

# Legal and Regulatory Issues in the Development of Geothermal Resources

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# Overview

- Legal and regulatory issues raised by
  - Proposal for onshore deep geothermal project in Scotland
  - Possibility of developing geothermal resources offshore

# Onshore – Issues

- Who has authority to regulate geothermal in Scotland?
  - Energy in general – reserved to Westminster
  - Onshore hydrocarbons – devolved to Holyrood
  - Power to promote renewable heat – devolved to Holyrood
  - Geothermal?
    - UK and Scottish Governments have discussed this in the context of licensing, but no conclusions reached due to uncertainty over who owns geothermal energy or even how to characterise it...

# Onshore – Issues

- What has happened in England?
  - Initial projects permitted on the basis of environmental and planning law
- Relevance for Scotland?
  - Environmental and planning issues are devolved to Holyrood
- Conclusion?
  - Appears that a deep geothermal project could proceed with relevant environmental and planning permission

# Scottish Government Guidance

- Scenarios
  - Hot wet rock
    - Sufficient permeability (fractures) and presence of groundwater
    - Geothermal energy could be extracted from abstracted water and reinjected
  - Hot dry rock
    - No permeability (fractures) and absence of groundwater
    - Geothermal energy exploitation would require engineered geothermal system

# Scottish Government Guidance

- Three legal and regulatory issues
  1. Risk to the environment
  2. Planning permission
  3. Occupational health and safety

# Risk to the environment

- SEPA Guidance – relevant activities
  - Construction and operation of boreholes
  - Abstraction of water
  - Return of abstracted water
- Relevance of Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR)

# CAR – General Binding Regulation 17

- A project may be authorised if it meets certain conditions:
  - Abstracted water must be returned to the same part of the geological structure
  - Any volume may be abstracted, but volume not returned must not exceed 10m<sup>3</sup>/day
  - No substances may be added to (or allowed to enter) water prior to return
  - Must be able to demonstrate net abstraction below 10m<sup>3</sup>/day
  - Water leakage must be minimised
  - No activity within 250m of abstraction for human consumption



# Planning and Occupational Health and Safety

- Planning
  - Permission would be required for boreholes, wellhead development and ongoing operations
- Health and Safety
  - No specific regulation for geothermal operations
  - Health and Safety at Work Act 1974
  - Borehole Sites and Operations Regulations 1995 (supplemented by guidance)
  - Offshore Installations and Wells (Design and Construction) Regulations 1996
  - Ionising Radiation Regulations 2017
  - Waste Management Regulations 2017

# Any legal and regulatory problems?

- Standalone project looks relatively straightforward
- What about multiple neighbouring projects?
- Would require relevant regulators to consider impact of new developments on existing ones
- SEPA? Planning Authority?
- They already have to consider such issues, but would they have the relevant information to make an assessment of possible negative impacts on geothermal energy potential?
- Note EA disclaimer in England re GSHPs
- Licensing regime required?

# Offshore

- Scenarios
  - Geothermal co-production with hydrocarbons
  - Geothermal repurposing from hydrocarbon operations
  - Standalone geothermal production (drilling dedicated boreholes)

# Offshore – Issues

- Does a coastal state have the right to extract geothermal energy in its exclusive economic zone?
- Not specifically mentioned in UNCLOS, but no obvious prohibition
- Coastal state has sovereign rights to:
  - Explore for and exploit natural resources of continental shelf (including subsoil) (defined broadly to include mineral and non-living resources, including in the subsoil)
  - Authorise and regulate drilling for all purposes

# Offshore – Issues

- Continental Shelf Act 1964
  - Any rights exercisable by the UK outside territorial waters with respect to the seabed and subsoil and their natural resources...are hereby vested in Her Majesty
- Thus, any proposal to exploit geothermal energy offshore will require authorisation of the state
- But who will grant such authority?

# Scenario 1 – geothermal co-production

- Conversion of the heat energy present in produced water
  - Appears to be a simple adjunct to existing process
  - Currently treated as waste
  - Key issue offshore is contamination rather than heat of returned water
  - No regulation of abstraction
  - Nothing in licence appears to prevent it
  - Would need to consider implications for Safety Case

# Scenario 2 – geothermal repurposing

- Transitioning of existing hydrocarbon producing wells from scenario 1 to dedicated geothermal energy production or new purpose as alternative to decommissioning
- Geothermal is no longer an adjunct to an existing process
- Specific authorisation required
- Licensing analogous to hydrocarbons?
- Analogy is not precise – geothermal involves reinjection of the medium from which heat is extracted rather than depletion of a finite resource
- Suggests that a Crown lease would also be required (e.g. wind, CCUS)

# Scenario 3 – standalone geothermal production

- Dedicated offshore wells drilled with main objective of geothermal heat extraction
- Need for state to characterise offshore geothermal potential
- The possibility of one project impacting another
- All leads to a stronger case for lease and licence approach
- Which regulator?
  - NSTA
  - SEPA/EA
  - CE/CES
- A case can be made for any one of these depending on how geothermal is perceived and characterised



# Conclusions

- There appear to be few if any legal or regulatory obstacles to the development of pilot deep geothermal projects onshore and co-production projects offshore
- Once we begin to think on a larger scale, the case for licensing onshore and licensing and leasing offshore becomes stronger
- We can draw inspiration from other energy sectors as well as from other jurisdictions
- Benefits include greater certainty for potential investors