Hydrogen storage in porous rocks: the storage capacity of the UK continental shelf

Jonathan Scafidi, Mark Wilkinson, Stuart Gilfillan, and Niklas Heinemann
The University of Edinburgh, School of Geosciences, United Kingdom of Great Britain and Northern Ireland
(jonathan.scafidi@ed.ac.uk)

Increasing the amount of renewable energy in the UK reduces greenhouse gas emissions but will also lead to intermittency of supply, especially on a seasonal timescale. Over-producing energy when demand is low and under producing when demand is high requires large-scale storage to redress the balance. Hydrogen stored over seasonal timescales in subsurface porous rocks can act as a giant battery for the UK and is a flexible energy vector that can be used for heat, transport and electricity generation.

No large scale assessment of the hydrogen storage capacity of an industrialised region has yet been undertaken. Here, we present a novel method for calculating the hydrogen storage capacity of gas fields and saline aquifers on the UK continental shelf using data previously used to assess carbon-dioxide storage potential.