

REFERENCE DATA SERIES No. 2
2018 Edition

Nuclear Power Reactors in the World



IAEA

International Atomic Energy Agency

REFERENCE DATA SERIES No. 2

NUCLEAR POWER REACTORS IN THE WORLD

2018 Edition

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INTRODUCTION

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

This thirty-eighth edition of Reference Data Series No. 2 provides a detailed comparison of various statistics up to and including 31 December 2017. 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 on reactors under construction or in the decommissioning process. Data are collected by the IAEA via designated national correspondents in Member States.

PRIS outputs are available in the IAEA's annual publications and on the PRIS web page (<http://www.iaea.org/pris>). Detailed outputs are accessible to registered users through on-line applications. Enquiries should be addressed to:

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DEFINITIONS

Performance factors

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

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

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

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

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

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

where

EAF is the energy availability factor, expressed in per cent.

UCF is the unit capability factor, expressed in per cent.

UCL is the unplanned capability loss factor, expressed in per cent.

PCL is the planned capability loss factor, expressed in per cent.

LF is the load factor, expressed in per cent.

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 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. 2017

Country	Operational reactors		Reactors in long term shutdown		Reactors under construction		Nuclear electricity supplied in 2017	
	No. of units	Net capacity MW(e)	No. of units	Net capacity MW(e)	No. of units	Net capacity MW(e)	TW(e)·h	% of total
ARGENTINA	3	1633			1	25	5.7	4.5
ARMENIA	1	375					2.4	32.5
BANGLADESH					1	1080	NA	NA
BELARUS					2	2220	NA	NA
BELGIUM	7	5918			1	1340	40.2	49.9
BRAZIL	2	1884					14.9	2.7
BULGARIA	2	1926					14.9	34.3
CANADA	19	13554			18	19016	95.1	14.6
CHINA	39	34514					232.8	3.9
CZECH REP.	6	3930			1	1600	26.8	33.1
FINLAND	4	2769			1	1600	21.6	33.2
FRANCE	58	63130			1	1630	381.8	71.6
GERMANY	7	9515					72.2	11.6
HUNGARY	4	1889					15.2	50.0
INDIA	22	6255			7	4824	34.9	3.2
IRAN, ISL. REP	1	915					6.4	2.2
JAPAN	42	39752			2	2653	29.3	3.6
KOREA, REP. OF	24	22494			4	5360	141.3	27.1
MEXICO	2	1552					10.6	6.0
NETHERLANDS	1	482					3.3	2.9
PAKISTAN	5	1318			2	2028	8.1	6.2
ROMANIA	2	1300					10.6	17.7
RUSSIA	35	26142			7	5520	190.1	17.8
SLOVAKIA	4	1814			2	880	14.0	54.0
SLOVENIA	1	688					6.0	39.1
SOUTH AFRICA	2	1860					15.1	6.7
SPAIN	7	7121					55.6	21.2
SWEDEN	8	8629					63.1	39.6

TABLE 1. OVERVIEW OF POWER REACTORS AND NUCLEAR SHARE, 31 DEC. 2017 — continued

Country	Operational reactors		Reactors in long term shutdown		Reactors under construction		Nuclear electricity supplied in 2017	
	No. of units	Net capacity MW(e)	No. of units	Net capacity MW(e)	No. of units	Net capacity MW(e)	TW(e)·h	% of total
SWITZERLAND	5	3333					19.6	33.4
UAE					4	5380	NA	NA
UK	15	8918					63.9	19.3
UKRAINE	15	13107			2	2070	80.4	55.1
USA	99	99952			2	2234	805.6	20.0
Total	448	391721			59	60460	2502.9	NA

Notes:

— The total includes the following data from Taiwan, China:

6 units, 5052 MW in operation; 2 units, 2600 MW under construction;

21.6 TW(e)·h of nuclear electricity generation, representing 9.3% of the total electricity generated there;

— Electricity data for India are based on the provided annual country level value, as some individual reactor data are not available.

TABLE 2. TYPE AND NET ELECTRICAL POWER OF OPERATIONAL REACTORS, 31 DEC. 2017

Country	PWR		BWR		GCR		PHWR		LWGR		FBR		Total	
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)
ARGENTINA	1	375					3	1633					3	1633
ARMENIA	7	5918											7	5918
BELGIUM	2	1884											2	1884
BRAZIL	2	1926											2	1926
BULGARIA							19	13554					19	13554
CANADA	36	33140					2	1354			1	20	39	34514
CHINA	6	3930											6	3930
CZECH REP.	2	1009	2	1760									4	2769
FINLAND	58	63130											58	63130
FRANCE	6	8227	1	1288									7	9515
GERMANY	4	1889											4	1889
HUNGARY	2	1864	2	300			18	4091					22	6255
INDIA	1	915											1	915
IRAN,ISL.REP	20	17427	22	22325			4	2576					42	39752
JAPAN	20	19918	2	1552									24	22494
KOREA,REP.OF	1	482											2	1552
MEXICO	4	1228					1	90					5	1318
NETHERLANDS	4	1228					2	1300					2	1300
PAKISTAN	18	14543											35	26142
ROMANIA	4	1814									2	1380	4	1814
RUSSIA	1	688											1	688
SLOVAKIA	2	1860											2	1860
SLOVENIA	6	6057	1	1064									7	7121
SOUTH AFRICA	3	3075	5	5554									8	8629
SPAIN	3	1740	2	1593									5	3333
SWEDEN	1	1198											15	8918
SWITZERLAND	15	13107			14	7720							15	13107
UK	65	65625	34	34327									99	99952
USA	292	274843	75	72941	14	7720	49	24598	15	10219	3	1400	448	391721
TOTAL														

Notes:

1. The totals include 6 units, 5052 MW in Taiwan, China.
2. During 2017, 4 reactors, 3373 MW were newly connected to the grid.

TABLE 3. TYPE AND NET ELECTRICAL POWER OF REACTORS UNDER CONSTRUCTION, 31 DEC. 2017

Country	PWR		BWR		PHWR		LWGR		FBR		HTGR		Total	
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)
ARGENTINA	1	25											1	25
BANGLADESH	1	1080											1	1080
BELARUS	2	2220											2	2220
BRAZIL	1	1340											1	1340
CHINA	17	18816									1	200	18	19016
FINLAND	1	1600											1	1600
FRANCE	1	1630											1	1630
INDIA	2	1834			4	2520			1	470			7	4824
JAPAN			2	2653									2	2653
KOREA, REP. OF	4	5360											4	5360
PAKISTAN	2	2028											2	2028
RUSSIA	7	5520											7	5520
SLOVAKIA	2	880											2	880
UAE	4	5380											4	5380
UKRAINE	2	2070											2	2070
USA	2	2234											2	2234
TOTAL	49	52017	(*) 4	5253	4	2520			1	470	1	200	59	60460

Notes:

1. The totals include 2 units (2 x BWR), 2600 MW in Taiwan, China.
2. During 2017, construction started on 4 reactors, 4254 MW.

TABLE 4. REACTOR YEARS OF EXPERIENCE, UP TO 31 DEC. 2017

Country	Operational reactors		Reactors in long term shutdown		Permanently shut down reactors		Total			
	No.	Net capacity MW(e)	No.	Net capacity MW(e)	No.	Net capacity MW(e)	No.	Net capacity MW(e)	Operating experience Years	Months
ARGENTINA	3	1633					3	1633	82	2
ARMENIA	1	375			1	376	2	751	43	8
BELGIUM	7	5918			1	10	8	5928	289	7
BRAZIL	2	1884					2	1884	53	3
BULGARIA	2	1926			4	1632	6	3558	163	3
CANADA	19	13554			6	2143	25	15697	731	6
CHINA	39	34514					39	34514	280	9
CZECH REP.	6	3930					6	3930	158	10
FINLAND	4	2769					4	2769	155	4
FRANCE	58	63130			12	3789	70	66919	2164	4
GERMANY	7	9515			29	16860	36	26375	832	7
HUNGARY	4	1889					4	1889	130	2
HUNGARY	4	1889					4	1889	130	2
INDIA	22	6255					22	6255	482	11
IRAN,ISL.REP	1	915					1	915	6	4
ITALY										
JAPAN	42	39752			4	1423	4	1423	80	8
KAZAKHSTAN					18	9046	60	48798	1823	5
KOREA,REP.OF	24	22494			1	52	1	52	25	10
KOREA,REP.OF	24	22494			1	576	25	23070	523	5
LITHUANIA					2	2370	2	2370	43	6
MEXICO	2	1552					2	1552	11	11
NETHERLANDS	1	482			1	55	2	537	73	3
PAKISTAN	5	1318					5	1318	72	5
ROMANIA	2	1300					2	1300	31	11
ROMANIA	2	1300					2	1300	31	11
RUSSIA	35	26142			6	1171	41	27313	1261	9
SLOVAKIA	4	1814			3	909	7	2723	164	7
SLOVAKIA	4	1814			3	909	7	2723	164	7
SLOVENIA	1	688					1	688	36	3
SOUTH AFRICA	2	1860					2	1860	66	3
SPAIN	7	7121			3	1067	10	8188	329	1

TABLE 4. REACTOR YEARS OF EXPERIENCE, UP TO 31 DEC. 2017 — continued

Country	Operational reactors		Reactors in long term shutdown		Permanently shut down reactors		Total		
	No.	Net capacity MW(e)	No.	Net capacity MW(e)	No.	Net capacity MW(e)	No.	Net capacity MW(e)	Operating experience Months
SWEDEN	8	8629			5	2321	13	10950	451
SWITZERLAND	5	3333			1	6	6	3339	214
UK	15	8918			30	4715	45	13633	1589
UKRAINE	15	13107			4	3515	19	16622	488
USA	99	99952			34	14427	133	114379	4309
Total	448	391721			166	66463	614	458184	17430

Notes:

1. The total includes the following data from Taiwan, China:
— operational reactors : 6 units, 5052 MW; 218 years, 1 month.
2. Operating experience is counted from the grid connection excluding any long term shutdown period.

TABLE 5. OPERATIONAL REACTORS AND NET ELECTRICAL POWER, 1990 TO 2017

Country	Number of units and net capacity as of 31 Dec. of given year															
	1990		1995		2000		2005		2010		2015		2016		2017	
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)
ARGENTINA	2	935	2	978	2	935	2	935	2	935	3	1632	3	1632	3	1633
ARMENIA	1	376	1	376	1	376	1	376	1	376	1	375	1	375	1	375
BELGIUM	7	5631	7	5712	7	5801	7	5926	7	5913	7	5913	7	5913	7	5918
BRAZIL	1	626	1	1976	2	1901	2	1884	2	1884	2	1884	2	1884	2	1884
BULGARIA	5	2585	6	3538	6	2722	4	2722	2	1906	2	1926	2	1926	2	1926
CANADA	20	13993	21	14902	14	9998	18	12584	18	12604	19	13524	19	13554	19	13554
CHINA	3	2188	3	2188	9	6587	9	6587	13	10065	31	26774	36	31384	39	34514
CZECH REP.	4	1632	4	1782	5	2611	6	3373	6	3675	6	3930	6	3930	6	3930
FINLAND	4	2310	4	2310	4	2656	4	2676	4	2716	4	2752	4	2764	4	2769
FRANCE	56	56808	56	58573	59	63080	59	63260	58	63130	58	63130	58	63130	58	63130
GERMANY	21	21250	19	20972	19	21283	17	20339	17	20490	8	10799	8	10799	7	9515
HUNGARY	4	1710	4	1729	4	1729	4	1755	4	1889	4	1889	4	1889	4	1889
INDIA	7	1324	10	1746	14	2508	15	2993	19	4189	21	5308	22	6240	22	6255
IRAN, ISL. REP.	41	30867	50	39625	52	43245	55	47593	54	46821	43	40290	42	39752	42	39752
JAPAN	1	135	1	50	16	12990	20	16810	21	18698	24	21733	25	23077	24	22494
KAZAKHSTAN	9	7220	11	9115	16	12990	20	16810	21	18698	24	21733	25	23077	24	22494
KOREA, REP. OF	2	2760	2	2370	2	1290	2	1185	2	1300	2	1440	2	1552	2	1552
LITHUANIA	1	640	2	1256	2	449	1	450	2	425	2	482	1	482	1	482
MEXICO	2	539	2	510	1	449	1	450	2	425	2	482	1	482	1	482
NETHERLANDS	1	125	1	125	2	425	2	425	2	425	3	690	4	1005	5	1318
PAKISTAN	1	125	1	125	2	425	2	425	2	425	3	690	4	1005	5	1318
ROMANIA	29	18898	30	19848	30	19848	31	21743	32	22693	35	25413	35	26142	35	26142
SLOVAKIA	4	1632	4	1632	6	2440	6	2442	4	1816	4	1814	4	1814	4	1814
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	1860
SPAIN	9	7099	9	7097	9	7468	10	7591	8	7514	7	7121	7	7121	7	7121
SWEDEN	12	9826	12	10028	11	9397	10	8905	10	9303	10	9648	9	9102	8	8629
SWITZERLAND	5	2942	5	3170	5	3170	5	3238	5	3238	5	3333	5	3333	5	3333

TABLE 5. OPERATIONAL REACTORS AND NET ELECTRICAL POWER, 1990 TO 2017 — continued

Country	Number of units and net capacity as of 31 Dec. of given year																	
	1990		1995		2000		2005		2010		2015		2016		2017			
	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)	No.	MW(e)		
UK	37	11360	35	12910	33	12490	23	11852	19	10137	15	8918	15	8918	15	8918		
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	99	99851	99	99952		
WORLD	416	318253	434	341387	435	349984	441	368125	441	375277	441	382807	447	390491	448	391721		

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

— 1990: 6 units, 4828 MW; 1995: 6 units, 4884 MW; 2000: 6 units, 4884 MW; 2005: 6 units, 4884 MW; 2010: 6 units, 4982 MW; 2015: 6 units, 5052 MW; 2016: 6 units, 5052 MW; 2017: 6 units, 5052 MW.

TABLE 6. NUCLEAR ELECTRICITY PRODUCTION AND SHARE, FROM 1990 TO 2017

Country	Nuclear electricity supplied (TW-h) and percentage of nuclear share in given year															
	1990		1995		2000		2005		2010		2015		2016		2017	
	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	6.69	5.9	6.52	4.8	7.68	5.6	5.72	4.5	
ARMENIA					1.84	33.0	2.50	42.7	2.29	39.4	2.57	34.5	2.19	31.4	2.41	
BELGIUM	40.59	60.1	39.30	55.5	45.81	56.8	45.34	55.6	45.73	50.0	24.83	41.43	51.7	40.19	49.9	
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	14.97	2.9	14.85	
BULGARIA	13.51	35.7	16.22	46.4	17.39	45.0	17.38	44.1	14.24	33.1	14.70	31.3	15.08	14.87	34.3	
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	95.65	15.6	95.13	
CHINA			12.13	1.2	16.02	1.2	50.33	2.0	70.96	1.8	161.20	3.0	197.83	3.6	232.80	
CZECH REP.	11.77	NA	12.23	20.0	12.71	18.7	23.25	30.5	26.44	33.3	25.34	22.73	29.4	26.78		
FINLAND	18.13	35.1	18.13	29.9	21.58	32.2	22.36	32.9	21.89	28.4	22.33	33.7	21.57	33.2		
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	386.45	72.3	381.85	
GERMANY	139.37	33.1	146.13	29.6	160.66	30.6	154.61	26.6	133.01	22.6	86.81	80.07	13.1	72.16		
HUNGARY	12.89	51.4	13.20	42.3	13.35	40.6	13.02	37.2	14.66	42.1	14.96	15.18	51.3	15.22		
INDIA	5.29	2.2	6.99	1.9	14.23	3.1	15.73	2.8	20.48	2.9	34.64	3.5	35.01	3.4		
IRAN, ISL. REP.																
JAPAN	187.19	27.1	275.51	33.4	306.24	33.8	280.50	29.3	280.25	29.2	4.35	17.54	2.2	29.29		
KAZAKHSTAN			0.08	0.1												
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	154.31	30.3	141.28		
LITHUANIA	15.70	NA	10.64	86.1	7.42	73.9	9.54	70.3								
MEXICO	2.78	2.6	7.53	6.0	7.92	3.9	10.32	5.0	5.59	3.6	11.18	10.27	6.2	10.57		
NETHERLANDS	3.29	4.9	3.78	4.9	3.70	4.3	3.77	3.9	3.75	3.4	3.86	3.75	3.4	3.26		
PAKISTAN	0.38	1.1	0.46	0.9	0.90	1.7	2.41	2.8	2.56	2.6	4.33	5.44	4.4	8.11		
ROMANIA					5.05	10.9	5.11	8.6	10.70	19.5	10.39	17.3	10.39	17.1		
RUSSIA	109.62	NA	91.59	11.8	120.10	15.0	137.64	15.8	159.41	17.1	182.81	18.6	184.05	17.1		
SLOVAKIA	11.16	NA	11.35	44.1	15.17	53.4	16.34	56.1	13.54	51.8	14.08	13.73	54.1	14.02		
SLOVENIA	4.39	NA	4.57	39.5	4.55	37.4	5.61	42.4	5.38	37.3	5.37	5.43	35.2	5.97		
SOUTH AFRICA	8.47	5.6	11.29	6.5	13.00	6.6	12.24	5.5	12.90	5.2	10.97	4.7	15.21	6.6		
SPAIN	51.98	35.9	53.49	34.1	59.49	27.6	54.99	19.6	59.26	20.1	54.76	20.3	56.10	21.4		
SWEDEN	65.27	45.9	67.17	46.6	54.81	39.0	69.58	44.9	55.73	38.1	54.46	60.65	40.0	63.06		
SWITZERLAND	22.40	42.6	23.58	39.9	25.05	38.2	22.11	38.0	25.34	38.0	22.16	20.30	34.4	19.59		

TABLE 6. NUCLEAR ELECTRICITY PRODUCTION AND SHARE, FROM 1990 TO 2017 — continued

Country	Nuclear electricity supplied (TW·h) and percentage of nuclear share in given year															
	1990		1995		2000		2005		2010		2015		2016		2017	
	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
UK	58.77	19.7	70.64	25.4	72.99	21.9	75.34	20.0	56.85	15.6	63.89	18.9	65.15	19.3	63.89	19.3
UKRAINE	71.26	NA	65.78	37.8	72.56	47.3	83.40	48.5	83.95	48.1	82.41	56.5	76.08	52.3	80.41	55.1
USA	578.08	20.6	673.52	22.5	755.55	19.8	783.35	19.3	807.08	19.6	798.01	19.5	805.96	19.7	805.65	20.1
WORLD	1890.35		2190.94		2443.85		2626.34		2629.82		2441.34		2477.30		2502.88	

Notes:

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

1990: 31.54 TW(e)·h of nuclear electricity generation, representing 38.32% of the total electricity generated there;

1995: 33.8 TW(e)·h of nuclear electricity generation, representing 28.79% of the total electricity generated there;

2000: 37 TW(e)·h of nuclear electricity generation, representing 21.19% of the total electricity generated there;

2005: 38.4 TW(e)·h of nuclear electricity generation, representing 17.93% of the total electricity generated there;

2010: 39.89 TW(e)·h of nuclear electricity generation, representing 19.3% of the total electricity generated there;

2015: 35.14 TW(e)·h of nuclear electricity generation, representing 16.32% of the total electricity generated there;

2016: 30.46 TW(e)·h of nuclear electricity generation, representing 13.72% of the total electricity generated there;

2017: 21.56 TW(e)·h of nuclear electricity generation, representing 9.33% of the total electricity generated there.

— In 2017, the electricity supply of India is based on country annual data, as some individual reactor unit data are not available.

TABLE 7. ANNUAL CONSTRUCTION STARTS AND CONNECTIONS TO THE GRID, 1954 TO 2017

Year	Construction starts		Connections to the grid		Operational reactors	
	Number of units	Design capacity (MW(e))	Number of units	Design capacity (MW(e))	Number of units	Updated capacity (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	6	476	1	35	6	269
1959	7	976	5	176	11	548
1960	11	1010	4	438	15	1087
1961	7	1529	1	15	16	1104
1962	8	1379	9	955	25	2223
1963	5	1722	9	500	33	2677
1964	9	2932	8	1022	40	3686
1965	9	3291	8	1879	48	5910
1966	15	7052	8	1528	55	7539
1967	25	16287	11	2165	64	9595
1968	37	26859	7	1086	69	10648
1969	13	9277	10	3670	78	14121
1970	37	25489	6	3410	84	17656
1971	18	12623	16	7711	99	24320
1972	28	21163	16	8880	113	32797
1973	30	24657	20	12727	132	43761
1974	38	35222	26	17149	154	61021
1975	38	36434	15	10236	169	70414
1976	43	41729	19	14232	186	83992
1977	23	21849	18	13199	199	96202
1978	23	21735	20	15782	218	111740
1979	27	23007	8	6909	225	117814
1980	20	19084	21	15088	245	133037
1981	17	16029	23	20352	267	153832
1982	19	19765	19	15313	284	168317
1983	14	11286	23	19266	306	187756
1984	13	11332	33	30980	336	218452
1985	19	15337	33	31061	363	245779
1986	8	7286	27	27134	389	272074
1987	13	11202	22	22191	407	295812
1988	7	7722	14	13574	416	305212
1989	6	4018	12	10536	420	311942
1990	5	3267	10	10543	416	318253
1991	2	2246	4	3669	415	321924
1992	3	3094	6	4809	418	325261
1993	4	3515	9	9012	427	333914
1994	2	1334	5	4302	429	336904
1995			5	3536	434	341387
1996	1	610	6	7080	438	347281
1997	5	4410	3	3557	434	347880
1998	3	2150	4	2973	430	344900
1999	4	4540	4	2729	432	347353
2000	7	5356	6	3063	435	349984
2001	1	1304	3	2696	438	352715
2002	6	3440	6	5049	439	357481
2003	1	202	2	1627	437	359827
2004	2	1336	5	4785	438	364673
2005	3	2907	4	3823	441	368125
2006	4	3444	2	1492	435	369581
2007	8	6644	3	1842	439	371707
2008	10	10633			438	371557
2009	12	13500	2	1068	437	370697
2010	16	15948	5	3776	441	375277
2011	4	1888	7	4013	435	368921
2012	7	7054	3	2963	437	373245
2013	10	11323	4	4060	434	371775
2014	3	2480	5	4660	438	376262
2015	8	8481	10	9450	441	382807
2016	3	3014	10	9531	447	390491
2017	4	4254	4	3373	448	391721

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		2017	
	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months	No. Months
ARGENTINA																
BRAZIL	1	89	1	113	1	176										
BULGARIA	5	101	2	97												
CANADA			3	73												
CHINA					1	167	6	59	4	68	18	67	5	68	3	57
CZECH REP.	3	93	3	93	4	124	1	191								
FRANCE	15	86														
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	1	88		
LITHUANIA	1	116														
MEXICO	1	151	1	210												
PAKISTAN					1	83										
ROMANIA					1	169										
RUSSIA																
SLOVAKIA	4	72	1	109	2	150	2	233	1	161	3	108	1	99		
SPAIN	2	96														
UK	4	98	1	80												
UKRAINE	6	58	1	113												
USA	22	146	1	221	1	272	2	227								
TOTAL	85	93	29	82	23	121	20	59	12	77	29	68	10	76	4	59

Notes:

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

TABLE 9. CONSTRUCTION STARTS DURING 2017

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation
	Code	Name			Thermal	Gross	Net					
BANGLADESH	BD-1	ROOPPUR-1	PWR	VVER V-523	3200	1200	1080	NPCL	AEM	2017-11	—	—
INDIA	IN-35	KUDANKULAM-3	PWR	VVER V-412	3000	1000	917	NPCL	JSC ASE	2017-6	—	2023-3
	IN-36	KUDANKULAM-4	PWR	VVER V-412	3000	1000	917	NPCL	JSC ASE	2017-10	—	2023-11
KOREA, REP. OF	KR-29	SHIN-KORI-5	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2017-4	—	—

Note: During 2017, construction started on 4 reactors (4254 MW).

TABLE 10. CONNECTIONS TO THE GRID DURING 2017

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	First criticality	Grid connection
	Code	Name			Thermal	Gross	Net					
CHINA	CN-43	FUQING-4	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2012-11	2017-7	2017-7
	CN-45	TIANWAN-3	PWR	VVER V-428M	3000	1126	1060	JNPC	IZ	2012-12	2017-9	2017-12
	CN-41	YANGJIANG-4	PWR	CPR-1000	2905	1086	1000	YJNPC	CFHI	2012-11	2016-12	2017-1
PAKISTAN	PK-5	CHASNUPP-4	PWR	CNP-300	999	340	313	PAEC	CNNC	2011-12	2017-3	2017-7

Note: During 2017, 4 reactors (3373 MW) were newly connected to the grid.

TABLE 11. SCHEDULED CONNECTIONS TO THE GRID DURING 2018

Country	Reactor		Type	Capacity (MW)			Operator	NSSS supplier	Construction start	First criticality	Grid date
	Code	Name		Thermal	Gross	Net					
FINLAND	FI-5	OLKILUOTO-3	PWR	4300	1720	1600	TVO	AREVA	2005-8	—	—
RUSSIA	RU-163	LENINGRAD 2-1	PWR	3200	1199	1111	REA	AEM	2008-10	2018-2	2018-3
	RU-162	NOVORONEZH 2-2	PWR	3200	1195	1114	REA	AEM	2009-7	2018-11	2018-12
	RU-64	ROSTOV-4	PWR	3000	1070	1011	REA	AEM	2010-6	2017-12	2018-2

Note: During 2018, 4 reactors (4836 MW) are expected to achieve connection to the grid.

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2017

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Expected construction start
	Code	Name			Thermal	Gross			
BANGLADESH	BD-2	ROOPPUR-2	PWR	VVER V-523	3200	1200	NPCBL	AEM	—
CHINA	CN-73	BAMAOSHAN	PWR	CPR-1000	2905	1080			—
	CN-57	CHANGJIANG-3	PWR		1930	650			—
	CN-58	CHANGJIANG-4	PWR		1930	650			—
	CN-59	FANGCHENGANG-5	PWR						—
	CN-60	FANGCHENGANG-6	PWR						—
	CN-85	GUOHE-1	PWR	CAP-1400	4040	1534	SNPDP		—
	CN-86	GUOHE-2	PWR	CAP-1400	4040	1534	SNPDP		—
	CN-76	HAIYANG-3	PWR	AP-1000	3415	1253	SDNPC	WH	—
	CN-77	HAIYANG-4	PWR	AP-1000	3415	1253	SDNPC	WH	—
	CN-80	HONGSHIDING-1	PWR			0			—
	CN-81	HONGSHIDING-2	PWR	ACPR1000		0	HSDNPC	DEC	—
	CN-65	JIYANG-1	PWR			1000			—
	CN-66	JIYANG-2	PWR			1000			—
	CN-67	JIYANG-3	PWR			1000			—
	CN-68	JIYANG-4	PWR			1000			—
	CN-87	LUFENG-1	PWR	CPR-1000		1000	LFNPC		—
	CN-88	LUFENG-2	PWR	CPR-1000		1000	LFNPC		—
	CN-61	PENGZE-1	PWR			1250			—
	CN-62	PENGZE-2	PWR			1250			—
	CN-63	PENGZE-3	PWR			1250			—
CN-64	PENGZE-4	PWR			1250			—	
CN-78	SANMEN-3	PWR	AP-1000		3400	1251	SMNPC	WH/MHI	—
CN-79	SANMEN-4	PWR	AP-1000		3400	1251	SMNPC	WH/MHI	—
CN-71	SANMING-1	FBR	BN-800		2100	860	FSNPC		—
CN-72	SANMING-2	FBR	BN-800		2100	860	FSNPC		—
CN-74	TAOHUJIAJIANG-1	PWR				0		—	
CN-75	TAOHUJIAJIANG-2	PWR				0		—	

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Expected construction start
	Code	Name			Thermal	Gross			
CHINA	CN -69	XIANNING-1	PWR			0			—
	CN -70	XIANNING-2	PWR	CPR-1000	2905	1080	LNPC	DEC	—
	CN -82	XUDABU-1	PWR	CPR-1000	2905	1080	LNPC	DEC	—
	CN -83	XUDABU-2	PWR						—
FINLAND	FI -6	HANHIKIVI-1	PWR	VVER V-511	3200	1200	FV	AEM	—
HUNGARY	HU -5	PAKS-5	PWR	VVER V-491	3200	1200	PAKS II	AEM	—
	HU -6	PAKS-6	PWR	VVER V-491	3200	1200	PAKS II	AEM	—
INDIA	IN -33	GORAKHPUR-1	PHWR	PHWR-700	700	630	NPCIL		—
	IN -34	GORAKHPUR-2	PHWR	PHWR-700	700	630	NPCIL		—
IRAN, ISL. REP	IR -2	BUSHEHR-2	PWR	VVER V-528	3000	1000	NPPDCO	JSC ASE	—
	IR -5	BUSHEHR-3	PWR	VVER V-528	3000	1000	NPPDCO	JSC ASE	—
	IR -9	DARKHOVAIN	PWR	IR-360	1113	380	NPPDCO		—
JAPAN	JP -76	HAMAOKA-6	BWR	ABWR	3926	1400	CHUBU		—
	JP -69	HIGASHI DORI-1 (TEPCO)	BWR	ABWR	3926	1385	TEPCO	H/G	—
	JP -74	HIGASHI DORI-2 (TEPCO)	BWR	ABWR	3926	1385	TEPCO		—
	JP -72	HIGASHI DORI-2 (TOHOKU)	BWR	ABWR	3926	1067	TOHOKU		—
	JP -62	KAMINOSEKI-1	BWR	ABWR	3926	1373	1325 CHUGOKU		—
	JP -63	KAMINOSEKI-2	BWR	ABWR	3926	1373	1325 CHUGOKU		—
	JP -75	SENDAL-3	PWR	APWR	4466	1590	KYUSHU		—
	JP -67	TSURUGA-3	PWR	APWR	4466	1538	JAPCO	MHI	—
JP -68	TSURUGA-4	PWR	APWR	4466	1538	JAPCO	MHI	—	
KOREA, REP. OF	KR -30	SHIN-KORI-6	PWR	APR-1400	3983	1400	KHNP	DHICKOPC	—
RUSSIA	RU -171	BALTIC-2	PWR	VVER V-491	3200	1194	REA	AEM	—

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Expected construction start
	Code	Name			Thermal	Gross	Net			
RUSSIA	RU-202	BASHKIR-1	PWR	VVER V-510	3300	1255	1115	REA	AEM	—
	RU-203	BASHKIR-2	PWR	VVER V-510	3300	1255	1115	REA	AEM	—
	RU-207	BELOYARSK-5	FBR	BN-1200	3000	1220	0	REA	AEM	—
	RU-177	CENTRAL-1	PWR	VVER V-510	3300	1255	0	REA	AEM	—
	RU-178	CENTRAL-2	PWR	VVER V-510	3300	1255	0	REA	AEM	—
	RU-175	KOLA 2-1	PWR	-	3200	1200	0	REA	AEM	—
	RU-176	KOLA 2-2	PWR	-	3200	1200	1100	REA	AEM	—
	RU-166	KURSK 2-1	PWR	VVER V-510	3300	1255	1175	REA	AEM	2018-4
	RU-189	KURSK 2-2	PWR	VVER V-510	3300	1255	1175	REA	AEM	2019-5
	RU-190	KURSK 2-3	PWR	VVER V-510	3300	1255	1175	REA	AEM	—
	RU-191	KURSK 2-4	PWR	VVER V-510	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	—	
TURKEY	TR-1	AKKUYU-1	PWR	VVER V-509	3200	1200	1114	ANC	AEM	2018-4
	TR-2	AKKUYU-2	PWR	VVER V-509	3200	1200	1114	ANC	AEM	—
	TR-3	AKKUYU-3	PWR	VVER V-509	3200	1200	1114	ANC	AEM	—
	TR-4	AKKUYU-4	PWR	VVER V-509	3200	1200	1114	ANC	AEM	—
UK	GB-25A	HINKLEY POINT C-1	PWR	EPR-1750	4524	1720	1630	EDF-CGN	AREVA	—
	GB-25B	HINKLEY POINT C-2	PWR	EPR-1750	4524	1720	1630	EDF-CGN	AREVA	—
USA	US-5033	FERMI-3	BWR	ESBWR	4500	1600	1520	—	—	—

TABLE 12. REACTORS PLANNED FOR CONSTRUCTION AS KNOWN ON 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Expected construction start
	Code	Name			Thermal	Gross	Net			
USA	US -5017	NORTH ANNA-3	PWR	US-APWR			1500			—
	US -5012	SOUTH TEXAS-3	BWR	ABWR	3926	1400	1350			—
	US -5013	SOUTH TEXAS-4	BWR	ABWR	3926	1400	1350			—
	US -5040	TURKEY POINT-6	PWR	AP-1000	3750	1250	1117			—
	US -5041	TURKEY POINT-7	PWR	AP-1000	3750	1250	1117			—
	US -5018	WILLIAM STATES LEE III-1	PWR	AP-1000	3750	1250	1117			—
	US -5019	WILLIAM STATES LEE III-2	PWR	AP-1000	3750	1250	1117			—

Note: Status as of 31 December 2017. 86 reactors (79134 MW) were known as planned.

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2017

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	First criticality	Grid connection	Commercial operation	
	Code	Name			Thermal	Gross	Net							
ARGENTINA	AR-4	CAREM25	PWR	CAREM Prototyp	100	29	25	CNEA	CNEA	2014-2	—	—	—	
BANGLADESH	BD-1	ROOPPUR-1	PWR	VVER V-523	3200	1200	1080	NPCBL	AEM	2017-11	—	—	—	
BELARUS	BY-1	BELARUSIAN-1	PWR	VVER V-491	3200	1194	1110	BelNPP	JSC ASE	2013-11	—	—	—	
	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	ELETRONUC	KWU	2010-6	2024-9	2024-9	2025-1	
CHINA	CN-53	FANGCHENGANG-3	PWR	HPR1000	3150	1180	1000	GFNPC	CFHI	2015-12	—	—	—	
	CN-54	FANGCHENGANG-4	PWR	HPR1000	3150	1180	1000	GFNPC	CFHI	2016-12	—	—	—	
	CN-51	FUJING-5	PWR	HPR1000	3060	1150	1000	FQNP	NPIC	2015-5	—	—	—	
	CN-52	FUJING-6	PWR	HPR1000	3060	1150	1000	FQNP	NPIC	2015-12	—	—	—	
	CN-30	HAIYANG-1	PWR	AP-1000	3415	1250	1000	SDNPC	WH	2009-9	—	—	—	
	CN-31	HAIYANG-2	PWR	AP-1000	3415	1250	1000	SDNPC	WH	2010-6	—	—	—	
	CN-49	HONGYANHE-5	PWR	ACPR-1000	2905	1119	1061	LHNPC	DEC	2015-3	—	—	—	
	CN-50	HONGYANHE-6	PWR	ACPR-1000	2905	1119	1061	LHNPC	DEC	2015-7	—	—	—	
	CN-28	SANMEN-1	PWR	AP-1000	3400	1251	1157	SMNPC	WH/WHI	2009-4	—	—	—	
	CN-29	SANMEN-2	PWR	AP-1000	3400	1251	1157	SMNPC	WH/WHI	2009-12	—	—	—	
	CN-44	SHIDAO BAY-1	HTGR	HTR-PM	500	211	200	HSNPC	TSINGHUA	2012-12	—	—	—	
	CN-32	TAISHAN-1	PWR	EPR-1750	4590	1750	1660	TNPC	AREVA	2009-11	—	—	—	
	CN-33	TAISHAN-2	PWR	EPR-1750	4590	1750	1660	TNPC	AREVA	2010-4	—	—	—	
	CN-46	TIANWAN-4	PWR	VVER V-428M	3000	1126	1060	JNPC	IZ	2013-9	—	—	—	
	CN-55	TIANWAN-5	PWR	CNP-1000	2905	1118	1000	JNPC	SHE	2015-12	—	—	—	
	CN-56	TIANWAN-6	PWR	CNP-1000	2905	1118	1000	JNPC	SHE	2016-9	—	—	—	
	CN-47	YANGJIANG-5	PWR	ACPR-1000	2905	1086	1000	YJNPC	CFHI	2013-9	—	—	—	
	CN-48	YANGJIANG-6	PWR	ACPR-1000	2905	1086	1000	YJNPC	CFHI	2013-12	—	—	—	
	FINLAND	FI-5	OLKILUOTO-3	PWR	EPR	4300	1720	1600	TVO	AREVA	2005-8	—	—	2018-12

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	First criticality	Grid connection	Commercial operation
	Code	Name			Thermal	Gross						
FRANCE	FR-74	FLAMANVILLE-3	PWR	EPR	4300	1650	EDF	AREVA	2007-12	—	—	—
INDIA	IN-30	KAKRAPAR-3	PHWR	PHWR-700	2166	700	NPCIL	NPCIL	2010-11	—	—	—
	IN-31	KAKRAPAR-4	PHWR	PHWR-700	2166	630	NPCIL	NPCIL	2010-11	—	—	—
	IN-35	KUDANKULAM-3	PWR	VVER V-412	3000	1000	917	JSC ASE	2022-9	—	—	2023-3
	IN-36	KUDANKULAM-4	PWR	VVER V-412	3000	1000	917	JSC ASE	2017-10	—	—	2023-11
	IN-29	PFBR	FBR	Prototype	1253	500	470	BHAVINI	2004-10	—	—	—
	IN-21	RAJASTHAN-7	PHWR	Horizontal Pre	2177	700	630	NPCIL	2011-7	—	—	—
	IN-22	RAJASTHAN-8	PHWR	Horizontal Pre	2177	700	630	NPCIL	2011-9	—	—	—
	JP-66	OHMA	BWR	ABWR	3926	1383	1328	EPDC	H/G	2010-5	—	—
JP-65	SHIMANE-3	BWR	ABWR	3926	1373	1325	CHUGOKU	HITACHI	2007-10	—	—	—
KOREA, REP. OF	KR-27	SHIN-HANUL-1	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2012-7	—	—
	KR-28	SHIN-HANUL-2	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2013-6	—	—
	KR-26	SHIN-KORI-4	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2009-8	—	—
	KR-29	SHIN-KORI-5	PWR	APR-1400	3983	1400	1340	KHNP	DHICKOPC	2017-4	—	—
	PK-6	KANUPP-2	PWR	ACP-1000	3060	1100	1014	PAEC	CZEC	2015-8	2020-6	2020-7
PK-7	KANUPP-3	PWR	ACP-1000	3060	1100	1014	PAEC	CZEC	2016-5	—	—	
RUSSIA	RU-151	AKADEMIK LOMONOSOV-1	PWR	KLT-40S 'Float	150	38	32	REA	AEM	2007-4	—	2019-12
	RU-152	AKADEMIK LOMONOSOV-2	PWR	KLT-40S 'Float	150	38	32	REA	AEM	2007-4	—	2019-12
	RU-170	BALTIC-1	PWR	VVER V-491	3200	1194	1109	REA	AEM	2012-2	—	—
	RU-163	LENINGRAD 2-1	PWR	VVER V-491	3200	1199	1111	REA	AEM	2008-10	2018-2	2018-11
	RU-164	LENINGRAD 2-2	PWR	VVER V-491	3200	1199	1111	REA	AEM	2010-4	2011-11	2021-12
	RU-162	NOVOVORONEZH 2-2	PWR	VVER V-392M	3200	1195	1114	REA	AEM	2009-7	2018-11	2019-12
	RU-64	ROSTOV-4	PWR	VVER V-320	3000	1070	1011	REA	AEM	2010-6	2017-12	2018-10
	SK-10	MOCHOVCE-3	PWR	VVER V-213	1375	471	440	SE	SKODA	1987-1	2019-2	2019-2

TABLE 13. REACTORS UNDER CONSTRUCTION, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	First criticality	Grid connection	Commercial operation
	Code	Name			Thermal	Gross	Net						
SLOVAKIA	SK-11	MOCHOVCE-4	PWR	VVER V-213	1375	471	440	SE	SKODA	1987-1	2020-2	2020-2	2020-4
UAE	AE-01	BARAKAH-1	PWR	APR-1400	3983	1400	1345	NAWAH	KEPCO	2012-7	—	—	—
	AE-02	BARAKAH-2	PWR	APR-1400	3983	1400	1345	NAWAH	KEPCO	2013-4	—	—	—
	AE-03	BARAKAH-3	PWR	APR-1400	3983	1400	1345	NAWAH	KEPCO	2014-9	—	—	—
	AE-04	BARAKAH-4	PWR	APR-1400	3983	1400	1345	NAWAH	KEPCO	2015-7	—	—	—
UKRAINE	UA-51	KHIMELNIT SKI-3	PWR	VVER	3132	1089	1035	NNEG	JSC ASE	1986-3	—	—	—
	UA-52	KHIMELNIT SKI-4	PWR	VVER	3132	1089	1035	NNEG	JSC ASE	1987-2	—	—	—
USA	US-5025	VOGTLE-3	PWR	AP-1000	3400	1250	1117	SOUTHERN WH	WH	2013-3	—	—	—
	US-5026	VOGTLE-4	PWR	AP-1000	3400	1250	1117	SOUTHERN WH	WH	2013-11	—	—	—

Note: Status as of 31 December 2017. 59 reactors (60460 MW) were under construction, including 2 units (2600 MW) in Taiwan, China.

TAIWAN, CN

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TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies
	Code	Name			Thermal	Gross								
ARGENTINA	AR-1	ATUCHA-1	PWR	PHWR KWU	1179	362	340	SIEMENS	1988-6	1974-3	1974-6	80.1	80.3	-
	AR-3	ATUCHA-2	PWR	PHWR KWU	2160	745	693	NASA	1981-7	2014-6	2016-5	66.7	66.7	-
	AR-2	EMBALSE	PWR	CANDU 6	2015	648	600	NASA	1974-4	1983-4	1984-1	53.8	53.8	-
ARMENIA	AM-19	ARMENIAN-2	PWR	VVER V-270	1375	408	375	ANPPC-JSC	1975-7	1980-1	1980-5	69.2	71.6	-
BELGIUM	BE-2	DOEL-1	PWR	WH 2LP	1311	454	433	ELECTRAB	1969-7	1974-8	1975-2	91.1	91.9	-
	BE-4	DOEL-2	PWR	WH 2LP	1311	454	433	ELECTRAB	1971-9	1975-8	1975-12	87.8	88.7	-
	BE-5	DOEL-3	PWR	WH 3LP	3054	1056	1006	ELECTRAB	1975-1	1982-6	1982-10	47.0	47.1	-
	BE-7	DOEL-4	PWR	WH 3LP	2988	1090	1038	ELECTRAB	1978-12	1985-4	1985-7	82.7	83.1	-
	BE-3	TIHANGE-1	PWR	Framatome 3 lo	2873	1009	962	ELECTRAB	1970-6	1975-3	1975-10	61.7	62.2	-
	BE-6	TIHANGE-2	PWR	WH 3LP	3064	1055	1008	ELECTRAB	1976-4	1982-10	1983-6	51.9	52.0	-
	BE-8	TIHANGE-3	PWR	WH 3LP	3000	1089	1038	ELECTRAB	1978-11	1985-6	1985-9	89.9	91.3	-
	BR-1	ANGRA-1	PWR	WH 2LP	1882	640	609	ELETRONU WH	1971-5	1982-4	1985-1	79.3	79.4	-
BR-2	ANGRA-2	PWR	PRE KONVOI	3764	1350	1275	ELETRONU KWU	1976-1	2000-7	2001-2	90.6	91.2	-	
BULGARIA	BG-5	KOZLODUY-5	PWR	VVER V-320	3000	1000	963	KOZNPP	1980-7	1987-11	1988-12	87.7	88.2	DH
	BG-6	KOZLODUY-6	PWR	VVER V-320	3000	1000	963	KOZNPP	1982-4	1991-8	1993-12	87.1	88.1	DH
CANADA	CA-8	BRUCE-1	PHWR	CANDU 791	2620	830	760	BRUCEPOW O/H/AECL	1971-6	1977-1	1977-9	88.8	88.9	-
	CA-9	BRUCE-2	PHWR	CANDU 791	2620	830	760	BRUCEPOW O/H/AECL	1970-12	1976-9	1977-9	87.8	87.8	-
	CA-10	BRUCE-3	PHWR	CANDU 750A	2550	830	750	BRUCEPOW O/H/AECL	1972-7	1977-12	1978-2	81.3	81.3	-
	CA-11	BRUCE-4	PHWR	CANDU 750A	2550	830	750	BRUCEPOW O/H/AECL	1972-9	1978-12	1979-1	82.0	82.1	-
	CA-18	BRUCE-5	PHWR	CANDU 750B	2832	872	817	BRUCEPOW O/H/AECL	1978-6	1984-12	1985-3	87.4	87.6	-
	CA-19	BRUCE-6	PHWR	CANDU 750B	2690	891	817	BRUCEPOW O/H/AECL	1978-1	1984-6	1984-9	86.6	86.8	-
	CA-20	BRUCE-7	PHWR	CANDU 750B	2832	872	817	BRUCEPOW O/H/AECL	1979-5	1986-2	1986-4	88.0	88.1	-
	CA-21	BRUCE-8	PHWR	CANDU 750B	2690	872	817	BRUCEPOW O/H/AECL	1979-8	1987-3	1987-5	88.4	88.5	-
	CA-22	DARLINGTON-1	PHWR	CANDU 850	2776	934	878	OPG	1982-4	1990-12	1992-11	80.7	81.6	-

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DH district heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies	
	Code	Name			Thermal	Gross	Net									
CANADA	CA-23	DARLINGTON-2	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1981-9	1990-1	1990-10	64.2	64.9	-	
	CA-24	DARLINGTON-3	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1984-9	1992-12	1993-2	87.9	88.7	-	
	CA-25	DARLINGTON-4	PHWR	CANDU 850	2776	934	878	OPG	OH/AECL	1985-7	1993-4	1993-6	84.2	84.8	-	
	CA-4	PICKERING-1	PHWR	CANDU 500A	1744	542	515	OPG	OH/AECL	1966-6	1971-4	1971-7	68.3	68.8	-	
	CA-7	PICKERING-4	PHWR	CANDU 500A	1744	542	515	OPG	OH/AECL	1968-5	1973-5	1973-6	77.3	77.7	-	
	CA-13	PICKERING-5	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1974-11	1982-12	1983-5	75.7	76.7	-	
	CA-14	PICKERING-6	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1975-10	1983-11	1984-2	81.8	82.7	-	
	CA-15	PICKERING-7	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1976-3	1984-11	1985-1	78.8	79.2	-	
	CA-16	PICKERING-8	PHWR	CANDU 500B	1744	540	516	OPG	OH/AECL	1976-9	1986-1	1986-2	73.6	73.9	-	
	CA-17	POINT LEPREAU	PHWR	CANDU 6	2180	705	660	NBEPCC	AECL	1975-5	1982-9	1983-2	78.9	78.9	-	
	CHINA	CN-84	CEFR	FBR	BN-20	65	25	20	CIAE	IZ	2000-5	2011-7	—	—	—	—
		CN-36	CHANGJIANG-1	PWR	CNP-600	1930	650	601	HNPC	DEC	2010-4	2015-11	2015-12	87.0	87.0	-
		CN-37	CHANGJIANG-2	PWR	CNP-600	1930	650	601	HNPC	DEC	2010-11	2016-6	2016-8	90.5	90.5	-
		CN-2	DAYA BAY-1	PWR	M310	2905	984	944	DNMC	FRAM	1987-8	1993-8	1994-2	90.2	90.3	-
		CN-3	DAYA BAY-2	PWR	M310	2905	984	944	DNMC	FRAM	1988-4	1994-2	1994-5	87.1	87.2	-
		CN-38	FANGCHENGANG-1	PWR	CPR-1000	2905	1086	1000	GFNPC	DEC	2010-7	2015-10	2016-1	88.3	88.4	-
		CN-39	FANGCHENGANG-2	PWR	CPR-1000	2905	1086	1000	GFNPC	DEC	2010-12	2016-7	2016-10	84.2	84.3	-
CN-24		FANGJIASHAN-1	PWR	CPR-1000	2905	1089	1012	QNPC	NPIC	2008-12	2014-11	2014-12	88.6	88.8	-	
CN-25		FANGJIASHAN-2	PWR	CPR-1000	2905	1089	1012	QNPC	NPIC	2008-7	2015-1	2015-2	88.4	88.6	-	
CN-20		FUQING-1	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2008-11	2014-8	2014-11	88.1	88.1	-	
CN-21		FUQING-2	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2009-6	2015-8	2015-10	85.2	85.2	-	
CN-42		FUQING-3	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2010-12	2016-9	2016-10	84.7	84.7	-	
CN-43		FUQING-4	PWR	CNP-1000	2905	1089	1000	FQNP	NPIC	2012-11	2017-7	2017-9	100.0	100.0	-	
CN-16		HONGYANHE-1	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2007-8	2013-2	2013-6	84.7	85.3	-	
CN-17		HONGYANHE-2	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2008-3	2013-11	2014-5	82.7	83.3	-	
CN-26		HONGYANHE-3	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2009-3	2015-3	2015-8	89.6	90.3	-	
CN-27		HONGYANHE-4	PWR	CPR-1000	2905	1119	1061	LHNPC	DEC	2009-8	2016-4	2016-9	88.5	88.5	-	
CN-6	LINGAO-1	PWR	M310	2905	990	950	DNMC	FRAM	1997-5	2002-2	2002-5	89.4	89.8	-		
CN-7	LINGAO-2	PWR	M310	2905	990	950	DNMC	FRAM	1997-11	2002-9	2003-1	91.9	92.4	-		

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies	
	Code	Name			Thermal	Gross									Net
CHINA	CN-12	LINGAO-3	PWR	CPR-1000	2905	1086	1007	DNMC	2005-12	2010-7	2010-9	89.2	89.6	-	
	CN-13	LINGAO-4	PWR	CPR-1000	2905	1086	1007	DNMC	2006-6	2011-5	2011-8	89.5	89.7	-	
	CN-18	NINGDE-1	PWR	CPR-1000	2905	1089	1018	NDNP	2008-2	2012-12	2013-4	84.4	84.6	-	
	CN-19	NINGDE-2	PWR	CPR-1000	2905	1089	1018	NDNP	2008-11	2014-1	2014-5	90.6	90.6	-	
	CN-34	NINGDE-3	PWR	CPR-1000	2905	1089	1018	NDNP	2010-1	2015-3	2015-6	89.1	89.1	-	
	CN-35	NINGDE-4	PWR	CPR-1000	2905	1089	1018	NDNP	2010-9	2016-3	2016-7	88.9	88.9	-	
	CN-4	QINSHAN 2-1	PWR	CNP-600	1930	650	610	NPQJVC	1996-6	2002-2	2002-4	89.9	89.9	-	
	CN-5	QINSHAN 2-2	PWR	CNP-600	1930	650	610	NPQJVC	1997-4	2004-3	2004-5	88.3	88.3	-	
	CN-14	QINSHAN 2-3	PWR	CNP-600	1930	660	619	NPQJVC	2006-4	2010-8	2010-10	91.9	92.0	-	
	CN-15	QINSHAN 2-4	PWR	CNP-600	1930	660	619	NPQJVC	2007-1	2011-11	2011-12	89.3	89.5	-	
	CN-8	QINSHAN 3-1	PHWR	CANDU 6	2064	728	677	TQNPC	1998-6	2002-11	2002-12	88.5	88.7	-	
	CN-9	QINSHAN 3-2	PHWR	CANDU 6	2064	728	677	TQNPC	1998-9	2003-6	2003-7	92.9	93.2	-	
	CN-1	QINSHAN 1	PWR	CNP-300	966	310	298	CNNO	1995-3	1991-12	1994-4	91.2	91.4	-	
	CN-10	TIANWAN-1	PWR	VVER V-428	3000	1060	990	JNPC	1999-10	2006-5	2007-5	88.9	89.1	-	
	CN-11	TIANWAN-2	PWR	VVER V-428	3000	1060	990	JNPC	2000-9	2007-5	2007-8	91.0	91.1	-	
	CN-45	TIANWAN-3	PWR	VVER V-428M	3000	1126	1060	JNPC	2012-12	2017-12	—	—	—	—	—
	CN-22	YANGJIANG-1	PWR	CPR-1000	2905	1086	1000	YJNPC	2008-12	2013-12	2014-3	89.6	89.7	-	
	CN-23	YANGJIANG-2	PWR	CPR-1000	2905	1086	1000	YJNPC	2009-6	2015-3	2015-6	86.6	86.7	-	
	CN-40	YANGJIANG-3	PWR	CPR-1000	2905	1086	1000	YJNPC	2010-11	2015-10	2016-1	88.6	89.1	-	
	CN-41	YANGJIANG-4	PWR	CPR-1000	2905	1086	1000	YJNPC	2012-11	2017-1	2017-3	90.7	91.0	-	
	CZECH REP.	CZ-4	DUKOVANY-1	PWR	VVER V-213	1444	500	468	CEZ	1979-1	1985-2	1985-5	79.8	80.8	-
		CZ-5	DUKOVANY-2	PWR	VVER V-213	1444	500	471	CEZ	1979-1	1986-1	1986-3	74.5	75.7	-
		CZ-8	DUKOVANY-3	PWR	VVER V-213	1444	500	468	CEZ	1979-3	1986-11	1986-12	72.4	73.3	-
		CZ-9	DUKOVANY-4	PWR	VVER V-213	1444	500	471	CEZ	1979-3	1987-6	1987-7	81.2	82.1	-
CZ-23		TEMLIN-1	PWR	VVER V-320	3120	1080	1026	CEZ	1987-2	2000-12	2002-6	80.8	81.5	DH	
CZ-24		TEMLIN-2	PWR	VVER V-320	3120	1080	1026	CEZ	1987-2	2002-12	2003-4	74.5	74.5	DH	
FINLAND	FI-1	LOVIISA-1	PWR	VVER V-213	1500	531	507	FORTUMPH AEE	1971-5	1977-2	1977-5	91.7	92.7	-	
	FI-2	LOVIISA-2	PWR	VVER V-213	1500	526	502	FORTUMPH AEE	1972-8	1980-11	1981-1	91.9	92.9	-	

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DH district heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies
	Code	Name			Thermal	Gross	Net								
FINLAND	FI-3	OLKILUOTO-1	BWR	AA-III, BWR-25	2500	910	880	TVO	ASEASTAL	1974-2	1978-9	1979-10	93.9	94.9	-
	FI-4	OLKILUOTO-2	BWR	AA-III, BWR-25	2500	910	880	TVO	ASEASTAL	1975-11	1980-2	1982-7	90.3	91.0	-
FRANCE	FR-54	BELLEVILLE-1	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1980-5	1987-10	1988-6	75.9	77.3	-
	FR-55	BELLEVILLE-2	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1980-8	1988-7	1989-1	79.5	80.8	-
	FR-32	BLAYAIS-1	PWR	CP1	2785	951	910	EDF	FRAM	1977-1	1981-6	1981-12	78.9	84.4	-
	FR-33	BLAYAIS-2	PWR	CP1	2785	951	910	EDF	FRAM	1977-1	1982-7	1983-2	79.6	81.2	-
	FR-34	BLAYAIS-3	PWR	CP1	2785	951	910	EDF	FRAM	1978-4	1983-8	1983-11	66.6	67.8	-
	FR-35	BLAYAIS-4	PWR	CP1	2785	951	910	EDF	FRAM	1978-4	1983-5	1983-10	74.5	75.2	-
	FR-13	BUGEY-2	PWR	CP0	2785	945	910	EDF	FRAM	1972-11	1978-5	1979-3	75.2	78.3	-
	FR-14	BUGEY-3	PWR	CP0	2785	945	910	EDF	FRAM	1973-9	1978-9	1979-3	78.8	80.4	-
	FR-15	BUGEY-4	PWR	CP0	2785	917	880	EDF	FRAM	1974-6	1979-3	1979-7	81.2	82.1	-
	FR-16	BUGEY-5	PWR	CP0	2785	917	880	EDF	FRAM	1974-7	1979-7	1980-1	49.1	49.8	-
	FR-50	CATTENOM-1	PWR	P4 REP 1300	3817	1362	1300	EDF	FRAM	1979-10	1986-11	1987-4	71.3	72.4	-
	FR-53	CATTENOM-2	PWR	P4 REP 1300	3817	1362	1300	EDF	FRAM	1980-7	1987-9	1988-2	82.7	84.6	-
	FR-60	CATTENOM-3	PWR	P4 REP 1300	3817	1362	1300	EDF	FRAM	1982-6	1990-7	1991-2	82.4	84.9	-
	FR-65	CATTENOM-4	PWR	P4 REP 1300	3817	1362	1300	EDF	FRAM	1983-9	1991-5	1992-1	76.1	79.0	-
	FR-40	CHINON B-1	PWR	CP2	2785	954	905	EDF	FRAM	1977-3	1982-11	1984-2	72.4	73.7	-
	FR-41	CHINON B-2	PWR	CP2	2785	954	905	EDF	FRAM	1977-3	1983-11	1984-8	66.6	71.8	-
	FR-56	CHINON B-3	PWR	CP2	2785	954	905	EDF	FRAM	1980-10	1986-10	1987-3	80.2	80.9	-
	FR-57	CHINON B-4	PWR	CP2	2785	954	905	EDF	FRAM	1981-2	1987-11	1988-4	82.8	83.8	-
	FR-62	CHOZ B-1	PWR	N4 REP 1450	4270	1560	1500	EDF	FRAM	1984-1	1996-8	2000-5	79.2	81.4	-
	FR-70	CHOZ B-2	PWR	N4 REP 1450	4270	1560	1500	EDF	FRAM	1985-12	1997-4	2000-9	80.0	82.3	-
FR-72	CIVAUX-1	PWR	N4 REP 1450	4270	1561	1495	EDF	FRAM	1988-10	1997-12	2002-1	70.6	75.3	-	
FR-73	CIVAUX-2	PWR	N4 REP 1450	4270	1561	1495	EDF	FRAM	1991-4	1999-12	2002-4	79.8	81.7	-	
FR-42	CRUAS-1	PWR	CP2	2785	956	915	EDF	FRAM	1978-8	1984-4	1984-4	68.4	69.5	-	
FR-43	CRUAS-2	PWR	CP2	2785	956	915	EDF	FRAM	1978-11	1984-9	1985-4	79.3	82.6	-	
FR-44	CRUAS-3	PWR	CP2	2785	956	915	EDF	FRAM	1979-4	1984-5	1984-9	72.2	73.2	-	
FR-45	CRUAS-4	PWR	CP2	2785	956	915	EDF	FRAM	1979-10	1984-10	1985-2	72.7	73.7	-	
FR-22	DAMPIERRE-1	PWR	CP1	2785	937	890	EDF	FRAM	1975-2	1980-3	1980-9	80.1	81.4	-	

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies
	Code	Name			Thermal	Gross	Net								
FRANCE	FR -29	DAMPIERRE-2	PWR	CP1	2785	937	890	EDF	FRAM	1975-4	1980-12	1981-2	77.4	79.7	-
	FR -30	DAMPIERRE-3	PWR	CP1	2785	937	890	EDF	FRAM	1975-9	1981-1	1981-5	75.9	80.1	-
	FR -31	DAMPIERRE-4	PWR	CP1	2785	937	890	EDF	FRAM	1975-12	1981-8	1981-11	78.7	80.0	-
	FR -11	FESSENHEIM-1	PWR	CP0	2785	920	880	EDF	FRAM	1971-9	1978-1	1978-4	72.7	75.2	-
	FR -12	FESSENHEIM-2	PWR	CP0	2785	920	880	EDF	FRAM	1972-2	1977-4	1978-4	55.3	57.6	-
	FR -46	FLAMANVILLE-1	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1979-12	1985-12	1986-12	78.1	79.2	-
	FR -47	FLAMANVILLE-2	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1980-5	1986-7	1987-3	74.7	76.5	-
	FR -61	GOLFECH-1	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1982-11	1990-6	1991-2	85.0	86.9	-
	FR -68	GOLFECH-2	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1984-10	1993-6	1994-3	85.5	86.7	-
	FR -20	GRAVELINES-1	PWR	CP1	2785	951	910	EDF	FRAM	1975-2	1980-3	1980-11	70.3	74.6	-
	FR -21	GRAVELINES-2	PWR	CP1	2785	951	910	EDF	FRAM	1975-3	1980-8	1980-12	67.9	72.5	-
	FR -27	GRAVELINES-3	PWR	CP1	2785	951	910	EDF	FRAM	1975-12	1980-12	1981-6	81.3	82.3	-
	FR -28	GRAVELINES-4	PWR	CP1	2785	951	910	EDF	FRAM	1976-4	1981-6	1981-10	73.4	76.1	-
	FR -51	GRAVELINES-5	PWR	CP1	2785	951	910	EDF	FRAM	1979-10	1984-8	1985-1	61.4	62.9	-
	FR -52	GRAVELINES-6	PWR	CP1	2785	951	910	EDF	FRAM	1979-10	1985-8	1985-10	80.0	83.4	-
	FR -58	NOGENT-1	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1981-5	1987-10	1988-2	84.0	86.6	-
	FR -59	NOGENT-2	PWR	P4 REP 1300	3817	1363	1310	EDF	FRAM	1982-1	1988-12	1989-5	83.8	84.7	-
	FR -36	PALUEL-1	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1977-8	1984-6	1985-12	75.3	78.2	-
	FR -37	PALUEL-2	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1978-1	1984-9	1985-12	43.5	44.1	-
	FR -38	PALUEL-3	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1979-2	1985-9	1986-2	65.8	73.0	-
	FR -39	PALUEL-4	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1980-2	1986-4	1986-6	76.9	80.6	-
	FR -63	PENLY-1	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1982-9	1990-2	1990-12	82.5	84.0	-
	FR -64	PENLY-2	PWR	P4 REP 1300	3817	1382	1330	EDF	FRAM	1984-8	1992-2	1992-12	83.4	85.5	-
	FR -48	ST. ALBAN-1	PWR	P4 REP 1300	3817	1381	1335	EDF	FRAM	1979-1	1985-8	1986-5	77.8	82.8	-
	FR -49	ST. ALBAN-2	PWR	CP2	3817	1381	1335	EDF	FRAM	1979-7	1986-7	1987-3	80.3	84.6	-
FR -17	ST. LAURENT B-1	PWR	CP2	2785	956	915	EDF	FRAM	1976-5	1983-8	1983-8	70.5	74.2	-	
FR -23	ST. LAURENT B-2	PWR	CP2	2785	956	915	EDF	FRAM	1976-7	1981-6	1983-8	70.1	72.9	-	
FR -18	TRICASTIN-1	PWR	CP1	2785	955	915	EDF	FRAM	1974-11	1980-5	1980-12	69.1	73.4	-	
FR -19	TRICASTIN-2	PWR	CP1	2785	955	915	EDF	FRAM	1974-12	1980-8	1980-12	73.4	77.5	-	
FR -25	TRICASTIN-3	PWR	CP1	2785	955	915	EDF	FRAM	1975-4	1981-2	1981-5	71.9	80.8	-	

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies	
	Code	Name			Thermal	Gross									Net
FRANCE	FR-26	TRICASTIN-4	PWR	CP1	2785	955	915	EDF	FRAM	1975-5	1981-6	1981-11	75.5	77.5	-
GERMANY	DE-32	BROKDORF	PWR	PWR	3900	1480	1410	E.ON	KWU	1976-1	1986-10	1986-12	83.7	83.8	-
	DE-33	EMSLAND	PWR	Konvoi	3850	1406	1335	KLE	KWU	1982-8	1988-4	1988-6	92.8	93.6	-
	DE-27	GROHNDE	PWR	PWR	3900	1430	1360	KWG	KWU	1976-6	1984-9	1985-2	81.9	83.3	-
	DE-28	GUNDREMMINGEN-C	BWR	BWR-72	3840	1344	1288	KGK	KWU	1976-7	1984-11	1985-1	86.7	87.9	-
	DE-31	ISAR-2	PWR	Konvoi	3950	1485	1410	E.ON	KWU	1982-9	1988-1	1988-4	91.6	92.1	-
	DE-44	NECKARWESTHEIM-2	PWR	Konvoi	3850	1400	1310	EnKK	KWU	1982-11	1989-1	1989-4	91.2	91.7	-
HUNGARY	DE-24	PHILIPPSBURG-2	PWR	PWR	3950	1468	1402	EnKK	KWU	1977-7	1984-12	1985-4	78.2	78.2	-
	HU-1	PAKS-1	PWR	VVER V-213	1485	500	470	PAKS Zrt	AEE	1974-8	1982-12	1983-8	87.4	87.6	-
	HU-2	PAKS-2	PWR	VVER V-213	1485	500	473	PAKS Zrt	AEE	1974-8	1984-9	1984-11	90.7	91.0	DH
	HU-3	PAKS-3	PWR	VVER V-213	1485	500	473	PAKS Zrt	AEE	1979-10	1986-9	1986-12	88.1	88.6	DH
INDIA	HU-4	PAKS-4	PWR	VVER V-213	1485	500	473	PAKS Zrt	AEE	1979-10	1987-8	1987-11	89.9	90.8	DH
	IN-13	KAIGA-1	PHWR	Horizontal Pre	801	220	202	NPCL	NPCL	1989-9	2000-10	2000-11	87.3	94.4	-
	IN-14	KAIGA-2	PHWR	Horizontal Pre	801	220	202	NPCL	NPCL	1989-12	1999-12	2000-3	87.1	93.9	-
	IN-15	KAIGA-3	PHWR	Horizontal Pre	800	220	202	NPCL	NPCL	2002-3	2007-4	2007-5	80.4	84.5	-
	IN-16	KAIGA-4	PHWR	Horizontal Pre	800	220	202	NPCL	NPCL	2002-5	2011-1	2011-1	84.5	87.1	-
	IN-9	KAKRAPAR-1	PHWR	Horizontal Pre	801	220	202	NPCL	NPCL	1984-12	1992-11	1993-5	60.1	60.1	-
	IN-10	KAKRAPAR-2	PHWR	Horizontal Pre	801	220	202	NPCL	NPCL	1985-4	1995-3	1995-9	45.6	46.2	-
	IN-25	KUDANKULAM-1	PWR	VVER V-412	3000	1000	932	NPCL	MAEP	2002-3	2013-10	2014-12	49.2	49.2	-
	IN-26	KUDANKULAM-2	PWR	VVER V-412	3000	1000	932	NPCL	MAEP	2002-7	2016-8	2017-3	48.6	48.6	-
	IN-5	MADRAS-1	PHWR	Horizontal Pre	801	220	205	NPCL	NPCL	1971-1	1983-7	1984-1	75.8	92.3	DS
	IN-6	MADRAS-2	PHWR	Horizontal Pre	801	220	205	NPCL	NPCL	1972-10	1985-9	1986-3	62.4	77.9	DS
IN-7	NARORA-1	PHWR	Horizontal Pre	801	220	202	NPCL	NPCL	1976-12	1989-7	1991-1	81.5	92.5	-	
IN-8	NARORA-2	PHWR	Horizontal Pre	801	220	202	NPCL	NPCL	1977-11	1992-1	1992-7	80.2	91.8	-	
IN-3	RAJASTHAN-1	PHWR	Horizontal Pre	346	100	90	NPCL	AECI	1965-8	1972-11	1973-12	0.0	0.0	PH	
IN-4	RAJASTHAN-2	PHWR	Horizontal Pre	693	200	187	NPCL	AECI/DAE	1968-4	1980-11	1981-4	75.7	78.4	PH	
IN-11	RAJASTHAN-3	PHWR	Horizontal Pre	801	220	202	NPCL	NPCL	1990-2	2000-3	2000-6	91.6	92.6	PH	

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

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applics
	Code	Name			Thermal	Gross								
INDIA	IN-12	RAJASTHAN-4	PHWR	Horizontal Pre	801	220	202	NPCIL	1990-10	2000-11	2000-12	93.2	93.4	PH
	IN-19	RAJASTHAN-5	PHWR	Horizontal Pre	801	220	202	NPCIL	2002-9	2009-12	2010-2	93.4	93.4	-
	IN-20	RAJASTHAN-6	PHWR	Horizontal Pre	801	220	202	NPCIL	2003-1	2010-3	2010-3	76.3	76.3	-
	IN-1	TARAPUR-1	BWR	BWR-1 (Mark 2)	530	160	150	NPCIL	1964-10	1969-4	1969-10	63.3	63.3	-
	IN-2	TARAPUR-2	BWR	BWR-1 (Mark 2)	530	160	150	NPCIL	1964-10	1969-5	1969-10	64.8	64.8	-
	IN-23	TARAPUR-3	PHWR	Horizontal Pre	1730	540	490	NPCIL	2000-5	2006-6	2006-8	89.1	90.3	-
	IN-24	TARAPUR-4	PHWR	Horizontal Pre	1730	540	490	NPCIL	2000-3	2005-6	2005-9	87.6	91.4	-
	IRAN, ISL. REP	IR-1	BUSHEHR-1	PWR	VVER V-446	3000	1000	915	NPPDCO	1975-5	2011-9	2013-9	70.2	70.6
JAPAN	JP-25	FUKUSHIMA-DAINI-1	BWR	BWR-5	3293	1100	1067	TEPCO	1976-3	1981-7	1982-4	0.0	0.0	-
	JP-26	FUKUSHIMA-DAINI-2	BWR	BWR-5	3293	1100	1067	TEPCO	1979-5	1983-6	1984-2	0.0	0.0	-
	JP-35	FUKUSHIMA-DAINI-3	BWR	BWR-5	3293	1100	1067	TEPCO	1981-3	1984-12	1985-6	0.0	0.0	-
	JP-38	FUKUSHIMA-DAINI-4	BWR	BWR-5	3293	1100	1067	TEPCO	1981-5	1986-12	1987-8	0.0	0.0	-
	JP-27	GENKAI-2	PWR	M (2-loop)	1650	559	529	KYUSHU	1977-2	1980-6	1981-3	0.0	0.0	-
	JP-45	GENKAI-3	PWR	M (4-loop)	3423	1180	1127	KYUSHU	1988-6	1993-6	1994-3	0.0	0.0	DS
	JP-46	GENKAI-4	PWR	M (4-loop)	3423	1180	1127	KYUSHU	1992-7	1996-11	1997-7	0.0	0.0	DS
	JP-36	HAMAOKA-3	BWR	BWR-5	3293	1100	1056	CHUBU	1983-4	1987-1	1987-8	0.0	0.0	-
	JP-49	HAMAOKA-4	BWR	BWR-5	3293	1137	1092	CHUBU	1989-10	1993-1	1993-9	0.0	0.0	-
	JP-60	HAMAOKA-5	BWR	ABWR	3926	1380	1325	CHUBU	2000-7	2004-4	2005-1	0.0	0.0	-
	JP-58	HIGASHI DORI-1 (TOHOKU)	BWR	BWR-5	3293	1100	1067	TOHOKU	2000-11	2005-3	2005-12	0.0	0.0	-
	JP-32	IKATA-2	PWR	M (2-loop)	1650	566	538	SHIKOKU	1978-8	1981-8	1982-3	0.0	0.0	DS
	JP-47	IKATA-3	PWR	M (3-loop)	2660	890	846	SHIKOKU	1990-10	1994-3	1994-12	22.5	22.5	DS
	JP-33	KASHIWAZAKI KARIWA-1	BWR	BWR-5	3293	1100	1067	TEPCO	1980-6	1985-2	1985-9	0.0	0.0	-
	JP-39	KASHIWAZAKI KARIWA-2	BWR	BWR-5	3293	1100	1067	TEPCO	1985-11	1990-2	1990-9	0.0	0.0	-
	JP-52	KASHIWAZAKI KARIWA-3	BWR	BWR-5	3293	1100	1067	TEPCO	1989-3	1992-12	1993-8	0.0	0.0	-
JP-53	KASHIWAZAKI KARIWA-4	BWR	BWR-5	3293	1100	1067	TEPCO	1990-3	1993-12	1994-8	0.0	0.0	-	
JP-40	KASHIWAZAKI KARIWA-5	BWR	BWR-5	3293	1100	1067	TEPCO	1985-6	1989-9	1990-4	0.0	0.0	-	
JP-55	KASHIWAZAKI KARIWA-6	BWR	ABWR	3926	1356	1315	TEPCO	1992-11	1996-1	1996-11	0.0	0.0	-	
JP-56	KASHIWAZAKI KARIWA-7	BWR	ABWR	3926	1356	1315	TEPCO	1993-7	1996-12	1997-7	0.0	0.0	-	

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DS desalination, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies	
	Code	Name			Thermal	Gross	Net									
JAPAN	JP -14	MIHAMMA-3	PWR	M (3-loop)	2440	826	780	KEPCO	MHI	1972-8	1976-2	1976-12	0.0	0.0	-	
	JP -15	OHI-1	PWR	WH 4LP	3423	1175	1120	KEPCO	WH	1972-10	1977-12	1979-3	-	-	DS	
	JP -19	OHI-2	PWR	WH 4LP	3423	1175	1120	KEPCO	WH	1972-12	1978-10	1979-12	13.3	13.4	DS	
	JP -50	OHI-3	PWR	M (4-loop)	3423	1180	1127	KEPCO	MHI	1987-10	1991-6	1991-12	-	-	-	
	JP -51	OHI-4	PWR	M (4-loop)	3423	1180	1127	KEPCO	MHI	1988-6	1992-6	1993-2	14.1	14.1	-	
	JP -22	ONAGAWA-1	BWR	BWR-4	1593	524	498	TOHOKU	TOSHIBA	1980-7	1983-11	1984-6	0.0	0.0	-	
	JP -54	ONAGAWA-2	BWR	BWR-5	2436	825	796	TOHOKU	TOSHIBA	1991-4	1994-12	1995-7	0.0	0.0	-	
	JP -57	ONAGAWA-3	BWR	BWR-5	2436	825	796	TOHOKU	TOSHIBA	1998-1	2001-5	2002-1	0.0	0.0	-	
	JP -28	SENDAL-1	PWR	M (3-loop)	2660	890	846	KYUSHU	MHI	1979-12	1983-9	1984-7	43.6	43.6	-	
	JP -37	SENDAL-2	PWR	M (3-loop)	2660	890	846	KYUSHU	MHI	1981-10	1985-4	1985-11	39.7	39.7	-	
	JP -48	SHIKA-1	BWR	BWR-5	1593	540	505	HOKURIKU	HITACHI	1989-7	1993-1	1993-7	-	-	-	
	JP -59	SHIKA-2	BWR	ABWR	3926	1206	1108	HOKURIKU	HITACHI	2001-8	2005-7	2006-3	0.0	0.0	-	
	JP -41	SHIMANE-2	BWR	BWR-5	2436	820	789	CHUGOKU	HITACHI	1985-2	1988-7	1989-2	0.0	0.0	-	
	JP -8	TAKAHAMA-1	PWR	M (3-loop)	2440	826	780	KEPCO	W/MIHI	1970-4	1974-3	1974-11	0.0	0.0	-	
	JP -13	TAKAHAMA-2	PWR	M (3-loop)	2440	826	780	KEPCO	MHI	1971-3	1975-1	1975-11	0.0	0.0	-	
	JP -29	TAKAHAMA-3	PWR	M (3-loop)	2660	870	830	KEPCO	MHI	1980-12	1984-5	1985-1	28.2	28.2	DS	
	JP -30	TAKAHAMA-4	PWR	M (3-loop)	2660	870	830	KEPCO	MHI	1981-3	1984-11	1985-6	33.2	33.2	DS	
	JP -21	TOKAI-2	BWR	BWR-5	3293	1100	1060	JAPCO	GE	1973-10	1978-3	1978-11	0.0	0.0	-	
	JP -43	TOMARI-1	PWR	M (2-loop)	1650	579	550	HEPCO	MHI	1985-4	1988-12	1989-6	0.0	0.0	-	
	JP -44	TOMARI-2	PWR	M (2-loop)	1650	579	550	HEPCO	MHI	1985-6	1990-8	1991-4	0.0	0.0	-	
	JP -64	TOMARI-3	PWR	M (3-loop)	2660	912	866	HEPCO	MHI	2004-11	2009-3	2009-12	0.0	0.0	-	
	JP -34	TSURUGA-2	PWR	M (4-loop)	3411	1160	1108	JAPCO	MHI	1982-11	1986-6	1987-2	0.0	0.0	-	
	KOREA, REP. OF	KR -7	HANBIT-1	PWR	WH F	2787	1032	986	KHNP	WH	1981-6	1986-3	1986-8	81.9	82.5	-
		KR -8	HANBIT-2	PWR	WH F	2787	1028	988	KHNP	WH	1981-12	1986-11	1987-6	70.9	71.1	-
		KR -11	HANBIT-3	PWR	OPR-1000	2825	1039	986	KHNP	DHICKAEC	1989-12	1994-10	1995-3	73.8	74.2	-
		KR -12	HANBIT-4	PWR	OPR-1000	2825	1022	970	KHNP	DHICKAEC	1990-5	1995-7	1996-1	72.9	73.5	-
		KR -17	HANBIT-5	PWR	OPR-1000	2825	1052	994	KHNP	DHICKOPC	1997-6	2001-12	2002-5	85.8	86.2	-
		KR -18	HANBIT-6	PWR	OPR-1000	2825	1050	993	KHNP	DHICKOPC	1997-11	2002-9	2002-12	82.1	82.4	-
		KR -9	HANUL-1	PWR	France CPI	2775	1008	968	KHNP	FRAM	1983-1	1988-4	1988-9	84.2	84.3	-

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DS desalination.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies
	Code	Name			Thermal	Gross								
KOREA, REP. OF	KR-10	HANUL-2	PWR	France CFI	2775	1012	969	FRAM	1983-7	1989-4	1989-9	89.4	89.6	-
	KR-13	HANUL-3	PWR	OPR-1000	2825	1049	997	KHNP	1993-7	1998-1	1998-8	77.1	77.4	-
	KR-14	HANUL-4	PWR	OPR-1000	2825	1053	999	KHNP	1993-11	1998-12	1999-12	74.6	74.8	-
	KR-19	HANUL-5	PWR	OPR-1000	2815	1051	998	KHNP	1999-10	2003-12	2004-7	85.8	86.0	-
	KR-20	HANUL-6	PWR	OPR-1000	2825	1051	997	KHNP	2000-9	2005-1	2005-4	88.1	88.2	-
	KR-2	KORI-2	PWR	WHF	1882	681	640	WH	1977-12	1983-4	1983-7	83.4	85.3	-
	KR-5	KORI-3	PWR	WHF	2912	1044	1011	KHNP	1979-10	1985-1	1985-9	73.7	73.8	-
	KR-6	KORI-4	PWR	WHF	2912	1044	1012	KHNP	1980-4	1985-12	1986-4	73.8	73.9	-
	KR-21	SHIN-KORI-1	PWR	OPR-1000	2825	1044	997	KHNP	2006-6	2010-8	2011-2	63.3	63.6	-
	KR-22	SHIN-KORI-2	PWR	OPR-1000	2825	1046	997	KHNP	2007-6	2012-1	2012-7	79.3	79.6	-
	KR-25	SHIN-KORI-3	PWR	APR-1400	3983	1455	1416	KHNP	2008-10	2016-1	2016-12	99.8	100.0	-
	KR-23	SHIN-WOLSONG-1	PWR	OPR-1000	2825	1045	997	KHNP	2007-11	2012-1	2012-7	78.0	78.2	-
	KR-24	SHIN-WOLSONG-2	PWR	OPR-1000	2825	1050	993	KHNP	2008-9	2015-2	2015-7	81.0	81.2	-
	KR-3	WOLSONG-1	PHWR	CANDU 6	2061	682	661	KHNP	1977-10	1982-12	1983-4	73.4	78.2	-
	KR-4	WOLSONG-2	PHWR	CANDU 6	2061	655	632	KHNP	1992-9	1997-4	1997-7	85.4	90.2	-
	KR-15	WOLSONG-3	PHWR	CANDU 6	2061	670	648	KHNP	1994-3	1998-3	1998-7	74.8	79.5	-
KR-16	WOLSONG-4	PHWR	CANDU 6	2061	656	635	KHNP	1994-7	1999-5	1999-10	86.8	89.6	-	
MEXICO	MX-1	LAGUNA VERDE-1	BWR	BWR-5	2317	805	777	CFE	1976-10	1989-4	1990-7	81.5	84.0	-
	MX-2	LAGUNA VERDE-2	BWR	BWR-5	2317	810	775	CFE	1977-6	1994-11	1995-4	85.0	86.8	-
NETHERLANDS	NL-2	BORSSELE	PWR	KWU 2LP	1366	515	482	EPZ	1969-7	1973-7	1973-10	81.8	82.9	-
	PK-2	CHASNUPP-1	PWR	CNP-300	999	325	300	PAEC	1993-8	2000-6	2000-9	81.1	81.4	-
PAKISTAN	PK-3	CHASNUPP-2	PWR	CNP-300	999	325	300	PAEC	2005-12	2011-3	2011-5	84.7	84.8	-
	PK-4	CHASNUPP-3	PWR	CNP-300	999	340	315	PAEC	2011-5	2016-10	2016-12	94.0	94.6	-
	PK-5	CHASNUPP-4	PWR	CNP-300	999	340	313	PAEC	2011-12	2017-7	2017-9	95.2	95.2	-
	PK-1	KANUPP-1	PHWR	CANDU-137 MW	337	100	90	PAEC	1966-8	1971-10	1972-12	48.0	48.0	DS
ROMANIA	RO-1	CERNAVODA-1	PHWR	CANDU 6	2180	706	650	SNN	1982-7	1996-7	1998-12	92.8	93.5	DH

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DS desalination, DH district heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies	
	Code	Name			Thermal	Gross									Net
ROMANIA	RO-2	CERNAVOADA-2	PHWR	CANDU 6	2180	705	SNN	AECL	1983-7	2007-8	2007-10	93.2	94.1	DH	
RUSSIA	RU-96	BALAKOVO-1	PWR	VVER V-320	3000	1000	REA	AEM	1980-12	1985-12	1986-5	90.7	91.0	DH, PH	
	RU-97	BALAKOVO-2	PWR	VVER V-320	3000	1000	REA	AEM	1981-8	1987-10	1988-1	83.6	83.8	DH, PH	
	RU-98	BALAKOVO-3	PWR	VVER V-320	3000	1000	REA	AEM	1982-11	1988-12	1989-4	90.2	90.5	DH, PH	
	RU-99	BALAKOVO-4	PWR	VVER V-320	3200	1000	REA	AEM	1984-4	1993-4	1993-12	89.1	89.3	DH, PH	
	RU-21	BELOYARSK-3	FBR	BN-600	1470	600	REA	AEM	1969-1	1980-4	1981-11	83.0	83.1	DH, PH	
	RU-116	BELOYARSK-4	FBR	BN-800	2100	885	REA	AEM	2006-7	2015-12	2016-10	73.3	74.4	-	
	RU-141	BILIBINO-1	LWGR	EGP-6	62	12	11	REA	AEM	1970-1	1974-1	1974-4	80.5	80.5	DH
	RU-142	BILIBINO-2	LWGR	EGP-6	62	12	11	REA	AEM	1970-1	1974-12	1975-2	81.1	81.1	DH
	RU-143	BILIBINO-3	LWGR	EGP-6	62	12	11	REA	AEM	1970-1	1975-12	1976-2	83.5	83.5	DH
	RU-144	BILIBINO-4	LWGR	EGP-6	62	12	11	REA	AEM	1970-1	1976-12	1977-1	83.3	83.3	DH
	RU-30	KALININ-1	PWR	VVER V-338	3000	1000	950	REA	AEM	1977-2	1984-5	1985-6	80.9	80.9	DH, PH
	RU-31	KALININ-2	PWR	VVER V-338	3000	1000	950	REA	AEM	1982-2	1986-12	1987-3	85.3	85.3	DH, PH
	RU-36	KALININ-3	PWR	VVER V-320	3200	1000	950	REA	AEM	1985-10	2004-12	2005-11	80.0	80.0	DH, PH
	RU-37	KALININ-4	PWR	VVER V-320	3200	1000	950	REA	AEM	1986-8	2011-11	2012-12	84.9	84.9	DH, PH
	RU-12	KOLA-1	PWR	VVER V-230	1375	440	411	REA	AEM	1970-5	1973-6	1973-12	81.7	82.2	DH, PH
	RU-13	KOLA-2	PWR	VVER V-230	1375	440	411	REA	AEM	1970-5	1974-12	1975-2	84.1	84.3	DH, PH
	RU-32	KOLA-3	PWR	VVER V-213	1375	440	411	REA	AEM	1977-4	1981-3	1982-12	83.3	83.3	DH, PH
	RU-33	KOLA-4	PWR	VVER V-213	1375	440	411	REA	AEM	1976-8	1984-10	1984-12	81.9	81.9	DH, PH
	RU-17	KURSK-1	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1972-6	1976-12	1977-10	77.3	78.2	DH, PH
RU-22	KURSK-2	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1973-1	1979-1	1979-8	62.1	62.7	DH, PH	
RU-38	KURSK-3	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1978-4	1983-10	1984-3	86.9	87.5	DH, PH	
RU-39	KURSK-4	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1981-5	1985-12	1986-2	83.5	84.3	DH, PH	
RU-15	LENINGRAD-1	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1970-3	1973-12	1974-11	57.9	58.0	DH, PH	
RU-16	LENINGRAD-2	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1970-6	1975-7	1976-2	62.1	62.4	DH, PH	
RU-34	LENINGRAD-3	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1973-12	1979-12	1980-6	86.6	86.8	DH, PH	
RU-35	LENINGRAD-4	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1975-2	1981-2	1981-8	85.7	85.7	DH, PH	
RU-161	NOVOVORONEZH 2-1	PWR	VVER V-392M	3200	1180	1114	REA	AEM	2008-6	2016-8	2017-2	62.3	65.1	-	
RU-11	NOVOVORONEZH-4	PWR	VVER V-179	1375	417	385	REA	AEM	1967-7	1972-12	1973-3	87.6	88.7	DH, PH	

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DH district heating, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applics	
	Code	Name			Thermal	Gross									Net
RUSSIA	RU-20	NOVOVORONEZH-5	PWR	VVER V-187	3000	1000	REA	AEM	1974-3	1980-5	1981-2	79.9	80.1	DH, PH	
	RU-59	ROSTOV-1	PWR	VVER V-320	3200	1000	950	REA	AEM	1981-9	2001-12	89.8	89.8	-	
	RU-62	ROSTOV-2	PWR	VVER V-320	3200	1000	950	REA	AEM	1983-5	2010-3	2010-12	89.8	89.9	-
	RU-63	ROSTOV-3	PWR	VVER V-320	3000	1000	950	REA	AEM	2009-9	2014-12	2015-9	77.0	78.3	-
	RU-23	SMOLENSK-1	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1975-10	1982-12	1983-9	84.7	84.9	DH, PH
	RU-24	SMOLENSK-2	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1976-6	1985-5	1985-7	74.2	74.3	DH, PH
	RU-67	SMOLENSK-3	LWGR	RBMK-1000	3200	1000	925	REA	AEM	1984-5	1990-1	1990-10	89.7	89.8	DH, PH
SLOVAKIA	SK-13	BOHUNICE-3	PWR	VVER V-213	1471	505	471	SE	SKODA	1976-12	1984-8	1985-2	87.7	91.1	DH, PH
	SK-14	BOHUNICE-4	PWR	VVER V-213	1471	505	471	SE	SKODA	1976-12	1985-8	1985-12	88.7	91.8	DH, PH
	SK-6	MOCHOVCE-1	PWR	VVER V-213	1471	470	436	SE	SKODA	1983-10	1988-7	1988-10	90.3	91.0	-
	SK-7	MOCHOVCE-2	PWR	VVER V-213	1471	470	436	SE	SKODA	1983-10	1989-12	2000-4	92.2	93.1	-
SLOVENIA	SI-1	KRSKO	PWR	WH2LP	1994	727	688	NEK	WH	1975-3	1981-10	1983-1	91.8	92.2	-
SOUTH AFRICA	ZA-1	KOEBERG-1	PWR	CP1	2775	970	930	ESKOM	FRAM	1976-7	1984-4	1984-7	83.9	84.0	-
	ZA-2	KOEBERG-2	PWR	CP1	2775	970	930	ESKOM	FRAM	1976-7	1985-7	1985-11	87.4	88.9	-
SPAIN	ES-6	ALMARAZ-1	PWR	WH3LP	2947	1049	1011	CNAT	WH	1973-7	1981-5	1983-9	87.2	88.5	-
	ES-7	ALMARAZ-2	PWR	WH3LP	2947	1044	1006	CNAT	WH	1973-7	1983-10	1984-7	89.2	90.2	-
	ES-8	ASCO-1	PWR	WH3LP	2954	1033	995	ANAV	WH	1974-5	1983-8	1984-12	89.3	90.0	-
	ES-9	ASCO-2	PWR	WH3LP	2941	1035	997	ANAV	WH	1975-3	1985-10	1986-3	86.5	87.4	-
	ES-10	COFREPES	BWR	BWR-6 (Mark 3)	3237	1102	1064	ID	GE	1975-9	1984-10	1985-3	87.6	88.9	-
	ES-11	TRILLO-1	PWR	PWR3 loops	3010	1066	1003	CNAT	KWU	1979-8	1988-5	1988-8	89.3	90.4	-
	ES-16	VANDELLOS-2	PWR	WH3LP	2941	1087	1045	ANAV	WH	1980-12	1987-12	1988-3	89.0	90.4	-
SWEDEN	SE-9	FORSMARK-1	BWR	AA-III, BWR-25	2928	1022	984	FKA	ABBATOM	1973-6	1980-6	1980-12	88.4	89.4	-
	SE-11	FORSMARK-2	BWR	AA-III, BWR-25	3253	1158	1120	FKA	ABBATOM	1975-1	1981-1	1981-7	85.6	87.2	-
	SE-14	FORSMARK-3	BWR	AA-IV, BWR-300	3300	1203	1167	FKA	ABBATOM	1979-1	1985-3	1985-8	79.1	80.0	-
	SE-12	OSKARSHAMIN-3	BWR	AA-IV, BWR-300	3900	1450	1400	OKG	ABBATOM	1980-5	1985-3	1985-8	78.4	80.2	-

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DH district heating, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies
	Code	Name			Thermal	Gross								
SWEDEN	SE-4	RINGHALS-1	BWR	AA-1	2540	910	883	ABBATOM	1969-2	1974-10	1976-1	74.1	75.8	-
	SE-5	RINGHALS-2	PWR	WH3LP	2652	963	904	RAB	1970-10	1974-8	1975-5	48.2	50.8	-
	SE-7	RINGHALS-3	PWR	WH3LP	3135	1117	1066	RAB	1972-9	1980-9	1981-9	81.3	84.0	-
	SE-10	RINGHALS-4	PWR	WH3LP	3300	1171	1106	RAB	1973-11	1982-6	1983-11	83.5	85.9	-
SWITZERLAND	CH-1	BEZNAU-1	PWR	WH2LP	1130	380	365	Axpo AG	1965-9	1969-7	1969-12	41.5	41.5	DH
	CH-3	BEZNAU-2	PWR	WH2LP	1130	380	365	Axpo AG	1968-1	1971-10	1972-3	86.4	86.9	DH
	CH-4	GOESGEN	PWR	PWR3 Loop	3002	1060	1010	KKG	1973-12	1979-2	1979-11	87.9	88.3	PH
	CH-5	LEIBSTADT	BWR	BWR-6	3600	1275	1220	KKL	1974-1	1984-5	1984-12	73.9	75.5	-
	CH-2	MUEHLEBERG	BWR	BWR-4	1097	390	373	BKW	1967-3	1971-7	1972-11	90.8	91.2	-
UK	GB-18A	DUNGENESS B-1	GCR	AGR	1500	615	525	EDF UK	1965-10	1983-4	1985-4	65.4	65.4	-
	GB-18B	DUNGENESS B-2	GCR	AGR	1500	615	525	EDF UK	1965-10	1985-12	1989-4	63.8	64.1	-
	GB-19A	HARTLEPOOL A-1	GCR	AGR	1500	655	595	EDF UK	1968-10	1983-8	1989-4	68.2	68.3	-
	GB-19B	HARTLEPOOL A-2	GCR	AGR	1500	655	585	EDF UK	1968-10	1984-10	1989-4	67.2	67.3	-
	GB-20A	HEYSHAM A-1	GCR	AGR	1500	625	580	EDF UK	1970-12	1983-7	1989-4	50.1	50.3	-
	GB-20B	HEYSHAM A-2	GCR	AGR	1500	625	575	EDF UK	1970-12	1984-10	1989-4	66.7	66.8	-
	GB-22A	HEYSHAM B-1	GCR	AGR	1550	680	615	EDF UK	1980-8	1988-7	1989-4	90.1	90.1	-
	GB-22B	HEYSHAM B-2	GCR	AGR	1550	680	615	EDF UK	1980-8	1988-11	1989-4	88.2	88.3	-
	GB-16A	HINKLEY POINT B-1	GCR	AGR	1494	655	480	EDF UK	1967-9	1976-10	1978-10	88.3	88.3	-
	GB-16B	HINKLEY POINT B-2	GCR	AGR	1494	655	475	EDF UK	1967-9	1976-2	1976-9	87.8	87.8	-
	GB-17A	HUNTERSTON B-1	GCR	AGR	1496	644	480	TNPG	1967-11	1976-2	1976-2	88.5	88.9	-
	GB-17B	HUNTERSTON B-2	GCR	AGR	1496	644	485	TNPG	1967-11	1977-3	1977-3	83.6	83.6	-
	GB-24	SIZEWELL B	PWR	SNUPPS	3425	1250	1198	EDF UK	1988-7	1995-2	1995-9	86.5	86.6	-
	GB-23A	TORNES-1	GCR	AGR	1623	682	590	EDF UK	1980-8	1988-5	1988-5	86.6	87.9	-
	GB-23B	TORNES-2	GCR	AGR	1623	682	595	EDF UK	1980-8	1989-2	1989-2	88.0	88.6	-
	UKRAINE	UA-40	KHMELNITSKI-1	PWR	VVER V-320	3000	1000	950	NNEGC	1981-11	1987-12	1988-8	74.9	78.0
UA-41		KHMELNITSKI-2	PWR	VVER V-320	3000	1000	950	NNEGC	1985-2	2004-8	2005-12	83.0	84.1	DH
UA-27		ROVNO-1	PWR	VVER V-213	1375	420	381	NNEGC	1973-8	1980-12	1981-9	87.8	88.4	DH

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DH district heating, PH process heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applics
	Code	Name			Thermal	Gross							
UKRAINE	UA-28	ROVNO-2	PWR	VVER V-213	1375	415	376	1973-10	1981-12	1982-7	85.3	85.7	DH
	UA-29	ROVNO-3	PWR	VVER V-320	3000	1000	950	1980-2	1986-12	1987-5	68.4	70.9	DH
	UA-69	ROVNO-4	PWR	VVER V-320	3000	1000	950	1986-8	2004-10	2006-4	82.9	84.8	DH
	UA-44	SOUTH UKRAINE-1	PWR	VVER V-302	3000	1000	950	1976-8	1982-12	1983-12	63.7	68.8	DH
	UA-45	SOUTH UKRAINE-2	PWR	VVER V-338	3000	1000	950	1981-7	1985-4	1985-4	63.2	68.7	DH
	UA-48	SOUTH UKRAINE-3	PWR	VVER V-320	3000	1000	950	1984-11	1989-9	1989-12	70.2	76.7	DH
	UA-54	ZAPOROZHYE-1	PWR	VVER V-320	3000	1000	950	1980-4	1984-12	1985-12	64.9	66.8	DH
	UA-56	ZAPOROZHYE-2	PWR	VVER V-320	3000	1000	950	1981-1	1985-7	1986-2	67.1	73.8	DH
	UA-78	ZAPOROZHYE-3	PWR	VVER V-320	3000	1000	950	1982-4	1986-12	1987-3	69.7	71.3	DH
	UA-79	ZAPOROZHYE-4	PWR	VVER V-320	3000	1000	950	1983-4	1987-12	1988-4	77.1	79.6	DH
	UA-126	ZAPOROZHYE-5	PWR	VVER V-320	3000	1000	950	1985-11	1989-8	1989-10	79.1	83.0	DH
	UA-127	ZAPOROZHYE-6	PWR	VVER V-320	3000	1000	950	1986-6	1995-10	1996-9	78.9	81.8	DH
USA	US-313	ANO-1	PWR	B&W LLP (DRYAM)	2568	903	836	1968-10	1974-8	1974-12	84.5	85.7	-
	US-368	ANO-2	PWR	CE 2LP (DRYAM)	3026	1065	993	1968-12	1978-12	1980-3	84.2	84.2	-
	US-334	BEAVER VALLEY-1	PWR	WH 3LP (DRYSU)	2900	959	921	1970-6	1976-6	1976-10	92.6	92.6	-
	US-412	BEAVER VALLEY-2	PWR	WH 3LP (DRYSU)	2900	958	905	1974-5	1987-8	1987-11	93.5	93.5	-
	US-456	BRADWOOD-1	PWR	WH 4LP (DRYAM)	3645	1270	1194	1975-8	1987-7	1988-7	96.0	96.0	-
	US-457	BRADWOOD-2	PWR	WH 4LP (DRYAM)	3645	1230	1160	1975-8	1988-5	1988-10	96.0	96.0	-
	US-259	BROWNS FERRY-1	BWR	BWR-4 (Mark 1)	3458	1155	1101	1967-5	1973-10	1974-8	95.1	95.1	-
	US-260	BROWNS FERRY-2	BWR	BWR-4 (Mark 1)	3458	1155	1104	1967-5	1974-8	1975-3	93.1	93.1	-
	US-296	BROWNS FERRY-3	BWR	BWR-4 (Mark 1)	3458	1155	1105	1968-7	1976-9	1977-3	95.3	95.3	-
	US-325	BRUNSWICK-1	BWR	BWR-4 (Mark 1)	2923	990	938	1970-2	1976-12	1977-3	94.8	94.8	-
	US-324	BRUNSWICK-2	BWR	BWR-4 (Mark 1)	2923	960	920	1970-2	1975-4	1975-11	91.9	91.9	-
	US-454	BYRON-1	PWR	WH 4LP (DRYAM)	3645	1242	1164	1975-4	1985-3	1985-9	96.1	96.5	-
	US-455	BYRON-2	PWR	WH 4LP (DRYAM)	3645	1210	1136	1975-4	1985-3	1985-9	94.6	94.6	-
	US-483	CALLAWAY-1	PWR	WH 4LP (DRYAM)	3565	1275	1215	1975-9	1984-10	1984-12	87.1	87.1	-
	US-317	CLIFFS-1	PWR	CE 2LP (DRYAM)	2737	918	863	1968-6	1975-1	1975-5	96.4	96.5	-
	US-318	CALVERT CLIFFS-2	PWR	CE 2LP (DRYAM)	2737	911	855	1968-6	1976-12	1977-4	94.2	94.3	-
	US-413	CATAWBA-1	PWR	WH 4LP (ICECN)	3411	1188	1146	1974-5	1985-1	1985-6	94.3	94.3	-

Note: The column "Non-electrical applications" indicates the use of the facility to provide: DH district heating.

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies
	Code	Name			Thermal	Gross								
USA	US-414	CATAWBA-2	PWR	WH 4LP (ICECN)	3471	1188	1150	DUKEENER WH	1974-5	1986-5	1986-8	94.6	94.6	-
	US-461	CLINTON-1	BWR	BWR-6 (Mark 3)	3473	1098	1062	EXELON GE	1975-10	1987-4	1987-11	93.8	93.8	-
	US-397	COLUMBIA	BWR	BWR-5 (Mark 2)	3486	1190	1116	ENERGYNW GE	1972-8	1984-5	1984-12	91.5	91.9	-
	US-445	COMANCHE PEAK-1	PWR	WH 4LP (DRYAM)	3612	1259	1218	LUMINANT WH	1974-12	1990-4	1990-8	92.4	92.4	-
	US-446	COMANCHE PEAK-2	PWR	WH 4LP (DRYAM)	3612	1250	1207	LUMINANT WH	1974-12	1993-4	1993-8	90.2	90.2	-
	US-315	COOK-1	PWR	WH 4LP (ICECD)	3304	1131	1045	AEP WH	1969-3	1975-2	1975-8	86.0	86.0	-
	US-316	COOK-2	PWR	WH 4LP (ICECD)	3488	1231	1168	AEP WH	1969-3	1978-3	1978-8	90.0	90.0	-
	US-298	COOPER	BWR	BWR-4 (Mark 1)	2419	801	769	ENTERGY GE	1968-6	1974-5	1974-7	95.0	95.0	-
	US-346	DAVIS BESSE-1	PWR	B&W RLP (DRYAM)	2817	925	894	FENOC B&W	1970-9	1977-8	1978-7	90.5	90.5	-
	US-275	DIABLO CANYON-1	PWR	WH 4LP (DRYAM)	3411	1197	1138	PG&E WH	1968-4	1984-11	1985-5	91.7	91.7	-
	US-323	DIABLO CANYON-2	PWR	WH 4LP (DRYAM)	3411	1197	1118	PG&E WH	1970-12	1985-10	1986-3	93.0	93.0	-
	US-237	DRESDEN-2	BWR	BWR-3 (Mark 1)	2957	950	902	EXELON GE	1966-1	1970-4	1970-6	95.3	95.3	-
	US-249	DRESDEN-3	BWR	BWR-3 (Mark 1)	2957	935	895	EXELON GE	1966-10	1971-7	1971-11	97.4	97.4	-
	US-331	DJANE ARNOLD-1	PWR	BWR-4 (Mark 1)	1912	624	601	NEXTERA WH	1970-6	1974-5	1975-2	95.3	95.3	-
	US-348	FARLEY-1	PWR	WH 3LP (DRYAM)	2775	918	874	SOUTHERN WH	1970-10	1977-8	1977-12	93.1	93.1	-
	US-364	FARLEY-2	PWR	WH 3LP (DRYAM)	2775	928	883	SOUTHERN WH	1970-10	1981-5	1981-7	92.3	92.3	-
	US-341	FERMI-2	BWR	BWR-4 (Mark 1)	3486	1198	1122	DTEDESON GE	1972-9	1986-9	1988-1	87.5	87.5	-
	US-333	FITZPATRICK	BWR	BWR-4 (Mark 1)	2536	849	813	EXELON GE	1968-9	1975-2	1975-7	93.5	93.9	-
	US-244	GINNA	PWR	WH 2LP (DRYAM)	1775	608	580	EXELON WH	1966-4	1969-12	1970-7	96.2	96.2	-
	US-416	GRAND GULF-1	BWR	BWR-6 (Mark 3)	4408	1500	1401	ENTERGY GE	1974-5	1984-10	1985-7	81.1	81.1	-
	US-400	HARRIS-1	PWR	WH 3LP (DRYAM)	2900	960	928	PROGRESS WH	1978-1	1987-1	1987-5	91.9	91.9	-
	US-321	HATCH-1	BWR	BWR-4 (Mark 1)	2804	911	876	SOUTHERN GE	1968-9	1974-11	1975-12	94.3	94.3	-
	US-366	HATCH-2	BWR	BWR-4 (Mark 1)	2804	921	883	SOUTHERN GE	1972-2	1978-9	1979-9	94.4	94.4	-
	US-354	HOPE CREEK-1	BWR	BWR-4 (Mark 1)	3840	1240	1172	PSEG GE	1976-3	1986-8	1986-12	93.9	93.9	-
	US-287	INDIAN POINT-2	PWR	WH 4LP (DRYAM)	3216	1067	1020	ENTERGY WH	1968-10	1973-6	1974-8	91.5	91.5	-
	US-286	INDIAN POINT-3	PWR	WH 4LP (DRYAM)	3216	1085	1040	ENTERGY WH	1968-11	1976-4	1976-8	90.6	90.6	-
	US-373	LASALLE-1	BWR	BWR-5 (Mark 2)	3546	1207	1137	EXELON GE	1973-9	1982-9	1984-1	96.2	96.2	-
	US-374	LASALLE-2	BWR	BWR-5 (Mark 2)	3546	1207	1140	EXELON GE	1973-9	1984-4	1984-10	93.5	93.5	-
	US-352	LIMERICK-1	BWR	BWR-4 (Mark 2)	3515	1194	1130	EXELON GE	1974-6	1985-4	1986-2	96.5	96.5	-
	US-353	LIMERICK-2	BWR	BWR-4 (Mark 2)	3515	1194	1134	EXELON GE	1974-6	1989-9	1990-1	93.6	93.6	-

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies	
	Code	Name			Thermal	Gross									Net
USA	US-369	MCGUIRE-1	PWR	WH 4LP (ICECN)	3411	1215	1158	DUKEENER	WH	1971-4	1981-9	1981-12	90.9	90.9	-
	US-370	MCGUIRE-2	PWR	WH 4LP (ICECN)	3411	1215	1158	DUKEENER	WH	1971-4	1983-5	1984-3	94.6	94.6	-
	US-336	MILLSTONE-2	PWR	CE 2LP (DRYAM)	2700	918	869	DOMINION	CE	1969-11	1975-11	1975-12	93.2	93.2	-
	US-423	MILLSTONE-3	PWR	WH 4LP (DRYSU)	3650	1280	1229	DOMINION	WH	1974-8	1986-2	1986-4	91.2	91.2	-
	US-263	MONTICELLO	BWR	BWR-3 (Mark 1)	2004	691	647	NSP	GE	1967-6	1971-3	1971-6	87.2	87.2	-
	US-220	NINE MILE POINT-1	BWR	BWR-2 (Mark 1)	1850	642	613	EXELON	GE	1965-4	1969-11	1969-12	95.2	95.2	-
	US-410	NINE MILE POINT-2	BWR	BWR-5 (Mark 2)	3988	1320	1277	EXELON	GE	1975-8	1987-8	1988-3	95.1	95.1	-
	US-338	NORTH ANNA-1	PWR	WH 3LP (DRYSU)	2940	990	948	DOMINION	WH	1971-2	1978-4	1978-6	94.2	94.2	-
	US-339	NORTH ANNA-2	PWR	WH 3LP (DRYSU)	2940	1011	944	DOMINION	WH	1971-2	1980-8	1980-12	91.5	91.5	-
	US-269	OCONEE-1	PWR	B&W LLP (DRYA)	2568	891	847	DUKEENER	B&W	1967-11	1973-5	1973-7	93.9	93.9	-
	US-270	OCONEE-2	PWR	B&W LLP (DRYA)	2568	891	848	DUKEENER	B&W	1967-11	1973-12	1974-9	93.7	93.7	-
	US-287	OCONEE-3	PWR	B&W LLP (DRYA)	2568	900	859	DUKEENER	B&W	1967-11	1974-9	1974-12	96.7	96.7	-
	US-219	OYSTER CREEK	PWR	BWR-2 (Mark 1)	1930	652	619	EXELON	GE	1964-12	1969-9	1969-12	93.4	93.4	-
	US-255	PALISADES	PWR	CE 2LP (DRYAM)	2565	850	805	ENTERGY	CE	1967-3	1971-12	1971-12	90.3	90.3	-
	US-528	PALO VERDE-1	PWR	CE80 2LP (DRYA)	3990	1414	1311	APS	CE	1976-5	1985-6	1986-1	92.5	92.5	-
	US-529	PALO VERDE-2	PWR	CE80 2LP (DRYA)	3990	1414	1314	APS	CE	1976-6	1986-5	1986-9	93.7	93.7	-
	US-530	PALO VERDE-3	PWR	CE80 2LP (DRYA)	3990	1414	1312	APS	CE	1976-6	1987-11	1988-1	93.4	93.4	-
	US-277	PEACH BOTTOM-2	BWR	BWR-4 (Mark 1)	3951	1412	1308	EXELON	GE	1968-1	1974-2	1974-7	96.5	96.5	-
	US-278	PEACH BOTTOM-3	BWR	BWR-4 (Mark 1)	3951	1412	1309	EXELON	GE	1968-1	1974-9	1974-12	95.1	95.1	-
	US-440	PERRY-1	BWR	BWR-6 (Mark 3)	3758	1303	1256	FENOCO	GE	1974-10	1986-12	1987-11	90.4	90.4	-
	US-293	PILGRIM-1	BWR	BWR-3 (Mark 1)	2028	711	677	ENTERGY	GE	1968-8	1972-7	1972-12	89.3	90.5	-
	US-266	POINT BEACH-1	PWR	WH 2LP (DRYAM)	1800	640	591	NEXTERA	WH	1967-7	1970-11	1970-12	93.5	93.5	-
	US-301	POINT BEACH-2	PWR	WH 2LP (DRYAM)	1800	640	591	NEXTERA	WH	1968-7	1972-8	1973-10	95.2	95.2	-
	US-282	PRAIRIE ISLAND-1	PWR	WH 2LP (DRYAM)	1677	566	522	NSP	WH	1968-6	1973-12	1973-12	91.6	91.6	-
	US-306	PRAIRIE ISLAND-2	PWR	WH 2LP (DRYAM)	1677	560	519	NSP	WH	1969-6	1974-12	1974-12	83.7	83.7	-
	US-254	QUAD CITIES-1	BWR	BWR-3 (Mark 1)	2957	940	908	EXELON	GE	1967-2	1972-4	1973-2	96.0	96.0	-
	US-265	QUAD CITIES-2	BWR	BWR-3 (Mark 1)	2957	940	911	EXELON	GE	1967-2	1972-5	1973-3	96.5	96.5	-
US-458	RIVER BEND-1	PWR	BWR-6 (Mark 3)	3091	1016	967	ENTERGY	GE	1977-3	1985-12	1986-6	89.1	89.1	-	
US-261	ROBINSON-2	PWR	WH 3LP (DRYAM)	2339	780	741	PROGRESS	WH	1967-4	1970-9	1971-3	89.0	89.2	-	
US-272	SALEM-1	PWR	WH 4LP (DRYAM)	3459	1254	1169	PSEG	WH	1968-9	1976-12	1977-6	87.0	87.0	-	

TABLE 14. OPERATIONAL REACTORS, 31 DEC. 2017 — continued

Country	Reactor		Type	Model	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	EAF % 2013-2017	UCF % 2013-2017	Non-electrical applies
	Code	Name			Thermal	Gross								
USA	US-311	SALEM-2	PWR	WH 4LP (DRYAM)	3459	1200	1156	PSEG	1968-9	1981-6	1981-10	87.3	87.3	-
	US-443	SEABROOK-1	PWR	WH 4LP (DRYAM)	3648	1296	1246	NEXTERA	1976-7	1990-5	1990-8	94.4	94.4	-
	US-327	SEQUOYAH-1	PWR	WH 4LP (ICECN)	3455	1221	1152	TVA	1970-5	1980-7	1981-7	89.0	89.0	-
	US-328	SEQUOYAH-2	PWR	WH 4LP (ICECN)	3455	1200	1125	TVA	1970-5	1981-12	1982-6	92.6	92.6	-
	US-498	SOUTH TEXAS-1	PWR	WH 4LP (DRYAM)	3853	1354	1280	STP	1975-12	1988-3	1988-3	88.1	88.1	-
	US-499	SOUTH TEXAS-2	PWR	WH 4LP (DRYAM)	3853	1354	1280	STP	1975-12	1989-4	1989-6	88.2	88.2	-
	US-335	ST. LUCIE-1	PWR	CE 2LP (DRYAM)	3020	1045	981	FPL	1970-7	1976-5	1976-12	89.9	90.0	-
	US-389	ST. LUCIE-2	PWR	CE 2LP (DRYAM)	3020	1050	987	FPL	1977-6	1983-6	1983-8	90.2	90.7	-
	US-395	SUMMER-1	PWR	WH 3LP (DRYAM)	2900	1006	973	SCE&G	1973-3	1982-11	1984-1	88.4	88.4	-
	US-280	SURRY-1	PWR	WH 3LP (DRYSU)	2587	890	838	DOMINION	1968-6	1972-7	1972-12	92.3	92.3	-
	US-281	SURRY-2	PWR	WH 3LP (DRYSU)	2587	890	838	DOMINION	1968-6	1973-3	1973-5	92.7	92.7	-
	US-387	SUSQUEHANNA-1	BWR	BWR-4 (Mark 2)	3952	1330	1257	PPL SUSQ	1973-11	1982-11	1983-6	90.0	90.0	-
	US-388	SUSQUEHANNA-2	BWR	BWR-4 (Mark 2)	3952	1330	1257	PPL SUSQ	1973-11	1984-7	1985-2	89.2	89.2	-
	US-289	THREE MILE ISLAND-1	PWR	B&W LLP (DRYA)	2568	880	819	EXELON	1968-5	1974-9	1974-9	94.9	94.9	-
	US-250	TURKEY POINT-3	PWR	WH 3LP (DRYAM)	2644	829	802	FPL	1967-4	1972-11	1973-12	90.1	90.2	-
	US-251	TURKEY POINT-4	PWR	WH 3LP (DRYAM)	2644	829	802	FPL	1967-4	1973-6	1973-9	88.8	88.8	-
	US-424	VOGTLE-1	PWR	WH 4LP (DRYAM)	3626	1229	1150	SOUTHERN	1976-8	1987-3	1987-6	94.4	94.4	-
	US-425	VOGTLE-2	PWR	WH 4LP (DRYAM)	3626	1229	1152	SOUTHERN	1976-8	1989-4	1989-5	93.5	93.5	-
	US-382	WATERFORD-3	PWR	CE 2LP (DRYAM)	3716	1250	1168	ENTERGY	1974-11	1985-3	1985-9	89.8	89.8	-
	US-390	WATTS BAR-1	PWR	WH 4LP (ICECN)	3459	1210	1123	TVA	1973-7	1996-2	1996-5	91.9	92.0	-
US-391	WATTS BAR-2	PWR	WH 4LP (ICECN)	3411	1218	1165	TVA	1973-9	2016-6	2016-10	57.6	57.6	-	
US-482	WOLF CREEK	PWR	WH 4LP (DRYAM)	3565	1285	1200	WCNOC	1977-5	1985-6	1985-9	82.6	82.6	-	

Notes:

— Status as of 31 December 2017. 448 reactors (391721 MW) were connected to the grid, including 6 units (5052 MW) in Taiwan, China.

TAIWAN, CN	TW-1	CHINSHAN-1	BWR	BWR-4 (Mark 1)	1840	636	604	TPC	1973-6	1977-11	1978-12	86.6	86.7	-
	TW-2	CHINSHAN-2	BWR	BWR-4 (Mark 1)	1840	636	604	TPC	1973-12	1978-12	1979-7	82.2	82.5	-
	TW-3	KUOSHENG-1	BWR	BWR-6	2894	985	985	TPC	1975-11	1981-5	1981-12	83.9	84.9	-
	TW-4	KUOSHENG-2	BWR	BWR-6	2894	985	985	TPC	1976-3	1983-6	1983-3	86.9	87.2	-
	TW-5	MAANSHAN-1	PWR	WH 3LP (WE 31)	2822	951	936	TPC	1978-8	1984-5	1984-7	92.1	92.5	-
	TW-6	MAANSHAN-2	PWR	WH 3LP (WE 31)	2822	951	936	TPC	1979-2	1985-2	1985-5	87.3	87.5	-

— EAF and UCF for reactor units Kaiga 1-4, Madras 1-2 and Tarapur 3-4 in India was calculated for the period of 2013—2016, as 2017 production data are not available.

TABLE 15. REACTORS IN LONG TERM SHUTDOWN, 31 DEC. 2017

Country	Reactor		Type	Model	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	Long term shutdown date
	Code	Name			Thermal	Gross	Net						

Note: Status as of 31 December 2017, no reactor was in long term shutdown.

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2017

Country	Reactor		Type	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	Shutdown
	Code	Name		Thermal	Gross	Net						
ARMENIA	AM -18	ARMENIAN-1	PWR	1375	408	376	ANPPCJSC	FAEA	1969-7	1976-12	1977-10	1989-2
BELGIUM	BE -1	BR-3	PWR	41	12	10	CEN/SCK	WH	1957-11	1962-10	1962-10	1987-6
BULGARIA	BG -1	KOZLODUY-1	PWR	1375	440	408	KOZNPP	AEE	1970-4	1974-7	1974-10	2002-12
	BG -2	KOZLODUY-2	PWR	1375	440	408	KOZNPP	AEE	1975-4	1975-8	1975-11	2002-12
	BG -3	KOZLODUY-3	PWR	1375	440	408	KOZNPP	AEE	1973-10	1980-12	1981-1	2006-12
	BG -4	KOZLODUY-4	PWR	1375	440	408	KOZNPP	AEE	1973-10	1982-5	1982-6	2006-12
CANADA	CA -2	DOUGLAS POINT	PHWR	704	218	206	OH	AECL	1960-2	1967-1	1968-9	1984-5
	CA -3	GENTILLY-1	HWLWR	792	266	250	HQ	AECL	1966-9	1971-4	1972-5	1977-6
	CA -12	GENTILLY-2	PHWR	2156	675	635	HQ	AECL	1974-4	1982-12	1983-10	2012-12
	CA -5	PICKERING-2	PHWR	1744	542	515	OPG	OH/AECL	1966-9	1971-10	1971-12	2007-5
	CA -6	PICKERING-3	PHWR	1744	542	515	OPG	OH/AECL	1967-12	1972-5	1972-6	2008-10
	CA -1	ROLPHTON NPD	PHWR	92	25	22	OH	CGE	1958-1	1962-6	1962-10	1987-8
FRANCE	FR -9	BUGEY-1	GCR	1954	555	540	EDF	FRAM	1965-12	1972-4	1972-7	1994-5
	FR -2	CHINON A-1	GCR	300	80	70	EDF	LEVIVIER	1957-2	1963-6	1964-2	1973-4
	FR -3	CHINON A-2	GCR	800	230	180	EDF	LEVIVIER	1959-8	1965-2	1965-6	1985-6
	FR -4	CHINON A-3	GCR	1170	480	360	EDF	GTM	1961-3	1966-8	1966-8	1990-6
	FR -5	CHOOZ-A (ARDENNES)	PWR	1040	320	305	SENA	AFW	1962-1	1967-4	1967-4	1991-10
	FR -6	EL-4 (MONT'S D'ARREE)	HWGCR	260	75	70	EDF	GAFA	1962-7	1968-6	1968-6	1985-7
	FR -1B	G-2 (MARCOCULE)	GCR	250	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	CEA/EDF	CNCLNEY	1968-11	1973-12	1974-7	2010-2
	FR -7	ST. LAURENT A-1	GCR	1650	500	390	EDF	FRAM	1963-10	1969-3	1969-6	1990-4
	FR -8	ST. LAURENT A-2	GCR	1475	530	465	EDF	FRAM	1966-1	1971-8	1971-11	1992-5
	FR -24	SUPER-PHENIX	FBR	3000	1242	1200	EDF	ASPALDO	1976-12	1986-1	1986-12	1998-12
GERMANY	DE -4	AVR JUELICH	HTGR	46	15	13	AVR	BBK	1961-8	1967-12	1969-5	1988-12
	DE -12	BIBLIS-A	PWR	3517	1225	1167	RWE	KWU	1970-1	1974-8	1975-2	2011-8

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2017 — continued

Country	Reactor		Type	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	Shutdown
	Code	Name		Thermal	Gross						
GERMANY	DE -18	BIBLIS-B	PWR	3733	1300	1240	RWE	1972-2	1976-4	1977-1	2011-8
	DE -13	BRUNSBUETEL	BWR	2292	806	771	KB	1970-4	1976-7	1977-2	2011-8
	DE -23	GRAFENRHEINFELD	PWR	3765	1345	1275	E.ON	1975-1	1981-12	1982-6	2015-6
	DE -502	GREIFSWALD-1	PWR	1375	440	408	EWN	1970-3	1973-12	1974-7	1990-2
	DE -503	GREIFSWALD-2	PWR	1375	440	408	EWN	1970-3	1974-12	1975-4	1990-2
	DE -504	GREIFSWALD-3	PWR	1375	440	408	EWN	1972-4	1977-10	1978-5	1990-2
	DE -505	GREIFSWALD-4	PWR	1375	440	408	EWN	1972-4	1979-9	1979-11	1990-7
	DE -506	GREIFSWALD-5	PWR	1375	440	408	EWN	1976-12	1989-4	1989-11	1989-11
	DE -3	GUNDREMMINGEN-A	BWR	801	250	237	KBG	1962-12	1966-12	1967-4	2017-12
	DE -26	GUNDREMMINGEN-B	BWR	3840	1344	1284	KWU	1976-7	1984-3	1984-7	2017-12
	DE -7	HDR GROSSWELZHEIM	BWR	100	27	25	HDR	1965-1	1969-10	1970-8	1971-4
	DE -16	ISAR-1	BWR	2575	912	878	E.ON	1972-5	1977-12	1979-3	2011-8
	DE -8	KNK II	FBR	58	21	17	KBG	1974-9	1978-4	1979-3	1991-8
	DE -20	KRUEMMEL	BWR	3690	1402	1346	KKK	1974-4	1983-9	1984-3	2011-8
	DE -6	LINGEN	BWR	520	268	183	KWL	1964-10	1968-7	1968-10	1977-1
	DE -22	MUELHEIM-KAERLICH	PWR	3760	1302	1219	KBG	1975-1	1986-3	1987-8	1988-9
	DE -2	MZFR	PHWR	200	57	52	KBG	1961-12	1966-12	1966-12	1984-5
	DE -15	NECKARWESTHEIM-1	PWR	2497	840	785	EnKk	1972-2	1976-6	1976-12	2011-8
	DE -11	NIEDERAICHBACH	HWGCR	321	106	100	KKN	1966-6	1973-1	1973-1	1974-7
	DE -5	OBIRGHEIM	PWR	1050	357	340	EnBW	1965-3	1968-10	1969-3	2005-5
DE -14	PHILIPPSBURG-1	BWR	2575	926	890	EnKk	1970-10	1979-5	1980-3	2011-8	
DE -501	RHEINBERG	PWR	265	70	62	EWN	1960-1	1966-5	1966-10	1990-6	
DE -10	STADE	PWR	1900	672	640	E.ON	1967-12	1972-5	1972-5	2003-11	
DE -19	THTR-300	HTGR	760	308	296	HKG	1971-5	1985-11	1987-6	1988-9	
DE -17	UNTERWESER	PWR	3900	1410	1345	E.ON	1972-7	1978-9	1979-9	2011-8	
DE -1	VAK KAHL	BWR	60	16	15	VAK	1958-7	1961-6	1962-2	1985-11	
DE -9	WUERGASSEN	BWR	1912	670	640	PE	1968-1	1971-12	1975-11	1994-8	
ITALY	IT -4	CAORSO	BWR	2651	882	860	SOGIN	1970-1	1978-5	1981-12	1990-7
	IT -3	ENRICO FERMI	PWR	870	270	260	SOGIN	1961-7	1964-10	1965-1	1990-7
	IT -2	GARIGLIANO	BWR	506	160	150	SOGIN	1959-11	1964-1	1964-6	1982-3
	IT -1	LATINA	GCR	660	180	153	SOGIN	1958-11	1963-5	1964-1	1987-12

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2017 — continued

Country	Reactor		Type	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	Shutdown
	Code	Name		Thermal	Gross	Net						
JAPAN	JP -20	FUGEN ATR	H/WLWR	557	165	148	JAEA	HITACHI	1972-5	1978-7	1979-3	2003-3
	JP -5	FUKUSHIMA-DAIICHI-1	BWR	1380	460	439	TEPCO	GE/GETSC	1967-7	1970-11	1971-3	2011-5
	JP -9	FUKUSHIMA-DAIICHI-2	BWR	2381	784	760	TEPCO	GE/T	1969-6	1973-12	1974-7	2011-5
	JP -10	FUKUSHIMA-DAIICHI-3	BWR	2381	784	760	TEPCO	TOSHIBA	1970-12	1974-10	1976-3	2011-5
	JP -16	FUKUSHIMA-DAIICHI-4	BWR	2381	784	760	TEPCO	HITACHI	1973-2	1978-2	1978-10	2011-5
	JP -17	FUKUSHIMA-DAIICHI-5	BWR	2381	784	760	TEPCO	TOSHIBA	1972-5	1977-9	1978-4	2013-12
	JP -18	FUKUSHIMA-DAIICHI-6	BWR	3293	1100	1067	TEPCO	GE/T	1973-10	1979-5	1979-10	2013-12
	JP -12	GENKAI-1	PWR	1650	559	529	KYUSHU	MHI	1971-9	1975-2	1975-10	2015-4
	JP -11	HAMAOKA-1	BWR	1593	540	515	CHUBU	TOSHIBA	1971-6	1974-8	1976-3	2009-1
	JP -24	HAMAOKA-2	BWR	2436	840	806	CHUBU	TOSHIBA	1974-6	1978-5	1978-11	2009-1
	JP -23	IKATA-1	PWR	1650	566	538	SHIKOKU	MHI	1973-9	1977-2	1977-9	2016-5
	JP -1	JPDR	BWR	90	13	12	JAEA	GE	1960-12	1963-10	1965-3	1976-3
	JP -4	MIHAMA-1	PWR	1031	340	320	KEPCO	WH	1967-2	1970-8	1970-11	2015-4
	JP -6	MIHAMA-2	PWR	1456	500	470	KEPCO	MHI	1968-5	1972-4	1972-7	2015-4
	JP -31	MONJU	FBR	714	280	246	JAEA	T/HIF/M	1986-5	1995-8	NA	2017-12
	JP -7	SHIMANE-1	BWR	1380	480	439	CHUGOKU	HITACHI	1970-7	1973-12	1974-3	2015-4
	JP -2	TOKAI-1	GCR	587	166	137	JAPCO	GEC	1961-3	1965-11	1966-7	1998-3
JP -3	TSURUGA-1	BWR	1070	357	340	JAPCO	GE	1966-11	1969-11	1970-3	2015-4	
KAZAKHSTAN	KZ -10	AKTAU	FBR	1000	90	52	MAEC-KAZ	MAEC-KAZ	1964-10	1973-7	1973-7	1999-4
KOREA, REP. OF	KR -1	KORI-1	PWR	1729	607	576	KHNP	WH	1972-8	1977-6	1978-4	2017-6
LITHUANIA	LT -46	IGNALINA-1	LWGR	4800	1300	1185	INPP	MAEP	1977-5	1983-12	1985-5	2004-12
	LT -47	IGNALINA-2	LWGR	4800	1300	1185	INPP	MAEP	1978-1	1987-8	1987-12	2009-12
NETHERLANDS	NL -1	DODEWAARD	BWR	183	60	55	BV GKN	RDM	1965-5	1968-10	1969-3	1997-3
	RU -1	APS-1 OBNINSK	LWGR	30	6	5	MSM	MSM	1951-1	1954-6	1954-12	2002-4
RUSSIA	RU -3	BELOYARSK-1	LWGR	286	108	102	REA	MSM	1958-6	1964-4	1964-4	1983-1
	RU -6	BELOYARSK-2	LWGR	530	160	146	REA	MSM	1962-1	1969-12	1969-12	1990-1
	RU -4	NOVOVORONEZH-1	PWR	760	210	197	REA	MSM	1957-7	1964-9	1964-12	1988-2

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2017 — continued

Country	Reactor		Type	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	Shutdown
	Code	Name		Thermal	Gross	Net						
RUSSIA	RU-8	NOVOVORONEZH-2	PWR	1320	365	336	REA	MSM	1964-6	1969-12	1970-4	1990-8
	RU-9	NOVOVORONEZH-3	PWR	1375	417	385	REA	AEM	1967-7	1971-12	1972-6	2016-12
	SK-1	BOHUNICE A1	HWGCR	560	143	93	JAVYS	SKODA	1958-8	1972-12	1972-12	1977-2
SLOVAKIA	SK-2	BOHUNICE-1	PWR	1375	440	408	JAVYS	AEE	1972-4	1978-12	1980-4	2006-12
	SK-3	BOHUNICE-2	PWR	1375	440	408	JAVYS	AEE	1972-4	1980-3	1981-1	2008-12
SPAIN	ES-1	JOSE CABRERA-1	PWR	510	150	141	UFG	WH	1964-6	1968-7	1969-8	2006-4
	ES-2	SANTA MARIA DE GARONA	BWR	1381	466	446	NUCLENOR	GE	1966-9	1971-3	1971-5	2017-8
	ES-3	VANDELLOS-1	GCR	1670	500	480	HIFRENSA	CEA	1968-6	1972-5	1972-8	1990-7
SWEDEN	SE-1	AGESTA	PHWR	80	12	10	SVAFO	ABBATOM	1957-12	1964-5	1964-5	1974-6
	SE-6	BARSEBACK-1	BWR	1800	615	600	BKAB	ASEASTAL	1971-2	1975-5	1975-7	1999-11
	SE-8	BARSEBACK-2	BWR	1800	615	600	BKAB	ABBATOM	1973-1	1977-3	1977-7	2005-5
	SE-2	OSKARSHAMN-1	BWR	1375	492	473	OKG	ABBATOM	1966-8	1971-8	1972-2	2017-6
	SE-3	OSKARSHAMN-2	BWR	1800	661	638	OKG	ABBATOM	1969-9	1974-10	1975-1	2016-12
SWITZERLAND	CH-8	LUCENS	HWGCR	28	7	6	EOS	NGA	1962-4	1968-1	NA	1969-1
UK	GB-3A	BERKELEY-1	GCR	620	166	138	ML	TNPG	1957-1	1962-6	1962-6	1989-3
	GB-3B	BERKELEY-2	GCR	620	166	138	ML	TNPG	1957-1	1962-6	1962-10	1988-10
	GB-4A	BRADWELL-1	GCR	481	146	123	ML	TNPG	1957-1	1962-7	1962-7	2002-3
	GB-4B	BRADWELL-2	GCR	481	146	123	ML	TNPG	1957-1	1962-7	1962-11	2002-3
	GB-1A	CALDER HALL-1	GCR	268	60	49	SL	UKAEA	1953-8	1956-8	1956-10	2003-3
	GB-1B	CALDER HALL-2	GCR	268	60	49	SL	UKAEA	1953-8	1957-2	1957-2	2003-3
	GB-1C	CALDER HALL-3	GCR	268	60	49	SL	UKAEA	1953-8	1958-3	1958-5	2003-3
	GB-1D	CALDER HALL-4	GCR	268	60	49	SL	UKAEA	1953-8	1959-4	1959-4	2003-3
	GB-2A	CHAPEL CROSS-1	GCR	260	60	48	ML	UKAEA	1955-10	1959-2	1959-3	2004-6
	GB-2B	CHAPEL CROSS-2	GCR	260	60	48	ML	UKAEA	1955-10	1959-7	1959-8	2004-6
	GB-2C	CHAPEL CROSS-3	GCR	260	60	48	ML	UKAEA	1955-10	1959-11	1959-12	2004-6
	GB-2D	CHAPEL CROSS-4	GCR	260	60	48	ML	UKAEA	1955-10	1960-3	1960-3	2004-6
	GB-14	DOUNREAY DFR	FBR	60	15	11	UKAEA	UKAEA	1955-3	1962-10	1962-10	1977-3

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2017 — continued

Country	Reactor		Type	Capacity (MW)			Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	Shutdown
	Code	Name		Thermal	Gross	Net						
UK	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	2008-12
	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	1965-5	1965-5	2000-5
	GB-6A	HUNTERSTON A-1	GCR	595	173	150	ML	ML	1964-2	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-11A	OLDBURY A-1	GCR	730	230	217	ML	TNPG	1962-5	1967-11	1967-12	2012-2
	GB-11B	OLDBURY A-2	GCR	660	230	217	ML	TNPG	1962-5	1968-4	1968-9	2011-6
	GB-10A	SIZEWELL A-1	GCR	1010	245	210	ML	EE/B&W/T	1961-4	1966-1	1966-3	2006-12
	GB-10B	SIZEWELL A-2	GCR	1010	245	210	ML	EE/B&W/T	1961-4	1966-4	1966-9	2006-12
	GB-8A	TRAWSFYNYDD-1	GCR	850	235	195	ML	APC	1959-7	1965-1	1965-3	1991-2
	GB-8B	TRAWSFYNYDD-2	GCR	850	235	195	ML	APC	1959-7	1965-2	1965-3	1991-2
GB-5	WINDSCALE AGR	GCR	120	36	24	UKAEA	UKAEA	1958-11	1963-2	1963-3	1981-4	
GB-12	WINFRITH SGHWR	SGHWR	318	100	92	UKAEA	ICJ/FE	1963-5	1967-12	1968-1	1990-9	
GB-13A	WYLFA-1	GCR	1650	530	490	ML	EE/B&W/T	1963-9	1971-1	1971-11	2015-12	
GB-13B	WYLFA-2	GCR	1920	540	490	ML	EE/B&W/T	1963-9	1971-7	1972-1	2012-4	
UKRAINE	UA-25	CHERNOBYL-1	LWGR	3200	800	740	MTE	FAEA	1970-3	1977-9	1978-5	1996-11
	UA-26	CHERNOBYL-2	LWGR	3200	1000	925	MTE	FAEA	1973-2	1978-12	1979-5	1991-10
	UA-42	CHERNOBYL-3	LWGR	3200	1000	925	MTE	FAEA	1976-3	1981-12	1982-6	2000-12
	UA-43	CHERNOBYL-4	LWGR	3200	1000	925	MTE	FAEA	1979-4	1983-12	1984-3	1986-4
USA	US-155	BIG ROCK POINT	BWR	240	71	67	CPC	GE	1960-5	1962-12	1963-3	1997-8
	US-014	BONUS	BWR	50	18	17	DOE/PRWR	GNEPRWRA	1960-1	1964-8	1965-9	1968-6
	US-302	CRYSTAL RIVER-3	PWR	2568	890	860	PROGRESS	B&W	1968-9	1977-3	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-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	2012-11
	US-285	FORT CALHOUN-1	PWR	1500	512	482	EXELON	CE	1968-6	1973-9	1973-9	1976-10
	US-267	FORT ST. VRAIN	HTGR	842	342	330	PSCC	GA	1968-9	1976-12	1979-7	1989-8

TABLE 16. REACTORS PERMANENTLY SHUT DOWN, 31 DEC. 2017 — continued

Country	Reactor		Type	Capacity (MW)		Operator	NSSS supplier	Construction start	Grid connection	Commercial operation	Shutdown
	Code	Name		Thermal	Gross						
USA	US-018	GE VALLECITOS	BWR	50	24	24	GE	1956-1	1957-10	1957-10	1963-12
	US-213	HADDAM NECK	PWR	1825	603	560	CYAPC	1964-5	1967-8	1968-1	1996-12
	US-077	HALLAM	X	256	84	75	AEC/NPPD	1959-1	1963-9	1963-11	1964-9
	US-133	HUMBOLDT BAY	BWR	220	65	63	PG&E	1960-11	1963-4	1963-8	1976-7
	US-013	INDIAN POINT-1	PWR	615	277	257	ENTERGY	B&W	1962-9	1962-10	1974-10
	US-305	KEWAUNEE	PWR	1772	595	566	DOMINION	WH	1968-8	1974-4	2013-5
	US-409	LACROSSE	BWR	165	55	48	DPC	AC	1963-3	1968-4	1987-4
	US-309	MAINE YANKEE	PWR	2630	900	860	MYAPC	CE	1968-10	1972-11	1987-8
	US-245	MILLSTONE-1	BWR	2011	684	641	DOMINION	GE	1966-5	1970-11	1998-7
	US-130	PATHFINDER	BWR	220	63	59	NMC	AC	1962-2	1966-7	1967-10
	US-171	PEACH BOTTOM-1	HTGR	115	42	40	EXELON	GA	1967-1	1967-6	1974-11
	US-012	PIQUA	X	46	12	12	CofPiqua	GE	1960-1	1963-7	1966-1
	US-312	RANCHO SECO-1	PWR	2772	917	873	SMUD	B&W	1969-4	1974-10	1989-6
	US-206	SAN ONOFRE-1	PWR	1347	456	436	SCE	WH	1964-5	1968-1	1992-11
	US-361	SAN ONOFRE-2	PWR	3438	1127	1070	SCE	CE	1974-3	1982-9	2013-6
	US-362	SAN ONOFRE-3	PWR	3438	1127	1080	SCE	CE	1974-3	1983-9	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
	US-322	SHOREHAM	BWR	2436	849	820	LIPA	GE	1972-11	1986-8	1988-5
	US-320	THREE MILE ISLAND-2	PWR	2772	959	880	GPU	B&W	1969-11	1978-4	1978-3
	US-344	TROJAN	PWR	3411	1155	1095	PORTGE	WH	1970-2	1975-12	1992-11
	US-271	VERMONT YANKEE	BWR	1912	635	605	ENTERGY	GE	1967-12	1972-9	2014-12
	US-29	YANKEE NPS	PWR	600	180	167	YAEC	WH	1957-11	1960-11	1991-10
	US-295	ZION-1	PWR	3250	1085	1040	EXELON	WH	1968-12	1973-6	1998-2
	US-304	ZION-2	PWR	3250	1085	1040	EXELON	WH	1968-12	1973-12	1998-2

Note: Status as of 31 December 2017. 166 reactors (66463 MW) have been permanently shut down.

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2017

Country	Reactor		Shut down	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management phase	Decom. licensee	License terminated
	Code	Name							
ARMENIA	AM-18	ARMENIAN-1	1989-2	Others	Other	4,9	4	ANPPC/JSC	
	BE-1	BR-3	1987-6	2,5	ID	6	3,6,7	CEN/SCK	2031
	BG-1	KOZLODUY-1	2002-12	Others	Dd+PD+SE	6	3,6,7	E-03492	2031
	BG-2	KOZLODUY-2	2002-12	Others	Dd+PD+SE	6	3,6,7	E-03493	2031
BULGARIA	BG-3	KOZLODUY-3	2006-12	Others	Dd+PD+SE	6	3,7	E-00174	2031
	BG-4	KOZLODUY-4	2006-12	Others	Dd+PD+SE	6	3,6,7	E-0008	2031
	CA-1	ROLPHON NPD	1987-8	2	Dd+PD+SE	8	7	AECL	
	CA-2	DOUGLAS POINT	1984-5	2	Dd+SE	8	7	AECL	
CANADA	CA-3	GENTILLY-1	1977-6	2	Dd+PD+SE	8	7	AECL/HQ	
	CA-5	PICKERING-2	2007-5	2	Dd+PD+SE	8		OPG	
	CA-6	PICKERING-3	2008-10	2	Dd+PD+SE			OPG	
	FR-10	PHENIX	2010-2	2	ISD			OPG	
	FR-2	CHINON A-1	1973-4	1,2	ID			—	
	FR-24	SUPER-PHENIX	1988-12	Others	ID	9	3,6	EDF	
	FR-3	CHINON A-2	1985-6	1,2	ID	ID		NERSA	2025
	FR-4	CHINON A-3	1990-6	1,2	ID	ID		EDF	
	FR-5	CHOOZ-A (ARDENNES)	1991-10	Others	ID	9		EDF	2019
	FR-6	EL-4 (MONTS D'ARREE)	1985-7	1,2	ID	4		SENA	2015
FRANCE	FR-7	ST. LAURENT A-1	1990-4	1,2	ID			EDF	2027
	FR-8	ST. LAURENT A-2	1992-5	1,2	ID			EDF	2025
	FR-9	BUGEY-1	1994-5	1,2	ID			EDF	2020
	DE-1	VAK KAHL	1985-11	Others	Other	9		VAK	2010
	DE-10	STADE	2003-11	2	ID	3,4,6		E.ON	2023
	DE-11	NIEDERAICHBACH	1974-7	6	ID			KIT	1995
	DE-12	BIBLIS-A	2011-8	7	ID		3,7	RWE	
	DE-13	BRUNSBUETTEL	2011-8	7	ID	1,2	3	KKB	
	DE-14	PHILIPPSBURG-1	2011-8	7	ID	1	3	EnKK	
	DE-15	NECKARWESTHEIM-1	2011-8	7	ID	1	3	EnKK	
GERMANY	DE-16	ISAR-1	2011-8	7	ID	1		E.ON	2038
	DE-17	UNTERWESER	2011-8	7	ID	1,2		E.ON	2035
	DE-18	BIBLIS-B	2011-8	7	ID	2		RWE	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2017 — continued

Country	Reactor		Shut down	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management	Decom. licensee	License terminated	
	Code	Name								
GERMANY	DE-19	THTR-300	1988-9	6,Others	Other			HKG		
	DE-2	MZFR	1984-5	Others	Other			KTE		
	DE-20	KRUEMMEL	2011-8	7	ID	1	3	KKK		
	DE-22	MUELHEIM-KAERLICH	1988-9	7	Other			RWE		
	DE-23	GRAFENRHEINFELD	2015-6	7	ID			PElectra	2035	
	DE-3	GUNDREMMINGEN-A	1977-1	6,8	ID			KGG		
	DE-4	AVR JUELICH	1988-12	7	ID	3,4,9		—		
	DE-5	OBRIEGHEIM	2005-5	7	ID			EnKK		
	DE-501	RHEINBERG	1990-6	1,3,6,7	ID	9	4,7	G 01 KKR		
	DE-502	GREIFSWALD-1	1990-2	1,3,6,7	ID	3,9	7	G 01 KGR		
	DE-503	GREIFSWALD-2	1990-2	1,3,6,7	ID	3,9	3,7	G 01 KGR		
	DE-504	GREIFSWALD-3	1990-2	1,3,6,7	ID	3,9	7	G 01 KGR		
	DE-505	GREIFSWALD-4	1990-7	1,3,6,7	ID	3	3,7	G 01 KGR		
	DE-506	GREIFSWALD-5	1989-11	1,2,3,6,7	ID	1,3,9	3,7	G 01 KGR		
	DE-6	LINGEN	1977-1	2,5,6	ID	1,3,4,9		RWE AG	1998	
	DE-7	HDR GROSSWELZHEIM	1971-4	5	Other			KIT		
	DE-8	KNK II	1991-8	5	Other			KTE		
	DE-9	WUERGASSEN	1994-8	2	ID			E.ON		
	ITALY	IT-1	LATINA	1987-12	7,Others	ID	3		SOGIN	2040
		IT-2	GARIGLIANO	1982-3	3,4,Others	ID	3,6,9		SOGIN	2033
		IT-3	ENRICO FERMI	1990-7	7,Others	ID	3,4,6,9,10		SOGIN	2034
		IT-4	CAORSO	1990-7	7,Others	ID	4,9		SOGIN	2034
	JAPAN	JP-1	JPDR	1976-3	Others	ID	3		JAERI	2002
		JP-10	FUKUSHIMA-DAIICHI-3	2011-5	Others	Other			TEPCO DL	
JP-11		HAMAOKA-1	2009-1	6	Dd+SE	3,4,6,7		CHUBU DL	2037	
JP-16		FUKUSHIMA-DAIICHI-4	2011-5	Others	Other			TEPCO DL		
JP-17		FUKUSHIMA-DAIICHI-5	2013-12	Others	Other			TEPCO DL		
JP-18		FUKUSHIMA-DAIICHI-6	2013-12	Others	Other			TEPCO DL		
JP-2		TOKAI-1	1998-3	2	Dd+PD+SE	3,4,6,7,9		JAPCO	2025	
JP-20		FUGEN ATR	2003-3	2	Dd+SE	1,3,5	2,5	IAEA	2034	
JP-23		IKATA-1	2016-5	Others	Dd+SE	1,5,7	2	SHIKOKU	2056	
JP-24		HAMAOKA-2	2009-1	6	Dd+SE	3,4,6,7		CHUBU DL	2037	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2017 — continued

Country	Reactor		Shut down	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management	Decom. licensee	License terminated
	Code	Name							
JAPAN	JP-3	TSURUGA-1	2015-4	3	Dd+PD+SE	1,5,7		JAPCO	2040
	JP-4	MIHAMA-1	2015-4	3	Dd+PD+SE	3,8		KEPCO	2046
	JP-5	FUKUSHIMA-DAIICHI-1	2011-5	Others	Other			TEPCO DL	
	JP-6	MIHAMA-2	2015-4	3	Dd+PD+SE	3,8		KEPCO	2046
	JP-7	SHIMANE-1	2015-4	6	Other			CHUGOKU	
	JP-9	FUKUSHIMA-DAIICHI-2	2011-5	Others	Other			TEPCO DL	
	KZ-10	AKTAU	1999-4	2,5	Dd+PD+SE	1,6	4,7	MAEC-KAZ	
	KOREA, REP. OF	KR-1	KORI-1	2017-6	7, Others	ID	1,2	KHNP	
	LITHUANIA	LT-46	IGNALINA-1	2004-12	7, Others	ID	3		INPP
LT-47		IGNALINA-2	2009-12	7, Others	ID	2,3		INPP	2038
NETHERLANDS	NL-1	DODEWAARD	1997-3	2, Others	Dd+SE	7		BV GKN	2055
	RU-3	BELOYARSK-1	1983-1	Others	Other			EA	
RUSSIA	RU-4	NOVOVORONEZH-1	1988-2	Others	Other			EA	
	RU-6	BELOYARSK-2	1990-1	Others	Other			EA	
SLOVAKIA	RU-8	NOVOVORONEZH-2	1990-8	Others	Other			EA	
	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	
	ES-1	JOSE CABRERA-1	2006-4	Others	ID		7	UFG	2015
	ES-3	VANDELLOS-1	1990-7	4	Dd+PD+SE	8		ENRESA	2032
SWEDEN	SE-1	AGESTA	1974-6	2	Dd+SE	1,7	4	VAB	
	SE-2	OSKARSHAMN-1	2017-6	2	ID			OKG	
SWITZERLAND	SE-3	OSKARSHAMN-2	2016-12	2	ID			OKG	
	SE-6	BARSEBACK-1	1999-11	Others	Other	1	4	BKAB	2030
	SE-8	BARSEBACK-2	2005-5	Others	Other	1	4	BKAB	2030
	CH-8	LUCENS	1969-1	4	Dd+SE	1		EOS	2004
	GB-10A	SIZEWELL A-1	2006-12	2,8	Dd+SE	3,5,6,8		Magnox S	2110
	GB-10B	SIZEWELL A-2	2006-12	2,8	Dd+SE	3,5,6,8		Magnox S	2110
	GB-12	WINFRITH SGHWR	1990-9	Others	ID	10		UKAEA	2019
	GB-14	DOUNREAY DFR	1977-3	Others	Dd+PD+SE	5		DSR	2333
GB-15	DOUNREAY PFR	1994-3	Others	Dd+PD+SE	5		Magnox N	2333	
GB-1A	CALDER HALL-1	2003-3	2,8	Dd+PD+SE	8		SL	2117	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2017 — continued

Country	Reactor		Shut down	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management	Decom. licensee	License terminated
	Code	Name							
UK	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	3,5,6		Magnox N	2128
	GB-2B	CHAPELCROSS-2	2004-6	2.8	Dd+PD+SE	3,5,6		Magnox N	2128
	GB-2C	CHAPELCROSS-3	2004-6	2.8	Dd+PD+SE	3,5,6		Magnox N	2128
	GB-2D	CHAPELCROSS-4	2004-6	2.8	Dd+PD+SE	3,5,6		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
USA	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	3,5,6,8		Magnox S	2111
	GB-9B	DUNGENESS A-2	2006-12	2.8	Dd+PD+SE	3,5,6,8		Magnox S	2111
	US-001	SHIPPINGPORT	1982-10	3	ID			DOE DUQU	1989
	US-011	ELK RIVER	1968-2	1,Others	ID			RCPA	1974
	US-012	PIQUA	1966-1	4,5	ISD		11	Co/Piqua	
	US-013	INDIAN POINT-1	1974-10	5	Dd+PD+SE			ENTERGY	
	US-014	BONUS	1968-6	5,6	ISD			DOE/PRWR	1970
	US-018	GE VALLECITOS	1963-12	1	Dd+SE			GE&PGEC	
	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	Dd+SE		11	NMC		
US-133	HUMBOLDT BAY	1976-7	5	Dd+PD+SE		3,4,6	PG&E	2013	
US-144	CVTR	1967-1	7,Others	Dd+SE			CVPA	2009	
US-146	SAXTON	1972-5	Others	ID			GPUINC	2005	

TABLE 17. REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED, 31 DEC. 2017 — continued

Country	Reactor		Shut down	Shutdown reason	Decom. strategy	Current decom. phase	Current fuel management	Decom. licensee	License terminated
	Code	Name							
USA	US-155	BIG ROCK POINT	1997-8	2,Others	ID		7	OPC	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	
	US-206	SAN ONOFRE-1	1992-11	Others	Dd+PD+SE	4		SCE	2008
	US-213	HADDAM NECK	1996-12	6	ID	4,6		CYAPC	2007
	US-245	MILLSTONE-1	1998-7	6	Dd+PD+SE			DOMINRES	
	US-267	FORT ST. VRAIN	1989-8	1,Others	ID			PSCC	1996
	US-29	YANKEE NPS	1991-10	5,7	ID	4,6		YAEC	2005
	US-295	ZION-1	1998-2	5,6	Dd+PD+SE	1,9		CommonEd	
	US-304	ZION-2	1998-2	5,6	Dd+PD+SE	1,9		COMMED	
	US-305	KEWAUNEE	2013-5	2,6	Dd+SE			DOMINRES	
	US-309	MAINE YANKEE	1997-8	6	ID	4		MYAPC	2005
	US-312	RANCHO SECO-1	1989-6	5,6	Dd+PD+SE		7	SMUD	2009
	US-320	THREE MILE ISLAND-2	1979-3	4,5	Other	9,11	4	GPU	
	US-322	SHOREHAM	1989-5	7,Others	ID			LIPA	1995
	US-344	TROJAN	1992-11	6	Dd+PD+SE			PORTGE	2005
	US-409	LACROSSE	1987-4	2	Dd+PD+SE	9	7	DPC	

TABLE 17. DEFINITIONS FOR REACTORS IN DECOMMISSIONING PROCESS OR DECOMMISSIONED

Shutdown reason	Description	Decommissioning strategy	Description
1 2 3 4 5 6 7 8 Other	The technology or process being used became obsolete The process was no longer profitable Changes in licensing requirements After an operating incident Other technological reasons Other economic reasons Public acceptance or political reasons After major component failure or deterioration None of the above	ID Dd+SE Dd+PD+SE ISD Other	Immediate dismantling and removal of all radioactive materials Deferred dismantling, placing all radiological areas into safe enclosure Deferred dismantling, including partial dismantling and placing remaining radiological areas into safe enclosure In situ disposal, involving encapsulation of radioactive materials and subsequent None of the above
Fuel management	Description	Current decommissioning phase	Description
1 2 3 4 5 6 7 8	Transfer to a reactor facility Transfer away from a reactor facility Storage in an on-site facility Storage in an off-site facility Shipment to a reprocessing plant Underwater storage period Dry storage period Encapsulation	1 2 3 4 5 6 7 8 9 10 11	Drawing up the Final Decommissioning Plan Reactor core defuelling Waste conditioning on-site — only for decommissioning waste Waste shipment off-site — only for decommissioning waste Safe enclosure preparation Partial dismantling Active safe enclosure period Passive safe enclosure period Final dismantling Final survey Licence terminated — legal act at the end of the decommissioning

TABLE 18. PERFORMANCE FACTORS BY REACTOR CATEGORY, 2015 to 2017

Reactor category	Reactors reporting to IAEA PRIS (see notes)						
	Number of units	Availability factor (%)	Planned cap. loss factor (%)	Capacity factor (%)	Forced loss rate (%)	Operating factor (%)	Load factor (%)
PWR	299	77.6	17.0	78.8	2.6	77.7	76.1
PWR < 600 MW(e)	48	73.1	22.6	73.7	2.0	73.9	70.8
PWR >= 600 MW(e)	251	77.9	16.6	79.2	2.6	78.3	76.5
BWR	81	61.9	35.2	62.4	2.3	61.3	60.2
BWR < 600 MW(e)	9	37.4	59.5	37.9	5.8	46.7	37.4
BWR >= 600 MW(e)	72	62.7	34.5	63.1	2.3	62.5	60.9
PHWR	49	79.0	15.2	80.4	3.9	77.8	77.6
PHWR < 600 MW(e)	26	77.0	14.4	78.2	7.0	76.6	76.7
PHWR >= 600 MW(e)	23	79.9	15.6	81.3	2.7	79.1	78.0
LWGR	15	81.0	16.1	81.4	2.7	82.2	82.0
LWGR < 600 MW(e)	4	81.3	18.5	81.3	0.3	79.9	45.8
LWGR >= 600 MW(e)	11	81.0	16.1	81.4	2.7	83.1	82.1
GCR	15	79.1	13.5	79.3	5.3	85.7	79.6
FBR	2	80.5	16.5	80.9	1.9	83.3	82.2
TOTAL	461	74.7	20.4	75.7	2.7	75.2	73.3

Notes:

— Reactors shut down during 2015 to 2017 (16 units) are considered;

— Factors provided for PHWR and TOTAL were calculated without 2017 data from eight reactor units in India (Kaiga 1-4, Madras 1-2 and Tarapur 3-4), as information for these units is not available.

TABLE 19. FULL OUTAGE STATISTICS DURING 2017

Reactor type	Number of operating reactors	Full outage hours per operating reactor	Planned outages (%)	Unplanned outages (%)	External outages (%)
PWR	292	1909	73.9	20.7	5.4
PWR < 600 MW(e)	42	1977	81.8	14.3	3.9
PWR >= 600 MW(e)	250	1897	72.5	21.8	5.7
BWR	78	3321	89.7	4.3	6.0
BWR < 600 MW(e)	7	3374	99.2	0.8	0.0
BWR >= 600 MW(e)	71	3316	88.8	4.7	6.5
PHWR	49	1820	83.6	15.9	0.5
PHWR < 600 MW(e)	26	1644	83.0	16.5	0.5
PHWR >= 600 MW(e)	23	2020	84.1	15.3	0.6
LWGR	15	1552	94.0	5.6	0.4
LWGR < 600 MW(e)	4	1606	100.0	0.0	0.0
LWGR >= 600 MW(e)	11	1532	91.7	7.7	0.6
GCR	14	1256	62.6	37.4	0.0
FBR	2	1717	91.4	8.6	0.0
TOTAL	450	2111	79.5	15.7	4.8

Notes:

- Only reactors in commercial operation are considered;
- Reactors shut down during 2017 (5 units) are considered;
- Statistics for PHWR and TOTAL were calculated without data from eight reactor units in India (Kaiga 1-4, Madras 1-2 and Tarapur 3-4), as information for these units is not available.

TABLE 20. DIRECT CAUSES OF FULL OUTAGES DURING 2017

Direct cause	Planned full outages				Unplanned full outages			
	Energy lost		Time lost		Energy lost		Time lost	
	GW·h	%	Hours	%	GW·h	%	Hours	%
Plant equipment problem or failure								
Refuelling without maintenance	25243	3.33	26298	3.11			63099	91.22
Inspection, maintenance or repair combined with refuelling	353151	46.61	390593	46.12				
Inspection, maintenance or repair without refuelling	28216	3.72	40979	4.84				
Testing of plant systems or components	316	0.04	479	0.06				
Major backfitting, refurbishment or upgrading activities with refuelling	23425	3.09	35993	4.25				
Major backfitting, refurbishment or upgrading activities without refuelling	326031	43.03	343312	40.54				
Nuclear regulatory requirements	473	0.06	495	0.06			5581	8.07
Human factor related							307	0.44
Other	788	0.10	8760	1.03			185	0.27
TOTAL	757643	100.00	846909	100.00	62414	100.00	69172	100.00

Notes:

— Only reactors which have achieved full commercial operation in or before 2017 are counted;

— Statistics do not include data from eight Indian reactor units (Kaiga 1-4, Madras 1-2 and Tarapur 3-4), as information for these individual units is not available.

TABLE 21. DIRECT CAUSES OF FULL OUTAGES, 2013 TO 2017

Direct outage cause	Planned full outages				Unplanned full outages			
	Energy lost		Time lost		Energy lost		Time lost	
	GW·h	%	Hours	%	GW·h	%	Hours	%
Plant equipment problem/failure	144499	3.92	142657	3.38	273956	93.09	342350	92.68
Refuelling without maintenance	1505970	40.88	1701067	40.33	487	0.17	483	0.13
Inspection, maintenance or repair combined with refuelling	145816	3.96	227964	5.40				
Inspection, maintenance or repair without refuelling	11484	0.31	11048	0.26	155	0.05	394	0.11
Testing of plant systems or components	149854	4.07	186628	4.42				
Major backfitting, refurbishment or upgrading activities with refuelling	1716458	46.59	1894593	44.92				
Major backfitting, refurbishment or upgrading activities without refuelling	1731	0.05	3949	0.09	8164	2.77	8861	2.40
Nuclear regulatory requirements					7994	2.72	11800	3.19
Human factor related					1779	0.60	2162	0.59
Fire	4099	0.11	6054	0.14	717	0.24	552	0.15
Fuel management limitation (including high flux tilt, stretch out or coast-down operation)	3978	0.11	43933	1.04	1035	0.35	2783	0.75
Other								
TOTAL	3683889	100.00	4217893	100.00	294287	100.00	369385	100.00

Notes:

— Only reactors which have achieved full commercial operation in or before 2017 are counted;

— Numbers do not include 2017 statistics from eight Indian reactor units (Kaiga 1-4, Madras 1-2 and Tarapur 3-4), as information for these individual units is not available.

TABLE 22. COUNTRIES: ABBREVIATIONS AND SUMMARY

Country code	Full name	Number of reactors, as of 31 Dec. 2017			
		Operational	Construction	LT shut down	Shut down
AR	ARGENTINA	3	1		
AM	ARMENIA	1		1	1
BD	BANGLADESH		1		
BY	BELARUS	2			
BE	BELGIUM	7		1	
BR	BRAZIL	2	1		
BG	BULGARIA	2		4	
CA	CANADA	19	6		
CN	CHINA	39	18		31
CZ	CZECH REPUBLIC	6			
FI	FINLAND	4	1		1
FR	FRANCE	58	1	12	
DE	GERMANY	7		29	
HU	HUNGARY	4			2
IN	INDIA	22	7		2
IR	IRAN, ISLAMIC REPUBLIC OF	1			3
IT	ITALY				
JP	JAPAN	42	2	4	9
KZ	KAZAKHSTAN			18	
KR	KOREA, REPUBLIC OF	1		1	
LT	LITHUANIA	24	4	1	1
MX	MEXICO			2	
NL	NETHERLANDS	2			
PK	PAKISTAN	1		1	
RO	ROMANIA	5	2		
RU	RUSSIA	2			
RU	RUSSIA	35	7		22
SK	SLOVAKIA	4	2	6	
SI	SLOVENIA	1		3	
ZA	SOUTH AFRICA	2			
ES	SPAIN	7		3	

TABLE 22. COUNTRIES: ABBREVIATIONS AND SUMMARY — continued

Country code	Full name	Number of reactors, as of 31 Dec. 2017				
		Operational	Construction	LT shut down	Shut down	Planned
SE	SWEDEN	8			5	
CH	SWITZERLAND	5			1	4
TR	TURKEY					
UA	UKRAINE	15	2		4	
AE	UNITED ARAB EMIRATES		4			
GB	UNITED KINGDOM	15			30	2
US	UNITED STATES OF AMERICA	99	2		34	8
TOTAL		448	59		166	86

Note: The total includes the following data from Taiwan, China:
 — 6 units in operation; 2 units under construction.

TABLE 23. REACTOR TYPES: ABBREVIATIONS AND SUMMARY

Type code	Full name	Number of reactors, as of 31 Dec. 2017				
		Operational	Construction	LT shut down	Shut down	Planned
BWR	Boiling light-water cooled and moderated reactor	75	4		40	9
FBR	Fast breeder reactor	3	1		8	5
GCR	Gas cooled, graphite moderated reactor	14			38	
HTGR	High temperature gas cooled reactor		1		4	
HWGGCR	Heavy-water moderated, gas cooled reactor				4	
HWLWR	Heavy-water moderated, boiling light-water cooled reactor				2	
LWGR	Light-water cooled, graphite moderated reactor	15			9	
PHWR	Pressurized heavy-water moderated and cooled reactor	49	4		8	2
PWR	Pressurized light-water moderated and cooled reactor	292	49		50	70
SGHWR	Steam generating heavy-water reactor				1	
X	Other				2	
TOTAL		448	59		166	86

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY

Operator code	Full name	Number of reactors, as of 31 Dec. 2017			
		Operational	Construction	Shut down	Planned
AEC/NPPD	ATOMIC ENERGY COMMISSION AND NEBRASKA PUBLIC POWER DISTRICT				
AEP	AMERICAN ELECTRIC POWER COMPANY, INC.	2		1	
Ameren/UE	AMEREN UE, UNION ELECTRIC COMPANY	1			
ANAV	ASOCIACION NUCLEAR ASCO-VANDELLOS A.I.E. (ENDESA/ID)	3			
ANC	AKKUYU NUCLEAR JOINT STOCK COMPANY	1		1	4
ANPPC/JSC	CLOSED JOINT STOCK COMPANY, ARMENIAN NPP	3			
APS	ARIZONA PUBLIC SERVICE CO.				
A/V/R	ARBETTSGEMEINSCHAFT VERSUCHSREAKTOR GMBH	2		1	
Avpo AG	KERNKRAFTWERK BEZNAUCH-5312 DÖTTINGEN		2		
Be/NPP	REPUBLICAN UNITARY ENTERPRISE BELARUSIAN NUCLEAR POWER PLANT		1		
BHAVINI	BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED			2	
BKAB	BARSEBACK KRAFT AB				
BKW	BKW ENERGIE AG	1			
BRUCEPOW	BRUCE POWER	8			
BV GKN	BV GEMEENSCHAPPELIJKE KERNENERGIECENTRALE NEDERLAND (BV GKN)			1	
CEA/EDF	COMMISSARIAT A L'ENERGIE ATOMIQUE (80% ELECTRICITE 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			
CHUBU	CHUBU ELECTRIC POWER CO., INC.	3		2	1
CHUGOKU	THE CHUGOKU ELECTRIC POWER CO., INC.	1	1	1	2
CIAE	CHINA INSTITUTE OF ATOMIC ENERGY	1			
CNAT	CENTRALES NUCLEARES / ALMARAZ-TRILLO (ID/UGIENDES/HC/NUCLENOR)	3			
CNEA	COMISION NACIONAL DE ENERGIA ATOMICA		1		
CNNO	CNOC NUCLEAR OPERATION MANAGEMENT COMPANY LIMITED.	1			
CoPiQua	CITY OF PIQUA GOVERNMENT			1	
COGEMA	COMPAGNIE GENERALE DES MATIERES NUCLEAIRES			2	
CPC	CONSUMERS POWER CO.			1	
CVPA	CAROLINAS-VIRGINIA NUCLEAR POWER ASSOC.			1	

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator code	Full name	Number of reactors, as of 31 Dec. 2017		
		Operational	Construction	L.T. shut down / Shut down / Planned
CYAPC	CONNECTICUT YANKEE ATOMIC POWER CO.	6		1
DNMC	DAYA BAY NUCLEAR POWER OPERATIONS AND MANAGEMENT CO., LTD.			
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	2		4
EDF	ELECTRICITE DE FRANCE	58	1	8
EDF UK	EDF ENERGY	15		
EDF-CGN	EDF ENERGY - CHINA GENERAL NUCLEAR JOINT VENTURE			2
ELECTRAB	ELECTRABEL	7		
ELETRONU	ELETOBRAS ELETRONUCLEAR, S.A.	2	1	
ENBW	ENBW KRAFTWERKE AG			1
ENERGYNW	ENERGY NORTHWEST	1		
EnKK	ENBW KERNKRAFT GMBH	2		2
ENERGY	ENERGY NUCLEAR OPERATIONS, INC.	10		2
EOS	ENERGIE DE L'OUEST SUISSE			1
EPDC	ELECTRIC POWER DEVELOPMENT CO., LTD.		1	
EPZ	N.V. ELEKTRICITEITS-PRODUKTIEMAATSCHAPPIJ ZUID-NEDERLAND	1		
ESKOM	ESKOM	2		
EWN	ENERGIEWERKE NORD GMBH			6
EXELON	EXELON GENERATION CO., LLC	23		5
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		2	
FSNPC	FUJIAN SANMING NUCLEAR POWER CO., LTD.	4		2
FV	FENNOVOIMA OY			1

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator code	Full name	Number of reactors, as of 31 Dec. 2017			
		Operational	Construction	L.T. shut down	Shut down Planned
GE	GENERAL ELECTRIC				
GFNPC	GUANGXI FANGCHENGANG NUCLEAR POWER COMPANY, L.TD.	2	2		1
GPU	GENERAL PUBLIC UTILITIES(OWNED BY FIRSTENERGY CORP.)				1
HDR	HEISSDAMPREAKTOR-BETRIEBSGESELLSCHAFT MBH.	3			1
HEPCO	HOKKAIDO ELECTRIC POWER CO., INC.				1
HIFRENSA	HISPANO-FRANCESA DE ENERGIA NUCLEAR, S.A.				1
HKG	HOCHTEMPERATUR-KERNKRAFTWERK GMBH	2			1
HNPC	HAINAN NUCLEAR POWER COMPANY	2			
HOKURIKU	HOKURIKU ELECTRIC POWER CO.				2
HQ	HYDRO QUEBEC				1
HSDNPC	SHANDONG HONGSHING NUCLEAR POWER PLANT				
HSNPC	HUANENG SHANDONG SHIDAO BAY NUCLEAR POWER COMPANY, LTD.		1		
ID	IBERDROLA, S.A.	1			
INPP	IGNALINA NUCLEAR POWER PLANT				2
JAEA	JAPAN ATOMIC ENERGY AGENCY				3
JAPCO	JAPAN ATOMIC POWER CO.	2			2
JAVYS	JADROVA A VYRADOVACIA SPOLOCNOST/NUCLEAR AND DECOMMISSIONING COMPANY, PLC./				
JNPC	JIANGSU NUCLEAR POWER CORPORATION	3	3		3
KBG	KERNKRAFTWERK-BETRIEBSGESELLSCHAFT MBH				2
KEPCO	KANSAI ELECTRIC POWER CO.	9			2
KGB	KERNKRAFTWERKE GUNDRREMNINGEN BETRIEBSGESELLSCHAFT MBH				1
KGG	KERNKRAFTWERK GUNDRREMNINGEN GMBH	1			2
KHNP	KOREA HYDRO AND NUCLEAR POWER CO.	24	4		1
KKB	KERNKRAFTWERK BRUNSBUTTEL GMBH & CO. OHG				1
KKG	KERNKRAFTWERK GOESGEN-DAENIKEN AG	1			1
KKK	KERNKRAFTWERK KRÜMMEL GMBH & CO. OHG				1
KKL	KERNKRAFTWERK LEIBSTADT	1			
KKN	KERNKRAFTWERK NIEDERAICHBACH GMBH				1
KLE	KERNKRAFTWERKE LIPPE-EMIS GMBH	1			
KOZNP	KOZLODZY NPP, PLC.	2			
KWG	GEMEINSCHAFTSKERNKRAFTWERK GROHNDE GMBH & CO. OHG	1			4

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator code	Full name	Number of reactors, as of 31 Dec. 2017		
		Operational	Construction	Shut down
KWL	KERNKRAFTWERK LINGEN GMBH			
KYUSHU	KYUSHU ELECTRIC POWER CO., INC.	5		1
LFNPC	CGN LUFENG NUCLEAR POWER CO., LTD			1
LHNPC	LIAONING HONGYANHE NUCLEAR POWER CO. LTD. (LHNPC)	4	2	2
LIPA	LONG ISLAND POWER AUTHORITY			1
LNPC	LIAONIN NUCLEAR POWER COMPANY, LMT.			2
LUMINANT	LUMINANT GENERATION COMPANY, LLC	2		
MAEC-KAZ	MANGISHLAK ATOMIC ENERGY COMPLEX-KAZATOMPROM, LIMITED LIABILITY COMPANY			1
ML	MAGNOX, LTD			22
MSM	MINISTRY OF MEDIUM MACHINE BUILDING OF THE USSR (MINSREDMASH)			1
MTE	MINTOPENERGO OF UKRAINE - MINISTRY OF FUEL AND ENERGY OF UKRAINE			4
MYAPC	MAINE YANKEE ATOMIC POWER CO.			1
NASA	NUCLEOELECTRICA ARGENTINA S.A.	3		
NAWAH	NAWAH ENERGY COMPANY		4	
NBEPIC	NEW BRUNSWICK ELECTRIC POWER COMMISSION	1		
NDNP	FUJIAN NINGDE NUCLEAR POWER COMPANY, LTD.	4		
NEK	NUKLERANA ELEKTRARNA KRŠKO	1		
NEXTERA	NEXTERA ENERGY RESOURCES, LLC	4		
NMC	NUCLEAR MANAGEMENT CO.			1
NNEGC	STATE ENTERPRISE "NATIONAL NUCLEAR ENERGY GENERATING COMPANY 'ENERGOATOM"	15	2	
NPCBL	NUCLEAR POWER PLANT COMPANY BANGLADESH LIMITED	1	1	1
NPICIL	NUCLEAR POWER CORPORATION OF INDIA, LTD.	22	6	2
NPPDCO	NUCLEAR POWER PRODUCTION & DEVELOPEMENT CO. OF IRAN	1		3
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		2
OPG	ONTARIO POWER GENERATION	10		2
PAEC	PAKISTAN ATOMIC ENERGY COMMISSION			
PAKS II	MVM PAKS II, LTD.	5	2	2

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator code	Full name	Number of reactors, as of 31 Dec. 2017			
		Operational	Construction	LT shut down	Shut down
PAKS ZIT	PAKS NUCLEAR POWER PLANT, LTD.	4			
PE	PREUSSELEKTRA KERNKRAFT GMBH&CO KG				1
PG&E	PACIFIC GAS AND ELECTRIC COMPANY	2			1
PORTGE	PORTLAND GENERAL ELECTRIC CO.	2			1
PPL SUSQ	PPL SUSQUEHANNA, LLC	4			1
PROGRESS	PROGRESS ENERGY				1
PSCC	PUBLIC SERVICE CO. OF COLORADO	3			
PSEG	PSEG NUCLEAR, LLC	2			
QINPC	QINSHAN NUCLEAR POWER COMPANY	4			
RAB	RINGHALS AB				1
RCOPA	RURAL COOPERATIVE POWER ASSOC.				5
REA	JOINT STOCK COMPANY 'CONCERN ROSENERGOATOM'	35	7		22
RWE	RWE POWER AG				2
SCE	SOUTHERN CALIFORNIA EDISON CO.				3
SCE&G	SOUTH CAROLINA ELECTRIC & GAS CO.	1			
SDNPC	SHANDONG NUCLEAR POWER COMPANY, LTD.	4	2		2
SE	SLOVENSKE ELEKTARANE, AS	4	2		
SENA	SOCIETE D'ENERGIE NUCLEAIRE FRANCO-BELGE DES ARDENNES				1
SHIKOKU	SHIKOKU ELECTRIC POWER CO., INC	2			1
SL	SELLAFIELD LIMITED				4
SNMPC	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.	6			
SOUTHERN	SOUTHERN NUCLEAR OPERATING COMPANY, INC.	2			
STP	STP NUCLEAR OPERATING CO.				1
SVAFO	AB SVAFO				6
TEPCO	TOKYO ELECTRIC POWER COMPANY HOLDINGS, INC.				
TNPC	GUANGDONG TAISHAN NUCLEAR POWER JOINT VENTURE COMPANY LIMITED (TNPC)	11	2		2

TABLE 24. OPERATORS: ABBREVIATIONS AND SUMMARY — continued

Operator code	Full name	Number of reactors, as of 31 Dec. 2017			
		Operational	Construction	L.T. shut down	Shut down Planned
TOHOKU	TOHOKU ELECTRIC POWER CO., INC	4			1
TPC	TAIWAN POWER CO.	6	2		
TONPC	THE THIRD QINSHAN JOINT VENTURE COMPANY. LTD.	2			
TVA	TENNESSEE VALLEY AUTHORITY	7			
TVO	TEOLLISUUDEN VOIMA OYJ	2	1		
UFG	UNION FENOSA GENERATION, S.A.			1	
UKAEA	UNITED KINGDOM ATOMIC ENERGY AUTHORITY			4	
VAK	VERSUCHSATOMKRAFTWERK KAHL GMBH	1		1	
WCNOC	WOLF CREEK NUCLEAR OPERATION CORP.				
YAEC	YANKEE ATOMIC ELECTRIC CO.	4	2		1
YJNPC	YANGJIANG NUCLEAR POWER COMPANY				26
Not specified					
TOTAL		448	59	166	86

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY

NSSS supplier code	Full name of nuclear steam supply system supplier	Number of reactors, as of 31 Dec. 2017			
		Operational	Construction	L.T shut down	Shut down / Planned
A/FW	ASSOCIATION ACEC,FRAMATOME AND WESTINGHOUSE.				
ABBATOM	ABBATOM (FORMERLY ASEA-ATOM)	5			1
AC	ALLIS CHALMERS	4			4
ACECOWEN	ACECOWEN (ACEC-COCKERILL-WESTINGHOUSE)	1			3
ACLF	(ACECOWEN - CREUSOT LOIRE - FRAMATOME)	8			
AECL	ATOMIC ENERGY OF CANADA, LTD.	1			3
AECL/DAE	ATOMIC ENERGY OF CANADA LTDA AND DEPARTMENT OF ATOMIC ENERGY(INDIA)	3			
AECL/DHI	ATOMIC ENERGY OF CANADA LTD./DOOSAN HEAVY INDUSTRY & CONSTRUCTION	8			12
AEE	ATOMENERGOEXPORT				
AEG	ALLGEMEINE ELEKTRICITAETS-GESELLSCHAFT				1
AEG.GE	ALLGEMEINE ELEKTRICITAETS-GESELLSCHAFT, GENERAL ELECTRIC COMPANY (US)				1
AEG.KWU	ALLGEMEINE ELEKTRICITAETS-GESELLSCHAFT, KRAFTWERK UNION AG				2
AEM	JSC ATOMENERGOMASH	35	8		1
AMIN/GETS	ANSALDO MECCANICO NUCLEARE SPA / GENERAL ELECTRIC TECHNICAL SERVICES CO.				1
APC	ATOMIC POWER CONSTRUCTION, LTD.	2			2
AREVA	AREVA, 27-29, RUE LE PELETIER, 75433 PARIS CEDEX 09URL: WWW.AREVA.COM	2	4		2
ASEASTAL	ASEA-ATOM / STAL-LAVAL				
ASPALDO	ASPALDO	6			1
B&W	BABCOCK & WILCOX CO.				1
BBK	BROWN BOVERI-KRUPP REAKTORBAU GMBH				4
BBR	BROWN BOVERI REAKTOR GMBH				1
CE	COMBUSTION ENGINEERING CO.	11			4
CEA	COMMISSARIAT A L'ENERGIE ATOMIQUE	6	5		1
CFHI	CHINA FIRST HEAVY INDUSTRIES	1			
CGE	CANADIAN GENERAL ELECTRIC				1
CNCLINEY	CNIM-CONSTRUCTIONS NAVALES ET INDUSTRIELLES DE MEDITERRANEE CL - CREUSOT LOI				1
CNEA	COMISION NACIONAL DE ENERGIA ATOMICA				1
CNNC	CHINA NATIONAL NUCLEAR CORPORATION	9			
CZCEC	CHINA ZHONGYUAN ENGINEERING CORPORATION				2
DEC	DONGFANG ELECTRIC CORPORATIONDEC-NPIC-FANP	11	2		3

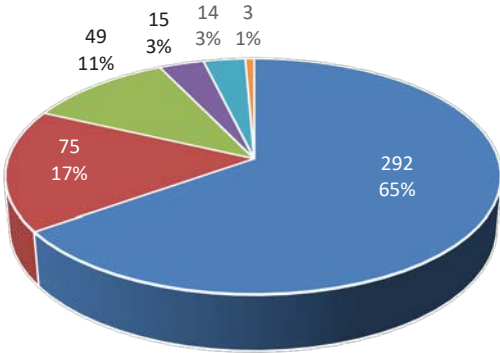
TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY — continued

NSSS supplier code	Full name of nuclear steam supply system supplier	Number of reactors, as of 31 Dec. 2017				
		Operational	Construction	L.T. shut down	Shut down	Planned
DHICKAEC	DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO.LTD./KOREA ATOMICENERGY RESEARCH I	2	4			1
DHICKOPC	DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO.LTD./KOREA POWER ENGINEERING COMPA	11			6	
EE/B&W/T	THE ENGLISH ELECTRIC CO., LTD./BABCOCK & WILCOX CO./TAYLOR WOODROW CONSTR				1	
EL/WEST	ELETTRONUCLEARE ITALIANA/ WESTINGHOUSE ELECTRIC CORP.	1			5	
FAEA	FEDERAL ATOMIC ENERGY AGENCY	66			3	
FRAM	FRAMATOMIE	2				
FRAMACEC	FRAMACECO (FRAMATOMIE-ACEC-COCKERILL)	2				
GA	GENERAL ATOMIC CORP.				2	
GAAA	GROUPEMENT ATOMIQUE ALSACIENNE ATLANTIQUE				1	
GE	GENERAL ELECTRIC CO.	44	2		14	
GE/AEG	GENERAL ELECTRIC COMPANY (US), ALLGEMEINE ELEKTRICITAETS- GESELLSCHAFT				1	
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.	2				
GNEPRWRA	GENERAL NUCLEAR ENGINEERING & PUERTO RICO WATER RESOURCES AUTHORITY (US)				1	
GTM	GRANDS TRAVAUX DE MARSEILLE				1	
H/G	HITACHI GE NUCLEAR ENERGY, LTD.		1			1
HITACHI	HITACHI, LTD.	8	1			
HRB	HOCHTEMPERATUR-REAKTORBAU GMBH				3	
IA	INTERATOM INTERNATIONALE ATOMREAKTORBAU GMBH				1	
ICL/FE	INTERNATIONAL COMBUSTION LTD. / FAIREY ENGINEERING LTD.				1	
IZ	IZHORSKIYE ZAVODY	4	1			
JSC ASE	JSC ATOMSTROYEXPORT	1	6			2
KEPCO	KOREA ELECTRIC POWER CORPORATION	4				
KWU	SIEMENS KRAFTWERK UNION, AG	10	1		11	
LEVIVIER	LEVIVIER				2	
MAEC-KAZ	MAEC-KAZATOMPROMMANGSHLAK ATOMIC ENERGY COMPLEX-KAZATOMPROM,LIMITED LIABILI				1	
MAEP	MINATOMENERGOPROM, MINISTRY OF NUCLEAR POWER AND INDUSTRY	2			2	
MHI	MITSUBISHI HEAVY INDUSTRIES, LTD.				3	
MSM	MINISTRY OF MEDIUM MACHINE BUILDING OF THE USSR (MINSREDMASH)	17			5	

TABLE 25. NSSS SUPPLIERS: ABBREVIATIONS AND SUMMARY — continued

NSSS supplier code	Full name of nuclear steam supply system supplier	Number of reactors, as of 31 Dec. 2017			
		Operational	Construction	L.T. shut down	Shut down
NGA	NATIONALE GESELLSCHAFT ZUR FORDERUNG DER INDUSTRIELLEN ATOMTECHNIK				
NNC	NATIONAL NUCLEAR CORPORATION	2			1
NPC	NUCLEAR POWER CO., LTD.	6			
NPCIL	NUCLEAR POWER CORPORATION OF INDIA, LTD. VIKRAM SARABHAI BHAVAN, ANUSHAKTI NA	16	4		
NPIC	NUCLEAR POWER INSTITUTE OF CHINA	6			
OH/AECL	ONTARIO HYDRO / ATOMIC ENERGY OF CANADA, LTD.	18			2
PAA	PRODUCTION AMALGAMATION 'ATOMMASH', VOLGODONSK	4			
PAIP	PRODUCTION AMALGAMATION IZ HORSKY PLANT 'ATOMMASH', VOLGODONSK, RUSSIA	11			
PPC	PWR POWER PROJECTS, LTD.	1			
RDM	ROTTERDAMSE DROOGDOK MAATSCHAPPIJ (RDM) IN ROTTERDAM (NL)	1			1
S/KWU	SIEMENS/KRAFTWERK UNION, AG.	1			
SACM	SOCIETE ALSACIENNE DE CONSTRUCTIONS MECANIQUE	1	1		2
SHE	SHANGHAI ELECTRIC	1			
SIEM, KWU	SIEMENS AG, KRAFTWERK UNION AG	1			2
SIEMENS	SIEMENS AG, POWER GENERATION	2			1
SKODA	SKODA CONCERN NUCLEAR POWER PLANT WORKS	10	2		1
T/H/F/M	TOSHIBA / HITACHI / FUJI ELECTRIC HOLDINGS / MITSUBISHI HEAVY INDUSTRIES	10			1
TNPG	THE NUCLEAR POWER GROUP, LTD.	4			10
TOSHIBA	TOSHIBA CORPORATION	13			4
TSINGHUA	TSINGHUA UNIVERSITY		1		
UEC	UNITED ENGINEERS AND CONTRACTORS				1
UKAEA	UNITED KINGDOM ATOMIC ENERGY AUTHORITY				10
WH	WESTINGHOUSE ELECTRIC CORPORATION	69	4		13
WH/MHI	WESTINGHOUSE ELECTRIC CORPORATION / MITSUBISHI HEAVY INDUSTRIES, LTD.	1	2		2
Not specified		1	1		41
TOTAL		448	59		166
					86

Number of reactors



Net electrical power [GW]

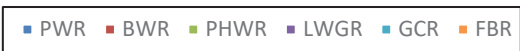
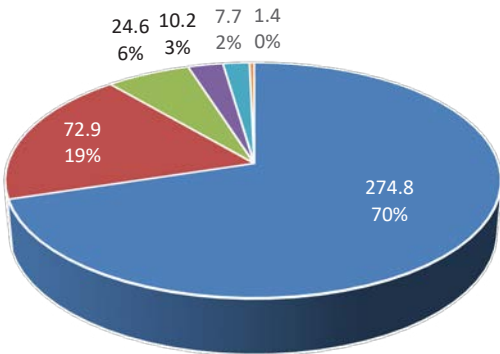
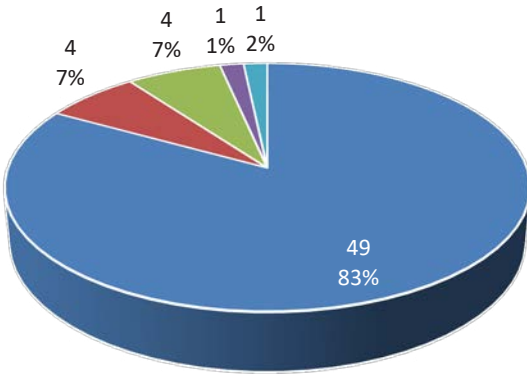


Figure 1. Number of operational reactors by type and net electrical power (as of 31 Dec. 2017).

Number of reactors



Net electrical power [GW]

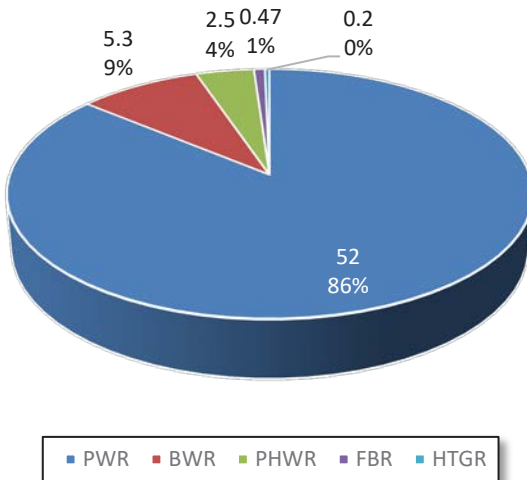


Figure 2. Reactors under construction by type and net electrical power (as of 31 Dec. 2017).

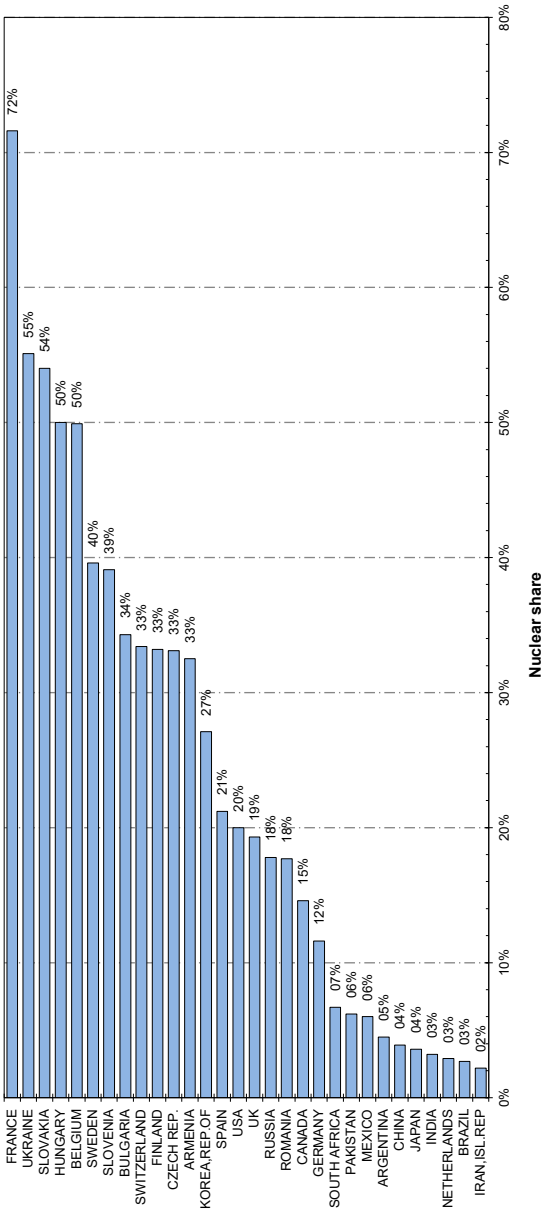


Figure 3. Nuclear share of electricity generation (as of 31 Dec. 2017).

Note: The nuclear share of electricity supplied in Taiwan, China was 9.3% of the total.

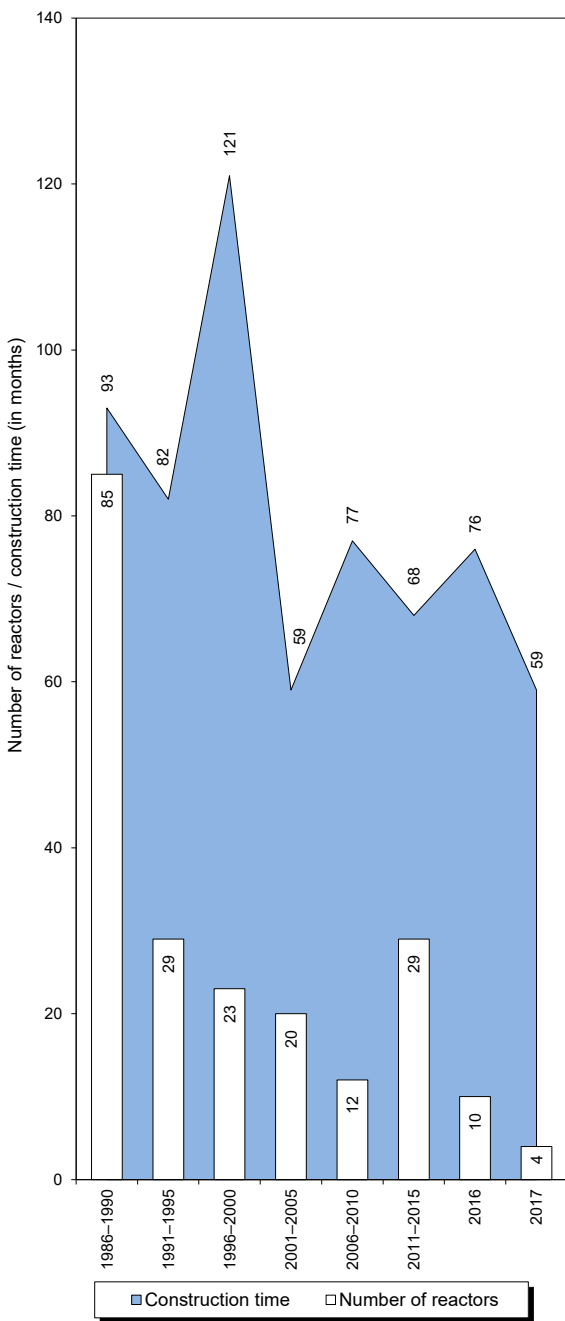


Figure 4. Worldwide median construction time in months (as of 31 Dec. 2017).

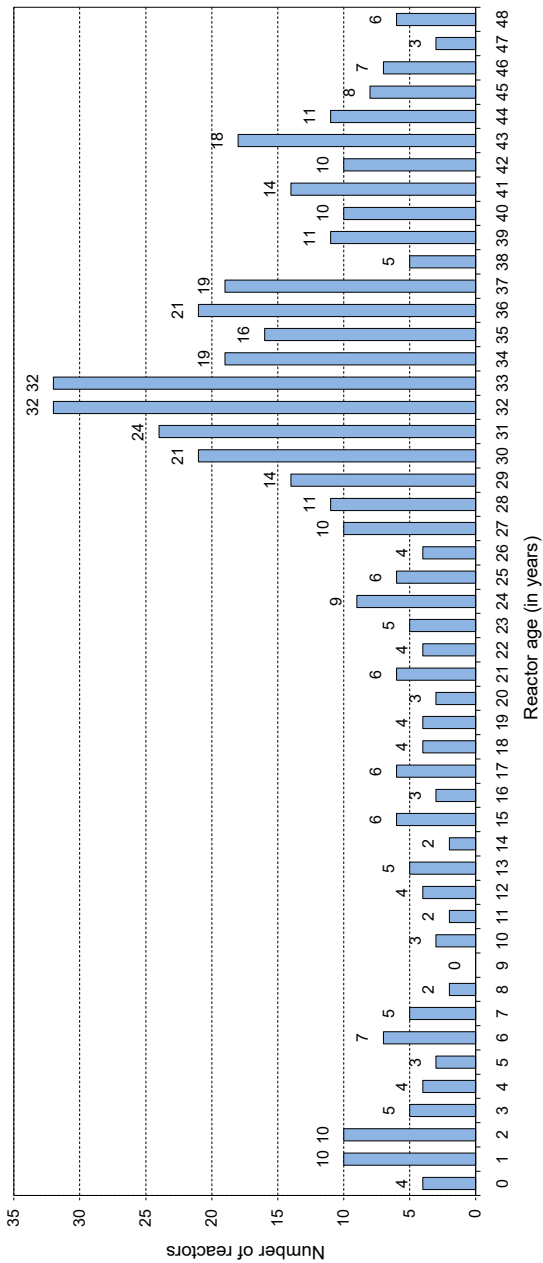


Figure 5. Number of operational reactors by age (as of 31 Dec. 2017).

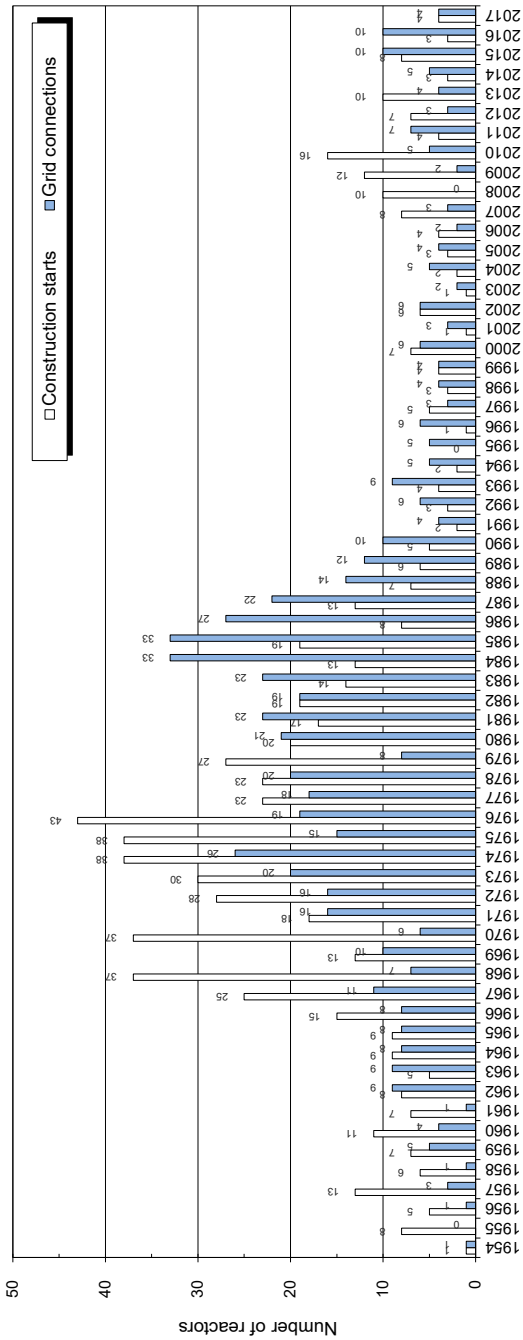


Figure 6. Annual construction starts and connections to the grid (1954 to 2017).



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