

PRESS RELEASE

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The BGS submits planning application for UK Geoenergy Observatory in Cheshire

The British Geological Survey (BGS) has submitted a planning application to Cheshire West and Chester Council (CWACC) to site a UK Geoenergy Observatory at Ince Marshes in Cheshire.

The submission comes as the country's top geoscientists complete drilling of its first 199 m-deep borehole at the UK Geoenergy Observatory in Glasgow.

The Glasgow observatory will allow the UK's earth science community to 'see' underground, probing whether warm water within the UK's disused mine workings can generate a geothermal heat source that could become a sustainable part of the energy mix. Over the next 15 months in Glasgow, the drilling team will create 12 boreholes from 9 m to 199 m deep across a 2 km² area, enabling research into underground water systems below one of the UK's principal cities.



Drillers pulling up core samples at the Glasgow observatory. BGS@UKRI

The same scientists behind the Glasgow observatory want to create a sister site in Cheshire to realise an even bigger science ambition — understanding how the whole underground system works.

To enable the most detailed study of any UK rock mass, the BGS would like to drill 50 boreholes from 50 m to 1200 m deep across a 12 km² area. They would contain a network of 1800 seismic sensors and 5 km of fibre-optic cable transmitting data on earth tremors 1000 times more sensitive than you can feel. They would allow thousands of water samples to be taken over the next 15 years from 50 m to 400 m below the surface. Some 8 km of borehole drilling would generate 3000 m of rock core to be taken back for laboratory analysis. All the data would be made free and open via a publicly owned website. The two observatories will facilitate STEM (science, technology, engineering and mathematics) education and engagement programmes.

The UK Geoenergy Observatory at Ince Marshes would make Cheshire home to the best-characterised rock mass in the world, providing a world-class environmental baseline on how the underground system works.

The UK's main funder in environmental science, the Natural Environment Research Council (NERC), has commissioned the £31 million UK Geoenergy Observatories to keep the UK at the cutting edge of geoscience and energy innovation and to provide the important knowledge needed to move the UK towards a low-carbon economy.

The BGS, the UK's principal provider of impartial geological evidence since 1835, will operate the observatories on behalf of the whole of the UK and the geoscience community.



Frodsham wind farm at dusk. ©Peter Corcoran.

Prof Mike Stephenson, chief scientist at the BGS, said: 'More and more of the solutions to decarbonising our energy supply will need to come from beneath our feet. Ensuring we take forward these solutions in a sustainable way means understanding more about the system. The UK Geoenergy Observatory in Cheshire will build up that high-resolution picture, providing a breakthrough in our understanding. This would be a world first in being able to observe the underground environment so closely and consistently. What we learn in Cheshire will lead the way in understanding the geological environment.'

The research undertaken would ensure that the best possible geological evidence is available to underpin decisions and regulatory controls around the management of the environment and its natural resources, as government, industry, regulators and academia look at how the underground might be used to power the future.

NERC consulted with the UK geoscience community in 2015 to determine what new evidence would be required. Professor of geological engineering at the University of Strathclyde, Zoe Shipton chaired the group of independent scientists who worked with NERC to write the research agenda for the UK Geoenergy Observatories.

Prof Shipton said: 'If we don't understand the science, we won't be able to engineer the system properly to de-risk emerging low-carbon technologies. Delivering the science depends on learning from research in a location typical of the demands people put on their environment.'

'Cheshire has a very particular geology. It has lots of the rocks found throughout the rest of the UK; they are in one location and close to the surface. This means that Ince Marshes will enable scientists to build up a really good picture of natural conditions in a variety of rocks types, how they respond to change, and apply this new understanding throughout the UK.'

The UK Geoenergy Observatory at Ince Marshes would enable research around a range of geoscience questions relating to techniques such as storing carbon, utilising rocks as a battery store for solar, wind and tidal energy, geothermal energy, and shale gas. The Glasgow observatory would help to answer science questions on the geothermal heat within flooded mine workings below Britain's towns and cities.

Mike Kendall, professor of geophysics at the University of Bristol, said: 'The UK Geoenergy Observatories will ensure we continue to lead the way in environmental impact monitoring by providing even better understanding of how the underground system works. It will improve our understanding of the connections and pathways and therefore identify what else we need to monitor from an environmental point of view. It will become a world-class showcase for how monitoring should be done.'



Ince Marshes in north Cheshire. ©Peter Corcoran.

David Grove, director at technical advisor Ramboll, which is project managing the planning, engineering and construction of the facility, said: 'The team at our Chester office has been working on the UK Geoenergy Observatories for more than 18 months. Cheshire stands to benefit from this unique science investment into a world-class observatory. The submission of the planning application is a very important milestone, and we would encourage people to participate in the statutory consultation over the coming months.'

For more information on the UK Geoenergy Observatories, watch [Imagine a cube of rock](#) on the BGS YouTube channel. The planning application will be available on the CWAC planning portal at <https://pa.cheshirewestandchester.gov.uk/online-applications/>.

Ends



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Notes for Editors

The British Geological Survey

The British Geological Survey (BGS) is a world leading applied geoscience research centre that is part of UK Research and Innovation (UKRI) and affiliated to the Natural Environment Research Council (NERC). BGS core science provides objective and authoritative geoscientific data, information and knowledge to inform UK Government on the opportunities and challenges of the subsurface. It undertakes national and public good research to understand earth and environmental processes in the UK and globally. The BGS annual budget of approximately £60 million pa is funded directly by UKRI, as well as research grants, government commissions and private sector contracts. Its 650 staff work across the UK with two main sites, the head office in Nottingham and Lyell Centre, a joint collaboration with Heriot-Watt University in Edinburgh. BGS works with more than 150 private sector organisations, has close links to 40 universities and sponsors about 100 PhD students each year. Please see www.bgs.ac.uk.

The Natural Environment Research Council

NERC is the UK's main agency for funding and managing research, training and knowledge exchange in the environmental sciences. Our work covers the full range of atmospheric, Earth, biological, terrestrial and aquatic science, from the deep oceans to the upper atmosphere and from the poles to the equator. We coordinate some of the world's most exciting research projects, tackling major issues such as climate change, environmental influences on human health, the genetic make-up of life on Earth, and much more. NERC is part of UK Research & Innovation, a non-departmental public body funded by a grant-in-aid from the UK government.

The UK Geoenergy Observatories

The UK Geoenergy Observatories will establish new centres for research into the subsurface environment and provide opportunities to research how natural processes can control resource availability, and how natural resources can be used responsibly for present and future generations. The knowledge they generate will contribute to an understanding of new low-carbon energy technologies both in the UK and internationally. The capital project is NERC's response to the British government's announcement in the 2014 Autumn Statement that it would create world-class subsurface energy research test centres through NERC, operated by the British Geological Survey.

Ramboll

Ramboll is a leading engineering, design and consultancy company with 15,000 staff across 300 offices in 35 countries in the UK, the Nordics, North America, Continental Europe, Middle East and Asia-Pacific. Ramboll works across the following markets: Buildings, Transport, Planning & Urban Design, Water, Environment & Health, Energy and Management Consulting. Ramboll was appointed to project manage the engineering design of the facility and to prepare all the necessary studies and documentation to support a full planning application. The multi-disciplinary team includes: global planning and property consultants JLL and cost managers Turner & Townsend.

The photographs in this press release are available from our ftp server via this link:

<ftp://ftp.bgs.ac.uk/pubload/bgspress/UKGEOSCheshire>

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