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

Published 18 March 2025

Mobeen Tahir
Director, Macroeconomics and Thematic Research

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.

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 coal[1]. The rock is uranium.

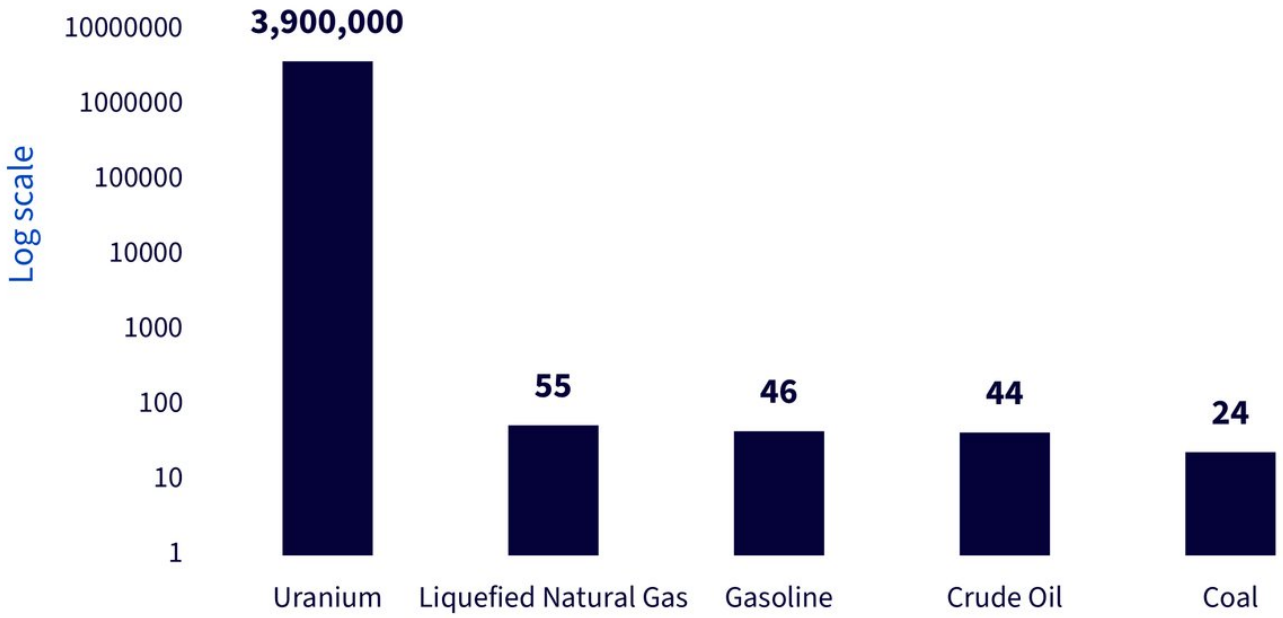
For decades, uranium has fuelled the world's most potent energy source: nuclear power. Yet, its journey has been anything but smooth, marked by booms, busts, and controversy. Now, as the world races to secure sustainable energy sources, uranium is back in the spotlight.

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

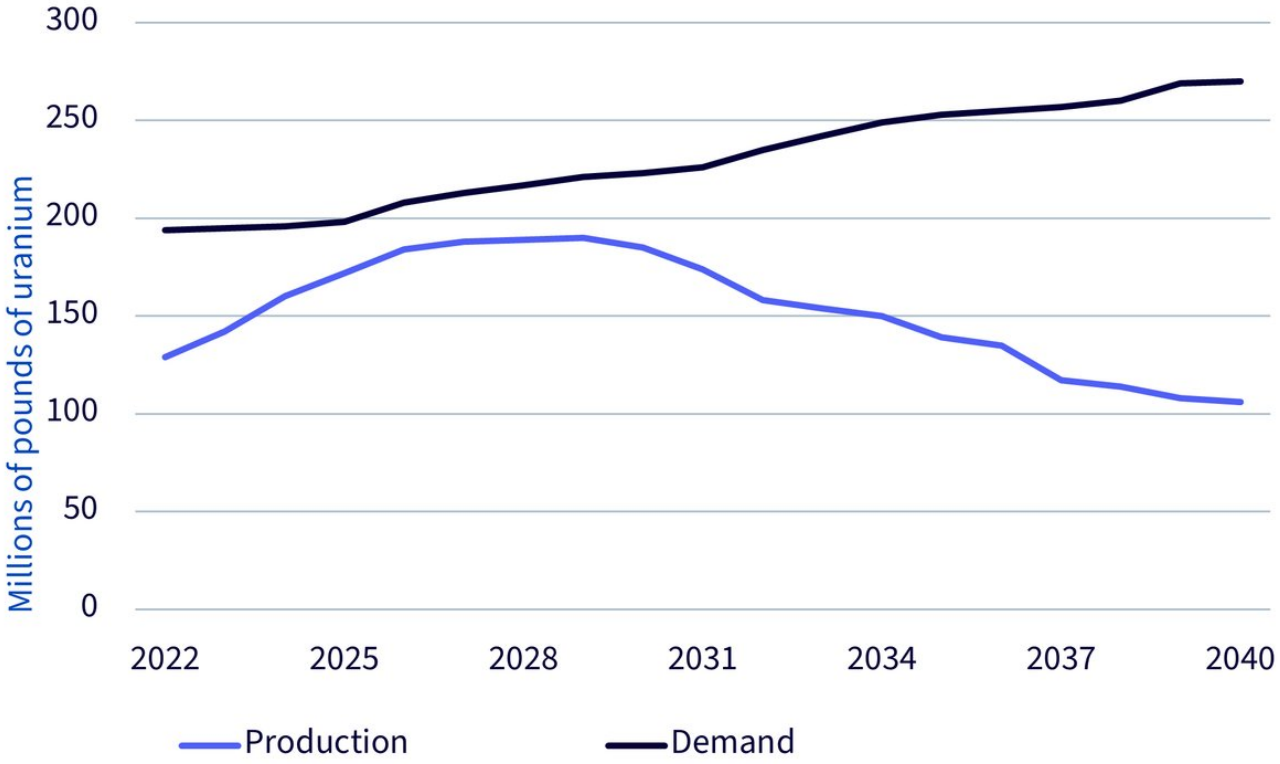
Uranium is the essential raw material for nuclear power, and several factors are driving demand growth:

1. **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[2].

2. **Rising Energy Demand** – artificial intelligence (AI), data centres, and cryptocurrencies are consuming more power, forcing companies and governments to seek sustainable solutions.

3. **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 operational[3], 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

Country	Tonnes (U)	% of world
Australia	1,684,100	28%
Kazakhstan	815,200	13%
Canada	588,500	10%
Russia	480,900	8%
Namibia	470,100	8%
South Africa	320,900	5%
Niger	311,100	5%
Brazil	276,800	5%

China	223,900	4%

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

Country	Tonnes (U)
Kazakhstan	21,227
Canada	7351
Namibia	5613
Australia	4553
Uzbekistan (est.)	3300
Russia	2508
Niger	2020
China (est.)	1700
India (est.)	600

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.

Important Risks Related to this Article

IMPORTANT INFORMATION

Marketing communications issued in the European Economic Area ("EEA"): This document has been issued and approved by WisdomTree Ireland Limited, which is authorised and regulated by the Central Bank of Ireland.

Marketing communications issued in jurisdictions outside of the EEA: This document has been issued and approved by WisdomTree UK Limited, which is authorised and regulated by the United Kingdom Financial Conduct Authority.

WisdomTree Ireland Limited and WisdomTree UK Limited are each referred to as "WisdomTree" (as applicable). Our Conflicts of Interest Policy and Inventory are available on request.

This marketing communication has been prepared for professional investors, but the WisdomTree products set out in this document may be available in some jurisdictions to any investors, subject to applicable laws and regulations. As the product may not be authorised or its offering may be restricted in your jurisdiction, it is the responsibility of every person or entity to satisfy themselves as to the full observance of the laws and regulations of the relevant jurisdiction. Prior to any application investors are advised to take all necessary legal, regulatory, tax and investment advice on the suitability and consequences of an investment in the products. Past performance is not a reliable indicator of future performance. Any historical performance included in this document may be based on back testing. Back testing is the process of evaluating an investment strategy by applying it to historical data to simulate what the performance of such strategy would have been. Back tested performance is purely hypothetical and is provided in this document solely for informational purposes. Back tested data does not represent actual performance and should not be interpreted as an indication of actual or future performance. The value of any investment may be affected by exchange rate movements. Any decision to invest should be based on the information contained in the appropriate prospectus and affer seeking independent investment, tax and legal advice. These products may not be available in your market or suitable for you. The content of this document does not constitute investment advice nor an offer for sale nor a solicitation of an offer to buy any product or make any investment.

An investment in exchange-traded products ("ETPs") is dependent on the performance of the underlying index, less costs, but it is not expected to match that performance precisely. ETPs involve numerous risks including among others, general market risks relating to the relevant underlying index, credit risks on the provider of index swaps utilised in the ETP, exchange rate risks, interest rate risks, inflationary risks, liquidity risks and legal and regulatory risks.

The information contained in this document is not, and under no circumstances is to be construed as, an advertisement or any other step in furtherance of a public offering of shares in the United States or any province or territory thereof, where none of the issuers or their products are authorised or registered for

distribution and where no prospectus of any of the issuers has been filed with any securities commission or regulatory authority. No document or information in this document should be taken, transmitted or distributed (directly or indirectly) into the United States. None of the issuers, nor any securities issued by them, have been or will be registered under the United States Securities Act of 1933 or the Investment Company Act of 1940 or qualified under any applicable state securities statutes.

This document may contain independent market commentary prepared by WisdomTree based on publicly available information. Although WisdomTree endeavours to ensure the accuracy of the content in this document, WisdomTree does not warrant or guarantee its accuracy or correctness. Any third party data providers used to source the information in this document make no warranties or representation of any kind relating to such data. Where WisdomTree has expressed its own opinions related to product or market activity, these views may change. Neither WisdomTree, nor any affiliate, nor any of their respective officers, directors, partners, or employees accepts any liability whatsoever for any direct or consequential loss arising from any use of this document or its contents.

This document may contain forward looking statements including statements regarding our belief or current expectations with regards to the performance of certain assets classes and/or sectors. Forward looking statements are subject to certain risks, uncertainties and assumptions. There can be no assurance that such statements will be accurate and actual results could differ materially from those anticipated in such statements. WisdomTree strongly recommends that you do not place undue reliance on these forward-looking statements.

WisdomTree Issuer ICAV

The products discussed in this document are issued by WisdomTree Issuer ICAV (“WT Issuer”). WT Issuer is an umbrella investment company with variable capital having segregated liability between its funds organised under the laws of Ireland as an Irish Collective Asset-management Vehicle and authorised by the Central Bank of Ireland (“CBI”). WT Issuer is organised as an Undertaking for Collective Investment in Transferable Securities (“UCITS”) under the laws of Ireland and shall issue a separate class of shares ("Shares") representing each fund.

The Fund is described in a Key Information Document (KID) or Key Investor Information Document (KIID) for UK investors, and the prospectus of WT Issuer (“WT Prospectus”). A copy of the WT Prospectus and the KID / KIID is available, for EEA/UK only, in English at www.wisdomtree.eu. Where required under national rules, the KID will also be available in the local language of the relevant EEA Member State. Investors should read the WT Prospectus before investing and should refer to the section of the WT Prospectus entitled 'Risk Factors' for further details of risks associated with an investment in the Shares.

The summary of investor rights associated with an investment in the fund is available in English on WisdomTree Europe's website. WisdomTree Management Limited may decide to terminate the arrangements made for the marketing of its collective investment undertakings. In such circumstances, shareholders in the affected EEA Member State will be notified of this decision and will be provided with the opportunity to

redeem their shareholding in the fund free of any charges or deductions for at least 30 working days from the date of such notification.

Notice to Investors in Switzerland – Qualified Investors

This document constitutes an advertisement of the financial product(s) mentioned herein.

The prospectus and the key investor information documents (KIID) are available from WisdomTree's website: https://www.wisdomtree.eu/en-ch/resource-library/prospectus-and-regulatory-reports

Some of the sub-funds referred to in this document may not have been registered with the Swiss Financial Market Supervisory Authority ("FINMA"). In Switzerland, such sub-funds that have not been registered with FINMA shall be distributed exclusively to qualified investors, as defined in the Swiss Federal Act on Collective Investment Schemes or its implementing ordinance (each, as amended from time to time). The representative and paying agent of the sub-funds in Switzerland is Société Générale Paris, Zurich Branch, Talacker 50, PO Box 5070, 8021 Zurich, Switzerland. The prospectus, the key investor information documents (KIID), the articles of association and the annual and semi-annual reports of the sub-funds are available free of charge from the representative and paying agent. As regards distribution in Switzerland, the place of jurisdiction and performance is at the registered seat of the representative and paying agent.

For Investors in France:

The information in this document is intended exclusively for professional investors (as defined under the MiFID) investing for their own account and this material may not in any way be distributed to the public. The distribution of the Prospectus and the offering, sale and delivery of Shares in other jurisdictions may be restricted by law. WT Issuer is a UCITS governed by Irish legislation, and approved by the Financial Regulatory as UCITS compliant with European regulations although may not have to comply with the same rules as those applicable to a similar product approved in France. The Fund has been registered for marketing in France by the Financial Markets Authority (Autorité des Marchés Financiers) and may be distributed to investors in France. Copies of all documents (i.e. the Prospectus, the Key Investor Information Document, any supplements or addenda thereto, the latest annual reports and the memorandum of incorporation and articles of association) are available in France, free of charge at the French centralizing agent, Societe Generale at 29, Boulevard Haussmann, 75009, Paris, France. Any subscription for Shares of the Fund will be made on the basis of the terms of the prospectus and any supplements or addenda thereto.

For Investors in Malta: This document does not constitute or form part of any offer or invitation to the public to subscribe for or purchase shares in the Fund and shall not be construed as such and no person other than the person to whom this document has been addressed or delivered shall be eligible to subscribe for or purchase shares in the Fund. Shares in the

Fund will not in any event be marketed to the public in Malta without the prior authorisation of the Maltese Financial Services Authority.

For Investors in Monaco: This communication is only intended for duly registered banks and/or licensed portfolio management companies in Monaco. This communication must not be sent to the public in Monaco.