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Geothermal Power Generated from UK Granites (GWatt)

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Exploitation of the UK underground thermal resource has been held back by; 1) knowledge gaps about permeability and fluid/heat flow within the fractured hot rocks, and 2) a perception that the uncertainty associated with drilling problems or limited fluid flow from deep boreholes are too high for the potential financial reward. The recently-started NERC-funded GWatt project seeks to address these barriers to uptake of EGS by:

- Increasing knowledge of the geological conditions needed for deep fracture-controlled fluid flow within granitic rocks.
- Developing a quantitative understanding of the heat resource and sustainability of the geothermal reservoir.
- Constructing robust geological risk assessments based on well-established oil & gas uncertainty quantification and optimisation methods, with a view to reducing perceived risks.
- Applying the integrated results of site-specific research to new geothermal exploration models for other granites, particularly those in SW England.

GWatt will link with the developing United Downs Deep Geothermal Power (UDDGP) project, a 2 borehole EGS in the Carnmenellis granite in Cornwall. This will provide a unique resource; downhole fluids, rock samples, geophysical logs, flow data and seismic data. GWatt will maximise the scientific potential from these data, and carry out innovative further analyses and interpretation, combining site-specific observations with regional studies and state-of-the-art uncertainty quantification, to address the challenges associated with EGS development within SW England. Other UK crystalline basement rocks show fracture-controlled groundwater flow, so the lessons learned from GWatt will ultimately benefit understanding of the rest of the UK deep subsurface. A background to the aims and initial findings of the project will be provided.

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