The European critical raw material (CRM) search is in full swing, and many are looking to the **Scandinavian countries** such as Sweden, Finland, and Greenland to meet the huge demand required to fuel the energy transition revolution, build renewable power generators, and supply the multiple gigafactories being built all over Europe.

The EU Critical Raw Materials Act launched in March of this year sets some ambitious targets for Europe with the EU Commission aiming for 10% of total EU demand of CRM to be satisfied by EU mining operations, 40% from local processing and 15% from recycling capabilities.

The EU demand for CRM is likely to grow significantly from current levels. To reach the stated goal of climate neutrality by 2050, The EU estimates it would require **60 times more lithium and 15 times more cobalt** in 2050 compared with current levels.

Demand for rare earth elements used in permanent magnets to power electrification transition such as wind turbines is expected to increase 10 times to 2050.

There is overwhelming desire in Europe to, if not achieve self-sufficiency, to remove the massive imbalance of supply where some countries account for almost of all the EU imports.

Some examples from German Mineral Resource Agency (DERA) from 2021 figures:

98% of European supply of Nickel Oxide comes from Russia, 72% of rare earth elements from China, 86% of vanadium from Russia and 56% of Molybdenum from Uzbekistan.

No wonder there was much rejoicing in Europe when the Swedish state-owned mining company **LKAB** announced earlier this year they had found more than a million tons of rare earth oxides in northern Sweden. More work on verification of the size of the possible resource needs to be undertaken, but anything over 1 million tonnes would place it as the largest, rare earth element deposit in Europe. However, it has been since reported oxides in the reserve could be quite low (0.18%) which could make permitting in Sweden more difficult.

Elsewhere in some of the surrounding Scandinavian countries, there is some interesting projects managed by Australian resource companies.

In Greenland – which has long been considered a possible treasure trove for CRMs and REEs – an Australian based explorer, **Eclipse Metals Ltd** is working on old mining site with potential high strategic value.

Eclipse Metals' Ivigtût project is in Southwest Greenland and was once the world's largest historical cryolite mine which has rare earth potential. The company has commenced preliminary drilling on 31 percussion holes. Early-stage samples suggest a possible economic resource from the substantial mine waste on site containing visible cryolite, fluorite, and quartz.

Drill sampling has also been conducted at the Grønnedal project and early samples have returned encouraging values of praseodymium (Pr) and Neodymium (Nd). These early results indicate Eclipse Metals' Grønnedal carbonite complex could be significant on a global basis in respect of Pr and Nd content.
Neodymium magnets are the most common type of rare earth magnets and the EU imports around 16,000 tonnes a year of rare earth magnets from China or 98% of EU demand. Any significant resource of Neodymium in Europe or its vicinity would be expected to be highly valued.
Elsewhere in Sweden, Australia based Talga Group successfully commissioned and commenced operating Europe's first lithium-ion battery anode plant in 2022. The qualification plant in Northern Sweden will supply coated anode material for customer qualification. The plant uses graphite concentrate from the Company's wholly owned Vittangi Graphite project. The Vittangi project will use 100% renewable electricity to extract graphite and refine it to coated anode material. The first stage of the project will produce 19,500tpa of anode for 24 years.
Finland also a long mining tradition and shares a mineral rich Fennoscandian bedrock with Sweden. This solid rock beneath the Scandinavian and Kola peninsulas has the potential to provide everything that's on the EU list of critical raw materials, according to some experts. The country also has the only significant current production of Cobalt in Europe at Sotkamo. The mine is operated by Terrafame which is majority owned by the Finnish Government through the Finnish Minerals Group.
One small-cap Australian based company, **Prospech Ltd** considers the region offers strong exploration and strategic opportunities. Prospech have assembled a portfolio of 3 projects highly prospective for REE, lithium and precious metals. The Company has over 4 years operating experience in Finland to identify REE and lithium assets. The Jokikangas REE project has returned early samples of up to 2% REE in elongated bodies and possible Vanadium deposits.
The CEO of Prospech, Jason Beckton, said about the Finnish projects "the company is delighted with its preliminary search and compilation of historical drill core data" from the Jokikangas project and "there was a significant increase in demand for locally supplied critical minerals in Europe" with the Finnish Government committed to fulfilling the demand from local sources.
Another Australian based company Neometals Ltd is developing a sustainable vanadium recovery and production processing plant (VRP) at the City of Pori in Finland. The project seeks to recover high-purity vanadium pentoxide from vanadium bearing steel making by-

product or “slag” generated or obtained from Scandinavian steel maker SSAB.
Neometals VRP is targeting a 1.5 million tonne reduction in CO2 emitted to the atmosphere over 10 years compared to conventional mining. The VRP will not have any waste streams and according to European raw Materials Alliance (ERMA) will “set a new precedent for circular economy practices in metals processing”. A final investment decision on the project is scheduled for June 2023 with construction planned to commence in July and operations to commence in early 2026.
Diversifying processing and supply of **Vanadium** is of significant interest to the EU. Vanadium on the list of Critical Raw Materials and is increasingly used in Vanadium Flow Batteries – ideal for storing large quantities of renewable energy at ready state for long periods of time and to rapidly release that energy as required.
With Finland, Sweden and Greenland holding significant likely reserves of critical raw materials and with a mining friendly approach from Government and EU agencies, it is no wonder there is growing appeal from global small and mid-cap resource sector in these countries and Scandinavian region.

Source: green leiter