

**Article overview:**

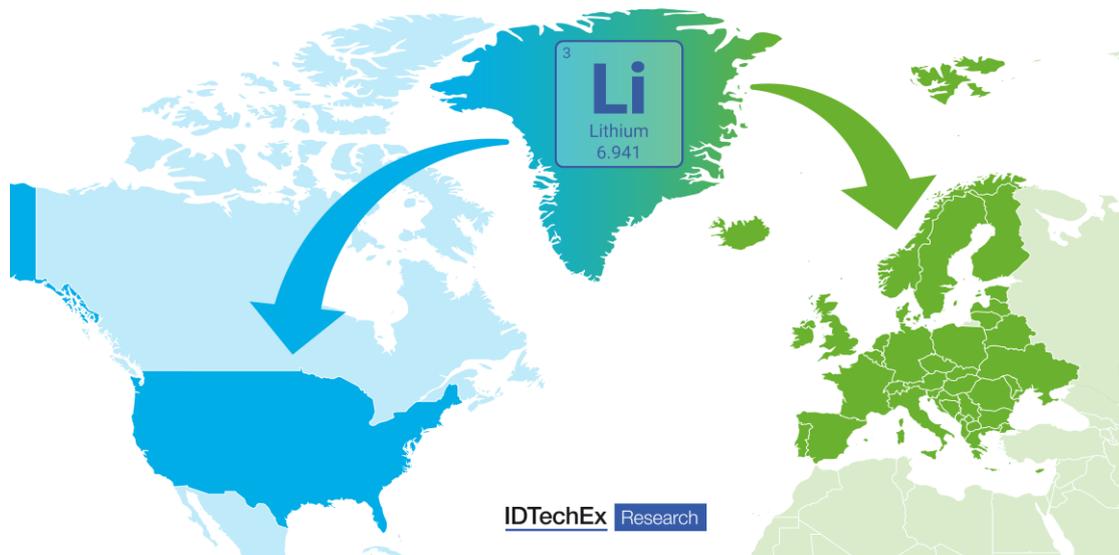
The US’ nascent lithium production capacity makes use of direct lithium extraction technologies to localize and secure battery supply chains. However, with political tensions around Greenland rising, this article explores how the recent discovery of hard rock lithium deposits in the region could reshape American lithium production.

**How Will Uncertainty in Greenland Shape American Lithium Production?**

At a time when lithium is in greater demand than ever and countries are seeking to secure their own mineral supplies, the geopolitical uncertainties that currently hang over Greenland threaten to shake up the global lithium market. The United States and its companies have so far focused on lithium production within its own borders by making use of direct lithium extraction (DLE) technologies, but tensions and the possibility of future exploration in Greenland could see it change course.

IDTechEx’s new “[Direct Lithium Extraction 2026-2036: Technologies, Players, Forecasts](#)” report forecasts the US will be a leading player in the global DLE space, which will fuel the growth of the lithium market to a value of US\$52 billion globally by 2036. However, the exact role the US plays in this market will be shaped by what the future holds for Greenland.

**Geopolitical Tensions Arising Over Greenland’s Lithium Deposits**



Greenland’s lithium deposits could go on to impact American lithium production, Source: IDTechEx

**What is direct lithium extraction (DLE)?**

DLE refers to a series of specialized processes that aim to extract lithium from brines quickly, efficiently, and sustainably. This is done through the use of customized materials including sorbents, solvents, and membranes which can selectively extract lithium from a wide range of brine types. The resulting process is highly efficient with lithium yields of over 80% and can be done in just hours or days.

This is in stark contrast to the conventional lithium extraction methods of hard rock mining and brine evaporation, both of which have challenges that make them difficult to scale. Hard rock mining makes use of unsustainable mining practices, with only moderate yield, and relies on intensive post-processing (most of which is controlled by China) to arrive at a battery-grade lithium product. Meanwhile, brine evaporation requires high land use for evaporation ponds and leads to significant losses of water from the ecosystem. It also offers the lowest lithium yield while requiring 12-24 months to sufficiently concentrate brines for extraction.

It is for all these reasons that DLE has seen increasing popularity and investment around the world, especially for brand new lithium projects to keep up with demand.

### **Why is the US using DLE?**

The US does have lithium-bearing brines within its borders, but these are generally not suitable for evaporation, which needs brines to have high lithium content with low levels of impurities. Instead, American brines are often either geothermal brines (at high temperature with quantities of potassium and boron contaminants) or oilfield brines (very low lithium contents with remnants of sulphur or hydrocarbon contamination from oil & gas exploration).

Therefore, in order to meet lithium demand for EV and energy storage battery cells, and to localize supply chains, the US has had to turn to DLE technologies. It saw its first commercial-scale DLE plant enter operation in 2025, with the new IDTechEx report highlighting many more in the planning or development stages. This includes projects in Nevada, Arkansas, Texas, Louisiana, Utah, and North Dakota.

### **How does Greenland impact American lithium production?**

Recent political tensions in Greenland have highlighted the bounty of critical mineral deposits that Greenland has to offer, including key battery materials such as lithium as well as nickel, cobalt, and graphite. Greenland's lithium comes in the form of hard rock deposits, the first of which were only unearthed in 2024. Further geological exploration is still being carried out, but surveys to date suggest that these are high purity deposits with good potential to be profitable. Pilot plant projects are already being planned to tap into them, with construction possibly starting in 2026.

This places American lithium production at a crossroads. With the possibility of increasing American influence over Greenland and its resources, American companies may be incentivized to exploit these hard rock deposits instead of domestic brine sources. Hard rock mining of lithium is a mature and well understood process responsible for the majority of global production, while DLE is more novel and comes with greater financial risk, requires higher CAPEX, and demands more significant R&D capabilities for development (especially for geothermal and oilfield brine DLE which are even less developed).

With the US expected to be a major DLE player in the short-term, a move like this would dampen the market for DLE projects and materials, while also stripping away the sustainability benefits provided by DLE processes.

However, Greenland's deposits come with their own challenges too. For one, hard rock mining still comes with a degree of risk (albeit lower than DLE) and there are no guarantees that these deposits will be profitable – this will depend on factors including deposit quality, location, ease of extraction, and more. Additionally, American resource companies would still be required to expand their own post-processing capacity in order to produce battery-grade products without relying on Chinese partners. Finally, hard rock mining is still less efficient than DLE, and this gap will continue to widen as DLE technology sees greater innovation globally. American manufacturers may feel that the higher risk of DLE projects is worth taking on for the potential upside they can provide.

### **IDTechEx's outlook**

IDTechEx expects that the US will continue to expand its DLE capabilities over the next decade as the technology gains greater maturity and comes down in its risks and costs. However, the scale of expansion and investment in this area will likely depend on the outcome of current political tensions and how quickly they can be resolved.

“[Direct Lithium Extraction 2026-2036: Technologies, Players, Forecasts](#)” highlights the role of DLE technologies within the global lithium market, driving its growth to US\$52 billion in value by 2036. It highlights the role of the US and key American players in the development of technologies and projects, as well as encompassing DLE activities in China, Europe, and South America. Technology and player benchmarking provide greater depth into projects, processes, and business models. 10-year granular forecasts for production quantities and market size are provided for the global lithium market and for DLE specifically, segmented by DLE technology type, brine type, and region.

### **About IDTechEx**

IDTechEx provides trusted independent research on emerging technologies and their markets. Since 1999, we have been helping our clients to understand new technologies, their supply chains, market requirements, opportunities and forecasts. For more information, contact [research@IDTechEx.com](mailto:research@IDTechEx.com) or visit [www.IDTechEx.com](http://www.IDTechEx.com).

### **About the Author**

Pranav Jaswani is a Senior Technology Analyst at IDTechEx, where his work focuses on electric vehicle and energy storage technologies, including Additives for Li-ion Batteries & PFAS-Free Batteries and Direct Lithium Extraction. Pranav graduated from Imperial College London with an MEng in Chemical Engineering. Prior to joining IDTechEx in 2023, he worked as a market intelligence analyst for a leading financial technology company, developing experience in identifying short and medium-term market opportunities. He is currently based in London, UK.

Pranav will be presenting on ‘Direct Lithium Extraction: Unlocking the True Potential of Lithium Brines’ in Track A at 4pm on Thursday, April 23, where he will cover direct lithium extraction (DLE) technologies, the state of the DLE market today, and how key technical, commercial, and

geopolitical drivers will drive its growth over the next decade and reshape the battery supply chain.