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China has begun laying the groundwork in various areas from the perspective of energy security

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How can China's recent efforts on energy and climate change be interpreted within the framework and perspective of energy security? What are the current and future impacts of these efforts?

Of China's total energy supply, coal accounts for 58%, oil 20%, natural gas 10%, renewable energy 9%, and nuclear power 3% (2024, EI Statistics). Focusing on imports as a percentage of total energy supply, imported oil accounts for 18% (9% imported from the Middle East), imported coal 7%, and imported natural gas 4% (2% imported via pipeline and 1% imported from the Middle East). From the perspective of energy security, it is important to reduce these imports, especially those of oil.

Regarding oil, the development of domestic resources is progressing. At a press conference on March 23, Sinopec announced that it had extracted 1 million tons of oil from the Jiyang Trough in the Bohai Bay Basin in 2025 and will expand the scale of shale oil development in the Bohai Bay Basin in the future. There are also predictions that China's shale oil production will increase to 16 million tons by 2035. However, the figure of 16 million tons is still minuscule compared to the 620 million tons of oil imports in 2025 (National Bureau of Statistics, Annual Statistical Bulletin).

Regarding coal-to-liquid (CTL) and coal-to-gas (CTG) processes, which replace oil and natural gas, the amount of coal consumed as an intermediate has surged. In 2023, the most recent year for which statistics are available, 38 million tons of coal were input into CTL and 50 million tons in CTG (National Bureau of Statistics, Coal Balance Table). Concerns have also been raised about the sharp increase in CO2 emissions from these processes. Therefore, on December 17, 2025, the National Development and Reform Commission and other bodies published the "Target Levels and Standard Levels for Key Areas of Clean and High-Efficiency Coal Utilization," and included CTL and CTG in this scope to improve utilization efficiency. It remains to be seen whether CTL and CTG will continue to increase in the future.

Regarding coal, some reports suggested a shift from imports to domestic production, citing a decrease of 50 million tons from 540 million tons to 490 million tons between 2024 and 2025, while domestic production increased by 70 million tons from 4.78 billion tons to 4.85 billion tons (National Bureau of Statistics, Annual Statistical Bulletin). However, coal imports are in a period of adjustment after a sharp increase from 290 million tons in 2022, when China suffered an energy shortages, to 470 million tons in 2023, and domestic production has also continued to increase by an average of 70 million

tons per year since 2023, making it difficult to see this as a shift from imports to domestic production.

Regarding renewable energy, which is a domestic energy source, the 15th Five-Year Plan Outline, approved on March 12, includes the construction of a new energy infrastructure/system consisting of clean energy bases such as wind and solar power in the "deserts, Gobi Desert, and wastelands" of the "Three Norths" (Northwest, North China, and Northeast), and large-scale hydroelectric power plants in the Southwest, as well as transmission lines that will carry the generated electricity across provinces and autonomous regions to the East. Furthermore, regarding the transportation sector, where petroleum is the main source of consumption, the plan states that, focusing on transportation routes where cargo volume is concentrated, multiple zero-carbon transportation corridor demonstration roads will be built by constructing facilities for charging and battery exchange, as well as hydrogen, ammonia and alcohol refueling.

However, currently, renewable energy sources face challenges such as fluctuations in output and an increase in the rate of electricity wasted (the proportion of electricity generated that is not utilized due to insufficient transmission capacity, etc.) or a decline in the utilization rate of generated electricity. From April 2025 to March 2026, the year-on-year monthly increase in generated electricity was 55.5% for solar power in July and 28.4% for wind power in August, while it decreased by 12.5% in March (National Bureau of Statistics, Monthly Data). In December, when overall electricity generation (electricity demand) increased by only 1.5%, solar power increased by 33.7% and wind power increased by 13.1%. From 2023 to 2025, the utilization rate of generated power decreased from 98.0% to 94.8% for solar power and from 97.3% to 94.3% for wind power. Solar power fell below 90% in the Tibet Autonomous Region, Qinghai Province, Xinjiang Uyghur Autonomous Region, and Gansu Province, while wind power fell below 90% in the Tibet Autonomous Region (Center for Power Industry Planning/Research and Monitoring/Early Warning, National Status on Grid Interconnection and Consumption of New Energy). In January-February 2026, the utilization rate of generated power was 90.8% for solar power and 91.5% for wind power, with slightly less than 10% being wasted.

One way to address these output fluctuations is through the production and utilization of green hydrogen using renewable energy. According to a press conference held by the National Energy Administration on April 27, by the end of March 2026, the renewable hydrogen production capacity that is in operation in China exceeded 250,000 tons per year, more than double the capacity at the end of 2024, with over 900,000 tons per year under construction. In Jilin Province, Inner Mongolia Autonomous Region, and Xinjiang Uyghur Autonomous Region, eight projects with a capacity of over 10,000 tons each are in operation. In Xinjiang Uyghur Autonomous Region, Inner Mongolia Autonomous Region, and Jilin Province, several projects with a capacity of over 50,000 tons each have started construction. In February, the first green ammonia was supplied to Lotte Fine Chemical of the Republic of Korea from a project in Chifeng City, Inner Mongolia Autonomous Region, operated by Envision Energy. Furthermore, in terms of utilization, on March 16, the Ministry of Industry and Information Technology, the Ministry of Finance, and the National Development and Reform

Commission issued a "Notice on the Implementation of Comprehensive Hydrogen Energy Application Pilot Projects" with the aim of reducing costs through large-scale applications in various situations. Cities will implement pilot projects in eligible application scenes, such as fuel cell vehicles, green ammonia and methanol, substitution of chemical raw materials with hydrogen, hydrogen steelmaking, and hydrogen-mixed combustion.

Recent efforts by China regarding energy and climate change reveal that it is carefully laying the groundwork in various areas from the perspective of energy security, but the impact is currently limited. However, in the future, the trends in CTL and CTG, and hydrogen will be worth watching. Regarding hydrogen, China's actions are particularly noteworthy while other countries are holding back. Its strategy, which looks not only at expanding domestic use but also at exports, is attracting attention.

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