Ucore targets to fill the processing gap in a Western rare earths supply chain by 2024

written by InvestorNews | April 25, 2022

As most investors familiar with the critical materials sector know, China currently dominates the space, especially in downstream critical materials 'processing'. This leaves the Western world very vulnerable to supply chain interruptions that can threaten the supply of end-user products such as electrical and electronic components, electric vehicles, wind turbines, solar panels, and/or military systems.

Today's company, Ucore Rare Metals Inc. (TSXV: UCU | OTCQX: UURAF) (Ucore), is working to bridge that gap, domestically, and become a USA 'processor' first of the rare earths, and ultimately of other key critical materials. They also plan to be a vertically integrated individual, separated, heavy rare earths producer.

Ucore is focused on initially developing an Alaska-based Strategic Metals Complex (SMC) rare earths' central processing facility with commissioning targeted for 2024. After that Ucore plans to develop its own magnet rare earths' deposit located on Bokan Mountain on Prince of Wales Island, Alaska. The ultimate plan for Ucore is to have their Bokan-Dotson Ridge REE Project – containing the heavy rare earths' Dysprosium (Dy), Terbium (Tb) & Yttrium (Y) – feed their first, Alaska located, SMC processing facility. The underlying technology for this and other planned SMCs is the RapidSX™ REE separation technology platform, which will be operated by Ucore's wholly owned subsidiary, Innovation

Metals Corp. (IMC).

Ucore plans to fill the processing gap in creation of a Western rare earths supply chain with their SMC facilities

Source: Ucore news January 2022

A key part of getting the Alaskan SMC processing facility up and running is to secure material supply agreements. The facility will have an initial 2,000 tpa total rare earth oxide (TREO) separation and purification capacity, ramping to at least 5,000t/year TREO by 2026.

Feedstock agreements are progressing well for Ucore's planned Alaskan SMC processing facility

In October 2021 Ucore signed a non-binding Memorandum of Understanding (MOU) with Vital Metals Limited (ASX: VML | OTCQB: VTMXF) for the supply of a mixed rare earth carbonate, beginning H1 2024. The deal is for "Vital to sell to Ucore a minimum of 500t REO (ex-cerium)/year, commencing H1 2024. Vital to expand production to support a minimum of 50% of Ucore's envisioned 5,000t TREO/yr processing capability by 2026."

It also was announced last week on April 20, 2022, that Ucore and Germany's ThyssenKrupp Materials Trading had executed a feedstock supply MOU for the Alaska SMC. Under the MOU "ThyssenKrupp Materials Trading is expected to begin the supply of a minimum of 1,000 tpa of mixed rare earth carbonate to Ucore in 2024 for ten years." The announcement also states that the non-binding MOU allows for increasing quantities in subsequent years and that the two parties will work towards a 10-year binding contract.

The above MOU is a great achievement and positive endorsement

for Ucore, as ThyssenKrupp Materials Services is the biggest mill-independent materials distributor and services provider in the Western world with around 380 locations, in more than 30 countries.

The loud and clear message for investors is that Ucore is putting together a North American individual rare earths supply chain from mixed rare earths carbonate (concentrate) all the way to the final product of separated individual rare earth oxides, used to make rare earth metal alloys (including magnets) such as those required for many critical and green energy products. It will be a key initial step for the USA to gain rare earths processing independence from China, which currently dominates the sector.

Ucore is also developing processing technology for other critical metals in Ontario

As announced on April 19, 2022 Ucore is improving the management and technical team for their Ontario RapidSX™ Commercialization and Development Facility (CDF). The demonstration plant construction is ongoing and is scheduled for commissioning in mid-2022.

What I find most interesting is that Ucore is also working on nickel laterite ore processing technologies as well as lithium-ion battery recycling, including working with clients such as Li-Cycle Holdings Corp.

Full details on Ucore's 2022 plans can be read here and include:

- A commercial demonstration plant for their RapidSX™ technology in Ontario.
- Development of the Alaska SMC Project.
- Exploring the potential of developing an SMC in Canada.
- Accelerating the development of the Bokan Project as a

vital US supply chain component to provide a long-term secure source of HREEs; the most expensive and scarce inputs of the permanent magnet alloys.

Ucore's business summary – Includes a target for construction of the Alaska SMC by 2023, subject to finance

Source: Ucore Rare Metals Inc. website – Alaska 2023

Closing remarks

The Western world needs to develop its own complete end-to-end supply chains for critical strategic metals. In the case of rare earths, Ucore is advancing well and steadily moving towards becoming a U.S. individual separated rare earths producer by 2024, all going to plan. Of course, investors should remember these dates are the best guide from the company only and are subject to variables such as successful funding.

Ucore Rare Metals Inc. trades on a market cap of C$37 million. Ucore still has a long way to go with several hurdles and risks ahead, partially explaining the very low market cap. Still, if they succeed the potential reward could be significant.

One of the world's richest rare earth deposits continues

towards resolution of issues with Burundi partner

written by InvestorNews | April 25, 2022

Rainbow Rare Earths' production in Africa to be expanded through extraction from South African mine tailings.

When it comes to rare earths it is important to identify the most valuable ones. Rare Earth permanent magnet production accounted for 91% of the total monetary value of rare earth consumption in 2019, and neodymium and praseodymium (NdPr) are the two key rare earth elements used in permanent magnets, particularly neodymium. This explains why most rare earth miners target NdPr. They are simply the most in demand and are highly valuable.

Rainbow Rare Earths Limited (LON: RBW) ("Rainbow") is a rare earths miner targeting NdPr production at their two African rare earth projects. Rainbow's strategy is to become a globally significant producer of magnet rare earths. Rainbow has two African-sited projects, each of which has a special attribute leading to potentially lower cost mining. Rainbow also has exclusive rights, across the SADC region of Africa, to privately owned American specialty chemical engineering company's (K-Tech) rare earths continuous ion chromatography separation technology. The K-Tech process targets individual separation of rare earth from natural mixtures in fewer stages with more flexibility than traditionally used solvent extraction thereby saving on upfront

CapEx and ongoing OpEx and potentially producing a higher end-value separated oxide rather than a carbonate. Testing is ongoing.

Rainbow's two rare earths projects are:

- The Phalaborwa Project in South Africa.
- The Gakara Project in Burundi, East Africa.

The Phalaborwa Project (70% earn-in agreement)

The Phalaborwa Project comprises an Inferred Mineral Resource estimate of 38.3Mt at 0.43% Total Rare Earth Oxides (TREO) contained within gypsum 'tailings' stacked in unconsolidated dumps derived from historic phosphate fertilizer hard rock mining. Being a tailings resource eliminates the need for hard rock mining, which is expected to lead to lower operational costs. The Resource has a high-value NdPr content representing 29.1% of the total contained rare earths, measured as oxides, with economic dysprosium and terbium, key rare earths for high temperature operation of permanent magnets, as valuable by-product credits. The Project has 5-10 times higher grade NdPr than a typical ionic clay style rare earth deposit (see table below). It also has low levels of radioactive elements which means easier processing and lower costs.

Being on the site of a past mining operation, the Phalaborwa Project has excellent infrastructure and transport logistics. The Project is largely permitted and positioned in an established mining region.

The Gakara Project (90% interest)

Rainbow states that "the Gakara Rare Earth Project is one of the world's richest rare earth deposits." Rainbow has a 90% interest in the Gakara Project with a non-dilutable 10% owned by the Burundi State. The mining permit covers a large area of over 39km^2 and has a 25-year mining license that began in March 2015.

Gakara was placed on care and maintenance in June 2021 at the request of the Government of Burundi. Primary concerns of the Burundi Government are understood to relate to the pricing of the mineral concentrate currently sold under a long-term off-take agreement with a German company's (ThyssenKrupp), trading arm. Rainbow states: "Rainbow continues to engage constructively with stakeholders to resolve the issue and allow trial mining to recommence as soon as possible."

Closing remarks

Rainbow has two exciting African rare earth projects.

The Phalaborwa Project has several advantages including:

1. An ore tailings source, so no need for hard rock mining, crushing, or milling and hence lower production costs.
2. High-value Nd and Pr oxide content representing 29.1% of the total contained rare earth oxides, with low levels of radioactive elements, and
3. An existing mining site with great infrastructure and logistics available.

The Gakara Project has outstanding NdPr grades in visible "veins" and is amenable to simple physical separation of minerals from waste rock to produce a high value rare earth

concentrate. This makes for a low OpEx project. The Project is currently on care and maintenance pending the expected resolution of certain legal issues with the government of Burundi.

Risks are typical of those for junior rare earths miners including funding risk and in this case, sovereign risk in Africa.

Rainbow Rare Earths Limited trades on a market cap of £ 78 million (~US$105 million). One to follow with great interest.