differ from each other, and individual revisions have been made compared with last year's version, or adjustments have been made according to the actual situation. For data that does not affect the overall judgment, the original cited data is retained.

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