

ANNEX 3 – NUCLEAR REACTORS IN THE WORLD “UNDER CONSTRUCTION”

Table 29 · Nuclear Reactors in the World “Under Construction” (as of 1 July 2023)

Country	Units	Capacity MW net	Model	Initial Construction Start	Expected Grid Connection	Delayed
Argentina	1	25				yes
Carem25		25	CAREM (PWR)	08/02/2014	2027 ¹	yes
Bangladesh	2	2 160				
Rooppur-1		1 080	VVER V-523	30/11/2017	2024 ²	yes
Rooppur-2		1 080	VVER V-523	14/07/2018	2024 ³	likely
Brazil	1	1 340				
Angra-3 ⁴		1 340	PRE KONVOI	01/06/2010 ⁵	2028 ⁶	yes
China	23	24 408				
Changjiang SMR-1 ⁷		125	ACP100 ⁸	13/07/2021	2026 ⁹	
Changjiang-3		1 000	HPR-1000 ¹⁰	31/03/2021	2026 ¹¹	
Changjiang-4		1 000	HPR-1000	28/12/2021	2026 ¹²	
Fangchenggang-4		1 000	HPR-1000	23/12/2016	2024 ¹³	yes
Haiyang-3		1 161	CAP1000	07/07/2022	2027 ¹⁴	
Haiyang-4		1 161	CAP1000	22/04/2023	2027 ¹⁵	
Lufeng-5		1 116	HPR-1000	08/09/2022	2027 ¹⁶	
Sanaocun-1		1 117	HPR-1000	31/12/2020	2026 ¹⁷	
Sanaocun-2		1 117	HPR-1000	30/12/2021	2027 ¹⁸	
Sanmen-3		1 163	CAP1000	28/06/2022	2027 ¹⁹	
Sanmen-4		1 163	CAP1000	23/03/2023	2028 ²⁰	
Shidao-Bay 2-1 ²¹		1 400	CAP1400	04/2019 ²²	2024 ²³	
Shidao-Bay 2-2		1 400	CAP1400	11/2019 ²⁴	2024 ²⁵	
Taipingling-1 ²⁶		1 116	HPR-1000	26/12/2019	2025 ²⁷	
Taipingling-2		1 116	HPR-1000	15/10/2020	2026 ²⁸	
Tianwan-7		1 171	VVER V-491	19/05/2021	2026 ²⁹	
Tianwan-8		1 171	VVER V-491	15/02/2022	2027 ³⁰	
Xiapu-1		642	CFR-600	29/12/2017	2023 ³¹	
Xiapu-2 ³²		642	CFR-600	27/12/2020	2026 ³³	
Xudabu-3 ³⁴		1 200	VVER V-491	19/05/2021	2027 ³⁵	
Xudabu-4		1 200	VVER V-491	19/05/2022	2028 ³⁶	
Zhangzhou-1		1 126	HPR-1000	16/10/2019	2024 ³⁷	
Zhangzhou-2		1 126	HPR-1000	04/09/2020	2025 ³⁸	

Country	Units	Capacity MW net	Model	Initial Construction Start	Expected Grid Connection	Delayed
Egypt	3	3300				
El Dabaa-1		1100	VVER 1200	20/07/2022	2028 ³⁹	
El Dabaa-2		1100	VVER 1200	19/11/2022	2029 ⁴⁰	
El Dabaa-3		1100	VVER 1200	03/05/2023	2030 ⁴¹	
France	1	1630				
Flamanville-3		1630	EPR	03/12/2007	2024 ⁴²	yes
India	8	6028				
Kakrapar-4		630	PHWR-700	22/11/2010	2024 ⁴³	yes
Kudankulam-3		917	VVER V-412	29/06/2017	2025 ⁴⁴	yes
Kudankulam-4		917	VVER V-412	23/10/2017	2025 ⁴⁵	yes
Kudankulam-5		917	VVER V-412	29/06/2021	2026/2027 ⁴⁶	likely ⁴⁷
Kudankulam-6		917	VVER V-412	20/12/2021	2027 ⁴⁸	likely ⁴⁹
PFBR		470	FBR	23/10/2004	12/2024 ⁵⁰	yes
Rajasthan-7		630	PHWR	18/07/2011	2026 ⁵¹	yes
Rajasthan-8		630	PHWR	30/09/2011	2026 ⁵²	yes
Iran	1	974				
Bushehr-2		974	VVER V-446	02/1976 ⁵³	2024 ⁵⁴	yes
Japan	1	1325				
Shimane-3		1325	ABWR	12/10/2007	2025 ⁵⁵	yes
Russia	5	2810				
BREST-OD-300		300	FBR	08/06/2021	2026 ⁵⁶	
Kursk 2-1		1200	VVER V-510	29/04/2018	2025 ⁵⁷	yes
Kursk 2-2		1200	VVER V-510	15/04/2019	2027 ⁵⁸	yes
Cape Nagloynyn 1-1 ⁵⁹		55	RITM-200S	30/08/2022	?	
Cape Nagloynyn 1-2		55	RITM-200S	30/08/2022	?	
Slovakia	1	440				
Mochovce-4		440	VVER V-213	01/01/1985	2024 ⁶⁰	yes
South Korea	3	4020				
Shin-Hanul-2		1340	APR-1400	19/06/2013	2024 ⁶¹	yes
Saeul-3 ⁶²		1340	APR-1400	03/04/2017	10/2024 ⁶³ (commercial operation)	yes
Saeul-4		1340	APR-1400	20/09/2018	10/2025 ⁶⁴ (commercial operation)	yes
Turkey	4	4456				
Akkuyu-1		1114	VVER V-509	03/04/2018	2024 ⁶⁵	yes
Akkuyu-2		1114	VVER V-509	08/04/2020	2025 ⁶⁶	
Akkuyu-3		1114	VVER V-509	10/03/2021	2026 ⁶⁷	
Akkuyu-4		1114	VVER V-509	21/07/2022	2027 ⁶⁸	

Country	Units	Capacity MW net	Model	Initial Construction Start	Expected Grid Connection	Delayed
UAE	1	1310				
Barakah-4		1310	APR-1400	30/07/2015	2023 ⁶⁹	yes
U.K.	2	3260				
Hinkley Point C-1	1	1630	EPR-1750	11/12/2018 ⁷⁰	2027 ⁷¹	yes
Hinkley Point C-2	1	1630	EPR-1750	12/12/2019 ⁷²	2028 ⁷³	yes
U.S.	1	1117				
Vogtle-4		1117	AP-1000	19/11/2013	2023 ⁷⁴	yes
World	58	58603		1976–2023	2023–2030	24

Notes:

1 - Delayed several times. The construction of CAREM, was suspended in 2019 “due to breaches by contractor companies”. Concreting restarted in January 2022, with a startup expected in 2027.

See Matías Alonso, “Sol Pedre: ‘El CAREM es un salto cualitativo para el sector nuclear argentino’”, *Agencia TSS*, 2 June 2022 (in Spanish), see <https://www.agenciats.com.ar/sol-pedre-el-carem-es-un-salto-cualitativo-para-el-sector-nuclear-argentino/>, accessed 8 November 2023; and ARN, “National Nuclear Safety Report—Argentinean National Report for the Convention on Nuclear Safety—Ninth Report”, Autoridad Regulatoria Nuclear/Nuclear Regulatory Authority of Argentina, August 2022, see https://www.argentina.gob.ar/sites/default/files/national_nuclear_safety_report_2022.pdf, accessed 11 September 2022.

2 - First acknowledged delay. Startup at construction start was expected in 2023.

See Rosatom, “First concrete poured at the constructed Rooppur NPP site (Bangladesh)”, Press Release, 30 November 2017, see <http://www.rusatom-overseas.com/media/news/first-concrete-poured-at-the-site-constructed-npp-rooppur-bangladesh.html>, accessed 17 August 2020.

Concerns about the implications of the financial sanctions on Russia arose as soon as March 2022, but were dismissed by Rosatom. See Masum Billah, “Western sanctions cast a cloud over Russia-backed Bangladesh nuclear power plant”, *bdnews24.com*, 1 March 2022, see <https://bdnews24.com/bangladesh/2022/03/02/western-sanctions-cast-a-cloud-over-russia-backed-bangladesh-nuclear-power-plant>, accessed 5 April 2022.

In April 2023, Rosatom confirmed the delay, quoting Rooppur Project Director Muhammad Shawkat Akbar: “Hopefully, Unit 1 will be commissioned in September 2024”.

See Rosatom, “Accelerating Towards Launch”, Newsletter #264, April 2023, see <https://rosatomnewsletter.com/2023/04/27/accelerating-towards-launch/>, accessed 13 May 2023.

But startup might be further delayed. See Rejaul Karim Byron, “Rooppur Nuke Power Plant: Launching not before 2025”, *The Daily Star*, 22 March 2023, see <https://www.thedailystar.net/news/bangladesh/news/rooppur-uke-power-plant-launching-not-2025-3277196>, accessed 16 July 2023.

3 - Expected startup at construction start.

See Rosatom, “Main construction of the 2nd Unit of Rooppur NPP begins with the ‘First Concrete’ ceremony”, Press Release, 14 July 2018, see <http://rosatom.ru/en/press-centre/news/main-construction-of-the-2nd-unit-of-rooppur-npp-begins-with-the-first-concrete-ceremony/>, accessed 15 July 2018.

Grid connection of Rooppur-2 is likely to be delayed, at least by a few months as well.

See previous note; and *The Daily Star*, “Rooppur power plant runs into further snag”, 28 April 2023, see <https://www.thedailystar.net/news/bangladesh/diplomacy/news/rooppur-power-plant-runs-further-snag-3305941>, accessed 13 May 2023.

4 - Construction was halted in September 2015 in the wake of financial problems and a major corruption scandal. Restart of the project has been announced several times since but without specific information. Eventually, in November 2022, Eletrobras announced the “resumption of concrete pouring”, marking the restart of the construction, and the reintroduction of Angra-3 in the WNISR list of constructions.

See Eletrobras, “Reinício da concretagem marca retomada das obras de Angra 3”, Press Release (in Portuguese), 11 November 2022, see <https://www.eletronuclear.gov.br/Imprensa-e-Midias/Paginas/Rein%C3%AAdcio-da-concretagem-marca-retomada-das-obras-de-Angra-3.aspx>, accessed 18 November 2022.

The outcome of a dispute regarding an embargo on the construction placed by the Angra dos Reis City Hall are still developing, and may delay the project further.

See “The Angra-3 Saga” in *Brazil Focus* for more details.

5 - The date of the actual construction start of Angra-3 is unclear. While site work was carried out as early as 1984, base slab concreting apparently did not take place until 2010.

6 - Delayed several times. 2028 is the expected startup date announced at construction restart in November 2022, but some delay is already expected, subject to construction restart.

See Eletrobras, “Reinício da concretagem marca retomada das obras de Angra 3”, Press Release (in Portuguese), 11 November 2022, op. cit.

7 - The Changjiang SMR is listed as Linglong-1 (Hainan Changjiang SMR) in IAEA-PRIS statistics.

8 - The ACP100 also goes by the name Linglong One.

9 - CNNC, “Workshop on the Application of Small Modular Reactor held in Hainan”, 8 September 2023, see https://en.cnncc.com.cn/2023-09/08/c_919054.htm, accessed 8 November 2023.

- 10 - The HPR-1000 also goes by the name Hualong One.
- 11 - Construction period is expected to be 60 months.
See *NEI Magazine*, “First concrete poured for China’s Changjiang 3”, 1 April 2021, see <https://www.neimagazine.com/news/newsfirst-concrete-poured-for-chinas-changjiang-3-8644649>, accessed 2 April 2021.
- 12 - *WNN*, “Construction begins at second Changjiang Hualong One”, *World Nuclear News*, 29 December 2021, see <https://world-nuclear-news.org/Articles/Construction-begins-at-second-Changjiang-Hualong-O>, accessed 30 December 2021.
- 13 - Delayed. In January 2022, CGN adjusted the expected date of commencement of operation of Fangchenggang Unit 4 to the first half of 2024 (previously 2022).
See CGN Power, “Inside Information Construction Progress of Fangchenggang Units 3 and 4”, 26 January 2022, see <http://en.cgnp.com.cn/encgnp/c211222/2022-01/26/4197b03727be4723a824odb19375c3fc/files/cdo2fo4566144542ab87ed85fa32f35d.pdf>, accessed 31 January 2022.
- 14 - No official startup date provided at construction start. WNISR used 2027, confirmed at construction start of Haiyang-4. See following note.
- 15 - According to Shanghai Nuclear Engineering Research and Design Institute (SNERDI), construction time of Haiyang-3 and -4 is expected to be 56 months, with both units to be in operation in 2027.
See SNERDI, “海阳核电4号机组顺利实现FCD [Haiyang Nuclear Power Unit 4 Successfully Achieves FCD]”, Press Release (in Chinese), Shanghai Nuclear Engineering Research & Design Institute Co, LTD., 22 April 2023, see <https://www.snerdi.com.cn/newsdetail?id=9277>, accessed 28 April 2023.
- 16 - CGN Power, “Inside Information - Operation Briefings for the Fourth Quarter of 2022”, 9 January 2023, see <http://en.cgnp.com.cn/encgnp/c22122503/2023-01/09/5dea667175824ede9c0ff34882623bec/files/2537af48e9584a85bdd4130e23b7c749.pdf>, accessed 8 November 2023.
- 17 - Commencement of operation of Sanaocun-1 (also known as San’ao or Cangnan-1) is expected in 2026.
See CGN Power, “Annual Report 2022”, March 2023, see <https://www1.hkexnews.hk/listedco/listconews/sehk/2023/0404/2023040401341.pdf>, accessed 1 June 2023.
- 18 - Commencement of operation of Sanaocun-2 (also known as San’ao or Cangnan-2) is expected in 2027.
See CGN Power, “2022 Annual Report”, March 2023, op. cit.
- 19 - No official information on expected startup date at construction start. World Nuclear Association (WNA) uses 2027.
See WNA, “Plans for New Nuclear Reactors Worldwide”, Updated May 2023, see <https://world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx>, accessed 1 June 2023.
- 20 - No official information on expected startup date at construction start. World Nuclear Association (WNA) uses 2028.
See WNA, “Plans for New Nuclear Reactors Worldwide”, Updated May 2023, op. cit.
- 21 - Provisional names for the two CAP1400 at Rongcheng/Shidaowan. Construction of those reactors was introduced in WNISR statistics in 2020 following *Nuclear Intelligence Weekly (NIW)* articles (in particular 10 July 2019) and confirmation from sources in China. In July 2019, *NIW* classified the two units as “under construction” on the basis of the Chinese National Nuclear Safety Administration (NNSA) map as of June 2019.
See *NIW Magazine*, “Chinese Power Reactor Project Wrapped in Secrecy”, 12 July 2019.
- 22 - According to sources in China, first basemat concrete for the first CAP1400 reactor was poured on 8 April 2019.
See also C.F. Yu, “CGN’s Taipingling Project Moves Ahead”, *NIW Magazine*, 20 December 2019. See previous note.
- 23 - No official startup dates at this point. According to sources in China, the expected construction duration of CAP1400 from Zheng Mingguang is about 56 months. WNISR2023 uses 2024 as expected grid connection.
- 24 - According to sources in China, first basemat concrete for the second CAP1400 reactor was poured in November 2019. See previous notes.
- 25 - No official startup dates at this point. WNISR2023 uses 2024 for grid connection date. See previous notes.
- 26 - Also known as Huizhou.
- 27 - CGN, “Annual Report 2022”, 2023, op. cit.
- 28 - Ibidem.
- 29 - According to sources in China, the contract between China and Russia stipulated a construction duration of 65 months. Rosatom stated about the Tianwan-7 and -8 project “the units are scheduled to be commissioned in 2026-2027”.
See Rosatom, “Start of new unit construction at China’s Tianwan and Xudapu nuclear power plants”, Press Release, 19 May 2021, see <https://rosatom.ru/en/press-centre/news/start-of-new-unit-construction-at-china-s-tianwan-and-xudapu-nuclear-power-plants>, accessed 14 June 2021.
- 30 - See Rosatom State Corporation Engineering Division, “The First Concrete has been Laid at Tianwan NPP Power Unit 8 in China”, Press Release, ASE Rosatom, 28 February 2022, see <https://ase-ec.ru/en/for-journalists/news/2022/feb/the-first-concrete-has-been-laid-at-tianwan-npp-power-unit-8-in-china/>, accessed 28 February 2022.
- 31 - *WNN*, “China begins building pilot fast reactor”, *World Nuclear News*, 29 December 2017, see <http://www.world-nuclear-news.org/NN-China-begins-building-pilot-fast-reactor-2912174.html>, accessed 30 December 2017.
- 32 - Unit introduced in IAEA-PRIS statistics in May 2023.
- 33 - No official information about expected grid connection. WNISR2023 uses 2026 (same duration as Xiapu-1).
- 34 - Also known as Xudapu or Xudabao.
- 35 - According to sources in China, the expected construction duration of VVER-1200/V491 is 69 months. At construction start, Rosatom stated about the Xudabao Project, “the units are expected to be commissioned in 2027-2028”.

See Rosatom, “Start of new unit construction at China’s Tianwan and Xudapu nuclear power plants”, Press Release, 19 May 2021, <https://rosatom.ru/en/press-centre/news/start-of-new-unit-construction-at-china-s-tianwan-and-xudapu-nuclear-power-plants/>, accessed 14 June 2021.

36 - According to Rosatom at construction start of Unit 4, commissioning of Xudabu-3 and -4 is scheduled for 2027–2028. See ASE-Rosatom, “First Concrete laid at Xudapu NPP Power Unit 4 in China”, Press Release, 19 May 2022, see <https://ase-ec.ru/en/for-journalists/news/2009/may/first-concrete-laid-at-xudapu-npp-power-unit-4-in-china/>, accessed 19 May 2022.

37 - No official startup date at construction start. See CNNC, “CNNC’s Zhangzhou nuclear plant goes into construction”, China National Nuclear Corporation, 23 December 2019, see http://en.cnncc.com.cn/2019-12/23/c_435889.htm, accessed 17 January 2020. Construction duration of Hualong One design given as 60 months.

38 - No official startup date at construction start. See WNN, “Zhangzhou unit 2 construction starts”, *World Nuclear News*, 4 September 2020, see <https://www.world-nuclear-news.org/Articles/Construction-starts-of-second-Zhangzhou-unit>, accessed 4 September 2020. Construction duration of Hualong One design given as 60 months.

39 - *EgyptToday*, “Egypt’s Nuclear Plants Authority, Rosatom committed to Dabaa plant construction schedule: Official”, 9 May 2022, see <https://www.egypttoday.com/Article/3/115597/Egypt-s-Nuclear-Plants-Authority-Rosatom-committed-to-Dabaa-plant-construction>, accessed 17 July 2022.

40 - No official specific startup date for El Dabaa-2 as of construction date. As all four units are expected online by 2030 or 2031, WNISR2023 uses 2029 (WNA uses 2030 for both El Dabaa-2 and -3)

41 - No official specific startup date for El Dabaa-3 as of construction date. As all four units are expected online by 2030 or 2031, WNISR2023 uses 2030 (WNA uses 2030 for both El Dabaa-2 and -3).

42 - Further delayed. Delayed many times from its original planned startup date of 2012. In December 2022, EDF announced a new provisional date for fuel loading: by the first quarter of 2024 (compared to second quarter of 2023 in WNISR2022). See EDF, “Update on the Flamanville EPR”, Press Release, 20 December 2022, see <https://www.edf.fr/en/the-edf-group/dedicated-sections/journalists/all-press-releases/update-on-the-flamanville-epr-o>, accessed 1 January 2023.

43 - Delayed several times. In 2022, according to an internal memo from the Ministry of Energy, seen by *Reuters*, NPCIL considers that Kakrapar-4 “would reach completion by March, 2024”. See Sudarshan Varadhan, “Operation of Fourth Nuclear Power Unit in Gujarat’s Kakrapar Delayed”, *Reuters*, 31 March 2022, see <https://www.reuters.com/world/india/operation-nuclear-power-unit-indias-western-gujarat-state-delayed-2022-05-31/>, accessed 8 November 2023.

44 - Further delayed. See Department of Atomic Energy and Rajya Sabha, “Unstarred Question No. 3842—Status of New Nuclear Power Plants”, answered by Jitendra Singh, Minister of State for Personnel, Public Grievances & Pensions, Prime Minister’s Office, Government of India, 6 April 2023, see <https://cdnbbsr.s3waas.gov.in/s35b8e4fd39d9786228649a8a8bec4e008/uploads/2023/04/2023041254.pdf>. See also note on Kudankulam-5.

45 - Delayed. *Ibidem*.

46 - Expected construction duration of Kudankulam-5 is 66 months. See Department of Atomic Energy and Lok Sabha “Unstarred Question No.2756—Kudankulam Nuclear Power Plant”, answered by Jitendra Singh, Minister of State for Personnel, Public Grievances & Pensions, Prime Minister’s Office, Government of India, 10 March 2021, see <https://dae.gov.in/writereaddata/lusq%202756.pdf>, accessed 30 June 2021.

47 - In March 2022, the Indian government announced that the “project completion schedule” for the four reactors under construction at Kudankulam are “likely to be impacted” because “components and equipments to be imported from Ukraine and Russia may be delayed due to the logistical and ocean freight problems” arising from the war on Ukraine. See Department of Atomic Energy and Rajya Sabha, “Unstarred Question No. 3286—Status of Work at Kudankulam Power Plant”, answered by Jitendra Singh, Minister of State for Personnel, Public Grievances & Pensions, Prime Minister’s Office, Government of India, 31 March 2022, see <http://dae.gov.in/writereaddata/rsusq3286.pdf>, accessed 7 April 2022.

48 - The expected construction duration of Kudankulam-6 is 75 months. See Department of Atomic Energy, “Lok Sabha - Unstarred Question No.2756 to be answered on 10.03.2021- Kudankulam Nuclear Power Plant”, Government of India, op. cit.

49 - See note on Kudankulam-5.

50 - Further delayed. Completion now expected in December 2024, compared to September 2024 in WNISR2022. See Project Monitoring Division, “448th Flash Report on Central Sector Projects (Rs. 150 crore and above)”, Ministry of Statistics and Programme Implementation and Infrastructure, Government of India, March 2023, see http://www.cspm.gov.in/english/flr/FR_March_2023.pdf, accessed 8 November 2023.

51 - Further delayed. Completion is expected in 2026 (compared to June 2023 in WNISR2022). See Department of Atomic Energy and Rajya Sabha, “Unstarred Question No. 3842—Status of New Nuclear Power Plants”, Government of India, 6 April 2023, op. cit. As of 1 September 2023, the “Expected Date of Commercial Operation” is “under review” on NPCIL’s dedicated webpage.

52 - Further delayed. Completion is expected in 2026 (compared to December 2023 in WNISR2022). See Department of Atomic Energy and Rajya Sabha, “Unstarred Question No. 3842—Status of New Nuclear Power Plants”, Government of India, 6 April 2023, op. cit. As of 1 September 2023, the “Expected Date of Commercial Operation” is “under review” on NPCIL’s dedicated webpage.

53 - Original construction of Bushehr-2 had started in February 1976 before it was halted in 1978. The reactor remained listed as “under construction” in PRIS-IAEA, “Nuclear Power Reactors in the World”, until the 1994 edition. Currently, PRIS indicates September 2019 as construction start, when construction work resumed, and a new concrete slab was poured.

See WNISR, “Iran: Construction Restart of Busheer-2”, 14 November 2019, see <https://www.worldnuclearreport.org/Iran-Construction-Restart-of-Busheer-2.html>, accessed 8 November 2023.

54 - 2024 is the date announced when construction resumed. However, as of June 2022, *Nuclear Engineering International* mentions a 28-month delay on the construction project, without precisions if this only applies to Unit 3, where no concrete pouring has taken place yet.

See *NEI Magazine*, “Iran begins concrete pouring for wall at Busheer 2”, 28 June 2022, see <https://www.neimagazine.com/news/newsiran-begins-concrete-pouring-for-wall-at-busheer-2-9806133>, accessed 7 July 2022.

55 - Construction status unclear. 2025 used for WNISR projections.

56 - Rosatom, “ROSATOM starts construction of unique power unit with BREST-OD-300 fast neutron reactor”, Press Release, 8 June 2021, see <https://rosatom-europe.com/press-centre/news/rosatom-starts-construction-of-unique-power-unit-with-brest-od-300-fast-neutron-reactor/>, accessed 19 August 2022.

57 - Further delayed. Start-up date of Kursk 2-1 and 2-2 at construction start was never very explicit, with 2022 often quoted for Unit 1, while others used 2023. However, in the 2019 edition of IAEA’s “Nuclear Power Reactors in the World”, Kursk 2-1 is the only ‘Construction Start During 2018’ to have a grid connection date, set to June 2022. In the 2022 edition, Kursk 2-1 was listed in the “Scheduled connections to the grid during 2022”. The 2023 edition uses March 2025 as grid connection date.

58 - Delayed. In the 2020 edition of IAEA’s “Nuclear Power Reactors in the World”, Kursk 2-2 is the only ‘Construction Start During 2019’ to have a grid connection date, set to December 2023. The 2023 edition of IAEA’s “Nuclear Power Reactors in the World” uses March 2027 as grid connection date for Kursk 2-2.

59 - In August 2022, Rosatom announced the keel-laying ceremony in China of the first Arctic-type Nuclear Floating Power Unit (NFPU) to be equipped with two RITM-200C reactors and to be deployed in Russia. As there is no official name yet for the reactors, those units are provisionally named Cape Nagloynyn 1-1 and 1-2 according to the overall project name Cape Nagloynyn. See Rosatom, “Keel-laying ceremony for the first Arctic-type Floating Power Unit with RITM-200 transport reactor vessels”, Press Release, 30 August 2022, see <https://rosatom-mena.com/press-centre/news/keel-laying-ceremony-for-the-first-arctic-type-floating-power-unit-with-ritm-200-transport-reactor-v/>, accessed 5 October 2022, and *WNN*, “Construction starts on Russia’s next floating nuclear power plant”, *World Nuclear News*, 31 August 2022, see <https://www.world-nuclear-news.org/Articles/Construction-starts-on-Russia-s-next-floating-nucl>, accessed 20 September 2022.

60 - Further delayed. In August 2022, the Ministry of Economy, stated that “the start-up of the fourth unit of the Mochovce nuclear power plant could be put into operation in approximately 21 months, i.e. in the spring of 2024”. See MHSP, “Tretí blok v Mochovciach realitou, pokryje až 13 % z celkovej potreby elektriny Slovenska”, Press Release (in Slovak), Ministerstvo hospodárstva Slovenskej republiky/Ministry of Economy of the Slovak Republic, 25 August 2022, see <https://www.economy.gov.sk/top/treti-blok-v-mochovciach-realitou-pokryje-az-13-z-celkovej-potreby-elektriny-slovenska?csrt=12344435397304283000>, accessed 3 June 2023.

61 - Further delayed. As of September 2023, KHNP’s page had not been updated, still announcing Commercial operation in September 2023 (compared to July 2023 in WNISR2022), with fuel loading in January 2023, which had not happened. Fuel loading was completed in September 2023.

See KHNP, “Nuclear Power Construction—Shin-Hanul #1,2”, Korea Hydro & Nuclear Power, Various Dates, see <https://cms.khnp.co.kr/eng/contents.do?key=524>, last accessed September 2023; and *WNN* “Fuel loading completed at second Shin Hanul unit”, 20 September 2023, see <https://www.world-nuclear-news.org/Articles/Fuel-loading-completed-at-second-Shin-Hanul-unit>, accessed 8 November 2023.

62 - In late 2022, two reactors under construction, Shin-Kori Unit 3 and 4, were renamed Saeul-1 and -2.

See KHNP, “Saeul NPP Renames as Saeul Units 1, 2, 3 and 4”, Press Release, Korea Hydro & Nuclear Power, 1 November 2022, see https://cms.khnp.co.kr/eng/selectBbsNttView.do;WCN_KHNPHOME=30yVBQtmOX8ttEVoH9XYo11xjJSy2XlO2nToY1Bfoo61Do1j_Acf!-1320158464?key=565&bbsNo=84&nttNo=46397&searchCtgrY=&searchCnd=all&searchKrdw=&integrDeptCode=&pageIndex=1, accessed 3 November 2022.

63 - Further delayed. Construction officially started in April 2017, suspended in July to resume in October of the same year. Commercial operation at construction start was October 2021; after numerous delays, it is now expected in October 2024 (compared to March 2024 in WNISR2022).

See KHNP, “Nuclear Power Construction – Saeul #3,4”, Korea Hydro & Nuclear Power, Various Dates, see <https://cms.khnp.co.kr/eng/contents.do?key=525>, last accessed September 2023.

64 - Further delayed. Commercial operation has been pushed back to October 2025 (compared to March 2025 in WNISR2022)

See KHNP, “Nuclear Power Construction—Saeul #3,4”, Korea Hydro & Nuclear Power, Various Dates, see <https://cms.khnp.co.kr/eng/contents.do?key=525>, last accessed September 2023.

65 - Delayed. The Akkuyu reactors are officially to be completed one per year starting in 2023.

In March 2019, the project management announced that it had finished the concreting of the basemat for the nuclear island and that it was now expected that Akkuyu-1 would be physically completed in 2023, with generation coming at a later date.

See Phil Chaffee, “New Build, Revised 2023 Milestone for Akkuyu”, *Nuclear Intelligence Weekly*, 29 March 2019.

WNISR uses 2024.

The first fuel for the reactor was delivered at the end of April 2023. While stressing that the contractual deadline for the commissioning of Unit 1 is 2025, Rosatom keeps saying that “the project stakeholders are making their best efforts to ensure the readiness for start-up and adjustment works on the Unit No. 1 in 2023, a jubilee year for the Republic of Turkey.”

See Akkuyu Nuclear, “First Batch of Fuel Delivered to Akkuyu NPP”, Rosatom, 27 April 2023, see <http://www.akkuyu.com/first-batch-of-fuel-was-delivered-to-akkuyu-npp/update>, accessed 29 April 2023.

66 - The Akkuyu reactors are officially to be completed one per year starting in 2023, and official startup date is often quoted as 2024.

See *Daily Sabah*, “Construction starts on 2nd unit of Turkey’s 1st nuclear power plant Akkuyu”, 28 June 2020, see <https://www.dailysabah.com/business/energy/construction-starts-on-2nd-unit-of-turkeys-1st-nuclear-power-plant-akkuyu>, accessed 28 June 2020. However, WNISR keeps a 5-year construction time, and a one-per-year startup frequency, beginning with Akkuyu-1 in 2024.

67 - See previous note.

68 - See previous note.

69 - Delayed. No information on a new start-up date for Barakah-4.

70 - WNISR, "The Oddly Discreet Construction Start of Hinkley Point C", 29 December 2018, see <https://www.worldnuclearreport.org/The-Oddly-Discreet-Construction-Start-of-Hinkley-Point-C.html>, accessed 24 August 2019.

71 - Delayed several times. According to EDF, in May 2022 "the risk of further delay of the two units is assessed at 15 months, assuming the absence of a new pandemic wave and no additional effects of the war in Ukraine". This risk estimate was explicitly confirmed in June 2023, without modification of the the target schedule.

See EDF Group, "Half-Year Financial Report at 30 June 2023", June 2023, see <https://www.edf.fr/sites/groupe/files/2023-07/2023-07-27-half-year-results-financial-report.pdf>, accessed 8 November 2023.

72 - See WNISR, "Strangely Belated Announcement of Hinkley Point C-2 Construction Start", 18 March 2020, see <https://www.worldnuclearreport.org/Strangely-Belated-Announcement-of-Hinkley-Point-C-2-Construction-Start.html>.

73 - Delayed several times. See Note on Hinkley Point C-1.

74 - Probably further delayed. Vogtle-4 is projected to enter service "in late fourth quarter 2023 or first quarter 2024", compared to "fourth quarter 2023" in WNISR2022.

See Georgia Power, "Vogtle 3 & 4 nuclear units take significant steps toward operations", Press Release, 1 April 2023, see <https://www.prnewswire.com/news-releases/vogtle-3--4-nuclear-units-take-significant-steps-toward-operations-301787633.html>, accessed 1 April 2023.