

xU308

Revolutionizing direct
access to the physical
spot uranium market

Contents

01	Introduction	3
02	The Uranium Market Today	6
03	Smart Contract Design	8
04	Key Partners	10
05	Important Considerations	11

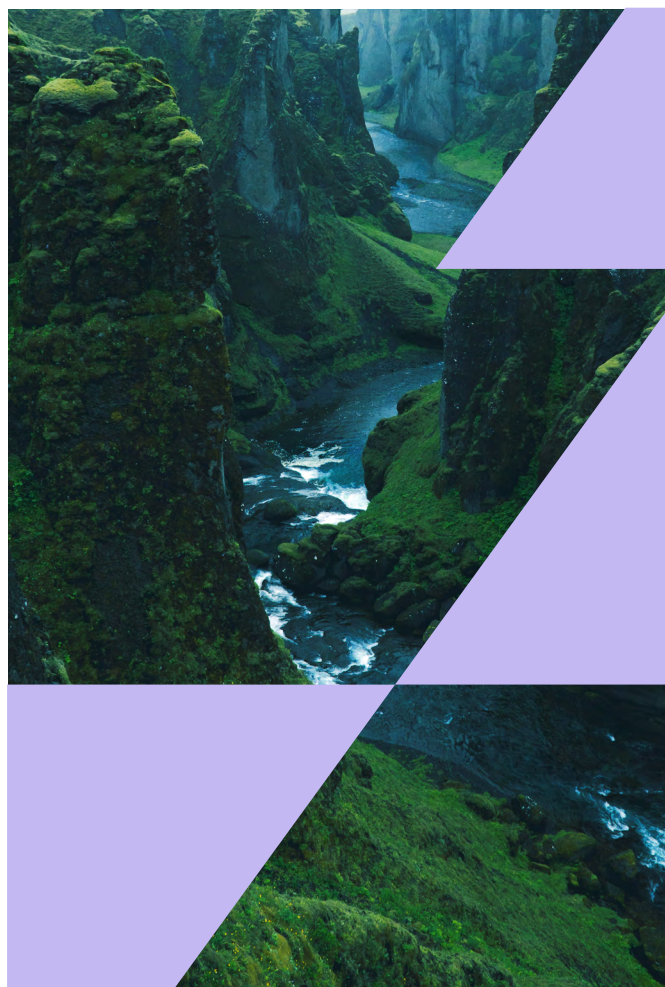
Introduction


xU3O8 enables users to gain ownership of a unique real world asset: uranium ore concentrate, also known as 'yellowcake'. By leveraging a decentralized ledger and smart contract capability, xU3O8 enables holders to own digitally allocated yellowcake uranium stored in the most secure physical vault in the world along with the benefit of lower transaction costs and the portability of a digital wallet.

Uranium ore concentrate is a powdered yellow form of uranium oxide with the chemical formula of U3O8. It typically has a high uranium concentration, making it a critical intermediary in the production of fuel for nuclear reactors. As global energy demand rises and climate goals are becoming increasingly urgent, nuclear energy is gaining traction as a low-carbon, reliable power source.

The access to the physical uranium market is currently complex and limited to primarily institutional buyers with access to specialised brokers due to storage, compliance, and minimum order requirements. To solve this problem and with the goal to digitize hard to access commodity assets, we have designed a structure that uses English trust law to underpin ownership and transfer of yellowcake uranium. With xU3O8, users will have the possibility to own, hold, and transfer uranium in small sums and at comparably low costs. The use of blockchain technology permits efficient, transparent and secured record of ownership and settlement of transactions.

This whitepaper sheds light on the novel design of xU3O8 that enables every holder to own, hold, transfer, or trade physical uranium without the complex hurdles of physical storage and security and high minimum lot sizes.





This is the first delivery as part of a broader alternative Real World Asset (“RWA”) digitization roadmap. The efficiencies and capabilities developed will be replicated across other difficult to access asset classes, which will become accessible using the Tezos technologies. We have designed a structure that uses English trust law to underpin ownership and transfer of U3O8. The beneficial ownership records are maintained by way of a Tezos based smart contract (named: **xU3O8**).

The importance of uranium ore concentrate

U3O8 is produced after mining and created through a process of milling – reducing / removing the presence of other oxides present in the initially mined uranium ore. U3O8 has relatively low levels of radioactivity and a half-life of c. 4.5 billion years. Uranium mines are present globally but the vast majority (85%) of uranium mining takes place in just six countries: Kazakhstan, Canada, Australia, Namibia, Niger, and Russia.

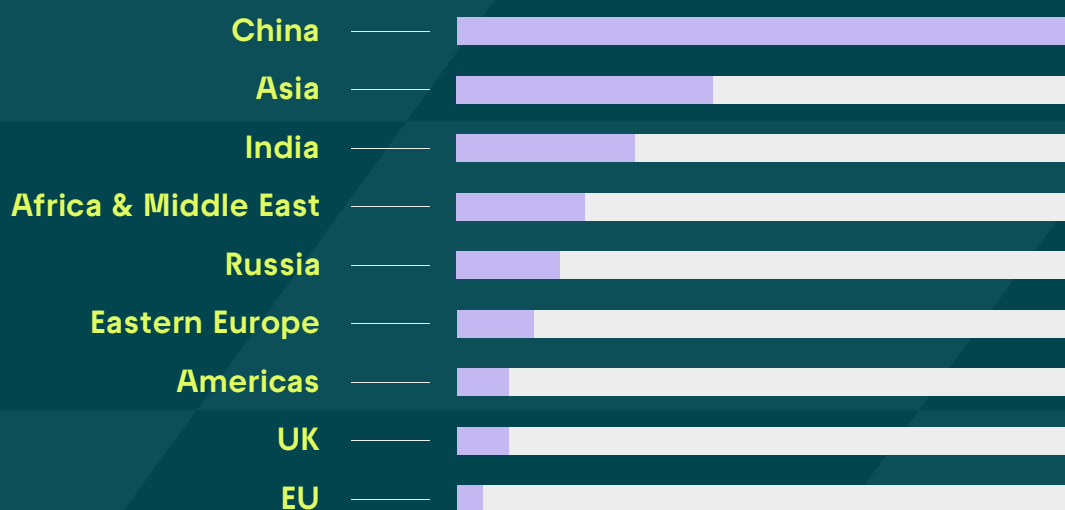
Following milling the U3O8 is enriched to support the powering of nuclear reactors. Enrichment requires the U3O8 to be in the form of a gas which is then separated into uranium-235 (needed for most reactors) and the other ‘tails’ containing lower concentration of uranium-235 isotopes (“depleted uranium”).

U3O8 is seeing increased demand due to more countries recognising the benefits of transitioning to nuclear fuel. This is further driven by the net-zero carbon targets being set globally. As Cameco reference: “There is increasing recognition that nuclear power, with its clean emissions profile, reliable and secure base load characteristics and low, levelized cost has a key role to play in achieving decarbonization goals. As Cameco reference: “There is increasing recognition that nuclear power, with its clean emissions profile, reliable and secure base load characteristics and low, levelized cost has a key role to play in achieving decarbonization goals.”

Demand for nuclear fuel driven by government demand

The 2023 edition of the World Nuclear Association's Nuclear Fuel Report shows a 28% increase in uranium demand over 2023-30. Demand thereafter will depend on new plants being built and the rate at which older plants are retired – the 2023 Nuclear Fuel Report has a 51% increase in uranium demand for the decade 2031-2040.¹ This demand is likely to have a positive effect on returns as spot prices continue an upward trajectory. According to the International Atomic Energy Agency there are currently 441 reactors operating globally and 58 reactors under construction"²

In 2000, primary market participants – utilities and producers – accounted for 95% of the spot market. That share decreased to two-thirds by 2005 and one-third by 2011 and it has remained at 30-40% since. The rest comes from the financial community, namely traders and financiers who have moved in on the market, bringing greater liquidity and efficiency³.



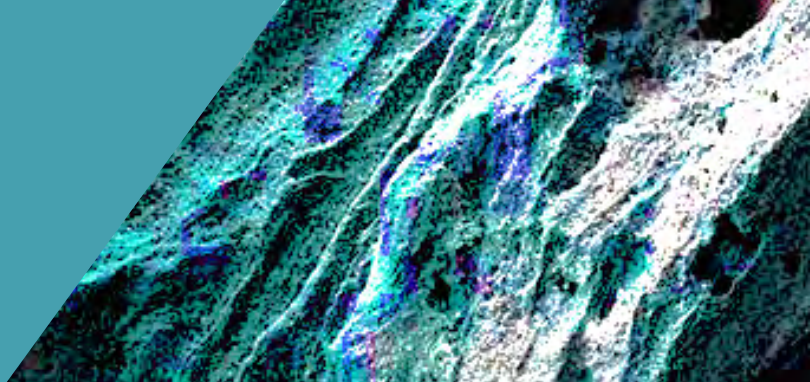
Source IAEA

¹ <https://world-nuclear.org/information-library/nuclear-fuel-cycle/uranium-resources/uranium-markets>

² <https://www.cameco.com/invest/markets/supply-demand>

³ <https://world-nuclear.org/information-library/nuclear-fuel-cycle/uranium-resources/uranium-markets>

The Uranium Market Today



Over-the-counter (“OTC”) Market of Uranium Ore Concentrate

Uranium ore concentrate is currently the most commonly traded form of uranium due to its concentration and stability. This form is more stable and manageable for transportation and storage compared to raw uranium ore, which contains very low concentrations of uranium. Furthermore, it is a dry, granular, and relatively safe form of uranium, making it practical for transportation over long distances, especially for export to processing facilities.

OTC is the only marketplace to access physical uranium ore concentrate at the moment. However, the barriers to entry are high due to the typical minimum lot size of 100,000 lbs (pounds of weight), which is an equivalent of c. USD 8,000,000 value, as of the spot price of October 2024.⁴ Additionally, a buyer must be registered with one of three of the approved depositories / convertors to store any physical uranium (actual receipt outside of the depository is not permitted). The final hurdle is the settlement time for spot trades typically taking between 14 and 30 days – making efficient trading and price discovery a challenge. As a result, the current market participants in the physical spot market are restricted to only qualified institutional buyers.

The nature of uranium ore concentrate also poses challenges for retail buyers or other institutional buyers to access the primary market. It is costly to store and storage facilities are not accessible to every buyer which makes it a difficult asset to trade, own, hold or transfer.

Other channels to gain uranium or uranium-related exposure

The other options to gain uranium or uranium-related exposure are: futures, ETFs, shares or CFDs of uranium miners. The options below are more accessible than the OTC market due to low barriers to entry. However, none of these options provide direct and actual ownership of the physical uranium. In addition, some of the options provide direct economic exposure but come at the cost of counterparty risks.

⁴<https://www.cameco.com/invest/markets/uranium-price>

A comparison of options available to non-institutional investors:

Method of Investing	Complexity (1 = Least 5 = Most)	Expiration Dates	Asset Management Fees	Leverage
Uranium Futures	5	YES	NO	YES
Uranium ETFs	2	NO	YES	NO
Uranium Shares	2	NO	NO	YES
Uranium CFDs	3	NO	NO	YES

xU3O8 Smart Contract Design

Description of the xU3O8 Smart Contract Operation

The xU3O8 smart contract is designed to enable all investors to own physical uranium and access the asset class' returns to support their investment objectives in a cost effective and transparent manner. By leveraging capabilities across the Tezos ecosystem and key third parties, investors can seamlessly acquire and trade U3O8. This solution will be lower cost than existing alternatives. The nature of the asset class and the xU3O8 smart contract enabled arrangements also makes it appealing to larger institutions that will be able to become market makers as well as having the ability to take long or short positions in the token.

The xU3O8 smart contract is structured using a layered ownership ledger: the primary layer reflects, in ounces, the amount of U3O8 held by the trustee for their beneficial owners; the secondary layer reflects the fractional ownership of each wallet holder in the U3O8 held in trust. To pay fees to the service providers that support the holding of the U3O8, a treasury wallet will be allocated fractional ownership on a daily basis, which means that the user wallets share in the U3O8 held in trust will be reduced. More details on the fee structure can be found in the "xU3O8 Smart Contract Fees" section.

The balance of units of xU3O8 credited to a wallet represents proportional ownership of the physical U3O8 held in trust for the wallet holders. The price of U3O8 is determined by supply and demand dynamics across available trading venues. There is no limit on the amount of U3O8 an investor / trader can hold – subject to payment of prevailing prices to acquire that U3O8 via the available trading venues. The physical U3O8 is held for the benefit of the wallet holders in a U3O8 storage account maintained at a regulated U3O8 depository.

Transferring U3O8 ownership entitlement can be achieved by way of the xU3O8 smart contract operation, which results in transferring fractional ownership in the physical U3O8 held in the U3O8 custody account.

Only wallets of approved trading venues (CEX) or whitelisted for use in the dApp can be used to acquire xU3O8. Trading in or out of U3O8 held through the xU3O8 arrangements must occur at a trading venue that can be accessed with the approved wallet. The approved xU3O8 trading venues serve as price discovery venues. There is no formal peg to the spot price of uranium. Market makers and other arbitrageurs that are accessing the approved xU3O8 trading venues are likely to maintain broad alignment to the OTC spot market. The U3O8 held through the xU3O8 arrangements is only deliverable to a U3O8 custody account opened and maintained by the wallet holder at a regulated U3O8 depository.

xU3O8 Smart Contract Fees

In addition to the efficacy of exposure compared to alternative approaches where investors are exposed to other factors, we believe the investment in physical U3O8 via the xU3O8 arrangements can be more cost effective than other approaches. Primarily this is because the xU3O8 arrangements result in U3O8 ownership, which is held in a trust arrangement protected by UK trust law for the beneficial owners of the U3O8 held in trust, permitting the removal of investment management and SPV fees that are common to other offerings.

As mentioned, fees are collected through the transfer of fractional ownership to a treasury wallet daily. This mechanism operates in a similar way to equity dilution in TradFi markets. The balance in the treasury wallet will be used to pay service providers and maintain the xU3O8 arrangements. The formula for calculating fees is as follows:

Fees to be covered include: Annual costs; storage costs, and; administration fees (c. 1% for all fees). The annual forecast fees will be made available publicly and updated monthly.

$$\begin{array}{l} \text{Treasury} \\ \text{xU3o8} \\ \text{balance} \\ \text{to be} \\ \text{credited} \end{array} = (\text{Annual Fees} / 365) \times \begin{array}{l} \text{Aggregate} \\ \text{User} \\ \text{xU3o8} \\ \text{balances} \end{array}$$

Key Partners

The delivery of the xU3O8 arrangements is dependent on a number of key stakeholders role is dependent on the model of trading / access provided. At a summary level there are four key stakeholders:



OTC broker supplying the physical U3O8 to buyers



Responsible for tokenisation, trustee account setup, and RWA administration and custody via Cameco as U3O8 custodian



Development of a direct dApp, relevant integrations, decentralised trading, and ecosystem



Management of CEX trading, including KYC / AML checks, investor acquisition

Important Considerations

- This document is for informational purposes only and does not constitute an offer or invitation to buy any financial product.
- The asset discussed is speculative, and its value may be volatile, with no guarantee of returns.
- The value of these products is variable and can decrease as well as increase.
- Past performance is not indicative of future results.

xU3o8

₮ Tezos