

The most powerful rock on earth: why uranium is making a comeback

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Key Takeaways

- Uranium's energy density is unparalleled.
 - Demand is set to rise, and supply might struggle to keep up.
 - Abundant uranium exists, but miners are key to unlocking its potential.
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- Imagine flying over the Australian Outback. Below, the land stretches endlessly—rugged, orange, and seemingly lifeless. But beneath the surface lies something powerful enough to light up entire cities. It's not oil, gas, or coal. It's a rock. And just one kilogram of it contains hundreds of thousands of times the energy in one kilogram of coal¹. The rock is uranium.

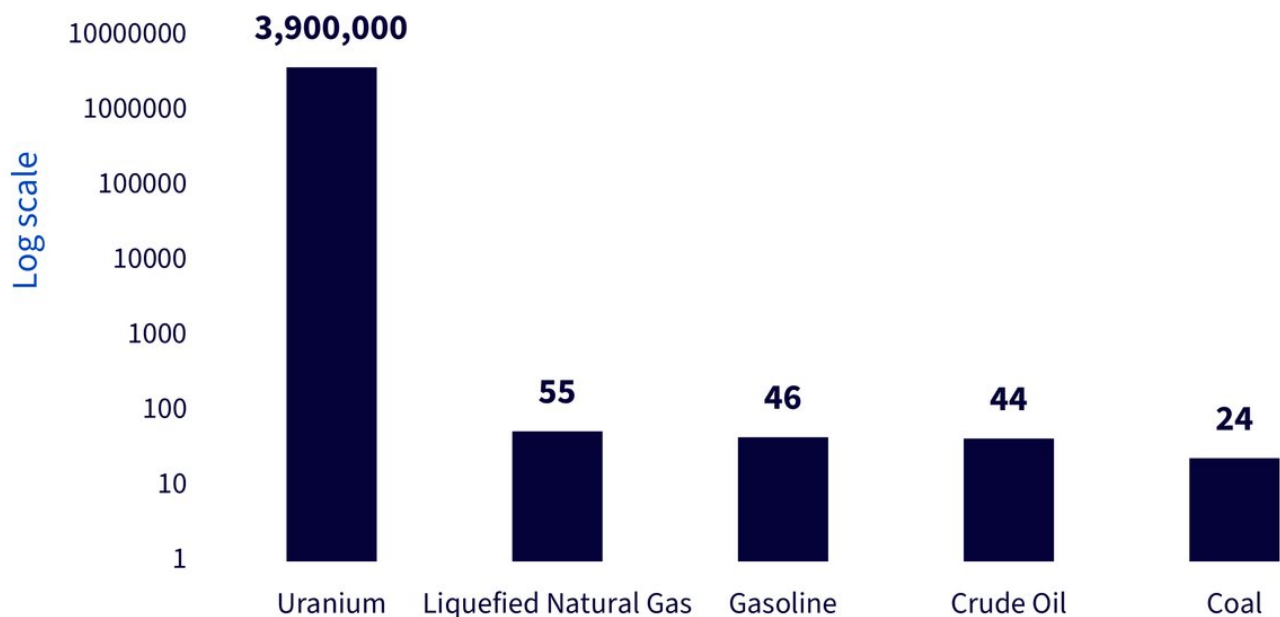
For decades, uranium has fuelled the world's most potent energy source: nuclear power. Yet, its journey has been anything but smooth, marked by booms, busts, and controversy. Now, as the world races to secure sustainable energy sources, uranium is back in the spotlight.

What's driving this renewed interest? What does the future hold? And how can investors tap into this opportunity?

Uranium: a highly energy-dense material

Uranium's energy density is unparalleled. One kilogram of uranium produces 3.9 million megajoules of energy, compared to just 24 megajoules from coal. This is because uranium is fissile—it sustains a nuclear chain reaction, generating immense energy. In contrast, fossil fuels like oil and gas rely on simple combustion, yielding far less energy.

Figure 1: Uranium's energy density vs other fuels (megajoules/kg)



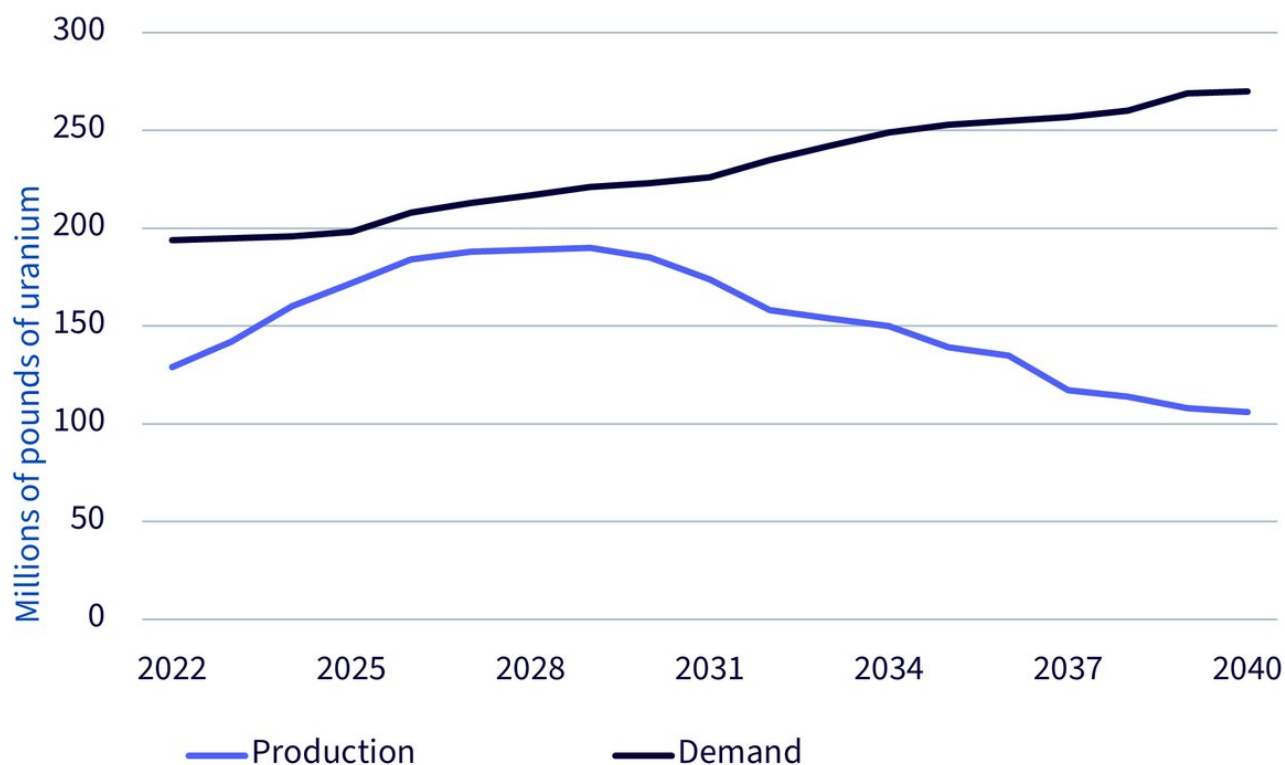
Source: Visualcapitalist, Energy Education, World Nuclear Association, 2023.

The supply gap is widening

Uranium is the essential raw material for nuclear power, and several factors are driving demand growth:

- Renewed political support** – since 2022, nuclear energy has been classified as “green” under the EU Taxonomy framework, recognising its role in achieving net-zero emissions by 2050. This marks a major shift in policy.
- Rising Energy Demand** – artificial intelligence (AI), data centres, and cryptocurrencies are consuming more power, forcing companies and governments to seek sustainable solutions.
- Advancements in small modular reactors (SMRs)** – small modular reactors offer scalable, decentralised nuclear power. Tech giants like Google and Amazon have already signed agreements to use SMRs for their data centres.

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.**

While demand is surging, supply remains constrained. For years, low prices discouraged new mining investment. Now, with demand accelerating, supply is struggling to keep up. Given that new uranium mines take 10–15 years to become operational³, a significant supply deficit is expected, likely supporting higher prices in the coming years.

Capture the opportunity with WisdomTree

The [WisdomTree Uranium and Nuclear Energy UCITS ETF \(NCLR\)](#) provides investors with access to the growth of uranium and nuclear energy.

Value chain approach:

The exchange-traded fund targets the most value-accretive segments of the uranium and nuclear value chain, including those poised for growth as nuclear energy adoption accelerates. This value chain consists of:

4. **Upstream activities (60% weight):** Uranium mining and the production of other raw materials for nuclear reactors.

5. **Midstream activities (25% weight):** Companies involved in uranium conversion, enrichment, fuel fabrication, and storage, as well as those supplying critical infrastructure, equipment, and services to the nuclear industry.
6. **Innovators (15% weight):** Developing advanced technologies such as small modular reactors and conducting research and development in fusion technology.

By investing across the nuclear value chain, investors gain exposure to established sectors like uranium mining and midstream companies that play a critical role in making uranium ready for reactors. Utilities are excluded as they consume, rather than produce, nuclear fuel. However, the strategy includes innovators driving next-generation nuclear technologies, such as small modular reactors and fusion research, both poised for significant growth.

Focus on purity:

Stock selection and weighting are based on revenue exposure to the uranium and nuclear energy value chain. Upstream companies must derive at least 50% of their revenue from the theme, while midstream companies require a minimum of 10%—a threshold that accounts for their strategic role in the value chain while acknowledging their diversified business models. Weightings are adjusted in favour of companies with higher revenue exposure, subject to caps and liquidity requirements.

Conclusion: uranium resources are abundant but underutilised

The World Nuclear Association's 2021 estimates show that uranium resources are plentiful, with the top 10 countries holding the largest reserves:

Figure 3: World Nuclear Association's 2021 uranium resource estimates

Source: World Nuclear Association, May 2024.

However, uranium production remains highly concentrated. In 2022, the top producers were:

Figure 4: Uranium top producers in 2022

Source: World Nuclear Association, May 2024.

Kazakhstan alone accounted for 43% of global uranium production in 2022, followed by Canada (15%) and Namibia (11%). While uranium resources are abundant, production must expand to meet rising demand. As nuclear energy adoption grows, uranium mining will play an increasingly crucial role in securing global energy stability.

Uranium is making a comeback, and with its unmatched energy density and growing demand, it presents a compelling opportunity for investors looking to capitalise on the future of nuclear energy.

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