



China - 2025

PREAMBLE AND SUMMARY

This report provides information on the status and development of the nuclear power programs in China, including factors related to effective planning, decision making and implementation of the nuclear power program that together lead to the safe and economical operation of nuclear power plants.

This CNPP report summarizes organizational and industrial aspects of the nuclear power program and provides information about the relevant legislative, regulatory and international framework in China.

As of December 31, 2024, China has 58 nuclear power units (57 are listed in PRIS) in commercial operation and 27 units under construction. In 2024, nuclear power accounted for 4.47%^[1] of the total power generation.

[1]Statistical data is sourced from the “Statistical Communiqué of the People’s Republic of China on the 2024 National Economic and Social Development”.

1. COUNTRY ENERGY OVERVIEW

1.1. ENERGY SYSTEM

1.1.1. Energy Policy

During the “14th Five-Year Plan” period (2021–2025), China’s energy structure continued to be optimized, with significant achievements in low-carbon transformation. In 2024, the share of clean energy consumption in total energy consumption reached 28.6%, an increase of 2.2 percentage points, while coal consumption accounted for 53.2% of total energy consumption, a decrease of 1.6 percentage points from the previous year. The installed capacities of hydropower, wind power, solar power and nuclear power reached 435 950 MW, 520 680 MW, 886 660 MW and 60 830 MW, respectively, making non-fossil energy power generation capacity the highest in the world.

During June 2023, the National Energy Administration released the “Blue Book on the Development of New Power Systems”, proposing to ensure the safe, efficient, economical and sustainable development of nuclear power, optimize key nuclear power technologies, and promote the application of new generation nuclear power research and development. It aims to accelerate the application of comprehensive nuclear energy utilization technologies, promote the demonstration of advanced reactor technologies (such as high-temperature, gas-cooled reactors and small modular reactors), and support nuclear fusion technology research and development.

During November 2024, the 12th Meeting of the Standing Committee of the 14th National People’s Congress adopted the “Energy Law of the People’s Republic of China”, which emphasizes the active, safe, and orderly development of nuclear power, encouraging and supporting research, development, demonstration, promotion, and industrialization of foundational, key, and cutting-edge major technologies, equipment, and related new materials in the safe utilization of nuclear energy.

Note: This report does not include data related to nuclear power in China’s Taiwan region.

1.1.2. Energy Statistics

Statistics on installed capacity and power generation by energy source are shown in Table 1.

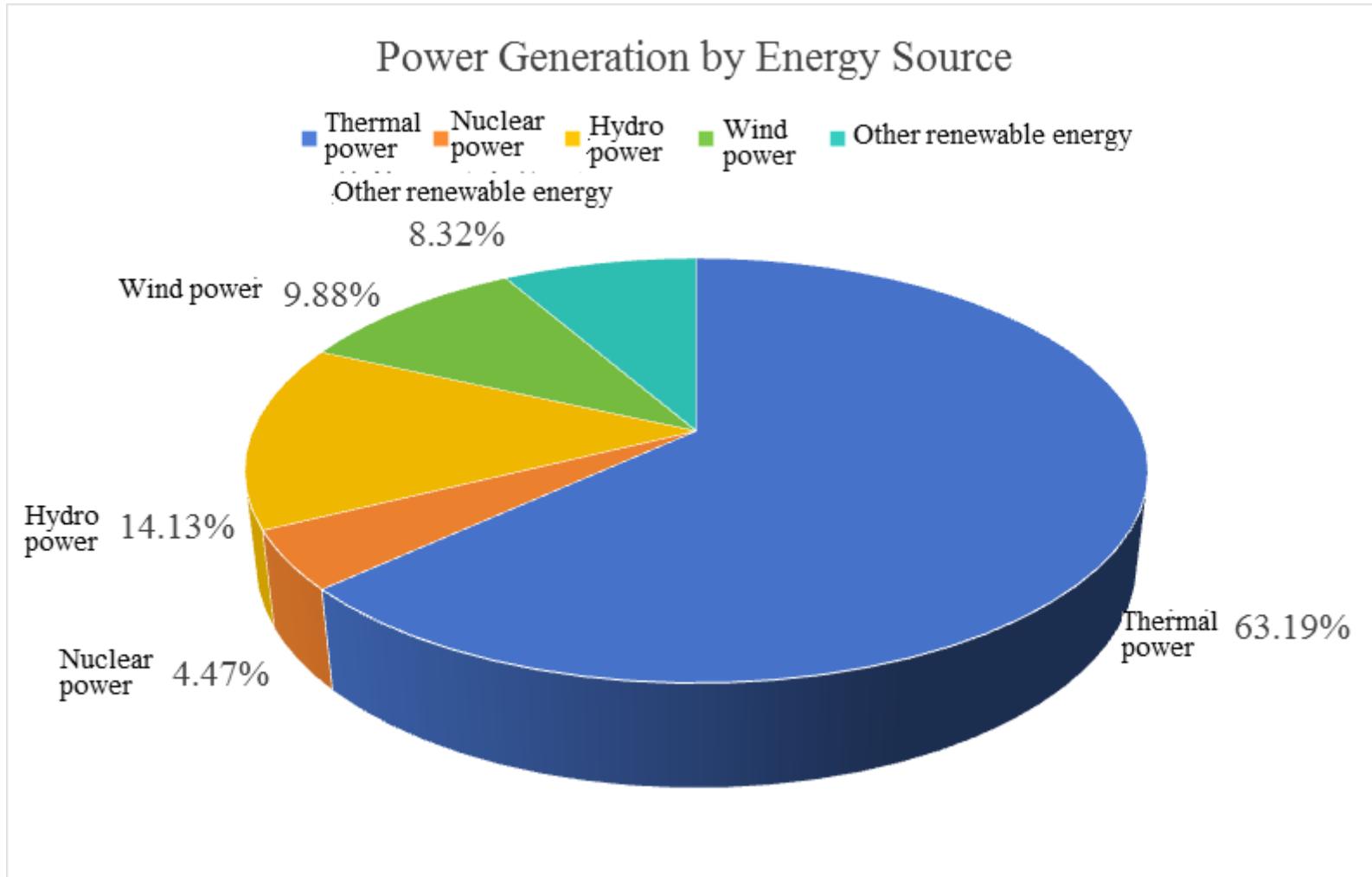


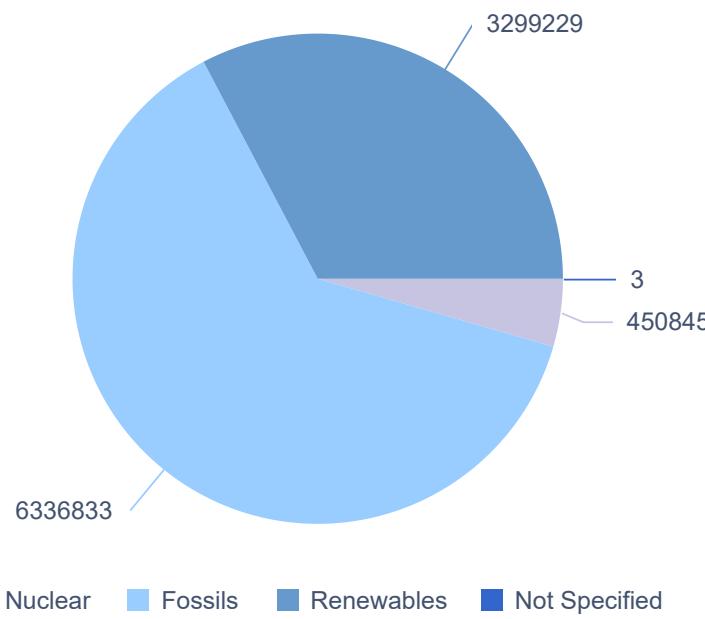
FIG 1. Power generation by energy source.

TABLE 1: INSTALLED CAPACITY AND ELECTRICITY PRODUCTION BY SOURCE

Energy Sources [Gross]	Electricity Supplied [GW(e)*h]	Installed Capacity	
		Share (%)	[GW(e)]
Energy Sources [Gross]			

Total	10086910	3348.62		
Nuclear	450844.6	4.5		
Fossils	6336832.706	62.8		
--Coal (hard coal, lignite)	6044761.171	59.9		
--Gas	282674.606	2.8		
--Oil	9396.929	0.1		
Renewables	3299229.171	32.7	956.63	28.6
--Biomass	37425.689	0.4		
--Hydro (including tidal and wave)	1425680	14.1	435.95	13
--Solar(PV)	839080.872	8.3		
--Wind	997042.61	9.9	520.68	15.5
Total				
Nuclear				
Fossils				
--Coal (hard coal, lignite)				
--Gas				
--Oil				
Renewables				
--Biomass				
--Hydro (including tidal and wave)				
--Solar(PV)				
--Wind				

Data as of 2024-12-31 from [IAEA Power Reactor Information System](#)

CHART 1: ELECTRICITY PRODUCTION BY SOURCE

TABLE 2: ENERGY CONSUMPTION

Final Energy consumption [PJ]	2005	2010	2015	2020	2023
Final Energy consumption [PJ]					
Coal, Lignite and Peat	55388	73049	81067	82992	92586
Petroleum products	13617	18368	23380	27421	30639
Natural gas	1836	4222	7370	12252	14231
Electricity	5661	9923	15248	23191	29969
Total	76502	105562	127065	145856	167425

Coal, Lignite and Peat

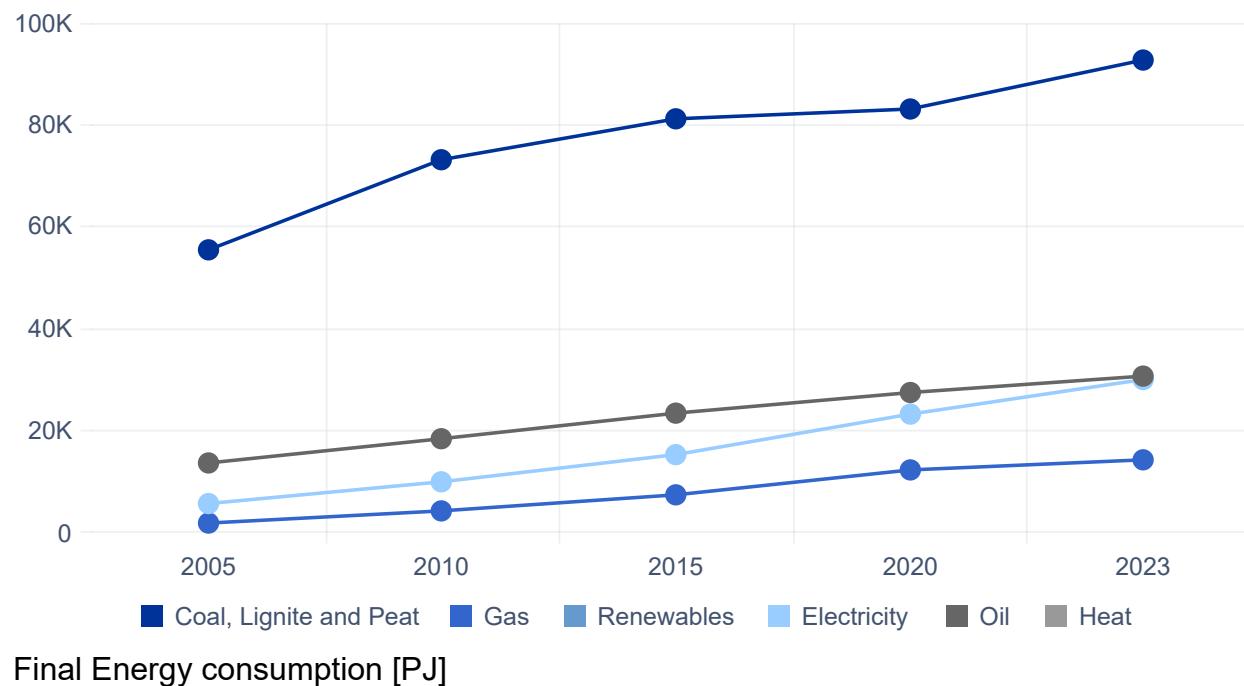
Petroleum products

Natural gas

Electricity

Total

Data as of 2024-12-31 from IAEA Referential Data Series 1

CHART 2: ENERGY CONSUMPTION


Final Energy consumption [PJ]

1.2. ELECTRICITY SYSTEM

1.2.1. Electricity System and Decision-Making Process

On 15 March 2021, President Xi Jinping stated important instructions on building a new power system at the 9th meeting of the Central Financial and Economic Commission. The report of the 20th National Congress of the Communist Party of China emphasized accelerating the planning and construction of a new energy system.

On 2 June 2023, the National Energy Administration organized 11 research institutions to jointly compile the “Blue Book on the Development of New Power Systems” (https://www.nea.gov.cn/2023-06/02/c_1310724249.htm), which points out that the new power system is primarily tasked with having a supply and consumption system with a high proportion of new energy, ensuring energy and power safety and meeting the power demand for high-quality economic and social development in China. The construction of China’s new power system will focus on the important milestones of 2030, 2045 and 2060, following a three-step development path of an accelerated transformation phase, a comprehensive formation phase, and a consolidation and improvement phase. The development of new energy will achieve a balance between centralized and distributed approaches, guiding the industry to shift from the eastern to the central and western regions.

On 20 November 2024, the National Energy Administration released the “Opinions of the National Energy Administration on Strengthening Power Safety Governance to Ensure High-Level Safety for the High-Quality Development of New Power Systems” (hereinafter referred to as the “Opinions”, https://www.gov.cn/zhengce/zhengceku/202411/content_6990253.htm). The “Opinions” propose requirements for improving the power safety governance system, enhancing power safety governance capabilities, refining power safety governance measures, and improving the effectiveness of power safety supervision and management. The aim is to fully implement President Xi Jinping’s new energy security strategy, advance the modernization of the power safety governance

system and governance capabilities, ensure high-level safety for the high-quality development of the new power system, and support the timely achievement of the new energy system construction and carbon peak and carbon neutrality goals.

On 29 November 2024, the “National Unified Power Market Development Planning Blue Book” (https://www.gov.cn/lianbo/bumen/202411/content_6990228.htm) was released, which was jointly compiled by the National Energy Administration and the China Electricity Council along with several other organizations. It clarified the “three-step” development goals: by 2025, a preliminary national unified power market will be established, with basic design of the power market essentially completed, and basic trading rules and technical standards unified nationwide; by 2029, the national unified power market will be fully established, promoting the unification of market foundational institutional rules, fair and unified market supervision, and high-standard interconnection of market facilities; by 2035, the national unified power market will be perfected.

1.2.2. Structure of the Electric Power Sector

The National Energy Administration serves as the government authority for the supervision and regulation of power generation enterprises and grid companies in China.

There are five national power generation enterprises in China, namely China Huaneng Group Co., Ltd., China Datang Corporation Ltd., China Huadian Corporation Ltd., State Power Investment Corporation Ltd., and China Energy Investment Corporation Ltd., all of which operate under the authorization of the State Council. In addition, China National Nuclear Corporation and China General Nuclear Power Group hold stakes in multiple nuclear power plants (NPPs). China Three Gorges Corporation constructs and operates several hydropower stations in China.

State Grid Corporation of China and China Southern Power Grid Co., Ltd. are the two national grid companies responsible for operating the national grid.

(Source: <http://www.ne21.com/news/show-64828.html>)

1.2.3. Electricity Statistics

The proportion of nuclear power in total power generation is shown in Figure 2.

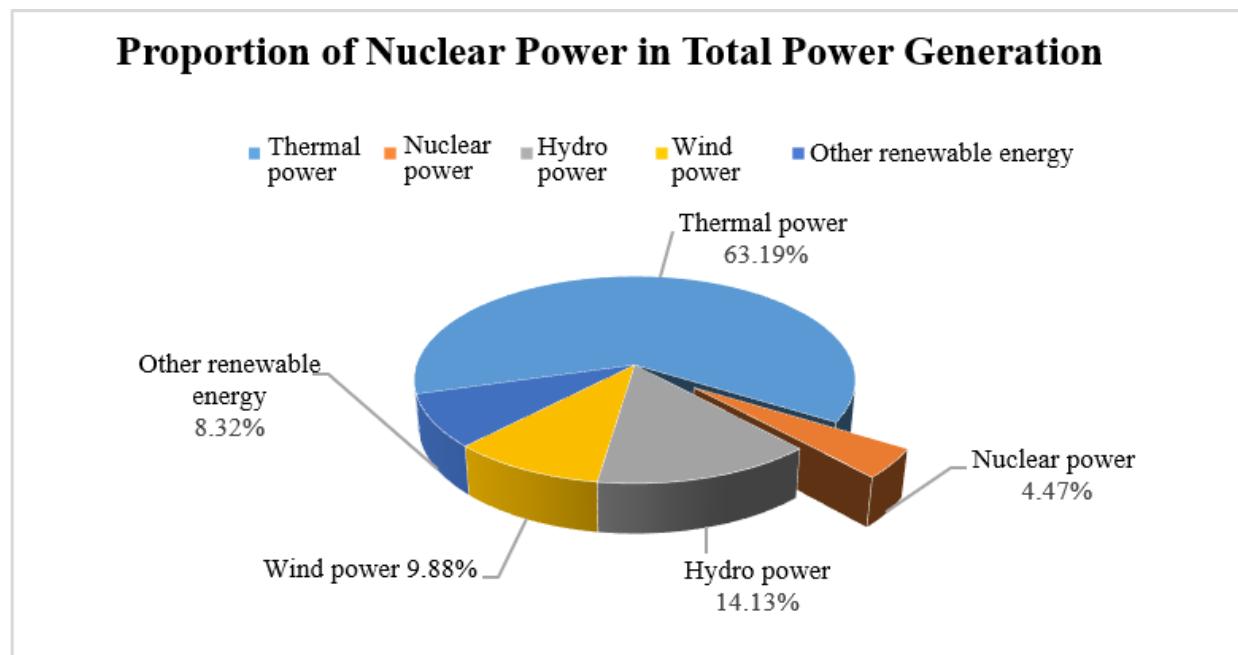


FIG 2. Proportion of nuclear power in total power generation.

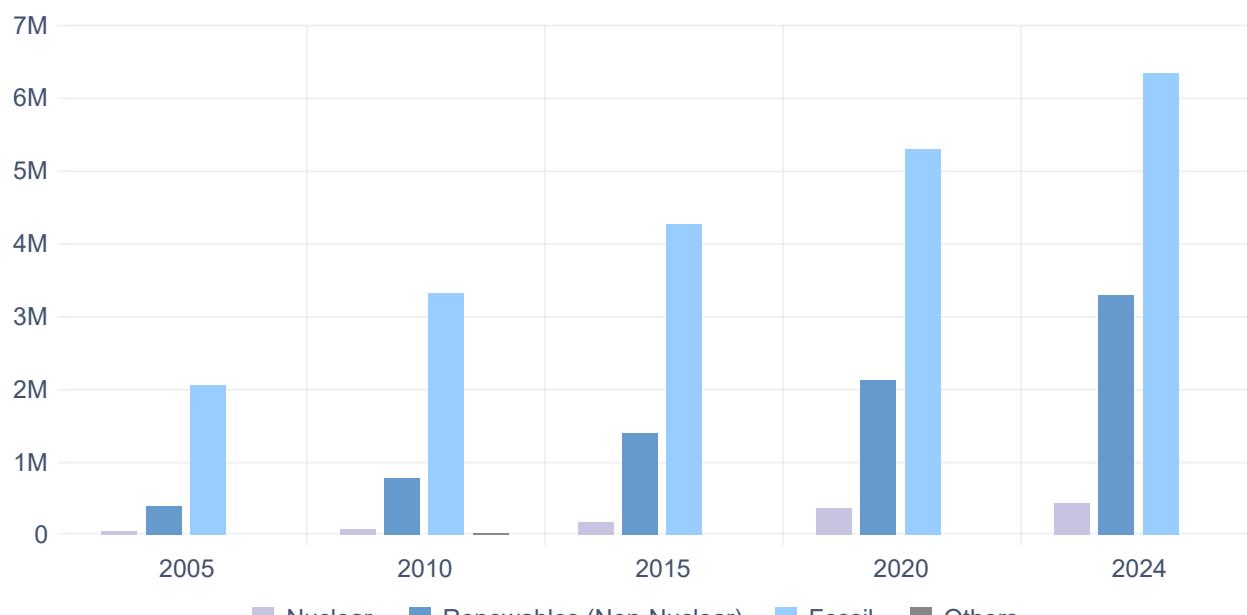
TABLE 3: ELECTRICITY PRODUCTION

Electricity production (GWh)	2005	2010	2015	2020	2024
Electricity production (GWh)					
Biomass and waste	3971	15230	28261	31702	37426
Coal, lignite and peat	1974473	3219617	4100137	5001329	6044761
Natural gas	12142	78063	145346	283527	282675
Oil	56751	19018	10444	13691	9397
Geothermal	0	0	0	0	0
Hydro	397017	722172	1130270	1355210	1425675
Nuclear	53088	73880	170789	366250	450845
Solar	0	1	38785	260873	839081
Tidal	7	7	7	7	7
Wind	0	44622	185766	466470	997043
Others	2819	34558	4784	23	0
Total	2500268	4207168	5814589	7779082	10086910
Biomass and waste					
Coal, lignite and peat					

Natural gas
Oil
Geothermal
Hydro
Nuclear
Solar
Tidal
Wind
Others
Total

Data as of 2024-12-31 from IAEA Referential Data Series 1

CHART 3: ELECTRICITY PRODUCTION



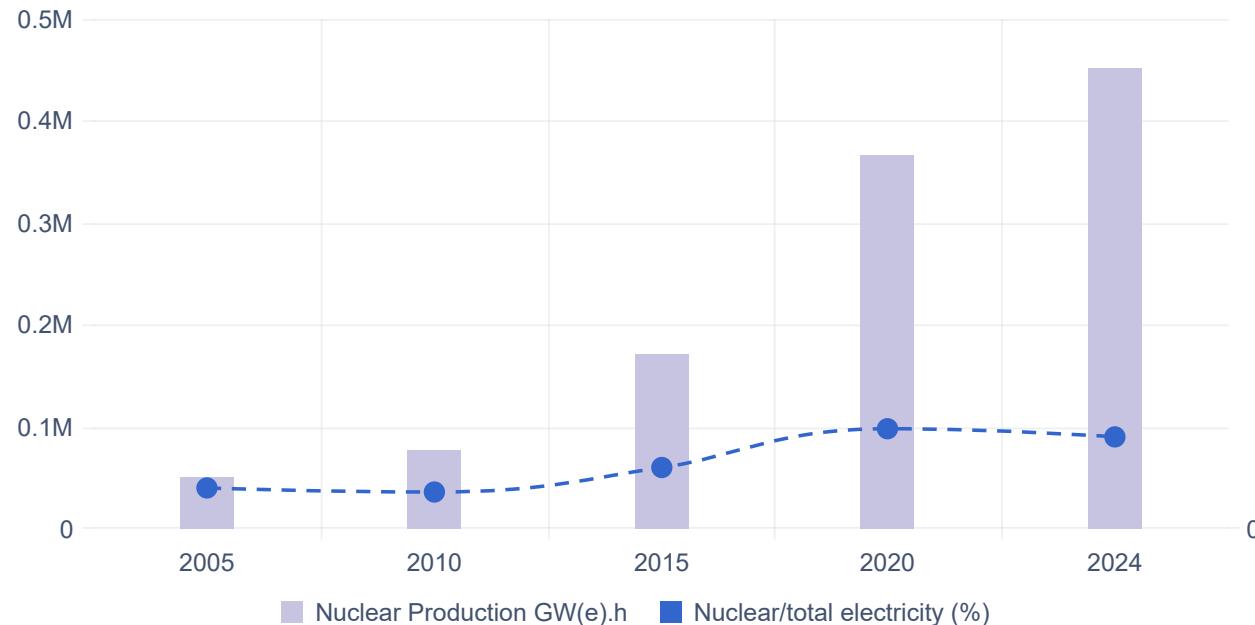
Electricity production (GWh)

TABLE 4: NUCLEAR SHARE OF TOTAL ELECTRICITY PRODUCTION

	2005	2010	2015	2020	2024
Nuclear/total electricity (%)	2	1.8	3	4.9	4.5
Nuclear/total electricity (%)					

Data as of 2024-12-31 from [IAEA Power Reactor Information System](#)

CHART 4: NUCLEAR SHARE TREND



2. NUCLEAR POWER SITUATION

2.1. OVERVIEW

2.1.1. Historical Developments

Since the mid-1980s, China's nuclear power has developed during the past 40 years, which can be roughly divided into three phases: initial phase, moderate development phase and large-scale development phase.

Initial Phase (the decade starting from the mid-1980s)

In the early 1970s, China began preliminary experimental research on key nuclear power technologies. In 1985, the first independently designed NPP in China, Qinshan NPP, commenced construction. It was first connected to the grid on 25 December 1991 and entered commercial operation on 1 April 1994. In 1987, two nuclear power units imported from France were constructed in Daya Bay, Guangdong, and were put into commercial operation in February and April 1994, respectively. The successful construction of Qinshan NPP and Daya Bay NPP laid the foundation for the subsequent development of nuclear power in China.

Moderate Development Phase (the decade starting from the mid-1990s)

In 1996, China began constructing two 650 MW pressurized water reactor units at Qinshan Phase II, which were designed and built independently based on the M310 technology. During this period, China also commenced construction of two French pressurized water reactor units at Lingao Phase I, two Canadian heavy water reactor units at Qinshan Phase III, and two Russian WWER units at Tianwan. The completion and commissioning of these eight units marked the initial scale of nuclear power in China, forming three nuclear power bases in Daya Bay, Guangdong, Qinshan, Zhejiang, and Tianwan, Jiangsu.

Large-scale Development Phase (from the mid-2000s to the present)

During March 2006, the executive meeting of the State Council reviewed and approved the “Medium- to Long-Term Development Plan for Nuclear Power (2005–2020)”, clearly stating to “actively promote nuclear power construction”, establishing the strategic position of nuclear power in China’s economic and energy sustainable development. In 2012, the executive meeting of the State Council reviewed and approved the revised “Medium- to Long-Term Development Plan for Nuclear Power (2011–2020)”, the “12th Five-Year Plan for Nuclear Safety and Radioactive Pollution Prevention and Control and Vision Goals for 2020”, and the “Nuclear Safety Plan (2011–2020)”, clarifying the goals and requirements for the continued development of nuclear power in China under the premise of ensuring safety in the era after the accident at the Fukushima Daiichi NPP. The “14th Five-Year Modern Energy System Plan” released in 2022 reiterated the active, safe, and orderly development of nuclear power, providing guidance for the sustained development of nuclear power in the new era. Under the coordination of various nuclear power development plans, China has successively carried out large-scale construction of improved second-generation nuclear power units and the HPR1000 nuclear power units; at the same time, efforts to introduce, assimilate, absorb and innovate the AP1000 technology have been actively promoted, successfully completing the AP1400 demonstration project.

2.1.2. Current Organizational structure

The main government departments responsible for the supervision and management of nuclear power in China include: the National Energy Administration, the China Atomic Energy Authority (CAEA), the Ministry of Ecology and Environment (National Nuclear Safety Administration) or MEE (NNSA), and the National Health Commission.

The National Energy Administration is the competent authority for energy of the Government of China, responsible for formulating nuclear power development plans, access conditions and technical standards, organizing implementation of the plans, providing review comments on major nuclear power projects, and organizing, coordinating, and guiding nuclear power scientific research.

The CAEA is the competent authority for the nuclear industry in China, which is responsible for researching and drawing up policies, codes, plans, programs and industry standards related to China’s peaceful use of nuclear energy. It is also responsible for exchanges and cooperation with other foreign governments and international organizations in the nuclear field, and takes a leading role in the national nuclear emergency response and management.

The MEE (NNSA) is the regulatory body for nuclear safety and radiation in China, implementing unified supervision of nuclear safety at Chinese NPPs and independently exercising nuclear safety supervision authority. One of the main measures of supervision and management by the MEE (NNSA) is the implementation of a licensing system, as well as the inspection of NPPs, nuclear materials and nuclear activities.

The National Health Commission is responsible for formulating laws and regulations on the prevention and control of radioactive occupational diseases in conjunction with relevant departments, organizing the formulation and issuance of standards related to radioactive occupational diseases, and conducting emergency medical rescue in nuclear and radiation accidents.

Currently, there are four central backbone enterprises engaged in nuclear power in China: China National Nuclear Corporation, China General Nuclear Power Group, State Power Investment Corporation Ltd. and China Huaneng Group. Among them, China National Nuclear Corporation and China General Nuclear Power Group operate multiple nuclear power units; State Power Investment Corporation is mainly engaged in the introduction, assimilation, absorption, research and development, transfer,

application and promotion of third-generation nuclear power technology. In addition, State Power Investment Corporation and China Huaneng Group hold controlling or minority stakes in some nuclear power projects.

China Datang Corporation, China Energy Investment Corporation, and China Huadian Corporation have invested in some nuclear power projects.

(Source: The Ninth National Report of the People's Republic of China for the "Convention on Nuclear Safety")

2.1.3. Development Strategy

In 2022, the National Development and Reform Commission and the National Energy Administration prepared the "14th Five-Year Modern Energy System Plan", clearly stating that China will "actively, safely, and orderly develop nuclear power". The plan points out that under the premise of ensuring safety, it will actively and orderly promote the construction of coastal nuclear power projects, maintain a steady construction pace, reasonably arrange new coastal nuclear power projects, demonstrate comprehensive utilization of nuclear energy, actively promote demonstration projects of advanced reactor types such as high-temperature gas-cooled reactors, fast reactors, small modular reactors and offshore floating reactors, and promote the comprehensive utilization of nuclear energy in clean heating, industrial heating and seawater desalination, while effectively protecting nuclear power site resources.

During March 2024, the National Energy Administration issued the "Guiding Opinions on Energy Work for 2024", proposing to closely monitor changes in the international energy situation, coordinate the use of domestic and international markets and resources, expand high-level international energy cooperation, enhance energy security under open conditions, and steadily and orderly promote international cooperation on nuclear power projects. Efforts should be made to organize the core technology breakthroughs and application demonstrations for energy digitalization and intelligence, and implement the first batch of national energy nuclear power digital transformation technology demonstration projects.

2.2. CONSTRUCTION

2.2.1. Project Management

The Government of China implements effective planning, guidance, supervision, and management for the development of nuclear power. The final approval of nuclear power projects is decided by discussions at the executive meetings of the State Council.

China's National Nuclear Safety Codes stipulate that nuclear safety licensees (or applicants) bear full responsibility for the safety of NPPs, nuclear materials and nuclear activities.

2.2.2. Project Funding

The group companies for nuclear power projects that have commenced construction, have been approved but not yet started construction, or have agreed to carry out preliminary work are all state-owned large enterprises. The funding for nuclear power projects is primarily raised by the group companies that hold the nuclear power projects, and the state allows qualified social capital to participate in new nuclear power projects.

2.2.3. Sites

Currently, there are 23 NPP sites in operation and under construction in China, all of which are coastal NPPs. The site selection procedures and external event evaluations are conducted in accordance with nuclear safety codes and are reviewed and confirmed by the MEE (NNSA).

(Source: The Ninth National Report of the People's Republic of China for the "Convention on Nuclear Safety", the official website of the Ministry of Ecology and Environment of the People's Republic of China)

TABLE 5A: STATUS OF REACTORS UNDER CONSTRUCTION

Reactor Unit	Type	Net Capacity [MW(e)]	Status	Date	Operator	Supplier
CHANGJIANG-3	PWR	1000	Under Construction		CHG	CFHI
CHANGJIANG-4	PWR	1000	Under Construction		CHG	CFHI
HAIYANG-3	PWR	1161	Under Construction		SDNPC	SNERDI
HAIYANG-4	PWR	1161	Under Construction		SDNPC	SNERDI
LIANJIANG-1	PWR	1224	Under Construction		ZJNPC	SNPEMC
LIANJIANG-2	PWR	1224	Under Construction		ZJNPC	CFHI
LINGLONG-1	PWR	100	Under Construction		HNPC	CFHI
LUFENG-5	PWR	1116	Under Construction		LFNPC	CFHI
LUFENG-6	PWR	1116	Under Construction		LFNPC	SENPE
NINGDE-5	PWR	1200	Under Construction		NDNP	CFHI
SANAO-1	PWR	1117	Under Construction		CGCNP	CFHI
SANAO-2	PWR	1117	Under Construction		CGCNP	CFHI
SANMEN-3	PWR	1163	Under Construction		SMNPC	Shanghai
SANMEN-4	PWR	1163	Under Construction		SMNPC	Shanghai
SHIDAWAN-1	PWR	1134	Under Construction		HSNPC	CFHI
TAIPINGLING-1	PWR	1116	Under Construction		HZNP	DEC
TAIPINGLING-2	PWR	1116	Under Construction		HZNP	CFHI
TIANWAN-7	PWR	1171	Under Construction		JNPC	Atommash
TIANWAN-8	PWR	1171	Under Construction		JNPC	Atommash
XIAPU-1	FBR	642	Under Construction		CNNC	CIAE(Chi)
XIAPU-2	FBR	642	Under Construction		CNNC	CIAE(Chi)
XUDAPU-1	PWR	1000	Under Construction		LNPC	DEC
XUDAPU-2	PWR	1000	Under Construction		LNPC	DEC
XUDAPU-3	PWR	1200	Under Construction		LNPC	Russian
XUDAPU-4	PWR	1200	Under Construction		LNPC	Atommash
ZHANGZHOU-2	PWR	1126	Under Construction		ZGZEC	CFHI

ZHANGZHOU-3 PWR	1129 Under Construction	ZGZEC	CFHI
ZHANGZHOU-4 PWR	1129 Under Construction	ZGZEC	CFHI

Number of reactors: 28

Data as of 2024-12-31 from [IAEA Power Reactor Information System](#)

2.2.4. Organizations and Institutions

The main organizations involved in nuclear power design and engineering management include:

- (1) China Nuclear Power Engineering Co., Ltd.
- (2) China General Nuclear Power Engineering Co., Ltd.
- (3) State Nuclear Power Engineering Co., Ltd.
- (4) Nuclear Power Institute of China
- (5) Shanghai Nuclear Engineering Research & Design Institute

The main construction and installation companies include:

- (1) China Nuclear Engineering & Construction Corporation Limited
- (2) Other major nuclear power construction companies: Shandong Electric Power Nuclear Power Construction Group Co., Ltd., Guangdong Power Engineering Co., Ltd., Tianjin Electric Power Construction Co., Ltd., Anhui No.2 Electric Power Construction Co., Ltd., China Construction Second Engineering Bureau Ltd.

The main equipment suppliers include:

- (1) Harbin Electric Corporation
- (2) Dongfang Electric Corporation
- (3) Shanghai Electric Group
- (4) China First Heavy Industries Group
- (5) China National Erzhong Group
- (6) ShenGu Group Co., Ltd

2.3. OPERATION

2.3.1. Status and Performance of Nuclear Power Plants

From 2020 to 2024, China had 11 units in commercial operation and 25 new units under construction. As of 31 December 2024, China had a total of 58 nuclear power units in commercial operation, with a total installed capacity of 60 947 MW; there were 27 nuclear power units under construction, with a total installed capacity of 32 369 MW. The annual cumulative electricity generation of nuclear power units in commercial operation in 2024 was 450.85 billion kWh, accounting for approximately 4.47% of the total electricity generation in the country. The basic information of China's NPPs as of the end of 2024 is shown in Table 5.

TABLE 5B: STATUS OF REACTORS IN OPERATION

Reactor Unit	Type	Net Capacity [MW(e)]	Status	Operator	Supplier	First Grid Date	Commercial Date	Suspension Date
CHANGJIANG-1	PWR	601	Operational	HNPC	DEC	2015-11-07	2015-12-25	
CHANGJIANG-2	PWR	601	Operational	HNPC	DEC	2016-06-20	2016-08-12	
DAYA BAY-1	PWR	944	Operational	DNMC	FRAM	1993-08-31	1994-02-01	
DAYA BAY-2	PWR	986	Operational	DNMC	FRAM	1994-02-07	1994-05-06	
FANGCHENGGANG-1	PWR	1000	Operational	GFPNC	DEC	2015-10-25	2016-01-01	
FANGCHENGGANG-2	PWR	1000	Operational	GFPNC	DEC	2016-07-15	2016-10-01	
FANGCHENGGANG-3	PWR	1000	Operational	GFPNC	CFHI	2023-01-10	2023-03-25	
FANGCHENGGANG-4	PWR	1000	Operational	GFPNC	CFHI	2024-04-09	2024-05-25	
FANGJIASHAN-1	PWR	1012	Operational	CNNO	NPIC	2014-11-04	2014-12-15	
FANGJIASHAN-2	PWR	1012	Operational	CNNO	NPIC	2015-01-12	2015-02-12	
FUQING-1	PWR	1000	Operational	FQNP	NPIC	2014-08-20	2014-11-22	
FUQING-2	PWR	1000	Operational	FQNP	NPIC	2015-08-06	2015-10-16	
FUQING-3	PWR	1000	Operational	FQNP	NPIC	2016-09-07	2016-10-24	
FUQING-4	PWR	1000	Operational	FQNP	NPIC	2017-07-29	2017-09-17	
FUQING-5	PWR	1075	Operational	FQNP	NPIC	2020-11-27	2021-01-30	
FUQING-6	PWR	1075	Operational	FQNP	NPIC	2022-01-01	2022-03-25	
HAIYANG-1	PWR	1170	Operational	SDNPC	WH	2018-08-17	2018-10-22	
HAIYANG-2	PWR	1170	Operational	SDNPC	WH	2018-10-13	2019-01-09	
HONGYANHE-1	PWR	1061	Operational	LHNPNC	DEC	2013-02-17	2013-06-06	
HONGYANHE-2	PWR	1061	Operational	LHNPNC	DEC	2013-11-23	2014-05-13	
HONGYANHE-3	PWR	1061	Operational	LHNPNC	DEC	2015-03-23	2015-08-16	
HONGYANHE-4	PWR	1061	Operational	LHNPNC	DEC	2016-04-01	2016-06-08	

HONGYANHE-5	PWR	1061 Operational	LHNPC	DEC	2021-06-25	2021-07-31	
HONGYANHE-6	PWR	1061 Operational	LHNPC	DEC	2022-05-02	2022-06-23	
LING AO-1	PWR	950 Operational	DNMC	FRAM	2002-02-26	2002-05-28	
LING AO-2	PWR	950 Operational	DNMC	FRAM	2002-09-14	2003-01-08	
LING AO-3	PWR	1007 Operational	DNMC	DEC	2010-07-15	2010-09-15	
LING AO-4	PWR	1007 Operational	DNMC	DEC	2011-05-03	2011-08-07	
NINGDE-1	PWR	1018 Operational	NDNP	DEC	2012-12-28	2013-04-15	
NINGDE-2	PWR	1018 Operational	NDNP	SHE	2014-01-04	2014-05-04	
NINGDE-3	PWR	1018 Operational	NDNP	CFHI	2015-03-21	2015-06-10	
NINGDE-4	PWR	1018 Operational	NDNP	CFHI	2016-03-29	2016-07-21	
QINSHAN 2-1	PWR	623 Operational	CNNO	CNNC	2002-02-06	2002-04-15	
QINSHAN 2-2	PWR	623 Operational	CNNO	CNNC	2004-03-11	2004-05-03	
QINSHAN 2-3	PWR	623 Operational	CNNO	CNNC	2010-08-01	2010-10-05	
QINSHAN 2-4	PWR	623 Operational	CNNO	CNNC	2011-11-25	2011-12-30	
QINSHAN 3-1	PHWR	677 Operational	CNNO	AECL	2002-11-19	2002-12-31	
QINSHAN 3-2	PHWR	677 Operational	CNNO	AECL	2003-06-12	2003-07-24	
QINSHAN-1	PWR	326 Operational	CNNO	CNNC	1991-12-15	1994-04-01	
SANMEN-1	PWR	1157 Operational	SMNPC	WH/MHI	2018-06-30	2018-09-21	
SANMEN-2	PWR	1157 Operational	SMNPC	WH/MHI	2018-08-24	2018-11-05	
SHIDAO BAY-1	HTGR	150 Operational	HSNPC	TSINGHUA	2021-12-14	2023-12-06	
TAISHAN-1	PWR	1660 Operational	TNPJVC	ORANO	2018-06-29	2018-12-13	
TAISHAN-2	PWR	1660 Operational	TNPJVC	ORANO	2019-06-23	2019-09-07	
TIANWAN-1	PWR	1000 Operational	JNPC	IZ	2006-05-12	2007-05-17	
TIANWAN-2	PWR	1000 Operational	JNPC	IZ	2007-05-14	2007-08-16	
TIANWAN-3	PWR	1060 Operational	JNPC	IZ	2017-12-30	2018-02-14	
TIANWAN-4	PWR	1060 Operational	JNPC	IZ	2018-10-27	2018-12-22	
TIANWAN-5	PWR	1060 Operational	JNPC	SHE	2020-08-08	2020-09-08	
TIANWAN-6	PWR	1060 Operational	JNPC	CFHI	2021-05-11	2021-06-02	
YANGJIANG-1	PWR	1000 Operational	YJNPC	CFHI	2013-12-31	2014-03-25	
YANGJIANG-2	PWR	1000 Operational	YJNPC	CFHI	2015-03-10	2015-06-05	
YANGJIANG-3	PWR	1000 Operational	YJNPC	CFHI	2015-10-18	2016-01-01	
YANGJIANG-4	PWR	1000 Operational	YJNPC	CFHI	2017-01-08	2017-03-15	
YANGJIANG-5	PWR	1000 Operational	YJNPC	CFHI	2018-05-23	2018-07-12	
YANGJIANG-6	PWR	1000 Operational	YJNPC	CFHI	2019-06-29	2019-07-24	
ZHANGZHOU-1	PWR	1126 Operational	ZGZEC	CFHI	2024-11-28	2025-01-01	

Number of reactors: 57

Data as of 2024-12-31 from [IAEA Power Reactor Information System](#)

2.3.2. Plant Life Management, Plant Upgrades and License Renewals

Power Plant Renovation

After the accident at the Fukushima Daiichi NPP, the MEE (NNSA) issued the “General Technical Requirements for Improvement Actions in Nuclear Power Plants after the Fukushima Nuclear Accident” and conducted on-site inspections of the implementation of nuclear power plant improvement actions during September 2012 and September 2013.

For newly constructed units, the improvement actions implemented before the initial fuel loading mainly include enhancements to the anti-flooding measures for nuclear safety-related buildings and equipment, the addition of facilities such as portable power supplies and portable pumps, improvements in seismic monitoring and seismic response capabilities of NPPs, enhancements to the SAMG (Severe Accident Management Guidelines) for NPPs, in-depth assessments of earthquake and tsunami risks and conducting probabilistic safety assessments for external events, improvements to emergency plans and enhancement of emergency response capabilities for nuclear accidents, establishment and improvement of information release procedures for NPPs, and enhancements to disaster prevention plans and management procedures. All nuclear power units that achieved initial fuel loading after the accident at the Fukushima Daiichi NPP completed their improvements as scheduled.

Lifetime Management

The aging management of NPPs is primarily based on the “Periodic Safety Review for Nuclear Power Plants” and the “Aging Management for Nuclear Power Plants”, incorporating good practices from the nuclear power industry both at home and abroad. Systematic aging management activities have been carried out throughout the construction, commissioning and operation phases of NPPs, establishing and improving the aging management system for NPPs.

In the application for renewal of NPP operating licenses, aging management is the most important safety demonstration component. To guide the work related to the renewal of the validity period of NPP operating licenses and ensure the operational safety of NPPs, the MEE (NNSA) issued and implemented the “Technical Policy for the Renewal of the Validity Period of Nuclear Power Plant Operating Licenses (Trial)” on 31 December 2015. The MEE (NNSA) issued the “Code on Safety Licensing Procedures for Nuclear Power Plants, Research Reactors and Fuel Cycle Facilities” on 11 July 2019, which specifies the application procedures and safety demonstration requirements for nuclear facility operating licenses that need to continue operation upon expiration, and provides clear provisions for subsequent applications for renewal of nuclear facility operating license validity.

Through the review of the application for renewal of the operating license, Qinshan NPP has carried out work, such as defining the scope of aging management and screening objects, an aging management review, and a time-limit aging analysis. From 2019 to 2021, Qinshan NPP completed all engineering modifications for the operating license renewal application. During May 2021, it passed the pre-OLE comprehensive inspection; during June 2021, it passed the review made by National Nuclear Safety Advisory Committee. In 2021, the MEE (NNSA) officially approved the application for renewal of the operating license for Qinshan NPP, extending the validity of the operating license until 30 July 2041.

Daya Bay NPP completed the feasibility analysis for the OLE (Operational Life Extension) of Unit 1 in 2015 and fully initiated the OLE verification assessment in 2016. During June 2019, Daya Bay NPP preliminarily completed the OLE verification assessment, and by the end of 2019, the application report was completed and submitted to the MEE (NNSA).

License Renewal

From 1 January 2013, to 31 December 2024, the MEE (NNSA) issued the following licenses for NPPs: site selection review comments for 25 sites, construction permits for 43 units, initial fuel loading approvals for 26 units, and operating licenses for 58 units.

(Source: The Ninth National Report of the People's Republic of China for the "Convention on Nuclear Safety", the official website of the Ministry of Ecology and Environment of the People's Republic of China)

2.3.3. Organizations and Institutions

Information on the owners and operators of NPPs in operation and under construction in China is shown in the table below.

Table 2.3.3. Owners and Operators of Nuclear Power Plants

NPP	Owner	Operator
Qinshan NPP	Qinshan Nuclear Power Co., Ltd.	CNNP Nuclear Power Operation Management Co., Ltd.
Qinshan Phase II NPP	<u>Nuclear Power Qinshan Jiont Venture Co., Ltd.</u>	CNNP Nuclear Power Operation Management Co., Ltd.
Qinshan Phase III NPP	Third Qinshan Nuclear Power Company Ltd.	CNNP Nuclear Power Operation Management Co., Ltd.
Fangjiashan NPP	Qinshan Nuclear Power Co., Ltd.	CNNP Nuclear Power Operation Management Co., Ltd.
Daya Bay NPP	Guangdong Nuclear Power Joint Venture Co., Ltd.	<u>Daya Bay Nuclear Power Operations and Management Co., Ltd.</u>
LingAo NPP Phase I	LingAo Nuclear Power Co., Ltd.	<u>Daya Bay Nuclear Power Operations and Management Co., Ltd.</u>
LingAo NPP Phase II	Lingdong Nuclear Power Co., Ltd.	<u>Daya Bay Nuclear Power Operations and Management Co., Ltd.</u>
Tianwan NPP	Jiangsu Nuclear Power Co., Ltd.	Jiangsu Nuclear Power Co., Ltd.
Hongyanhe NPP	Liaoning Hongyanhe Nuclear Power Co.,	Liaoning Hongyanhe Nuclear Power Co., Ltd.

NPP	Owner	Operator
	Ltd.	
Ningde NPP	Fujian Ningde Nuclear Power Co., Ltd.	Fujian Ningde Nuclear Power Co., Ltd.
Fuqing NPP	Fujian Fuqing Nuclear Power Co., Ltd.	Fujian Fuqing Nuclear Power Co., Ltd.
Yangjiang NPP	Yangjiang Nuclear Power Co., Ltd.	Yangjiang Nuclear Power Co., Ltd.
Changjiang NPP	Hainan Nuclear Power Co., Ltd.	Hainan Nuclear Power Co., Ltd.
Fangchenggang NPP	Guangxi Fangchenggang Nuclear Power Co., Ltd.	Guangxi Fangchenggang Nuclear Power Co., Ltd.
Sanmen NPP	Sanmen Nuclear Power Co., Ltd.	Sanmen Nuclear Power Co., Ltd.
Haiyang NPP	Shandong Nuclear Power Co., Ltd.	Shandong Nuclear Power Co., Ltd.
Taishan NPP	Taishan Nuclear Power Joint Venture Co., Ltd.	Taishan Nuclear Power Joint Venture Co., Ltd.
Zhangzhou NPP	CNNP National Power Zhangzhou Energy Co., Ltd.	CNNP National Power Zhangzhou Energy Co., Ltd.
Xudapu NPP	CNNP Liaoning Nuclear Power Co., Ltd.	CNNP Liaoning Nuclear Power Co., Ltd.
Taipingling NPP	CGN Huizhou Nuclear Power Co., Ltd.	CGN Huizhou Nuclear Power Co., Ltd.
San'ao NPP	CGN Cangnan Nuclear Power Co., Ltd.	CGN Cangnan Nuclear Power Co., Ltd.
State Nuclear Power Demonstration Plant	State Nuclear Power Demonstration Plant Co., Ltd.	State Nuclear Power Demonstration Plant Co., Ltd.
Huaneng Changjiang NPP	Huaneng Hainan Changjiang Nuclear Power Co., Ltd.	Huaneng Hainan Changjiang Nuclear Power Co., Ltd.
Shidao Bay NPP (High-Temperature Reactor)	Huaneng Shandong Shidao Bay Nuclear Power Co., Ltd.	Huaneng Shandong Shidao Bay Nuclear Power Co., Ltd.
Shidao Bay NPP (Pressurized Water Reactor)	Huaneng Shidao Bay Nuclear Power Development Co., Ltd.	Huaneng Shidao Bay Nuclear Power Development Co., Ltd.
Lufeng NPP	CGN Lufeng Nuclear Power Co., Ltd.	CGN Lufeng Nuclear Power Co., Ltd.
Lianjiang NPP	State Nuclear Zhanjiang Nuclear Power Co.,	State Nuclear Zhanjiang Nuclear Power Co.,

NPP	Owner	Operator
	Ltd.	Ltd.

2.4. DECOMMISSIONING

As of 31 December 2024, there were no nuclear power units in a decommissioning or permanent shutdown state in China.

2.5. PLANNED DEPLOYMENT OF NUCLEAR POWER

2.5.1. Planned Nuclear Power Projects

As of 31 December 2024, there were a total of 15 planned nuclear power projects in China. These include:

- Units 1, 2 and 3 of Xuwei NPP,
- Unit 6 of Ningde NPP,
- Units 3 and 4 of San'ao NPP,
- Units 1 and 2 of Jinqimen NPP,
- Units 3 and 4 of Taipingling NPP,
- Units 1 and 2 of Lufeng NPP,
- Unit 2 of Shidao Bay NPP,
- Units 1 and 2 of Bailong NPP.

TABLE 7: CONSIDERED AND PLANNED NUCLEAR POWER PLANTS

Reactor Unit	Type	Net Capacity [MW(e)]	Status	Expected Construction Start Year	Expected Grid Construction Licence Year Submission Date
FANGCHENGGANG-5	PWR	1000	Planned		
FANGCHENGGANG-6	PWR	1000	Planned		
HAIXING-1	PWR		Considered		
HAIXING-2	PWR		Considered		
LUFENG-1	PWR	1000	Planned		
LUFENG-2	PWR	1000	Planned		
NINGDE-6	PWR	1200	Planned		2024-07-23
SHIDAO WAN-2	PWR	1134	Planned		2023-01-12
SN-1	PWR	1534	Planned		2013-03-21
SN-2	PWR	1534	Planned		2013-03-21
TAIPINGLING-3	PWR	1209	Planned	2025	2024-01-05

TAIPINGLING-4	PWR	1209 Planned	2024-01-05
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Number of reactors: 12

Data as of 2024-12-31 from [IAEA Power Reactor Information System](#)

Please refer to [RDS2 Publication Table 12](#) for more information on status of Planned reactors

2.5.2. Considered Technologies

Units 1 and 2 of Jiangsu Xuwei NPP, Unit 6 of Fujian Ningde NPP, Units 3 and 4 of Zhejiang San'ao NPP, Units 1 and 2 of Zhejiang Jinqimen NPP, Units 3 and 4 of Guangdong Taipingling NPP, Units 1 and 2 of Guangdong Lufeng NPP, and Unit 2 of Shidao Bay NPP adopted HPR1000.

Units 1 and 2 of Guangdong Lufeng NPP and Units 1 and 2 of Guangxi Bailong NPP adopted CAP1000.

Unit 3 of Jiangsu Xuwei NPP adopted a high-temperature gas-cooled reactor.

2.6. FUEL CYCLE AND WASTE MANAGEMENT

2.6.1. Fuel Cycle Activities

China has established large-scale production capabilities in the field of nuclear fuel processing, including uranium conversion, uranium enrichment, and fuel assembly manufacturing, capable of providing nuclear fuel assemblies for various reactor types to meet the needs of nuclear power development.

China National Nuclear Corporation is the main supplier of nuclear fuel in China. The company's subsidiaries, including CNNC Jinyuan Uranium Industry Co., Ltd., CNNC North Nuclear Fuel Element Co., Ltd., CNNC Fuel Element Co., Ltd. Southern Branch, CNNC Lanzhou Uranium Enrichment Co., Ltd., CNNC Shaanxi Uranium Enrichment Co., Ltd., CNNC 404 Co., Ltd., as well as CGN Uranium Industry Co., Ltd. under China General Nuclear Power Group, are the main producers of natural uranium and nuclear fuel.

2.6.2. Waste Management

(1) Waste Management in Nuclear Power Plants

All NPPs are equipped with facilities for radioactive liquid waste and gas treatment, as well as solid waste storage facilities. They have developed a radioactive waste management program that implements classified management of radioactive waste and has established corresponding radioactive waste management procedures based on the program.

By 2022, China had built and put into operation a centralized disposal site for low and intermediate-level radioactive solid waste, capable of receiving low and intermediate-level radioactive solid waste generated from NPPs nationwide. In addition, NPPs continue to implement radioactive waste minimization management. In the design of new NPPs, the new waste treatment technologies and operation modes have been actively adopted, such as in-barrel drying, waste resin drying and hot pressing, high integrity container, mobile waste liquid treatment devices and centralized waste treatment facilities. In addition, radioactive waste gas, waste liquid and solid wastes are subject to information-based management.

(2) Spent Fuel Management

China implements a closed nuclear fuel cycle technology route, and the first pilot plant for spent fuel reprocessing from power reactors has been completed and put into operation. Nuclear power plants in China are equipped with spent fuel storage facilities with a certain storage capacity to accept spent fuel generated from the operation of NPPs over a certain period and ensure its safe storage.

2.7. EMERGENCY PREPAREDNESS

China has issued a series of regulations and guidelines, including the “Nuclear Safety Law of the People's Republic of China”, the “Law of the People's Republic of China on the Prevention and Control of Radioactive Pollution”, the “Law of the People's Republic of China on Emergency Response”, and the “Emergency Management Regulations for Nuclear Accidents at Nuclear Power Plants”, which specifically stipulate the national emergency management system and the emergency preparedness of NPP operating organizations. In 2013, the State Council approved and issued the revised “National Nuclear Emergency Plan”, further defining the management scope of nuclear emergency work, clarifying work principles and main bodies of responsibility, enhancing the command mechanism, detailing emergency preparedness and guarantee measures, standardizing information reporting and release procedures, and specifying the follow-up work after accidents in nuclear facilities. In 2022, the National Nuclear Safety Administration issued guidelines for “Establishing Emergency Action Levels for Pressurized Water Reactor Nuclear Power Plants”, which describes the general methods for establishing emergency action levels by operating organizations of pressurized water reactor NPPs, mainly including the basic requirements for establishing emergency action levels, initial condition matrices and examples of emergency action levels.

China's nuclear accident emergency response implements a three-level emergency organization system, namely the national nuclear accident emergency organization, the nuclear accident emergency organization in the province (autonomous region or municipality directly under the Central Government) where the NPP is located, and the nuclear accident emergency organization of the NPP operating organization. The National Nuclear Accident Emergency Coordination Committee is responsible for organizing and coordinating national nuclear accident emergency preparedness and response work, with daily operations handled by the National Nuclear Accident Emergency Office. Provincial nuclear emergency committees are responsible for emergency preparedness and response work for nuclear accidents within their respective administrative regions, uniformly commanding off-site emergency response actions for nuclear accidents within their jurisdictions. The emergency command headquarters of NPP operating organization is responsible for organizing on-site nuclear emergency preparedness and response work, uniformly directing emergency responses in its own organization, cooperating with and assisting in off-site nuclear emergency preparedness and response work, and proposing the recommendations for entering the off-site emergency status and taking off-site emergency protective measures in a timely manner. In addition, the superior corporate group of the NPP operating organization is responsible for leading and coordinating nuclear emergency preparedness work for the nuclear facility operating organization, and in the event of an accident, is responsible for deploying its emergency resources and forces to support the response actions of the nuclear power plant operating organization.

2.8. RESEARCH AND DEVELOPMENT

2.8.1. Development of Novel Technology and Applications

In over 30 years of nuclear power development, China has adhered to the policy of combining the introduction and absorption of foreign technology with independent research and development, not only independently designing and constructing the Qinshan 300 MW NPP in 1991 but also mastering the design and construction technologies for 600 MW-class and 1000 MW-class pressurized water reactor NPP through the assimilation and absorption of the M310 technology from Daya Bay NPP.

To achieve sustainable development of nuclear energy, China has formulated a three-step development strategy of thermal neutron reactor-fast neutron reactor-controlled nuclear fusion, enhancing the independent innovation capability of nuclear power.

HPR1000

The HPR1000 has a safety design concept that combines active and passive safety systems, with its safety indicators and technical performance reaching the advanced level of international third-generation nuclear power technology, and possesses complete independent intellectual property rights. On 29 January 2021, the world's first HPR1000 unit, Unit 5 of Fuqing NPP, completed 168 hours of continuous operation at full power, meeting the conditions for commercial operation. On 6 December 2021, the first fuel cycle of Unit 5 of Fuqing NPP concluded, and the first refueling outage commenced. On 20 May 2021, the first HPR1000 overseas unit — Unit 2 of the Karachi NPP in Pakistan—officially commenced commercial operation.

Currently, there are a total of 33 nuclear power units utilizing HPR1000 technology under construction and in operation at home and abroad, with the safety and quality of construction and operation being well controlled.

CAP1400

China is actively promoting the assimilation, absorption, and innovation of AP1000 technology. The major project of advanced pressurized water reactor NPPs, the CAP1400 demonstration project, has completed its design and passed safety reviews. The CAP1400 demonstration power plant is located at the Shidao Bay site in Rongcheng, Weihai, Shandong Province, with a design life of 60 years and a single reactor installed capacity of 1534 MW. Currently, Units 1 and 2 have been loaded with fuel and are in operation.

High-Temperature Gas-Cooled Reactor (HTGR)

The construction of the Shidao Bay High-Temperature Gas-Cooled Reactor Nuclear Power Plant Demonstration Project (HTR-PM) is progressing smoothly. The first reactor completed its initial fuel loading on 21 August 2021, successfully connected to the grid on 20 December 2021, and achieved full power operation in 2022. On 6 December 2023, it completed a 168-hour continuous operation test and officially commenced commercial operation, becoming the world's first operational fourth-generation reactor.

The subsequent development route for the high-temperature gas-cooled reactor includes improved demonstration projects, supercritical versions, and hydrogen production versions. Currently, the technical schemes for the 600 MW high-temperature gas-cooled reactor power generation version and steam supply version have been solidified, a preliminary industrial chain for high-temperature gas-cooled reactors has been formed, and the market for the industrialization of comprehensive nuclear energy utilization has been opened.

Other Nuclear Reactors

China also places importance on the development of other advanced nuclear power technologies and is conducting research and development on small reactors, floating reactors, molten salt reactors, and nuclear fusion reactors.

2.8.2. Organizations and Institutions

The main nuclear power research and development institutions in China include:

- (1) China Institute of Atomic Energy
- (2) Nuclear Power Institute of China
- (3) Shanghai Nuclear Engineering Research & Design Institute
- (4) CGN Research Institute Co., Ltd.
- (5) Suzhou Nuclear Power Research Institute Co., Ltd.
- (6) Research Institute of Nuclear Power Operations (RINPO)
- (7) China Institute for Radiation Protection
- (8) Institute of Nuclear and New Energy Technology, Tsinghua University
- (9) China Nuclear Power Engineering Co., Ltd.
- (10) Nuclear Power Operations Research Institute
- (11) Huaneng Nuclear Technology Research Institute Co., Ltd.

2.9. HUMAN RESOURCES DEVELOPMENT

The Government of China actively formulates talent education and training plans to meet the continuous growth demand for human resources in nuclear power development. The State, enterprises, colleges and universities, and research institutions are vigorously strengthening talent cultivation in fields such as nuclear energy technology, nuclear power design, equipment manufacturing, nuclear facility construction, nuclear and radiation safety, nuclear fuel cycle, operation management, and maintenance, enhancing investment and ensuring a good reserve of talents.

2.10. STAKEHOLDER INVOLVEMENT

Public participation is involved in the environmental assessment of NPPs from site selection to decommissioning. The "Law of the People's Republic of China on Environmental Impact Assessment" and the "Interim Measures for Public Participation in Environmental Impact Assessment" stipulate that for projects that could cause adverse environmental impacts and directly involve public environmental rights, a demonstration meeting, a hearing, or other forms should be held to solicit opinions from relevant organizations, experts, and the public on the environmental impact report before the draft is submitted for approval.

In the environmental impact report during the site selection phase of NPPs, a chapter on public participation must be prepared. Construction and operating organizations should seriously consider the opinions of relevant organizations, experts, and the public regarding environmental impacts and should include explanations for the acceptance or non-acceptance of these opinions in the environmental impact report submitted for review. For environmental impact reports that do not include a chapter on public participation, the administrative department for environmental protection under the State Council will not accept them.

During the site approval phase of NPPs, construction organizations should widely solicit public opinions beforehand and use intuitive and effective methods to disseminate knowledge about nuclear power to the local public, such as distributing nuclear power knowledge brochures, organizing special lectures on nuclear power knowledge, holding exhibitions on nuclear power knowledge, and arranging on-site visits to NPPs.

The main communication methods between the MEE (NNSA) and the public and media include:

- (1) The MEE (NNSA) promptly releases important regulatory activity information on its official website, such as license issuance, important review and supervision activities and results, reports on nuclear facility construction events and operational events, radiation environmental monitoring results, and emergency information related to nuclear and radiation accidents;
- (2) Using websites, newspapers, periodicals, television, publications, and promotional materials to publicize knowledge and information related to nuclear and radiation safety;
- (3) Before releasing important regulatory documents or decisions, soliciting public opinions through information disclosure, distributing surveys, and holding symposiums and hearings to accept public inquiries and supervision;
- (4) Inviting media to participate in important experience exchange activities on nuclear safety regulation and organizing experts to answer questions of public concern in the media.

2.11. INTERNATIONAL COOPERATIONS AND INITIATIVES

China participates in the IAEA-led Innovative Nuclear Reactor and Fuel Cycle Projects (INPRO) and has sent several experts to participate in INPRO's steering committee, seminars, technical meetings, and other events to assist INPRO in completing various tasks.

China officially joined the International Forum on Fourth Generation Nuclear System (GIF) in 2006 and is actively involved in eight project arrangements under three system arrangements: the very high temperature gas-cooled reactor, the sodium-cooled fast reactor, and the supercritical water reactor. China also participates as an observer in the temporary system steering committee for the lead-cooled fast reactor and has long been involved in activities related to molten salt reactors.

China's nuclear energy development implements a three-step strategy for the thermal reactor-fast reactor-fusion reactor. During November 2006, China officially signed the ITER Agreement and joined the ITER program; during February 2007, the State Council officially approved the establishment of a special project for the ITER program. China is responsible for 18 procurement arrangement agreements for ITER (including four supplementary agreements). By 2016, China had signed all manufacturing task agreements for procurement packages. During September 2019, multiple Chinese entities collaborated and, after intense bidding efforts, the consortium led by China Nuclear Power Engineering Co., Ltd. of China National Nuclear Corporation won the contract for the installation of the ITER main components (TAC-1), with a total contract amount of 240 million euros. This includes the assembly and installation of the ITER reactor Dewar structure and all components and systems between the Dewar and vacuum chamber, ensuring that the ITER device achieves its first plasma discharge by the end of 2025, marking a crucial milestone for the completion of the ITER program.

On 1 February 2022, China and Argentina officially signed the design, procurement, and construction contract for the Atucha III NPP project in Argentina. According to the agreement, China National Nuclear Corporation will construct a HPR1000 pressurized water reactor NPP for Argentina in a “turkey” mode through engineering general contracting.

On 2 February 2022, Unit 3 of the Karachi NPP (K-3) was officially delivered to Pakistan, marking the full completion of China's first export project of the HPR1000 third-generation nuclear power technology to Pakistan.

On 24 October 2024, Changjiang NPP (CNNC) signed the world's first small modular reactor capacity-building implementation agreement with the IAEA. Changjiang NPP (CNNC) will undertake activities such as small modular reactor education, training and human resource development organized by the IAEA and participate in technical assistance activities and cross-regional technical seminars to help accelerate the development of small modular reactors in various countries.

On 12 November 2024, the shipment ceremony for the micro-reactor systems and equipment for Thailand was held at China National Nuclear Corporation, marking the official entry of the Thailand micro-reactor project into the construction phase. The Thailand micro-reactor is the sixth micro-reactor exported by China Institute of Atomic Energy and will be located at Suranaree University of Technology in Thailand. The micro-reactor design and equipment processing have been completed.

On 30 December 2024, the first tank of concrete was poured for the nuclear island of Unit 5 of the Chashma NPP, constructed in cooperation between China and Pakistan. The core equipment of Unit 5 of the Chashma NPP adopts HPR1000 technology, making it the most technologically advanced nuclear power unit constructed through cooperation between the two parties to date.

3. NATIONAL LAWS AND REGULATIONS

3.1. REGULATORY FRAMEWORK

3.1.1. Regulatory Authority(s)

China's nuclear safety and radiation regulatory authority is the MEE (NNSA), which implements unified supervision over nuclear safety in China's NPPs and independently exercises nuclear safety supervision rights.

The administrative department for environmental protection under the State Council supervises and manages national radioactive pollution prevention and control work according to the law. The health administrative department under the State Council and other relevant departments supervise and manage related radioactive pollution prevention and control work according to the responsibilities stipulated by the State Council.

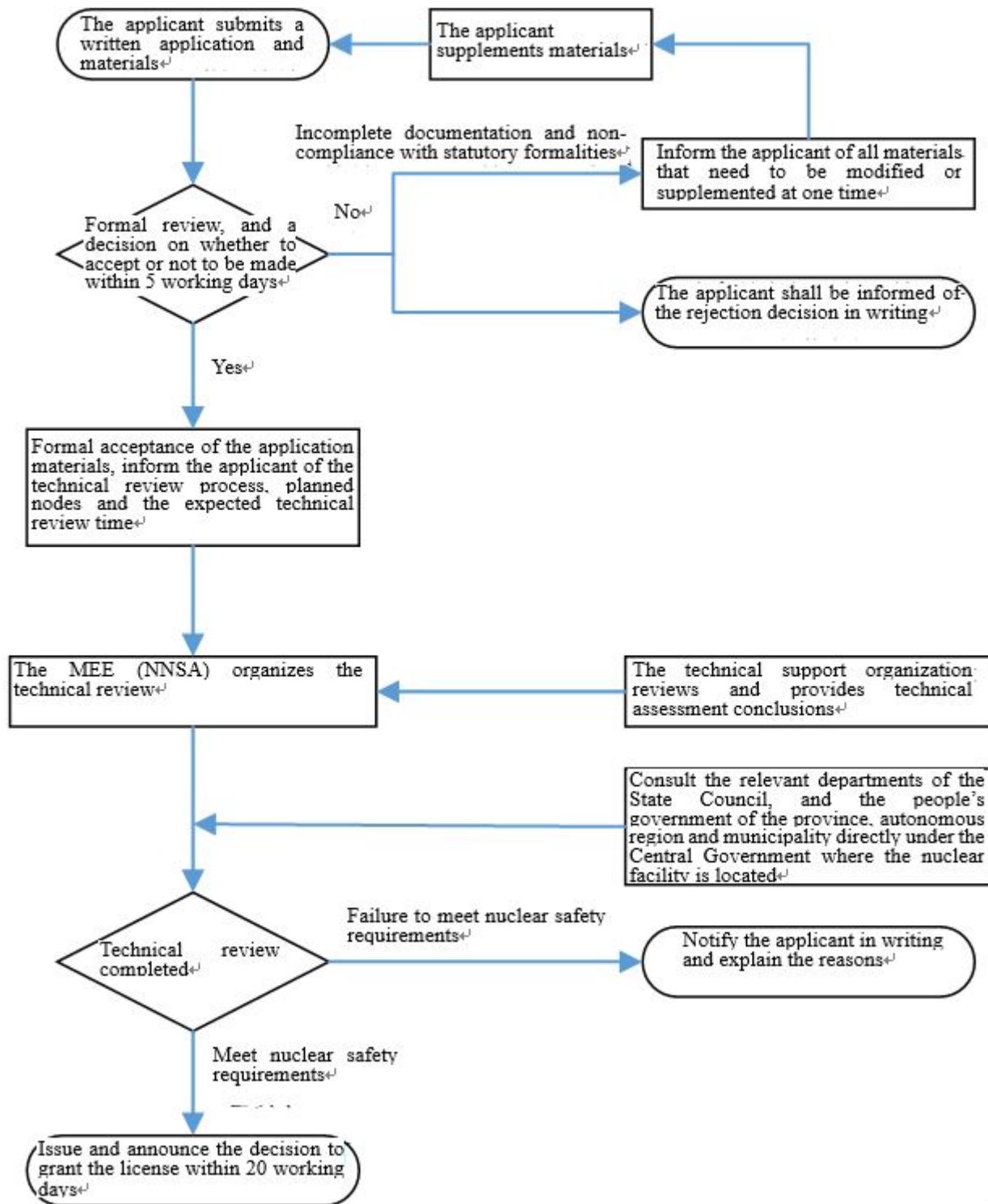
3.1.2. Licensing Process

The current types of nuclear safety licenses for NPPs in China include:

- (1) Review Comments on NPP Siting;
- (2) Construction License of NPP;
- (3) Operating License of NPP;

(4) Instrument of Ratification for Decommissioning of NPPs and other documents subjected to approval.

The application and approval process of nuclear safety license is shown in Figure 3.


FIG 3. Process of Application and Issuance of Nuclear Safety Licenses

3.2. MAIN NATIONAL LAWS AND REGULATIONS IN NUCLEAR POWER

As of 31 December 2024, the following nuclear power-related laws and regulations were promulgated.

I. National Laws

- (1) "Nuclear Safety Law of the People's Republic of China"

(Adopted in the Twenty-Ninth Meeting of the Standing Committee, the Twelfth National People's Congress of the People's Republic of China, 1 September 2017)

- (2) "Law of the People's Republic of China on the Prevention and Control of Radioactive Pollution"

(Adopted in the Third Meeting of the Standing Committee, the Tenth National People's Congress of the People's Republic of China, 28 June 2003)

- (3) "Law of the People's Republic of China on Environmental Impact Assessment"

(Adopted in the Thirtieth Meeting of the Standing Committee, the Ninth National People's Congress of the People's Republic of China, 28 October 2002; amended for the second time in the Seventh Meeting of the Standing Committee, the Thirteenth National People's Congress of the People's Republic of China, 29 December 2018)

- (4) "Law of the People's Republic of China on the Prevention and Control of Occupational Diseases"

(Adopted in the Twenty-Fourth Meeting of the Standing Committee, the Ninth National People's Congress of the People's Republic of China, 27 October 2001; amended for the fourth time in the Seventh Meeting of the Standing Committee, the Thirteenth National People's Congress of the People's Republic of China, 29 December 2018)

- (5) "Environmental Protection Law of the People's Republic of China"

(Adopted in the Eleventh Meeting of the Standing Committee, the Seventh National People's Congress of the People's Republic of China, 26 December 1989; amended by the Eighth Meeting of the Standing Committee, the Twelfth National People's Congress of the People's Republic of China, 24 April 2014)

II. Administrative Regulations of the State Council

- (1) "Rules of the People's Republic of China on the Safety Regulation for Civil Nuclear Facilities (HAF001)"

(Issued by the State Council, 29 October 1986)

- (2) "Regulations on Nuclear Materials Control of the People's Republic of China (HAF501)"

(Issued by the State Council, 15 June 1987)

(3) "Regulations on Emergency Management for Nuclear Accidents at Nuclear Power Plants (HAF002)"

(Issued by the State Council on 4 August 1993, revised on 8 January 2011)

(4) "Regulations on the Supervision and Management of Civil Nuclear Safety Equipment"

(Issued by the State Council on 11 July 2007, revised for the second time on 2 March 2019)

(5) "Regulations for Management of Transport Safety of Radioactive Materials"

(Issued by the State Council, 14 September 2009)

(6) "Regulations for Management of Radioactive Waste Safety"

(Issued by the State Council, 20 December 2011)

(7) "Regulations on the Safety and Protection of Radioisotopes and Radiation Devices"

(Issued by the State Council on 14 September 2005, revised for the second time on 2 March 2019)

(8) "Regulations of the People's Republic of China on the Control of Nuclear Export"

(Issued by the State Council on 10 September 1997, revised on 9 November 2006)

(9) "Regulations of the People's Republic of China on the Export Control of Nuclear Dual-use Items and Related Technologies"

(Issued by the State Council on 10 June 1998, revised on 26 January 2007)

APPENDIX 1. INTERNATIONAL, MULTILATERAL AND BILATERAL AGREEMENTS

Agreements with the IAEA

Agreement : Agreement between the People's Republic of China and the International Atomic Energy Agency for the Application of Safeguards in China

Countries : China

Signature Date : 1988-09-20

Ratification Date :

In-Force Date :

Notes :

Agreement : Protocol Additional to the Agreement between the People's Republic of China and the International Atomic Energy Agency for the Application of Safeguards in China

Countries : China
Signature Date : 2002-03-28
Ratification Date :
In-Force Date :
Notes :

Agreement : Supplementary Agreement Concerning the Provision of Technical Assistance by the International Atomic Energy Agency
Countries : China
Signature Date : 1990-06-22
Ratification Date :
In-Force Date :
Notes :

International Treaties

Agreement : Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
Countries : China
Signature Date :
Ratification Date :
In-Force Date :
Notes : Commencement Date; 11 October 1987

Agreement : Convention on Early Notification of a Nuclear Accident
Countries : China
Signature Date :
Ratification Date :
In-Force Date :
Notes : Commencement Date; 11 October 1987

Agreement : Convention on Nuclear Safety
Countries : China
Signature Date :
Ratification Date :
In-Force Date :
Notes : Commencement Date; 8 July 1996

Agreement : Convention on the Physical Protection of Nuclear Material
Countries : China
Signature Date :

Ratification Date :

In-Force Date :

Notes : Commencement Date; 9 February 1989

Agreement : International Convention for the Suppression of Acts of Nuclear Terrorism

Countries : China

Signature Date :

Ratification Date :

In-Force Date :

Notes : Commencement Date; October 14, 1987

Agreement : Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

Countries : China

Signature Date :

Ratification Date :

In-Force Date :

Notes : Commencement Date; September 28, 2006

Agreement : Treaty on the Non-Proliferation of Nuclear Weapons

Countries : China

Signature Date :

Ratification Date :

In-Force Date :

Notes : Commencement Date; 11 March 1992

Other Relevant International Treaties

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : Argentina, China

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : Canada, China

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, United Kingdom

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Thailand

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : Belgium, China

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China

Signature Date :

Ratification Date :

In-Force Date :

Notes : # Euratom

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Pakistan

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Saudi Arabia

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Viet Nam

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, United States of America

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Kazakhstan

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Jordan

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Switzerland

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Japan

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Romania

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Ghana

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : Algeria, China

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : Belarus, China

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Egypt

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, South Africa

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, France

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Iran, Islamic Republic of

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : Australia, China

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Germany

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Russian Federation

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Poland

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Korea, Republic of

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Spain

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : China, Türkiye

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : Bangladesh, China

Signature Date :

Ratification Date :

In-Force Date :

Notes :

Agreement : Bilateral Cooperation Agreements on the Peaceful Use of Nuclear Energy

Countries : Brazil, China

Signature Date :

Ratification Date :

In-Force Date :

Notes :

APPENDIX 2. MAIN ORGANIZATIONS, INSTITUTIONS AND COMPANIES INVOLVED IN NUCLEAR POWER RELATED ACTIVITIES

National Authorities

Organization Name	Address	Contact	Website
National Atomic Energy Agency (CAEA)	A-8, Fucheng Road, Haidian District, Beijing, China	Tel: +86-10-8858-1381 /+86-10-8858-1286	Fax: +86-10-8858-1516
National Energy Administration(NEA)	38 Yuetan South Street, Xicheng	Tel: +86-10-6855-5875	Fax: +86-



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National Nuclear Safety Administration (NNSA) (Under the Ministry of Ecology and Environment)	District, Beijing, China	10-6855-5848
	115 Xizhimennei Nanxiaojie, Xicheng District, Beijing, China	Tel: +86-10-6655-6006 /+86-10-6655-6114 Fax: +86-10-6655-6010

Nuclear Research Institutes

Organization Name	Address	Contact	Website
China Nuclear Power Engineering Co., Ltd.	No. 117, Third Ring North Road, Haidian District, Beijing, China	+86-10-6841-5086	
Nuclear Power Institute of China	No. 328, Section 1, Huayang Changshun Avenue, Shuangliu County, Chengdu City, Sichuan Province, China	+86-28-8590-3138 /+028-8590-0214	
China Institute of Atomic Energy	Beifang Village, Xinzen, Fangshan District, Beijing, China	Tel: +86-10-6935-7493 Fax: +86-10-6935-7008	
Shanghai Nuclear Engineering Research and Design Institute	No. 29, Hongcao Road, Shanghai, China	Tel: +86-21-6186-0000 Fax: +86-21-6186-0728	

Other Nuclear Organizations

Organization Name	Address	Contact	Website
China Huaneng Group Co., Ltd.	No. 6, Fuxingmennei Street, Xicheng District, Beijing, China	Tel: +86-10-6322-8800 Fax: +86-10-6322-8866	
CNNC Jianzhong Nuclear Fuel Co., Ltd.	No. 1, Yingbin Street, Baixi Town, Xuzhou District, Yibin City, Sichuan Province	Tel: +86-0831-8279911 Fax: +86-831-8278981	
CGNPC Uranium Resources Co., Ltd.	A-22 Shiao International Center, No. 101, Shaoyaolu Beili, Chaoyang District, Beijing	Tel: 010-57321990 Fax: 010-57321991	
CNNC 404 Co., Ltd.	A-4, PO Box 508, Lanzhou City, Gansu Province, China	Tel: 0937-6769113 Fax: 09376764984	
China National Uranium Co., Ltd.	Building 14, Hepingli 7th Block, Dongcheng District, Beijing	Tel: 010-64271870 Fax: 010-64211783	
CNNC Shaanxi Uranium Enrichment Co., Ltd.	Apartments 6-11, Unit 3, Building 70, Chunhui Residential Quarter, Yangxian County, Hanzhong City, Shaanxi Province	Tel: 0916-8506000 Fax: 0916-8506000	
China Zhongyuan Engineering Corp.	CICG Financial Center, 140 Xizhimenwai Street, Xicheng District, Beijing	Tel: 0086-10-62355635 Fax: 0086-10-62355640	
SPIC Uranium Development Co., Ltd.	No. 65, Zhichun Road, Haidian District, Beijing	Tel: 010-53910000 Fax: 01053910004	
China National Nuclear Corporation	No. 1, Nansanxiang, Sanlihe, Xicheng District, Beijing, China	Tel: +86-10-6851-2211 Fax: +86-10-6853-3989	



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CNNC North Nuclear Fuel Components Co., Ltd.	East side of the intersection of Jingyin Line and Jianhua Road, Qingshan District, Baotou City, Inner Mongolia	+86-0472-3139805
China Nuclear Energy Industry Corp.	No. 9, Huayuan Street, Jinrongjie Subdistrict, Xicheng District, Beijing, China	Tel: +86-10-6629-7033 Fax: +86-10-6801-0445
Hualong Nuclear Power Technology Co., Ltd.	6/F, CNECC Building, 12 Chegongzhuang Street, Xicheng	
China General Nuclear Power Corporation	CGN Building, 2002 Shennan Road, Shenzhen, Guangdong, China	Tel: +86-755-8443-1555 Fax: +86-755-8369-9900
CNNC Lanzhou Uranium Enrichment Co., Ltd.	No. 1, Xin'an Road, Xigu District, Lanzhou City, Gansu Province	Tel: 0931-7917017 Fax: 0931-7917304
State Power Investment Corporation Limited	Building 3, Yard 28, Jinrong Street, Xicheng District, Beijing, China	Tel: +86-10-6629-8000 /+86-10-6621-6666 Fax: +86-10-6629-8095

Universities

Organization Name	Address	Contact	Website
School of Nuclear Science and Technology, Harbin Engineering University	Building 31, Harbin Engineering University, 145 Nantong Street, Nangang District, Harbin, Heilongjiang Province, China	+86-451-8256-8070	
Institute of Nuclear and New Energy Technology, Tsinghua University	No. 30, Shuangqing Road, Haidian District, Beijing, China	Tel: +86-10-6259-4533	Fax: +86-10-6256-4177
School of Energy and Power Engineering, Xi'an Jiaotong University	No. 28, Xianning West Road, Xi'an City, Shaanxi Province, China	+86-29-8266-8721	
School of Nuclear Science and Engineering, Shanghai Jiaotong University	No. 800, Dongchuan Road, Minhang District, Shanghai, China	Tel: +86-21-3420-5182	Fax: +86-21-3420-5182

Organization Name	Address	Contact	Website
School of Nuclear Science and Technology, Harbin Engineering University	Building 31, Harbin Engineering University, 145 Nantong Street, Nangang District, Harbin, Heilongjiang Province, China	+86-451-8256-8070	
Institute of Nuclear and New Energy Technology, Tsinghua University	No. 30, Shuangqing Road, Haidian District, Beijing, China	Tel: +86-10-6259-4533	Fax: +86-10-6256-4177
School of Energy and Power Engineering, Xi'an Jiaotong University	No. 28, Xianning West Road, Xi'an City, Shaanxi Province, China	+86-29-8266-8721	
School of Nuclear Science and Engineering, Shanghai Jiaotong University	No. 800, Dongchuan Road, Minhang District, Shanghai, China	Tel: +86-21-3420-5182	Fax: +86-21-3420-5182

REFERENCES

Number	Source	Link
Not Applicable		

COORDINATOR INFORMATION

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