

LOW CARBON HEAT IN SCOTLAND



#SCOTLANDISNOW

WELCOME TO SCOTLAND

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The small country making a big impact on the global landscape.

Scotland is where you will find excellence in education, a renowned engineering heritage, a flair for invention and a passion for research. It's a place where great ideas become global standards.

In Scotland, we are committed to decarbonising our economy for the benefit of our environment, our people and our prosperity. Scotland was the first country in the world to declare a Climate Change Emergency and our government has shown global leadership in setting world-leading targets.

Our Net-Zero 2045 emissions target will halt Scotland's contribution to global climate change within one generation, setting the pace for the rest of the world and opening up huge opportunities for companies like yours.

You'll find a unique opportunity for low carbon heat investment in Scotland. Having already largely decarbonised electricity, we are now pursuing the decarbonisation of heat as a national priority. Heat is the single largest source of carbon emissions in Scotland and the largest element of our energy demand. With the lowest rate of decarbonised heat of any country in Europe, twinned with the toughest statutory ambition in the world, we need to rapidly scale up the expansion of low carbon heat capacity.

By locating in Scotland, you will also have easy access to the emerging UK heat market and benefit from early collaboration across both the public and private sectors.

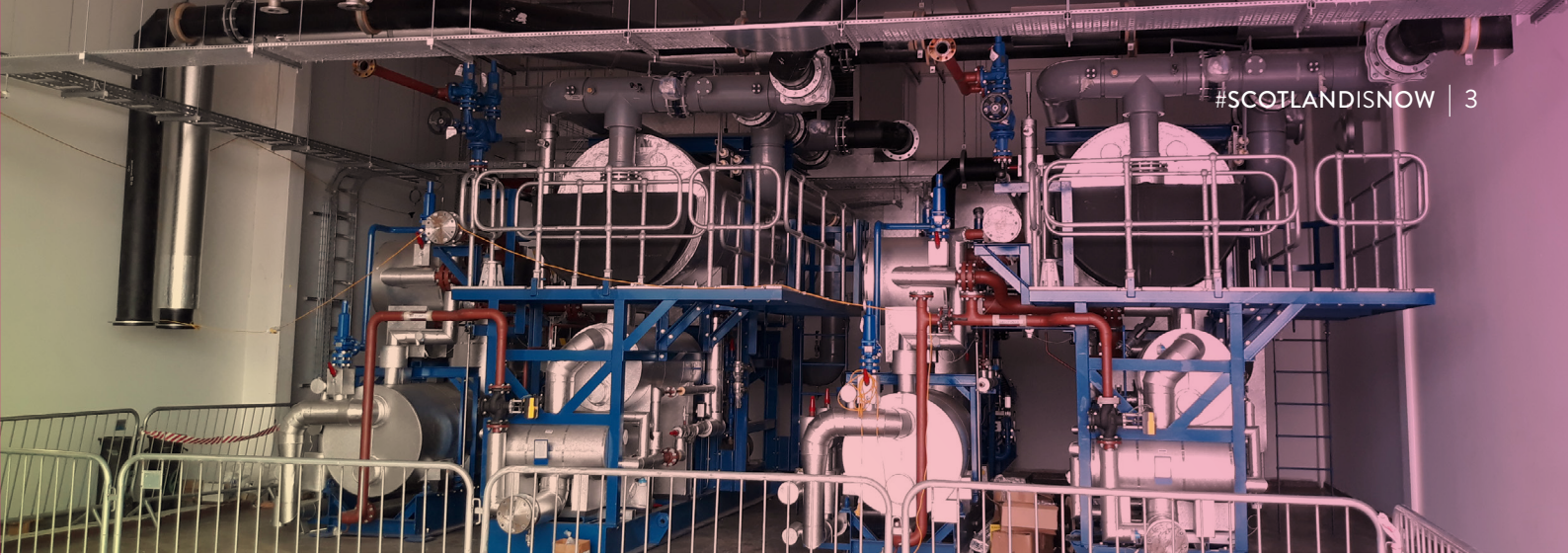
You'll find us progressive and pioneering. With a track record of invention and innovation, Scotland is a land of low carbon heat firsts: from Europe's first housing estate district heating scheme in 1920, to the world's only shallow mine geothermal research facility of its kind and the first heat-from-wastewater scheme in the UK, offering solutions to both new build and the retrofit markets.

Across all our industries, the shining jewel in our crown is our people. By locating in Scotland, you'll access one of the most highly educated and skilled workforces in the world, and you'll be connected to a culture of research, innovation and creativity through our academic institutions and centres of excellence which have an outstanding record of collaboration with industry.

Our driving determination is the key to our success. We'd love you to join the many global businesses that choose to locate, operate and grow in Scotland alongside our ambitious local companies.

We're here for you throughout the journey – you will be supported before, during and after you locate in Scotland.

Now is the time to invest in Scotland. So come on in; be part of Scotland's continuing success story.



SCOTLAND'S HEAT OPPORTUNITY

The scale of the low carbon heat opportunity in Scotland is enormous, presenting immediate opportunities across the sector.

HEAT PUMP OPPORTUNITIES

The heat pump market – manufacturing, components, installation and servicing – is set to boom in Scotland and the UK.

In order to decarbonise heat, it is estimated that over 1 million heat pumps need to be installed annually in the UK by the mid-2030s, totalling 26 million by 2050. In 2018, only 27,000 heat pump units were sold in the UK, demonstrating the industrial ramp up required and the scale of the opportunity for innovative companies like yours.

Scotland has committed £1.6bn for investment in decarbonising heat and improving energy efficiency,

while the forthcoming Heat Pump Sector Deal will also drive the transition to low carbon heat.

Scotland's supply chain for heat pumps is still developing and by locating here you can be part of this evolving market from the get-go, helping to create new technology ecosystems, collaborations and value chains.

The scale of the market will create specific opportunities for **heat pump and component manufacturing**, and increased innovation around **heat pump systems, installation, smart controls and O&M**.

HEAT NETWORK OPPORTUNITIES

Heat networks will play a key role in Scotland's transition to low carbon heating, helping us meet our climate change targets and tackling fuel poverty, whilst creating exciting opportunities for companies like yours.

Scotland could potentially see 460,000 homes heated through renewable sources by 2030, which, alongside the growing UK market, will provide a strong pipeline of new opportunities.

Scotland is the first country in the UK to legislate on the development of heat networks, with the draft **Heat Networks Bill** (2020) providing a supportive regulatory framework to ensure the growth of new heat networks through heat zoning and de-risking investment. As well as developing new heat networks, transforming our

existing heat networks – which are largely powered by gas CHP – into low carbon networks presents another rich opportunity for low carbon heat companies.

Scotland has a strong core of companies with a range of heat network innovation and capabilities, but the rapidly expanding market means there will be an increasing opportunity for:

- **Manufacturing / assembling and installation of large capacity heat pump systems**
- **Manufacture, supply and installation of Heat Interface Units**
- **Piping components**
- **Heat metering/billing services**
- **Smart controls**
- **System innovations to integrate heat, electricity, buildings and mobility.**



WHY SCOTLAND FOR LOW CARBON HEAT?



WORLD-LEADING CLIMATE CHANGE TARGETS

Scotland's commitment to decarbonisation is demonstrated by our world-leading climate change targets, creating a huge market for low carbon heat:

- 50% of Scotland's total energy demand (electricity, heat and transport) to be supplied by renewable sources by 2030
- Net-zero greenhouse gas emissions by 2045
- 75% emissions reduction by 2030 – the toughest statutory emissions target in the world.



SUPPORTIVE GOVERNMENT POLICIES & INCENTIVES

Scotland's commitment to a net-zero future is underpinned by strong government support designed to boost the scale and pace of decarbonised heat:

- £1.6bn commitment to decarbonise heat and improve energy efficiency
- £301m in public funding for low carbon heat, including £120m Heat Transition Deal
- The Heat Networks Bill (2020) sets the regulation and licensing regime to ensure the development of new heat networks.



AMBITIOUS LOW CARBON HEAT TARGETS

Strong government targets will drive the growth of low carbon heating in Scotland:

- 35% of heat for domestic buildings from low carbon heat technologies by 2032
- 70% of heat & cooling for non-domestic buildings from low carbon heat technologies by 2032
- All new homes must use low carbon heating from 2024.



HUGE OPPORTUNITY TO DECARBONISE HEAT

The scale of the transition to low carbon heat in Scotland offers huge opportunities for innovative heat companies, as currently:

- 52% of Scotland's energy demand comes from heat (approx. 82,895 GWh per year)
- Heat is the single largest source of our CO₂ emissions at 41%
- Natural gas heats 79% of houses and around 50% of businesses.



EXCELLENT INNOVATION INFRASTRUCTURE

You can take your R&D to the next level and exploit commercial opportunities at an accelerated pace in Scotland thanks to cutting edge facilities like the Energy Technology Partnership (ETP), Glasgow Geothermal Energy Research Field Site and the Construction Scotland Innovation Centre.

THE RIGHT TALENT FOR YOUR BUSINESS

**Want to attract and retain the right talent to maintain your competitive edge?
Come in – we’ve been waiting for you.**

We often say that people are our greatest asset and in fact, our 2.8 million strong workforce is internationally recognised as one of the best trained, most reliable and cost-competitive labour forces in the world. And, with a world-renowned educational system and a high ratio of graduates per capita, Scotland surpasses most countries of comparable size in Europe.

When it comes to energy and heating skills, you’ll find the talent you need in Scotland. By choosing Scotland you’ll have access to:



Highly skilled talent pool renowned for its manufacturing, energy, engineering and design expertise.



19 world-class universities and a steady stream of science, technology and engineering graduates.



Ambitious skills initiatives to meet industry demand - the Energy Skills Partnership and the Climate Emergency Skills Action Plan will ensure we continue to produce appropriately skilled talent.



Relevant academic programmes & specialisms, including sustainable engineering, geothermal energy and hydrogen storage.



7 further education colleges offering specialist training in the latest renewable and energy efficiency technologies funded by SP Energy Networks’ Green Economy Fund.



Vocational apprenticeships designed for industry by industry, including plumbing, heating, ventilation, air conditioning & refrigeration.

We will listen to your business, giving you the opportunity to influence skills, education and training provision to maximise your human capital. So while you focus on growing your business, you can rest assured that Scotland has a talent pool with the skills and experience you need, both now and in the future.

SCOTLAND’S APPRENTICESHIPS

Scotland operates a range of apprenticeship models developed by business for business, giving you access to a robust recruitment and talent pipeline to meet your company’s needs. Funding of up to £36k is available and different models include engaging with young people in school, upskilling your staff to achieve industry approved qualifications and developing experienced employees to Masters’ degree level.

You’ll find that Scotland’s apprenticeships:

- Improve your productivity, morale, staff retention and quality of service
- Support your company’s bespoke skills requirements
- Reduce recruitment times and costs.

A POWERHOUSE OF INNOVATION AND INVENTION

Scotland is renowned as a world leader in renewable energy with a proven track record in delivering pioneering low carbon projects. In fact, Scotland's innovation ecosystem and experienced energy supply chain are globally recognised as being at the vanguard of low carbon innovation. By locating here you'll be able to take your R&D to the next level thanks to our connected infrastructure and outstanding level of academic and industry collaboration. If you're thinking business innovation, think Scotland.

PIONEERING HEAT INNOVATION

Scotland boasts an impressive portfolio of pioneering low carbon heat projects, driven by our integrated energy policy and world-leading emissions targets. Key projects include:

Hillpark District Heating, Glasgow – the UK's largest hybrid air sourced heat pump network replaced electric storage heaters in 350 homes in 7 tower blocks.

Queen's Quay Clydebank – the largest single heat network in Scotland with a river-based heat pump that will heat 1200 homes and businesses.

HALO Kilmarnock Regeneration Initiative – £63m flagship project that will use 100% renewable energy to service its residential and commercial community, integrating large-scale heat pumps used to provide hot water and heating to hundreds of homes.

Borders College, Galashiels – flagship heat from wastewater project, the first in any UK organisation.

EastHeat – advanced heat battery thermal storage for 1000 tenants in over 650 homes, including three sheltered housing complexes, across two housing associations.

Stirling Renewable Heat Project – pioneering district heat network using heat extracted from wastewater, combined with biogas from sewage and CHP, to heat a leisure centre, school, sports stadium and offices.

CENTRES OF EXCELLENCE

Across all energy and low carbon technologies, our centres of excellence and innovation centres exist to help businesses do incredible things. Transformational collaboration between universities and industry could help your company increase the pace of innovation by working on identified technical problems, de-risking new product development and exploiting commercial market opportunities.

Here are just some of the centres that could help you grow your heat business:



Energy Technology Partnership (ETP) – Europe's largest energy research partnership with specialist expertise in heating / cooling technologies, thermal energy storage and supply / demand mapping.



Construction Scotland Innovation Centre – industry-led centre to support businesses to deliver transformational change in construction, including increasing efficiency.



CENSIS – Scotland's innovation centre for accelerating business growth through sensing, imaging and Internet of Things (IoT) technologies, including an IoT project to tackle fuel poverty.



The Data Lab – industry-led innovation centre that enables new data science capabilities to develop in a collaborative environment, including a data-informed approach to heating systems.



TECHNOLOGY EXPERTISE

You'll find that Scotland's truly open innovation environment enables us to continually develop new solutions for the energy sector and that we have the technological expertise to put them into practice.

Here are just a few of the ways we're applying pioneering technology to low carbon heating in Scotland:

HEAT NETWORKS

Not only is Scotland driving the development of heat networks, but we're also utilising innovative and ground-breaking low carbon heat generation technologies including harnessing heat from wastewater and large-scale water sourced heat pumps.

The £250m Queens Quay regeneration project in Clydebank will feature Scotland's largest single heat network powered by Scotland's first large-scale river-based heat pumps. The heat generated from the two 2.6 MW heat pumps will be pumped through 2.5km of district heating pipe to over 1000 new homes, local businesses and public buildings, including West College Scotland and Clydebank Library. Initial CO2 reductions are estimated at 409 tonnes per annum, with further plans to expand the heat network.

MINEWATER GEOTHERMAL

Scotland's industrial legacy of disused mines offers unique opportunities for minewater geothermal technologies to be used in residential district heating and industrial applications. The Glasgow Geothermal Energy Research Field Site, The Glasgow Observatory, is a network of 12 boreholes designed to observe warm water movement around the abandoned mine workings to monitor changes in properties of the environment just below the surface. This at-scale facility, open for research and innovation, explores the processes and impacts of this heat source and potential heat store as a sustainable way of heating urban homes and businesses.

It's estimated that disused mine workings could meet up to 40% of Glasgow's heat demand, providing an exciting opportunity for geothermal companies to innovate and grow here.

PIONEERING TEST & RESEARCH FACILITIES

Scotland offers unique facilities to help your business apply new low carbon heat technology expertise.

Construction Scotland Innovation Centre's 'Innovation Factory' – custom-designed facility containing a range of testing equipment to develop the energy efficiency products of the future.

Power Networks Demonstration Centre – highly realistic and accelerated technology testing of distribution networks and smart grid innovations.

Glasgow Geothermal Energy Research Field Site – network of 12 boreholes to test water flow, heat flow, chemistry and microbiology.

Energy Technology Centre – low carbon energy test facilities include thermal, heat transfer, biomass, fuel cells, hydrogen and storage.

Thermal Technology Test Centre – UKAS accredited thermal testing facilities.

As well as extensive research facilities, you'll also find that Scotland's infrastructure and geography provide an ideal testing ground for low carbon heat technologies. Our varied geography includes densely populated urban centres, remote islands, off grid rural communities and former coal-mining industrial areas, while our vast chemicals, whisky, food & drink, and manufacturing industries offer even more opportunities for industrial heat innovation.

A SUPPORTIVE BUSINESS ENVIRONMENT

With a compact geography, engaged and connected industry leaders and active support from the Scottish Government, Scotland offers an accessible, well-connected and collaborative location for your low carbon heat project.

You'll find that community is an important part of doing business in Scotland and you'll benefit from our established and influential industry networks, enjoying the sharing of knowledge, networks, research and best practice from the moment you set up here.

Scotland is a place where businesses are supported, and the entrepreneurial spirit is strong. This ethos is supported by our strong ecosystem of incubators, accelerators and co-working spaces across the country, which provide inspiring environments for businesses to spark ideas and find like-minded talent.

Beyond academia, we know that industry engagement is paramount in utilising research to solve real-world problems. That's why our research excellence is aligned with – and supported by – a network of innovation centres that have been designed by industry for industry-led collaborations.

TARGETED GOVERNMENT SUPPORT

You can be assured that Scotland is committed to driving market growth in low carbon heating through its strong government programmes and public funding, including:

Scotland's Programme for Government 2020 – a commitment to secure investment of £1.6bn in heat and energy efficiency in our homes and buildings.

£120m Heat Transition Deal – includes a £50m Heat Networks Early Adopter Challenge Fund for local authorities and a £10m fund to support hydrogen heat demonstrator projects.

Community and Renewable Energy Scheme (CARES) – offers a range of financial support to local energy and heat projects.

The District Heating Loan Fund – offers low interest unsecured loans of up to £1m, with larger loans available on a co-investment basis.

District heating relief – rate relief guaranteed until 2032, providing certainty to investors.

Low Carbon Infrastructure Transition Programme (LCITP) – accelerates the development and delivery of substantive low-carbon energy projects across Scotland.

STRATEGICALLY LOCATED & WELL CONNECTED

A connected base. Invest in Scotland and you'll be connected to a culture of research, innovation and creativity.

You can take advantage of our close connections to the best academic institutions, both in Scotland and abroad, and your company will benefit from dynamic industry clusters, influential organisations and connected supply chains.

Key organisations include:

Scottish Futures Trust – provides infrastructure expertise to public sector organisations, supporting them to plan, fund, deliver and manage their construction projects and buildings better.

District Heating Scotland – a 'one-stop-shop' to boost the uptake of low carbon heat networks in Scotland, including a heat map that identifies areas of heat demand and current projects.

The Energy Saving Trust – instrumental in addressing the challenge of reaching net zero by taking action to reduce our energy consumption, install new infrastructure and accelerate a move to sustainable, low carbon lifestyles.

Zero Waste Scotland (ZWS) – leads Scotland's ambition to use products and resources responsibly by informing policy and motivating individuals and businesses to embrace the environmental, economic, and social benefits of a circular economy.

SCOTTISH RENEWABLES



Scottish Renewables is the voice of Scotland's renewable energy industry, with a vision for Scotland to lead the world in renewable energy. Representing all low carbon technologies, Scottish Renewables drives and informs the debate on how the growth of renewable energy can help sustainably heat and power Scotland's homes and businesses. Scottish Renewables runs a Heat Industry Group involving

the public and private sector and organises frequent networking events, seminars, annual conferences and exhibitions, including the Low Carbon Heat Conference, Scottish Green Energy Awards and Young Professionals Green Energy Awards.

CONNECTED SUPPLY CHAIN

By choosing Scotland, you'll benefit from dynamic industry clusters and connected supply chains involving a range of companies that are developing products, services and business models to support the decarbonisation of heat.

Our renowned engineering heritage means we have a strong and experienced energy and engineering sector, including over 10,500 companies already working in Scotland's renewables and low carbon industry.

Our connected business infrastructure will take your business to the next level.

THRIVE IN SCOTLAND WITH ONGOING BUSINESS SUPPORT

Connected business support from Scotland's enterprise agencies will ensure that you are supported before, during and after you locate in Scotland.

Locating to a new area can be a daunting task, but we can make it quick and easy for your business to settle in Scotland. We'll be with you every step of the way and can assist you with:



PROPERTY SEARCHES AND ADVICE – we can help you find the right sites and facilities fast, and get help with feasibility studies.



FINANCIAL SUPPORT – we can offer a range of attractive incentives, to help you upskill your staff, develop new products and services and access growth capital.



CONNECTIONS – we can introduce you to our university and supply-chain contacts, enabling you to access cutting-edge research and exceptional talent.



TALENT – we will listen to your business, giving you the opportunity to influence skills, education and training provision to maximise your human capital.



PROFESSIONAL ADVICE – we can connect you to expert advice on pressing issues like visas and contracts, to help you get up and running in Scotland.

And the support doesn't end when you make the move. We are committed to your growth in Scotland, by taking the time to understand your needs now and in the future. We have the tools to take your business to the next level, whether it's identifying investment, developing your business strategy, upskilling your staff or improving your business processes.

CONNECTED TO THE WORLD

Invest in Scotland and you'll be close to some huge markets. Whether you're heading to London, Europe or the rest of the world, Scotland is well-connected for business travel.



6 AIRPORTS

connecting Europe,
Middle East and
North America



FAST AND FREQUENT

rail links to all parts
of the UK



CONNECTED MARITIME INFRASTRUCTURE

featuring
ferry ports, harbours, 18 deep
water ports and 2 container ports



Daily **DIRECT**
FLIGHTS TO 150
DESTINATIONS
worldwide



130 FLIGHTS PER
DAY TO LONDON
with a 1hr flight time



44 MINS journey time
BETWEEN GLASGOW AND
EDINBURGH
by train

Beyond our robust and efficient transport network, our advanced and reliable **DIGITAL CONNECTIVITY INFRASTRUCTURE** makes Scotland the strategic location for your business.

95.5 PER CENT FIBRE BROADBAND COVERAGE, including all major cities in Scotland.

100 PER CENT of Scottish premises will have access to superfast broadband by 2021.

Our future-proofed fibre network makes Scotland one of the **BEST-CONNECTED PLACES** anywhere in Europe.



GET IN TOUCH

WE'D LOVE TO WELCOME YOU

We will make it quick and easy for your business to settle in Scotland so we will help you to identify premises, academic partners and investment opportunities, recruit staff and access funding for employment creation, R&D and training programmes.

Working together, everyone from national government and local authorities to universities and advisors will make the connections which ensure your investment goes smoothly, so that you can focus on growing your business.

To find out why #SCOTLANDISNOW for your company or to find out more about how you can experience Scotland for yourself, get in touch and we will be happy to help.

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