Large quantities of rare-earth minerals found in certain geothermal waters

In addition to producing zero-carbon heat and power, large quantities of rare-earth minerals may add additional cashflow from certain geothermal waters, pending local geology.

Geothermal's unique position in the future energy mix

Large-scale renewable generation also requires large-scale power storage if energy is to be supplied steadily. Lithium-ion batteries are used to power electronic devices and store energy generated from wind and solar power, among their many other uses. Five times more lithium than is mined currently is going to be necessary to meet global climate targets by 2050, according to the World Bank (Source: https://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf).

The new gold rush for Green Lithium

Lithium is crucial for the transition to renewables but mining it has been environmentally costly. Obtaining lithium by conventional means takes its own environmental toll, or rather three: carbon emissions, water and land.

Currently, lithium is mainly sourced from hard rock mines – where the mineral is extracted from open pit mines and then roasted using fossil fuels – leaving scars in the landscape, requiring a large amount of water and releases large amounts of CO2.

The other conventional option, extracting lithium from underground reservoirs, relies on even more water to extract the lithium – and it takes place in typically very water-scarce parts of the world, leading to indigenous communities questioning their sustainability.

A more sustainable source of lithium is found deep beneath our feet. Extracting lithium from geothermal waters has a tiny environmental footprint in comparison, including very low carbon emissions. The consultancy Minviro found that geothermal lithium extraction has substantially less environmental impact on both carbon emissions, water and land.

Zero-carbon heat and power – and zero-carbon lithium

Rock Energy already plans to produce zero-carbon heat and power from geothermal waters. The same geothermal waters will in certain locations contain lithium and other rare-earth minerals. Extraction of the lithium from geothermal waters is made possible by technological advances in both exploration and extraction. The green lithium extracted will be zero-carbon lithium.

- All the clean technologies that we need to combat climate change – whether that's wind turbines, solar panels or batteries are all very mineral intensive. We need to make sure we extract these materials as responsibly as possible otherwise it mitigates the reason for building these technologies in the first place. Zero-carbon lithium could become a powerful example of a mineral essential for sustainable energy, obtained in a sustainable way, says Lars Christian Beitnes, CEO of NET Trading Group NTG AB, owner of Rock Energy Group.

Energy used for rare-earth extraction to be provided by the geothermal plant itself

There are different methods for extracting lithium from geothermal waters. Rock Energy will pump hot geothermal waters to the surface, and if the waters contain relevant rare-earth

minerals, use the heat to power its lithium extraction process, and feed excess back into the grid.

Attractive additional cash flow source, with the potential to become the main source of revenue

Recent discoveries of the highest concentrations of lithium ever found in geothermal fluid is opening the door to a new business model for the renewable energy source.

- It will really become a game-changer for the industry to be able to say we don't just produce power, don't just produce heat – we will produce lithium as well, particularly zero carbon lithium, according to Mr. Beitnes.

Environmental and social impact of the electric vehicle supply chain

Demand for lithium is expected to boom in the coming years on the back of the shift to electric vehicles. The demand for lithium with a lower environmental footprint appears to be gaining ground. There are signs of car manufacturers starting to think about the environmental and social impact of their electric vehicle supply chain.

Traceability into the supply chains of lithium batteries

Currently, imports can have issues related to human rights or carbon footprint because of the transportation distances involved. Lithium is a mineral for the future – a crucial component for electric car batteries among other high tech uses – hence mining and manufacturing it locally will be a big driver in the energy transition and make it a key contributor towards realising the climate targets.

- Europe is expected to see a huge increase in demand for lithium, with a stated aim to create a fleet of 30 million electric vehicles by 2030. The European Union will soon adopt policies to introduce traceability into the supply chains of lithium batteries. Some of the big car manufacturers are already signing agreements about how they source their low carbon lithium because they can see what's coming, Mr. Beitnes added.

Rock Energy Group (rock.energy) is a wholly owned subsidiary of Net Trading Group NTG AB (publ).

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