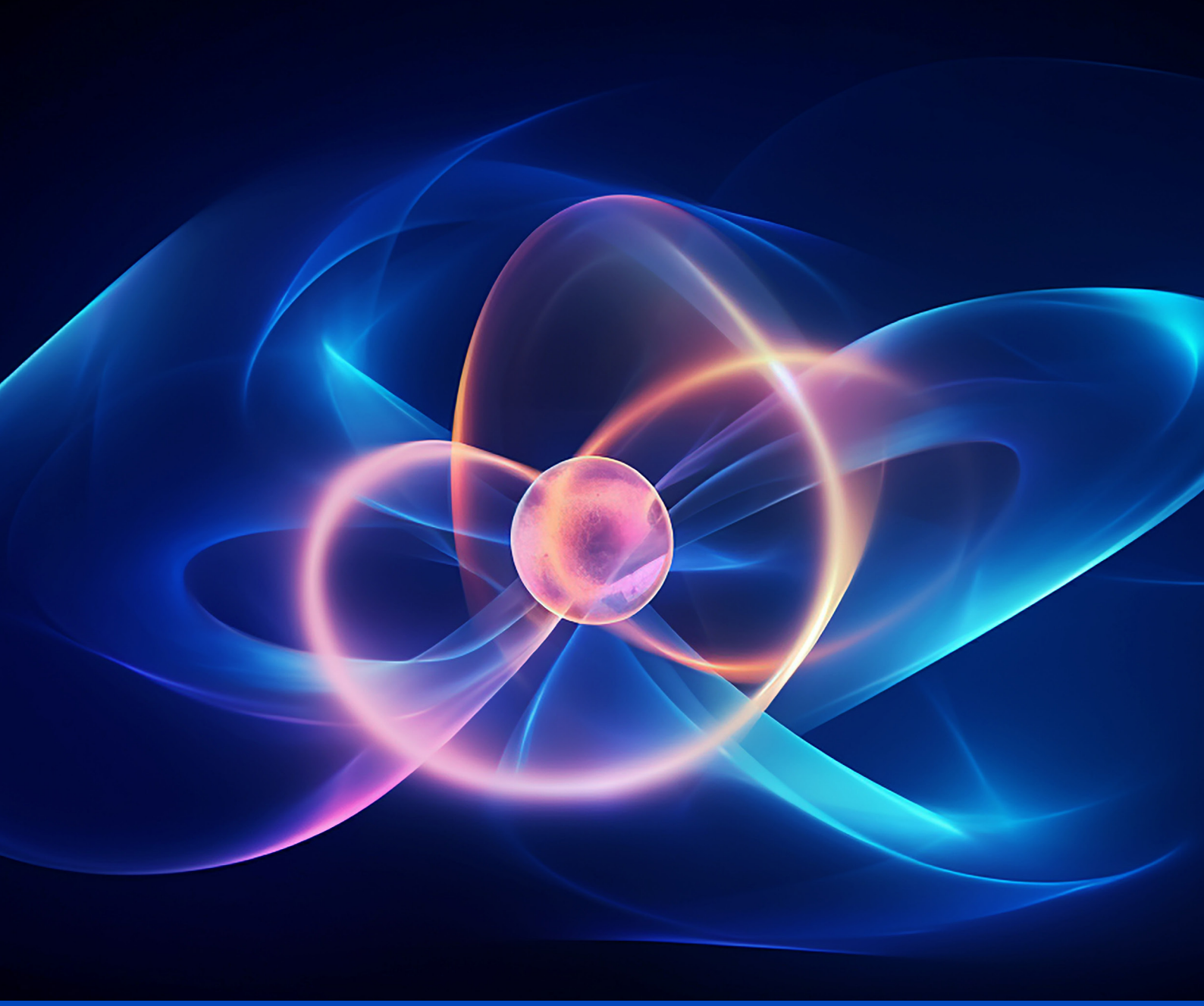

The case for uranium and nuclear energy: A sustainable energy source for powering tomorrow's technologies

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In 1954, the Soviet Union's Obninsk Nuclear Power Plant became the first facility in the world to generate electricity from nuclear energy. What began as an experiment in harnessing the immense power of the atom soon sparked a global revolution. By the mid-20th century, nuclear power plants were being built across Europe, the US, and Asia, promising abundant, clean, and reliable energy.

However, despite its early success, nuclear energy faced setbacks as safety concerns and a few high-profile incidents turned public sentiment sour. For several years, the momentum slowed. But now, as the world grapples with soaring energy demand and the need for sustainable power, nuclear energy is staging a comeback. Advanced reactors and growing adoption by industries like artificial intelligence (AI), crypto, and data centres – where energy reliability is critical – are once again positioning nuclear as the clean and scalable solution for the future.

We see five exciting tailwinds behind nuclear energy production that can make it the unsung hero of the green energy transition and a promising thematic investment opportunity.

1. There is renewed political support for nuclear energy

Since 2022, nuclear energy has been classified as a "green" energy source under the EU Taxonomy framework. This acknowledges its critical role in achieving net-zero emissions by 2050 and represents an important shift in the political stance toward nuclear energy.

Countries are already advancing plans for increased nuclear adoption. For instance, France plans to build six new nuclear reactors, supported by potential zero-interest loans and a long-term guaranteed price for electricity. The €50 billion project aims to enhance energy security and support the nation's clean energy goals[1].

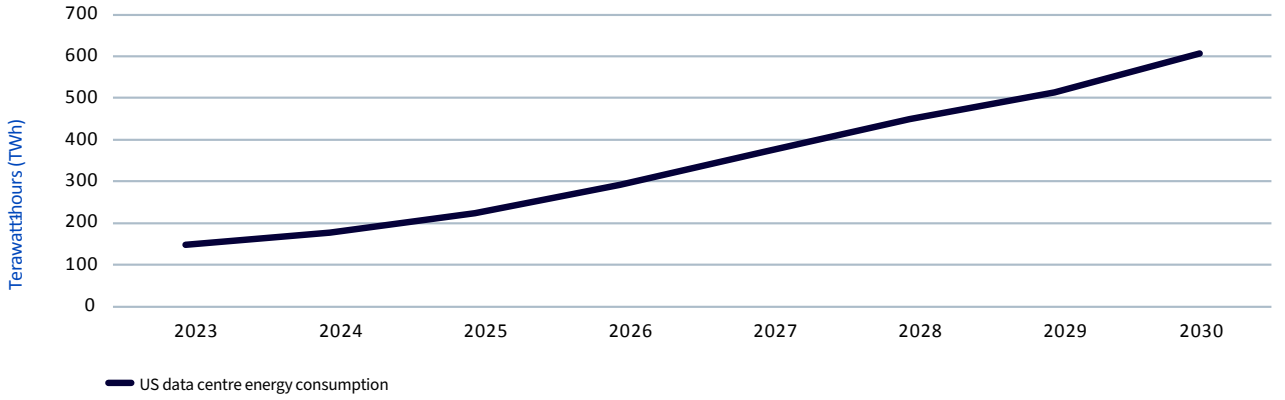
In the US, the Three Mile Island nuclear power plant—the site of the country's worst nuclear accident in 1979—could reopen in 2028. Its owner, Constellation Energy, announced a deal with Microsoft that would allocate the plant's entire output to the tech company.

Beyond environmental considerations and the pursuit of clean energy sources, geopolitical risks and volatility in energy prices have also catalysed renewed interest in nuclear, as countries seek greater energy independence.

2. Energy demand from AI, data centres, and crypto is rising

According to the International Energy Agency, a single ChatGPT query can require up to ten times the energy of a traditional Google search—an illustration of how power-intensive advanced computing operations have become. Technologies like artificial intelligence, large-scale data centres, and cryptocurrency mining continuously push the boundaries of energy consumption, as they rely on complex algorithms and data processing that run around the clock. As these sectors rapidly expand, tech companies must secure not only reliable power but also sustainable sources of electricity that can scale with their growth. This shift is prompting a closer look at innovative, low-emission solutions such as nuclear energy, which can provide predictable, around-the-clock power without the volatility of renewables or the carbon footprint of fossil fuels.

Figure 1: Data centre power demand is expected to rise significantly in the US



Source: Global Energy Perspective 2023, McKinsey, October 18, 2023, Mckinsey analysis. **Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.**

1 Reuters, November 2024.

For example, Google made a noteworthy move recently by signing a deal with Kairos Power to secure multiple small modular reactors (SMRs) to power its data centres. Such partnerships reflect a broader industry trend, as more companies seek energy sources that can maintain operational continuity, manage costs, and meet evolving environmental standards.

3. New technologies are transforming nuclear power

Small modular reactors represent the next generation of nuclear technology. Unlike traditional nuclear power plants, which are massive, complex, and expensive to build, SMRs are smaller, scalable, and faster to deploy. They are designed to be assembled in factories and transported to sites, reducing construction timelines and costs. With a smaller physical footprint and enhanced safety features, SMRs can be deployed in locations unsuitable for conventional reactors, such as remote or industrial areas.

While SMRs are not yet widely operational, countries like the US, Canada, and the UK are advancing projects to bring them online within this decade. Google's recent partnership with Kairos Power to develop SMRs underscores their importance in providing clean, reliable energy for energy-intensive operations, such as AI and data centres. This deal highlights how private-sector investment is accelerating SMR adoption, positioning them as a critical solution for achieving net-zero goals while meeting growing energy demand.

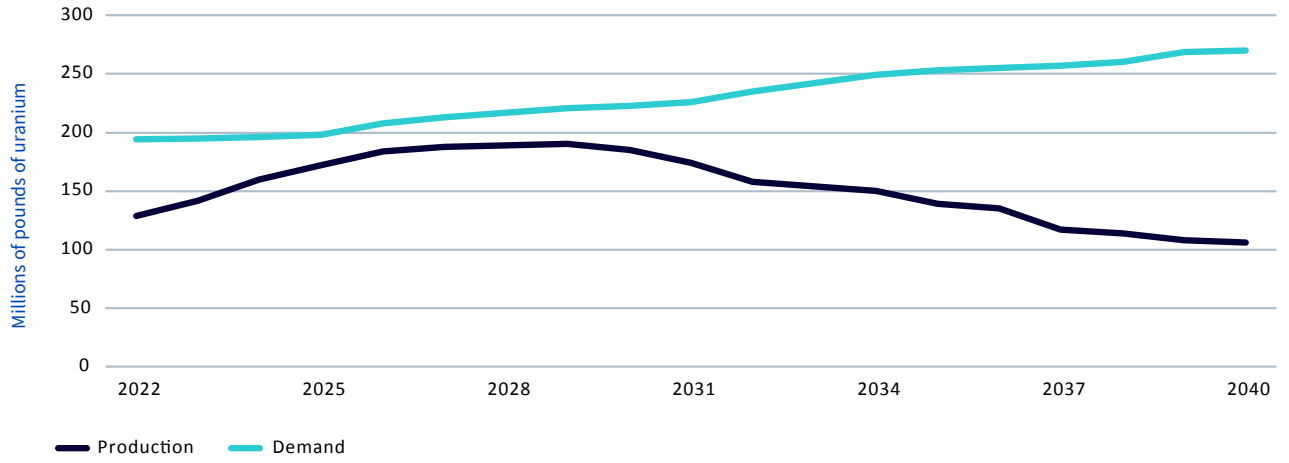
Nuclear fusion, often described as the ultimate moonshot, has the potential to revolutionise global energy. Unlike fission, fusion replicates the process powering the sun, fusing atoms to release vast amounts of clean energy without long-lived radioactive waste. If successfully harnessed, fusion could provide limitless, carbon-free power, solving energy scarcity and decarbonisation challenges simultaneously. While still in the experimental phase, breakthroughs from projects like ITER (International Thermonuclear Experimental Reactor), the world’s largest fusion experiment aiming to prove the viability of fusion energy, and private initiatives signal that fusion may no longer be science fiction, but a game-changing reality for the future of energy.

4. There are strong tailwinds for global uranium markets

Uranium is vital for nuclear power as the energy source for reactors. Unlike fossil fuels, uranium-powered reactors provide carbon-free, baseload energy critical for achieving net-zero emissions. The nuclear fuel cycle, from mining to processing and recycling, ensures efficient energy production while minimising waste[2].

2 World Nuclear Association, May 2024.

Figure 2: The uranium supply gap is expected to widen

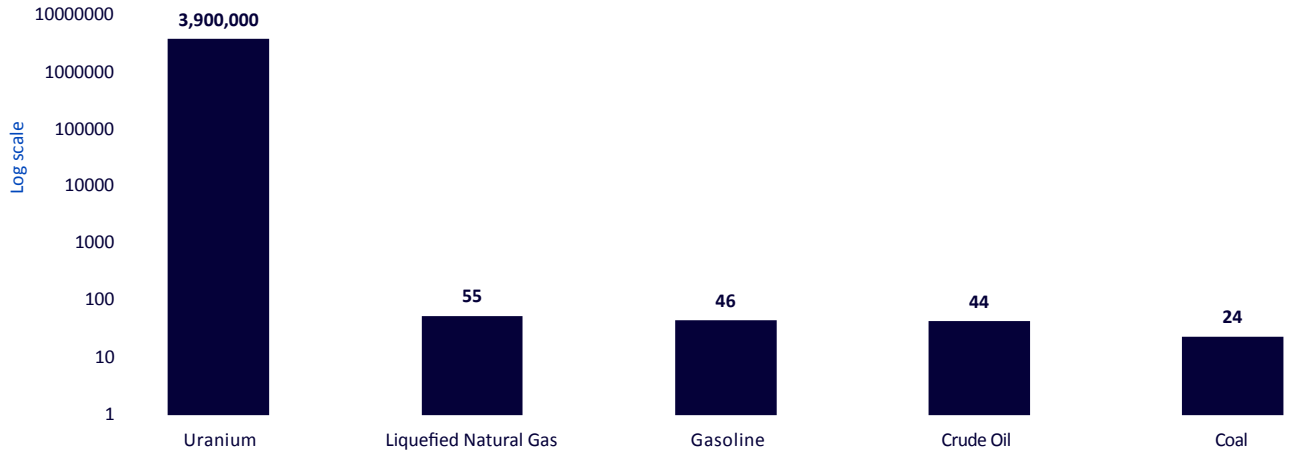


Source: Visualcapitalist, UxC, December 2023. Forecasts from 2023 and onwards. **Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.**

Uranium has exceptional energy density given it is fissile in nature, i.e., it can sustain a nuclear chain reaction to produce large amounts of energy. Fossil fuels like oil and gas, in contrast, are simply combusted and therefore have much lower energy densities.

With rising reactor construction and SMR development, uranium demand is increasing. This growing reliance highlights its strategic importance in energy security and decarbonisation goals. Uranium's supply, on the other hand, is declining. This brings into light the importance of uranium miners that have a critical role in reactivating inactive mines and exploring new ones. But given new mines can take 10-15 years to become operational[3], uranium is expected to be in a significant supply deficit in the coming years. This could continue exerting a tailwind for prices.

Figure 3: Uranium's Energy Density vs Other Fuels (megajoules/kg)



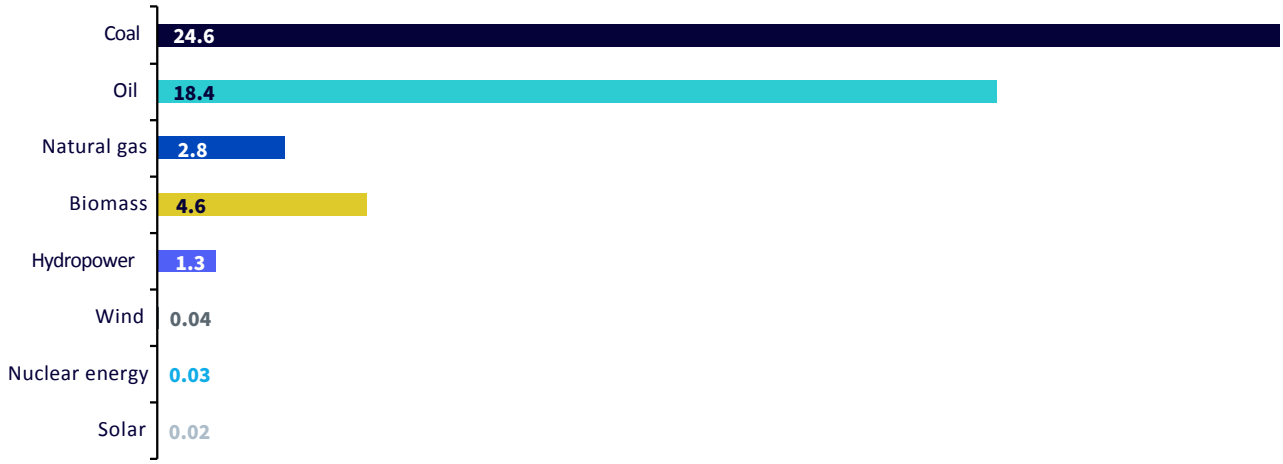
Source: Visualcapitalist, Energy Education, World Nuclear Association, 2023.

3 International Energy Agency.

5. Nuclear energy is an effective decarbonisation tool

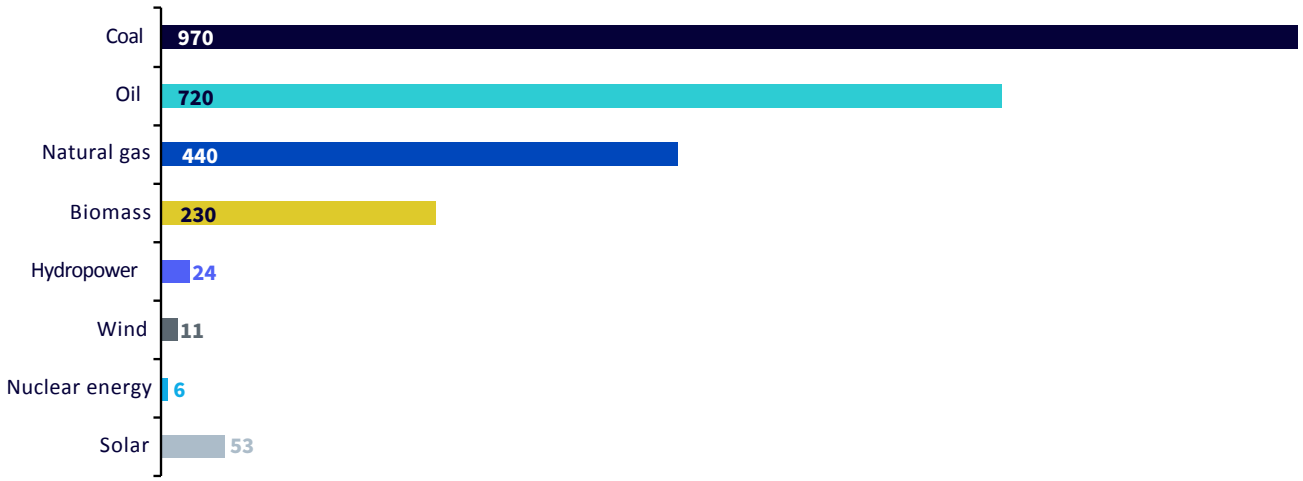
Nuclear energy is considered one of the safest and most reliable low-carbon sources of electricity. Modern reactor designs incorporate multiple, independent safety systems to prevent accidents. Compared to fossil fuels, nuclear reactors produce minimal greenhouse gases, thus significantly reducing carbon emissions and mitigating climate change. Additionally, the high energy density of uranium fuel ensures stable, long-term energy generation with a relatively small environmental footprint.

Figure 4: Death rate from accidents and air pollution (deaths per terawatt-hour of electricity production)



Source: Ourworldindata, Nuclear Energy, April 2024.

Figure 5: Greenhouse gas emissions (in tonnes of CO2 equivalents per gigawatt-hour



Source: Ourworldindata, Nuclear Energy, April 2024.

Conclusion

As the world seeks sustainable solutions for rapidly rising energy demands—driven by technologies like AI, data centres, and crypto—nuclear power is reasserting its relevance. Renewed political support, breakthrough reactor designs, and growing momentum in uranium markets underscore the sector's potential to deliver reliable, low-emission power for the future. For investors, this confluence of factors points to a compelling, long-term opportunity in nuclear and uranium as central pillars of tomorrow's global energy mix.

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