Five reasons to be excited about nuclear energy

Published 20 October 2025

Mobeen Tahir
Director, Macroeconomics and Thematic Research

Key Takeaways

- It's clean – Low-carbon, with only steam rising from its towers.
- It's efficient – Tiny amounts of uranium power entire cities.
- It's cutting-edge – Modern reactors bring safety, speed, and flexibility.
- It's cheap – Costs fall with scale, as China has shown.
- It's all the rage – Governments and big tech are going nuclear.

In the control room, a sailor sits at the sonar console with headphones on. He listens carefully for any trace of an acoustic signal. Distinguishing between background noise, whale calls, or the sound of another submarine is the crucial task assigned to him. He is one of 135 sailors on board, each with a unique role but all equally important.

This is the USS Oregon, a naval submarine that can be deployed at sea for six to seven months. It produces its own fresh water through distillation and only needs to return to shore to resupply food and give its sailors rest. Never to refuel.

The USS Oregon is one of many nuclear-powered submarines in the US Navy. Its nuclear core is designed to last the entire life of the submarine – more than three decades. Nuclear propulsion not only frees it from refuelling, but the absence of exhaust gases compared to diesel-electric submarines also gives it a stealth advantage.

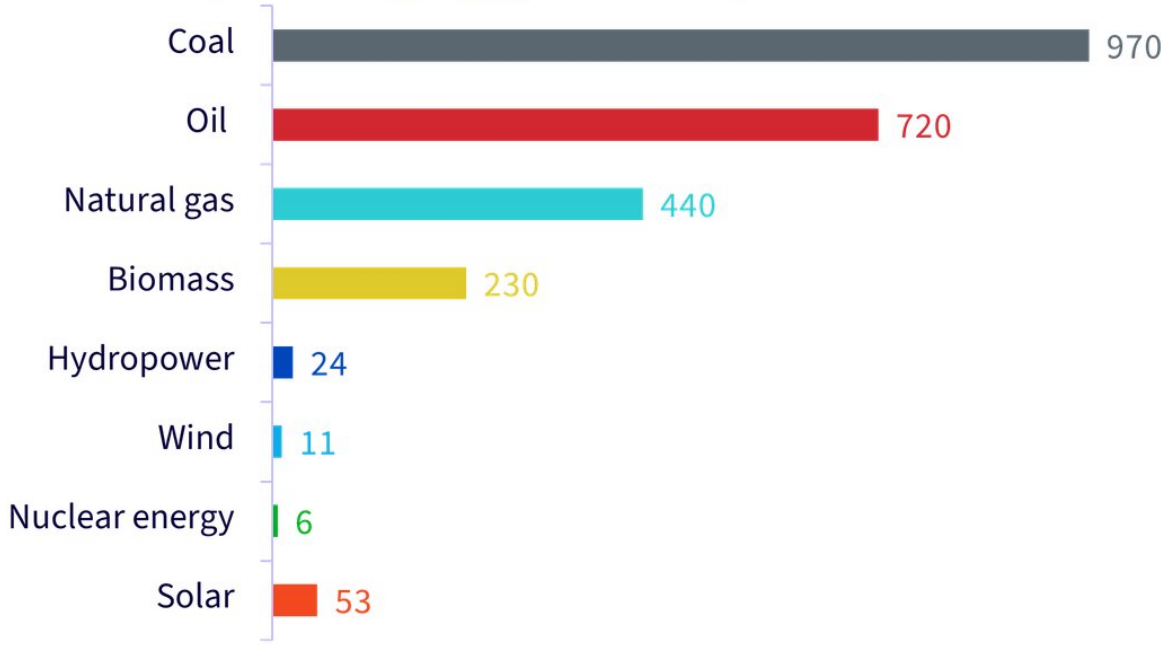
Nuclear power has the ability to rewrite how we interact with energy. The world is waking up to this realisation and it has the potential to alter our future. This blog post outlines five reasons to be excited about nuclear energy.

It's clean:

Can the world's rapidly rising energy needs be met with a very low carbon source of power? Yes, they can. When it comes to greenhouse gas emissions from electricity generation, nuclear's credentials even outshine solar, hydropower and wind (see figure 1). What people see rising from the large cooling towers at

nuclear plants is steam, not smoke. The visible plumes, although dramatic, are simply clouds of condensed water – harmless to the environment.

Figure 1: Greenhouse gas emissions (in tonnes of CO2 equivalents per gigawatt-hour)



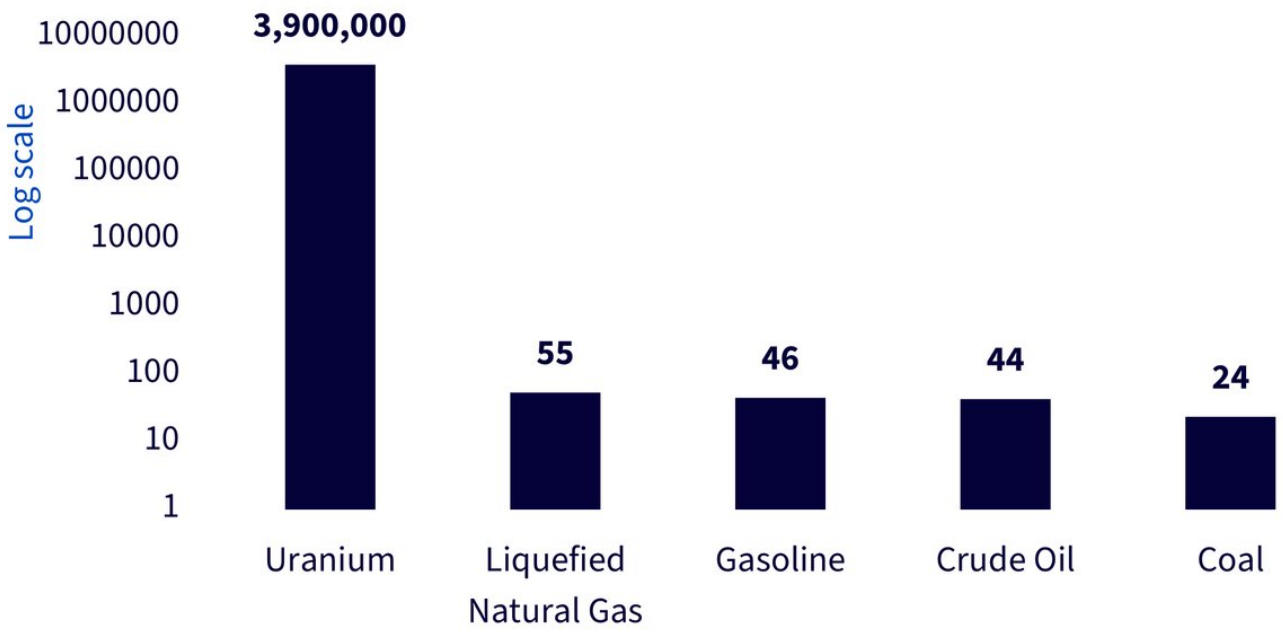
Source: Our world in data, Nuclear Energy, April 2024.

Even nuclear waste, which many people worry about (and which The Simpsons has helped caricature as glowing green sludge leaking out of barrels), is not green at all. It is usually solid, and used fuel rods are stored first in heavily shielded water pools and later in dry casks. Finland is leading the way with its Onkalo facility, now under construction. Its deep underground repository is designed to safely store high-level nuclear waste in stable bedrock tunnels for thousands of years.

It's efficient:

The fuel for nuclear energy, uranium, does need to be mined. As the industry often puts it, a tonne of coal produces the same energy as uranium the size of a jellybean. In other words, far less uranium is required. The energy density of this remarkable element is millions of times greater than fossil fuels (see figure 2). This is the potential the world is now turning to more seriously.

Figure 2: Uranium's Energy Density vs Other Fuels (megajoules/kg)



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

Efficiency also shows up in land use. Nuclear power requires 27 times less land per unit of energy than coal and 34 times less than solar photovoltaic (PV), making it one of the most space-efficient energy sources available[1].

It's cutting-edge:

Large reactors have become far more advanced over the decades. Passive safety features that cool the reactor without human intervention reduce the risk of accidents. Digital controls improve monitoring and greater fuel efficiency means less uranium is needed and less waste is produced.

Large reactors aren't the only way forward. Small modular reactors are attracting growing attention because they could be game changers. Their modular design means they can be built in factories, deployed faster and scaled up as demand grows. They promise long refuelling cycles thanks to high fuel efficiency, and like large reactors, they incorporate advanced passive safety systems. Crucially, they can also be placed close to sources of high energy demand, such as data centres.

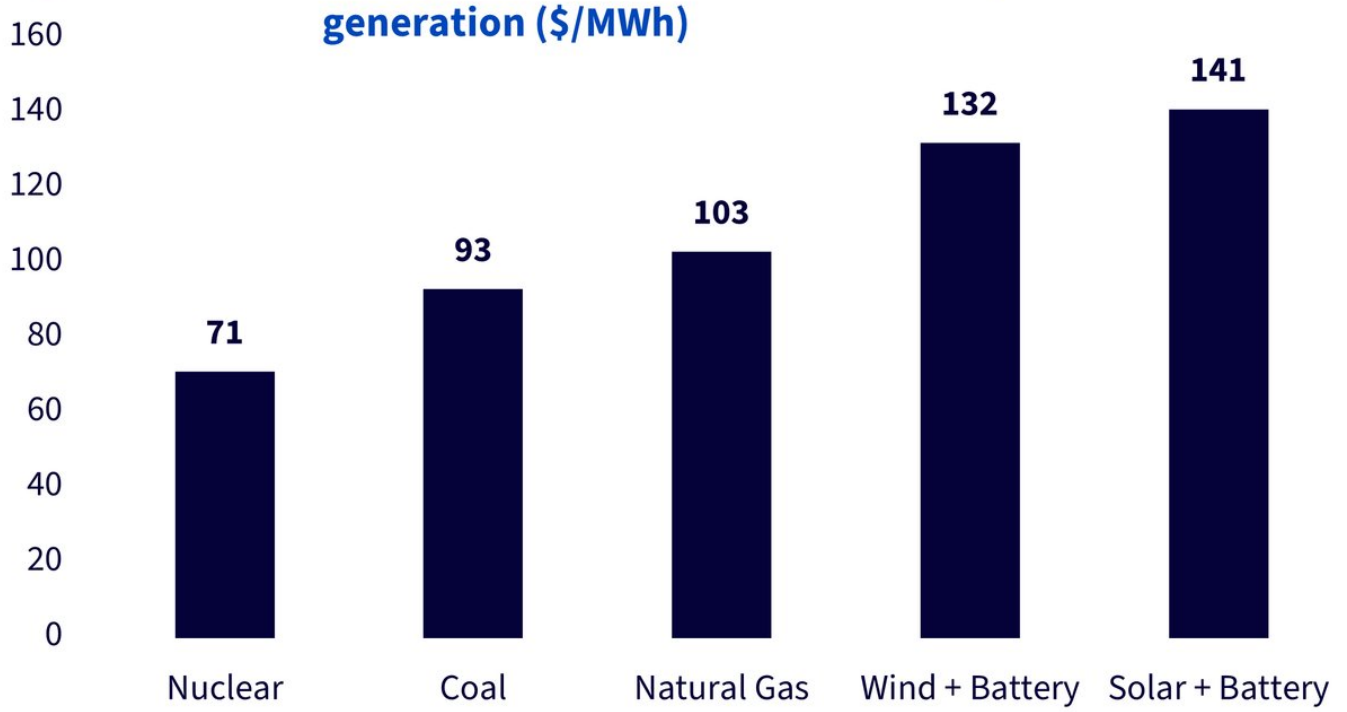
Companies like Oklo are making waves with plans to deploy the first Aurora powerhouse in the US as soon as 2027. Its design also uses recycled nuclear fuel – a budding but exciting innovation.

It's cheap:

When it comes to the cost of electricity generation, nuclear offers some of the strongest credentials. It averages around $71 per megawatt-hour, compared with $93 for coal and $103 for natural gas (see figure 3).

But what about the cost overruns and delays that often make headlines? It's true, they happen. Yet the issue is not with the technology itself but with how infrequently most countries have built reactors in recent decades. A lack of standardised designs and established supply chains has been the main culprit.

Figure 3: Nuclear energy reduces the cost of electricity generation ($/MWh)



Source: BofA Research Investment Committee, Lazard, Entler, et al. (2018). Note: nuclear, coal, and natural gas price estimates from Entler, et al. Wind and solar cost estimates are from Lazard's 2023 Levelized Cost of Energy+ report. Wind + battery and solar + battery use estimates from California's Independent System Operator (CAISO) and assume a 4-hour lithium-ion battery storage system to account for firming costs. All cost estimates show unsubsidised costs.

China, by contrast, has increased its nuclear capacity fivefold in the last 15 years by developing supply chains, standardising designs and building reactors at scale to capture knowledge and expertise. As other countries take inspiration from this blueprint, they too are likely to benefit from economies of scale.

It's all the rage:

Since late 2024, the nuclear renaissance has well and truly ignited. At the United Nations Climate Change Conference in 2023, 25 countries pledged to triple global nuclear capacity by 2050, with another six joining the pledge the following year. The US has gone further, with executive orders from President Trump aiming to quadruple America's capacity within just 25 years. Extending existing plants, reopening closed ones,

building new reactors, advancing SMRs, and creating a more favourable regulatory regime are all on the table. More and more countries are picking from that menu of options.

Equally, big tech has set a chain reaction in motion with bold plans to run their energy-hungry data centres on nuclear power. From Microsoft to Amazon, Google to Meta, hyperscalers are turning to nuclear to secure sustainable and reliable energy for their technological ambitions.

When both governments and hyperscalers go nuclear, you know the technology has reached a tipping point.

Conclusion

For many years, nuclear energy faced a brand image problem. Now it is reinventing itself. Rapidly rising energy needs, environmental pressures, technological advances and shifting public sentiment have made the world realise what a colossal mistake it would be to ignore the abundant power of this source. Nuclear can solve many of the world's toughest energy challenges. The renaissance is only just beginning. The change it will bring to the world and the investment opportunities it will create are exciting to consider.

If it can make a submarine energy independent, imagine the freedom it could give to everything else.

[1] Our World in Data, World Economic Forum, 2022.

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.