# Thermal Earth’s mine water geothermal project cuts 17.5 tonnes of CO2 annually



In a remarkable innovation towards sustainable energy, Thermal Earth has unveiled a pioneering project that taps into the geothermal potential of treated mine water. The initiative, launched at their newly renovated renewable heating centre, showcases how naturally warm mine water can contribute significantly to low-carbon heating solutions. Positioned within an extensive 1800m² facility, the project utilises water that flows at a stable temperature of 14°C, harnessing heat from underground rock layers and former coal mines. This effort not only highlights the company's commitment to sustainability but also illustrates the potential of utilising overlooked natural resources.

Led by Nick Salini, Thermal Earth's Lead Engineer and Director, the project represents the culmination of rapid teamwork, transforming the concept into a fully operational system within just two weeks. By incorporating heat exchangers located in a settlement pond at the Lindsay Mine Water Treatment Site, the company has successfully devised a method to recover heat from the mine water. Since it went live on 14th March 2025, the system is projected to save an impressive 17.5 tonnes of CO2 emissions annually compared to traditional liquefied petroleum gas (LPG) heating.

The success of this initiative stems from strategic collaborations, notably with the Mining Remediation Authority, alongside crucial funding obtained through Innovate UK. The Mining Remediation Authority itself is at the forefront of similar initiatives throughout the UK, working on various projects aimed at extracting geothermal energy from historical coal mine networks. This effort is part of a broader strategy to enhance the adoption of low-carbon heating systems, crucial for the UK's transition towards sustainable energy solutions.

Moreover, the project exists alongside a wider movement driven by the establishment of the UK's first 'living laboratory', designed to study the thermal and hydrogeological behaviour of mine water heat systems. This laboratory, inaugurated by the Mining Remediation Authority, seeks not only to advance the country's progress towards net-zero emissions but also to optimise the technology behind mine water heating. These collaborative efforts significantly bolster the viability and effectiveness of geothermal heating technologies.

Ground source heat pumps (GSHPs), the technology leveraged in Thermal Earth’s initiative, are central to the efficiency of the project. These systems function by circulating a mixture of water and antifreeze through underground pipes, allowing them to absorb heat from the earth and distribute it throughout a building. The benefits are noteworthy: GSHPs can achieve high efficiency levels, resulting in reduced energy consumption compared to traditional heating methods. They typically have lifespans between 20 to 25 years, making them a cost-effective and environmentally friendly choice for homes and businesses alike.

As the demand for sustainable heating solutions continues to rise, GSHPs offer significant environmental benefits by decreasing reliance on fossil fuels and subsequently lowering greenhouse gas emissions. Thermal Earth emphasises their commitment to ongoing innovation within this field, suggesting that such projects could set a new benchmark for the renewable heating industry. The future of GSHPs appears promising, with ongoing technological advancements enhancing installation processes and efficiency.

In summary, the mine water heating project by Thermal Earth represents a vital step towards a greener future, underscoring the untapped potential of geothermal energy in the fight against climate change. As these initiatives mature and expand, they stand to play a critical role in transforming how we approach heating and energy sustainability.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://www.acrjournal.uk/heat-pumps/an-innovative-mine-water-heating-initiative/), [[4]](https://www.gov.uk/government/news/new-ground-breaking-mine-water-heat-living-laboratory-launched)
* Paragraph 2 – [[1]](https://www.acrjournal.uk/heat-pumps/an-innovative-mine-water-heating-initiative/), [[2]](https://www.gov.uk/government/collections/mine-water-heat), [[5]](https://www.thermalearth.co.uk/renewable-energy)
* Paragraph 3 – [[3]](https://www.thenationalnews.com/climate/2025/01/16/deep-coal-mine-shafts-studied-for-geothermal-heating-potential/), [[6]](https://www.thermalearth.co.uk/funding)
* Paragraph 4 – [[1]](https://www.acrjournal.uk/heat-pumps/an-innovative-mine-water-heating-initiative/), [[7]](https://www.thinkgeoenergy.com/gateshead-uk-mine-water-geothermal-heating-scheme-hailed-a-success/)
* Paragraph 5 – [[1]](https://www.acrjournal.uk/heat-pumps/an-innovative-mine-water-heating-initiative/), [[2]](https://www.gov.uk/government/collections/mine-water-heat), [[4]](https://www.gov.uk/government/news/new-ground-breaking-mine-water-heat-living-laboratory-launched)
* Paragraph 6 – [[1]](https://www.acrjournal.uk/heat-pumps/an-innovative-mine-water-heating-initiative/), [[5]](https://www.thermalearth.co.uk/renewable-energy)
* Paragraph 7 – [[2]](https://www.gov.uk/government/collections/mine-water-heat), [[5]](https://www.thermalearth.co.uk/renewable-energy)
* Paragraph 8 – [[1]](https://www.acrjournal.uk/heat-pumps/an-innovative-mine-water-heating-initiative/), [[3]](https://www.thenationalnews.com/climate/2025/01/16/deep-coal-mine-shafts-studied-for-geothermal-heating-potential/)

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## Bibliography

1. <https://www.acrjournal.uk/heat-pumps/an-innovative-mine-water-heating-initiative/> - Please view link - unable to able to access data
2. <https://www.gov.uk/government/collections/mine-water-heat> - The UK's Mining Remediation Authority is collaborating with various stakeholders to harness heat from historical coal mine networks, aiming to provide sustainable heating solutions for homes and businesses. This initiative focuses on extracting geothermal energy from former coal mines to support the transition to low-carbon heating systems.
3. <https://www.thenationalnews.com/climate/2025/01/16/deep-coal-mine-shafts-studied-for-geothermal-heating-potential/> - The UK's Mining Remediation Authority has launched the world's first 'living laboratory' to research the potential of mine water heat technology. This project aims to study the thermal and hydrogeological behaviour of mine water heat systems, advancing the UK's journey towards net-zero emissions.
4. <https://www.gov.uk/government/news/new-ground-breaking-mine-water-heat-living-laboratory-launched> - The Mining Remediation Authority has announced the launch of the Gateshead mine water heat Living Laboratory, a pioneering research initiative designed to expand the potential of mine water heat technology and advance the UK's journey towards net-zero emissions.
5. <https://www.thermalearth.co.uk/renewable-energy> - Thermal Earth offers a comprehensive range of renewable energy systems, including ground source and air source heat pumps, solar thermal, and energy storage solutions. Their expertise lies in designing and supplying high-quality, renewable heating and cooling systems suitable for various properties, from residential homes to industrial factories.
6. <https://www.thermalearth.co.uk/funding> - Thermal Earth provides information on funding opportunities for renewable energy projects, such as the Green Heat Network Fund (GHNF), which supports the transition to low and zero-carbon technologies in heat networks. They also offer finance options to help customers manage the upfront costs of installing renewable heating systems.
7. <https://www.thinkgeoenergy.com/gateshead-uk-mine-water-geothermal-heating-scheme-hailed-a-success/> - The Gateshead mine water heating scheme, located in northeastern England, has been hailed a great success six months after it officially started operations in March 2023. Operated by the council-owned Gateshead Energy Company, it is now the largest mine water heat network in Great Britain and one of the largest in Europe, providing hot water and heat to hundreds of homes and businesses.