

Nuclear Energy Renaissance: A Potential Watershed Moment for European Energy

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Europe is working to bring nuclear energy back as a key component of its energy mix. Despite divergence in energy policy across the region, reviving nuclear power programmes is an objective shared by many. With lofty clean energy ambitions, nuclear proponents believe that public investment in the technology can help reduce emissions and increase energy security by the mid-century mark. Here, Europe's growing relationship with nuclear power will be underlined. Argument could be made that Europe is now positioned as a leader in the nuclear power space which could result in significant opportunities as the clean energy transition gathers steam.

Key Takeaways

- European energy policies are fragmented, but global interest in nuclear power is growing.^{1,2} A potential turning point for public-interest nuclear power was the inaugural Nuclear Energy Summit held in March 2024, the first high-level nuclear energy summit.³
- Russia's invasion of Ukraine in February 2022 was an inflection point for European energy. Russia cutting off gas supply to Europe via the Nord Stream pipeline that September prompted governments to prioritize energy security, including by way of nuclear power.⁴
- France and the United Kingdom stand out as leaders in new nuclear energy capacity. France has plans to add at least six new reactors, and the UK is considering a new large-scale nuclear reactor that could be the UK nuclear sector's greatest expansion in 70 years.^{5,6}

Nuclear Power Enters a New Era Across Europe

Heads of state from more than 30 nations and the European Union (EU) gathered in Brussels for the first Nuclear Energy Summit in Brussels in March 2024 to increase worldwide backing for nuclear power.⁷ The President of the European Commission (EC) has recognised that there are different views among EU member states regarding nuclear energy; however, she emphasised that the urgency of addressing climate change should prompt countries considering retiring their nuclear power facilities to carefully evaluate their options before dismissing a readily available source of low-emission electricity.⁸ The world's first high-level nuclear energy summit followed the United Nations Climate Change Conference (COP28), where for the first-time nuclear power played a crucial role and had its own dedicated pavilion.⁹ Delegates from dozens of countries emphasised the importance of nuclear power in achieving climate goals, sustainable development, and energy security.¹⁰

Europe is on board. In the EU, nuclear power accounts for about a quarter of total electricity and about half of the electricity that is low in carbon emissions.¹⁰ Different energy regimes are in place from country to country in the EU, but the continent is energy-connected from an infrastructure standpoint, and nuclear power is expected to become a bigger part of the mix.¹¹ Beyond the EU,



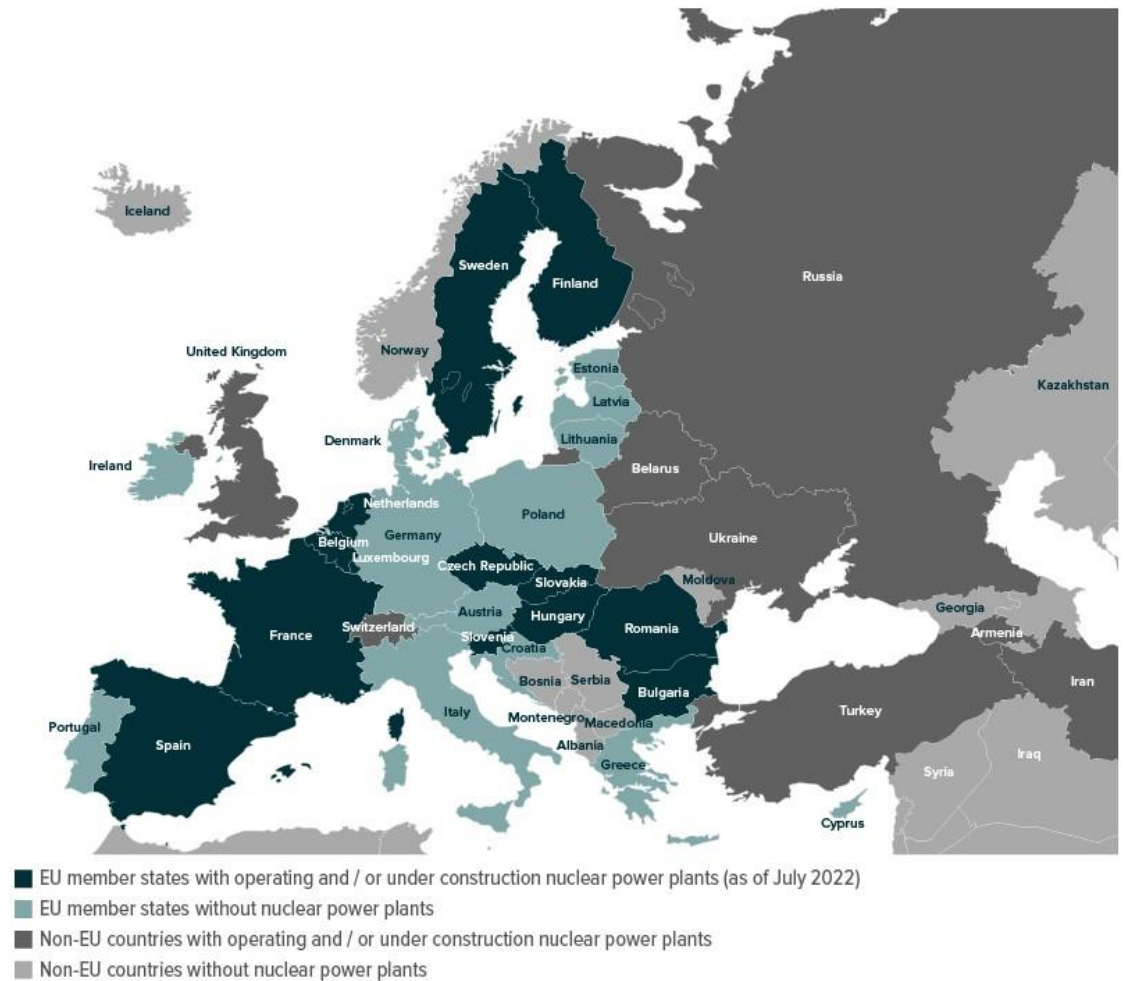
Switzerland, Norway, the United Kingdom, and certain Balkan states are to some extent electrically networked with the EU.¹²

To support new nuclear energy capacity and to hasten research, development, and implementation, the EC established the European Industrial Alliance on Small Modular Reactors in February 2024.¹³ The announcement coincided with the commission’s evaluation of the EU’s 2040 climate target.¹⁴ By the early 2030s, the alliance hopes to aid in the development of SMRs throughout Europe.¹⁵

The announcement was the latest in a series of recent measures designed to accelerate the clean energy transition. In March 2023, the EC proposed power market reforms under the Net-Zero Industry Act (NZIA) to increase clean technology production in the EU.¹⁶ SMRs were listed as advanced technologies that could help decarbonise energy.¹⁷ In November 2023, the European Parliament passed the NZIA, according to which Europe should produce 40% of its yearly deployment needs in net-zero technologies by 2030 and capture 25% of the worldwide market value.¹⁸

EUROPEAN NUCLEAR REACTORS MAP

Sources: Global X ETFs illustration with information derived from World Nuclear Association. (2024, April). Nuclear Power in the European Union.



Russia's War with Ukraine Put Energy Security Atop the To-Do List

The EC implemented its five-pronged energy unification strategy in 2015. It aims to 1) enhance energy supply security; 2) develop a single integrated energy market; 3) raise energy efficiency; 4) decarbonise the economy; and 5) boost research and innovation.¹⁹ In February 2022, the European over-reliance on Russia heightened the importance of the first prong of that 2015 strategy.

In May 2022, the EC presented its REPowerEU Plan to phase out Russian fossil fuels after the war in Ukraine significantly curbed Europe's energy supply.²⁰ After Russia stopped sending gas to Europe through the Nord Stream pipeline that September, the need for energy security and independence was clear, and Europe began to mobilise by diversifying its gas imports and by expanding their energy mix to other sources.²¹ As part of this mobilisation, nuclear energy gained momentum. The ability to store uranium as a strategic reserve to secure energy supply is another benefit of nuclear power, together with the consideration that nuclear is one of the most dependable energy sources because it has one of the largest capacity factors.²²

Renewable energies like solar and wind have many merits, but factors such as space constraints for the infrastructure that they require and their dependence on specific weather conditions requiring comprehensive backup systems can be hindrances. For the EU to meet its energy demands, it needs more than renewable. A February 2021 report drew the same conclusion.²³ Two groups in the European Parliament, the European Conservatives and Reformists (ECR) and Renew Europe, commissioned a report on key issues related to the EU's goal of becoming climate neutral by 2050.²⁴ Notable in the report was a study of the space that wind and solar energy infrastructure would require compared to nuclear energy. In two cases, the study found that the Netherlands and the Czech Republic would not have enough available land to meet their power needs with solar and wind. The study also found that nuclear energy would be cheaper than renewables.²⁵

Spurred by the war in Ukraine, the need to break away from Russia for energy security, and the realities of clean tech, the number of planned and proposed reactors in Europe has surged. Making their development more critical is that, historically, Europe relies heavily on Russia for nuclear fuel. Russia accounts for 4% of the world's uranium supply and controls about 50% of the world's uranium enrichment capacity, an influential position that has caused western countries to develop concerns about their energy security.^{26,27} Russia is the third-largest supplier of uranium to EU member states, behind Niger and Kazakhstan.²⁸



NUMBER OF REACTORS AT DIFFERENT DEVELOPMENT STAGES IN EUROPE* 2022 VS 2024 SNAPSHOT

Sources: Global X ETFs illustration with information derived from World Nuclear Association. Nuclear Power Reactors & Uranium Requirements: March 2022 and April 2024.

	Operable	Under Construction	Planned	Proposed
As of April 2024	130	10	16	62
As of March 2022	135	11	10	30
Change April 2024 vs March 2022	-5	-1	6	+32

*The list of countries includes Turkey and excludes Russia. Countries with nuclear energy capacity included: Belarus, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Lithuania, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom. Operable = Connected to the grid. Under Construction = First concrete for reactor poured. Planned = Approvals, funding, or commitment in place, mostly expected to be in operation within the next 15 years. Proposed = Specific programme or site proposals, timing very uncertain.

New Initiatives Boost Uranium Prospects, Especially in France and the UK

Efforts in France and the United Kingdom to embrace nuclear energy stand out. France derives about 70% of its electricity from nuclear energy due to a long-standing policy based on energy security.²⁹ In February 2022, the government announced plans to build six new reactors and that it would consider building eight more.³⁰ France is the world's largest net exporter of electricity due to its low cost of generation, a prime benefit of nuclear power.³¹ Developing nuclear technology is a major focus in France's energy programme, and reactors and, in particular, fuel products and services are significant exports.³² About 17% of France's electricity is from recycled nuclear fuel.³³

In March 2024, France's nuclear policy committee approved a plan to recycle fuel for future reactors.³⁴ The Orano la Hague nuclear fuel recycling complex will get considerable investments.³⁵ Also, Orano SA will spend €1.7 billion to expand a uranium-enrichment plant in southern France as part of the government's plan to reduce its reliance on Russian nuclear fuel.³⁶

In addition, France and Finland are pioneering the use of the once-unthinkable green debt to support nuclear power generation, another indicator that financial markets are embracing nuclear power. In November 2023, Electricite de France SA launched Europe's first such nuclear green bond for a nominal amount of €1 billion, and the Finnish nuclear power company Teollisuuden Voima Oyj (TVO) raised €280 million through the private placement of green bonds, the first of its kind under its Green Bond Framework.^{37,38} Consequently, in May 2024, TVO issued a seven-year green bond worth \$600m.³⁹

The UK currently generates only about 15% of its electricity from about 6.5 gigawatts (GW) of nuclear capacity.⁴⁰ However, government plans call for up to 24 GW of new nuclear capacity by 2050 to provide about 25% of the UK's electricity.⁴¹ Most of its existing capacity is set for retirement by the end of the decade, though the first of a new generation of nuclear plants is under construction.⁴² Perhaps the most talked about plan is the potential construction of a new large-scale

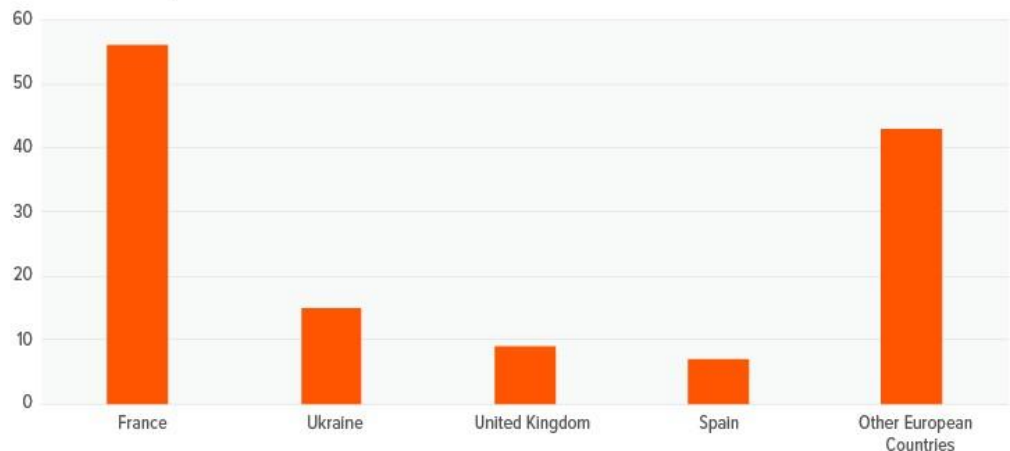


nuclear reactor that the government is considering. An investigation on a new power plant the size of Hinkley C and Sizewell C is part of the government's strategy.⁴³ If completed, the project would represent the biggest expansion in the UK nuclear sector in 70 years.⁴⁴

Other notable projects include the UK's March 2024 agreement to buy the Wylfa nuclear station in Wales from Hitachi.⁴⁴ The site is a leading candidate for a small modular reactor.⁴⁵ Also, the UK stepped up efforts to get the Sizewell C nuclear plant's project off the ground this year. Indeed, in May 2024, the first nuclear site licence in over a decade was granted to Sizewell C.⁴⁶ Building out a pipeline of domestic supply of uranium for advanced reactors is a focus as well, and the government announced in January 2024 that it will invest GBP300 million to launch a high-assay low enriched uranium (HALEU) programme, making the UK the first country in Europe to launch such a nuclear fuel programme.⁴⁷

EUROPEAN NUCLEAR REACTORS MAP

Sources: Global X ETFs illustration with information derived from World Nuclear Association. (2024, April) Nuclear Power Reactors & Uranium Requirements.



Conclusion: Europe Seemingly Set to Boost Global Demand for Uranium

The positive shift in sentiment towards nuclear energy is global, and Europe is echoing France and the UK's lead. Uranium's price dynamics reflect this shift, as the spot price has increased by more than double since February 2022 due to the perception of insufficient supply to meet increased long-term demand.⁴⁸ With Europe needing to wean off Russian energy to establish greater energy independence, government investments to develop nuclear power as a key component in the region's clean energy mix are expected to continue. In line to possibly benefit are uranium producers and the nuclear power value chain.

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Glossary

Small modular reactors (SMRs): advanced nuclear reactors that have a power capacity of up to 300 MW(e) per unit, which is about one-third of the generating capacity of traditional nuclear power reactors.

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