

on the island. At the end of the war, these bases continued to serve as key Western posts to protect and defend against potential invasion by the Soviet Union. Today, the Pituffik Space Base (also known as Thule Air Base) is the northernmost US military installation with missile detection and defense as well as space surveillance capabilities.

As Arctic ice caps melt, new emerging shipping routes through the region are creating new economic and geostrategic opportunities for global powers. The Northwest Passage is a series of maritime routes running through Canada's Arctic Archipelago, connecting the Pacific to the Atlantic Ocean. The passage is currently only navigable for short windows of time each year due to difficult conditions and shifting sea ice. But scientists project that with accelerated global warming and technological advancements, the passage may soon be open for transit every summer, connecting East Asia to Western Europe with a route 7,000 km shorter than the current route through the Panama Canal. Control of these Arctic waters will be key to unlocking the economic and security advantages of the emerging global passage, and Greenland's advantageous position along this route lends it strategic importance to the United States, China, and any other power looking to access the Northwest Passage.

ways to counter China's hold on global REE resources — US officials extensively lobbied the Tanbreez developer to prevent the sale of the deposit to a Chinese buyer. Tanbreez Mining sold the deposit to New York-based Critical Metals Corp for reportedly less than earlier offers from Chinese firms.

Deposits and ore grades

Greenland has two large deposits of rare earth minerals that are at the center of the surge in interest in Greenland's mineral wealth: the Kvanefjeld and Tanbreez mine sites. Both deposits are located on the southern tip of the island in close proximity to the town of Narsaq. Kvanefjeld is the third-largest known land deposit of REEs, with over 11 million metric tons of reserves and resources, including 370,000 metric tons of heavy rare earths. The project began exploration and prefeasibility under Energy Transition Minerals (formerly Greenland Minerals and Energy) in 2007, completing feasibility and entering the permitting stage in 2015. The feasibility studies revealed high rare earth ore grades of 1.43 percent, well above projects like Brazil's Serra Verde (0.15 percent) and Texas's Round Top (0.033 percent) but falling short of the superior grades of Australia's Mt Weld (6.40 percent), MP Materials' Mountain Pass (5.96 percent), and China's Bayan Obo (2.55 percent) (see the table).

Top Rare Earth Mines by Ore Grade

Rare Earth Mine	Country/Location	Ore Grade of Reserves (%)
Tomtorskoye	Russia	14.500
Steenkampsraal	South Africa	8.680
Mt Weld	Australia	6.400
Mountain Pass	United States	5.960
Ngallala	Tanzania	4.800
Ozango	Angola	3.040
Kangankunde	Malawi	2.900
Nolans Bore	Australia	2.900
Bayan Obo	China	2.555
Wicheeda	Canada	2.430
Nechalacho	Canada	1.700
Kvanefjeld	Greenland	1.430
Songwe Hill	Malawi	1.160

sage and project power globally.

For years, China has attempted to establish a foothold in Greenland through infrastructure investments, but no Chinese investment has come to fruition due to geopolitical concerns. In the last 10 years, China has ventured to invest in Greenland's airports, an abandoned naval station, and a satellite ground station, but its ambitions have been largely stalled and curtailed by US and Danish stakeholders. While China has yet to build a Polar Silk Road of geopolitical significance, China's dominant position in rare earth separating and processing offers it an advantage in accessing Greenland's rare earth resources via processing offtake agreements. The United States is actively looking for

The Tanbreez deposit is not as far along in development — only completing its preliminary economic assessment in 2025 — but is also estimated to contain a globally significant deposit of REEs, potentially the world's largest, at 28.2 million metric tons. Over 27 percent of the project is estimated to consist of heavy rare earths. However, ore grades are estimated to be much lower, at 0.38 percent. Ore grades are especially important to the economic feasibility of a rare earth mine — higher-grade deposits require less material to be mined and are easier to separate and process, equating to lower costs. Nevertheless, the high concentration of valuable heavy rare earths makes Tanbreez an attractive deposit despite lower ore grades.



Social license to operate

While both Kvanefjeld and Tanbreez are globally significant deposits of rare earths, Tanbreez is one of only two mine sites, out of 147 active mineral licenses in all of Greenland, to receive an exploitation license. Intense political opposition to certain kinds of mining due to environmental and safety concerns has obstructed further licensing. REE deposits are commonly co-located with uranium. Mining deposits with uranium yield radioactive waste, creating additional environmental management challenges. Unlike the Tanbreez project, which is co-located with tantalum, niobium, and zirconium, there are an estimated 270,000 tons of uranium co-located in the Kvanefjeld deposit, making it the eighth-largest uranium deposit in the world. The Kvanefjeld project has sought an exploitation license since 2019, but the project's application has been repeatedly denied due to concerns with the deposit's uranium content.

In 2021, the Inuit Ataqatigiit party won parliamentary elections, and Greenland's parliament promptly passed legislation banning exploration and mining of mineral deposits with a uranium concentration over 100 parts per million, effectively blocking the development of the Kvanefjeld rare earth mine, which has a uranium concentration of approximately 300 parts per million. The future of Greenland's mining industry was a pivotal issue in the 2021 election, which became widely known as the "mining election". The Inuit Ataqatigiit campaigned heavily for a ban on uranium mining in Greenland to protect the environment, public health, and Greenland's tourism and fishing industries. The grassroots movement "Uranium? No" gained momentum in the years leading up to the election, organizing protests at the Kvanefjeld mine site with an alliance of sheep farmers, fishermen, and the predominantly indigenous residents of Narsaq. The group's founding

A rock containing "red" rare earth elements, "black" arfvedsonite, and "white" feldspar minerals is held up at the Tanbreez site, Greenland.

JAMES BROOKS/BBC

activist, Mariane Paviaisen, was elected to the Greenlandic Parliament in 2021 as a member of the Inuit Ataqatigiit party. As a result of the uranium mining ban, the Kvanefjeld project has been tied up in litigation since 2022. Energy Transition Minerals argues the legislation constitutes expropriation and demands compensation of \$11.5 billion, equivalent to nearly four times Greenland's GDP as of 2023. The uranium mining ban may not be permanent — the ban was originally adopted in the 1950s before being repealed in 2013 and reinstated in 2021 — but the intense local opposition to the Kvanefjeld project will continue to be a long-term barrier to operating.

Infrastructure

Despite Greenland's promising mineral wealth, there have only been nine active mine sites since World War II. Today, there are only two mining projects operating on the island: the White Mountain anorthosite mine and the small but high-grade Nalunaq gold mine. No rare earth mining has taken place to date. Further development of the mining sector is impeded by inadequate transport and energy infrastructure. The entire island, three times the size of Texas, has only 93 miles of road. Furthermore, Greenland has only 16 ports, each with only limited capacity. The Nuuk port, the island's largest, carried 2 million tons of cargo in 2021. The closest large port near the Kvanefjeld and Tanbreez mines is the Narsaq port, which handles only 50,000 tons of cargo annually — just 2.5 percent of the Nuuk port. Electricity generation is inconsistent and limited. The largest installed electricity generation capacity is currently 54 MW in the capital city of Nuuk, 290 miles away from Narsaq. Significant investment in energy transmission and capacity will be a necessity for any mining operation.

Viable large-scale rare earth mining in Greenland will require major investments in the enabling infrastructure. China has shown its willingness to invest in Greenland's infrastructure to support its mining operations as well as its Arctic ambitions, but so far, no major projects have come to fruition. In 2018, the state-owned Chinese Communication Construction company was shortlisted to construct and expand a network of airports in Nuuk, Ilulissat, and Qaqortoq. The project would require a nearly \$550 million investment, equivalent to 17 percent of Greenland's GDP, which was just \$3.3 billion as of 2023. The proposed project raised flags with both the United States and Denmark. US Secretary of Defense James Mattis urged the Danish government to interfere in the transaction to prevent China from establishing a foothold in the region. Denmark pulled the bid and financed a large portion of the airport updates itself to block Chinese involvement. While Denmark interfered in the project for national security reasons, growing calls from the Greenlandic people for economic independence may make the island nation more eager to accept foreign investment from China in the future.



Members of the Danish armed forces during a military drill in Kangerlussuaq, Greenland, in September 2025.

GUGLIELMO MANGIAPANE/REUTERS

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