

**DURHAM
ENERGY
COUNCIL**

PREAMBLE

Once upon a time, our ancestors spoke and they were listened to.
Once upon a time, County Durham supplied the world with energy.

Coal from County Durham powered ships and heated homes.
Coal from County Durham fuelled industry and fed our families.

Now we live among the remnants of our coal heritage.
Now we meet in rooms at Blackhall Community Centre and at Redhills.

Among us there are artists & activists; parents & grandparents;
the descendants of miners; carers & volunteers.
Among us there are educators & learners; students & leaders;
community champions & citizens of the world.

We do not know all the answers but we are ready for the questions.
We do know that information is power and we welcome new discoveries.
There is a huge amount to learn and we are only just beginning.
There is a huge amount to learn but we refuse to be daunted.

Our past has gifted us with important knowledge that we will not forget.
Our past is important but we must not reduce it to mere nostalgia.

The pits are closed but our minds are open.
The rich seams of our community still sustain us.

Together we shoulder the responsibility for the world we will leave behind.
Together we work to create hope for future generations
of human and non-human kind.

It is time for us to raise our voices.
It is our legacy and we reclaim it.

Once upon a time is only a beginning.
Once we begin we can be unstoppable.

DURHAM ENERGY MANIFESTO

WE FEW CITIZENS OF DURHAM OFFER OUR DEMANDS & OUR OWN COMMITMENTS FOR A NEW ENERGY SYSTEM

Guided by our heritage, inspired by our future

WE WANT A FUTURE-PROOFED ENERGY SYSTEM

THIS MEANS rapid transition to secure & consistent energy sources that are not vulnerable to distant powers & conflicts; that bring prosperity for communities; & that mitigate environmental collapse.

WE WILL educate ourselves & keep up to date on regional energy system policy; share what we know within our communities; & keep the conversation alive with our politicians & leaders.

WE WANT NO ONE LEFT BEHIND

THIS MEANS government-funded financial support & public consultation to ensure every household can take advantage of appropriate green technologies; & ambitious re-training & financial support packages for workers made redundant.

WE WILL lobby for a joined-up regional strategy of financial & employment support.

WE WANT CONFIDENCE IN INFORMATION

THIS MEANS having access to trustworthy, up-to-date information on energy transition progress & climate targets to ensure everyone can track positive developments & stay informed about whether we are honouring our national promises & ancestral responsibilities.

WE WILL gather in our community spaces to share information & speak truth about energy in our context.

WE WANT GOOD JOBS FOR LIFE

THIS MEANS enabling people of this region to benefit from our new energy system with a joined-up work strategy that includes ongoing training & education alongside improved transport infrastructure to ensure accessibility of opportunities at every career stage from school to retirement.

WE WILL share information about green energy sector jobs & training with our communities & wider networks, highlighting key gaps in our existing transport system.

WE WANT COLLABORATION

THIS MEANS reawakening our region's tradition of energy democracy so that everyone from communities to executives & mayors can help shape our energy transition.

WE PROPOSE a funded & legally binding programme of Citizens' Assemblies on energy policy, both for our region & nationally.

JUNE 2026

Dear family members, friends, communities and all other interested parties,

Here we are in 2026 thinking about what the world will be like 25, 50, 100 years from now, and specifically what progress has been made with the energy transition that we are currently living through. What has happened to the Net Zero targets set for 2050? What other technologies have been developed beyond wind, solar, geothermal, and hydroelectric that we already know about? How reliant are we still on fossil fuels? What legacy are we leaving for future generations?

Many of us are only too aware of what an energy transition looks like when it abandons people and communities. When our collieries were discarded after the closure of the pits in the 1980s, years of austerity followed. It has been hard to stay optimistic. It has been hard to believe that we could do anything to make things better. Durham Energy Council is changing that.

In July 2025, it brought us together as a group and we have met more than 15 times over a period of ten months. Together we began to learn about our current energy systems and to reflect on both the positive and difficult things about our own legacy. As we grew in confidence, we had lots of lively discussions and began to form opinions about the energy transition. Many of us attended the 2025 Energy Days conference held at Redhills Miners Hall in Durham and stood alongside energy experts from the worlds of politics, academic research, and industry, as well as community leaders and artists.

We ourselves took to the stage in the Pitman's Parliament, adding our voices to those of our ancestors to speak the preamble of our manifesto. This reminded us of the critical role our region has played in national energy conversations.

Our manifesto captures who we are and the importance of where we come from. We have written it to highlight expertise in our region and projects happening here that make a greener, fairer future feel possible, and environmental collapse feel less inevitable. We have written a manifesto with our descendants in mind.

At the heart of the manifesto is a list of demands that we are sharing with people who have the power to influence and action the necessary changes to our laws and to our government policies. At its heart is a list of commitments we are making for the sake of a better present and a better future.

Above all, the Durham Energy Council manifesto is an act of hope.

• RICH • SEAMS

POWERING OUR PRESENT • FUELLING OUR FUTURE

DURHAM ENERGY COUNCIL: NEW CITIZENS' COUNCIL FORMED



Over 20 ordinary people aged from 18 to 83 answered the call to play their part in the UK energy transition.

Their motivation? To have their say in what that transition might look like; to influence policymakers and other key stakeholders; and to ensure that, whatever form the transition might take, it will not leave people like them behind.

Individuals from any background and with any point of view were encouraged to take part. No specialist knowledge was required. In fact, the Council was intended for those who don't usually get to have their say.

The only real requirements – an open mind, a willingness to listen to others, and the desire to be a good ancestor.

WORLD-CLASS CLIMATE RESEARCH IN THE NORTH

Introducing the Durham Energy Institute (DEI) by Lynn Gibson, Institute Manager

When it comes to solving the climate crisis, no single technology or idea will be enough. What's needed is the full picture, the science, the engineering, the economics, the policy, and crucially, the people. That is exactly what Durham Energy Institute (DEI) was built to provide.

Founded at Durham University in 2009, DEI brings together researchers from across disciplines: earth sciences, engineering, physics, anthropology, law, geography, economics and more, to tackle the urgent challenge of moving the world to clean, affordable energy. Its defining belief is that the energy transition is not just a technical problem. It is a human one, and it must work for everyone.

DEI's research spans a remarkable breadth of areas. In each of its research themes, DEI unlocks synergies between disciplines and sectors, applying new and integrated perspectives to existing and emerging energy challenges to produce major insights into the complexities of transitioning to low-carbon living.

On renewable power generation, DEI is home to a Wind Energy Group recognised globally as a leading research group, with expertise spanning turbine blade design, offshore foundations, power electronics, reliability and the wider regulatory context of wind farms. N8 Research Durham is a key

partner in the Energi Coast offshore wind cluster for the North East, and recent DEI research has been directly shaping plans for wind development north of Dogger Bank, feeding into the 10 Year Vision and Strategy for North East England Offshore Wind.

Transport is another major focus. DEI's research covers all aspects of decarbonising the transport system, including electric vehicles, hydrogen for road transport, the decarbonisation of the marine sector, low and zero carbon trains, and more sustainable aviation. DEI leads the national Network-H2 for hydrogen-fuelled transportation, and is working with partners including National Grid and the Teesside Industrial Cluster on demonstrating how hydrogen can decarbonise not just vehicles, but heating and industry too.

DEI also runs state-of-the-art laboratories for thermochemical systems, zero-carbon energy, hydrogen and smart grids, giving researchers and industry partners access to cutting-edge facilities. Alongside this, its work on next-generation technologies and materials covers improving components for solar photovoltaics, exploring natural hydrogen and helium resources, and addressing greenhouse gases through carbon capture and storage.

Then there is the question of governance, perhaps the least visible but most essential piece of the puzzle. DEI leads research on UK and global systems for the energy transition,

covering justice in energy law, offshore renewables regulation, climate change litigation, and international climate policy. Clean energy will only happen at the pace and scale required if the right laws, incentives and international agreements are in place.

Closer to home, Durham has a particular advantage in geothermal energy. Geothermal mine water energy is now a key pillar in the North East Energy for Growth Strategy, with the Mining Remediation Authority (formerly the Coal Authority) having more geothermal projects in its pipeline for this region than anywhere else in the UK, a direct result of pioneering research at DEI.

Running through all of this is a commitment to what DEI calls a just transition: the conviction that cutting carbon must not mean leaving communities behind. For a region that knows the consequences of deindustrialisation all too well, that is not an abstract principle, it is the whole point.

World-class climate research does not only happen in London or the traditional centres of academic power. It happens here too, in Durham, in the North East, where the questions are urgent, the expertise is deep, and the stakes are very real.

Image (Below): Workshop at The Durham Energy Day 2025. Photo by Neil Terry Photography.



COUNTY DURHAM BACK IN THE ENERGY CONVERSATION: LEARNING FROM THE PAST AND LOOKING TO THE FUTURE

Durham coalfield formed before living memory and was mined for generations. In total about four billion tonnes of coal was hewn here – that’s enough to fill London Underground 1,200 times over and to produce CO² that you will probably be breathing wherever you are in the world. It’s a history that runs deep, both physically and emotionally.

County Durham is home to one of the country’s oldest mining associations, Durham Miners’ Association (DMA), and its influence spread far beyond the region. National energy conversations were shaped here – 180 collieries and allied trades would convene at the ancestral headquarters of the DMA. Known as Redhills, ‘Durham’s Other Cathedral’ is a palace of working-class power and energy democracy. At the heart of Redhills is the Pitman’s Parliament, where a representative from every County Durham pit village would take their numbered seat and debate their energy futures.

Redhills is part of the shared heritage of the Durham Energy Council members. Here their ancestors had a powerful voice that echoed countrywide.

That powerful voice brought into being a social reform movement predating the welfare state. People from County Durham made decisions that shaped national energy policy.

DEC members heard their own voices echo in the Pitman’s Parliament as they took their place in discussions about the future of energy in the UK during Energy Days 2025, a landmark public conference held at Redhills. Their voices rekindled a vibrant tradition of energy democracy. They spoke with voices that must be included in the energy conversations that shape all our futures.

Images (Right): Durham Energy Councillors take the stage at The Durham Energy Day 2025. Photo by Neil Terry Photography.



NORTHEAST IS HOME TO AN OFFSHORE WIND FARM FIRST



Thousands of years ago, our ancestors hunted here on what was known as Doggerland and could walk across to mainland Europe. Now that land is submerged beneath the North Sea, and shallow waters equivalent in size to the whole of Greater London provide the ideal conditions for what is set to become the world's largest offshore wind farm. Once all three phases of its development are complete, 277 turbines will produce 3.6GW of energy, which is enough to generate 5% of the UK's energy needs and to power six million homes.*

Phase A of the Dogger Bank Wind Farm development, covering an area of 515km², is already fully operational. Phase B, which will cover a total area of 599 km², is close to completion and due to be switched on in 2027 with the expected completion date for phase C, the third and final phase, looking likely to be 2028.*

In the current joint venture partnership, SSE Renewables (40%), part of FTSE 100 listed energy infrastructure company SSE PLC, is leading on development and construction; Equinor (40%), a UK energy provider, will operate the wind farm for its expected 35 year life span; Vårgrønn (20%), a joint venture between energy company

Plenitude (Eni) and Norwegian entrepreneur and investor HitecVision, 'provides unique offshore competence, financial expertise and entrepreneurial drive.*' The seabed itself is Crown owned and on lease.

The turbines present an awe-inspiring sight being over two and half times the height of Big Ben at their highest point above sea level. A single blade measures 107m in length, double the wingspan of the Angel of the North, and in a single rotation, which takes around six seconds, can power a house for two days.

Installing, running, and maintaining these impressive machines requires a dedicated team of people working both onshore and offshore. Staff certainly seem happy and well provided for, with a calm environment and impressive facilities available to everyone – including saunas and good coffee!

An innovative project on this ambitious scale does not, of course, come without challenges on both a technical and human level. Grid capacity is a challenge, and three new converter stations are being built so that the electricity produced in DC can be converted to high voltage AC in order for it to be moved more efficiently to the main substations and then on to the National Grid. And there are current local skills shortages, in electrical engineering for example, which is

also a potential opportunity if training and accessibility can be effectively addressed.

The really good news is that there is still plenty of green energy potential in the Dogger Bank site, some of which is already in the process of being tapped. Dogger Bank D, a 50/50 joint venture partnership between SSE Renewables and Equinor, would maximise the Dogger Bank C lease area; Equinor is looking for sites further north along the coast; and RWE is developing the 593 km² Sofia Offshore Wind Farm site.*

*Source: <https://doggerbank.com>



Image (Above): *Ancestral Reverb* Launch Party event held at Blackhall Community Centre, November 2025.

WHAT IS NET ZERO AND WHY IS IT IMPORTANT?

Written by Tom Bray

We have heard the phrase Net Zero used a lot over the last few years, but what does it really mean and why is it important?

Net Zero has become the catch-all term that we tend to use when we are talking about action to slow or stop climate change. It is referring to the calculation that compares the amount of CO² emissions that human activities produce each year with the amount of CO² consumed by the natural world. The idea is that warming linked to climate change will slow when emissions are equal to what can be absorbed by plant life. Governments around the world have committed to reducing their countries' emissions to Net Zero by

various dates. Many of these commitments were in response to the signing of the Paris Agreement, in 2016, when countries agreed they would work together to limit global warming to less than 2°C above pre-industrial temperatures, and keep it as close to 1.5°C as possible. Targets we associate with Net Zero are based on scientific models that predict the warming caused by our emissions over the next number of decades.

In the UK, our target is to reach Net Zero by 2050. This was signed into law in June 2019, and government is working to reduce emissions to achieve this by targeting clean power by 2030, providing grants and policy support to install heat pumps around the country, supporting the transition to electric vehicles, investing in research and development of new technology to support emissions reduction in industry and working to restore nature. Depending on how you measure them, UK emissions have dropped by nearly 50% since 1990, but activities on our shores are still responsible for about 300 million tonnes of CO² each year.

Action to reduce emissions in response to climate change is not limited to the UK, with countries around the world targeting similar emissions reduction, contributing to a coordinated effort to limit the impact of climate change.

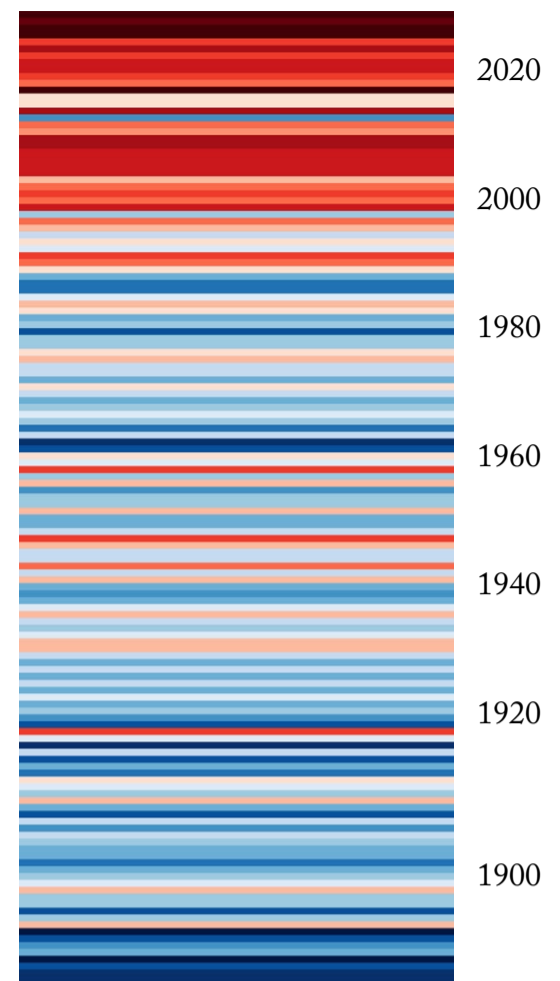


Image (Above): A chart representing temperature change in the United Kingdom since 1884. Image credit: Ed Hawkins, University of Reading.

BLACKHALL COMMUNITY CENTRE: A KEY LOCATION FOR DURHAM ENERGY COUNCIL

Blackhall Community Centre (pictured on the left) is the first place that the Durham Energy Council convened and remains the core location for its meetings.

At the heart of the community is what was once the Miners' Welfare Hall. Opened in 1959 by local schoolteacher Muriel Pritchard, it was where the miners gathered on a Saturday for an evening of socialising that revolved around dancing. Now a thriving Community Centre, thanks to the passionate stewardship of Alison Paterson, it draws people in from Blackhall and beyond. Many of the Durham Energy Council meetings have been held here and everyone has been welcomed with warmth and a cuppa – plus a cake or a biscuit, if they were in luck!

RECLAIMING THE PAST FOR A GREENER FUTURE: GATESHEAD LEADS THE WAY IN GEOTHERMAL HEAT

There is a beautiful circularity in abandoned coal mines being a source of green energy capable of providing heat and hot water for homes, colleges, commercial premises, and places of leisure. And there is a shining example of this exciting potential right here in north-east England.

Gateshead's mine water heat network uses geothermal heat recovered from disused mine workings 150 metres below the town to provide both heat and hot water. When the scheme went live on 29th March 2023, it was the largest network of its kind in Great Britain and one of the largest in Europe.

The heat recovered enhances the Gateshead District Energy Scheme, a major infrastructure scheme funded and owned by Gateshead Council and operated by Gateshead Energy Company, which generates and distributes power, stores energy, and provides National Grid services.

Gateshead Energy Company, which is owned by Gateshead Council, worked with The Mining Remediation Authority (previously The Coal Authority) on the mine water heat network project. With funding from the Heat Network Investment Project (HNIP) and Gateshead Council, it took around three years to bring to fruition and, according to the Mining Remediation Authority, has an estimated saving of 72,000 tonnes of CO² over 40 years or around 1,800 tonnes per annum.

As well as contributing to Gateshead Energy Company's five-year business plan to further reduce emissions, Gateshead's mine water heat network provides a model for similar projects in all parts of the north-east region where there are abandoned mine workings. Not only does this mean reclaiming what has been abandoned for the benefit of us now and for future generations, it also provides hope that a sense of community can be rekindled without the very real dangers to life and health presented by the mining of coal.

Sources: Gateshead Council & Mining Remediation Authority websites





Image credit: Members of the Durham Energy Council with Volunteers at the Pitman's Parliament, Redhills. Photo by Andy Martin.

WHAT ON EARTH DOES 'JUST TRANSITION' MEAN?

Written by Adam Cooper

Leave no one behind – that’s a deep, human idea that, isn’t it? It’s an irrational compulsion baked into our DNA that drives us to heroics: to run into a burning building for a stranger, or to spend our evenings volunteering down the food bank. The compulsion to leave no one behind is something deeply human. But also something humans can be deeply bad at. We’re capable of insane bravery and slow sacrifice in service of others. But also of thoughtlessness, lethargy, and injustice.

That instinct for justice is tested in moments of transition. When we switch from one way of being to another. And we are, right now, living through an enormous transition. From oil rigs and pipelines and refineries and the gas boiler...to monolithic turbines, fields of solar panels, of heat pumps and electric buses. We’re living through an energy transition.

We’ve done energy transition before in the North East. The shuttering of the UK coal industry and the vandalism of our pit communities is a global case study in Un-Just Transition.

Members of the British mineworkers’ unions today advise governments around the world on how not to do energy transition. In this place, County Durham, the lessons of justice and energy transition had a high price – the livelihoods, health, and identity of hundreds of thousands of people in communities across the landscape. Such dearly expensive lessons must be honoured as we journey into this new energy transition.

So what does a Just Transition mean? The International Labour Organization (ILO) defines it this way: ‘Greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind.’

To the Durham Energy Council it means that both the benefits and the costs of enormous change are spread fairly through our society. It means that new wealth and opportunities created by towering turbines and horizons of solar panels are shared across our communities. It means that anyone whose job disappears through the change has the opportunity for a new, rewarding career.

‘We’ve done energy transition before in the North East.’

In this place, in County Durham, it means honouring the hard, hard learned lessons of the past. It means the people leading and guiding our great new energy transition showing the best of being human – bravery, compassion, and determination.

It means no one left behind.

BEING A GOOD ANCESTOR: WHAT DOES THIS MEAN FOR THE DURHAM ENERGY COUNCIL?

Written by Barbara Old and Val Owens

A good ancestor sets a positive example to those who follow. That means demonstrating the power of community and what can be achieved by working together. It means sharing what skills and knowledge you can to help others.

A good ancestor reflects on the past to inform the future. This means being honest about what has been helpful and what has been harmful. It means doing your best to protect the good things to preserve them for future generations: good things like strong family values; pride in where we live; hope in the face of difficulty; warmth, kindness, and a sense of humour. It also means protecting our planet’s precious resources, because past experience has not only taught us that nothing lasts forever, but has also shown us what the cost is in human terms.

A good ancestor enables future generations to benefit from advancements that have been made during their lifetime by embracing positive change so that it has the best chance of being carried forward. For us that means making sure that our legacy includes the knowledge we have gained about why the move away from fossil fuels is necessary, and about what we can do as individuals to support the transition to a system of clean energy for the benefit of the people and the planet.

As ancestors, it is our hope that if we all do our part in moving towards greener solutions for our energy needs, the environment will be cleaner and make a more sustainable future possible for everyone.

COUNTY DURHAM GRANDPARENTS GO GREEN

*Keeping it clean with an
air source heat pump*

Committed Durham Energy Council member Val and her husband have made a major step towards living the clean energy dream after replacing their gas-fired combi boiler with an air source heat pump.

When the old boiler, which was fitted in 2008, needed to be replaced, the couple took the decision to future-proof their home and ensure a consistent power supply with a more sustainable option than a like-for-like replacement. With the incentive of a £7,500 Government grant in exchange for a £300 admin fee, and the prospect of significantly reducing household bills, proud grandmother and community worker Val installed a Riello heat pump.

Total Engineering Services N.E. Ltd, which is among a number of companies now offering a similar service, ensured that the process was clear before measuring the couple's home to calculate the required radiator size for each room. Installation took just two days, including the removal of the old boiler, the fitting of the heat pump outside the house, fitting of new radiators and the water tank, plus all necessary electrical work. Val and her husband now enjoy constant hot water and a steady air temperature of their choosing. Having made the decision to move completely away from gas, they have now invested in a new induction hob and are also planning to add solar panels to their home.

Val said: 'Although we were a bit nervous at first, we couldn't be happier with the results and are looking forward to knowing we will never be without a means of keeping warm, whilst also saving money and doing our part for the planet. If people of our generation can make the change, anyone can.'

TEN YEAR WINDOW OF HOPE AND POWER

Written by Adam Cooper

We happen to live during what may be the most important 10 years of human history. And you, dear reader, may be one of the most powerful people who will ever live. Let me explain why.

In 2026 there is no sensible debate, at all, on the existence and urgency of climate change. This just isn't a controversial thing to say anymore. We have reached the point where our bodies can tell us what scientists have for decades.

What does David Attenborough have in common with Shell, Chevron, The UK Trades Union Congress, The National Trust, the Church of England, the UK and Chinese governments (among many others)?

All have publicly stated that climate change is real, human driven, and very, very serious. Much of this discussion (but for Sir David) lags decades behind the advice of scientists.

Our species burns huge quantities of fossilised stuff that has been under the ground and seas for hundreds of millions of years. At the same time we cut down unimaginably massive chunks of forest and jungle all over the world every day. We are deliberately filling the atmosphere with gases that catch the heat of the sun.

We have built a greenhouse, and it's getting hotter. And the hotter it gets, the more people and life will die. This will happen in lots of different ways, but those ways include crops failing, oceans dying, and crazy weather events the like of which no one alive today has seen.

We have built a greenhouse, and it's getting hotter. **And here is a crucial idea: when you switch off the heat, it takes many decades for things to stop warming.** Much of the warming our world is heading to is already 'baked in'. Our descendants will inherit from us a changed, difficult world. This cannot be undone. It is scientific fact, not up for debate.

'This means that the action you take right now determines how liveable a world will be inherited by every human to come after you.'

This is how you are powerful. **More powerful than any generation who came before or will come after:** there is scientific consensus that we have a window of hope and power fewer than 10 years wide. In that window the new systems we set in motion will determine the level of damage we pass to all future humans. Anything done outside that window has diminishing returns.

You cannot catch up on a slow start in this race.

This means that the action you take right now determines how liveable a world will be inherited by every human to come after you. It took us just a couple of hundred years to gouge up and burn enough material to release trillions of tonnes of greenhouse gases into our atmosphere – it'll be the work of hundreds of generations to mitigate that damage. But none of them will have the opportunity that our generation has – that you have. We live in a 10 year window of hope and power.

What will you do with it?

LOOKING ON THE BRIGHT SIDE: SHINING A LIGHT ON SOLAR TECHNOLOGY

Written by Alison Paterson and Alex Telford

Solar panels on house roofs are a familiar sight around the UK, and in a sense this demonstrates one of the most attractive aspects of solar technology: it is a means to achieve energy independence.

Although costs may be prohibitive to many households, a situation that members of the Durham Energy Council would like to see addressed, there are benefits both in terms of reducing carbon footprint and, once the panels themselves have been paid for, financially through selling energy to the National Grid.

Newer technologies are dispelling the myth that solar panels only work in full sun, as Durham Energy Council member Alison has discovered since installing solar panels to power Blackhall Community Centre. She was familiar with some of the plus points of solar power, having used it effectively in her campervan to keep devices fully charged. And since investing in panels for the community centre, it has come as a very welcome surprise that even on the many days when the sun doesn't shine in the North East, energy is still being generated.

Not only has Blackhall Community Centre saved on the cost of utilities, income is now being made for the centre by selling electricity back to the grid – proof that for those who can afford to make the initial outlay, it's a win-win situation, which is probably the reason for the emergence of community solar projects.

For example, in rural Northumberland, which is still heavily reliant on heating oil, Humshaugh village has a mission to build and run a community-owned solar farm with shares offered. Profits from the project will go into a community fund for energy efficiency measures, low carbon technologies, reducing fuel poverty and supporting other community groups fighting climate change.'

Community owned solar capacity should continue to grow in the North East thanks in part to the Durham Energy Association Ltd (DEAL). DEAL is a not-for-profit community benefit society who are bringing together community representatives and technical experts to instal fully funded solar technology in community spaces.

There is real potential in the North East for solar technology, but projects must be done the right way – protecting green and arable spaces and creating benefit for local communities.

With effective communication, collaboration, and creativity, solar technology can help unlock energy independence and wealth for communities, as well as further career opportunities for the North East's next generation of energy sector workers.

WHAT GOOD IS A BANANA TO A MOBILE PHONE? THE POSSIBILITIES OF ANAEROBIC DIGESTION



Written by Katharine Jones

Anaerobic digestion (AD) is a natural, oxygen-free biologic process where microorganisms break down organic materials – such as food waste, manure, and sewage sludge – inside sealed reactors.

As members of the DEC discovered on a visit to Dawdon Mine Water Treatment scheme in 2026, ochre extracted from the mine water is sold as cake to anaerobic digester processors, further optimising the potential for this technology to make use of what would otherwise be discarded.

According to the Mining Remediation Authority website, using ochre in the process of anaerobic digestion captures hydrogen sulphide, which can reduce odour and save on the expense of cleaning this from the biogas produced. And sourcing ochre locally reduces the environmental impact of importing iron hydroxide from overseas.

Anaerobic digestion turns waste into nutrient-rich digestate (fertiliser) and renewable biogas, which can then be used in place of natural gas, in power stations to produce electricity, for cooking or heating, or transport fuel, thereby reducing both landfill use and carbon emissions. This sustainable technology is critical for meeting waste targets, reducing carbon footprints, and supporting circular economy initiatives by turning waste into valuable resources.

Food waste collected by local authorities is recycled in an anaerobic digester, and weekly food waste collections are now a requirement for all homes in England. Admittedly, not all councils are currently up and running with this initiative, but once they are we can all take an active role in putting our food waste to powerful use.

Just think, anaerobic digestion can extract enough energy from one banana skin to charge two mobile phones!



DAWDON MINE WATER TREATMENT & SEAHAM GARDEN VILLAGE: DEC MEMBERS GET HANDS ON

Five members of Durham Energy Council visited Dawdon Mine Water Treatment Scheme and Mine Water Heat Facility in April 2026. Donning hard hats and high-vis vests, we were led around the facility by two very informative guides. On entering the building, we were struck by the dusty atmosphere and the smell, and we were soon to notice our orange hands and clothes! This staining was caused by the iron concentrations known as ochre.

Dawdon has limited availability of land, so the usual practice of constructing passive lagoons and reed beds to allow the ochre to settle out from the mine water, as is done in Horden, was not possible. The mine water is instead degassed, oxidised, and has lime and polymer added to make it safe to drink.

The primary purpose of the facility was to protect drinking water as the rising mine waters were at risk of flowing into the aquifer. However, as underground mine water can typically be around 20°C, a heat pump with a heat exchanger was installed in 2012 to extract

heat from the mine water. Heat exchangers transferred the heat from the mine water and used it to heat the plant.

In early 2016, 192 solar photovoltaic panels were installed on the roof of the main building at the Dawdon treatment scheme. Every hour, the panels generate around 50kWh of electricity, which is being used to offset the costs of pumping the mine water on site.

More recently, in March 2025, The Mining Remediation Authority and Durham County Council began work on a major project that uses the heat from the mine water to provide heating for a new housing development, Seaham Garden Village. The energy centre and mine treatment scheme will also provide heat for a new primary school, village centre and innovation hubs.

Other regional work undertaken in Gateshead, including Gateshead Energy Company's mine water heat project and the heat pump technology Lanchester Wines is using for its Gateshead warehouses, has seen

the first large-scale mine water heat network in Great Britain and the use of mine water for large space heating. Beyond Net Zero targets, mine water heat delivers the benefits of energy security and employment.

Dawdon is just one of more than 75 mine water treatment sites operated by the Mining Remediation Authority (formerly the Coal Authority). Every day, these sites bring up naturally warmed water from old coal mines—and the heat in that water is mostly going to waste.

If we captured and used that heat, even allowing for real world losses, it could heat around 55,000 homes every year. That's more homes than in a town the size of Darlington – and shows just how much untapped energy is still beneath our feet.

THANK YOU TO OUR SUPPORTERS

The *Durham Energy Manifesto* would not have been possible without the support and collaboration with Blackhall Community Centre, led by Alison Paterson. To have the project led and shaped by an organisation that is so deeply committed to community has been incredible. Thank you to brilliant Blackhall – you’ve done your Ancestors proud.

We have been privileged to be able to host meetings of the Durham Energy Council at Redhills. All the project participants were inspired and energised to be able to explore our energy heritage and futures in the very spaces where our ancestors created and wielded power. Redhills is a precious place, a monument to what we can achieve together, and we’re grateful to the Redhills team for their support.

We are deeply grateful to the project supporters who enabled us to dream big, and work long-term with community members around the county.

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We are also grateful to the Joseph Rowntree Foundation for their ongoing support of Threads in the Ground and the Durham Energy Council, as part of their investment in the North East for the Emerging Futures programme.

We can achieve brilliant things when partners like this come together - we feel grateful and privileged to be trusted with your support.

Thanks also to the team at the Dawdon Minewater Treatment Works, for hosting an education visit of the members of the Durham Energy Council.

OUR ADVISORS AND HELPERS

We want to thank Dr Elaine Forde of the Durham Energy Institute, for her support in steering the Durham Energy Council project from just an idea to something tangible and meaningful for all of us involved.

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Pete Barrett supported the Durham Energy Council project as a volunteer, giving much time and energy to help facilitate our meetings at Blackhall and Redhills – thank you from all the team!

CREDITS

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Disclaimer:

The project team have done our best to take expert advice, to verify information and to correctly credit. We’ve never made a newspaper before though, and we aren’t energy system professionals. If you spot an error...sorry about that, and thank you for reading so closely.

Scan the QR code below to read the Durham Energy Council’s Manifesto or visit:

demanifesto.uk



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