

## What is the potential for geothermal energy on the Isle of Man?

A recent discussion on Manx Radio's Mannin Line<sup>1</sup> has raised the question of whether there is a viable geothermal energy resource on the Isle of Man.

Geothermal energy is the heat that comes from the Earth's interior. As a renewable resource, it is attractive because it theoretically provides constant power, unlike wind and solar energies that vary with weather and sunlight. Also, geothermal plants tend to cover less area than that of a wind farm or solar park. Sadly, the short answer is that geothermal energy is very unlikely to work on the Isle of Man. Essentially the geology rules it out.

The usual way of utilising geothermal energy is with water, which carries the heat from sub-surface rocks to the surface where it can be used for electricity or heating. There are two systems in commercial operation in different parts of the world.

In volcanic areas like Iceland, the ground is so hot that water can be circulated through shallow boreholes to form steam which drives turbines for electricity. In contrast, the rocks of the Isle of Man are cold. One would have to drill 3-4 kilometres to reach temperatures of 100°C at a cost of many tens of millions of pounds. Unfortunately, the rocks at this depth on the Island are impermeable meaning it would be difficult to circulate water through them without using expensive techniques such as artificial fractures. Even then, the rocks would be cooled by the water so the resource is finite.



*Svartsengi geothermal power plant & Blue Lagoon leisure park in Iceland (source: [www.theneweconomy.com](http://www.theneweconomy.com))*

In other areas such as Denmark and Germany, there are porous and permeable rocks ("aquifers") at depth which contain hot water. The hot water can flow by itself into the boreholes and is brought to surface for use in district heating schemes where it is distributed to communities via insulated pipes. The hot water is

---

<sup>1</sup> [www.manxradio.com/news/isle-of-man-news/geothermal-energy-could-make-island-self-sufficient/](http://www.manxradio.com/news/isle-of-man-news/geothermal-energy-could-make-island-self-sufficient/)

then used in radiators via central heating systems in each individual property. A small-scale scheme has been in operation in Southampton since 1986.

The boreholes and the district heating schemes require considerable investment but the heating costs thereafter are very low. One issue with a new borehole is that there is a risk that it will not produce the predicted amount of hot water, meaning the Government often has to provide insurance against failure.



*A borehole drilled in Denmark to supply hot water to a district heating scheme (source: [www.geotermi.dk](http://www.geotermi.dk))*

In the Isle of Man there are no suitable aquifers. The Island is instead underlain by hard rocks such as the Manx slate which contains very little water.

Another geothermal option for district heating is being investigated, for example, in Glasgow. The idea is to use warm water from flooded coal mines. The Manx Geological Survey has been looking to see whether the old lead mines on the Isle of Man, particularly those around Foxdale, would have similar potential. Unfortunately, we have drawn a blank – the temperatures are too low and the volume of water is too small. We have also searched for thermal springs without success.

Having said all this, there is always the chance of a surprise so please do let us know if you come across some warm water flowing to surface!

Dr Dave Quirk  
Manx Geological Survey  
26 April 2022.

**Postscript:** There are indirect ways of using the thermal qualities of the Earth, including ground-sourced heat pumps and underground storage of surplus heat. These are currently under investigation by the Energy & Sustainability Centre Isle of Man - [www.energysustainabilitycentre.im/knowledge-hub](http://www.energysustainabilitycentre.im/knowledge-hub).