

China's Nuclear Energy Priorities Under Its 15th Five-Year Plan

By Jane Nakano and Yu-Hsuan Yeh

China adopted the **15th Five-Year Plan** (15FYP) for 2026-2030 in March, following the annual sessions of the Chinese People's Political Consultative Conference (China's top political advisory body) and the National People's Congress (China's national legislature). With innovation and security as its leading themes, the latest FYP illuminates how nuclear energy underpins multiple strategic priorities for China in the context of not only energy security but also technological innovation and global engagement. These priorities point to the country's continued interest in technology exports through the Belt and Road Initiative, domestic advanced reactor deployment, and fusion energy development.

China also supports the global expansion of nuclear power capacity. At the second Nuclear Energy Summit held in Paris the same week of the National People's Congress, China joined a **pledge** that stemmed from the 2023 UN Climate Change Conference in Dubai, also known as COP28, to triple global nuclear energy capacity by 2050. China's commitment renders this pledge more feasible given that it hosts the fastest-growing fleet of nuclear power plants in the world.

This white paper outlines seven key observations on China's nuclear-energy-related goals through 2030. Taken together, these goals and aspirations will have important implications for the future of the global nuclear sector as well as the future of Chinese influence and competitiveness in technological innovation and supply chains.

Seven Key Observations

1. NUCLEAR POWER WILL CONTINUE TO BE A KEY SOURCE OF A DIVERSIFIED POWER PORTFOLIO.

China continues to view nuclear as an electricity source that advances its energy security while also reducing reliance on fossil fuels, as noted in the latest FYP (**Part II, Chapter 7**): “Promote the safe, reliable, and orderly replacement of fossil fuels with non-fossil energy sources; pursue a multi-pronged approach that combines wind, solar, hydro, and nuclear power; and implement the ten-year plan to double non-fossil energy capacity.” The remarkable growth of renewable energy sources and coal’s continuing preeminence have shaped nuclear energy’s role as a non-carbon-emitting baseload in China’s power generation portfolio (Table 1). Nuclear energy seems to serve as a versatile power source that supplements coal’s role as an energy security enforcer as well as the role of renewables as clean energy boosters. By 2030, China targets 110 gigawatts (GW) of installed nuclear power capacity. If realized, the installed capacity in China will surpass that of the United States unless U.S. capacity—currently the world’s largest—grows substantially from **102.5 GW** (gross) in 2025.

The installed capacity has been growing at a remarkable rate in China, the future home of **just under half** of the world’s nuclear reactors currently under construction. While the Chinese government has missed its FYP targets for the last three five-year planning cycles, capacity addition should accelerate, as the State Council has been approving **10 or more new reactor units** annually since 2022. Yet, it remains to be seen whether the country will add 48 GW—roughly equivalent to 40 large reactor units—in the next five years to meet its 2030 target.

Table 1: China’s Cumulative Capacity Targets and Achievements

		Installed Power Capacity by Sources		
Year		Nuclear	Wind & Solar	Coal
2015	Target for*	40 GW	121 GW	960 GW
	Achieved by	27 GW	174 GW	900 GW
2020	Target for*	58 GW (>30GW)	320 GW	<1,100 GW
	Achieved by	52 GW	530 GW	1,080 GW
2025	Target for*	70 GW	n/a**	n/a
	Achieved by	62 GW	1,840 GW	1,238 GW
2030	Target for*	110 GW	1,200 GW	n/a

Note: *The targets are from the Chinese government’s five-year plans.** The 14th Five-Year Plan (2021–2025) did not set a target for 2025, but for 2030 it remains to be seen whether the energy-specific FYP for 2026–2030 would set a revised wind and solar target for 2030.

Source: CSIS.

2. NUCLEAR TECHNOLOGY DEVELOPMENT CONTINUES TO ENJOY GOVERNMENT SUPPORT.

Developing and deploying Chinese-made reactors has been a **priority** for the Chinese government. China has successfully done so with the Hualong One. Also known as HPR1000, Hualong One is a 1,100 megawatt (MW) (net) pressurized water reactor developed by China National Nuclear Corporation (CNNC), a major state-owned nuclear power company. Since the country's first Hualong One unit came online in **2021**, 6 additional units have begun commercial operation, 16 units are under construction, and **18 units** have received government approval in China. According to the CNNC, the Hualong One will become the country's **mainstream type** of third-generation thermal reactor by 2030.

China has also developed and deployed the CAP-1400 reactor. Compared with the Hualong One, the CAP-1400, made by the State Power Investment Corporation (SPIC), is at an earlier stage. After its first unit came online in late **2024**, CAP-1400 reactors have just recently entered the large-scale deployment phase. Shortly after the State Council adopted the 15FYP, **SPIC** announced that the at-scale production of the CAP-1400 is one of the projects to be supported by a 2026 investment of 200 billion yuan.

China is also investing in domestic small modular reactor (SMR) technology. The Linglong One (or ACP100) is a land-based small-modular pressurized water reactor and the first land-based SMR to be approved by the International Atomic Energy Agency. When the Chinese government mentions the Linglong One, it often notes the reactor's use in heating, hydrogen production, and desalination.

In contrast to the clear plans for building the Hualong One, however, no government announcement has been made on building a second Linglong One unit. Based on limited available information, China may have faced multiple obstacles in building and operating the SMR reactor. According to a January 2026 **press release**, the deputy director of the Commissioning Management Department of Hainan Nuclear Power Corporation—jointly owned by CNNC and another state-owned company, Huaneng—said, “As the first reactor of its kind, the commissioning phase [for the Linglong One] presented numerous novel challenges and required validation of various new functions.” He further **noted** that the “on-site team” needs to “continuously identify issues, refine and optimize solutions, and iterate through feedback.”

3. CHINA'S NUCLEAR REACTOR EXPORTS SEEMINGLY STRUGGLE.

Nuclear commerce is a valuable means to cement a multidecadal tie between exporting and importing countries, even if basic trust is a prerequisite. Being a global technology supplier also accords a country an important voice on nuclear safety and security matters, such as shaping standards and norms. To China's leadership, nuclear exports are also about **international prestige**.

The 15FYP did not set a specific target for the number of reactors the country aims to export. About a decade ago, China signaled its ambition to build as many as **30 units abroad** by 2030. It is uncertain if this vision was inclusive of foreign-designed reactors or represented ambition to export domestically designed reactors. Nonetheless, it is clear that China aims to become a global exporter of nuclear reactor technology, with the Hualong One as its flagship reactor design for export—potentially to **Argentina, Egypt, and Kenya**.

Until recently, **Chinese government officials** had mentioned **both** the Hualong One and CAP-1400 reactor designs when discussing reactor export efforts and prospects. However, in December 2025,

SPIC announced that there is currently **no plan** for exporting the CAP-1400. The Chinese government has likely chosen the Hualong One over the CAP-1400 not only because Hualong One supply chains are **more mature and domestic** than those of the CAP-1400, but also due to the CAP-1400’s “**U.S. heritage**” and use of U.S.-derived technology, which complicates its export prospects politically.

Meanwhile, China’s ambition to export SMRs may be delayed for now. Despite global attention, especially from **developing countries** with limited grid capacity, the lack of continued manufacturing after the first Linglong One deployment makes near-term global exports unlikely.

4. CHINA PRESENTS ITS NUCLEAR EXPERTISE AS A CONTRIBUTION TO THE GLOBAL SOUTH UNDER THE BELT AND ROAD INITIATIVE.

The Belt and Road Initiative (BRI) is a key focus of the 15FYP, with energy—including nuclear—being a major priority (Part VII, Chapter 23). As it seeks to become a global supplier of nuclear technology, China is now presenting its nuclear energy expertise as the country’s contribution to the Global South. The country’s nuclear-focused appeal to the Global South is captured in its slogan “**Atoms for Better Home, China’s Solutions** [核美家园 中国方案].” Introduced by the China Atomic Energy Authority in September 2023, this slogan is meant to convey that China can help others build a beautiful homeland by providing nuclear energy projects and services. Since then, China has been holding multiple international engagements under this thematic slogan, including its Peaceful Uses of Nuclear Technology forum meetings with the **Association of Southeast Asian Nations** (ASEAN) and **Gulf Cooperation Council** (GCC).

One concrete strategy appears to be for China’s major nuclear power plant (NPP) builders to engage in **non-nuclear projects** under the BRI, which currently counts **156 countries** as participating nations. Today, China’s leading NPP companies—such as the China General Nuclear Power Corporation, **PowerChina Nuclear Engineering Company Limited**, and China National Nuclear Corporation Overseas Limited, the CNNC’s overseas building branch—are building not only energy projects such as renewables and energy storage but also housing and highways in BRI countries. For example, in Bangladesh, the CNNC has built a power substation and a landmark skyscraper in the capital, Dhaka.

Chinese nuclear builders appear to be pursuing integration into the energy systems of BRI countries to familiarize the host governments with what they can offer and then to leverage non-nuclear track records to secure a nuclear contract in the future. In a speech at the BRI Media Cooperation Conference in September 2025, a CNNC board member emphasized how the company had earned trust under the BRI through its work in energy, infrastructure, and urban services, while alluding to the fact that the CNNC’s **core competency** is in nuclear energy. Also, in promoting SMR projects in **Bangladesh**, a senior executive from a subsidiary of a CNNC affiliate company referred to existing energy infrastructure cooperation as an important foundation.

Within the BRI, China is particularly focused on ASEAN and the GCC for civil nuclear exports. China’s civil nuclear cooperation with ASEAN began in 2015, when CGN signed a deal for capacity building with the **ASEAN Center for Energy**. Within ASEAN, **Thailand** has been the most active country engaging in civil nuclear energy cooperation with China. In 2023, China shipped an experimental fusion facility to Thailand to launch bilateral collaboration on **nuclear fusion**. In 2024, the CNNC also exported an experimental **microreactor** to Thailand.

The GCC is another key region for China's export ambitions. In its 2016 **China-Arabian Countries Policy Document**, China identified nuclear energy as a key field for cooperation, encompassing a wide range of areas such as plant design and construction, fundamental research, nuclear fuel, and spent-fuel treatment and disposal. Saudi Arabia appears to be China's top target within the GCC and has been a target for further cooperation under China's Gulf countries strategy since 2017. Currently, China is one of the five major contenders for what would be Saudi Arabia's first NPP. Westinghouse of the United States, Électricité de France, Rosatom, and Korea Electric Power Corporation/Korea Hydro and Nuclear Power are vying for a contract in competition with the CNNC to build two initial reactor units. China's efforts to sweeten the deal have included the 2022 offer to jointly build a **China-GCC Nuclear Security Demonstration Center** in Saudi Arabia to train a total of 300 nuclear energy technology professionals.

5. ADVANCED NUCLEAR REACTORS ARE A TECHNOLOGY DEVELOPMENT PRIORITY.

Apart from the existing fleet of light-water-based reactor designs, the 15FYP calls for “steadily advancing the research, development, and demonstration of Generation IV reactor technology” (**Part II, Chapter 7**). Generation IV reactors are the next generation of reactors, which generally use non-water coolants and rely on fuels other than low-enriched uranium. China's endeavors in non-light-water-based advanced reactor technologies have reached important milestones, with corresponding aspirations for future commercialization.

For example, China's 2 MW experimental Thorium Molten Salt Reactor (TMSR) achieved the **first thorium-to-uranium fuel conversion** in November 2025, building from significant funding commitments and research undertaken by the Chinese Academy of Sciences since 2011. The Chinese Academy of Sciences plans to build **10 MW-scale TMSRs** and commercialize them by 2030, while also building a 100 MW-scale TMSR and establishing a thorium-uranium fuel cycle by 2040. By 2050, China seeks to have TMSRs account for more than **10 percent** of China's power supply capacity. As molten salt reactors do not rely on water for cooling, their successful deployment could significantly facilitate reactor siting in water-constrained inland locations. Most of China's nuclear power plants are currently located in the coastal regions that are highly populated and where land is increasingly scarce for additional large infrastructure.

Notably, China is also pursuing TMSR use for maritime shipping. In December 2023, Jiangnan Shipyard announced it would build the **world's first** thorium-powered 24,000 twenty-foot equivalent unit (TEU) container cargo ship. The company claims that these cargo ships would enjoy a longer refueling cycle of 15 to 20 years, as opposed to the cycle commonly possible with a light-water reactor using low-enriched uranium fuels. Additionally, China has identified the potential to use a TMSR to power what would be the country's **first nuclear-powered icebreaker**, adding to China's **current fleet** of three non-nuclear-powered icebreakers. These vessels have become valuable to China's national security and commercial interests, as they accord operational and economic advantage through access to the Northern Sea Route, the shortest shipping route between Europe and Asia as sea ice continues to recede.

Another advanced reactor type that warrants attention is fast neutron reactors. According to China's 1983 “three-step” road map for nuclear reactor development, **fast neutron reactors** are China's next area of focus after thermal reactor technologies have been mastered. China began fast neutron reactor development **with Russia** in the early 1990s and connected its first experimental reactor, the China Experimental Fast Reactor (**CEFR**), to the grid in 2011. While CEFR was built with substantial and

substantive assistance from Russia, the **China Institute of Atomic Energy** developed demonstration reactor China Fast Reactor-600 (CFR-600), with steam generator modules and fuel **from Russia**. As of the summer of 2025, **two CFR-600 units** were under construction. The CNNC also finalized the design of what would be the country's first commercial fast neutron reactor, the **CFR-1000**, in the summer of 2025. Altogether, China plans to deploy 8 GW of fast reactors by 2030.

6. RUSSIA CONTINUES TO BE AN IMPORTANT PARTNER IN THE FIELD OF NUCLEAR TECHNOLOGY.

Although the 15FYP made no specific mention of bilateral nuclear engagements, Russia continues to be a key international partner to China, including in advancing its nuclear energy expertise. At a press conference coinciding with the National People's Congress in March, Chinese Minister of Foreign Affairs Wang Yi characterized China-Russia relations to be **"unshakable as a mountain."**

Despite Russia's general economic turmoil and increasing reliance on China, innovation in nuclear technology is an area where Russia has a lead over China. Key **Russian strengths** include the development of fast neutron reactors, the closing of the nuclear fuel cycle, the production of uranium-plutonium fuel, and the management of spent fuel. Also, China has long imported Russian nuclear reactor technologies. China is home to a fifth of the 20 Rosatom VVER reactor units that are currently under active construction in seven countries—two reactors each at Tianwan NPP (Units 7 and 8) and Xudapu NPP (Units 3 and 4).

Yet China's growing nuclear technology and supply chain capacity have not gone unnoticed. Chinese localization has steadily increased since the first Russian project in China in the early 2000s. Over time, **Rosatom's** role has become limited to technical assistance, with China taking on the majority of the work. Russian experts have remarked that China has learned to build Russian-designed NPPs **faster than Rosatom**. In fact, China's technical competence and strong supply chains have helped shield the Tianwan and Xudapu projects from the financial and logistical challenges introduced by Western sanctions on other Rosatom projects abroad following Russia's full-scale invasion of Ukraine.

In addition to advancing capacity and expertise in nuclear technology and supply chains, China is expanding its ability to produce fuel for Russian-designed VVERs. While France produces Russian fuel under licensing, China is the only country with Russian reactors that can also produce their fuel. The strong bilateral ties in the fuel production dating back to 2009 remain robust; Russia supplied equipment in 2023 to modernize the Yibin Fuel Plant in Sichuan province, China. Having localized fuel production for the VVER-1000 some years ago, the Yibin plant is currently completing the **localization** of fuel production for the VVER-1200. This trajectory suggests that China will begin supplying fuels to domestic VVERs, shrinking Rosatom's scope of business with China in the future.

7. FUSION ENERGY IS AMONG THE "FRONTIER TECH" PRIORITIES THROUGH 2030.

Fusion energy is **one** of the eight technology areas for focused development under the 15FYP (Part I, Chapter 3). China has significantly expanded its efforts to develop fusion energy in recent years, investing over **\$6.5 billion** since 2023. Also, several new fusion research and development **facilities** are under construction in China, such as the Burning Plasma Experimental Superconducting Tokamak (BEST).

China has been pursuing “**new quality productive forces**” that would enable high-quality, technology-driven growth rather than traditional capital-intensive manufacturing. In addition to fusion energy, the “**frontier technology areas**” under the 15FYP include AI, quantum technology, and deep-sea and arctic exploration.

China’s pursuit of deep space exploration is also motivating these investments in fusion energy. The country’s efforts to “develop a reusable heavy-lift launch vehicle” and “study the feasibility of establishing an international lunar research station” (**Part III, Chapter 8, Section 2**) may help Chinese scientists evaluate and eventually exploit valuable lunar resources, such as Helium-3. Considered to be an ideal fuel for fusion energy, **Helium-3** is available on the Moon in large quantities but virtually nonexistent on Earth.

Beyond fusion science itself, the development of advanced materials, such as high-end special steels and superconducting materials, are among the key industrial priorities under the 15FYP (Part II, Chapter 4). While scientists around the world work to master fusion science, China is additionally focused on becoming a leader in fusion technology component manufacturing. For example, the magnetic confinement fusion approach requires materials such as steel that can withstand near absolute zero temperature for superconductivity as well as the high pressure from massive magnetic forces. Reportedly, **Chinese scientists** are developing a specialized steel that is designed to withstand extreme fusion conditions.

CONCLUSION

To China, nuclear energy is not only about supplying more electricity with less emissions. Reactor technology development is closely linked to the country’s innovation capacity, industrial ambition, and international prestige. As China embarks on a new five-year cycle of economic development, the nation’s growing nuclear expertise is a key source for high-quality, technology-driven growth and a vital foundation for frontier technologies, such as fusion energy. China’s latest goals and aspirations demonstrate to U.S. policymakers that extending the United States’ competitiveness in nuclear innovation, supply chains, and commerce will require a strong, bipartisan focus and sustained commitment. ■

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