

Cornwall's rich lithium reserves could power UK's electric revolution

Cornwall and Devon have enough lithium to power the UK electric revolution, with huge potential for job creation. **Olivier Vergnault** reports on an industry which could revive Cornwall's mining fortunes

LITHIUM is a key element in electric batteries in everything from smartphones to Tesla cars. At the moment most of the metal comes from China and is treated using petrol-based polluting technologies before being shipped to Japan or Korea to be used in batteries which are then shipped or flown around the world to various assembly lines at car plants or phone factories.

What the burgeoning lithium industry in Cornwall believes is that the Duchy holds vast reserves of lithium that are big enough to make the UK a world leader and a pioneer of the electric revolution.

The lithium-ion battery market is expected to

be worth almost £90 billion globally by 2027, with demand driven by the dramatic switch towards electric cars across the world. The Government plans to ban new petrol and diesel cars from 2035. Similarly, the smartphone market does not show any signs of slowing down.

Yet the lack of exploration in Cornwall for more than 30 years means that one of the most

highly mineralised areas in Europe remains effectively untouched by modern exploration techniques.

Cornish Lithium believes the county's lithium reserves could go a long way to rebalance the market, especially as the metal becomes increasingly strategic from a geo-political point of view.

The company, based at the Tremough Innova-

tion Centre in Penryn, has been carrying out drilling tests and surveys using the latest computing, satellite and 3D modelling technology, and says the potential for Cornwall is enormous.

"Lithium has the power to enable the electric revolution," Jeremy Wrathall, CEO and founder of Cornish Lithium, told a Zoom press conference.

"Cornwall has the potential to supply the UK with almost all the lithium it needs - it's that globally significant. Without lithium you can't build electric batteries for phones or cars and you can't build energy storage batteries which work with wind, solar and geothermal energy sources.

"This is a massive opportunity for Cornwall and for the UK, and what we've done at United Downs Deep Geothermal Project near Redruth with our partners Geothermal Engineering Ltd can be replicated all over the county and beyond. The layer of granite that lithium is being extracted from runs from the Isles of Scilly to Dartmoor and is enormous."

Cornish Lithium says the Duchy holds some of the best top-grade reserves of the valuable mineral, a potential cash cow for the county and a way to revive its mining industry, albeit



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with 21st-century technologies.

The firm is looking at extracting the mineral not only from geothermal brines but from hard rock itself, something it has been investigating in the clay country around St Austell.

Competitor British Lithium Ltd (BLL) recently secured £500,000 of government backing to help develop hard-rock lithium extraction in the St Austell area as well. The Roche firm, which carried out its first drilling programmes last year with “staggeringly good” results, will become the first company in the UK to explore for hard-rock lith-

ium, something Cornish Lithium is now also doing.

In a 1987 geological survey, it was estimated there were 3.3 million tonnes of recoverable lithium in granite in the St Austell area alone.

BLL’s aim is to create a quarry and refinery in Cornwall that would pro-

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» The Cornish Lithium drill rig at the Gwennap test site
Neil Williams



duce 20,000 tonnes per year of lithium carbonate. Andrew Smith, its managing director, said: "The amount of lithium we are planning to produce annually will be a major step forward in attracting more battery manufacturers and maintaining our car industry.

"If batteries aren't being made in the UK, car makers are likely to continue investing in electric vehicle production in Europe because that's where the gigaplants are: yet Europe isn't actually producing any battery-grade lithium, so achieving that in Cornwall would give the UK as a whole a huge competitive advantage."

For Mr Wrathall, the potential is not just for lithium but for other precious metals such as tin and copper which are still found in abundant yet

untapped quantities beneath the ground in Cornwall.

"Renewables will need a lot of lithium and other metals which Cornwall has in abundance, but really this is about how much imagination Cornwall can show", he said.

"Geothermal water can be used to heat up homes, greenhouses or aquaculture as well as produce lithium. It will need incentives from the Government to get started but it would be a huge mistake not to invest in it as we could stop our dependence on importing metal such as lithium from China."

Cornish Lithium has been working alongside GES at United Downs to explore how much lithium there is in the hot rock waters 5km below ground. It has done similar work with Cornish

Metals Inc (formerly Strongbow), the owners of South Crofty mine, to look at lithium potential in the tin and copper mine the Canadian firm is working towards reopening.

Mr Wrathall says he believes that as more lithium is extracted from Cornwall's granite and geothermal

fault lines, more plants will be built, each employing up to 50 staff, and up to 100 staff at rock extraction mines. If 'gigaplants', which are power-storing battery plants, are built in the UK over the coming years Cornwall is likely to be home to one or two, which again could lead to jobs creation.

"We will expand our team too," he said, "but the job prospects for Cornwall are looking very good; then you have all the spin-off industries.

"This is a fantastic opportunity for Cornwall and for the UK. Lithium will bring jobs and prosperity and my hope is to see Cornwall become the battery metals hub for the UK. This is how significant our findings are."

The company says its preliminary results from samples taken in deep geothermal waters at the United Downs Deep Geothermal Power Project, show some of the world's highest-grade lithium

deposits and best overall chemical qualities in published records for geothermal waters anywhere in the world.

The findings are not only significant from a prospecting point of view, but extracting lithium from geothermal water is easier as the same hot rock water can be used to power turbines and generate zero-carbon electricity and heat.

Mr Wrathall, a former Cambridge School of Mines student, said further sampling would be done to inform the design and construction of a lithium extraction pilot plant at United Downs, for which GEL has been awarded a share of the Government's Getting Building Fund.

The £4 million project will design, procure and build a pilot plant to trial technology to extract lithium from the geothermal waters which circulate naturally at

depth in the granite layer that form Cornwall's bedrock.

Mr Wrathall said that while Cornish Lithium had secured £1.4 million with an initial equity crowdfunder through Exeter-based Crowdcube and a further £800,000 from investors, he was actively looking at further financing opportunities to help Cornish Lithium expand to a point at which production could begin.

"We have two horses in the race, through geothermal exploration and hard rock extraction, so the future for the lithium industry in Cornwall is looking very encouraging", he said.

Further testing is expected to take place in October with a view to building a plant as soon as the results confirm the most recent findings.

Rob Bowell, from international mining experts SRK Consulting, said: "This is a fantastic opportunity for Cornwall to lead the charge on environmentally responsible extraction of this critical raw material in Europe and beyond."

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