Chapter 5

# Clearing the Runway: Policies and Regulations to Scale the United Kingdom's Geothermal Potential

*Renewable Energy Association (REA), with contributions from Project InnerSpace*

***The United Kingdom currently lacks a dedicated geothermal strategy and national deployment targets—a sharp contrast with European peers. A range of interconnected barriers continues to prevent the UK from putting its significant subsurface resources to work for heating, cooling, and electricity generation, yet each of these barriers can be addressed with targeted policy interventions and a comprehensive regulatory effort. Taking such action would set the stage for a robust domestic geothermal industry.***

Geothermal offers a renewable, domestic, and reliable energy source for heating, electricity, industrial heat, and cooling—and the UK offers a lot of opportunity. Analysis from Project InnerSpace shows there are approximately 3,900 gigawatts of technical potential down to 3.5 kilometres for heating and cooling applications, the most exciting opportunity for geothermal in the UK. (See Chapter 3, "Where Is the Heat? Exploring the United Kingdom's Subsurface Geology," for more details.) In addition to this potential, the heat found in water in former coal mines across the UK can serve as a valuable resource as well. Approximately 25% of the UK population lives above abandoned coalfields (see Chapter 4, "Geothermal Heating and Cooling: Applications for the United Kingdom's Industrial, Municipal, Residential, and Technology Sectors," for more details), which could be harnessed to provide 2.2 million gigawatt-hours of heat—enough to heat all homes in the UK for more than 100 years.[1,2] Analysis by Project InnerSpace also estimates approximately 25 gigawatts of technical potential for electricity down to 5 kilometres.

As the UK moves towards a renewable, reliable, and secure grid—and faces high energy bills driven by exposure to volatile international gas markets and unusually high electricity prices[3]—geothermal can supply domestic, dispatchable, baseload electricity; deliver clean heating and cooling; create thousands of jobs; lower heating costs; and decarbonise industrial heat, all without relying on imported fuels or generating

problematic waste streams. Scaling geothermal can also bolster the UK's long-term energy security via its world-leading oil and gas workforce.

The potential of geothermal energy has been recognised, to varying degrees, by UK governments since the 1970s. Mechanisms to support it as an energy source have included grants, subsidy payments (notably the now-defunct Renewable Heat Incentive, which was effectively a generous feed-in tariff), and a state-driven national exploration programme in the 1970s. However, technologies of the time, competitive global energy prices, and shifting government priorities left geothermal as a niche energy source. Today, vast improvements in technologies (many taken from the oil and gas sector); a growing number of start-ups in the region (see Chapter 10, "A New Age of Innovation: The United Kingdom's Geothermal Start-Up Scene"); and the renewed national drive for clean, affordable, reliable energy sources mean that geothermal is primed to become a viable and valuable option.

But while geothermal resources are substantial, deployment has been held back by limited policy support, regulatory uncertainty, and the low visibility of geothermal within the wider UK energy system—factors that have hindered investor confidence and slowed project development.[4]

The urgency of addressing policy barriers is reinforced by the UK's own energy system modelling. The National Energy System Operator's Future Energy Scenarios consistently show that the next decade will include rapid electrification of heat; expansion of heat networks; rising constraints on electricity networks; and a growing need for firm, domestically sourced, low-carbon energy. Crucially, these scenarios highlight that policy and investment decisions made in the next five years will largely determine the shape of the energy system through the 2030s—as infrastructure choices, network layouts, and supply chains become locked in. This shift creates a window for geothermal: Aligning geothermal policy with the system pathways already envisaged in the Future Energy Scenarios and enabling deployment now could allow geothermal to be integrated into emerging heat networks and local energy systems at the lowest cost and highest value. Delaying action risks foreclosing geothermal's role and being left with higher-cost alternatives.

This chapter outlines the policy and regulatory barriers to the development of a robust geothermal industry and presents a menu of solutions to unlock investment, reduce project risk, and accelerate growth. By adapting proven policies already applied in other UK sectors and in leading geothermal markets abroad, the UK can fully harness its geothermal potential.

The "Policy Recommendations" box shows seven proposed policy actions that can catalyse geothermal across the United Kingdom. Many of these recommendations can be implemented independently but could be effective if implemented as part of a comprehensive National Policy Statement issued on behalf of the UK government. **Figure 5.1** outlines the key barriers and specific proposed solutions to reach this goal.

## SEVEN PRIORITY POLICY ACTIONS

1. Set a national geothermal strategy (with national geothermal goals).
2. Establish a "geothermal desk" to streamline licensing and permitting.
3. Develop financial incentives.
4. Leverage the government estate to stimulate geothermal demand.
5. Advance skills and supply chains.
6. Enhance data transparency and resource mapping.
7. Advance public engagement and awareness.

## A BRIEF HISTORY OF GOVERNMENT INCENTIVES FOR GEOTHERMAL IN THE UK

The UK's first geothermal push came after the 1973 oil crises, when the government funded the Hot Dry Rock programme. This effort involved drilling exploratory boreholes across Britain and constructing a pioneering geothermal plant at Rosemanowes Quarry in Cornwall while also training a generation of engineers and academics. But it never produced a commercially viable power station. With oil prices low and little political return, the programme ended in 1990, and geothermal energy lost support. For the next two decades, geothermal saw little policy development.

## POLICY MENU FOR ACCELERATED GEOTHERMAL DEVELOPMENT IN THE UK

| Theme | Barrier or Challenge | Policy Solution or Recommendation | Responsible Party |
|---|---|---|---|
| **Regulatory and Governance** | Lack of national strategy or deployment targets, which undermines investor confidence.<br><br>Fragmented regulation and unclear planning/ permitting roles causing project delays. | **Policy Recommendation 1:** Publish a national geothermal strategy with explicit 2035/2050 heat and electricity goals.<br><br>**Policy Recommendation 2:** Establish a "geothermal desk" for one-stop coordination between DESNZ and agencies with defined permit timelines; update national planning guidance to classify geothermal as a nationally significant, strategic, resilient, and renewable infrastructure. | DESNZ, Cabinet Office, HMT<br><br>DESNZ; MHCLG; Environment Agency; Scottish government; Welsh government; Northern Ireland Executive; Mayoral Authorities |
| **Financial and Investment** | High up-front exploration and drilling risk that discourages private investors.<br><br>Limited financial incentives compared with other renewables.<br><br>Weak bankability of long-term heat offtake contracts. | **Policy Recommendation 3:** Create a geothermal resource insurance facility modelled on France and Germany.<br><br>**Policy Recommendation 3:** Establish a geothermal exploration grant programme; include geothermal in Contract for Difference auctions; ring-fence funding in the GHNF.<br><br>**Policy Recommendation 3:** Develop a geothermal financing framework using blended finance, tax breaks, and a contracts for heat regime with standardised heat purchasing agreements. Pair targeted capital support, loan guarantees, and resource insurance to reduce early drilling risk and unlock additional investment. | DBT, DESNZ, HMT<br><br>Great British Energy, HMT, National Wealth Fund, DESNZ<br><br>DESNZ, Ofgem, HNDU, local authorities |
| **Market and Infrastructure** | Low coverage of district heat networks, limiting viable demand. | **Policy Recommendation 4:** Introduce a public heat purchase obligation requiring public estate to procure low-carbon heat; designate geothermal opportunity zones within network areas. | Ministry of Defence, MHCLG, Cabinet Office, DESNZ, local authorities |
| **Data, Coordination, and Integration** | Incomplete or inaccessible subsurface data, which constrains exploration. | **Policy Recommendation 6:** Expand subsurface data resource mapping BGS Geothermal Data Map into a public National Geothermal Atlas; mandate open access to non-commercial well data. | BGS, DESNZ, GSNI |
| **Skills and Awareness** | Low awareness of technical skills and domestic capacity.<br><br>Low public familiarity/ examples; confusion with hydraulic fracturing. | **Policy Recommendation 5:** Create a Geothermal Skills Transition Fund for oil and gas workforce retraining; incentivise UK manufacturing of drilling and heat-exchange components by establishing local-content rules.<br><br>**Policy Recommendation 7:** Run a national geothermal awareness campaign; develop national guidance distinguishing geothermal from hydraulic fracturing; highlight success stories (such as Southampton). | DESNZ, DBT, OPITO<br><br>DESNZ, local authorities, industry associations |

**Figure 5.1:** BGS = British Geological Survey; DBT = Department for Business and Trade; DESNZ = Department for Energy Security and Net Zero; GHNF = Green Heat Network Fund; GSNI = Geological Survey of Northern Ireland; HMT = HM Treasury; HNDU = Heat Networks Delivery Unit; MHCLG = Ministry of Housing, Communities and Local Government; Ofgem = Office of Gas and Electricity Markets; OPITO = Offshore Petroleum Industry Training Organisation. Source: author.

In 2008, however, the nation passed the Climate Change Act, embedding statutory greenhouse gas reduction targets and reinforcing interest in low-carbon energy sources. By the end of 2010, geothermal projects were eligible for enhanced incentives under the Renewables Obligation, which was revised in 2009 to introduce banded support that provided higher subsidies for emerging and capital-intensive technologies such as geothermal power.[5] Between 2009 and 2011, the nation's Department of Energy distributed nearly £5 million in capital grants via a challenge fund to deep geothermal projects.[6] The 2011 Renewable Heat Incentive offered subsidies close to £50 per megawatt for heat producers (this programme was discontinued in 2023) and limited capital grants from the Department of Energy.[7] The squeeze on public finances following the financial crash in 2008 and subsequent austerity measures constrained long-term support for such initiatives.

In 2014, geothermal became technically eligible for Contracts for Difference**,** but with no ring-fenced allocation (money specifically allocated for one area), it struggled to compete with cheaper technologies such as wind and solar. The Heat Networks Investment Project (2017–22) and its successor, the Green Heat Network Fund (from 2022), made geothermal heat an eligible option for district heating, though there are opportunities for expansion.[8]

## OPPORTUNITIES FOR ADVANCEMENT

The UK has yet to set out a dedicated geothermal strategy or national deployment targets, even as European peers have moved to scale their geothermal sectors. Germany, for example, has recently moved to accelerate deployment with a new KfW geothermal development loan paired with government-funded exploration and resource-risk protection (including debt relief up to 100% of the bank loan if a well makes no—or only partial—discovery), alongside a draft law intended to speed up approvals and elevate geothermal expansion as a matter of overriding public interest.[9] In the UK, a range of interconnected barriers continues to prevent the sector from expanding. Nearly all of these barriers were identified by geothermal start-ups and developers working in the UK (see Chapter 10, "A New Age of Innovation: The United Kingdom's Geothermal Start-Up Scene"). Fortuitously, each of these barriers could be addressed by policy interventions or a comprehensive regulatory effort.

1. **Fragmented regulation and governance:** The UK has a comprehensive system of environmental permitting and regulation, overseen in England by the Environment Agency and a range of equivalent bodies in devolved administrations. While geothermal energy projects are subject to this full suite of mature environmental regulations, the regulatory system has evolved mainly in the context of water wells and the oil and gas industry. The geothermal energy sector therefore lacks a specific and clear framework and a dedicated permitting system, leaving an ad hoc patchwork system where requirements can vary at officials' discretion. Multiple agencies regulate subsurface access, planning, water use, and environmental compliance, along with data access, creating complexity, uncertainty, and long timelines for developers. Compared with streamlined pathways for the deployment of wind, solar, and even nuclear, limited local familiarity of geothermal further slows approvals and undermines investor confidence.
2. **High up-front exploration risk:** Developers face high drilling costs without assurance of viable subsurface resources, difficulty in obtaining exploration and resource-risk insurance, and insufficient geological data to price premiums—a classic market failure. Even successful exploratory wells lack legal certainty to monetise discoveries, allowing other parties to piggyback on the discovery, benefitting from it without sharing the up-front risks. Environment Agency abstraction licences provide a partial solution by allowing legal water extraction, but geological conditions vary from site to site, and risk profiles differ accordingly, leaving investors exposed to high up-front risk.
3. **Limited financial incentives:** Geothermal projects compete against mature wind, solar, and nuclear production with more established support mechanisms. Geothermal projects require major upfront investment—multi-million-pound price tags to drill wells, often between £25,000 and £30,000 per day for the rigs necessary for that drilling[10]—plus early borehole viability risk and few UK demonstration projects, deterring investors. Even ground source heat pumps face relatively high up-front costs despite strong lifetime performance and proven high operational efficiency, leaving a financing gap that current incentives do not bridge.[11,12]

4. **Problems with the planning system:** While major changes to the UK's planning and infrastructure systems are underway, geothermal projects currently face a complex and often time-consuming planning and permitting process. This reflects the fact that each project is a mid-scale infrastructure development involving boreholes, a surface plant, and temporary drilling pads, with preparatory works, drilling operations, and subsequent site reinstatement that can extend over many months. Many authorities are unfamiliar with the technology. And its benefits—small environmental footprints, low emissions, firm energy—can be overlooked amid concerns about noise, water, and induced seismicity.
5. **Lack of public awareness and community acceptance:** Municipal, industrial, and commercial consumers are often unaware of the technical and financial benefits of geothermal heating and cooling in the UK. Without early engagement and education, concerns can cause delays or, even worse, leave geothermal solutions off the table. Community and government outreach about geothermal's benefits, safety, low emissions, and minimal impacts can aid adoption and planning.

Most of these barriers have a proven policy solution, often already in use by other countries that have successfully grown their geothermal sectors.

## POTENTIAL POLICY AND REGULATORY ACTIONS TO CATALYSE GEOTHERMAL ENERGY IN THE UK

As a renewable energy capable of meeting continuous demand,[13] geothermal energy could make a significant contribution to the UK's policy objectives on energy security, economic growth, and decarbonisation while also reducing costs for customers. The technology's exceptionally small surface footprint—the smallest of any renewable energy[14]—also makes it suitable in a densely populated country with stringent planning laws.

Where and when doing so is affordable, introducing incentive programmes to encourage the sector—alongside regulatory changes that would be relatively cheap to deliver—could make disproportionately large gains for delivering geothermal projects.

### 1. Set a National Geothermal Strategy (with National Geothermal Goals)

The UK government could make a clear policy commitment to geothermal energy. The technology has benefitted from various policy measures in the past—for example, the Renewable Heat Incentive—but an explicit statement supporting geothermal in the context of the UK's energy security, economic growth, and job creation goals would give investors more confidence that the technology would have long-term policy support. In Germany and the Netherlands, for example, advances in geothermal deployment were supported by establishing and explicitly stating national goals.[15]

The UK government is currently considering a national geothermal strategy, which could include setting targets for the rollout of geothermal projects. These targets could be aligned with other government initiatives on the future of the energy grid and the development of heat networks.

Under past governments, state support for geothermal energy has seemed ambiguous at times, leaving it outside the group of "most favoured" renewable energy technologies. Setting targets—even ones to signal direction—for the share of renewable heat and electricity generation expected to come online in, say, 2035 and 2050 would reassure investors and developers that the technology is being taken seriously.

Adopting targets is not a novel recommendation; many have been suggested by independent bodies, including the National Geothermal Centre's target of 10 gigawatts of heat and 1.5 gigawatts of electricity by 2050. While these goals have different costs and benefits in terms of decarbonisation, jobs created, and investments stimulated, any goals in this range set by the government would be impactful.

***If the policies recommended in this report are enacted soon (for instance, in the next one to three years), the 2050 time frame could be accelerated or the targets could be raised beyond 15 gigawatts for heat and 1.5 gigawatts to 2 gigawatts for electricity.***

Goals of 15 gigawatts for heat and between 1.5 gigawatts and 2 gigawatts for electricity by 2050 are consistent with current technologies, cost estimates, and the data in this report and would be ambitious targets at today's costs. These goals sit at the upper end of projections, however, based on current evidence and capabilities—and if financial, regulatory, planning, and permitting barriers are unlocked, they have the potential to become a reality. If the policies recommended in this report are enacted soon (for instance, in the next one to three years), the 2050 time frame could be accelerated or the targets could be raised beyond 15 gigawatts for heat and 1.5 gigawatts to 2 gigawatts for electricity.

**Action: Department for Energy Security and Net Zero/central government**

## 2. Establish a "Geothermal Desk" to Streamline Licensing and Permitting

To unlock its geothermal potential, the UK should overhaul—and streamline—its fragmented and uncertain permitting environment. This process should start with a comprehensive review.

As an example, the Nuclear Regulatory Taskforce's 2025 review of the nuclear industry, led by Chair John Fingleton, concluded that an overly complex nuclear regulatory system has contributed to the "relative decline" of the UK's ability to deliver faster and cheaper nuclear projects.[16] Gold plating—or the idea that utility companies under regulatory pressure from government agencies have overcorrected and gone too far in some areas of a project's development—leads to grossly inflated project costs, with some projects inflated by many billions over their lifetime.[17] The prime minister's announcement signalling the government's intention to expand the scope of the Fingleton review to other parts of UK industry is an opportunity. The geothermal sector should seize on, and even emulate, such a regulatory review process.

Geothermal projects are capital-intensive, site-specific, and subject to an overlapping system of approvals from local planning authorities, environmental regulators, and infrastructure bodies. Across the energy sector, for

### Policy Idea: Cross-Agency Strikeforce on Advancing UK Geothermal

Create a unified, whole-government mechanism to accelerate geothermal deployment. The mandate could include coordinating subsurface data sharing, aligning regulatory pathways for deep and shallow geothermal projects, identifying strategic investment zones and ways to incentivise private sector investment, fast-tracking permitting, and unlocking blended finance for heat networks and industrial decarbonisation. By convening economic, geological, regulatory, and investment authorities under one umbrella, the UK Cross-Agency Geothermal Strikeforce would reduce fragmentation, signal high-level political prioritisation, and deliver a clear national strategy for scaling geothermal heat and electricity as a key pillar of UK energy security and economic renewal.

**Who could be included:** National Wealth Fund; Great British Energy; British Geological Survey; HM Treasury; Department for Business and Trade; Ofgem; Department for Energy Security and Net Zero; Environment Agency; Mining Remediation Authority; Ministry of Housing, Communities and Local Government; and North Sea Transition Authority.

***To help solve the challenge of lengthy permitting, the central government could also establish a single-window "geothermal desk," consolidating all required consents into a single portal managed by the Department for Energy Security and Net Zero.***

example, the Environment Agency's water abstraction licence timelines and procedures are cited as some of the biggest regulatory barriers to geothermal development in the UK.

Another example is that the current Nationally Significant Infrastructure Projects procedure is considered financially onerous. The patchwork system creates high transaction costs and long lead times that discourage investment. For example, the slow pace of permitting for open-loop and larger closed-loop shallow geothermal systems can be a significant disincentive for developers. The project's up-front capital requirements can also be a barrier for smaller renewable energy developers—particularly geothermal, which is largely driven by small and midsize firms.

To help solve the challenge of lengthy permitting, the central government could also establish a single-window "geothermal desk," consolidating all required consents into a single portal managed by the Department for Energy Security and Net Zero. This desk could be jointly managed by officials from renewable heat and power directorates and other relevant statutory regulators. It should be empowered to grant approvals across drilling, environmental permitting, and infrastructure integration processes and work closely and constructively with the devolved administrations where appropriate. The desk could also introduce statutory "permit clocks"—time-bound deadlines for decision-making that provide certainty for investors and accountability for regulators. Parliament could also grant geothermal heat-only projects public interest or priority infrastructure status, ensuring they are treated comparably to the current 50 megawatt electric threshold for nationally significant low-carbon energy projects. This would streamline land-use decisions, reduce litigation risk, and align geothermal with the UK's legally binding carbon budgets.

Finally, the Department for Energy Security and Net Zero and the Ministry of Housing, Communities and Local Government could issue national guidance for local authorities to treat geothermal resources as strategic infrastructure. Like onshore wind and solar, geothermal should be embedded in local development plans and energy strategies.

**Action: Ministry of Housing, Communities and Local Government and Department for Energy Security and Net Zero**

## 3. Develop Financial Incentives

While the previous measures would help deep geothermal developers, they do not directly address the fundamental economic issues. Getting a geothermal project to the breaking-ground stage requires a lot of money and commitments. Developers must also deal with uncertainty due to geological resource levels and future income streams. The overall aim is to combine and improve existing financial levers, including Contracts for Difference (including combined heat and power); targeted capital grants such as the Green Heat Network Fund and an exploration grant programme; and a state-backed drilling and resource insurance program with catalytic public anchors to transfer early subsurface risk, make heat and electricity revenues bankable, and gather private capital. These solutions are described in detail in Chapter 9, "Minding the Gap: Financing Solutions to Advance Geothermal in the United Kingdom."

### Contracts for Difference

The UK's Contracts for Difference (CfD) regime—a government-backed mechanism that guarantees a fixed electricity price and stabilises revenues—has successfully taken billions of pounds of risk out of offshore wind investment by guaranteeing an expanded fixed strike price over a 15-year period (extended to 20 years in Allocation Round 7).[18] By offering a geothermal combined heat and electricity CfD, the government could guarantee developers a stable revenue stream for geothermal co-generated megawatt-electric-hours delivered to the electricity grid. Heat sales would be paid for by a different mechanism (see "Contracts for Heat or Standardised Heat Offtake Templates"). The

## Lessons Learned from the Netherlands

The Netherlands provides a clear example of how implementing some of the policy recommendations outlined in this chapter has led to real benefits and projects on the ground. The Netherlands has more than 3,000 aquifer thermal energy storage (ATES) systems—about 85% of all the ATES systems on Earth.[19] Why? The country's policy framework.[20] The UK could use a similar framework as a model to help scale ATES and other heating solutions.

The UK could emulate the Netherlands in the following ways:

- **Create demand-pull through building energy performance rules:** New buildings must adhere to performance rules (such as early energy-neutral buildings). Because these performance rules emphasise low primary energy and renewable shares, they promote the development of low-carbon heating and cooling solutions in dense urban developments.[21]
- **Improve project economics with fiscal incentives:** Companies can deduct a large share of eligible investments via the Netherlands' Energy Investment Allowance and use a system called the MIA/Vamil environmental tax program.[22] Households and some businesses can also access subsidies for heat technologies, including ground source heat pumps. Together, these instruments improve the business case for ATES.[23,24]
- **Improve permitting and siting:** The Netherlands' Geo Energy Systems Amendment[25] moved permitting for open ground-energy (ATES) water permits from the uniform public preparation procedure to the regular procedure, which normally has a maximum decision period of eight weeks.[26] Additionally, specified temperature limits and the requirement for an energetically balanced operation promote the long-term efficient operation of ATES systems. The introduction of geothermal energy master plans by Dutch authorities also helps address the increasing scarcity of subsurface space in dense urban areas.
- **Cut soft exploration costs with national screening and data tools:** The public WKO-bodemenergietool provides a first-pass feasibility screen that can evaluate the potential of closed and open geothermal systems or prohibited, restricted, or viable areas. This reduces early transaction costs before detailed studies and permitting are required.[27]
- **Build public trust:** The Dutch government only allows certified companies to design, install, and manage ATES systems—BRL SIKB 11000 for the underground part and BRL 6000-21 for the above-ground scope—anchoring quality, safety, and performance across projects.[28]

After it was approved in the Dutch Senate, a permitting system specifically tailored to geothermal energy was rolled out in mid-2023. This system allowed for cooperation between state actors, local authorities, and private developers and made it easier for geothermal projects to be realised. For example, the system enabled projects in the Westmade-Noord district near The Hague that now provide tens of megawatts of deep geothermal heat to horticultural businesses—and heat to hundreds of homes in nearby residential developments.

Similar enabling programs in the UK could improve permitting and regulatory approvals, enhance data, create fiscal incentives, and build public trust—creating a robust geothermal industry.

CfD regime is administered by the government-owned Low Carbon Contracts Company, in which each hour (or day ahead) absorbs the difference between the market clearing electricity price and a generator's CfD electricity price so the generator receives long-term stable revenue per megawatt-hour of electricity.[29] To ensure geothermal access alongside mature and other emerging technologies, the current Allocation Round 7, £15 million Pot 2, for which all emerging technologies compete could in future rounds be enhanced to provide a ring-fenced pot for the special case of geothermal combined heat and electricity.

Evidence from Cornwall shows this framework can work. In 2023, Geothermal Engineering Ltd secured CfDs for three proposed plants, covering 12 megawatts

of electrical capacity at a guaranteed £165 per megawatt-hour-electric (in 2024 money, escalated by inflation). The first of these plants is due to come online in 2026, offering developers and investors a reliable income stream.

While a CfD regime can provide a clear and bankable route to market for geothermal electricity once a plant is built, it does not address the high up-front exploration and drilling risks that deter investment to begin with. Without complementary policies, CfDs alone are unlikely to unlock geothermal deployment at scale. For geothermal combined heat and power projects, CfD electricity revenues should be aligned with standardised long-term, real-terms, fixed-price heat contracts so that both revenue streams can be financed together.

**Contracts for Heat or Standardised Heat Offtake Templates**

Long-term, bankable heat offtake is essential for project financing. The government should publish model lender-friendly contracts for heat tied to designated heat-network zones. Templates should include standard provisions on indexation, termination, step-in rights, and measurement and verification. These models should be referenced in the Green Heat Network Fund and CfD guidance so combined heat and electricity schemes can finance electricity and heat revenues together.

**Action: Ofgem, Heat Networks Delivery Unit, Department for Energy Security and Net Zero, and local authorities**

**Capital Grants and Loan Guarantees**

Capital grants, loan guarantees, and feed-in tariffs can incentivise private investors and lead to more heat and, potentially, electricity projects. Multiple geothermal start-up companies that were interviewed for this report (see Chapter 10, "A New Age of Innovation: The United Kingdom's Geothermal Start-Up Scene") said they would like to see an exploration grant programme created to fund the drilling of exploration wells in different locations in the UK. This approach could prove temperature and flow rates, catalyse private financing, and eliminate the exploration "valley of death." In France[30] and Germany, exploratory grants have been effective for carrying the deep geothermal sector through its early stages. Geothermal projects that have been realised in the UK have relied heavily on grants.

As for the sources of grants that already exist—such as the Green Heat Network Fund, which provides capital grants for low-carbon heat network developers—future rounds should be altered to more explicitly target deep geothermal projects and geothermal district heat networks. Where a project is insured under a geothermal resource insurance facility programme (see "Insurance"), grant milestones should be aligned with insurance verification to reduce timing risk and accelerate construction.

The UK government's new state-backed energy company, Great British Energy (GB Energy), or the UK's National Wealth Fund (formerly UK Infrastructure Bank) could make additional direct investments in geothermal projects or issue other investment sources such as a challenge fund. Further involvement of these institutions could move the sector to more sustainable financial footing at minimal cost to the public.

**Action: Department for Energy Security and Net Zero, GB Energy, National Wealth Fund, and HM Treasury**

**Insurance**

Another option to reduce developers' risk is a state-backed insurance program covering first-borehole risk. Governments in France, Germany, and the Netherlands operate such programs, and they have proven catalytic: In the Paris Basin, geothermal now provides a substantial share of heating, and every €1 of government risk mitigation has leveraged private investment worth between €30 and €40.[31] In late 2025, Germany signalled a stronger national commitment to scaling geothermal by pairing permitting reforms with new public finance and de-risking tools—aimed at cutting approval timelines and reducing early drilling and subsurface risk so projects can reach investment-grade status faster and be replicated at scale.[32,33] This kind of clear, government-backed direction—especially when coupled with mechanisms that address the "first projects" risk hurdle—can materially improve investor confidence, spread risk, and accelerate deployment in the UK.


***Governments in France, Germany, and the Netherlands operate such programs, and they have proven catalytic: In the Paris Basin, geothermal now provides a substantial share of heating, and every €1 of government risk mitigation has leveraged private investment worth between €30 and €40.***

To make this approach work, the UK can establish a government-backed geothermal resource insurance facility (GRIF) that covers exploration failure, initial underperformance, and early temperature and pressure decline for the first 5 to 10 years, using deductibles, co-insurance, and reinsurance in global specialty markets. To generate the underwriting data and lower the cost of capital, the GRIF can be paired with a non-state philanthropic first-loss fund of between £3 million and £5 million per project to pay for the cost of front-end studies and a pilot borehole.

**Action: Department for Business and Trade, Department for Energy Security and Net Zero, and HM Treasury**

**Portfolio Approach and Data Discipline**

Geothermal projects have struggled with duplicative costs and extended timelines. To help avoid these challenges, projects should adopt a common approach for initial work such as standard well design and stimulation workflows; rig specifications; Organic Rankine Cycle specifications; and engineering, procurement, and construction scopes. Health and safety approvals for working fluids should be fast-tracked using standardised evidence practices. Appraisal and flow-test results generated under the insurance programme should be reported to a secure data system to strengthen actuarial evidence and, over time, reduce premiums.

**Action: Department for Energy Security and Net Zero (with Health and Safety Executive), delivery partners, and suppliers**

**Refinancing and Recycling Public Investment to Keep Capital Moving**

To lower heat costs and scale deployment without stranding public capital, pilots should be refinanced with low-cost, long-term instruments such as national gilts, local climate bonds, or lending against proven heat reserves. Public sector investors should recycle proceeds into the next round of appraisals and developments, creating a rolling pipeline of projects.

**Action: HM Treasury, Debt Management Office, local authorities and financing partners**

## 4. Leverage the Government Estate to Stimulate Geothermal Demand

Even with investors and borehole permissions secured, geothermal projects face the challenge of identifying reliable customers for heat and electricity. Long-term heat contracts are rare in the UK, and developers typically rely on heat networks to aggregate demand. Yet, in 2024, only about 3% of the UK's heat demand is supplied through heat networks,[34] far short of the government's 20% target for 2050.[35]

Recent reforms, however, can address this constraint. Under the Energy Act 2023, designated heat network zones in England (and Local Heat and Energy Efficiency Strategies in Scotland) can require new buildings, large public sector buildings, large private buildings, and existing communally heated residential buildings to be networked for district heating,[36] subject to cost-effectiveness tests.[37] This requirement creates a powerful mechanism to aggregate geothermal demand—but only if zones are strategically located and supplied with low-carbon heat. Heat network zones in Leeds, Plymouth, Bristol, Stockport, Sheffield, and some boroughs of London have so far been formally designated.[38]

The UK public estate—including National Health Service trusts, universities, Ministry of Defence sites, prisons, council buildings, schools, and civic venues—is large and creditworthy and has intensive needs for heating. By prioritising heat network zones near viable geothermal resources and anchoring them with mandatory or long-term public sector heat offtake, the government can underwrite a first scaled wave of geothermal projects and take a significant amount of risk out of early geothermal development while protecting public services from volatile gas prices.

**Public Heat Purchase Obligation**

- Require central government departments and arm's-length bodies (including executive agencies, non-departmental public bodies, and public corporations) that are publicly funded and accountable to UK government departments[39] to procure a rising share of space heating and cooling and process heat from qualifying low-carbon sources, including geothermal, within designated heat network zones.
- Aggregate public sector loads within each heat network zone and tender them as a single package to geothermal developers, guaranteeing connection to district networks and creating scale for new production wells or minewater heat pumps.

**Geothermal Heat Zones**

- The Future Homes Standard is already set to increase the rollout of low-carbon heat networks. Within designated heat network zones, local authorities should establish geothermal heat zones in which (i) new or significantly expanded heat networks must assess geothermal as a first option on a levelised-cost basis; and (ii) large new loads such as public anchors and major commercial developments are required to connect to low-carbon heat networks where technically and economically viable.
- Standardised contracts for heat should be available in a pre-approved template to reduce legal negotiations and internal approvals and therefore shorten procurement timing.

**Warm Homes Plan**

- Carve out an explicit and specialised policy to maximise the rollout of include shallow geothermal heat networks and ground source heat pumps in the deployment of the UK's recently announced Warm Homes Plan, which commits £15 billion of public investment in the coming years to support home energy upgrades.

**Additional Enhancements**

- **Minimum contract lengths:** Require 10- to 15-year offtake agreements to improve bankability for developers and reduce investor risk.
- **Price indexing or cost pass-through:** Link public sector tariffs to market mechanisms to ensure affordability and predictability.
- **Early adopter incentives:** Offer temporary capital grants or reduced connection fees for demonstration projects serving public loads to encourage early deployment.
- **Private sector co-funding:** Encourage private heat networks to participate alongside public loads, leveraging government contracts to unlock broader commercial demand.

By turning the public estate into a reliable, aggregated customer for geothermal heat and cooling, the government would provide the demand certainty needed to accelerate deployment of low-carbon heat networks.

**Action: National Health Service, Ministry of Defence, Department for Energy Security and Net Zero, central government departments, and local authorities**

## 5. Advance Skills and Supply Chains

Developing a geothermal supply chain creates jobs, reduces dependence on imports, and positions the UK to leverage its extensive expertise and technology into an exportable asset for European and global markets.

Britain has world-class engineering expertise in oil and gas development and strong project delivery capacity in offshore wind. These skills can all be deployed for geothermal exploration, drilling, and heat network integration as well. To retrain petroleum engineers, drillers, and subsea specialists for geothermal applications, the government should establish a geothermal skills transition fund.

At the same time, incentives should be offered for domestic manufacturing of geothermal hardware such as drilling rigs, casing, heat exchangers, and ground source heat pumps. Incentives can be offered via innovation grants, preferential purchasing for UK-made equipment, or a Production Linked Incentive–style subsidy tied to manufacturing unit output. These supply chain initiatives must be aligned with the workforce development strategies discussed in Chapter 8, "Beyond the North Sea: Leveraging the United Kingdom's Oil and Gas Expertise to Advance Geothermal." Training programs and cross-sector skills initiatives—such as OPITO's Integrated People and Skills Strategy or the Energy Skills Passport—can be extended to geothermal so that engineers, drillers, and technicians from oil, gas, and coal backgrounds are ready to support an expanding domestic supply chain.

**Action: Department for Business and Trade and Offshore Petroleum Industry Training Organisation**

## 6. Enhance Data Transparency and Resource Mapping

The government should invest in expanding and building out subsurface data in several ways:

A. **Comprehensive subsurface heat mapping:** Fund a national programme that integrates seismic data, borehole logs, thermal gradients, and other relevant subsurface information for both shallow and deep geothermal resources.
B. **Standardised and reprocessed data:** Reprocess historic data sets and standardise formatting to improve usability and interoperability, reducing complexity and duplication of effort.
C. **Publicly accessible geothermal atlas:** Maintain and enhance a central digital platform managed by the British Geological Survey and the Geological Survey of Northern Ireland, or another dedicated agency, in which all geothermal data—including new and legacy data sets for seismic data, rock properties, and well data—are shared and available to developers, investors, and local authorities.
D. **Time-bound open data for publicly supported wells:** Require standardised reporting and public release of non-commercial subsurface data within a period of 12 months to 18 months to help take the risk out of future projects and strengthen actuarial evidence for insurance programmes.

Transparent, high-quality data are the backbone of a modern energy industry. Without it, funders will likely hesitate to invest private capital in UK geothermal. By

building on the geological survey map and investing in these measures, the government can remove one of the most significant barriers to geothermal deployment.

**Action: British Geological Survey, Geological Survey of Northern Ireland, and Department for Energy Security and Net Zero**

## 7. Advance Public Engagement and Awareness

As mentioned, geothermal energy is a valuable contributor to energy security, has excellent green credentials, and has the potential to lower heating bills. Yet, public understanding of geothermal remains limited in the UK. For most residents, geothermal is a new and unfamiliar technology, often confused with controversial activities such as hydraulic fracturing for oil and gas. This lack of awareness can lead to misunderstanding, hesitation, and costly planning delays, which can be prevented using the following strategies.

- **Ensure local community engagement during the planning process:** Involving and informing people and organisations about geothermal's benefits for their communities can make planning and development considerably smoother. During project development, supportive local government partners can help navigate local issues. The Southampton geothermal system, for instance, was created largely because of one local councillor who championed sustainability and innovation. Similar leadership in other parts of the country could help normalise geothermal as a trusted local energy option.
- **Introduce a community benefits package:** To further strengthen public confidence and ensure local communities share directly in the value of geothermal development, the UK could adopt a community benefits package model similar to that used in the onshore wind sector.[40] Such packages—offered voluntarily by developers—could include measures such as reduced heat

### Geothermal Energy and the Devolved Administrations

The devolved administrations across the UK are strongly committed to tackling energy security, lowering the cost of heating bills, and addressing climate issues, and they have taken a range of actions to support geothermal projects and programmes.

The Scottish government has supported several geothermal energy projects over the past 10 years, from the Hill of Banchory deep geothermal feasibility study in 2016 to a 2025 study exploring how NHS Grampian can use deep geothermal heat.[41] The latter study received a £50,000 grant from the Scottish government's Sustainable Estates Team.[42] In December 2025, UK Research and Innovation granted £1 million to the University of Aberdeen to drill an instrumented borehole for geothermal assessment.[43]

In February 2025, a study by Scottish Enterprise, the national economic development agency, detailed how Scotland's Midland Valley has many flooded mines with great potential to make use of shallow geothermal energy.[44] In parallel, the Glasgow Observatory run by the British Geological Survey has studied how heat moves within old mine workings to maximise the efficiency of heat recovery.[45]

Wales also has a legacy of flooded mine workings. In 2024, the Welsh Senedd funded the Mine Water Heat Opportunity Map. The principality's first commercial minewater heat programme, in Ammanford (north of Swansea), uses heat exchangers submerged in minewater to produce low-carbon heat and hot water. The system launched in 2025 and supplies heat to a nearby industrial site. The programme is operated by the Mining Remediation Authority, which worked with local company Thermal Earth, with funding from Innovate UK's New Innovators in Net Zero Industry, South West Wales initiative.[46]

In 2023, the Northern Ireland Assembly launched GeoEnergy NI to galvanise growth in the geothermal energy sector and explore the role the sector can play in Northern Ireland's green economy. With funding of £3 million, the programme focuses on the potential for shallow geothermal energy on the Stormont Estate in Belfast and deeper solutions at the College of Agriculture, Food and Rural Enterprise Greenmount Campus near Antrim.[47]

bills for local households, contributions to local community funds, energy-efficiency upgrades, or investment in local skills and training. Introducing clear local benefits within a project's design would demonstrate that geothermal developments deliver not only clean energy but also meaningful, long-term economic value to the communities that host them.

- **Offer guidance on geothermal hydraulic fracturing:** Occasionally, geothermal hydraulic fracturing is needed in highly controlled circumstances to enable access to deep geothermal wells (largely for electricity generation). To prevent this valuable energy source from being ruled out, particularly in the massive granites in the south-west and north-east of England, the government should clearly distinguish geothermal hydraulic fracturing from traditional oil and gas hydraulic fracturing—which carries significantly greater risks to the environment—and articulate geothermal's unique economic and environmental benefits.
- **Implement a national communications and awareness campaign:** To build broad public support, a national geothermal awareness initiative should be launched to make clear that geothermal energy can be a mainstream, domestic, clean energy source within the UK's wider energy security and economic development strategy. Such a campaign could do the following:
    - Highlight geothermal's role in reducing heating bills and providing stable, local energy year-round.
    - Clarify that hydraulic fracturing for geothermal has far greater benefits than hydraulic fracturing for traditional oil and gas, as it is a renewable and low-impact technology that can strengthen local energy resilience.
    - Emphasise the UK's strong environmental safeguards currently in place.
    - Explain how geothermal deployments in Southampton, Cornwall, and university-led demonstration sites created tangible local benefits.
    - Partner with local councils, educational institutions, and media outlets to share accurate and accessible information.
    - Support citizen engagement programs, school initiatives, and skills campaigns to build awareness of geothermal as a future jobs and innovation sector.

**Department for Energy Security and Net Zero, local authorities, and industry associations**

## CONCLUSION

The UK is committed to meeting the challenges of energy security. Geothermal energy can make a significant contribution, but the nation's vast resources have been left almost entirely undeveloped. The government has an opportunity to kick-start a rapid expansion of the technology by putting in place a suite of supportive policies. These policies include easy and inexpensive changes in regulation to more costly but still economically positive actions such as capital grants.

The reward could be a new and expanding renewable energy sector that provides secure, low-carbon heat and electricity. The United Kingdom would take its place alongside other European nations making use of their sustainable geothermal resources.

## CHAPTER REFERENCES


1 Coal Authority & Mining Remediation Authority. (2025, May 27). *Mine water heat*. Government of the United Kingdom. https://www.gov.uk/government/collections/mine-water-heat

2 UK Research and Innovation. (n.d.). *Geothermal Energy from Mines and Solar-Geothermal heat (GEMS)*. https://gtr.ukri.org/project/0B3478B7-1D87-427B-98BE-A7FC755592E7

3 Department for Energy Security and Net Zero. (2025, February 25). *Rising energy bills: What you need to know*. Government of the United Kingdom. https://www.gov.uk/government/news/rising-energy-bills-what-you-need-to-know

4 BGS Press. (2023, July 17). *New report assesses deep geothermal energy in the UK*. BGS News. https://www.bgs.ac.uk/news/new-report-assesses-deep-geothermal-energy-in-the-uk/

5 Environmental Programmes. (2009). *Renewables Obligation: Annual report 2007–2008*. Ofgem. https://www.ofgem.gov.uk/sites/default/files/docs/2009/03/annual-report-2007-08_version-4_0.pdf

6 Department for Energy and Climate Change & Huhne, C. (2010, September 15). *Search for hot rocks heats up with £1m fund*. Government of the United Kingdom. https://www.gov.uk/government/news/search-for-hot-rocks-heats-up-with-1m-fund

7 International Energy Agency (IEA). (2019, October 24). *Renewable Heat Incentive (RHI) for domestic and non-domestic generators*. https://www.iea.org/policies/5060-renewable-heat-incentive-rhi-for-domestic-and-non-domestic-generators

8 Department for Business, Energy and Industrial Strategy & Callanan, L. (2022, December 20). *First Green Heat Network Fund awards for cutting-edge low carbon energy projects* [Press release]. Government of the United Kingdom. https://www.gov.uk/government/news/first-green-heat-network-fund-awards-for-cutting-edge-low-carbon-energy-projects

9 KFW. (2025, December 18). *New promotion of deep geothermal plants for municipal heat supply* [Press release]. https://www.kfw.de/About-KfW/Newsroom/Latest-News/Pressemitteilungen-Details_875520.html

10 Amer, M. Y., Salem, S. K., Farahat, M. S., & Salem, A. M. (2025). Reducing drilling cost of geothermal wells by optimizing drilling operations: Cost effective study. *Unconventional Resources*, *7*, 100196. https://www.sciencedirect.com/science/article/pii/S2666519025000627

11 Bielby, S. (2024, December 19). *New study confirms heat pumps vastly outperform traditional heating systems*. Ground Source Heat Pump Association. https://gshpa.site-ym.com/news/689669/New-Study-Confirms-Heat-Pumps-Vastly-Outperform-Traditional-Heating-Systems.htm

12 Salhein, K., Salheen, S. A., Annekaa, A. M., Hawsawi, M., Alhawsawi, E. Y., Kobus, C. J., & Zohdy, M. (2025). A comprehensive review of geothermal heat pump systems. *Processes*, *13*(7), 2141. https://www.mdpi.com/2227-9717/13/7/2142

13 McCay, A. T., Feliks, M. E. J., & Roberts, J. J. (2019). Life cycle assessment of the carbon intensity of deep geothermal heat systems: A case study from Scotland. *Science of the Total Environment*, *685*, 208–219. https://www.sciencedirect.com/science/article/pii/S0048969719323587

14 Lovering, J., Swain, M., Blomqvist, L., & Hernandez, R. R. (2022). Land-use intensity of electricity production and tomorrow's energy landscape. *PLOS One*, *17*(7), e0270155. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0270155

15 Platform Geothermie. (2018). *Master plan geothermal energy in the Netherlands: A broad foundation for sustainable heat supply*. https://www.geothermie.nl/images/bestanden/Masterplan_Aardwarmte_in_Nederland_ENG.pdf

16 Department for Energy Security and Net Zero, Ministry of Defence, Miliband, E., & Pollard, L. (2025, November 24). *Taskforce calls for radical reset of nuclear regulation in the UK*. Government of the United Kingdom. https://www.gov.uk/government/news/taskforce-calls-for-radical-reset-of-nuclear-regulation-in-uk

17 Fingleton, J. (2025). *Nuclear regulatory review 2025*. Government of the United Kingdom. https://assets.publishing.service.gov.uk/media/692080f75c394e481336ab89/nuclear-regulatory-review-2025.pdf


18 Department for Energy Security and Net Zero. (2025, July 15). *Further reforms to the CfD scheme for AR7: Government response to policy proposals*. Government of the United Kingdom. https://www.gov.uk/government/consultations/further-reforms-to-the-contracts-for-difference-scheme-for-allocation-round-7/outcome/further-reforms-to-the-cfd-scheme-for-ar7-government-response-to-policy-proposals-published-july-2025-accessible-webpage

19 Fleuchaus, P., Godschalk, B., Stober, I., & Blum, P. (2018). Worldwide application of aquifer thermal energy storage–A review. *Renewable and Sustainable Energy Reviews*, *94*, 861–876. https://www.sciencedirect.com/science/article/abs/pii/S1364032118304933?

20 Stemmle, R., Hanna, R., Menberg, K., Alberg Østergaard, P., Jackson, M., Staffell, I., & Blum, P. (2025). Policies for aquifer thermal energy storage: International comparison, barriers and recommendations. *Clean Technologies and Environmental Policy*, *27*, 1455–1478. https://link.springer.com/article/10.1007/s10098-024-02892-1

21 Netherlands Enterprise Agency. (2025, October 20). *Energy performance–BENG*. Government of the Netherlands. https://www.rvo.nl/onderwerpen/wetten-en-regels-gebouwen/beng

22 Netherlands Energy Agency. (2025, December 30). *Environmental and energy list 2025*. Government of the Netherlands. https://www.rvo.nl/milieu-energielijst-2025

23 Netherlands Energy Agency. (2025). *Energy Investment Deduction (EIA), Commissioned by the Ministry of Climate and Sustainable Growth.* https://www.rvo.nl/sites/default/files/2025-01/Brochure-EIA-Energielijst2025.pdf

24 Netherlands Energy Agency, *Environmental and energy list 2025*, 2025.

25 Ministry of Infrastructure and the Environment. (2013, March 29). Environmental Management Activities Decree. *Official Gazette of the Kingdom of the Netherlands*, *112*. https://zoek.officielebekendmakingen.nl/stb-2013-112.html

26 Information Point for the Living Environment (IPLO). (n.d.). *Short and comprehensive preparation procedure*. Government of the Netherlands. https://iplo.nl/regelgeving/overzicht-procedures/korte-uitgebreide-voorbereidingsprocedure/

27 Netherlands Energy Agency. (n.d.). *WKO-bodemenergietool*. Government of the Netherlands. https://wkotool.nl/?page=Bodemenergietool

28 Netherlands Energy Agency. (2020, July 16). *Policy on geothermal energy and geothermal energy*. Government of the Netherlands. https://www.rvo.nl/onderwerpen/bodemenergie-aardwarmte/beleid

29 Department for Energy Security and Net Zero. (2025, December 16). *Contracts for difference*. Government of the United Kingdom. https://www.gov.uk/government/collections/contracts-for-difference

30 Schmidlé-Bloch, V. (2021). *GEORISK-Feedback webinar*. French Agency for the Ecological Transition. https://www.georisk-project.eu/wp-content/uploads/2021/09/6-FGGF-GEODEEP-VF.pdf

31 European Geothermal Energy Council & Well Engineering Partners. (n.d.). *Geothermal lessons from Germany, Denmark and France for the Dutch market*. https://www.connaissancedesenergies.org/sites/connaissancedesenergies.org/files/pdf-actualites/Report_Geothermal-lessons-from-Germany-Denmark-and-France-for-the-Dutch-Market_Printing.pdf

32 Federal Ministry for Economic Affairs and Energy. (2025, August 22). *Geothermal energy expansion is being accelerated: New law has been introduced.* https://www.bundeswirtschaftsministerium.de/Redaktion/DE/Artikel/Energie/geothermie-ausbau-wird-beschleunigt-neues-gesetz-auf-den-weg-gebracht.html

33 Keller, Y. (2025, December 19). *Munich Re and KfW launch state-based cover for geothermal drilling*. Beinsure. https://beinsure.com/news/munich-re-kfw-launch-state-backed-cover/

34 Department for Energy Security and Net Zero. (2024, July 25). *UK heat networks: Market overview*. Government of the United Kingdom. https://www.gov.uk/government/publications/uk-heat-networks-market-overview/uk-heat-networks-market-overview-accessible-webpage

35 Department for Energy Security and Net Zero, 2024.

36 Government of the United Kingdom. (2023). *Energy Act 2023*. https://www.legislation.gov.uk/ukpga/2023/52/notes/division/13/index.htm

37 Department for Energy Security and Net Zero & Department for Business, Energy and Industrial Strategy. (2023, September 1). *Energy Security Bill contextual note: Heat network zoning and the planning system*. Government of the United Kingdom. https://www.gov.uk/government/publications/energy-security-bill-factsheets/energy-security-bill-contextual-note-heat-network-zoning-and-the-planning-system

38 Department for Energy Security and Net Zero & Fahnbulleh, M. (2024, October 25). *Six towns and cities to pilot clean heating innovation* [Press release]. Government of the United Kingdom. https://www.gov.uk/government/news/six-towns-and-cities-to-pilot-clean-heating-innovation

39 Cabinet Office. (2025, January 7). *Public bodies*. Government of the United Kingdom. https://www.gov.uk/guidance/public-bodies-reform#arms-length-bodies

40 Scottish Renewables & Renewable UK. (n.d.). *Community benefit in action: Case studies from the onshore wind sector*. https://www.renewableuk.com/media/pzhf5bcj/community_benefit_in_action-_case_studies_from_the_onshore_wind_industry.pdf

41 Milligan, G., et al. (2016). *Hill of Banchory geothermal energy project feasibility study report*. Scottish Government. https://eprints.gla.ac.uk/118526/

42 Geothermal Transition Network. (2025, March 11). *NHS Grampian exploring geothermal to heat public buildings*. https://geothermaltransition.com/news/europe/nhs-grampian-exploring-geothermal-to-heat-public-buildings

43 University of Aberdeen. (2025, December 9). *£1 investment in geothermal pilot to unlock heat beneath our feet*. https://www.abdn.ac.uk/news/24918/

44 Scottish Enterprise. (2025). *Unlocking the economic potential of minewater geothermal in Scotland*. https://www.scottish-enterprise.com/insights-and-events/research-evaluation-and-insight/2025/unlocking-the-economic-potential-of-minewater-geothermal-in-scotland

45 UK Geoenergy Observatories. (n.d.). *Glasgow Observatory*. British Geological Survey. https://www.ukgeos.ac.uk/glasgow-observatory

46 Mining Remediation Authority. (2025, May 27). *Landmark mine water heat scheme goes live in Wales* [Press release]. Government of the United Kingdom. https://www.gov.uk/government/news/landmark-mine-water-heat-scheme-goes-live-in-wales

47 Department for the Economy & GeoEnergy NI. (2023). *Unearthing the heat beneath our feet*. https://geoenergyni.org/wp-content/uploads/2023/09/3033-GeoThermal-GeoEnergy-NI-A4-210x297mm-Booklet-D10.pdf