

SCOTTISH DEVELOPMENT INTERNATIONAL

# Geothermal Energy

**Harnessing Heat Beneath our Feet: Unlocking the potential of Geothermal Heat and Energy in Scotland**

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Updated September 2023



# Why is Scotland Excited by Geothermal Opportunities?

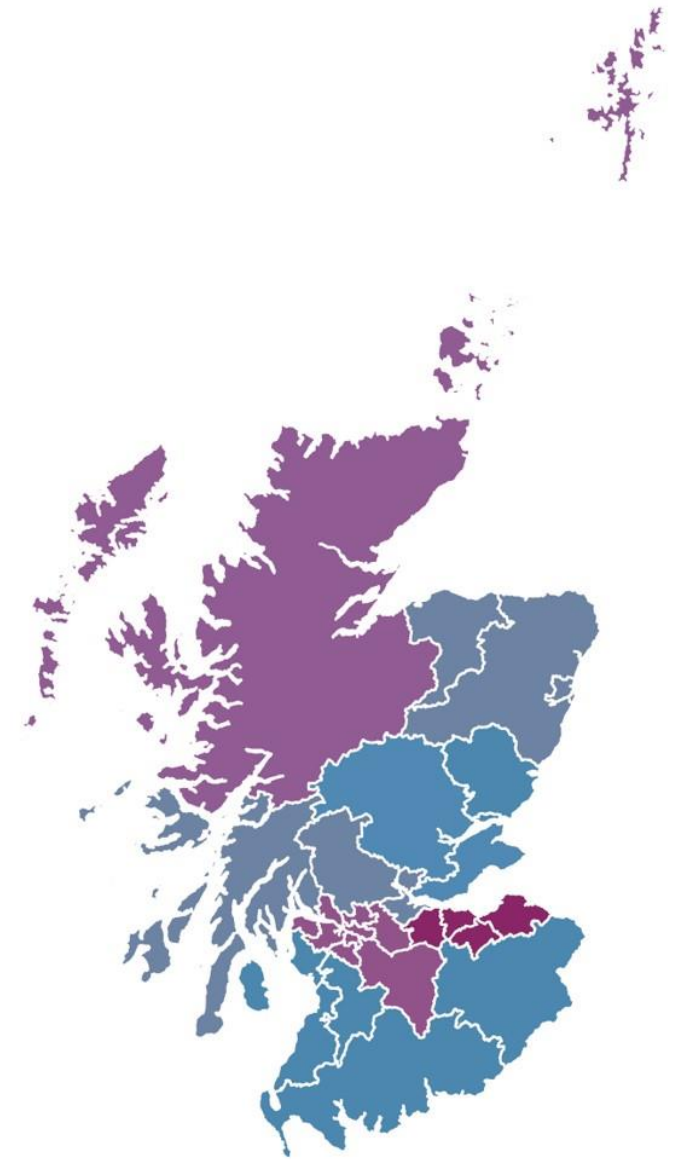
- Net Zero Targets
- Energy Experience
- Variety of Opportunities

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# First Country in the World to Declare a Climate Emergency

- Climate neutral by 2045
- 75% reduction ofm emissions by 2030
- Low carbon heating from 2024



# NEW, BUT EXPERIENCED SUPPLY CHAIN OF COMPANIES

Scottish offshore oil sector -  
innovation and engineering in  
harsh conditions

Skills are transferable and  
valuable

A Just Transition

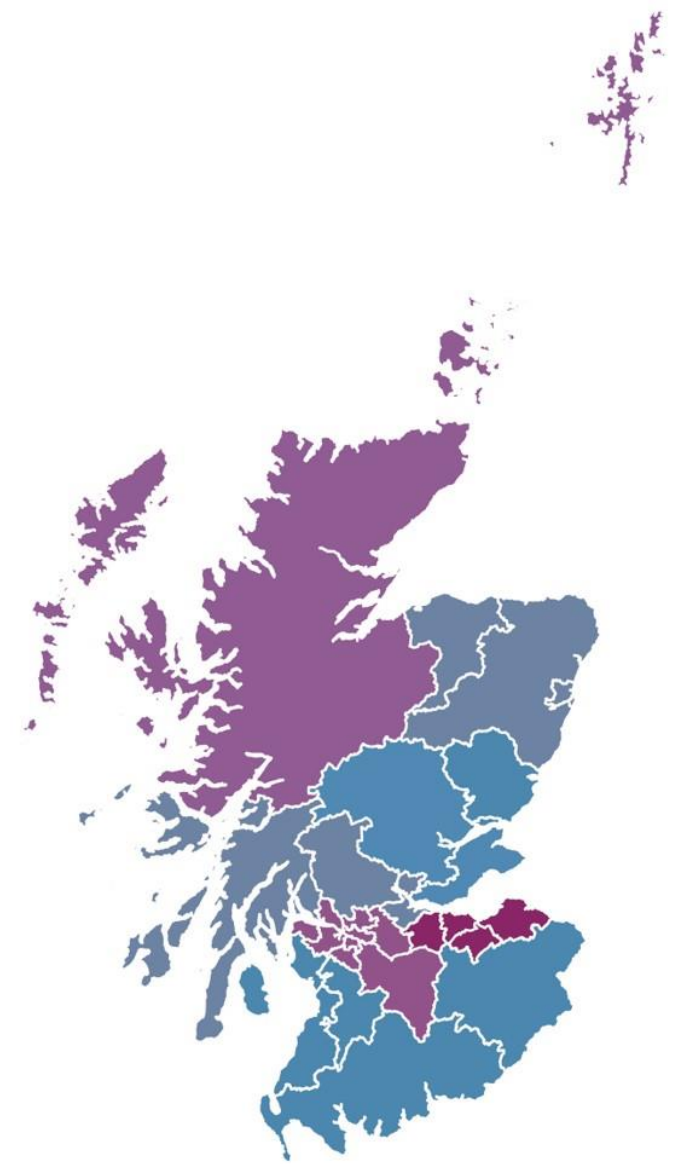


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# Range of Opportunities

- Abandoned Mineworkings
- Hot Sedimentary Aquifers
- Hot Dry Rocks
- Lithium
- Heating Networks



# Supply Chain and Workforce

Delivering a just transition

In 2022, 113% of Scotland's gross electricity consumption generated through renewable sources



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**THE STARTING POINT?**

# **Scottish Government Targets and focus on Renewable Energy**

## **Optimat Geothermal Report January 2022\***

[\\*Scotland's Geothermal Supply Chain Analysis and Global  
Market Opportunities Study](#)

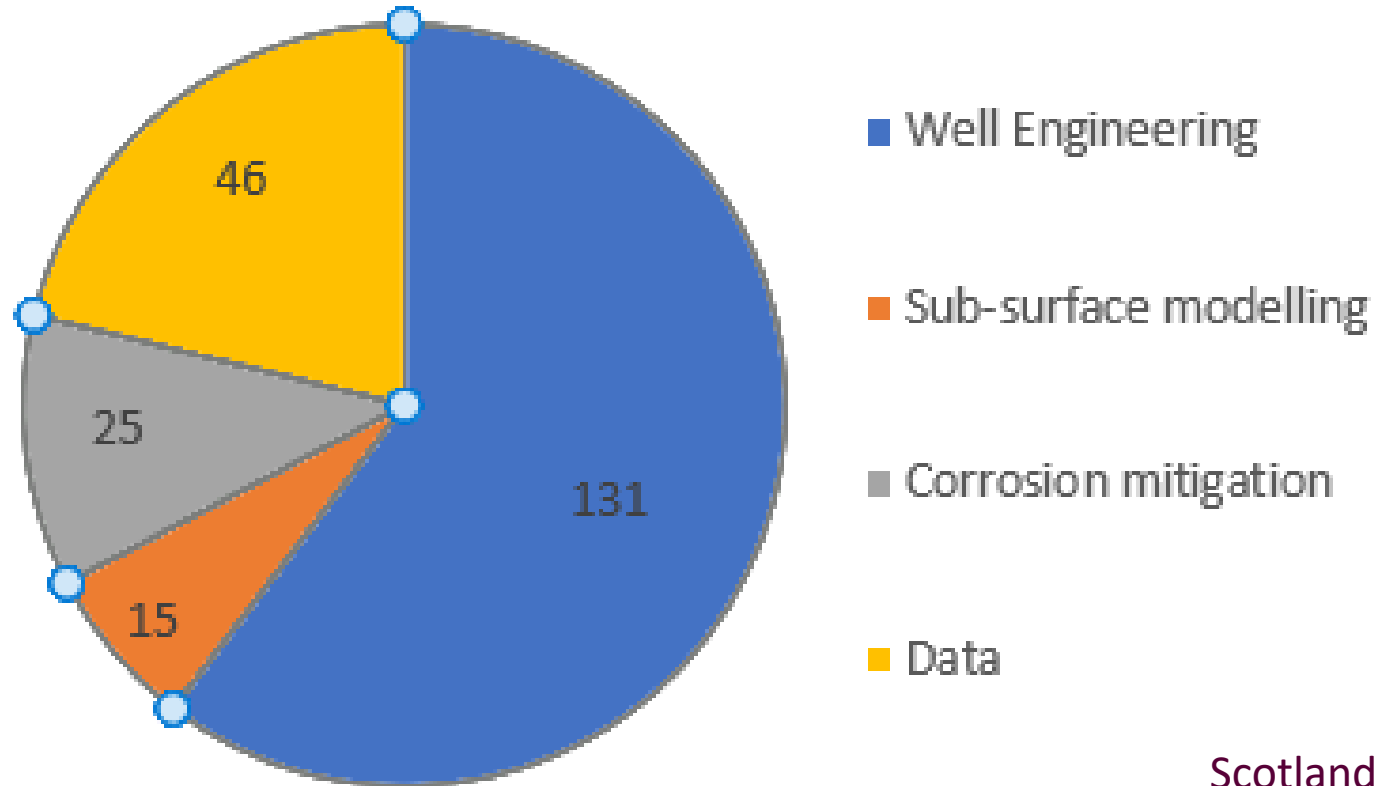
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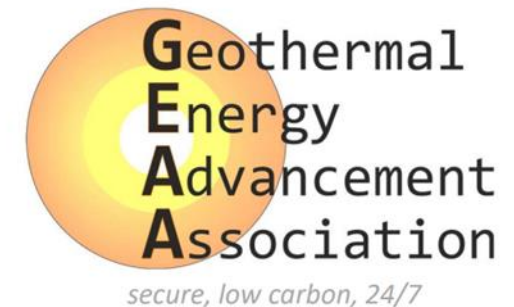


# SCOTTISH COMPANY BASE

Almost 220 oil and gas supply chain companies with capabilities that offer the potential for diversification into the geothermal supply chain were identified.



**37,000 direct jobs**  
**270,000 in supply chain**







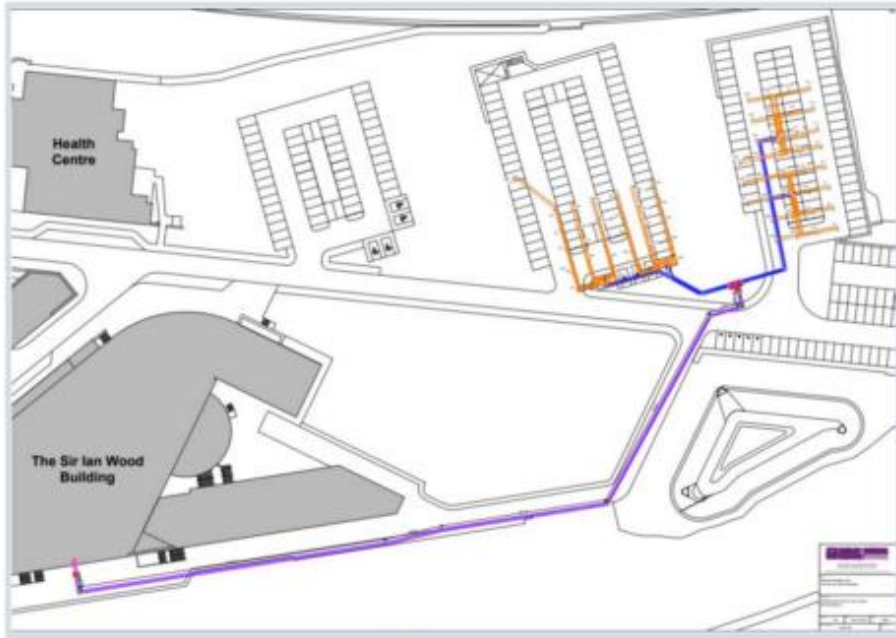
**ROBERT GORDON  
UNIVERSITY ABERDEEN**

## Unlocking the geothermal potential

- Potential simulator for geothermal drilling
- Links with BGS to use AI in borehole reporting
- New geothermal rig and test site



*The Press and Journal*

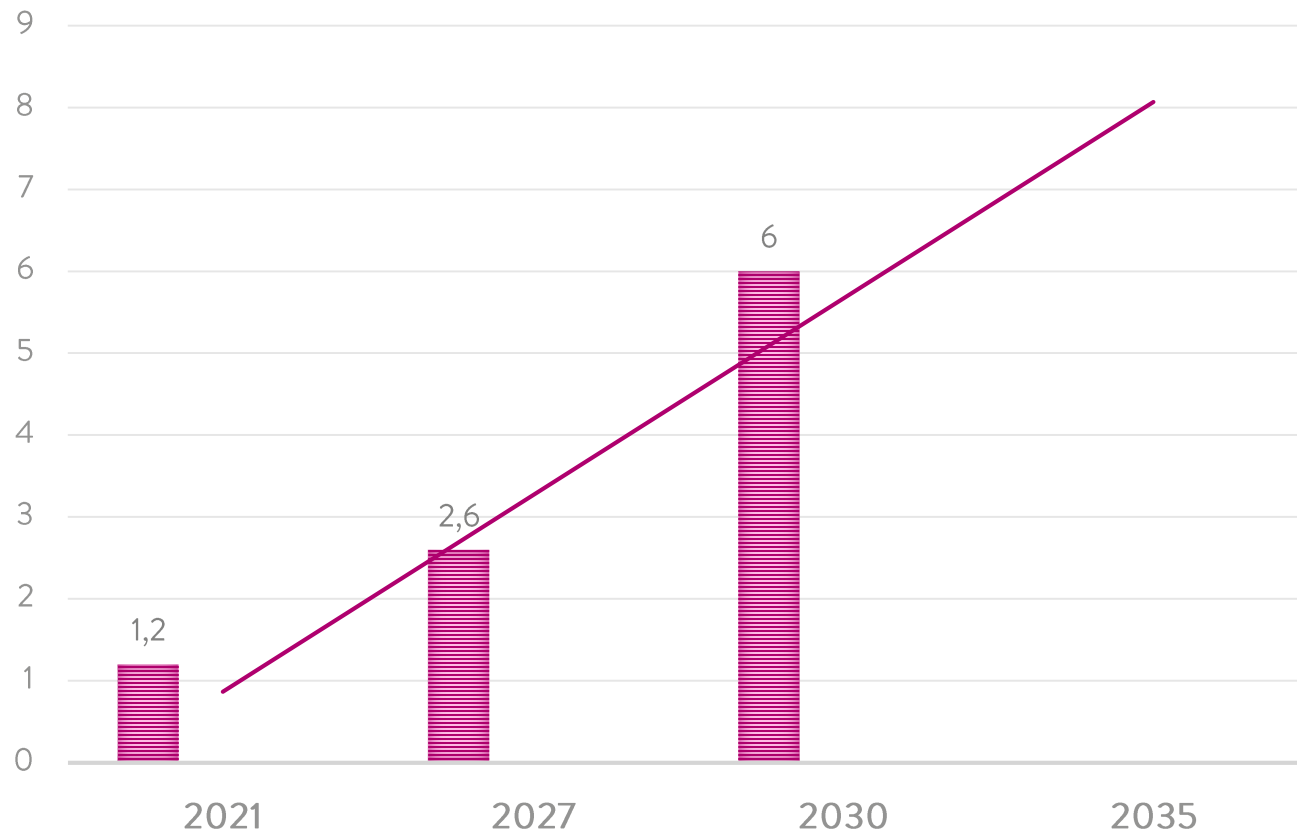


## RGU already has access to ground source heating

- RGU has 66 shallow 200 meter depth boreholes on campus
- Already using a ground source heat pump system
  - Operating at a higher temperature than predicted
- Aspiration is to deepen these wells to extract more geothermal energy to decarbonise the campus and provide wider community benefits

# HEAT NETWORKS (SCOTLAND) ACT 2021

Sets ambitious targets for the amount of heat to be supplied by heat networks



£300m Heat Network Fund – 50% capital funding available to public and private sector bodies.

**Overall process driven by Scottish Government,  
SDI and others**

**Identify opportunities and set up  
encouragement structure**

**Set up support infrastructure – NZTC,  
Energy Transition Zone, Global  
Underwater Hub, SE Scotwind Team**



**Net Zero  
Technology  
Centre**

**Technology Driving Transition**

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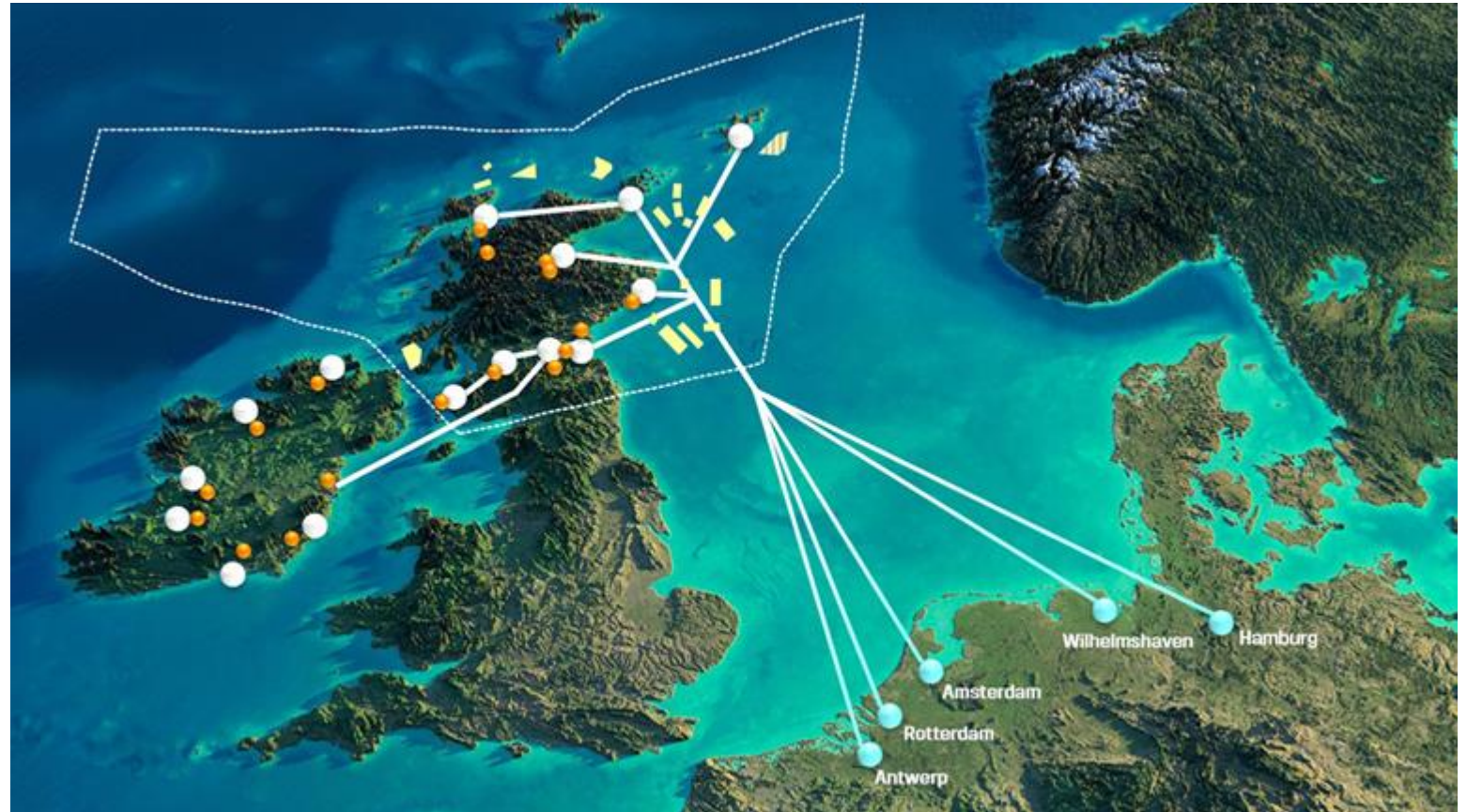




Net Zero  
Technology  
Centre

Over £20 million awarded to net zero technologies through NZTC's 2022 open innovation programme.

£8 million from NZTC and over £12 million co-funded by industry





## Purpose

To become the "go-to" centre for solving geothermal technology challenges and world leading in supporting government legislation and best practice.

# National Geothermal Centre

**03. ACCELERATOR PROGRAM**



**01. TECHNOLOGY DEVELOPMENT**

**02. KNOWLEDGE HUB**



# Project 1 Cairngorm Mountain



Cairngorm Mountain

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# Cairngorm Mountain Technical Feasibility

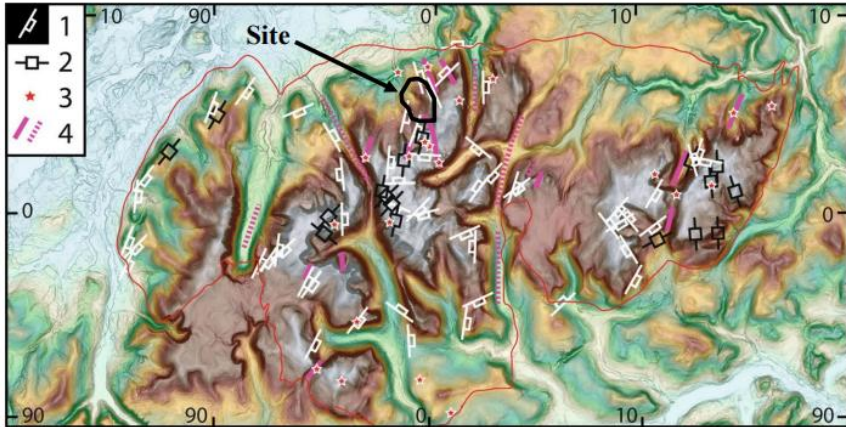


Figure 7: Cairngorms: Quartz veins and linear alteration zones, (1) Quartz veins, (2) LAZs, (3) Saprolite [13]. Inferred site location shown in Black

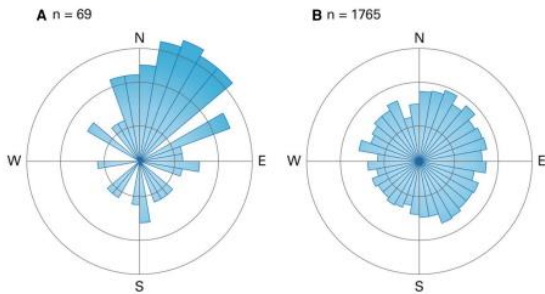


Figure 8: Cairngorms: orientation of different structural features: (A) quartz veins (proxy for LAZs), (B) joint sets (data showing feature strike; the dip direction of these features is 90 clockwise from strike) [13]

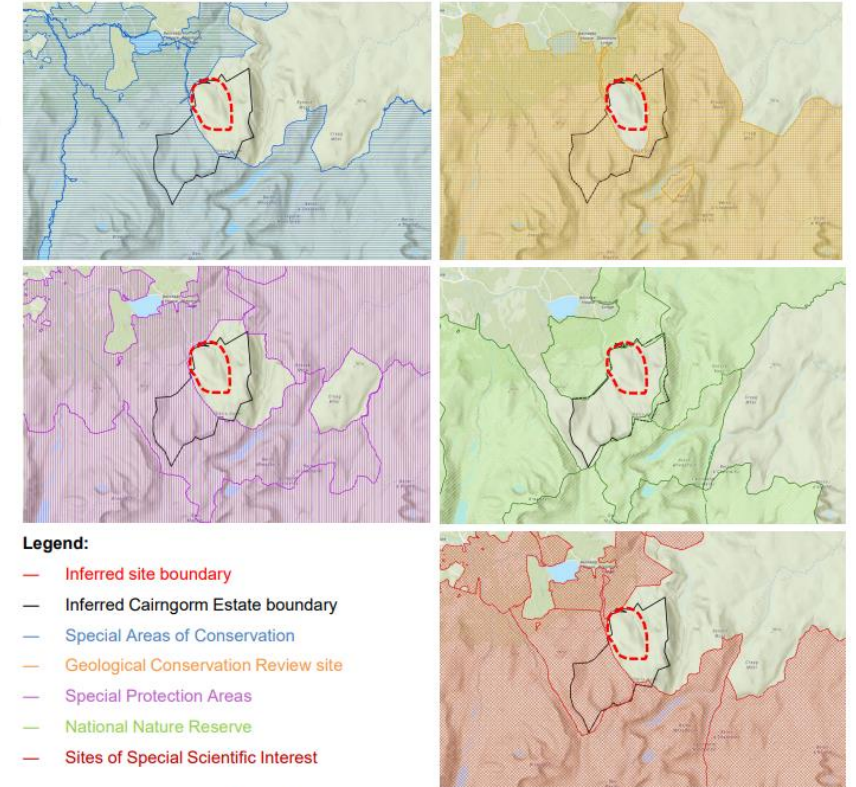
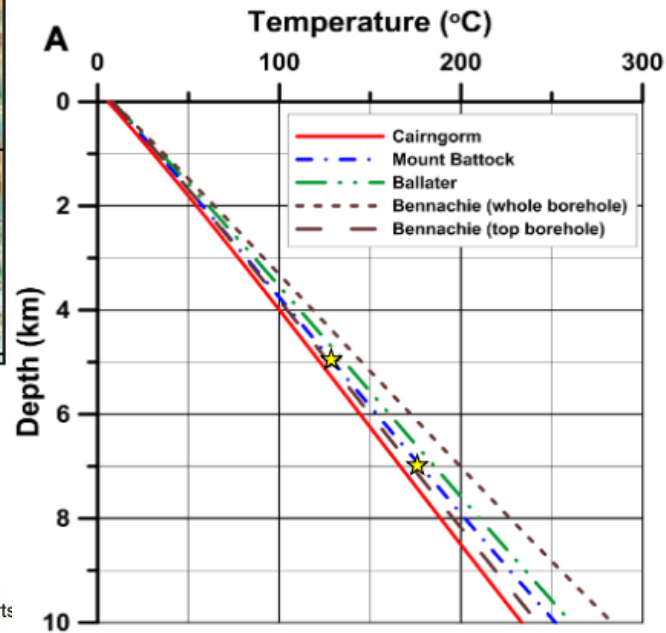
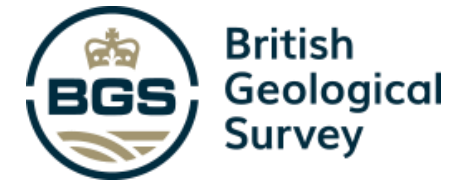


Figure 2: SEPA environmental designations [1]



# Project 2 Glasgow Observatory



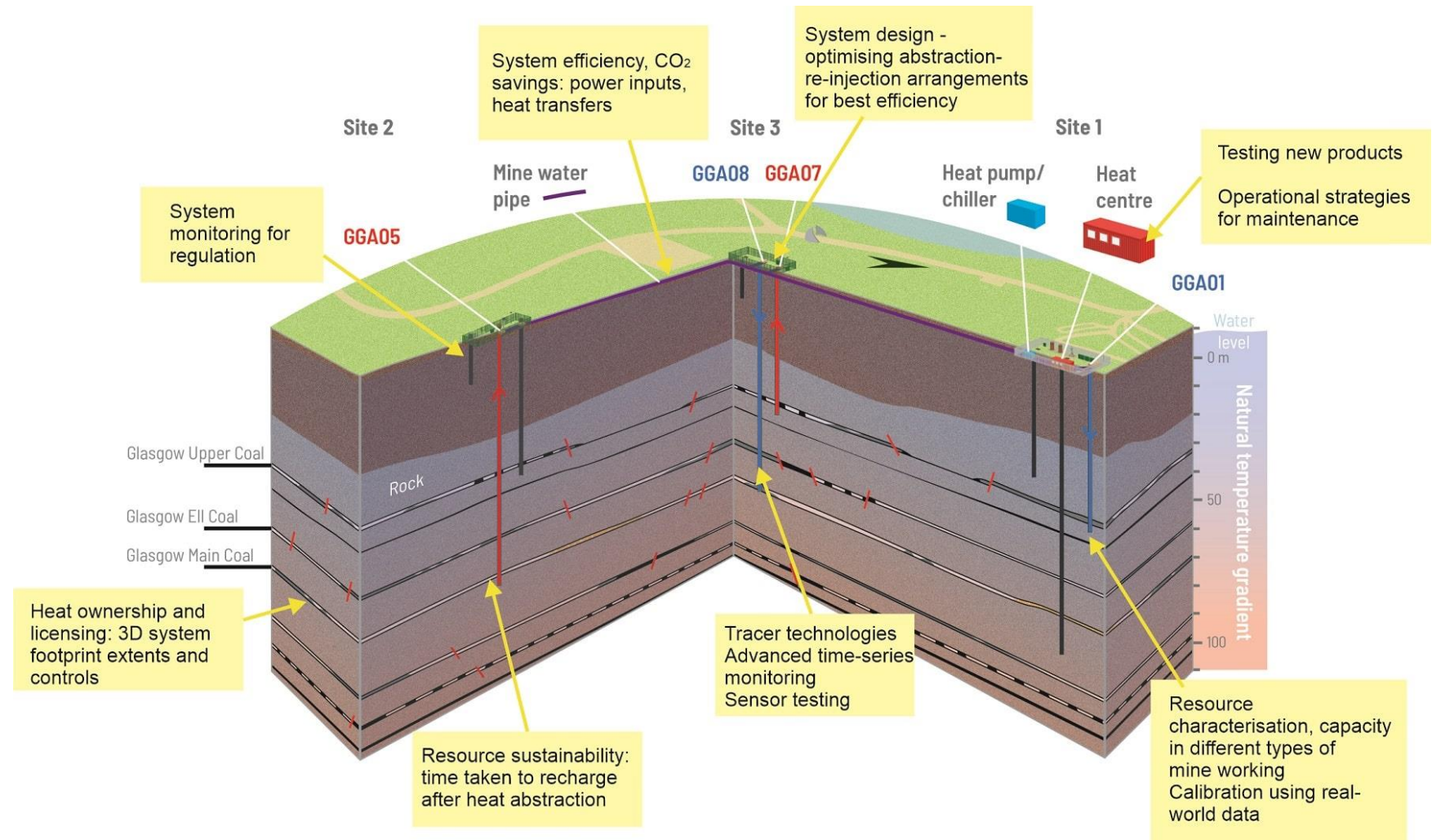
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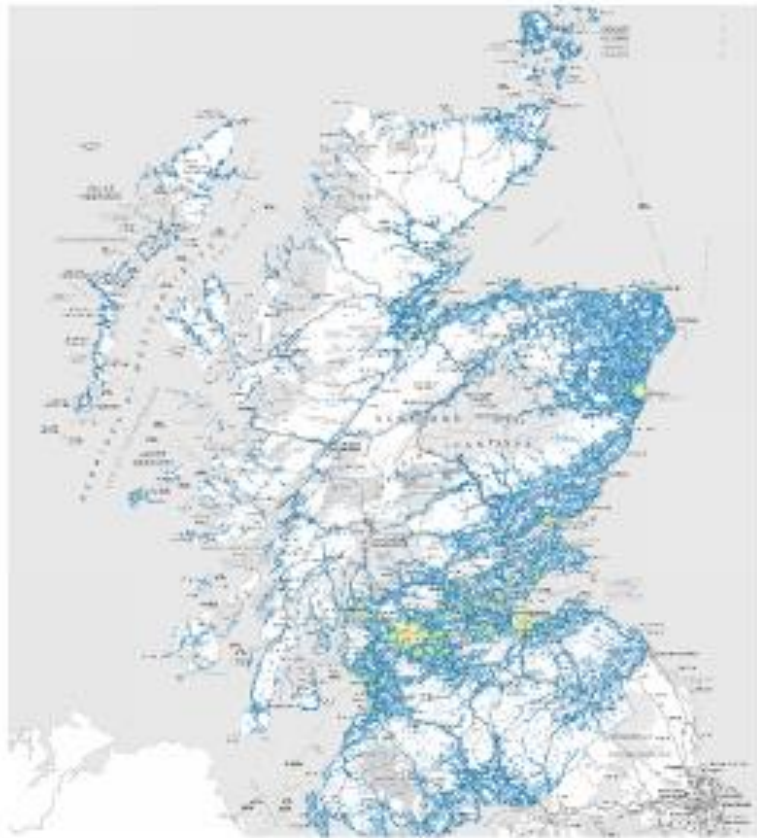


# Glasgow Observatory Infrastructure

- geothermal resource characterisation
- resource sustainability
- operational de-risking



# Project 3 Scotland Heat Map



- An energy planning tool
- Maps heat demand alongside heat supply
- An “opportunities identifier” for energy projects
- <https://www.gov.scot/publications/scotland-heat-map-documents/>



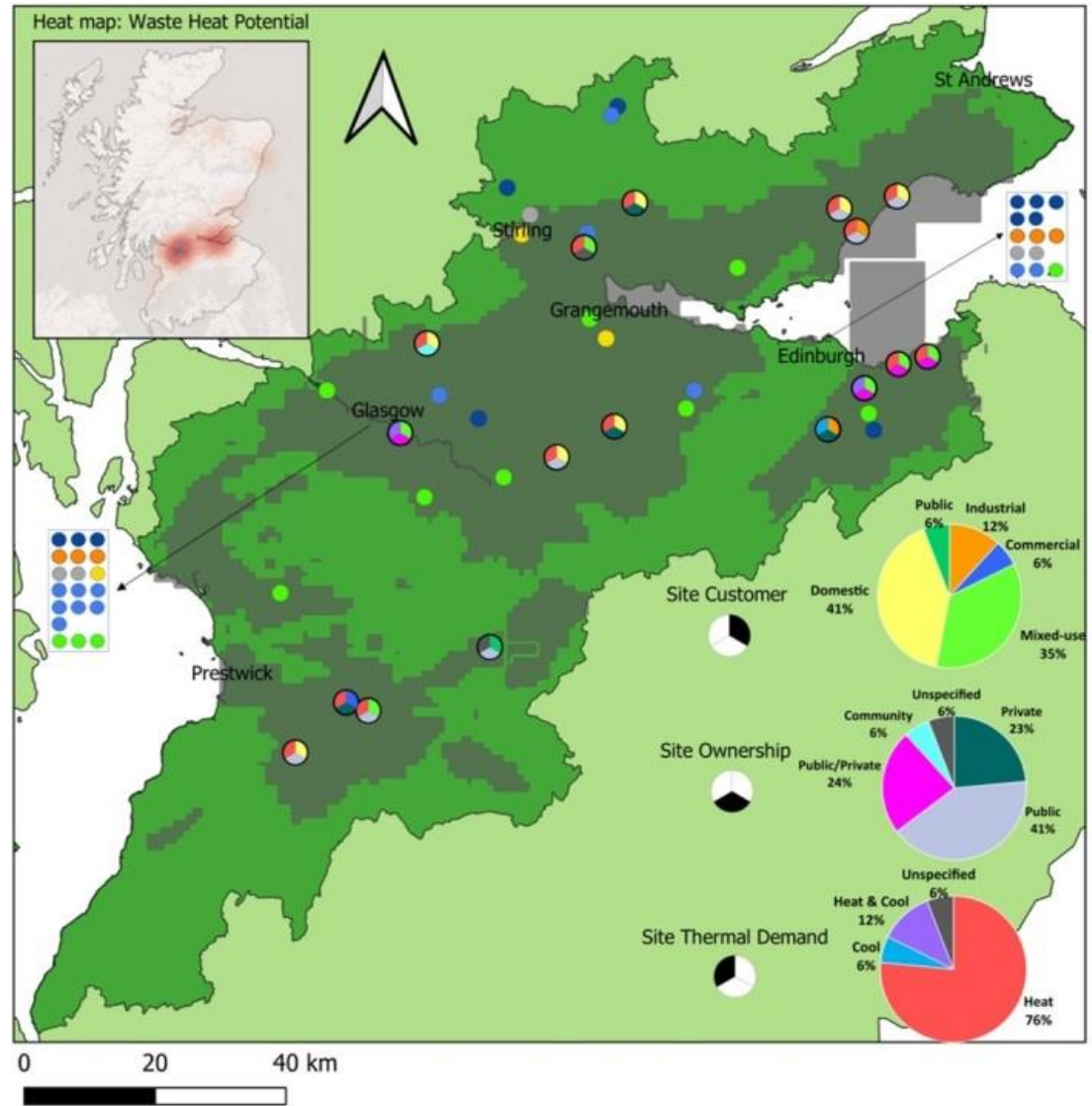
Scottish Government  
Riaghaltas na h-Alba  
gov.scot

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# The HotScot Project

Universities / private company consortium



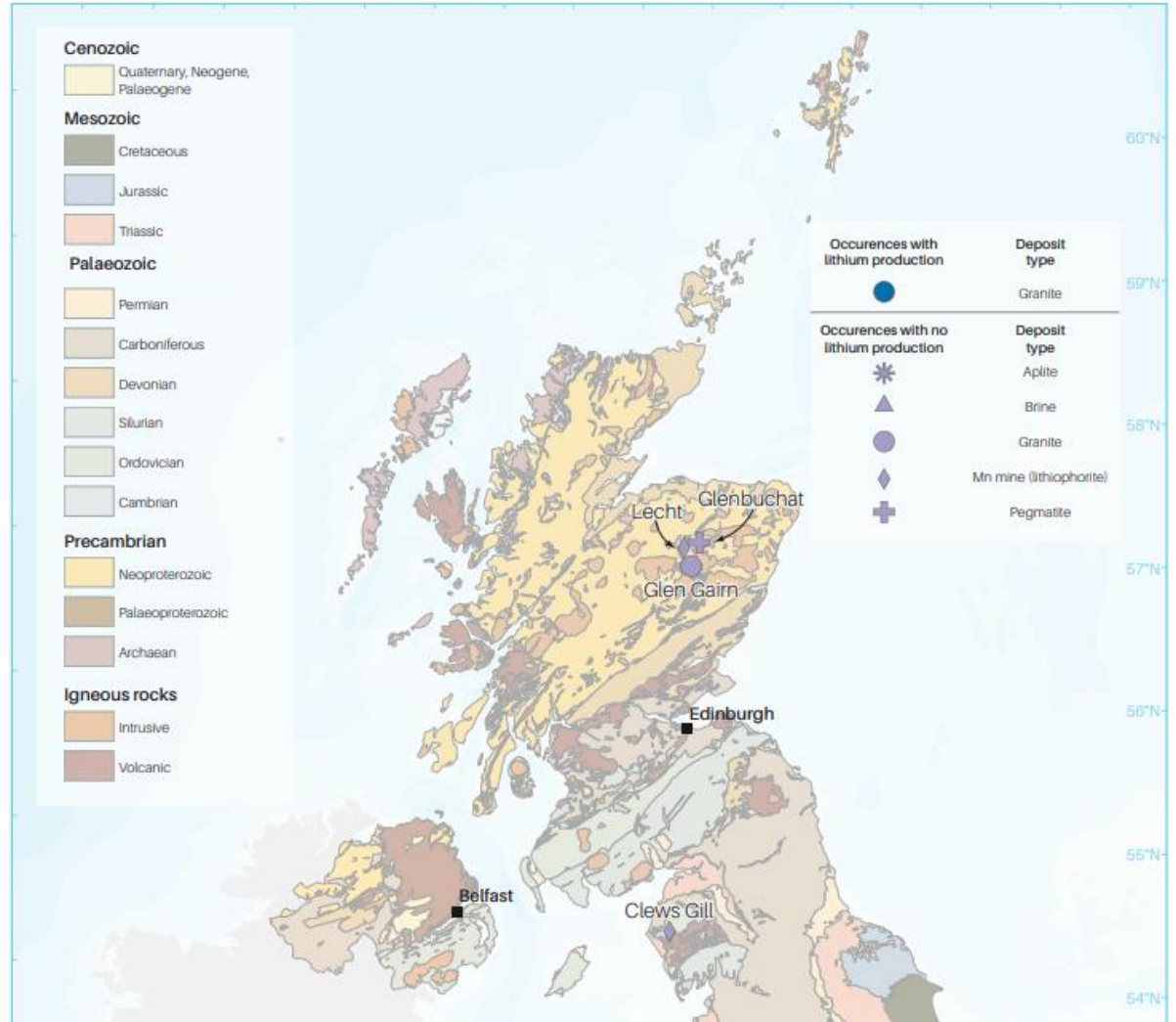
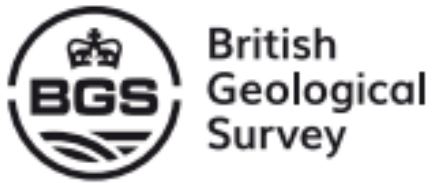
## The HotScot Project Legend

- HotScot Sites
- HotScot Partners
  - Community/Public/Stakeholder Org.
  - Consortium Partner - Industry
  - Consortium Partner - University
  - Creative Industries
  - Engineering Companies
  - Colleges
- Coal Reporting Area
- HotScot Economic Geography
- Scotland



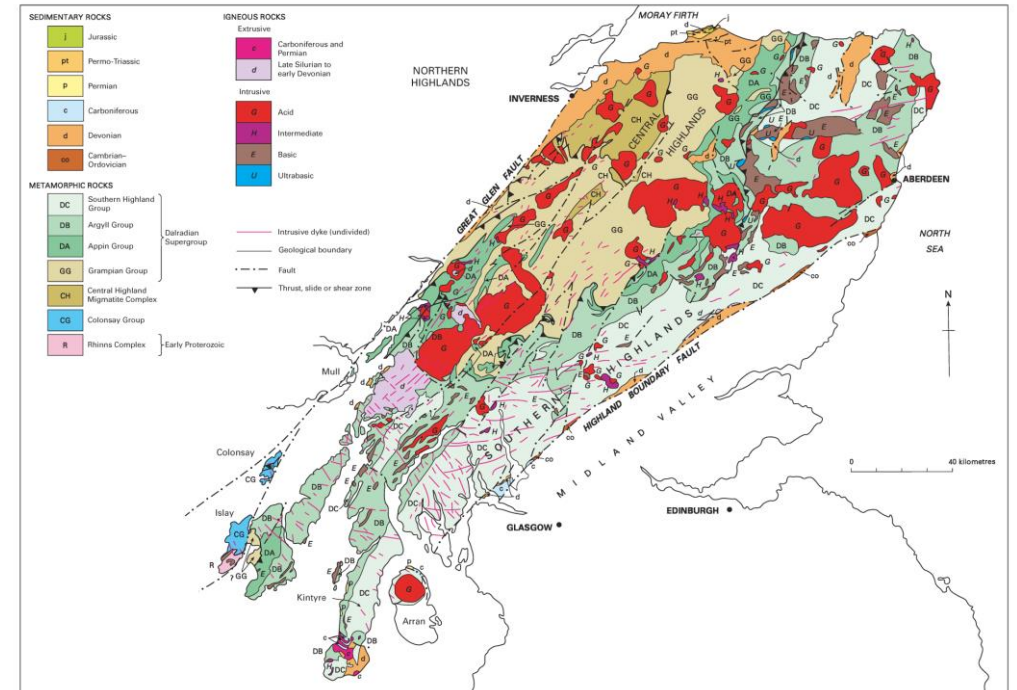
# Potential for Lithium

Gem-quality elbaite  
(Litourmaline) at  
Glenbuchat, north-east



# Ongoing Scottish Projects

## Balmoral Estate Aberdeenshire – Evaluating Options



Deep Geothermal Exploration in Grampian Mountains using Satellite Data



# Expertise at GeoTHERM

- Industry accredited training
- Geothermal Scale & Corrosion Specialists
- Safety, Operational and Environmental Performance when hiring rigs
- Compressors, generators, filters
- Proprietary power plant design
- Well consultancy
- Engineering and training for wells and drilling
- Well engineering consultancy and project management

Scotland is open for....

# International Opportunities

- **Joint International Research**
- **Projects**
- **Collaboration and Information Sharing**

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# PROGRESS FEBRUARY 2024

**Working with Scottish Public and Private interests to help transition from oil and gas**

**Geothermal potential recognized and the sheer scale of the potential supply chain and jobs stirred interest**

**15 Scottish companies attending Geotherm Today**

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# LET'S KEEP IN TOUCH

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