Galleries to Calories

Minewater Energy in Scotland

Information Sheet

Galleries to Calories (G2C) is a research collaboration between the University of Edinburgh and a team comprising UK renewable energy experts and international academic researchers. The G2C project focuses on the potential of Scotland's historic mine workings to provide heating, cooling and energy storage to Scotland's businesses and homes.

Running from 2022 – 2025, assessment of mine workings in Midlothian will be undertaken, including drilling boreholes into mines to extract and reinject minewater to inform their potential for future heating and cooling. The results of the pilot study will be an understanding of the viability of using mines to transport waste heat energy from the University of Edinburgh's Advanced Computing Facility (ACF) at the Easter Bush Campus, Midlothian to other population centres above the interconnected mine working complex.

The project is funded by the European Commission Geothermica ERA-NET programme and Scottish Enterprise, with the support for the Coal Authority, Scottish Environmental Protection Agency (SEPA), and Midlothian Council.

About the Project

Galleries to Calories (G2C) comprises industry, academic and national research partners from Scotland, USA, and Ireland, aiming to demonstrate for the first time the use of legacy mine workings as recycled heat storage and transport networks to provide managed sustainable regional recharge of low enthalpy (< 40°C) geothermal heat.

G2C will undertake in-depth geological, hydrogeological, and geochemical site characterisation, an assessment of the sustainable thermal resource management for different development scenarios, development of socially based economic models, investigation into the legal aspects of subsurface heat ownership models and technical consideration of its wider application to European and US coal and mineral mines.

The long-term objective of the project is to provide heating and cooling services, including:

- Cooling for the Advanced Computing Facility at Easter Bush Campus, Midlothian.
- Heating and cooling to local commercial sites, via minewater fed water-source heat pumps.
- Heating and cooling for local or regional heat networks, providing energy to homes and businesses.
- Enabling energy storage, where excess heat generation may be stored underground and transported via mine networks for later use.

Find Out More

Throughout our work, we will be providing updates and information regarding the project's progress.

Updates will be available via the project website:
https://www.ed.ac.uk/geosciences/research/galleries-to-calories

To find out more, ask questions, or get involved with the project, please contact the project team:

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