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Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Geothermal Energy in Ireland

A roadmap for a policy and
regulatory framework

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1 Introduction and context

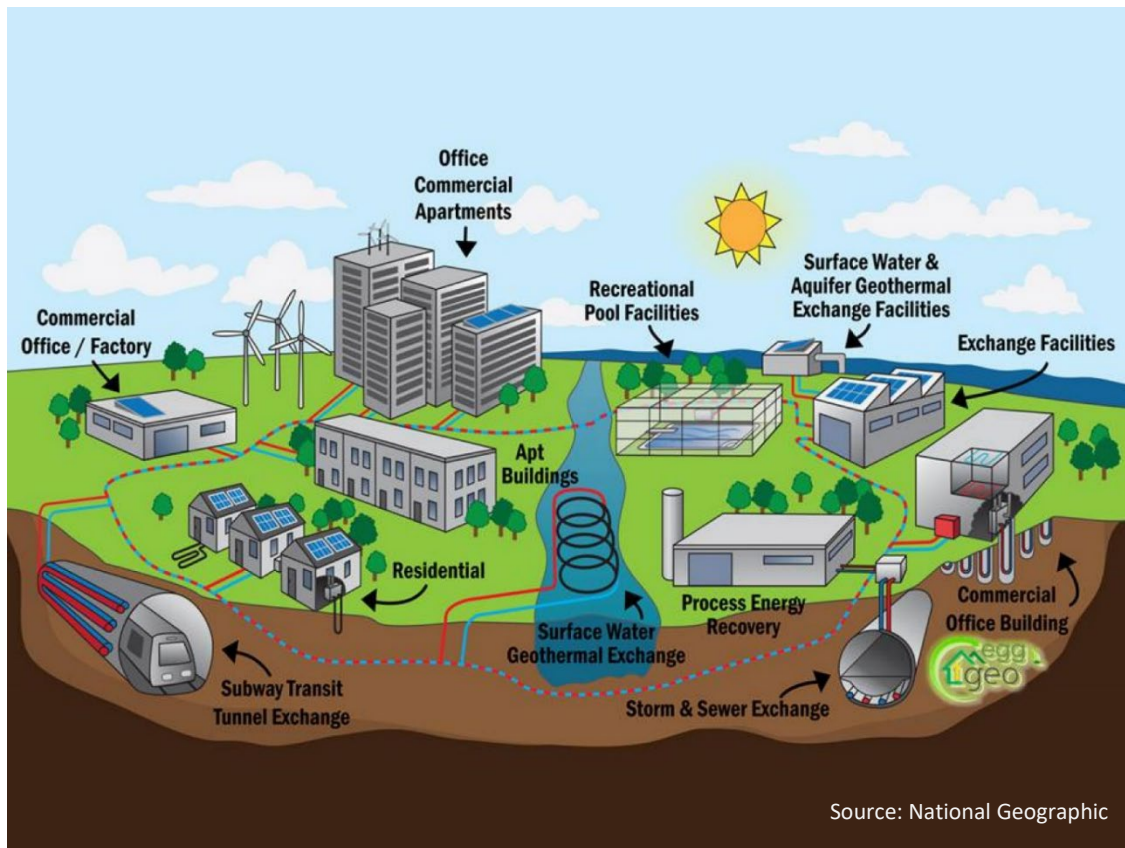
1.1 What is geothermal energy?

Geothermal energy is a secure, environmentally sustainable and cost-effective source of renewable energy that is growing in popularity across the world. The EU defines geothermal energy as “energy stored in the form of heat beneath the surface of solid Earth”. Geothermal installations are commonly used across the globe to heat and cool homes and businesses under the following categories:

- District Heating;
- Agriculture, food production and food and beverage processing;
- Heat and hot water;
- Industrial drying processes;
- Industrial cooling processes; and,
- Electricity generation.

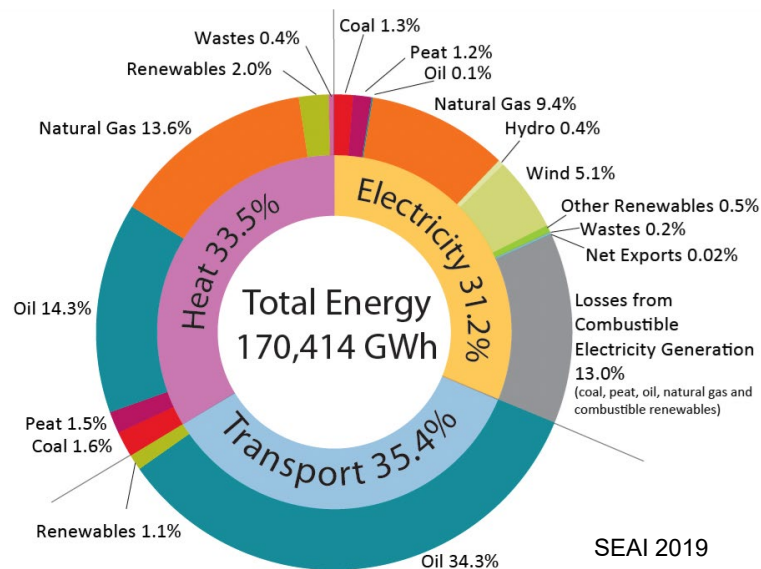
Geothermal energy can be harnessed by a range of different technologies depending on the nature of the resource, the intended use and the amount of heat required. Some degree of drilling is usually required to access geothermal areas of suitable temperature. The harnessing of geothermal resources is usually termed as either direct use (taking energy directly from geothermal fluids such as pore waters for space heating, cooling, balneology or industrial applications) or indirect use (converting heat from geothermal fluids into electricity or for adsorption cooling systems).

The production of electricity from geothermal resources is more advanced in places where geological conditions give rise to high heat flow from the Earth's interior (e.g., volcanic areas such as Iceland, Italy, Costa Rica and New Zealand where geothermal energy delivers approximately 14% and 13% of national electricity) and where the resource is easily accessible, usually at the Earth's surface. However, recent advances in technology (drilling and more efficient surface energy plants at the surface) have made the use of geothermal energy possible across a wider range of geological settings. These natural resources are usually accessed by drilling deep boreholes, which can be several kilometres deep below the ground. These new technologies and our improved understanding of the subsurface mean this energy source could now be viable in Ireland.



1.2 Ireland's Geothermal Energy Potential

Ireland has untapped geothermal energy resources onshore that could provide a significant proportion of the country's heating needs but are currently no district heating/cooling geothermal projects in operation in Ireland. Approximately one-third of our energy demand is in the heating sector. SEAI estimates approximately 32% of energy consumed in Ireland is used for heat, the vast majority of which is powered by fossil fuels.



Ireland's geothermal energy resources are currently under-utilised and mostly used for small-scale, individual heating projects (e.g. for single domestic dwellings or industrial heating applications). Our low-temperature, shallow resources (to a depth of approximately 400m; note that this depth is not a definition but a guideline for the purposes of this document) have been well documented by DECC (GSI) and others in a series of geothermal suitability maps and an accompanying Homeowner's Guide to Ground Source Heat.

However, while Ireland's deeper geothermal resources are not fully understood, research conducted to date indicates that there is significant potential for the increased development of geothermal resources onshore Ireland. Recent research publications have shown that resources suitable for district heating, commercial and municipal applications are most likely to be found in the deeper parts of the Carboniferous basins in the East, Midlands and Southwest of Ireland, while Wicklow, Wexford, Waterford and Cork show presence of deep untapped reservoirs of geothermal heat.

To support the greater deployment of geothermal energy in Ireland the Government is developing a policy regulatory framework to facilitate the exploration for, and development of, geothermal energy resources.

1.3 What is this document?

This document is a non-technical roadmap for the development of a policy and regulatory framework for geothermal energy in Ireland. It is being published alongside An Assessment of Geothermal Energy for District Heating in Ireland which provides, inter alia, background detail on geothermal energy generally, Ireland's geothermal potential, a comparison of international policy frameworks and a summary of the other relevant regulatory frameworks and how they interact.

The two documents together form an important step in the activation stage of developing a policy and regulatory framework for geothermal energy in Ireland. It is important that, as well as drawing on best practice and experience, we take account of stakeholders' views on how they want to be involved to ensure their participation at appropriate stages in the development process. The aim of this document is to describe how we will do this, when we will do this and what we will do with the outcomes of your views and opinions.

The specific purposes of this document are to:

- inform all interested parties that a policy and regulatory framework for geothermal energy in Ireland is being developed;
- set out the scope and broad content of a framework;
- assist in identifying key stakeholders who need to be kept informed of progress in the development of the framework; and
- describe how we take account of stakeholders' views on how they want to be involved to ensure their participation at appropriate stages in the process, when we will do this and what we will do with the outcomes of their views and opinions.

1.4 Our principles of engagement

In developing this framework we will be guided by the following principles. We will:

- involve people early on in the process and in developing specific policy;
- engage with interested people and organisations at the appropriate time using effective engagement methods and allowing sufficient time for meaningful consultation;
- be adaptable, recognising that some consultation methods work better for some people and some issues and that a one size fits all approach will not work;
- respect the diversity of people and their lifestyles and give people a fair chance to have their voice heard regardless of gender, age, race, abilities, sexual orientation, circumstances or wherever they live;
- be clear in the purpose of any engagement and how you may contribute and let people know how their views have been taken into account within agreed timescales;
- make documents publicly available on the Department's website; communicate clearly with people using plain language and seek to avoid jargon wherever possible.

1.5 Who is this document for?

This document is for those who have an interest in renewable energy, environmental sustainability, geoscience, and the circular economy. Stakeholders could represent a wide range of interests, including those who develop, deliver or utilise energy resources, from individuals to groups to organisations.

People have the opportunity to be involved in developing this framework. If you are part of a local group, work in local government (including as an Elected Representative), business or an individual with an interest in geothermal energy, you may have information and ideas that can help shape its future. By taking part in this process you can influence the decisions being made about the future of geothermal energy in Ireland.

1.6 Getting involved

Anybody who wants to become involved in this process may make contact in writing by email at geothermal@decc.gov.ie or by post to the Geoscience Policy Division, Department of the Environment, Climate and Communications, Adelaide Road, Dublin, D02 X285.

2 Background to Geothermal Energy

2.1 Ireland's geothermal Policy / Regulatory Framework

As set out in the accompanying Assessment of Geothermal Energy for District Heating in Ireland, Ireland has no specific legislation or regulatory framework covering geothermal energy beyond a definition of “geothermal energy” as “energy stored in the form of heat beneath the surface of solid earth” in Statutory Instrument No. 147 of 2011 (European Communities (Renewable Energy) Regulations). Ownership of geothermal energy has not been clarified.

There is no process for licencing the exploration for, or development and production of, geothermal energy resources. There is no mandatory national or local reporting on geothermal projects beyond requirements under existing environmental and planning regulations.

Draft heads of a Geothermal Development Bill were submitted to Government in July 2010. The draft covered the exploration and development of deep geothermal energy resources in Ireland (excluding aspects such as district heating, market regulation and health and safety). An extensive consultative process started in 2008 in advance of the drafting of the general scheme of the Bill and included web-based consultations, two national workshops and meetings with industry stakeholders.

Ultimately though, the Bill was not brought before the Oireachtas but the Energy White Paper 'Ireland's Transition to a Low Carbon Energy Future 2015-2030' makes provision for the establishment of a regulatory framework to facilitate the exploration for, and development of, geothermal energy resources.

The national plans listed below also support the case for the development of a policy and legislative framework to enable the realisation of Ireland's geothermal energy potential:

- The Climate Action Plan (CAP) aims to deliver step-change in Ireland's emission performance over the coming decade to meet our EU targets for 2030, but will also meet our mid-century decarbonisation objectives. Action Item 70 directs GSI to examine the potential of geothermal energy to contribute to district heating and to develop this Roadmap.
- The National Mitigation Plan (NMP) 2017 details the Government's plans to decarbonise the electricity, built environment, and transportation sectors, and to approach carbon neutrality for agriculture, forestry, and land use sectors. The NMP lists geothermal energy as a possible source for renewable heat and electricity generation and GSI is tasked with assessing Ireland's geothermal potential.

- The National Renewable Energy Action Plan 2010 addresses the EU requirement to prepare a national plan for reaching Ireland's target of 16% renewable energy by 2020. The report notes the government's intention to draft geothermal legislation.

While the lack of geothermal legislation does not necessarily preclude exploration for, or development of, geothermal energy, it does increase the level of risk and uncertainty for projects and potential investors (including local authorities/municipal users). An opportunity therefore exists now to reactivate the development of a policy and regulatory framework for geothermal energy.

Project milestones would include, for example:

1. A non-technical roadmap..."Towards a Geothermal Energy Framework for Ireland" published alongside the Assessment of Geothermal Energy for District Heating in Ireland
2. A draft policy statement or paper;
3. The final policy;
4. Supporting legislation setting out the new regulatory framework.

Public and stakeholder consultation would be an important component of the overall project, mainly taking place under 2 above.

3 Stages in the preparation of a policy and regulatory framework for geothermal energy

This roadmap marks the first stage in the development of a policy and regulatory framework for geothermal energy in Ireland. There will be four broad stages in the development of the framework.

The first is the Activation Stage and comprises this non-technical roadmap and the accompanying technical background paper.

Stage 2, the Development Stage, will run until Q4 of 2021 and will involve the preparation of a draft policy statement for geothermal energy. This stage will draw together key information and viewpoints from stakeholders in order to identify and test options for a preferred approach to policy and regulation. It will conclude with the publication of a final policy statement.

Stage 3, the Finalisation Stage, will run from Q4 of 2021 to Q4 of 2022. It will include approval of a regulatory framework by Government, and preparation of the necessary supporting legislation.

The final stage of the process, Stage 4, will run from end 2022 onwards. It will involve implementation of the new framework, and the increased roll-out of geothermal as part of Ireland's energy mix.

Throughout these formal stages, DECC (GSI) will continue its research and data collection work on geothermal potential and Ireland will continue to support EU activities through the SET Plan Deep Geothermal Implementation Working Group.

Stage	Milestone	Timeframe
Activation Stage	Publication of the technical and non-technical roadmaps	Immediate – complete
Development Stage	Prepare draft policy statement	Q3 2021
	Undertake public consultation on draft policy statement	Q4 2021
Finalisation Stage	Publish final policy statement Prepare supporting legislation	● To Minister/Government by ● Seek to secure Oireachtas approval by
Implementation and Review Stage	Implementation and review	2022 onwards

4 Consultation phases for a geothermal policy and regulatory framework

4.1 When will we engage?

We will carry out ongoing engagement as the framework develops and will work closely with our key stakeholders and people interested in geothermal energy. In addition, formal public consultation will take place during the preparation of the policy statement, with a draft policy statement providing the basis for that consultation.

The timeline in Section 3 above sets out our proposed stages of plan making, highlighting a number of key opportunities for stakeholder input into the planning process. However, you should note that these timelines represent a guide only.

4.2 Who will we engage with?

As previously mentioned, throughout the development of a policy and regulatory framework and into implementation phases we are committed to engaging with anyone who has an interest in the geothermal energy. However, there are certain sectors that are immediately recognisable as playing a key part in the area, such as:

- Energy, including energy development, distribution and regulation;
- construction and planning;
- water supply / quality;
- local authorities and CAROs;
- environmental organisations,
- cultural heritage.

5 Contributing to the process

Whenever we carry out stakeholder engagement, we will feed back the outcomes of the process.

As part of the process, we will take into account the views and feedback from all stakeholders. Stakeholder engagement is vital and while we will consider all comments, views and representations made, the outcome might not result in all viewpoints being satisfied.

The policy and regulatory framework must integrate future needs as well as different views. There are many different factors that contribute to the decision making process and the need to operate within existing national government policies. However we will take all feedback into consideration, with a duty to maintain transparency throughout the process. In addition, we will ensure we are clear with stakeholders as to how decisions will be made.

As set out under section 1 above, anybody who wants to become involved in this process may make contact in writing by email at geothermal@decc.gov.ie or by post to the Geoscience Policy Division, Department of the Environment, Climate and Communications, Adelaide Road, Dublin, D02 X285.