

The background of the entire page is a light blue gradient. It is populated with various 3D molecular models. These models consist of dark blue, glossy spheres of different sizes connected by thin, metallic-looking rods. Some models are simple diatomic molecules, while others are more complex, resembling branched hydrocarbon chains or larger organic molecules. The lighting is soft, creating subtle highlights and shadows on the spheres, giving them a three-dimensional appearance.

# THINK HYDROGEN

## THINK SCOTLAND

**#SCOTLANDISNOW**

 **SCOTLAND**

Think Hydrogen, Think Scotland

# WELCOME TO SCOTLAND

## FÀILTE GU ALBA

**WELCOME TO SCOTLAND;** the small country making a big impact on the global hydrogen landscape.

In Scotland, we are serious about hydrogen. We're actively creating a hydrogen economy, making Scotland the ideal home for your hydrogen investment. You'll benefit from our ambitious targets for hydrogen production, a wealth of renewable energy resource, a proven track record of advancing new energy technologies, supportive government policy and over sixty years of transferable experience and skills from established sectors such as oil & gas.

Join us as we become a hydrogen nation. As we transition away from fossil fuels, we are maximising our huge renewable energy generation capacity, creating immediate opportunities in both renewable and low carbon hydrogen and its supply chains. In fact, in addition to producing hydrogen for our domestic use, our ambition is to use our geographical advantage to export renewable and low carbon hydrogen at scale to the rest of the UK and to Europe.

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 net zero by 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 our hydrogen economy.

You'll find us progressive and pioneering. Our "world first" hydrogen demonstration projects show our

drive and determination to lead this sector and our creation of regional hydrogen hubs across the length and breadth of the country will ensure we continue to lead the way.

As a global energy hub, our highly skilled workforce, on and offshore infrastructure and global supply chain make Scotland the partner of choice for large and complex hydrogen projects. And thanks to our advanced innovation ecosystem, we're a proven world-leader in developing trailblazing low carbon solutions, including the world's first floating offshore wind farm. We're now firmly focused on becoming a hydrogen nation, so now is your chance to join us and reap the rewards of the hydrogen revolution.

In Scotland we pride ourselves on our values, meaning you'll be at home in a place where health, happiness, equality and sustainability come together to produce a dynamic business environment with global impact. Many global businesses which share our values have already chosen to locate, operate and grow in Scotland and we'd love you to join them.

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.**



Hydrogen  
production & storage



Electrolysers



End-use appliances



Hydrogen hubs



Sustainable  
Transport

# SCOTLAND'S VALUES AND TARGETS

## WORLD-LEADING CLIMATE CHANGE TARGETS

Scotland is committed to a net zero future. By choosing to locate here, you'll join us on our journey towards meeting world-leading climate change targets:



Net zero greenhouse gas emissions by 2045



5GW of renewable and low carbon hydrogen production by 2030



50% of Scotland's total energy demand (electricity, heat and transport) to be supplied by renewable sources by 2030



25GW of renewable and low carbon hydrogen production by 2045



75% emissions reduction by 2030 – one of the toughest statutory emissions targets in the world

## DELIVERING RECORD-BREAKING RESULTS

We've already made great strides in our transition away from fossil fuels, proving we don't just set targets we also deliver. In 2020, we generated the equivalent of 97.4% of our gross electricity demand from renewable sources and generated 31.8 TWh of renewable electricity – a record year for renewable electricity in Scotland.

But to achieve a just transition to net zero we need to ramp up our generation of renewable energy and clean hydrogen to decarbonise our heat, transport and industrial sectors, and we'd love you to join us on our journey to becoming a hydrogen nation and a leading exporter.

## OUR VALUES

As a progressive, inclusive, sustainable country that prioritises collective wellbeing, we want to work with global companies like yours that share our values. Together we can enjoy a successful economy that delivers high productivity, high innovation, high levels of technology and high employment for the long term. Join us in building a greener and fairer future for all by investing in our three core values:



### INCLUSIVE PROSPERITY

We consider health, happiness, equality and sustainability to be fundamental for a successful economy. You'll benefit from the long-term growth that comes from prioritising our people and our planet, thanks to our focus on collective wellbeing and opportunities for all.



### NET ZERO

When you invest in Scotland, you are choosing to locate in a country which has set global standards for climate change, sending a clear message to your customers about your own green credentials and actions.



### FAIR WORK

Our commitment to create good, green, well-paying jobs means you'll have access to a range of resources, funding and tools to support your fair and flexible working objectives.



# SCOTLAND'S HYDROGEN OPPORTUNITY

Scotland has the resources, expertise and ambition to rise to the challenges of the climate change emergency and to become a world-leading hydrogen nation. Now is the time to invest in Scotland and gain early-mover advantage. By locating in Scotland, you'll find immediate investment opportunities across the hydrogen sector, including:



## HYDROGEN PRODUCTION

Scotland's geographical advantage, with vast wind, wave and tidal resources, creates huge potential for the early deployment of large-scale hydrogen production and carbon capture utilisation and storage (CCUS), firmly positioning Scotland at the forefront of a growing global industry.

With one of Europe's largest Offshore Renewable Energy Zones and very favourable wind speeds, we already have an enormous project pipeline of both onshore and offshore wind. The recent ScotWind leasing round will add 28GW of new offshore wind capacity and in fact, our total energy pipeline could exceed 50GW, enabling huge scale-up of electrolytic hydrogen production over the next decade. The size of the electrolytic hydrogen market in Scotland was recently estimated to be 126 Terawatt hours (TWh) of green hydrogen production, positioning Scotland as an exporter of green energy to Europe and potentially creating over 300,000 jobs by 2045.

As well as direct opportunities within hydrogen production and CCUS, you'll find that Scotland's production of low carbon hydrogen at a commercial scale is creating opportunities to decarbonise industry, transport, heat and other sectors, and to develop the accompanying transportation and storage infrastructure.



## ELECTROLYSER MANUFACTURING

You'll find exciting opportunities for the manufacture of electrolysers in Scotland to service our huge project pipeline. With the large volume of green hydrogen production projects planned for Scotland's local and export markets, along with our growing supply chain, skills and knowledge base, Scotland is the ideal location for your electrolyser manufacturing project.

Our manufacturing capacity is geared up to support this demand, and you will be supported by transformational investment in infrastructure, innovation and skills initiatives to ensure Scotland is a global leader in high value and advanced manufacturing. You'll also benefit from significant opportunities for the integration of knowledge and skills hubs, training academies and research centres, to really give your business the edge. We have already identified a range of sites suitable for large-scale factories and our teams are ready to help you select the perfect location for your project.

You can also take advantage of our low carbon and green electricity to reduce your carbon footprint and the embedded carbon of your final product. In 2020, 50TWh of electricity was generated in Scotland with an average grid carbon intensity of 40.2 gCO<sub>2</sub>/kWh; one of the lowest grid carbon intensities in Europe.





## STORAGE, CONVERSION & DISTRIBUTION

To accelerate Scotland's hydrogen economy, we need innovative technologies and equipment to store, convert and transport hydrogen. You'll find that Scotland is the ideal location for CCUS projects, due to our proximity to offshore CO<sub>2</sub> storage resources, readily available natural gas supplies, existing oil and gas infrastructure and technical expertise. You'll benefit from a wealth of transferable skills from the oil and gas sector, including the highest concentration of gas handling experts in the UK, world-leading offshore and subsea expertise, and research and innovation facilities to support the development and deployment of new technologies.



## END-USE APPLIANCES

You'll find ample opportunities for hydrogen-ready technologies for both domestic and commercial use in Scotland. We are actively exploring using hydrogen to decarbonise our gas grid by blending up to 20% hydrogen into the existing gas network, with the possibility of transitioning to 100% hydrogen in the future, requiring the development of innovative end-use appliances.



## SUSTAINABLE TRANSPORT

Scotland is at the forefront of the global shift to zero emission mobility, creating exciting opportunities for investment in hydrogen vehicles, refuelling stations and other infrastructure. We already have fleets of hydrogen-powered buses, cars, and refuse vehicles, and within the next ten years hydrogen-powered HGVs could become a common sight on Scotland's roads. In fact, transport's demand for hydrogen is projected to increase to around 6TWh a year by 2035, and up to 14.9TWh by 2045 as other modes of transport like aviation, maritime and rail start to use large volumes of hydrogen.



## REGIONAL HYDROGEN HUBS

Scotland is actively supporting the creation of Regional Hydrogen Hubs across the country that are host to the entire hydrogen value chain, from production, storage and distribution to end-use. Led by industry, Scotland's Hydrogen Hubs include multiple end-users with applications covering more than one sector and offer huge opportunities for investment. You'll find more information on our Hydrogen Hubs on pages 6 and 7.



## EXPORT

Global demand for renewable hydrogen is expected to grow steadily over the coming decades and Scotland is in prime position to become a top exporter of hydrogen to serve this growing global market. The European Union has set a target to import 10 million tonnes of renewable hydrogen by 2030, with Germany, the Netherlands and Belgium expected to be major importers. By locating in Scotland, you can take advantage of our abundant renewable resources, close proximity to expected European centres of hydrogen demand and our experienced and advanced marine and energy infrastructure capable of transporting hydrogen at low cost by ship or by pipeline.





# SCOTLAND'S REGIONAL HYDROGEN HUBS

## 1. ABERDEEN

Already one of Europe's most pioneering hydrogen cities, Aberdeen has two hydrogen refuelling stations, one of the largest fleets of hydrogen vehicles and many ambitious hydrogen production projects in planning. The development of the new South Harbour, the UK's largest marine infrastructure project, is currently underway and the adjacent Energy Transition Zone (ETZ) is set to become a catalyst for high-value manufacturing, R&D and hydrogen development.

## 2. ARGYLL & ISLANDS

MACC Hydrogen Futures aims to establish a green hydrogen production and distribution site at Machrihanish Airbase on the Kintyre Peninsula. A former military aerodrome, Machrihanish has been transformed into a thriving community-owned business park offering over 1,000 acres (400+ hectares) of unique properties, development land and assets, as well as its own airport.

## 3. AYRSHIRE

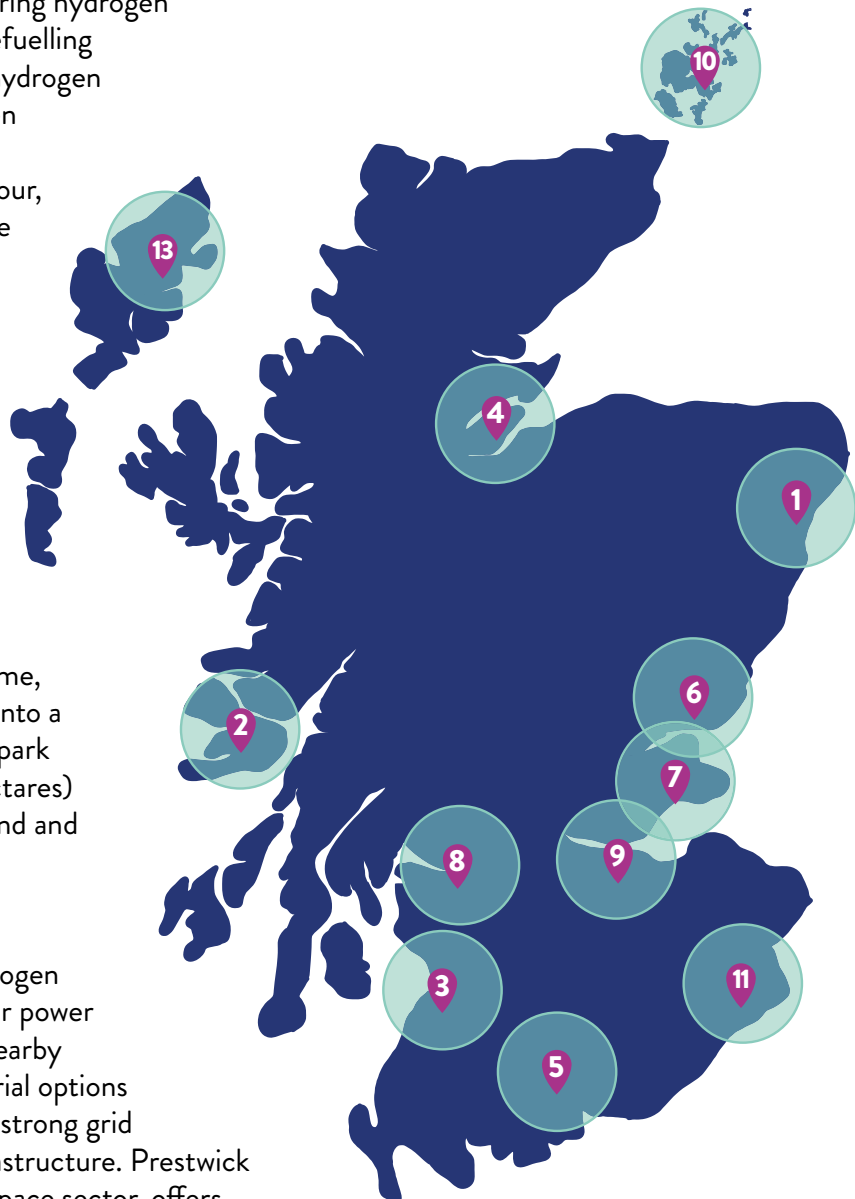
Ayrshire is emerging as a hub of hydrogen activity. Hunterston, a former nuclear power station, is an ideal landing point for nearby offshore wind farms, with vast industrial options for hydrogen production and export, strong grid connections and existing marine infrastructure. Prestwick Aerospace, home to Scotland's aerospace sector, offers exciting opportunities to service the aviation sector, set to emerge as one of hydrogen's key end-users.

## 4. CROMARTY

The North of Scotland Hydrogen Programme aims to develop a state-of-the-art hub to produce, store and distribute green hydrogen to the local area, the UK and Europe. Ideally located close to large-scale renewable resources, there is a driving ambition for the region to become a hydrogen economy, with a huge local demand for green hydrogen from distilleries, industry, transport and domestic applications.

## 5. DUMFRIES & GALLOWAY

Centrally located in the UK, Dumfries & Galloway produces 11% of all Scotland's renewable energy and offers easy access to existing gas transmission pipelines (including the Scotland to Northern Ireland Pipeline) and future 'Project Union' and 'European Backbone' transmission infrastructure. The area already has a hydrogen supply chain cluster, including hydrogen-enabled industrial boilers, and key development sites include Chapelcross which offers up to 500 acres.



## 6. DUNDEE

Ideally located next to several offshore wind farms, Dundee has ambitions to deploy hydrogen production, refuelling infrastructure and hydrogen vehicle fleets. Michelin Scotland Innovation Parc (MSIP) is a key site, focused on driving innovation and R&D in sustainable mobility and low carbon energy and offering a wide range of industrial spaces, cutting-edge research facilities and a Skills Centre of Excellence.

## 7. FIFE

Fife's world-first H100 hydrogen network will be deployed in 2023, heating 300 homes with clean gas produced by a dedicated electrolysis plant. The project is built on the legacy of Fife's pioneering Hydrogen Office which launched in 2011 with a 750kW wind turbine and 30kW electrolyser and subsequently added a solar PV, smart microgrid, fleet of 17 hydrogen vehicles, 250kW of electrolysis and 100kW fuel cell.

## 8. GLASGOW

The Sustainable Glasgow initiative aims to make Scotland's largest city net zero by 2030, with projects including deploying hydrogen refuse collection vehicles and new refuelling infrastructure. The nearby Whitelee wind farm, one of Europe's largest onshore wind farms, will have the UK's largest electrolyser at 20MW, while the Hy2Go project proposes a green hydrogen production park off the M74 motorway.

## 9. GRANGEMOUTH

Scotland's largest industrial area, Grangemouth offers numerous exciting opportunities to decarbonise. A new energy plant is due to commission in late 2023, designed to fuel switch to hydrogen in the future, and a large-scale hydrogen production plant could export captured carbon offshore for permanent storage via the ACORN project, while SGN could repurpose existing pipeline to transport hydrogen from Grangemouth to Edinburgh.

## 10. ORKNEY

The Flotta Hydrogen Hub is a proposed industrial-scale green hydrogen production facility on an existing oil terminal in Orkney. Utilising offshore wind, this exciting project could export significant quantities of hydrogen to Europe and the UK gas grid at St Fergus, forming the foundation for an international maritime green hydrogen refuelling hub.

## 11. SCOTTISH BORDERS

The Scottish Borders is ideally situated to emerge as a leading hydrogen hub. The area boasts large onshore windfarms and easy access to the East Coast's offshore windfarms, via Eyemouth harbour, and the European Hydrogen Backbone initiative. Main gas transmission pipelines to England cross the area, as will new 'Project Union' infrastructure, while local engineering firms offer strong electrolyser supply chain potential.

## 12. SHETLAND

The ambitious ORION Clean Energy Project will shape Shetland as a world-leading clean energy hub. Green hydrogen (from abundant wind, wave and tidal resources) will power homes, businesses and vehicles, electrify oil and gas installations, and serve export markets using existing infrastructure, including Shetland Gas Plant and Sullom Voe, a deepwater port/oil terminal.

## 13. WESTERN ISLES

The Outer Hebrides Energy Hub will maximise the area's abundant onshore and offshore wind resources, producing enough green hydrogen to power the islands, as well as for export to the UK domestic and international markets.

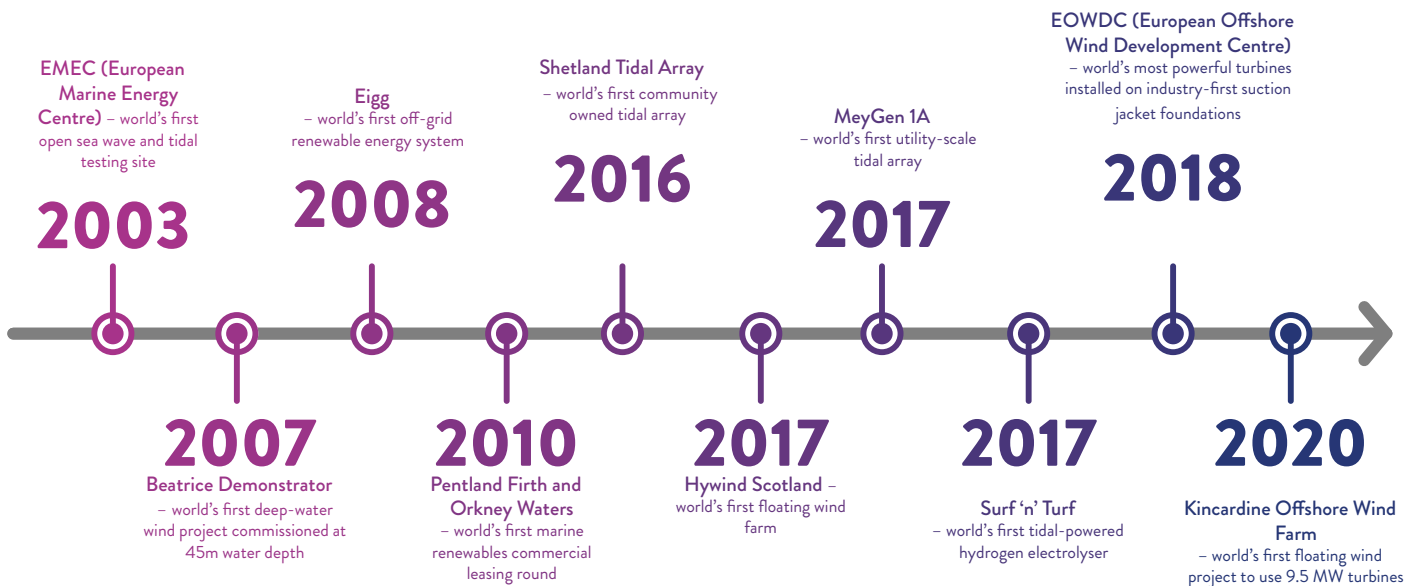
## A POWERHOUSE OF INNOVATION AND INVENTION

Scotland's innovation ecosystem and experienced energy supply chain are globally recognised as being at the vanguard of low carbon innovation. You'll be able to take your hydrogen R&D to the next level thanks to our connected infrastructure and outstanding level of academic and industry collaboration.

So, if you're thinking hydrogen innovation, think Scotland.

### WORLD FIRST RENEWABLES PROJECTS

Our pioneering energy sector has a proven track record in delivering world first projects.



### CENTRES OF EXCELLENCE

Our centres of excellence and innovation exist to help businesses do incredible things. Here are just some of the centres that could help transform your hydrogen business:

- **Net Zero Technology Centre (NZTC)** – develops and deploys technology to accelerate the transition to an affordable net zero energy industry. Also leads the Net Zero Solution Centre
- **The Energy Transition Alliance** – ground-breaking collaboration to accelerate the energy transition, focusing on floating wind for oil and gas production, increased renewables, hydrogen and CCUS
- **Offshore Renewable Energy Catapult (OREC)** – leading innovation centre with the world's most comprehensive, open-access test facilities, enabling the scale-up of offshore renewables
- **Power Networks Demonstration Centre (PNDC)** – accelerated technology testing of distribution networks and smart grid innovations, including whole energy systems, heat and hydrogen
- **European Marine Energy Centre (EMEC)** – grid-connected test centre for wave and tidal devices, with a cutting-edge demonstration site for new hydrogen technologies
- **Energy Technology Partnership (ETP)** – Europe's largest energy research partnership with specialist expertise in hydrogen, renewable generation, conversion, storage, distribution and infrastructure
- **Eden Campus** – the University of St Andrews innovation centre designed to help shape a sustainable future through collaborative research
- **Hydrogen Accelerator** – a partnership between the Universities of St Andrews and Strathclyde to scale-up Scotland's hydrogen technologies, located at the Eden Campus



## 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 workforce is internationally recognised as one of the best trained, most reliable and cost-competitive labour forces in the world. This, combined with our famous work ethic, means that your company will benefit from a hard-working, dependable and diverse workforce, which in turn means stability and reassurance for your business.

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



A highly skilled talent pool renowned for its energy, engineering and manufacturing expertise



Hydrogen and fuel cell expertise from several renowned Scottish universities, including the Universities of St Andrews and Strathclyde



76,600 people working directly in Scotland's energy sector and a large pool of transferable talent from the oil and gas sector



19 world-class universities and higher education institutions providing a steady stream of science, technology and engineering graduates



Flexible funded apprenticeships developed by industry for industry, including the All Energy Apprenticeship programme with credit-rated hydrogen units



Further education colleges offering specialist training in the latest energy technologies, including upskilling gas engineers in hydrogen technologies

## FLEXIBLE LEARNING PROGRAMMES

We will listen to your business, giving you the opportunity to influence skills, education and training provision to get the most out of your people. 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, and with a highly responsive skills and education system, we will meet your needs both now and in the future.

## FUTURE-PROOF YOUR WORKFORCE

By locating in Scotland, you'll benefit from ambitious skills initiatives that will ensure your workforce has the right skills as we transition to a net zero future:

- **Green Jobs Workforce Academy** – a key initiative to help workers transition into green jobs through reskilling and upskilling
- **The Energy Skills Partnership** – a collaboration of Scotland's colleges and industry partners to provide the skills required by the energy, engineering and construction sectors to achieve Scotland's energy transition and hydrogen economy
- **The National Energy Skills Accelerator (NESA)** – provides access to new skills and capabilities required for delivering net zero
- **Climate Emergency Skills Action Plan** – ensures Scotland's workforce has the skills needed for the transition to a net zero economy and the new job opportunities it will create
- **Integrated People and Skills Strategy** – a joined-up approach to people and skills across the offshore energy industry, designed to meet the commitments of the North Sea Transition Deal



## A SUPPORTIVE BUSINESS ENVIRONMENT

With a compact geography, engaged and connected industry leaders and active support from the Scottish Government, you'll quickly see that community is an important part of doing business in Scotland.

### A SUPPORTIVE GOVERNMENT

By locating in Scotland, you'll have the backing of a supportive government which is truly committed to, and determined to achieve, a net zero future. You'll benefit from ambitious government policies and initiatives which will drive Scotland's energy transition, creating opportunities for companies like yours:

- **Energy Transition Fund** – a £62m fund to support businesses in the oil, gas, and energy sectors as they grow and diversify to help deliver a net zero future
- **Emerging Energy Technologies Fund** – £100m will be pumped into Scotland's renewable hydrogen industry to achieve the hydrogen economy vision set out in the Scottish Government's Hydrogen Policy Statement. A further £80m will fund the development of CCUS technologies.

### INFLUENTIAL ORGANISATIONS

When you choose Scotland, you become part of something much bigger. One of the things that sets Scotland apart from the rest is our globally-recognised public and private sector partnership approach to achieve a shared industry ambition. Here are just a few key organisations that are ready to work with you, immediately connecting you to our company base:



**Scottish Hydrogen and Fuel Cell Association (SHFCA)** – promotes and develops Scottish expertise in fuel cells and hydrogen technologies. It is the largest and most proactive hydrogen and fuel cell association in the UK with over 150 members from across industry, academia and the public sector.



**Scottish Renewables** – the voice of Scotland's renewable energy industry, working to grow Scotland's renewable energy sector and sustain our position at the forefront of the global clean energy industry. You'll be connected to Scottish Renewables' vast network through frequent events, annual conferences and exhibitions.



**Global Underwater Hub** – based in Scotland, the industry body and focal point for the UK's underwater supply chain, including oil and gas, offshore wind and marine renewables.



**NECCUS** – an alliance of industry, government and experts which provides a multi-partner approach to CCUS and decarbonisation projects in Scotland.

## STRATEGICALLY LOCATED AND WELL CONNECTED

### A connected base.

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






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

Here is just a flavour of some of the unique locations where your energy business could flourish:

- **Energy Transition Zone, Aberdeen** – a dedicated zone for energy research, development, manufacturing, storage and distribution, including offshore wind, hydrogen and CCUS
- **Arrol Gibb Innovation Campus (AGIC), Rosyth** – a global centre of excellence to transform large-scale manufacturing, with extensive development, office and incubator space
- **Michelin Scotland Innovation Parc (MSIP), Dundee** – focused on driving innovation and R&D in sustainable mobility and low carbon energy, MSIP offers industrial spaces, cutting-edge research facilities and a Skills Centre of Excellence
- **UHI Power House, Alness** – a centre of excellence in future renewable energy technologies with co-working spaces and an educational hub focused on floating offshore wind and green hydrogen
- **Advanced Manufacturing Innovation District Scotland (AMIDS), Renfrewshire** – Scotland's home for manufacturing innovation, AMIDS houses the National Manufacturing Institute Scotland, business parks and new developments on a 52-hectare site next to Glasgow Airport
- **Nigg Energy Park, Cromarty Firth** – extensive port, development and office facilities, with plans to deliver green hydrogen to power part of the Port of Nigg's operations
- **Chapelcross Green Energy Park, Annan** – a large-scale strategic development site for green energy production, storage and distribution
- **Port of Cromarty Firth, Invergordon** – extensive port, development and collaborative workspaces, including a dedicated renewables into green hydrogen production and storage facility

## CONNECTED SUPPLY CHAIN & INFRASTRUCTURE

You'll find that Scotland's 60-year history of offshore engineering means we have unrivalled expertise in the safe, sustainable and profitable harnessing of energy resources. Our experienced and skilled supply chain and connected energy infrastructure can help you grow and succeed in Scotland:

<p><b>10,500+</b> SUPPLY CHAIN COMPANIES IN SCOTLAND'S RENEWABLES AND LOW CARBON INDUSTRY</p> 	<p><b>2000+</b> ENERGY AND ENGINEERING COMPANIES WHICH ALREADY SUPPLY <b>OFFSHORE OIL &amp; GAS</b></p> 	<p>A NETWORK OF STRATEGICALLY LOCATED <b>PORTS, HARBOURS, AND LARGE DEEP-WATER PLATFORMS AND RIG CONSTRUCTION SITES,</b> WITH EXTENSIVE LAYDOWN AREAS, PORTSIDE FACILITIES AND SUPPLY CHAIN</p> 	
<p><b>1000+</b> SCOTTISH COMPANIES EITHER INVOLVED OR INTERESTED IN THE HYDROGEN OPPORTUNITY</p>	<p><b>400+</b> COMPANIES CURRENTLY IN THE SCOTTISH LOW CARBON HEAT INDUSTRY CLUSTER</p> 	<p><b>ONSHORE AND OFFSHORE PIPELINES,</b> INFRASTRUCTURE AND CO<sub>2</sub> STORAGE FOR CCUS AND BLUE HYDROGEN</p>	<p><b>700</b> SUBSEA COMPANIES</p> 

# GET IN TOUCH

## WE'D LOVE TO WELCOME YOU

Scottish Development International has more than 30 offices throughout the world, and our global team is dedicated to helping you establish and grow your business in Scotland.

We'll support you before, during and after you set up in Scotland and can assist you with property searches, financial support, connections to academia and supply chain, talent and skills and professional advice.

To find out why **#SCOTLANDISNOW** for your company or to experience Scotland for yourself, get in touch and we will be happy to arrange this for you.

**NOW IS THE TIME TO INVEST IN SCOTLAND.  
WE'D LOVE TO WELCOME YOU**



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