

# Greenland Minerals Ltd

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## Greenland Minerals works toward mine licence for Kvanefjeld rare earths

Greenland Minerals and Energy Limited (ASX:GGG) (FRA:G7P) (OTCMKTS:GDLNF) managing director Dr John Mair has described the company's large Kvanefjeld magnet metals project in in the Danish territory as having a "simple processing path."

Mair, who was speaking at last week's Greenland Day Perth, is advancing a company agenda to reduce capital costs for its wholly-owned project, as part of a multi-disciplinary team.

**READ:** Greenland Minerals reduces Kvanefjeld costs, optimises civil engineering design

Greenland Minerals' leader Mair has a PhD in economic geology and extensive international experience across a range of commodities.

He became the managing director of Greenland Minerals in 2014 after first becoming involved with Greenland in 2008.

MD Mair told delegates at Greenland Day last Wednesday that Kvanefjeld was the company's focus.

Mair said: "Our primary focus has been, since we stepped into Greenland — a little over 10 years (ago) — has been on a project called Kvanefjeld.

"It's very unique, primarily a rare earths project, a very unusual polymetallic project that also involves uranium, some zinc, as well as industrial (elements) ... in terms of projected product output.

"As far as projects like this go, it's one of the more significant globally — it's backed by a very significant resource, very unique."

**READ:** Greenland Government highlights value of open frontier at Greenland Day Perth

The project features 1.01 billion tonnes grading 1.1% rare earth oxides (REO) with a substantial uranium resource of 593 million pounds, as well as zinc.

As the uranium is recovered at low incremental cost, it would likely be an important by-product revenue stream for Kvanefjeld.

Mair said: "For this kind of project, it lends itself to a very, very simple processing path, which is a real advantage in the space which is typically very, very complex.

"That equates to cost structure and so that sets the project up as being a potential long-term low-cost producer of metals which are going to be very,

**Price:** A\$0.14

**Market Cap:** A\$158.57M

### 1 Year Share Price Graph



### Share Information

**Code:** GGG

**Listing:** ASX

**52 week High Low**  
A\$0.15 A\$0.05

**Sector:** Energy

**Website:** www.ggg.gl

### Company Synopsis:

*Greenland Minerals and Energy Ltd (ASX:GGG) is listed on the Australian Securities Exchange.*

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very important with the coming decades, metals which are fundamental to the clean energy transition to a lot of the ... electric carbons.

"That's primarily what the rare earth's all about."

A clean energy future

Greenland Minerals' vision is to develop a stable, long-term source of materials for clean energy generation and energy-efficient technologies.

Its flagship project has previously been tipped to become one of the largest producers globally of key magnet metals along with by-production of uranium and zinc.

Mair said Kvanefjeld had "a deep foundation both at a technical level, in terms of where we're taking the project commercially, but also in terms of our involvement at a stakeholder level in Greenland."

He highlighted the company's flagship project was located near a historic fishing town and had year-round shipping access.

READ: Greenland Minerals welcomes added government support for mining

Mair pointed to the project's long history, saying: "The project was really started back in the 1950s with some state-sponsored research programs.

"We continued to advance the project and took it to where it currently is now, which is very much a polymetallic approach, that commenced in 2007 and so it's been a little over 10 years.

"It's an advanced project, it's a mature project, there's close to \$100 million of sunk cost across resources, metallurgy, feasibility, environmental work, stakeholder engagement."

Cost reductions

The Greenland Minerals leader pointed to cost reduction efforts reported on Monday last week, where the company managed to reduce forecasted project costs by making major reductions to the amount of civil earthworks required to prepare the site for an open pit mine and a plant.

With the help of Tetra Tech, the design for a process plant pad was revised heavily and shaped to match the contours of the land, reducing civil construction effort and associated cost.

Greenland Minerals is also hoping to reduce metallurgical processing costs under the guidance of its major shareholder Shenghe Resources Holding Co Ltd (SHA:600392), a leading rare earths company.

Mair said told Greenland Day: "We're working with Shenghe Resources, which is a Chinese rare earth company but it's the most internationally focused of China's rare earth fleet.

"It's not a state rare earths entity, they're a major Chinese supplier to the

international markets, they're arguably the strongest company fixed in the rare earths space globally.

"An example of their international pedigree, they're the group (MP Mine Operations LLC) that's key in restarting the (open-pit rare-earth-elements) Mountain Pass mine in California."

Strategic partner Shenghe supplies high-purity rare earth metals and oxides to end-users across the globe and has formally agreed to pick up Greenland Minerals' mine product, or refine and market its rare earth products, to its international customer network.

The parties' offtake memorandum of understanding was inked in August 2018.

#### Kvanefjeld's site location in Greenland

Greenland Minerals reported last week Canadian Civil and Mining Contractor Nuna Logistics, which has arctic expertise, is expected to share a new civil construction cost estimate for Kvanefjeld project in November 2018, which will be based on an updated civil design that quantifies cost reductions.

PND Engineers and China Communications Construction Co (C-CCC) are also part of the engineering group team hoping to reduce capital costs at the site.

A studied approach

Western Australian company Greenland Minerals has produced a number of studies over the past years, which its multi-disciplinary team is now updating costings on.

Greenland Minerals is following a government process to earn a mining licence

These include a 2015 feasibility study and updated feasibility study of 2016 which it released after undertaking pilot plant operations and additional engineering studies.

The study predicted a 37-year mine life based on the 108 million tonne ore reserve — a tiny 10% of the JORC-compliant 1.01 billion tonne resource estimate.

Kvanefjeld's net present value was US\$1.59 billion in the 2016 study, with a 43.4% internal rate of return.

Project financing costs were US\$831.9 million and the project had a payback period of 5 years.

A JORC graph from the 2016 update to the Kvanefjeld feasibility study envisages expansions to both mine life and capacity

Greenland Minerals is following a process to tick the boxes to achieve a mining licence for Kvanefjeld.

Mair said: "Like Ironbark (Zinc Ltd (ASX:IBG), it's a long road to get to this type of point with these type of projects, they don't happen overnight.

"But we're now coming down to the pointy end of going through the approvals, mining licence and then following the footsteps of (fellow Australian company in Greenland) Ironbark and moving onto project finance and also with project development."

BIG PICTURE: Ironbark Zinc courts build-to-operate partners for Citronen mine as field operations begin

Greenland Minerals lodged an environmental impact assessment (EIA) report with the Greenland Government in August 2018.

A draft EIA had been submitted in late 2015, with the submitted document extensively reviewed by Greenland's Environmental Agency for Mineral

Resource Activities (EAMRA) and its advisory bodies.

GHD Consulting had prepared the document with Orbicon, drawing on the technical expertise of specialists at Arcadis, the Danish Hydraulic Institute, SRK Consulting and the Wood Group.

The final EIA was to be translated into Greenlandic and Danish languages and reviewed in parallel with a public consultation period.

READ: Greenland Minerals lodges EIA for large rare earths project

The rare earths market is changing globally, as China looks to cap primary production of rare earths at 140,000 tonnes a year by 2020 and electric-vehicle battery makers seek long-term supply contracts.

Government policies across the globe are transitioning in electric vehicles and aiming to significantly expand offshore wind-power capacity.

The policies effectively underwrite continued demand growth for neodymium, praseodymium and dysprosium and drive up their prices amid a forecasted supply gap.

The influence of the US, with its focus on energy security, is another factor changing the space, as the North American country looks to firm up supply sources from within its borders and from markets outside China.

Greenland Minerals looks set to become a major new supplier in this changing regime, helping open up Greenland as a destination for mining investment and emerging rare earth projects.

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