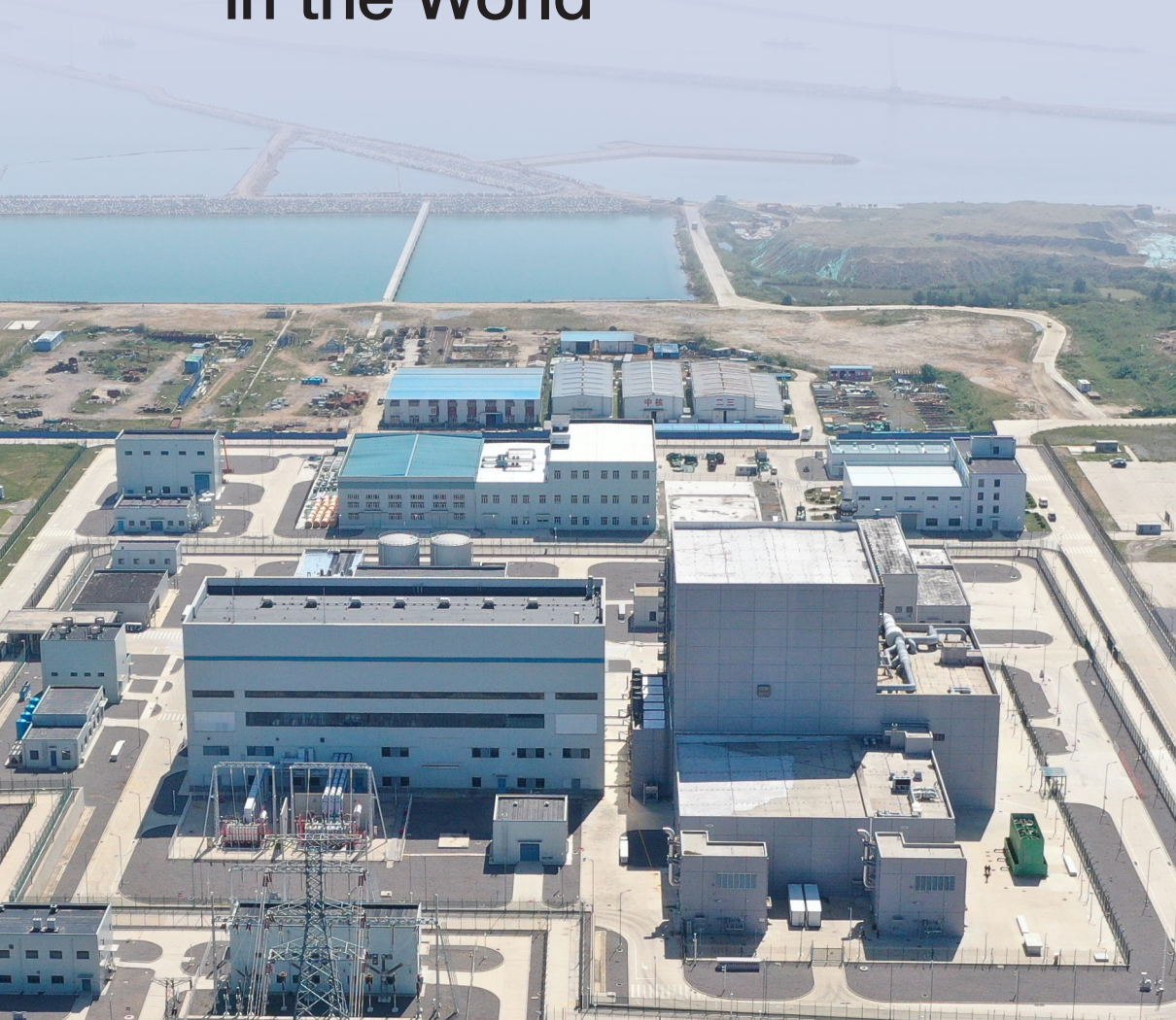


Nuclear Power Reactors in the World



**NUCLEAR POWER REACTORS
IN THE WORLD**

REFERENCE DATA SERIES No. 2

**NUCLEAR POWER REACTORS
IN THE WORLD**

2022 Edition

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2022

EDITORIAL NOTE

This publication has been prepared from the original material as submitted by the contributors and has not been edited by the editorial staff of the IAEA. The views expressed remain the responsibility of the contributors and do not necessarily represent the views of the IAEA or its Member States.

Neither the IAEA nor its Member States assume any responsibility for consequences which may arise from the use of this publication. This publication does not address questions of responsibility, legal or otherwise, for acts or omissions on the part of any person.

The use of particular designations of countries or territories does not imply any judgement by the publisher, the IAEA, as to the legal status of such countries or territories, of their authorities and institutions or of the delimitation of their boundaries.

The mention of names of specific companies or products (whether or not indicated as registered) does not imply any intention to infringe proprietary rights, nor should it be construed as an endorsement or recommendation on the part of the IAEA.

The IAEA has no responsibility for the persistence or accuracy of URLs for external or third party Internet web sites referred to in this publication and does not guarantee that any content on such web sites is, or will remain, accurate or appropriate.

NUCLEAR POWER REACTORS
IN THE WORLD
IAEA-RDS-2/42
ISBN 978-92-0-125122-0
ISSN 1011-2642

Printed by the IAEA in Austria
June 2022

Cover photo:
Shidao Bay-1, High-Temperature Gas-Cooled Reactor (HTGC) in China

Cover photo credit:
China Nuclear Energy Association (CNEA)

CONTENTS

Introduction.....	1
Definitions.....	4
Table 1. Overview of power reactors and nuclear share, 31 Dec. 2021	7
Table 2. Type and net electrical power of operational reactors, 31 Dec. 2021	9
Table 3. Type and net electrical power of reactors under construction, 31 Dec. 2021 ...	11
Table 4. Reactor years of experience, up to 31 Dec. 2021.....	12
Table 5. Operational reactors and net electrical power (1990 – 2021).....	14
Table 6. Nuclear electricity production and share (1990 – 2021)	16
Table 7. Annual construction starts and connections to the grid (1954 – 2021)	18
Table 8. Number of new reactors connected to the grid and median construction time in months.....	21
Table 9. Construction starts during 2021	22
Table 10. Connections to the grid during 2021	23
Table 11. Scheduled connections to the grid during 2022	23
Table 12. Reactors planned for construction as known on 31 Dec. 2021	24
Table 13. Reactors under construction, 31 Dec. 2021.....	27
Table 14. Operational reactors, 31 Dec. 2021	30
Table 15. Reactors in long term shutdown, 31 Dec. 2021	49
Table 16. Reactors permanently shut down, 31 Dec. 2021	50
Table 17. Reactors in decommissioning process or decommissioned, 31 Dec. 2021....	58
Table 18. Performance factors by reactor category (2019 – 2021)	66
Table 19. Full outage statistics during 2021	67
Table 20. Direct causes of full outages during 2021.....	68
Table 21. Direct causes of full outages (2017 – 2021)	69
Table 22. Countries: abbreviations and summary	70
Table 23. Reactor types: abbreviations and summary.....	72
Table 24. Operators: abbreviations and summary.....	73
Table 25. NSSS suppliers: abbreviations and summary.....	80
Figure 1. Number of operational reactors by type and net electrical power (as of 31 Dec. 2021).....	84
Figure 2. Reactors under construction by type and net electrical power (as of 31 Dec. 2021).....	85
Figure 3. Nuclear share of electricity generation (as of 31 Dec. 2021)	86
Figure 4. Worldwide median construction time in months (as of 31 Dec. 2021)	87
Figure 5. Number of operational reactors by age (as of 31 Dec. 2021)	88
Figure 6. Annual construction starts and connections to the grid (1954 – 2021)	89
Figure 7. Number of reactors in operation worldwide (as of 31 Dec. 2021)	90
Figure 8. Number of reactors under construction worldwide (as of 31 Dec. 2021)	91
Figure 9. Historical evolution of the worldwide nuclear power (as of 31 Dec. 2021).....	92

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-second edition of Reference Data Series No. 2 (RDS-2) provides a detailed comparison of various statistics up to and including 31 December 2021. 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 31 December 2021, there were 437 operational nuclear power reactors worldwide, with a total capacity of 389.5 GW(e). Overall, nuclear power capacity has shown a gradual growth trend over the past decade, including some 20.7 GW(e) of new capacity added by the connection of new units to the grid or upgrades to existing reactors.

In 2021, while the total global capacity decreased by some 3 GW(e) compared with 2020, the electricity generation increased by 4 percent. During the year, 447 operational power reactors generated electricity and contributed to the 2021 data results and statistics.

In 2021, six new reactors were connected to the grid, resulting in an additional 5.2 GW(e) of nuclear power capacity. All new nuclear power capacity was added in Asia, including three reactors in China at Tianwan-6 (PWR, 1000 MW(e)), Hongyanhe-5 (PWR, 1061 MW(e)), and Shidao Bay-1, a high-temperature reactor pebble-bed module (HTR-PM), part of a new generation of modular high-temperature gas-cooled reactors (HTGRs), with a total capacity of 200 MW(e). In India, Kakrapar-3 (PHWR, 630 MW(e)) was connected in January, followed by Pakistan's Kanupp-2 (PWR, 1017 MW(e)) in March and Barakah-2 (PWR, 1310 MW(e)) in the United Arab Emirates, which was connected to the grid in September 2021.

As of 31 December 2021, 56 reactors were under construction in 19 countries with a total of capacity of 58.1 GW(e). Installed nuclear power capacity under construction has remained largely steady in recent years, except for continuous growth in Asia, where a total of 63.6 GW(e) operational capacity (70 reactors) has been connected to the grid since 2005. In 2021, the construction of six new PWR reactor units began in China at Changjiang-3 (1000 MW(e)), Changjiang-4 (1000 MW(e)), Linglong-1 (100 MW(e)), Sanaocun-2 (1117 MW(e)), Tianwan-7 (1171 MW(e)) and Xudabu-3 (1200 MW(e)). Two PWR reactors, Kudankulam-5 and Kudankulam-6, each with 917 MW(e) capacity, began construction in India. In March, the Republic of Türkiye started construction of a third unit (1114 MW(e)) at the Akkuyu-3 site, located in Mersin province on Türkiye's Mediterranean coast. In June, Russia began construction of a lead-cooled fast neutron reactor, Brest-OD-300 (300 MW(e)).

Ten reactors with a total capacity of 8.7 GW(e) were permanently shut down globally. Some 65% of the capacity loss resulting from permanent shutdowns came from three reactors in Germany: Brokdorf (PWR, 1410 MW(e)), Grohnde (PWR 1360 MW(e)), Gundremmingen-C (BWR, 1288 MW(e)), and three reactors in the United Kingdom: Dungeness gas-cooled reactor (GCR) units B-1 and B-2, each unit with a capacity of 545 MW(e), and Hunterston B-1 (GCR, 490 MW(e)). Pakistan's first ever nuclear power reactor Kanupp-1 (PHWR, 985 MW(e)), which was connected to the grid over 50 years ago, was retired in August. After 45 years of operations, Kursk-1 (LWGR, 925 MW(e)) reactor in Russia shut down in December, followed by Kuosheng-1 (BWR, 985 MW(e)) in Taiwan, China, at the end of the year.

Information and data received by the IAEA through 31 May 2022 are included in this publication, with all commercially operating units reporting data up to this date. 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 PRIS Statistics on-line application. Enquiries should be addressed to:

Director
Division of Nuclear Power
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 Vienna, Austria
Email: PrisAdmin@iaea.org

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 as planned from the date when a construction licence application has been submitted to the relevant national regulatory authorities to 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 as operational.

Commercial operation

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

Long term shutdown (suspended operation)

A unit is considered to be in long term shutdown if it has been shut down for an extended period (usually several years) initially without any firm recovery schedule, but with the intention to restart the unit eventually. Suspended operation is a new term for this status.

Permanent shutdown

The date when the plant is officially declared to be shut down by the owner 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	=	0.39 megatonnes of coal equivalent (input);
	=	0.23 megatonnes of oil equivalent (input).

TABLE 1. OVERVIEW OF POWER REACTORS AND NUCLEAR SHARE, 31 DEC. 2021

Country	Reactors in Operation		Long Term Shutdown Reactors		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)	TWh	% of Total
ARGENTINA	3	1641			1	25	10.2	7.2
ARMENIA	1	448					1.9	25.3
BANGLADESH								
BELARUS	1	1110			2	2160	5.4	14.1
BELGIUM	7	5942			1	1110	48.0	50.8
BRAZIL	2	1884			1	1340	13.9	2.4
BULGARIA	2	2006			1		15.8	34.6
CANADA	19	13624					86.8	14.3
CHINA	53	50034			16	15967	383.2	5.0
CZECH REP.	6	3934					29.0	36.6
FINLAND	4	2794			1	1600	22.6	32.8
FRANCE	56	61370			1	1630	363.4	69.0
GERMANY	3	4055					65.4	11.9
HUNGARY	4	1916					15.1	46.8
INDIA	22	6795	1	134	8	6028	39.8	3.2
IRAN,ISL.REP	1	915			1	974	3.2	1.0
JAPAN	33	31679			2	2653	61.3	7.2
KOREA.REP.OF	24	23091			4	5360	150.5	28.0
MEXICO	2	1552					11.6	5.3
NETHERLANDS	1	482					3.6	3.1
PAKISTAN	5	2242			1	1014	15.8	10.6
ROMANIA	2	1300			4	3759	10.4	18.5
RUSSIA	37	27727			2	880	208.4	20.0
SLOVAKIA	4	1868					14.6	52.3
SLOVENIA	1	688					5.4	36.9
SOUTH AFRICA	2	1854					12.2	6.0

TABLE 1. OVERVIEW OF POWER REACTORS AND NUCLEAR SHARE, 31 DEC. 2021 — continued

Country	Reactors in Operation		Long Term Shutdown Reactors		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	7121					54.2	20.8
SWEDEN	6	6882					51.4	30.8
SWITZERLAND	4	2960					18.6	28.8
TÜRKIYE					3	3342		
UAE	2	2762			2	2690	10.1	1.3
UK	12	7343			2	3260	41.8	14.8
UKRAINE	15	13107			2	2070	81.1	55.0
USA	93	95523			2	2234	771.6	19.6
TOTAL	437	389508	1	134	56	58096	2653.1	

Notes:

The total includes the following data from Taiwan, China:

— 3 units, 2859 MW(e) in operation;

— 26.8 TW.h of nuclear electricity generation, representing 10.8% of the total electricity generated there.

TABLE 2. TYPE AND NET ELECTRICAL POWER OF OPERATIONAL REACTORS, 31 DEC. 2021

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	448													1	448
BELARUS	1	1110													1	1110
BELGIUM	7	5942													7	5942
BRAZIL	2	1884													2	1884
BULGARIA	2	2006													2	2006
CANADA									19	13624					19	13624
CHINA	49	48460			1	200			2	1354				1	20	50034
CZECH REP.	6	3934													6	3934
FINLAND	2	1014	2	1780											4	2794
FRANCE	56	61370													56	61370
GERMANY	3	4055													3	4055
HUNGARY	4	1916													4	1916
INDIA	2	1864	2	300					18	4631					22	6795
IRAN,ISL.REP	1	915													1	915
JAPAN	16	14120	17	17559											33	31679
KOREA,REP.OF	21	21327							3	1764					24	23091
MEXICO			2	1552											2	1552
NETHERLANDS	1	482													1	482
PAKISTAN	5	2242													5	2242
ROMANIA															2	1300
RUSSIA	24	18914							2	1300					37	27727
SLOVAKIA	4	1868													4	1868
SLOVENIA	1	688													1	688
SOUTH AFRICA	2	1854													2	1854
SPAIN	6	6057	1	1064											7	7121

TABLE 2. TYPE AND NET ELECTRICAL POWER OF OPERATIONAL REACTORS, 31 DEC. 2021 — 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)
SWEDEN	2	2202	4	4680											6	6882
SWITZERLAND	3	1740	1	1220											4	2960
UAE	2	2762													2	2762
UK	1	1198			11	6145									12	7343
UKRAINE	15	13107													15	13107
USA	62	62814	31	32709											93	95523
TOTAL	303	288167	61	61849	11	6145	1	200	47	24314	11	7433	3	1400	437	389508

Notes:

1. The totals include 3 units, 2859 MW(e) in Taiwan, China.
2. During 2021, 6 reactors, 5218 MW(e) were newly connected to the grid.

TABLE 3. TYPE AND NET ELECTRICAL POWER OF REACTORS UNDER CONSTRUCTION, 31 DEC. 2021

Country	PWR No.	MW(e)	BWR No.	MW(e)	PHWR No.	MW(e)	LWGR No.	MW(e)	FBR No.	MW(e)	HTGR No.	MW(e)	Totals No.	MW(e)
ARGENTINA	1	25											1	25
BANGLADESH	2	2160											2	2160
BELARUS	1	1110											1	1110
BRAZIL	1	1340											1	1340
CHINA	15	15325							1	642			16	15967
FINLAND	1	1600											1	1600
FRANCE	1	1630											1	1630
INDIA	4	3688			3	1890			1	470			8	6028
IRAN,ISL.REP	1	974											1	974
JAPAN			2	2653									2	2653
KOREA,REP.OF	4	5360											4	5360
PAKISTAN	1	1014											1	1014
RUSSIA	3	3459							1	300			4	3759
SLOVAKIA	2	880											2	880
TÜRKIYE	3	3342											3	3342
UAE	2	2690											2	2690
UK	2	3260											2	3260
UKRAINE	2	2070											2	2070
USA	2	2234											2	2234
TOTAL	48	52141	2	2653	3	1890			3	1412			56	58096

TABLE 4. REACTOR YEARS OF EXPERIENCE, UP TO 31 DEC. 2021

Country	In Operation		Long Term Shutdown		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	94	2
ARMENIA	1	448			1	376	2	824	47	8
BELARUS	1	1110					1	1110	1	2
BELGIUM	7	5942			1	10	8	5952	317	7
BRAZIL	2	1884					2	1884	61	3
BULGARIA	2	2006			4	1632	6	3638	171	3
CANADA	19	13624			6	2143	25	15767	807	6
CHINA	53	50034					53	50034	470	0
CZECH REP.	6	3934					6	3934	182	10
FINLAND	4	2794					4	2794	171	4
FRANCE	56	61370			14	5549	70	66919	2393	0
GERMANY	3	4055			30	22180	33	26235	830	11
HUNGARY	4	1916					4	1916	146	2
INDIA	22	6795	1	134			23	6929	554	9
IRAN,ISL.REP	1	915					1	915	10	4
ITALY							4	1423	80	8
JAPAN	33	31679			27	17119	60	48798	1965	6
KAZAKHSTAN					1	52	1	52	25	10
KOREA,REP.OF	24	23091			2	1237	26	24328	620	2
LITHUANIA					2	2370	2	2370	43	6
MEXICO	2	1552					2	1552	59	11
NETHERLANDS	1	482			1	55	2	537	77	0
PAKISTAN	5	2242			1	90	6	2332	92	11
ROMANIA	2	1300					2	1300	39	11
RUSSIA	37	27727			10	3957	47	31684	1410	7
SLOVAKIA	4	1868			3	909	7	2777	180	7

TABLE 4. REACTOR YEARS OF EXPERIENCE, UP TO 31 DEC. 2021 — continued

Country	In Operation		Long Term Shutdown		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	40	3
SOUTH AFRICA	2	1854					2	1854	74	3
SPAIN	7	7121			3	1067	10	8188	357	1
SWEDEN	6	6882			7	4054	13	10936	480	0
SWITZERLAND	4	2960			2	379	6	3339	232	11
UAE	2	2762					2	2762	1	9
UK	12	7343			33	6295	45	13638	1648	6
UKRAINE	15	13107			4	3515	19	16622	548	6
USA	93	95523			40	19171	133	114694	4694	4
TOTAL	437	389508	1	134	199	95776	637	485418	19170	9

Notes:

1. The total includes the following data from Taiwan, China:
— operational reactors, 3 units, 2859 MW(e); permanently shutdown reactors, 3 units, 2193 MW(e); 236 years, 8 months.
2. Operating experience is counted from the grid connection excluding any long term shutdown period.

TABLE 5. OPERATIONAL REACTORS AND NET ELECTRICAL POWER (1990-2021)

Country	Number of Units and Net Capacity [MW(e)] Connected to the Grid (Latest in each year)															
	1990		1995		2000		2005		2010		2015		2020		2021	
	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	935	2	935	2	935	2	935	3	1632	3	1641	3	1641
ARMENIA			1	376	1	376	1	376	1	376	1	375	1	415	1	448
BELARUS													1	1110	1	1110
BELGIUM	7	5501	7	5631	7	5712	7	5801	7	5913	7	5913	7	5942	7	5942
BRAZIL	1	626	1	626	2	1976	2	1901	2	1884	2	1884	2	1884	2	1884
BULGARIA	5	2585	6	3538	6	3760	4	2722	2	1906	2	1926	2	2006	2	2006
CANADA	20	13993	21	14902	14	9998	18	12584	18	12584	19	13524	19	13624	19	13624
CHINA			3	2188	3	2188	9	6587	13	10065	31	26774	50	47528	53	50034
CZECH REP.	4	1632	4	1782	5	2611	6	3373	6	3675	6	3930	6	3934	6	3934
FINLAND	4	2310	4	2310	4	2656	4	2676	4	2716	4	2752	4	2794	4	2794
FRANCE	56	55808	56	58573	59	63080	59	63260	58	63130	58	63130	56	61370	56	61370
GERMANY	21	21250	19	20972	19	21283	17	20339	17	20490	8	10799	6	8113	3	4055
HUNGARY	4	1710	4	1729	4	1729	4	1755	4	1889	4	1889	4	1902	4	1916
INDIA	7	1324	10	1746	14	2508	14	2903	18	4099	20	5218	21	6165	22	6795
IRAN,ISL.REP															1	915
JAPAN	41	30867	50	39625	52	43245	55	47593	54	46821	43	40290	33	31679	33	31679
KAZAKHSTAN	1	135	1	50												
KOREA,REP.OF	9	7220	11	9115	16	12990	20	16810	21	18698	24	21733	24	23150	24	23091
LITHUANIA	2	2760	2	2370	2	2370	1	1185								
MEXICO	1	640	2	1256	2	1290	2	1360	2	1300	2	1440	2	1552	2	1552
NETHERLANDS	2	539	2	510	1	449	1	450	1	482	1	482	1	482	1	482
PAKISTAN	1	125	1	125	2	425	2	425	2	425	3	690	5	1318	5	2242
ROMANIA					1	655	1	655	2	1300	2	1300	2	1300	2	1300
RUSSIA	29	18898	30	19848	30	19848	31	21743	32	22693	35	25413	38	28578	37	27727
SLOVAKIA	4	1632	4	1632	6	2440	6	2442	4	1816	4	1814	4	1837	4	1868

TABLE 5. OPERATIONAL REACTORS AND NET ELECTRICAL POWER (1990-2021) — continued

Country	Number of Units and Net Capacity [MW(e)] Connected to the Grid (Latest in each year)															
	1990		1995		2000		2005		2010		2015		2020		2021	
	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	620	1	676	1	656	1	666	1	688	1	688	1	688
SOUTH AFRICA	2	1840	2	1840	2	1840	2	1800	2	1800	2	1860	2	1860	2	1854
SPAIN	9	7099	9	7097	9	7468	9	7591	8	7514	7	7121	7	7121	7	7121
SWEDEN	12	9826	12	10028	11	9397	10	8905	10	9303	10	9648	6	6882	6	6882
SWITZERLAND	5	2942	5	3056	5	3170	5	3220	5	3238	5	3333	4	2960	4	2960
UAE																
UK	37	11360	35	12910	33	12490	23	11852	19	10137	15	8918	15	8923	12	7343
UKRAINE	15	13020	15	13045	13	11195	15	13107	15	13107	15	13107	15	13107	15	13107
USA	108	96228	108	98068	103	96297	103	98145	104	101211	99	99167	94	96553	93	95523
TOTAL	416	318253	434	341387	435	349984	440	368035	440	375187	440	382717	441	392522	437	389508

Notes:

The total includes the following data from Taiwan, China:

— 1990: 6 units, 4828 MW(e); 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); 2021: 3 units, 2859 MW(e).

TABLE 6. NUCLEAR ELECTRICITY PRODUCTION AND SHARE (1990-2021)

Country	Nuclear Production [TWh] of Reactors Connected to the Grid (Latest in each year)															
	1990		1995		2000		2005		2010		2015		2020		2021	
	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	6.72	19.8	6.57	11.8	5.74	7.3	6.37	6.9	6.69	5.9	6.52	4.8	10.01	7.5	10.17	7.2
ARMENIA	0.00	NA	0.00	NA	1.84	33.0	2.50	42.7	2.29	39.4	2.57	34.5	2.55	34.5	1.85	25.3
BELARUS	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.34	1.0	5.42	14.1
BELGIUM	40.59	60.1	39.30	55.5	45.81	56.8	45.34	55.6	45.73	50.0	24.83	37.5	32.79	39.1	47.96	50.8
BRAZIL	2.06	1.0	2.33	1.0	5.59	1.9	9.20	2.5	13.77	3.1	13.89	2.8	13.24	2.1	13.86	2.4
BULGARIA	13.51	35.7	16.22	46.4	16.79	45.0	17.38	44.1	14.24	33.1	14.70	31.3	15.94	40.8	15.80	34.6
CANADA	69.87	14.8	93.98	17.3	69.12	11.8	86.83	14.5	85.50	15.1	95.64	16.6	92.17	14.6	86.78	14.3
CHINA	0.00	NA	12.13	1.2	16.02	1.2	50.33	2.0	70.96	1.8	161.20	3.0	344.75	4.9	383.21	5.0
CZECH REP.	11.77	NA	12.23	20.0	12.71	18.7	23.25	30.5	26.44	33.3	25.34	32.5	28.37	37.3	29.04	36.6
FINLAND	18.13	35.0	18.13	29.9	21.58	32.2	22.36	32.9	21.89	28.4	22.33	33.7	22.35	33.9	22.65	32.8
FRANCE	297.61	74.5	358.71	76.1	395.39	76.4	431.18	78.5	410.09	74.1	419.04	76.3	338.74	70.6	363.39	69.0
GERMANY	139.37	33.1	146.13	29.6	160.66	30.6	154.61	26.6	133.01	22.6	86.81	14.1	60.92	11.3	65.44	11.9
HUNGARY	12.89	51.4	13.20	42.3	13.35	40.6	13.02	37.2	14.66	42.1	14.96	52.7	15.18	48.0	15.12	46.8
INDIA	5.29	2.2	6.99	1.9	14.23	3.1	15.73	2.8	20.48	2.8	34.64	3.5	40.37	3.3	39.76	3.2
IRAN,ISL.REP	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00	NA	3.20	1.3	5.79	1.7	3.24	1.0
JAPAN	187.19	27.1	275.51	33.4	306.24	33.8	280.50	29.3	280.25	29.2	4.35	0.5	43.10	5.1	61.30	7.2
KAZAKHSTAN	0.00	NA	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
KOREA,REP.OF	50.26	49.1	60.21	36.1	103.54	40.7	137.59	44.7	141.89	32.2	157.20	31.7	152.58	29.6	150.46	28.0
LITHUANIA	15.70	NA	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
MEXICO	2.78	2.6	7.53	6.0	7.92	3.9	10.32	5.0	5.59	3.6	11.18	6.8	10.86	4.9	11.61	5.3
NETHERLANDS	3.29	4.8	3.78	4.9	3.70	4.3	3.77	3.9	3.75	3.4	3.86	3.7	3.89	3.2	3.61	3.1
PAKISTAN	0.98	1.1	0.46	0.9	0.90	1.6	2.41	2.8	2.56	2.6	4.33	4.4	9.64	7.1	15.83	10.6
ROMANIA	0.00	NA	0.00	NA	5.05	10.9	5.11	8.6	10.70	19.5	10.71	17.3	10.58	19.9	10.40	18.5
RUSSIA	109.62	NA	91.59	11.8	120.10	15.0	137.64	15.8	159.41	17.1	182.81	18.6	201.82	20.6	208.44	20.0
SLOVAKIA	11.16	NA	11.35	44.1	15.17	53.4	16.34	56.1	13.54	51.8	14.08	55.9	14.36	53.1	14.65	52.3
SLOVENIA	4.39	NA	4.57	39.5	4.55	37.4	5.61	42.4	5.38	37.3	5.37	38.0	6.04	37.8	5.42	36.9

TABLE 6. NUCLEAR ELECTRICITY PRODUCTION AND SHARE (1990-2021) — continued

Country	Nuclear Production [TWh] of Reactors Connected to the Grid (Latest in each year)																
	1990	1995	2000	2005	2010	2015	2020	2021	1990	1995	2000	2005	2010	2015	2020	2021	
	TW.h	TW.h	TW.h	TW.h	TW.h	TW.h	TW.h	TW.h	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total
SOUTH AFRICA	8.47	11.29	13.00	12.24	12.90	10.97	11.62	12.20	5.6	6.6	5.5	5.2	4.7	4.7	5.9	5.9	6.0
SPAIN	51.98	53.49	59.49	54.99	59.26	54.76	55.80	54.22	35.9	27.6	19.6	20.1	20.3	20.3	22.2	22.2	20.8
SWEDEN	65.27	67.17	54.81	69.58	55.73	54.46	47.36	51.43	45.9	39.0	44.9	38.1	34.3	34.3	29.8	29.8	30.8
SWITZERLAND	22.40	23.58	25.05	22.11	25.34	22.16	23.05	18.59	42.6	38.2	38.0	38.0	33.5	33.5	32.9	32.9	28.8
UAE	0.00	NA	0.00	0.00	0.00	0.00	1.56	1.3	NA	NA	NA	NA	NA	NA	1.1	1.1	1.3
UK	58.77	70.64	72.99	75.94	56.85	63.89	45.67	14.8	19.7	21.9	20.0	15.6	18.9	18.9	14.5	14.5	14.8
UKRAINE	71.26	NA	72.56	83.40	83.95	82.41	71.55	55.0	NA	47.3	48.5	48.1	56.5	51.2	51.2	81.13	55.0
USA	578.08	673.52	755.55	783.35	807.08	798.01	789.92	771.64	20.6	19.8	19.3	19.6	19.5	19.7	19.7	19.7	19.6
TOTAL	1890.35	2190.94	2443.85	2626.34	2629.82	2441.34	2553.24	2653.34									

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

	31.54	38.3	33.80	28.8	37.00	21.2	38.40	17.9	39.89	16.3	30.34	12.7	26.82	10.8
--	-------	------	-------	------	-------	------	-------	------	-------	------	-------	------	-------	------

TABLE 7. ANNUAL CONSTRUCTION STARTS AND CONNECTIONS TO THE GRID (1954-2021)

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	26834	7	1029	68	10632
1969	13	9398	9	3647	76	14080
1970	37	25552	6	3410	82	17615
1971	18	12659	16	7726	98	24304
1972	28	21320	16	8880	112	32781
1973	30	24842	19	12544	130	43645
1974	38	35337	26	17333	153	61005
1975	38	36659	15	10289	168	70398
1976	43	41882	19	14232	185	83977
1977	23	21849	18	13199	198	96187
1978	23	21781	20	15782	217	111725
1979	27	23103	8	6909	224	117799

TABLE 7. ANNUAL CONSTRUCTION STARTS AND CONNECTIONS TO THE GRID (1954-2021) — continued

Year	Construction Starts		Connections to the Grid		Reactors in Operation	
	Units	MW(e)	Units	MW(e)	Units	MW(e)
1980	20	19195	21	15245	244	133022
1981	17	16029	23	20352	266	153820
1982	18	19165	19	15664	283	168302
1983	15	12000	23	19318	305	187744
1984	13	11332	33	31079	335	218437
1985	19	15356	33	31433	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	10600	420	311942
1990	5	3267	10	10543	416	318253
1991	2	2246	4	3738	415	321824
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	4495	3	3557	434	347880
1998	3	2150	4	3020	430	344900
1999	4	4540	4	2729	432	347353
2000	7	5356	6	3178	435	349984
2001	1	1108	3	2738	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	3627	440	368035
2006	5	4769	2	1492	434	369491

TABLE 7. ANNUAL CONSTRUCTION STARTS AND CONNECTIONS TO THE GRID (1954-2021) — 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	438	371617
2008	10	10664			437	371467
2009	12	13626	2	1068	436	370607
2010	16	15968	5	3776	440	375187
2011	4	1888	7	4013	434	368831
2012	7	7054	3	2963	436	373155
2013	10	11309	4	4060	433	371685
2014	2	2455	5	4660	437	376172
2015	9	8659	10	9450	440	382717
2016	3	3014	10	9607	446	390401
2017	5	4896	4	3373	447	391631
2018	5	6339	9	10323	449	396528
2019	5	6021	6	5174	442	392008
2020	4	4473	5	5596	441	392522
2021	10	8836	6	5218	437	389508

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

Country	1986 to 1990		1991 to 1995		1996 to 2000		2001 to 2005		2006 to 2010		2011 to 2015		2016 to 2021	
	No.	Months	No.	Months	No.	Months	No.	Months	No.	Months	No.	Months	No.	Months
ARGENTINA														
BELARUS														
BRAZIL					1	176								
BULGARIA	1	89	1	113										
CANADA	5	101	2	97										
CHINA			3	73			6	59	4	68	18	67	19	68
CZECH REP.	3	93			1	167	1	191						
FRANCE	15	86	3	93	4	124								
GERMANY	6	103												
HUNGARY	2	90												
INDIA	1	152	3	120	4	122	1	64	4	81	2	123	1	170
IRAN,ISL.REP														
JAPAN	8	49	10	46	3	42	4	47	1	53	1	222		
KOREA.REP.OF	4	62	2	61	5	56	4	54	1	51	3	56	2	103
LITHUANIA	1	116												
MEXICO	1	152	1	210										
PAKISTAN					1	83								
ROMANIA					1	161								
RUSSIA	4	72	1	109			2	233	1	290	3	108	7	119
SLOVAKIA														
SPAIN	2	96			2	187								
UAE														
UK	4	98	1	80										
UKRAINE	6	58	1	113										
USA	22	146	1	221	1	272								
WORLDWIDE	85	93	29	82	23	121	20	59	12	77	29	68	34	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 2021

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation
					Thermal	Gross					
CHINA	CN -902	CHANGJIANG-3	PWR	HPR1000	3190	1197	1000 CHG	CFHI	2021-3		
	CN -903	CHANGJIANG-4	PWR	HPR1000	3190	1200	1000 CHG	CFHI	2021-12		
	CN -89	LINGLONG-1	PWR	ACP100	385	125	100 HNPC	CFHI	2021-7		
	CN -84	SANAOJUN-2	PWR	HRP1000	3180	1210	1117 CGONP	CFHI	2021-12		
	CN -933	TIANWAN-7	PWR	VVER-1200V491	3200	1265	1171 JNPC	Atommesh	2021-5		
	CN -932	XUDABU-3	PWR	VVER-1200V491	3200	1274	1200 LNPC	Russian	2021-7		
	CN -37	KUDANKULAM-5	PWR	VVERV412	3000	1000	917 NPCIL	JSC ASE	2021-6		2026-12
INDIA	IN -38	KUDANKULAM-6	PWR	VVERV412	3000	1000	917 NPCIL	JSC ASE	2021-12		2027-9
RUSSIA	RU -208	BREST-OD-300	FBR	BREST-OD-300	700	320	300 SKtK	NA	2021-6		
TÜRKIYE	TR -3	AKKUYU-3	PWR	VVER V-509	3200	1200	1114 ANC	AEM	2021-3		

Note: During 2021, construction started on 10 reactors (8836 MW(e)).

TABLE 10. CONNECTIONS TO THE GRID DURING 2021

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Construction Start	First Critically	Grid Connection
					Thermal	Gross					
CHINA	CN -49	HONGYANHE-5	PWR	ACPR-1000	2905	1119	1061	LHNPC	2015-3	2021-6	2021-6
	CN -44	SHIDAO BAY-1	HTGR	HTR-PM	500	211	200	HSNPC	2012-12	2021-9	2021-12
	CN -54	TIANWAN-6	PWR	CNP-1000	2905	1118	1000	JNPC	2016-9	2021-5	2021-5
INDIA	IN -30	KAKRAPAR-3	PHWR	PHWR-700	2166	700	630	NPCL	2010-11	2020-7	2021-1
	PK -6	KANUPP-2	PWR	ACP-1000	3060	1100	1017	PAEC	2015-8	2021-2	2021-3
PAKISTAN	PK -6	KANUPP-2	PWR	ACP-1000	3060	1100	1017	PAEC	2015-8	2021-2	2021-3
UAE	AE -02	BARAKAH-2	PWR	APR-1400	3983	1417	1310	NAWAH	2013-4	2021-8	2021-9

Note: During 2021, 6 reactors (5218 MW(e)) were newly connected to the grid.

TABLE 11. SCHEDULED CONNECTIONS TO THE GRID DURING 2022

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Construction Start	First Critically	Grid Date
					Thermal	Gross					
CHINA	CN -52	FUQING-6	PWR	HPR1000	3060	1150	1075	FQNP	2015-12	2021-12	2022-1
	CN -50	HONGYANHE-6	PWR	ACPR-1000	2905	1119	1061	LHNPC	2015-7	2022-4	2022-5
FINLAND	FI -5	OLKILUOTO-3	PWR	EPR	4300	1720	1600	TVO	2005-8	2021-12	2022-3
PAKISTAN	PK -7	KANUPP-3	PWR	ACP-1000	3060	1100	1014	PAEC	2016-5	2022-2	2022-3
RUSSIA	RU -166	KURSK 2-1	PWR	VVER V-510K	3300	1255	1175	REA	2018-4	2022-2	2022-6
SLOVAKIA	SK -10	MOCHOVCE-3	PWR	VVER V-213	1375	471	440	SE	1987-1	2022-6	2022-6

Note: During 2021, 6 reactors (6365 MW(e)) are expected to achieve connection to grid.

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2021

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Expected Construction Start	
					Thermal	Gross				
CHINA	CN -900	BAMAOSHAN	PWR	CPR-1000	2905	1080	900			
	CN -904	FANGCHENGGANG-5	PWR				1000			
	CN -905	FANGCHENGGANG-6	PWR				1000			
	CN -908	HAIYANG-3	PWR	AP-1000	3415	1253	1126	SDNPC	WH	
	CN -909	HAIYANG-4	PWR	AP-1000	3415	1253	1126	SDNPC	WH	
	CN -910	HONGSHIDING-1	PWR				0			
	CN -911	HONGSHIDING-2	PWR	ACPR1000			0	HSDNPC	DEC	
	CN -912	JIYANG-1	PWR				1000			
	CN -913	JIYANG-2	PWR				1000			
	CN -914	JIYANG-3	PWR				1000			
	CN -915	JIYANG-4	PWR				1000			
	CN -916	LUFENG-1	PWR				1000	LFNPC		
	CN -917	LUFENG-2	PWR				1000	LFNPC		
	CN -918	PENGZE-1	PWR				1250			
	CN -919	PENGZE-2	PWR				1250			
	CN -920	PENGZE-3	PWR				1250			
	CN -921	PENGZE-4	PWR				1250			
	CN -922	SANMEN-3	PWR				1250			
	CN -923	SANMEN-4	PWR				1250			
	CN -924	SANMING-1	FBR				800	FSNPC		
	CN -925	SANMING-2	FBR				800	FSNPC		
	CN -59	SN-1	PWR				1534	SNPDP	SNERDI	
	CN -60	SN-2	PWR				1534	SNPDP	SNERDI	
	CN -926	TAOHUJIANG-1	PWR				0			
	CN -927	TAOHUJIANG-2	PWR				0			
	CN -934	TIANWAN-8	PWR				1265	1171	JNPC	Atomash
	CN -928	XIANNING-1	PWR				3200	1171	JNPC	2022-2

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Expected Construction Start
					Thermal	Gross			
CHINA	CN -929	XIANNING-2	PWR						
	CN -930	XUDABU-1	PWR	CPR-1000	2905	1080	1000 LNPC	DEC	
	CN -931	XUDABU-2	PWR	CPR-1000	2905	1080	1000 LNPC	DEC	
	CN -935	XUDABU-4	PWR	VVER-1200V491	3200	1274	1200 LNPC	Atomsmash	2022-5
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	NPCIL	
	IR -9	DARKHOVAIN	PWR	IR-360	1113	360	330 NPPDCO	JSC-ASE	
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	3926	1385	1067 TOHOKU		
RUSSIA	JP -62	KAMINOSEKI-1	BWR	ABWR	3926	1373	1325 CHUGOKU		
	JP -63	KAMINOSEKI-2	BWR	ABWR	3926	1373	1325 CHUGOKU		
	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	
	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		

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]			Operator	NSSS Supplier	Expected Construction Start	
					Thermal	Gross	Net				
RUSSIA	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-510K	3300	1255	1175	REA	AEM		
	RU -191	KURSK 2-4	PWR	VVER V-510K	3300	1255	1175	REA	AEM		
	RU -165	LENINGRAD 2-3	PWR	VVER V-491	3200	1199	1111	REA	AEM		
	RU -167	LENINGRAD 2-4	PWR	VVER V-491	3200	1199	1111	REA	AEM		
	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 -198	SMOLENSK 2-1	PWR	VVER V-510	3300	1255	0	REA	AEM		
	RU -199	SMOLENSK 2-2	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		
	TÜRKIYE	TR -4	AKKUYU-4	PWR	VVER V-509	3200	1200	1114	ANC	AEM	

Note: Status as of 31 December 2021, 70 reactors (59608 MW(e)) were known as planned.

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2021

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Construction Start	First Criticality	Grid Connection	Commercial Operation
					Thermal	Gross						
ARGENTINA	AR -4	CAREM25	PWR	CAREM Prototype	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			
	BY -2	BELARUSIAN-2	PWR	VVER V-491	3200	1194	1110 BelNPP	JSC ASE	2014-4			
BRAZIL	BR -3	ANGRA-3	PWR	PRE KONVOI	3900	1405	1340 ELETROBR	KWU	2010-6	2027-8	2027-8	2027-11
CHINA	CN -902	CHANGJIANG-3	PWR	HPR1000	3190	1197	1000 CHG	CFHI	2021-3			
	CN -903	CHANGJIANG-4	PWR	HPR1000	3190	1200	1000 CHG	CFHI	2021-12			
	CN -55	FANGCHENGANG-3	PWR	HPR1000	3150	1180	1000 GFNPC	CFHI	2015-12			
	CN -56	FANGCHENGANG-4	PWR	HPR1000	3150	1180	1000 GFNPC	CFHI	2016-12			
	CN -52	FUJING-6	PWR	HPR1000	3060	1150	1075 FQNP	NPIC	2015-12	2021-12	2022-1	2022-3
	CN -50	HONGYANHE-6	PWR	ACPR-1000	2905	1119	1061 LHNPC	DEC	2015-7	2022-4	2022-5	
	CN -69	LINGLONG-1	PWR	ACP-100	385	125	100 HNPC	CFHI	2021-7			
	CN -63	SANAOCCUN-1	PWR	HRP1000	3180	1210	1117 CGGNP	CFHI	2020-12			
	CN -64	SANAOCCUN-2	PWR	HRP1000	3180	1210	1117 CGGNP	CFHI	2021-12			
	CN -61	TAIPINGLING-1	PWR	HRP1000	3190	1200	1116 HZNP	DEC	2019-12			
CN -82	TAIPINGLING-2	PWR	HRP1000	3190	1202	1116 HZNP	CFHI	2020-10				
CN -933	TIANWAN-7	PWR	VVER-1200V491	3200	1265	1171 JNPC	Atommas	2021-5				
CN -00	XIAPU-1	FBR	CFR600	1882	682	642 CNNC	CIAE(Chi)	2017-12				
CN -932	XUDABU-3	PWR	VVER-1200V491	3200	1274	1200 LNPC	Russian	2021-7				
CN -57	ZHANGZHOU-1	PWR	HRP1000	3180	1212	1126 ZGZEC	CFHI	2019-10				
CN -58	ZHANGZHOU-2	PWR	HRP-1000	3190	1212	1126 ZGZEC	CFHI	2020-9				
FINLAND	FI-5	OLKILUOTO-3	PWR	EPR	4300	1720	1600 TVO	ORANO	2005-8	2021-12	2022-3	
FRANCE	FR -74	FLAMANVILLE-3	PWR	EPR	4300	1650	1630 EDF	ORANO	2007-12			
INDIA	IN -31	KAKRAPAR-4	PHWR	PHWR-700	2166	700	630 NPCIL	NPCIL	2010-11			
	IN -35	KUDANKULAM-3	PWR	VVER V-412	3000	1000	917 NPCIL	JSC ASE	2017-6	2022-9		2023-3
	IN -36	KUDANKULAM-4	PWR	VVER V-412	3000	1000	917 NPCIL	JSC ASE	2017-10	2023-5		2023-11
	IN -37	KUDANKULAM-5	PWR	VVERV412	3000	1000	917 NPCIL	JSC ASE	2021-6	2026-9		2026-12

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Net	Operator	NSSS Supplier	Construction Start	First Criticality	Grid Connection	Commercial Operation
					Thermal	Gross							
INDIA	IN -38	KUDANKULAM-6	PWR	VVERV412	3000	1000	917	NPCIL	JSC ASE	2021-12	2027-6		2027-9
	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			
	KR -27	SHIN-HANUL-1	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2012-7	2022-5		
KOREA,REP.OF	KR -28	SHIN-HANUL-2	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2013-6			
	KR -29	SHIN-KORI-5	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2017-4			
PAKISTAN	KR -30	SHIN-KORI-6	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2018-9			
	PK -7	KANUPP-3	PWR	ACP-1000	3060	1100	1014	PAEC	CZEC	2016-5	2022-2	2022-3	2022-4
RUSSIA	RU -170	BALTIC-1	PWR	VVER V-491	3200	1194	1109	REA	AEM	2012-2			
	RU -208	BREST-OD-300	FBR	BREST-OD-300	700	320	300	SKHK	NA	2021-6			
	RU -166	KURSK 2-1	PWR	VVER V-510K	3300	1255	1175	REA	AEM	2018-4		2022-6	2023-9
SLOVAKIA	RU -189	KURSK 2-2	PWR	VVER V-510K	3300	1255	1175	REA	AEM	2019-4		2023-12	2024-8
	SK -10	MOCHOVCE-3	PWR	VVER V-213	1375	471	440	SE	ŠKODA	1987-1	2022-6	2022-6	2022-9
	SK -11	MOCHOVCE-4	PWR	VVER V-213	1375	471	440	SE	ŠKODA	1987-1	2023-10	2023-11	2024-2
	TR -1	AKKUYU-1	PWR	VVER V-509	3200	1200	1114	ANC	AEM	2018-4			
TÜRKIYE	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			
	AE -03	BARAKAH-3	PWR	APR-1400	3983	1400	1345	NAWAH	KEPCO	2014-9			
UAE	AE -04	BARAKAH-4	PWR	APR-1400	3983	1400	1345	NAWAH	KEPCO	2015-7			
	GB -25A	HINKLEY POINT C-1	PWR	EPR-1750	4524	1720	1630	EDF-CGN	ORANO	2018-12			
UK	GB -25B	HINKLEY POINT C-2	PWR	EPR-1750	4524	1720	1630	EDF-CGN	ORANO	2019-12			
	UA -51	KHMELNITSKI-3	PWR	VVER	3132	1089	1035	NNEG	JSC ASE	1986-3			
UKRAINE	UA -52	KHMELNITSKI-4	PWR	VVER	3132	1089	1035	NNEG	JSC ASE	1987-2			

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Construction Start	First Criticality	Grid Connection	Commercial Operation
					Thermal	Gross						
USA	US -5025	VOGTLE-3	PWR	AP-1000	3400	1250	1117 SOUTHERN	WH	2013-3			
	US -5026	VOGTLE-4	PWR	AP-1000	3400	1250	1117 SOUTHERN	WH	2013-11			

Note: Status as of 31 December 2021, 56 reactors (58096 MW(e)) were under construction.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2021

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA		
					Thermal	Gross									Net	
ARGENTINA	AR -1	ATUCHA-1	PHWR	PHWR KWU	1179	362	340	NASA	SIEMENS	1968-6	1974-3	1974-6	74.6	75.5	-	
	AR -2	EMBALSE	PHWR	CANDU 6	2064	656	608	NASA	AECL	1974-4	1983-4	1984-1	78.7	78.9	-	
	AR -3	ATUCHA-2	PHWR	PHWR KWU	2160	745	693	NASA	SIEMENS	1981-7	2014-6	2016-5	53.9	53.9	-	
ARMENIA	AM -19	ARMENIAN-2	PWR	VVER V-270	1375	451	448	ANPPC/JSC	FAEA	1975-7	1980-1	1980-5	65	67	-	
BELARUS	BY -1	BELARUSIAN-1	PWR	VVER V-491	3200	1194	1110	BelNPP	JSC ASE	2013-11	2020-11	2021-6	58.7	58.7	-	
BELGIUM	BE -2	DOEL-1	PWR	WH 2LP	1311	454	445	EBL+EDF	ACECOWE	1969-7	1974-8	1975-2	83.6	84.4	-	
	BE -3	TIHANGE-1	PWR	Framatome 3 lo	2873	1009	962	EBL	ACLIF	1970-6	1975-3	1975-10	80.3	82.3	-	
	BE -4	DOEL-2	PWR	WH 2LP	1311	454	445	EBL+EDF	ACECOWE	1971-9	1975-8	1975-12	81.1	81.9	-	
	BE -5	DOEL-3	PWR	WH 3LP	3054	1056	1006	EBL+EDF	FRAMACEC	1975-1	1982-6	1982-10	78.8	79.8	-	
	BE -6	TIHANGE-2	PWR	WH 3LP	3064	1055	1008	EBL	FRAMACEC	1976-4	1982-10	1983-6	79.9	80.7	-	
	BE -7	DOEL-4	PWR	WH 3LP	2988	1090	1038	EBL+EDF	ACECOWE	1978-12	1985-4	1985-7	83.5	84.1	-	
	BE -8	TIHANGE-3	PWR	WH 3LP	3000	1089	1038	EBL	ACECOWE	1978-11	1985-6	1985-9	86.3	87.7	-	
	BRAZIL	BR -1	ANGRA-1	PWR	WH 2LP	1882	640	609	ELETROBR	WH	1971-5	1982-4	1985-1	63.6	68.4	-
		BR -2	ANGRA-2	PWR	PRE KONVOI	3764	1350	1275	ELETROBR	KWU	1976-1	2000-7	2001-2	86.7	87.8	-
	BULGARIA	BG -5	KOZLODUY-5	PWR	VVER V-320	3120	1040	1003	KNPP	AEE	1980-7	1987-11	1988-12	73.3	75.3	DH
		BG -6	KOZLODUY-6	PWR	VVER V-320	3120	1040	1003	K N N P	AEE	1982-4	1991-8	1993-12	79	80.8	DH
	CANADA	CA -10	BRUCE-3	PHWR	CANDU 750A	2550	865	770	BRUCEPOW	OH/AECL	1972-7	1977-12	1978-2	74	74.5	-
		CA -11	BRUCE-4	PHWR	CANDU 750A	2550	868	769	BRUCEPOW	OH/AECL	1972-9	1978-12	1979-1	74.7	75.3	-
	CANADA	CA -13	PICKERING-5	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1974-11	1982-12	1983-5	74.6	75.3	-
		CA -14	PICKERING-6	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1975-10	1983-11	1984-2	78.6	79.3	-
		CA -15	PICKERING-7	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1976-3	1984-11	1985-1	77.9	78.5	-
		CA -16	PICKERING-8	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1976-9	1986-1	1986-2	75.5	76.2	-
CA -17		POINT LEPREAU	PHWR	CANDU 6	2180	705	660	NBEPC	AECL	1975-5	1982-9	1983-2	72.4	73.1	-	

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Net	Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA	
					Thermal	Gross										
CANADA	CA -18	BRUCE-5	PHWR	CANDU 750B	2832	872	817	BRUCEPOW	OH/AECL	1978-5	1984-12	1985-2	85.7	86.2	-	
	CA -19	BRUCE-6	PHWR	CANDU 750B	2690	891	817	BRUCEPOW	OH/AECL	1978-1	1984-6	1984-9	79	79.6	-	
	CA -20	BRUCE-7	PHWR	CANDU 750B	2832	872	817	BRUCEPOW	OH/AECL	1979-5	1986-2	1986-4	85.7	86.4	-	
	CA -21	BRUCE-8	PHWR	CANDU 750B	2690	872	817	BRUCEPOW	OH/AECL	1979-7	1987-3	1987-5	84	84.9	-	
	CA -22	DARLINGTON-1	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1982-4	1990-12	1992-11	85.1	86.1	-	
	CA -23	DARLINGTON-2	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1981-9	1990-10	1990-10	71.2	72.1	-	
	CA -24	DARLINGTON-3	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1984-9	1992-12	1993-2	82.4	83.1	-	
	CA -25	DARLINGTON-4	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1985-7	1993-4	1993-6	85.5	86.3	-	
	CA -4	PICKERING-1	PHWR	CANDU 500A	1744	542	515	OPG	OH/AECL	1966-6	1971-4	1971-7	68	68.2	-	
	CA -7	PICKERING-4	PHWR	CANDU 500A	1744	542	515	OPG	OH/AECL	1968-5	1973-5	1973-6	68.2	68.6	-	
	CA -8	BRUCE-1	PHWR	CANDU 791	2620	868	774	BRUCEPOW	OH/AECL	1971-6	1977-1	1977-9	72.4	72.8	-	
	CA -9	BRUCE-2	PHWR	CANDU 791	2620	836	777	BRUCEPOW	OH/AECL	1970-12	1976-9	1977-9	69.9	70.4	-	
	CHINA	CN -1	QINSHAN-1	PWR	CNP-300	966	330	308	CNNO	CNNC	1985-3	1991-12	1994-4	82.3	83.3	-
		CN -10	TIANWAN-1	PWR	VVER V-428	3000	1060	1000	JNPC	IZ	1999-10	2006-5	2007-5	86.8	87	-
		CN -11	TIANWAN-2	PWR	VVER V-428	3000	1060	1000	JNPC	IZ	2000-9	2007-5	2007-8	89.4	89.6	-
		CN -12	LING AO-3	PWR	CPR-1000	2905	1086	1007	DNMC	DEC	2005-12	2010-7	2010-9	87.6	88	-
		CN -13	LING AO-4	PWR	CPR-1000	2905	1086	1007	DNMC	DEC	2006-6	2011-5	2011-8	89.4	90	-
		CN -14	QINSHAN 2-3	PWR	CNP-600	1930	660	619	NPQJVC	CNNC	2006-4	2010-8	2010-10	90.6	90.7	-
		CN -15	QINSHAN 2-4	PWR	CNP-600	1930	660	619	NPQJVC	CNNC	2007-1	2011-11	2011-12	91.1	91.2	-
CN -16		HONGYANHE-1	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2007-8	2013-2	2013-6	88.9	89.9	-	
CN -17		HONGYANHE-2	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2008-3	2013-11	2014-5	86.1	87.2	-	
CN -18		NINGDE-1	PWR	CPR-1000	2905	1089	1018	NDNP	DEC	2008-2	2012-12	2013-4	87.9	87.9	-	
CN -19	NINGDE-2	PWR	CPR-1000	2905	1089	1018	NDNP	SHE	2008-11	2014-1	2014-5	91.6	91.6	-		

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross								
CHINA	CN-2	DAYA BAY-1	PWR	M310	2905	984	944 DNMC	FRAM	1987-8	1993-8	1994-2	86.5	88.9	-
	CN-20	FUQING-1	PWR	CNP-1000	2905	1089	1000 FQNP	NPIC	2008-11	2014-8	2014-11	90	90.3	-
	CN-21	FUQING-2	PWR	CNP-1000	2905	1089	1000 FQNP	NPIC	2009-6	2015-8	2015-10	88.8	89.1	-
	CN-22	YANGJIANG-1	PWR	CPR-1000	2905	1086	1000 YJNPC	CFHI	2008-12	2013-12	2014-3	90.4	90.4	-
	CN-23	YANGJIANG-2	PWR	CPR-1000	2905	1086	1000 YJNPC	CFHI	2009-6	2015-3	2015-6	91.5	91.5	-
	CN-24	FANGJIASHAN-1	PWR	CPR-1000	2905	1089	1012 QNPC	NPIC	2008-12	2014-11	2014-12	91.9	92.3	-
	CN-25	FANGJIASHAN-2	PWR	CPR-1000	2905	1089	1012 QNPC	NPIC	2009-7	2015-1	2015-2	91.3	91.8	-
	CN-26	HONGYANHE-3	PWR	CPR-1000	2905	1119	1061 LHNPC	DEC	2009-3	2015-3	2015-8	89.3	90.7	-
	CN-27	HONGYANHE-4	PWR	CPR-1000	2905	1119	1061 LHNPC	DEC	2009-8	2016-4	2016-6	89.6	90.8	-
	CN-28	SANMEN-1	PWR	AP-1000	3400	1251	1157 SMNPC	WH/WHI	2009-4	2018-6	2018-9	91.2	92.1	-
	CN-29	SANMEN-2	PWR	AP-1000	3400	1251	1157 SMNPC	WH/WHI	2009-12	2018-8	2018-11	66.5	67.8	-
	CN-3	DAYA BAY-2	PWR	M310	2905	984	944 DNMC	FRAM	1988-4	1994-2	1994-5	86.6	87.7	-
	CN-30	HAIYANG-1	PWR	AP-1000	3415	1250	1170 SDNPC	WH	2009-9	2018-8	2018-10	91.5	92.3	-
	CN-31	HAIYANG-2	PWR	AP-1000	3415	1250	1170 SDNPC	WH	2010-6	2018-10	2019-1	93.1	93.9	-
	CN-32	TAISHAN-1	PWR	EPR-1750	4590	1750	1660 TNPJVC	ORANO	2009-11	2018-6	2018-12	72.5	73	-
	CN-33	TAISHAN-2	PWR	EPR-1750	4590	1750	1660 TNPJVC	ORANO	2010-4	2019-6	2019-9	89.1	90	-
	CN-34	NINGDE-3	PWR	CPR-1000	2905	1089	1018 NDNP	CFHI	2010-1	2015-3	2015-6	92	92	-
	CN-35	NINGDE-4	PWR	CPR-1000	2905	1089	1018 NDNP	CFHI	2010-9	2016-3	2016-7	93.4	93.4	-
	CN-36	CHANGJIANG-1	PWR	CNP-600	1930	650	601 HNPC	DEC	2010-4	2015-11	2015-12	88.8	88.8	-
	CN-37	CHANGJIANG-2	PWR	CNP-600	1930	650	601 HNPC	DEC	2010-11	2016-6	2016-8	89.2	89.2	-
	CN-38	FANGCHENGANG-1	PWR	CPR-1000	2905	1086	1000 GFNPC	DEC	2010-7	2015-10	2016-1	91.8	91.8	-
	CN-39	FANGCHENGANG-2	PWR	CPR-1000	2905	1086	1000 GFNPC	DEC	2010-12	2016-7	2016-10	93.2	93.2	-
	CN-4	QINSHAN 2-1	PWR	CNP-600	1930	650	610 NPQJVC	CNNC	1996-6	2002-2	2002-4	84.4	84.5	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA	
					Thermal	Gross									Net
CHINA	CN-40	YANGJIANG-3	PWR	CPR-1000	2905	1086	1000	YJNPC	CFHI	2010-11	2015-10	2016-1	91.4	91.7	-
	CN-41	YANGJIANG-4	PWR	CPR-1000	2905	1086	1000	YJNPC	CFHI	2012-11	2017-1	2017-3	90.5	90.6	-
	CN-42	FUQING-3	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2010-12	2016-9	2016-10	89.5	89.8	-
	CN-43	FUQING-4	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2012-11	2017-7	2017-9	90.7	91.1	-
	CN-44	SHIDAO BAY-1	HTGR	HTR-PM	500	211	200	HSNPC	TSINGHUA	2012-12	2021-12		0	0	-
	CN-45	TIANWAN-3	PWR	VVER V-428M	3000	1126	1060	JNPC	IZ	2012-12	2017-12	2018-2	88.7	89.3	-
	CN-46	TIANWAN-4	PWR	VVER V-428M	3000	1126	1060	JNPC	IZ	2013-9	2018-10	2018-12	91.9	91.9	-
	CN-47	YANGJIANG-5	PWR	ACPR-1000	2905	1086	1000	YJNPC	CFHI	2013-9	2018-5	2018-7	91.7	91.9	-
	CN-48	YANGJIANG-6	PWR	ACPR-1000	2905	1086	1000	YJNPC	CFHI	2013-12	2019-6	2019-7	92.4	92.4	-
	CN-49	HONGYANHE-5	PWR	ACPR-1000	2905	1119	1061	LHNPC	DEC	2015-3	2021-6	2021-7	97.7	100	-
	CN-5	QINSHAN 2-2	PWR	CNP-600	1930	650	610	NPQJVC	CNNC	1997-4	2004-3	2004-5	88.9	89	-
	CN-51	FUQING-5	PWR	HPR1000	3060	1150	1075	FQNP	NPIC	2015-5	2020-11	2021-1	91.5	92.1	-
	CN-53	TIANWAN-5	PWR	CNP-1000	2905	1118	1060	JNPC	SHE	2015-12	2020-8	2020-9	86.5	87.4	-
	CN-54	TIANWAN-6	PWR	CNP-1000	2905	1118	1060	JNPC	CFHI	2016-9	2021-5	2021-6	98.9	100	-
	CN-6	LING AO-1	PWR	M310	2905	990	950	DNMC	FRAM	1997-5	2002-2	2002-5	89.8	90.2	-
CN-7	LING AO-2	PWR	M310	2905	990	950	DNMC	FRAM	1997-11	2002-9	2003-1	90.5	90.8	-	
CN-8	QINSHAN 3-1	PHWR	CANDU 6	2064	728	677	TONPC	AECL	1998-6	2002-11	2002-12	89.7	90.2	-	
CN-9	QINSHAN 3-2	PHWR	CANDU 6	2064	728	677	TONPC	AECL	1998-9	2003-6	2003-7	91.4	91.8	-	
CN-901	CEFR	FBR	BN-20	65	25	20	CIAE	IZ	2000-5	2011-7		0	0	-	
CZECH REP.	CZ-23	TEMELIN-1	PWR	VVER V-320	3120	1082	1027	CEZ	ŠKODA	1987-2	2000-12	2002-6	75.8	76	DH
	CZ-24	TEMELIN-2	PWR	VVER V-320	3120	1082	1029	CEZ	ŠKODA	1987-2	2002-12	2003-4	77.8	78	DH
	CZ-4	DUKOVANY-1	PWR	VVER V-213	1444	500	468	CEZ	ŠKODA	1979-1	1985-2	1985-5	83.1	84	-
	CZ-5	DUKOVANY-2	PWR	VVER V-213	1444	500	471	CEZ	ŠKODA	1979-1	1986-1	1986-3	81.7	82.7	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Net	Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross									
CZECH REP.	CZ -8	DUKOVANY-3	PWR	VVER V-213	1444	500	468 CEZ	ŠKODA	1979-3	1986-11	1986-12	81.2	82.7	-	
	CZ -9	DUKOVANY-4	PWR	VVER V-213	1444	500	471 CEZ	ŠKODA	1979-3	1987-6	1987-7	83.5	84.4	-	
	FI -1	LOVIISA-1	PWR	VVER V-213	1500	531	507 FORTUMPH	AEE	1971-5	1977-2	1977-5	88	88.6	-	
	FI -2	LOVIISA-2	PWR	VVER V-213	1500	531	507 FORTUMPH	AEE	1972-8	1980-11	1981-1	89.5	90.3	-	
FINLAND	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	93.6	-	
	FR -13	BUGEY-2	PWR	CP0	2785	945	910 EDF	FRAM	1972-11	1978-5	1979-3	72.2	74.4	-	
	FR -14	BUGEY-3	PWR	CP0	2785	945	910 EDF	FRAM	1973-9	1978-9	1979-3	70.8	73.3	-	
FRANCE	FR -15	BUGEY-4	PWR	CP0	2785	917	880 EDF	FRAM	1974-6	1979-3	1979-7	74.3	76.3	-	
	FR -16	BUGEY-5	PWR	CP0	2785	917	880 EDF	FRAM	1974-7	1979-7	1980-1	72.4	74.8	-	
	FR -17	ST. LAURENT B-1	PWR	CP2	2785	956	915 EDF	FRAM	1976-5	1981-1	1983-8	75.2	77.4	-	
	FR -18	TRICASTIN-1	PWR	CP1	2785	955	915 EDF	FRAM	1974-11	1980-5	1980-12	75.2	78	-	
	FR -19	TRICASTIN-2	PWR	CP1	2785	955	915 EDF	FRAM	1974-12	1980-8	1980-12	74.9	78.4	-	
	FR -20	GRAVELINES-1	PWR	CP1	2785	951	910 EDF	FRAM	1975-2	1980-3	1980-11	74.1	76	-	
	FR -21	GRAVELINES-2	PWR	CP1	2785	951	910 EDF	FRAM	1975-3	1980-8	1980-12	76.8	79	-	
	FR -22	DAMPIERRE-1	PWR	CP1	2785	937	890 EDF	FRAM	1975-2	1980-3	1980-9	74.8	77.7	-	
	FR -23	ST. LAURENT B-2	PWR	CP2	2785	956	915 EDF	FRAM	1976-7	1981-6	1983-8	75	77.5	-	
	FR -25	TRICASTIN-3	PWR	CP1	2785	955	915 EDF	FRAM	1975-4	1981-2	1981-5	76.9	80.4	-	
FRANCE	FR -26	TRICASTIN-4	PWR	CP1	2785	955	915 EDF	FRAM	1975-5	1981-6	1981-11	78.8	81.3	-	
	FR -27	GRAVELINES-3	PWR	CP1	2785	951	910 EDF	FRAM	1975-12	1980-12	1981-6	77.4	78.9	-	
FRANCE	FR -28	GRAVELINES-4	PWR	CP1	2785	951	910 EDF	FRAM	1976-4	1981-6	1981-10	78	79.5	-	
	FR -29	DAMPIERRE-2	PWR	CP1	2785	937	890 EDF	FRAM	1975-4	1980-12	1981-2	77.1	78.8	-	
	FR -30	DAMPIERRE-3	PWR	CP1	2785	937	890 EDF	FRAM	1975-9	1981-1	1981-5	77.7	79.5	-	

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross								
FRANCE	FR -31	DAMPIERRE-4	PWR	CP1	2785	937	890 EDF	FRAM	1975-12	1981-8	1981-11	75.7	78.1	-
	FR -32	BLAYAIS-1	PWR	CP1	2785	951	910 EDF	FRAM	1977-1	1981-6	1981-12	76.8	79.6	-
	FR -33	BLAYAIS-2	PWR	CP1	2785	951	910 EDF	FRAM	1977-1	1982-7	1983-2	80.1	82.1	-
	FR -34	BLAYAIS-3	PWR	CP1	2785	951	910 EDF	FRAM	1978-4	1983-8	1983-11	78.8	80.8	-
	FR -35	BLAYAIS-4	PWR	CP1	2785	951	910 EDF	FRAM	1978-4	1983-5	1983-10	78.6	81	-
	FR -36	PALUEL-1	PWR	P4 REP 1300	3817	1382	1330 EDF	FRAM	1977-8	1984-6	1985-12	75.4	78.1	-
	FR -37	PALUEL-2	PWR	P4 REP 1300	3817	1382	1330 EDF	FRAM	1978-1	1984-9	1985-12	67	69.3	-
	FR -38	PALUEL-3	PWR	P4 REP 1300	3817	1382	1330 EDF	FRAM	1979-2	1985-9	1986-2	71.7	74.2	-
	FR -39	PALUEL-4	PWR	P4 REP 1300	3817	1382	1330 EDF	FRAM	1980-2	1986-4	1986-6	76.4	78.5	-
	FR -40	CHINON B-1	PWR	CP2	2785	954	905 EDF	FRAM	1977-3	1982-11	1984-2	76.3	78.1	-
	FR -41	CHINON B-2	PWR	CP2	2785	954	905 EDF	FRAM	1977-3	1983-11	1984-8	76.4	78.4	-
	FR -42	CRUAS-1	PWR	CP2	2785	956	915 EDF	FRAM	1978-8	1983-4	1984-4	76.2	78.7	-
	FR -43	CRUAS-2	PWR	CP2	2785	956	915 EDF	FRAM	1978-8	1983-4	1984-4	76.2	78.7	-
	FR -44	CRUAS-3	PWR	CP2	2785	956	915 EDF	FRAM	1978-11	1984-9	1985-4	77	80.2	-
	FR -45	CRUAS-4	PWR	CP2	2785	956	915 EDF	FRAM	1979-4	1984-5	1984-9	77.1	80.6	-
	FR -46	FLAMANVILLE-1	PWR	P4 REP 1300	3817	1382	1330 EDF	FRAM	1979-10	1984-10	1985-2	75.7	78.6	-
	FR -47	FLAMANVILLE-2	PWR	P4 REP 1300	3817	1382	1330 EDF	FRAM	1979-12	1985-12	1986-12	69.4	72.3	-
	FR -48	ST. ALBAN-1	PWR	P4 REP 1300	3817	1381	1335 EDF	FRAM	1980-5	1986-7	1987-3	73.7	75.6	-
	FR -49	ST. ALBAN-2	PWR	P4 REP 1300	3817	1381	1335 EDF	FRAM	1979-1	1985-8	1986-5	75	77.3	-
	FR -50	CATTENOM-1	PWR	P4 REP 1300	3817	1382	1300 EDF	FRAM	1979-7	1986-7	1987-3	75.6	78.4	-
	FR -51	GRAVELINES-5	PWR	CP1	2785	951	910 EDF	FRAM	1979-10	1986-11	1987-4	73.1	74.9	-
	FR -52	GRAVELINES-6	PWR	CP1	2785	951	910 EDF	FRAM	1979-10	1984-8	1985-1	76.4	78.1	-
	FR -53	CATTENOM-2	PWR	P4 REP 1300	3817	1382	1300 EDF	FRAM	1979-10	1985-8	1985-10	78.3	79.9	-
									1980-7	1987-9	1988-2	76.8	79.1	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross								
FRANCE	FR -54	BELLEVILLE-1	PWR	P4 REP 1300	3817	1363	1310 EDF	FRAM	1980-5	1987-10	1988-6	75.8	77.4	-
	FR -55	BELLEVILLE-2	PWR	P4 REP 1300	3817	1363	1310 EDF	FRAM	1980-8	1988-7	1989-1	77	78.9	-
	FR -56	CHINON B-3	PWR	CP2	2785	954	905 EDF	FRAM	1980-10	1988-10	1987-3	77.6	79.3	-
	FR -57	CHINON B-4	PWR	CP2	2785	954	905 EDF	FRAM	1981-2	1987-11	1988-4	78.7	80.7	-
	FR -58	NOGENT-1	PWR	P4 REP 1300	3817	1363	1310 EDF	FRAM	1981-5	1987-10	1988-2	77.7	79.7	-
	FR -59	NOGENT-2	PWR	P4 REP 1300	3817	1363	1310 EDF	FRAM	1982-1	1988-12	1989-5	80	82.3	-
	FR -60	CATTENOM-3	PWR	P4 REP 1300	3817	1362	1300 EDF	FRAM	1982-6	1990-7	1991-2	77.9	80	-
	FR -61	GOLFECH-1	PWR	P4 REP 1300	3817	1363	1310 EDF	FRAM	1982-11	1990-6	1991-2	82.9	85.8	-
	FR -62	CHOOZ B-1	PWR	N4 REP 1450	4270	1560	1500 EDF	FRAM	1984-1	1996-8	2000-5	77.6	81	-
	FR -63	PENLY-1	PWR	P4 REP 1300	3817	1382	1330 EDF	FRAM	1982-9	1990-5	1990-12	80.4	81.8	-
	FR -64	PENLY-2	PWR	P4 REP 1300	3817	1382	1330 EDF	FRAM	1984-8	1992-2	1992-11	82.4	83.7	-
	FR -65	CATTENOM-4	PWR	P4 REP 1300	3817	1362	1300 EDF	FRAM	1983-9	1991-5	1992-1	81.8	84.2	-
	FR -68	GOLFECH-2	PWR	P4 REP 1300	3817	1363	1310 EDF	FRAM	1984-10	1993-6	1994-3	82.2	83.8	-
	FR -70	CHOOZ B-2	PWR	N4 REP 1450	4270	1560	1500 EDF	FRAM	1985-12	1997-4	2000-9	75.9	83.2	-
FR -72	CIVAUX-1	PWR	N4 REP 1450	4270	1561	1495 EDF	FRAM	1988-10	1997-12	2002-1	75.2	78	-	
FR -73	CIVAUX-2	PWR	N4 REP 1450	4270	1561	1495 EDF	FRAM	1991-4	1999-12	2002-4	76.1	80.9	-	
GERMANY	DE -31	ISAR-2	PWR	Konvoi	3950	1485	1410 PElektra	KWU	1982-9	1988-1	1988-4	92.4	92.7	-
	DE -33	EMSLAND	PWR	Konvoi	3850	1406	1335 KLE	KWU	1982-8	1988-4	1988-6	93.3	93.5	-
	DE -44	NECKARWESTHEIM-2	PWR	Konvoi	3850	1400	1310 EnKK	KWU	1982-11	1989-1	1989-4	92.3	92.6	-
HUNGARY	HU -1	PAKS-1	PWR	VVER V-213	1485	509	479 PAKS Zt	AEE	1974-8	1982-12	1983-8	86.8	87	-
	HU -2	PAKS-2	PWR	VVER V-213	1485	506	479 PAKS Zt	AEE	1974-8	1984-9	1984-11	82.7	82.9	DH
	HU -3	PAKS-3	PWR	VVER V-213	1485	506	479 PAKS Zt	AEE	1979-10	1986-9	1986-12	87.5	87.9	DH
	HU -4	PAKS-4	PWR	VVER V-213	1485	506	479 PAKS Zt	AEE	1979-10	1987-8	1987-11	88.3	88.7	DH

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross								
INDIA	IN -1	TARAPUR-1	BWR	BWR-1 (Mark 2)	530	160	150	NPICL	1964-10	1969-4	1969-10	65	65.8	-
	IN -10	KAKRAPAR-2	PHWR	Horizontal Pre	801	220	202	NPICL	1985-4	1995-3	1995-9	70.3	79	-
	IN -11	RAJASTHAN-3	PHWR	Horizontal Pre	801	220	202	NPICL	1990-2	2000-3	2000-6	80.5	90.4	PH
	IN -12	RAJASTHAN-4	PHWR	Horizontal Pre	801	220	202	NPICL	1990-10	2000-11	2000-12	82.6	92.1	PH
	IN -13	KAIGA-1	PHWR	Horizontal Pre	801	220	202	NPICL	1989-9	2000-10	2000-11	77.5	91.8	-
	IN -14	KAIGA-2	PHWR	Horizontal Pre	801	220	202	NPICL	1989-12	2000-12	2000-3	76.7	90.7	-
	IN -15	KAIGA-3	PHWR	Horizontal Pre	800	220	202	NPICL	2002-3	2007-4	2007-5	72.3	83.9	-
	IN -16	KAIGA-4	PHWR	Horizontal Pre	800	220	202	NPICL	2002-5	2011-1	2011-1	86.1	91.7	-
	IN -19	RAJASTHAN-5	PHWR	Horizontal Pre	801	220	202	NPICL	2002-9	2009-12	2010-2	90.3	90.5	-
	IN -2	TARAPUR-2	BWR	BWR-1 (Mark 2)	530	160	150	NPICL	1964-10	1969-5	1969-10	65.8	66.5	-
	IN -20	RAJASTHAN-6	PHWR	Horizontal Pre	801	220	202	NPICL	2003-1	2010-3	2010-3	80.3	80.6	-
	IN -23	TARAPUR-3	PHWR	Horizontal Pre	1730	540	490	NPICL	2000-5	2006-6	2006-8	79.4	88.8	-
	IN -24	TARAPUR-4	PHWR	Horizontal Pre	1730	540	490	NPICL	2000-3	2005-6	2005-9	71.9	84.4	-
	IN -25	KUDANKULAM-1	PWR	VVER V-412	3000	1000	932	NPICL	2002-3	2013-10	2014-12	57.1	58.5	-
	IN -26	KUDANKULAM-2	PWR	VVER V-412	3000	1000	932	NPICL	2002-7	2016-8	2017-3	55.7	55.7	-
	IN -30	KAKRAPAR-3	PHWR	PHWR-700	2166	700	630	NPICL	2010-11	2021-1		0	0	-
	IN -4	RAJASTHAN-2	PHWR	Horizontal Pre	693	200	187	NPICL	1968-4	1980-11	1981-4	59.3	62.8	PH
	IN -5	MADRAS-1	PHWR	Horizontal Pre	801	220	205	NPICL	1971-1	1983-7	1984-1	51.4	60.3	DS
	IN -6	MADRAS-2	PHWR	Horizontal Pre	801	220	205	NPICL	1972-10	1985-9	1986-3	62.5	73.6	DS
IN -7	NARORA-1	PHWR	Horizontal Pre	801	220	202	NPICL	1976-12	1989-7	1991-1	63.3	74.1	-	
IN -8	NARORA-2	PHWR	Horizontal Pre	801	220	202	NPICL	1977-11	1992-1	1992-7	65.1	75.2	-	
IN -9	KAKRAPAR-1	PHWR	Horizontal Pre	801	220	202	NPICL	1984-12	1992-11	1993-5	62.2	67.1	-	
IRAN/ISL REP	IR -1	BUSHEHR-1	PWR	VVER V-446	3000	1000	915	NPPDCO	1975-5	2011-9	2013-9	71.4	71.9	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA	
					Thermal	Gross									Net
JAPAN	JP -13	TAKAHAMA-2	PWR	M (3-loop)	2440	826	780	KEPCO	MHI	1971-3	1975-1	1975-11	53.7	53.8	-
	JP -14	MIHAMA-3	PWR	M (3-loop)	2440	826	780	KEPCO	MHI	1972-8	1976-2	1976-12	54.9	54.9	-
	JP -21	TOKAI-2	BWR	BWR-5	3293	1100	1080	JAPCO	GE	1973-10	1978-3	1978-11	54.4	54.9	-
	JP -28	SENDAI-1	PWR	M (3-loop)	2660	890	846	KYUSHU	MHI	1979-12	1983-9	1984-7	71.4	71.4	-
	JP -29	TAKAHAMA-3	PWR	M (3-loop)	2660	870	830	KEPCO	MHI	1980-12	1984-5	1985-1	71	71.1	DS
	JP -30	TAKAHAMA-4	PWR	M (3-loop)	2660	870	830	KEPCO	MHI	1981-3	1984-11	1985-6	72.1	72.1	DS
	JP -33	KASHIWAZAKI KARIWA-1	BWR	BWR-5	3293	1100	1067	TEPCO	TOSHIBA	1980-6	1985-2	1985-9	47	47.8	-
	JP -34	TSURUGA-2	PWR	M (4-loop)	3411	1180	1108	JAPCO	MHI	1982-11	1986-6	1987-2	54	54.1	-
	JP -36	HAMAOKA-3	BWR	BWR-5	3293	1100	1056	CHUBU	TOSHIBA	1983-4	1987-1	1987-8	53.1	53.2	-
	JP -37	SENDAI-2	PWR	M (3-loop)	2660	890	846	KYUSHU	MHI	1981-10	1985-4	1985-11	73.1	73.1	-
	JP -39	KASHIWAZAKI KARIWA-2	BWR	BWR-5	3293	1100	1067	TEPCO	TOSHIBA	1985-11	1990-2	1990-9	40.3	40.3	-
	JP -40	KASHIWAZAKI KARIWA-5	BWR	BWR-5	3293	1100	1067	TEPCO	HITACHI	1985-6	1989-9	1990-4	45.8	47.4	-
	JP -41	SHIMANE-2	BWR	BWR-5	2436	820	789	CHUGOKU	HITACHI	1985-2	1988-7	1989-2	56.1	56.1	-
	JP -43	TOMARI-1	PWR	M (2-loop)	1650	579	550	HEPCO	MHI	1985-4	1988-12	1989-6	57	57	-
	JP -44	TOMARI-2	PWR	M (2-loop)	1650	579	550	HEPCO	MHI	1985-6	1990-8	1991-4	55.1	55.1	-
	JP -45	GENKAI-3	PWR	M (4-loop)	3423	1180	1127	KYUSHU	MHI	1988-6	1993-6	1994-3	63.3	63.3	DS
	JP -46	GENKAI-4	PWR	M (4-loop)	3423	1180	1127	KYUSHU	MHI	1992-7	1996-11	1997-7	63.2	63.2	DS
	JP -47	IKATA-3	PWR	M (3-loop)	2660	890	846	SHIKOKU	MHI	1990-10	1994-3	1994-12	64.1	64.1	DS
	JP -48	SHIKA-1	BWR	BWR-5	1593	540	505	HOKURIKU	HITACHI	1989-7	1993-1	1993-7	44.1	44.1	-
	JP -49	HAMAOKA-4	BWR	BWR-5	3293	1137	1092	CHUBU	TOSHIBA	1989-10	1993-1	1993-9	49.8	50.3	-
	JP -50	OHI-3	PWR	M (4-loop)	3423	1180	1127	KEPCO	MHI	1987-10	1991-6	1991-12	64.5	64.6	DS
	JP -51	OHI-4	PWR	M (4-loop)	3423	1180	1127	KEPCO	MHI	1988-6	1992-6	1993-2	69.5	69.5	DS
	JP -52	KASHIWAZAKI KARIWA-3	BWR	BWR-5	3293	1100	1067	TEPCO	TOSHIBA	1989-3	1992-12	1993-8	37	37.7	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Net	Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA	
					Thermal	Gross										
JAPAN	JP -53	KASHIWAZAKI KARIWA-4	BWR	BWR-5	3293	1100	1067	TEPCO	HITACHI	1990-3	1993-12	1994-8	35.3	37	-	
	JP -54	ONAGAWA-2	BWR	BWR-5	2436	825	796	TOHOKU	TOSHIBA	1991-4	1994-12	1995-7	43.5	46.8	-	
	JP -55	KASHIWAZAKI KARIWA-6	BWR	ABWR	3926	1356	1315	TEPCO	TOSHIBA	1992-11	1996-1	1996-11	44.3	45.9	-	
	JP -56	KASHIWAZAKI KARIWA-7	BWR	ABWR	3926	1356	1315	TEPCO	HITACHI	1993-7	1996-12	1997-7	40	41.5	-	
	JP -57	ONAGAWA-3	BWR	BWR-5	2436	825	796	TOHOKU	TOSHIBA	1998-1	2001-5	2002-1	30.7	33.9	-	
	JP -58	HIGASHI DORI-1 (TOHOKU)	BWR	BWR-5	3293	1100	1067	TOHOKU	TOSHIBA	2000-11	2005-3	2005-12	26.6	26.6	-	
	JP -59	SHIKA-2	BWR	ABWR	3926	1206	1108	HOKURIKU	HITACHI	2001-8	2005-7	2006-3	16.3	16.3	-	
	JP -60	HAMAOKA-5	BWR	ABWR	3926	1380	1325	CHUBU	TOSHIBA	2000-7	2004-4	2005-1	17.3	20.6	-	
	JP -64	TOMARI-3	PWR	M (3-loop)	2660	912	866	HEPCO	MHI	2004-11	2009-3	2009-12	18.1	18.1	-	
	JP -8	TAKAHAMA-1	PWR	M (3-loop)	2440	826	780	KEPCO	WH/MIHI	1970-4	1974-3	1974-11	53.3	53.3	-	
	KOREA, REP. OF	KR -10	HANUL-2	PWR	France CPI	2775	1010	967	KHNP	FRAM	1983-7	1989-4	1989-9	86.4	86.7	-
		KR -11	HANBIT-3	PWR	OPR-1000	2825	1041	986	KHNP	DHICKAEC	1989-12	1994-10	1995-3	78.4	78.5	-
		KR -12	HANBIT-4	PWR	OPR-1000	2825	1022	970	KHNP	DHICKAEC	1990-5	1995-7	1996-1	72.8	73	-
		KR -13	HANUL-3	PWR	OPR-1000	2825	1051	997	KHNP	DHICKOPC	1993-7	1998-1	1998-8	85	85.2	-
		KR -14	HANUL-4	PWR	OPR-1000	2825	1053	999	KHNP	DHICKOPC	1993-11	1998-12	1999-12	80.3	80.4	-
		KR -15	WOLSONG-3	PHWR	CANDU 6	2061	628	607	KHNP	AECL/DHI	1994-3	1998-3	1998-7	85.3	86.7	-
		KR -16	WOLSONG-4	PHWR	CANDU 6	2061	595	575	KHNP	AECL/DHI	1994-7	1999-5	1999-10	90.3	91.1	-
		KR -17	HANBIT-5	PWR	OPR-1000	2825	1050	992	KHNP	DHICKOPC	1997-6	2001-12	2002-5	80.6	80.8	-
		KR -18	HANBIT-6	PWR	OPR-1000	2825	1053	993	KHNP	DHICKOPC	1997-11	2002-9	2002-12	85.4	85.7	-
		KR -19	HANUL-5	PWR	OPR-1000	2825	1049	998	KHNP	DHICKOPC	1999-10	2003-12	2004-7	89	89.2	-
	KR -2	KORI-2	PWR	WHF	1882	681	640	KHNP	WH	1977-12	1983-4	1983-7	84.5	84.8	-	
KR -20	HANUL-6	PWR	OPR-1000	2825	1050	997	KHNP	DHICKOPC	2000-9	2005-1	2005-4	89	89.1	-		
KR -21	SHIN-KORI-1	PWR	OPR-1000	2825	1046	996	KHNP	DHICKOPC	2006-6	2010-8	2011-2	74.2	75.3	-		

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Net	Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross									
KOREA, REP. OF	KR -22	SHIN-KORI-2	PWR	OPR-1000	2825	1047	996	KHNP	DHICKOPC	2007-6	2012-1	2012-7	81.9	83.1	-
	KR -23	SHIN-WOLSONG-1	PWR	OPR-1000	2825	1048	997	KHNP	DHICKOPC	2007-11	2012-1	2012-7	81.8	82.1	-
	KR -24	SHIN-WOLSONG-2	PWR	OPR-1000	2825	1050	993	KHNP	DHICKOPC	2008-9	2015-2	2015-7	83.3	83.5	-
	KR -25	SHIN-KORI-3	PWR	APR-1400	3983	1488	1416	KHNP	DHICKOPC	2008-10	2016-1	2016-12	76.2	76.3	-
	KR -26	SHIN-KORI-4	PWR	APR-1400	3983	1493	1418	KHNP	DHICKOPC	2008-8	2019-4	2019-8	79.2	79.3	-
	KR -4	WOLSONG-2	PHWR	CANDU 6	2061	592	582	KHNP	AECL/DHI	1992-9	1997-4	1997-7	89.5	90.7	-
	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	83.6	84	-
	KR -7	HANBIT-1	PWR	WH F	2787	1025	995	KHNP	WH	1981-6	1986-3	1986-8	84.2	84.4	-
KR -8	HANBIT-2	PWR	WH F	2787	1025	988	KHNP	WH	1981-12	1986-11	1987-6	83.4	83.6	-	
KR -9	HANUL-1	PWR	France CPI	2775	1013	966	KHNP	FRAM	1983-1	1988-4	1988-9	85.6	86	-	
MEXICO	MX -1	LAGUNA VERDE-1	BWR	BWR-5	2317	805	777	CFE	GE	1976-9	1989-4	1990-7	80.4	81.7	-
	MX -2	LAGUNA VERDE-2	BWR	BWR-5	2317	803	775	CFE	GE	1977-6	1994-11	1995-4	82.9	83.9	-
NETHERLANDS	NL -2	BORSSELE	PWR	KWU 2LP	1366	515	482	EPZ	S/KWU	1969-7	1973-7	1973-10	84.9	85.3	-
PAKISTAN	PK -2	CHASNUPP-1	PWR	CNP-300	999	325	300	PAEC	CNNC	1993-8	2000-6	2000-9	78	78.4	-
	PK -3	CHASNUPP-2	PWR	CNP-300	999	325	300	PAEC	CNNC	2005-12	2011-3	2011-5	86.3	86.5	-
	PK -4	CHASNUPP-3	PWR	CNP-300	999	340	315	PAEC	CNNC	2011-5	2016-10	2016-12	89.6	90.3	-
	PK -5	CHASNUPP-4	PWR	CNP-300	999	340	313	PAEC	CNNC	2011-12	2017-6	2017-9	88.5	89.1	-
	PK -6	KANUPP-2	PWR	ACP-1000	3060	1100	1014	PAEC	CZEC	2015-8	2021-3	2021-5	98.6	98.6	-
ROMANIA	RO -1	CERNAVODA-1	PHWR	CANDU 6	2180	706	650	SNN	AECL	1983-3	1996-7	1996-12	89.9	90.9	DH
	RO -2	CERNAVODA-2	PHWR	CANDU 6	2180	705	650	SNN	AECL	1983-7	2007-8	2007-11	93.6	94.5	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
	RU -116	BELOYARSK-4	FBR	BN-800	2100	885	820	REA	AEM	2006-7	2015-12	2016-10	65.9	67	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross								
RUSSIA	RU-12	KOLA-1	PWR	VVER V-230	1375	440	411 REA	AEM	1970-5	1973-6	1973-12	72.2	77.4	DH, PH
	RU-13	KOLA-2	PWR	VVER V-230	1375	440	411 REA	AEM	1970-5	1974-12	1975-2	72.9	77.4	DH, PH
	RU-142	BILIBINO-2	LWGR	EGP-6	62	12	11 REA	AEM	1970-1	1974-12	1975-2	72.9	81.6	DH
	RU-143	BILIBINO-3	LWGR	EGP-6	62	12	11 REA	AEM	1970-1	1975-12	1976-2	73.2	81.9	DH
	RU-144	BILIBINO-4	LWGR	EGP-6	62	12	11 REA	AEM	1970-1	1976-12	1977-1	71.8	80.1	DH
	RU-151	AKADEMIK LOMONOSOV-1	PWR	KLt-40S 'Fibrot	150	35	32 REA	AEM	2007-4	2019-12	2020-5	87	87	-
	RU-152	AKADEMIK LOMONOSOV-2	PWR	KLt-40S 'Fibrot	150	35	32 REA	AEM	2007-4	2019-12	2020-5	83.5	83.5	-
	RU-161	NOVOVORONEZH 2-1	PWR	VVER V-392M	3200	1180	1100 REA	AEM	2008-6	2016-8	2017-2	76.3	78.2	-
	RU-162	NOVOVORONEZH 2-2	PWR	VVER V-392M	3200	1181	1101 REA	AEM	2009-7	2019-5	2019-10	79.6	81.8	-
	RU-163	LENINGRAD 2-1	PWR	VVER V-491	3200	1188	1101 REA	AEM	2008-10	2018-3	2018-10	79.4	80.6	-
	RU-164	LENINGRAD 2-2	PWR	VVER V-491	3200	1188	1101 REA	AEM	2010-4	2020-10	2021-3	88.4	91	-
	RU-20	NOVOVORONEZH-5	PWR	VVER V-187	3000	1000	950 REA	AEM	1974-3	1980-5	1981-2	67	67.8	DH, PH
	RU-21	BELOYARSK-3	FBR	BN-600	1470	600	560 REA	AEM	1969-1	1980-4	1981-11	75.9	76.4	DH, PH
	RU-22	KURSK-2	LWGR	RBMK-1000	3200	1000	925 REA	AEM	1973-1	1979-1	1979-8	64.1	66	DH, PH
	RU-23	SMOLENSK-1	LWGR	RBMK-1000	3200	1000	925 REA	AEM	1975-10	1982-12	1983-9	74.2	75.9	DH, PH
	RU-24	SMOLENSK-2	LWGR	RBMK-1000	3200	1000	925 REA	AEM	1976-6	1985-5	1985-7	75.9	77.8	DH, PH
	RU-30	KALININ-1	PWR	VVER V-338	3000	1000	950 REA	AEM	1977-2	1984-5	1985-6	74.5	75.2	DH, PH
	RU-31	KALININ-2	PWR	VVER V-338	3000	1000	950 REA	AEM	1982-2	1986-12	1987-3	77.7	79.6	DH, PH
	RU-32	KOLA-3	PWR	VVER V-213	1375	440	411 REA	AEM	1977-4	1981-3	1982-12	76.6	82.4	DH, PH
	RU-33	KOLA-4	PWR	VVER V-213	1375	440	411 REA	AEM	1976-8	1984-10	1984-12	76.7	82.3	DH, PH
	RU-34	LENINGRAD-3	LWGR	RBMK-1000	3200	1000	925 REA	AEM	1973-12	1979-12	1980-6	73.4	74.2	DH, PH
	RU-35	LENINGRAD-4	LWGR	RBMK-1000	3200	1000	925 REA	AEM	1975-2	1981-2	1981-8	74.8	75.7	DH, PH
	RU-36	KALININ-3	PWR	VVER V-320	3200	1000	950 REA	AEM	1985-10	2004-12	2005-11	84.3	84.4	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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA	
					Thermal	Gross									Net
RUSSIA	RU -37	KALININ-4	PWR	VVER V-320	3200	1000	950 REA	AEM	1986-8	2011-11	2012-12	88.6	88.6	DH, PH	
	RU -38	KURSK-3	LWGR	RBMK-1000	3200	1000	925 REA	AEM	1978-4	1983-10	1984-3	73.9	75	DH, PH	
	RU -39	KURSK-4	LWGR	RBMK-1000	3200	1000	925 REA	AEM	1981-5	1985-12	1986-2	77.5	78.5	DH, PH	
	RU -59	ROSTOV-1	PWR	VVER V-320	3200	1041	989 REA	AEM	1981-9	2001-3	2001-12	87.9	88.3	-	
	RU -62	ROSTOV-2	PWR	VVER V-320	3200	1000	950 REA	AEM	1983-5	2010-3	2010-12	88.9	89.2	-	
	RU -63	ROSTOV-3	PWR	VVER V-320	3000	1000	950 REA	AEM	2009-9	2014-12	2015-9	85	86.1	-	
	RU -64	ROSTOV-4	PWR	VVER V-320	3000	1030	979 REA	AEM	2010-6	2018-2	2018-9	90.7	92.4	-	
	RU -67	SMOLENSK-3	LWGR	RBMK-1000	3200	1000	925 REA	AEM	1984-5	1990-1	1990-10	79.1	80.7	DH, PH	
	RU -96	BALAKOVO-1	PWR	VVER V-320	3000	1000	950 REA	AEM	1980-12	1985-12	1986-5	74.5	76.3	DH, PH	
	RU -97	BALAKOVO-2	PWR	VVER V-320	3000	1000	950 REA	AEM	1981-8	1987-10	1988-1	74.1	76.4	DH, PH	
	RU -98	BALAKOVO-3	PWR	VVER V-320	3000	1000	950 REA	AEM	1982-11	1988-12	1989-4	76.5	79.4	DH, PH	
	RU -99	BALAKOVO-4	PWR	VVER V-320	3200	1000	950 REA	AEM	1984-4	1993-4	1993-12	81	84.1	DH, PH	
	SLOVAKIA	SK -13	BOHUNICE-3	PWR	VVER V-213	1471	500	466 SE	ŠKODA	1976-12	1984-8	1985-2	81.7	84.9	DH, PH
		SK -14	BOHUNICE-4	PWR	VVER V-213	1471	500	466 SE	ŠKODA	1976-12	1985-8	1985-12	82.7	85.8	DH, PH
SK -6		MOCHOVCE-1	PWR	VVER V-213	1471	500	467 SE	ŠKODA	1983-10	1998-7	1998-10	86.9	88.4	-	
SK -7		MOCHOVCE-2	PWR	VVER V-213	1471	500	469 SE	ŠKODA	1983-10	1999-12	2000-4	87.3	88.6	-	
SLOVENIA	SI -1	KRSKO	PWR	WH 2LP	1994	727	688 NEK	WH	1975-3	1981-10	1983-1	86.5	87.5	-	
	ZA -1	KOEBERG-1	PWR	CP1	2775	970	924 ESKOM	FRAM	1976-7	1984-4	1984-7	73.4	76.6	-	
SOUTH AFRICA	ZA -2	KOEBERG-2	PWR	CP1	2775	970	930 ESKOM	FRAM	1976-7	1985-7	1985-11	74.2	80.1	-	
	ES -10	COFRENTES	BWR	BWR-6 (Mark 3)	3237	1102	1064 ID	GE	1975-9	1984-10	1985-3	87.4	88.4	-	
SPAIN	ES -11	TRILLO-1	PWR	PWR 3 loops	3010	1066	1003 CNAT	KWU	1979-8	1988-5	1988-8	87.3	87.8	-	
	ES -16	VANDELLOS-2	PWR	WH 3LP	2941	1087	1045 ANAV	WH	1980-12	1987-12	1988-3	82.4	83.4	-	
	ES -6	ALMARAZ-1	PWR	WH 3LP	2947	1049	1011 CNAT	WH	1973-7	1981-5	1983-9	86	87.1	-	

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Net	Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross									
SPAIN	ES-7	ALMARAZ-2	PWR	WH 3LP	2947	1044	1006	CNAT	WH	1973-7	1983-10	1984-7	87.6	88.7	-
	ES-8	ASCO-1	PWR	WH 3LP	2941	1033	995	ANAV	WH	1974-5	1983-8	1984-12	85.5	86.1	-
	ES-9	ASCO-2	PWR	WH 3LP	2941	1027	997	ANAV	WH	1975-3	1985-10	1986-3	87.6	88.5	-
	SE-10	RINGHALS-4	PWR	WH 3LP	3300	1171	1130	RAB	WH	1973-11	1982-6	1983-11	83.1	85.3	-
	SE-11	FORSMARK-2	BWR	AA-III, BWR-25	3253	1157	1118	FKA	ABB ATOM	1975-1	1981-1	1981-7	82.8	84.6	-
SWEDEN	SE-12	OSKARSHAMIN-3	BWR	AA-IV, BWR-300	3900	1450	1400	OKG	ABB ATOM	1980-5	1985-3	1985-8	81.1	82.3	-
	SE-14	FORSMARK-3	BWR	AA-IV, BWR-300	3300	1195	1172	FKA	ABB ATOM	1979-1	1985-3	1985-8	85.4	87.5	-
	SE-7	RINGHALS-3	PWR	WH 3LP	3135	1117	1072	RAB	WH	1972-9	1980-9	1981-9	78.3	80.2	-
	SE-9	FORSMARK-1	BWR	AA-III, BWR-25	2927	1027	990	FKA	ABB ATOM	1973-6	1980-6	1980-12	84.6	86.6	-
	CH-1	BEZNAU-1	PWR	WH 2LP	1130	380	365	Axpo AG	WH	1965-9	1969-7	1969-12	80.6	80.9	DH
SWITZERLAND	CH-3	BEZNAU-2	PWR	WH 2LP	1130	380	365	Axpo AG	WH	1968-1	1971-10	1972-3	87.5	87.7	DH
	CH-4	GOESGEN	PWR	PWR 3 Loop	3002	1060	1010	KKG	KWU	1973-12	1979-2	1979-11	89	89.8	PH
	CH-5	LEIBSTADT	BWR	BWR-6	3600	1275	1220	KKL	GETSCO	1974-1	1984-5	1984-12	82	83.6	-
	AE-01	BARAKAH-1	PWR	APR-1400	3983	1417	1417	NAWAH	KEPCO	2012-7	2020-8	2021-4	85.4	86	-
	AE-02	BARAKAH-2	PWR	APR-1400	3983	1417	1345	NAWAH	KEPCO	2013-4	2021-9		0	0	-
UK	GB-16A	HINKLEY POINT B-1	GCR	AGR	1494	655	485	EDF UK	TNPG	1967-9	1976-10	1978-10	75.4	75.9	-
	GB-16B	HINKLEY POINT B-2	GCR	AGR	1494	655	480	EDF UK	TNPG	1967-9	1976-2	1976-9	74	74.9	-
	GB-17B	HUNTERSTON B-2	GCR	AGR	1496	644	495	EDF UK	TNPG	1967-11	1977-3	1977-4	71.4	71.5	-
	GB-19A	HARTLEPOOL A-1	GCR	AGR	1500	655	590	EDF UK	NPC	1968-10	1983-8	1989-4	69.8	70	-
	GB-19B	HARTLEPOOL A-2	GCR	AGR	1500	655	595	EDF UK	NPC	1968-10	1984-10	1989-4	71.1	71.3	-
UAE	GB-20A	HEYSHAM A-1	GCR	AGR	1500	625	485	EDF UK	NPC	1970-12	1983-7	1989-4	68	68.2	-
	GB-20B	HEYSHAM A-2	GCR	AGR	1500	625	575	EDF UK	NPC	1970-12	1984-10	1989-4	67.1	67.6	-
	GB-22A	HEYSHAM B-1	GCR	AGR	1550	680	620	EDF UK	NPC	1980-8	1988-7	1989-4	78.8	79.4	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Net	Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross									
UK	GB-22B	HEYSHAM B-2	GCR	AGR	1550	680	620	EDF UK	NPC	1980-8	1988-11	1989-4	78	78.9	-
	GB-23A	TORNESS-1	GCR	AGR	1623	682	595	EDF UK	NNC	1980-8	1988-5	1988-5	77.4	79	-
	GB-23B	TORNESS-2	GCR	AGR	1623	682	605	EDF UK	NNC	1980-8	1989-2	1989-2	77.1	78.1	-
	GB-24	SIZEWELL B	PWR	SNUPPS	3425	1250	1198	EDF UK	PPC	1988-7	1995-2	1995-9	83.6	84.4	-
	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	ROVNO-1	PWR	VVER V-213	1375	420	381	NNEGC	PAIP	1973-8	1980-12	1981-9	79.2	80	DH
	UA-28	ROVNO-2	PWR	VVER V-213	1375	415	376	NNEGC	PAIP	1973-10	1981-12	1982-7	80.4	81.5	DH
	UA-29	ROVNO-3	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1980-2	1986-12	1987-5	69	71	DH
USA	UA-40	KHEMELITSKI-1	PWR	VVER V-320	3000	1000	950	NNEGC	PAIP	1981-11	1987-12	1988-8	71.5	72.7	DH
	UA-41	KHEMELITSKI-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	ROVNO-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
	US-220	NINE MILE POINT-1	BWR	BWR-2 (Mark 1)	1850	642	613	EXELON	GE	1965-4	1969-11	1969-12	79.2	79.2	-
	US-237	DRESDEN-2	BWR	BWR-3 (Mark 1)	2957	950	894	EXELON	GE	1966-1	1970-4	1970-6	82.4	82.4	-
US-244	GINNA	PWR	WH 2LP (DRYAMB)	1775	608	560	EXELON	WH	1966-4	1969-12	1970-7	87.4	87.4	-	
US-249	DRESDEN-3	BWR	BWR-3 (Mark 1)	2957	935	879	EXELON	GE	1966-10	1971-7	1971-11	80	80	-	

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross								
USA	US -250	TURKEY POINT-3	PWR	WH 3LP (DRYAMB)	2644	829	837	FPL	1967-4	1972-4	1972-11	80.2	80.3	-
	US -251	TURKEY POINT-4	PWR	WH 3LP (DRYAMB)	2644	829	821	FPL	1967-4	1973-6	1973-9	80.8	80.8	-
	US -254	QUAD CITIES-1	BWR	BWR-3 (Mark 1)	2957	940	908	EXELON	1967-2	1972-4	1973-2	82.6	82.6	-
	US -255	PALISADES	PWR	CE 2LP (DRYAMB)	2565	850	805	ENTERGY	1967-3	1971-12	1971-12	74.6	75.4	-
	US -259	BROWNS FERRY-1	BWR	BWR-4 (Mark 1)	3458	1256	1200	TVA	1967-5	1973-10	1974-12	78.2	78.5	-
	US -260	BROWNS FERRY-2	BWR	BWR-4 (Mark 1)	3458	1259	1200	TVA	1967-5	1974-8	1975-3	83.1	83.3	-
	US -261	ROBINSON-2	PWR	WH 3LP (DRYAMB)	2339	780	741	PROGRESS	1967-4	1970-9	1971-3	81	81.2	-
	US -263	MONTICELLO	BWR	BWR-3 (Mark 1)	2004	691	628	NSP	1967-6	1971-3	1971-6	86	86.1	-
	US -265	QUAD CITIES-2	BWR	BWR-3 (Mark 1)	2957	940	911	EXELON	1967-2	1972-5	1973-3	81.5	82	-
	US -266	POINT BEACH-1	PWR	WH 2LP (DRYAMB)	1800	640	591	NEXTERA	1967-7	1970-11	1970-12	85.9	86.2	-
	US -269	OCONEE-1	PWR	B&W LLP (DRYAMB)	2568	891	847	DUKEENER	1967-11	1973-5	1973-7	83	83.2	-
	US -270	OCONEE-2	PWR	B&W LLP (DRYAMB)	2568	891	848	DUKEENER	1967-11	1973-12	1974-9	84.7	84.9	-
	US -272	SALEM-1	PWR	WH 4LP (DRYAMB)	3459	1254	1169	PSEG	1968-9	1976-12	1977-6	73.7	73.8	-
	US -275	DIABLO CANYON-1	PWR	WH 4LP (DRYAMB)	3411	1197	1138	PG&E	1968-4	1984-11	1985-5	88.4	88.5	-
	US -277	PEACH BOTTOM-2	BWR	BWR-4 (Mark 1)	3951	1412	1300	EXELON	1968-1	1974-2	1974-7	80.3	80.4	-
	US -278	PEACH BOTTOM-3	BWR	BWR-4 (Mark 1)	3951	1412	1331	EXELON	1968-1	1974-9	1974-12	80.6	80.7	-
	US -280	SURRY-1	PWR	WH 3LP (DRYSUB)	2587	890	838	DOMINION	1968-6	1972-7	1972-12	79.5	79.5	-
	US -281	SURRY-2	PWR	WH 3LP (DRYSUB)	2587	890	838	DOMINION	1968-6	1973-3	1973-5	80	80	-
	US -282	PRAIRIE ISLAND-1	PWR	WH 2LP (DRYAMB)	1677	566	522	NSP	1968-6	1973-12	1973-12	87.5	87.5	-
	US -287	OCONEE-3	PWR	B&W LLP (DRYAMB)	2588	900	859	DUKEENER	1967-11	1974-9	1974-12	83.9	84.1	-
	US -286	BROWNS FERRY-3	BWR	BWR-4 (Mark 1)	3458	1260	1210	TVA	1968-7	1976-9	1977-3	85.4	85.7	-
	US -288	COOPER	BWR	BWR-4 (Mark 1)	2419	801	769	ENTERGY	1968-6	1974-5	1974-7	80.1	80.2	-
	US -301	POINT BEACH-2	PWR	WH 2LP (DRYAMB)	1800	640	591	NEXTERA	1968-7	1972-8	1972-10	86.9	86.9	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Net	Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross									
USA	US -306	PRAIRIE ISLAND-2	PWR	WH 2LP (DRYAMB)	1677	560	519	NSP	WH	1969-6	1974-12	1974-12	88.3	88.3	-
	US -311	SALEM-2	PWR	WH 4LP (DRYAMB)	3459	1200	1158	PSEG	WH	1968-9	1981-6	1981-10	76.3	76.3	-
	US -313	ANO-1	PWR	B&W LLP (DRYAM)	2568	903	836	ENTERGY	B&W	1968-10	1974-8	1974-12	81.6	82	-
	US -315	COOK-1	PWR	WH 4LP (ICECDN)	3304	1131	1030	AEP	WH	1969-3	1975-2	1975-8	73.4	73.6	-
	US -316	COOK-2	PWR	WH 4LP (ICECDN)	3468	1231	1168	AEP	WH	1969-3	1978-3	1978-7	74.6	74.7	-
	US -317	CALVERT CLIFFS-1	PWR	CE 2LP (DRYAMB)	2737	918	877	EXELON	CE	1968-6	1975-1	1975-5	82.3	82.5	-
	US -318	CALVERT CLIFFS-2	PWR	CE 2LP (DRYAMB)	2737	911	865	EXELON	CE	1968-6	1976-12	1977-4	85.2	85.3	-
	US -321	HATCH-1	BWR	BWR-4 (Mark 1)	2804	911	876	SOUTHERN	GE	1968-9	1974-11	1975-12	84	84	-
	US -323	DIABLO CANYON-2	PWR	WH 4LP (DRYAMB)	3411	1197	1118	PG&E	WH	1970-12	1985-10	1986-3	88.3	88.4	-
	US -324	BRUNSWICK-2	BWR	BWR-4 (Mark 1)	2923	960	932	PROGRESS	GE	1970-2	1975-4	1975-11	78.4	78.7	-
	US -325	BRUNSWICK-1	BWR	BWR-4 (Mark 1)	2923	990	938	PROGRESS	GE	1970-2	1976-12	1977-3	79.4	79.7	-
	US -327	SEQUOYAH-1	PWR	WH 4LP (ICECDN)	3455	1221	1152	TVA	WH	1970-5	1980-7	1981-7	77.4	77.4	-
	US -328	SEQUOYAH-2	PWR	WH 4LP (ICECDN)	3455	1200	1139	TVA	WH	1970-5	1981-12	1982-6	80.6	80.6	-
	US -333	FITZPATRICK	BWR	BWR-4 (Mark 1)	2536	849	813	EXELON	GE	1968-9	1975-2	1975-7	81.7	81.8	-
	US -334	BEAVER VALLEY-1	PWR	WH 3LP (DRYSUB)	2900	959	908	FENOC	WH	1970-6	1976-6	1976-10	78.8	78.8	-
	US -335	ST. LUCIE-1	PWR	CE 2LP (DRYAMB)	3020	1045	981	FPL	CE	1970-7	1976-5	1976-12	83.6	83.8	-
	US -336	MILLSTONE-2	PWR	CE 2LP (DRYAMB)	2700	918	869	DOMINION	CE	1969-11	1975-11	1975-12	73	73.5	-
	US -338	NORTH ANNA-1	PWR	WH 3LP (DRYSUB)	2940	990	948	DOMINION	WH	1971-2	1978-4	1978-6	84.6	85.1	-
	US -339	NORTH ANNA-2	PWR	WH 3LP (DRYSUB)	2940	1011	944	DOMINION	WH	1971-2	1980-8	1980-12	87.2	87.9	-
	US -341	FERMI-2	BWR	BWR-4 (Mark 1)	3486	1198	1115	DTEDISON	GE	1972-9	1986-9	1988-1	80.5	80.5	-
	US -346	DAVIS BESSE-1	PWR	B&W RLP (DRYAM)	2817	925	894	FENOC	B&W	1970-9	1977-8	1978-7	74.7	74.8	-
	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	91.9	91.9	-

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA
					Thermal	Gross								
USA	US -353	LIMERICK-2	BWR	BWR-4 (Mark 2)	3515	1194	1134 EXELON	GE	1974-6	1989-9	1990-1	93.8	93.8	-
	US -354	HOPE CREEK-1	BWR	BWR-4 (Mark 1)	3840	1240	1172 PSEG	GE	1976-3	1986-8	1986-12	88.6	88.6	-
	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	85.6	85.6	-
	US -368	ANO-2	PWR	CE 2LP (DRYAMB)	3026	1065	988 ENTERGY	CE	1988-12	1978-12	1980-3	84.1	84.2	-
	US -369	MCGUIRE-1	PWR	WH 4LP (ICECND)	3411	1215	1158 DUKEENER	WH	1971-4	1981-9	1981-12	84.2	84.5	-
	US -370	MCGUIRE-2	PWR	WH 4LP (ICECND)	3411	1215	1158 DUKEENER	WH	1971-4	1983-5	1984-3	87.1	87.1	-
	US -373	LASALLE-1	BWR	BWR-5 (Mark 2)	3546	1207	1137 EXELON	GE	1973-9	1982-9	1984-1	82.6	82.6	-
	US -374	LASALLE-2	BWR	BWR-5 (Mark 2)	3546	1207	1140 EXELON	GE	1973-9	1984-4	1984-10	81.8	81.8	-
	US -382	WATERFORD-3	PWR	CE 2LP (DRYAMB)	3716	1250	1168 ENTERGY	CE	1974-11	1985-3	1985-9	87.7	88	-
	US -387	SUSQUEHANNA-1	BWR	BWR-4 (Mark 2)	3952	1330	1257 PPL_SUSQ	GE	1973-11	1982-11	1983-6	85.8	85.8	-
	US -388	SUSQUEHANNA-2	BWR	BWR-4 (Mark 2)	3952	1330	1257 PPL_SUSQ	GE	1973-11	1984-7	1985-2	88.7	88.7	-
	US -389	ST. LUCIE-2	PWR	CE 2LP (DRYAMB)	3020	1050	987 FPL	CE	1977-6	1983-6	1983-8	86.6	86.9	-
	US -390	WATTS BAR-1	PWR	WH 4LP (ICECND)	3459	1210	1157 TVA	WH	1973-7	1996-2	1996-5	90	90.1	-
	US -391	WATTS BAR-2	PWR	WH 4LP (ICECND)	3411	1218	1164 TVA	WH	1973-9	2016-6	2016-10	84.7	84.7	-
	US -395	SUMMER-1	PWR	WH 3LP (DRYAMB)	2900	1006	973 SCE&G	WH	1973-3	1982-11	1984-1	86	86	-
US -397	COLUMBIA	BWR	BWR-5 (Mark 2)	3486	1190	1131 ENERGYNW	GE	1972-8	1984-5	1984-12	81.6	82.2	-	
US -400	HARRIS-1	PWR	WH 3LP (DRYAMB)	2900	980	964 PROGRESS	WH	1978-1	1987-1	1987-5	89.5	89.6	-	
US -410	NINE MILE POINT-2	BWR	BWR-5 (Mark 2)	3988	1320	1277 EXELON	GE	1975-8	1987-8	1988-3	87.6	87.6	-	
US -412	BEAVER VALLEY-2	PWR	WH 3LP (DRYSUB)	2900	958	905 FENOC	WH	1974-5	1987-8	1987-11	88.8	88.8	-	
US -413	CATAWBA-1	PWR	WH 4LP (ICECND)	3411	1188	1160 DUKEENER	WH	1974-5	1985-1	1985-6	87.2	87.2	-	
US -414	CATAWBA-2	PWR	WH 4LP (ICECND)	3411	1188	1150 DUKEENER	WH	1974-5	1986-5	1986-8	88.2	88.2	-	
US -416	GRAND GULF-1	BWR	BWR-6 (Mark 3)	4408	1500	1401 ENTERGY	GE	1974-5	1984-10	1985-7	84.4	84.6	-	

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. 2021 — continued

Country	Code	Reactor Name	Type	Model	Capacity [MW]		Operator	NSSS Supplier	Const. Start	Grid Connection	Comm. Operation	EAF % 2011 - 2021	UCF % 2011 - 2021	NEA	
					Thermal	Gross									Net
USA	US-423	MILLSTONE-3	PWR	WH 4LP (DRY)SUB	3650	1280	1210	DOMINION	WH	1974-8	1986-2	1986-4	81.5	81.5	-
	US-424	VOGTLE-1	PWR	WH 4LP (DRY)AMB	3626	1229	1150	SOUTHERN	WH	1976-8	1987-3	1987-6	91.5	91.5	-
	US-425	VOGTLE-2	PWR	WH 4LP (DRY)AMB	3626	1229	1152	SOUTHERN	WH	1976-8	1989-4	1989-5	91.9	91.9	-
	US-440	PERRY-1	BWR	BWR-6 (Mark 3)	3758	1303	1240	FENOC	GE	1974-10	1986-12	1987-11	84.4	84.4	-
	US-443	SEABROOK-1	PWR	WH 4LP (DRY)AMB	3648	1296	1246	NEXTERA	WH	1976-7	1990-5	1990-8	88.9	89	-
	US-445	COMANCHE PEAK-1	PWR	WH 4LP (DRY)AMB	3612	1259	1205	LUMINANT	WH	1974-12	1990-4	1990-8	90.9	90.9	-
	US-446	COMANCHE PEAK-2	PWR	WH 4LP (DRY)AMB	3612	1250	1195	LUMINANT	WH	1974-12	1993-4	1993-8	91.1	91.2	-
	US-454	BYRON-1	PWR	WH 4LP (DRY)AMB	3645	1242	1164	EXELON	WH	1975-4	1985-3	1985-9	90.2	90.3	-
	US-455	BYRON-2	PWR	WH 4LP (DRY)AMB	3645	1210	1136	EXELON	WH	1975-4	1987-2	1987-8	93.3	93.3	-
	US-456	BRAIDWOOD-1	PWR	WH 4LP (DRY)AMB	3645	1270	1194	EXELON	WH	1975-8	1987-7	1988-7	90.6	90.6	-
	US-457	BRAIDWOOD-2	PWR	WH 4LP (DRY)AMB	3645	1230	1160	EXELON	WH	1975-8	1988-5	1988-10	92.5	92.5	-
	US-458	RIVER BEND-1	BWR	BWR-6 (Mark 3)	3091	1016	967	ENTERGY	GE	1977-3	1985-12	1986-6	84.9	85.1	-
	US-461	CLINTON-1	BWR	BWR-6 (Mark 3)	3473	1098	1062	EXELON	GE	1975-10	1987-4	1987-11	82.5	82.5	-
	US-482	WOLF CREEK	PWR	WH 4LP (DRY)AMB	3565	1285	1200	WCNOC	WH	1977-5	1985-6	1985-9	85.8	85.8	-
	US-483	CALLAWAY-1	PWR	WH 4LP (DRY)AMB	3565	1275	1215	AmerenUE	WH	1975-9	1984-10	1984-12	87	87.1	-
	US-498	SOUTH TEXAS-1	PWR	WH 4LP (DRY)AMB	3853	1354	1280	STP	WH	1975-12	1988-3	1988-8	84.5	84.5	-
	US-499	SOUTH TEXAS-2	PWR	WH 4LP (DRY)AMB	3853	1354	1280	STP	WH	1975-12	1989-4	1989-6	84.5	84.5	-
	US-528	PALO VERDE-1	PWR	CE80 2LP (DRYA	3990	1414	1311	APS	CE	1976-5	1985-6	1986-1	82.7	82.8	-
	US-529	PALO VERDE-2	PWR	CE80 2LP (DRYA	3990	1414	1314	APS	CE	1976-6	1986-5	1986-9	84.6	84.7	-
	US-530	PALO VERDE-3	PWR	CE80 2LP (DRYA	3990	1414	1312	APS	CE	1976-6	1987-11	1988-1	86.3	86.5	-
Note: Status as of 31 December 2021. 437 reactors (389508 MW(e)) were connected to the grid, including 3 units (2859MMW(e)) in Taiwan, China.															
TAIWAN, CHINA	TW-4	KUOSHENG-2	BWR	BWR-6	2894	985	985	TPC	GE	1976-3	1982-6	1983-3	83.7	84.7	-
	TW-5	MAANSHAN-1	PWR	WH 3LP (WE 312	2822	951	936	TPC	WH	1978-8	1984-5	1984-7	86.8	87.7	-
	TW-6	MAANSHAN-2	PWR	WH 3LP (WE 312	2822	951	938	TPC	WH	1979-2	1985-2	1985-5	86.3	87.4	-

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

TABLE 15. REACTORS IN LONG TERM SHUTDOWN, 31 DEC. 2021

Country	Code	Reactor Name	Type	Model	Thermal Capacity [MW]	Net	Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Long-term Shutdown date
INDIA	IN-3	RAJASTHAN-1	PHWR	Horizontal Pte	346	134	NPCIL	AECL	1965-8	1972-11	1973-12	2004-10

Note:

Status as of 31 December 2021, 1 reactor was in long term shutdown.

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2021

Country	Code	Reactor Name	Type	Capacity [MW]		Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Shutdown	
				Thermal	Gross							Net
ARMENIA	AM -18	ARMENIAN-1	PWR	1375	408	376 ANPPC/ISC	FAEA	1969-7	1976-12	1977-10	1989-2	
	BE -1	BR-3	PWR	41	12	10 CEN/SCK	WH	1957-11	1962-10	1962-10	1987-6	
	BULGARIA	BG -1	KOZLODUY-1	PWR	1375	440	408 K N N P	AEE	1970-4	1974-7	1974-10	2002-12
		BG -2	KOZLODUY-2	PWR	1375	440	408 KOZNP	AEE	1970-4	1975-8	1975-11	2002-12
CANADA	BG -3	KOZLODUY-3	PWR	1375	440	408 K N N P	AEE	1973-10	1980-12	1981-1	2006-12	
	BG -4	KOZLODUY-4	PWR	1375	440	408 K N N P	AEE	1973-10	1982-5	1982-6	2006-12	
	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	OHI/AECL	1966-9	1971-10	1971-12	2007-5	
	CA -6	PICKERING-3	PHWR	1744	542	515 OPG	OHI/AECL	1967-12	1972-5	1972-6	2008-10	
	CA -1	ROLPHONT 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		CHOOZA (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 (MARCOCULE)	GCR	260	43	39 COGEMA	SACM	1955-3	1959-4	1959-4	1980-2	
FR -1		G-3 (MARCOCULE)	GCR	260	43	40 COGEMA	SACM	1956-3	1960-4	1960-4	1984-6	
FR -10	PHENIX	FBR	345	142	130 CEAE/DF	ONCLINEY	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		
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	

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2021 — continued

Country	Reactor		Type	Capacity [MW]		Net	Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Shutdown
	Code	Name		Thermal	Gross							
GERMANY	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 -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	AEK	1970-3	1973-12	1974-7	1990-2
	DE -503	GREIFSWALD-2	PWR	1375	440	408	EWN	AEK	1970-3	1974-12	1975-4	1990-2
	DE -504	GREIFSWALD-3	PWR	1375	440	408	EWN	AEK	1972-4	1977-10	1978-5	1990-2
	DE -505	GREIFSWALD-4	PWR	1375	440	408	EWN	AEK	1972-4	1979-9	1979-11	1990-7
	DE -506	GREIFSWALD-5	PWR	1375	440	408	EWN	AEK	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 -8	KINK 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 -5	OBRIGHEIM	PWR	1050	357	340	EnBW	SIEM,KWU	1965-3	1968-10	1969-3	2005-5	
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	RHEINBERG	PWR	265	70	62	EWN	AEK	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	HTRG	760	308	296	HKG	HRB	1971-5	1985-11	1987-6	1988-9	

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2021 — continued

Country	Code	Reactor Name	Type	Capacity [MW]		Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Shutdown
				Thermal	Gross						
GERMANY	DE -17	UNTERWESER	PWR	3900	1410	E.ON	KWU	1972-7	1978-9	1979-9	2011-8
	DE -9	WUERGASSEN	BWR	1912	670	PE	AEG/KWU	1968-1	1971-12	1975-11	1994-8
	IT -4	CAORSO	BWR	2651	882	SOGIN	AMN/GETS	1970-1	1978-5	1981-12	1990-7
ITALY	IT -3	ENRICO FERMI	PWR	870	270	SOGIN	ELWEST	1961-7	1964-10	1965-1	1990-7
	IT -2	GARIGLIANO	BWR	506	160	SOGIN	GE	1959-11	1964-1	1964-6	1982-3
	IT -1	LATINA	GCR	660	160	SOGIN	TNPG	1958-11	1963-5	1964-1	1987-12
JAPAN	JP -20	FUGEN ATR	HWLWR	557	165	JAEA	HITACHI	1972-5	1978-7	1979-3	2003-3
	JP -5	FUKUSHIMA-DAIICHI-1	BWR	1380	460	TEPCO	GE/GETSC	1967-7	1970-11	1971-3	2011-5
	JP -9	FUKUSHIMA-DAIICHI-2	BWR	2381	784	TEPCO	GE/T	1969-6	1973-12	1974-7	2011-5
	JP -10	FUKUSHIMA-DAIICHI-3	BWR	2381	784	TEPCO	TOSHIBA	1970-12	1974-10	1976-3	2011-5
	JP -16	FUKUSHIMA-DAIICHI-4	BWR	2381	784	TEPCO	HITACHI	1973-2	1978-2	1978-10	2011-5
	JP -17	FUKUSHIMA-DAIICHI-5	BWR	2381	784	TEPCO	TOSHIBA	1972-5	1977-9	1978-4	2013-12
	JP -18	FUKUSHIMA-DAIICHI-6	BWR	3293	1100	TEPCO	GE/T	1973-10	1979-5	1979-10	2013-12
	JP -25	FUKUSHIMA-DAINI-1	BWR	3293	1100	TEPCO	TOSHIBA	1976-3	1981-7	1982-4	2019-9
	JP -26	FUKUSHIMA-DAINI-2	BWR	3293	1100	TEPCO	HITACHI	1979-5	1983-6	1984-2	2019-9
	JP -35	FUKUSHIMA-DAINI-3	BWR	3293	1100	TEPCO	TOSHIBA	1981-3	1984-12	1985-6	2019-9
	JP -38	FUKUSHIMA-DAINI-4	BWR	3293	1100	TEPCO	HITACHI	1981-5	1986-12	1987-8	2019-9
	JP -12	GENKAI-1	PWR	1650	559	KYUSHU	MHI	1971-9	1975-2	1975-10	2015-4
	JP -27	GENKAI-2	PWR	1650	559	KYUSHU	MHI	1977-2	1980-6	1981-3	2019-4
JP -11	HAMAOKA-1	BWR	1593	540	CHUBU	TOSHIBA	1971-6	1974-8	1976-3	2009-1	
JP -24	HAMAOKA-2	BWR	2436	840	CHUBU	TOSHIBA	1974-6	1978-5	1978-11	2009-1	
JP -23	IKATA-1	PWR	1650	566	SHIKOKU	MHI	1973-9	1977-2	1977-9	2016-5	
JP -32	IKATA-2	PWR	1650	566	SHIKOKU	MHI	1978-8	1981-8	1982-3	2018-5	
JP -1	JPDR	BWR	90	13	JAEA	GE	1960-12	1963-10	1965-3	1976-3	
JP -4	MIHAMA-1	PWR	1031	340	KEPCO	WH	1967-2	1970-8	1970-11	2015-4	
JP -6	MIHAMA-2	PWR	1456	500	KEPCO	MHI	1968-5	1972-4	1972-7	2015-4	
JP -31	MONJU	FBR	714	280	JAEA	T/HIF/M	1986-5	1995-8		2017-12	

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2021 — continued

Country	Reactor		Type	Capacity [MW]		Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Shutdown
	Code	Name		Thermal	Gross						
JAPAN	JP-15	OHI-1	PWR	3423	1175	1120	KEPCO	1972-10	1977-12	1979-3	2018-3
	JP-19	OHI-2	PWR	3423	1175	1120	KEPCO	1972-12	1978-10	1979-12	2018-3
	JP-22	ONAGAWA-1	BWR	1593	524	498	TOHOKU	1980-7	1983-11	1984-6	2018-12
	JP-7	SHIMANE-1	BWR	1380	460	439	CHUGOKU	1970-7	1973-12	1974-3	2015-4
	JP-2	TOKAI-1	GCR	587	166	137	JAPCO	1961-3	1965-11	1966-7	1998-3
	JP-3	TSURUGA-1	BWR	1070	357	340	JAPCO	1966-11	1969-11	1970-3	2015-4
	KAZAKHSTAN	KZ-10	AKTAU	1000	90	52	MAEC-KAZ	1964-10	1973-7	1973-7	1999-4
KOREA, REP. OF	KR-1	KORI-1	PWR	1729	607	576	KHNP	1972-8	1977-6	1978-4	2017-6
	KR-3	WOLSONG-1	PHWR	2061	683	661	KHNP	1977-10	1982-12	1983-4	2019-12
LITHUANIA	LT-46	IGNALINA-1	LWGR	4800	1300	1185	INPP	1977-5	1983-12	1985-5	2004-12
	LT-47	IGNALINA-2	LWGR	4800	1300	1185	INPP	1978-1	1987-8	1987-12	2009-12
	NL-1	DODEWAARD	BWR	183	60	55	BV GKN	1965-5	1988-10	1969-3	1997-3
PAKISTAN	PK-1	KANUPP-1	PHWR	337	100	90	PAEC	1966-8	1971-10	1972-12	2021-8
RUSSIA	RU-1	APS-1 OBNINSK	LWGR	30	6	5	MSM	1951-1	1954-6	1954-12	2002-4
	RU-3	BELOYARSK-1	LWGR	286	108	102	REA	1958-6	1964-4	1964-4	1983-1
	RU-6	BELOYARSK-2	LWGR	530	160	146	REA	1962-1	1967-12	1969-12	1990-1
	RU-141	BILIBINO-1	LWGR	62	12	11	REA	1970-1	1974-1	1974-4	2019-1
	RU-17	KURSK-1	LWGR	3200	1000	925	REA	1972-6	1976-12	1977-10	2021-12
	RU-15	LENINGRAD-1	LWGR	3200	1000	925	REA	1970-3	1973-12	1974-11	2018-12
	RU-16	LENINGRAD-2	LWGR	3200	1000	925	REA	1970-6	1975-7	1976-2	2020-11
SLOVAKIA	RU-4	NOVOVORONEZH-1	PWR	760	210	197	REA	1957-7	1964-9	1964-12	1988-2
	RU-8	NOVOVORONEZH-2	PWR	1320	365	336	REA	1964-6	1969-12	1970-4	1990-8
	RU-9	NOVOVORONEZH-3	PWR	1375	417	385	REA	1967-7	1971-12	1972-6	2016-12
	SK-1	BOHUNICE A1	HWGCR	560	143	93	JAVYS	1958-8	1972-12	1972-12	1977-2
	SK-2	BOHUNICE-1	PWR	1375	440	408	JAVYS	1972-4	1978-12	1980-4	2006-12
SPAIN	SK-3	BOHUNICE-2	PWR	1375	440	408	JAVYS	1972-4	1980-3	1981-1	2008-12
	ES-1	JOSE CABRERA-1	PWR	510	150	141	UFG	1964-6	1968-7	1969-8	2006-4

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2021 — continued

Country	Code	Reactor Name	Type	Capacity [MW]		Net	Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Shutdown
				Thermal	Gross							
SPAIN	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
	SE -1	AGESTA	PHWR	80	12	10	SVAFO	ABB ATOM	1957-12	1964-5	1964-5	1974-6
SWEDEN	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	OSKARSHAMIN-1	BWR	1375	492	473	OKG	ABB ATOM	1966-8	1971-8	1972-2	2017-6
	SE -3	OSKARSHAMIN-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
SWITZERLAND	SE -5	RINGHALS-2	PWR	2652	963	852	RAB	WH	1970-10	1974-8	1975-5	2019-12
	CH -8	LUCENS	HWGCR	28	7	6	EOS	NGA	1962-4	1968-1	1969-1	1969-1
	CH -2	MUEHLEBERG	BWR	1097	390	373	BKW	GETSCO	1967-3	1971-7	1972-11	2019-12
	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
UK	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
	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	

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2021 — continued

Country	Code	Reactor Name	Type	Capacity [MW]		Net	Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Shutdown
				Thermal	Gross							
UK	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 -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 -11A	OLDBURY A-1	GCR	730	230	217	ML	TNPG	1962-5	1967-11	1967-12	2012-2
	GB -11B	OLDBURY A-2	GCR	680	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	TRAFSFYNYDD-1	GCR	850	235	195	ML	APC	1959-7	1965-1	1965-3	1991-2
	GB -8B	TRAFSFYNYDD-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
UKRAINE	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
	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
	UA -42	CHERNOBYL-3	LWGR	3200	1000	925	MTE	FAEA	1976-3	1981-12	1982-6	2000-12
USA	UA -43	CHERNOBYL-4	LWGR	3200	1000	925	MTE	FAEA	1979-4	1983-12	1984-3	1986-4
	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	

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2021 — continued

Country	Reactor		Type	Capacity [MW]		Net	Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Shutdown
	Code	Name		Thermal	Gross							
USA	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 -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
	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	CoPiquia	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

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2021 — continued

Country	Code	Reactor Name	Type	Capacity [MW]		Operator	NSSS Supplier	Construction Start	Grid Connection	Commercial Operation	Shutdown
				Thermal	Gross						
USA	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	1988-2
	US -304	ZION-2	PWR	3250	1085	1040 EXELON	WH	1968-12	1973-12	1974-9	1988-2
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

Note: Status as of 31 December 2021, 199 reactors (65776 MW(e)) have been permanently shut down, including 3 units (2193MW(e)) in Taiwan, China.

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2021

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	Others	Other			ANPPC/JSC	
BELGIUM	BE -1	BR-3	1987-6	2,5	ID		4	GEN/ISCK	
BULGARIA	BG -1	KOZLODUY-1	2002-12	Others	Dd+Pd+SE	6	3,4,9,10	E-03492	2031
	BG -2	KOZLODUY-2	2002-12	Others	Dd+Pd+SE	6	3,4,9,10	E-03493	2031
	BG -3	KOZLODUY-3	2006-12	Others	Dd+Pd+SE	6	3,4,9,10	E-00174	2031
	BG -4	KOZLODUY-4	2006-12	Others	Dd+Pd+SE		3,4,9,10	E-0008	2031
	CA -1	ROLPHTON NPD	1987-8	2	Dd+Pd+SE			AECL	
CANADA	CA -2	DOUGLAS POINT	1984-5	2	Dd+SE			AECL	
	CA -3	GENTILLY-1	1977-6	2	Dd+Pd+SE	8		AECL/HQ	
	CA -5	PICKERING-2	2007-5	2	Dd+SE			OPG	
	CA -6	PICKERING-3	2008-10	2	Dd+SE			OPG	
	FR -10	PHENIX	2010-2	Others	ID			-	
	FRANCE	FR -2	CHINON A-1	1973-4	1,2	ID	9		EDF
FR -24		SUPER-PHENIX	1988-12	Others	ID	9	3	NERSA	
FR -3		CHINON A-2	1985-6	1,2	ID	9		EDF	2025
FR -4		CHINON A-3	1980-6	1,2	ID	9		EDF	
FR -5		CHOOZA (ARDENNES)	1991-10	Others	ID			SENA	2019
FR -6		EL-4 (MONTS D'ARREE)	1985-7	1,2	ID			EDF	2015
FR -7		ST. LAURENT A-1	1980-4	1,2	ID			EDF	2027
FR -8		ST. LAURENT A-2	1982-5	1,2	ID			EDF	2025
FR -9		BUGEY-1	1984-5	1,2	ID	9		EDF	2020
DE -1		VAK KAHL	1985-11	5	ID			VAK	2010
DE -10		STADE	2003-11	2	ID		3,4,6,9,10,15	PElektra	2026
DE -11		NIEDERACHBACH	1974-7	5	Dd+SE			KIT	1995
DE -12		BIBLIS-A	2011-8	7	ID			RWE	
DE -13		BRUNSBUETTEL	2011-8	7	ID		1	3	KKB
DE -14	PHILIPPSBURG-1	2011-8	7	ID		1	3	EnKK	
GERMANY									

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2021 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management phase	Decom. licensee	License Expiration
GERMANY	DE -15	NECKARWESTHEIM-1	2011-8	7	ID	1	3	EnKK	
	DE -16	ISAR-1	2011-8	7	ID	9		PElektra	2038
	DE -17	UNTERWESER	2011-8	7	ID	9	3	E.ON	2035
	DE -18	BIBLIS-B	2011-8	7	ID	2	3	RWE	
	DE -19	THTR-300	1988-9	2	Dd+SE		4	HKG	
	DE -2	MZFR	1984-5	5	ID			KTE	
	DE -20	KRUEMMEL	2011-8	7	ID	1	3	KKK	
	DE -22	MUELHEIM-KAERLICH	1988-9	7	ID			RWE	
	DE -23	GRAFENHEINFELD	2015-6	7	ID			PElektra	2035
	DE -24	PHILIPPSBURG-2	2019-12	7	ID		3	EnKK	
	DE -26	GUNDREMMINGEN-B	2017-12	7	ID		3	RWE/E.ON	
	DE -27	GROHNDE	2021-12	7	ID		3	PEL/SBi	
	DE -28	GUNDREMMINGEN-C	2021-12	7	ID		3	RWE/PEL	
	DE -3	GUNDREMMINGEN-A	1977-1	6,8	ID		3	KGG	
	DE -32	BROKDORF	2021-12	7	ID			PEL/VEN	
	DE -4	AVR JUELICH	1988-12	2	ID	3,4		xxxx	
	DE -5	OBRIEGHEIM	2005-5	7	ID		3	EnKK	
	DE -501	RHEINBERG	1980-6	7	ID		4	G 01 KKR	
	DE -502	GREIFSWALD-1	1990-2	2	ID	3,9	4	G 01 KGR	
	DE -503	GREIFSWALD-2	1990-2	2	ID	3,9	4	G 01 KGR	
	DE -504	GREIFSWALD-3	1990-2	2	ID	3,9	4	G 01 KGR	
	DE -505	GREIFSWALD-4	1990-7	2	ID	3	4	G 01 KGR	
	DE -506	GREIFSWALD-5	1989-11	2	ID	1,3,9	4	G 01 KGR	
	DE -6	LINGEN	1977-1	2,5	ID	1,3,4,9		RWE AG	
	DE -7	HDR GROSSWELZHEIM	1971-7	1	ID		4	KIT	1998
	DE -8	KNK II	1991-8	5	ID		4	KTE	
	DE -9	WUERGASSEN	1984-8	2	ID		3	E.ON	2029

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2021 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management phase	Decom. licensee	License Expiration
ITALY	IT-1	LATINA	1987-12	7,Others	Other	3,6		SOGIN	2043
	IT-2	GARIGLIANO	1982-3	Others	ID	3,6,9		SOGIN	2040
	IT-3	ENRICO FERMI	1990-7	7,Others	ID	6		SOGIN	2037
	IT-4	CAORSO	1990-7	7,Others	ID	3,4,9		SOGIN	2038
	JP-1	JPDR	1976-3	Others	ID	3		JAERI	2002
	JP-10	FUKUSHIMA-DAIICHI-3	2011-5	4	Other			TEPCO DL	
	JP-11	HAMAOKA-1	2009-1	6	Dd+SE	3,6,7,14		CHUBU DL	2037
	JP-12	GENKAI-1	2015-4	3	Dd+PD+SE	9		KYUSHU	
	JP-15	OHI-1	2018-3	3	Dd+PD+SE	3,6,8		KEPCO	2049
	JP-16	FUKUSHIMA-DAIICHI-4	2011-5	4	Other			TEPCO DL	
	JP-17	FUKUSHIMA-DAIICHI-5	2013-12	4	Other			TEPCO DL	
	JP-18	FUKUSHIMA-DAIICHI-6	2013-12	4	Other			TEPCO DL	
	JP-19	OHI-2	2018-3	3	Dd+PD+SE	3,6,8		KEPCO	2049
	JP-20	TOKAI-1	1998-3	2	Dd+PD+SE	3,4,6,7,9		JAPCO	2030
	JP-23	FUGEN ATR	2003-3	2	ID	1,6	3,5	JAEA	2034
	JP-24	HAMAOKA-2	2009-1	6	Dd+SE	7		SHIKOKU	2056
	JP-27	GENKAI-2	2019-4	3	Dd+PD+SE	3,6,7,14		CHUBU DL	2037
	JP-3	TSURUGA-1	2015-4	3	Dd+PD+SE	3,4,6,7		KYUSHU	
JP-31	MONJU	2017-12	7	ID	1,2	1	...	2040 2047	
JP-32	IKATA-2	2018-5	Others	Other	1		SHIKOKU		
JP-4	MIHAMA-1	2015-4	3	Dd+PD+SE	3,6,8		KEPCO	2046	
JP-5	FUKUSHIMA-DAIICHI-1	2011-5	4	Other			TEPCO DL		
JP-6	MIHAMA-2	2015-4	3	Dd+PD+SE	3,6,8		KEPCO	2046	
JP-7	SHIMANE-1	2015-4	6	Other			CHUGOKU		
JP-9	FUKUSHIMA-DAIICHI-2	2011-5	4	Other			TEPCO DL		
KAZAKHSTAN	KZ-10	AKTAU	1989-4	2,5	Dd+PD+SE	1,6	4	MAEC-KAZ	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2021 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management phase	Decom. licensee	License Expiration
KOREA, REP. OF	KR -1	KORI-1	2017-6	7,Others	ID	1		KHNP	
	KR -3	WOLSONG-1	2019-12	Others	ID			KHNP	
LITHUANIA	LT -46	IGNALINA-1	2004-12	7,Others	ID	3,9,10,12	3	INPP	2038
	LT -47	IGNALINA-2	2009-12	7,Others	ID	3,9,10,12	3	INPP	2038
NETHERLANDS	NL -1	DODEWAARD	1997-3	2,Others	Dd+SE	7		BV GKN	2055
RUSSIA	RU -3	BELOYARSK-1	1983-1	Others	Other			EA	
	RU -4	NOVOVORONEZH-1	1988-2	Others	Other			EA	
	RU -6	BELOYARSK-2	1990-1	Others	Other			EA	
	RU -8	NOVOVORONEZH-2	1990-8	Others	Other			EA	
SLOVAKIA	SK -1	BOHUNICE A1	1977-2	4	Dd+PD+SE	3,6		JAVYS	
	SK -2	BOHUNICE-1	2006-12	7	ID	3,4,9		JAVYS	
	SK -3	BOHUNICE-2	2008-12	7	ID	3,4,9		JAVYS	
SPAIN	ES -1	JOSE CABRERA-1	2006-4	3	ID			UFG	2015
	ES -2	SANTA MARIA DE GARONA	2017-8	3	ID	1,3,4	3	Enresa	2031
	ES -3	VANDELLOS-1	1990-7	4	Dd+SE	8		Enresa	2032
SWEDEN	SE -1	AGESTA	1974-6	2	Dd+SE	3,7		VAB	
	SE -2	OSKARSHAMIN-1	2017-6	2	ID	3,4,9,11,12	4	OKG	2050
	SE -3	OSKARSHAMIN-2	2016-12	2	ID	3,4,9,11,12	4	OKG	2050
	SE -6	BARSEBACK-1	1999-11	Others	Other	3,4,9	4	BKAB	2033
	SE -8	BARSEBACK-2	2005-5	Others	Other	3,4,9	4	BKAB	2033
SWITZERLAND	CH -2	MUEHLEBERG	2019-12	2	ID			BKW	
	CH -8	LUCENS	1969-1	4	Dd+SE	1		EOS	2004
UK	GB -10A	SIZEWELL A-1	2006-12	2,8	Dd+SE	8		Magnox S	2110
	GB -10B	SIZEWELL A-2	2006-12	2,8	Dd+SE	8		Magnox S	2110
	GB -12	WINFRITH SGHWR	1990-9	Others	ID			UKAEA	2019
	GB -14	DOUNREAY DFR	1977-3	Others	Dd+PD+SE	5		DSR	2333
	GB -15	DOUNREAY PFR	1984-3	Others	Dd+PD+SE	5		Magnox N	2333

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2021 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management phase	Decom. licensee	License Expiration
UK	GB -1A	CALDER HALL-1	2003-3	2,8	Dd+Pd+SE	8		SL	2117
	GB -1B	CALDER HALL-2	2003-3	2,8	Dd+Pd+SE	8		SL	2117
	GB -1C	CALDER HALL-3	2003-3	2,8	Dd+Pd+SE	8		SL	2117
	GB -1D	CALDER HALL-4	2003-3	2,8	Dd+Pd+SE	8		SL	2117
	GB -2A	CHAPELCROSS-1	2004-6	2,8	Dd+Pd+SE	8		Magnox N	2128
	GB -2B	CHAPELCROSS-2	2004-6	2,8	Dd+Pd+SE	8		Magnox N	2128
	GB -2C	CHAPELCROSS-3	2004-6	2,8	Dd+Pd+SE	8		Magnox N	2128
	GB -2D	CHAPELCROSS-4	2004-6	2,8	Dd+Pd+SE	8		Magnox N	2128
	GB -3A	BERKELEY-1	1989-3	2,8	Dd+SE	8		Magnox S	2083
	GB -3B	BERKELEY-2	1988-10	2,8	Dd+SE	8		Magnox S	2083
	GB -4A	BRADWELL-1	2002-3	2,8	Dd+SE	8		Magnox S	2104
	GB -4B	BRADWELL-2	2002-3	2,8	Dd+SE	8		Magnox S	2104
	GB -5	WINDSCALE AGR	1981-4	Others	Dd+Pd+SE	7		SL	2065
	GB -6A	HUNTERSTON A-1	1990-3	2,8	Dd+Pd+SE	8		Magnox N	2090
	GB -6B	HUNTERSTON A-2	1989-12	2,8	Dd+Pd+SE	8		Magnox N	2090
	GB -7A	HINKLEY POINT A-1	2000-5	2,8	Dd+Pd+SE	8		Magnox S	2104
	GB -7B	HINKLEY POINT A-2	2000-5	2,8	Dd+Pd+SE	8		Magnox S	2104
	GB -8A	TRAWSFYNYDD-1	1991-2	2,8	Dd+Pd+SE	8		Magnox N	2098
	GB -8B	TRAWSFYNYDD-2	1991-2	2,8	Dd+Pd+SE	8		Magnox N	2098
	GB -9A	DUNGENESS A-1	2006-12	2,8	Dd+Pd+SE	8		Magnox S	2111
GB -9B	DUNGENESS A-2	2006-12	2,8	Dd+Pd+SE	8		Magnox S	2111	
USA	US -001	SHIPPINGPORT	1982-10	1,10	ID			DOE DUQU	1989
	US -011	ELK RIVER	1968-2	1,Others	ID			RCPA	1974
	US -012	PIQUA	1966-1	5,10	Other	11		CofPiqua	
	US -013	INDIAN POINT-1	1974-10	5	Dd+Pd+SE			ENERGY	
	US -014	BONUS	1968-6	5,6	ISD			DOE/PRWR	1970
	US -018	GE VALLECITOS	1963-12	1	Dd+SE			GE&PGEC	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2021 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management phase	Decom. licensee	License Expiration
USA	US -077	HALLAM	1964-9	5	Dd+SE			AEC&NPPD	1971
	US -10	DRESDEN-1	1978-10	6	Dd+SE	9, 11		EXELON	
	US -130	PATHFINDER	1967-10	5, 10	Other	11		NMC	2013
	US -133	HUMBOLDT BAY	1976-7	5	Dd+PD+SE	3, 4, 6		PG&E	2009
	US -144	CVTR	1967-1	7, Others	Dd+SE			CVPA	2005
	US -146	SAXTON	1972-5	10, Others	Other			GPUNC	2005
	US -155	BIG ROCK POINT	1997-8	2, Others	ID			CPC	2007
	US -16	FERMI-1	1972-11	4, 5	Dd+SE	9, 11		DTEDISON	2025
	US -171	PEACH BOTTOM-1	1974-11	1	Dd+SE	1, 9		EXELON	2008
	US -206	SAN ONOFRE-1	1992-11	10, Others	Other	4		SCE	2007
	US -213	HADDAM NECK	1986-12	6	ID	4, 6		CYAPC	
	US -219	OYSTER CREEK	2018-9	2, 7	Dd+PD+SE			EXELCORP	
	US -245	MILLSTONE-1	1988-7	6	Dd+PD+SE			DOMINRES	
	US -247	INDIAN POINT-2	2020-4	Others	ISD			ENERGY	1996
	US -267	FORT ST. VRAIN	1989-8	1, Others	ID			PSCC	
	US -271	VERMONT YANKEE	2014-12	7	Dd+PD+SE			ENERGY	
	US -285	FORT CALHOUN-1	2016-10	2	Dd+SE			OPPD	
	US -286	INDIAN POINT-3	2021-4	2, 7	Dd+SE			ENERGY	
	US -289	THREE MILE ISLAND-1	2019-9	2	Dd+PD+SE			EXELCORP	
	US -29	YANKEE NPS	1991-10	1, 7	Other	4, 6		YAEC	2005
	US -293	PILGRIM-1	2019-5	2	Dd+PD+SE			ENERGY	
	US -295	ZION-1	1988-2	6, 10	Dd+PD+SE	1, 9		CommonEd	
	US -302	CRYSTAL RIVER-3	2013-2	5	Dd+PD+SE			DUKEENER	
	US -304	ZION-2	1988-2	6, 10	Other	1, 9		COMMED	
	US -305	KEWAUNEE	2013-5	2, 6	Dd+SE			Entry Nuclear	
	US -309	MAINE YANKEE	1997-8	6, 10	Other	4		MYAPC	2005
	US -312	RANCHO SECO-1	1989-6	6, 10	Other			SMUD	2009

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2021 — continued

Country	Reactor Ref. no.	Unit	Shutdown	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management phase	Decom. licensee	License Expiration
USA	US -320	THREE MILE ISLAND-2	1979-3	4, 10	Other	9, 11	4	GPU	1995
	US -322	SHOREHAM	1989-6	7, 10	ID			LIPA	
	US -331	DUANE ARNOLD-1	2020-10	2, 5	Dd+SE			NEXTERA	
	US -344	TROJAN	1992-11	6, 10	Other	9		PORTGE	2005
	US -361	SAN ONOFRE-2	2013-6	7	Dd+PD+SE			SCE	
	US -362	SAN ONOFRE-3	2013-6	7	Dd+PD+SE			SCE	
	US -409	LACROSSE	1987-4	2	Dd+PD+SE	9		DPC	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2021 — continued

Table 17: Definitions for reactors in decommissioning process or decommissioned		
Shutdown reason	Description	Description
1	The technology or process being used became obsolete	Immediate dismantling and removal of all radioactive materials
2	The process was no longer profitable	Deferred dismantling, placing all radiological areas into safe enclosure
3	Changes in licensing requirements	Deferred dismantling, including partial dismantling and placing remaining radiological areas into safe enclosure
4	After an operating incident	In situ disposal, involving encapsulation of radioactive materials and subsequent restriction of access
5	Other technological reasons (please mention them below)	None of the above
6	Other economical reasons (please mention them below)	
7	Public acceptance or political reasons	
8	After major component failure or deterioration	
10	Licence terminated - legal act at the end of the decommissioning process (and site released for restricted/unrestricted use)	
Other	None of the above	
Fuel Management	Description	Decom. strategy
1	Transfer to a reactor facility	ID
2	Transfer away from a reactor facility	Dd+SE
3	Storage in an on-site facility	Dd+PD+SE
4	Storage in an off-site facility	ISD
5	Shipment to a reprocessing plant	Other
6	Underwater storage period	
7	Dry storage period	
8	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
		1 Drawing up the Final Decommissioning Plan
		2 Reactor core defuelling (See also Fuel Management)
		3 Waste conditioning on-site - only for decommissioning waste
		4 Waste shipment off-site - only for decommissioning waste
		5 Safe enclosure preparation
		6 Partial dismantling
		7 Active safe enclosure period
		8 Passive safe enclosure period
		9 Final dismantling
		10 Final survey
		11 Licence terminated - legal act at the end of the decommissioning process (and site released for restricted/unrestricted use)
		12 Transition phase following permanent shutdown, including reactor core defuelling (See also Fuel Management) and strategy preparation
		13 Preparation for dismantling of major equipment and buildings
		14 Safe enclosure period
		15 Demolition (if disconnected from nuclear dismantling / conventional demolition)

TABLE 18. PERFORMANCE FACTORS BY REACTOR CATEGORY (2019-2021)

Reactor Category	Number of Units	Reactors reporting to IAEA PRIS (see note)						
		Availability Factor (EAF) %	Planned Cap.Loss Factor (PCL) %	Capacity Factor (UCF) %	Forced Loss Rate (FLR) %	Operating Factor (OF) %	Load Factor (LF) %	
PWR	312	80	14.2	81.6	2.5	81	78.9	
PWR < 600 MWe	42	80.8	16.7	81.6	1.1	82.1	79.6	
PWR >= 600 MWe	270	79.9	14.1	81.6	2.6	80.9	78.9	
BWR	72	65.2	33.1	65.6	1.5	65	64.8	
BWR < 600 MWe	4	25	73.4	25.5	4.3	33.6	25.1	
BWR >= 600 MWe	68	65.8	32.6	66.1	1.5	66.7	65.4	
PHWR	48	77.4	17.1	78.2	4.5	80.3	77.5	
PHWR < 600 MWe	27	80.7	14.4	81.9	4	81.4	80.9	
PHWR >= 600 MWe	21	75.5	18.6	76	4.9	78.9	75.6	
LWGR	14	75	22.6	75.8	1.8	78.4	76	
LWGR < 600 MWe	4	82.3	17.7	82.3	0	80.7	40.7	
LWGR >= 600 MWe	10	75	22.6	75.8	1.8	77.7	76.1	
GCR	14	58.8	10.9	59.3	8.3	62	58.3	
FBR	2	71.6	22.3	72.3	6.3	75.8	72.8	
TOTAL	482	76.8	17.8	78.1	2.6	77.9	75.9	

Note:

1. Reactors shut down during 2019 to 2021 (28 units) are considered.
2. Nuclear power operating statistics do not include outage data from French reactor units as information for these units was not available by the time of publication.

TABLE 19. FULL OUTAGE STATISTICS DURING 2021

Reactor Type	Number of Units	Full Outage Hours per Operating Experience Year	% Planned Outages	% Unplanned Outages	% External Outages
PWR	305	1552	77.2	16.8	6
PWR < 600 MWe	41	1467	78.7	7.6	13.7
PWR >= 600 MWe	264	1565	77	18.1	4.9
BWR	63	3127	97.6	2.4	0
BWR < 600 MWe	3	8760	100	0	0
BWR >= 600 MWe	60	2846	97.2	2.8	0
PHWR	47	1767	82.8	16.4	0.8
PHWR < 600 MWe	27	1659	79.5	19.6	0.9
PHWR >= 600 MWe	20	1913	86.7	12.7	0.6
LWGR	12	1847	94.2	3	2.8
LWGR < 600 MWe	3	1858	89.3	0	10.7
LWGR >= 600 MWe	9	1843	95.8	4.1	0.1
GCR	14	3906	27.5	71.1	1.4
FBR	2	3018	75.9	24.1	0
ALL REACTORS	443	1888	79.8	16.6	3.6

Notes:

1. Only reactors in commercial operation are considered.
2. Reactors shut down during 2021 (10 unit(s)) are considered.

TABLE 20. DIRECT CAUSES OF FULL OUTAGES DURING 2021

Direct Outage Cause	Planned Full Outages			Unplanned Full Outages		
	Energy Lost GW.h	%	Time Lost Hours	Energy Lost GW.h	%	Time Lost Hours
Plant equipment problem/failure	85691	13.31	83302	45650	73.06	54379
Refuelling without maintenance			11.52			68.29
Inspection, maintenance or repair combined with refuelling	306089	47.56	346769			
Inspection, maintenance or repair without refuelling	41152	6.39	68709			
Testing of plant systems or components	263	0.04	216	76	0.12	410
Major backfitting, refurbishment or upgrading activities with refuelling	15732	2.44	18676			
Major backfitting, refurbishment or upgrading activities without refuelling	193774	30.11	201480			
Nuclear regulatory requirements	499	0.08	2448			
Human factor related				1075	1.72	1083
Fire				1872	3	1406
Fuel management limitation (including high flux tilt, stretch out or coast-down operation)				1675	2.68	11241
Other	418	0.06	1496	12134	19.42	11117
TOTAL	643618	100	723096	62482	100	79636

Note:

Only reactors which have achieved full commercial operation in or before 2021 are counted.

TABLE 21. DIRECT CAUSES OF FULL OUTAGES (2017-2021)

Direct Outage Cause	Planned Full Outages			Unplanned Full Outages		
	Energy Lost GW.h	%	Time Lost Hours	Energy Lost GW.h	%	Time Lost Hours
Plant equipment problem/failure	235050	6.77	232288	289250	86.70	322847
Refuelling without maintenance	1704045	49.12	1893403			
Inspection, maintenance or repair combined with refuelling	188740	5.44	335242			
Inspection, maintenance or repair without refuelling	8050	0.23	9203	775	0.23	1329
Testing of plant systems or components	78614	2.27	95316			
Major backfitting, refurbishment or upgrading activities with refuelling	1250901	36.05	1343957			
Major backfitting, refurbishment or upgrading activities without refuelling	1541	0.04	5787	5314	1.59	5911
Nuclear regulatory requirements				6760	2.03	6808
Human factor related				1907	0.57	1524
Fire	207	0.01	404	2033	0.61	11580
Fuel management limitation (including high flux tilt, stretch out or coast-down operation)	2276	0.07	10264	27593	8.27	25768
Other						
TOTALS	3469424	100	3925864	333632	100	375767

Notes

1. Only reactors which have achieved full commercial operation in or before 2021 are counted.
2. Nuclear power operating statistics do not include outage data from French reactor units as information for these units was not available by the time of publication.

TABLE 22. COUNTRIES: ABBREVIATIONS AND SUMMARY

Country Code	Full Name	Number of reactors, as of 31 Dec. 2021			
		Under construction	Operational	Long term shutdown	Shutdown
AR	ARGENTINA	1	3		
AM	ARMENIA		1		1
BD	BANGLADESH	2			
BY	BELARUS	1	1		
BE	BELGIUM		7		1
BR	BRAZIL	1	2		
BG	BULGARIA		2		4
CA	CANADA		19		6
CN	CHINA	16	53		
CZ	CZECH REPUBLIC		6		31
FI	FINLAND	1	4		
FR	FRANCE	1	56		14
DE	GERMANY		3		30
HU	HUNGARY		4		
IN	INDIA	8	22	1	
IR	IRAN, ISLAMIC REPUBLIC OF	1	1		
IT	ITALY				4
JP	JAPAN	2	33		27
KZ	KAZAKHSTAN				9
KR	KOREA, REPUBLIC OF	4	24		1
LT	LITHUANIA				2
MX	MEXICO		2		2
NL	NETHERLANDS		1		1
PK	PAKISTAN	1	5		1
RO	ROMANIA		2		
RU	RUSSIA	4	37		10
SK	SLOVAKIA	2	4		3

TABLE 22. COUNTRIES: ABBREVIATIONS AND SUMMARY — continued

Country Code	Full Name	Number of reactors, as of 31 Dec. 2021				
		Under construction	Operational	Long term shutdown	Shutdown	Planned
SI	SLOVENIA		1			
ZA	SOUTH AFRICA		2			
ES	SPAIN		7		3	
SE	SWEDEN		6		7	
CH	SWITZERLAND		4		2	
TR	TÜRKIYE	3				1
UA	UKRAINE	2	15		4	
AE	UNITED ARAB EMIRATES	2	2			
GB	UNITED KINGDOM	2	12		33	
US	UNITED STATES OF AMERICA	2	93		40	
TOTAL		56	437	1	199	70

Note:

The total includes the following data from Taiwan, China:

— 3 units in operation; 3 units in shutdown.

TABLE 23. REACTOR TYPES: ABBREVIATIONS AND SUMMARY

Type Code	Type	Under construction	Operational	Long term shutdown	Shutdown
BWR	Boiling Light-Water Cooled and Moderated Reactor	2	61		52
FBR	Fast Breeder Reactor	3	3		8
GCR	Gas Cooled, Graphite Moderated Reactor		11		41
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	47	1	10
PWR	Pressurized Light-Water Moderated and Cooled Reactor	48	303		63
SGHWR	Steam Generating Heavy-Water Reactor				1
X	Other				2
TOTAL		56	437	1	199

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY

Operator Code	Full Name	Under construction	Operational	Long term shutdown	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-VANDELLOS A.I.E. (ENDESA/ID)			3	
ANC	AKKUYU NUCLEAR JOINT STOCK COMPANY (JSC)	3			
ANPPC/JSC	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 DOTTINGEN			2	
BelNPP	REPUBLICAN UNITARY ENTERPRISE "BELARUSIAN NUCLEAR POWER PLANT"	1		1	
BHAVINI	BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED	1			
BKAB	BARSEBACK 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
CIAE	CHINA INSTITUTE OF ATOMIC ENERGY			1	
CMAT	CENTRALES NUCLEARES ALMARAZ-TRILLO (ID/UFGENDESA/H/NUCLEONOR)			3	
CNEA	COMISION NACIONAL DE ENERGIA ATOMICA	1			

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Long term shutdown	Shutdown
CNNC	CHINA NATIONAL NUCLEAR CORPORATION	1			
CNNO	CNNC NUCLEAR OPERATION MANAGEMENT COMPANY LIMITED		1		1
CofPiqua	CITY OF PIQUA GOVERNMENT				2
COGEMA	COMPAGNIE GENERALE DES MATIERES NUCLEAIRES				1
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		3		
EBL+EDF	ENGIE ELECTRABEL + EDF BELGIUM + EDF LUMINUS		4		
EDF	ÉLECTRICITÉ DE FRANCE	1	56		10
EDF UK	EDF ENERGY		12		3
EDF-CGN	EDF ENERGY - CHINA GENERAL NUCLEAR JOINT VENTURE	2			
ELETROBR	ELETRORBRAS ELETRONUCLEAR S.A.	1	2		
EnBW	ENBW KRAFTWERKE AG				1
ENERGYNW	ENERGY NORTHWEST		1		
EnKK	ENBW KERNKRAFT GMBH		1		3
ENTERGY	ENTERGY NUCLEAR OPERATIONS, INC.		7		5
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	Long term shutdown	Shutdown
EPZ	N.V. ELEKTRICITEITS-PRODUKTIEMAATSCHAPPIJ ZUID-NEDERLAND		1		
ESKOM	ESKOM		2		6
EWN	ENERGIEWERKE NORD GMBH				7
EXELON	EXELON GENERATION CO., LLC		21		
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 FUJING NUCLEAR POWER CO., LTD	1	5		
FSNPC	FUJIAN SANMING NUCLEAR POWER CO., LTD.				
FV	FENNOVOIMA OY				
GE	GENERAL ELECTRIC				1
GFNPC	GUANGXI FANGCHENGANG NUCLEAR POWER COMPANY, LTD.	2	2		
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
HSDNPC	SHANDONG HONGSHIDING NUCLEAR POWER PLANT				
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

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Long term shutdown	Shutdown
JAVYS	JADROVA A VYRADOVACIA SPOLOCNOST /NUCLEAR AND DECOMMISSIONING COMPANY, PLC./				3
JNPC	JIANGSU NUCLEAR POWER CORPORATION	1		6	3
K N N P	KOZLODUY NUCLEAR POWER PLANT			1	2
KBG	KERNKRAFTWERK-BETRIEBSGESELLSCHAFT MBH			7	4
KEPCO	KANSAI ELECTRIC POWER CO.				1
KGB	KERNKRAFTWERKE GUNDREMMINGEN BETRIEBSGESELLSCHAFT MBH				4
KGG	KERNKRAFTWERK GUNDREMMINGEN GMBH				3
KHNP	KOREA HYDRO AND NUCLEAR POWER CO.	4		24	2
KKB	KERNKRAFTWERK BRUNSBÜTTEL GMBH & CO. OHG				1
KKG	KERNKRAFTWERK GÖSGEN-DÄNIKEN AG			1	1
KKK	KERNKRAFTWERK KRÜMMEL GMBH & CO. OHG				1
KKL	KERNKRAFTWERK LEIBSTADT			1	
KLE	KERNKRAFTWERKE LIPPE-EMS GMBH			1	
KNPP	KOZLODUY NPP ,LC			1	
KOZNPP	□				1
KWL	KERNKRAFTWERK LINGEN GMBH				1
KYUSHU	KYUSHU ELECTRIC POWER CO., INC.				2
LFNPC	CGN LUFENG NUCLEAR POWER CO., LTD			4	
LHNPC	LIAONING HONGYANHE NUCLEAR POWER CO. LTD. (LHNPC)	1		5	1
LIPA	LONG ISLAND POWER AUTHORITY				1
LNPC	LIAONING NUCLEAR POWER COMPANY ,LMT.	1		2	
LUMINANT	LUMINANT GENERATION COMPANY, LLC				
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

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Long term shutdown	Shutdown
NASA	NUCLEOELECTRICA ARGENTINA S.A.		3		
NAWAH	NAWAH ENERGY COMPANY	2			
NBEPG	NEW BRUNSWICK ELECTRIC POWER COMMISSION		2		
NDNP	FUJIAN NINGDE NUCLEAR POWER COMPANY, LTD.		1		
NEK	NUKLEARNA ELEKTRARNA KRŠKO		4		
NEXTERA	NEXTERA ENERGY RESOURCES, LLC		1		
			3		1
NMC	NUCLEAR MANAGEMENT CO.				1
NNEG	STATE ENTERPRISE "NATIONAL NUCLEAR ENERGY GENERATING COMPANY 'ENERGOATOM'"	2		15	
NPCBL	NUCLEAR POWER PLANT COMPANY BANGLADESH LIMITED	2			
NPCL	NUCLEAR POWER CORPORATION OF INDIA, LTD.	7		22	1
NPPDCO	NUCLEAR POWER PRODUCTION AND DEVELOPMENT CO. OF IRAN	1		1	
NPQJVC	NUCLEAR POWER PLANT QINSHAN JOINT VENTURE COMPANY LTD.			4	
NSP	NORTHERN STATES POWER CO. (SUBSIDIARY OF XCEL ENERGY)		3		
NUCLENOR	NUCLENOR, S.A.				1
OH	ONTARIO HYDRO				2
OKG	OKG AKTIEBOLAG		1		
OPG	ONTARIO POWER GENERATION		10		2
PAEC	PAKISTAN ATOMIC ENERGY COMMISSION				
PAKS II	MVM PAKS II, LTD.	1		5	1
PAKS Zrt	PAKS NUCLEAR POWER PLANT, LTD.			4	
PE	PREUSSENERLEKTRA KERNKRAFT GMBH&CO KG				1
PElektra	PREUSSENERLEKTRA GMBH		1		2
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

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Long term shutdown	Shutdown
PSEG	PSEG NUCLEAR, LLC		3		
QNPC	QINSHAN NUCLEAR POWER COMPANY		2		2
RAB	RINGHALS AB		2		1
RCPA	RURAL COOPERATIVE POWER ASSOC.		37		9
REA	JOINT STOCK COMPANY 'CONCERN ROSENERGOATOM'	3			2
RWE	RWE POWER AG				3
SCE	SOUTHERN CALIFORNIA EDISON CO.		1		
SCE&G	SOUTH CAROLINA ELECTRIC & GAS CO.		2		
SDNPC	SHANDONG NUCLEAR POWER COMPANY, LTD.		4		
SE	SLOVENSKÉ ELEKTRÁRNE, AS.	2			
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		
SMUD	SACRAMENTO MUNICIPAL UTILITY DISTRICT				1
SNEC	SAXTON NUCLEAR EXPERIMENTAL REACTOR CORPORATION				1
SNN	SOCIETA TEA NATIONALA NUCLEARELECTRICA, S.A.		2		
SNPDP	STATE NUCLEAR POWER DEMONSTRATION PLANT CO., LTD.				4
SOGIN	SOCIETA GESTIONE IMPANTI NUCLEARI S.P.A.				
SOUTHERN	SOUTHERN NUCLEAR OPERATING COMPANY, INC.	2	6		
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.		3		3
TQNPC	THE THIRD QINSHAN JOINT VENTURE COMPANY, LTD.		2		

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator Code	Full Name	Under construction	Operational	Long term shutdown	Shutdown
TVA	TENNESSEE VALLEY AUTHORITY		7		
TVO	TEOLLISUUDEN VOIMA OYJ	1	2		1
UFG	UNION FENOSA GENERATION, S.A.				4
UKAEA	UNITED KINGDOM ATOMIC ENERGY AUTHORITY		1		
WCNOC	WOLF CREEK NUCLEAR OPERATING CORP.				1
YAEC	YANKEE ATOMIC ELECTRIC CO.				
YJNPC	YANGJIANG NUCLEAR POWER COMPANY		6		
ZGZEC	CNNP GUODIAN ZHANGZHOU ENERGY CO.,LTD	2			
Not specified	OTHERS				
TOTAL		56	437	1	199

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY

Supplier Code	Type	Under Construction	Operational	Long term shutdown	Shutdown
AJFW	ASSOCIATION A CEC-FRAMATOMIE 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 - FRAMATOMIE)		1		
AECL	ATOMIC ENERGY OF CANADA, LTD.		6	1	4
AECL/D/AE	ATOMIC ENERGY OF CANADA LTDA AND DEPARTMENT OF ATOMIC ENERGY(INDIA)		1		
AECL/D/HI	ATOMIC ENERGY OF CANADA LTD./DOOSAN HEAVY INDUSTRIES & CONSTRUCTION		3		
AEE	ATOMENERGOEXPORT		8		12
AEG	ALLGEMEINE ELEKTRICITAETS-GESELLSCHAFT				1
AEG,GE	ALLGEMEINE ELEKTRICITAETS-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
Atom mash	ATOMMASH AEM-TECHNOLOGIES	1			
B&W	BABCOCK & WILCOX CO.		5		5
BBK	BROWN BOVERI-KRUPP REAKTORBAU GMBH				1
BBR	BROWN BOVERI REAKTOR GMBH				1
CE	COMBUSTION ENGINEERING CO.		11		4
CEA	COMMISSARIAT A L'ENERGIE ATOMIQUE				1
CFHI	CHINA FIRST HEAVY INDUSTRIES				
CGE	CANADIAN GENERAL ELECTRIC	10	9		2
CIAE/Chi	CHINA INSTITUTE OF ATOMIC ENERGY				
CNCLNEY	CNIM-CONSTRUCTIONS NAVALES ET INDUSTRIELLES DE MEDITERRANEE CL - CREUSOT LOIRE, NEY - NEYRPIIC	1			1

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY — continued

Supplier Code	Type	Under Construction	Operational	Long term shutdown	Shutdown
CNEA	COMISIÓN NACIONAL DE ENERGÍA ATÓMICA	1			
CNRC	CHINA NATIONAL NUCLEAR CORPORATION		9		
CZEC	CHINA ZHONGYUAN ENGINEERING CORPORATION	1	1		
DEC	DONGFANG ELECTRIC CORPORATION	2	12		
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	4	12		
EE/BAW/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		64		5
FRAMACEC	FRAMATECO (FRAMATOME-ACEC-COCKERILL)		2		
GA	GENERAL ATOMIC CORP.				2
GAAA	GROUPEMENT ATOMIQUE ALSACIENNE ATLANTIQUE				1
GE	GENERAL ELECTRIC CO.		38		20
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			1
H/G	HITACHI GE NUCLEAR ENERGY, LTD.				5
HITACHI	HITACHI, LTD.	1	6		
HRB	HOCHTEMPERATUR-REAKTORBAU GMBH				1
IA	INTERNATOM INTERNATIONALE ATOMREAKTORBAU GMBH				1
IC/LIFE	INTERNATIONAL COMBUSTION LTD. / FAIREY ENGINEERING LTD.				1
IZ	IZHORSKIYE ZAVODY		5		

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY — continued

Supplier Code	Type	Under Construction	Operational	Long term shutdown	Shutdown
JSC ASE	JSC "ATOMSTROYEXPORT"	8	2		
KEPCO	KOREA ELECTRIC POWER CORPORATION	2	2		
KWU	KRAFTWERK UNION, AG	1	6		15
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.		15		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		
NPCL	NUCLEAR POWER CORPORATION OF INDIA, LTD. VIKRAM SARABHAI BHAVAN, ANUSHAKTI NAGAR, MUMBAI - 400 094.	3	17		
NPIC	NUCLEAR POWER INSTITUTE OF CHINA	1	7		2
OH/AECL	ONTARIO HYDRO / ATOMIC ENERGY OF CANADA, LTD.		18		
ORANO	ORANO	4	2		
PAA	PRODUCTION AMALGAMATION 'ATOMMASH', VOLGODONSK		4		
PAIP	PRODUCTION AMALGAMATION IZHORSKY PLANT ATOMMASH, VOLGODONSK, RUSSIA		11		
PPC	PWR POWER PROJECTS, LTD.		1		
RDM	ROTTERDAMSE DROOGDOEK MAATSCHAPPIJ (RDM) IN ROTTERDAM (NL)				1
Russian	RUSSIAN HYDRAULIC PRESS DESIGN INSTITUTE (OKB)	1			
SI/KWU	SIEMENS/KRAFTWERK UNION, AG.		1		
SACM	SOCIETE ALSACIENNE DE CONSTRUCTIONS MECANIQUES				2
SHE	SHANGHAI ELECTRIC				
SIEM.KWU	SIEMENS AG, KRAFTWERK UNION AG		2		1
SIEMENS	SIEMENS AG, POWER GENERATION		2		1

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY — continued

Supplier Code	Type	Under Construction	Operational	Long term shutdown	Shutdown
ŠKODA	ŠKODA CONCERN NUCLEAR POWER PLANT WORKS	2	10		1
SNERDI	SHANGHAI NUCLEAR ENGINEERING RESEARCH AND DESIGN INSTITUTE CO. LTD				1
T/H/F/M	TOSHIBA / HITACHI / FUJI ELECTRIC HOLDINGS / MITSUBISHI HEAVY INDUSTRIES		3		11
TNPG	THE NUCLEAR POWER GROUP, LTD.		10		7
TOSHIBA	TOSHIBA CORPORATION		1		
TSINGHUA	TSINGHUA UNIVERSITY				
UEC	UNITED ENGINEERS AND CONTRACTORS				1
UKAEA	UNITED KINGDOM ATOMIC ENERGY AUTHORITY				10
WH	WESTINGHOUSE ELECTRIC CORPORATION	2	66		18
WH/MIHI	WESTINGHOUSE ELECTRIC CORPORATION / MITSUBISHI HEAVY INDUSTRIES, LTD.		3		
Not specified	OTHERS	1			
TOTAL		56	437	1	199

Figure 1. Number of operational reactors by type and net electrical power (as of 31 Dec. 2021)

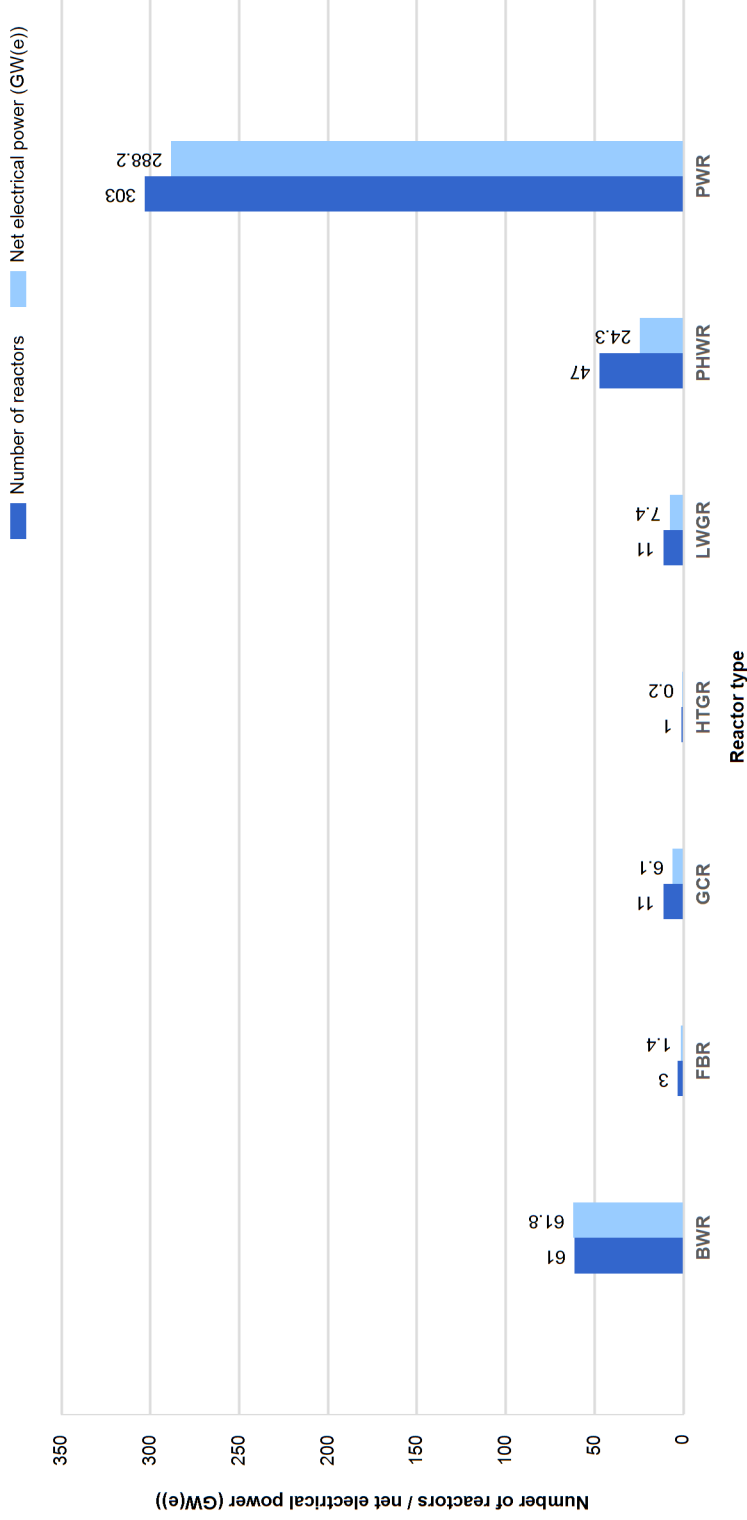


Figure 2. Reactors under construction by type and net electrical power (as of 31 Dec. 2021)

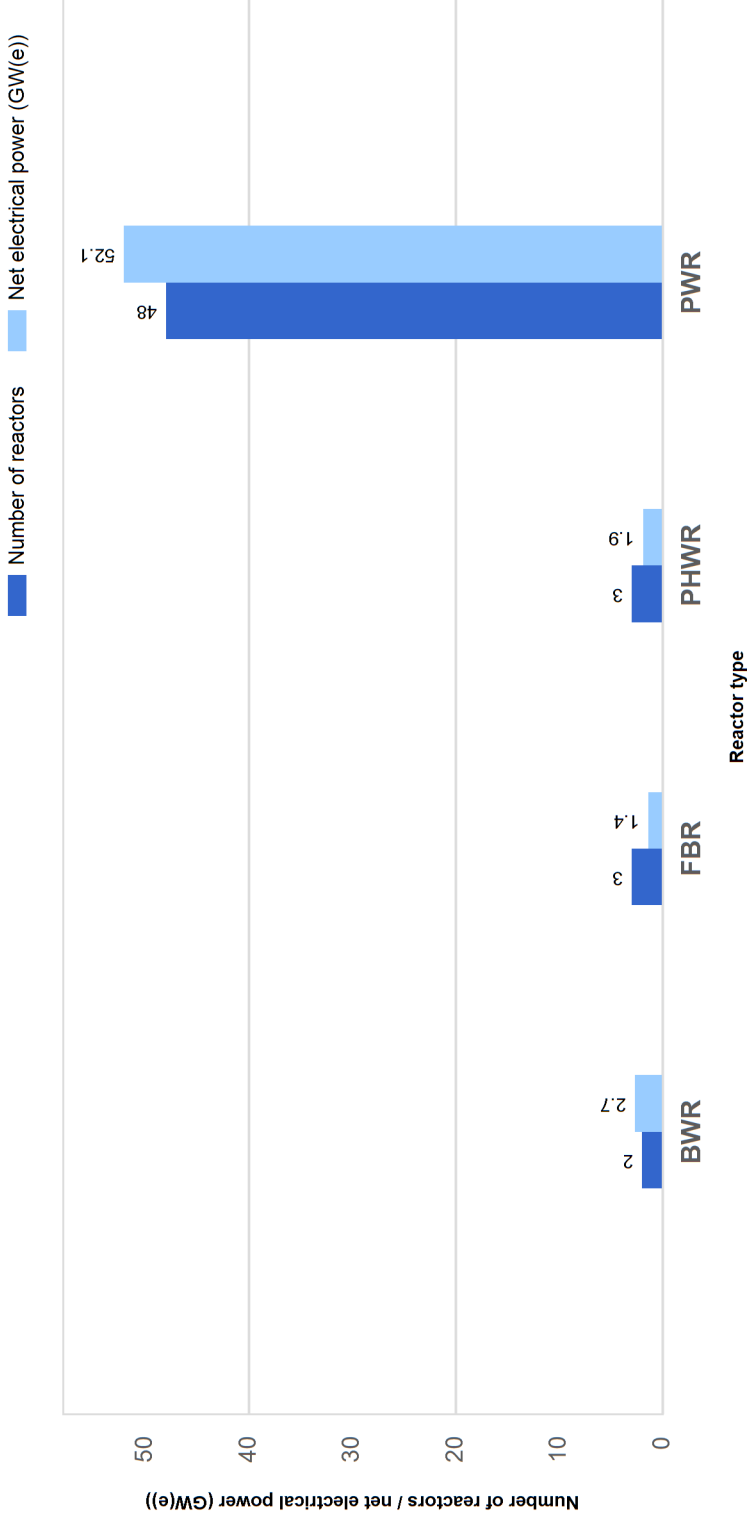
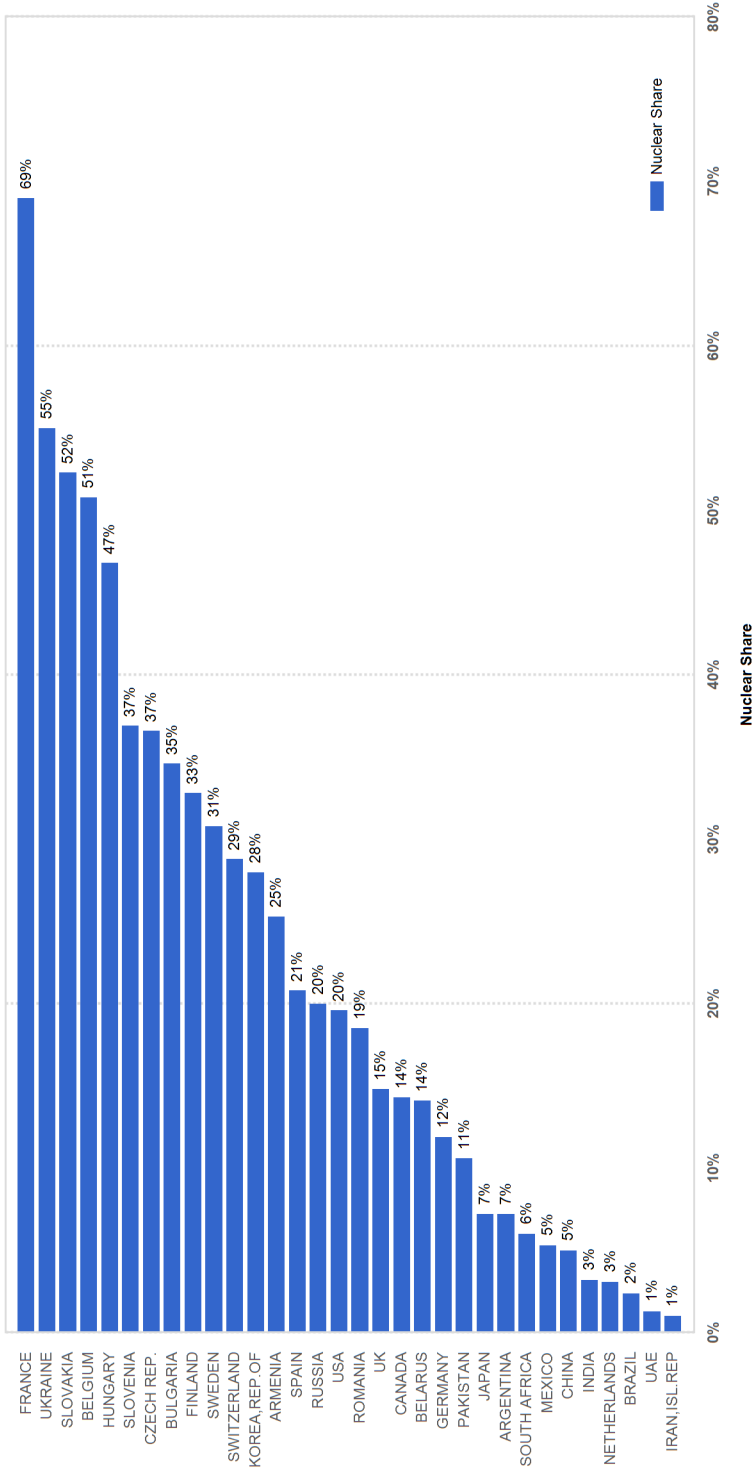


Figure 3. Nuclear share of electricity generation (as of 31 Dec. 2021)



Note: The nuclear share of electricity supplied in Taiwan, China was 10.8% of the total.

Figure 4. Worldwide median construction time in months (as of 31 Dec. 2021)

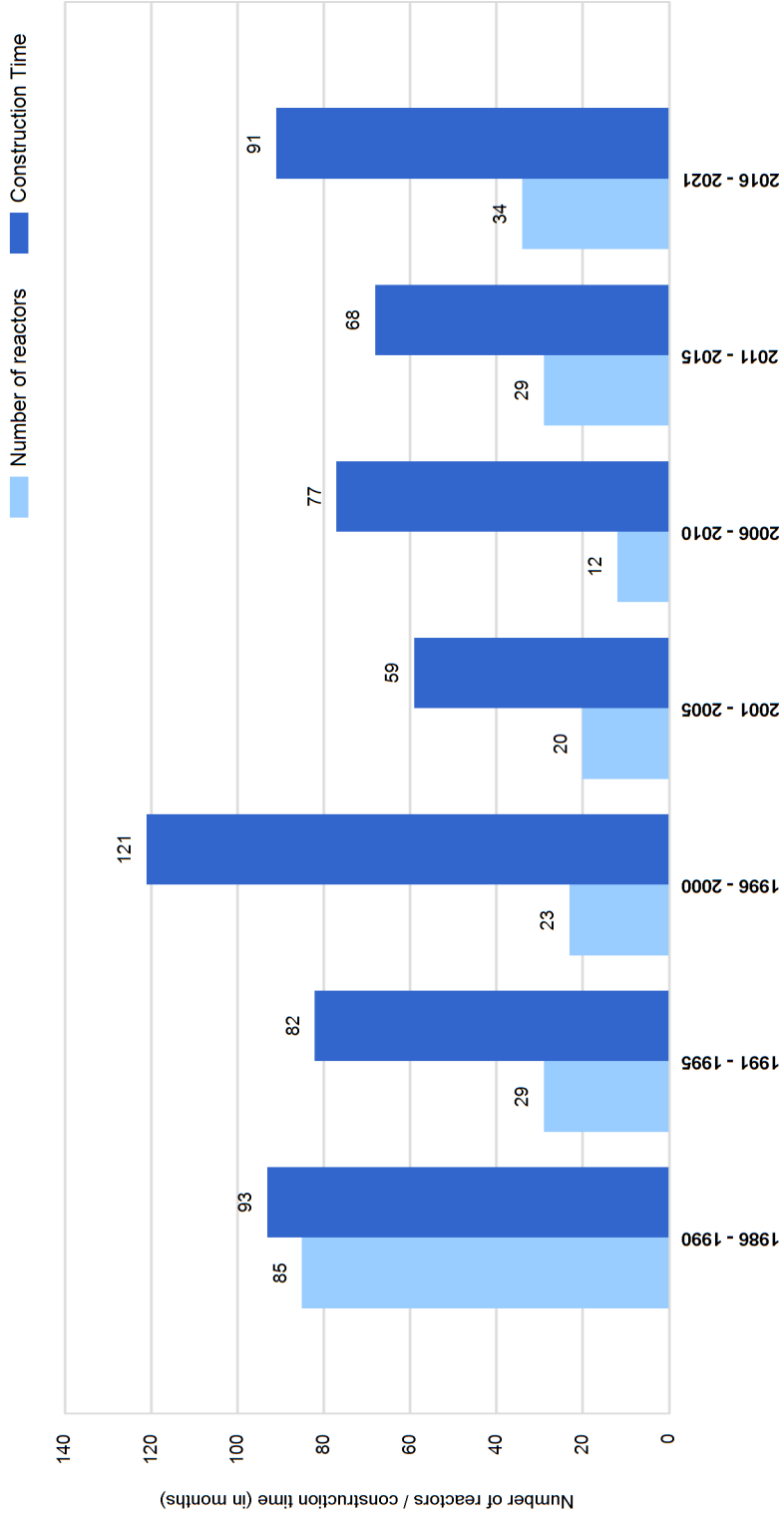


Figure 5. Number of operational reactors by age (as of 31 Dec. 2021)

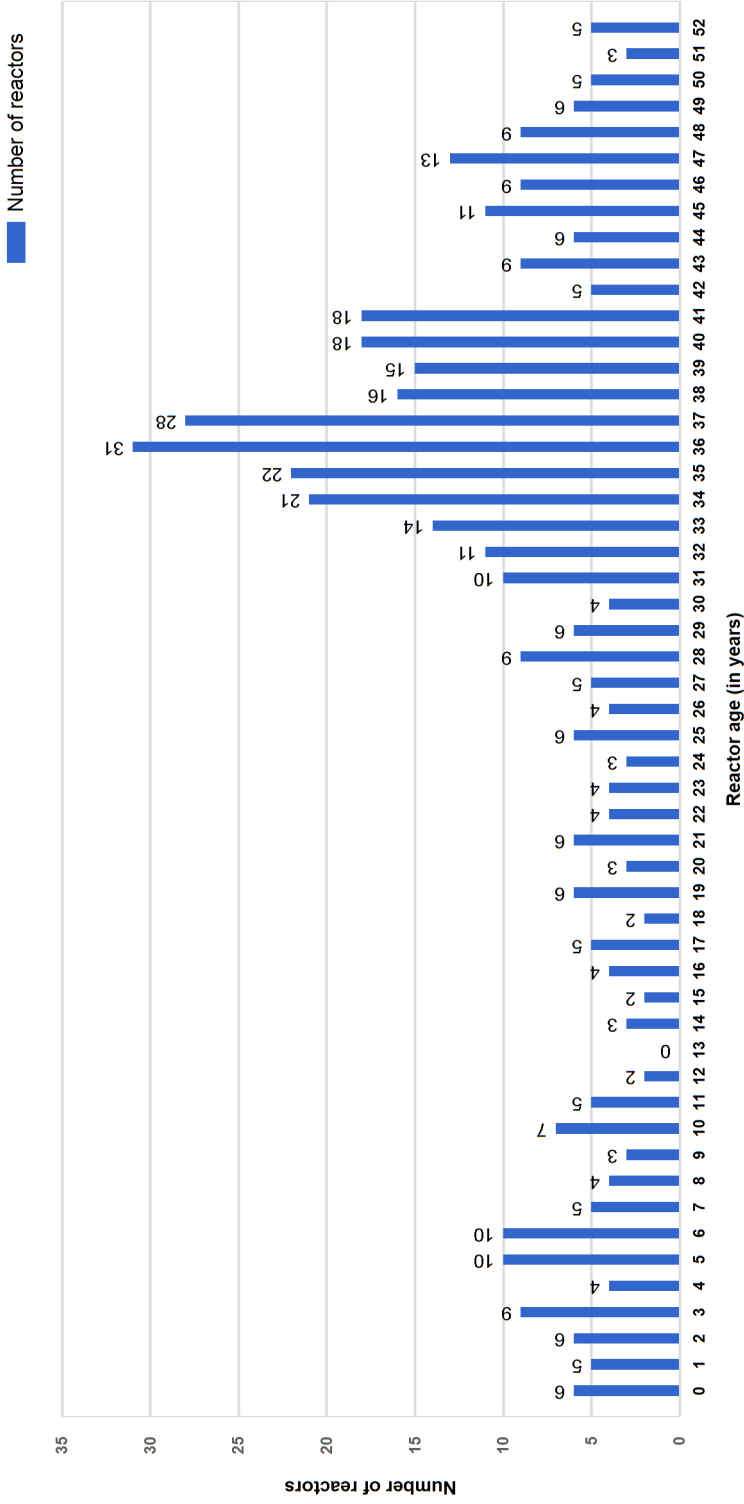


Figure 6. Annual construction starts and connections to the grid (1954 - 2021)

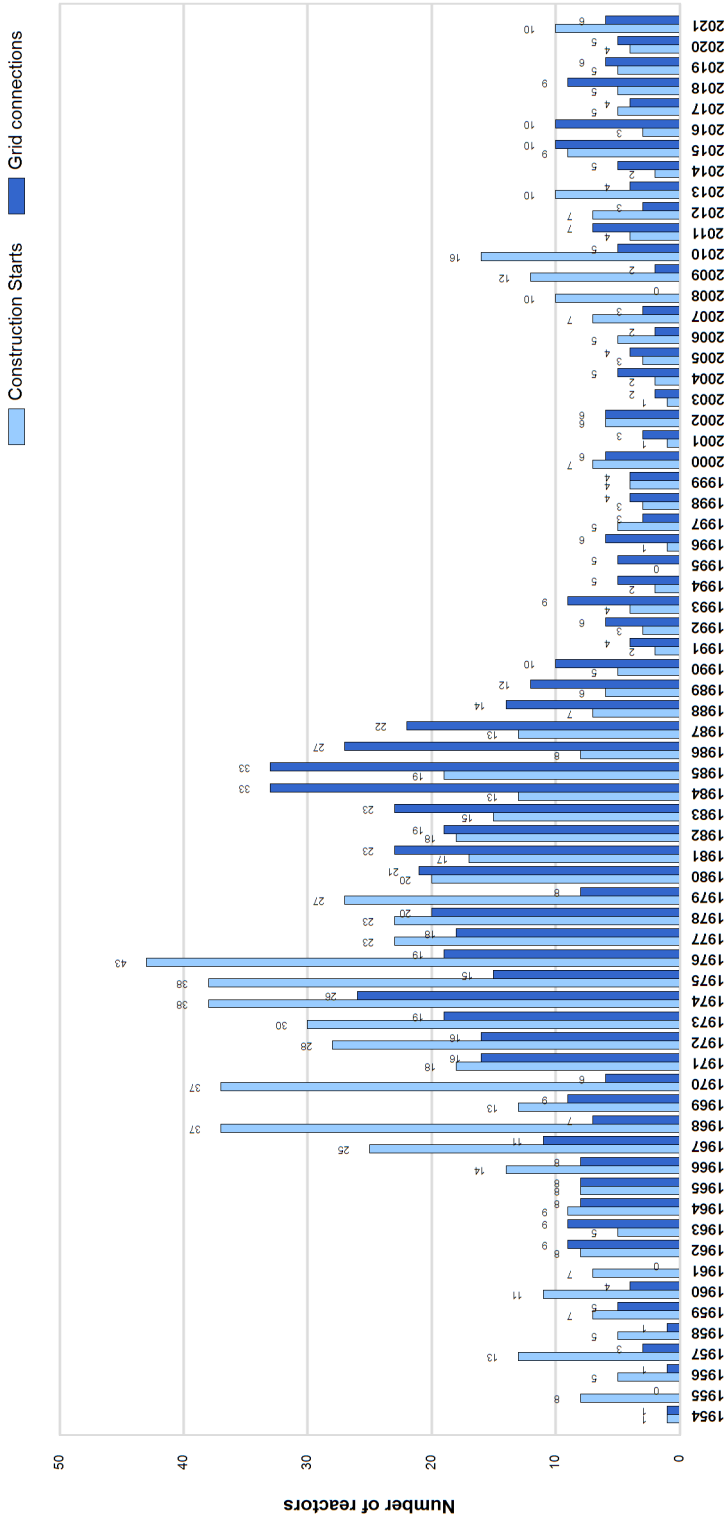
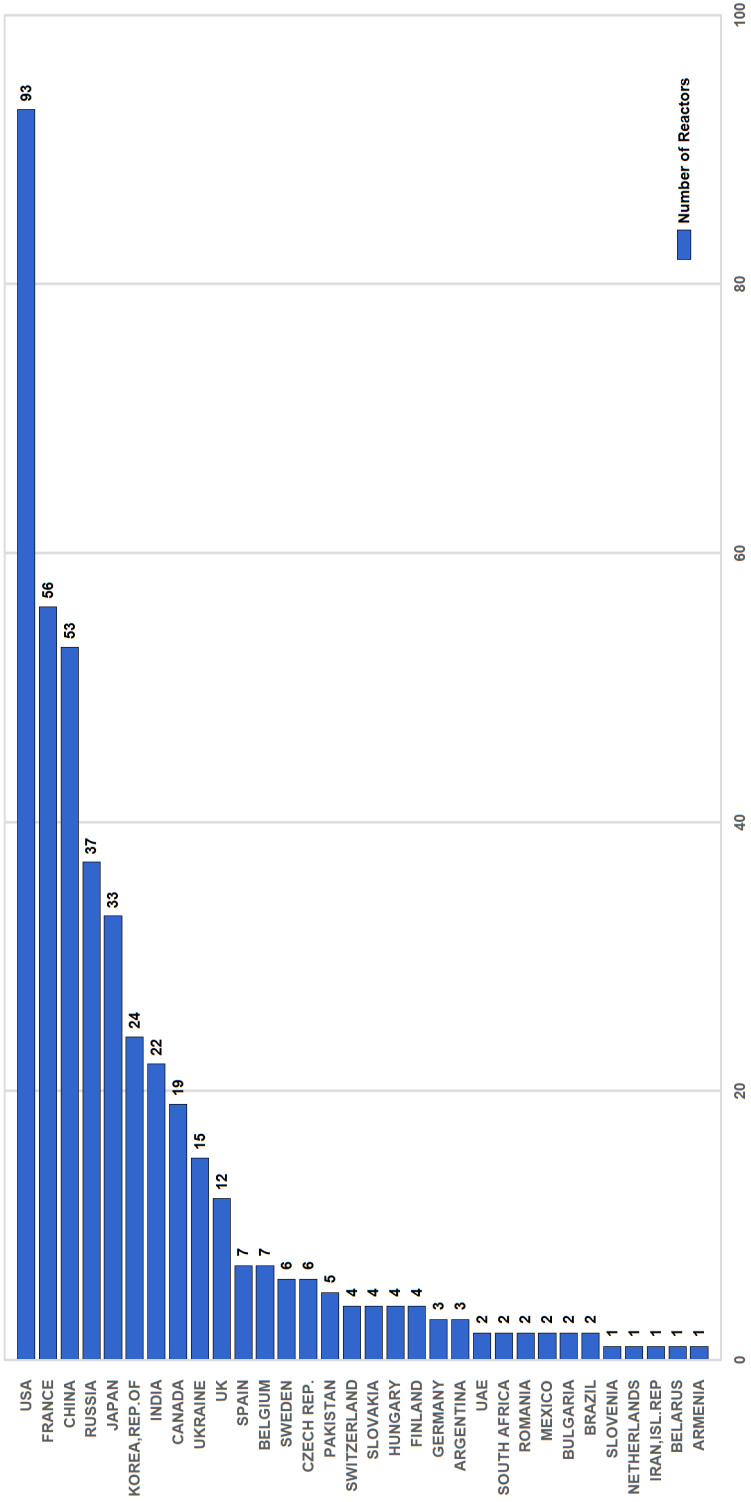


Figure 7. Number of reactors in operation worldwide (as of 31 Dec. 2021)



Note: Taiwan, China: — 3 reactors in operation.

Figure 8. Number of reactors under construction worldwide (as of 31 Dec. 2021)

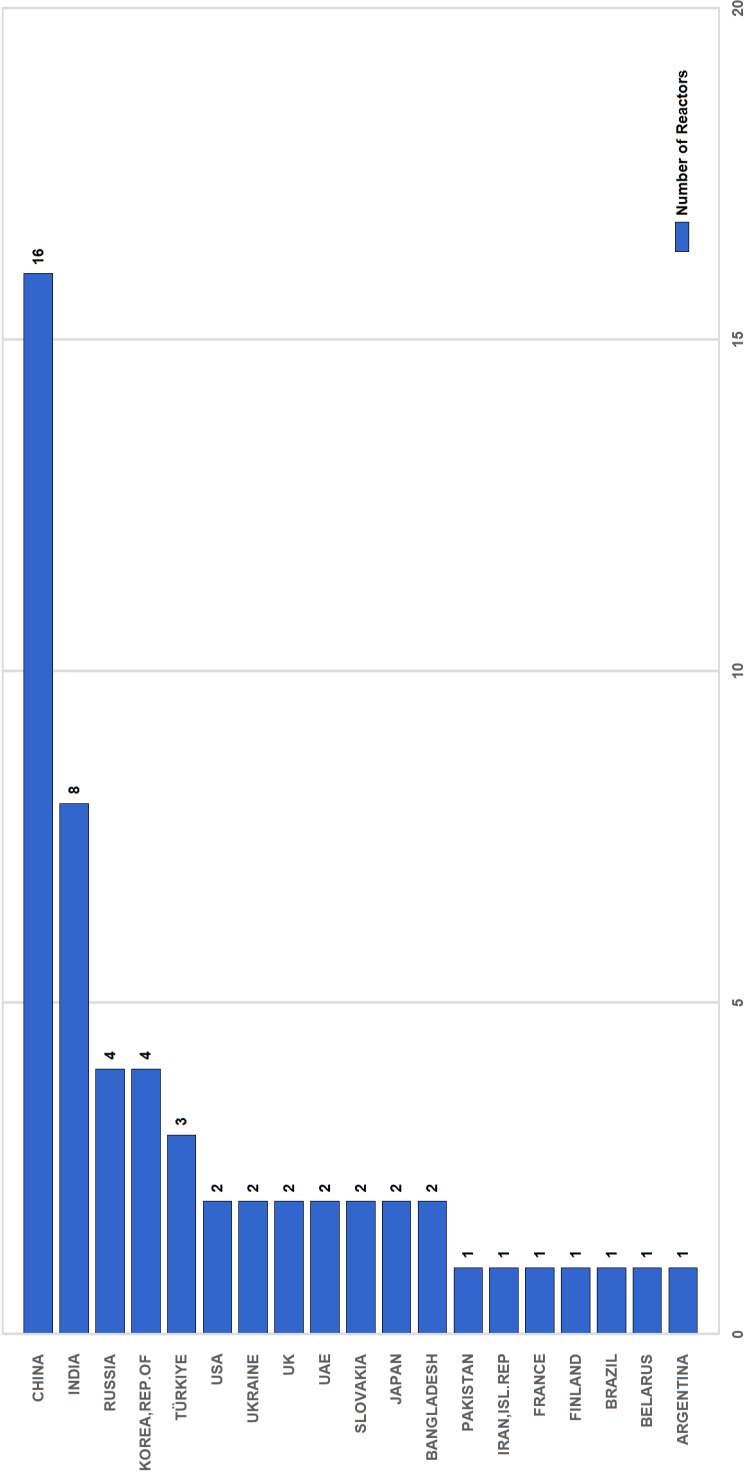
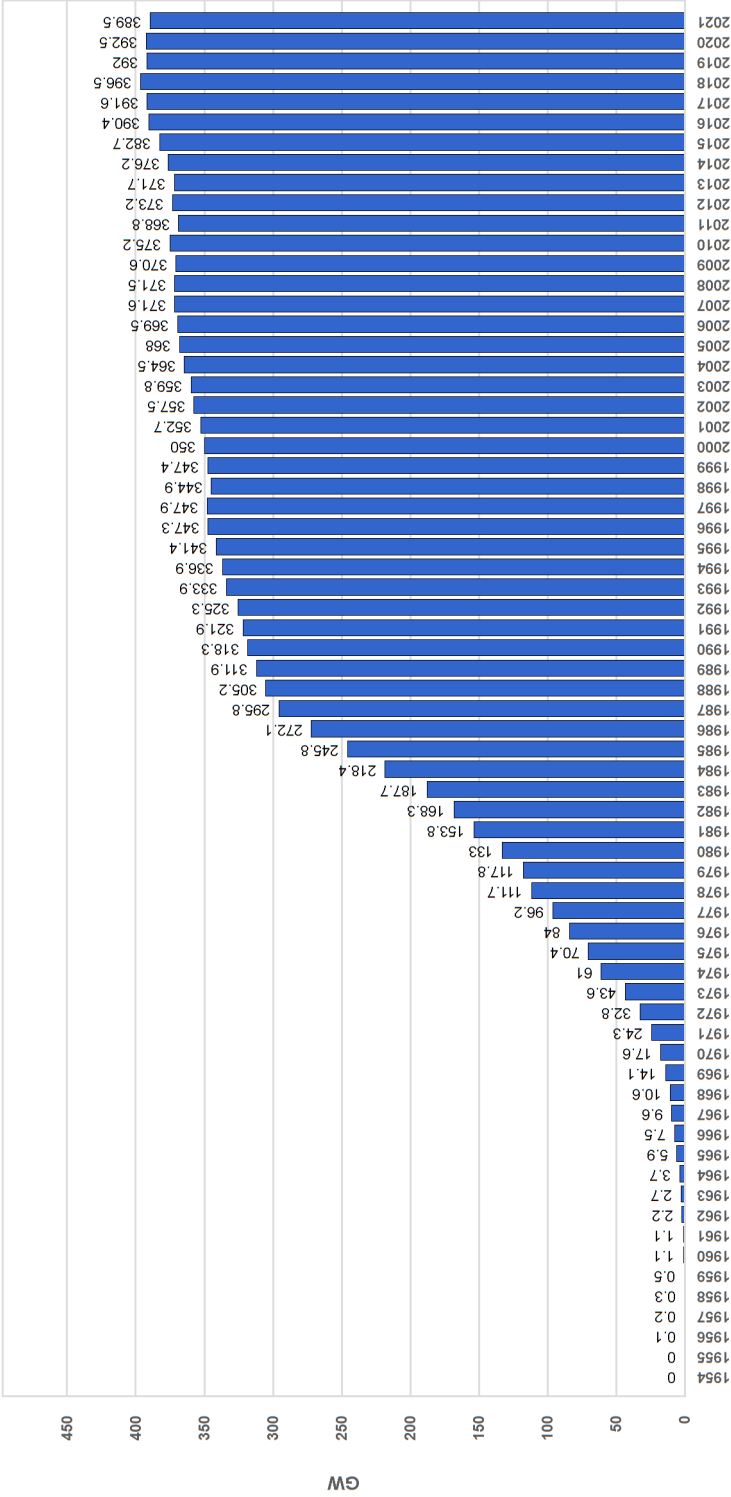


Figure 9. Historical evolution of the worldwide nuclear power (as of 31 Dec. 2021)





ORDERING LOCALLY

IAEA priced publications may be purchased from the sources listed below or from major local booksellers.

Orders for unpriced publications should be made directly to the IAEA. The contact details are given at the end of this list.

NORTH AMERICA

Bernan / Rowman & Littlefield

15250 NBN Way, Blue Ridge Summit, PA 17214, USA

Telephone: +1 800 462 6420 • Fax: +1 800 338 4550

Email: orders@rowman.com • Web site: www.rowman.com/bernan

REST OF WORLD

Please contact your preferred local supplier, or our lead distributor:

Eurospan Group

Gray's Inn House

127 Clerkenwell Road

London EC1R 5DB

United Kingdom

Trade orders and enquiries:

Telephone: +44 (0)176 760 4972 • Fax: +44 (0)176 760 1640

Email: eurospan@turpin-distribution.com

Individual orders:

www.eurospanbookstore.com/iaea

For further information:

Telephone: +44 (0)207 240 0856 • Fax: +44 (0)207 379 0609

Email: info@eurospangroup.com • Web site: www.eurospangroup.com

Orders for both priced and unpriced publications may be addressed directly to:

Marketing and Sales Unit

International Atomic Energy Agency

Vienna International Centre, PO Box 100, 1400 Vienna, Austria

Telephone: +43 1 2600 22529 or 22530 • Fax: +43 1 26007 22529

Email: sales.publications@iaea.org • Web site: www.iaea.org/publications



INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA