

High Potential Opportunity

# Floating Offshore Wind Manufacturing

An opportunity to establish portside manufacturing facilities for the serial production of floating substructures and associated components, close to huge deployment opportunities in the world's first floating offshore wind market of scale.

The Cromarty and Moray Firths, Scottish Highlands



Department for  
International Trade



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## Floating Offshore Wind in Scotland

Home to the world's first floating wind farm (Hywind Scotland), and the world's largest (Kincardine), Scotland is a global leader in the deployment of floating offshore wind and is set to host some of the world's first commercial-scale floating wind projects.

A unique opportunity exists to establish portside manufacturing facilities in the Cromarty and Moray Firths to meet the growing demand for floating substructures, mooring systems, dynamic cables and substations. The region is home to the leading floating wind cluster in Europe and ideally located to access commercial-scale floating wind development sites.

**IT'S YOURS TO BUILD**



# 1

## Seize a sea of opportunity to develop and manufacture substructures and components for floating offshore wind

### Executive Summary

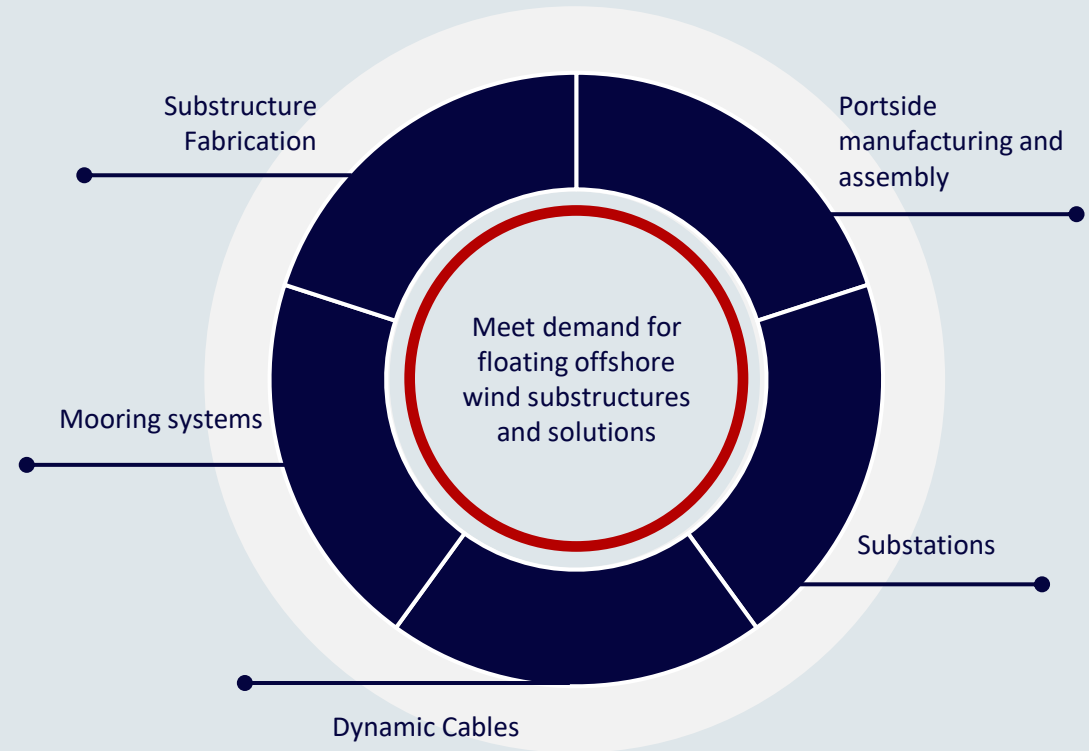
Meet growing national and international demand for floating wind substructures and components.

**There is a commercial opportunity to establish manufacturing facilities for the serial production of floating substructures and associated components in the Cromarty and Moray Firths, to capitalise on the vast scale and rapid development of the floating wind market in Scotland, the UK and beyond.**

Floating wind is attracting increasing investment and public policy support because it can unlock 80% of the world’s offshore generation potential, which exists within water depths exceeding 60 metres. These deeper waters tend to be further offshore, where wind is typically more consistent, but where bottom-fixed offshore wind support structures are less feasible technically, logistically, and economically.

In Scotland and around the UK, projects are anticipated to grow in scale from 2022 to 2035 – from small demonstrator projects to full scale commercial projects. ScotWind, the Scottish offshore wind leasing programme, has awarded leases for up to 25GW of offshore wind capacity. Floating wind projects make up 60% of this capacity. Additionally, the Innovation and Targeted Oil and Gas (INTOG) leasing process could add a further 4.5GW of floating wind. These projects will create a clear pipeline of demand for floating substructures, sub components, and related services.

The Cromarty and Moray Firths, are locations ideally positioned to meet this demand; home to a cluster of floating wind developers, close proximity to floating wind sites, suitable port infrastructure, and proven capability in subsea and offshore engineering.





# 1

## Executive Summary

Establish your business in a location primed for investment in floating wind fabrication.

## Co-locate with Europe's leading floating offshore wind cluster, in a region primed to capitalise on a rapidly growing pipeline of projects.

The Cromarty and Moray Firths offer access to ideal portside fabrication and assembly facilities, a highly-skilled and experienced energy industry workforce, a world-class research and innovation community, and a growing industry cluster of potential customers and partners.

Directly access a **growing pipeline of projects from a strategic location**. Crown Estate Scotland has awarded leases for up to 25GW of offshore wind capacity from 17 projects around the coast of Scotland for ScotWind.

**Gain competitive advantages through portside fabrication and assembly**; ports in the Cromarty and Moray Firths have the infrastructure and technical capability required.

Gain direct access to a **core of highly-skilled engineering students and specialist energy, engineering and offshore talent**; 46,500 people are employed in Scotland's low carbon sector.

Integrate with **globally leading research and innovation centres**; including the Offshore Renewable Energy (ORE) Catapult and National Manufacturing Institute Scotland.

**Benefit from customers and partners on your doorstep**: the region's DeepWind cluster contains leading floating wind developers and supply chain companies.

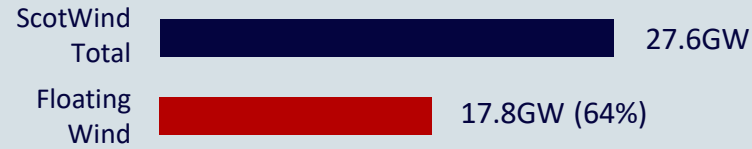
Profit from **competitive salary costs**; lower than other key markets such as Norway, France, Ireland and Spain.





# ScotWind Leasing Successful Floating Bids

The scale of the floating wind projects in the ScotWind leasing round will make Scotland the largest market in the world for this emerging technology and offers the potential for a large proportion of the components for these wind farms to be manufactured in Scotland.



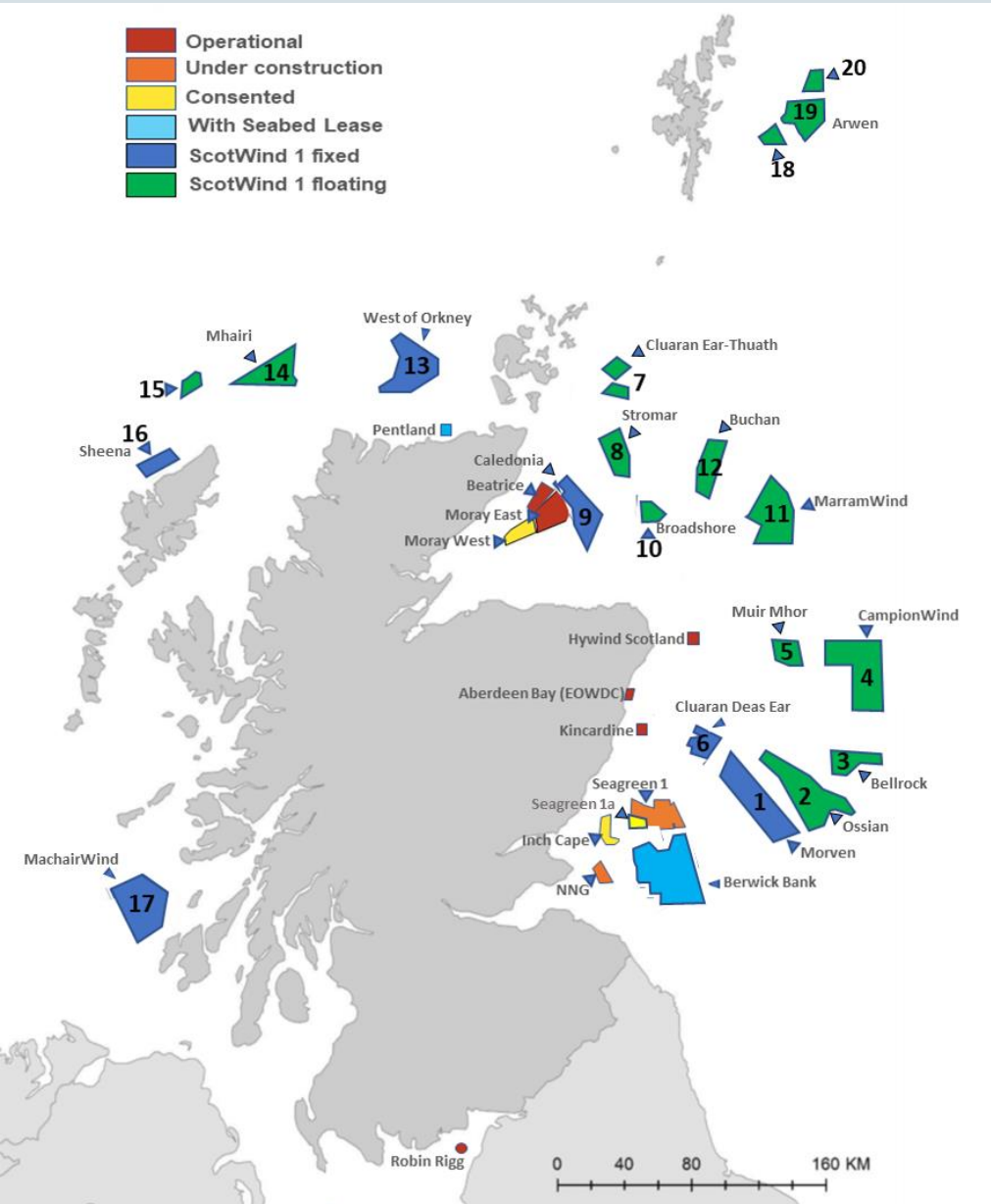
Site	Developers	Floating Capacity
2	SSE Renewables, CIP and Marubeni	2,610MW
3	Falck Renewables and BlueFloat Energy	1,200MW
4	Shell and ScottishPower Renewables	2,000MW
5	Vattenfall and Fred. Olsen Renewables	798MW
7	Thistle Wind Partners (DEME, Aspiravi and Qair)	1,008MW
8	Falck Renewables, Ørsted and BlueFloat Energy	1,000MW
10	Falck Renewables and BlueFloat Energy	500MW
11	Shell and ScottishPower Renewables	3,000MW
12	Floating Wind Alliance (BayWa r.e., Elicio, BW Ideol)	960MW
14	Northland Power	1,500MW
15	Magnora ASA and Technip UK	495MW



We want to help build strong local supply chains capable of competing nationally and internationally. This also supports local communities and provides opportunities to learn new skills and have long-term careers in a huge variety of roles.

Danielle Lane, UK Country Manager, Vattenfall

- Operational
- Under construction
- Consented
- With Seabed Lease
- ScotWind 1 fixed
- ScotWind 1 floating





# 2

## The Opportunity

Capture a significant market for floating wind substructures and components.

Pipeline of Floating Wind Projects

Substructure Fabrication

Portside Manufacturing & Assembly

Mooring Systems

Cables and Substations

## Capitalise on a growing pipeline of development projects

The potential scale of the market for floating substructures is enormous, both in Scotland and the rest of the UK, and globally. In Scotland, projects are anticipated to grow from now until 2030 – from small demonstrator projects to full-scale commercial projects.

### Scottish pre-commercial scale projects

The global floating wind industry is currently at the pre-commercial stage.

With Equinor's Hywind Scotland project, and ACS's Kincardine project recently completed, Scotland is home to the two largest floating offshore wind projects in the world. This growth is set to continue with pre-commercial projects such as the 100MW Pentland project off Dounreay.

These projects provide an opportunity to de-risk floating wind technologies for future commercial projects.



Kincardine

### ScotWind has attracted leading floating offshore wind developers

Crown Estate Scotland, through ScotWind, has awarded leases of up to 25GW of offshore wind capacity from 17 sites around the coast of Scotland. Commercial scale floating wind projects make up 60% of the total ScotWind capacity. The 11 floating wind sites will deliver 15GW of capacity. This first ScotWind, with more to follow, attracted over 70 applications from developers. The projects were announced on the 17th of January 2022, and most should be delivered by 2027-2032.

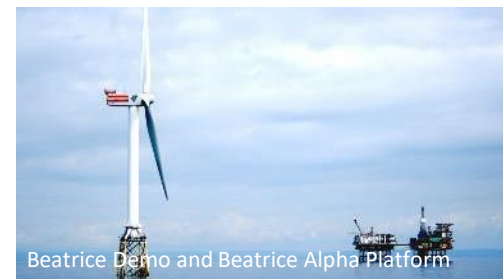


Hywind Scotland

### Energy Transition Market

The oil and gas industry are looking to electrification to decarbonise their platforms on the UK Continental Shelf (UKCS). The North Sea Transition Authority, the UK regulator, has set an industry target of a Net Zero Basin by 2050.

The INTOG leasing round will see up to an additional 4.5GW of floating wind aimed at the decarbonisation of the oil and gas facilities in the North Sea through electrification with this renewable power. Flotation Energy's 300MW Green Volt Project is an oil and gas energy transition project to provide renewable electricity to a major oil and gas platform. Construction is expected to start in 2025.



Beatrice Demo and Beatrice Alpha Platform

In addition to the vast Scottish market, it is projected that commercial-scale floating wind will grow and develop in the wider UK and globally over the next decade.

This is a unique opportunity to work with leading international floating offshore wind developers on some of the world's first commercial-scale floating wind projects – forging relationships that could put your business in pole position for future global opportunities.

Sources: DeepWind Cluster, Floating Offshore Wind presentation, 2021; Offshore Wind Scotland: Scottish Offshore Wind Market, 2021; OGA: UKCS Energy Integration, Aug 2020



# Manufacture the substructures required to power the floating wind industry

There is a commercial opportunity to establish a manufacturing facility in the Cromarty and Moray Firths for the serial production of floating substructures to serve the growing pipeline of floating wind projects.

With floating offshore wind, the turbine is installed on a steel, concrete, or hybrid floating substructure, which is anchored to the seabed by mooring systems consisting of flexible anchors, chains or steel cables.

Substructures to date have been largely bespoke with a wide range of designs. The four most prominent substructure types are:

- › Semi-submersible
- › Spar (vertical floating columns)
- › Barge
- › Tension-leg platform (TLP)

The choice of substructure type will depend on sea and seabed conditions, the winds in the area, the size of the turbine, and the depth of the harbours.



Source: Iberdrola, Floating offshore wind power, 2021;  
 Emerald Floating Wind, Technology, 2021  
 ORE Catapult, FOW Cost Reduction Pathways to Subsidy Free, Dec 2020;  
 Scottish Renewables: Floating Wind, The UK Industry Ambition, Oct 2019;  
 DeepWind Cluster, Floating Offshore Wind presentation, July 2021;  
 Offshore Wind Innovation Hub, Substructures, 2021

## Fill the gap in the supply chain to manufacture substructures at scale

The UK FOW supply chain in almost all areas is assessed as being ready, or having a clear path to readiness, for commercial-scale floating wind projects. The notable exception to this is substructure fabrication. Scotland’s DeepWind cluster contains a number of companies capable of fabricating substructure components but, as yet, there is no single company looking at serial substructure fabrication or assembly. There is an opportunity for a company with expertise in the fabrication and assembly of large steel or concrete structures to capitalise on this lucrative gap in the supply chain.

## Benefit from cost reduction pathways

In addition to a clear pipeline of commercial scale projects unlocking economies of scale, cost reduction will be driven by a combination of continued technology optimisation and innovation, increasing standardisation and targeted port investment.

Collaborate with Scotland’s leading innovation ecosystem to realise cost advantages from advances in fabrication and assembly facilities and processes, such as advanced manufacturing and robotic welding.

## A clear market of scale

# 1000+

substructures required in Scotland by 2032

Project	No of substructures required
100MW Pentland project	10
500MW innovation projects from INTOG	28
4,000MW of Energy Transition projects (INTOG)	222
15,000MW of ScotWind projects	833

- Pipeline of Floating Wind Projects
- Substructure Fabrication
- Portside Manufacturing & Assembly
- Mooring Systems
- Cables and Substations





# Gain a competitive advantage through portside fabrication and assembly in the Cromarty Firth

Ports in the Cromarty Firth have significant potential for floating substructure fabrication and assembly facilities, based on existing infrastructure and technical capability, proven expertise in delivering major energy projects, and a central position relative to the ScotWind floating wind sites.

### Prime location and proven supply chain

- › Proximity to ScotWind development sites
- › Proven supply chain of world-class energy companies
- › Significant track record in completing major energy and engineering projects

### £110m of Infrastructure investments ensuring the ports are equipped to support the future offshore wind sector

- › Large fabrication and assembly facilities
- › Vast deep water quaysides
- › Sheltered deep water anchorages
- › Unrivalled dry dock capability
- › Wet dock facility
- › Extensive laydown and storage areas
- › Heavy lift and servicing facilities



### Fabrication and assembly close to wind farm sites is crucial to keep costs down

The next generation of substructures will have diameters in the 70-80m range to accommodate 15-18MW turbines. Transporting substructures of this size over any distance will be very expensive, with semi-submersible heavy lift vessels capable of transporting only one unit. The final assembly with the turbine installed on the substructure can only be towed at 3-3.5 knots, meaning units assembled outside Scotland would take days to transport to the wind farm site, involving a much higher weather window risk.



Sources: Scottish Energy Ports Capability Directory, 2021; Port of Nigg, 2021 DeepWind Cluster, Floating Offshore Wind presentation, July 2021 Port of Cromarty Firth, News, Partnership with global leader in floating offshore wind, 2021;

### Case Study: Global leader in floating offshore wind to establish serial manufacturing yard in the Cromarty Firth

Port of Cromarty Firth has signed a Letter of Intent with BW Ideol, a global leader in floating foundations for offshore wind. The agreement would see the French-headquartered company and its future local construction partners use the Port's land and Firth berthing sites and cooperating towards further developing the facilities and infrastructure to establish a concrete hull serial manufacturing yard for their 960MW floating wind project.

BW Ideol has partnered with Elicio and BayWa r.e, both leading wind farm developers and operators, to form the Floating Wind Alliance consortium which went on to win a ScotWind site from Crown Estate Scotland.

“This partnership shows the vital manufacturing role the Port can play in the rapid expansion in renewable projects off Scotland’s shores. We have some of the best marine resources in the world and are in close proximity to around 14 of the 15 areas identified in the Crown Estate Scotland’s marine plan for offshore wind development”.

*Bob Buskie, Port of Cromarty Firth Chief Executive*

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# Secure opportunities to manufacture and supply dedicated mooring systems and anchor solutions

## Mooring systems

Mooring is the element that fixes and flexibly connects the floating substructure to the anchoring point on the seabed. Two main types of mooring systems are commonly used: catenary and taut mooring. The choice of mooring system depends on variables such as the depth, the type of floating platform and the meteorological conditions (waves, currents, winds). In floating wind, catenary mooring has been deployed for semi-submersible, spar and barge-type substructures.

Several components compose a mooring system: mooring lines, connectors, clump weights and anchors.

## Anchors

Anchors are the elements that connect the moorings to the seabed. The anchor type used depends on the mooring system configuration, characteristics of the seabed and the environmental loads.

### Anchor types:

- › Drag anchor
- › Suction anchor
- › Driven piles
- › Drilled piles
- › Gravity anchor
- › Vertically loaded

### Cost reduction in mooring systems could be achieved through innovations such as:

- › Improvements in design standards, standardisation of components,
- › Use of novel materials (including synthetic rope)
- › Optimisation of array layouts

A more integrated design interface between anchors, mooring system and substructure would enable further benefits and speed up installation and major repair operations.

The table below shows component number projections for Scotland based on **1,000 substructures**.

Component	Per substructure	Total required
Anchors	3-4	3,000-4,000
Mooring chain/rope	*720m - 2,400m	*720km - 2,400km
Clump weights	150t - 180t	150,000t-180,000t

\*60-100m water depth

## Case study – UK-based oil and gas anchor specialist capitalising on new FOW opportunities

Bruce Anchor is a British company specialising in drag-embedded anchors and associated equipment design. Originally the company provided anchors for the oil and gas industry, but has since successfully diversified into offshore renewables. Bruce Anchor has been involved in multiple floating offshore wind projects both in the UK and abroad. The company is developing a drag embedded anchor specifically for floating offshore wind. This anchor will be able to provide the same holding capacity as bigger units, but at a significantly reduced weight and, as the consequence of reduced weight, at a fraction of the transportation costs.



Drag Embedment Anchor  
Picture credit: Bruce Anchor

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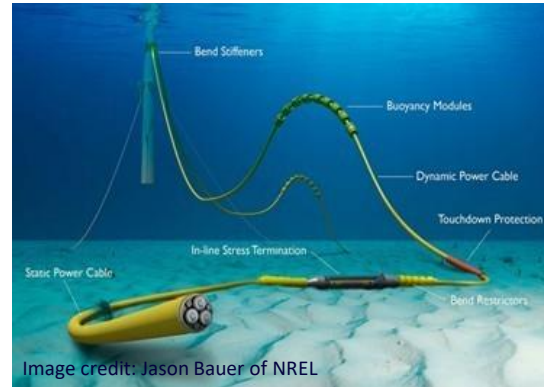
Cables and Substations

## Capture the market for dynamic cables and cable components with innovative solutions

### Dynamic Cables

FOW requires dynamic, high-capacity subsea cable systems to collect and export the power they generate. The cable needs to be 'dynamic', as it connects the moving substructure to a fixed element (the seabed).

In addition to the cable, a number of supporting components are required to allow limited movement and to protect the cables and the connection with the static array cables on the seabed.



### Develop industry leading solutions to cable design challenges

- › Optimise cable connection systems to reduce the time taken to connect and disconnect cables.
- › Improve cable design to withstand the different loadings dynamic cables are under in site conditions at FOW sites.
- › Innovations required in both static and dynamic cable design to provide higher voltage array cables for projects using higher rated turbines.

Sources: ORE Catapult, FOW Cost Reduction Pathways to Subsidy Free, Dec 2020; DeepWind Cluster, Floating Offshore Wind presentation, July 2021; Windpower Engineering: New cable designs are critical for floating wind turbines, Dec 2020

## Develop Offshore Substations for commercial-scale projects

### Offshore Substations (OSS)

Substations have not been needed for demonstration floating wind projects as they generate limited levels of power that can be exported directly to shore. However, commercial scale projects, with significantly higher power outputs, will require OSS to host a step-up transformer and the equipment necessary to export power in high voltage. With commercial scale projects on the horizon, substation solutions are attracting greater attention and investment from leading industry players.

#### Bottom-fixed substation foundations

For early commercial floating windfarms, where water depths allow, fixed-bottom structures may be preferred to limit the risks and costs associated with new technologies. A bottom-fixed OSS could be economically competitive in water depths of up to 100m, a depth not unusual for oil and gas fixed platforms.

#### Floating substation foundations

Required for access to wind farm sites in water depths not suitable for fixed bottom foundations.

The different concepts foreseen for floating OSS foundations are similar to designs utilised for wind turbines: semi-submersibles, tension leg platforms (TLP), barge, or even spars. French company BW Ideol and Hitachi ABB are developing scalable floating substations based on a barge design.

Locating in the Cromarty and Moray Firths offers the unique opportunity to collaborate with industry and world leading centres of excellence, combining expertise in bottom-fixed offshore wind and oil and gas substructures, to take a leading role in developing OSS required for commercial-scale projects.

Sources: DNV: Articles, Floating Substations: the next challenge on the path to commercial scale floating windfarms, 2021; Offshore mag: BW Ideol enters floating wind substation agreement, Jun 2021

Pipeline of Floating Wind Projects

Substructure Fabrication

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Mooring Systems

Cables and Substations

Component	Per substructure	Total required
Dynamic cables	2	2,000
Buoyancy modules	2	2,000
In-line cable connectors	2	2,000
Bend restrictors	4	4,000

Component number projections for Scotland based on 1,000 substructures.

# Explore the Cromarty and Moray Firths, Scottish Highlands

A compelling case for your business

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SKILLS & RESEARCH

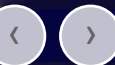
CLUSTER INFORMATION

SOFT LANDING LOCAL SUPPORT

GOVERNMENT SECTOR SUPPORT

CASE STUDIES





# 3

## Skilled and experienced workforce ready to support your investment

Scotland has a highly skilled and experienced workforce in the energy and offshore renewables industries and a strong pipeline of talent benefiting from targeted skills initiatives.

### Skills & Research

Capitalise on world-class research, and access the skills you need to succeed now and in the future.

Ambitious skills Initiatives to meet Industry demand

Dedicated training network for the offshore wind industry

19,800 Students in engineering & technology

46,500 Employed in Scotland's low carbon sector

1

### Existing skills base

Scotland has the specialist energy, engineering, and offshore talent that the industry requires with over 46,500 highly-skilled people working in the low carbon sector and a large pool of transferable talent from the 101,400 people employed in the oil and gas industry.

2

### Skills base for the future

Scotland is investing in ambitious skills initiatives to meet industry demand. The Energy Skills Partnership (ESP) is a collaboration of Scotland's colleges and industry partners established to deliver the right skills for the energy and engineering sectors.

A steady stream of engineering talent with almost 20,000 students undertaking a degree-level course in engineering and technology.

3

### Access skills training

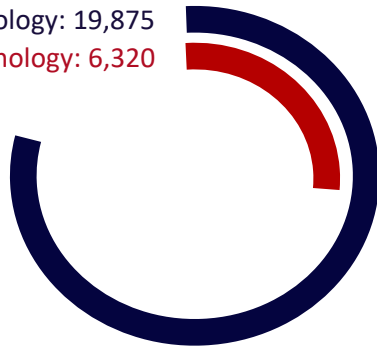
ESP's growing Wind and Marine Training Network, a college network to support large-scale renewables across Scotland, has supported the development of the Global Wind Organisation (GWO) Wind Turbine Technician course delivered at 3 colleges; Fife, Ayrshire, and Dumfries and Galloway. To date the network has supported over 600 Wind Turbine Technicians and 100 Apprentices.

Nigg Skills Academy, based in the region at Nigg Energy Park, delivers Modern Apprenticeships and up-skilling courses in Advanced Fabrication and Welding, producing 'work ready candidates for the renewable energy industry.

## Leading institutions developing a pipeline of talent for your business now and in the future

Universities and colleges in Scotland are supporting a steady pipeline of students and graduates educated for the offshore wind industry.

Students in engineering & technology: 19,875  
 Graduates in engineering & technology: 6,320



Globally ranked universities such as Heriot Watt University and the University of Strathclyde offer degrees in relevant courses.

Students currently studying at Scottish Higher Education institutes



Mechanical Engineering



Electronic and Electrical Engineering



General Engineering



Production and Manufacturing Engineering

The graduate pool is strengthened by courses tailored for the offshore renewable energy industry and world-class research centres.

### University of the Highlands and Islands

9,525

students across all subjects

UHI has three campuses in the area with Inverness College, North Highland College and Moray College delivering degree level engineering courses and modern apprenticeship courses suitable for the offshore wind industry. North Highland is also planning to join the ESP College GWO training network for wind turbine technicians.

### University of Strathclyde, Glasgow

22,640

students across all subjects

The Kelvin Hydrodynamics Lab tank provides excellent conditions for measuring the performance of floating and underwater structures. Strathclyde offers degree level engineering courses and a range of industry-relevant postgraduate courses including Offshore Floating Systems and Subsea & Pipeline Engineering.

### University of Aberdeen

14,775

students across all subjects

Offers engineering courses and postgraduate courses, such as Offshore Engineering and Advanced Structural Engineering, designed to equip students with the skills needed to work in the offshore engineering sector.

### Heriot Watt University

10,935

students across all subjects

Home to the Orca Hub, a multimillion-pound programme developing autonomous systems for the offshore renewable sector, such as robotic solutions to inspect and repair wind-turbines sub-structures and energy cables. Offers courses in engineering, Robotics and Marine Renewable Energy.

### Centre for Doctoral Training (CDT) in Wind and Marine Energy Systems and Structures

A comprehensive doctoral training programme bringing together the leading UK research groups in Wind Energy and Offshore Structures at Strathclyde, Marine Energy at the University of Edinburgh and Offshore Structures at the University of Oxford.



## Benefit from pioneering research capability and collaborative practice

Access significant innovation networks through universities, national research assets and specialist offshore wind industry research bodies, dedicated to enabling the transfer of technology from research to industry applications.



FLOATING OFFSHORE WIND  
CENTRE OF EXCELLENCE



### Offshore Renewable Energy Catapult (OREC)

The UK's leading innovation centre for offshore renewable energy, operating the world's most comprehensive, open-access test facilities to enable the scale-up of offshore renewable energy technologies. OREC's 200-strong team has extensive technical and research capabilities, industry experience and track record.

OREC work with companies across the supply chain reducing the cost and risk of technology development and operations. OREC provides solutions to validate designs, manufacturing processes and product reliability. This enables you to bring products to market earlier and with greater confidence. [www.ore.catapult.org.uk](http://www.ore.catapult.org.uk)

### Floating Offshore Wind Centre of Excellence

Established by the ORE Catapult to develop an internationally recognised initiative to reduce the cost of energy from floating wind. The Centre will accelerate the build-out of floating farms, create opportunities for the UK supply chain, and drive innovations in manufacturing, installation and O&M. The Centre is a collaborative programme with industry, academic and stakeholder partners. Industry partners include: BP, EDF Energy, Equinor, Ørsted, RWE, ScottishPower Renewables, SSE Renewables and Shell.

The Centre has published market projection reports for floating wind, available for download [here](#).

[www.ore.catapult.org.uk/what-we-do/innovation/fowcoe](http://www.ore.catapult.org.uk/what-we-do/innovation/fowcoe)

### ETP

The largest energy research partnership in Europe, with 250 academics and 600 researchers, ensuring easy access to world-class capability, resources and collaboration. ETP is the Scottish academic research pool for energy, an autonomous alliance of 13 independent Scottish Higher Education Institutions, each with areas of outstanding research capability in the energy sector. ETP is forging links between Scotland's world leading universities and the offshore wind industry.

[www.etp-scotland.ac.uk](http://www.etp-scotland.ac.uk)

## World-leading Energy Transition programmes

### Net Zero Technology Centre (NZTC)

With £180 million funding from the UK and Scottish Governments, NZTC supports the oil and gas industry to develop and deploy technology to accelerate the transition to an affordable net-zero future.

### NZTC Roadmap

Offshore renewables is a priority area of the Energy System Integration Programme and the Roadmap targets reducing the cost of floating offshore wind from £175/MWh to £50MWh by 2030.

[www.netzerotc.com](http://www.netzerotc.com)

### Energy Transition Alliance (ETA)

The ETA, formed by the NZTC and the ORE Catapult, will collaborate with the energy industry to drive a focused, funded programme to develop advanced technologies, including floating offshore wind. The ETA is launching an ambitious programme of five initial projects, which include a UK supply chain specific floating wind foundation competition: stimulating innovation in floating wind, to reduce the cost of floating foundations by 25-30%.

[www.ore.catapult.org.uk/stories/energy-transition-alliance](http://www.ore.catapult.org.uk/stories/energy-transition-alliance)





## Key assets and capabilities to help you accelerate the delivery of market-ready solutions



**Lightweight Manufacturing Centre**



### National Manufacturing Institute Scotland (NMIS)

The key advanced manufacturing research body in Scotland, with its Advanced Forming Research Centre and Lightweight Manufacturing Centre both offering significant resources to the offshore wind industry.

[www.nmis.scot](http://www.nmis.scot)

### Lightweight Manufacturing Centre

Hosted and operated by the University of Strathclyde, the centre focuses on developing novel lightweight solutions to help manufacturing businesses overcome challenges. Through working with the Centre companies can access world-class technologies and expertise in a breadth of processes and materials.

[www.strath.ac.uk/workwithus/lightweightmanufacturingcentre](http://www.strath.ac.uk/workwithus/lightweightmanufacturingcentre)

### Advanced Forming Research Centre

A globally-recognised Centre of Excellence in innovative manufacturing technologies, R&D, and metal forming and forging research. The Centre de-risks and accelerates the introduction of new technologies, materials and processes.

[www.strath.ac.uk/research/advancedformingresearchcentre](http://www.strath.ac.uk/research/advancedformingresearchcentre)



### National Subsea Centre (NSC)

Robert Gordon University and NZTC have partnered to create the NSC, a multi-million-pound Centre of Excellence for Subsea Research Technology development. NSC harnesses the university's academic expertise and facilities to establish a world-class R&D centre; providing industry-led, applied academic research and technology development, with a focus on the fields of subsea engineering, AI, and integrated energy.

[www.nationalsubseacentre.com](http://www.nationalsubseacentre.com)



### ORCA Hub – Offshore Robotics

Led by the Edinburgh Centre for Robotics from Heriot-Watt University in Edinburgh, ORCA Hub is made up of a collaboration of leading UK universities. With industrial partners, including EDF and SeeByte, the team is developing autonomous systems that can inspect and repair wind-turbines sub-structures and energy cables. By engaging with the ORCA Hub you will gain access to early stage technology that could benefit your business and differentiate you from your peers.

[www.orcahub.org](http://www.orcahub.org)

### £60 million boost for innovative floating offshore wind technologies

The government has awarded £31.6 million in grant funding, matched by more than £30 million from industry, for demonstration of innovative floating offshore wind technologies. Eleven projects were funded, covering 5 challenge areas:

1. Dynamic cables
2. Anchorings and moorings
3. Floaters and foundations
4. Industry defined innovation (other technology, not 1, 2 or 3)
5. Integrated demonstration of multiple technologies

By stimulating development now through the Floating Offshore Wind Demonstration Programme, the costs of building and locating floating turbines in deep-water areas will come down faster, increasing the rate of deployment and growing the UK supply chain.





# 4

## Cluster Information

Strong connectivity and access to the rest of the UK and the world.

### Get connected to the world

A connected transport network providing easy access to the rest of the UK, Europe and beyond.





## Capitalise on a clear customer, partner and supply base

Scotland is a global leader in floating wind and offshore renewable energy, driven by over 50 years of expertise in the energy industry, a proven supply chain and one of the most highly skilled and experienced energy workforces in the world.

### DeepWind Cluster

DeepWind is the offshore wind supply chain cluster in the North of Scotland, and the leading floating wind cluster in Europe.

- > 680+ members
- > 220+ Floating Wind Subgroup members
- > 36+ Offshore wind developers
- > Members comprise developers, tier 1 companies, supply chain companies, ports and harbours, academia and local government.

**This extensive cluster offers a powerful conduit into the UK's offshore wind sector for inward investors.** DeepWind will work with investors to make connections to its supply chain members.

### Floating Offshore Wind Subgroup

Members cover all aspects of floating wind including substructures, mooring systems, anchoring, installation, electrical systems (connectors and dynamic cables), subsea surveys and inspections.

Members comprise:

- > Leading floating wind developers as well as international substructure design and supply companies who together are responsible for many of the current and future floating wind projects either operational or planned
- > Infrastructure members representing over 25 ports and harbours in Scotland, looking to develop the necessary manufacturing, assembly and maintenance facilities required for floating offshore wind
- > Companies from oil and gas sector with extensive experience of building, deploying and servicing floating structures in the North Sea
- > Supply chain companies with knowledge gained from 15 years of offshore wind development in the UK.



## DeepWind Cluster developer members



Many of the cluster members have been attracted by Scotland's potential as a global hub of floating offshore wind development.



## Strategic locations to access North Sea Floating Wind Opportunities

With over £270m of investments made in infrastructure sites across the wider highlands region since 2010; the area hosts a range of world-leading ports specifically geared towards the requirements of the renewable energy industry.

### Port of Nigg (Global Energy Group)

One of Scotland’s largest and most important port facilities boasting an exemplary track record in successfully delivering large scale Energy Industry projects. Sitting at the mouth of the sheltered natural harbour of the Cromarty Firth, the Port of Nigg combines some of the largest fabrication shops in Europe, a large dry dock, expansive storage areas, over 1,100 meters of deep water quay side and unrestricted access to the North Sea. The physical characteristics and infrastructure at the Port make it the ideal location for conducting major Capex projects and the most capable port in the UK for the fabrication and assembly for floating offshore wind.

### Offshore Wind Track Record

Since 2018, the Port has successfully completed the Beatrice Offshore wind project wind turbine marshalling and logistics for Siemens Gamesa, the Moray East jacket foundation marshalling for Deme, the Moray East wind turbine generator marshalling and logistics for Vestas, and is currently conducting the Seagreen jacket foundations marshalling and logistics for Subsea 7. [www.nigg.com](http://www.nigg.com)

### Port of Cromarty Firth, Invergordon



Image credit: Port of Nigg

The largest commercial Port in the Highlands of Scotland and one of the deepest, most sheltered ports in the country. It is a leading hub for offshore renewable energy projects.

### Servicing the offshore wind Industry

Modern port facilities and a proven track record in offshore wind assembly and logistics. The local supply chain has experience in the fabrication, assembly and disassembly of prototype wave and tidal generators. Heavy loading assembly and storage land adjoining the deep water quays are available, with the benefit of dedicated heavy lift crane pads.

The port was Subsea 7’s marshalling and load out port for the jacket substructures for SSE’s 588MW Beatrice offshore wind farm.

[www.pocf.co.uk](http://www.pocf.co.uk)



Image credit: Port of Cromarty Firth

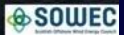
Source: Scottish Energy Ports Capability Directory, 2021; Highlands and Islands Enterprise, 2021; Opportunity Cromarty Firth, 2021

### Floating Offshore Wind Port Cluster

This port cluster in the Moray and Cromarty Firths was identified in the Strategic Investment Assessment report for the Scottish Offshore Wind Energy Council (SOWEC) :

“the Cromarty Firth emerges as the most suitable location in Scotland for platform fabrication and manufacture, with the two ports of Invergordon and Nigg acting as the focus of effort to secure platform fabrication and manufacture.

The wider Cromarty Firth offers space for wet storage of platforms and close access to many potential ScotWind sites. Close to these two ports sits the mothballed Ardersier port site, which could in future be made a part of this Port Cluster.” SOWEC SIA report, August 2021.





# Strategic locations to access North Sea Floating Wind Opportunities

This port cluster has already seen major investments in their existing infrastructure along with current and future expansion plans which makes it the ideal location for floating wind related manufacturing.

## Ardersier Port

One of the largest brownfield port sites in the UK. Ardersier, 14 miles east of Inverness, was previously an oil and gas fabrication yard and is now the latest Energy Transition Facility in Scotland. Plans at the 400 acre site, which features 1.5km of quayside access, include the recycling of steel from decommissioning of oil and gas structures, from the North Sea, to manufacture components for the offshore wind sector. The £300m green steel plant will be powered by a waste to energy plant and offshore wind.

### Floating offshore wind activity

The port has been identified as a suitable site for floating wind activity and has signed a MOU with BW Ideol for the manufacture of concrete floating wind substructures for ScotWind projects.

[www.ap.uk](http://www.ap.uk)

industry. The port enjoys unrivalled accessibility to the Highlands and because of its sheltered location, offers almost guaranteed access irrespective of the weather.

### Servicing the wind industry

Modern port facilities with 740m of available quayside split over 4 main berths and a proven track record in onshore wind logistics. As a major facilitator in the distribution of goods across the wider Highland Region, the Port continues to attract new business across all sectors, including freight, cruise ships and is playing an increasingly prominent role in renewables.

[www.portofinverness.co.uk](http://www.portofinverness.co.uk)



Image credit: Ardersier Port Authority

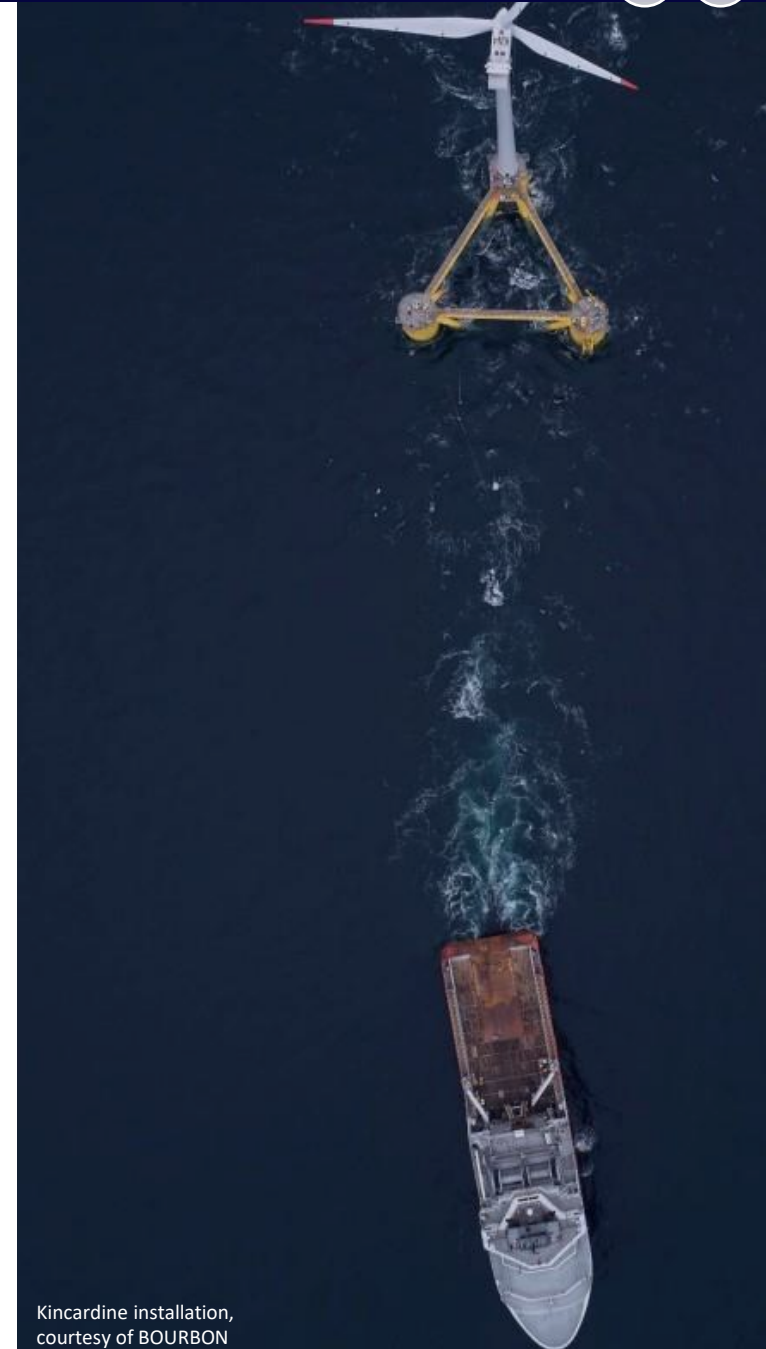
As one of Scotland's most sheltered natural deep water harbours, the

Port of Inverness is a natural choice for the renewable energy

Source: Highlands and Islands Enterprise, 2021;

Ardersier Port, 2021;

Port of Inverness, 2021



Kincardine installation, courtesy of BOURBON



# 5

## Soft Landing & Local Support

A high quality, cost competitive location against leading European markets.

## A competitive package against other leading global locations

Inverness is one of Europe’s fastest growing cities with a highly-skilled, flexible workforce, and a highly competitive cost base.



### Cost Effective Salaries

Salary costs in region are lower than other European clusters.

	Chief Engineer	Engineer	Welder
<b>Inverness</b>	<b>55,473</b>	<b>36,482</b>	<b>31,096</b>
Malaga	59,503	39,602	34,078
Cork	68,779	46,762	40,072
Marseille	70,265	51,744	45,013
Stavanger	75,858	60,977	54,893

Salary costs in GBP (European cities converted from €)



The UK offers a very competitive tax package compared to its major European competitors.



## Opportunity Cromarty Firth – Free Trade Zone Potential

Opportunity Cromarty Firth is an ambitious and collaborative initiative, exploring the opportunity for the Cromarty Firth to become a ‘Free Trade Zone’, as part of the UK Government’s post-EU exit economic growth strategy.

The Firth represents the ideal location to establish a free trade zone. The area is steeped in industrial history, having supported North Sea oil and gas activity since the 1970s and is now playing a critical role in the Scottish offshore wind sector. The Firth hosts a number of leading supply chain companies as well as a locally skilled workforce with essential engineering experience. This is coupled with first-class port infrastructure and manufacturing facilities, which have benefitted from over £110m of industry-led investments in the past 10 years.





## Access a well-connected network of support

Scottish Development International works with international investors to coordinate enterprise support across Scotland to drive your business forward.

### Highlands and Islands Enterprise (HIE)

The economic development agency for the north and west of Scotland.

HIE offer a full range of business support services including business planning, product development, financing, skills, property, events, growth and exporting.

[www.hie.co.uk](http://www.hie.co.uk)

### Scottish Development International (SDI)

Scotland's international trade and investment body has more than 30 offices around the world with local staff ready to help businesses set up and grow in Scotland.

Providing a single point of contact, SDI offers unrivalled assistance with property searches and planning advice, connections to universities, colleges and supply chain, talent and recruitment advice, financial support, professional services and connections to business networks.

[www.sdi.co.uk](http://www.sdi.co.uk)

### Scottish Enterprise

Scotland's economic development agency offers bespoke packages of support to help businesses flourish, including grants, debt and equity funding, and attractive incentives for R&D.

[www.scottish-enterprise.com](http://www.scottish-enterprise.com)

### Skills Development Scotland (SDS)

The national skills body ensuring your business has the skilled employees you need to succeed. When an investor is looking at Scotland, SDS will work to map all job roles to apprentice opportunities.

[www.skillsdevelopmentscotland.co.uk](http://www.skillsdevelopmentscotland.co.uk)



## Financial support to help your company succeed

Scottish economic development agencies have significant experience in delivering public sector investment packages and may be able to provide a range of discretionary financial support for inward investors.



### Investor Support Packages

HIE can advise you on eligibility for grant schemes and provide an indicative offer on the amount of grant assistance potentially available.

### R&D Support

R&D Grants and Loans are available, with varying degrees of intervention depending on the nature of activity.

### Training Support

HIE can make a discretionary contribution towards the training costs of new and existing staff.



The Scottish National Investment Bank

### Scottish National Investment Bank

The Bank is a mission-led development bank providing patient capital to build a stronger, fairer, more sustainable Scotland. It invests in debt and equity on commercial terms based on project or business needs.

- › Supporting Scotland’s transition to net zero by 2045
- › Building communities and promoting equality by 2040
- › Harnessing innovation to enable Scottish people to flourish by 2040

### Grasp export opportunities with support from UK Export Finance (UKEF)

The UK government is helping UK companies export the country’s world leading expertise in the offshore wind sector, and estimates export opportunities for the UK’s low-carbon sector will be more than £60 billion by 2030.



UK Export Finance

UKEF is the UK’s export credit agency, working alongside the Department for International Trade. They work with over 100 private credit insurers and lenders to help UK companies access export finance to enable international trade to take place as easily and securely as possible. £2bn of direct lending is dedicated to financing clean growth projects, aligning with the PM’s 10 point plan.



**Case Study: Cable Protection Systems manufacturer secures major offshore wind contracts with financial backing from UKEF.**

First Subsea Ltd, leading designers and manufacturers of Cable Protection Systems for fixed and floating offshore wind farms, has won major contracts to supply several offshore wind projects in overseas markets thanks to financial support from UKEF.

Part of the First Tech Ltd group headquartered in Aberdeen, First Subsea has recently shifted away from fossil fuels to operating almost exclusively in renewables. Its cable protection systems are designed specifically for the challenging environmental conditions associated with offshore wind farms.

The company now has over £12 million of export orders to supply offshore wind farms.

“The support from UKEF and Virgin Money has enabled us to not only complete vital projects but will enable First Subsea Ltd to execute far more projects concurrently.”

*Steven Brown, Group Finance Director, First Tech Ltd*



## A place to thrive

Incubation and soft landing platforms with dedicated collaborative space for your business, industry and academia.

### Inverness Campus



A world-class business location with pioneering facilities. It brings together businesses, researchers, academia and scientists providing the perfect place to collaborate and innovate. Developed by Highlands and Islands Enterprise (HIE), the 215-acre site is already a thriving business community.

#### Space available

Flexible accommodation rental options and land available for development.

#### Accessing skills

The Campus is home to the University of the Highlands and Islands, providing easy links with academia and a fresh pool of talented graduates

#### Support for businesses

Highlands and Islands Enterprise can offer both support and incentives to help you grow your business at Inverness Campus.

[www.invernesscampus.co.uk](http://www.invernesscampus.co.uk)



offshore wind technologies. Hosted by the University of the Highlands and Islands at Tern House, Alness, the centre's initial focus will be in substructure manufacture and deployment.

#### Industry cluster

Tern House is located on the Cromarty Firth, a strategic, national renewable energy hub with a proven track record in supporting onshore and offshore renewable energy projects. The area's existing cluster is expanding due to the location of the ScotWind leasing sites and new manufacturing and production facilities are being established for floating substructures and steel offshore wind components.

#### Developing the skills your business needs

The PowerHouse will act as a specialist educational hub to deliver training modules from STEM activities for school pupils to continuous professional development (CPD) for workers interested in joining the renewable energy industry.

[www.opportunitycromartyfirth.co.uk/powerhouse](http://www.opportunitycromartyfirth.co.uk/powerhouse)







# 6

## Government & Sector Support

A dynamic and flexible offshore wind sector, underpinned by a supportive regulatory environment.

### The UK aims to lead the global floating offshore wind market

In 2019, the UK became the first major economy to pass laws to end its contribution to global warming by 2050. The Prime Minister’s Ten Point Plan for a Green Industrial Revolution is mobilising £12 billion of UK Government investment to accelerate our path to net zero. This is supported by the Government’s Plan for Growth, which sets out investment in infrastructure, skills and innovation to enable the transition to net zero and the levelling up of the UK.

Offshore wind is at the heart of the government’s plan for net zero.

#### Ten Point Plan for a Green Industrial Revolution & British Energy Security Strategy

##### Point 1 – Advancing Offshore Wind

- › Ambition to deliver up to 50GW of offshore wind by 2030, including up to 5GW of innovative floating wind; supporting up to 90,000 jobs in the offshore wind sector;
- › Investing £160 million into offshore wind ports and fixed-bottom manufacturing infrastructure;

The Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS) will provide £160 million in government funding to boost floating offshore wind capability around the UK at sites in Scotland, Wales and elsewhere by supporting manufacturers and giving private investors the confidence to back this emerging sector which is expected to rapidly expand in the years ahead.

#### Net Zero Innovation Portfolio

A £1 billion fund to accelerate the commercialisation of low-carbon technologies. Future offshore wind was one of ten priority areas and competitions launched in 2021 to support the development and demonstration of state of the art technologies and products for the future offshore wind industry.

#### Contracts for Difference (CfD)

The CfD scheme is the UK government’s main mechanism for supporting low-carbon electricity generation. CfDs incentivise investment in renewable energy by providing developers of projects with high upfront costs and long lifetimes with direct protection from volatile wholesale prices.

- › CfD Allocation Round 4 opened in December 2021 and aims to double the capacity of renewable energy compared to the Round 3.
- › £24m funding ringfenced for floating offshore wind projects. The technology has an administrative strike price of £122/MWh.

#### Scottish Government

The Scottish Government has committed to reduce emissions to net zero by 2045, one of the most ambitious targets globally. To support this ambition, they have set a target to deliver up to 11GW of offshore wind capacity by 2030.

#### Crown Estate Scotland leasing (ScotWind)

In January 2021 ScotWind awarded leases for up to 25GW of offshore wind capacity. Floating wind projects make up 60% of this capacity. It is anticipated that further rounds of ScotWind will take place around 24 months after completion of the first cycle of leasing.

#### Innovation and Targeted Oil and Gas Decarbonisation (INTOG) Leasing

Crown Estate Scotland has launched a new leasing process for offshore wind farms to help decarbonise Scotland’s oil and gas sector. The new INTOG round could add a further 4.5GW to the Scottish market total, with floating wind expected to make up the bulk of this.



## UK and Scottish industry bodies can provide you with quick and easy links to partners, suppliers and customers

### Offshore Renewable Energy Catapult

The UK's leading innovation centre for offshore renewable energy brings together industry and academia, enabling the scale-up of offshore renewable energy technologies.

### Global Underwater Hub

The industry body for the entire British subsea industry and aims to increase business opportunities at home and abroad for the sector.

### ETP

The largest energy research partnership in Europe, with 250 academics and 600 researchers, ensures easy access to world-class capability, resources and collaboration.

### Net Zero Technology Centre

Centre of excellence to accelerate the energy transition by developing technology for an affordable net zero energy industry.

### Floating Offshore Wind Centre of Excellence

Accelerates the development of next-generation offshore wind technologies.

### Scottish Renewables

The voice of the renewable energy industry, working to grow Scotland's renewable energy sector and sustain its position at the forefront of the global clean energy industry.

### Scottish Offshore Wind Energy Council

A partnership between the Scottish Government and the offshore wind industry, the Council aims to create a competitive, commercially-attractive offshore wind sector in Scotland.

### DeepWind Cluster

Largest offshore wind representative body in Scotland with over 600 members. Specialises in fixed and floating offshore wind in deeper waters.

### Forth & Tay Offshore

Works on behalf of members to promote the capabilities of companies and organisations in the offshore wind sector and to assist them in accessing new opportunities.

### Offshore Wind Industry Council

Brings together industry, policy-makers and stakeholders to drive the development of the world-leading offshore wind sector in the UK.

### Carbon Trust Floating Wind Joint Industry Project

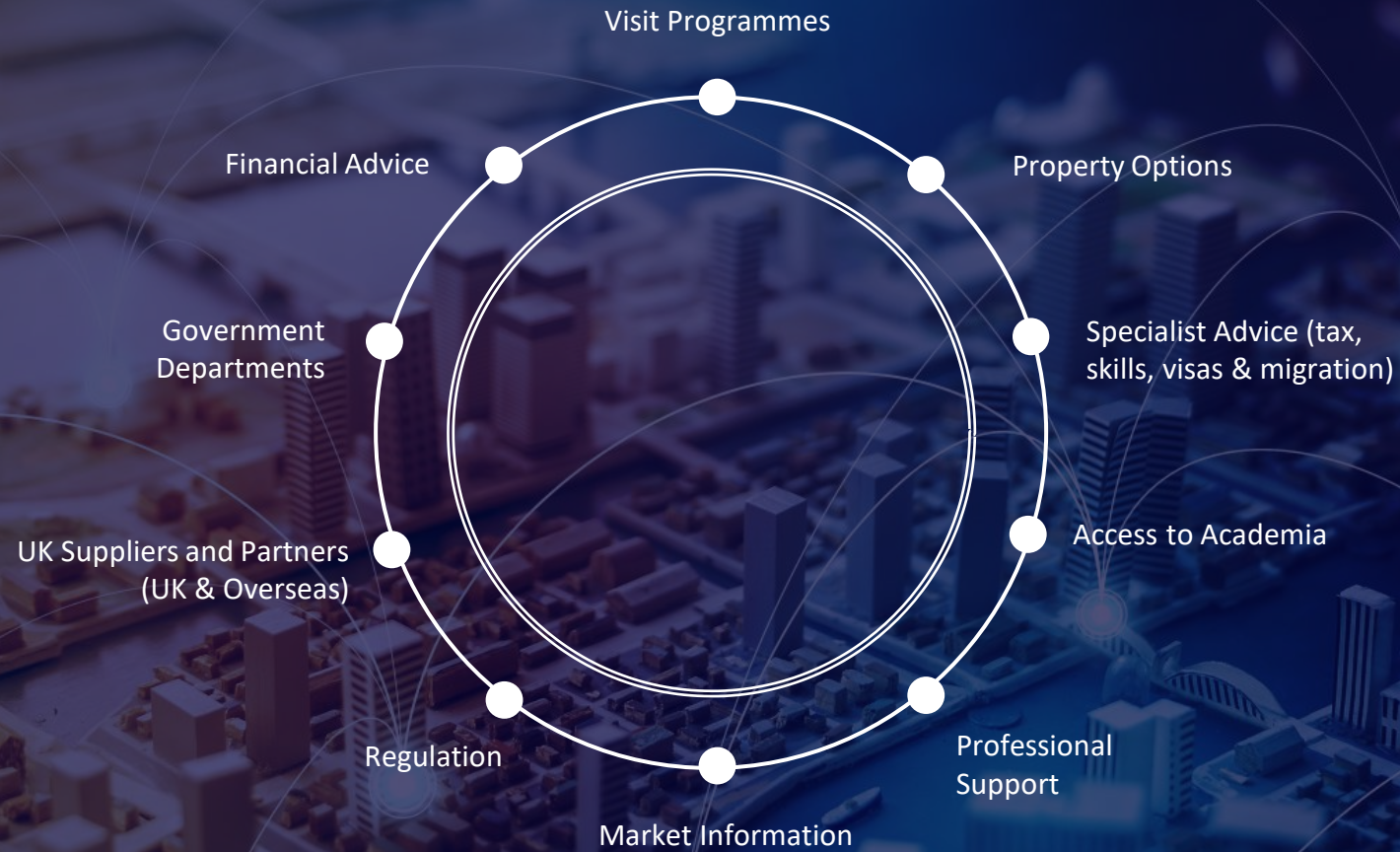
R&D initiative aiming to overcome the challenges and investigate opportunities for the deployment of large-scale commercial floating wind farms.

### Offshore Wind Growth Partnership

Promotes closer collaboration across the supply chain and facilitates growth opportunities between developers and the supply chain.



Accompanied by the right support from local partners and Government to ensure a seamless investor process



Read on to see how this combines with local government to provide you with world-class support services.

Real companies. Real experience. Real value.



# 7

## Case Studies

Join companies who have demonstrated ongoing success in the region.



Our ScotWind projects will make the best use of our fantastic natural resources to help power the UK's transition from fossil fuels to renewables and a better future, quicker.

Keith Anderson, CEO of Scottish Power



Pictured: UK SME, Angoka, installing test equipment prior to V2X trials.

### Shell and ScottishPower Renewables Consortium

The Shell and ScottishPower Renewables consortium has laid out a significant ambition for ScotWind leasing with 2 sites amounting to 5GW of floating offshore wind.

Their successful bids for a 2GW and a 3GW lease were announced in January 2022 and these will represent some of the largest commercial floating wind developments in the world.

The new wind farms will be delivered through two joint ventures called MarramWind and ChampionWind. They bring together ScottishPower Renewable's and Shell's decades of experience working offshore and significant presence in Scotland, as well as their strong innovation capabilities for delivering world-class offshore energy projects.



Read more case studies

[Shell and ScottishPower](#)[SSE, CIP and Marubeni](#)[Falck, BlueFloat and Ørsted](#)[Northland Power](#)



SSE is playing a major role in delivering Scotland’s offshore wind ambitions for 2030 and beyond, with construction of Seagreen in the near term, development of Berwick Bank and now this ScotWind project which will be one of the largest floating wind sites in the world.

Stephen Wheeler, MD, SSE Renewables



### SSE Renewables, Marubeni Corporation and Copenhagen Infrastructure Partners Consortium

A multi national consortium of Scottish, Japanese and Danish companies have come together for a successful ScotWind bid. SSE Renewables, Marubeni Corporation and Copenhagen Infrastructure Partners are the consortium behind a huge 2.6GW ScotWind floating wind project that the companies say will contribute significant input into the Scottish economy.

Success for SSE Renewables-Marubeni-CIP in the ScotWind leasing round paves the way for the partnership to deliver substantially on economic and social benefits worth billions of pounds for Scotland. This includes the creation of a multi-million-pound supply chain fund to directly invest into Scottish companies and achieve spending of circa 50% in the Scottish economy from the projects over their lifetime as well as supporting the transition of Scottish Oil and Gas sector companies to enter the offshore wind sector.



Read more case studies

[Shell and ScottishPower](#)

[SSE, CIP and Marubeni](#)

[Falck, BlueFloat and Ørsted](#)

[Northland Power](#)



The Scottish coastline is ideal for developing offshore wind projects and our team is thrilled to be given the opportunity to deploy our expertise to deliver these projects in Scotland, ...and now look forward to ensuring we work with as many local companies as possible.

Carlos Martin, CEO of BlueFloat Energy



### Falck Renewables and BlueFloat Energy Consortium

The Falck Renewables and BlueFloat Energy consortium has been successful in securing two leases for floating wind projects along with a third site in partnership with Ørsted in the ScotWind.

This will give the consortium a total of 2.7GW of floating wind in Scottish waters in this new round.

The successful bids combined BlueFloat Energy's knowledge and experience in developing, financing and executing offshore wind projects with Falck Renewables' strong track record of global project development and over 15 years of community engagement in Scotland.



Read more case studies

[Shell and ScottishPower](#)

[SSE, CIP and Marubeni](#)

[Falck, BlueFloat and Ørsted](#)

[Northland Power](#)



The Scotland has established policies that will be at the front of the energy transition, and we are looking forward to supporting the country's ambitious journey to net-zero, getting back into the community and starting work to bring these important projects to life.

Nigel Slater, MD Europe, Northland Power



## Northland Power

Canadian company, Northland Power, has been successful in securing the N2 site for a 1,500MW floating wind project off the Northwest Coast of Scotland.

The company will now bring forward its development plans in line with the successful bid and will include accompanying supply chain commitments. An important first step will be the appointment of a Scotland-based supply chain and skills manager who will work with Scottish businesses and enterprise agencies. This builds on work done to-date by Highlands and Islands Enterprise (HIE) in establishing a renewables-based supply chain to further develop local capabilities that can serve these projects long term.



Read more case studies

[Shell and ScottishPower](#)[SSE, CIP and Marubeni](#)[Falck, BlueFloat and Ørsted](#)[Northland Power](#)



## Dedicated to finding the ideal fit for your business

The Department for International Trade (DIT) and local partners are here to support you in navigating the opportunities across the UK – to find the right fit for your business.

Based on our experience of investors like you, this attractive opportunity demonstrates the strength and depth of capability available locally and in central Government to support you, and maximise your investment in the UK.

For investors interested in considering high value options further – we provide a bespoke service tailored to your needs from investment inception, right through to aftercare support.

We pride ourselves in developing long-term relationships with our clients, predicated on a full understanding of their needs.

## Contact us

### Investment Services Team

T: +44(0) 207 000 9012

[How to set up a business in the UK](#)

[Web](#)

[Email](#)





#### Department for International Trade

The UK's Department for International Trade (DIT) has overall responsibility for promoting UK trade across the world and attracting foreign investment to our economy. We are a specialised government body with responsibility for negotiating international trade policy, supporting business, as well as delivering an outward-looking trade diplomacy strategy.

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