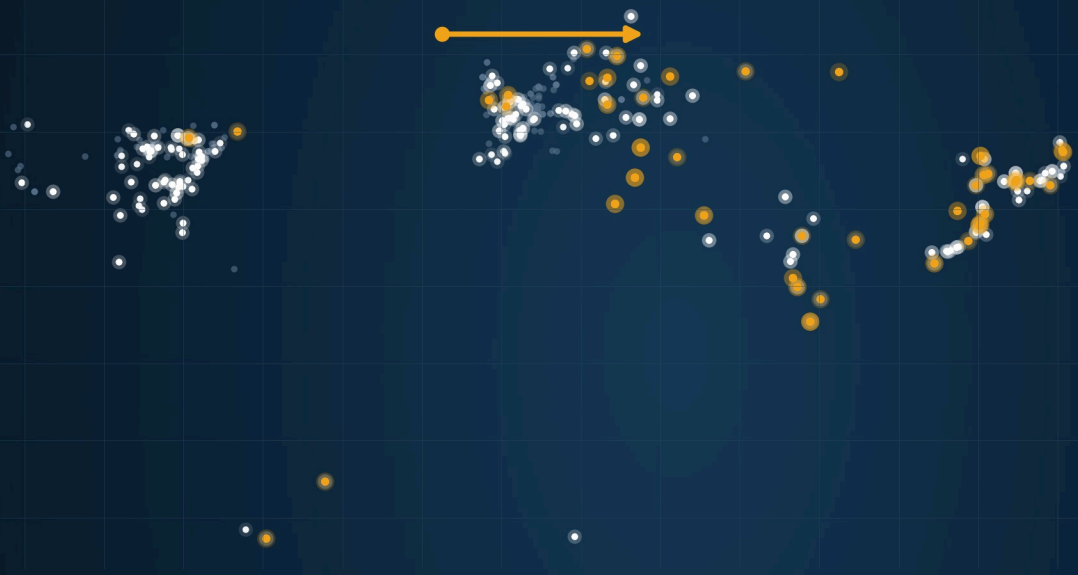
REACTORS · PRODUCERS · MAPS · SCENARIOS TO 2045



● operating ● under construction or planned ● shut down → the fleet's centre of gravity, 2005 to 2026

THE EASTWARD ATOM

Nuclear Power in the World: Twenty Years of Evidence, the Map of Reactors and Projections to 2045

2005 · 2026 · 2045

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THE EASTWARD ATOM

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This book is a collective work of the contributors of Global Strategy Files. The assembly of the data, the indicators defined in the book (including the centre of gravity of the world fleet, the concentration measures, the vendor origin accounts and the GSF Nuclear Power Index), the country projection model, the Monte Carlo simulation, the diagnosis and the projections to 2045 are original work of Global Strategy Files. Model parameters marked as judgments are conditional assumptions, documented in Appendix B; projections are scenarios, not forecasts.

Data were collected in November 2026 from the World Nuclear Association (country tables, reactor database, Outlook and Performance reports), the International Atomic Energy Agency (PRIS and the 2025 and 2026 editions of Reference Data Series No. 1), the World Nuclear Industry Status Report 2026, Ember and the Energy Institute via Our World in Data, the GeoNuclearData plant database, the US Energy Information Administration, the International Energy Agency, Lazard, national regulators and company reports. Every figure and table names its source. Maps show internationally recognized borders as drawn in Natural Earth, simplified.

First edition, November 2026.
Global Strategy Files
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The United States pledges before you, and therefore before the world, its determination to help solve the fearful atomic dilemma, to devote its entire heart and mind to find the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life.

Dwight D. Eisenhower, Atoms for Peace, United Nations,
8 December 1953

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Executive Summary

Nuclear power in 2026 is two stories that rarely meet. The first is told in conference halls and policy speeches: a renaissance, a pledge signed by 38 countries to triple capacity by 2050, technology companies signing contracts for gigawatts of firm clean power, governments that once planned an exit now planning new builds. The second is told by the data: a fleet that has barely grown in twenty years, a share of world electricity that has fallen from 15.0% in 2005 to 8.85% in 2025, construction times of a decade outside Asia, and a building boom that is almost entirely Chinese and Russian.

This book puts the two stories side by side. It reconstructs twenty years of evidence from 2005 to 2025 for every country that operates a reactor, maps the world fleet unit by unit, and builds an original country model of nuclear capacity to 2045 with three scenarios and five thousand Monte Carlo simulations. Its conclusion fits in a sentence: nuclear power will grow, but it will grow in the East, and it will not grow fast enough to regain the place in world electricity that it held in 2005.

Ten findings

1. Record output, falling share. World nuclear generation reached a record 2,812 TWh in 2025 (Our World in Data basis; 2,702 TWh net on the World Nuclear Association basis), only 3.1% above 2005. World electricity grew 75.2% over the same period. The share of nuclear power fell from 15.0% to 8.85%.

2. Without China, nuclear power has shrunk. China multiplied its nuclear output by 9.2, from 53 TWh to 488 TWh. The rest of the world peaked in 2006 at 2,707 TWh and produced 14.1% less in

2025. China accounted for the whole of the net increase in world nuclear generation since 2005, and more.

3. The atom has moved east by fifty-one degrees. The capacity-weighted centre of gravity of the world fleet, a Global Strategy Files indicator, has moved from 14.9 degrees west in 2005 (the middle of the Atlantic) to 36.3 degrees east in 2026 (the longitude of the eastern Mediterranean). No other energy technology has relocated so quickly.

4. Building is a two-country business. Of the 88.5 GW under construction in November 2026, 44.1 GW (49.8%) use Chinese designs and 26.0 GW (29.4%) Russian designs. China alone hosts 52.5% of the capacity under construction; Asia hosts 78.9%. Russia builds 80.6% of all reactor capacity that is under construction outside its vendor's home country.

5. Speed is the dividing line. The median reactor connected between 2005 and 2023 took 6.3 years to build. Chinese units took 5.8 years; the rest of the world 8.7. The flagship Western projects (Olkiluoto 3, Flamanville 3, Vogtle 3 and 4, Hinkley Point C) saw their costs rise by a factor of 1.9 to 7.2 against the first estimate.

6. The fleet is old. The capacity-weighted mean age of operating reactors is 33.0 years; 68.9% of capacity is over thirty years old and 44.0% over forty. The United States, the largest producer, operates the oldest large fleet, with a mean age of 43.6 years. Life extension, not new build, is the main source of nuclear electricity in the West to 2045.

7. Fuel is the hidden choke point. Three countries (Kazakhstan, Canada, Namibia) mine 74.6% of the world's uranium; reactor requirements of 68,920 tU exceed 2024 mine output by 8,707 t; Rosatom controls 40% to 46% of world enrichment capacity. The fuel chain is more concentrated than the reactor fleet itself.

8. Our central projection: 670 GW in 2045. The Global Strategy Files model projects world operable capacity rising from 407 GW

in 2026 to 465 GW in 2030, 529 GW in 2035 and 670 GW in 2045. The low scenario stalls at 416 GW; the high scenario reaches 906 GW. The Monte Carlo median is 671 GW, with a 90% interval of 573 to 779 GW.

9. The share of nuclear power will barely move. Even in the central case, nuclear output rises to 4,840 TWh but its share of world electricity edges only from 8.2% in 2026 to 8.7% in 2045, because demand grows almost as fast. A share of 9% or more by 2045 occurs in 38.4% of simulations. The tripling pledge is reached in none.

10. China becomes the first nuclear power in 2030. In the central scenario China passes the United States in operable capacity in 2030 and in generation in 2032. In 75.1% of simulations the capacity crossover occurs in 2030. By 2045 China operates 235 GW, nearly twice the United States (126 GW), and Asia holds 54.6% of world capacity.

What this means

The question this book set out to answer was how nuclear power has evolved in twenty years and what its place will be in the next twenty. The answer has three parts. Its place in the world's electricity will remain modest, around one kilowatt-hour in eleven. Its place in the world's geography will change completely, as the industry's centre of gravity settles in East Asia. Its place in geopolitics will grow, because the countries that build reactors abroad and control fuel gain decades of leverage over the countries that buy them. The GSF Nuclear Power Index, which combines fleet, dependence, momentum, fuel-cycle control and exports, ranks Russia first (71.6), China second (66.0) and France third (61.1); the United States, the largest producer, is fourth (42.7).

Seven signposts, set out in Chapter 27, will tell which of the three paths the world is on: China's construction starts, the first large reactor starts in the United States, Western build times, Japanese restarts, the uranium term price, firm orders for small modular reactors and the fate of Russian export contracts.

Introduction: Two Stories About the Atom

In December 2023, at the climate conference in Dubai, a group of countries declared that the world should triple its nuclear capacity by 2050. Three years later the declaration has 38 signatories. In the same period the United States set a goal of 400 GW of nuclear capacity by 2050, China set a goal of 110 GW by 2030, India passed a law to reach 100 GW by 2047, Belgium repealed its exit law, and the largest technology companies on the planet signed agreements for up to 13 GW of nuclear power to run their data centers. Read from the press releases, nuclear power is in the middle of a revival.

Read from the statistics, the picture is different. In 2005 the world produced 2,727 TWh of nuclear electricity, and nuclear power supplied 15.0% of all the electricity generated on Earth. In 2025 it produced 2,812 TWh, a record, but its share had fallen to 8.85%. Over the same twenty years, solar power went from 4 TWh to 2,779 TWh and wind from 104 TWh to 2,713 TWh. Each of them now produces almost as much electricity as all the reactors of the world combined. The nuclear fleet outside China produces less than it did in 2006.

Both stories are true. The aim of this book is to explain why, to measure each part of the gap between ambition and delivery, and to project what the next twenty years will bring for nuclear power country by country.

The questions

The book answers five questions.

How has nuclear power evolved over the twenty years from 2005 to 2025? Part II follows the period in sequence: the renaissance announced before 2011 and its failure, the accident at Fukushima Daiichi and the exits that followed, the construction machine built by China, the stall of Western projects, the export strategy of Russia, the division of Europe and the ageing of the fleet.

Who are the largest producers, and how has the ranking changed? Chapters 1 and 2 set out the league table of 2025 and its evolution since 2005, with the concentration of output in a handful of countries.

What does the world map of nuclear installations look like? Chapter 3 maps every power reactor site on the planet by status and capacity, with regional maps of Europe and East Asia, and Chapters 4 and 5 map where the reactors of tomorrow are being built and how the industry's centre of gravity has moved.

What will be the place of nuclear power in the next twenty years? Part IV presents an original projection model, three scenarios for 2045, a Monte Carlo simulation, and the resulting league table and world map of 2045.

What does this mean for power between nations? Part V builds the GSF Nuclear Power Index, analyses the geopolitics of reactor exports and fuel, follows the newcomer countries and sets out the signposts that will tell which future is unfolding.

Data and conventions

The book combines several sources that do not always agree, and it is worth stating the conventions once.

For time series of generation from 2005 to 2025, it uses the Ember and Energy Institute data published by Our World in Data. These are gross figures and give 2,812 TWh for 2025. The World Nuclear Association gives 2,702 TWh net for the same year, and the World Nuclear Industry Status Report gives 2,703 TWh. The difference

of about 4% is mostly the difference between gross and net output and does not affect any trend discussed in the book. Where the book quotes a national figure for 2025 in the country tables, it uses the World Nuclear Association basis.

For the fleet in 2026, it uses the World Nuclear Association country table of November 2026: 444 operable reactors with 406,748 MWe of net capacity, 81 reactors under construction (88,473 MWe), 119 planned and 336 proposed. "Operable" includes reactors that are connected to the grid but idle, notably in Japan. The International Atomic Energy Agency counted 413 reactors in operation with 377.1 GW at the end of 2025, and the Status Report counted 411 operating reactors in 31 countries on 1 July 2026. The differences reflect definitions, not disagreements about facts.

For the location, age and construction history of individual reactors, the book uses the GeoNuclearData plant database, which records the coordinates, status, model and key dates of 804 units. Its snapshot dates from March 2024, and Global Strategy Files has updated the status of units connected or shut down since then: among others, Vogtle 4 in the United States, Flamanville 3 in France, Barakah 4 in the United Arab Emirates, Rooppur 1 in Bangladesh and seven Chinese units now operate, while the last reactors of Taiwan and most Belgian units are shut.

All projections are scenarios built by Global Strategy Files with explicit assumptions documented in Appendix B. They are conditional statements of the form "if these assumptions hold, then", not forecasts.

How to read the book

Each chapter opens with a short box that says what the chapter does and closes with a box of what to remember and a look ahead. Readers in a hurry can read the Executive Summary, Chapter 1, Chapter 19 (the three scenarios) and Chapter 28 (the

findings). Readers interested in a given country will find its profile in Appendix C and its 2045 range in Chapter 22.

Key Numbers

Table 0.1. Nuclear power in the world: key numbers, 2005, 2025 to 2026 and 2045

Indicator	2005	2025 or 2026	2045, central scenario
World nuclear generation, TWh	2,727	2,812 (gross); 2,702 (net)	4,840 (net)
Share of world electricity	15.0%	8.85%	8.7%
Operable capacity, GW	About 367 (plant database)	406.7 (WNA)	669.9
Countries with operating reactors	31	32	35
China's share of world nuclear output	1.9%	17.3%	35.4%
Five largest producers' share of output	67.4%	73.6%	72.9% of capacity
Longitude of the fleet's centre of gravity	14.9 degrees west	36.3 degrees east	Not projected
Capacity under construction, GW	Not computed	88.5	Not projected
Share of construction using Chinese or Russian designs	Not computed	79.2%	Not projected
Capacity-weighted mean age of the fleet, years	Not computed	33.0	Not projected
Uranium requirements, tonnes	Not computed	68,920	About 113,000
Asia and Middle East share of world capacity	Not computed	34.6%	55.0%

Source: Ember and Energy Institute via Our World in Data; World Nuclear Association; GeoNuclearData plant database; Global Strategy Files calculations and projection model. Monte Carlo range for 2045 capacity: 573 to 779 GW (90% interval).

PART I

The State of the Atom

Where nuclear power stands in 2026: output, producers, the map of reactors and the eastward shift of the industry.

CHAPTER 1

The Atom in 2026: A Snapshot

In this chapter

- The size of the world nuclear fleet and its output in 2025 and 2026.
- Why record output and a falling share are two sides of the same fact.
- How nuclear power compares with the other low-carbon sources.

A fleet of 444 reactors

In November 2026 the world counts 444 operable power reactors with a combined net capacity of 406.7 GW, spread over 32 countries if Bangladesh, which connected its first unit on 17 November 2026, is included. Another 81 reactors with 88.5 GW are under construction, 119 reactors with 108.1 GW are planned, meaning that approvals, funding or commitments are in place, and 336 reactors with 299.3 GW are proposed. These figures come from the World Nuclear Association and include the idle Japanese units that are connected to the grid but not running. On a stricter count, 411 reactors were in operation in mid 2026, with a mean age of 32.9 years.

The fleet is dominated by a single technology. Pressurized water reactors, cooled and moderated by ordinary water kept liquid under high pressure, make up the large majority of capacity (Figure 13.3 in Chapter 13). Boiling water reactors, heavy water reactors of the Canadian and Indian families, the British gas-

cooled reactors and the Russian graphite reactors make up the remainder.

The average reactor delivers a lot of electricity for its size. The World Nuclear Association puts the global capacity factor at 83.7% in 2025, which means that the average reactor produced 83.7% of what it would have produced running at full power all year. Only geothermal and some hydro plants come close. A gigawatt of nuclear capacity produces about 7.3 TWh a year; a gigawatt of solar panels produces between 1 and 2 TWh.

Table 1.1. The world nuclear fleet at a glance, November 2026

Indicator	Value	Source
Operable reactors	444 (406.7 GW net)	WNA
Reactors in operation, mid 2026	411 in 31 countries	WNISR 2026
Under construction	81 (88.5 GW)	WNA
Planned	119 (108.1 GW)	WNA
Proposed	336 (299.3 GW)	WNA
Generation 2025	2,702 TWh net; 2,812 TWh gross	WNA; OWID
Share of world electricity 2025	8.85%	OWID, GSF calculation
Global capacity factor 2025	83.7%	WNA
Uranium requirements	68,920 tU per year	WNA
Mean age of operating reactors	32.9 years	WNISR 2026

Source: World Nuclear Association, country table and Outlook Report (November 2026); World Nuclear Industry Status Report 2026; Our World in Data.

Record output, shrinking share

The headline numbers of 2025 look good for the industry. Nuclear generation reached a record of 2,812 TWh on the gross basis, beating the previous high of 2,777 TWh set in 2024 and the pre-Fukushima peak of 2,762 TWh in 2006. On the net basis the

World Nuclear Association reports 2,702 TWh, up from 2,667 TWh in 2024.

Yet the share of nuclear power in world electricity has fallen almost every year for two decades: from 15.0% in 2005 to 12.8% in 2010, 10.6% in 2015, 9.9% in 2020 and 8.85% in 2025 (Figure 1.1). The reason is arithmetic. World electricity generation grew 75.2% between 2005 and 2025, from 18,134 TWh to 31,772 TWh. Nuclear generation grew 3.1%. A source that does not grow while the market almost doubles loses nearly half its share.

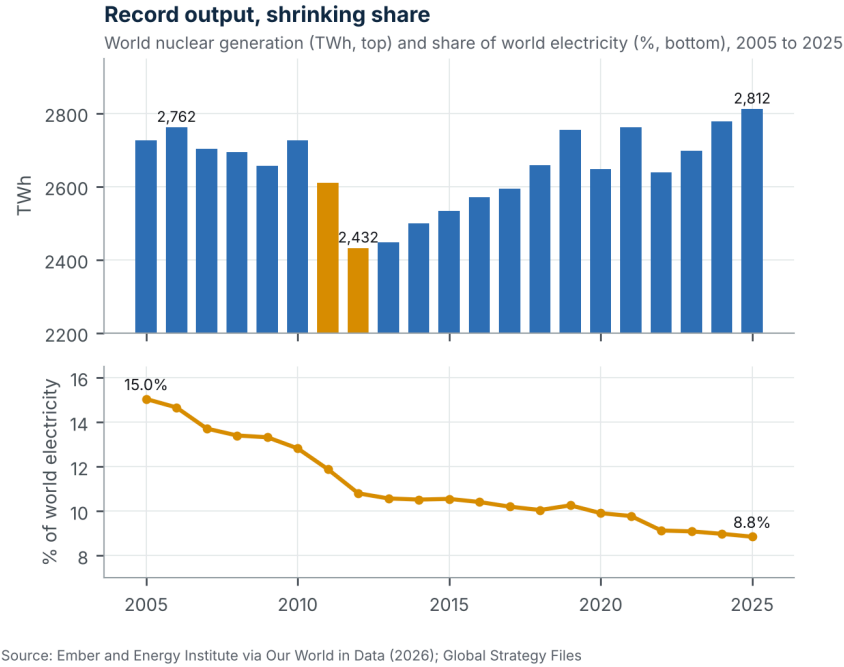


Figure 1.1. World nuclear generation and share of world electricity, 2005 to 2025

The path between the two dates is not a straight line. Generation dipped to 2,432 TWh in 2012, the year after Fukushima, when Japan shut its entire fleet and Germany closed eight units. It took until 2019 to come back to the level of 2005, fell again in the pandemic year of 2020, and has risen since 2022 on the back of

Chinese additions and the recovery of the French fleet after its corrosion problems. Each new record therefore says more about recovery from accidents than about expansion.

The new neighbours: solar and wind

Twenty years ago nuclear power was the largest low-carbon source of electricity after hydro and accounted for 47.4% of the electricity produced by nuclear, hydro, wind and solar together. In 2025 that share was 22.1% (Figure 1.2). Solar generation rose from 4 TWh to 2,779 TWh and wind from 104 TWh to 2,713 TWh. In 2025 solar produced 98.8% as much electricity as nuclear and wind 96.5%. On current trends, solar will overtake nuclear in 2026 and wind shortly after.

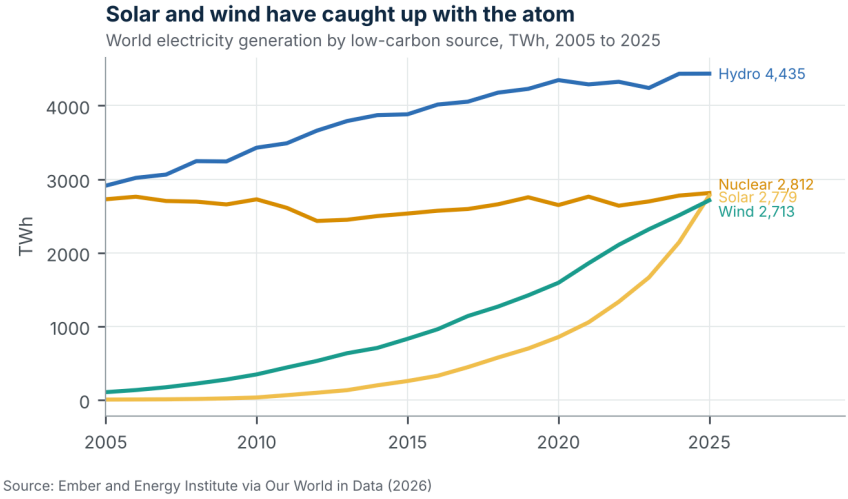


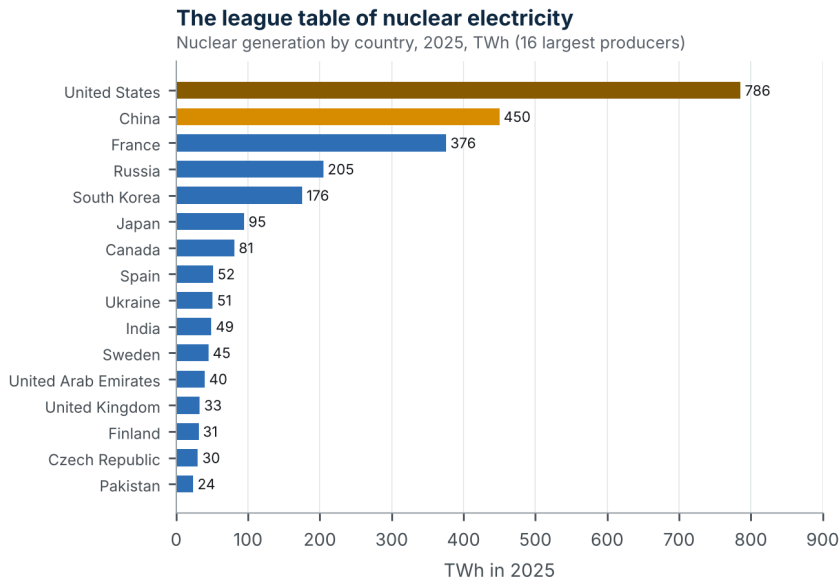
Figure 1.2. World electricity generation by low-carbon source, 2005 to 2025

The comparison should not be pushed too far. A megawatt-hour from a reactor is available day and night, in winter and in summer, while solar and wind output depends on the weather and requires storage, backup or a larger grid to match demand. This is the core of the case for nuclear power in a decarbonized system,

and the reason why electricity planners who model deep decarbonization tend to keep a share of firm low-carbon capacity. But in volume, the race between the atom and the renewables is over: the renewables won it in the decade from 2015 to 2025, and the gap will widen.

Where the electricity comes from

A first look at the country ranking shows how unevenly nuclear power is distributed (Figure 1.3). The United States produced 785 TWh in 2025, 27.9% of world nuclear generation. China followed with 488 TWh, France with 392 TWh, Russia with 219 TWh and South Korea with 185 TWh. These five countries produced 73.6% of the world's nuclear electricity. Japan, which was the third largest producer in 2005 with 293 TWh, produced 94 TWh in 2025 and ranks sixth.



Source: World Nuclear Association, Nuclear Power in the World Today (country table, November 2026)

Figure 1.3. Nuclear generation by country, 2025, sixteen largest producers

The next chapter looks at this league table in detail. For now, three features matter. Output is concentrated in a few countries. The ranking of 2025 is very different from that of 2005, with China up from twelfth place to second. And only one of the five largest producers, China, has a fleet that is growing quickly.

The headline numbers of 2026

The year 2026 has so far confirmed these trends. To mid November, seven reactors were connected to the grid: five in China (Taipingling 1 and 2, San'ao 1, Changjiang 3 and Tianwan 7), one in Slovakia (Mochovce 4) and, on a trial basis, the first unit of Bangladesh (Rooppur 1). Fourteen reactors started construction: eight in China, two in India (Kaiga 5 and 6), one in Russia (Kursk II-3), one in Hungary (Paks II-1), one in South Korea (Shin-Hanul 4) and one in Canada, the first small modular reactor of the Western world at Darlington. In the United States, TerraPower began building its Natrium advanced reactor at Kemmerer in Wyoming in April 2026, the first commercial reactor to start construction in the country since 2013; it is not yet counted in the country table used in this book.

The International Atomic Energy Agency raised its high projection for 2050 again, from 992 GW in its previous edition to 1,045 GW. Electricity demand, driven by data centers, air conditioning and electrification, is growing faster than at any time since the early 2010s: the International Energy Agency estimates growth of 3% in 2025, 3.6% in 2026 and 3.8% in 2027. Every source of electricity will be needed. The war launched by the United States and Israel against Iran on 28 February 2026, and the disruption of shipping through the Strait of Hormuz, added an energy security shock: in March 2026 oil prices recorded their steepest monthly rise on record. Several governments cited the shock when extending or restarting reactors in 2026. The question is how much of the new demand nuclear power will capture.

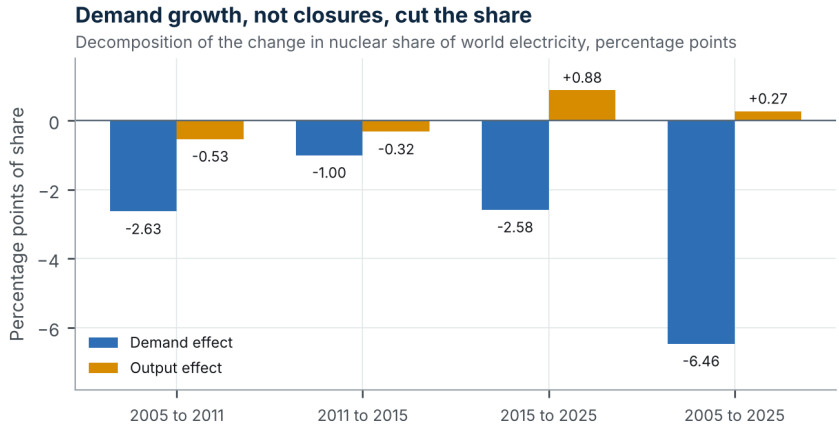
GSF analysis: why the share fell

The fall in the share of nuclear power can be split into two effects. The demand effect is the change in share that would have occurred if nuclear output had stayed at its level of the start of the period while world electricity grew as it did. The output effect is the rest, due to the change in nuclear output itself. Global Strategy Files computed both for three periods.

Table 1.2. Decomposition of the change in the nuclear share of world electricity, percentage points

Period	Share at start	Share at end	Demand effect	Output effect	Growth of world electricity	Growth of nuclear output
2005 to 2011	15.04%	11.88%	-2.63	-0.53	+21.2%	-4.3%
2011 to 2015	11.88%	10.55%	-1.00	-0.32	+9.2%	-3.0%
2015 to 2025	10.55%	8.85%	-2.58	+0.88	+32.4%	+11.0%
2005 to 2025	15.04%	8.85%	-6.46	+0.27	+75.2%	+3.1%

Source: Ember and Energy Institute via Our World in Data; Global Strategy Files calculation. The two effects add up to the change in share over each period.



Source: Ember and Energy Institute via Our World in Data; Global Strategy Files analysis calculation

Figure 1.4. Decomposition of the change in the nuclear share of world electricity

Over the twenty years as a whole, the demand effect explains more than the entire fall: growth in world electricity alone would have cut the share by 6.46 points, and the small growth of nuclear output recovered 0.27 points. Even in the period from 2005 to 2011, which includes the first months after Fukushima, the demand effect was five times larger than the output effect. Only from 2011 to 2015, when Japanese output collapsed and world demand slowed, did the output effect weigh in a meaningful way, and even then less than demand.

The lesson is simple. Nuclear power did not lose its place because reactors closed; it lost its place because almost no reactors were added while the world's appetite for electricity grew by three quarters. The same arithmetic governs the future: to hold its share, nuclear output must grow as fast as electricity demand.

Original findings of this chapter

The share fell because the denominator grew. Of the 6.2 percentage points lost by nuclear power between 2005 and 2025, almost none came from lower output. If nuclear generation had kept its 2005 share, it would have produced about 4,780 TWh in 2025, 70% more than it did. The industry did not shrink in absolute terms; it missed the whole growth of the electricity market.

Records are recoveries. The records of 2024 and 2025 exceed the 2006 peak by less than 2%. Two decades of construction worldwide, including more than 100 GW of new capacity connected, have been needed to offset the closures in Japan, Germany and elsewhere.

What to remember

- 444 operable reactors, 406.7 GW, 2,702 TWh net in 2025.
- Share of world electricity: 15.0% in 2005, 8.85% in 2025.
- Solar and wind each now produce almost as much as nuclear power.
- Five countries produce 73.6% of nuclear electricity.

Looking ahead to 2045

In the central scenario of Part IV, world nuclear generation rises to 4,840 TWh in 2045, 72% above 2025. Its share of world electricity rises only slightly, to 8.7%, because demand grows at a similar pace. The snapshot of 2026 is therefore a good guide to the future share of nuclear power, but a poor guide to its future geography.

CHAPTER 2

Who Produces: The League Table and Its Upheavals

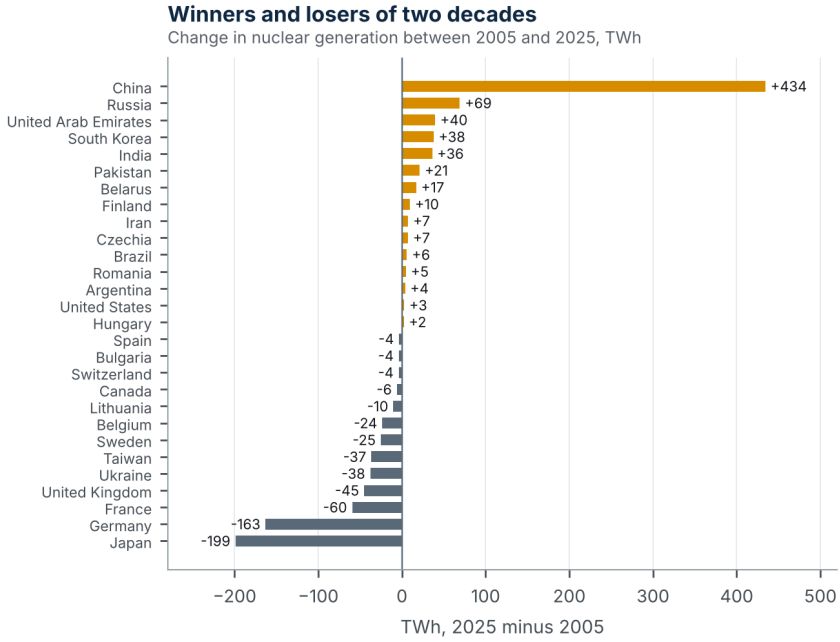
In this chapter

- The ranking of producers in 2025 and how it changed from 2005.
- Where nuclear power weighs most in national electricity.
- Concentration: is the nuclear world becoming more or less diverse?

Winners and losers of two decades

Between 2005 and 2025 the total output of the world's reactors barely changed, but underneath the stable total the map of production was redrawn (Figure 2.1). China added 434.5 TWh, more than the entire output of France in 2025. Russia added 69.2 TWh, the United Arab Emirates 39.8 TWh from a standing start, South Korea 37.9 TWh, India 36.1 TWh, Pakistan 21.3 TWh and Belarus 17.0 TWh. The United States, despite closing more than a dozen reactors and opening only three, added 2.8 TWh, thanks to power uprates and higher capacity factors.

On the other side, Japan lost 199.0 TWh, Germany 163.1 TWh as it closed its entire fleet, France 59.5 TWh, the United Kingdom 45.2 TWh, Ukraine 37.9 TWh, Taiwan 36.7 TWh as it closed its last reactor in May 2025, Sweden 25.3 TWh and Belgium 23.5 TWh.



Source: Ember and Energy Institute via Our World in Data (2026); WNA for 2025 Ukraine and UAE; Global Strategy Files

Figure 2.1. Change in nuclear generation by country between 2005 and 2025

The pattern is clear. The gains are almost all in Asia, Russia and the Middle East. The losses are almost all in Western Europe and in the Asian democracies that took the decision to reduce or end nuclear power after 2011. The only Western country with a meaningful gain is Finland (9.6 TWh), thanks to Olkiluoto 3, followed by Czechia (7.2 TWh), which improved the output of an existing fleet.

The ranking of 2025

Table 2.1. The twenty largest producers of nuclear electricity, 2005 and 2025

Country	2005 TWh	2025 TWh	Change TWh	Share of national electricity 2025
United States	782.0	784.8	+2.8	17.3%
China	53.1	487.6	+434.5	4.6%
France	451.5	392.1	-59.5	68.2%
Russia	149.5	218.7	+69.2	18.3%
South Korea	146.8	184.7	+37.9	29.4%
Japan	293.0	94.1	-199.0	9.2%
Canada	91.4	85.3	-6.1	12.8%
Spain	57.5	54.1	-3.5	18.0%
India	17.7	53.8	+36.1	2.6%
Ukraine	88.8	50.9	-37.9	54.8%
Sweden	72.4	47.1	-25.3	27.4%
United Arab Emirates	0.0	39.8	+39.8	21.2%
United Kingdom	81.6	36.4	-45.2	12.3%
Finland	23.3	32.8	+9.6	39.5%
Czechia	24.7	31.9	+7.2	42.1%
Belgium	47.6	24.1	-23.5	32.6%
Pakistan	2.4	23.7	+21.3	13.9%
Switzerland	23.3	19.4	-3.9	27.1%
Slovakia	17.7	19.3	+1.6	65.2%
Belarus	0.0	17.0	+17.0	38.8%

Source: Ember and Energy Institute via Our World in Data (generation, gross); World Nuclear Association (share 2025); Ukraine 2025 from WNA. Global Strategy Files calculation.

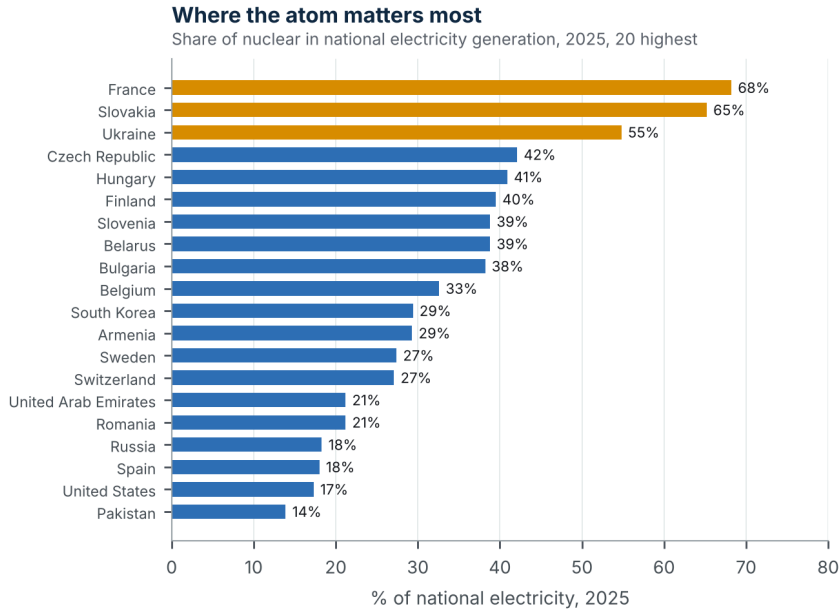
The United States remains by far the largest producer, with almost as much output as China and France combined. Its 94 reactors, most of them built in the 1970s and 1980s, have run at capacity factors above 90% for two decades. The fleet is the oldest of the large fleets in the world, and its future depends far more on licence renewals than on new construction.

China is now the clear second. In 2005 it was the twelfth largest producer, behind Spain and Sweden. Its fleet grew from a handful of units to 65 operable reactors with 65.1 GW, and its share of world nuclear output rose from 1.9% to 17.3%. Yet nuclear power supplies only 4.6% of China's electricity, because the Chinese power system is so large: China generates almost a third of the world's electricity.

France is the country most dependent on nuclear power among the large producers, with 68.2% of its electricity from 57 reactors in 2025. Its output fell sharply in 2022, to the lowest level in more than three decades, after stress corrosion was found in the piping of several reactors, and has since recovered. The 2025 level remains below that of 2005.

Where the atom matters most

A different ranking emerges when the measure is the share of nuclear power in national electricity rather than volume (Figure 2.2). France leads with 68.2%, followed by Slovakia (65.2%), Ukraine (54.8%), Czechia (42.1%), Hungary (40.9%), Finland (39.5%), Belarus and Slovenia (38.8% each), Bulgaria (38.2%) and Belgium (32.6%). Nine of the ten countries most dependent on nuclear power are in Europe, and most of them in Central and Eastern Europe, where the reactors were built to Soviet designs.



Source: World Nuclear Association, Nuclear Power in the World Today (country table, November 2026)

Figure 2.2. Share of nuclear power in national electricity generation, 2025

The share ranking has also moved. In 2005 Lithuania drew 71.7% of its electricity from nuclear power, Belgium 56.4%, Ukraine 47.6%, Sweden 45.7% and Switzerland 40.4%. Lithuania closed its last reactor at the end of 2009 as a condition of joining the European Union. Belgium cut its share by more than twenty points, Sweden by eighteen and Switzerland by thirteen.

For countries with a high share, nuclear power is the backbone of the electricity system and a question of national security. For countries with a low share but a large volume, such as China, India and the United States, it is one source among others, and its future depends on how it competes with coal, gas and renewables.

A more concentrated nuclear world

As the number of countries that close reactors has grown and the growth has been concentrated in one country, the nuclear world has become more concentrated (Figure 2.3). The Herfindahl index of national shares of world nuclear generation, a standard measure of concentration that ranges from close to zero for a perfectly fragmented market to 10,000 for a single producer, rose from 1,363 in 2005 to 1,425 in 2025. It peaked at 1,521 in 2013, when the collapse of Japanese output gave even more weight to the United States and France. The share of the five largest producers rose from 67.4% to 73.6%.

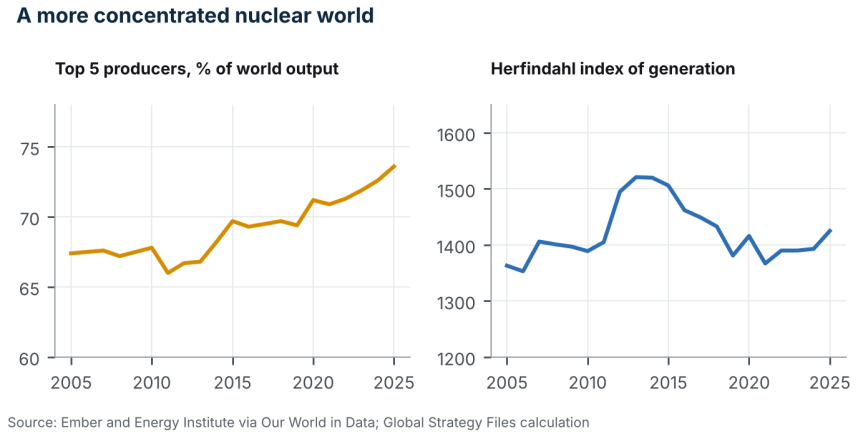


Figure 2.3. Concentration of world nuclear generation, 2005 to 2025

Concentration matters for two reasons. It makes the global industry more vulnerable to decisions taken in a few capitals: the Japanese shutdown of 2011 to 2015 removed a tenth of world nuclear output in a few months. And it means that the industry's supply chain, research and skills are increasingly concentrated too. When five countries account for three quarters of output and two of them account for four fifths of construction, the idea of a global nuclear industry becomes a figure of speech.

GSF analysis: twenty years of rank mobility

Ranking the producers by output in 2005 and in 2025 measures how much the hierarchy has moved.

Table 2.2. Rank of the fifteen largest producers of 2025, in 2005 and 2025

Country	Rank 2005	Rank 2025	Movement
United States	1	1	Unchanged
China	12	2	Up 10
France	2	3	Down 1
Russia	5	4	Up 1
South Korea	6	5	Up 1
Japan	3	6	Down 3
Canada	7	7	Unchanged
Spain	11	8	Up 3
India	19	9	Up 10
Ukraine	8	10	Down 2
Sweden	10	11	Down 1
United Arab Emirates	None	12	New
United Kingdom	9	13	Down 4
Finland	17	14	Up 3
Czechia	15	15	Unchanged

Source: Ember and Energy Institute via Our World in Data; Global Strategy Files ranking.

Three countries left the top fifteen: Germany, fourth in 2005, now without reactors; Belgium, thirteenth, after closing most of its fleet; and Taiwan, fourteenth, after closing all of its reactors. Three entered: China and India from the lower ranks, and the United Arab Emirates from nowhere. The two largest climbers, China and India, each gained ten places; the largest fallers, apart from the exit countries, were the United Kingdom and Japan.

The pattern is the mirror image of the economic geography of the period. The countries that climbed are those whose electricity demand grew fastest and whose states plan and finance construc-

tion. The countries that fell are those whose fleets aged or whose governments chose to exit.

Original findings of this chapter

China's gain exceeds the world's gain. China added 434.5 TWh between 2005 and 2025; the world as a whole added 84.6 TWh. The rest of the world therefore lost about 350 TWh, the equivalent of the output of France.

Two blocs of losers. The losses are concentrated in a few groups: the countries that chose to exit or reduce nuclear power after 2011 (Germany, Japan, Taiwan, Belgium, Switzerland, Spain) the countries whose fleets aged faster than they were renewed (the United Kingdom, Sweden, France), and Ukraine, where war has cut output since 2022. Together the eight largest losers gave up 590 TWh.

Concentration is rising. The top five share rose by 6.2 points in twenty years. Our projections in Chapter 22 suggest it will keep rising, because China will become the largest producer while most other fleets stay flat.

> **What to remember**
>
> - United States 785 TWh, China 488 TWh, France 392 TWh, Russia 219 TWh, South Korea 185 TWh in 2025.
> - China moved from twelfth to second place in twenty years.
> - France has the highest share (68.2%); nine of the ten most dependent countries are in Europe.
> - The five largest producers rose from 67.4% to 73.6% of output.

Looking ahead to 2045

In the central scenario, the league table of 2045 is headed by China (235 GW of operable capacity), followed by the United States (126 GW), France (52 GW), India (42 GW), South Korea and Russia (33 GW each). India overtakes Japan, Russia, South Korea, Ukraine and Canada to reach fourth place. Chapter 22 shows the full table.

CHAPTER 3

The World Map of Nuclear Power

In this chapter

- The world map of operating capacity by country.
- Every power reactor site on the planet, by status and size.
- Two regional close-ups: Europe and East Asia.
- What the geography reveals: a northern, coastal and clustered industry.

Thirty-two countries out of almost two hundred

Nuclear power is often described as a global industry. On the map it looks more like an archipelago (Figure 3.1). Of the roughly 195 countries of the world, 32 operate at least one power reactor in November 2026, counting Bangladesh, which joined the club this month. Seventeen of them are in Europe, including Russia, Ukraine and Belarus; nine are in Asia and the Middle East, counting Armenia; three are in North America; two are in South America; one is in Africa.

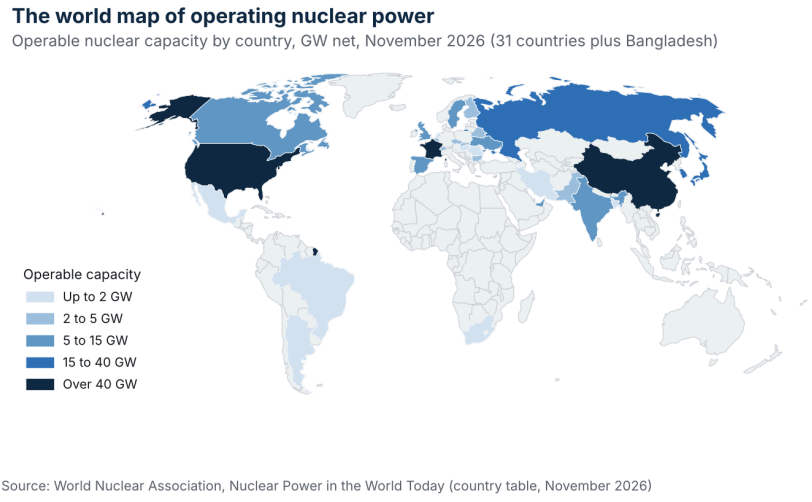


Figure 3.1. Operable nuclear capacity by country, November 2026

Capacity is even more concentrated than the count of countries suggests. The ten countries with the largest fleets (the United States, China, France, Japan, Russia, South Korea, Ukraine, Canada, India and Spain) hold 86.3% of the world's operable capacity. Africa has a single nuclear power plant, Koeberg, near Cape Town, with 1.9 GW. Latin America has three countries with reactors and 5.1 GW between them. Australia, which holds 28% of the world's uranium resources, has none. The whole southern hemisphere has 5.3 GW of operating capacity, about 1.3% of the world total.

Every site on the planet

Figure 3.2 shows every power reactor site recorded in the GeoNuclearData plant database, updated by Global Strategy Files to November 2026. Each circle is a site, sized by capacity and coloured by status: operating, under construction or planned, and shut down.

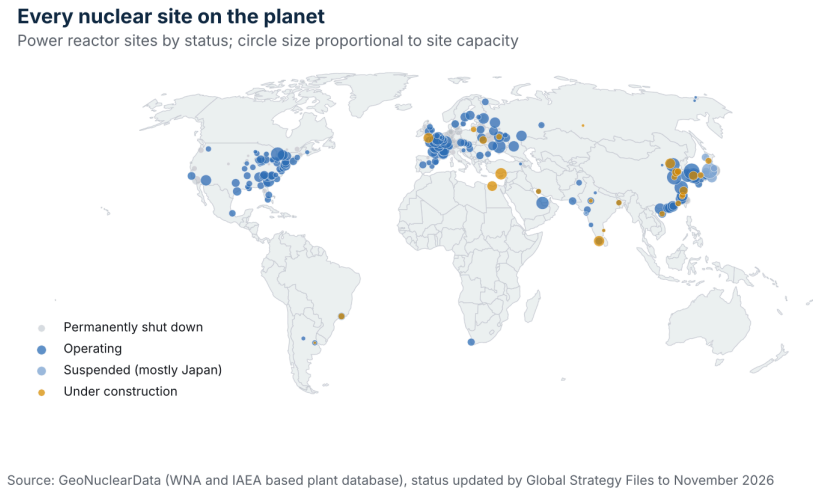


Figure 3.2. The world's nuclear power sites by status, 2026

Three features stand out.

The industry is northern. 81.7% of operating capacity lies north of the thirtieth parallel. The main nuclear belts follow the industrial heartlands of the twentieth century: the eastern half of the United States, Western and Central Europe, European Russia and Ukraine, Japan and South Korea. The new Chinese fleet extends the belt southward along the Chinese coast, and the plants of India, Pakistan, the United Arab Emirates and Bangladesh push it into the tropics.

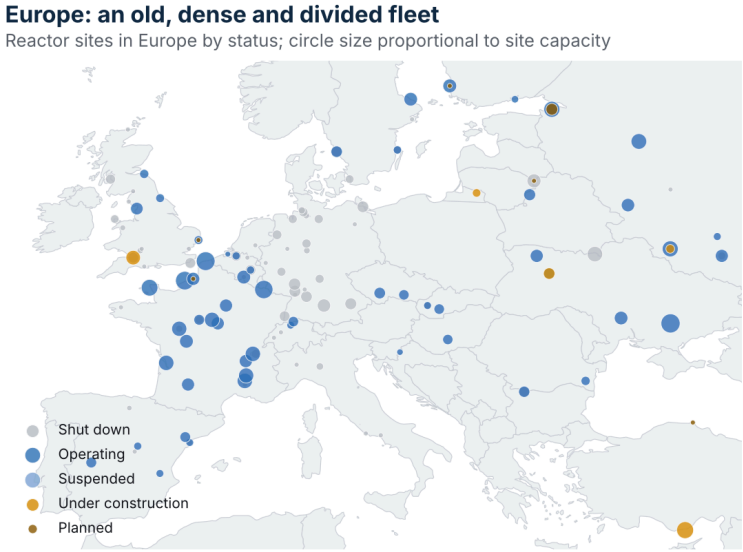
The industry is coastal or riverine. Reactors need large volumes of cooling water. Almost all sites are on a coast, a large river or a lake. China has built its entire fleet on the coast; its inland projects remain on hold. In Europe, the Rhône, the Loire, the Danube, the Rhine and the Dnipro host many plants, which makes them vulnerable to summer heatwaves and droughts: in August 2026, record low water in the Danube forced Hungary to shut down its Paks plant entirely for the first time.

The industry is clustered. Sites with six or more large reactors are common. The world's largest operating sites are Tianwan in

China (seven units, 7.3 GW in the database), Hongyanhe (6.4 GW), Bruce in Canada (6.2 GW), Fuqing and Yangjiang in China (6.2 and 6.0 GW), Zaporizhzhia in Ukraine (5.7 GW), Hanul and Hanbit in South Korea (5.7 GW each) and Gravelines in France (5.5 GW). Kashiwazaki-Kariwa in Japan, with 8.2 GW, was long the largest of all, but only one of its seven units, unit 6, has run again since 2011, after its restart in 2026. Zaporizhzhia, under military occupation since March 2022, has produced no electricity since September 2022.

Europe: dense, old and divided

Europe holds the densest concentration of nuclear plants on the planet (Figure 3.3). France alone has 18 sites with 57 reactors. A line of plants runs along the Rhine and the Rhône, through Belgium, Switzerland, southern Germany (where all plants are now shut), Czechia, Slovakia and Hungary, and on to Ukraine and the Russian plants west of the Volga.



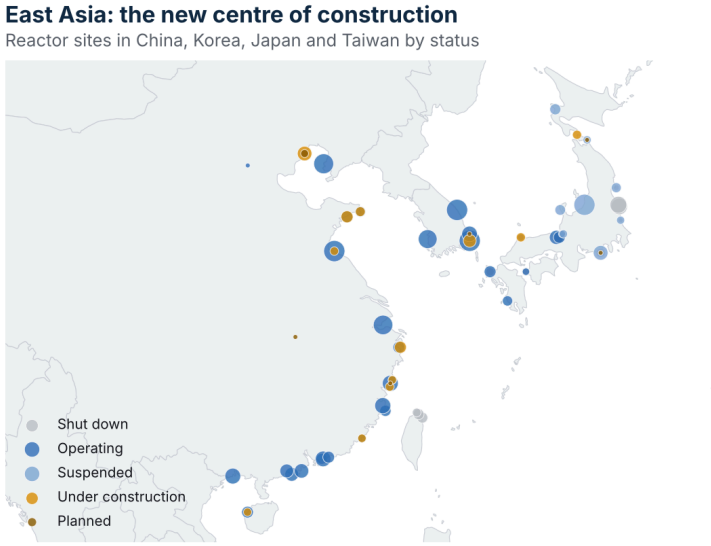
Source: GeoNuclearData plant database, statuses updated by Global Strategy Files to November 2026; Natural Earth

Figure 3.3. Nuclear power sites in Europe by status, 2026

The map also shows the division of Europe. Germany, Italy, Lithuania, Austria (whose only plant never operated) and now most of Belgium have dark sites, reactors that are shut down. Poland, which has never operated a reactor, has planned sites on the Baltic coast. The Nordic plants of Sweden and Finland sit on the Baltic and the Gulf of Bothnia. The plants of Spain are spread across the interior and the Mediterranean coast. The British plants, nearly all of them approaching the end of their lives, are spread along the coast of England and Scotland, with Hinkley Point C and Sizewell C under construction or planned.

East Asia: the growth belt

The second regional map shows the zone where most of the world's nuclear growth is taking place (Figure 3.4). China's sites stretch along its coastline from Liaoning in the north to Hainan in the south. In November 2026 China has 65 operable reactors and 41 under construction according to the World Nuclear Association, plus 39 planned. Several of the newer sites, such as San'ao, Taipingling, Lufeng, Zhangzhou and Haiyang, will each host six reactors or more.



Source: GeoNuclearData plant database, statuses updated by Global Strategy Files to November 2026; Natural Earth

Figure 3.4. Nuclear power sites in East Asia by status, 2026

South Korea's plants are concentrated on the southeastern coast and on the west coast at Hanbit. Japan's sites follow its coastline; most are shut or idle, with restarts concentrated in the west of the country. Taiwan's sites, once home to six reactors, are now all shut down. The map makes one strategic point clearly: the greatest concentration of new reactors in the world sits within a few hundred kilometres of the Taiwan Strait, the East China Sea and the Korean Peninsula.

The geography of the next twenty years

The map of 2026 is the map of decisions taken twenty to fifty years ago. The map of 2045 will be the map of decisions being taken now. Three shifts are already visible in the construction data and are measured in the next two chapters. The East grows: almost four fifths of the capacity under construction is in Asia. The South arrives: Egypt, Turkey and Bangladesh are building their first plants, and several other countries in Asia and Africa

are planning theirs. The West renews rather than expands: in North America and Western Europe, the dominant activity is life extension of existing plants.

GSF analysis: nuclear power by latitude

To quantify how northern the industry is, Global Strategy Files grouped operating capacity in the plant database by latitude band.

Table 3.1. Operating nuclear capacity by latitude band, 2026

Latitude band	Share of operating capacity	Main countries
South of the equator	1.5%	Brazil, Argentina, South Africa
Equator to 23.5 degrees north (tropics)	7.1%	Southern India, southern China (Guangdong, Hainan), Mexico
23.5 to 35 degrees north	19.8%	Eastern China, southern Japan, Pakistan, southern United States, Iran, United Arab Emirates
35 to 45 degrees north	36.3%	United States, Canada (Ontario), northern China, South Korea, Japan, Spain, Armenia
45 to 55 degrees north	29.2%	France, Central Europe, Ukraine, United Kingdom, European Russia
North of 55 degrees north	6.1%	Sweden, Finland, Russia, Scotland

Source: GeoNuclearData plant database, updated by Global Strategy Files; shares of operating capacity in the database.

Almost two thirds of the world's capacity lies between 35 and 55 degrees north, the band of temperate industrial economies. The tropics, where most of the world's population growth and much of its future electricity demand will occur, host only 7.1%, and the southern hemisphere 1.5%. The newcomer programmes of Bangladesh, Egypt, Vietnam and the Gulf will add weight to the tropical band, but by 2045 it will remain small compared with the temperate north.

Original findings of this chapter

A map with one dense pole becoming two. In 2005 the nuclear world had one centre of density, the North Atlantic, stretching from the eastern United States to Western Europe. In 2026 it has two: the North Atlantic, where the fleet is old and flat, and the coast of China, where it is young and growing. By 2045 the second pole will be larger than the first.

The southern gap. With 5.3 GW south of the equator, nuclear power is almost absent from the half of the world where electricity demand will grow fastest after 2030. The newcomer programmes of Chapter 26 are mostly in the northern tropics. A real southern expansion would require countries such as South Africa, Brazil, Argentina or Indonesia to build, and our scenarios give them only modest additions.

> **What to remember**
>
> - 32 countries operate reactors; ten hold 86.3% of capacity.
> - 81.7% of capacity lies north of 30 degrees north; the southern hemisphere has 5.3 GW.
> - Two poles: the old North Atlantic fleet and the young Chinese coastal fleet.
> - The world's largest construction cluster lies on the coast of China.

Looking ahead to 2045

The 2045 map in Chapter 22 shows a world where China's fleet reaches at least 190 GW in every scenario, India passes 40 GW in the central case, and the newcomers of the Middle East, South Asia and Central Asia add a third pole of smaller fleets. The North Atlantic remains a large producer, but it is no longer the centre.

CHAPTER 4

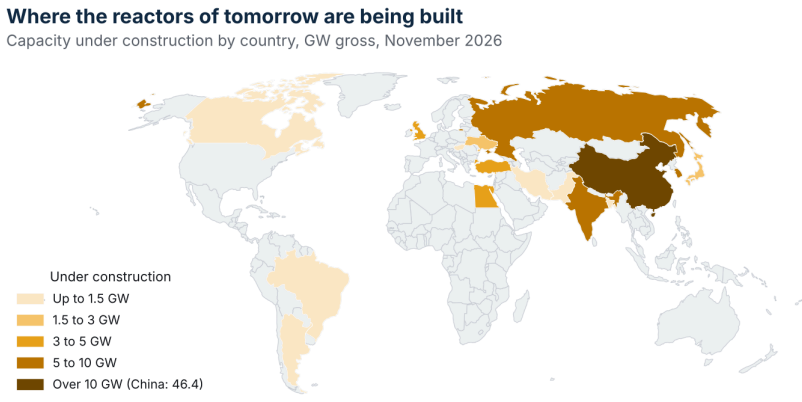
Where the Reactors of Tomorrow Are Being Built

In this chapter

- The map of construction in November 2026.
- Construction starts year by year since 2005.
- Whose designs are being built: the vendor-origin account of Global Strategy Files.

Eighty-one reactors under construction

If the operating fleet is the map of the past, the construction pipeline is the map of the next ten years. In November 2026 the World Nuclear Association counts 81 reactors under construction with 88.5 GW of gross capacity, in 16 countries (Figure 4.1). The Status Report, with a stricter definition that excludes long-stalled projects, counted 73 in mid 2026, the highest number since 1987, of which 37 were in China.



Source: World Nuclear Association, Nuclear Power in the World Today (country table, November 2026)

Figure 4.1. Capacity under construction by country, November 2026

Table 4.1. Reactors under construction by country, November 2026

Country	Reactors	GW gross	Share of world	Main designs
China	41	46.4	52.5%	Hualong One, CAP1000, CAP1400, VVER-1200, HTR-PM, ACP100
India	8	6.6	7.5%	PHWR-700, VVER-1000, fast breeder
South Korea	4	5.7	6.5%	APR1400
Russia	7	5.3	6.0%	VVER-1200, BREST, small units
Egypt	4	4.8	5.4%	VVER-1200
Turkey	4	4.8	5.4%	VVER-1200
United Kingdom	2	3.4	3.9%	EPR
Japan	2	2.8	3.1%	ABWR
Ukraine	2	2.2	2.5%	VVER-1000 (Soviet era)
Brazil	1	1.4	1.6%	Siemens KWU PWR
Pakistan	1	1.2	1.4%	Hualong One
Hungary	1	1.2	1.4%	VVER-1200
Bangladesh	1	1.2	1.4%	VVER-1200
Iran	1	1.1	1.2%	VVER-1000
Canada	1	0.3	0.4%	BWRX-300
Argentina	1	0.03	0.03%	CAREM-25
World	81	88.5	100%	

Source: World Nuclear Association, country table (November 2026); designs from WNA country profiles. Global Strategy Files calculation.

China alone hosts 52.5% of the capacity under construction in the world. Adding India, South Korea, Japan, Pakistan, Bangladesh, Iran and Turkey, Asia and the Middle East host 78.9%. Europe outside Russia and Turkey accounts for 7.7%, almost all of it in three projects: Hinkley Point C in the United Kingdom, Paks II in Hungary and the long-stalled Khmelnytskyi units in Ukraine. The Americas account for 2.0%, with Angra 3 in Brazil, a project that started in the 1980s, and the first BWRX-300 small modular reactor at Darlington in Canada. The United States, the world's largest producer, has no large reactor under

construction; TerraPower's 345 MW Natrium advanced reactor, whose construction began at Kemmerer in Wyoming in April 2026, is not yet included in the country table.

Some of the units counted here are not really being built. Angra 3, the two Ukrainian units and the Japanese units at Ohma and Shimane have been under construction for decades or are suspended. Excluding them, the share of China and Russia in active construction would be even higher.

Twenty-two years of construction starts

The flow of construction starts shows how the pipeline was built (Figure 4.2). In the five years before Fukushima, starts accelerated from 3 in 2005 to 16 in 2010, the highest number since the 1980s. Most were in China. The accident of March 2011 froze approvals in China for more than a year and new projects almost everywhere else. Starts fell to 4 in 2011 and 2 in 2014, and stayed between 2 and 12 a year until 2020.

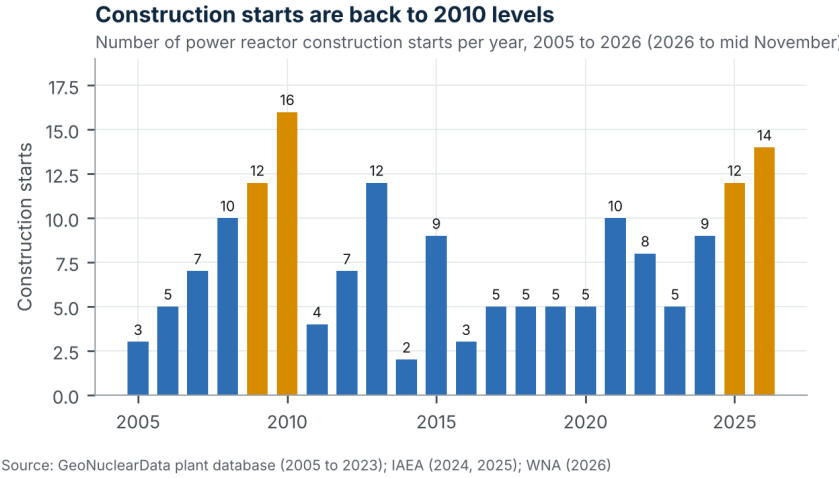


Figure 4.2. Construction starts per year, 2005 to 2026

Since 2021 the curve has turned up again: 10 starts in 2021, 9 in 2024, 12 in 2025 and 14 in 2026 to mid November, close to the peak of 2010. Of the fourteen starts of 2026, eight are in China. Over the whole period from 2005 to 2025, 154 reactors started construction; of the 133 starts recorded in the plant database from 2005 to 2023, China accounted for 69, Russia for 13, South Korea for 10 and India for 8. The United States started four, all at Vogtle and Virgil C. Summer, and two of them, at Summer, were abandoned in 2017 after billions had been spent.

The International Energy Agency observes that 94% of the reactors that started construction over the past decade were of Chinese or Russian design. The Status Report finds that 51 of the 52 construction starts between 2020 and 2025 were carried out by Chinese or Russian state companies.

Whose designs are being built

The country where a reactor is built is one question. The country whose design and industry build it is another. Global Strategy Files has classified every unit under construction by the origin of its design (Figure 4.3).

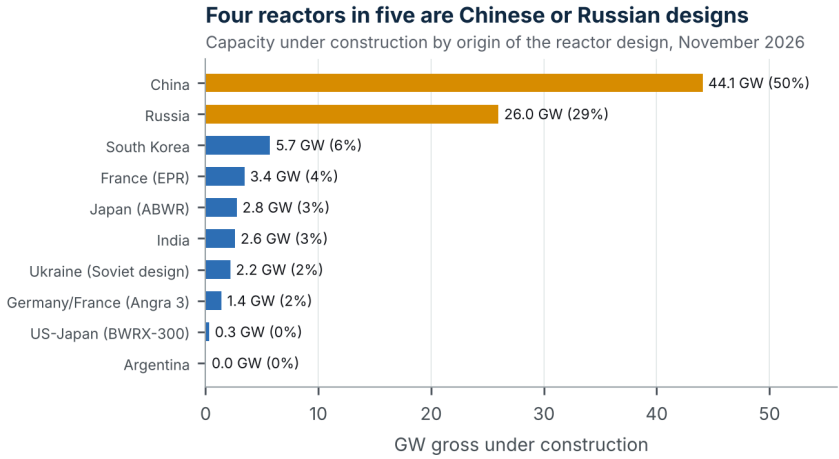


Figure 4.3. Capacity under construction by origin of the reactor design, November 2026

Chinese designs, mostly the Hualong One and the CAP1000 and CAP1400 family derived from the American AP1000, account for 44.1 GW, or 49.8% of world capacity under construction. Russian designs, mainly the VVER-1200, account for 26.0 GW, or 29.4%. Together they make up 79.2%. South Korea's APR1400 accounts for 5.7 GW, all at home. The French EPR accounts for 3.4 GW, entirely at Hinkley Point C. Japanese ABWRs, Indian heavy water reactors and the old Soviet-era units in Ukraine make up most of the remainder. The only American-origin design under construction in the table is the BWRX-300 of GE Vernova Hitachi in Canada, with 0.3 GW; the Natrium reactor started in Wyoming in April 2026 would add 0.35 GW.

This is the most striking structural fact of the industry today. The United States and France, which designed and exported most of the world's reactors in the 1970s and 1980s, together account for less than 5% of the capacity being built. The reactor market has become a duopoly of two state-owned industries, the Chinese and the Russian, with South Korea as a distant third.

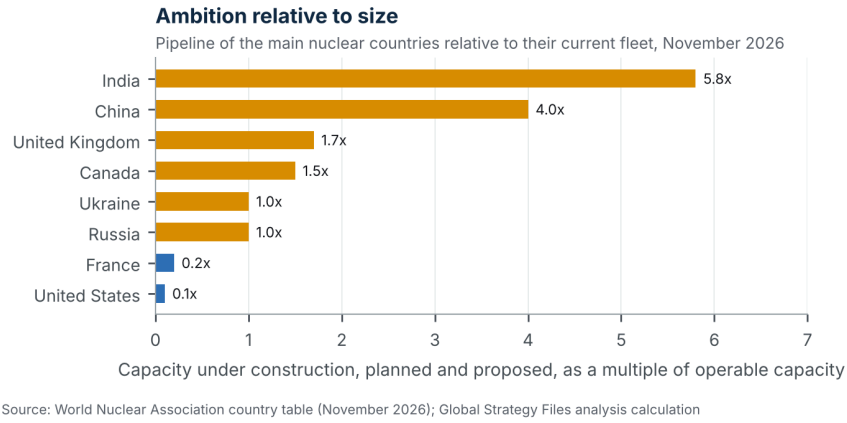
GSF analysis: the pipeline beyond construction

Reactors under construction show the next decade. Planned and proposed reactors show the ambitions for the decade after. The World Nuclear Association counts 108.1 GW planned and 299.3 GW proposed in November 2026.

Table 4.2. The nuclear pipeline of the main countries, November 2026, GW

Country	Operable	Under construction	Planned	Proposed	Pipeline as a multiple of operable fleet
China	65.1	46.4	44.9	168.6	4.0
India	7.9	6.6	8.3	30.8	5.8
Russia	28.0	5.3	21.0	0.8	1.0
Canada	12.7	0.3	0.1	18.5	1.5
Turkey	0	4.8	0	9.6	New
Poland	0	0	5.0	9.0	New
Ukraine	13.1	2.2	2.5	8.8	1.0
France	63.0	0	3.3	6.6	0.2
United States	97.0	0	0	7.5	0.1
United Kingdom	5.9	3.4	3.8	2.8	1.7

Source: World Nuclear Association, country table (November 2026); Global Strategy Files calculation. The pipeline multiple is the sum of capacity under construction, planned and proposed divided by operable capacity.



Source: World Nuclear Association country table (November 2026); Global Strategy Files analysis calculation

Figure 4.4. Pipeline of the main nuclear countries relative to their current fleet

China alone accounts for 52.4% of the world's planned and proposed capacity, a share similar to its share of construction. India's pipeline is the largest relative to its current fleet, almost six times its size. At the other end, the United States and France, the two largest Western fleets, have pipelines of 10% and 20% of their current size: whatever their targets say, their official project lists do not yet contain the reactors needed to grow.

Original findings of this chapter

The four-fifths rule. Four megawatts in five under construction in the world use Chinese or Russian designs. This proportion has held, within a few points, for the past decade, and the construction starts of 2024 to 2026 suggest it will hold for several more years.

Construction is a leading indicator. With an average build time of six years in China and nine to eleven years elsewhere, the reactors that will enter service before 2033 are almost all already under construction. The net capacity additions of our central scenario to 2030 (58 GW) are nearly all on this list. The real uncertainty concerns the period after 2033.

The empty column. The United States has the largest fleet, the largest uranium enrichment ambitions and the most ambitious target (400 GW by 2050), yet no large reactor under construction, only the first Natrium advanced reactor. Until that column is filled, every American target remains a statement of intent.

> **What to remember**
>
> - 81 reactors, 88.5 GW under construction in 16 countries.
> - China 52.5% of capacity under construction; Asia and the Middle East 78.9%.
> - Chinese and Russian designs: 79.2% of capacity under construction.
> - The United States has no large reactor under construction.

Looking ahead to 2045

Signpost 2 of Chapter 27 is the first construction start of a large reactor in the United States. Our high scenario assumes three or more by 2029; our low scenario assumes none before the early 2030s. The difference between the two, by 2045, is more than 100 GW of American capacity.

CHAPTER 5

The Great Eastward Shift

In this chapter

- The centre of gravity of the world fleet: an original GSF indicator.
- Regional generation since 2005: Asia passes Europe, then North America.
- China versus the rest of the world.

Measuring a migration

To summarize where an industry is located, geographers use the idea of a centre of gravity: the point that would balance the map if each plant were a weight proportional to its size. For a fleet spread over the whole globe, the centre is computed in three dimensions, as the average of the positions of all reactors on the sphere weighted by capacity, and then projected back to the surface. Its latitude has little meaning for a global fleet, since the centre of a set of points spread around the Northern Hemisphere sits close to the pole. Its longitude, however, is a clear and intuitive measure of where the fleet's weight lies between West and East.

Global Strategy Files computed this longitude for the operating fleet in each year from 2005 to 2026, using the plant database updated with the latest connections and closures (Figure 5.1).

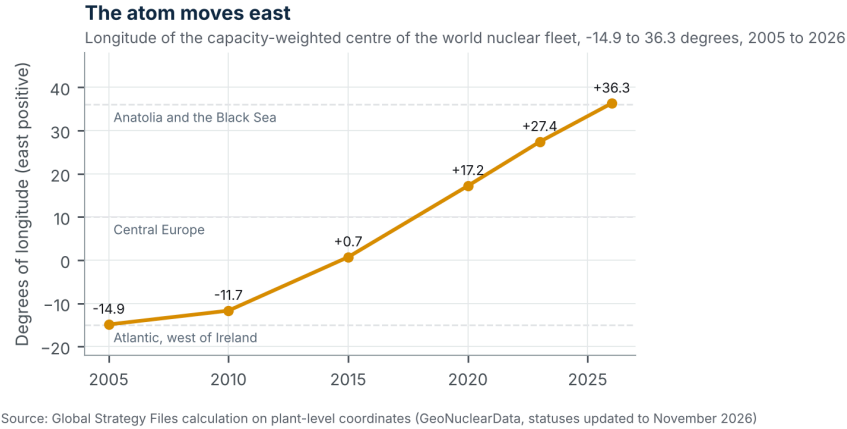


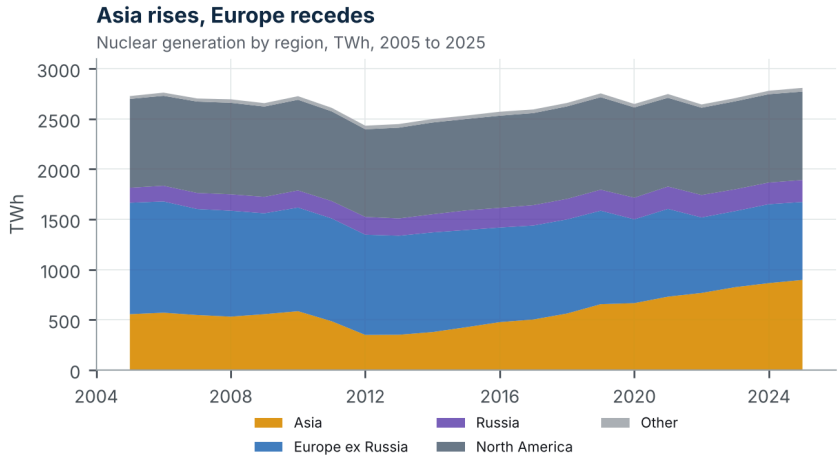
Figure 5.1. Longitude of the centre of gravity of the world nuclear fleet, 2005 to 2026

In 2005 the centre of gravity lay at 14.9 degrees west, a longitude that runs through the middle of the North Atlantic, between the American and European fleets that dominated the industry. In 2010 it had moved to 11.7 degrees west. By 2015, after the Japanese shutdown had reduced the Asian weight and the first wave of Chinese units had increased it, it crossed the Greenwich meridian, at 0.7 degrees east. It then moved quickly: 17.2 degrees east in 2020, 27.4 in 2023 and 36.3 in 2026, the longitude of the eastern Mediterranean. In twenty-one years the centre of the world's nuclear industry has moved 51.2 degrees to the east, an average of about 2.4 degrees a year, and the pace has accelerated since 2015.

No other large energy technology has relocated so quickly. Coal power moved east too, but it was already centred in Asia by 2005. Solar manufacturing moved to China, but solar generation remains spread across all continents. The migration of nuclear power is a migration of the whole fleet, driven by construction in one country and closures in several others.

Asia passes Europe, then North America

Regional generation data tell the same story in kilowatt-hours (Figure 5.2). In 2005, Europe outside Russia (including Ukraine and Belarus) produced 1,110 TWh of nuclear electricity, North America 884 TWh, Asia 556 TWh, Russia 149 TWh and the rest of the world 28 TWh. Europe produced 40.7% of world nuclear output and Asia 20.4%.



Source: Ember and Energy Institute via Our World in Data (2026); Global Strategy Files regional grouping

Figure 5.2. Nuclear generation by region, 2005 to 2025

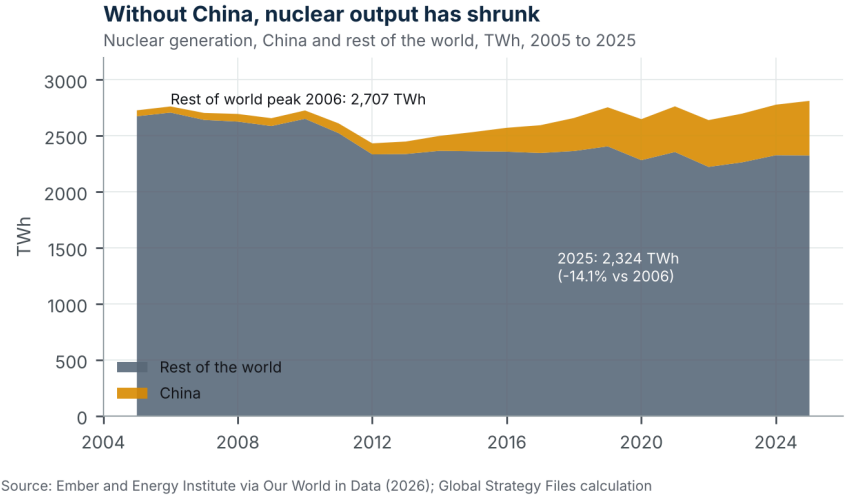
Asia's path had a deep trough. Its output fell from 585 TWh in 2010 to 349 TWh in 2012 when Japan shut its fleet, a loss of 40% in two years. It took until 2018 to regain the level of 2005. But from that low point it grew without interruption, to 897 TWh in 2025, a gain of 157% in thirteen years.

Europe's path was a slow decline with a few sharp drops: the German closures of 2011 and 2023, the French corrosion crisis of 2022, the war in Ukraine from 2022. Its output fell to 776 TWh in 2025, 30.1% below 2005. North America stayed flat, between 869 TWh and 921 TWh in every year, and produced 880 TWh in 2025. Russia grew by 46%, from 149 TWh to 219 TWh.

Two crossings mark the shift. In 2022, Asia produced more nuclear electricity than Europe outside Russia for the first time (767 TWh against 752 TWh). In 2025 it produced more than North America for the first time (897 TWh against 880 TWh). Asia is now the largest nuclear region of the world, with 31.9% of world output.

China against the rest

The single most important number in this book may be this one: outside China, world nuclear generation peaked in 2006 at 2,707 TWh and was 14.1% lower in 2025, at 2,324 TWh (Figure 5.3). The Status Report reaches the same conclusion with net data, finding that output outside China was 14% below its 2006 level in 2025.



Source: Ember and Energy Institute via Our World in Data (2026); Global Strategy Files calculation

Figure 5.3. Nuclear generation in China and in the rest of the world, 2005 to 2025

China's output, meanwhile, rose from 53 TWh in 2005 to 488 TWh in 2025, a multiple of 9.2. It grew in every single year of the period. China passed South Korea in 2015, Russia in 2016 and France in 2020 to become the second largest producer. Its growth rate has slowed in relative terms, from more than 15% a year in

the 2010s to 7.6% in 2025 on the Status Report's basis, but in absolute terms the additions are larger than ever, and 41 reactors are under construction.

The implication is uncomfortable for the narrative of a global renaissance. If China is removed, nuclear power is an industry in slow decline, losing about 20 TWh of output a year on average since 2006, as the closures of old reactors outweigh the openings of new ones. The global figures look stable only because China has added the output of one large reactor every four to five months for two decades.

Why the East

Several factors explain why the industry moved east.

Demand. Electricity demand in China grew several times over between 2005 and 2025, and in India it more than doubled. Demand in the United States and Europe was flat or falling for much of the period. A growing market needs new capacity of every kind; a flat market needs only replacement.

State planning and finance. Chinese and Russian reactors are built by state-owned companies with access to cheap state finance, and electricity prices that guarantee recovery of the investment. In liberalized Western markets, a reactor that takes ten years to build and costs ten billion dollars or more is a risk that private investors will rarely take without public guarantees.

Industrial continuity. China has built reactors every year since the 1990s and has kept its supply chain and workforce busy. The United States started no large reactor between 1978 and 2013, and France connected none between 1999 and 2024. Skills and suppliers do not survive such gaps intact.

Politics. After 2011, several Western and Asian democracies chose to exit or reduce nuclear power. No such reversal occurred in China or Russia.

GSF analysis: four snapshots of the regional balance

Table 5.1. Regional shares of world nuclear generation (2005 to 2025) and capacity (2045, central scenario)

Region	2005 generation	2015 generation	2025 generation	2045 capacity, central
Asia and Middle East	20.4%	16.8%	31.9%	55.0%
Europe excluding Russia	40.7%	38.2%	27.6%	16.9%
North America	32.4%	35.9%	31.3%	21.0%
Russia	5.5%	7.7%	7.8%	4.9%
Rest of the world	1.0%	1.3%	1.3%	2.2%

Source: Ember and Energy Institute via Our World in Data (generation); Global Strategy Files projection model (2045 capacity). The 2045 column uses capacity because the model projects capacity directly; regional definitions differ slightly between the two sources.

Between 2005 and 2015 the regional balance barely changed, because China's growth was offset by Japan's collapse. Between 2015 and 2025 it shifted decisively. The 2045 column shows the shift continuing at a similar pace.

Original findings of this chapter

Fifty-one degrees in twenty-one years. The centre of gravity of the world fleet moved from the mid Atlantic to the eastern Mediterranean, crossing the Greenwich meridian in the mid 2010s. On the trend of 2020 to 2026, about 3.2 degrees a year, it would pass 60 degrees east, the longitude of the Ural Mountains, in the early to mid 2030s.

Two crossings. Asia passed Europe in 2022 and North America in 2025. Both crossings went largely unnoticed, but they mark the end of a period of almost seventy years in which nuclear power was mostly a Western industry.

The declining rest. Excluding China, world nuclear output has fallen by 14.1% since 2006. A global renaissance would require this curve to turn up; the construction data of Chapter 4 suggest

it will do so only slowly, as Russia, India, South Korea and the newcomers add units and the West extends rather than expands.

What to remember

- The fleet's centre of gravity: 14.9 degrees west in 2005, 36.3 degrees east in 2026.
- Asia passed Europe in 2022 and North America in 2025.
- Outside China, nuclear output is 14.1% below its 2006 peak.
- China multiplied its output by 9.2 in twenty years.

Looking ahead to 2045

In our central scenario, Asia and the Middle East hold 55% of world operable capacity by 2045, against 35% in 2026, and North America and Europe hold 38% between them, against 57%. The eastward shift is not over; it is about halfway.

End of the free excerpt

You have read the first part of *The Eastward Atom*. The complete book continues with twenty years of history (Fukushima, China's standardized machine, the Western stall, Russia's exports, a divided Europe, the ageing fleet), the building blocks of construction, fuel, cost, safety and small reactors, the full projection model to 2045 with three scenarios and five thousand simulations, the GSF Nuclear Power Index, the newcomers and the seven signposts to watch, plus ten appendices with country profiles and statistical tables.

The complete book, about 268 pages with 63 charts and maps and 44 tables, is available in PDF for 60 USD at:

GLOBALSTRATEGYFILES.COM

Nuclear power will grow. It will grow in the East.

In 2005 nuclear power supplied 15% of the world's electricity. In 2025 it produced a record amount, yet supplied less than 9%. Outside China, nuclear output is lower than in 2006. This book reconstructs twenty years of evidence for every nuclear country, maps every reactor site on the planet, and builds an original country model with three scenarios and five thousand simulations to 2045. It shows who produces, who builds, who controls the fuel, and where the atom will stand in twenty years.

51°
eastward shift of the world fleet's centre of gravity since 2005

79%
of capacity under construction uses Chinese or Russian designs

2030
China passes the United States in nuclear capacity

670 GW
world capacity in 2045, central scenario (2026: 407 GW)

8.7%
share of world electricity in 2045: growth without share

107
original charts, maps and tables (63 and 44), every one sourced