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Nuclear Power Reactors in the World

2024 Edition

NUCLEAR POWER REACTORS IN THE WORLD

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The total electricity production for 2023 does not include output from Ukrainian reactor units, as operational data for these units were not submitted by the time of publication.

Nuclear power operating statistics do not include 2022 and 2023 outage data from Ukrainian reactor units as information for these units was not reported by the time of publication.

The EAF and UCF for Ukrainian reactors are calculated using data from the period 2012-2021, as Ukraine has not submitted operational data for 2023.

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Vogtle Nuclear Power Plant, Units 1-4

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INTRODUCTION

Nuclear Power Reactors in the World is an annual publication that presents the most recent data pertaining to nuclear power reactor units in IAEA Member States.

This forty-fourth edition of Reference Data Series No. 2 (RDS-2) provides a detailed comparison of various statistics up to and including 31 December 2023. The tables and figures contain the following information:

- General statistics on nuclear reactors in IAEA Member States;
- Technical data on specific reactors that are either planned, under construction or operational, or that have been shut down or decommissioned;
- Performance data on reactors operating in IAEA Member States, as reported to the IAEA.

The data compiled in this publication are a product of the IAEA's Power Reactor Information System (PRIS). The PRIS database is a comprehensive source of data on all nuclear power reactors in the world. It includes specification and performance history data on operational reactors as well as reactors under construction or in the decommissioning process. Data are collected by the IAEA via officially nominated national liaison officers and data providers in Member States. The IAEA appreciates the valuable assistance of the national authorities, official correspondents and various utilities in gathering the information for this report.

As of the end of December 2023, the global operational nuclear power capacity was 371.5 GW(e), provided by 413 reactors in 31 Member States. Additionally, 21.3 GW(e) from 25 reactors, licensed for operation, remained in suspended operations throughout 2023. This includes four reactors in India with a combined net capacity of 639 MW(e) and 21 reactors in Japan with a combined net capacity of 20,633 MW(e). Japan restarted two reactors in 2023, Takahama-1 and Takahama-2, which had been in suspended operation since 2011.

Nuclear power capacity has remained at a consistent level over the past decade, with an additional 69.8 GW(e) nuclear capacity connected to the grid since the beginning of

2013. Over 79% of this capacity growth occurred in Asia, where a total capacity of 55.4 GW(e) (54 reactors) was connected to the grid over the same period. China leads the region's growth, adding 40.02 GW(e) of new capacity to the grid since the beginning of 2013.

Throughout 2023, there were 418 operational reactors with a total capacity of 377.6 GW(e). However, only 403 of these reactors, with a combined capacity of 364.5 GW(e), reported their electricity production to the Agency. The total reported production was 2552.07 TWh, representing a slight 2.6% increase from 2022. [1] The top three producers of nuclear electricity in 2023 were the United States, China and France. The United States, with the largest nuclear fleet in the world, accounted for 31% of the total nuclear electricity generation, producing 779.2 TWh. China followed with 16% (406.5 TWh), continuing to surpass France in nuclear electricity generation for the fourth consecutive year. France produced 323.8 TWh, contributing 13% to the global total.

In 2023, 45 nuclear power reactors across 10 Member States supplied 2046.0 GWh of electrical equivalent of heat for non-electric applications. The majority of this heat (88%) was utilized for district heating, totalling 1799.1 GWh, in Bulgaria, the Czech Republic, China, Hungary, Russia, Romania, Slovakia and Switzerland. Industrial heating in India and Switzerland was supported by 211.8 GWh (10%) of electrical equivalent of heat, while 35.1 GWh (2%) was used for desalination.

In 2023, five pressurized water reactors (PWRs) with a total capacity of 5 GW(e) were connected to the grid in five different Member States. In China, Fangchenggang-3 was connected to the grid on 10 January, which is the first of two Hualong One (HPR1000) demonstration reactors being constructed at the Fangchenggang site. In Slovakia, the Mochovce-3 reactor, a water-water energetic reactor (VVER) V-213 model with a net electric capacity of 440 MW(e), was connected to the grid on 31 January. In the United States of America, the Vogtle-3 AP1000 reactor (1117 MW(e)) connected to the grid on 31 March. In Belarus, Belarusian-2 reactor model VVER V-491 (1110 MW(e)) connected to the grid on 13 May. And, on 21 December, Shin-Hanul-2 (1340 MW(e)) APR-1400

[1] The total electricity production does not include Ukrainian reactor units, as operational data were not submitted for the year 2023 by the time of publication.

reactor in Republic of Korea, connected to the grid. All these reactors, except Mochovce-3 and Shin-Hanul-2, started commercial operations during 2023.

At the end of 2023, a total capacity of 61.1 GW(e) (59 reactors) was under construction in 17 countries. During the year, construction began on six PWR nuclear power reactors in China and Egypt with total capacity of 6.8 GW(e). China continued to lead the world's nuclear power expansion by starting the construction of five reactors. These include four CAP1000 reactors: Haiyang-4 (1161 MW(e)), Lianjiang-1 (1224 MW(e)), Sanmen-4 (1163 MW(e)), and Xudapu-1 (1000 MW(e)). Additionally, construction began on one HPR1000 reactor, Lufeng-6 (1116 MW(e)). On 3 May, the first concrete was poured into the foundation, marking the start of the main construction phase for Unit 3 (a 1100 MW(e) VVER-1200 reactor) of the El Dabaa nuclear power plant project in Egypt.

At the end of 2023, the 69 years of worldwide cumulative operating experience amounted to over 19 751 reactor-years, from 647 reactors with a total capacity of 497.9 GW(e) across 35 countries. About 67% of global operational reactor capacity (261.8 GW(e), 295 reactors) has been in operation for over 30 years, while over 29% (112.2 GW(e), 142 reactors) has been in operation for over 40 years and 4% (17.5 GW(e), 28 reactors) for over 50 years.

Even as the fleet ages, operational nuclear power reactors continue to demonstrate high levels of overall reliability and performance. Load factor, also referred to as capacity factor, is the actual energy output of a reactor divided by the energy output that would be produced if it operated at its reference unit power for the entire year. A high load factor indicates good operational performance. In 2023, the global median capacity factor was 88.0%. Boiling water reactors (BWR) and pressurized water reactors (PWR) have been the best performing reactors since 2013, with median capacity factors of 89.3% and 82.7% respectively.

Throughout 2023, 6 GW(e) of nuclear capacity (five reactors) were permanently taken offline. In Belgium, after over 40 years of operation, Tihange-2 (PWR, 1008 MW(e)) was permanently shut down on 1 February. This was followed by the shutdown of Kuosheng-2 (BWR, 985 MW(e)) in Taiwan, China, on 14 March. Germany's last three operational reactors – Emsland (PWR, 1335 MW(e)), Isar-2 (PWR, 1410 MW(e)), and

Neckarwestheim-2 (PWR, 1310 MW(e)) – were shut down on 15 April, twelve years after the country implemented its nuclear power phaseout policy.

Information and data received by the IAEA through 21 June 2024 are included in this publication. Any modifications received at a later date, although not included in this publication, are available in the PRIS database.

PRIS statistics are available in the IAEA's annual publications such as "Operating Experience with Nuclear Power Stations in Member States" and "Country Nuclear Power Profiles", as well as on the PRIS web page (http://www.iaea.org/pris). Detailed nuclear power reactor data and reports are accessible to registered users through the PRIS Statistics on-line application. Enquiries should be addressed to:

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DEFINITIONS

Performance factors

$$\text{EAF (\%)} = \frac{(\text{REG} - \text{PEL} - \text{UEL} - \text{XEL})}{\text{REG}} \times 100$$

$$\text{UCF (\%)} = \frac{(\text{REG} - \text{PEL} - \text{UEL})}{\text{REG}} \times 100$$

$$\text{UCL (\%)} = \frac{\text{UEL}}{\text{REG}} \times 100$$

$$\text{PCL (\%)} = \frac{\text{PEL}}{\text{REG}} \times 100$$

$$\text{LF (\%)} = \frac{\text{EG}}{\text{REG}} \times 100$$

$$\text{OF (\%)} = \frac{\text{On-line hours}}{\text{Total hours}} \times 100$$

where

EAF is the energy availability factor, expressed in per cent;
UCF is the unit capability factor, expressed in per cent;
UCL is the unplanned capability loss factor, expressed in per cent;
PCL is the planned capability loss factor, expressed in per cent;
LF is the load factor, expressed in per cent; and
OF is the operating factor, expressed in per cent.

REG Reference energy generation: The net electrical energy (MW·h) supplied by a unit continuously operated at the reference unit power for the duration of the entire reference period.

PEL Planned energy loss: The energy (MW·h) that was not supplied during the period because of planned shutdowns or load reductions due to causes under plant management control. Energy losses are considered to be planned if they are scheduled at least four weeks in advance.

UEL Unplanned energy loss: The energy (MW·h) that was not supplied during the period because of unplanned shutdowns, outage extensions or load reductions due to causes under plant management control. Energy losses are considered to be unplanned if they are not scheduled at least four weeks in advance.

XEL External energy loss: The energy (MW·h) that was not supplied owing to constraints beyond plant management control that reduced plant availability.

EG Electrical energy: The net electrical energy supplied during the reference period as measured at the unit outlet terminals after deducting the electrical energy taken by unit auxiliaries and the losses in transformers that are considered to be integral parts of the unit.

Planned reactors

The IAEA considers a reactor to be planned from the date when a construction licence application has been submitted to the relevant national regulatory authorities until the construction start date.

Construction start

The date when the first major placing of concrete, usually for the base mat of the reactor building, is carried out.

First criticality

The date when the reactor is made critical for the first time.

Grid connection

The date when the plant is first connected to the electrical grid for the supply of power. After this date, the plant is considered operational.

Commercial operation

The date when the plant is handed over by the contractors to the owner and declared officially in commercial operation.

Suspended operation

A unit is considered in the suspended operations status if it has been shut down for an extended period (usually more than one year) and there is an intention to re-start the unit but:

1. restart is not being aggressively pursued (there is no vigorous onsite activity to restart the unit) or
2. no firm restart date or recovery schedule was established when the unit was shutdown.

Suspended operations may be due to due to technical, economic, strategic or political reasons. This status does not apply to long-term maintenance outages, including unit refurbishment, if the outage schedule is consistently followed, or to long-term outages due to regulatory restrictions (license suspension), if a restart (license recovery) term and conditions have been established. Such units are still considered "operational" (in a long-term outage). If an intention not to restart the shutdown unit has been officially announced by the owner, the unit is considered "permanently shutdown".

Permanent shutdown

The date when the plant is officially declared by the owner to be shut down and taken out of operation permanently.

NSSS supplier

The supplier of a power reactor unit's nuclear steam supply system.

Units and energy conversion

1 terawatt hour (TW·h) = 10^6 megawatt hours (MW·h)

For an average power plant:

1 TW·h = equivalent to 0.39 megatonnes of coal (input);
= equivalent to 0.23 megatonnes of oil (input).

TABLE 1. OVERVIEW OF POWER REACTORS AND NUCLEAR SHARE, 31 DEC. 2023

Country	Reactors in Operation		Reactors in Suspended Operation		Reactors Under Construction		Nuclear Electricity Supplied	
	Number of units	Net Capacity MW(e)	Number of units	Net Capacity MW(e)	Number of units	Net Capacity MW(e)	TW.h	% of Total
ARGENTINA	3	1641			1	25	9.0	6.3
ARMENIA	1	416					2.5	31.1
BANGLADESH					2	2160		
BELARUS	2	2220					11.0	28.6
BELGIUM	5	3908					31.3	41.2
BRAZIL	2	1884			1	1340	13.7	2.2
BULGARIA	2	2006					15.5	40.5
CANADA	19	13699					83.5	13.7
CHINA	55	53152			24	24948	406.5	4.9
CZECH REP.	6	3934					28.7	40.0
EGYPT					3	3300		
FINLAND	5	4394					32.8	42.0
FRANCE	56	61370			1	1630	323.8	64.8
HUNGARY	4	1916					15.1	48.8
INDIA	19	6290	4	639	8	6028	44.6	3.1
IRAN,ISL.REP	1	915			1	974	6.1	1.7
JAPAN	12	11046	21	20633	2	2653	77.5	5.5
KOREA,REP.OF	26	25825			2	2680	171.6	31.5
MEXICO	2	1552					12.0	4.9
NETHERLANDS	1	482					3.8	3.4
PAKISTAN	6	3262					22.4	17.4
ROMANIA	2	1300					10.3	18.9
RUSSIA	37	27727			3	2700	204.0	18.4
SLOVAKIA	5	2308			1	440	17.0	61.3
SLOVENIA	1	688					5.3	36.8
SOUTH AFRICA	2	1854					8.2	4.4

TABLE 1. OVERVIEW OF POWER REACTORS AND NUCLEAR SHARE, 31 DEC. 2023 — continued

Country	Reactors in Operation		Reactors in Suspended Operation		Reactors Under Construction		Nuclear Electricity Supplied	
	Number of units	Net Capacity MW(e)	Number of units	Net Capacity MW(e)	Number of units	Net Capacity MW(e)	TW.h	% of Total
SPAIN	7	7123					54.4	20.3
SWEDEN	6	6944					46.6	28.6
SWITZERLAND	4	2973					23.4	32.4
TÜRKIYE					4	4456		
UAE	3	4011			1	1310	31.2	19.7
UK	9	5883			2	3260	37.3	12.5
UKRAINE	15	13107			2	2070		
USA	93	95835			1	1117	779.2	18.5
TOTAL	**413**	**371539**	**25**	**21272**	**59**	**61091**	**2545.5**	

Notes:

1. The totals include the following data from Taiwan, China:
— 2 units, 1874 MW(e) in operation;
— 17.2 TW·h of nuclear electricity generation, representing 6.9% of the total electricity generated there.

2. The total electricity production does not include Ukrainian reactor units as operational data was not submitted for the year 2023 by the time of publication.

3. The total electricity production excludes output from reactors that were permanently shut down in 2023.

TABLE 2. TYPE AND NET ELECTRICAL POWER OF OPERATIONAL REACTORS, 31 DEC. 2023

Country	PWR		BWR		GCR		HTGR		PHWR		LWGR		FBR		Totals	
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)
ARGENTINA									3	1641					3	1641
ARMENIA	1	416													1	416
BELARUS	2	2220													2	2220
BELGIUM	5	3908													5	3908
BRAZIL	2	1884													2	1884
BULGARIA	2	2006													2	2006
CANADA									19	13699					19	13699
CHINA	52	51648					1	150	2	1354					55	53152
CZECH REP.	6	3934													6	3934
FINLAND	3	2614	2	1780											5	4394
FRANCE	56	61370													56	61370
HUNGARY	4	1916													4	1916
INDIA	2	1864							17	4426					19	6290
IRAN,ISL.REP	1	915													1	915
JAPAN	12	11046													12	11046
KOREA,REP.OF	23	24081							3	1744					26	25825
MEXICO			2	1552											2	1552
NETHERLANDS	1	482													1	482
PAKISTAN	6	3262													6	3262
ROMANIA									2	1300					2	1300
RUSSIA	24	18914									11	7433	2	1380	37	27727
SLOVAKIA	5	2308													5	2308
SLOVENIA	1	688													1	688
SOUTH AFRICA	2	1854													2	1854
SPAIN	6	6059	1	1064											7	7123
SWEDEN	2	2211	4	4733											6	6944

TABLE 2. TYPE AND NET ELECTRICAL POWER OF OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	PWR		BWR		GCR		HTGR		PHWR		LWGR		FBR		Totals	
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)
SWITZERLAND	3	1740	1	1233											4	2973
UAE	3	4011													3	4011
UK	1	1198			8	4685									9	5883
UKRAINE	15	13107													15	13107
USA	62	63126	31	32709											93	95835
TOTAL	**304**	**290656**	**41**	**43071**	**8**	**4685**	**1**	**150**	**46**	**24164**	**11**	**7433**	**2**	**1380**	**413**	**371539**

Notes:

1. The totals include 2 units, 1874 MW(e) in Taiwan, China.
2. During 2023, 5 reactors, 5007 MW(e) were newly connected to the grid.

TABLE 3. TYPE AND NET ELECTRICAL POWER OF REACTORS UNDER CONSTRUCTION, 31 DEC. 2023

Country	PWR		BWR		PHWR		LWGR		FBR		HTGR		Totals	
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)
ARGENTINA	1	25											1	25
BANGLADESH	2	2160											2	2160
BRAZIL	1	1340											1	1340
CHINA	22	23664							2	1284			24	24948
EGYPT	3	3300											3	3300
FRANCE	1	1630											1	1630
INDIA	4	3668			3	1890			1	470			8	6028
IRAN,ISL.REP	1	974											1	974
JAPAN			2	2653									2	2653
KOREA,REP.OF	2	2680											2	2680
RUSSIA	2	2400							1	300			3	2700
SLOVAKIA	1	440											1	440
TÜRKIYE	4	4456											4	4456
UAE	1	1310											1	1310
UK	2	3260											2	3260
UKRAINE	2	2070											2	2070
USA	1	1117											1	1117
TOTAL	**50**	**54494**	**2**	**2653**	**3**	**1890**			**4**	**2054**			**59**	**61091**

TABLE 4. REACTOR YEARS OF EXPERIENCE, UP TO 31 DEC. 2023

Country	In Operation		Suspended Operation		Permanently Shutdown		All Operating and Shutdown Reactors		Operating Experience	
	Number	Net Capacity MW(e)	Number	Net Capacity MW(e)	Number	Net Capacity MW(e)	Number	Net Capacity MW(e)	Years	Months
ARGENTINA	3	1641					3	1641	100	2
ARMENIA	1	416			1	376	2	792	49	8
BELARUS	2	2220					2	2220	3	10
BELGIUM	5	3908			3	2024	8	5932	329	5
BRAZIL	2	1884					2	1884	65	3
BULGARIA	2	2006			4	1632	6	3638	175	3
CANADA	19	13699			6	2143	25	15842	845	6
CHINA	55	53152					55	53152	568	2
CZECH REP.	6	3934					6	3934	194	10
FINLAND	5	4394					5	4394	181	2
FRANCE	56	61370			14	5549	70	66919	2505	0
GERMANY					33	26235	33	26235	862	0
HUNGARY	4	1916					4	1916	154	2
INDIA	19	6290	4	639			23	6929	585	6
IRAN,ISL.REP	1	915					1	915	12	4
ITALY					4	1423	4	1423	80	8
JAPAN	12	11046	21	20633	27	17119	60	48798	1734	6
KAZAKHSTAN					1	52	1	52	25	10
KOREA,REP.OF	26	25825			2	1237	28	27062	669	10
LITHUANIA					2	2370	2	2370	43	6
MEXICO	2	1552					2	1552	63	11
NETHERLANDS	1	482			1	55	2	537	79	0
PAKISTAN	6	3262			1	90	7	3352	104	9
ROMANIA	2	1300					2	1300	43	11
RUSSIA	37	27727			10	3957	47	31684	1484	7
SLOVAKIA	5	2308			3	909	8	3217	189	7

TABLE 4. REACTOR YEARS OF EXPERIENCE, UP TO 31 DEC. 2023 — continued

Country	In Operation		Suspended Operation		Permanently Shutdown		All Operating and Shutdown Reactors		Operating Experience	
	Number	Net Capacity MW(e)	Number	Net Capacity MW(e)	Number	Net Capacity MW(e)	Number	Net Capacity MW(e)	Years	Months
SLOVENIA	1	688					1	688	42	3
SOUTH AFRICA	2	1854					2	1854	78	3
SPAIN	7	7123			3	1067	10	8190	371	1
SWEDEN	6	6944			7	4054	13	10998	492	0
SWITZERLAND	4	2973			2	379	6	3352	240	11
UAE	3	4011					3	4011	7	0
UK	9	5883			36	7755	45	13638	1667	9
UKRAINE	15	13107			4	3515	19	16622	578	6
USA	93	95835			41	19976	134	115811	4879	7
TOTAL	**413**	**371539**	**25**	**21272**	**209**	**105095**	**647**	**497906**	**19751**	**7**

Notes:

1. The total includes the following data from Taiwan, China:

   — operational reactors, 2 units, 1874 MW(e); permanently shutdown reactors, 4 units, 3178 MW(e); 241 years, 11 months.

2. Operating experience is counted from the grid connection excluding any suspended operations period.

TABLE 5. OPERATIONAL REACTORS AND NET ELECTRICAL POWER (1995-2023)

Country	Number of Units and Net Capacity [MW(e)] Connected to the Grid (Latest in each year)															
	1995		2000		2005		2010		2015		2020		2022		2023	
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)
ARGENTINA	2	935	2	978	2	935	2	935	3	1632	3	1641	3	1641	3	1641
ARMENIA	1	376	1	376	1	376	1	375	1	375	1	415	1	416	1	416
BELARUS											1	1110	1	1110	2	2220
BELGIUM	7	5631	7	5712	7	5801	7	5926	7	5913	7	5942	6	4936	5	3908
BRAZIL	1	626	2	1976	2	1901	2	1884	2	1884	2	1884	2	1884	2	1884
BULGARIA	6	3538	6	3760	4	2722	2	1906	2	1926	2	2006	2	2006	2	2006
CANADA	21	14902	14	9998	18	12584	18	12604	19	13524	19	13624	19	13624	19	13699
CHINA	3	2188	3	2188	9	6587	13	10065	30	26754	49	47508	54	52131	55	53152
CZECH REP.	4	1782	5	2611	6	3373	6	3675	6	3930	6	3934	6	3934	6	3934
FINLAND	4	2310	4	2656	4	2676	4	2716	4	2752	4	2794	5	4394	5	4394
FRANCE	56	58573	59	63080	59	63260	58	63130	58	63130	56	61370	56	61370	56	61370
GERMANY	19	20972	19	21283	17	20339	17	20490	8	10799	6	8113	3	4055		
HUNGARY	4	1729	4	1729	4	1755	4	1889	4	1889	4	1902	4	1916	4	1916
INDIA	10	1746	14	2508	14	2903	18	4099	20	5218	18	5660	19	6290	19	6290
IRAN,ISL.REP									1	915	1	915	1	915	1	915
JAPAN	50	39625	52	43245	55	47593	50	42564	20	18097	10	9486	10	9486	12	11046
KAZAKHSTAN	1	50														
KOREA,REP.OF	11	9115	16	12990	20	16810	21	18698	24	21733	24	23150	25	24489	26	25825
LITHUANIA	2	2370	2	2370	1	1185										
MEXICO	2	1256	2	1290	2	1360	2	1300	2	1440	2	1552	2	1552	2	1552
NETHERLANDS	2	510	1	449	1	450	1	482	1	482	1	482	1	482	1	482
PAKISTAN	1	125	2	425	2	425	2	425	3	690	5	1318	6	3262	6	3262
ROMANIA			1	655	1	655	2	1300	2	1300	2	1300	2	1300	2	1300
RUSSIA	30	19848	30	19848	31	21743	32	22693	35	25413	38	28578	37	27727	37	27727
SLOVAKIA	4	1632	6	2440	6	2442	4	1816	4	1814	4	1837	4	1868	5	2308

TABLE 5. OPERATIONAL REACTORS AND NET ELECTRICAL POWER (1995-2023) — continued

Country	Number of Units and Net Capacity [MW(e)] Connected to the Grid (Latest in each year)															
	1995		2000		2005		2010		2015		2020		2022		2023	
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)
SLOVENIA	1	620	1	676	1	656	1	666	1	688	1	688	1	688	1	688
SOUTH AFRICA	2	1840	2	1840	2	1800	2	1800	2	1860	2	1860	2	1854	2	1854
SPAIN	9	7097	9	7468	9	7591	8	7514	7	7121	7	7121	7	7123	7	7123
SWEDEN	12	10028	11	9397	10	8905	10	9303	10	9648	6	6882	6	6937	6	6944
SWITZERLAND	5	3056	5	3170	5	3220	5	3238	5	3333	4	2960	4	2973	4	2973
UAE											1	1345	3	4011	3	4011
UK	35	12910	33	12490	23	11852	19	10137	15	8918	15	8923	9	5883	9	5883
UKRAINE	15	13045	13	11195	15	13107	15	13107	15	13107	15	13107	15	13107	15	13107
USA	108	98068	103	96297	103	98145	104	101211	99	99167	94	96553	92	94718	93	95835
TOTAL	**434**	**341387**	**435**	**349984**	**440**	**368035**	**436**	**370930**	**416**	**360504**	**414**	**369804**	**411**	**370941**	**413**	**371539**

Notes:

The total includes the following data from Taiwan, China:

— 1995: 6 units, 4884 MW(e); 2000: 6 units, 4884 MW(e); 2005: 6 units, 4884 MW(e); 2010: 6 units, 4982 MW(e); 2015: 6 units, 5052 MW(e); 2020: 4 units, 3844 MW(e); 2022: 3 units, 2859 MW(e); 2023: 2 units, 1874 MW(e).

TABLE 6. NUCLEAR ELECTRICITY PRODUCTION AND SHARE (1995-2023)

Country	Nuclear Production [TW.h] of Reactors Connected to the Grid (Latest in each year)															
	1995		2000		2005		2010		2015		2020		2022		2023	
	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total
ARGENTINA	6.57	11.8	5.74	7.3	6.37	6.9	6.69	5.9	6.52	4.8	10.01	7.5	7.47	5.4	8.96	6.3
ARMENIA	0.00	NA	1.84	33.0	2.50	42.7	2.29	39.4	2.57	34.5	2.55	34.5	2.63	31.0	2.51	31.1
BELARUS	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.34	1.0	4.41	11.9	11.00	28.6
BELGIUM	39.30	55.5	45.81	56.8	45.34	55.6	45.73	50.0	24.83	37.5	32.79	39.1	41.74	46.4	31.29	41.2
BRAZIL	2.33	1.0	5.59	1.9	9.20	2.5	13.77	3.1	13.89	2.8	13.24	2.5	13.74	2.5	13.70	2.2
BULGARIA	16.22	46.4	16.79	45.0	17.38	44.1	14.24	33.1	14.70	31.3	15.94	40.8	15.78	32.6	15.49	40.4
CANADA	93.98	17.3	69.12	11.8	86.83	14.5	85.50	15.1	95.64	16.6	92.17	14.6	81.72	12.9	83.47	13.7
CHINA	12.13	1.2	16.02	1.2	50.33	2.0	70.96	1.8	161.20	3.0	344.75	4.9	395.35	5.0	406.48	4.9
CZECH REP.	12.23	20.0	12.71	18.7	23.25	30.5	26.44	33.3	25.34	32.5	28.37	37.3	29.31	36.7	28.73	40.0
FINLAND	18.13	29.9	21.58	32.2	22.36	32.9	21.89	28.4	22.33	33.7	22.35	33.9	24.24	35.0	32.76	42.0
FRANCE	358.71	76.1	395.39	76.4	431.18	78.5	410.09	74.1	419.04	76.3	338.74	70.6	282.09	62.6	323.77	64.8
GERMANY	146.13	29.6	160.66	30.6	154.61	26.6	133.01	22.6	86.81	14.1	60.92	11.3	31.89	5.8	6.72	1.4
HUNGARY	13.20	42.3	13.35	40.6	13.02	37.2	14.66	42.1	14.96	52.7	15.18	48.0	14.95	47.0	15.09	48.8
INDIA	6.99	1.9	14.23	3.1	15.73	2.8	20.48	2.8	34.64	3.5	40.37	3.3	41.97	3.1	44.65	3.1
IRAN,ISL.REP	0.00	NA	0.00	NA	0.00	NA	0.00	NA	3.20	1.3	5.79	1.7	6.01	1.7	6.07	1.7
JAPAN	275.51	33.4	306.24	33.8	280.50	29.3	280.25	29.2	4.35	0.5	43.10	5.1	51.91	6.1	77.54	5.6
KAZAKHSTAN	0.08	0.1	0.00	0.0	0.00	NA	0.00	0.0	0.00	0.0	0.00	NA	0.00	NA	0.00	NA
KOREA,REP.OF	60.21	36.1	103.54	40.7	137.59	44.7	141.89	32.2	157.20	31.7	152.58	29.6	167.51	30.4	171.64	31.5
LITHUANIA	10.64	86.1	7.42	73.9	9.54	70.3	0.00	0.0	0.00	0.0	0.00	NA	0.00	NA	0.00	NA
MEXICO	7.53	6.0	7.92	3.9	10.32	5.0	5.59	3.6	11.18	6.8	10.86	4.9	10.54	4.5	12.04	4.9
NETHERLANDS	3.78	4.9	3.70	4.3	3.77	3.9	3.75	3.4	3.86	3.7	3.89	3.2	3.93	3.3	3.77	3.4
PAKISTAN	0.46	0.9	0.90	1.6	2.41	2.8	2.56	2.6	4.33	4.4	9.64	7.1	22.22	16.2	22.38	17.4
ROMANIA	0.00	NA	5.05	10.9	5.11	8.6	10.70	19.5	10.71	17.3	10.58	19.9	10.22	19.4	10.31	18.9
RUSSIA	91.59	11.8	120.10	15.0	137.64	15.8	159.41	17.1	182.81	18.6	201.82	20.6	209.52	19.6	203.96	18.4
SLOVAKIA	11.35	44.1	15.17	53.4	16.34	56.1	13.54	51.8	14.08	55.9	14.36	53.1	14.83	59.2	17.00	61.3
SLOVENIA	4.57	39.5	4.55	37.4	5.61	42.4	5.38	37.3	5.37	38.0	6.04	37.8	5.31	42.8	5.33	36.8

TABLE 6. NUCLEAR ELECTRICITY PRODUCTION AND SHARE (1995-2023) — continued

Country	Nuclear Production [TW.h] of Reactors Connected to the Grid (Latest in each year)															
	1995		2000		2005		2010		2015		2020		2022		2023	
	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total	TW.h	% of Total
SOUTH AFRICA	11.29	6.5	13.00	6.6	12.24	5.5	12.90	5.2	10.97	4.7	11.62	5.9	10.12	4.9	8.15	4.4
SPAIN	53.49	34.1	59.49	27.6	54.99	19.6	59.26	20.1	54.76	20.3	55.80	22.2	56.15	20.3	54.37	20.3
SWEDEN	67.17	46.6	54.81	39.0	69.58	44.9	55.73	38.1	54.46	34.3	47.36	29.4	50.02	29.4	46.65	28.6
SWITZERLAND	23.58	39.9	25.05	38.2	22.11	38.0	25.34	38.0	22.16	33.5	23.05	32.9	23.18	36.4	23.40	32.4
UAE	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00	NA	1.56	1.1	19.30	12.4	31.21	19.7
UK	70.64	25.4	72.99	21.9	75.34	20.0	56.85	15.6	63.89	18.9	45.67	14.5	43.60	14.2	37.28	12.5
UKRAINE	65.78	37.8	72.56	47.3	83.40	48.5	83.95	48.1	82.41	56.5	71.55	51.2	0.00	NA	0.00	NA
USA	673.52	22.5	755.55	19.8	783.35	19.3	807.08	19.6	798.01	19.5	789.92	19.7	772.22	18.2	779.19	18.6
TOTAL	**2190.94**		**2443.85**		**2626.34**		**2629.82**		**2441.34**		**2553.24**		**2486.83**		**2552.07**	

Notes: NA - Not Available

1. The totals include the following data from Taiwan, China:

	33.80	28.8	37.00	21.2	38.40	17.9	39.89	19.3	35.14	16.3	30.34	12.7	22.92	9.1	17.15	6.9

2. The total electricity production does not include Ukrainian reactor units as operational data were not submitted for the year 2023 by the time of publication.

TABLE 7. ANNUAL CONSTRUCTION STARTS AND CONNECTIONS TO THE GRID (1954-2023)

Year	Construction Starts		Connections to the Grid		Reactors in Operation	
	Units	MW(e)	Units	MW(e)	Units	MW(e)
1954	1	60	1	5	1	5
1955	8	260			1	5
1956	5	577	1	35	2	65
1957	13	1836	3	119	5	209
1958	5	461	1	35	6	269
1959	7	976	5	176	11	548
1960	11	1010	4	438	15	1087
1961	7	1529			15	1088
1962	8	1379	9	955	24	2207
1963	5	1722	9	500	32	2661
1964	9	2792	8	1022	39	3670
1965	8	3268	8	1879	47	5894
1966	14	6952	8	1528	54	7523
1967	25	16287	11	2165	63	9579
1968	37	26819	7	1029	68	10632
1969	13	9398	9	3647	76	14080
1970	37	25552	6	3410	82	17615
1971	18	12676	16	7711	98	24304
1972	28	21163	16	8880	112	32781
1973	30	24627	19	12544	130	43645
1974	38	35230	26	17333	153	61005
1975	38	36434	15	10289	168	70398
1976	43	41845	19	14232	185	83977
1977	23	21849	18	13199	198	96187
1978	23	21781	20	15782	217	111725
1979	27	23055	8	6909	224	117799

TABLE 7. ANNUAL CONSTRUCTION STARTS AND CONNECTIONS TO THE GRID (1954-2023) — continued

Year	Construction Starts		Connections to the Grid		Reactors in Operation	
	Units	MW(e)	Units	MW(e)	Units	MW(e)
1980	20	19195	21	15088	244	133022
1981	17	16029	23	20352	266	153820
1982	18	19165	19	15313	283	168302
1983	15	11936	23	19211	305	187744
1984	13	11332	33	31079	335	218437
1985	19	15337	33	31276	363	245779
1986	8	7286	27	27134	389	272074
1987	13	11434	22	22191	407	295812
1988	7	7722	14	13574	416	305212
1989	6	4018	12	10536	420	311913
1990	5	3267	10	10543	416	318224
1991	2	2246	4	3719	415	321924
1992	3	3094	6	4809	418	325261
1993	4	3562	9	9012	427	333914
1994	2	1334	5	4302	429	336904
1995	0		5	3536	434	341387
1996	1	610	6	7080	438	347281
1997	5	4453	3	3557	434	347880
1998	3	2150	4	3020	430	344900
1999	4	4540	4	2729	432	347353
2000	6	5336	6	3178	435	349984
2001	1	1304	3	2696	438	352715
2002	6	3440	6	5209	439	357481
2003	1	202	2	1627	437	359827
2004	2	1336	5	4785	437	364539
2005	3	2907	4	3823	440	368035
2006	5	4769	2	1492	434	369491

TABLE 7. ANNUAL CONSTRUCTION STARTS AND CONNECTIONS TO THE GRID (1954-2023) — continued

Year	Construction Starts		Connections to the Grid		Reactors in Operation	
	Units	MW(e)	Units	MW(e)	Units	MW(e)
2007	7	5315	3	1842	436	369483
2008	10	10588			434	368266
2009	12	13626	2	1068	433	367406
2010	16	15968	5	3776	436	370930
2011	4	1888	6	3993	414	350655
2012	7	7019	3	2963	412	350942
2013	10	11309	4	4060	409	349472
2014	2	2420	5	4660	413	353959
2015	9	8624	10	9450	416	360504
2016	3	3014	10	9531	422	368188
2017	5	4896	4	3373	423	369418
2018	5	6364	9	10323	424	374110
2019	5	6046	6	5174	417	369590
2020	5	5115	5	5561	414	369804
2021	10	8836	6	5218	410	366790
2022	8	9125	6	7400	411	370941
2023	6	6764	5	5007	413	371539

TABLE 8. NUMBER OF NEW REACTORS CONNECTED TO THE GRID AND MEDIAN CONSTRUCTION TIME IN MONTHS

Country	1991 to 1995		1996 to 2000		2001 to 2005		2006 to 2010		2011 to 2015		2016 to 2020		2021 to 2023	
	No.	Months	No.	Months	No.	Months	No.	Months	No.	Months	No.	Months	No.	Months
ARGENTINA									1	396				
BELARUS											1	85		
BRAZIL			1	295										
BULGARIA	1	113												
CANADA	2	97												
CHINA	3	73			6	59	4	68	17	67	19	68	5	76
CZECH REP.			1	167	1	191								
FINLAND													1	200
FRANCE	3	93	4	124										
INDIA	3	120	4	122	1	64	4	81	2	123	1	170	1	123
IRAN,ISL.REP									1	222				
JAPAN	10	46	3	42	4	47	1	53						
KOREA,REP.OF	2	61	5	56	4	54	1	51	3	56	2	103	1	120
MEXICO	1	210												
PAKISTAN			1	83					1	64	2	67	2	70
ROMANIA			1	161			1	290						
RUSSIA	1	109			2	233	1	323	3	108	7	119		
SLOVAKIA			2	187										
UAE											1	98	2	100
UK	1	80												
UKRAINE	1	113			2	227								
USA	1	221	1	272							1	250		
WORLDWIDE	**29**	**82**	**23**	**121**	**20**	**59**	**12**	**77**	**28**	**68**	**34**	**91**	**12**	**91**

Note: Construction time is measured from the first pouring of concrete to the connection of the unit to the grid.

TABLE 9. CONSTRUCTION STARTS DURING 2023

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial
					Thermal	Gross	Net		Supplier	Start	Connection	Operation
CHINA	CN -75	HAIYANG-4	PWR	CAP1000	3400	1253	1161	SDNPC	SNERDI	2023-4		
	CN -79	LIANJIANG-1	PWR	CAP1000	3400	1224	1224	ZJNPC	SNPEMC	2023-9		
	CN -77	LUFENG-6	PWR	HPR1000	3180	1200	1116	LFNPC	SENPE	2023-8		
	CN -73	SANMEN-4	PWR	CAP1000	3400	1251	1163	SMNPC	Shanghai	2023-3		
	CN -81	XUDABU-1	PWR	CAP1000	2905	1290	1000	LNPC	DEC	2023-11		
EGYPT	EG -3	EL DABAA-3	PWR	VVER-1200	3200	1200	1100	NPPA	JSC ASE	2023-5		

Note: During 2023, construction started on 6 reactors (6764 MW(e)).

TABLE 10. CONNECTIONS TO THE GRID DURING 2023

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Construction	First	Grid
					Thermal	Gross	Net		Supplier	Start	Critically	Connection
BELARUS	BY -2	BELARUSIAN-2	PWR	VVER V-491	3200	1194	1110	BelNPP	JSC ASE	2014-4	2023-3	2023-5
CHINA	CN -55	FANGCHENGGANG-3	PWR	HPR1000	3150	1180	1000	GFNPC	CFHI	2015-12	2022-12	2023-1
KOREA,REP.OF	KR -28	SHIN-HANUL-2	PWR	APR-1400	3983	1455	1340	KHNP	DHICKOPC	2013-6	2023-12	2023-12
SLOVAKIA	SK -10	MOCHOVCE-3	PWR	VVER V-213	1375	471	440	SE	ŠKODA	1987-1	2022-10	2023-1
USA	US -5025	VOGTLE-3	PWR	AP-1000	3400	1250	1117	SOUTHERN	WH	2013-3	2023-3	2023-3

Note: During 2023, 5 reactors (5007 MW(e)) were newly connected to the grid.

TABLE 11. SCHEDULED CONNECTIONS TO THE GRID DURING 2024

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Construction	First	Grid Date
					Thermal	Gross	Net		Supplier	Start	Critically	
CHINA	CN -56	FANGCHENGGANG-4	PWR	HPR1000	3150	1180	1000	GFNPC	CFHI	2016-12	2024-4	2024-4
INDIA	IN -31	KAKRAPAR-4	PHWR	PHWR-700	2166	700	630	NPCIL	NPCIL	2010-11	2023-12	2024-2
SLOVAKIA	SK -11	MOCHOVCE-4	PWR	VVER V-213	1375	471	440	SE	ŠKODA	1987-1	2024-7	2024-8
UAE	AE -04	BARAKAH-4	PWR	APR-1400	3983	1417	1310	NAWAH	KEPCO	2015-7	2024-3	2024-3
USA	US -5026	VOGTLE-4	PWR	AP-1000	3400	1250	1117	SOUTHERN	WH	2013-11	2024-2	2024-3

Note: During 2023, 5 reactors (4497 MW(e)) are expected to achieve connection to grid.

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2023

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Expected
					Thermal	Gross	Net		Supplier	Construction Start
CHINA	CN -904	FANGCHENGGANG-5	PWR				1000			
	CN -905	FANGCHENGGANG-6	PWR				1000			
	CN -80	LIANJIANG-2	PWR	CAP1000	3400	1224	1224	ZJNPC	CFHI	2024-4
	CN -916	LUFENG-1	PWR	CPR-1000			1000	LFNPC		
	CN -917	LUFENG-2	PWR	CPR-1000			1000	LFNPC		
	CN -59	SN-1	PWR	CAP1400			1534	SNPDP	SNERDI	
	CN -60	SN-2	PWR	CAP1400			1534	SNPDP	SNERDI	
	CN -931	XUDABU-2	PWR	CPR-1000	2905	1290	1000	LNPC	DEC	
	CN -932	ZHANGZHOU-3	PWR	HPR1000	3180	1214	1129	ZGZEC	CFHI	2024-2
	CN -933	ZHANGZHOU-4	PWR	HPR1000	3180	1214	1129	ZGZEC	CFHI	
EGYPT	EG -4	EL DABAA-4	PWR	VVER-1200	3200	1200	1100	NPPA	JSC ASE	2024-1
FINLAND	FI -6	HANHIKIVI-1	PWR	VVER V-522	3200		1200	FV	AEM	
HUNGARY	HU -5	PAKS-5	PWR	VVER V-527	3200	1265	1185	PAKS II	AEM	
	HU -6	PAKS-6	PWR	VVER V-527	3200	1265	1185	PAKS II	AEM	
INDIA	IN -33	GORAKHPUR-1	PHWR	PHWR-700		700	630	NPCIL		
	IN -34	GORAKHPUR-2	PHWR	PHWR-700		700	630	NPCIL		
	IN -17	KAIGA-5	PHWR		2166	700	630	NPCIL	NPCIL	
	IN -18	KAIGA-6	PHWR		2166	700	630	NPCIL	NPCIL	
IRAN,ISL.REP	IR -5	BUSHEHR-3	PWR	VVER V-528	3000	1000	915	NPPDCO	JSC ASE	
	IR -9	DARKHOVAIN	PWR	IR-360	1113	360	330	NPPDCO		
JAPAN	JP -76	HAMAOKA-6	BWR	ABWR	3926	1400	1350	CHUBU		
	JP -69	HIGASHI DORI-1 (TEPCO)	BWR	ABWR	3926	1385	1343	TEPCO	H/G	
	JP -74	HIGASHI DORI-2 (TEPCO)	BWR	ABWR	3926	1385	1343	TEPCO		
	JP -72	HIGASHI DORI-2 (TOHOKU)	BWR	ABWR			1067	TOHOKU		
	JP -62	KAMINOSEKI-1	BWR	ABWR	3926	1373	1325	CHUGOKU		
	JP -63	KAMINOSEKI-2	BWR	ABWR	3926	1373	1325	CHUGOKU		

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Expected
					Thermal	Gross	Net		Supplier	Construction Start
JAPAN	JP -75	SENDAI-3	PWR	APWR	4466	1590	1590	KYUSHU		
	JP -67	TSURUGA-3	PWR	APWR	4466	1538	1475	JAPCO	MHI	
	JP -68	TSURUGA-4	PWR	APWR	4466	1538	1475	JAPCO	MHI	
RUSSIA	RU -171	BALTIC-2	PWR	VVER V-491	3200	1194	1109	REA	AEM	
	RU -202	BASHKIR-1	PWR	VVER V-510	3300	1255	1115	REA	AEM	
	RU -203	BASHKIR-2	PWR	VVER V-510	3300	1255	1115	REA	AEM	
	RU -207	BELOYARSK-5	FBR	BN-1200	3000	1220	0	REA	AEM	
	RU -177	CENTRAL-1	PWR	VVER V-510	3300	1255	0	REA	AEM	
	RU -178	CENTRAL-2	PWR	VVER V-510	3300	1255	0	REA	AEM	
	RU -175	KOLA 2-1	PWR	-	3200	1200	0	REA	AEM	
	RU -176	KOLA 2-2	PWR	-	3200	1200	1100	REA	AEM	
	RU -190	KURSK 2-3	PWR	VVER V-510	3300	1255	1200	REA	AEM	
	RU -191	KURSK 2-4	PWR	VVER V-510	3300	1255	1200	REA	AEM	2025-2
	RU -165	LENINGRAD 2-3	PWR	VVER V-491	3200	1199	1150	REA	AEM	2024-3
	RU -167	LENINGRAD 2-4	PWR	VVER V-491	3200	1199	1150	REA	AEM	2023-10
	RU -181	NIZHEGORODSK-1	PWR		3300	1255	1175	REA	AEM	
	RU -182	NIZHEGORODSK-2	PWR		3300	1255	1175	REA	AEM	
	RU -187	SEVERSK-1	PWR	VVER V-510	3300	1255	0	REA	AEM	
	RU -188	SEVERSK-2	PWR	VVER V-510	3300	1255	0	REA	AEM	
	RU -204	SOUTH URALS-1	FBR	BN-1200	3000	1220	0	REA	AEM	
	RU -205	SOUTH URALS-2	FBR	BN-1200	3000	1220	0	REA	AEM	

Note: Status as of 31 December 2023, 47 reactors (43767 MW(e)) were known as planned.

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2023

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Construction	First	Grid	Commercial
					Thermal	Gross	Net		Supplier	Start	Criticality	Connection	Operation
ARGENTINA	AR -4	CAREM25	PWR	CAREM Prototyp	100	29	25	CNEA	CNEA	2015-8			
BANGLADESH	BD -1	ROOPPUR-1	PWR	VVER V-523	3200	1200	1080	NPCBL	AEM	2017-11			
	BD -2	ROOPPUR-2	PWR	VVER V-523	3200	1200	1080	NPCBL	AEM	2018-7			
BRAZIL	BR -3	ANGRA-3	PWR	PRE KONVOI	3900	1405	1340	ELETRONU	KWU	2010-5	2028-3	2028-3	2028-7
CHINA	CN -65	CHANGJIANG-3	PWR	HPR1000	3190	1198	1000	CHG	CFHI	2021-3			
	CN -66	CHANGJIANG-4	PWR	HPR1000	3190	1198	1000	CHG	CFHI	2021-12			
	CN -56	FANGCHENGGANG-4	PWR	HPR1000	3150	1180	1000	GFNPC	CFHI	2016-12	2024-4	2024-4	2024-5
	CN -74	HAIYANG-3	PWR	CAP1000	3400	1253	1161	SDNPC	SNERDI	2022-7			
	CN -75	HAIYANG-4	PWR	CAP1000	3400	1253	1161	SDNPC	SNERDI	2023-4			
	CN -79	LIANJIANG-1	PWR	CAP1000	3400	1224	1224	ZJNPC	SNPEMC	2023-9			
	CN -69	LINGLONG-1	PWR	ACP100	385	125	100	HNPC	CFHI	2021-7			
	CN -76	LUFENG-5	PWR	HPR1000	3180	1200	1116	LFNPC	CFHI	2022-9			
	CN -77	LUFENG-6	PWR	HPR1000	3180	1200	1116	LFNPC	SENPE	2023-8			
	CN -63	SANAOCUN-1	PWR	HRP1000	3180	1210	1117	CGCNP	CFHI	2020-12			
	CN -64	SANAOCUN-2	PWR	HRP1000	3180	1210	1117	CGCNP	CFHI	2021-12			
	CN -72	SANMEN-3	PWR	CAP1000	3400	1251	1163	SMNPC	Shanghai	2022-6			
	CN -73	SANMEN-4	PWR	CAP1000	3400	1251	1163	SMNPC	Shanghai	2023-3			
	CN -61	TAIPINGLING-1	PWR	HPR1000	3190	1202	1116	HZNP	DEC	2019-12			
	CN -62	TAIPINGLING-2	PWR	HPR1000	3190	1202	1116	HZNP	CFHI	2020-10			
	CN -67	TIANWAN-7	PWR	VVER-1200/V491	3200	1265	1171	JNPC	Atommash	2021-5			
	CN -68	TIANWAN-8	PWR	VVER-1200/V491	3200	1265	1171	JNPC	Atommash	2022-2			
	CN -00	XIAPU-1	FBR	CFR600	1882	682	642	CNNC	CIAE(Chi	2017-12			
	CN -78	XIAPU-2	FBR	CFR600	1882	682	642	CNNC	CIAE(Chi	2020-12			
	CN -81	XUDABU-1	PWR	CAP1000	2905	1290	1000	LNPC	DEC	2023-11			
	CN -70	XUDABU-3	PWR	VVER-1200/V491	3200	1274	1200	LNPC	Russian	2021-7			
	CN -71	XUDABU-4	PWR	VVER-1200/V491	3200	1274	1200	LNPC	Atommash	2022-5			
	CN -57	ZHANGZHOU-1	PWR	HPR1000	3190	1212	1126	ZGZEC	CFHI	2019-10			

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Construction	First	Grid	Commercial
					Thermal	Gross	Net		Supplier	Start	Criticality	Connection	Operation
CHINA	CN -58	ZHANGZHOU-2	PWR	HPR1000	3190	1212	1126	ZGZEC	CFHI	2020-9			
EGYPT	EG -1	EL DABAA-1	PWR	VVER-1200	3200	1200	1100	NPPA	JSC ASE	2022-7			
	EG -2	EL DABAA-2	PWR	VVER-1200	3200	1200	1100	NPPA	JSC ASE	2022-11			
	EG -3	EL DABAA-3	PWR	VVER-1200	3200	1200	1100	NPPA	JSC ASE	2023-5			
FRANCE	FR -74	FLAMANVILLE-3	PWR	EPR	4300	1650	1630	EDF	FRAM	2007-12			
INDIA	IN -31	KAKRAPAR-4	PHWR	PHWR-700	2166	700	630	NPCIL	NPCIL	2010-11	2023-12	2024-2	2024-3
	IN -35	KUDANKULAM-3	PWR	VVER V-412	3000	1000	917	NPCIL	JSC ASE	2017-6			
	IN -36	KUDANKULAM-4	PWR	VVER V-412	3000	1000	917	NPCIL	JSC ASE	2017-10			
	IN -37	KUDANKULAM-5	PWR	VVERV412	3000	1000	917	NPCIL	JSC ASE	2021-6			
	IN -38	KUDANKULAM-6	PWR	VVERV412	3000	1000	917	NPCIL	JSC ASE	2021-12			
	IN -29	PFBR	FBR	Prototype	1253	500	470	BHAVINI		2004-10			
	IN -21	RAJASTHAN-7	PHWR	Horizontal Pre	2177	700	630	NPCIL	NPCIL	2011-7			
	IN -22	RAJASTHAN-8	PHWR	Horizontal Pre	2177	700	630	NPCIL	NPCIL	2011-9			
IRAN,ISL.REP	IR -2	BUSHEHR-2	PWR	V-528 VVER-100	3012	1057	974	NPPDCO	JSC ASE	2019-9			
JAPAN	JP -66	OHMA	BWR	ABWR	3926	1383	1328	EPDC	H/G	2010-5			
	JP -65	SHIMANE-3	BWR	ABWR	3926	1373	1325	CHUGOKU	HITACHI	2006-10			
KOREA,REP.OF	KR -29	SAEUL-3	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2017-4			
	KR -30	SAEUL-4	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2018-9			
RUSSIA	RU -208	BREST-OD-300	FBR	BREST-OD-300	700	320	300	SKhK	NA	2021-6			
	RU -166	KURSK 2-1	PWR	VVER V-510	3300	1255	1200	REA	AEM	2018-4	2024-11	2025-3	2025-12
	RU -189	KURSK 2-2	PWR	VVER V-510	3300	1255	1200	REA	AEM	2019-5	2026-12	2027-3	2027-12
SLOVAKIA	SK -11	MOCHOVCE-4	PWR	VVER V-213	1375	471	440	SE	ŠKODA	1987-1	2024-7	2024-8	2024-10
TÜRKIYE	TR -1	AKKUYU-1	PWR	VVER V-509	3200	1200	1114	ANJSC	AEM	2018-4			
	TR -2	AKKUYU-2	PWR	VVER V-509	3200	1200	1114	ANC	AEM	2020-4			
	TR -3	AKKUYU-3	PWR	VVER V-509	3200	1200	1114	ANC	AEM	2021-3			
	TR -4	AKKUYU-4	PWR	VVER V-509	3200	1200	1114	ANC	AEM	2022-7			
UAE	AE -04	BARAKAH-4	PWR	APR-1400	3983	1417	1310	NAWAH	KEPCO	2015-7	2024-3	2024-3	

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Construction	First	Grid	Commercial
					Thermal	Gross	Net		Supplier	Start	Criticality	Connection	Operation
UK	GB -25A	HINKLEY POINT C-1	PWR	EPR-1750	4524	1720	1630	EDF-CGN	ORANO	2018-12			
	GB -25B	HINKLEY POINT C-2	PWR	EPR-1750	4524	1720	1630	EDF-CGN	ORANO	2019-12			
UKRAINE	UA -51	KHMELNITSKI-3	PWR	VVER	3132	1089	1035	NNEGC	JSC ASE	1986-3			
	UA -52	KHMELNITSKI-4	PWR	VVER	3132	1089	1035	NNEGC	JSC ASE	1987-2			
USA	US -5026	VOGTLE-4	PWR	AP-1000	3400	1250	1117	SOUTHERN	WH	2013-11	2024-2	2024-3	

Notes:

1. As of 31 December 2023, 59 reactors (61091 MW(e)) were under construction.
2. Fist Criticality, Grid Connection, and Commercial Operation dates are reported as planned.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
ARGENTINA	AR -1	ATUCHA-1	PHWR	PHWR KWU	1179	362	340	NASA	SIEMENS	1968-5	1974-3	1974-6	74.4	75.4	-
	AR -2	EMBALSE	PHWR	CANDU 6	2064	656	608	NASA	AECL	1974-3	1983-4	1984-1	79.1	79.5	-
	AR -3	ATUCHA-2	PHWR	PHWR KWU	2160	745	693	NASA	SIEMENS	1981-7	2014-6	2016-5	45.8	45.9	-
ARMENIA	AM -19	ARMENIAN-2	PWR	VVER V-270	1375	448	416	ANPPCJSC	FAEA	1975-7	1980-1	1980-5	65.2	67.4	-
BELARUS	BY -1	BELARUSIAN-1	PWR	VVER V-491	3200	1194	1110	BelNPP	JSC ASE	2013-11	2020-11	2021-6	61.4	61.9	-
	BY -2	BELARUSIAN-2	PWR	VVER V-491	3200	1194	1110	BelNPP	JSC ASE	2014-4	2023-5	2023-11	84.6	84.6	-
BELGIUM	BE -2	DOEL-1	PWR	WH 2LP	1311	454	445	EBL+EDF	ACECOWE	1969-7	1974-8	1975-2	83.9	84.7	-
	BE -3	TIHANGE-1	PWR	Framatome 3 lo	2873	1009	962	EBL	ACLF	1970-6	1975-3	1975-10	80.1	82.1	-
	BE -4	DOEL-2	PWR	WH 2LP	1311	454	445	EBL+EDF	ACECOWE	1971-9	1975-8	1975-12	81.6	82.3	-
	BE -7	DOEL-4	PWR	WH 3LP	2988	1090	1026	EBL+EDF	ACECOWE	1978-12	1985-4	1985-7	83.9	84.6	-
	BE -8	TIHANGE-3	PWR	WH 3LP	3000	1089	1030	EBL	ACECOWE	1978-11	1985-6	1985-9	86.1	87.4	-
BRAZIL	BR -1	ANGRA-1	PWR	WH 2LP	1882	640	609	ELETRONU	WH	1971-5	1982-4	1985-1	64.7	69.3	-
	BR -2	ANGRA-2	PWR	PRE KONVOI	3764	1350	1275	ELETRONU	KWU	1976-1	2000-7	2001-2	86.2	87.3	-
BULGARIA	BG -5	KOZLODUY-5	PWR	VVER V-320	3120	1040	1003	KNPP	AEE	1980-7	1987-11	1988-12	74.2	76.2	DH
	BG -6	KOZLODUY-6	PWR	VVER V-320	3120	1040	1003	KNPP	AEE	1982-4	1991-8	1993-12	79.5	81.1	DH
CANADA	CA -10	BRUCE-3	PHWR	CANDU 750A	2550	865	770	BRUCEPOW	OH/AECL	1972-7	1977-12	1978-2	72.9	73.5	-
	CA -11	BRUCE-4	PHWR	CANDU 750A	2550	868	807	BRUCEPOW	OH/AECL	1972-9	1978-12	1979-1	74.7	75.4	-
	CA -13	PICKERING-5	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1974-11	1982-12	1983-5	74.5	75.2	-
	CA -14	PICKERING-6	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1975-10	1983-11	1984-2	78.5	79.3	-
	CA -15	PICKERING-7	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1976-3	1984-11	1985-1	78.7	79.3	-
	CA -16	PICKERING-8	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1976-9	1986-1	1986-2	75.4	76.1	-
	CA -17	POINT LEPREAU	PHWR	CANDU 6	2180	705	660	NBEPC	AECL	1975-5	1982-9	1983-2	72.4	73.1	-
	CA -18	BRUCE-5	PHWR	CANDU 750B	2832	872	817	BRUCEPOW	OH/AECL	1978-5	1984-12	1985-2	85.7	86.2	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
CANADA	CA -19	BRUCE-6	PHWR	CANDU 750B	2690	891	817	BRUCEPOW	OH/AECL	1978-1	1984-6	1984-9	75.8	76.4	-
	CA -20	BRUCE-7	PHWR	CANDU 750B	2832	872	817	BRUCEPOW	OH/AECL	1979-5	1986-2	1986-4	86.3	86.9	-
	CA -21	BRUCE-8	PHWR	CANDU 750B	2690	872	817	BRUCEPOW	OH/AECL	1979-7	1987-3	1987-5	84	84.8	-
	CA -22	DARLINGTON-1	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1982-4	1990-12	1992-11	80	81	-
	CA -23	DARLINGTON-2	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1981-9	1990-1	1990-10	72.1	73.1	-
	CA -24	DARLINGTON-3	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1984-9	1992-12	1993-2	78.5	79.3	-
	CA -25	DARLINGTON-4	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1985-7	1993-4	1993-6	84.8	85.4	-
	CA -4	PICKERING-1	PHWR	CANDU 500A	1744	542	515	OPG	OH/AECL	1966-6	1971-4	1971-7	68.5	68.7	-
	CA -7	PICKERING-4	PHWR	CANDU 500A	1744	542	515	OPG	OH/AECL	1968-5	1973-5	1973-6	68.7	69.1	-
	CA -8	BRUCE-1	PHWR	CANDU 791	2620	868	811	BRUCEPOW	OH/AECL	1971-6	1977-1	1977-9	73.9	74.3	-
	CA -9	BRUCE-2	PHWR	CANDU 791	2620	836	777	BRUCEPOW	OH/AECL	1970-12	1976-9	1977-9	71.3	71.8	-
CHINA	CN -1	QINSHAN-1	PWR	CNP-300	966	330	326	CNNO	CNNC	1985-3	1991-12	1994-4	83.1	84	-
	CN -10	TIANWAN-1	PWR	VVER V-428	3000	1060	1000	JNPC	IZ	1999-10	2006-5	2007-5	88	88.2	-
	CN -11	TIANWAN-2	PWR	VVER V-428	3000	1060	1000	JNPC	IZ	2000-9	2007-5	2007-8	90.1	90.4	-
	CN -12	LING AO-3	PWR	CPR-1000	2905	1086	1007	DNMC	DEC	2005-12	2010-7	2010-9	88.7	89	-
	CN -13	LING AO-4	PWR	CPR-1000	2905	1086	1007	DNMC	DEC	2006-6	2011-5	2011-8	90.5	91	-
	CN -14	QINSHAN 2-3	PWR	CNP-600	1930	660	623	CNNO	CNNC	2006-4	2010-8	2010-10	91.7	91.8	-
	CN -15	QINSHAN 2-4	PWR	CNP-600	1930	660	623	CNNO	CNNC	2007-1	2011-11	2011-12	91.6	91.8	-
	CN -16	HONGYANHE-1	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2007-8	2013-2	2013-6	88.1	89.3	-
	CN -17	HONGYANHE-2	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2008-3	2013-11	2014-5	87.7	89.1	-
	CN -18	NINGDE-1	PWR	CPR-1000	2905	1089	1018	NDNP	DEC	2008-2	2012-12	2013-4	88.6	88.6	-
	CN -19	NINGDE-2	PWR	CPR-1000	2905	1089	1018	NDNP	SHE	2008-11	2014-1	2014-5	92.5	92.6	-
	CN -2	DAYA BAY-1	PWR	M310	2905	984	944	DNMC	FRAM	1987-8	1993-8	1994-2	87.2	89.3	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
CHINA	CN -20	FUQING-1	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2008-11	2014-8	2014-11	91.1	91.4	-
	CN -21	FUQING-2	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2009-6	2015-8	2015-10	90.5	90.9	-
	CN -22	YANGJIANG-1	PWR	CPR-1000	2905	1086	1000	YJNPC	CFHI	2008-12	2013-12	2014-3	91.7	91.8	-
	CN -23	YANGJIANG-2	PWR	CPR-1000	2905	1086	1000	YJNPC	CFHI	2009-6	2015-3	2015-6	91.8	91.9	-
	CN -24	FANGJIASHAN-1	PWR	CPR-1000	2905	1089	1012	CNNO	NPIC	2008-12	2014-11	2014-12	92	92.6	-
	CN -25	FANGJIASHAN-2	PWR	CPR-1000	2905	1089	1012	CNNO	NPIC	2009-7	2015-1	2015-2	92.3	92.9	-
	CN -26	HONGYANHE-3	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2009-3	2015-3	2015-8	89.3	90.9	-
	CN -27	HONGYANHE-4	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2009-8	2016-4	2016-6	89.3	90.7	-
	CN -28	SANMEN-1	PWR	AP-1000	3400	1251	1157	SMNPC	WH/MHI	2009-4	2018-6	2018-9	91.9	92.8	-
	CN -29	SANMEN-2	PWR	AP-1000	3400	1251	1157	SMNPC	WH/MHI	2009-12	2018-8	2018-11	76.1	77.2	-
	CN -3	DAYA BAY-2	PWR	M310	2905	984	944	DNMC	FRAM	1988-4	1994-2	1994-5	86.4	87.4	-
	CN -30	HAIYANG-1	PWR	AP-1000	3415	1250	1170	SDNPC	WH	2009-9	2018-8	2018-10	91.7	92.6	DH
	CN -31	HAIYANG-2	PWR	AP-1000	3415	1250	1170	SDNPC	WH	2010-6	2018-10	2019-1	93.3	94	DH
	CN -32	TAISHAN-1	PWR	EPR-1750	4590	1750	1660	TNPJVC	ORANO	2009-11	2018-6	2018-12	52.5	53.1	-
	CN -33	TAISHAN-2	PWR	EPR-1750	4590	1750	1660	TNPJVC	ORANO	2010-4	2019-6	2019-9	81.9	82.9	-
	CN -34	NINGDE-3	PWR	CPR-1000	2905	1089	1018	NDNP	CFHI	2010-1	2015-3	2015-6	92.5	92.5	-
	CN -35	NINGDE-4	PWR	CPR-1000	2905	1089	1018	NDNP	CFHI	2010-9	2016-3	2016-7	92.5	92.5	-
	CN -36	CHANGJIANG-1	PWR	CNP-600	1930	650	601	HNPC	DEC	2010-4	2015-11	2015-12	90.4	90.5	-
	CN -37	CHANGJIANG-2	PWR	CNP-600	1930	650	601	HNPC	DEC	2010-11	2016-6	2016-8	90.6	90.7	-
	CN -38	FANGCHENGGANG-1	PWR	CPR-1000	2905	1086	1000	GFNPC	DEC	2010-7	2015-10	2016-1	92.7	92.7	-
	CN -39	FANGCHENGGANG-2	PWR	CPR-1000	2905	1086	1000	GFNPC	DEC	2010-12	2016-7	2016-10	92.8	92.9	-
	CN -4	QINSHAN 2-1	PWR	CNP-600	1930	650	623	CNNO	CNNC	1996-6	2002-2	2002-4	85.3	85.4	-
	CN -40	YANGJIANG-3	PWR	CPR-1000	2905	1086	1000	YJNPC	CFHI	2010-11	2015-10	2016-1	92.5	92.7	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
CHINA	CN -41	YANGJIANG-4	PWR	CPR-1000	2905	1086	1000	YJNPC	CFHI	2012-11	2017-1	2017-3	92.2	92.3	-
	CN -42	FUQING-3	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2010-12	2016-9	2016-10	91.1	91.6	-
	CN -43	FUQING-4	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2012-11	2017-7	2017-9	86.6	87	-
	CN -44	SHIDAO BAY-1	HTGR	HTR-PM	500	211	150	HSNPC	TSINGHUA	2012-12	2021-12	2023-12	100	100	-
	CN -45	TIANWAN-3	PWR	VVER V-428M	3000	1126	1060	JNPC	IZ	2012-12	2017-12	2018-2	88.6	89.3	-
	CN -46	TIANWAN-4	PWR	VVER V-428M	3000	1126	1060	JNPC	IZ	2013-9	2018-10	2018-12	92.3	92.3	-
	CN -47	YANGJIANG-5	PWR	ACPR-1000	2905	1086	1000	YJNPC	CFHI	2013-9	2018-5	2018-7	92	92.1	-
	CN -48	YANGJIANG-6	PWR	ACPR-1000	2905	1086	1000	YJNPC	CFHI	2013-12	2019-6	2019-7	92.3	92.3	-
	CN -49	HONGYANHE-5	PWR	ACPR-1000	2905	1119	1061	LHNPC	DEC	2015-3	2021-6	2021-7	93.5	95	-
	CN -5	QINSHAN 2-2	PWR	CNP-600	1930	650	623	CNNO	CNNC	1997-4	2004-3	2004-5	89.4	89.5	-
	CN -50	HONGYANHE-6	PWR	ACPR-1000	2905	1119	1061	LHNPC	DEC	2015-7	2022-5	2022-6	89.7	91.2	-
	CN -51	FUQING-5	PWR	HPR1000	3050	1161	1075	FQNP	NPIC	2015-5	2020-11	2021-1	85.5	86.6	-
	CN -52	FUQING-6	PWR	HPR1000	3060	1150	1075	FQNP	NPIC	2015-12	2022-1	2022-3	86.1	87.8	-
	CN -53	TIANWAN-5	PWR	CNP-1000	2905	1118	1060	JNPC	SHE	2015-12	2020-8	2020-9	91.6	92.7	-
	CN -54	TIANWAN-6	PWR	CNP-1000	2905	1118	1060	JNPC	CFHI	2016-9	2021-5	2021-6	91.8	92.4	-
	CN -55	FANGCHENGGANG-3	PWR	HPR1000	3150	1180	1000	GFNPC	CFHI	2015-12	2023-1	2023-3	98.2	98.2	-
	CN -6	LING AO-1	PWR	M310	2905	990	950	DNMC	FRAM	1997-5	2002-2	2002-5	89.7	90.1	-
	CN -7	LING AO-2	PWR	M310	2905	990	950	DNMC	FRAM	1997-11	2002-9	2003-1	90.2	90.6	-
	CN -8	QINSHAN 3-1	PHWR	CANDU 6	2064	728	677	CNNO	AECL	1998-6	2002-11	2002-12	90.2	90.7	-
	CN -9	QINSHAN 3-2	PHWR	CANDU 6	2064	728	677	CNNO	AECL	1998-9	2003-6	2003-7	91.5	91.9	-
CZECH REP.	CZ -23	TEMELIN-1	PWR	VVER V-320	3120	1082	1027	CEZ	ŠKODA	1987-2	2000-12	2002-6	76.5	76.8	DH
	CZ -24	TEMELIN-2	PWR	VVER V-320	3120	1082	1029	CEZ	ŠKODA	1987-2	2002-12	2003-4	78.6	78.7	DH
	CZ -4	DUKOVANY-1	PWR	VVER V-213	1444	500	468	CEZ	ŠKODA	1979-1	1985-2	1985-5	83	84	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
CZECH REP.	CZ -5	DUKOVANY-2	PWR	VVER V-213	1444	500	471	CEZ	ŠKODA	1979-1	1986-1	1986-3	81.6	82.6	-
	CZ -8	DUKOVANY-3	PWR	VVER V-213	1444	500	468	CEZ	ŠKODA	1979-3	1986-11	1986-12	81.7	83.3	-
	CZ -9	DUKOVANY-4	PWR	VVER V-213	1444	500	471	CEZ	ŠKODA	1979-3	1987-6	1987-7	83.4	84.3	-
FINLAND	FI -1	LOVIISA-1	PWR	VVER V-213	1500	531	507	FORTUMPH	AEE	1971-5	1977-2	1977-5	88.1	88.8	-
	FI -2	LOVIISA-2	PWR	VVER V-213	1500	531	507	FORTUMPH	AEE	1972-8	1980-11	1981-1	89.5	90.4	-
	FI -3	OLKILUOTO-1	BWR	AA-III, BWR-25	2500	920	890	TVO	ASEASTAL	1974-2	1978-9	1979-10	92.8	93.2	-
	FI -4	OLKILUOTO-2	BWR	AA-III, BWR-25	2500	920	890	TVO	ASEASTAL	1975-11	1980-2	1982-7	93	93.5	-
	FI -5	OLKILUOTO-3	PWR	EPR	4300	1660	1600	TVO	FRAM	2005-8	2022-3	2023-5	96.3	96.9	-
FRANCE	FR -13	BUGEY-2	PWR	CP0	2785	945	910	EDF	FRAM	1972-11	1978-5	1979-3	71.6	73.8	-
	FR -14	BUGEY-3	PWR	CP0	2785	945	910	EDF	FRAM	1973-9	1978-9	1979-3	70.9	73.3	-
	FR -15	BUGEY-4	PWR	CP0	2785	917	880	EDF	FRAM	1974-6	1979-3	1979-7	73.8	75.9	-
	FR -16	BUGEY-5	PWR	CP0	2785	917	880	EDF	FRAM	1974-7	1979-7	1980-1	72.2	74.5	-
	FR -17	ST. LAURENT B-1	PWR	CP2	2785	956	915	EDF	FRAM	1976-5	1981-1	1983-8	75.2	77.3	-
	FR -18	TRICASTIN-1	PWR	CP1	2785	955	915	EDF	FRAM	1974-11	1980-5	1980-12	75.3	78.2	-
	FR -19	TRICASTIN-2	PWR	CP1	2785	955	915	EDF	FRAM	1974-12	1980-8	1980-12	75.1	78.6	-
	FR -20	GRAVELINES-1	PWR	CP1	2785	951	910	EDF	FRAM	1975-2	1980-3	1980-11	72.5	74.7	-
	FR -21	GRAVELINES-2	PWR	CP1	2785	951	910	EDF	FRAM	1975-3	1980-8	1980-12	76	78.1	-
	FR -22	DAMPIERRE-1	PWR	CP1	2785	937	890	EDF	FRAM	1975-2	1980-3	1980-9	74.4	77.7	-
	FR -23	ST. LAURENT B-2	PWR	CP2	2785	956	915	EDF	FRAM	1976-7	1981-6	1983-8	72.2	76	-
	FR -25	TRICASTIN-3	PWR	CP1	2785	955	915	EDF	FRAM	1975-4	1981-2	1981-5	75.8	79.4	-
	FR -26	TRICASTIN-4	PWR	CP1	2785	955	915	EDF	FRAM	1975-5	1981-6	1981-11	78.5	81.8	-
	FR -27	GRAVELINES-3	PWR	CP1	2785	951	910	EDF	FRAM	1975-12	1980-12	1981-6	76.2	77.7	-
	FR -28	GRAVELINES-4	PWR	CP1	2785	951	910	EDF	FRAM	1976-4	1981-6	1981-10	78.1	79.6	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
FRANCE	FR -29	DAMPIERRE-2	PWR	CP1	2785	937	890	EDF	FRAM	1975-4	1980-12	1981-2	76.1	77.9	-
	FR -30	DAMPIERRE-3	PWR	CP1	2785	937	890	EDF	FRAM	1975-9	1981-1	1981-5	77.6	79.3	-
	FR -31	DAMPIERRE-4	PWR	CP1	2785	937	890	EDF	FRAM	1975-12	1981-8	1981-11	75.4	77.7	-
	FR -32	BLAYAIS-1	PWR	CP1	2785	951	910	EDF	FRAM	1977-1	1981-6	1981-12	75.6	78.8	-
	FR -33	BLAYAIS-2	PWR	CP1	2785	951	910	EDF	FRAM	1977-1	1982-7	1983-2	79.3	81.3	-
	FR -34	BLAYAIS-3	PWR	CP1	2785	951	910	EDF	FRAM	1978-4	1983-8	1983-11	78.6	80.5	-
	FR -35	BLAYAIS-4	PWR	CP1	2785	951	910	EDF	FRAM	1978-4	1983-5	1983-10	78	81	-
	FR -36	PALUEL-1	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1977-8	1984-6	1985-12	75.7	78.3	-
	FR -37	PALUEL-2	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1978-1	1984-9	1985-12	67.1	69.6	-
	FR -38	PALUEL-3	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1979-2	1985-9	1986-2	72.1	74.6	-
	FR -39	PALUEL-4	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1980-2	1986-4	1986-6	75.8	78	-
	FR -40	CHINON B-1	PWR	CP2	2785	954	905	EDF	FRAM	1977-3	1982-11	1984-2	74.8	77.1	-
	FR -41	CHINON B-2	PWR	CP2	2785	954	905	EDF	FRAM	1977-3	1983-11	1984-8	76.3	78.5	-
	FR -42	CRUAS-1	PWR	CP2	2785	956	915	EDF	FRAM	1978-8	1983-4	1984-4	75.7	78.4	-
	FR -43	CRUAS-2	PWR	CP2	2785	956	915	EDF	FRAM	1978-11	1984-9	1985-4	76.6	80	-
	FR -44	CRUAS-3	PWR	CP2	2785	956	915	EDF	FRAM	1979-4	1984-5	1984-9	76.5	80.1	-
	FR -45	CRUAS-4	PWR	CP2	2785	956	915	EDF	FRAM	1979-10	1984-10	1985-2	74.9	78	-
	FR -46	FLAMANVILLE-1	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1979-12	1985-12	1986-12	66.8	69.9	-
	FR -47	FLAMANVILLE-2	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1980-5	1986-7	1987-3	72.3	74.3	-
	FR -48	ST. ALBAN-1	PWR	P4 REP 1300	3817	1381	1335	EDF	FRAM	1979-1	1985-8	1986-5	74.6	77.3	-
	FR -49	ST. ALBAN-2	PWR	P4 REP 1300	3817	1381	1335	EDF	FRAM	1979-7	1986-7	1987-3	75.5	78.3	-
	FR -50	CATTENOM-1	PWR	P4 REP 1300	3817	1362	1300	EDF	FRAM	1979-10	1986-11	1987-4	71.7	73.8	-
	FR -51	GRAVELINES-5	PWR	CP1	2785	951	910	EDF	FRAM	1979-10	1984-8	1985-1	76	77.7	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
FRANCE	FR -52	GRAVELINES-6	PWR	CP1	2785	951	910	EDF	FRAM	1979-10	1985-8	1985-10	77.6	79.2	-
	FR -53	CATTENOM-2	PWR	P4 REP 1300	3817	1362	1300	EDF	FRAM	1980-7	1987-9	1988-2	76.4	78.8	-
	FR -54	BELLEVILLE-1	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1980-5	1987-10	1988-6	75.1	76.7	-
	FR -55	BELLEVILLE-2	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1980-8	1988-7	1989-1	76.5	78.5	-
	FR -56	CHINON B-3	PWR	CP2	2785	954	905	EDF	FRAM	1980-10	1986-10	1987-3	75.8	77.4	-
	FR -57	CHINON B-4	PWR	CP2	2785	954	905	EDF	FRAM	1981-2	1987-11	1988-4	78.4	80.7	-
	FR -58	NOGENT-1	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1981-5	1987-10	1988-2	77.3	79.4	-
	FR -59	NOGENT-2	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1982-1	1988-12	1989-5	79.5	81.8	-
	FR -60	CATTENOM-3	PWR	P4 REP 1300	3817	1362	1300	EDF	FRAM	1982-6	1990-7	1991-2	75.3	77.6	-
	FR -61	GOLFECH-1	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1982-11	1990-6	1991-2	78.2	81.1	-
	FR -62	CHOOZ B-1	PWR	N4 REP 1450	4270	1560	1500	EDF	FRAM	1984-1	1996-8	2000-5	73.7	77.3	-
	FR -63	PENLY-1	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1982-9	1990-5	1990-12	76.9	78.3	-
	FR -64	PENLY-2	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1984-8	1992-2	1992-11	80.7	82	-
	FR -65	CATTENOM-4	PWR	P4 REP 1300	3817	1362	1300	EDF	FRAM	1983-9	1991-5	1992-1	80.2	82.7	-
	FR -68	GOLFECH-2	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1984-10	1993-6	1994-3	81.5	83.4	-
	FR -70	CHOOZ B-2	PWR	N4 REP 1450	4270	1560	1500	EDF	FRAM	1985-12	1997-4	2000-9	72	79.4	-
	FR -72	CIVAUX-1	PWR	N4 REP 1450	4270	1561	1495	EDF	FRAM	1988-10	1997-12	2002-1	72.3	74.9	-
	FR -73	CIVAUX-2	PWR	N4 REP 1450	4270	1561	1495	EDF	FRAM	1991-4	1999-12	2002-4	72.2	76.7	-
HUNGARY	HU -1	PAKS-1	PWR	VVER V-213	1485	509	479	PAKS Zrt	AEE	1974-8	1982-12	1983-8	86.7	86.9	-
	HU -2	PAKS-2	PWR	VVER V-213	1485	506	479	PAKS Zrt	AEE	1974-8	1984-9	1984-11	83.3	83.6	DH
	HU -3	PAKS-3	PWR	VVER V-213	1485	506	479	PAKS Zrt	AEE	1979-10	1986-9	1986-12	87.4	87.8	DH
	HU -4	PAKS-4	PWR	VVER V-213	1485	506	479	PAKS Zrt	AEE	1979-10	1987-8	1987-11	88.5	88.9	DH
INDIA	IN -10	KAKRAPAR-2	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	1985-4	1995-3	1995-9	71.8	79.8	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
INDIA	IN -11	RAJASTHAN-3	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	1990-2	2000-3	2000-6	76.8	86.3	PH
	IN -12	RAJASTHAN-4	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	1990-10	2000-11	2000-12	81.9	91	PH
	IN -13	KAIGA-1	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	1989-9	2000-10	2000-11	78.6	92	-
	IN -14	KAIGA-2	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	1989-12	1999-12	2000-3	78.1	91	-
	IN -15	KAIGA-3	PHWR	Horizontal Pre	800	220	202	NPCIL	NPCIL	2002-3	2007-4	2007-5	75.2	85.4	-
	IN -16	KAIGA-4	PHWR	Horizontal Pre	800	220	202	NPCIL	NPCIL	2002-5	2011-1	2011-1	87.1	91.8	-
	IN -19	RAJASTHAN-5	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	2002-9	2009-12	2010-2	90.4	90.7	-
	IN -20	RAJASTHAN-6	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	2003-1	2010-3	2010-3	82.1	82.5	-
	IN -23	TARAPUR-3	PHWR	Horizontal Pre	1730	540	490	NPCIL	NPCIL	2000-5	2006-6	2006-8	80.8	89.1	-
	IN -24	TARAPUR-4	PHWR	Horizontal Pre	1730	540	490	NPCIL	NPCIL	2000-3	2005-6	2005-9	73.6	84.8	-
	IN -25	KUDANKULAM-1	PWR	VVER V-412	3000	1000	932	NPCIL	MAEP	2002-3	2013-10	2014-12	63.5	64.6	-
	IN -26	KUDANKULAM-2	PWR	VVER V-412	3000	1000	932	NPCIL	MAEP	2002-7	2016-8	2017-3	61.7	62.1	-
	IN -30	KAKRAPAR-3	PHWR	PHWR-700	2166	700	630	NPCIL	NPCIL	2010-11	2021-1	2023-6	94.6	94.6	-
	IN -4	RAJASTHAN-2	PHWR	Horizontal Pre	693	200	187	NPCIL	AECL/DAE	1968-4	1980-11	1981-4	59.6	63.1	PH
	IN -6	MADRAS-2	PHWR	Horizontal Pre	801	220	205	NPCIL	NPCIL	1972-10	1985-9	1986-3	63.7	74.2	DS
	IN -7	NARORA-1	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	1976-12	1989-7	1991-1	64.2	74.7	-
	IN -8	NARORA-2	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	1977-11	1992-1	1992-7	66	75.8	-
	IN -9	KAKRAPAR-1	PHWR	Horizontal Pre	801	220	202	NPCIL	NPCIL	1984-12	1992-11	1993-5	64.4	69	-
IRAN,ISL.REP	IR -1	BUSHEHR-1	PWR	VVER V-446	3000	1000	915	NPPDCO	JSC ASE	1975-5	2011-9	2013-9	73.7	74.3	-
JAPAN	JP -13	TAKAHAMA-2	PWR	M (3-loop)	2440	826	780	KEPCO	MHI	1971-3	1975-1	1975-11	68.9	69	-
	JP -14	MIHAMA-3	PWR	M (3-loop)	2440	826	780	KEPCO	MHI	1972-8	1976-2	1976-12	55	55	-
	JP -28	SENDAI-1	PWR	M (3-loop)	2660	890	846	KYUSHU	MHI	1979-12	1983-9	1984-7	72.4	72.4	-
	JP -29	TAKAHAMA-3	PWR	M (3-loop)	2660	870	830	KEPCO	MHI	1980-12	1984-5	1985-1	70.8	70.8	DS

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
JAPAN	JP -30	TAKAHAMA-4	PWR	M (3-loop)	2660	870	830	KEPCO	MHI	1981-3	1984-11	1985-6	72	72	DS
	JP -37	SENDAI-2	PWR	M (3-loop)	2660	890	846	KYUSHU	MHI	1981-10	1985-4	1985-11	73.2	73.2	-
	JP -45	GENKAI-3	PWR	M (4-loop)	3423	1180	1127	KYUSHU	MHI	1988-6	1993-6	1994-3	62.3	62.3	DS
	JP -46	GENKAI-4	PWR	M (4-loop)	3423	1180	1127	KYUSHU	MHI	1992-7	1996-11	1997-7	63.6	63.6	DS
	JP -47	IKATA-3	PWR	M (3-loop)	2660	890	846	SHIKOKU	MHI	1990-10	1994-3	1994-12	65.7	65.7	DS, DS
	JP -50	OHI-3	PWR	M (4-loop)	3423	1180	1127	KEPCO	MHI	1987-10	1991-6	1991-12	65.7	65.8	DS
	JP -51	OHI-4	PWR	M (4-loop)	3423	1180	1127	KEPCO	MHI	1988-6	1992-6	1993-2	69.8	69.8	DS
	JP -8	TAKAHAMA-1	PWR	M (3-loop)	2440	826	780	KEPCO	WH/MHI	1970-4	1974-3	1974-11	69.8	69.8	-
KOREA,REP.OF	KR -10	HANUL-2	PWR	France CPI	2775	1011	967	KHNP	FRAM	1983-7	1989-4	1989-9	86.2	86.5	-
	KR -11	HANBIT-3	PWR	OPR-1000	2825	1041	986	KHNP	DHICKAEC	1989-12	1994-10	1995-3	78.5	78.6	-
	KR -12	HANBIT-4	PWR	OPR-1000	2825	1041	970	KHNP	DHICKAEC	1990-5	1995-7	1996-1	71.4	71.5	-
	KR -13	HANUL-3	PWR	OPR-1000	2825	1051	997	KHNP	DHICKOPC	1993-7	1998-1	1998-8	85.2	85.4	-
	KR -14	HANUL-4	PWR	OPR-1000	2825	1052	999	KHNP	DHICKOPC	1993-11	1998-12	1999-12	80.7	80.8	-
	KR -15	WOLSONG-3	PHWR	CANDU 6	2061	624	601	KHNP	AECL/DHI	1994-3	1998-3	1998-7	85.4	86.7	-
	KR -16	WOLSONG-4	PHWR	CANDU 6	2061	589	567	KHNP	AECL/DHI	1994-7	1999-5	1999-10	90.6	91.4	-
	KR -17	HANBIT-5	PWR	OPR-1000	2825	1051	992	KHNP	DHICKOPC	1997-6	2001-12	2002-5	78.5	78.7	-
	KR -18	HANBIT-6	PWR	OPR-1000	2825	1053	993	KHNP	DHICKOPC	1997-11	2002-9	2002-12	84.8	85.1	-
	KR -19	HANUL-5	PWR	OPR-1000	2825	1049	998	KHNP	DHICKOPC	1999-10	2003-12	2004-7	88.2	88.4	-
	KR -2	KORI-2	PWR	WH F	1882	681	640	KHNP	WH	1977-12	1983-4	1983-7	82.5	82.8	-
	KR -20	HANUL-6	PWR	OPR-1000	2825	1049	997	KHNP	DHICKOPC	2000-9	2005-1	2005-4	88.5	88.6	-
	KR -21	SHIN-KORI-1	PWR	OPR-1000	2825	1048	996	KHNP	DHICKOPC	2006-6	2010-8	2011-2	77	78	-
	KR -22	SHIN-KORI-2	PWR	OPR-1000	2825	1047	996	KHNP	DHICKOPC	2007-6	2012-1	2012-7	83.9	84.9	-
	KR -23	SHIN-WOLSONG-1	PWR	OPR-1000	2825	1048	997	KHNP	DHICKOPC	2007-11	2012-1	2012-7	82.8	83.1	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
KOREA,REP.OF	KR -24	SHIN-WOLSONG-2	PWR	OPR-1000	2825	1048	993	KHNP	DHICKOPC	2008-9	2015-2	2015-7	85.3	85.5	-
	KR -25	SAEUL-1	PWR	APR-1400	3983	1488	1416	KHNP	DHICKOPC	2008-10	2016-1	2016-12	79.2	79.3	-
	KR -26	SAEUL-2	PWR	APR-1400	3983	1491	1418	KHNP	DHICKOPC	2009-8	2019-4	2019-8	84.1	84.3	-
	KR -27	SHIN-HANUL-1	PWR	APR-1400	3983	1455	1414	KHNP	DHICKOPC	2012-7	2022-6	2022-12	99.3	99.7	-
	KR -28	SHIN-HANUL-2	PWR	APR-1400	3983	1455	1340	KHNP	DHICKOPC	2013-6	2023-12	2024-4	0	0	-
	KR -4	WOLSONG-2	PHWR	CANDU 6	2061	599	576	KHNP	AECL/DHI	1992-9	1997-4	1997-7	87.8	88.9	-
	KR -5	KORI-3	PWR	WH F	2912	1046	1011	KHNP	WH	1979-10	1985-1	1985-9	82.2	82.5	-
	KR -6	KORI-4	PWR	WH F	2912	1046	1012	KHNP	WH	1980-4	1985-12	1986-4	83	83.4	-
	KR -7	HANBIT-1	PWR	WH F	2787	1025	995	KHNP	WH	1981-6	1986-3	1986-8	83.9	84.3	-
	KR -8	HANBIT-2	PWR	WH F	2787	1024	988	KHNP	WH	1981-12	1986-11	1987-6	82.3	82.5	-
	KR -9	HANUL-1	PWR	France CPI	2775	1014	966	KHNP	FRAM	1983-1	1988-4	1988-9	85.2	85.6	-
MEXICO	MX -1	LAGUNA VERDE-1	BWR	BWR-5	2317	805	777	CFE	GE	1976-9	1989-4	1990-7	80.4	81.8	-
	MX -2	LAGUNA VERDE-2	BWR	BWR-5	2317	803	775	CFE	GE	1977-6	1994-11	1995-4	83.1	84.1	-
NETHERLANDS	NL -2	BORSSELE	PWR	KWU 2LP	1366	515	482	EPZ	S/KWU	1969-7	1973-7	1973-10	85.1	85.6	-
PAKISTAN	PK -2	CHASNUPP-1	PWR	CNP-300	999	325	300	PAEC	CNNC	1993-8	2000-6	2000-9	79	79.6	-
	PK -3	CHASNUPP-2	PWR	CNP-300	999	325	300	PAEC	CNNC	2005-12	2011-3	2011-5	86.9	87.3	-
	PK -4	CHASNUPP-3	PWR	CNP-300	999	340	315	PAEC	CNNC	2011-5	2016-10	2016-12	88.2	89.7	-
	PK -5	CHASNUPP-4	PWR	CNP-300	999	340	313	PAEC	CNNC	2011-12	2017-6	2017-9	90.2	91.4	-
	PK -6	KANUPP-2	PWR	ACP-1000	3060	1100	1017	PAEC	CZEC	2015-8	2021-3	2021-5	77.2	79.2	-
	PK -7	KANUPP-3	PWR	ACP-1000	3060	1100	1017	PAEC	CZEC	2016-5	2022-3	2022-4	90.6	90.9	-
ROMANIA	RO -1	CERNAVODA-1	PHWR	CANDU 6	2180	706	650	SNN	AECL	1983-3	1996-7	1996-12	89.7	90.9	DH
	RO -2	CERNAVODA-2	PHWR	CANDU 6	2180	705	650	SNN	AECL	1983-7	2007-8	2007-11	93.5	94.3	DH
RUSSIA	RU -11	NOVOVORONEZH-4	PWR	VVER V-179	1375	417	385	REA	AEM	1967-7	1972-12	1973-3	78.2	79.5	DH, PH

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
RUSSIA	RU -116	BELOYARSK-4	FBR	BN-800	2100	885	820	REA	AEM	2006-7	2015-12	2016-10	67.1	68.4	-
	RU -12	KOLA-1	PWR	VVER V-230	1375	440	411	REA	AEM	1970-5	1973-6	1973-12	72.7	77.7	DH, PH
	RU -13	KOLA-2	PWR	VVER V-230	1375	440	411	REA	AEM	1970-5	1974-12	1975-2	73.5	77.8	DH, PH
	RU -142	BILIBINO-2	LWGR	EGP-6	62	12	11	REA	AEM	1970-1	1974-12	1975-2	73.5	81.8	DH
	RU -143	BILIBINO-3	LWGR	EGP-6	62	12	11	REA	AEM	1970-1	1975-12	1976-2	73.6	82	DH
	RU -144	BILIBINO-4	LWGR	EGP-6	62	12	11	REA	AEM	1970-1	1976-12	1977-1	72.3	80.3	DH
	RU -151	AKADEMIK LOMONOSOV-1	PWR	KLT-40S 'Float	150	35	32	REA	AEM	2007-4	2019-12	2020-5	61.7	61.7	-
	RU -152	AKADEMIK LOMONOSOV-2	PWR	KLT-40S 'Float	150	35	32	REA	AEM	2007-4	2019-12	2020-5	64.9	64.9	-
	RU -161	NOVOVORONEZH 2-1	PWR	VVER V-392M	3200	1180	1100	REA	AEM	2008-6	2016-8	2017-2	76.2	78.4	-
	RU -162	NOVOVORONEZH 2-2	PWR	VVER V-392M	3200	1181	1101	REA	AEM	2009-7	2019-5	2019-10	81.7	83.9	-
	RU -163	LENINGRAD 2-1	PWR	VVER V-491	3200	1188	1101	REA	AEM	2008-10	2018-3	2018-10	73.7	74.8	-
	RU -164	LENINGRAD 2-2	PWR	VVER V-491	3200	1188	1101	REA	AEM	2010-4	2020-10	2021-3	84.5	86.1	-
	RU -20	NOVOVORONEZH-5	PWR	VVER V-187	3000	1000	950	REA	AEM	1974-3	1980-5	1981-2	67.8	68.6	DH, PH
	RU -21	BELOYARSK-3	FBR	BN-600	1470	600	560	REA	AEM	1969-1	1980-4	1981-11	75.4	75.9	DH, PH
	RU -22	KURSK-2	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1973-1	1979-1	1979-8	64.8	66.7	DH, PH
	RU -23	SMOLENSK-1	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1975-10	1982-12	1983-9	74.1	75.8	DH, PH
	RU -24	SMOLENSK-2	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1976-6	1985-5	1985-7	76.3	78.1	DH, PH
	RU -30	KALININ-1	PWR	VVER V-338	3000	1000	950	REA	AEM	1977-2	1984-5	1985-6	75.4	76	DH, PH
	RU -31	KALININ-2	PWR	VVER V-338	3000	1000	950	REA	AEM	1982-2	1986-12	1987-3	78.2	80	DH, PH
	RU -32	KOLA-3	PWR	VVER V-213	1375	440	411	REA	AEM	1977-4	1981-3	1982-12	76.8	82.3	DH, PH
	RU -33	KOLA-4	PWR	VVER V-213	1375	440	411	REA	AEM	1976-8	1984-10	1984-12	76.9	82.3	DH, PH
	RU -34	LENINGRAD-3	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1973-12	1979-12	1980-6	73.8	74.6	DH, PH
	RU -35	LENINGRAD-4	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1975-2	1981-2	1981-8	75	75.9	DH, PH

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
RUSSIA	RU -36	KALININ-3	PWR	VVER V-320	3200	1000	950	REA	AEM	1985-10	2004-12	2005-11	84.8	84.9	DH, PH
	RU -37	KALININ-4	PWR	VVER V-320	3200	1000	950	REA	AEM	1986-8	2011-11	2012-12	89.1	89.1	DH, PH
	RU -38	KURSK-3	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1978-4	1983-10	1984-3	74	75.2	DH, PH
	RU -39	KURSK-4	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1981-5	1985-12	1986-2	77.3	78.3	DH, PH
	RU -59	ROSTOV-1	PWR	VVER V-320	3200	1041	989	REA	AEM	1981-9	2001-3	2001-12	88	88.4	-
	RU -62	ROSTOV-2	PWR	VVER V-320	3200	1000	950	REA	AEM	1983-5	2010-3	2010-12	89.9	90.2	-
	RU -63	ROSTOV-3	PWR	VVER V-320	3000	1000	950	REA	AEM	2009-9	2014-12	2015-9	86.2	87	-
	RU -64	ROSTOV-4	PWR	VVER V-320	3000	1030	979	REA	AEM	2010-6	2018-2	2018-9	91.4	93	-
	RU -67	SMOLENSK-3	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1984-5	1990-1	1990-10	79.3	80.8	DH, PH
	RU -96	BALAKOVO-1	PWR	VVER V-320	3000	1000	950	REA	AEM	1980-12	1985-12	1986-5	75.6	77.3	DH, PH
	RU -97	BALAKOVO-2	PWR	VVER V-320	3000	1000	950	REA	AEM	1981-8	1987-10	1988-1	75.1	77.3	DH, PH
	RU -98	BALAKOVO-3	PWR	VVER V-320	3000	1000	950	REA	AEM	1982-11	1988-12	1989-4	77.6	80.3	DH, PH
	RU -99	BALAKOVO-4	PWR	VVER V-320	3200	1000	950	REA	AEM	1984-4	1993-4	1993-12	81.6	84.5	DH, PH
SLOVAKIA	SK -10	MOCHOVCE-3	PWR	VVER V-213	1375	471	440	SE	ŠKODA	1987-1	2023-1		0	0	-
	SK -13	BOHUNICE-3	PWR	VVER V-213	1471	500	466	SE	ŠKODA	1976-12	1984-8	1985-2	82.1	85.4	DH, PH
	SK -14	BOHUNICE-4	PWR	VVER V-213	1471	500	466	SE	ŠKODA	1976-12	1985-8	1985-12	83.1	86.2	DH, PH
	SK -6	MOCHOVCE-1	PWR	VVER V-213	1471	500	467	SE	ŠKODA	1983-10	1998-7	1998-10	87.3	88.9	-
	SK -7	MOCHOVCE-2	PWR	VVER V-213	1471	500	469	SE	ŠKODA	1983-10	1999-12	2000-4	87.8	89.1	-
SLOVENIA	SI -1	KRSKO	PWR	WH 2LP	1994	727	688	NEK	WH	1975-3	1981-10	1983-1	86.5	87.5	-
SOUTH AFRICA	ZA -1	KOEBERG-1	PWR	CP1	2775	964	924	ESKOM	FRAM	1976-7	1984-4	1984-7	72.2	75.3	-
	ZA -2	KOEBERG-2	PWR	CP1	2775	970	930	ESKOM	FRAM	1976-7	1985-7	1985-11	73.6	79.2	-
SPAIN	ES -10	COFRENTES	BWR	BWR-6 (Mark 3)	3237	1102	1064	ID	GE	1975-9	1984-10	1985-3	87.4	88.4	-
	ES -11	TRILLO-1	PWR	PWR 3 loops	3010	1066	1003	CNAT	KWU	1979-8	1988-5	1988-8	87.3	87.9	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
SPAIN	ES -16	VANDELLOS-2	PWR	WH 3LP	2941	1087	1047	ANAV	WH	1980-12	1987-12	1988-3	82.9	83.9	-
	ES -6	ALMARAZ-1	PWR	WH 3LP	2947	1049	1011	CNAT	WH	1973-7	1981-5	1983-9	86.3	87.4	-
	ES -7	ALMARAZ-2	PWR	WH 3LP	2947	1044	1006	CNAT	WH	1973-7	1983-10	1984-7	87.9	89	-
	ES -8	ASCO-1	PWR	WH 3LP	2941	1033	995	ANAV	WH	1974-5	1983-8	1984-12	85.5	86.3	-
	ES -9	ASCO-2	PWR	WH 3LP	2941	1027	997	ANAV	WH	1975-3	1985-10	1986-3	87.5	88.5	-
SWEDEN	SE -10	RINGHALS-4	PWR	WH 3LP	3300	1178	1130	RAB	WH	1973-11	1982-6	1983-11	81.5	83.8	-
	SE -11	FORSMARK-2	BWR	AA-III, BWR-25	3253	1160	1121	FKA	ABB ATOM	1975-1	1981-1	1981-7	82.8	84.6	-
	SE -12	OSKARSHAMN-3	BWR	AA-IV, BWR-300	3900	1450	1400	OKG	ABB ATOM	1980-5	1985-3	1985-8	81	82.3	-
	SE -14	FORSMARK-3	BWR	AA-IV, BWR-300	3300	1208	1172	FKA	ABB ATOM	1979-1	1985-3	1985-8	85.7	87.8	-
	SE -7	RINGHALS-3	PWR	WH 3LP	3135	1128	1081	RAB	WH	1972-9	1980-9	1981-9	78.5	80.6	-
	SE -9	FORSMARK-1	BWR	AA-III, BWR-25	3075	1078	1040	FKA	ABB ATOM	1973-6	1980-6	1980-12	84.7	86.6	-
SWITZERLAND	CH -1	BEZNAU-1	PWR	WH 2LP	1130	380	365	Axpo AG	WH	1965-9	1969-7	1969-12	80.8	81.2	DH
	CH -3	BEZNAU-2	PWR	WH 2LP	1130	380	365	Axpo AG	WH	1968-1	1971-10	1972-3	87.6	87.8	DH
	CH -4	GOESGEN	PWR	PWR 3 Loop	3002	1060	1010	KKG	KWU	1973-12	1979-2	1979-11	89	89.9	PH
	CH -5	LEIBSTADT	BWR	BWR-6	3600	1275	1233	KKL	GETSCO	1974-1	1984-5	1984-12	82.4	84	-
UAE	AE -01	BARAKAH-1	PWR	APR-1400	3983	1417	1337	NAWAH	KEPCO	2012-7	2020-8	2021-4	81.1	81.7	-
	AE -02	BARAKAH-2	PWR	APR-1400	3983	1417	1337	NAWAH	KEPCO	2013-4	2021-9	2022-3	92	92.5	-
	AE -03	BARAKAH-3	PWR	APR-1400	3983	1417	1337	NAWAH	KEPCO	2014-9	2022-10	2023-2	96.8	97.4	-
UK	GB -19A	HARTLEPOOL A-1	GCR	AGR	1500	655	590	EDF UK	NPC	1968-10	1983-8	1989-4	70.2	70.3	-
	GB -19B	HARTLEPOOL A-2	GCR	AGR	1500	655	595	EDF UK	NPC	1968-10	1984-10	1989-4	71.1	71.3	-
	GB -20A	HEYSHAM A-1	GCR	AGR	1500	625	485	EDF UK	NPC	1970-12	1983-7	1989-4	68.3	68.6	-
	GB -20B	HEYSHAM A-2	GCR	AGR	1500	625	575	EDF UK	NPC	1970-12	1984-10	1989-4	66.9	67.4	-
	GB -22A	HEYSHAM B-1	GCR	AGR	1550	680	620	EDF UK	NPC	1980-8	1988-7	1989-4	78.6	79.2	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
UK	GB -22B	HEYSHAM B-2	GCR	AGR	1550	680	620	EDF UK	NPC	1980-8	1988-11	1989-4	77.5	78.3	-
	GB -23A	TORNESS-1	GCR	AGR	1623	682	595	EDF UK	NNC	1980-8	1988-5	1988-5	77.5	79	-
	GB -23B	TORNESS-2	GCR	AGR	1623	682	605	EDF UK	NNC	1980-8	1989-2	1989-2	76.5	77.5	-
	GB -24	SIZEWELL B	PWR	SNUPPS	3425	1250	1198	EDF UK	PPC	1988-7	1995-2	1995-9	83.8	84.6	-
UKRAINE	UA -126	ZAPOROZHYE-5	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1985-11	1989-8	1989-10	73.4	75.3	DH
	UA -127	ZAPOROZHYE-6	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1986-6	1995-10	1996-9	78.6	80.7	DH
	UA -27	RIVNE-1	PWR	VVER V-213	1375	420	381	NNEGC	PAIP	1973-8	1980-12	1981-9	79.2	80	DH
	UA -28	RIVNE-2	PWR	VVER V-213	1375	415	376	NNEGC	PAIP	1973-10	1981-12	1982-7	80.4	81.5	DH
	UA -29	RIVNE-3	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1980-2	1986-12	1987-5	69	71	DH
	UA -40	KHMELNITSKI-1	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1981-11	1987-12	1988-8	71.5	72.7	DH
	UA -41	KHMELNITSKI-2	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1985-2	2004-8	2005-12	78.3	79.8	DH
	UA -44	SOUTH UKRAINE-1	PWR	VVER V-302	3000	1000	950	NNEGC	PAA	1976-8	1982-12	1983-12	68	70.4	DH
	UA -45	SOUTH UKRAINE-2	PWR	VVER V-338	3000	1000	950	NNEGC	PAA	1981-7	1985-1	1985-4	65.2	67.6	DH
	UA -48	SOUTH UKRAINE-3	PWR	VVER V-320	3000	1000	950	NNEGC	PAA	1984-11	1989-9	1989-12	68.3	71.8	DH
	UA -54	ZAPOROZHYE-1	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1980-4	1984-12	1985-12	66.7	68.9	DH
	UA -56	ZAPOROZHYE-2	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1981-1	1985-7	1986-2	68.5	71	DH
	UA -69	RIVNE-4	PWR	VVER V-320	3000	1000	950	NNEGC	PAA	1986-8	2004-10	2006-4	76	78.1	DH
	UA -78	ZAPOROZHYE-3	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1982-4	1986-12	1987-3	71.4	74.1	DH
	UA -79	ZAPOROZHYE-4	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1983-4	1987-12	1988-4	73	75.2	DH
USA	US -220	NINE MILE POINT-1	BWR	BWR-2 (Mark 1)	1850	642	613	EXELON	GE	1965-4	1969-11	1969-12	79.8	79.8	-
	US -237	DRESDEN-2	BWR	BWR-3 (Mark 1)	2957	950	894	EXELON	GE	1966-1	1970-4	1970-6	83	83	-
	US -244	GINNA	PWR	WH 2LP (DRYAMB	1775	608	560	EXELON	WH	1966-4	1969-12	1970-7	87.8	87.8	-
	US -249	DRESDEN-3	BWR	BWR-3 (Mark 1)	2957	935	879	EXELON	GE	1966-10	1971-7	1971-11	80.6	80.6	-

Notes:

1. The column Non-Electric Applications (NEA) indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

2. The EAF and UCF calculated for Ukrainian reactor units are from 2012-2021 as operational data were not submitted for 2022 and 2023.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
USA	US -250	TURKEY POINT-3	PWR	WH 3LP (DRYAMB	2644	829	837	FPL	WH	1967-4	1972-11	1972-12	80.9	81	-
	US -251	TURKEY POINT-4	PWR	WH 3LP (DRYAMB	2644	829	821	FPL	WH	1967-4	1973-6	1973-9	81.2	81.3	-
	US -254	QUAD CITIES-1	BWR	BWR-3 (Mark 1)	2957	940	908	EXELON	GE	1967-2	1972-4	1973-2	83.2	83.2	-
	US -259	BROWNS FERRY-1	BWR	BWR-4 (Mark 1)	3458	1256	1200	TVA	GE	1967-5	1973-10	1974-12	79.4	79.7	-
	US -260	BROWNS FERRY-2	BWR	BWR-4 (Mark 1)	3458	1259	1200	TVA	GE	1967-5	1974-8	1975-3	83.8	84	-
	US -261	ROBINSON-2	PWR	WH 3LP (DRYAMB	2339	780	741	PROGRESS	WH	1967-4	1970-9	1971-3	81.7	81.8	-
	US -263	MONTICELLO	BWR	BWR-3 (Mark 1)	2004	691	628	NSP	GE	1967-6	1971-3	1971-6	86.4	86.4	-
	US -265	QUAD CITIES-2	BWR	BWR-3 (Mark 1)	2957	940	911	EXELON	GE	1967-2	1972-5	1973-3	82	82.5	-
	US -266	POINT BEACH-1	PWR	WH 2LP (DRYAMB	1800	640	591	NEXTERA	WH	1967-7	1970-11	1970-12	86.2	86.5	-
	US -269	OCONEE-1	PWR	B&W LLP (DRYAM	2568	891	847	DUKEENER	B&W	1967-11	1973-5	1973-7	83.5	83.7	-
	US -270	OCONEE-2	PWR	B&W LLP (DRYAM	2568	891	848	DUKEENER	B&W	1967-11	1973-12	1974-9	85.1	85.2	-
	US -272	SALEM-1	PWR	WH 4LP (DRYAMB	3459	1254	1169	PSEG	WH	1968-9	1976-12	1977-6	74.4	74.5	-
	US -275	DIABLO CANYON-1	PWR	WH 4LP (DRYAMB	3411	1197	1138	PG&E	WH	1968-4	1984-11	1985-5	88.4	88.5	-
	US -277	PEACH BOTTOM-2	BWR	BWR-4 (Mark 1)	3951	1412	1300	EXELON	GE	1968-1	1974-2	1974-7	81.1	81.2	-
	US -278	PEACH BOTTOM-3	BWR	BWR-4 (Mark 1)	3951	1412	1331	EXELON	GE	1968-1	1974-9	1974-12	81.4	81.5	-
	US -280	SURRY-1	PWR	WH 3LP (DRYSUB	2587	890	838	DOMINION	WH	1968-6	1972-7	1972-12	80.1	80.1	-
	US -281	SURRY-2	PWR	WH 3LP (DRYSUB	2587	890	838	DOMINION	WH	1968-6	1973-3	1973-5	80.5	80.5	-
	US -282	PRAIRIE ISLAND-1	PWR	WH 2LP (DRYAMB	1677	566	522	NSP	WH	1968-6	1973-12	1973-12	87.8	87.9	-
	US -287	OCONEE-3	PWR	B&W LLP (DRYAM	2568	900	859	DUKEENER	B&W	1967-11	1974-9	1974-12	84.4	84.6	-
	US -296	BROWNS FERRY-3	BWR	BWR-4 (Mark 1)	3458	1260	1210	TVA	GE	1968-7	1976-9	1977-3	85.8	86.1	-
	US -298	COOPER	BWR	BWR-4 (Mark 1)	2419	801	769	ENTERGY	GE	1968-6	1974-5	1974-7	80.6	80.7	-
	US -301	POINT BEACH-2	PWR	WH 2LP (DRYAMB	1800	640	591	NEXTERA	WH	1968-7	1972-8	1972-10	87.3	87.3	-
	US -306	PRAIRIE ISLAND-2	PWR	WH 2LP (DRYAMB	1677	560	519	NSP	WH	1969-6	1974-12	1974-12	88.3	88.3	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
USA	US -311	SALEM-2	PWR	WH 4LP (DRYAMB	3459	1200	1158	PSEG	WH	1968-9	1981-6	1981-10	77.3	77.3	-
	US -313	ANO-1	PWR	B&W LLP (DRYAM	2568	903	836	ENTERGY	B&W	1968-10	1974-8	1974-12	81.9	82.2	-
	US -315	COOK-1	PWR	WH 4LP (ICECDN	3304	1131	1030	AEP	WH	1969-3	1975-2	1975-8	74	74.1	-
	US -316	COOK-2	PWR	WH 4LP (ICECDN	3468	1231	1168	AEP	WH	1969-3	1978-3	1978-7	75.5	75.7	-
	US -317	CALVERT CLIFFS-1	PWR	CE 2LP (DRYAMB	2737	918	877	EXELON	CE	1968-6	1975-1	1975-5	82.9	83.1	-
	US -318	CALVERT CLIFFS-2	PWR	CE 2LP (DRYAMB	2737	911	855	EXELON	CE	1968-6	1976-12	1977-4	85.8	85.9	-
	US -321	HATCH-1	BWR	BWR-4 (Mark 1)	2804	911	876	SOUTHERN	GE	1968-9	1974-11	1975-12	84.5	84.5	-
	US -323	DIABLO CANYON-2	PWR	WH 4LP (DRYAMB	3411	1197	1118	PG&E	WH	1970-12	1985-10	1986-3	88.6	88.7	-
	US -324	BRUNSWICK-2	BWR	BWR-4 (Mark 1)	2923	960	932	PROGRESS	GE	1970-2	1975-4	1975-11	79.2	79.5	-
	US -325	BRUNSWICK-1	BWR	BWR-4 (Mark 1)	2923	990	938	PROGRESS	GE	1970-2	1976-12	1977-3	80.1	80.4	-
	US -327	SEQUOYAH-1	PWR	WH 4LP (ICECND	3455	1221	1152	TVA	WH	1970-5	1980-7	1981-7	78.2	78.3	-
	US -328	SEQUOYAH-2	PWR	WH 4LP (ICECND	3455	1200	1139	TVA	WH	1970-5	1981-12	1982-6	81.3	81.3	-
	US -333	FITZPATRICK	BWR	BWR-4 (Mark 1)	2536	849	813	EXELON	GE	1968-9	1975-2	1975-7	82.4	82.6	-
	US -334	BEAVER VALLEY-1	PWR	WH 3LP (DRYSUB	2900	959	908	FENOC	WH	1970-6	1976-6	1976-10	79.4	79.4	-
	US -335	ST. LUCIE-1	PWR	CE 2LP (DRYAMB	3020	1045	981	FPL	CE	1970-7	1976-5	1976-12	84.2	84.4	-
	US -336	MILLSTONE-2	PWR	CE 2LP (DRYAMB	2700	918	869	DOMINION	CE	1969-11	1975-11	1975-12	73.6	74.1	-
	US -338	NORTH ANNA-1	PWR	WH 3LP (DRYSUB	2940	990	948	DOMINION	WH	1971-2	1978-4	1978-6	85.1	85.6	-
	US -339	NORTH ANNA-2	PWR	WH 3LP (DRYSUB	2940	1011	944	DOMINION	WH	1971-2	1980-8	1980-12	87.1	87.7	-
	US -341	FERMI-2	BWR	BWR-4 (Mark 1)	3486	1198	1115	DTEDISON	GE	1972-9	1986-9	1988-1	80.8	80.8	-
	US -346	DAVIS BESSE-1	PWR	B&W RLP (DRYAM	2817	925	894	FENOC	B&W	1970-9	1977-8	1978-7	75.5	75.5	-
	US -348	FARLEY-1	PWR	WH 3LP (DRYAMB	2775	918	874	SOUTHERN	WH	1970-10	1977-8	1977-12	86	86.1	-
	US -352	LIMERICK-1	BWR	BWR-4 (Mark 2)	3515	1194	1134	EXELON	GE	1974-6	1985-4	1986-2	92.1	92.1	-
	US -353	LIMERICK-2	BWR	BWR-4 (Mark 2)	3515	1194	1134	EXELON	GE	1974-6	1989-9	1990-1	94.1	94.1	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
USA	US -354	HOPE CREEK-1	BWR	BWR-4 (Mark 1)	3840	1240	1172	PSEG	GE	1976-3	1986-8	1986-12	89	89	-
	US -364	FARLEY-2	PWR	WH 3LP (DRYAMB	2775	928	883	SOUTHERN	WH	1970-10	1981-5	1981-7	89.4	89.4	-
	US -366	HATCH-2	BWR	BWR-4 (Mark 1)	2804	921	883	SOUTHERN	GE	1972-2	1978-9	1979-9	86	86	-
	US -368	ANO-2	PWR	CE 2LP (DRYAMB	3026	1065	988	ENTERGY	CE	1968-12	1978-12	1980-3	84.6	84.7	-
	US -369	MCGUIRE-1	PWR	WH 4LP (ICECND	3411	1215	1158	DUKEENER	WH	1971-4	1981-9	1981-12	84.8	85	-
	US -370	MCGUIRE-2	PWR	WH 4LP (ICECND	3411	1215	1158	DUKEENER	WH	1971-4	1983-5	1984-3	87.4	87.4	-
	US -373	LASALLE-1	BWR	BWR-5 (Mark 2)	3546	1207	1137	EXELON	GE	1973-9	1982-9	1984-1	83.3	83.3	-
	US -374	LASALLE-2	BWR	BWR-5 (Mark 2)	3546	1207	1140	EXELON	GE	1973-9	1984-4	1984-10	82.5	82.5	-
	US -382	WATERFORD-3	PWR	CE 2LP (DRYAMB	3716	1250	1168	ENTERGY	CE	1974-11	1985-3	1985-9	87.3	87.6	-
	US -387	SUSQUEHANNA-1	BWR	BWR-4 (Mark 2)	3952	1330	1257	PPL_SUSQ	GE	1973-11	1982-11	1983-6	86.5	86.5	-
	US -388	SUSQUEHANNA-2	BWR	BWR-4 (Mark 2)	3952	1330	1257	PPL_SUSQ	GE	1973-11	1984-7	1985-2	89	89	-
	US -389	ST. LUCIE-2	PWR	CE 2LP (DRYAMB	3020	1050	987	FPL	CE	1977-6	1983-6	1983-8	87.1	87.5	-
	US -390	WATTS BAR-1	PWR	WH 4LP (ICECND	3459	1210	1157	TVA	WH	1973-7	1996-2	1996-5	90.5	90.5	-
	US -391	WATTS BAR-2	PWR	WH 4LP (ICECND	3411	1218	1164	TVA	WH	1973-9	2016-6	2016-10	84.3	84.3	-
	US -395	SUMMER-1	PWR	WH 3LP (DRYAMB	2900	1006	973	SCE&G	WH	1973-3	1982-11	1984-1	86.7	86.7	-
	US -397	COLUMBIA	BWR	BWR-5 (Mark 2)	3486	1190	1131	ENERGYNW	GE	1972-8	1984-5	1984-12	82.2	82.8	-
	US -400	HARRIS-1	PWR	WH 3LP (DRYAMB	2900	980	964	PROGRESS	WH	1978-1	1987-1	1987-5	89.9	90	-
	US -410	NINE MILE POINT-2	BWR	BWR-5 (Mark 2)	3988	1320	1277	EXELON	GE	1975-8	1987-8	1988-3	88.1	88.1	-
	US -412	BEAVER VALLEY-2	PWR	WH 3LP (DRYSUB	2900	958	905	FENOC	WH	1974-5	1987-8	1987-11	89.1	89.1	-
	US -413	CATAWBA-1	PWR	WH 4LP (ICECND	3411	1188	1160	DUKEENER	WH	1974-5	1985-1	1985-6	87.6	87.6	-
	US -414	CATAWBA-2	PWR	WH 4LP (ICECND	3411	1188	1150	DUKEENER	WH	1974-5	1986-5	1986-8	88.4	88.4	-
	US -416	GRAND GULF-1	BWR	BWR-6 (Mark 3)	4408	1500	1401	ENTERGY	GE	1974-5	1984-10	1985-7	84.8	85	-
	US -423	MILLSTONE-3	PWR	WH 4LP (DRYSUB	3650	1280	1210	DOMINION	WH	1974-8	1986-2	1986-4	81.9	81.9	-

Note: The column Non-Electrical Applications indicates the use of the facility to provide: DH district heating, DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Const.	Grid	Comm.	EAF % 2013 - 2023	UCF % 2013 - 2023	NEA
					Thermal	Gross	Net		Supplier	Start	Connection	Operation			
USA	US -424	VOGTLE-1	PWR	WH 4LP (DRYAMB	3626	1229	1150	SOUTHERN	WH	1976-8	1987-3	1987-6	91.7	91.8	-
	US -425	VOGTLE-2	PWR	WH 4LP (DRYAMB	3626	1229	1152	SOUTHERN	WH	1976-8	1989-4	1989-5	92.1	92.1	-
	US -440	PERRY-1	BWR	BWR-6 (Mark 3)	3758	1303	1240	FENOC	GE	1974-10	1986-12	1987-11	84.9	84.9	-
	US -443	SEABROOK-1	PWR	WH 4LP (DRYAMB	3648	1296	1246	NEXTERA	WH	1976-7	1990-5	1990-8	89.3	89.4	-
	US -445	COMANCHE PEAK-1	PWR	WH 4LP (DRYAMB	3612	1259	1205	LUMINANT	WH	1974-12	1990-4	1990-8	90.8	90.8	-
	US -446	COMANCHE PEAK-2	PWR	WH 4LP (DRYAMB	3612	1250	1195	LUMINANT	WH	1974-12	1993-4	1993-8	91.4	91.4	-
	US -454	BYRON-1	PWR	WH 4LP (DRYAMB	3645	1242	1164	EXELON	WH	1975-4	1985-3	1985-9	90.6	90.7	-
	US -455	BYRON-2	PWR	WH 4LP (DRYAMB	3645	1210	1136	EXELON	WH	1975-4	1987-2	1987-8	93.3	93.3	-
	US -456	BRAIDWOOD-1	PWR	WH 4LP (DRYAMB	3645	1270	1194	EXELON	WH	1975-8	1987-7	1988-7	91	91	-
	US -457	BRAIDWOOD-2	PWR	WH 4LP (DRYAMB	3645	1230	1160	EXELON	WH	1975-8	1988-5	1988-10	92.8	92.8	-
	US -458	RIVER BEND-1	BWR	BWR-6 (Mark 3)	3091	1016	967	ENTERGY	GE	1977-3	1985-12	1986-6	84.8	85	-
	US -461	CLINTON-1	BWR	BWR-6 (Mark 3)	3473	1098	1062	EXELON	GE	1975-10	1987-4	1987-11	83	83	-
	US -482	WOLF CREEK	PWR	WH 4LP (DRYAMB	3565	1285	1200	WCNOC	WH	1977-5	1985-6	1985-9	86.1	86.2	-
	US -483	CALLAWAY-1	PWR	WH 4LP (DRYAMB	3565	1275	1215	AmerenUE	WH	1975-9	1984-10	1984-12	86.9	86.9	-
	US -498	SOUTH TEXAS-1	PWR	WH 4LP (DRYAMB	3853	1354	1280	STP	WH	1975-12	1988-3	1988-8	85.2	85.2	-
	US -499	SOUTH TEXAS-2	PWR	WH 4LP (DRYAMB	3853	1354	1280	STP	WH	1975-12	1989-4	1989-6	85.1	85.1	-
	US -5025	VOGTLE-3	PWR	AP-1000	3400	1250	1117	SOUTHERN	WH	2013-3	2023-3	2023-7	100	100	-
	US -528	PALO VERDE-1	PWR	CE80 2LP (DRYA	3990	1414	1311	APS	CE	1976-5	1985-6	1986-1	83.1	83.2	-
	US -529	PALO VERDE-2	PWR	CE80 2LP (DRYA	3990	1414	1314	APS	CE	1976-6	1986-5	1986-9	85	85	-
	US -530	PALO VERDE-3	PWR	CE80 2LP (DRYA	3990	1414	1312	APS	CE	1976-6	1987-11	1988-1	86.8	87	-
Note: Status as of 31 December 2023, 413 reactors (371539 MW(e)) were connected to the grid, including 2 units (1874MW(e)) in Taiwan, China.															
TAIWAN,CHINA	TW -5	MAANSHAN-1	PWR	WH 3LP (WE 312	2822	951	936	TPC	WH	1978-8	1984-5	1984-7	87.2	88.1	-
	TW -6	MAANSHAN-2	PWR	WH 3LP (WE 312	2822	951	938	TPC	WH	1979-2	1985-2	1985-5	86.7	87.8	-

TABLE 15. REACTORS IN SUSPENDED OPERATION, 31 DEC. 2023

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Suspended
					Thermal	Gross	Net		Supplier	Start	Connection	Operation	Operation date
INDIA	IN -5	MADRAS-1	PHWR	Horizontal Pre	801	220	205	NPCIL	NPCIL	1971-1	1983-7	1984-1	2018-1
	IN -3	RAJASTHAN-1	PHWR	Horizontal Pre	346	100	134	NPCIL	AECL	1965-8	1972-11	1973-12	2004-10
	IN -1	TARAPUR-1	BWR	BWR-1 (Mark 2)	530	160	150	NPCIL	GE	1964-10	1969-4	1969-10	2020-1
	IN -2	TARAPUR-2	BWR	BWR-1 (Mark 2)	530	160	150	NPCIL	GE	1964-10	1969-5	1969-10	2020-7
JAPAN	JP -36	HAMAOKA-3	BWR	BWR-5	3293	1100	1056	CHUBU	TOSHIBA	1983-4	1987-1	1987-8	2010-11
	JP -49	HAMAOKA-4	BWR	BWR-5	3293	1137	1092	CHUBU	TOSHIBA	1989-10	1993-1	1993-9	2011-5
	JP -60	HAMAOKA-5	BWR	ABWR	3926	1380	1325	CHUBU	TOSHIBA	2000-7	2004-4	2005-1	2011-5
	JP -58	HIGASHI DORI-1 (TOHOKU)	BWR	BWR-5	3293	1100	1067	TOHOKU	TOSHIBA	2000-11	2005-3	2005-12	2011-3
	JP -33	KASHIWAZAKI KARIWA-1	BWR	BWR-5	3293	1100	1067	TEPCO	TOSHIBA	1980-6	1985-2	1985-9	2011-8
	JP -39	KASHIWAZAKI KARIWA-2	BWR	BWR-5	3293	1100	1067	TEPCO	TOSHIBA	1985-11	1990-2	1990-9	2007-7
	JP -52	KASHIWAZAKI KARIWA-3	BWR	BWR-5	3293	1100	1067	TEPCO	TOSHIBA	1989-3	1992-12	1993-8	2007-9
	JP -53	KASHIWAZAKI KARIWA-4	BWR	BWR-5	3293	1100	1067	TEPCO	HITACHI	1990-3	1993-12	1994-8	2008-2
	JP -40	KASHIWAZAKI KARIWA-5	BWR	BWR-5	3293	1100	1067	TEPCO	HITACHI	1985-6	1989-9	1990-4	2012-1
	JP -55	KASHIWAZAKI KARIWA-6	BWR	ABWR	3926	1356	1315	TEPCO	TOSHIBA	1992-11	1996-1	1996-11	2012-3
	JP -56	KASHIWAZAKI KARIWA-7	BWR	ABWR	3926	1356	1315	TEPCO	HITACHI	1993-7	1996-12	1997-7	2011-8
	JP -54	ONAGAWA-2	BWR	BWR-5	2436	825	796	TOHOKU	TOSHIBA	1991-4	1994-12	1995-7	2011-3
	JP -57	ONAGAWA-3	BWR	BWR-5	2436	825	796	TOHOKU	TOSHIBA	1998-1	2001-5	2002-1	2011-3
	JP -48	SHIKA-1	BWR	BWR-5	1593	540	505	HOKURIKU	HITACHI	1989-7	1993-1	1993-7	2011-3
	JP -59	SHIKA-2	BWR	ABWR	3926	1206	1108	HOKURIKU	HITACHI	2001-8	2005-7	2006-3	2011-3
	JP -41	SHIMANE-2	BWR	BWR-5	2436	820	789	CHUGOKU	HITACHI	1985-2	1988-7	1989-2	2012-1
	JP -21	TOKAI-2	BWR	BWR-5	3293	1100	1060	JAPCO	GE	1973-10	1978-3	1978-11	2011-3
	JP -43	TOMARI-1	PWR	M (2-loop)	1650	579	550	HEPCO	MHI	1985-4	1988-12	1989-6	2011-4

TABLE 15. REACTORS IN SUSPENDED OPERATION, 31 DEC. 2023 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Suspended
					Thermal	Gross	Net		Supplier	Start	Connection	Operation	Operation date
JAPAN	JP -44	TOMARI-2	PWR	M (2-loop)	1650	579	550	HEPCO	MHI	1985-6	1990-8	1991-4	2011-8
	JP -64	TOMARI-3	PWR	M (3-loop)	2660	912	866	HEPCO	MHI	2004-11	2009-3	2009-12	2012-5
	JP -34	TSURUGA-2	PWR	M (4-loop)	3411	1160	1108	JAPCO	MHI	1982-11	1986-6	1987-2	2011-5

Note: Status as of 31 December 2023, 25 reactors were in Suspended Operation.

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2023

Country	Reactor		Type	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Shutdown
	Code	Name		Thermal	Gross	Net		Supplier	Start	Connection	Operation	
ARMENIA	AM -18	ARMENIAN-1	PWR	1375	408	376	ANPPCJSC	FAEA	1969-7	1976-12	1977-10	1989-2
BELGIUM	BE -1	BR-3	PWR	41	12	10	CEN/SCK	WH	1957-11	1962-10	1962-10	1987-6
	BE -5	DOEL-3	PWR	3054	1056	1006	EBL+EDF	FRAMACEC	1975-1	1982-6	1982-10	2022-9
	BE -6	TIHANGE-2	PWR	3064	1055	1008	EBL	FRAMACEC	1976-4	1982-10	1983-6	2023-2
BULGARIA	BG -1	KOZLODUY-1	PWR	1375	440	408	KNPP	AEE	1970-4	1974-7	1974-10	2002-12
	BG -2	KOZLODUY-2	PWR	1375	440	408	KNPP	AEE	1970-4	1975-8	1975-11	2002-12
	BG -3	KOZLODUY-3	PWR	1375	440	408	KNPP	AEE	1973-10	1980-12	1981-1	2006-12
	BG -4	KOZLODUY-4	PWR	1375	440	408	KNPP	AEE	1973-10	1982-5	1982-6	2006-12
CANADA	CA -2	DOUGLAS POINT	PHWR	704	218	206	OH	AECL	1960-2	1967-1	1968-9	1984-5
	CA -3	GENTILLY-1	HWLWR	792	266	250	HQ	AECL	1966-9	1971-4	1972-5	1977-6
	CA -12	GENTILLY-2	PHWR	2156	675	635	HQ	AECL	1974-4	1982-12	1983-10	2012-12
	CA -5	PICKERING-2	PHWR	1744	542	515	OPG	OH/AECL	1966-9	1971-10	1971-12	2007-5
	CA -6	PICKERING-3	PHWR	1744	542	515	OPG	OH/AECL	1967-12	1972-5	1972-6	2008-10
	CA -1	ROLPHTON NPD	PHWR	92	25	22	OH	CGE	1958-1	1962-6	1962-10	1987-8
FRANCE	FR -9	BUGEY-1	GCR	1954	555	540	EDF	FRAM	1965-12	1972-4	1972-7	1994-5
	FR -2	CHINON A-1	GCR	300	80	70	EDF	LEVIVIER	1957-2	1963-6	1964-2	1973-4
	FR -3	CHINON A-2	GCR	800	230	180	EDF	LEVIVIER	1959-8	1965-2	1965-2	1985-6
	FR -4	CHINON A-3	GCR	1170	480	360	EDF	GTM	1961-3	1966-8	1966-8	1990-6
	FR -5	CHOOZ-A (ARDENNES)	PWR	1040	320	305	SENA	A/F/W	1962-1	1967-4	1967-4	1991-10
	FR -6	EL-4 (MONTS D'ARREE)	HWGCR	250	75	70	EDF	GAAA	1962-7	1967-7	1968-6	1985-7
	FR -11	FESSENHEIM-1	PWR	2785	920	880	EDF	FRAM	1971-9	1977-4	1978-1	2020-2
	FR -12	FESSENHEIM-2	PWR	2785	920	880	EDF	FRAM	1972-2	1977-10	1978-4	2020-6
	FR -1B	G-2 (MARCOULE)	GCR	260	43	39	COGEMA	SACM	1955-3	1959-4	1959-4	1980-2
	FR -1	G-3 (MARCOULE)	GCR	260	43	40	COGEMA	SACM	1956-3	1960-4	1960-4	1984-6
	FR -10	PHENIX	FBR	345	142	130	CEA/EDF	CNCLNEY	1968-11	1973-12	1974-7	2010-2
	FR -7	ST. LAURENT A-1	GCR	1650	500	390	EDF	FRAM	1963-10	1969-3	1969-6	1990-4
	FR -8	ST. LAURENT A-2	GCR	1475	530	465	EDF	FRAM	1966-1	1971-8	1971-11	1992-5

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2023 — continued

Country	Reactor		Type	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Shutdown
	Code	Name		Thermal	Gross	Net		Supplier	Start	Connection	Operation	
FRANCE	FR -24	SUPER-PHENIX	FBR	3000	1242	1200	EDF	ASPALDO	1976-12	1986-1	1986-12	1998-12
GERMANY	DE -4	AVR JUELICH	HTGR	46	15	13	AVR	BBK	1961-8	1967-12	1969-5	1988-12
	DE -12	BIBLIS-A	PWR	3517	1225	1167	RWE	KWU	1970-1	1974-8	1975-2	2011-8
	DE -18	BIBLIS-B	PWR	3733	1300	1240	RWE	KWU	1972-2	1976-4	1977-1	2011-8
	DE -32	BROKDORF	PWR	3900	1480	1410	PElektra	KWU	1976-1	1986-10	1986-12	2021-12
	DE -13	BRUNSBUETTEL	BWR	2292	806	771	KKB	KWU	1970-4	1976-7	1977-2	2011-8
	DE -33	EMSLAND	PWR	3850	1406	1335	KLE	KWU	1982-8	1988-4	1988-6	2023-4
	DE -23	GRAFENRHEINFELD	PWR	3765	1345	1275	E.ON	KWU	1975-1	1981-12	1982-6	2015-6
	DE -502	GREIFSWALD-1	PWR	1375	440	408	EWN	AEE	1970-3	1973-12	1974-7	1990-12
	DE -503	GREIFSWALD-2	PWR	1375	440	408	EWN	AEE	1970-3	1974-12	1975-4	1990-2
	DE -504	GREIFSWALD-3	PWR	1375	440	408	EWN	AEE	1972-4	1977-10	1978-5	1990-2
	DE -505	GREIFSWALD-4	PWR	1375	440	408	EWN	AEE	1972-4	1979-9	1979-11	1990-6
	DE -506	GREIFSWALD-5	PWR	1375	440	408	EWN	AEE	1976-12	1989-4	1989-11	1989-11
	DE -27	GROHNDE	PWR	3900	1430	1360	PElektra	KWU	1976-6	1984-9	1985-2	2021-12
	DE -3	GUNDREMMINGEN-A	BWR	801	250	237	KGB	AEG,GE	1962-12	1966-12	1967-4	1977-1
	DE -26	GUNDREMMINGEN-B	BWR	3840	1344	1284	KGG	KWU	1976-7	1984-3	1984-7	2017-12
	DE -28	GUNDREMMINGEN-C	BWR	3840	1344	1288	KGG	KWU	1976-7	1984-11	1985-1	2021-12
	DE -16	ISAR-1	BWR	2575	912	878	E.ON	KWU	1972-5	1977-12	1979-3	2011-8
	DE -31	ISAR-2	PWR	3950	1485	1410	PElektra	KWU	1982-9	1988-1	1988-4	2023-4
	DE -8	KNK II	FBR	58	21	17	KBG	IA	1974-9	1978-4	1979-3	1991-8
	DE -20	KRUEMMEL	BWR	3690	1402	1346	KKK	KWU	1974-4	1983-9	1984-3	2011-8
	DE -6	LINGEN	BWR	520	268	183	KWL	AEG	1964-10	1968-7	1968-10	1977-1
	DE -22	MUELHEIM-KAERLICH	PWR	3760	1302	1219	KGG	BBR	1975-1	1986-3	1987-8	1988-9
	DE -2	MZFR	PHWR	200	57	52	KBG	SIEMENS	1961-12	1966-3	1966-12	1984-5
	DE -15	NECKARWESTHEIM-1	PWR	2497	840	785	EnKK	KWU	1972-2	1976-6	1976-12	2011-8
	DE -44	NECKARWESTHEIM-2	PWR	3850	1400	1310	EnKK	KWU	1982-11	1989-1	1989-4	2023-4
	DE -5	OBRIGHEIM	PWR	1050	357	340	EnBW	SIEM,KWU	1965-3	1968-10	1969-3	2005-5

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2023 — continued

Country	Reactor		Type	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Shutdown
	Code	Name		Thermal	Gross	Net		Supplier	Start	Connection	Operation	
GERMANY	DE -14	PHILIPPSBURG-1	BWR	2575	926	890	EnKK	KWU	1970-10	1979-5	1980-3	2011-8
	DE -24	PHILIPPSBURG-2	PWR	3950	1468	1402	EnKK	KWU	1977-7	1984-12	1985-4	2019-12
	DE -501	RHEINSBERG	PWR	265	70	62	EWN	AEE	1960-1	1966-5	1966-10	1990-6
	DE -10	STADE	PWR	1900	672	640	E.ON	KWU	1967-12	1972-1	1972-5	2003-11
	DE -19	THTR-300	HTGR	760	308	296	HKG	HRB	1971-5	1985-11	1987-6	1988-9
	DE -17	UNTERWESER	PWR	3900	1410	1345	E.ON	KWU	1972-7	1978-9	1979-9	2011-8
	DE -9	WUERGASSEN	BWR	1912	670	640	PE	AEG,KWU	1968-1	1971-12	1975-11	1994-8
ITALY	IT -4	CAORSO	BWR	2651	882	860	SOGIN	AMN/GETS	1970-1	1978-5	1981-12	1990-7
	IT -3	ENRICO FERMI	PWR	870	270	260	SOGIN	EL/WEST	1961-7	1964-10	1965-1	1990-7
	IT -2	GARIGLIANO	BWR	506	160	150	SOGIN	GE	1959-11	1964-1	1964-6	1982-3
	IT -1	LATINA	GCR	660	160	153	SOGIN	TNPG	1958-11	1963-5	1964-1	1987-12
JAPAN	JP -20	FUGEN ATR	HWLWR	557	165	148	JAEA	HITACHI	1972-5	1978-7	1979-3	2003-3
	JP -5	FUKUSHIMA-DAIICHI-1	BWR	1380	460	439	TEPCO	GE/GETSC	1967-7	1970-11	1971-3	2011-5
	JP -9	FUKUSHIMA-DAIICHI-2	BWR	2381	784	760	TEPCO	GE/T	1969-6	1973-12	1974-7	2011-5
	JP -10	FUKUSHIMA-DAIICHI-3	BWR	2381	784	760	TEPCO	TOSHIBA	1970-12	1974-10	1976-3	2011-5
	JP -16	FUKUSHIMA-DAIICHI-4	BWR	2381	784	760	TEPCO	HITACHI	1973-2	1978-2	1978-10	2011-5
	JP -17	FUKUSHIMA-DAIICHI-5	BWR	2381	784	760	TEPCO	TOSHIBA	1972-5	1977-9	1978-4	2013-12
	JP -18	FUKUSHIMA-DAIICHI-6	BWR	3293	1100	1067	TEPCO	GE/T	1973-10	1979-5	1979-10	2013-12
	JP -25	FUKUSHIMA-DAINI-1	BWR	3293	1100	1067	TEPCO	TOSHIBA	1976-3	1981-7	1982-4	2019-9
	JP -26	FUKUSHIMA-DAINI-2	BWR	3293	1100	1067	TEPCO	HITACHI	1979-5	1983-6	1984-2	2019-9
	JP -35	FUKUSHIMA-DAINI-3	BWR	3293	1100	1067	TEPCO	TOSHIBA	1981-3	1984-12	1985-6	2019-9
	JP -38	FUKUSHIMA-DAINI-4	BWR	3293	1100	1067	TEPCO	HITACHI	1981-5	1986-12	1987-8	2019-9
	JP -12	GENKAI-1	PWR	1650	559	529	KYUSHU	MHI	1971-9	1975-2	1975-10	2015-4
	JP -27	GENKAI-2	PWR	1650	559	529	KYUSHU	MHI	1977-2	1980-6	1981-3	2019-4
	JP -11	HAMAOKA-1	BWR	1593	540	515	CHUBU	TOSHIBA	1971-6	1974-8	1976-3	2009-1
	JP -24	HAMAOKA-2	BWR	2436	840	806	CHUBU	TOSHIBA	1974-6	1978-5	1978-11	2009-1
	JP -23	IKATA-1	PWR	1650	566	538	SHIKOKU	MHI	1973-9	1977-2	1977-9	2016-5

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2023 — continued

Country	Reactor		Type	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Shutdown
	Code	Name		Thermal	Gross	Net		Supplier	Start	Connection	Operation	
JAPAN	JP -32	IKATA-2	PWR	1650	566	538	SHIKOKU	MHI	1978-8	1981-8	1982-3	2018-5
	JP -1	JPDR	BWR	90	13	12	JAEA	GE	1960-12	1963-10	1965-3	1976-3
	JP -4	MIHAMA-1	PWR	1031	340	320	KEPCO	WH	1967-2	1970-8	1970-11	2015-4
	JP -6	MIHAMA-2	PWR	1456	500	470	KEPCO	MHI	1968-5	1972-4	1972-7	2015-4
	JP -31	MONJU	FBR	714	280	246	JAEA	T/H/F/M	1986-5	1995-8		2017-12
	JP -15	OHI-1	PWR	3423	1175	1120	KEPCO	WH	1972-10	1977-12	1979-3	2018-3
	JP -19	OHI-2	PWR	3423	1175	1120	KEPCO	WH	1972-12	1978-10	1979-12	2018-3
	JP -22	ONAGAWA-1	BWR	1593	524	498	TOHOKU	TOSHIBA	1980-7	1983-11	1984-6	2018-12
	JP -7	SHIMANE-1	BWR	1380	460	439	CHUGOKU	HITACHI	1970-7	1973-12	1974-3	2015-4
	JP -2	TOKAI-1	GCR	587	166	137	JAPCO	GEC	1961-3	1965-11	1966-7	1998-3
	JP -3	TSURUGA-1	BWR	1070	357	340	JAPCO	GE	1966-11	1969-11	1970-3	2015-4
KAZAKHSTAN	KZ -10	AKTAU	FBR	1000	90	52	MAEC-KAZ	MAEC-KAZ	1964-10	1973-7	1973-7	1999-4
KOREA,REP.OF	KR -1	KORI-1	PWR	1729	607	576	KHNP	WH	1972-8	1977-6	1978-4	2017-6
	KR -3	WOLSONG-1	PHWR	2061	683	661	KHNP	AECL	1977-10	1982-12	1983-4	2019-12
LITHUANIA	LT -46	IGNALINA-1	LWGR	4800	1300	1185	INPP	MAEP	1977-5	1983-12	1985-5	2004-12
	LT -47	IGNALINA-2	LWGR	4800	1300	1185	INPP	MAEP	1978-1	1987-8	1987-12	2009-12
NETHERLANDS	NL -1	DODEWAARD	BWR	183	60	55	BV GKN	RDM	1965-5	1968-10	1969-3	1997-3
PAKISTAN	PK -1	KANUPP-1	PHWR	337	100	90	PAEC	CGE	1966-8	1971-10	1972-12	2021-8
RUSSIA	RU -1	APS-1 OBNINSK	LWGR	30	6	5	MSM	MSM	1951-1	1954-6	1954-12	2002-4
	RU -3	BELOYARSK-1	LWGR	286	108	102	REA	MSM	1958-6	1964-4	1964-4	1983-1
	RU -6	BELOYARSK-2	LWGR	530	160	146	REA	MSM	1962-1	1967-12	1969-12	1990-1
	RU -141	BILIBINO-1	LWGR	62	12	11	REA	AEM	1970-1	1974-1	1974-4	2019-1
	RU -17	KURSK-1	LWGR	3200	1000	925	REA	AEM	1972-6	1976-12	1977-10	2021-12
	RU -15	LENINGRAD-1	LWGR	3200	1000	925	REA	AEM	1970-3	1973-12	1974-11	2018-12
	RU -16	LENINGRAD-2	LWGR	3200	1000	925	REA	AEM	1970-6	1975-7	1976-2	2020-11
	RU -4	NOVOVORONEZH-1	PWR	760	210	197	REA	MSM	1957-7	1964-9	1964-12	1988-2
	RU -8	NOVOVORONEZH-2	PWR	1320	365	336	REA	MSM	1964-6	1969-12	1970-4	1990-8

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2023 — continued

Country	Reactor		Type	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Shutdown
	Code	Name		Thermal	Gross	Net		Supplier	Start	Connection	Operation	
RUSSIA	RU -9	NOVOVORONEZH-3	PWR	1375	417	385	REA	AEM	1967-7	1971-12	1972-6	2016-12
SLOVAKIA	SK -1	BOHUNICE A1	HWGCR	560	143	93	JAVYS	ŠKODA	1958-8	1972-12	1972-12	1977-2
	SK -2	BOHUNICE-1	PWR	1375	440	408	JAVYS	AEE	1972-4	1978-12	1980-4	2006-12
	SK -3	BOHUNICE-2	PWR	1375	440	408	JAVYS	AEE	1972-4	1980-3	1981-1	2008-12
SPAIN	ES -1	JOSE CABRERA-1	PWR	510	150	141	UFG	WH	1964-6	1968-7	1969-8	2006-4
	ES -2	SANTA MARIA DE GARONA	BWR	1381	466	446	NUCLENOR	GE	1966-9	1971-3	1971-5	2017-8
	ES -3	VANDELLOS-1	GCR	1670	500	480	HIFRENSA	CEA	1968-6	1972-5	1972-8	1990-7
SWEDEN	SE -1	AGESTA	PHWR	80	12	10	SVAFO	ABB ATOM	1957-12	1964-5	1964-5	1974-6
	SE -6	BARSEBACK-1	BWR	1800	615	600	BKAB	ASEASTAL	1971-2	1975-5	1975-7	1999-11
	SE -8	BARSEBACK-2	BWR	1800	615	600	BKAB	ABB ATOM	1973-1	1977-3	1977-7	2005-5
	SE -2	OSKARSHAMN-1	BWR	1375	492	473	OKG	ABB ATOM	1966-8	1971-8	1972-2	2017-6
	SE -3	OSKARSHAMN-2	BWR	1800	661	638	OKG	ABB ATOM	1969-9	1974-10	1975-1	2016-12
	SE -4	RINGHALS-1	BWR	2540	910	881	RAB	ABB ATOM	1969-2	1974-10	1976-1	2020-12
	SE -5	RINGHALS-2	PWR	2652	963	852	RAB	WH	1970-10	1974-8	1975-5	2019-12
SWITZERLAND	CH -8	LUCENS	HWGCR	28	7	6	EOS	NGA	1962-4	1968-1		1969-1
	CH -2	MUEHLEBERG	BWR	1097	390	373	BKW	GETSCO	1967-3	1971-7	1972-11	2019-12
UK	GB -3A	BERKELEY-1	GCR	620	166	138	ML	TNPG	1957-1	1962-6	1962-6	1989-3
	GB -3B	BERKELEY-2	GCR	620	166	138	ML	TNPG	1957-1	1962-6	1962-10	1988-10
	GB -4A	BRADWELL-1	GCR	481	146	123	ML	TNPG	1957-1	1962-7	1962-7	2002-3
	GB -4B	BRADWELL-2	GCR	481	146	123	ML	TNPG	1957-1	1962-7	1962-11	2002-3
	GB -1A	CALDER HALL-1	GCR	268	60	49	SL	UKAEA	1953-8	1956-8	1956-10	2003-3
	GB -1B	CALDER HALL-2	GCR	268	60	49	SL	UKAEA	1953-8	1957-2	1957-2	2003-3
	GB -1C	CALDER HALL-3	GCR	268	60	49	SL	UKAEA	1955-8	1958-3	1958-5	2003-3
	GB -1D	CALDER HALL-4	GCR	268	60	49	SL	UKAEA	1955-8	1959-4	1959-4	2003-3
	GB -2A	CHAPELCROSS-1	GCR	260	60	48	ML	UKAEA	1955-10	1959-2	1959-3	2004-6
	GB -2B	CHAPELCROSS-2	GCR	260	60	48	ML	UKAEA	1955-10	1959-7	1959-8	2004-6
	GB -2C	CHAPELCROSS-3	GCR	260	60	48	ML	UKAEA	1955-10	1959-11	1959-12	2004-6

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2023 — continued

Country	Reactor		Type	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Shutdown
	Code	Name		Thermal	Gross	Net		Supplier	Start	Connection	Operation	
UK	GB -2D	CHAPELCROSS-4	GCR	260	60	48	ML	UKAEA	1955-10	1960-1	1960-3	2004-6
	GB -14	DOUNREAY DFR	FBR	60	15	11	UKAEA	UKAEA	1955-3	1962-10	1962-10	1977-3
	GB -15	DOUNREAY PFR	FBR	600	250	234	UKAEA	TNPG	1966-1	1975-1	1976-7	1994-3
	GB -9A	DUNGENESS A-1	GCR	840	230	225	ML	TNPG	1960-7	1965-9	1965-10	2006-12
	GB -9B	DUNGENESS A-2	GCR	840	230	225	ML	TNPG	1960-7	1965-11	1965-12	2006-12
	GB -18A	DUNGENESS B-1	GCR	1500	615	545	EDF UK	APC	1965-10	1983-4	1985-4	2021-6
	GB -18B	DUNGENESS B-2	GCR	1500	615	545	EDF UK	APC	1965-10	1985-12	1989-4	2021-6
	GB -7A	HINKLEY POINT A-1	GCR	900	267	235	ML	EE/B&W/T	1957-11	1965-2	1965-3	2000-5
	GB -7B	HINKLEY POINT A-2	GCR	900	267	235	ML	EE/B&W/T	1957-11	1965-3	1965-5	2000-5
	GB -16A	HINKLEY POINT B-1	GCR	1494	655	485	EDF UK	TNPG	1967-9	1976-10	1978-10	2022-8
	GB -16B	HINKLEY POINT B-2	GCR	1494	655	480	EDF UK	TNPG	1967-9	1976-2	1976-9	2022-7
	GB -6A	HUNTERSTON A-1	GCR	595	173	150	ML	GEC	1957-10	1964-2	1964-2	1990-3
	GB -6B	HUNTERSTON A-2	GCR	595	173	150	ML	GEC	1957-10	1964-6	1964-7	1989-12
	GB -17A	HUNTERSTON B-1	GCR	1496	644	490	EDF UK	TNPG	1967-11	1976-2	1976-2	2021-11
	GB -17B	HUNTERSTON B-2	GCR	1496	644	495	EDF UK	TNPG	1967-11	1977-3	1977-4	2022-1
	GB -11A	OLDBURY A-1	GCR	730	230	217	ML	TNPG	1962-5	1967-11	1967-12	2012-2
	GB -11B	OLDBURY A-2	GCR	660	230	217	ML	TNPG	1962-5	1968-4	1968-9	2011-6
	GB -10A	SIZEWELL A-1	GCR	1010	245	210	ML	EE/B&W/T	1961-4	1966-1	1966-3	2006-12
	GB -10B	SIZEWELL A-2	GCR	1010	245	210	ML	EE/B&W/T	1961-4	1966-4	1966-9	2006-12
	GB -8A	TRAWSFYNYDD-1	GCR	850	235	195	ML	APC	1959-7	1965-1	1965-3	1991-2
	GB -8B	TRAWSFYNYDD-2	GCR	850	235	195	ML	APC	1959-7	1965-2	1965-3	1991-2
	GB -5	WINDSCALE AGR	GCR	120	36	24	UKAEA	UKAEA	1958-11	1963-2	1963-3	1981-4
	GB -12	WINFRITH SGHWR	SGHWR	318	100	92	UKAEA	ICL/FE	1963-5	1967-12	1968-1	1990-9
	GB -13A	WYLFA-1	GCR	1650	530	490	ML	EE/B&W/T	1963-9	1971-1	1971-11	2015-12
	GB -13B	WYLFA-2	GCR	1920	540	490	ML	EE/B&W/T	1963-9	1971-7	1972-1	2012-4
UKRAINE	UA -25	CHERNOBYL-1	LWGR	3200	800	740	MTE	FAEA	1970-3	1977-9	1978-5	1996-11
	UA -26	CHERNOBYL-2	LWGR	3200	1000	925	MTE	FAEA	1973-2	1978-12	1979-5	1991-10

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2023 — continued

Country	Reactor		Type	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Shutdown
	Code	Name		Thermal	Gross	Net		Supplier	Start	Connection	Operation	
UKRAINE	UA -42	CHERNOBYL-3	LWGR	3200	1000	925	MTE	FAEA	1976-3	1981-12	1982-6	2000-12
	UA -43	CHERNOBYL-4	LWGR	3200	1000	925	MTE	FAEA	1979-4	1983-12	1984-3	1986-4
USA	US -155	BIG ROCK POINT	BWR	240	71	67	CPC	GE	1960-5	1962-12	1963-3	1997-8
	US -014	BONUS	BWR	50	18	17	DOE/PRWR	GNEPRWRA	1960-1	1964-8	1965-9	1968-6
	US -302	CRYSTAL RIVER-3	PWR	2568	890	860	PROGRESS	B&W	1968-9	1977-1	1977-3	2013-2
	US -144	CVTR	PHWR	65	19	17	CVPA	WH	1960-1	1963-12	1963-12	1967-1
	US -10	DRESDEN-1	BWR	700	207	197	EXELON	GE	1956-5	1960-4	1960-7	1978-10
	US -331	DUANE ARNOLD-1	BWR	1912	624	601	NEXTERA	GE	1970-6	1974-5	1975-2	2020-10
	US -011	ELK RIVER	BWR	58	24	22	RCPA	AC	1959-1	1963-8	1964-7	1968-2
	US -16	FERMI-1	FBR	200	65	61	DTEDISON	UEC	1956-8	1966-8	1966-8	1972-11
	US -285	FORT CALHOUN-1	PWR	1500	512	482	EXELON	CE	1968-6	1973-8	1973-9	2016-10
	US -267	FORT ST. VRAIN	HTGR	842	342	330	PSCC	GA	1968-9	1976-12	1979-7	1989-8
	US -018	GE VALLECITOS	BWR	50	24	24	GE	GE	1956-1	1957-10	1957-10	1963-12
	US -213	HADDAM NECK	PWR	1825	603	560	CYAPC	WH	1964-5	1967-8	1968-1	1996-12
	US -077	HALLAM	X	256	84	75	AEC/NPPD	GE	1959-1	1963-9	1963-11	1964-9
	US -133	HUMBOLDT BAY	BWR	220	65	63	PG&E	GE	1960-11	1963-4	1963-8	1976-7
	US -013	INDIAN POINT-1	PWR	615	277	257	ENTERGY	B&W	1956-5	1962-9	1962-10	1974-10
	US -247	INDIAN POINT-2	PWR	3216	1067	998	ENTERGY	WH	1966-10	1973-6	1974-8	2020-4
	US -286	INDIAN POINT-3	PWR	3216	1085	1030	ENTERGY	WH	1968-10	1976-4	1976-8	2021-4
	US -305	KEWAUNEE	PWR	1772	595	566	DOMINION	WH	1968-8	1974-4	1974-6	2013-5
	US -409	LACROSSE	BWR	165	55	48	DPC	AC	1963-3	1968-4	1969-11	1987-4
	US -309	MAINE YANKEE	PWR	2630	900	860	MYAPC	CE	1968-10	1972-11	1972-12	1997-8
	US -245	MILLSTONE-1	BWR	2011	684	641	DOMINION	GE	1966-5	1970-11	1971-3	1998-7
	US -219	OYSTER CREEK	BWR	1930	652	619	EXELON	GE	1964-12	1969-9	1969-12	2018-9
	US -255	PALISADES	PWR	2565	850	805	ENTERGY	CE	1967-3	1971-12		2022-5
	US -130	PATHFINDER	BWR	220	63	59	NMC	AC	1959-1	1966-7	1966-8	1967-10
	US -171	PEACH BOTTOM-1	HTGR	115	42	40	EXELON	GA	1962-2	1967-1	1967-6	1974-11

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2023 — continued

Country	Reactor		Type	Capacity [MW]			Operator	NSSS	Construction	Grid	Commercial	Shutdown
	Code	Name		Thermal	Gross	Net		Supplier	Start	Connection	Operation	
USA	US -293	PILGRIM-1	BWR	2028	711	677	ENTERGY	GE	1968-8	1972-7	1972-12	2019-5
	US -012	PIQUA	X	46	12	12	CofPiqua	GE	1960-1	1963-7	1963-11	1966-1
	US -312	RANCHO SECO-1	PWR	2772	917	873	SMUD	B&W	1969-4	1974-10	1975-4	1989-6
	US -206	SAN ONOFRE-1	PWR	1347	456	436	SCE	WH	1964-5	1967-7	1968-1	1992-11
	US -361	SAN ONOFRE-2	PWR	3438	1127	1070	SCE	CE	1974-3	1982-9	1983-8	2013-6
	US -362	SAN ONOFRE-3	PWR	3438	1127	1080	SCE	CE	1974-3	1983-9	1984-4	2013-6
	US -146	SAXTON	PWR	24	3	3	SNEC	GE	1960-1	1967-3		1972-5
	US -001	SHIPPINGPORT	PWR	236	68	60	DOE DUQU	WH	1954-1	1957-12	1958-5	1982-10
	US -322	SHOREHAM	BWR	2436	849	820	LIPA	GE	1972-11	1986-8		1989-6
	US -289	THREE MILE ISLAND-1	PWR	2568	880	819	EXELON	B&W	1968-5	1974-6	1974-9	2019-9
	US -320	THREE MILE ISLAND-2	PWR	2772	959	880	GPU	B&W	1969-11	1978-4	1978-12	1979-3
	US -344	TROJAN	PWR	3411	1155	1095	PORTGE	WH	1970-2	1975-12	1976-5	1992-11
	US -271	VERMONT YANKEE	BWR	1912	635	605	ENTERGY	GE	1967-12	1972-9	1972-11	2014-12
	US -29	YANKEE NPS	PWR	600	180	167	YAEC	WH	1957-11	1960-11	1961-7	1991-10
	US -295	ZION-1	PWR	3250	1085	1040	EXELON	WH	1968-12	1973-6	1973-12	1998-2
	US -304	ZION-2	PWR	3250	1085	1040	EXELON	WH	1968-12	1973-12	1974-9	1998-2

Note: Status as of 31 December 2023, 209 reactors (105095 MW(e)) have been permanently shut down, including 4 units (3178MW(e)) in Taiwan, China.

TAIWAN,CHINA	TW -1	CHINSHAN-1	BWR	1840	636	604	TPC	GE	1972-6	1977-11	1978-12	2018-12
	TW -2	CHINSHAN-2	BWR	1840	636	604	TPC	GE	1973-12	1978-12	1979-7	2019-7
	TW -3	KUOSHENG-1	BWR	2894	985	985	TPC	GE	1975-11	1981-5	1981-12	2021-12
	TW -4	KUOSHENG-2	BWR	2894	985	985	TPC	GE	1976-3	1982-6	1983-3	2023-3

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2023

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel managemt phase	Decom. licensee	License Expiration
ARMENIA	AM -18	ARMENIAN-1	1989-2	None of the above	Other			ANPPCJSC	
BELGIUM	BE -1	BR-3	1987-6	3,7	ID		4	CEN/SCK	2020
BULGARIA	BG -1	KOZLODUY-1	2002-12	None of the above	Dd+PD+SE	10,11,12	3,4,10	E-03492	2031
	BG -2	KOZLODUY-2	2002-12	None of the above	Dd+PD+SE	10,11,12	4,10	E-03493	2031
	BG -3	KOZLODUY-3	2006-12	None of the above	Dd+PD+SE	10,11,12	4,10	E-00174	2031
	BG -4	KOZLODUY-4	2006-12	None of the above	Dd+PD+SE	10,11,12	4,10	E-0008	2031
CANADA	CA -1	ROLPHTON NPD	1987-8	3	Dd+PD+SE			AECL	
	CA -2	DOUGLAS POINT	1984-5	3	Dd+SE			AECL	
	CA -3	GENTILLY-1	1977-6	3	Dd+PD+SE	9		AECL/HQ	
	CA -5	PICKERING-2	2007-5	3	Dd+SE	7,9		OPG	2064
	CA -6	PICKERING-3	2008-10	3	Dd+SE	7		OPG	2064
FRANCE	FR -10	PHENIX	2010-2	None of the above	ID			-	
	FR -2	CHINON A-1	1973-4	1,3	ID	10		EDF	
	FR -24	SUPER-PHENIX	1998-12	None of the above	ID	10	3	NERSA	2026
	FR -3	CHINON A-2	1985-6	1,3	ID	10		EDF	
	FR -4	CHINON A-3	1990-6	1,3	ID	10		EDF	
	FR -5	CHOOZ-A (ARDENNES)	1991-10	None of the above	ID			SENA	
	FR -6	EL-4 (MONTS D'ARREE)	1985-7	1,3	ID			EDF	
	FR -7	ST. LAURENT A-1	1990-4	1,3	ID			EDF	
	FR -8	ST. LAURENT A-2	1992-5	1,3	ID			EDF	
	FR -9	BUGEY-1	1994-5	1,3	ID			EDF	
GERMANY	DE -1	VAK KAHL	1985-11	7	ID			VAK	2010
	DE -10	STADE	2003-11	3	ID	6,10,11,13,14,15		PElektra	2026
	DE -11	NIEDERAICHBACH	1974-7	7	Dd+SE			KIT	1995
	DE -12	BIBLIS-A	2011-8	2	ID	10	3	RWE	
	DE -13	BRUNSBUETTEL	2011-8	2	ID	10	3	KKB	
	DE -14	PHILIPPSBURG-1	2011-8	2	ID	10	3	EnKK	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2023 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel managemt phase	Decom. licensee	License Expiration
GERMANY	DE -15	NECKARWESTHEIM-1	2011-8	2	ID	10	3	EnKK	
	DE -16	ISAR-1	2011-8	2	ID	10		PElektra	2036
	DE -17	UNTERWESER	2011-8	2	ID	10		PElektra	2033
	DE -18	BIBLIS-B	2011-8	2	ID	10	3	RWE	
	DE -19	THTR-300	1988-9	3	Dd+SE	7	4	HKG	
	DE -2	MZFR	1984-5	7	ID	10		KTE	
	DE -20	KRUEMMEL	2011-8	2	ID	1,2	3	KKK	
	DE -22	MUELHEIM-KAERLICH	1988-9	2	ID	10		RWE	
	DE -23	GRAFENRHEINFELD	2015-6	2	ID	6,10		PElektra	2035
	DE -24	PHILIPPSBURG-2	2019-12	2	ID	2,3,5	3	EnKK	
	DE -26	GUNDREMMINGEN-B	2017-12	2	ID	2,3,6	3	RWE/E.ON	
	DE -27	GROHNDE	2021-12	2	ID	1,2,3,6,10	3	PElektra	2038
	DE -28	GUNDREMMINGEN-C	2021-12	2	ID	2,3,6	3	RWE/PEL	
	DE -3	GUNDREMMINGEN-A	1977-1	6,8	ID	10	3	RWE	
	DE -31	ISAR-2	2023-4	2	ID		3	PEL/SwM	
	DE -32	BROKDORF	2021-12	2	ID	1,2,3,6,10	3	PElektra	2039
	DE -33	EMSLAND	2023-4	2	ID			RWE/PEL	
	DE -4	AVR JUELICH	1988-12	3	ID	10		JEN	
	DE -44	NECKARWESTHEIM-2	2023-4	2	ID			EnKK	
	DE -5	OBRIGHEIM	2005-5	2	ID	10	3	EnKK	
	DE -501	RHEINSBERG	1990-6	2	ID	10	4	EWN	
	DE -502	GREIFSWALD-1	1990-12	3	ID	10	4	EWN	
	DE -503	GREIFSWALD-2	1990-2	3	ID	10	4	EWN	
	DE -504	GREIFSWALD-3	1990-2	3	ID	10	4	EWN	
	DE -505	GREIFSWALD-4	1990-6	3	ID	10	4	EWN	
	DE -506	GREIFSWALD-5	1989-11	3	ID	10	4	EWN	
	DE -6	LINGEN	1977-1	3,7	Dd+SE	1,10,14,15		RWE AG	2032

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2023 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel managemt phase	Decom. licensee	License Expiration
GERMANY	DE -7	HDR GROSSWELZHEIM	1971-7	1	ID			KIT	1998
	DE -8	KNK II	1991-8	7	ID	10	4	KTE	
	DE -9	WUERGASSEN	1994-8	3	ID	14		PElektra	2019
ITALY	IT -1	LATINA	1987-12	2,None of the above	Other	6,14		SOGIN	2044
	IT -2	GARIGLIANO	1982-3	None of the above	ID	6,10,14		SOGIN	2039
	IT -3	ENRICO FERMI	1990-7	2,None of the above	ID	10,11		SOGIN	2037
	IT -4	CAORSO	1990-7	2,None of the above	ID	10,14		SOGIN	2039
JAPAN	JP -1	JPDR	1976-3	None of the above	ID	14		JAERI	1996
	JP -10	FUKUSHIMA-DAIICHI-3	2011-5	5	Other			TEPCO DL	
	JP -11	HAMAOKA-1	2009-1	8	Dd+SE	6,7,8,10,14,15		CHUBU DL	2037
	JP -12	GENKAI-1	2015-4	4	Dd+PD+SE	10		KYUSHU	
	JP -15	OHI-1	2018-3	4	Dd+PD+SE	6,7,9,14	9	KEPCO	2049
	JP -16	FUKUSHIMA-DAIICHI-4	2011-5	5	Other			TEPCO DL	
	JP -17	FUKUSHIMA-DAIICHI-5	2013-12	5	Other			TEPCO DL	
	JP -18	FUKUSHIMA-DAIICHI-6	2013-12	5	Other			TEPCO DL	
	JP -19	OHI-2	2018-3	4	Dd+PD+SE	6,7,9,14	9	KEPCO	2049
	JP -2	TOKAI-1	1998-3	3	Dd+PD+SE	6,8,10,14,15		JAPCO	2030
	JP -20	FUGEN ATR	2003-3	3	ID	1,6	3,5	JAEA	2032
	JP -23	IKATA-1	2016-5	None of the above	Dd+SE			SHIKOKU	2056
	JP -24	HAMAOKA-2	2009-1	8	Dd+SE	6,7,8,10,14,15		CHUBU DL	2037
	JP -27	GENKAI-2	2019-4	4	Dd+PD+SE	10		KYUSHU	
	JP -3	TSURUGA-1	2015-4	4	Dd+PD+SE	3,4,6,7		JAPCO	2040
	JP -31	MONJU	2017-12	2	ID	1		...	2047
	JP -32	IKATA-2	2018-5	None of the above	Other			SHIKOKU	2059
	JP -4	MIHAMA-1	2015-4	4	Dd+PD+SE	3,6,8	9	KEPCO	2046
	JP -5	FUKUSHIMA-DAIICHI-1	2011-5	5	Other			TEPCO DL	
	JP -6	MIHAMA-2	2015-4	4	Dd+PD+SE	3,6,8	9	KEPCO	2046

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2023 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel managemt phase	Decom. licensee	License Expiration
JAPAN	JP -7	SHIMANE-1	2015-4	8	Other	2,5,6,7		CHUGOKU	2046
	JP -9	FUKUSHIMA-DAIICHI-2	2011-5	5	Other			TEPCO DL	
KAZAKHSTAN	KZ -10	AKTAU	1999-4	3,7	Dd+PD+SE	1,6	4	MAEC-KAZ	
KOREA,REP.OF	KR -1	KORI-1	2017-6	2,None of the above	ID			KHNP	
	KR -3	WOLSONG-1	2019-12	None of the above	ID	1,2	3	KHNP	2034
LITHUANIA	LT -46	IGNALINA-1	2004-12	2,None of the above	ID	10,11,12,13,14		INPP	2027
	LT -47	IGNALINA-2	2009-12	2,None of the above	ID	10,11,12,13,14		INPP	2027
NETHERLANDS	NL -1	DODEWAARD	1997-3	3,None of the above	Dd+SE	7,8		BV GKN	2055
PAKISTAN	PK -1	KANUPP-1	2021-8	None of the above	Dd+SE			PAEC	
RUSSIA	RU -3	BELOYARSK-1	1983-1	None of the above	Other			EA	
	RU -4	NOVOVORONEZH-1	1988-2	None of the above	Other			EA	
	RU -6	BELOYARSK-2	1990-1	None of the above	Other			EA	
	RU -8	NOVOVORONEZH-2	1990-8	None of the above	Other			EA	
SLOVAKIA	SK -1	BOHUNICE A1	1977-2	5	Dd+PD+SE	6,14		JAVYS	
	SK -2	BOHUNICE-1	2006-12	2	ID	10,11,13,14,15		JAVYS	2027
	SK -3	BOHUNICE-2	2008-12	2	ID	10,11,13,14,15		JAVYS	2027
SPAIN	ES -1	JOSE CABRERA-1	2006-4	4	ID	11,14,15		UFG	2024
	ES -2	SANTA MARIA DE GARONA	2017-8	4	ID	3,5,6,14,15	3	Enresa	2031
	ES -3	VANDELLOS-1	1990-7	5	Dd+SE	7,9		Enresa	2044
SWEDEN	SE -1	AGESTA	1974-6	3	Dd+SE	10,11,14,15		VAB	2024
	SE -2	OSKARSHAMN-1	2017-6	3	ID	2,10,12,14,15	4	OKG	2026
	SE -3	OSKARSHAMN-2	2016-12	3	ID	2,10,12,14,15	4	OKG	2026
	SE -4	RINGHALS-1	2020-12	8	ID			RAB	
	SE -6	BARSEBACK-1	1999-11	None of the above	Other	10,14,15	4	BKAB	2033
	SE -8	BARSEBACK-2	2005-5	None of the above	Other	10,14,15	4	BKAB	2033
SWITZERLAND	CH -2	MUEHLEBERG	2019-12	3	ID		4	BKW	2030
	CH -8	LUCENS	1969-1	5	Dd+SE	1		EOS	2003

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2023 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel managemt phase	Decom. licensee	License Expiration
UK	GB -10A	SIZEWELL A-1	2006-12	3,6	Dd+SE	9		Magnox S	
	GB -10B	SIZEWELL A-2	2006-12	3,6	Dd+SE	9		Magnox S	
	GB -12	WINFRITH SGHWR	1990-9	None of the above	ID			UKAEA	2019
	GB -14	DOUNREAY DFR	1977-3	None of the above	Dd+PD+SE	4		DSR	
	GB -15	DOUNREAY PFR	1994-3	None of the above	Dd+PD+SE	4		Magnox N	
	GB -1A	CALDER HALL-1	2003-3	3,6	Dd+PD+SE	9		SL	
	GB -1B	CALDER HALL-2	2003-3	3,6	Dd+PD+SE	9		SL	
	GB -1C	CALDER HALL-3	2003-3	3,6	Dd+PD+SE	9		SL	
	GB -1D	CALDER HALL-4	2003-3	3,6	Dd+PD+SE	9		SL	
	GB -2A	CHAPELCROSS-1	2004-6	3,6	Dd+PD+SE	9		Magnox N	
	GB -2B	CHAPELCROSS-2	2004-6	3,6	Dd+PD+SE	9		Magnox N	
	GB -2C	CHAPELCROSS-3	2004-6	3,6	Dd+PD+SE	9		Magnox N	
	GB -2D	CHAPELCROSS-4	2004-6	3,6	Dd+PD+SE	9		Magnox N	
	GB -3A	BERKELEY-1	1989-3	3,6	Dd+SE	9		Magnox S	
	GB -3B	BERKELEY-2	1988-10	3,6	Dd+SE	9		Magnox S	
	GB -4A	BRADWELL-1	2002-3	3,6	Dd+SE	9		Magnox S	
	GB -4B	BRADWELL-2	2002-3	3,6	Dd+SE	9		Magnox S	
	GB -5	WINDSCALE AGR	1981-4	None of the above	Dd+PD+SE	8		SL	
	GB -6A	HUNTERSTON A-1	1990-3	3,6	Dd+PD+SE	9		Magnox N	
	GB -6B	HUNTERSTON A-2	1989-12	3,6	Dd+PD+SE	9		Magnox N	
	GB -7A	HINKLEY POINT A-1	2000-5	3,6	Dd+PD+SE	9		Magnox S	
	GB -7B	HINKLEY POINT A-2	2000-5	3,6	Dd+PD+SE	9		Magnox S	
	GB -8A	TRAWSFYNYDD-1	1991-2	3,6	Dd+PD+SE	9		Magnox N	
	GB -8B	TRAWSFYNYDD-2	1991-2	3,6	Dd+PD+SE	9		Magnox N	
	GB -9A	DUNGENESS A-1	2006-12	3,6	Dd+PD+SE	9		Magnox S	
	GB -9B	DUNGENESS A-2	2006-12	3,6	Dd+PD+SE	9		Magnox S	
USA	US -001	SHIPPINGPORT	1982-10	1,10	ID			DOE DUQU	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2023 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel managemt phase	Decom. licensee	License Expiration
USA	US -011	ELK RIVER	1968-2	1,None of the above	ID			RCPA	1974
	US -012	PIQUA	1966-1	7,10	Other	12		CofPiqua	
	US -013	INDIAN POINT-1	1974-10	7	Dd+PD+SE			ENTERGY	
	US -014	BONUS	1968-6	7,8	ISD			DOE/PRWR	
	US -018	GE VALLECITOS	1963-12	1	Dd+SE			GE&PGEC	1965
	US -077	HALLAM	1964-9	7	Dd+SE			AEC&NPPD	
	US -10	DRESDEN-1	1978-10	8	Dd+SE	10,12		EXELON	
	US -130	PATHFINDER	1967-10	7,10	Other	12		NMC	
	US -133	HUMBOLDT BAY	1976-7	7	Dd+PD+SE	6,14,15		PG&E	
	US -144	CVTR	1967-1	2,None of the above	Dd+SE			CVPA	1986
	US -146	SAXTON	1972-5	None of the above,10	Other			GPUNC	
	US -155	BIG ROCK POINT	1997-8	3,None of the above	ID			CPC	
	US -16	FERMI-1	1972-11	5,7	Dd+SE	10,12		DTEDISON	
	US -171	PEACH BOTTOM-1	1974-11	1	Dd+SE	1,10		EXELON	
	US -206	SAN ONOFRE-1	1992-11	None of the above,10	Other	15		SCE	
	US -213	HADDAM NECK	1996-12	8	ID	6,15		CYAPC	
	US -219	OYSTER CREEK	2018-9	2,3	Dd+PD+SE			EXELCORP	
	US -245	MILLSTONE-1	1998-7	8	Dd+PD+SE			DOMINRES	
	US -247	INDIAN POINT-2	2020-4	None of the above	ISD			ENTERGY	
	US -255	PALISADES	2022-5	3	Dd+PD+SE			ENTERGY	
	US -267	FORT ST. VRAIN	1989-8	1,None of the above	ID			PSCC	
	US -271	VERMONT YANKEE	2014-12	2	Dd+PD+SE			ENTERGY	
	US -285	FORT CALHOUN-1	2016-10	3	Dd+SE			OPPD	
	US -286	INDIAN POINT-3	2021-4	2,3	Dd+SE			ENTERGY	
	US -289	THREE MILE ISLAND-1	2019-9	3	Dd+PD+SE			EXELCORP	
	US -29	YANKEE NPS	1991-10	1,2	Other	6,15		YAEC	
	US -293	PILGRIM-1	2019-5	3	Dd+PD+SE			ENTERGY	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2023 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel managemt phase	Decom. licensee	License Expiration
USA	US -295	ZION-1	1998-2	8,10	Dd+PD+SE	1,10		CommonEd	
	US -302	CRYSTAL RIVER-3	2013-2	7	Dd+PD+SE			DUKEENER	
	US -304	ZION-2	1998-2	8,10	Other	1,10		COMMED	
	US -305	KEWAUNEE	2013-5	3,8	Dd+SE			Entergy Nuclear	
	US -309	MAINE YANKEE	1997-8	8,10	Other	15		MYAPC	
	US -312	RANCHO SECO-1	1989-6	8,10	Other			SMUD	
	US -320	THREE MILE ISLAND-2	1979-3	5,10	Other	10,12	4	GPU	
	US -322	SHOREHAM	1989-6	2,10	ID			LIPA	1995
	US -331	DUANE ARNOLD-1	2020-10	3,7	Dd+SE			NEXTERA	
	US -344	TROJAN	1992-11	8,10	Other	10		PORTGE	
	US -361	SAN ONOFRE-2	2013-6	2	Dd+PD+SE			SCE	
	US -362	SAN ONOFRE-3	2013-6	2	Dd+PD+SE			SCE	
	US -409	LACROSSE	1987-4	3	Dd+PD+SE	10		DPC	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2023 — continued

Table 17: Definitions for reactors in decommissioning process or decommissioned

Shutdown reason	Description
1	Obsolescent technology or major technology failure or deterioration
2	Political decision
3	Economic case no longer viable
4	Licence not granted for continued operation
5	Accident
6	After major component failure
7	Other technological reasons
8	Other economical reasons
10	Licence terminated - legal act at the end of the decommissioning process (and site released for restricted/unrestricted use)
Other	None of the above

Decom. strategy	Description
ID	Immediate dismantling and removal of all radioactive material
Dd+SE	Deferred dismantling, placing all radiological areas into safe enclosure
Dd+PD+SE	A combination of immediate and deferred dismantling
ISD	In situ disposal, involving encapsulation of radioactive materials and subsequent restriction of access
Other	None of the above

Fuel Management	Description
1	Transfer for Storage at reactor facility (AR Pool)
3	Transfer for storage in away from reactor facility (AFR-RS) on reactor site - Dry Storage Technology
4	Transfer for storage in away from reactor facility (AFR-OS) off reactor site - Dry Storage Technology
5	Shipment to a reprocessing plant
8	Pre-disposal activities (Encapsulation)
9	Transfer for storage in away from reactor facility (AFR-RS) on reactor site - Wet Storage Technology
10	Transfer for storage in away from reactor facility (AFR-OS) off reactor site - Wet Storage Technology

Current decom. phase	Description
1	1. Drawing up the Final Decommissioning Plan
2	2. Transition phase following permanent shutdown, including reactor core defuelling (See also Fuel Management) and strategy preparation
3	2.1. Core defueling
4	2.2. Preparation for Safe Enclosure
5	2.3. Preparation for dismantling of major equipment and buildings
6	2.4. Partial dismantling of peripheral structures or buildings in advance of the main plant deferred dismantling
7	3. Safe enclosure period
8	3.1. Active safe enclosure period
9	3.2. Passive safe enclosure period
10	4. Dismantling of major plant and buildings
11	5. Preparation for site release, including final survey
12	6. Licence terminated - legal act at the end of the decommissioning process (and site released for restricted/unrestricted use)
13	7. Demolition (if disconnected from nuclear dismantling / conventional demolition)
14	8. Waste conditioning on-site - only for decommissioning waste
15	9. Waste shipment off-site - only for decommissioning waste

TABLE 18. PERFORMANCE FACTORS BY REACTOR CATEGORY (2021-2023)

Reactor Category	Reactors reporting to IAEA PRIS (see note)						
	Number of Units	Availability Factor (EAF) %	Planned Cap.Loss Factor (PCL) %	Capacity Factor (UCF) %	Forced Loss Rate (FLR) %	Operating Factor (OF) %	Load Factor (LF) %
PWR	310	81.2	12.5	82.7	3.4	83.1	80.6
PWR < 600 MWe	39	88.3	9.4	89.4	0.9	88.1	86.5
PWR >= 600 MWe	271	80.8	12.7	82.3	3.6	82.3	80.2
BWR	44	92.2	6.1	92.6	1.3	92.6	91.3
BWR < 600 MWe	0						
BWR >= 600 MWe	44	92.2	6.1	92.6	1.3	92.6	91.3
PHWR	47	75.1	20.5	75.9	3.5	79.9	75.4
PHWR < 600 MWe	26	81.3	13.1	82.6	3.1	83.9	81.6
PHWR >= 600 MWe	21	71.6	24.6	72.1	3.7	74.9	72
LWGR	12	77.9	19.3	78.7	2	80.9	78.8
LWGR < 600 MWe	3	83.3	16.7	83.3	0	82	30.5
LWGR >= 600 MWe	9	77.9	19.3	78.7	2.1	80.4	79
GCR	14	66.2	16.8	67	8.7	71.4	66
FBR	2	65.4	27.7	66.4	8.1	70.2	66.1
TOTAL	**429**	**81.8**	**12.5**	**83.1**	**3.2**	**83.3**	**81.2**

Notes:

1. Reactors shut down during 2021 to 2023 (19 units) are considered.

2. Nuclear power operating statistics do not include 2022 and 2023 outage data from Ukrainian reactor units as information for these units was not reported by the time of publication.

TABLE 19. FULL OUTAGE STATISTICS DURING 2023

Reactor Type	Number of Units	Full Outage Hours per Operating Experience Year	% Planned Outages	% Unplanned Outages	% External Outages
PWR	306	1354	72.9	21.7	5.4
PWR < 600 MWe	39	957	87.4	8.3	4.3
PWR >= 600 MWe	267	1412	71.4	23.1	5.5
BWR	42	564	90.1	9.2	0.7
BWR < 600 MWe	0		0	0	0
BWR >= 600 MWe	42	564	90.1	9.2	0.7
PHWR	46	1835	90.8	8.7	0.5
PHWR < 600 MWe	25	1476	84.3	15	0.7
PHWR >= 600 MWe	21	2262	95.9	3.9	0.2
LWGR	11	1535	97.3	2.7	0
LWGR < 600 MWe	3	1038	98.7	1.3	0
LWGR >= 600 MWe	8	1721	97	3	0
GCR	8	2300	67.5	31.2	1.3
FBR	2	2731	95.9	4.1	0
ALL REACTORS	**415**	**1357**	**77**	**18.8**	**4.2**

Notes:

1. Only reactors in commercial operation are considered.
2. Reactors shut down during 2023 (5 units) are considered.
3. Nuclear power operating statistics do not include outage data from Ukrainian reactor units as information for these units was not reported by the time of publication.

TABLE 20. DIRECT CAUSES OF FULL OUTAGES DURING 2023

Direct Outage Cause	Planned Full Outages				Unplanned Full Outages			
	Energy Lost		Time Lost		Energy Lost		Time Lost	
	GW.h	%	Hours	%	GW.h	%	Hours	%
Plant equipment problem/failure					94537	98.29	86550	97.76
Refuelling without maintenance	31668	8.17	33345	7.54				
Inspection, maintenance or repair combined with refuelling	296055	76.42	317596	71.84				
Inspection, maintenance or repair without refuelling	26234	6.77	44141	9.98				
Testing of plant systems or components	1184	0.31	947	0.21	240	0.25	800	0.9
Major backfitting, refurbishment or upgrading activities with refuelling	15615	4.03	17756	4.02				
Major backfitting, refurbishment or upgrading activities without refuelling	13547	3.5	23283	5.27				
Nuclear regulatory requirements	454	0.12	2230	0.5	1		2	
Human factor related					1286	1.34	1001	1.13
Fuel management limitation (including high flux tilt, stretch out or coast-down operation)					1		1	
Other	2663	0.69	2792	0.63	114	0.12	174	0.2
TOTAL	**387420**	**100**	**442090**	**100**	**96179**	**100**	**88528**	**100**

Notes:

1. Only reactors which have achieved full commercial operation in or before 2023 are counted.
2. Nuclear power operating statistics do not include outage data from Ukrainian reactor units as information for these units was not reported by the time of publication.

TABLE 21. DIRECT CAUSES OF FULL OUTAGES (2019-2023)

Direct Outage Cause	Planned Full Outages				Unplanned Full Outages			
	Energy Lost		Time Lost		Energy Lost		Time Lost	
	GW.h	%	Hours	%	GW.h	%	Hours	%
Plant equipment problem/failure					392901	89.61	391888	88.18
Refuelling without maintenance	287455	13.05	285945	11.54				
Inspection, maintenance or repair combined with refuelling	1558391	70.77	1674148	67.58				
Inspection, maintenance or repair without refuelling	181440	8.24	298698	12.06				
Testing of plant systems or components	9885	0.45	8290	0.33	893	0.20	2024	0.46
Major backfitting, refurbishment or upgrading activities with refuelling	74375	3.38	92219	3.72				
Major backfitting, refurbishment or upgrading activities without refuelling	80471	3.65	99064	4.00				
Nuclear regulatory requirements	4078	0.19	10549	0.43	3185	0.73	3182	0.72
Human factor related					5987	1.37	5947	1.34
Fire					1907	0.43	1524	0.34
Fuel management limitation (including high flux tilt, stretch out or coast-down operation)	207	0.01	404	0.02	2034	0.46	11581	2.61
Other	5594	0.25	8139	0.33	31549	7.20	28251	6.36
TOTALS	**2201896**	**100**	**2477456**	**100**	**438456**	**100**	**444397**	**100**

Notes:

1. Only reactors which have achieved full commercial operation in or before 2023 are counted.
2. Nuclear power operating statistics do not include 2022 and 2023 outage data from Ukrainian reactor units as information for these units was not reported by the time of publication.

TABLE 22. COUNTRIES: ABBREVIATIONS AND SUMMARY

Country Code	Full Name	Number of reactors, as of 31 Dec. 2023				
		Under construction	Operational	Suspended Operation	Shutdown	Planned
AR	ARGENTINA	1	3			
AM	ARMENIA		1		1	
BD	BANGLADESH	2				
BY	BELARUS		2			
BE	BELGIUM		5		3	
BR	BRAZIL	1	2			
BG	BULGARIA		2		4	
CA	CANADA		19		6	
CN	CHINA	24	55			10
CZ	CZECH REPUBLIC		6			
EG	EGYPT	3				1
FI	FINLAND		5			1
FR	FRANCE	1	56		14	
DE	GERMANY				33	
HU	HUNGARY		4			2
IN	INDIA	8	19	4		4
IR	IRAN, ISLAMIC REPUBLIC OF	1	1			2
IT	ITALY				4	
JP	JAPAN	2	12	21	27	9
KZ	KAZAKHSTAN				1	
KR	KOREA, REPUBLIC OF	2	26		2	
LT	LITHUANIA				2	
MX	MEXICO		2			
NL	NETHERLANDS, KINGDOM OF THE		1		1	
PK	PAKISTAN		6		1	
RO	ROMANIA		2			
RU	RUSSIA	3	37		10	18

TABLE 22. COUNTRIES: ABBREVIATIONS AND SUMMARY — continued

Country Code	Full Name	Number of reactors, as of 31 Dec. 2023				
		Under construction	Operational	Suspended Operation	Shutdown	Planned
SK	SLOVAKIA	1	5		3	
SI	SLOVENIA		1			
ZA	SOUTH AFRICA		2			
ES	SPAIN		7		3	
SE	SWEDEN		6		7	
CH	SWITZERLAND		4		2	
TR	TÜRKIYE	4				
UA	UKRAINE	2	15		4	
AE	UNITED ARAB EMIRATES	1	3			
GB	UNITED KINGDOM	2	9		36	
US	UNITED STATES OF AMERICA	1	93		41	
TOTAL		**59**	**413**	**25**	**209**	**47**

Note:
The total includes the following data from Taiwan, China:
— 2 units in operation; 4 units in shutdown.

TABLE 23. REACTOR TYPES: ABBREVIATIONS AND SUMMARY

Type Code	Type	Under construction	Operational	Suspended Operation	Shutdown
BWR	Boiling Light-Water Cooled and Moderated Reactor	2	41	19	53
FBR	Fast Breeder Reactor	4	2		8
GCR	Gas Cooled, Graphite Moderated Reactor		8		44
HTGR	High Temperature Gas Cooled Reactor		1		4
HWGCR	Heavy-Water Moderated, Gas Cooled Reactor				3
HWLWR	Heavy-Water Moderated, Boiling Light-Water Cooled Reactor				2
LWGR	Light-Water Cooled, Graphite Moderated Reactor		11		13
PHWR	Pressurized Heavy-Water Moderated and Cooled Reactor	3	46	2	10
PWR	Pressurized Light-Water Moderated and Cooled Reactor	50	304	4	69
SGHWR	Steam Generating Heavy-Water Reactor				1
X	Other				2
TOTAL		**59**	**413**	**25**	**209**

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY

Operator Code	Full Name	Under construction	Operational	Suspended Operation	Shutdown
AEC/NPPD	ATOMIC ENERGY COMMISSION AND NEBRASKA PUBLIC POWER DISTRICT				1
AEP	AMERICAN ELECTRIC POWER COMPANY, INC.		2		
AmerenUE	AMEREN UE, UNION ELECTRIC COMPANY		1		
ANAV	ASOCIACIÓN NUCLEAR ASCÓ-VANDELLÓS A.I.E. (ENDESA/ID)		3		
ANC	□	3			
ANJSC	AKKUYU NUCLEAR JOINT STOCK COMPANY (JSC)	1			
ANPPCJSC	CLOSED JOINT STOCK COMPANY ARMENIAN NPP		1		1
APS	ARIZONA PUBLIC SERVICE CO.		3		
AVR	ARBEITSGEMEINSCHAFT VERSUCHSREAKTOR GMBH				1
Axpo AG	KERNKRAFTWERK BEZNAU CH-5312 DÖTTINGEN		2		
BelNPP	REPUBLICAN UNITARY ENTERPRISE "BELARUSIAN NUCLEAR POWER PLANT"		2		
BHAVINI	BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED	1			
BKAB	BARSEBÄCK KRAFT AB				2
BKW	BKW ENERGIE AG				1
BRUCEPOW	BRUCE POWER		8		
BV GKN	BV GEMEENSCHAPPELIJKE KERNENERGIECENTRALE NEDERLAND (BV GKN)				1
CEA/EDF	COMMISSARIAT À L'ENERGIE ATOMIQUE (80%) ELECTRICITÉ DE FRANCE (20%)				1
CEN/SCK	CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE / STUDIECENTRUM VOOR KERNENERGIE				1
CEZ	CZECH POWER CO., CEZ A.S.		6		
CFE	COMISION FEDERAL DE ELECTRICIDAD		2		
CGCNP	CGN CANGNAN NUCLEAR CO.,LTD	2			
CHG	CHINA HUANENG GROUP	2			
CHUBU	CHUBU ELECTRIC POWER CO., INC.			3	2
CHUGOKU	THE CHUGOKU ELECTRIC POWER CO., INC.	1		1	1
CNAT	CENTRALES NUCLEARES ALMARAZ-TRILLO (ID/UFG/ENDESA/HC/NUCLENOR)		3		
CNEA	COMISION NACIONAL DE ENERGIA ATOMICA	1			

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Suspended Operation	Shutdown
CNNC	CHINA NATIONAL NUCLEAR CORPORATION	2			
CNNO	CNNC NUCLEAR OPERATION MANAGEMENT COMPANY LIMITED		9		
CofPiqua	CITY OF PIQUA GOVERNMENT				1
COGEMA	COMPAGNIE GENERALE DES MATIERES NUCLEAIRES				2
CPC	CONSUMERS POWER CO.				1
CVPA	CAROLINAS-VIRGINIA NUCLEAR POWER ASSOC.				1
CYAPC	CONNECTICUT YANKEE ATOMIC POWER CO.				1
DNMC	DAYA BAY NUCLEAR POWER OPERATIONS AND MANAGEMENT CO, LTD.		6		
DOE DUQU	DEPARTMENT OF ENERGY AND DUQUESNE LIGHT CO.				1
DOE/PRWR	DOE & PUERTO RICO WATER RESOURCES				1
DOMINION	DOMINION ENERGY		6		2
DPC	DAIRYLAND POWER COOPERATIVE				1
DTEDISON	DETROIT EDISON CO.		1		1
DUKEENER	DUKE ENERGY CORP.		7		
E.ON	E.ON KERNKRAFT GMBH				4
EBL	ENGIE ELECTRABEL		2		1
EBL+EDF	ENGIE ELECTRABEL + EDF BELGIUM + EDF LUMINUS		3		1
EDF	ÉLECTRICITÉ DE FRANCE	1	56		10
EDF UK	EDF ENERGY		9		6
EDF-CGN	EDF ENERGY - CHINA GENERAL NUCLEAR JOINT VENTURE	2			
ELETRONU	□	1	2		
EnBW	ENBW KRAFTWERKE AG				1
ENERGYNW	ENERGY NORTHWEST		1		
EnKK	ENBW KERNKRAFT GMBH				4
ENTERGY	ENTERGY NUCLEAR OPERATIONS, INC.		6		6
EOS	ENERGIE DE L'OUEST SUISSE				1
EPDC	ELECTRIC POWER DEVELOPMENT CO., LTD.	1			

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Suspended Operation	Shutdown
EPZ	N.V. ELEKTRICITEITS-PRODUKTIEMAATSCHAPPIJ ZUID-NEDERLAND		1		
ESKOM	ESKOM		2		
EWN	ENERGIEWERKE NORD GMBH				6
EXELON	EXELON GENERATION CO., LLC		21		7
FENOC	FIRST ENERGY NUCLEAR OPERATING CO.		4		
FKA	FORSMARK KRAFTGRUPP AB		3		
FORTUMPH	FORTUM POWER AND HEAT OY (FORMER IVO)		2		
FPL	FLORIDA POWER & LIGHT CO.		4		
FQNP	CNNC FUJIAN FUQING NUCLEAR POWER CO., LTD		6		
FV	FENNOVOIMA OY				
GE	GENERAL ELECTRIC				1
GFNPC	GUANGXI FANGCHENGGANG NUCLEAR POWER COMPANY, LTD.	1	3		
GPU	GENERAL PUBLIC UTILITIES (OWNED BY FIRSTENERGY CORP.)				1
HEPCO	HOKKAIDO ELECTRIC POWER CO., INC.			3	
HIFRENSA	HISPANO-FRANCESA DE ENERGIA NUCLEAR, S.A.				1
HKG	HOCHTEMPERATUR-KERNKRAFTWERK GMBH				1
HNPC	HAINAN NUCLEAR POWER COMPANY	1	2		
HOKURIKU	HOKURIKU ELECTRIC POWER CO.			2	
HQ	HYDRO QUEBEC				2
HSNPC	HUANENG SHANDONG SHIDAO BAY NUCLEAR POWER COMPANY, LTD.		1		
HZNP	CGN HUIZHOU NUCLEAR POWER CO.,LTD,	2			
ID	IBERDROLA, S.A.		1		
INPP	IGNALINA NUCLEAR POWER PLANT				2
JAEA	JAPAN ATOMIC ENERGY AGENCY				3
JAPCO	JAPAN ATOMIC POWER CO.			2	2
JAVYS	JADROVA A VYRADOVACIA SPOLOCNOST /NUCLEAR AND DECOMMISSIONING COMPANY, PLC./				3
JNPC	JIANGSU NUCLEAR POWER CORPORATION	2	6		

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Suspended Operation	Shutdown
KBG	KERNKRAFTWERK-BETRIEBSGESELLSCHAFT MBH				2
KEPCO	KANSAI ELECTRIC POWER CO.		7		4
KGB	KERNKRAFTWERKE GUNDREMMINGEN BETRIEBSGESELLSCHAFT MBH				1
KGG	KERNKRAFTWERK GUNDREMMINGEN GMBH				3
KHNP	KOREA HYDRO AND NUCLEAR POWER CO.	2	26		2
KKB	KERNKRAFTWERK BRUNSBÜTTEL GMBH & CO. OHG				1
KKG	KERNKRAFTWERK GÖSGEN-DÄNIKEN AG		1		
KKK	KERNKRAFTWERK KRÜMMEL GMBH & CO. OHG				1
KKL	KERNKRAFTWERK LEIBSTADT		1		
KLE	KERNKRAFTWERKE LIPPE-EMS GMBH				1
KNPP	KOZLODUY NPP ,LC		2		4
KWL	KERNKRAFTWERK LINGEN GMBH				1
KYUSHU	KYUSHU ELECTRIC POWER CO., INC.		4		2
LFNPC	CGN LUFENG NUCLEAR POWER CO., LTD	2			
LHNPC	LIAONING HONGYANHE NUCLEAR POWER CO. LTD. (LHNPC)		6		
LIPA	LONG ISLAND POWER AUTHORITY				1
LNPC	LIAONING NUCLEAR POWER COMPANY, LMT.	3			
LUMINANT	LUMINANT GENERATION COMPANY, LLC		2		
MAEC-KAZ	LIMITED LIABILITY PARTNERSHIP «MANGISTAU ATOMIC ENERGY COMPLEX-KAZATOMPROM»				1
ML	MAGNOX, LTD				22
MSM	MINISTRY OF MEDIUM MACHINE BUILDING OF THE USSR (MINSREDMASH)				1
MTE	MINTOPENERGO OF UKRAINE - MINISTRY OF FUEL AND ENERGY OF UKRAINE				4
MYAPC	MAINE YANKEE ATOMIC POWER CO.				1
NASA	NUCLEOELECTRICA ARGENTINA S.A.		3		
NAWAH	NAWAH ENERGY COMPANY	1	3		
NBEPC	NEW BRUNSWICK ELECTRIC POWER COMMISSION		1		
NDNP	FUJIAN NINGDE NUCLEAR POWER COMPANY, LTD.		4		
NEK	NUKLEARNA ELEKTRARNA KRŠKO		1		

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Suspended Operation	Shutdown
NEXTERA	NEXTERA ENERGY RESOURCES, LLC		3		1
NMC	NUCLEAR MANAGEMENT CO.				1
NNEGC	STATE ENTERPRISE “NATIONAL NUCLEAR ENERGY GENERATING COMPANY ‘ENERGOATOM”	2	15		
NPCBL	NUCLEAR POWER PLANT COMPANY BANGLADESH LIMITED	2			
NPCIL	NUCLEAR POWER CORPORATION OF INDIA, LTD.	7	19	4	
NPPA	NUCLEAR POWER PLANTS AUTHORITY	3			
NPPDCO	NUCLEAR POWER PRODUCTION AND DEVELOPMENT CO. OF IRAN	1	1		
NSP	NORTHERN STATES POWER CO. (SUBSIDIARY OF XCEL ENERGY)		3		
NUCLENOR	NUCLENOR, S.A.				1
OH	ONTARIO HYDRO				2
OKG	OKG AKTIEBOLAG		1		2
OPG	ONTARIO POWER GENERATION		10		2
PAEC	PAKISTAN ATOMIC ENERGY COMMISSION		6		1
PAKS II	MVM PAKS II, LTD.				
PAKS Zrt	PAKS NUCLEAR POWER PLANT, LTD.		4		
PE	PREUSSENELEKTRA KERNKRAFT GMBH&CO KG				1
PElektra	PREUSSENELEKTRA GMBH				3
PG&E	PACIFIC GAS AND ELECTRIC COMPANY		2		1
PORTGE	PORTLAND GENERAL ELECTRIC CO.				1
PPL_SUSQ	PPL SUSQUEHANNA, LLC		2		
PROGRESS	PROGRESS ENERGY		4		1
PSCC	PUBLIC SERVICE CO. OF COLORADO				1
PSEG	PSEG NUCLEAR, LLC		3		
RAB	RINGHALS AB		2		2
RCPA	RURAL COOPERATIVE POWER ASSOC.				1
REA	JOINT STOCK COMPANY 'CONCERN ROSENERGOATOM'	2	37		9
RWE	RWE POWER AG				2

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Suspended Operation	Shutdown
SCE	SOUTHERN CALIFORNIA EDISON CO.				3
SCE&G	SOUTH CAROLINA ELECTRIC & GAS CO.		1		
SDNPC	SHANDONG NUCLEAR POWER COMPANY, LTD.	2	2		
SE	SLOVENSKÉ ELEKTRÁRNE, A.S.	1	5		
SENA	SOCIETE D'ENERGIE NUCLEAIRE FRANCO-BELGE DES ARDENNES				1
SHIKOKU	SHIKOKU ELECTRIC POWER CO., INC		1		2
SKhK	□	1			
SL	SELLAFIELD LIMITED				4
SMNPC	SANMEN NUCLEAR POWER CO., LTD.	2	2		
SMUD	SACRAMENTO MUNICIPAL UTILITY DISTRICT				1
SNEC	SAXTON NUCLEAR EXPERIMENTAL REACTOR CORPORATION				1
SNN	SOCIETATEA NATIONALA NUCLEARELECTRICA, S.A.		2		
SNPDP	STATE NUCLEAR POWER DEMONSTRATION PLANT CO., LTD.				
SOGIN	SOCIETA GESTIONE IMPANTI NUCLEARI S.P.A.				4
SOUTHERN	SOUTHERN NUCLEAR OPERATING COMPANY, INC.	1	7		
STP	STP NUCLEAR OPERATING CO.		2		
SVAFO	AB SVAFO				1
TEPCO	TOKYO ELECTRIC POWER COMPANY HOLDINGS, INC.			7	10
TNPJVC	TAISHAN NUCLEAR POWER JOINT VENTURE COMPANY LIMITED		2		
TOHOKU	TOHOKU ELECTRIC POWER CO., INC			3	1
TPC	TAIWAN POWER CO.		2		4
TVA	TENNESSEE VALLEY AUTHORITY		7		
TVO	TEOLLISUUDEN VOIMA OYJ		3		
UFG	UNION FENOSA GENERATION, S.A.				1
UKAEA	UNITED KINGDOM ATOMIC ENERGY AUTHORITY				4
WCNOC	WOLF CREEK NUCLEAR OPERATING CORP.		1		
YAEC	YANKEE ATOMIC ELECTRIC CO.				1
YJNPC	YANGJIANG NUCLEAR POWER COMPANY		6		

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Suspended Operation	Shutdown
ZGZEC	CNNP GUODIAN ZHANGZHOU ENERGY CO.,LTD	2			
ZJNPC	ZHANJIANG NUCLEAR POWER COMPANY, LTD.	1			
Not specified	OTHERS				
TOTAL		**59**	**413**	**25**	**209**

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY

Supplier Code	Type	Under Construction	Operational	Suspended Operation	Shutdown
A/F/W	ASSOCIATION ACEC,FRAMATOME AND WESTINGHOUSE.				1
ABB ATOM	ABB ATOM (FORMERLY ASEA-ATOM)		4		5
AC	ALLIS CHALMERS				3
ACECOWEN	ACECOWEN (ACEC-COCKERILL-WESTINGHOUSE)		4		
ACLF	(ACECOWEN - CREUSOT LOIRE - FRAMATOME)		1		
AECL	ATOMIC ENERGY OF CANADA, LTD.		6	1	4
AECL/DAE	ATOMIC ENERGY OF CANADA LTDA AND DEPARTMENT OF ATOMIC ENERGY(INDIA)		1		
AECL/DHI	ATOMIC ENERGY OF CANADA LTD./DOOSAN HEAVY INDUSTRIES & CONSTRUCTION		3		
AEE	ATOMENERGOEXPORT		8		12
AEG	ALLGEMEINE ELEKTRICITAETS-GESELLSCHAFT				1
AEG,GE	ALLGEMEINE ELECTRICITAETS-GESELLSCHAFT, GENERAL ELECTRIC COMPANY (US)				1
AEG,KWU	ALLGEMEINE ELEKTRICITAETS GESELLSCHAFT, KRAFTWERK UNION AG				1
AEM	ATOMENERGOMASH	8	37		5
AMN/GETS	ANSALDO MECCANICO NUCLEARE SPA / GENERAL ELECTRIC TECHNICAL SERVICES CO.				1
APC	ATOMIC POWER CONSTRUCTION, LTD.				4
ASEASTAL	ASEA-ATOM / STAL-LAVAL		2		1
ASPALDO	ASPALDO				1
Atommash	ATOMMASH AEM-TECHNOLOGIES	3			
B&W	BABCOCK & WILCOX CO.		5		5
BBK	BROWN BOVERI-KRUPP REAKTORBAU GMBH				1
BBR	BROWN BOVERI REAKTOR GMBH				1
CE	COMBUSTION ENGINEERING CO.		10		5
CEA	COMMISSARIAT A L'ENERGIE ATOMIQUE				1
CFHI	CHINA FIRST HEAVY INDUSTRIES	10	10		
CGE	CANADIAN GENERAL ELECTRIC				2
CIAE(Chi	CHINA INSTITUTE OF ATOMIC ENERGY	2			
CNCLNEY	CNIM-CONSTRUCTIONS NAVALES ET INDUSTRIELLES DE MEDITERRANEE CL - CREUSOT LOIRE , NEY - NEYRPIC				1

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY — continued

Supplier Code	Type	Under Construction	Operational	Suspended Operation	Shutdown
CNEA	COMISIÓN NACIONAL DE ENERGÍA ATÓMICA	1			
CNNC	CHINA NATIONAL NUCLEAR CORPORATION		9		
CZEC	CHINA ZHONGYUAN ENGINEERING CORPORATION		2		
DEC	DONGFANG ELECTRIC CORPORATION	2	13		
DHICKAEC	DOOSAN HEAVY INDUSTRIES AND CONSTRUCTION CO. LTD./KOREA ATOMIC ENERGY RESEARCH INSTITUTE/COMBUSTION ENGINEERING		2		
DHICKOPC	DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO.LTD./KOREA POWER ENGINEERING COMPANY/COMBUSTIONENGINEERING	2	14		
EE/B&W/T	THE ENGLISH ELECTRIC CO., LTD / BABCOCK & WILCOX CO. / TAYLOR WOODROW CONSTRUCTION, LTD.				6
EL/WEST	ELETTRONUCLEARE ITALIANA / WESTINGHOUSE ELECTRIC CORP.				1
FAEA	FEDERAL ATOMIC ENERGY AGENCY		1		5
FRAM	FRAMATOME	1	65		5
FRAMACEC	FRAMACECO (FRAMATOME-ACEC-COCKERILL)				2
GA	GENERAL ATOMIC CORP.				2
GAAA	GROUPEMENT ATOMIQUE ALSACIENNE ATLANTIQUE				1
GE	GENERAL ELECTRIC CO.		34	3	21
GE/GETSC	GENERAL ELECTRIC CO. / GENERAL ELECTRIC TECHNICAL SERVICES CO.				1
GE/T	GENERAL ELECTRIC CO. / TOSHIBA CORPORATION				2
GEC	GENERAL ELECTRIC COMPANY (UK)				3
GETSCO	GENERAL ELECTRIC TECHNICAL SERVICES CO.		1		1
GNEPRWRA	GENERAL NUCLEAR ENGINEERING & PUERTO RICO WATER RESOURCES AUTHORITY (US)				1
GTM	GRANDS TRAVAUX DE MARSEILLE				1
H/G	HITACHI GE NUCLEAR ENERGY, LTD.	1			
HITACHI	HITACHI, LTD.	1		6	5
HRB	HOCHTEMPERATUR-REAKTORBAU GMBH				1
IA	INTERATOM INTERNATIONALE ATOMREAKTORBAU GMBH				1
ICL/FE	INTERNATIONAL COMBUSTION LTD. / FAIREY ENGINEERING LTD.				1
IZ	IZHORSKIYE ZAVODY		4		

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY — continued

Supplier Code	Type	Under Construction	Operational	Suspended Operation	Shutdown
JSC ASE	JSC "ATOMSTROYEXPORT"	10	3		
KEPCO	KOREA ELECTRIC POWER CORPORATION	1	3		
KWU	KRAFTWERK UNION, AG	1	3		18
LEVIVIER	LEVIVIER				2
MAEC-KAZ	MAEC-KAZATOMPROM LIMITED LIABILITY PARTNERSHIP «MANGISTAU ATOMIC ENERGY COMPLEX-KAZATOMPROM»				1
MAEP	MINATOMENERGOPROM, MINISTRY OF NUCLEAR POWER AND INDUSTRY		2		2
MHI	MITSUBISHI HEAVY INDUSTRIES, LTD.		11	4	5
MSM	MINISTRY OF MEDIUM MACHINE BUILDING OF THE USSR (MINSREDMASH)				5
NA	NA	1			
NGA	NATIONALE GESELLSCHAFT ZUR FÖRDERUNG DER INDUSTRIELLEN ATOMTECHNIK				1
NNC	NATIONAL NUCLEAR CORPORATION		2		
NPC	NUCLEAR POWER CO., LTD.		6		
NPCIL	NUCLEAR POWER CORPORATION OF INDIA, LTD. VIKRAM SARABHAI BHAVAN, ANUSHAKTI NAGAR, MUMBAI - 400 094.	3	16	1	
NPIC	NUCLEAR POWER INSTITUTE OF CHINA		8		
OH/AECL	ONTARIO HYDRO / ATOMIC ENERGY OF CANADA, LTD.		18		2
ORANO	ORANO	2	2		
PAA	PRODUCTION AMALGAMATION 'ATOMMASH', VOLGODONSK		4		
PAIP	PRODUCTION AMALGAMATION IZHORSKY PLANT ATOMMASH,VOLGODONSK,RUSSIA		11		
PPC	PWR POWER PROJECTS, LTD.		1		
RDM	ROTTERDAMSE DROOGDOK MAATSCHAPPIJ (RDM) IN ROTTERDAM (NL)				1
Russian	RUSSIAN HYDRAULIC PRESS DESIGN INSTITUTE (OKB)	1			
S/KWU	SIEMENS/KRAFTWERK UNION, AG.		1		
SACM	SOCIETE ALSACIENNE DE CONSTRUCTIONS MECANIQUES				2
SENPE	SHANGHAI ELECTRIC NUCLEAR POWER EQUIPMENT CO., LTD	1			
Shanghai	SHANGHAI NUCLEAR ENGINEERING RESEARCH & DESIGN INSTITUTE CO. , LTD.	2			
SHE	SHANGHAI ELECTRIC		2		

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY — continued

Supplier Code	Type	Under Construction	Operational	Suspended Operation	Shutdown
SIEM,KWU	SIEMENS AG, KRAFTWERK UNION AG				1
SIEMENS	SIEMENS AG, POWER GENERATION		2		1
ŠKODA	ŠKODA CONCERN NUCLEAR POWER PLANT WORKS	1	11		1
SNERDI	SHANGHAI NUCLEAR ENGINEERING RESEARCH AND DESIGN INSTITUTE CO. LTD	2			
SNPEMC	SHANGHAI NUCLEAR POWER EQUIPMENT MANUFACTURING CO. LTD	1			
T/H/F/M	TOSHIBA / HITACHI / FUJI ELECTRIC HOLDINGS / MITSUBISHI HEAVY INDUSTRIES				1
TNPG	THE NUCLEAR POWER GROUP, LTD.				14
TOSHIBA	TOSHIBA CORPORATION			10	7
TSINGHUA	TSINGHUA UNIVERSITY		1		
UEC	UNITED ENGINEERS AND CONTRACTORS				1
UKAEA	UNITED KINGDOM ATOMIC ENERGY AUTHORITY				10
WH	WESTINGHOUSE ELECTRIC CORPORATION	1	67		18
WH/MHI	WESTINGHOUSE ELECTRIC CORPORATION / MITSUBISHI HEAVY INDUSTRIES, LTD.		3		
Not specified	OTHERS	1			
TOTAL		**59**	**413**	**25**	**209**

Figure 1. Number of operational reactors by type and net electrical power (as of 31 Dec. 2023)

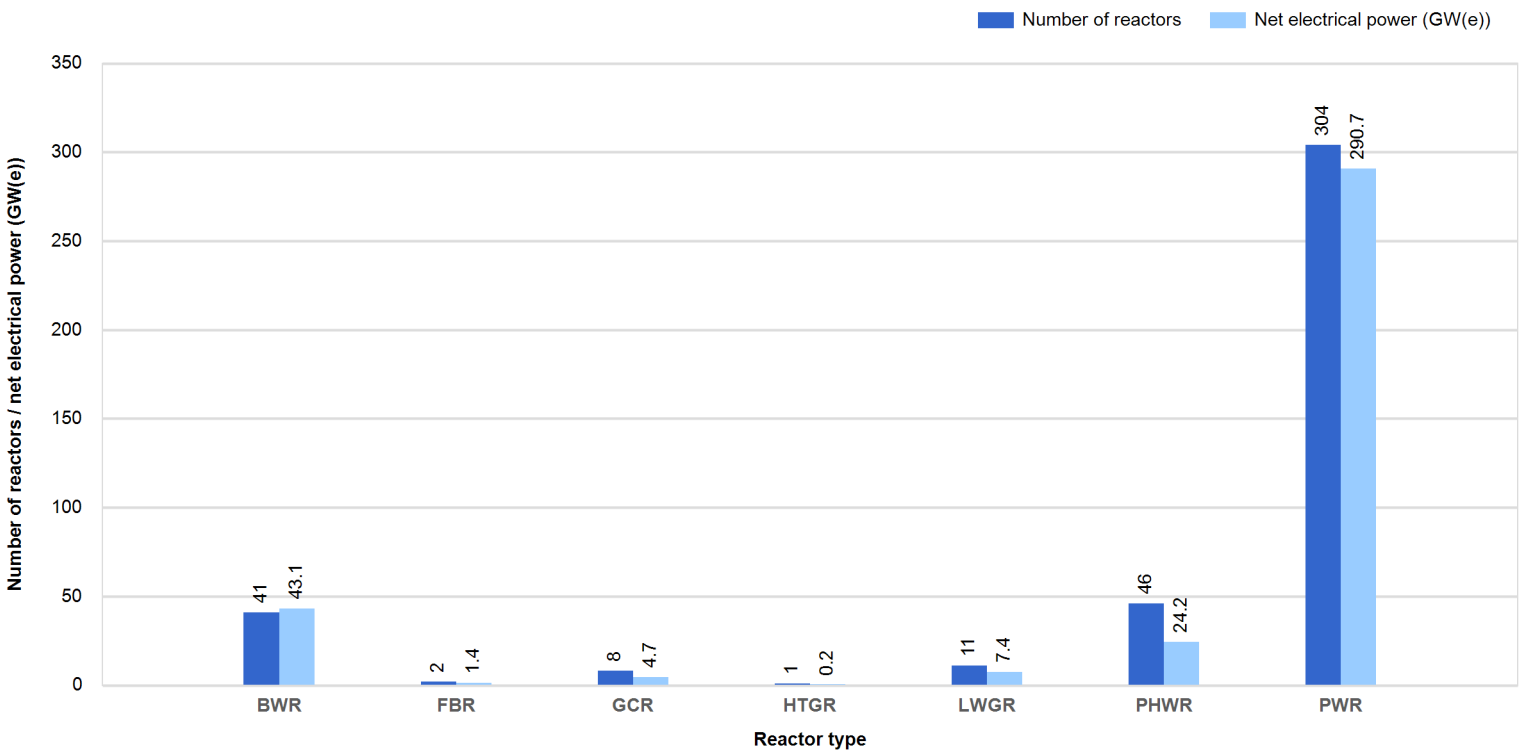


Figure 2. Reactors under construction by type and net electrical power (as of 31 Dec. 2023)

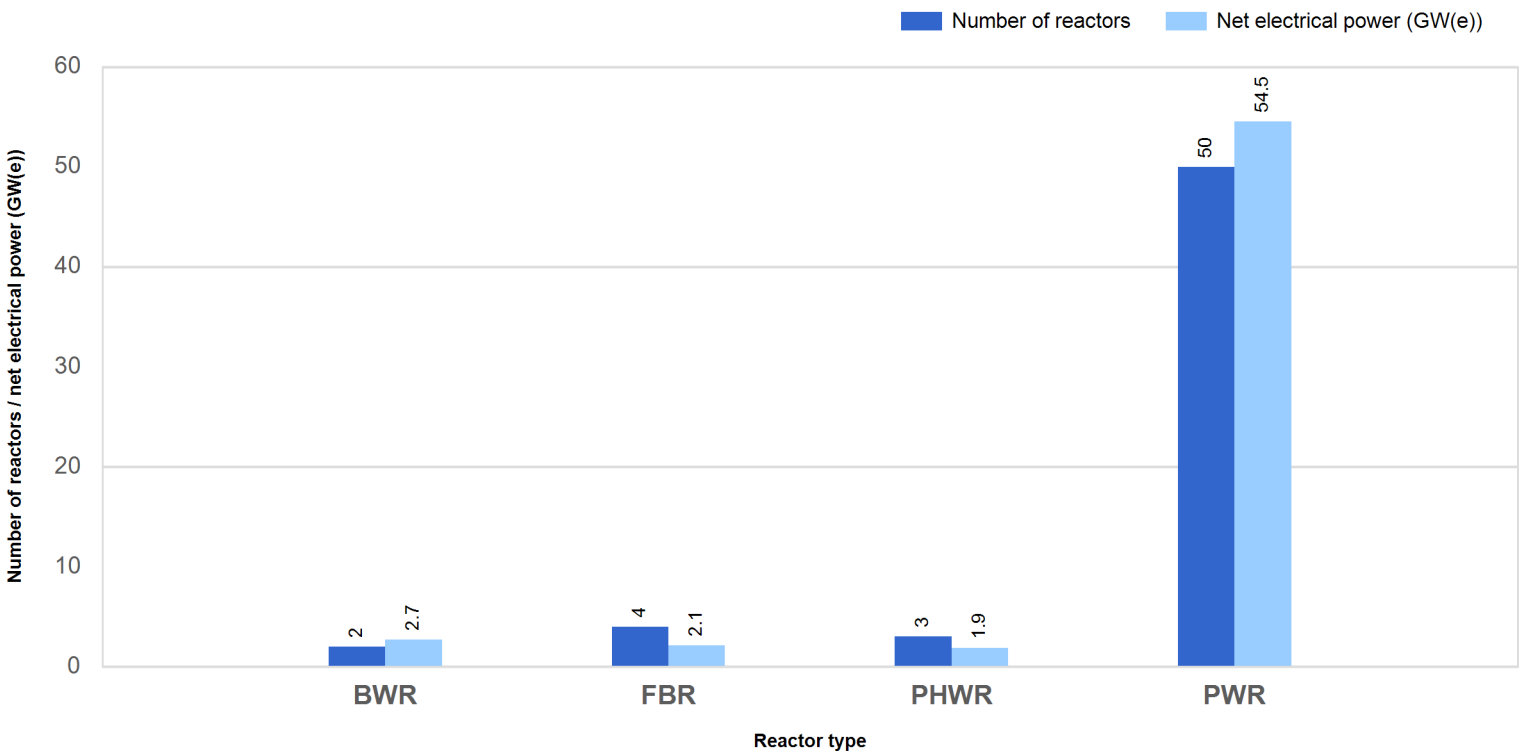
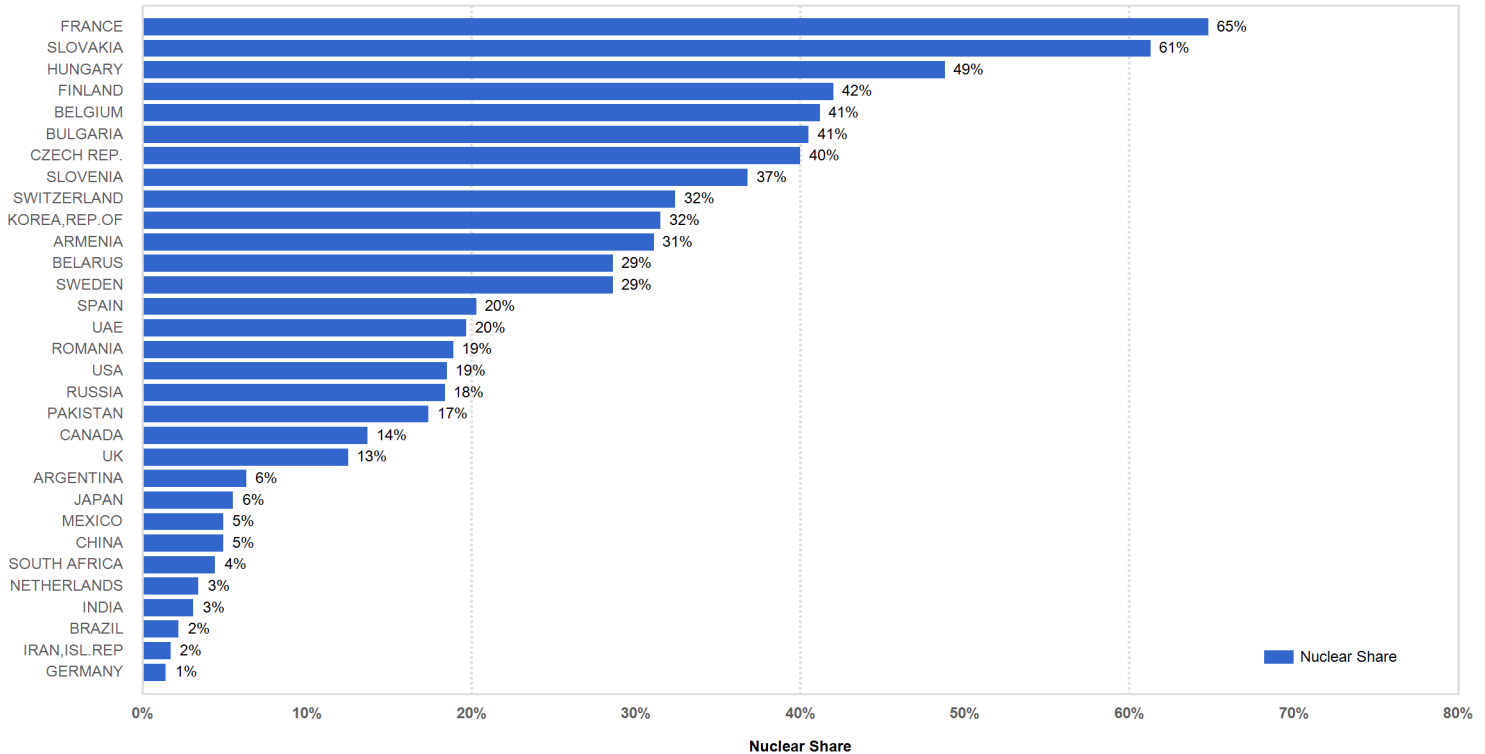


Figure 3. Nuclear share of electricity generation (as of 31 Dec. 2023)



Note: The nuclear share of electricity supplied in Taiwan, China was 6.9% of the total.

Figure 4. Worldwide median construction time in months (as of 31 Dec. 2023)

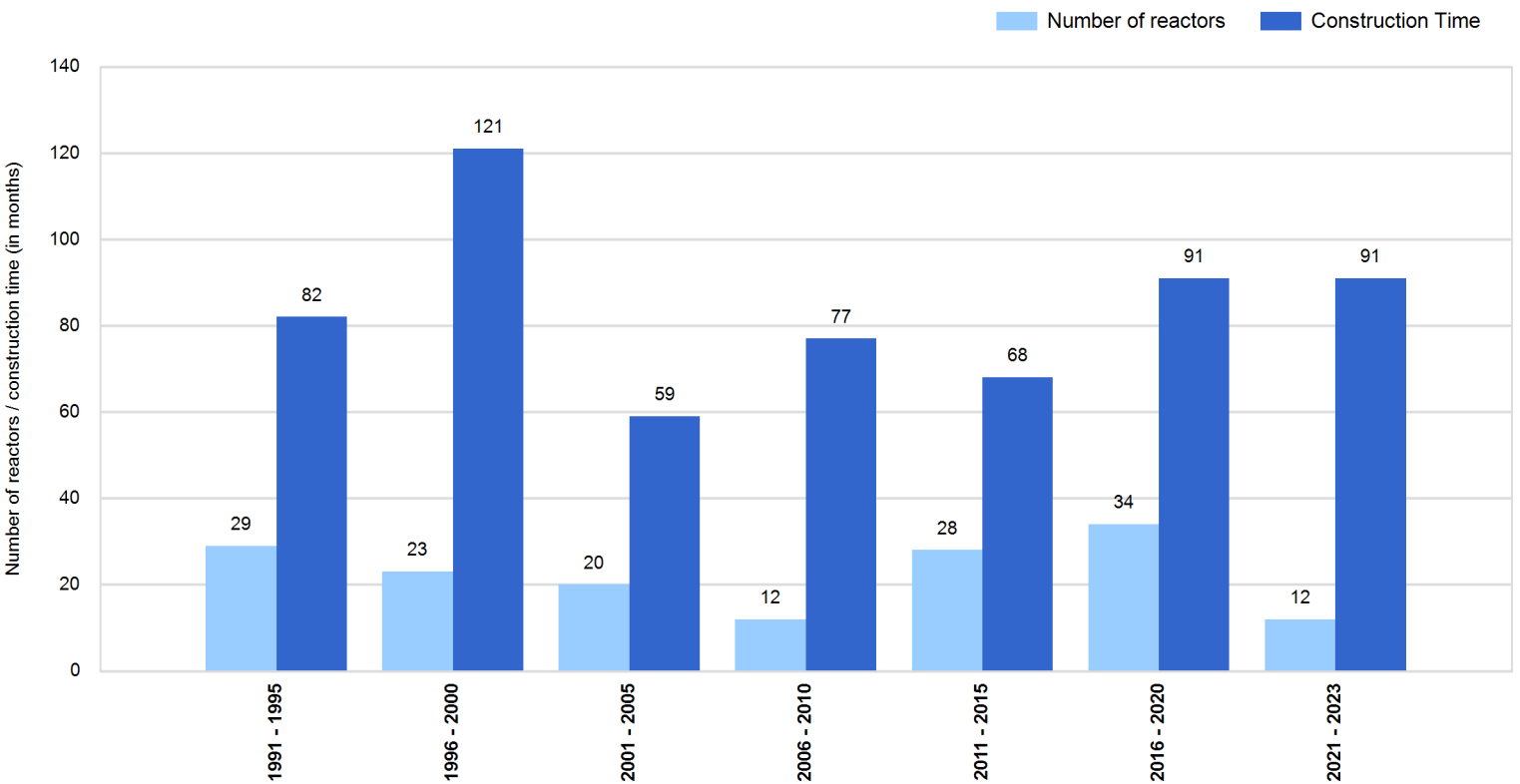
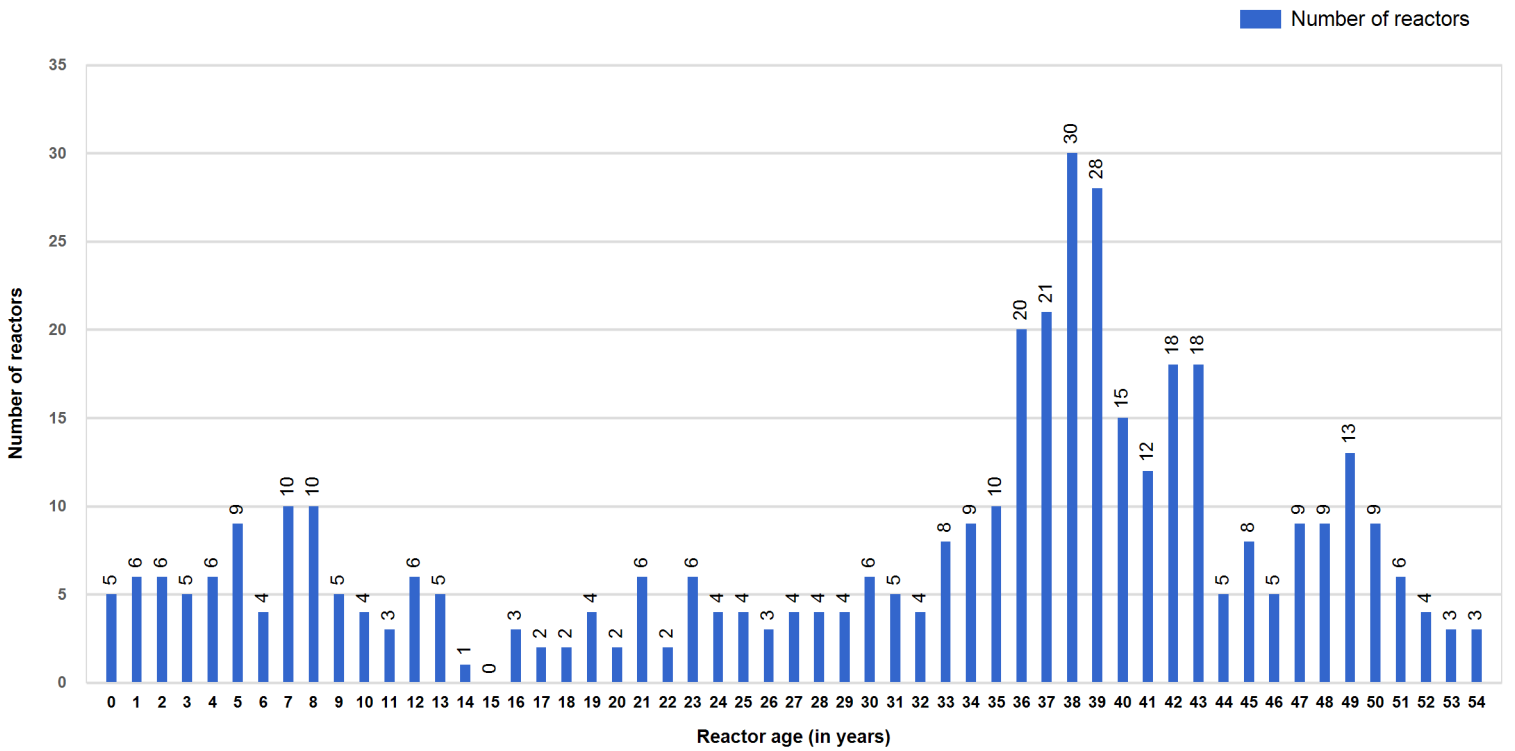


Figure 5. Number of operational reactors by age (as of 31 Dec. 2023)



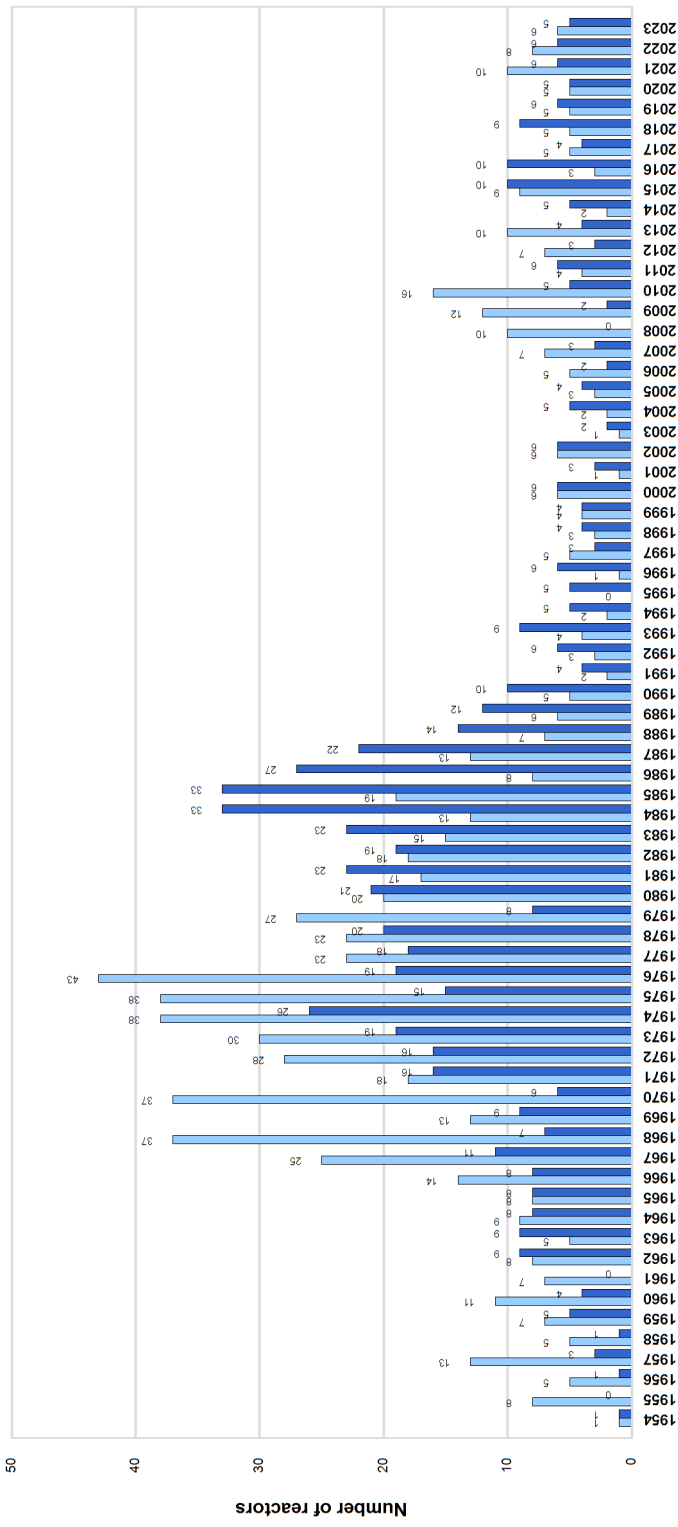


Figure 6. Annual construction starts and connections to the grid (1954 - 2023)

Figure 7. Number of reactors in operation worldwide (as of 31 Dec. 2023)

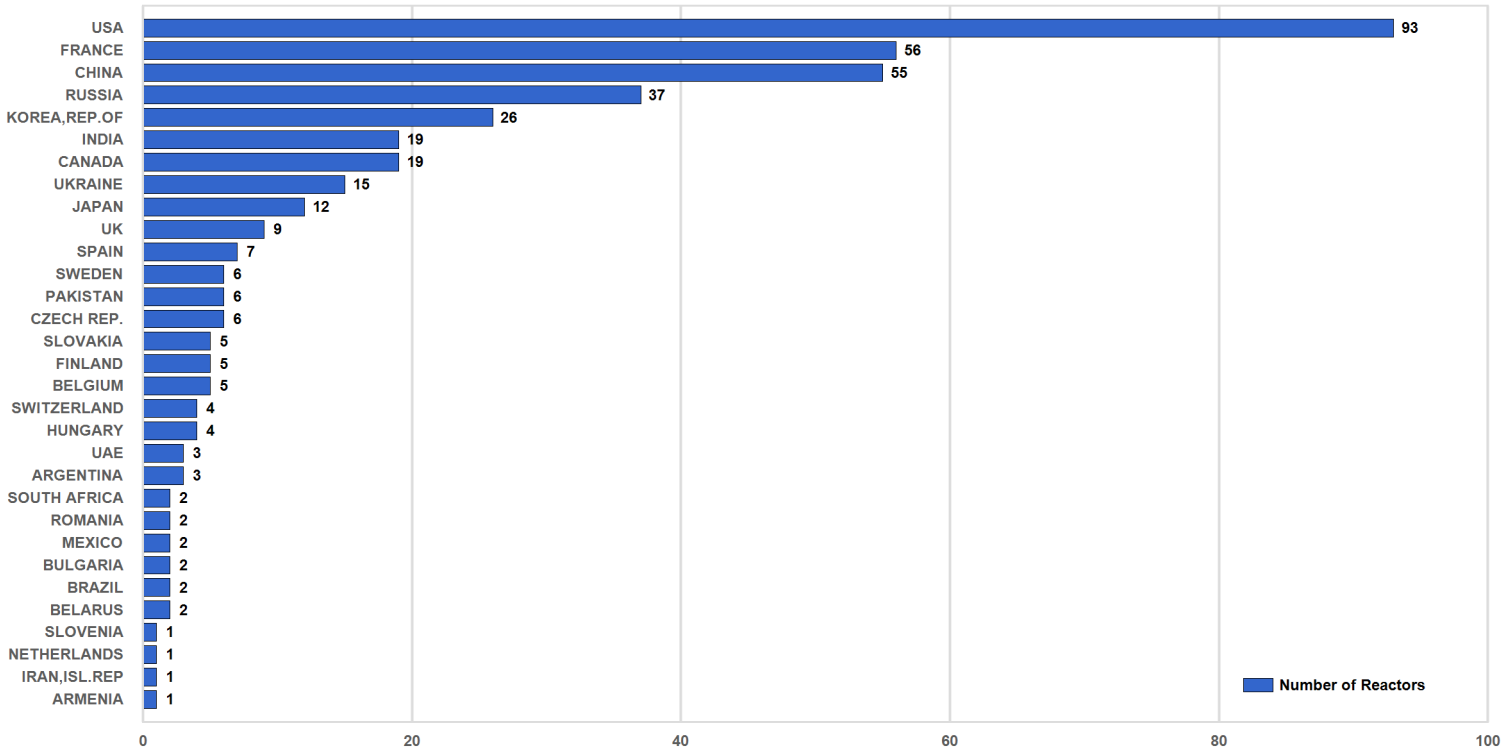
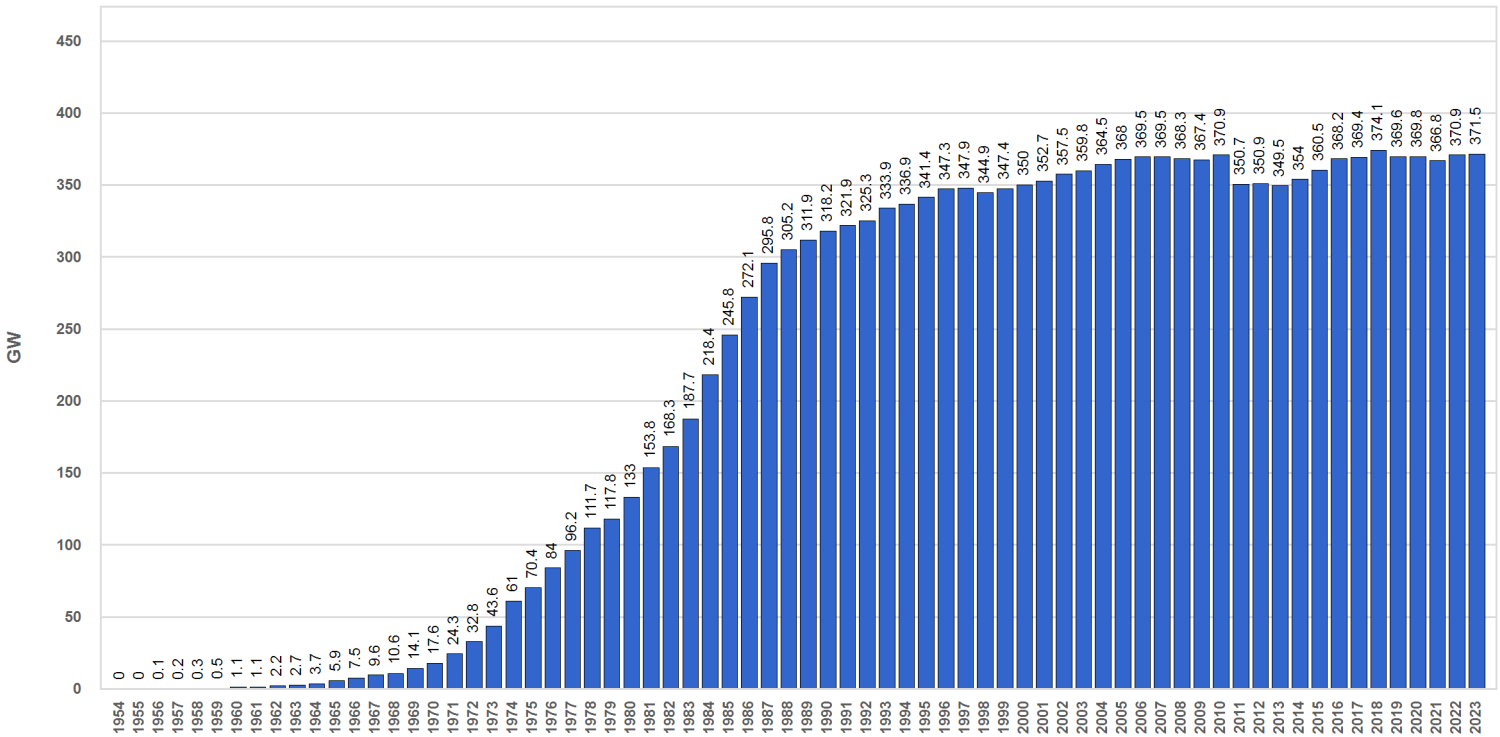


Figure 8. Number of reactors under construction worldwide (as of 31 Dec. 2023)

Figure 9. Historical evolution of the worldwide nuclear power (as of 31 Dec. 2023)



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This is the 44th edition of Reference Data Series No. 2, which presents the most recent reactor data available to the IAEA. It contains summarized information as of the end of 2023 on power reactors operating, under construction and shut down as well as performance data on reactors operating in the IAEA Member States. The information is collected through designated national correspondents in the Member States and the data are used to maintain the IAEA's Power Reactor Information System (PRIS).

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