Keeping carbon in the ground

To ward off catastrophic climate change, nations and firms are taking steps to reduce their emissions of planet-warming gases. But even as they pursue activities such as switching from fossil fuels to renewables, the search is hotting up for technology to draw down greenhouse gases already in the air. One example is an upcoming carbon capture and storage plant in Scotland, where the COP26 climate talks are being held. Audrey Tan finds out more.

WHAT IS CARBON CAPTURE AND STORAGE?

Such technology prevents carbon dioxide (CO₂) – the main greenhouse gas driving global warming – from entering the atmosphere by storing it underground.

The CO₂ for the Scottish site comes mainly from nine different sources, including industrial sites, power generation plants, directly from the air, and from the reformation of natural gas to produce hydrogen.

Hydrogen is considered a clean fuel as it produces no CO₂ when burned.

Britain’s Acorn programme aims to produce hydrogen and capture CO₂ from the various sources for storage underground.

The project is funded and supported by Storegga, a company that develops projects for carbon reduction and removal, oil and gas firms Shell and Harbour Energy, as well as the British and Scottish governments and the European Union.

HOW BRITAIN’S ACORN PROGRAMME WORKS

Location:
St Fergus gas terminal in north-east Scotland, the first landing point for about a third of all natural gas used in Britain.

Natural gas is extracted from the North Sea and taken to the St Fergus terminal. There, the natural gas is reformed to produce hydrogen.

CO₂ generated from the reformation process and from other sources is captured using the carbon capture and storage infrastructure. Existing gas pipelines can be used to take the CO₂ to the storage site, saving costs.

The storage site comprises a large volume of sandstone rock found over 2.5km under the seabed, and is located about 100km offshore from St Fergus.

The first Acorn hydrogen plant is expected to go online around 2026.

- For a start, a blend of 2 per cent hydrogen and 98 per cent natural gas will be sent through the distribution networks for electricity generation as special pipes are needed to transport hydrogen.
- The aim is to ramp this up to 20 per cent and eventually 100 per cent hydrogen once the infrastructure is ready.

Sources: THE ACORN PROJECT, STOREGGA PHOTO: STOREGGA STRAITS TIMES GRAPHICS