



EXPLORING THE POWER OF URANIUM

Nicole Galloway Warland, Thor Energy Plc, Australia, explores the current challenges facing nuclear fuel supply, and how the complex combination of supply and demand factors means that uranium miners operating in friendly jurisdictions are certain to benefit.

The price of uranium is expected to rise 'significantly higher' than current levels due to a myriad of reasons, including rising demand for clean energy and the need to secure local energy supplies due to ever-evolving geopolitical tensions.¹ This puts Thor Energy in the perfect position to aid the shift to a green energy economy and help re-draw global supply routes, as the company focuses on uranium in the US and energy metals in Australia.

Nuclear power and the green energy transition

The global energy market has reached an inflection point, where the urgent need for cleaner power sources is finally being recognised. To meet the conditions of the 2015 Paris Agreement, carbon dioxide emissions from electricity generation must be close to non-existent by 2050. To achieve this, whilst simultaneously increasing electricity

demand by expanding its use in heating, transportation and industrial use, a complete overhaul of the current energy infrastructure will be needed.

Although nuclear power is not considered renewable energy, it is considered by the EU, amongst others, as 'green' in lieu of its ability to generate a huge amount of power whilst emitting limited greenhouse gases. Nuclear is therefore considered a key climate change solution. It has been widely recognised as having the highest capacity factor of any other energy source, as it produces maximum power for more than 92% of the year.²



Figure 1. Thor Energy USA project location map.

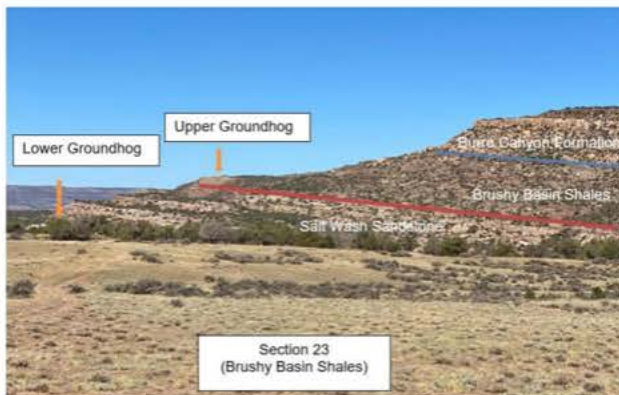


Figure 2. Uranium prospective stratigraphy – Wedding Bell Project.



Figure 3. Airborne magnetic and radiometric survey over the Wedding Bell Project.

It also has a minimal carbon footprint of roughly 15 – 50 g of CO₂ per KWh, compared to the 450 CO₂/KWh for a gas-powered generator, and 1050 CO₂/KWh for coal.³

As the recognition of the benefits of nuclear power has increased, the supply side has struggled to keep up. De-weaponised stockpiles have been largely depleted, and uranium mining has not met reactor demand since the end of the Cold War. As there is an increase in nuclear reactors being authorised by national governments to be constructed globally, the limited supply of uranium is becoming a pressing issue. As nuclear power starts to generate a larger supply of the world's energy, mining companies that are highly leveraged to uranium are poised to benefit.

This has led many countries to actively encourage uranium mining exploration, with the US achieving this through its Inflation Reduction Act. The Inflation Reduction Act proposes investments in energy technologies, including: hydrogen, renewables, and nuclear. A major benefit of the legislation is the provision of tax credits for the production of zero-emission nuclear power. The Act, through tax incentives and investments, guarantees a long-term commitment to nuclear energy by the US (and hence the domestic supply of uranium), as the country transitions to net zero emissions.

Thor Energy will directly benefit from these incentives and investments through the increased funding dedicated to upskilling the clean energy workforce. One example of the initiatives is the Clean Energy Innovator Fellowship Programme, which matches new energy professionals and recent graduates to organisations to help advance clean energy solutions.

Energy security: redrawing global supply chains

With global demand for uranium heavily outweighing supply, the problem becomes exacerbated further when looking at the geopolitical tensions across supply chains. There is an over-reliance on limited supply, with some of the top producers being Kazakhstan, Canada, Australia, Namibia, and Russia. These countries account for 70% of the world's uranium production, leaving it extremely vulnerable to supply chain issues.⁴

With the media predominantly focused on the global reliance on Russia's gas, oil and coal, the Russian invasion of Ukraine has also shown us how exposed and vulnerable the current global uranium supply chain is.

For example, in 2021, The US Energy Information Administration examined how the US imports almost all of its uranium supply, with over 14% of it coming from Russia. Additionally, 35% of US imports rely on Kazakhstan, and, as it is landlocked, thus depends on supply routes through Russia to ship uranium to Europe and then back to the US.⁵ If sanctions are imposed on Rosatom, Russia's civilian nuclear firm, it could cut off exports of uranium to the US' nuclear industries.

In mid-February 2023, the probability of a ban on Russia's uranium supply "drastically increased" following discussions in the European Parliament and US Congress.¹ Therefore, the global dependency on a limited number of

countries' nuclear fuel-production capacity must be re-evaluated, and it is essential that alternative supply chains are found to guarantee countries' energy security.

Working to secure domestic supply

The US is the world's largest consumer of uranium, accounting for 28% of global demand. This is due to their desire for a secure energy supply. However, the US is currently over-reliant on uranium imports, with domestic uranium production levels falling short of this demand.

Thor Energy is one of the companies helping to shift the balance of these global supply chains, aiming to bring more uranium supply and production to the US. The focus on its uranium and energy metals even led it to change its name from Thor Mining Plc to Thor Energy Plc earlier this year.

With the move to regionally and nationally secure supply chains in the nuclear and battery metals industries,

Thor Energy is well placed to leverage off its North American and Australian portfolios.

Whilst also having exposure to uranium, nickel, copper, lithium and gold projects in Australia, Thor Energy holds a 100% interest in three uranium-vanadium projects in the highly prospective Uravan Mineral Belt on the border of Utah and Colorado in the US.

The Wedding Bell Project and the Radium Mountain Project are both in Colorado and comprise of 199 mineral claims over areas of historical high-grade uranium and vanadium production. The Vanadium King Project in south-east Utah comprises of 100 mineral claims, approximately 4 km north of the town of Moab.

Since acquiring the projects in 2020, Thor Energy has completed thorough geological reviews of the claims. It secured high-grade sampling of up to 1.25% U_3O_8 and vanadium up to 3.4% V_2O_5 . Initial drilling confirmed uranium mineralisation at shallow depth and preparation for the next phase of drilling is underway.

At the Wedding Bell and Radium Mountain uranium projects in the US, the intersection of uranium-bearing, reduced sandstones at the greenfields Section 23 prospect means exciting times ahead, as do the lateral continuity of high-grades along strike of historic workings at both the Rim Rock and Groundhog prospects.

As well as these promising geological results, the proximity of Thor Energy's projects also means it is well placed to benefit from the US' transition to a domestic nuclear energy supply. Located approximately 100 km from the Wedding Bell Project in Blanding, Utah, is the White Mesa Mill. Operated by Energy Fuels Inc., the White Mesa Mill is the only fully licensed and conventional uranium processing plant in the US.

It is reported to be the largest producer of uranium in the US and has historically accepted toll milling agreements, as well as purchase programmes for processing ores from third-party mines.

The US still has a long way to go to scale its capacity to produce enough enriched uranium, and to decrease its reliance on uranium imports. However, there is much to be optimistic about in light of discussions in the community, as well as at the top levels of government about the importance of domestic uranium mining and production. It is imperative to prioritise projects that will help achieve energy security, aid the green energy transition, and reduce the US' exposure to the global nuclear fuel supply chain. **GMR**



Figure 4. Thor Energy drilling at Section 23 – Wedding Bell Project 2022.



Figure 5. Nicole Galloway Warland underground at Rim Rock Prospect, Radium Mountain Project.

References

Available upon request.