



Consultation on the Draft Heat Generation Policy Statement

The Scottish Government

Energy Efficiency, Heat and Low Carbon Unit

Area 1D South

Victoria Quay

Edinburgh

EH6 6QQ

6 June 2014

Dear Sir/Madam,

CONSULTATION RESPONSE TO Q20 ON BEHALF OF FIFE GEOTHERMAL

Introduction

Thank you for the opportunity to comment on Scotland's approach to the energy we use for heating. This is a key area in meeting our environmental targets, as over half of the energy used in Scotland is in the form of heat.

Fife is active in making a contribution to this agenda, and in a recent initiative has established the Fife Geothermal network of relevant organisations to take forward this aspect of our heat resources. Fife is variously quoted as a favourable source of geothermal energy, and the group has been established to assess, justify and develop an appropriate demonstrator or demonstrators in this area.

The group is interested in developing geothermal resources residing both in geological aquifers and in old mine workings.

The group currently comprises Fife Council, St Andrews University, British Geological Survey, Cluff Geothermal, GT Energy, Town Rock Energy and the Big Partnership. The inaugural meeting of this group was held in Methil on 14 May 2014. Further organisations are expected to join the network as the project develops.

The meeting agreed that an early task would be to register the interest of the group with the Scottish Government as a site for demonstrator geothermal projects.

Response to Q20

Fife Geothermal supports the three key areas identified in the consultation document – namely the creation of demonstrator projects, the clarification of legal issues, and the development of a strategic national way forward.

Of these, however, priority should be given to the setting up of the demonstrator projects, in order to see progress on the ground. A special case should be made to address the legal issues on demonstrator projects, as the associated legal issues with geothermal energy may take some time to resolve in all details. One possible approach would be for the Scottish Government - in respect of the official demonstrator projects only - to consider helping to cover any associated liabilities.

Similarly, the initiation of demonstrator projects should not be held back pending consultation on a national strategy in this area. The two should proceed in parallel.

Capabilities of Fife Geothermal

We are pleased to set out some relevant background information on the capabilities of Fife Geothermal in the attached Annex 1, in particular:

- (a) the expertise of St Andrews University in the geology of Fife;
- (b) the experience of the British Geological Survey in building 3D models of abandoned coal mines and as the joint authors of the Scottish Government “*Study into the Potential for Deep Geothermal Energy in Scotland*”;
- (c) the relevant plans of Fife Council for public heating schemes that will act as anchor loads for geothermal demonstrator projects.

This expertise is supported by key industrial advisors, including Cluff Geothermal, GT Energy and Town Rock Energy.

We look forward to the speedy establishment of such projects in this part of Scotland.

Yours sincerely

Iain Todd

Facilitator for Fife Geothermal

St Andrews University

The University has a group of staff active in researching geothermal resources and who are particularly keen to use their expertise in the geology of Fife to identify and help develop the best hot saline aquifer and coal mine water resources in the region. The group is also working to apply geothermal concepts to medium-term storage of heat in geological aquifers.

The group maintains specific laboratory facilities for measuring thermal and other important properties of natural materials essential for three-dimensional modelling of heat transport and estimating geothermal resources. The equipment includes the only thermal conductivity divided bar sensor of its kind in Europe, and about £500k investment in the capital equipment base for geothermal and rock analyses, which is part of a much larger infrastructure investment in the Department of Earth and Environmental Sciences by the University over the past three years.

Complementary skills and infrastructure exist for conducting geophysical surveys of potential geothermal sites, and for the collation of all relevant data (e.g. heat maps, data from oil and gas exploration) into a Fife Geothermal Information System. Such data will be used to identify sites of potential geothermal resource and better inform the choice of demonstrator sites.

As a provider of research and educational services, the University of St Andrews supports the creation of a new industry based on geothermal energy by providing geological and related research for potential developers, consultancies and other stakeholders. Specific geothermal-related training and placements within PhD research and Masters courses would be provided, along with tailored workshops and short courses. It is envisaged that these activities will fall within the penumbra of an Earth Resources Innovation and Outreach Centre being installed at the Guardbridge brownfield site recently purchased and renovated by the University as an SME and knowledge exchange hotspot between the University's intellectual resources and stakeholders from government, industry, and the wider non-profit sector.

British Geological Survey

The British Geological Survey (BGS) is the world's oldest national geological survey and the UK's premier provider of objective and authoritative geo-scientific data, information and knowledge for wealth creation, sustainable use of natural resources, reducing risk and living with the impacts of environmental change. BGS provides expert services and impartial advice in all areas of geoscience. It advances understanding of the structure, properties and processes of the solid Earth system through interdisciplinary surveys, monitoring and research for the benefit of society.

BGS are experts in shallow and deep geothermal energy in the UK and provide [geological guidance](#) on installing ground source heat pumps. We are partners in the [BritGeothermal](#) project along with the Universities of Glasgow, Durham and Newcastle.

BGS is working with Glasgow City Council and the private sector to look into the use of heat energy from the ground to help to warm Glasgow's homes and communities. Our new 3D models of Glasgow's geology and mine workings are helping to identify which parts of the city would offer the best prospects of supplying this kind of [energy](#).

Mine water systems make use of the enhanced permeability in previously mined areas where rock and minerals/coal were removed, creating artificial void space. Collapsed shafts, remnant roadways and subsidence fractures provide storage and pathways for the flow of underground water. The heat energy contained within these waters (which may be enhanced in deep mining systems) can be extracted using ground source heat pumps.

BGS highlighted the 170 metre-thick Upper Devonian Knox Pulpit Sandstone Formation in Fife as the main Hot Sedimentary Aquifer (HSA) prospect in the Midland Valley of Scotland in the Scottish Government [Study into the Potential for Deep Geothermal Energy in Scotland](#)

The Carboniferous Passage Formation in Clackmannanshire, Fife and the Lothians, may have geothermal potential.

Fife Council plans for district heating schemes, and link to heat mapping

Heat is the biggest proportion of energy we use. In Fife we use heat to keep our homes and offices warm, or even to cool them in hot weather. Heat is used for hot water, to cook our food, manufacture goods to sustain our local economy.

We all know that heat costs are rising.

Heating and lighting cost Fife Council £14.1 million in 2013. Fife Council's Energy Programme is a series of projects tackling significant challenges in current and future budgets, working to generate income by sale of electricity and heat, and avoiding energy costs. We can significantly reduce our carbon emissions, reduce energy costs and create income by:

- Reducing the number and size of buildings we use
- Improving the energy efficiency of our buildings
- Generating our own renewable energy and heat

The Fife Heat Map <http://www.fifedirect.org.uk/heatmap> is one of Fife Council's tools to plan and prepare for the way we use and generate heat. (We will switch to the national map once data agreements are completed.) We have used the map internally to help identify 10 geographical areas with overlaps of heat demand and supply opportunities, where district heat networks could be created. Our district heat matrix was then populated to help us set priorities for district heat.

Using the heat map and matrix has allowed us to currently focus the Council's expertise and capacity on 4 proposed district heat developments: Dunfermline, Kirkcaldy, Cardenden and Methil. The heat matrix is reviewed by Fife Council's District Heat Working Group (a multi-disciplinary group of Council officers) every 6 months to ensure we manage opportunities and threats to developing heat networks in Fife.

In addition to Fife Council focus on 4 district heat networks, we are undertaking a renewables audit to focus our capacity and resources in advantageous areas. This will include new heat generation opportunities, to augment existing heat sources, and to open new opportunities for Fife.