

Interview 12 - Dr. Jon Busby, UK

Profile

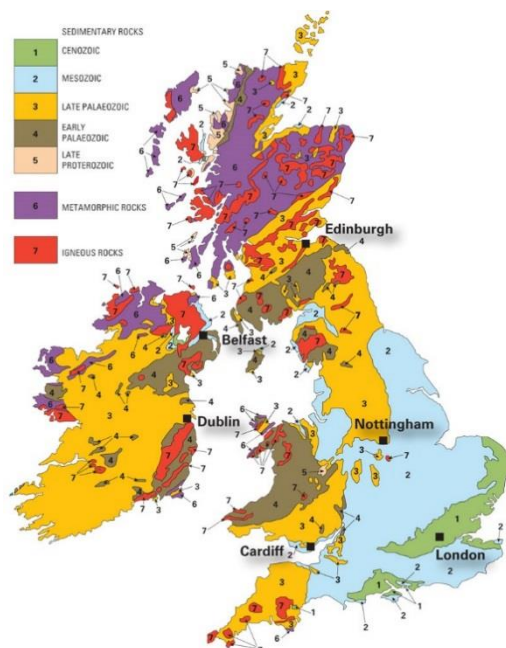
Name: Jon Busby
Age: 60
Education: BSc, PhD
Activity: Team Leader Geothermal Energy
Lives in Nottingham, UK
Experience in the thermogeology sector: 12 years
Geographical working area: UK

Thermogeology in UK

Dr. Jon Busby is the Team Leader at the British Geological Survey for Geothermal Energy. He is a geophysicist by training with 35 years' experience of geophysical and geothermal projects and he is actively involved in shallow and deep geothermal research. He led the BGS input to a European project to provide suitability maps for shallow geothermal ground collector systems and has worked extensively on UK heat flow and the temperature distribution within the shallow sub-surface. He has interests in providing quantitative information for the design of shallow geothermal ground collector loops. He has led a wide variety of projects from multinational research projects to commercial projects for a single client. He represents the UK on the International Energy Agency Geothermal Technical Cooperation Programme and advises the UK Department for Business, Energy and Industrial strategy on geothermal issues. He has published widely on geothermal in the peer reviewed scientific literature, technical publications and magazine articles.

What are the main features of Shallow Geothermal Energy (SGE) in England?

There is a very diverse range in geology in the UK ranging from Archaean rocks (Lewisian gneiss) in the northwest Scotland to Tertiary deposits in the south. There are also in some areas thick superficial glacial, glaciofluvial and fluvial deposits. There are number of major and minor aquifers, of mainly Triassic and Cretaceous age, that can be exploited for open loop GSHP. Closed loop GSHP in vertical boreholes is possible in most localities except for some very hard rock areas and some upland areas where the water table is low.



Simplified map of the UK
"Contains British Geological Survey materials © NERC 2018"

How is SGE managed under the regulation point of view?

Development of open loop GSHP requires permissions and licenses from the environmental authorities who oversee abstraction of ground water. In England this is the Environment Agency (<https://www.gov.uk/government/organisations/environment-agency>), in Scotland the Scottish Environment Protection Agency (<https://www.sepa.org.uk/>), in Wales Natural Resources Wales (<http://naturalresources.wales/splash?orig=%2f&lang=cy>) and Northern Ireland the Northern Ireland Environment Agency (<https://www.daera-ni.gov.uk/northern-ireland-environment-agency>).

It is highly recommended that installers of GSHP systems are certified with the Microgeneration Certification Scheme (MCS) by which they follow an approved standard of installation (MIS 3005 Issue 5.0 <http://www.microgenerationcertification.org/mcs-standards/installer-standards/heat-pump-systems>). Although MCS certification is not mandatory, financial incentives for installing GSHP that are paid through the Renewable Heat Incentive (RHI) Scheme, can only be claimed if the installation was done by an MCS registered installer.

What is the general state of development of SGE?

Statistics on total installations of SGE are based on extrapolations of business data. As of December 2016 estimated installation were as follows;

Small GSHP, less than or equal to 20 kW

Total number of installations = 22,953

Total installed capacity = 246 MW

Heat use (geothermal contribution) in 2016 = 303 GWh/yr

Medium to large GSHP, greater than 20 kW

Total number of installations = 3,806

Total installed capacity = 352 MW

Heat use (geothermal contribution) in 2016 = 377 GWh/yr

There are no data on the number of types of GSHP systems, i.e. open or closed loop, vertical or horizontal systems. Total new installations of GSHP in 2016 were 2388, which showed a reduction from 2250 in 2015 and 2190 in 2014.

Are there particular best practices examples (or projects aimed to foster thermogeology)?

The Environment Agency have produced an “Environmental good practice guide for ground source heating and cooling”

(https://www.gshp.org.uk/pdf/EA_GSHC_Good_Practice_Guide.pdf). This guide is updated by the Ground Source Heat Pump Association.

The Ground Source Heat Pump Association produce a number of standards to assist designers and installers of GSHP systems to specify a high level of design and installation of systems. The current standards are a Vertical Borehole Standard, a Thermal Pile Standard and a Shallow Ground Source Standard. These are available from https://www.gshp.org.uk/GSHP_Standards.html.

The Chartered Institution of Building Service Engineers (CIBSE) have produced a code of practice for open loop GSHP, available from <https://www.cibse.org/getattachment/Knowledge/CP3-Open-loop-groundwater-source-heat-pumps-Consul/CP3-Draft-2-1d-2018-1-22.pdf.aspx>.