

A long, hard look underground is required to reach net zero, say experts

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Advances and investment in geothermal energy, carbon capture and storage (CCS) and bioenergy with carbon capture and storage (BECCS) are "critical" to moving the UK toward its target, according to a new report published in *Petroleum Geoscience*.

Professor Mike Stephenson, Chief Scientist, Decarbonisation & Resource Management at BGS, said: "If we want to reach net zero by

2050, we need to focus on increasing our knowledge of the subsurface of the UK.

"Geothermal energy, carbon capture and storage and bioenergy with carbon capture and storage are the three technologies that could get the UK towards net zero.

"The Natural Environment Research Council commissioned the £31million UK Geoenergy Observatories, which are underway in Cardiff, Glasgow and Cheshire. These observatories are a huge step forwards and will help us understand the subsurface in detail that hasn't been possible before.

"We need more large-scale pilot and demonstrations of geothermal, CCS and BECCS so that we can make rapid advances in these fields."

Before meaningful progress can be made in decarbonization and the three technologies with the most potential, Stephenson warned, scientists need to advance their understanding of the UK's subsurface.

Professor Sebastian Geiger, director of Heriot-Watt University's Institute for GeoEnergy Engineering, said: "Carbon capture and storage, combined with oil and gas production or hydrogen generation, can create almost carbon neutral energy supplies. It is an essential component to provide energy security while we transition to a low-carbon energy future.

"The North Sea industry and supply chain already has many of the technologies we need to make CCS a reality and our institute has been active in CCS research for nearly 20 years. Now what's required is large-scale demonstrations so we can build the business case for CCS.

"Energy firms around the world are committing many millions of pounds

into making CCS reality, and it's essential that the UK isn't left behind."

Nick Rogers, president of the Geological Society said "Across the UK, geoscientists are working to address the challenges posed by the need to transition to low-carbon energy sources and meet UK targets for net-zero emissions.

"By bringing together knowledge of subsurface structural characteristics, fluid flow, and geochemistry, they will be able to support and drive forward efforts to ensure the energy security and independence of the UK, whilst minimizing the environmental impacts of energy generation."

The new report was compiled following the 2019 Bryan Lovell conference organized by the Geological Society.

More information: Michael H. Stephenson et al. Geoscience and decarbonization: current status and future directions, *Petroleum Geoscience* (2019). [DOI: 10.1144/petgeo2019-084](https://doi.org/10.1144/petgeo2019-084)

Provided by Heriot-Watt University

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