LOW CARBON TRANSPORT IN SCOTLAND

#SCOTLANDISNOW
Welcome to Scotland
Fàilte Gu Alba

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

Scotland is where you will find excellence in education, a flair for invention and a penchant for research. It’s a place where great ideas become global standards.

We are committed to decarbonising and our government has shown global leadership in setting targets and policies and selecting investments according to these principles.

Scotland was the first country in the world to declare the Climate Change Emergency and pass world-leading climate change legislation, which sets a target date for net-zero emissions of all greenhouse gases by 2045.

We’ve already made good progress in reducing Greenhouse Gas (GHG) emissions from the power sector by deploying renewables, and the Scottish Government has now committed to take radical steps to decarbonise transport in Scotland. As such, opportunities abound for ambitious companies to locate in Scotland, and with strong public sector support, work with us as we work to reduce transport emissions.

You’ll find that local and national government, industry and academia in Scotland are uniquely connected, so change can be driven quickly.

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

With highly populated urban centres, sparsely populated islands and combination of mountainous and coastal terrain, Scotland is an ideal living lab for the development, testing and scale-up of new technology.

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 OPPORTUNITY

When it comes to low carbon transport, Scotland is leading the way. We have the resources, expertise, drive and determination to rise to the challenges of the climate change emergency.

Growing the low carbon transport industry has the full support of both the UK and Scottish governments, and there is significant private and public support for investments in low carbon transport projects.

BATTERIES & ENERGY STORAGE
As demand for battery cells in the automotive industry outstrips supply, Scotland is looking to develop its supply chain and scale up the production of batteries and battery packs, plus smart tech for battery systems. We are also investigating sodium-ion as a cheaper and more abundant element to further reduce battery costs and this will create areas of opportunity in Scotland for R&D and manufacturing.

There is a specific opportunity to develop this supply chain in Scotland, to reduce the UK’s reliance on overseas markets. Supplementary opportunities exist for battery recycling and reuse of batteries for second and third life use.

RAIL
Scotland’s ambition is to achieve zero emission railways by 2035, five years ahead of the rest of the UK. Our rail opportunity is based on a market of £48bn planned and committed investment in rail in the UK, with a £5bn investment in electrification projects and £3bn for rolling stock replacement in Scotland alone. There are also opportunities for companies to produce diesel alternatives for non-electrified routes, such as independently powered battery and fuel cell electric trains.

In addition to decarbonisation, investment at UK level in ‘mega’ rail infrastructure projects such as HS2 and Northern Power House Rail, provide a generational opportunity for the rail supply chain. We are working to grow industrial capability in Scotland to develop an outward looking cluster providing skills, innovation and supply chain capability to support decarbonisation of rail and delivery of projects on time and on budget.

HEAVY DUTY VEHICLES
Scotland is fast becoming a leading centre for the development of electric drive trains for heavy duty vehicles. We are establishing a series of platforms for R&D on different vehicle types including buses, trains, ferries, refuse & emergency vehicles. This is opening up exciting opportunities for companies to get involved in vehicle design, manufacturing, standardisation, safety and whole systems modelling, linking vehicle deployment with low carbon energy supply and refuelling infrastructure.

Scotland’s heavy populated urban areas and remote rural locations provide an ideal test bed for new electric vehicle development & deployment.

HYDROGEN
With strong knowledge and capabilities in hydrogen, yet a currently limited supply chain, Scotland offers plentiful opportunity for international companies active in this field. There are opportunities for fuel cell development, niche vehicle design and manufacturing, and additional supply chain opportunities include refuelling infrastructure, operation and maintenance, plus hydrogen safety and flow rate meteorology.

You can take advantage of the opportunity to work with Aberdeen Hydrogen Hub to develop a commercial supply of green hydrogen into the north east region or with Hydrogen Accelerator Initiative at the University of St Andrews to develop niche vehicles and optimise drive trains for specific applications.
A LEADING LIGHT FOR GLOBAL CLIMATE CHANGE

Since the Scottish Enlightenment, our small country has always been known as a nation of great thinkers. From advancements in medicine to agriculture, philosophy to engineering, Scotland is ahead of the curve and the transition to a low carbon economy is just the latest example of how the Scots are showing global leadership at a time of significant industrial change.

While the policy and direction on decarbonisation comes from the Scottish Government, this is an ambition the whole country is getting behind. We are aiming high; by 2032 we will phase out the need to buy petrol and diesel cars and vans and have plans to decarbonise Scotland’s railways by 2035.

By choosing Scotland for your low carbon transport project, you will be part of a connected business infrastructure, where expertise from across industry, academia and the public sector combines to transform current practices and research in the decarbonisation of transport.

You’ll also have access to a forward-thinking, environmentally conscious customer-base, which is already demanding battery powered transport and supports the concept of hydrogen fuel cells, biofuels and other emerging technologies.

Companies like yours will take comfort in knowing that Scotland is responding to the climate change emergency by making investments to reduce emissions.

PUBLIC INVESTMENT BANK - £2bn of patient public finance has been allocated to a new Public Investment Bank to decarbonise Scotland’s economy.

GREEN INVESTMENT PORTFOLIO - a £3bn green investment portfolio has been launched by the Scottish Government to attract new low carbon investments into Scotland.

You can be assured that when you make the decision to invest in Scotland, you’ll be in good company. We can all work together for a brighter future – for Scotland and for the entire planet.

DID YOU KNOW?

- The world’s first net zero aviation region is in the highlands and islands of Scotland and by 2040, all internal flights will be zero carbon
- Every one of Scotland’s city centres will be vehicle emission-free by 2030 thanks to a £80m investment in walking and cycling and a £500m investment in bus infrastructure
- The world’s largest fleet of hydrogen buses is located in Aberdeen and has already delivered over 1 million passenger miles
- The world’s first hydrogen-fuelled seagoing car and passenger ferry is scheduled for launch in Orkney in 2021
- Dundee was named Europe’s most visionary EV city in 2018 by the World Electric Vehicle Association and has the largest UK electric taxi fleet
- Scotland’s islands are home to some of the world’s most innovative projects integrating renewable energy generation and transport systems, including a number of hydrogen demonstration projects on Orkney
- The world’s first passenger-carrying autonomous bus will be the CAV Forth Project over the Forth Road Bridge
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.

Scotland’s academics have the ambition to be world leaders in sustainable development, and our universities and colleges understand their role in developing people that can meet the skillset required for the future.

**Heriot-Watt** - a world-leading centre for policy and innovation in transport logistics.

**University of St Andrews** - hosts the Fuel Cells & Batteries research project which, with funding from the Faraday Institution, aims to create a safe, cheap, long-lasting battery which could revolutionise electric travel and renewable energy storage.

**St Andrews University** - hosts the Fuel Cells & Batteries research project which, with funding from the Faraday Institution, aims to create a safe, cheap, long-lasting battery which could revolutionise electric travel and renewable energy storage.

**Strathclyde [Design, Manufacturing and Engineering Management]** - combines end-to-end multidisciplinary expertise from creative design, manufacture & management of an entire product or system.

**Edinburgh** - a world-leading informatics department, including the Bayes Centre.

**Napier** - a hub for the development of ULEVs, including Scotland’s longest established transport research group to solve practical problems and issues in transport.

Scotland is strongly represented in complimentary sectors such as advanced engineering and manufacturing. These industries can offer supply-chain skill sets well suited to diversification into low carbon-based opportunities, meaning you can unlock new value from our well-established expertise.

16 of Scotland’s colleges provide automotive training, with a number of those already including City & Guilds or IMI hybrid and electric vehicle courses as part of their training programmes. There are on average 1112 starts per year on the Automotive, Bus & Coach Engineering and Maintenance Modern Apprenticeships with a number of those already including City & Guilds or IMI hybrid and electric vehicle courses as part of their training programmes.

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, and with a highly responsive skills and education system, we will meet your needs both now and in the future.
A POWERHOUSE OF INNOVATION & INVENTION

Scotland’s long tradition of innovation remains as strong today as it ever has been. Smart, profitable ideas flow from the broad mix of multinational firms based here, and from the diverse business, academic and technology communities that support them.

As we transition to a zero-carbon emissions economy, the focus for Scotland is on creating innovations which will deliver against our sustainable objectives and make a real difference in the areas that matter.

We can achieve this by working with strong partners and with the connected and world-leading academic clusters in Scotland. And when you locate in Scotland, you become part of this dynamic business environment.

Scotland is already home to many ambitious low carbon transport projects, and has led the way in demonstrating a number of zero emission transport solutions.

Destination Innovation
The Connected Places Catapult recognises Scotland’s efforts to transform the transport industry. By having a base in Scotland, the Connected Places Catapult hopes to harness Scotland’s ongoing efforts to transform the future of the transport industry. It focuses on growing businesses with innovations in mobility services and connects public and private sectors, local government and transport authorities, to drive new commercial opportunities in places.

The Michelin-Scotland Innovation Parc (MSIP) provides an environment for innovation and R&D in sustainable mobility. It has excellent infrastructure, connectivity and space to grow as well as green energy and heat supplied from local sustainable sources. This is another pin in Scotland’s map of excellence in sustainable mobility. A key aspect of MSIP will be the creation of a Skills Centre of Excellence creating a talent pipeline with the right skills and a fully equipped environment for businesses to upskill and train staff across the sector.

With world-leading scientific expertise, state-of-the-art research facilities, a pool of highly skilled personnel and a growing cluster of companies engaged in decarbonising transport, we believe Scotland has what you need.
Innovation in low carbon rail
Scotland is leading on rail decarbonisation through a new innovation project, the Power of Tomorrow Innovation Train. Led by Scottish Enterprise and Transport Scotland, the project is engaging with Scottish SMEs and academics to convert a train provided by ScotRail to battery and hydrogen fuel cell electric.

The project is aimed at accelerating development and deployment of battery electric and fuel cell electric powered trains, providing alternatives to diesel for non-electrified lines. This will build Scotland’s innovation and supply chain expertise related to zero emission rail.

Innovation in hydrogen-powered vehicles
Port Glasgow-based Ferguson Marine Engineering Limited has successfully led a European consortium in a bid for EU funding support to pave the way for the world’s first sea-going car and passenger ferry fuelled by hydrogen – Hyseas III. The supported development is expected to cost around €12.6m and the vessel’s fuel will be produced from renewable electricity marking an important step in the journey towards emission-free marine transport.

Innovation in batteries & energy storage
The University of St Andrews – together with other academic and industrial partners in the UK and overseas through the Faraday Institution – is currently working to accelerate the development of sodium-ion battery technology by taking a multi-disciplinary approach incorporating fundamental chemistry right through to scale-up and cell manufacturing.

Glasgow City Council has commissioned an innovative hydrogen-powered refuse truck which is one of the first of its kind in the world.

Alexander Dennis Ltd has been at the forefront of innovation in zero emission buses, leading the market in the development of double decker battery and hydrogen powered vehicles with specialist international partners.

CAV Forth is a world-leading project which will provide a globally significant demonstration of UK autonomous bus capability along a 14-mile route across the Forth Road Bridge between Fife and Edinburgh. This multi-partner approach will see the autonomous bus service operate on a trunk road network from Fife, across the Forth Road Bridge Public Transport.

#SCOTLANDISNOW | 7
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 transport project.

Community is an important part of doing business in Scotland. Here you’ll find plenty of opportunities to network, like the Energy Technology Partnership (ETP), the largest and most broad-based energy research partnership in Europe, and Transform Scotland, the national alliance for sustainable transport.

For companies which want to be part of something bigger, there’s the Transport Research Institute, part of Edinburgh Napier University. With a strong reputation for its work in electric vehicles, the Institute works with partners at other academic institutions across Scotland and beyond and has strong links with industry and governments worldwide.

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 likeminded talent. The Innovation Hub based at MSIP, currently under development, will be specifically designed for collaborative use by industry and academia focused on sustainable mobility.

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.

Here’s a flavour of how our centres are exploring topics relevant to sustainable mobility:

**NMIS: the National Manufacturing Institute Scotland (NMIS)** is an industry-led international centre of manufacturing expertise, which aims to make Scotland and the UK a global leader in advanced manufacturing. Industry, academia and public-sector support bodies are working together to transform skills, productivity and innovation in the sector, with the AFRS and Lightweight Centre already underway.

**CENSIS: industry-led Innovation Centre for Sensor and Imaging Systems (SIS)** enables collaboration at the forefront of market-focused SIS innovation, developing products and services for global markets, with expertise in Smart Transport applications.

**Power Networks Demonstration Centre (PNDC)** enables accelerated technology testing alongside a portfolio of research programmes across the full Smart Grid domain.

And with 50-250 hectare strategic sites with utilities, road, rail, port and airport infrastructure in place and intact as logistics, manufacturing and supply chain hubs, you will have easy access to supply chains and markets in Scotland, the rest of the UK and across the globe.

**OUR CONNECTED BUSINESS INFRASTRUCTURE WILL TAKE YOUR BUSINESS TO THE NEXT LEVEL**
STRATEGICALLY LOCATED AND 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 and connected supply chains.

Scottish Enterprise is funding a Cluster Builder project for the emerging Low Carbon Transport sector to bring the sector together to share learning and foster collaboration and is expected to go live in autumn 2020.

The Low Carbon Infrastructure Transition Programme (LCITP) aims to support Scotland’s transition to a low-carbon economy. Through this programme, companies like yours can access a range of support, from expert advice to financial support to assist the development and delivery of private, public and community low-carbon projects across the country.

Making the most of our natural resources
Largescale renewable energy resources such as wind, wave and tidal are now being linked to storage and markets in the UK and Europe. Scotland has the greatest wind resource in Europe (25%) and some of the highest capacity factors. Efficient energy storage will help unlock the potential to use Scotland’s abundant natural resource to power our transport requirements.

As such, there are plans to situate hydrogen production close to wind farms, which will use surplus electricity to reduce cost of hydrogen, making your low carbon transport project more cost efficient.

Connections that matter

Can Do Innovation Challenge Fund - a national fund which supports Scottish public sector organisations to find and develop innovative solutions. Currently working on a number of transport-related challenges in the public sector with private sector solution providers.

MAAS Scotland - a network of over 75 public and private sector organisations from across the MaaS supply chain, offering a community of potential partners which share a goal to develop and upscale MaaS solutions across Scotland.

Energy Technology Partnership - links academic expertise in energy and transport with companies in the sector. It aims to translate excellent research into economic impact by contributing to a Scottish world-leading research base, creating economic impact through communication and knowledge exchange and supporting the energy sector with the skills it needs.

SHFCA - the Scottish Hydrogen and Fuel Cell Association (SHFCA) promotes and develops Scottish expertise in fuel cells and hydrogen technologies. It brings together specialist fuel cell and power generation companies, academic institutions, R&D bodies and consultants with local enterprise companies and local authorities to provide a coherent voice to represent, promote and develop Scottish hydrogen and fuel technologies.
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. You can also access a dedicated business advisor, via our Account Management service (subject to eligibility).

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.
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

**FERRY PORTS AND 2 CONTAINER PORTS**
connect to mainland Europe

**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.
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.

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

investment@scotent.co.uk
+44 300 013 2734
www.linkedin.com/company/scottish-development-international
@scotdevint
www.youtube.com/user/sditv

GET IN TOUCH
WE’D LOVE TO WELCOME YOU