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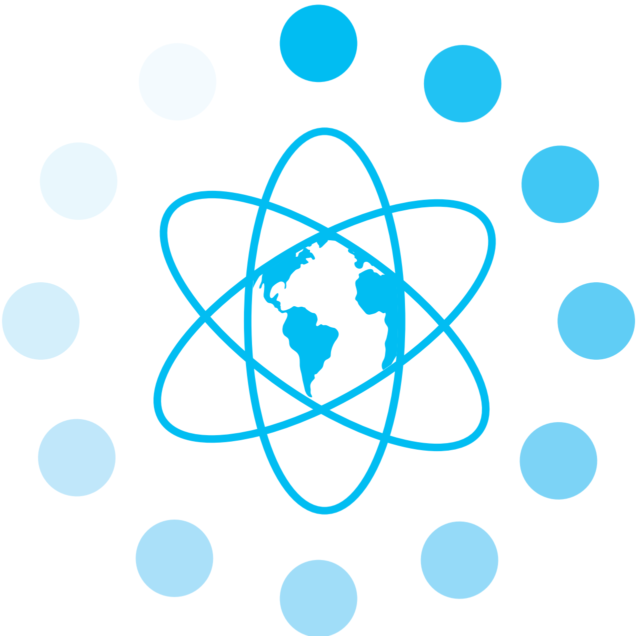

The global nuclear energy revival

Review Report 2025

Contents

Editorial

2025 - The global revival of nuclear power is firmly established

By Valérie Faudon, Sfen Executive Director

It is a great pleasure to present the third edition of the Sfen annual report on the revival of nuclear power around the world. At the end of 2023, Sfen decided to proactively monitor a renewed governmental interest in nuclear power supported by a more positive shift in public opinion. Since then, the Sfen has continued to report on nuclear-related announcements across various countries, some of which, in terms of long-term energy, remain aspirational. By 2025 the nuclear revival has translated into hard numbers. A recent report by the International Energy Agency (IEA) shows that investment in nuclear power has increased by 50% worldwide over the last five years and is expected to exceed $70 billion in 2025. While growth is still being driven by large reactor projects in China, the IEA expects small modular reactor (SMR) demand for data centres could become a significant growth factor in the future.

While at the end of 2022, the nuclear revival was being driven by research into low-carbon energy and energy security, the last twelve months have seen issues of industrial sovereignty increasingly come to the fore. In September 2024, the European Commission's Draghi report on, The future of European competitiveness, highlighted the importance of "promoting European industrial leadership in the nuclear field." In the United States, decrees issued by the new administration at the end of May 2025 stated that nuclear power must meet urgent energy needs to "meet the challenges of AI" and to "consolidate the energy dominance of the United States."

While many challenges remain, 2025 has nonetheless seen unprecedented breakthroughs. In terms of financing and following initial support from private sector banks at the end of 2024, this year has seen public institutions, including the European Investment Bank (EIB) and the World Bank announce their return to finance provision for major nuclear projects. In innovation, the Nuclear Energy Agency (NEA) listed more than 120 SMR models worldwide at the start 2025. In July 2025, the UK government announced the final investment decision for the project to build two EPRs at Sizewell C in Suffolk.

I would like to thank the teams at Sfen, as well as the nuclear advisors at the respective embassies for their careful reviews and suggestions. As always, we also welcome your feedback and any proposals you may have for the 2026 edition. ■

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2025 in Review

I

2025 in Review

1 Highlights

1.1. Europe: time for action

In September 2024, the Draghi report on The future of European competitiveness reaffirmed the significant role nuclear power has to play. From an energy perspective it is expected to "contribute to the achievement of the EU's climate objectives and to the strengthening of security of supply," together with renewables, while also promoting "European industrial leadership in the nuclear sector."

In June 2025, the European Commission published its draft Nuclear Indicative Programme (PINC), based on the EU Member States' National Energy and Climate Plans (NECPs) that were submitted in the summer of 2024. This 8th PINC estimates that by 2050, installed capacity together from current and new-build large-scale reactors as well as from the long-term operation of existing facilities will amount to 109 GW. Small modular reactors (SMRs/AMRs) could provide additional capacity of 53 GW. This represents a radical shift from the 7th PINC (2019), which had forecast capacity of 71 GW by 2050. Delivering on these objectives will require investments of approximately €241 billion.

Eleven European countries have nuclear programmes at varying stages of progress. 2025 has seen a broad-based re-evaluation of anti-nuclear legislation. In May 2025, Belgium repealed its law phasing out nuclear power, as did Serbia six months earlier in November 2024. Italy, which has joined the Nuclear Alliance, and Switzerland are both following suit with new legislative proposals. Denmark has announced that it will reopen the door to nuclear energy, which has been banned since 1985, and Spain has declared itself "open" to extending the life of its reactors beyond 2035. In terms of construction, the project for two EPRs at Sizewell C in the U.K. secured its crucial final investment decision (FID) in July 2025.

In September 2025, the IAEA raised its long-term global nuclear capacity forecast for the fifth straight year in a row.

1.2 Major strategic mobilisation

In September 2025 and for the fifth year in a row, the International Atomic Energy Agency (IAEA) lifted its projections for global nuclear capacity. The low-case projection shows growth of 50% by 2050, while the high-case projection shows an increase of more than 2.5 times, from 377 GW in 2024 to 992 GW by 2050. While most of the increase is expected to come from reactors generating power in excess of 1,000 MW, SMR/AMR reactors could alone account for up to 24% of capacity. These projections are close to the commitment of tripling global capacity made by 20 heads of state at the Dubai COP28 in 2023.

In the United States, President Trump has raised the previous administration's ambitious triple-capacity target, by announcing that it will now be quadrupled. India has also raised its ambitions, and is planning to increase current capacity of 7.5 GW to 22 GW by 2032, and to an even higher target of 100 GW by 2047. With sixteen reactors either under construction or in the planning stages, the sub-continent is becoming the second country in the world, in terms of the number of construction sites, behind the leader China. Lastly, as noted above, Europe has updated its 2050 nuclear indicative programme, revising up its projections by 50% compared to 2019.

These new programmes require proactive intensive legislative action and new legal frameworks. This is the case for new entrants, as well as for countries such as Italy that are returning to nuclear power. Established nuclear countries are also overhauling their safety authorities (Finland,

the Netherlands, France, the United States) and accelerating their authorisation processes, in particular by enabling closer cooperation across several authorities. India is simplifying its projects by way of amendments on land acquisition, the authorisation of private actors to develop nuclear projects, and its Civil Liability for Nuclear Damage Act.

1.3 SMR/AMR: The West is getting down to business

In terms of SMR technology, China and Russia have taken the lead. China is exploring the full range of reactor technologies. Since 2021, it has been operating a high-temperature reactor and is currently building a pressurised water SMR that is scheduled to enter commercial service in 2026. Since 2019 however, Russia has been commercially operating the Akademik Lomonosov barge (2 × 35 MWe), and has commenced construction of the BREST-OD-300 lead-cooled fast reactor. It is also preparing a series of RITM-200 land-based and marine reactors (approx. production capacity of 55 MWe).

So far there are no SMRs in commercial operation in the Western world. Canada is leading the way with the construction of four water-cooled BWRX-300s (GE-Hitachi) at Darlington, Ontario, the first unit of which is scheduled to start up in 2030. The United Kingdom is moving forward with the Rolls-Royce 470 MWe SMR, which is currently undergoing regulatory review and has been selected not only for deployment in the UK but also in the Czech Republic. In Sweden, Rolls-Royce is also a finalist in the tender process pitted against GE-Hitachi, the latter of which has already been chosen in both Poland and Estonia. In the United States, the Department of Energy's (DoE) fast-tracking Reactor Pilot Program has selected eleven advanced technologies that will receive regulatory support. The goal is to achieve criticality in at least three prototypes by July 2026. In France, EDF and its partners have begun redesigning the Nuward project, while the designer of the Calogena SMR has entered into discussions with the CEA (French Alternative Energies and Atomic Energy Commission) with a view to potential deployment. France now benefits from an ecosystem comprising around a dozen specialized players.

1.4 Nuclear fusion: record levels of private investment and first purchase agreements

While this report does not discuss the rationale underlying nuclear fusion in detail, it is clear that 2025 has underscored an unprecedented boom in this alternative energy source. Major public research reactors (WEST in France, JT-60SA in Japan, NIF in the United States, Wendelstein 7-X in Germany, and EAST in China) are breaking performance records, and the international collaboration project ITER is making progress with the assembly of a vacuum chamber.

In addition to a record numbers of experiments, project leaders have secured exceptional levels of financial support. In 2024, the 53 companies listed by the Fusion Industry Association (FIA) raised $2.65 billion in 2024 bringing total funding since 2021 to nearly $10 billion, 90% of which came from the private sector. Fusion is also entering power purchase agreements (PPAs). In 2023, Helion Energy signed a PPA with Microsoft, with supply scheduled to begin in 2028. In 2025,

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Google announced its first fusion PPA, which it signed with start-up Commonwealth Fusion Systems (CFS). CFS later received some $900 million in investment, notably from Nvidia and Morgan Stanley.

In France, GenF (a Thales spin-off with ongoing support) and Renaissance Fusion are the leading names in the fusion space. Indeed FIA figures indicate that after raising $36 million Renaissance Fusion ranks among the twelve best-funded global start-ups in 2024.

2 Indicator tracking

2.1 Investment needs in the fuel supply chain

The World Nuclear Association's September 2025 Nuclear Fuel report confirms uranium resources are sufficient out to 2040, even under ambitious global nuclear-fleet-capacity scenarios. However, investment is urgently needed to bring these resources into production. Several highly productive mines will reach the end of their operational lifespans in the 2030s, while it currently takes 10-20 years to develop new mines and bring them online. While the construction time for new fuel-cycle facilities is shorter than for power reactors, offering some timeline leeway, the fuel requirements for innovative technologies (AMR) could see fuel become a critical factor in project deployment.

43 reactors worldwide supply district heating networks, chiefly in Eastern Europe and Russia.

The crisis associated with the invasion of Ukraine (2022) exposed the West's dependence on Russia for the conversion and enrichment of uranium, and for the manufacture of fuel for VVER reactors. At the end of 2024, the United States banned Russian enriched uranium imports until 2040, with possible exemptions until 2028. In June 2025, the European Union announced that it would work within the RepowerEU framework on new measures to restrict imports of uranium, enriched uranium, and other nuclear materials from Russia.

Western nations are investing in new enrichment capacity. At the end of 2024, Orano launched a project to expand capacity at its GB2 plant (Tricastin, France) by 30%. Urenco is investing in Eunice (United States), Almelo (Netherlands), and Capenhurst (United Kingdom) as part of its Haleu production plans (medium-enriched uranium) by 2031. The Capenhurst facility has also secured UK government funding of £196 million ($259 million approx.). In Europe, all VVER operators, except for Hungary, have signed diversification contracts with Westinghouse and Framatome.

2.2 Interest in nuclear heat continues to grow

Cogeneration, the simultaneous production of steam and low-carbon electricity, is already a well-established practice: IAEA data indicate that 43 reactors worldwide supply district heating networks (mainly in Eastern Europe and Russia). In Switzerland, Beznau has been supplying heat to 20,000 people since 1983. More and more countries are expressing interest in the use of heat (>500 °C) from nuclear power to decarbonise both urban district heating, and industrial processes.

China is intent on investing in high-temperature reactors and adapting its existing fleet to supply low-carbon heat. The site at the coastal city of Haiyang supplies

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Nuclear power is becoming the fuel of choice for data centres –the IEA signals this demand could double by 2030.

district heating using AP1000 reactors and this long-distance project currently serves approximately 400,000 people. In March 2024, the HTR-PM reactor in Shidao was connected to the municipal heating system. In Europe, three Finnish municipalities are studying SMRs for district heating, and France's Calogena consortium is developing a prototype concept at Cadarache.

In the industrial sector, Dow and X-Energy submitted a construction permit application in March–April 2025 for four Xe-100 reactors at the Seadrift (Texas) manufacturing plant. The U.S. Nuclear Regulatory Commission has accepted the application for review. In July 2024, China announced an industrial nuclear cogeneration project at Xuwei (Jiangsu), designed to supply 32.5 million tonnes per year of industrial steam.

2.3 Nuclear power, driving data centres and AI

In February 2025, at the Paris Summit for Action on Artificial Intelligence, President Macron quipped "Plug baby, plug," emphasizing how the reliability and competitiveness of France's largely nuclear, low-carbon electricity mix positions it to support increasingly energy-intensive AI and data-centre infrastructure.

Nuclear power is becoming the energy source of choice for data centres. The IEA's World Energy Investment 2025 report projects their consumption potentially doubling to reach 950 TWh by 2030. The major digital-technology companies, motivated by emissions-reduction goals and by operational reliability requirements, are showing correspondingly greater interest in dependable low-carbon power.

In 2024, Microsoft and Constellation Energy committed to restarting Three Mile Island Unit 1. Google is advancing work with Kairos Power's AMRs, and Amazon is partnering with Dominion Energy and X-Energy. Meta is preparing a call for projects amounting to capacity of 4 GW in the United States by 2030. A recent announcement concerns discussions about a data-centre development in Texas using power from four AP1000 reactors at the Fermi site.

In France, where more than 90% of electricity generated is decarbonised, this data centre opportunity is also being seized. In March 2025, EDF launched two calls for expressions of interest from digital-sector companies for data-centre siting. In September, the electricity company signed a nuclear production allocation contract (CAPN) with European operator Data4 (also working with Westinghouse on the AP300 SMR). EDF will commence supplying power in 2026 under a twelve-year agreement delivering 230 GWh per year.

2.4 Bespoke financing tailored to nuclear projects

Competitive tailored financing is essential for the success of large nuclear reactor projects. Europe has clearly understood this message. Several financing models are currently being studied in Brussels. In the Czech Republic, for the construction of two reactors, with an option for two more, the government is committing to

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a zero-interest state loan, a 40-year revenue guarantee, and a mechanism to shield the project from unforeseen events. Poland has opted for up to €14 billion in direct state support, while the remaining 70% of the total cost for the €45 billion three AP1000 units will be financed largely through a loan from the US Export–Import Bank, with the Polish state acting as guarantor. A bilateral contract-for-difference mechanism will also be implemented to ensure long-term revenue stability. Sweden, which is currently structuring its new-build programme, is preparing a framework combining state loans, a contract-for-difference price mechanism, and a rate-of-return guarantee, covering both large reactors and SMRs.

In the U.K., the Sizewell C two EPR model has attracted sizeable private investment. CDBQ holds 20%, Centrica 15%, and Amber Infrastructure 7.6%. EDF, the project developer, has seen its share decrease from 16% to 12.5%. The UK government, will ultimately hold the remaining 44.9%. Most of the project's debt will be backed by the UK sovereign wealth fund, and Bpifrance is providing export guarantees of up to €5 billion ($6.6 billion). Sizewell C benefits from the RAB (regulated asset base) funding model, which reduces financial risks by engaging regulated consumer contributions right from the start of the construction phase. In addition, the agreement unveiled on 22 July 2025, provides for a cap on cost overruns attributable to private partners, as well as incentives for completing the project on schedule.

2025 also saw the World Bank reverse its long-standing position on nuclear power. After financing its first and only nuclear project in Italy in 1959, it had stayed away from the sector. However, in a new partnership with the IAEA it will now support countries that choose to include nuclear energy in their development strategies. While specific initial projects have yet to be announced, this policy shift is expected to encourage other international financial institutions to follow suit.

The European Investment Bank (EIB) has likewise signalled renewed interest in nuclear energy. It recently signed a €400 million loan agreement to support the expansion of the Georges Besse II (led by Orano) uranium enrichment plant. The EIB has also indicated that it will soon be financing reactor projects. ■

2025 also marked a World Bank U-turn on nuclear power; hitherto the bank had only financed one such project, back in 1959.

Geographical Focus

II

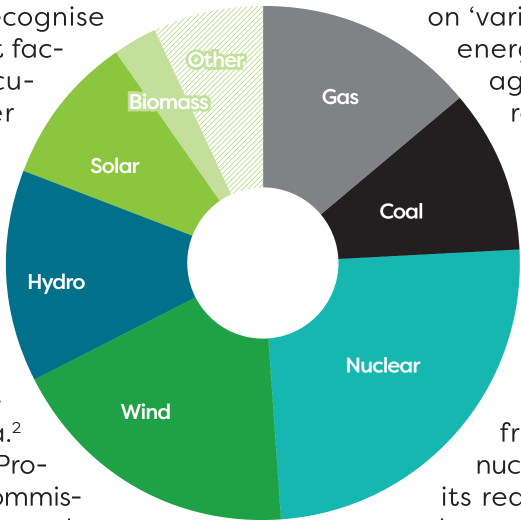
Europe

1 Europe laying the groundwork for the nuclear energy revival

OVERVIEW As long-term reactor operation becomes the norm, new projects are taking shape, including in the small modular reactor space. With nuclear power now winning over countries traditionally more hesitant, partnerships are tightening, while the European Union puts the cost of future nuclear programmes at €241 billion by 2050.[1]

Europe's attraction to nuclear power is clearly strengthening. Even across traditionally disinclined countries such as Italy, Belgium, Denmark and Norway, there is a definite resurgence of interest in nuclear power. This shift is now prompting European institutions to recognise nuclear energy as an important factor in decarbonisation and security-of-supply for EU Member States. The launch of both an Industrial Alliance for SMRs in February 2024, followed by an Important Project of Common European Interest (IPCEI) focusing on innovative nuclear technologies in April 2025, demonstrate that nuclear energy has firmly re-entered the EU's strategic agenda.[2]

In its eighth Nuclear Illustrative Programme (PINC), the European Commission projects current high-power nuclear capacity of 98 GW rising by around 10 GW to roughly 109 GW by 2050.[3] SMRs could add a further 53 GW. This contrasts significantly with the previous seventh PINC (2019), which instead had projected a drop in nuclear capacity to 71 GW by 2050.



Electricity mix 2024

EU27 minus Malta

- **Gas :** 13,9%
- **Coal :** 10,4%
- **Nuclear :** 24,8%
- **Wind :** 18,6%
- **Hydro :** 13,2%
- **Solar :** 9,5%
- **Biomass :** 2,9%
- **Other :** 6,7%

Source : ENTSO-E.

1 • *European Commission, "Commission assesses nuclear investment needs by 2050 in view of decarbonisation and competitiveness goals," 13 June 2025.*

2 • *European Commission, "Commission announces IPCEI Design Support Hub and endorses project candidate on innovative nuclear technologies at Joint European Forum," 10 April 2025.*

3 • *European Commission, "Commission assesses nuclear investment needs by 2050 in view of decarbonisation and competitiveness goals," 13 June 2025.*

The atom regaining support

Anti-nuclear legislation in certain European countries has become the subject of intense political debate, and a number of such laws have already been repealed. Belgium is such a case in point. In May 2025 it overwhelmingly passed legislation on 'various provisions related to nuclear energy' (102 votes in favour, 8 votes against, 31 abstentions) effectively repealing an earlier 2003 nuclear phase-out law. In October 2024 Serbia lifted a moratorium on nuclear energy that dated back to the Yugoslav era. EDF and Egis are currently supporting the development of Serbia's emerging nuclear programme for its six million inhabitants.

Italy is also revising its legal framework to enable a return to nuclear energy, nearly forty years after its reactors were shut down following the post-Chernobyl referendum of 1987. Lastly, in May 2025, after a four-decade hiatus, Denmark's government announced it is considering nuclear energy and in particular SMRs.

The acceleration of small modular reactors (SMRs): Rolls-Royce and GE-Hitachi at the vanguard

While several design concepts coexist, SMR deployment plans are becoming increasingly concrete. For example, Rolls-Royce's SMR (470 MW) has been selected to build the first small-scale power plants in the Czech Republic (September 2024)

Europe

Beyond specific reactor projects, the Eagles initiative highlights Europe's capacity to coordinate effectively on major undertakings.

and in the United Kingdom (June 2025). In August 2025 Sweden's Vattenfall also shortlisted the UK design in the final phase of its call for tenders alongside GE-Hitachi's BWRX-300 boiling water reactor. GE-Hitachi's BWRX-300 has also recently enjoyed a series of wins. In May 2025, the Estonian government formally launched site studies to host two BWRX-300s (600 MW), while Poland's OSGE announced in August 2025 that it had selected a site at Wloclawek on the banks of the Vistula River in the centre of the country, for the construction of a BWRX-300.

The Rolls-Royce SMR and the BWRX-300 are among nine projects selected by the European Small Modular Reactor Alliance in October 2024, along with EDF's Nuward SMR. Over the course of the summer 2024, EDF comprehensively modernised the Nuward design using proven technological building blocks.[4] EDF has also signed a memorandum of understanding (MoU) with Edison and Italy's National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA). The revamped Nuward development timeline looks set to align with Italy's nuclear revival timetable. Italy's input in the SMR projects reflects its strong engineering capabilities, particularly in liquid lead-cooled fast-neutron technologies. In June 2025, Italian firm Ansaldo Nucleare together with the Belgian (SCK CEN), Italian (ENEA), and Romanian (Raten) research centres launched the Eagles consortium, the goal of which is to commercialise a 300MW reactor by 2039. Beyond the reactor proper, the project illustrates Europe's ability to collaborate effectively across borders.

High-power projects: a global industry that is getting organised

2025 has been an eventful year for European large-scale projects. The three principal reactor vendors operating in the region, France's EDF, Korea's KHNP, and America's Westinghouse, are actively competing across the continent. KHNP and Westinghouse have long been embroiled in a dispute over intellectual property rights associated with certain technological components of the APR-1400 reactor, as well as its 1,000 MW version. Both parties finally signed a global settlement accord in January 2025, which reportedly includes agreement on industrial cooperation and a delineation of their respective

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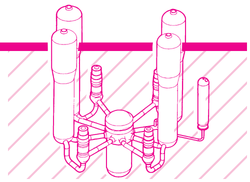
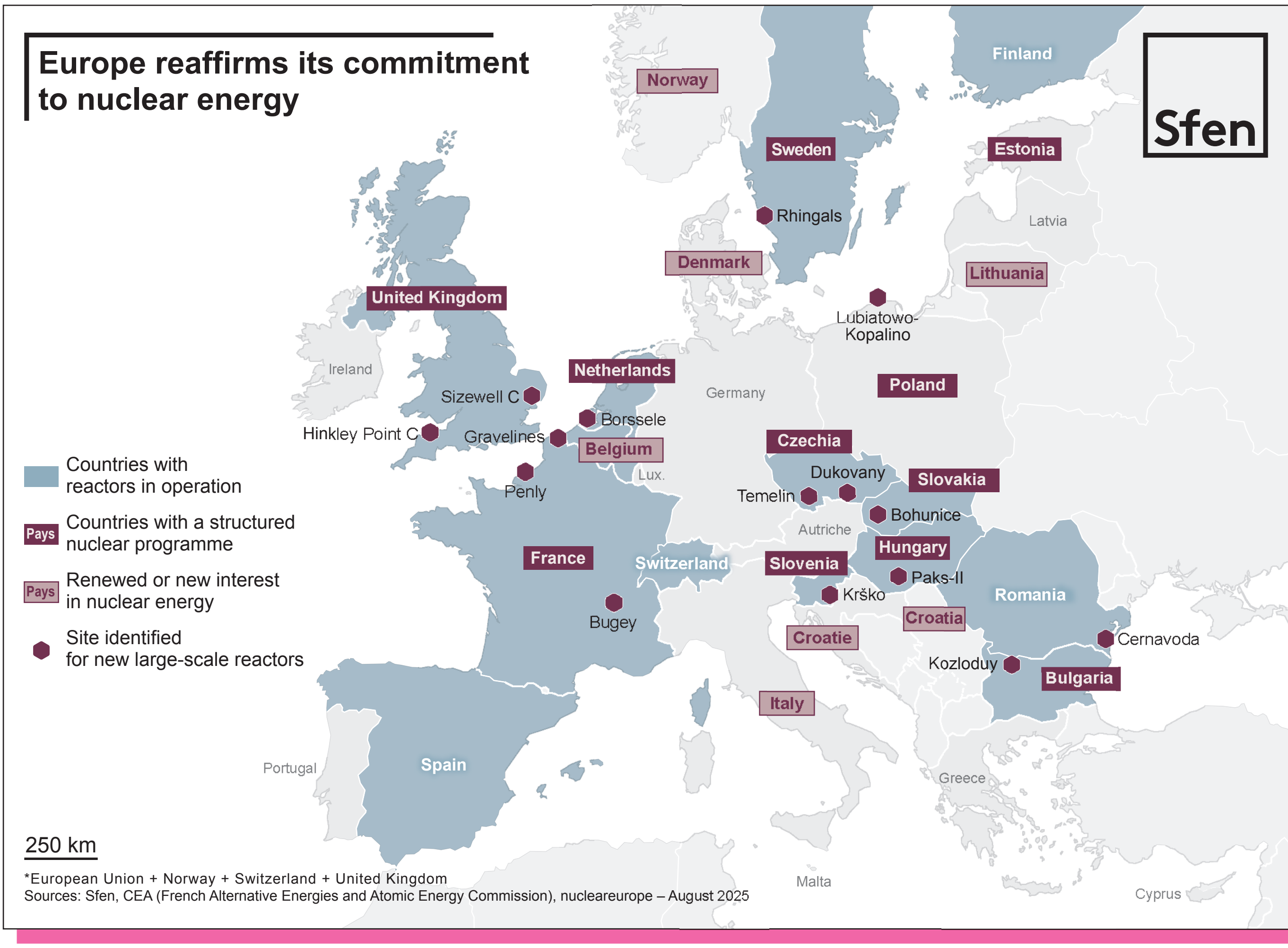
Industrial capacity



Europe can draw on substantial capacity to manufacture large nuclear components across several industrial players, including ENSA (Spain), Framatome (France), and the Czech Vitkovice Machinery Group, which, together with Škoda JS, produce reactor pressure vessels and internal components. Ansaldo Nucleare and Mangiarotti (Italy) complement this ecosystem with steam-generator manufacturing capabilities. European forging facilities support this industrial base, notably Framatome–Le Creusot in France, F.A. Vienne and Società delle Fucine in Italy, Pilsen Steel and Vítkovice Heavy Machinery in the Czech Republic, and Sheffield Forgemasters in the United Kingdom.

4 • Revue générale nucléaire, « Découvrez le nouveau concept du SMR Nuward » (Discover the new Nuward SMR concept), 26 February 2025.

Europe



market ambitions. [5] Notably, KHNP, whose president was pressured to resign, has since withdrawn from several European nuclear tenders including Sweden (Dec 2024), Slovenia (Feb 2025), the Netherlands (Mar 2025) ,and Poland (Aug 2025). This suggests KHNP is strategically pulling back from its European interests and focusing primarily on its role with the construction project at the Czech Dukovany nuclear power plant. Meanwhile, Westinghouse is boosting its European presence and is working in partnership with Hyundai E&C on AP1000 construction projects across a number of potential European sites. An ongoing EU Commission investigation is assessing if the Czech Dukovany project involves market distorting foreign financial subsidies originating from South Korea, which if confirmed would contravene EU competition rules. In addition, the financing framework for up to two new units at Dukovany has yet to be fully approved.

France's EDF received a fillip when in July 2025 the UK government gave its green light to the final investment decision for constructing two EPRs at the Sizewell C site in Suffolk, while work continues at the Hinkley Point site in Somerset. In June 2025 EDF launched its Grand Chantier, a major construction programme preparing for the deployment of up to 14 EPR2 reactors. Phase one comprises an initial series of six reactors. The Grand Chantier

5 • *The Korea Herald, "Westinghouse deal tensions loom over Korea–US summit," 20 August 2025; Financial Times, "US–South Korea nuclear reactor tie-up proposed amid accusations of 'slave contract'," 21 August 2025.*

Europe

initiative also proactively addresses the regional effects of the construction of two EPRs reactors in Gravelines (Hauts-de-France).

US energy giant Westinghouse has been selected by Poland, Bulgaria, and Slovakia to build AP1000 units (3, 2, and 1 respectively). Poland's long-term energy goals include reaching 6-9 GW of installed nuclear capacity by the 2040s. The three AP1000 units planned for the Lubiatow-Kopalino site on Poland's northern coastline represent the initial phase of the country's first ever commercial nuclear capacity. The commissioning date for the first unit has been delayed by three years to 2036, with costs set to overrun by roughly 50%.[6] In summer 2025, Poland launched a second separate nuclear project to which EDF has been invited to participate.

The selection of reactor technologies for the Swedish, Slovenian and Dutch nuclear programmes remains open. In May 2025, Sweden adopted legislation enabling the financing of 4-6 GW of new nuclear capacity. In June 2025, Slovenia launched a public consultation as part of the spatial-planning process for one or two new units at the Krško nuclear power plant. The Netherlands is seeking to build two units each with capacity of between 1,000 and 1,650 MWe; for which three potential sites have been identified, including Borssele in the country's south.[7] The government is also conducting exploratory consultations on additional sites and reactor technologies.

Hungary remains one of the EU's most nuclear-dependent countries. Rosatom is building the two-unit Paks-II power plant, with first concrete for Unit 1 due to be poured at the end of 2025. However, since September 2025 the project has faced uncertainty following a European Court of Justice, ruling to annul the European Commission's 2017 decision approving state aid for Paks II.

6 • Nuclear Engineering International, "New schedule delays Poland's first NPP," 17 December 2024.
7 • World Nuclear News, "Dutch nuclear new build timeline set to slip," February 2025.

HIGHLIGHT

On 29 August 2025, France and Germany announced that they were working to realign their policies around the principles of technological neutrality and equal treatment for all low-carbon energy sources within the European Union.[8]

8 • Élysée, "Press conference of President Emmanuel Macron and Chancellor Friedrich Merz", 29 August 2025.

Europe at the forefront of geological storage

Europe continues to lead global progress on deep geological repositories for spent fuel. Finland's Onkalo facility, under construction since excavation began under licence in 2016, entered trial operations in August 2024, with full operation expected by the mid-2020s. On 15 January 2025, Sweden's SKB announced the start of construction of the national spent nuclear fuel repository adjacent to the Forsmark nuclear power plant. This will ultimately house more than 6,000 canisters representing 12,000 tonnes of spent fuel. Lastly, in July 2025, the French Radioactive Waste Management Agency (Andra) announced that the Nuclear Safety and Radiation Protection Authority (ASNR) had completed the final technical evaluation of its 2023 application for authorisation to create the Cigéo deep geological repository. ASNR's final opinion on the entire Cigéo dossier is expected in November 2025, with construction scheduled to begin at the end of the decade. ■

Sweden, Slovenia, and the Netherlands are evaluating nuclear reactor designs options for their future programmes.

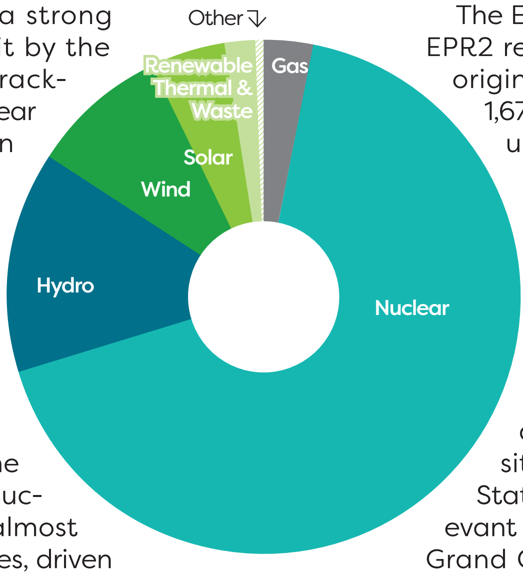
France

2 The French nuclear industry is gaining momentum

OVERVIEW France is preparing to build six new EPR2 reactors under the first phase of its national nuclear programme, while also renewing its nuclear fuel-cycle facilities. In terms of small modular reactors, the government aims to make up for lost ground and is supporting the construction of a demonstrator.

2024 was an exceptional year for French nuclear power. The country's nuclear fleet made a strong comeback after output was hit by the discovery of stress-corrosion cracking in several units in 2022. Nuclear production rose from 279 TWh in 2022 to 320 TWh in 2023, and climbed again to almost 362 TWh in 2024. Bolstered by both this bounce-back and greater hydropower generation, which itself reached nearly a nine-year high, France became Europe's leading electricity exporter in 2024 with a net positive balance of 89 TWh. EDF is not alone in enjoying strong operational success. Framatome reported an almost 12% increase in its annual revenues, driven in particular by contracts for the six EPR2 steam generators for the Sizewell C project in the United Kingdom.[9] Framatome also secured new contract signings to supply fuel assemblies in Hungary, Slovenia and the United States. Orano similarly reported higher 2024 revenues (+ 20%), buoyed by new export contracts in the back-end of the fuel cycle.[10] Together, these successes are reinforcing the sector's foundations for a more ambitious nuclear future.

On 17 March 2025, the French government reaffirmed its long-term vision for the future of nuclear power, confirming a series of initiatives to renew the nuclear fleet (EPR2 programme), to modernise downstream fuel cycle facilities (Orano's Aval du future, (Downstream of the Future), programme), to encourage innovation through the development of small modular reactors (SMR), and to close the fuel cycle.



Electricity mix 2024
- **Gas :** 3,2%
- **Nuclear :** 67,1%
- **Hydro :** 13,9%
- **Wind :** 8,7%
- **Solar :** 4,6%
- **Renewable Thermal & Waste :** 2%
- **Other :** 0,5%

Source : RTE.

The EPR2 programme is well underway

The EPR2 programme looks to build six EPR2 reactors (optimised edition of the original EPR design) targeting 1,650–1,670 MWe per reactor, with an option under consideration to expand the fleet to fourteen units. The first pairs are planned for the Penly, Gravelines, and Bugey sites. According to the Nuclear Policy Council (CPN) in March 2025, the first unit is scheduled to come onstream in 2038.[11] In July 2024, preparatory works were authorised to proceed at the Penly site and in June 2025, the French State together with EDF and the relevant regional authorities deployed the Grand Chantier initiative at the Gravelines site to anticipate and manage the regional impacts of constructing two EPR2 units, addressing housing, transport, training, employment, public services, and local-business integration.

To provide a coherent framework for the revival of the French nuclear programme, a new sector-wide strategic contract was signed for the period 2025-2028. It sets out the sector's priority actions and supports the development of longer-term action planning, particularly in terms of workforce skills training needs and industrial capability.[12] In terms of industrial capacity, on 27

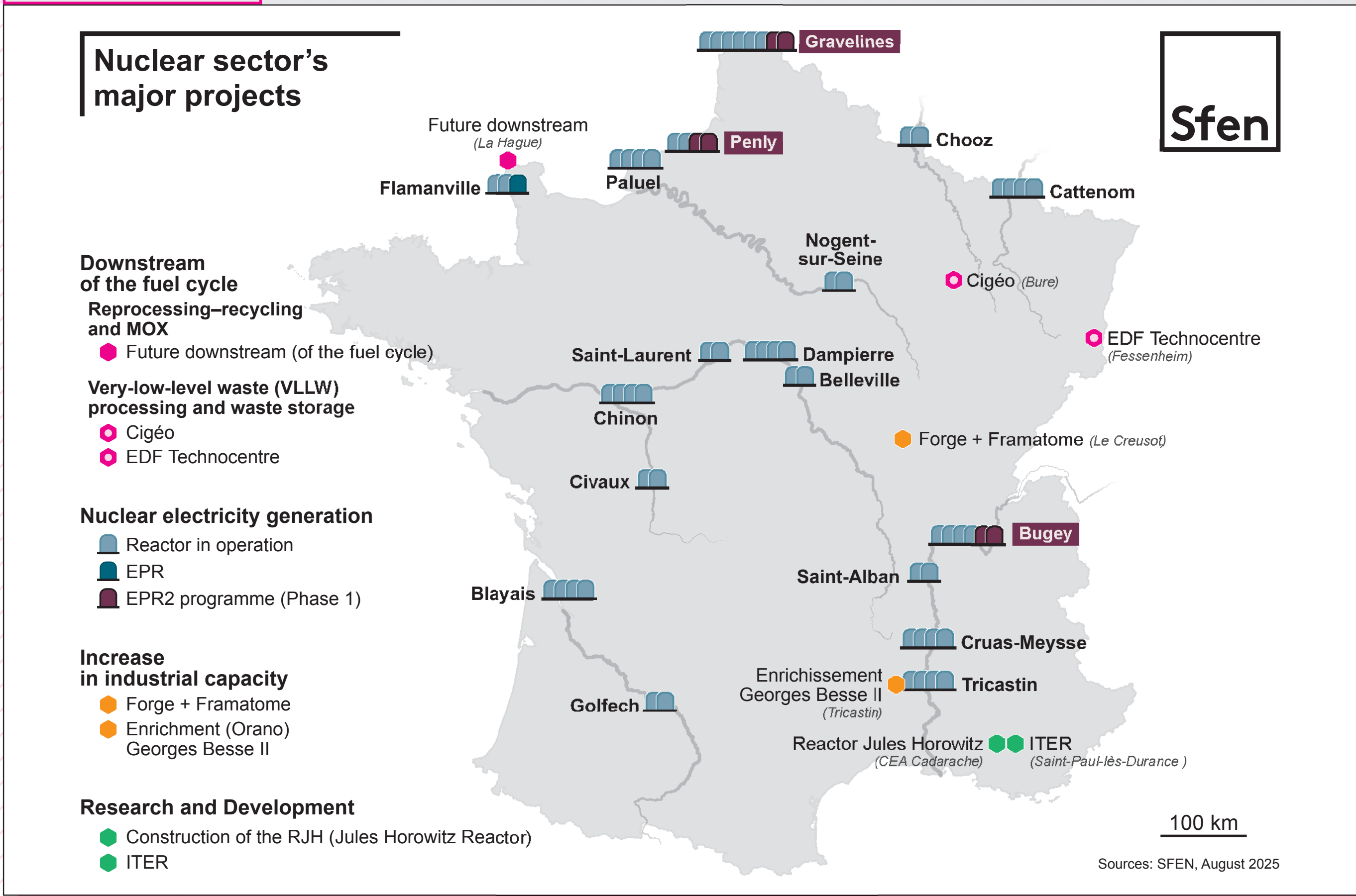
9 •Framatome, « *Framatome publie ses résultats financiers 2024* » (*Framatome publishes its 2024 financial results*), 21 February 2025.

10 •Orano, « *Rapport annuel d'activité 2024* » (*2024 annual activity report*), 2025.

11 • Élysée, « *Réunion du 4e Conseil de politique nucléaire* » (*Meeting of the 4th Nuclear Policy Council*), 17 March 2025.

12 • *Contrat stratégique de la filière nucléaire, 2025-2028* (*Strategic Contract for the Nuclear Sector, 2025–2028*).

France



May 2025, Framatome launched a preliminary public consultation on the Forge + project, which aims to increase capacity and start manufacturing components that have hitherto been supplied by Japan Steel Works.[13] With Forge +, the Le Creusot plant would be well-positioned to support the EPR2 programme, and supply both export markets as well as SMR construction components.

Renewal of fuel cycle plants and fuel cycle closure systems

With each EPR2 reactor designed to operate for at least 60 years, French nuclear generation could extend beyond 2100. To continue supplying and supporting the French nuclear fleet as it enters a new renewal phase, Orano is planning to build a new MOX (mixed oxide using recycled plutonium and depleted uranium) fuel manufacturing plant at the La Hague site with commissioning scheduled for the early 2040s, as well as a new spent-fuel treatment plant also at La Hague with a target completion date between 2045-2050. In October 2024, Orano announced the first engineering contracts aimed at delivering its Aval du future, or 'Downstream of the Future' programme.

Key issues include the kind of plant that should be built and which technologies will underpin the reactors of the future. Meanwhile in March 2025, the government reaffirmed its commitment to closing the fuel cycle. The Nuclear Policy Council (NPC) requested that industry leaders (EDF, Framatome, Orano), the CEA, and other stakeholders involved in fast-neutron technologies, prepare a roadmap and work programme by year-end 2025 for the development of fast reactors, along with a proposal covering the industrial organisation aspects, which then will be examined at the next NPC meeting. Fast-neutron reactor projects

13 • CNDP, « Forge +, projet de construction d'un nouvel atelier de forge au Creusot, bilan de la concertation » (Forge+, project to build a new forging workshop in Le Creusot, summary of the public consultation), 2025.

France

are currently primarily driven by companies responding to calls for projects within the ‘France 2030’ energy plan.

Small modular reactors: a first demonstrator ready by the early 2030s?

The France 2030 nuclear investment package, part of the broader France 2030 plan, has supported new entrants whose reactor concepts are based on technologies that for the most part differ from those currently deployed. Depending on their size and characteristics, these projects aim to meet a wide variety of needs, including the production of urban or industrial heat, hydrogen, fresh water, etc. Twelve winning projects have been selected for the France 2030 energy pillar of the broader plan. Eleven of these made submissions to the calls for innovative reactor projects alongside Nuward, which received support from another component of the France 2030 umbrella investment plan. Among these winning projects, Jimmy Energy became the first to formally apply for a design acceptance confirmation (DAC) in April 2024.[14] Jimmy Energy is using a new reactor design. So too is EDF spinoff, Nuward, which completed a formal review of its design in the summer of 2024 to better align with market expectations.[15] The approach centres exclusively on using proven technological building blocks and adopting a prefabrication strategy based on a highly standardised model, particularly on a European scale.

To speed up the whole innovation programme, the government has “mandated the General Secretariat for Investment to support companies by prioritizing projects most likely to result in the commissioning of a demonstrator in the early 2030s. The Nuclear Policy Council has also asked the CEA (French Alternative Energies and Atomic Energy Commission) to make relevant site data for the Marcoule and Cadarache sites available to companies that request it and to enter discussions with a view to establishing the most advanced projects at these sites.”[16] On 26 August 2025, Calogena, which designs a small 30 MWth calogen reactor, signed a letter of intent with the CEA to study the installation of a demonstrator at the CEA Cadarache site.

HIGHLIGHT

2024 saw France regain high production levels, generating 362 TWh of nuclear electricity, of which 89 TWh were exported.

Progress at the EDF technocentre as well as at Cigéo

Led by EDF, by way of its expert subsidiary Cyclife, the technocentre project will enable the recovery of very low-level radioactive metals from the dismantling of nuclear facilities, as well as stimulating greater industrial activity in the region in the wake of the closure of the Fessenheim power plant in 2020. Following public debate between October 2024 and February 2025, EDF confirmed its intention to proceed with the project, with commissioning expected for the early 2030s.

Lastly, in July 2025, the French National Agency for Radioactive Waste Management (Andra) announced the completion of the technical review of its application for authorisation to create the Cigéo deep geological repository. The final opinion of the Nuclear Safety and Radiation Protection Authority (ASNR) on the entire Cigéo review process is expected in November 2025. Construction is scheduled to begin at the end of the decade, making it one of the most advanced projects of its kind worldwide. Only Finland and Sweden have similarly commenced constructing these types of facilities. The Finnish repository is expected to soon become operational. ■

14 • *La Tribune, « Course aux petits réacteurs nucléaires : la start-up Jimmy contrainte de revoir son design, le calendrier dérape » (Race for small nuclear reactors: start-up Jimmy forced to revise its design as the timetable slips), 21 July 2025.*

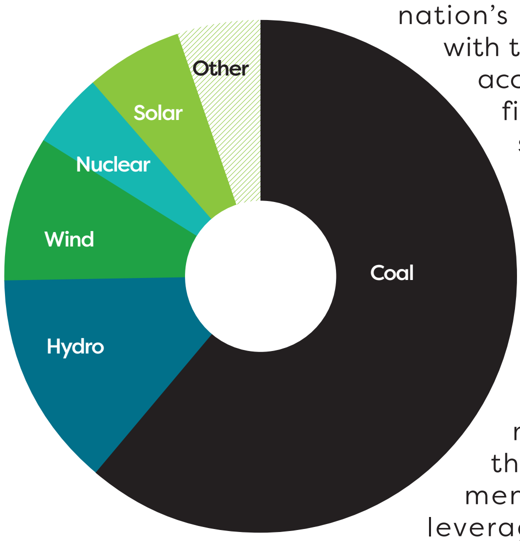
15 • *Revue générale nucléaire, « [Exclusif] Découvrez le nouveau concept du SMR Nuward » ([Exclusive] Discover Nuward's new SMR concept), 26 February 2025.*

16 • *Élysée, « Réunion du 4e Conseil de politique nucléaire » (Meeting of the 4th Nuclear Policy Council), March 2025.*

3 China is both efficient and innovative

OVERVIEW **The Middle Kingdom is impressive, both for its industrial strength and rich research and development activities. China has established itself as a model in all areas, ranging from reactor construction to the development of new technologies including new uses for nuclear energy.**

In a highly carbon-intensive electricity mix, nuclear power will be a key asset in China achieving carbon neutrality by 2060 and in securing an adequate electricity supply. In 2024 China produced more than 10,000 TWh, more than twice the electricity produced by the United States. This level of production, which has doubled between 2011 and 2025, continues to support the nation's economic growth, with the industrial sector accounting for 60% of final electricity consumption.[17] Despite being the second largest producer of nuclear power in the world (450 TWh in 2024) nuclear energy accounts for only 4.5% of China's electricity mix.[18] Nevertheless, the Chinese government intends to fully leverage nuclear power across a broad range of applications, including carbon-free electricity, district and industrial heat, and hydrogen production. China's nuclear energy development strategy, unchanged since 1982, sets three major goals: (1) the deployment of a large fleet of pressurized water reactors; (2) the introduction of fast-neutron reactors to enable closure of the fuel cycle; and (3) the long-term development of fusion energy. China is giving itself the means to achieve these ends. The country currently operates 58 reactors and a further 56 are either under construction or in the planning phases; it already operates a sodium-cooled fast reactor (CFR600), and is positioning itself as a leader in fusion.



Electricity mix 2023
- Coal : 61,3%
- Hydro : 13,5%
- Wind : 9,3%
- Nuclear : 4,6%
- Solar : 6,1%
- Other : 5,2%

Source : AIE.

Record construction times

China has now been building nuclear reactors non-stop for more than thirty years. Since 1991, 58 commercial reactors have been connected to the grid, with around ten of those being in the last five years and nearly half in the past decade. Thirty additional units remain under construction, and China is demonstrating its expertise with its third-generation reactors, i.e. the Hualong-One (1,200 MW) which is taking on average 6 years to build. With only five units of this type completed in China plus two exported to Pakistan, these timeframes are expected shrink further as experience accumulates.

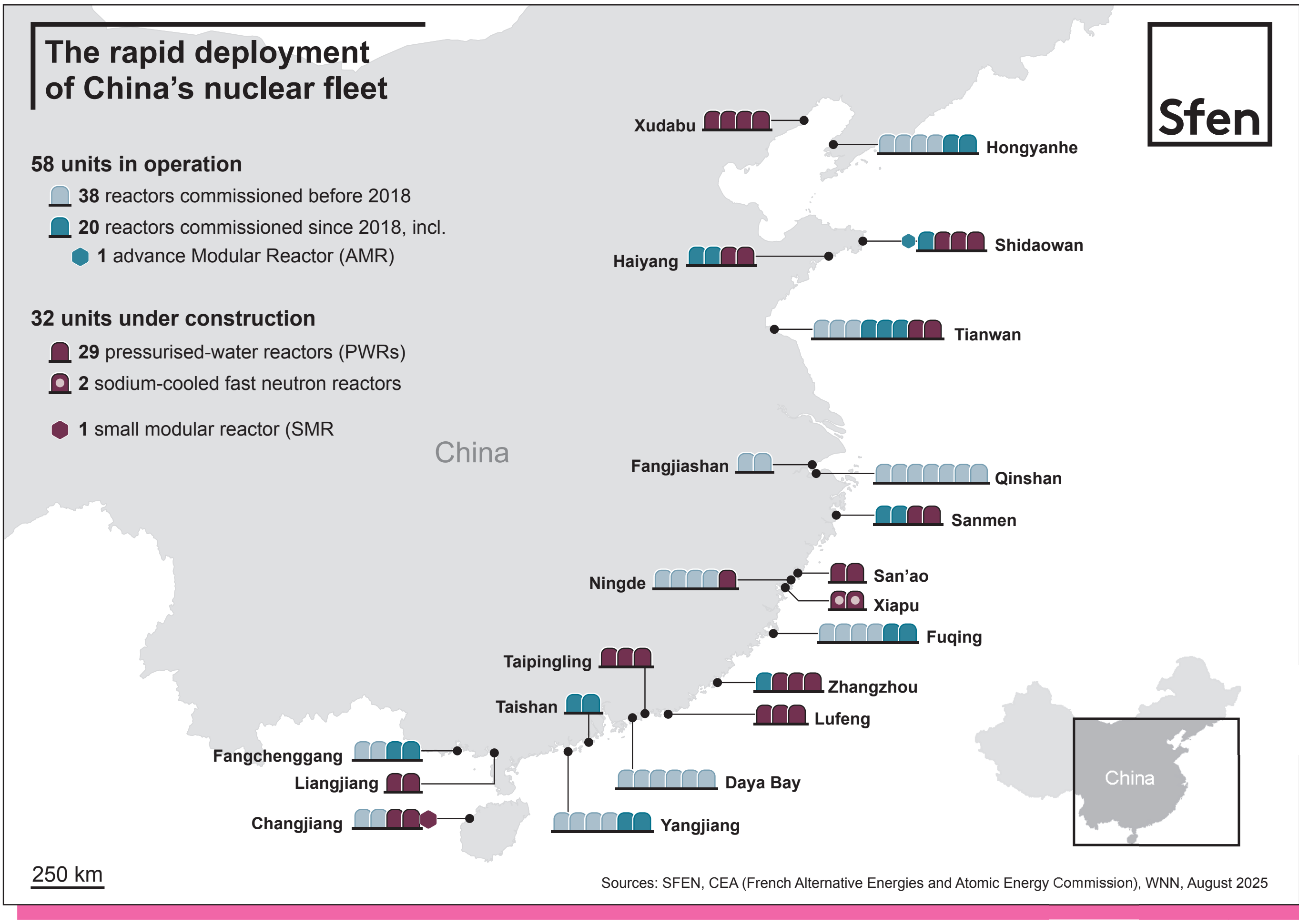
The first CAP1400 (Guohe-One), a Chinese version of the American AP1000 was connected to the grid in November 2024, after only sixty-seven months of construction. It should be added that the construction schedule for the two CAP1000 reactors at Haiyang intends for a fifty-six month timeframe, i.e. under five years illustrating the growing confidence and capability of China's nuclear industry. [19] These performance levels are unmatched anywhere else in the world.

A land of innovation

A network of research institutes, universities, and industrial companies sustains significant ongoing R&D activ-

17 • *IEA, 2023.*
18 • *Power Reactor Information System (PRIS), IAEA.*
19 • *World Nuclear News, « Containment vessel heads in place at two CAP1000 units » (Containment vessel heads in place at two CAP1000 units), 12 September 2024.*

China



ity. China is developing virtually the full range of reactor technologies, with an emphasis on sodium-cooled fast neutron reactors and high-temperature reactors. The sodium-cooled fast-neutron reactor programme seeks to maximise all of the value of nuclear material and has been accelerating since the 20 MWt CEFR prototype became operational in 2011, and construction started for two 600 MWe units in 2017 and 2020 in Xiapu. The initial 600 MWe unit achieved first criticality in 2023 and the second unit is expected to start up in 2026. Ultimately, the goal is to deploy an integrated system on the same site comprising six commercial fast reactors with a capacity of approximately 1,000 MWe (CFR1000-design approval secured in July 2025), along with fuel manufacturing, and pyro-processing facilities.

High-temperature reactors are intended for new applications such as industrial steam production, district heating, and even potentially hydrogen production. Drawing on feedback from a 10 MWe experimental unit built in the 1990s, the HTR-PM200 was put into

A robust ecosystem of research institutes, universities, and industry partners enables Beijing to pursue extensive R&D activities.

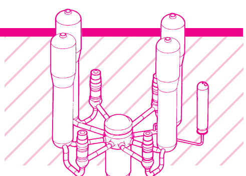
China

On the nuclear fusion front, the country is relying on the ITER project, to which it contributes 9% of the funding and for which it has secured several related contracts.

commercial service in 2023, and the Institute of Nuclear and New Technologies (INET) at Tsinghua University launched new designs for more powerful reactors. A HTR600 project has already been approved in Xuwei, Jiangsu, to be built alongside Hualong-One reactors with the goal being to supply industrial steam to the nearby petrochemical park.

A further illustration of how innovative Chinese participants are in this sector is the start-up of a small experimental molten salt reactor unit in October 2023 (TMSR-LF1) that operated with thorium in October 2024. Similarly, a small modular light-water reactor (SMR ACP100) in Hainan has been under construction since 2021 and is scheduled to come online in May 2026.

QUID Industrial capacity



Driven by a strong order pipeline, China commands a formidable nuclear industrial sector capable of constructing as many as 40 reactors at once. Key manufacturers of major forged components such as reactor vessels, steam generators, pressurisers and primary pumps include Dongfang Electric, Shanghai Electric, China First Heavy Industries, and Harbin Electric Corporation.

In terms of nuclear fusion, China's roadmap ranges from the construction of experimental facilities right through to commercial deployment by 2050, including a demonstrator (CFETR) by 2035. The country relies on the ITER project, which it finances for up to 9% (Europe covers 45.6%, with the remainder shared among the other members), and for which Chinese firms have won several major contracts. Furthermore, Beijing is counting on two major public players to develop fusion. The first is the Institute of Plasma Physics (ASIPP) at the Chinese Academy of Sciences (ASIPP), which operates the EAST tokamak and is building a new-generation tokamak (BEST), as well as an experimentation and manufacturing complex. The second is the China National Nuclear Corporation (CNNC), which operates the HL-3 tokamak through its SWIP institute and which, at the end of July 2025 founded a new company dedicated to fusion; the China Fusion Energy Company (CFEC).[20]

The Chinese private sector is also investing in nuclear fusion by financing several start-ups, including Energy Singularity, which operates a 100% high-temperature superconducting tokamak (HH-70), Startorus Fusion, a spin-off from Tsinghua University, which operates a spherical tokamak (SUNIST-2), and ENN, which is developing fusion based on hydrogen-boron reactions.

Putting nuclear power's wide range of uses into practice. China is seeking to

20 • Southwestern Institute of Physics.

China

HIGHLIGHT

China shows real industrial capability: Zhangzhou-1, a third-generation reactor, was connected to the grid in November 2024 after a construction phase of only five years. Similarly, the very first CAP1400 was built in just over five years.

use nuclear power for a variety of purposes including urban district heating, industrial steam production, radioisotope production, hydrogen production, and seawater desalination. The Haiyang plant is a perfect example of this ambition. This showcase project, comprising two AP1000 reactors, currently meets the heating needs of 400,000 inhabitants of the cities of Haiyang and Rushan and could theoretically supply 1 million people. The site also hosts a seawater-desalination demonstration project that converts seawater into freshwater for normal tap-water use, while the heat generated from the salt removal process is used to heat the homes of plant employees. New projects, including both small and large reactors, already plan for diversified uses, with nuclear urban district heating continuing to extend its reach, particularly in the Shandong region and in northern China. Several Chinese SMR concepts specifically targeting heat production are also being developed.

Securing fuel supplies to meet future needs

China's growing nuclear fleet requires secure access to fuel supplies. This begins with domestic natural uranium production, which accounts for around 3% of global production.[21] However, domestic output covers only 11% of the fleet's needs. Consequently, companies in the sector source fuel from foreign suppliers and actively prospect internationally, particularly in Kazakhstan and Namibia. More than a third of China's uranium supply is expected to come from Chinese-owned mines in these two countries. In terms of conversion and enrichment, capacity at the Lanzhou, Hanzhong, and Emeishan facilities is currently considered adequate, although uncertainties remain going forward, given that around 30 additional reactors are already under construction. Lastly, Chinese industry has sufficient capacity to meet the fuel assembly requirements of the growing nuclear fleet. ■

> ***New projects, ranging from small to large reactors, are already being planned for a variety of applications.***

21 • *NEA, IAEA, Uranium 2022: Resources, Production and Demand.*

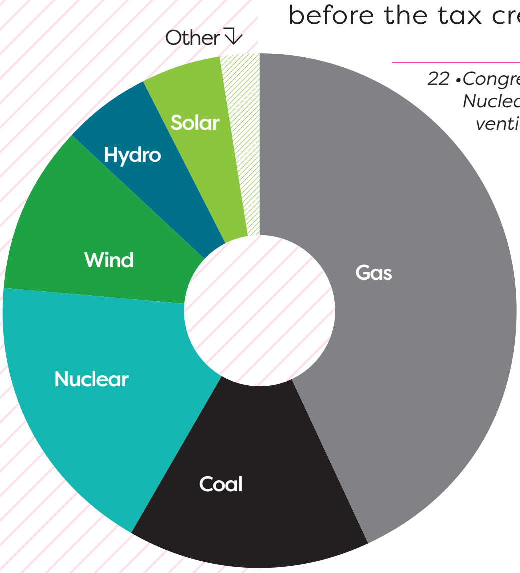
United States

4 The United States is undergoing rapid transformation

OVERVIEW **The US nuclear industry is in a state of dynamic churn. While the Democratic administration had already set an ambitious goal of tripling nuclear capacity by 2050, the Republican administration is now going even further, aiming to quadruple it over the same time frame. To achieve this, it is launching a major reform of the nuclear sector, including a reorganisation of the safety authority.**

The United States still has the largest nuclear fleet in the world with 94 reactors operating across 54 power plants producing almost 20% of the country's electricity. Keeping these reactors operational was a key element of the Democratic administration's mandate, which introduced several provisions to prevent plant closures because of economic pressures. Some twelve reactors closed between 2013 and 2021.[22] Although nuclear power enjoys broad political support, the republican administration that came into power in early 2025 initially sparked concerns over the durability of that support. This spurred the industry to mobilise and protect existing support mechanisms. In her address to the Nuclear Energy Industry's Nuclear Energy Forum in May 2025, NEI president Maria Korsnick remarked "Life before the tax credits involved prematurely retiring plants and limited investment across the industry. After those tax credits were passed, what did we start to see? Power upgrades, plant restarts, and decades-long reactor extensions." A few days later, President Trump signed four executive orders with the following goals, (i) add 300 GW of capacity by 2050, (ii) strengthen the country's fuel cycle sovereignty by developing enrichment capacities and reshaping US policy toward spent-fuel reprocessing, (iii) develop skills in the sector, (iv) accelerate the deployment of 'advanced' reactors, (v) reform the Nuclear Regulatory Commission (NRC), and finally, (vi) facilitate the deployment of technological demonstrators with the objective of having three pilot projects operating by 04 July 2026.

22 •Congressional Research Service, "U.S. Nuclear Plant Shutdowns, State Interventions, and Policy Concerns", 2021.



Electricity mix 2024

- **Gas :** 43,3%
- **Coal :** 15,1%
- **Nuclear :** 18,1%
- **Wind :** 10,5%
- **Hydro :** 5,6%
- **Solar :** 5%
- **Other :** 2,4%

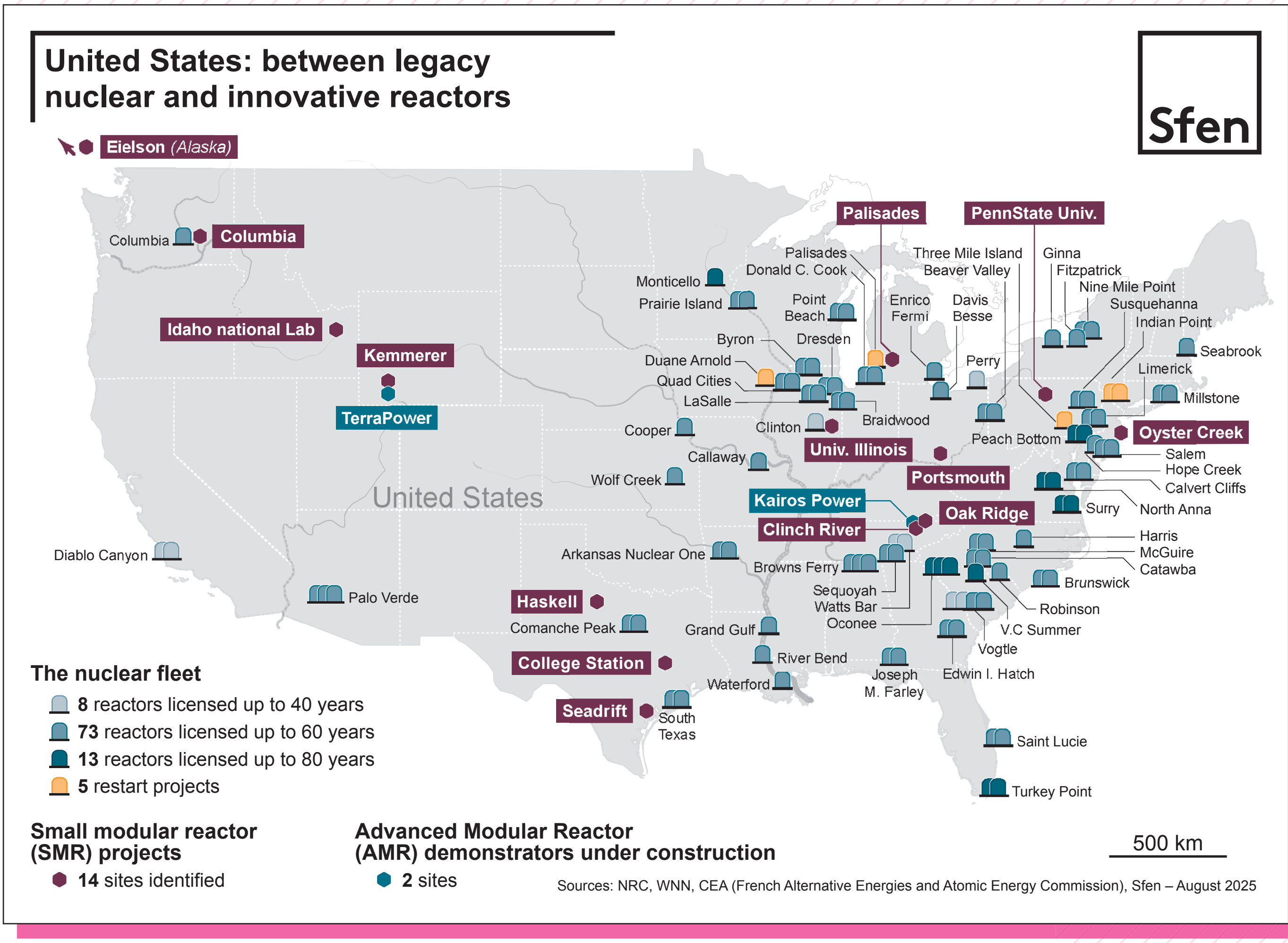
Source : US EIA.

Maintaining support mechanisms for nuclear power

The new budget bill, dubbed the One Big Beautiful Bill Act of 2025 (OBBBA), severely curbs tax credits for wind and solar projects not in service by 31 December 2027, while retaining credits for three non-carbon energy sources, namely nuclear, hydroelectricity, and geothermal energy. This support optimises electricity production from existing nuclear facilities by avoiding unplanned retirements, encouraging the restarting of idle units, and pursuing capacity extensions.

The goal is to bring the entire fleet to an eighty-year operational lifespan, and the Nuclear Regulatory Commission (NRC) has already given the green light to thirteen units provided that safety remains satisfactory. This represents five additional approvals compared with

United States



eight reported in our 2024 publication. In the US, reactors initially receive 40-year operating licences and then have an opportunity to twice exercise a 20-year extension option. As such almost all of the nation's fleet is operating under 60-year licences.

Furthermore, these Federal support mechanisms will also enable three previously closed reactors to reconnect to the grid. In Michigan, Holtec, which acquired the Palisades plant for decommissioning, has received a $1.5 billion federal loan, along with local authority support that will enable the unit to restart in 2026.[23] This support includes a Department of Agriculture power purchase agreement (PPA) subsidy worth $1.3 billion.[24] In Pennsylvania, Constellation Energy announced its intention to restart Unit 1 at the Three Mile Island power plant in 2027, five years after it was mothballed, the goal being to supply power to Microsoft's data centres for the next 20 years.

Lastly, in January 2025, NextEra initiated the procedures required to restart the Duane Arnold plant, including a licence amendment and the negotiation of a PPA. Together, these three restart projects represent more than 2 GW of capacity. Regarding power uprates, the NRC notes that such operations have enabled installed capacity to rise by 6 GW between

23 • *Department of Energy, "DOE Approves Fourth Loan Disbursement to Restart the Palisades Nuclear Plant", 20 June 2025.*

24 • *Utility Dive / Department of Energy / USDA, "USDA announce over $2.8B for Palisades nuclear plant restart", 01 October 2024.*

United States

HIGHLIGHT

In line with the government's plan to expand nuclear capacity from 97 GW to 400 GW by 2050, Westinghouse aims to have ten AP1000 reactors under construction in the United States by 2030.

2000 and 2021.[25] The government is also pushing for an additional 5 GW.

Fast-tracking American nuclear power: a period of accelerated delivery

In November 2024, President Biden announced the objective of tripling nuclear capacity to reach 300 GW by 2050. On 23 May 2025, President Trump went even further, raising the country's nuclear capacity goal of reaching 400 GW by 2050, compared to the current capacity level of 96 GW. The priority was to increase power and launch ten large nuclear reactor construction projects by 2030.[26] This is a strong signal for the nuclear industry, although the roadmap for reaching the 400 GW target within twenty-five years remains to be clarified. Currently only a few projects exist and most are far from being finalised. The quickest way to add capacity would be to resume construction of the two AP1000 reactors at VC Summer, which was halted in 2017 after a series of setbacks culminating in the bankruptcy of the main contractor Westinghouse. In early 2025, South Carolina's utility Santee Cooper, which owns both units launched a request for proposals for the sale of its units to an industrial consortium. A number of expressions of interest have also emerged, notably from the former governor of Texas and Secretary of Energy Rick Perry, now president of Fermi America, who is proposing the construction of a data centre supported by four AP1000s.

In the summer of 2025, New York State Governor Kathy Hochul announced her intention to build 1 GW of nuclear power, by way of either the AP1000 or a small modular reactor.[27]

Although much less powerful than the Westinghouse AP1000, SMRs, based on mature or advanced technologies, will nevertheless have a role to play, and the government wants to accelerate the process and move directly into deployment. A new programme seeks to have three pilot projects achieve criticality by 04 July 2026. "Reactors built under the DOE's Reactor Pilot Program will not require Nuclear Regulatory Commission licencing, [Ed. note: Licences will however be granted by the DoE], however reactor designs approved by the DOE can and will be fast-tracked for subsequent NRC licencing," reported the American Nuclear Society.[28] Given the tight schedule, applicants must already have a construction site and secured arrangements for fuel procurements, in particular medium-enriched uranium (Haleu) supplies from the DoE. Outside of this fast-track programme, it should be noted that Terra Power and Kairos Power both began construction of their demonstrators in the summer of 2024, developing a fast neutron sodium-cooled reactor (RNR-Na), and a high-temperature reactor with a molten salt coolant (FHR) respectively. Meanwhile, an application submitted by the Tennessee Valley Authority to build a BWRX-300 (boiling water reactor) unit at Clinch River, Tennessee, has been under NRC review since July 2025.

Safety reforms are raising questions

To facilitate the deployment of new units, the government has begun reorganising the nuclear-safety landscape, notably by giving more weight

25 • Nuclear Regulatory Commission website, "Power Uprates".

26 • Department of Energy, "9 Key Takeaways from President Trump's Executive Orders on Nuclear Energy", 20 June 2025.

27 • American Nuclear Society, Nuclear Newswire, "Report: New York state adding 1 GW of nuclear to fleet", 23 July 2025.

28 • American Nuclear Society, Nuclear Newswire, "DOE opens pilot program to authorize test reactors outside national labs", 20 June 2025.

United States

to the Departments of Energy (DoE) and Defence (DoD). The Executive Order "Ordering the Reform of the Nuclear Regulatory Commission" has effectively criticised the NRC's performance, highlighting its very high costs and excessively long review timelines. The NRC is now required to issue a final decision within 18 months for new reactor construction and operation applications, and within 12 months for licence-renewal applications. It must also cap the hourly fees charged to applicants for licencing reviews. On 24 June 2025, the NRC announced that it would halve certain fees, introduce a fast-track process for reactor designs previously approved by the DoE or DoD, and develop a simplified authorisation pathway for the deployment of microreactors and modular reactors (certain models or components could also be authorised via DoD and/or DoE licenses).[29]

In July 2025, TerraPower welcomed the new shorter certification timetable for its reactor, down from twenty-six to nineteen months. The not-for-profit professional body, the American Nuclear Society, described the change as "a positive trend," while expressing some reservations over and stressing the need for NRC independence. In particular, the shock dismissal of one of the NRC commissioners, Christopher Hanson in 2025, has sparked concerns across the industry over the body's independence.

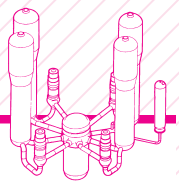
The end of the Carter anti-plutonium doctrine?

Plutonium is an artificial element created when uranium-238 captures a neutron. Plutonium is fissile (and therefore reusable) in fast-neutron reactors and can be recycled. The United States never truly abandoned the Carter doctrine (1978) that severely restricted commercial reprocessing and the commercial reuse of plutonium because of the risk of nuclear proliferation. This new Republican administration has now redirected the DoE to design a pathway to efficiently transfer spent nuclear fuel, stored at power plant sites, to a reprocessing an recycling facility that would be State-owned and private-sector managed. In addition, the US president has ordered the creation of a programme designed to dispose of excess plutonium by converting it into fuel for advanced reactors, potentially opening up new options for fast-neutron reactors, which, without plutonium, relied on fuel enriched up to 20% (Haleu).

Future export champion in the making?

The new republican administration is explicitly pursuing a leadership position in the nuclear sector, including the export market. It aims to negotiate numerous new bilateral peaceful-nuclear cooperation agreements ("Section 123" agreements) to open up markets for U.S. industry. The new administration has directed agencies to "aggressively pursue" at least twenty 123 agreements to extend U.S. access to partner-country markets. Westinghouse remains a major player in Europe and together with recent agreements involving South Korea's KHNP now stands as a principal competitor to EDF in several markets. ■

29 • NRC, «NRC Reduces Hourly Rate for Advanced Nuclear Reactor Applicants and Pre-Applicants», 24 June 2025.



QUID Industrial capacity

Framatome and Westinghouse are key suppliers of heavy components to the U.S. nuclear sector. Historically, Westinghouse has subcontracted much of its production to Doosan Enerbility in South Korea and to ENSA in Spain. More recently it has sought to ramp up production at its Mangiarotti plant in Italy. In terms of SMRs, designers are looking abroad and South Korea has a strong presence in that market.

Canada

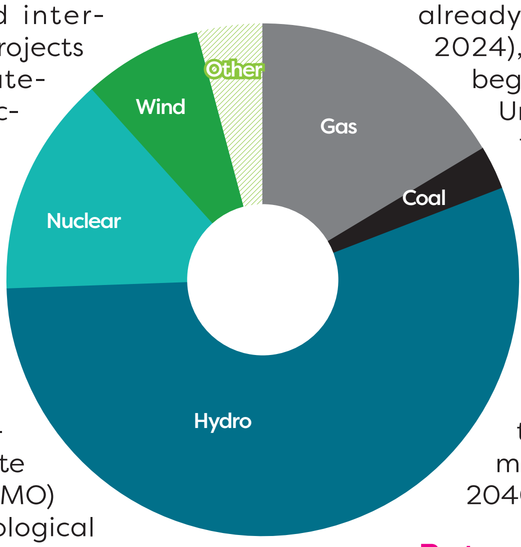
5 Canada accelerating even faster on nuclear

OVERVIEW **Canada is pushing ahead on all fronts; it's extending the life of its existing nuclear fleet, launching its first small modular reactors, and even considering new large-scale reactors. Meanwhile, the uranium-mining landscape is shifting, notably with Nova Scotia lifting its ban on uranium exploration.**

Canada is pushing even faster on its nuclear programme. Construction of its first small modular reactor plant (SMR) is commencing and interest in large scale power plant projects has returned. Government statements indicate additional capacity from new large reactors could approach 10 GW. Canada's uranium sector is expanding amid the global nuclear revival, notably with the recommissioning of the McClean Lake mine and the repeal of Nova Scotia's long-standing ban on uranium exploration and mining. Noteworthy is that in November 2024, Canada's Nuclear Waste Management Organization (NWMO) selected the site for a deep geological repository for used nuclear fuel.

Long-term operation of Canda's nuclear fleet

Following the closure of two 500 MWe units at the end of 2024, Canada's nuclear fleet consists of 17 reactors using the national Candu technology (Canada Deuterium-Uranium), a national pressurised heavy-water reactor design fuelled with natural uranium. Sixteen of these reactors are in Ontario, Canada's second-largest province. In order to maintain nuclear power's contribution to carbon-free electricity generation, 2016 saw the start of a large-scale refurbishment programme for key CANDU plants. The refurbishment plan is specifically geared to extending the operating life of these units by thirty years. Work on three of the four reactors at the Darlington plant has already been completed (2020, 2023, 2024), while work on the fourth unit began in July 2023. At Bruce Power, Unit 6 returned to the grid in September 2023, and two more units are currently undergoing maintenance and life-extension activities. Similar maintenance and life-extension activity is planned for Pickering (Units 5–8), while Point Lepreau is currently being maintained under its existing licence (valid to 2032) with a second refurbishment under consideration for the 2040s.



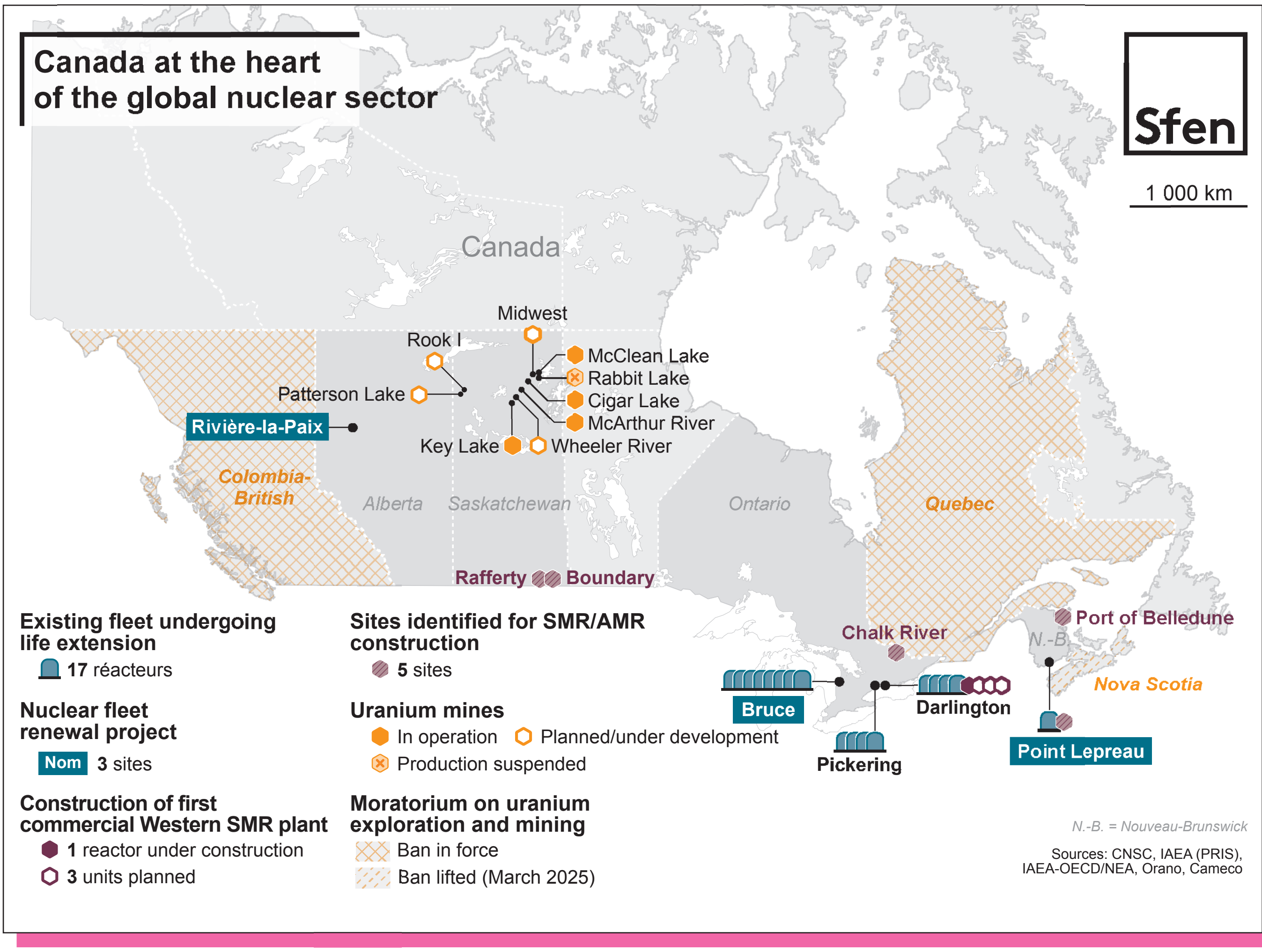
Electricity mix 2024

Source : AIE.

Return to large-scale power plant projects

Alongside this refurbishment programme, which extends right to the core of the current fleet's reactors, both provinces of Ontario and Alberta are evaluating major new reactor projects, with cumulative capacity potentially approaching 10 GW. For Alberta, this would be the province's first nuclear power station. Its Peace River proposal includes units with capacity of up to 4.8 GW using Candu Monark technology (1,000 MWe units) developed by AtkinsRéalis and unveiled at the end of 2023, alongside ongoing SMR feasibility studies. In March 2025, the Canadian gov-

Canada



ernment announced a four-year public loan of up to C$304 million (€190 million approx.) to support the design phase. AtkinsRéalis holds an exclusive licence to use the national Candu technology (IP rights remain with the government's federal Crown corporation AECL - Atomic Energy of Canada Limited).

Small modular reactors: ambitions are taking real shape

Canada is showing great interest in small-scale nuclear power, which is particularly well-suited to small electrical grids and isolated industrial or civilian sites. In 2018 the Federal Government Department, Natural Resources Canada (NRCan) together with provincial and territorial governments, Indigenous peoples and communities, public agencies, industry, laboratories, universities, and civil-society groups published the Canadian Small Modular Reactor Roadmap. Canada can justifiably take pride in having begun construction, following provincial approval in May 2025, on what is set to become the first commercial-scale SMR project in a Western-market country. The project aims to deploy four 300 MWe units (BWRX-300) with first commissioning slated for the end of 2030. Despite the project's significant cost of C$ 20.9 billion (€13 billion approx.) for a total capacity of 1,200 MWe, the Darlington SMR plant will position its designer, GE-Hitachi, as a recognised industry pioneer and increase the likelihood that further SMR projects will proceed in Canada

Canada

HIGHLIGHT

On 8 May 2025, the Ontario government gave the green light to begin construction of what is set to be the Western world's first commercial SMR. According to GE Vernova Hitachi's schedule, the first unit is expected to be commissioned in 2030, with four units planned to be in operation by the mid-2030s.

and abroad. To date, four sites across three provinces (Ontario, New Brunswick, and Saskatchewan) have been identified for potential small-scale reactor developments.

A robust fuel cycle

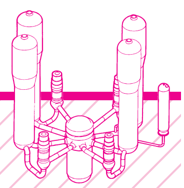
The characteristics of Canada's nuclear sector give the industry a high degree of robustness. The country is the world's second-largest producer of uranium, and roughly 20% of this production is enough to supply its 17 nuclear reactors.[30] Nova Scotia, which lifted its uranium exploration and mining ban in March 2025, is offering new production opportunities. Also noteworthy is the resumption of operations at the McClean Lake mine, announced by Orano and Denison in July 2025, and made possible thanks to an innovative extraction technique (SABRE) developed by both partners. In terms of the fuel cycle, the sector can rely on the Blind River and Port Hope facilities for the conversion of uranium (U_3O_8) into UO_3 and then to UO_2. Lastly, Ontario is home to two fuel-fabrication plants, with one operated by BWXT and the other by Cameco.

A deep geological repository site selected

In November 2024, Ignace (Ontario), was selected to host the deep geological repository project for nuclear waste, in particular spent nuclear fuel. Commissioning of the installation, located around 600 metres underground, is planned for between 2045 and 2050. In parallel, Canada is seeking a second site for medical sector-related radioactive waste as well as non-spent fuel waste from nuclear power plants. However, the scope of this second facility could eventually be expanded to include spent fuel from the country's future reactors. The Nuclear Waste Management Organization (NWMO/Société de gestion des déchets nucléaires, SGDN) says it will publish new information as it becomes available and incorporate community feedback into its planning and schedules. ■

30 • NEA–IAEA, *"Uranium 2024: Resources, Production and Demand."*

QUID Industrial capacity



BWXT Canada provides components for CANDU reactors e.g. Bruce Power Major Component Replacement (MCR) programme. In terms of SMRs, Canada is relying on BWXT to scale up its domestic manufacturing. In early 2024, BWXT announced a C$80 million investment (€48 million approx.) to expand its Cambridge facility.

Russia

6 Russia remains a global partner of choice

OVERVIEW Russia is pursuing a very ambitious nuclear policy, marked by strong export performance, the renewal of its nuclear fleet, and a drive to reduce dependence on natural uranium through innovation in reactor and fuel technologies. The government has proposed building 30 GW of new nuclear capacity to generate 25% of Russia's electricity by 2045, though achieving this target still faces significant hurdles.

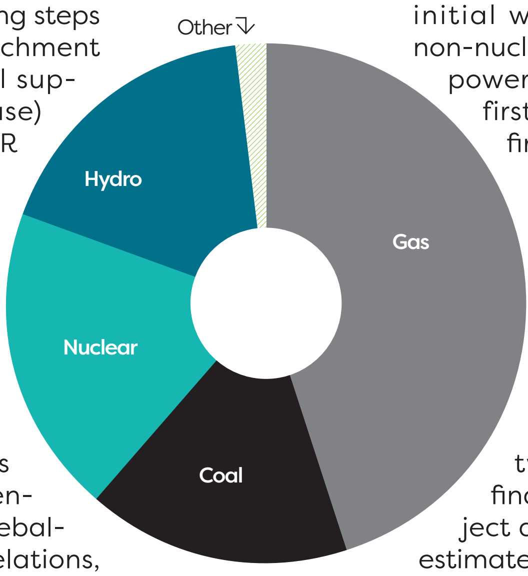
Since the invasion of Ukraine in February 2022, Russian sales of nuclear reactors have been shunned by the Western world, with many countries taking steps to move away from Russian enrichment services and towards other fuel suppliers (Framatome, Westinghouse) for their Russian-designed VVER power plants. Russia, however, is far from being isolated and continues to enjoy a degree of success thanks to its diversified offering. Domestically, it continues both to expand its nuclear fleet and pursue technological innovation.

Russia's eyeing Asia?

The term 'Asian pivot' refers to Russia's strategy of strengthening its ties with Asia in order to rebalance its trade and diplomatic relations, amid heightened tensions with the West. Whether in Uzbekistan, Kazakhstan, China, Bangladesh, India, Vietnam, or Myanmar, one thing is certain: Rosatom continues to find receptive partners in the East.

Firstly, Rosatom remains involved in several international construction projects in Bangladesh, China, Egypt, Hungary, India, and Turkey. A total of 18 VVER reactors are currently under construction for export. First concrete for Unit 1 of Hungary's two units is expected to be poured this year, and several of these reactors are nearing commissioning, including Rooppur-1 (Bangladesh), Akkuyu-1 (Turkey), Kudankulam-3 (India), and Tianwan-7 (China). In Uzbekistan, initial work has commenced on the non-nuclear buildings of a two-unit SMR power plant. This is both the Russia's first SMR export and Uzbekistan's first nuclear project. Construction of Unit 1 is scheduled to begin in 2027. In addition, a plant with two to four VVER-1000 reactors is under consideration under an agreement signed in June 2025.[31] Also in June 2025, Rosatom was selected to build Kazakhstan's first power plant comprising two VVER-1200 reactors.[32] The financing mechanisms for this project are under consideration with an estimated cost of $14 billion.

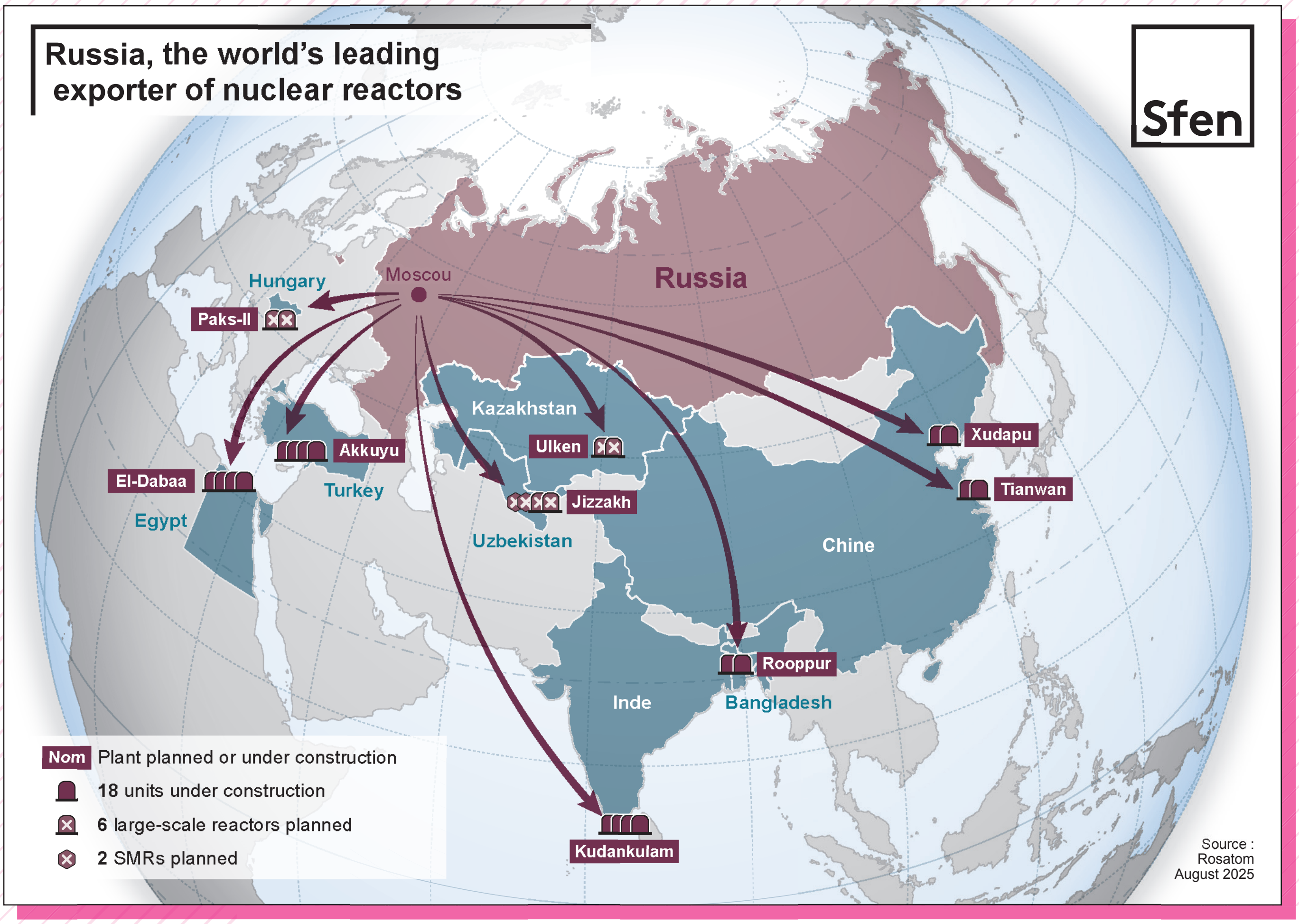
Before these developments, Russia signed cooperation agreements with Vietnam in May 2025, ranging from research to the potential construction of a VVER-1200 power plant, although Rosatom CEO Alexey Likhachev, insisted that this was a "long journey" towards nuclear energy.[33] In Myanmar, cooper-



Electricity mix 2022
Gas : 45,1%
Coal : 16,3%
Nuclear : 19,4%
Hydro : 17,3%
Other : 1,9%
Source : AIE.

31 • World Nuclear News, "Uzbekistan studying option of a four-unit VVER-1000 plant", 20 June 2025.
32 • Rosatom, Newsletter, 18 June 2025.
33 • World Nuclear News, "Vietnam and Russia 'to expedite' nuclear power plant talks", 12 May 2025.

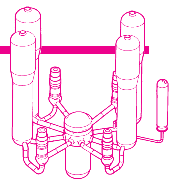
Russia



ation agreements were signed on 04 March 2025, to study, among other things, the potential deployment of an SMR project of between 110 to 330 MWe.

Nuclear fleet renewal

Moscow continues to modernise its fleet with third-generation reactors, while a roadmap sets out plans for an additional 30 GW of nuclear power, from both large and small units, by 2042. With construction of a VVER-1200 unit commencing at the Leningrad power plant in spring 2024, the country now has four units under construction. Of the 36 reactors in operation, 11 were connected to the grid after 2010. Russia is also supporting SMRs, as evidenced by the commercial commissioning in 2020 of the Akademik Lomonosov, a barge equipped



QUID Industrial capacity

Russia has a strong industrial base supported by a steady order book. JSC AEM-Technologies, part of JSC Atomenergomash, manufactures forged and cast components for the petrochemical sector and for thermal and nuclear power plants (shells and other reactor-vessel parts, steam generators, primary coolant pump units, etc.). The company operates four major plants; Petrozavodskmash, Izhora, AEM-SpetsStal, and Atommash, and in 2023 it produced five reactor pressure vessels and had 18 steam generators for VVER units under construction.

Russia

with two 30 MWe units moored at the port of Pevek in the Russian Far East. Rosatom subsidiary, OKBM Afrikantov, is offering several successors to the KLT-40S barge reactor with its RITM-200 series (55 MWe), including land-based and marine reactor versions. The Russian schedule envisages the commissioning by the end of the decade of two 55 MWe RITM-200Ns in Yakutia, as well as two barges, i.e. four additional units to power a gold and cobalt mine in the east of the country. The RITM-200N is derived from the nuclear propulsion systems that the latest generation of icebreakers are using and that are already in series production. As of March 2025, eight RITM-200s were in simultaneous production, either for nuclear propulsion or for future barges.[34] The Russian industry is thus gaining significant experience to cement its position in the field of small-scale nuclear power.

Russia is accelerating towards closure of the fuel cycle

Russia's significant uranium reserves are still difficult to exploit. As a result, the country produces less than half of the natural uranium needed for its domestic nuclear power plants, while it also has to ensure adequate fuel supplies for the reactors it is constructing abroad. The Russian fleet consumes 5,430 tU/year, and demand is expected to double as the VVER reactors currently under construction for export are brought online.[35]

The first solution to alleviate this bottleneck is to source ore abroad, particularly from Kazakhstan, where joint ventures between Russia's Uranium One and Kazatomprom operate six major deposits. The Rosatom conglomerate is also seeking to build new partnerships in Namibia, Tanzania, and Kyrgyzstan.[36]

34 • World Nuclear News, «Eight RITM reactors currently under production», March 2025.

35 • Observatoire de la sécurité des flux et des matières énergétiques, « L'approvisionnement en uranium naturel : enjeu de la relance nucléaire » [Supply of natural uranium: a challenge for the nuclear revival], January 2025.

36 • NEA, IAEA, «Uranium 2024: Resources, Production and Demand».

HIGHLIGHT

Preparatory work for construction of the BN-1200 began in July 2025. According to Rosatom, first concrete for this 1,200 MWe sodium-cooled fast neutron reactor is scheduled for 2027.

The second solution is to optimise excess enrichment capacity by operating enrichment plants with very low U-235 tails assays (underfeeding), and/or by re-enriching depleted uranium. Thirdly, and still focusing on conserving material, Rosatom is developing a new fuel for its pressurised-water reactors that allows for multiple recycling; the first assemblies were loaded into Unit 1of the Balakovo power plant in 2021.

At the same time, Russia is stepping up its fast-reactor-based closed fuel cycle strategy. The country operates two sodium-cooled fast neutron reactors, the BN600 and the BN800, which were commissioned in 1980 and 2015 respectively. In June 2025, the nuclear safety authority approved the extension of the BN600's operating life to 2040. Preparatory works ahead of the construction of a BN-1200 MWe sodium-cooled fast reactor also commenced this year, with first concrete planned for 2027. France remains the only country in the world to have operated this reactor technology at such a high power level. Also noteworthy is the construction since 2021of a lead-cooled fast neutron reactor (BREST-OD-300) in Seversk. This reactor is part of the Proryv (Breakthrough) project, which also includes the construction of a plant for manufacturing new or recycled fuel as well as a reprocessing plant.[37] ■

37 • OCDE-AEN, «The NEA Small Modular Reactor Dashboard: Third Edition», July 2025.

India

7 India's nuclear industry is gearing up

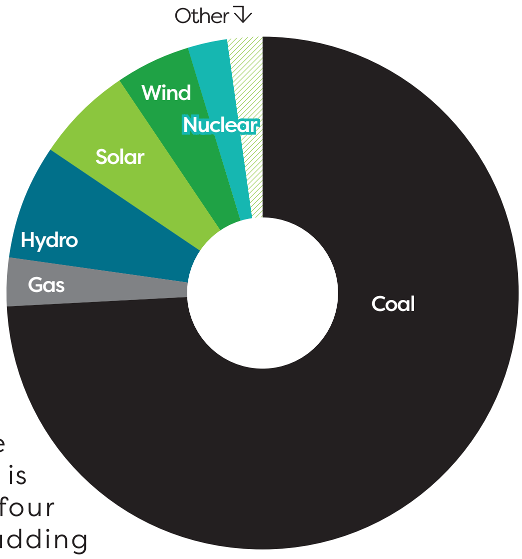
OVERVIEW India's nuclear industry is undergoing a major transformation aimed at accelerating the deployment of new reactors. The government is seeking a tenfold increase in installed nuclear capacity by 2047, reaching a total of 100 GW.

India needs to meet rapidly growing electricity demand while targeting carbon neutrality by 2070. With electricity production growing at roughly 10% per year, the country now generates 2,000 TWh, double its 2010 level, and four times that of France. In order to meet its twin goals, the Indian government is turning to nuclear power. According to the targets set at the beginning of 2025, total installed nuclear capacity, which currently stands at 7.5 GW across 23 reactors, could reach 22 GW in 2032, and then 100 GW in 2047. The World Nuclear Industry Status Report 2025 (WNISR 2025) identifies six reactors currently under construction in India, amounting to 5 GW approx. of capacity. In parallel, the World Nuclear Association (WNA) reports approximately ten additional reactors in the planning or pre-construction pipeline, corresponding to an estimated 7 GW of further capacity. Achieving the target of 100 GW by 2050 will require a considerable expansion of India's nuclear industry.

The rollout of large reactor series programmes

The government has initiated construction of a series of 700 MW PHWRs using natural uranium, on a technology derived from earlier Canadian CANDU designs (1960s imported models). Three units are now grid-connected (2021, 2024, 2025) and a fourth is currently under construction. Ten more units have been officially approved as part of the long-term fleet programme and are at various stages of planning. Russian VVER-1000 reactors are also contributing to the expansion. At the Kudankulam Nuclear Power Plant, India operates two VVER-1000 reactors (since 2013 and 2016) and is currently building four more, potentially adding roughly 4 GW of nuclear power capacity, if all are completed.

Alongside these projects, negotiations with foreign suppliers continue, including with EDF for the supply of six EPRs in Jaïtapur, Rosatom for six VVER-1200s, and Westinghouse for six AP1000s in Andhra Pradesh. If the EPR project is confirmed, the Jaïtapur plant would be the most powerful in the world with an installed capacity of nearly 10 GW. Combined, these three foreign-supplier projects could add around 23 GW. Lastly, the government is also considering the deployment of SMRs using two technologies, namely the 220 MWe Bharat SMR heavy-water reactor, and an imported light-water reactor that is still



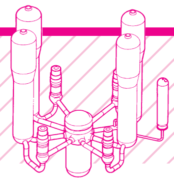
Electricity mix 2023
- **Coal :** 74,4%
- **Gas :** 3%
- **Hydro :** 7,2%
- **Solar :** 6%
- **Wind :** 4,7%
- **Nuclear :** 2,5%
- **Other :** 2,2%

Source : AIE.

HIGHLIGHT

With six reactors under construction and ten more in the pipeline, India now has the world's second-largest nuclear programme, after China.

India



QUID
Industrial capacity

India has an industrial base dedicated to supporting its national nuclear programme. For major nuclear system components, the country can rely in particular on Larsen & Toubro, which has contributed to virtually every nuclear construction project. Similarly, Bharat Heavy Electricals Limited (BHEL), India's largest engineering and manufacturing company in the power sector, has the capability to produce the full range of power-plant equipment. EDF subsidiary Arabelle Solutions also operates in India, with a facility that provides integrated nuclear turbine solutions.

to be selected, with a capacity of around 300 MWe. These modular reactors are intended initially to replace life-expired coal-fired power plants at industrial sites.

The nuclear sector is undergoing major restructuring

The Indian government has launched a major legislative initiative to transform the sector. This includes allowing the private sector to contribute to the country's nuclear programme, in contrast with the current situation where nuclear power is wholly controlled by the State-owned Nuclear Power Corporation of India Limited (NPCIL). Going forward, private sector entities could, as a result, own up to 49% of the shares in joint ventures established with public entities. However, that is not the full extent of the changes. A series of amendments aim to simplify the development of new projects including easier land acquisition, smaller exclusion zones around industrial sites to permit SMR co-location, and an overhaul of nuclear the civil liability space between technology suppliers and nuclear operators in the event of serious accidents, etc. On this last point, it should be noted that under Indian law, in the event of an accident, the nuclear operators can currently claim unlimited financial compensation from technology supplier and with no deadline restrictions. Since early 2025, the government has been working to reform this point to comply with international standards and thus facilitate private sector participation in financing the major projects mentioned above. Thanks to this initiative, India also hopes to reduce construction times for its 700 MW reactors from the current average of ten years down to six years.

Closing the fuel cycle: India's fast neutron reactor soon to enter commissioning phase

India has eight uranium mines with production supplying 35% of the current nuclear fleet. To weaken its dependence on uranium, India's national strategy aims first to commission fast breeder reactors, followed by advanced heavy water reactors that would operate on thorium-based fuel (with fertile thorium converted to fissile U-233 after neutron capture). India holds a significant 13% of the world's identified thorium reserves.[38] However, the AHWR/thorium pathway is not expected to play a role in achieving the targeted 100 GW for 2047.

In addition to the small research reactor based on the French Rapsodie model, the country has built a 500 MW sodium-cooled industrial demonstrator. Launched in 2004, the project has experienced significant delays, and commissioning has been postponed to March 2026.[39] The development of such reactors goes hand-in-hand with the construction of facilities for reprocessing spent fuel. India has three small plants designed for natural-uranium-based fuels in its operating fleet and inaugurated a pilot facility in January 2024 to demonstrate fuel reprocessing from fast neutron reactors. Despite the hurdles, the country is establishing itself as a leader in closed-cycle technologies. ■

38 • World Nuclear Association
39 •Government of India, Press Information Bureau, "Parliament question: Prototype Fast Breeder Reactor", 21 June 2025.

Japan

8 Japan turns towards the nuclear power of tomorrow

OVERVIEW Japan's existing fleet restart plan continues with fourteen units now back in operation. Furthermore, Japanese nuclear power is moving forwards with regulatory changes that mean plants can remain in operation longer, and plans that focus on building safer and more innovative units.

Following the Fukushima nuclear accident in 2011, all 54 reactors on the archipelago were shut down. After major nuclear safety reforms, 33 of those 54 reactors were deemed to be 'operable' (i.e. can restart if meeting safety requirements) and the first restart occurred in 2015. Since then Japan has restarted a total of 14 out of those 33. While restarting the existing fleet remains a key government priority, the renewal of Japan's nuclear capacity is now receiving growing attention. In July 2025, for the first time since the 2011 nuclear accident, Kansai Denryoku (Kepco), Japan's most nuclear-reliant power company, operating in the Osaka region and playing a central role in the national reactor restart strategy, announced that it was launching a feasibility study with the aim of building a new nuclear reactor. Although the study is still at a very early stage it marks a step forward towards the return to ongoing nuclear power production. Press reports also suggest that Mitsubishi Heavy Industries (MHI), designer of the Gen III SRZ-1200 reactor is consulting with 200 suppliers with the aim of being ready to build again.[40] Japan aims to raise the share of nuclear power in order to achieve a diversified electricity mix by 2040, that targets 40-50% from renewables (up from roughly 23-26% in 2023), 20% from nuclear (up from 8.5%), and 30-40% from thermal generation (down from roughly 69%). [41]

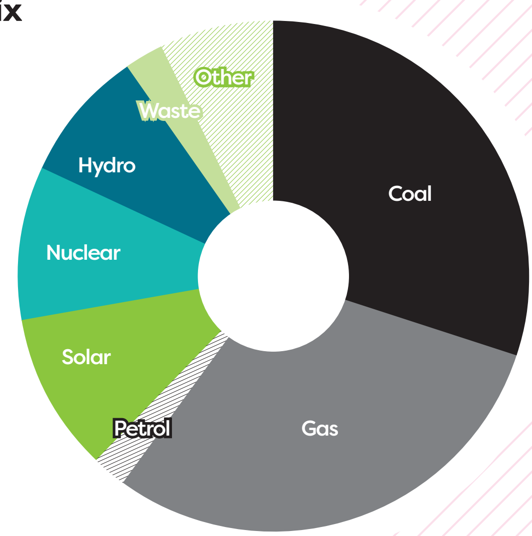
40 • Nikkei Asia, «Mitsubishi Heavy talks to 200 suppliers to rebuild Japan nuclear reactors», 07 May 2025.

41 • Agence des Ressources naturelles et de l'Énergie, «The 7th Strategic Energy Plan», February 2025.

Electricity mix 2024

- **Coal :** 30,1 %
- **Gas :** 29,9 %
- **Petrol :** 2,3 %
- **Solar :** 10 %
- **Nuclear :** 9,5 %
- **Hydro :** 8,7 %
- **Waste :** 2,4 %
- **Other :** 7,1 %

Source : AIE.



Safety reforms geared towards long-term operation

On 06 June 2025, the new energy law (GX-Green Transformation) came into effect, modifying, among other things, Japan's nuclear safety framework. Under the previous system, a nuclear reactor was granted a 40-year operating licence with the option of a single 20-year extension, thus capping its operating life at sixty years. In order to give greater predictability to industry stakeholders, the new energy law replaces the concept of a reactor's operating life with that of its operating period. Going forwards, the sixty-year operating period may well exclude certain shutdown intervals that arise for reasons beyond the operator's responsibility (regulatory changes, legal decisions and so on), thus poten-

Japan

tially extending calendar times.[42] This will thus mean that the ten-year plus reactor stoppage following the Fukushima shutdown will no longer be counted in the calculations of reactors' operating periods. Lastly, with the average age of Japan's 33 operational reactors now standing at 35 years, operators are required to submit an ageing-management plan to the Nuclear Regulation Authority (NRA) once a unit reaches 30 years of operation, and every ten years thereafter.

Public opinion remains strongly influenced by the nuclear accident

Japanese society focuses on health and economic issues. When it comes to the issue of nuclear power, the population remains ambivalent. For many, nuclear power continues to carry a negative connotation, although it is also perceived as useful, even indispensable. In the Japan Atomic Energy Relations Organization (JAERO) October 2024 survey, 55% of respondents selected 'dangerous' among the various images they associate with nuclear energy.[43] Roughly 40% of the population supported the use of nuclear power, albeit within the framework of a gradual phase-out. Only 18.3% favoured increasing or maintaining the same number of reactors as before the accident. However, examining trends over time, support for nuclear energy grew by 7 percentage points between 2021 and 2024, while the share of respondents calling for a rapid phase-out fell from 16.9% in 2016 to only 4.9% in 2024. At 40%, the proportion favouring a gradual exit stands at its lowest level since 2014. The overall trend is therefore positive for nuclear power, although the topic remains complex, with 33% of respondents indicating they cannot express an opinion, some ten percentage points more than in 2021. Among them, 27% said there was "too much information," while 25.9% said there was "not enough information to form a view." In addition, 33.5% say they "do not know which information to trust." In short, although attitudes have improved over the past decade, the mistrust triggered by the nuclear accident remains tangible. Rebuilding public confidence therefore remains a key challenge if nuclear power is to contribute more fully to Japan's energy security and energy transition.

Advanced reactor technologies and nuclear fusion: innovation continues to progress

Japan's 7th Energy Plan published in February 2025 includes the promotion of research and development into the reactors of tomorrow including third-generation light-water reactors, small modular reactors, fast neutron reactors, high-temperature reactors, and nuclear fusion reactors. Mitsubishi Heavy Industries (MHI), Framatome's counterpart, is at the heart of this strategy, as the manufacturer is working on all of these technologies. In line with its fuel-cycle closure strategy, in 2023 the government tasked MHI with working on a fast neutron reactor concept for launch as early as 2040. Framatome, EDF and the CEA (French Alternative Energies and Atomic Energy Commission) will contribute to the programme under cooperation agreements signed in December 2024 with JAEA, MHI, MFBR and JAPC. Japan also wants to restart Jôyô, a small experimental sodium-cooled fast test reactor,

42 • *Forum industriel japonais (JAIF), "GX Decarbonization Power Source Act Enacted", June 2025.*
43 • *Japan Atomic Energy Relations Organization (JAERO), poll conducted over the year 2024.*

HIGHLIGHT

Japan continues to pursue an ambitious research and development policy. In December 2024, the country signed a new cooperation agreement with its French partners to advance the development of a demonstration sodium-cooled fast neutron reactor.

Japan

which was shut down in May 2007, with a restart date planned for the second half of 2026, notably to produce a medical isotope (actinium-225).

Japan is also interested in high-temperature reactors due to their intrinsic safety characteristics and their potential for hydrogen production. Japan is one of the few countries to have a reactor in operation, namely a 30 MWth experimental reactor (HTGR). The Ministry of Economy, Trade and Industry (METI) has tasked MHI with developing the concept for a demonstrator reactor scheduled for commissioning in the late 2030s.

As a stakeholder in the ITER project, Japan is also involved in nuclear fusion. In addition, in November 2024, the FAST (Fusion by Advanced Superconducting Tokama) project was unveiled, and it aims to commission a demonstrator (tokamak) in the late 2030s.

Ensuring the effective management of the back-end of the nuclear fuel cycle

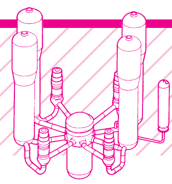
In August 2024, following a change in the Nuclear Regulation Authority's (NRA) seismic calculation rules, the commissioning of the spent-fuel reprocessing and the MOX fuel fabrication plants were further postponed until fiscal year 2026 for the former, and fiscal 2027 for the latter. In 2023, METI stated, however, that the spent-fuel storage pools at power plant sites were 80% full on average, and likely even fuller for operators with restarted units.[44] To meet this challenge, Japan is turning to Orano for MOX fuel manufacture. On 02 December 2024, two contracts were signed for the supply of 64 MOX fuel assemblies. Four reactors can now accommodate MOX and the Japanese industry's goal is to have twelve MOX-capable units by 2030.[45] In addition to this, Japanese operators, through the Federation of Electric Power Companies (FEPC), are collaborating with Orano on multirecycling (reprocessing MOX fuels).[46] Lastly, several operators are also building dry storage facilities to ensure uninterrupted nuclear power generation. [47]

The first decommissioning site commences operations

The operator in the Chûbu region began decommissioning the reactor core of Unit 2 at the Hamaoka power plant in March 2025. This is the first decommissioning of a commercial reactor. The combined estimated cost for the Units 1 and 2 is JP¥83 billion (€480 million approx.).[48] It should also be noted that Japan is prioritising the recycling of very low-level radioactive metals with a dedicated plant planned for the Fukui Prefecture. The company responsible for this project was created in August 2025 with investment from the nuclear industry, the Prefecture, and the six municipalities of Reinan. ■

44 • METI–Enecho, "The Current Status of the Nuclear Fuel Cycle to Efficiently Utilize Spent Fuel", 18 July 2023.

QUID
Industrial capacity



Japan can rely on Mitsubishi Heavy Industries (MHI) and the Japan Steel Works (JSW) forge for the manufacture of large forged components such as reactor vessels, steam generators, and pressurisers.

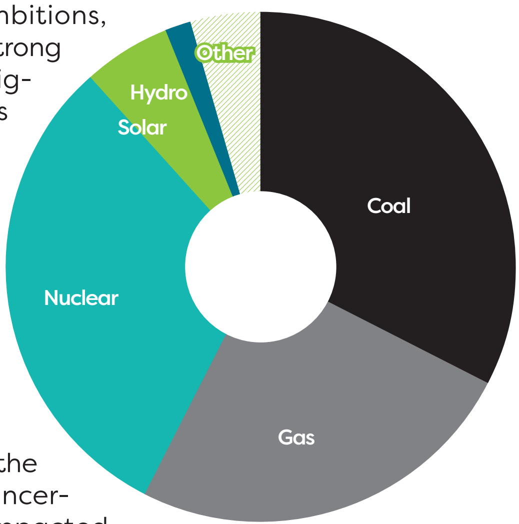
45 • World Nuclear News, "French-Japanese MOX fuel recycling studies expanded", 13 February 2025.
46 • The 29th N-20 Joint Statement, 01 May 2025.
47 • JAIF, "NRA Approves Dry Storage Facilities at Onagawa and Takahama", June 2025.
48 • The Asahi Shimbun, "Dismantling work begins at Hamaoka nuclear plant", 17 March 2025.

South Korea

9 A new period of uncertainty dawns in the Republic of Korea

OVERVIEW In 2022, South Korea made a commitment to revive its nuclear programme. With the change of government in June 2025 uncertainty surrounds this forward momentum. Notwithstanding, given its strong industrial capabilities, the ROK remains a major player in global projects.

The Republic of Korea (ROK) is navigating a new period of political instability that may lead to a scaling-back of its nuclear expansion ambitions, notwithstanding the industry's strong international credentials and significant US demand. The ROK's newly-elected president, Lee Jae-myung, who took office in June 2025, has emphasised renewable energy, supports retaining current nuclear plants, but opposes building new reactors for the time being. [49]



Electricity mix 2024
- **Coal :** 32,6 %
- **Gas :** 24,9 %
- **Nuclear :** 31,1 %
- **Solar :** 5,5 %
- **Hydro :** 1,5 %
- **Other :** 4,4 %

Source : AIE.

The political backdrop

Although energy policy is not the reason per se for the political uncertainty, it is nonetheless being impacted. At the end of 2016, the impeachment of conservative President Park Geun-hye triggered fresh elections that saw democratic candidate Moon Jae-in come to power. President Moon Jae-in sought to gradually phase-out nuclear power (no new builds and no operating lifetime extensions). In 2022, conservative President Yoon Suk-yeol reversed this approach and relaunched the project to build two APR-1400s at Shin-Hanul, with construction on Unit 1 starting in May 2025. However, Yoon Suk-yeol was rapidly removed from power after an attempted coup in December 2024. After fresh elections, democratic candidate Lee Jae-myung's government came to power in June 2025. However, its position on nuclear remains ambivalent. One point is clear: Democratic Party lawmakers are vehemently critical of the confidential intellectual-property settlement between the state-owned KHNP and the American company Westinghouse. This agreement continues to cast uncertainty over South Korea's longer-term position in the global nuclear market.

What does the future hold for the APR-1400?

The APR-1400 is a 1,400 MW third-generation reactor promoted by the Korean nuclear industry, both domestically and for export. Eight of these units are currently operating worldwide; four in Korea and four in the United Arab Emirates. Two

49 • *Japan Times, "South Korea's presidential front-runner backs nuclear power — for now", June 2025.*

South Korea

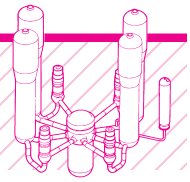
additional units are due to enter into service in Korea in 2026, alongside the unit currently under construction at the Shin-Hanul site, where a second unit is also planned.

In recent years, KHNP, which has been actively promoting its reactors across Europe has withdrawn from several projects, and some press reports are noting concerns that its agreement with Westinghouse may restrict its Western ambitions to a limited number of markets, particularly Dukovany in the Czech Republic.[50] The agreement reportedly includes a payment of US$ 825 million per APR-1400 reactor to Westinghouse over 50 years (covering goods, services, and technology licensing), and that the two companies have held discussions about forming a joint venture to enable KHNP's entry into the U.S. market.[51] KHNP has indeed stepped back from several European tenders in Sweden (December 2024), Slovenia (February 2025), the Netherlands (March 2025), and Poland (August 2025), and its Dukovany contract in the Czech Republic that was signed in June 2025, remains under ongoing EU examination for potential foreign-subsidy concerns. The financing profile remains to be fully determined and validated. As a result ROK's APR-1400 export ambitions could be revised downwards. The smaller APR-1000 reactor will probably also likely remain a project confined to the Czech Republic.

South Korea a bulwark for the global nuclear revival

Despite the uncertainties mentioned above, the South Korean industrial sector will remain a key player in the global nuclear revival. In particular, it is being called upon to develop and build small modular reactors in the United States. For example, KHNP and Doosan Enerbility partnered with X-Energy and Amazon in August 2025 to advance the deployment of the Xe-100 SMR (a small 80 MW high-temperature reactor). The partners plan to mobilise up to US$50 billion in public and private investment for U.S. projects. Since 2023 Doosan has also been forging the first components of NuScale's SMR. The Korean industry will be well positioned to contribute to the construction of AP1000 reactors now that President Trump has announced a fourfold increase in the US nuclear capacity target. Korean companies have already participated in the construction of two American AP1000 reactors at Vogtle and four Chinese units, two each at Sanmen and Haiyang. ■

QUID
Industrial capacity



Among other activities, South Korea's Doosan (now Doosan Enerbility) manufactures large forged components for nuclear reactor boilers, for both South Korean and US nuclear reactors.

HIGHLIGHT

The Democratic Party's rise to power in June 2025 raises questions over the nuclear ambitions laid out by the previous administration.

50 • *The Korea Herald, «Westinghouse deal tensions loom over Korea-US summit», 20 August 2025.*

51 • *Financial Times, «US-South Korea nuclear reactor tie-up proposed amid accusations of 'slave contract'», 21 August 2025.*

Africa

10 Africa is a real stakeholder in the nuclear revival — from uranium to reactors

OVERVIEW Africa is also fully involved in the global nuclear revival. At one level, small and microreactors represent an attractive option for the continent. On another, rising uranium prices driven by renewed worldwide interest in nuclear power are opening up new opportunities for exploration and production.

The African continent currently has just one commercial nuclear power plant, located in South Africa, with two reactor units. Four units are also under construction in Egypt. However, many governments are considering turning to nuclear power to enable their economies to grow while also keeping CO2 emissions as low as possible. The rising popularity of small modular reactors could facilitate access to nuclear energy through smaller and less expensive projects. On 30 June 2025, representatives from host country Rwanda, Togo, Ghana, Mali, Kenya, Tanzania and Niger gathered in the capital Kigali for the Nuclear Energy Innovation Summit for Africa. They underlined their interest in nuclear power, whether for economic development (raw materials extraction and processing, industrialisation, etc.) or societal advancement (access to electricity, employment, reliable cold chains, etc.).

Only a few large reactor projects, but interest is growing

While most African countries are focusing on small-capacity reactors, others are opening the door to large power plants. The first of these is, of course, Egypt, which in 2022 commenced construction of the first of four VVER-1200 reactors at the El Dabaa power plant site. Although no other large power plant projects are expected on the continent in the coming years, several governments have expressed their interest. South Africa, for example, has repeatedly expressed its desire to build more units. In 2023 the potential for an additional 2.5 GW of nuclear power met was discussed and after much political debate the Minister of the Environment granted Eskom an environmental permit for a new power plant with capacity of up to 4 GW[52] In April 2024 Ghana signed agreements with the Chinese company CNNC for the potential construction of a Hualong-One unit and in May 2025 Uganda commissioned Korean company KHNP to conduct a site-evaluation study for up to four APR-1400 reactors.

While these projects demonstrate the interest in nuclear power, they still remain far from becoming a reality. To give an idea of the scale involved, 33 countries on the African continent have a GDP lower than the estimated $30 billion cost of the Egyptian nuclear project (€27 billion approx.).[53] Beyond the economic constraints, there are also technical considerations related to electricity grid networks, which would need to be capable of absorbing the output of a high-power unit. With this in mind, small (< 300 MWe) and even microreactors (< 10 MWe) are attracting considerable interest.

A series of memoranda of understanding for SMRs

In recent years, there has been a proliferation of memoranda of understanding relating to small reactors. For example, in 2022 Ghana announced that it would study the construction of small modular reactors with the United States and Japan as part of the FIRST programme. Two years later, in September 2024, it announced it was collaborat-

52 • *Reuters, "South Africa pushes ahead with new Cape nuclear plant," 08 August 2025.*
53 • *Trading Economics.*

Africa

ing with NuScale to study the construction of a plant based on the American designer's technology. This interest was renewed in April 2025. US company Nano Nuclear Energy, which provides microreactors, signed cooperation agreements in Rwanda in August 2024 and in Togo in December 2024. It should also be noted that South Africa is seeking, with support from China, to relaunch a high-temperature pebble-bed reactor (PBMR) project. Lastly, in June 2024, the Republic of Guinea expressed interest in Rosatom's floating nuclear power plants. Rosatom also signed agreements with Mali and Niger during the summer of 2025, although it is still difficult to judge the true substance of these memoranda of understanding (MoUs), which also function as political messaging, especially insofar as their post-coup regimes have moved into a closer orbit of Russian influence.

HIGHLIGHT

In 2025, the World Bank lifted its ban on financing nuclear projects. It placed particular emphasis on small modular reactors, thereby opening up new opportunities for Africa.

China and Russia - preferred partners for uranium mining on the continent

With Russia looking to meet the challenge of fuelling both its domestic nuclear reactors as well as those sold to third countries, and China seeking to ensure that fuel supplies are sufficient for its rapidly growing national fleet, Africa appears as part of the solution. According to estimates, Africa accounts for 21% of the world's uranium resources that can be mined at under $130/kg.[54] Namibia (8%), Niger (6%), and South Africa (5%) account for the bulk of this percentage. In 2023, Namibia accounted for 14% of global production, compared with only 2% for Niger and 0.3% for South Africa.[55] Namibian production is mainly destined for the Chinese nuclear fleet. China National Nuclear Corporation (CNNC) has held nearly 70% of the Rössing mine since 2019 and 25% of the Langer Heinrich mine, which was reopened in 2024. China General Nuclear (CGN) owns 90% of the Husab mine in partnership with the China Development Bank. Namibia also dominates the exploration sector, having dedicated roughly 70% of the $95 million allocated in 2022 for exploration on the continent.[56] Russia is seeking to resume its exploration project at the Wings deposit in Namibia.[57] Rosatom estimates that this could represent annual production of 3,000 tons of uranium per year for twenty-five years. However, various reports note that water scarcity in Namibia limits further expansion of uranium production and Rosatom has also faced pushback from the Namibian Ministry of Agriculture.[58] In the shorter term, Russia is focusing on Tanzania with a pilot project launched in July 2025 and production is scheduled to begin in 2029.[59] The nominal production capacity is estimated at 3,000 tons of uranium per year.[60] ■

54 • IAEA, NEA, *"Uranium 2024: Resources, Production and Demand."*

55 • *Observatoire de la sécurité des flux et des matières énergétiques, « L'approvisionnement en uranium naturel : enjeu de la relance nucléaire » ("Supply of natural uranium: a challenge for the nuclear revival"), January 2025.*

56 • *IAEA, NEA, "Uranium 2024: Resources, Production and Demand," 2024.*

57 • *Rosatom / Headspring Investments, "Wing project," 2025.*

58 • *Observatoire de la sécurité des flux et des matières énergétiques, « L'approvisionnement en uranium naturel : enjeu de la relance nucléaire » ("Supply of natural uranium: a challenge for the nuclear revival"), January 2025.*

59 • *World Nuclear News, "Pilot uranium processing plant launched in Tanzania," 31 July 2025.*

60 • *Rosatom, "Marking a milestone in the development of Tanzania's strategic uranium reserves," 30 July 2025.*

Rest of the world

Bangladesh

Russia is building Bangladesh's first nuclear power plant in Rooppur, 30 km from the Indian border, which includes two VVER-1200 reactors. Construction on the first unit commenced in November 2017, and in July 2018 for the second unit. Hot functional testing continued during the summer of 2025, suggesting commissioning for the first unit will occur before the end of the year. The Rooppur plant will account for 15% of the country's electricity production.

Brazil

Brazil has one power plant with two reactors in operation and another, Angra-3, the construction of which has been on hold since April 2023. Construction of Angra-3 has been stop-start since it commenced in 2010 and the goal now is for it to reach commissioning by 2031.

United Arab Emirates

The fourth and final unit of the Barakah nuclear power plant connected to the grid in March 2024. Less than fifteen years after the start of construction of the first reactor, nuclear power already accounts for more than 20% of the country's electricity production.

Kazakhstan

In June 2025, Kazakhstan selected Rosatom to build its first nuclear power plant comprising two reactors. The country which supports a population of 20 million is also looking to launch a second project at the same time, this one with Chinese partners. In terms of mining, Kazakhstan is the world's leading uranium producer, with 43% of global production in 2022. [61]

Mongolia

Mongolia has no nuclear reactors, but it has 2% of the world's identified uranium reserves. In January 2025, Orano and the Mongolian government signed an investment agreement to develop and operate the Zuuvch Ovoo uranium mine in the southeast of the country.

Uzbekistan

The country does not have any nuclear reactors but intends for that to change. It signed agreements with Rosatom in 2017 to build two Russian 1,200 MW units and six small 55 MW modular reactors. It is now considering building two to four high-power units, but according to the latest statements, the SMR project is being scaled back to only two 55MW units.[62] The first concrete for the first SMR is scheduled for pour in 2027.

Pakistan

The country has six nuclear reactors in operation, all based on Chinese technology, which together accounted for approximately 16% of national electricity production in 2024. Two third-generation reactors came into service in 2021 and 2022, while a third has been under construction in Chashma since December 2024.

Turkey

Turkey has ordered four VVER-1200 units from Russia. First concrete for the first unit was poured in 2018 and the Turkish president has stated that industrial commissioning of the first unit is expected before the end of 2025.[63] The plant will eventually meet around 10% of the country's electricity needs.

Vietnam

Vietnam is once again pursuing nuclear ambitions as the government seeks to revive the Ninh Thuan nuclear project, which was approved in 2009 but abandoned in 2016. The project included construction of two Russian VVER reactors. A second project in the same region, led by a Japanese consortium, was also abandoned in 2016. In May 2025, Vietnam and Russia signed cooperation agreements, notably for the construction of a second research reactor in the country.[64]

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61 • *AIEA, AEN, Uranium 2024: Resources, Production and Demand.*
62 • *Anewz, "Uzbekistan revises small nuclear power plant project, explores larger facility with Russia," 24 June 2025.*
63 • *TRT, « Erdogan annonce que la centrale nucléaire Akkuyu commencera à produire l'électricité d'ici fin 2025 », ("Erdoğan announces that the Akkuyu nuclear power plant will begin producing electricity by the end of 2025"), May 2025.*
64 • *World Nuclear News, "Vietnam and Russia 'to expedite' nuclear power plant talks," 12 May 2025.*

Data

Data

I - Nuclear power worldwide

1• Nuclear reactors worldwide in 2025 *(Source: IAEA-PRIS, September 2025*

	2023	2024	2025 (septembre)
Reactors currently in operation	410	417	416
Reactors in suspended operational mode	27	25	23
Reactors under construction	57	62	63

2• Nuclear power worldwide in 2025 *(Source: IAEA-PRIS, September 2025)*

Country	Nuclear Capacity (GW)	Reactors under construction	Reactors in operation	% Share of 2025 electricity production
United States	97	0	94	18.6
France	63	0	57	67
China**	61	32	58	5
Russia	27	4	36	18
Republic of Korea	25	2	26	32
Canada	12.7	0	17	13
Ukraine	13	2*	–	-
Japan	12.6	2*	14	8
India	7.5	6	21	3
Spain	7	0	7	20
Sweden	7	0	6	29
United Kingdom	5.8	2	9	12
United Arab Emirates	5.3	0	4	22
Finland	4.3	0	5	40
Czech Republic	4	0	6	40
Belgium	3.4	0	4	42
Pakistan	3.2	0	6	17
Switzerland	3	0	4	27
Slovakia	2.3	1	5	60
Belarus	2.2	0	2	36
Bulgaria	2	0	2	41
Hungary	2	0	4	47
South Africa	1.8	0	2	4
Brazil	1.8	1	2	2
Argentina	1.5	1	3	7.3
Mexico	1.5	0	2	5
Romania	1.3	0	2	20
Iran	0.9	1	1	1.70
Slovenia	0.7	0	1	35
Armenia	0.4	0	1	31
Netherlands	0.5	0	1	3
Bangladesh	0	2	0	0.00
Egypt	0	4	0	0.00
Turkey	0	4	0	0.00

***Project suspended-resumption date unknown ** Addition of CAP1400 units not listed in PRIS*

Data

3• Growth in world's nuclear fleet (2005-2024) *Source: AIEA – PRIS.*

Year	Nuclear Capacity (GW)	No. of reactors in operation
2005	368	442
2010	372	438
2015	364	423
2020	375	422
2024	377	417

4• Reactors connected to grid (September 2024-September 2025)

Reactor	Country	Power (Mwe)	Grid connection
Zhangzhou-1	China	1,126	28 November 2024
Flamanville-3	France	1,630	21 December 2024
Onagawa-2*	Japan	800	15 November 2024
Shimane-2*	Japan	800	12 December 2024
Rajasthan-7	India	630	17 March 2025

** Unit restarts following Fukushima accident*

5• Reactor closures (September 2024 – September 2025)

Reactor	Country	Power (MWe)	Permanent shutdown
Pickering-1	Canada	500	01 October 2024
Pickering-2	Canada	500	31 December 2024
Doel-1	Belgium	445	14 February 2025
Maanshan-2	Taiwan	938	18 May 2025

6• New nuclear reactor construction projects (September 2024-September 2025)

Reactor	Country	Power (MWe)	First Pour
Zhangzhou-4	China	1,100	27 September 2024
Chasnupp-5	Pakistan	1,100	30 December 2024
Taipingling	China	1,209	10 juin 2025

II - Third Generation Reactor Construction Periods

7• Korean reactor construction (APR1400)

Reactor (construction country)	Construction start	Grid connection	Construction period (months)
Saeul-1 (South Korea)	2008	2016	87
Saeul-2 (South Korea)	2009	2019	116
Shin-Hanul-1 (South Korea)	2012	2022	119
Shin-Hanul-2 (South Korea)	2013	2023	126
Average duration (South Korea)			**112 (9.3 years)**
Barakah-1 (United Arab Emirates)	2012	2020	97
Barakah-2 (United Arab Emirates)	2013	2021	100
Barakah-3 (United Arab Emirates)	2014	2022	96
Barakah-4 (United Arab Emirates)	2015	2024	103
Average duration (UAE)			**99 (8.2 years)**

Data

8• Chinese reactor construction (HPR1000)

Reactor (construction country)	Construction start	Grid connection	Construction period (months)
Fuqing-5 (China)	2015	2020	66
Fuqing-6 (China)	2015	2022	73
Fangchenggang-3 (China)	2015	2023	85
Fangchenggang-4 (China)	2016	2024	87
Zhangzhou-1 (China)	2019	2024	61
Average duration (China)			**74 (6.2 years)**

9• Russian reactor construction (VVER1200)

Reactor (construction country)	Construction start	Grid connection	Construction period (months)
Novovoronezh-2-1 (Russia)	2008	2016	97
Leningrad-2-1 (Russia)	2008	2018	112
Novovoronezh-2-2 (Russia)	2009	2019	117
Leningrad-2-2 (Russia)	2010	2020	126
Average duration (Russia)			**113 (9.4 years)**
Astravets-1 (Belarus)	2013	2020	83
Astravets-2 (Belarus)	2014	2023	109
Average duration (Belarus)			**96 (8 years)**

10• French reactor construction (EPR)

Reactor (construction country)	Construction start	Grid connection	Construction period (months)
Taishan-1 (China)	2009	2018	104
Taishan-2 (China)	2010	2019	110
Average duration (China)			**107 (9 years)**
Olkiluoto-3 (Finland)	2005	2022	199
Flamanville-3 (France)	2007	2024	203
Average duration (rest of world)			**154 (12.8 years)**

11• American reactor construction (AP1000)

Reactor (construction country)	Construction start	Grid connection	Construction period (months)
Sanmen-1 (China)	2009	2018	110
Sanmen-2 (China)	2009	2018	104
Haiyang-1 (China)	2009	2018	106
Haiyang-2 (China)	2010	2018	99
Average duration (China)			**104 (8.7 years)**
Vogtle-3 (United States)	2013	2023	121
Vogtle-4 (United States)	2013	2024	124
Average duration (United States)			**122 (10.2 years)**

Data

III - Small Modular Reactors

12• Certification of small modular reactors around the world (February 2025)

Source: AEN, SMR Dashboard.

Year	Pre-certification	Certification in progress	Certification approved	Construction authorised	Licensed for operation
2024	20	5	1	4	3
2025	33	7	1	7	3

13• Activities related to the selection of a construction site (February 2025)

Source: AEN, SMR Dashboard.

Year	Selection of technology by site owner	Construction permit obtained	Construction underway or completed
2024	17	1	6
2025	22	3	7

IV - Supply of uranium and enrichment capacity

14• Identified resources at a cost below USD 130/kgU as of 01 January 2023 *Source: AIEA, AEN.*

Country	Tonnes uranium	Percentage share
Australia	1,671,200	28
Kazakhstan	813,900	14
Canada	582,000	10
Russia	476,600	8
Namibia	497,900	8
Niger	336,000	6
South Africa	320,900	5
China	270,500	5
Brazil	167,800	3
Other	770,341	13
Total	**5,925,700**	**100 %**

Data

15• Global natural uranium production *Source : Euratom Supply Agency.*

	Production (tU) 2023	Global Share 2023 (%)	Production (tU) 2024	Global Share 2024 (%)
Kazakhstan	24,902	38.7	27,442	38.5
Canada	12,973	20.1	16,874	23.7
Namibia	8,255	12.8	8,664	12.2
Australia	5,534	8.6	5,443	7.6
Uzbekistan	-	-	4,717	6.6
Russia	3,175	4.9	3,084	4.3
China	1,905	3	1,905	2.7
Niger	1,315	2	1,134	1.6
Other	-	-	-	2.7

16• Uranium supply in Europe in 2024 *Source: Euratom Supply Agency.*

Country of origin	Share (%)
Canada	34
Kazakhstan	24
Russia	15.5
Australia	10.5
Niger	8.5
China	4.6

17• Enrichment capacity by company in 2022 *Source: Euratom Supply Agency.*

Company name	Capacity (SWU)	Percentage global share
Rosatom (Russia)	27,100	44
Urenco (UK, Germany, Netherlands, USA)	17,900	30
CNNC (China)	8,900	14
Orano (France)	7,500	12
Other (INB, JNFL)	100	0.001

Glossary of terms

AIEA = IAEA	International Atomic Energy Agency
AIE = IEA	International Energy Agency
AMR	Advance Modular Reactor-advanced technology
AP1000	American third-generation reactor (1100 MW)
APR1400	South Korean third-generation reactor (1400 MW)
ASN	Autorité de sûreté nucléaire (French nuclear safety authority)
Construction period	Period between a nuclear reactor project's first pour and its grid connection
EPR	French third-generation reactor (1650 MW)
EPR2	Optimized version of the EPR (1650 MW)
Gen III+	Third-generation type reactor
FHR	Fluoride Salt-Cooled High-Temperature Reactor
Haleu	High-Assay Low-Enriched Uranium
HTR	High-Temperature Reactor
Hualong-One	Chinese third-generation reactor (1000 MW)
MMR	Micro Modular Reactor
MW	Megawatt
MWe	Megawatt electric
MWth	Megawatt thermal
Na	Sodium
REB = BWR	Boiling water reactor
REP = PWR	Pressurized water reactor
RNR = FNR	Fast neutron reactor
SMR	Small Modular Reactor-small light water modular reactor
VVER-1200	Russian third-generation reactor (1200 MW)
WNA	World Nuclear Association

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