The Coal Authority

Mine Water Heat Opportunities Framework 2024 to 2027

Who we are

The Coal Authority exists to manage the legacy from Great Britain's coal mining past. So much of our 3 nation's history has been shaped by the natural minerals under our soil. None more than coal, which has provided heat, steam and power for hundreds and hundreds of years.

Coal was nationalised in 1947, which is why the UK Government own the majority of underground workings and remaining coal reserves under England, Scotland and Wales, along with the responsibility for many of the associated challenges and hazards.

As domestic coal mining has reduced, and humanity recognises the impacts of burning carbon on our climate, we are seeking alternative ways to maximise low carbon opportunities from closed and abandoned mines such as mine water heat networks. These can provide heat for homes and businesses, across communities whose identity was shaped by coal, while also supporting decarbonisation and levelling up outcomes for communities who could now benefit from low carbon, social and economic benefits from the warm water in the historic mining assets.

We work with partners, communities and customers to listen, learn and take practical action to support them to create safer, cleaner and greener communities.

We are a 24/7 emergency response organisation, with staff across Great Britain ready to respond and take action to keep people safe and provide peace of mind.

Extensive coalfields exist across Great Britain and it is estimated that 25% of homes and businesses are located above former coal mines. The vast majority of people will never experience any problems from that, but for those who do we are here to provide support and expertise.

The Coal Authority is a non-departmental public body and partner organisation of the Department for Energy Security and Net Zero.

Click or scan to view our Business Plan

Click or scan to view our Sustainability Plan

Foreword

Richard Bond
Innovation and Services Director

David Brooks
Non-Executive Director

We are pleased to share our Mine Water Heat Framework for 2024-2027. This explains our work to date in influencing and enabling mine water heat schemes in line with our 2022-2025 Business Plan and demonstrates how we will work with others to develop further opportunities over the next 3 years.

The Coal Authority are a practical operational organisation and focus on using our technical expertise and professionalism to keep coalfield communities and environments safe.

Our ongoing innovation programme continues to consider opportunities for creating financial, social and environmental value to minimise costs for the taxpayer, reduce waste, support the circular economy and contribute to our ambition to be a net zero organisation by 2030. We also continue to seek to deliver beyond our remit by supporting key government priorities across England, Scotland and Wales such as net zero. This is in line with the priorities outlined in our Sustainability Plan 2023 – 2026, our Business Plan and our 10 year vision.

The decarbonisation of heat in buildings is critical to UK plans to reach net zero by 2050, as it accounts for 37% of total UK carbon emissions, with only 5% of home heating currently being low carbon.

Mine Water heat is our most exciting opportunity to help develop zero carbon heat opportunities as we estimate that 25% of properties are located on the coal mining reporting area, including major conurbations in England, Scotland and Wales.

Our work with Gateshead Council has seen the successful launch of the first large scale Mine Water Heat Network in Great Britain in March 2023; a project delivered in just three years. This, coupled with the pioneering work by Lanchester Wines in Durham to use mine water for large space heating, prove that this technology works in Great Britain. Beyond net zero targets, mine water heat can also deliver energy security, green jobs and contribute to levelling up.

We know that Mine Water Heat uses established technology, but it remains a newly emerging heat source within Great Britain. We recognise that we have an important part to play in establishing this as a key part of Heat Policy across England, Scotland and Wales. In addition, we know it is essential we develop private and public sector understanding of the opportunity and ensure early schemes generate consumer confidence.

To help achieve this we recognise that working with private and public organisations possessing complementary skills and expertise will allow us to maximise value and impact. To encourage this we will ensure we remain an organisation that embraces innovative approaches and that is easy to work with.

Our people are core to the delivery of this framework. We know it is important that everyone understands the opportunities that are available to the organisation and that they are critical considerations as we evolve of our ways of operation and service delivery in response to the changing world around us.

We will continue our programme of research and development, working with key partners to understand how to maximise the opportunity for mine water heat. We will continue to liaise with other international projects sharing mutual learnings and using these to help inform best practice. We will extend this to develop knowledge of how cooling and storage of heat generated by other low carbon sources can also become part of our net zero offering.

Over the next three years, we will continue to strengthen existing relationships and seek additional opportunities to develop schemes in England, Scotland and Wales. As our experience grows we will also begin to consider the opportunities for Great Britain to export our mine water heat skills and knowledge internationally.

This is an exciting time to be part of the evolution of the coal mining infrastructure, helping it to take its place as part of Great Britain's Low Carbon Future delivering secure, stable priced heat.

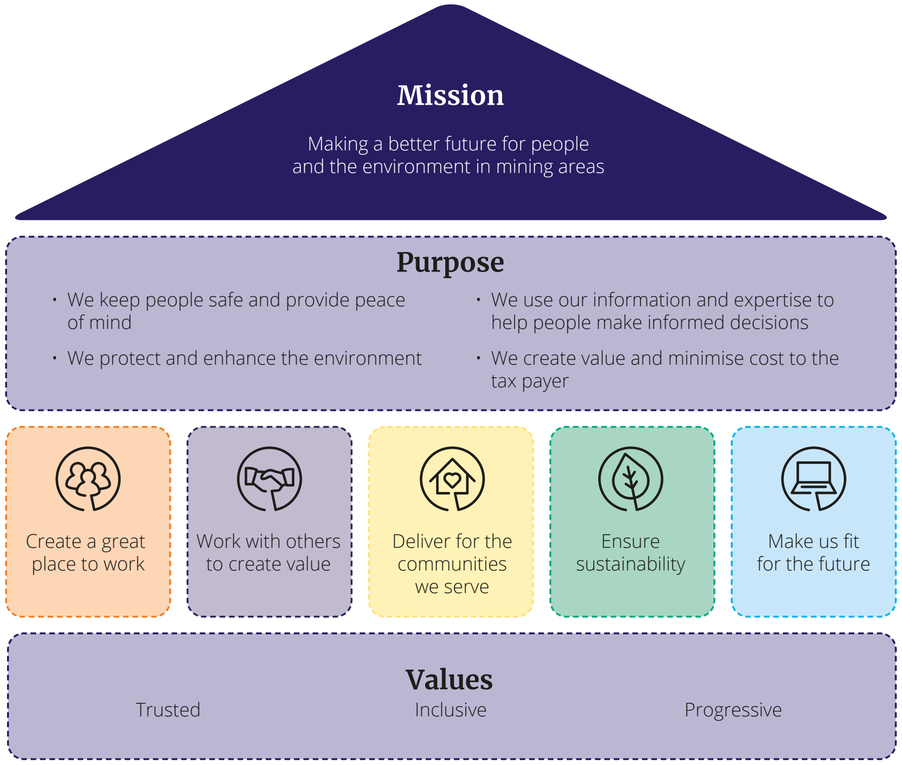
The Coal Authority are keen to build on the success to date, working with enterprising organisations from across the Private and Public sector to maximise the impact of this proven technology. This framework might be the first step on your Mine Water Heat journey, but we want to work with you to develop the potential opportunities this technology could deliver to your organisation or community.

Click or scan to view our Business Plan

Click or scan to find out how mine water heat could benefit your organisation or community

Click or scan to view our Sustainability Plan

Our mission, purpose and values



Our values

Trusted:

- we act with integrity
- we areopen and transparent
- we deliver on our commitments

Inclusive:

- we promote a culture of mutual respect
- we recognise that our differences make us stronger
- we work with others to achieve our mission

Progressive:

- we are open minded and innovative
- we recognise that the past can help us shape the future
- we listen and learn

Mine water heat and our role in developing it

The Coal Authority own, on behalf of the country, the vast majority of unworked coal and former coal mines in Great Britain, which we safely manage to protect and enhance the environment and look for ways in which this national asset can be used to protect and enhance the environment and create value for the taxpayer.

As part of our work to make a better future for people and the environment in mining areas, we're developing opportunities to use mine water to heat and cool homes and businesses.

Less than 5% of home heating is currently low carbon, with the majority of homes in Great Britain currently using fossil fuels and heating accounts for 37% of total UK carbon emissions. Therefore, decarbonisation of heat in buildings is critical to UK plans to reach net zero by 2050. There is no single solution to heat decarbonisation, but mine water heat networks can offer a solution to areas on the former coalfields. We estimate that 25% of properties are located on the coal mining reporting area, including major conurbations in England, Scotland and Wales.

Mine water heat can maximise Great British generated, low carbon, stable priced heat opportunities along with levelling up benefits across the former coal mining communities of Great Britain.

Heat networks using mine water are technology ready and can play an important part in achieving net zero.

We will continue to promote and facilitate the opportunity that mine water heat represents. We will do this by working with both private and public sector developers, providing advisory services, permits and licencing to support their safe and sustainable delivery of mine water heat opportunities across the former coalfields. If you want to understand how mine water heat could help in achieving your decarbonisaton targets **contact our specialist team**

Click or scan to find out how mine water heat could benefit your organisation or community

Click or scan to learn more about mine water heat access agreements

Our mine water heat priorities

Mine water heat is our most exciting opportunity to help support net zero targets in Great Britain, with the potential to provide stable priced, low carbon, home grown heat for homes, businesses, industry and agriculture. We will build upon our work to date, and continue to influence and enable mine water heat schemes across England, Scotland and Wales.

To achieve this, our Mine Water Heat Opportunities Framework will underpin our activities between 2024 and 2027, with our work focusing on 4 priorities.

Create a great place to work

Work with others to create value

Deliver for the communities we serve

Ensure Sustainability

Make us fit for the future

Contributing to net zero and energy security

We will continue to work with the private and public sectors, UK and devolved governments to enable mine water heating, cooling and storage schemes.

We will build on our relationships with all 3 nations we serve to further develop mine water heat as a sustainable energy source, supporting the activities driven by the governments in England, Scotland and Wales.

We will make strides forward in to providing guidance and supporting materials digitally,

We will support our work surrounding mine water heat by developing digital solutions, providing accessible spaces for those looking to understand how to incorporate mine water heat in to their developments and giving those interested in exploring mine water heat further easy access to the resources needed to make informed decisions.

Click for more information

Work with partners

We will continue to work with partners across the private and public sectors and support them to deliver mine water heat schemes. We will continue to work with environmental regulators in England, Scotland and Wales to ensure our processes in granting permissions for mine water heat schemes are aligned.

We will develop how we can deliver value, using and sharing our knowledge and experiences, to support the delivery of key government priorities across the three nations we serve.

Click for more information

Supporting research and development

We will continue to lead our own research to understand interactions between mine water heat schemes, using this evidence to help support evidence based decision making to drive the wider uptake of mine water heat networks.

We will also to build up on existing partnerships and develop new relationships with researchers, academics, private and public sector bodies that are undertaking research relevant to mine water heat networks and our 2030 vision.

Click for more information

Mine water heat awareness

We will build further on our successes of working across a range of media to continue to deliver awareness across our range of stakeholders. We will do this to promote the concept of mine water heating, cooling and storage as a viable option for decarbonisation for coalfield communities.

We will build upon the success of collaborating with partner organisations to deliver the annual ‘mine water energy symposium’.

Click for more information

Back to our mine water heat priorities

Contributing to net zero and energy security

We will continue to work with governments, and with both private and public sector partners, to ensure mine water heat and energy storage is a key part of heat network policy.

We are committed to supporting 'home grown' mine water heat schemes across Great Britain.

Heat is one of a number of areas of public policy where the UK Parliament has devolved its legislative power so nations can develop their own independent policies. We are working closely with governments in England, Scotland & Wales to support and encourage policies to facilitate heat networks and mine water heat in particular. Our work includes supporting Heat Network Zoning in England, Heat Opportunity Mapping in Scotland and Local Area Energy Plans in Wales.

We are continuing to work with both private companies and public organisations to enable them to develop mine water heat schemes and heat networks.

What our aims for the future?

We will continue to work with the private and public sectors to facilitate the implementation of a number of operational schemes by providing clear guidance, cost-recovery advisory services and developing streamlined licensing procedures with relevant environmental regulators.

We will advance our digital space to make our information and data around mine water heat more readily accessible and provide an evolving resource for those looking to understand how to incorporate mine water heat into their developments.

We will continue to engage with private and public organisations to seek funded options to deliver broader mine water heat opportunity maps.

We will understand how others measure carbon savings and use these learnings to develop models and reporting which will enable us to track the carbon savings associated with our work.

We will continue work with governments in England, Scotland and Wales to champion the adoption of mine water heat as a key part of heat network policy.

What have we achieved so far?

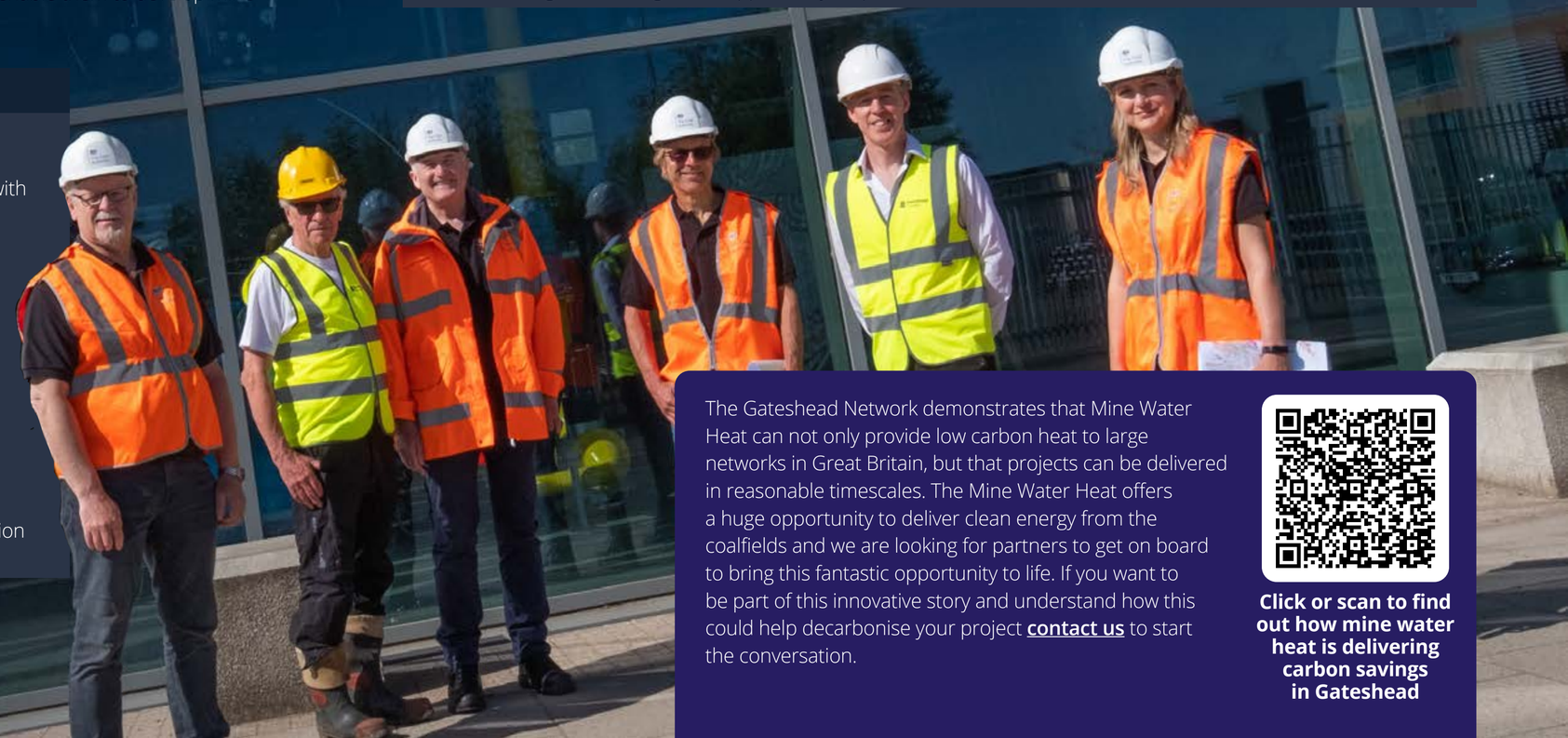
We have successfully supported Gateshead Council, to deliver an operational 6 megawatt mine water heat network in just three years – you can find out more about this project by clicking on the link.

We have worked with Lanchester Wines, the first private developer and adopter of a mine water heat solution to regularise their licenses.

We have presented evidence on the potential that mine water heat offers to a wide range of organisations, including Developers and Local Authorities, the Environment Audit Committee, the 1922 committee, the Coalfields Regeneration Trust, the Northern Housing Consortium and the All Party Parliamentary Group on Coalfield Communities.

We have responded to UK and devolved government consultations on heat including consultations on; Review of Net Zero, Heat Network Zoning and the Energy Strategy Consultation to ensure mine water heat is considered in all areas.

We have delivered mine water heat opportunity maps for all of the Welsh coalfields for consideration in the regional Local Area Energy Plans, opportunity maps for ten major cities in England to support delivery and roll out of Heat Network Zoning and borough wide opportunity maps for several local authorities in Scotland.



The Gateshead Network demonstrates that Mine Water Heat can not only provide low carbon heat to large networks in Great Britain, but that projects can be delivered in reasonable timescales. The Mine Water Heat offers a huge opportunity to deliver clean energy from the coalfields and we are looking for partners to get on board to bring this fantastic opportunity to life. If you want to be part of this innovative story and understand how this could help decarbonise your project **contact us** to start the conversation.

Click or scan to find out how mine water heat is delivering carbon savings in Gateshead

Working with partners

We work with both private and public sector partners, to enable opportunities for mine water heat, combining our skills and expertise to deliver our priorities.

Value creation is key to our thinking and we consider financial, environmental and social benefits when supporting mine water heat schemes.

We recognise that working with partners from both the private and public sector brings differing skills and expertise that will help maximise the value we can generate from the mine water heat opportunity for those living and working on the former coalfields.

Back to our mine water heat priorities

What have we achieved so far?

We have worked with the private and public sectors to both develop understanding of and build confidence in the opportunity that mine water heat networks can offer to them. This has included contribution to the development of scheme techno-economic models and outline contractual agreements for working with the Coal Authority.

We have begun working with the three environmental regulators across England, Scotland & Wales to align our processes for permitting and licencing mine water heat schemes. This will make it simpler for partners to engage with us.

We have worked with the British Geological Survey to map mine water temperatures and also with the Ordnance Survey to map heating, cooling demands and building types across areas of known mine workings. This is already helping to identify the best areas where mine water heat could be adopted.

We are working with energy companies to develop best mechanisms to engage with the Coal Authority to operate Mine Water Heat schemes.

What are our aims for the future?

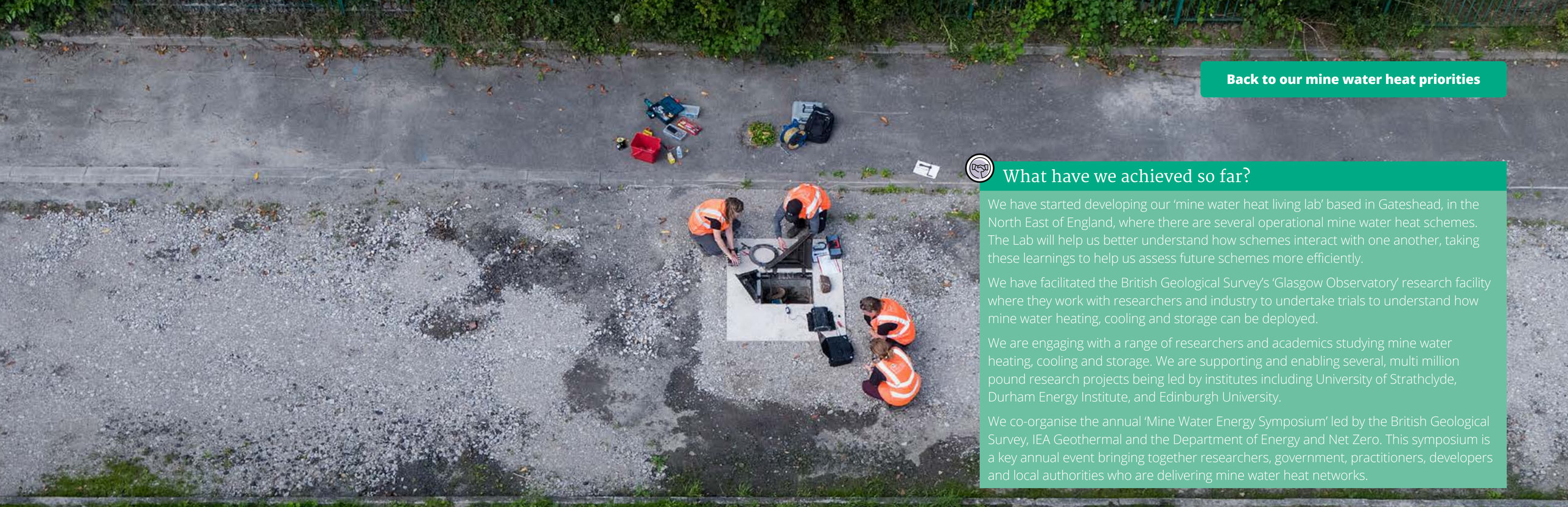
We will continue to support private and public sector organisations to seek out and develop new opportunities to accelerate the uptake of mine water heat networks as a sustainable source of energy to provide heat to homes.

We will conclude our work with the three environmental regulators across England, Scotland & Wales to develop efficient permitting and licencing processes for mine water heat schemes.

We will explore funding opportunities and enabling options across the private and public sector. We will share this with partners & developers to facilitate the wider adoption of mine water heat.

The maps we have created with BGS and Ordnance Survey are a great place to start reviewing the opportunities in areas where you may be considering net zero solutions. To continue the discussion on how mine water heat could help decarbonise your project or to understand how specific mapping could help identify the best locations to consider, **contact us** and speak to one of our team of Mine Heat specialists.

Click or scan to find out more about our work with Ordnance Survey



Back to our mine water heat priorities

What have we achieved so far?

We have started developing our ‘mine water heat living lab’ based in Gateshead, in the North East of England, where there are several operational mine water heat schemes. The Lab will help us better understand how schemes interact with one another, taking these learnings to help us assess future schemes more efficiently.

We have facilitated the British Geological Survey’s ‘Glasgow Observatory’ research facility where they work with researchers and industry to undertake trials to understand how mine water heating, cooling and storage can be deployed.

We are engaging with a range of researchers and academics studying mine water heating, cooling and storage. We are supporting and enabling several, multi million pound research projects being led by institutes including University of Strathclyde, Durham Energy Institute, and Edinburgh University.

We co-organise the annual ‘Mine Water Energy Symposium’ led by the British Geological Survey, IEA Geothermal and the Department of Energy and Net Zero. This symposium is a key annual event bringing together researchers, government, practitioners, developers and local authorities who are delivering mine water heat networks.

Supporting research and development

We support researchers and academics across Great Britain to better inform our work and enable us to make decisions underpinned with science and evidence to give confidence to our private and public partners.

Mine Water Heat it is an established technology. However, most schemes in the world currently exist in isolation and wider adoption requires understanding of the potential interactions between schemes if they are to be deployed sustainably at scale.

We hold unique knowledge, assets and data, but recognise that we don’t have all the skills to maximise the opportunities presented by this.

As we develop the opportunity for heat across England, Scotland and Wales, the energy sector is also seeking to understand the potential for cooling and for the safe storage of heat within the former coal mining infrastructure. We will actively support this research.

As well as undertaking our own research and development, we recognise the importance of working with universities, private and public organisations, such as the British Geological Survey, to better inform our work and to widen our impact.

Click to find out about the R&D work being undertaken to maximise mine water heat potential and how we could support your project

What are our aims for the future?

We will complete the development of our ‘Mine water heat Living Lab’, using evidence gathered to inform future licensing, management and wider adoption of mine water heat schemes.

We will continue to support research projects focused on mine water heating, cooling and storage to broaden understanding of both the challenges and the opportunities. This will allow us to support the drive to net zero and has the potential to establish Great Britain as a key exporter of skills in this area.

We will continue to support the ‘Mine Water Energy Symposium’, helping to facilitate a forum where researchers, government, practitioners, developers and local authorities can share learnings and progress mine water heat network deployment.

We will continue research and development, working with universities and partner organisations to better inform our work and enable us to make decisions underpinned with science and evidence.

Back to our mine water heat priorities

Mine water heat awareness

We will continue to develop and raise awareness of the opportunity for mine water heat networks, including their use for cooling and explore options for how we can use our infrastructure for heat storage from other low carbon energy sources.

We are passionate about communicating the value of mine water heat networks as a solution for heat decarbonisation in coalfield communities. We use our information, skills and expertise to explain how mine water heat networks operate to both technical and non-technical stakeholders.

We recognise the need to explain how mine water heat schemes are constructed if we are to build confidence with partners, stakeholders, funders and communities who will benefit from these schemes.

Our experience over the past few years shows that working with a range of partners to deliver awareness campaigns has joint benefits and has driven interest in mine water heat networks as a credible solution for decarbonisation of heat in coalfield communities. To find out more about how you could become part of this story, please **contact us**.

Click or scan to find out more about mine water heat

What have we achieved so far?

We have contributed to over 100 articles on mine water heat since 2022, working across a range of media including; social media, printed press, online news websites, local, national and international television and radio.

We have presented our work and delivered learning sessions for technical conferences, industry groups, local authorities, members of parliament and local government, environmental regulators and members of the public.

We have presented the mine water heat opportunity to potential heat network developers, funders and owners including, UK and devolved governments, local authorities, large energy companies and privately owned businesses.

What are our aims for the future?

We will continue to develop information resources and build even stronger relations with media organisations to establish the Coal Authority as the key authority of choice for mine water heat reporting.

We will use these resources to deliver evolving learning sessions and presentations to all of our stakeholders.

We will work with partners including the National Coal Mining Museum for England to maximise the opportunities to enhance understanding of Mine Water Heat across key communities.

We will expand awareness of the potential for the use of mine water heat for cooling and heat storage as research and development progresses.

We will seek out opportunities to promote the development of mine water heating in Great Britain on the international stage.

Our progress so far

Over the course of the past 13 years we have developed our understanding of how heat can be recovered from mine water and used to provide space heating and hot water.

Creating a dedicated Mine Water Heat team in 2021 allowed us to focus on developing the mine water heat opportunity. In the next 3 years we will work to enable and deliver more mine water heat schemes across all three nations.

2011 to 2015

We enabled a mine water heat scheme using an abandoned mine shaft to provide space heating to a building in Derbyshire

Click or scan to learn more about our history

The Coal Authority

Making a better future for people and the environment in mining areas

Click or scan to find out how mine water heat could benefit your organisation or community