

# MARINE ENERGY

The Highlands and Islands is home to some of the world's richest wave and tidal power resources, facilities and expertise





The OIG Giant II ship berthed at the pier at the Arnish Fabrication Yard

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# PIVOTAL IN THE WORLDWIDE MARINE ENERGY SECTOR

### OVERVIEW

Scotland has around 25% of Europe's tidal stream potential, equivalent to approximately 10GW and 10% of wave resource with a potential of around 15GW. The Highlands and Islands is home to some of the world's richest resources of wind, wave and tidal power, thanks to its exposed northerly location, and provides some of the optimum conditions required for the development, testing and commercial deployment of offshore renewable energy technologies anywhere in the world. Add to this the history of oil and gas exploration and recovery, a legacy of transferable skills and infrastructure, the Highlands and Islands of Scotland is proving not only prominent, but pivotal in the worldwide marine energy sector.

Highlands and Islands Enterprise (HIE), the Scottish Government's economic and community development agency for the north and north-west of Scotland, is committed to supporting and encouraging the development and growth of the renewable energy sector.

The economic prospects of marine energy have the potential to generate sustainable economic growth and even at this early stage in the industry's life, economic benefits are being derived. In Orkney, significant business is being generated in supporting the European Marine Energy Centre (EMEC) and the technology developers currently attracted to the facility. This unique demonstration and test centre is the only facility in the world to offer the ability to test full-scale, grid connected wave and tidal devices. As a result it is hosting most of the leading wave and tidal technologies and consequently is able to offer informed observation on the sector.

Real progress has been made since EMEC first opened in 2004, so much so that the wave site at Billia Croo and the tidal site at the Fall of Warness have further expansion plans being developed to meet industry requirements.

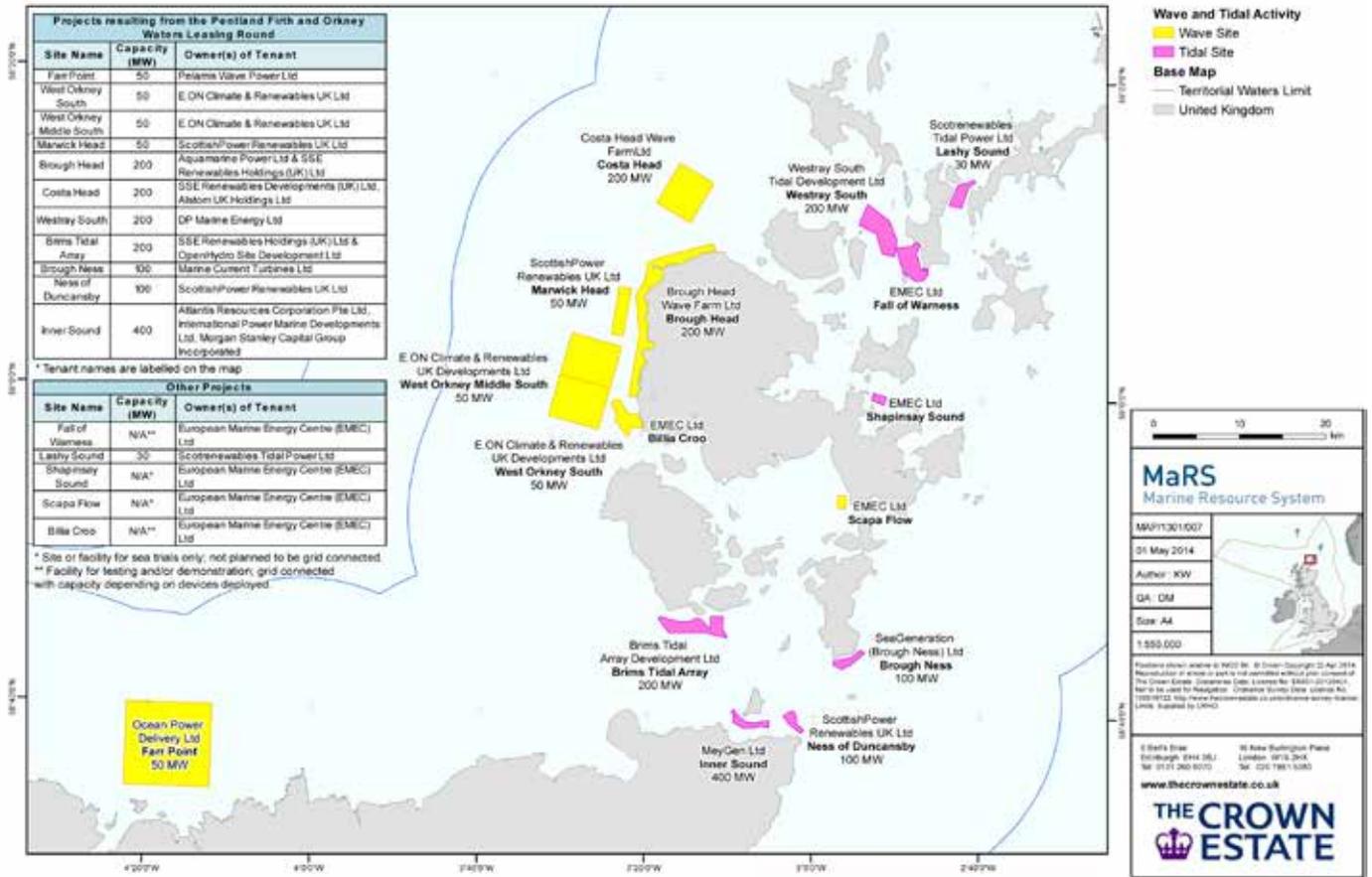
The latest addition to EMEC is an area of nursery site test berths which is attracting interest from all over the world. These test berths allow developers to trial smaller scale marine energy devices, as well as full size prototypes, in less challenging sea conditions than those experienced at EMEC's main test sites.

The region is not only home to leading-edge testing and demonstration activity, but also to the world's first commercial scale leasing programme in the Pentland Firth and Orkney waters, attracting international developers, utilities and investors looking to deploy up to 1.6GW of commercial scale marine energy over the next decade.

### **Pentland Firth and Orkney Waters Marine Energy Park**

In 2012, the UK Government announced the Pentland Firth and Orkney Waters area as the UK's second Marine Energy Park, further recognising the leading role the region is playing in taking forward the marine energy industry. Highlands and Islands Enterprise, along with partners including The Crown Estate, Scottish Government, Highland Council and Orkney Islands Council, is working with industry to capitalise upon this status. The Marine Energy Park is also home to Enterprise Areas and Zones, including Hatston, Lyness, Scrabster, Arnish and Nigg, offering incentives for new renewable energy businesses to locate and invest in the area.

# WAVE AND TIDAL ACTIVITY IN PENTLAND AND ORKNEY WATER



## SUPPLY CHAIN

The region supports a strong and expanding supply chain, thanks to its long history of oil and gas exploration and recovery. In recent years, the Highlands and Islands has seen an increasing number of locally-based businesses diversifying to service the rapidly growing renewable energy sector, alongside some significant inward investments.

Key companies active in the marine renewables sector include BIFab at the Arnish Yard on the Isle of Lewis, Global Energy Group, Aquatera, an Orkney-based environmental consultancy and many other engineering, project management and RD&D companies based in the Highlands and Islands.

It is true to say that the region can offer an end-to-end supply chain of complementary companies that can conceive, devise, test, manufacture, install, operate and maintain marine renewable energy technology from concept to full-scale commercial deployment.

To enable the marine industry to realise its full potential it has already been recognised that current port and harbour infrastructure requires modification and to this end, upgrades have already taken place in Lyness and Hatston Piers in Orkney, Scrabster Harbour in Thurso, Arnish Yard in the Western Isles and Nigg, in Easter Ross. Further, HIE has invested in forward supply units at Hatston to accommodate tidal developers testing at the Fall of Warness, adding to the provision of facilities for marine developers. These combined infrastructure developments will help with continued testing and demonstration of devices, through to the manufacturing, installation, operations and maintenance of commercial-scale developments in the longer term.

Energy North represents the business community in the oil and gas, decommissioning and renewable energy sectors, and with over 220 active members supports supply chain activity in the area through networking events, focus groups and trade missions.

## SUPPORT AVAILABLE FROM HIE

HIE supports businesses active, or with an ambition to be active in the sector, in a number of ways. Principally, this is undertaken through the account management process, where businesses are supported to deliver their growth aspirations through the use of a number of support tools including advice, market information and financial assistance. In addition HIE works with Scottish Government, Scottish Enterprise and other partners to secure finance to support innovation, research, development and deployment in the marine energy sector, including the delivery of specific schemes.



The Scotrenewables Tidal Turbine being towed in to position by a MultiCat vessel, Orkney



Installation of the Hammerfest Strom Tidal Turbine at the test site at Eday, Orkney



Oyster 800 wave energy device installation in Orkney

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# THE HIGHLANDS AND ISLANDS WORLD FIRSTS CASE STUDY

## THE REGION LAYS CLAIM TO MANY WORLD FIRSTS FOR THE MARINE SECTOR

### EMEC

Based in the world class wave and tidal conditions of the Orkney Islands, the European Marine Energy Centre (EMEC) is home to some of the most innovative marine energy devices currently in development. As the first and only accredited test laboratory of its kind, EMEC has successfully supported the deployment of more grid-connected devices at its full-scale wave and tidal testing facilities than at any other single site in the world. Pelamis Wave Power tested their P1 device at EMEC and subsequently became the world's first floating wave device to generate electricity to the national grid. Over at the tidal site, OpenHydro installed their open-centred turbine and this was the world's first tidal turbine to be grid-connected in Scotland and the first to successfully generate to the grid in the UK.

EMEC also provides a wide range of support, research and consultancy services, is at the forefront in the development of international standards for marine energy, and is forging alliances around the world.

### MeyGen

The MeyGen tidal stream project is at the forefront of world marine energy development and will harvest the tidal resource of one of the most energetic sites in Europe, the Inner Sound in the Pentland Firth.

## Pentland Firth and Orkney Waters Commercial Scale Leasing Programme

The world's first commercial scale wave and tidal leasing round in the Pentland Firth and Orkney waters, being delivered by The Crown Estate, further adds to this world-class marine energy location, with 12 leases secured by major developers for up to 1.6GW capacity.

### Wave Energy Scotland

Wave Energy Scotland(WES) aims to support and accelerate the development of wave energy technology in Scotland and was established as part of Highlands and Islands Enterprise, at the request of Scottish Government in December 2014.

WES will provide financial support for the development of innovative technologies to produce low cost, efficient and reliable components and subsystems which can form the basis of the cost effective generation of wave energy in Scotland.

WES will enable developers to take proposals from the earliest stage of development through to proving and demonstration.

WES is fully funded by the Scottish Government and has a budget of £14.3m until the end of the financial year in 2016.

WES seeks applications from interested parties who will be able to apply for up to 100% financial support (via a contract) for wave technology development. Applications will be made through a competitive call process. WES is particularly interested in proposals which will produce new technology and technology transfer, and/or bring about significant changes in the performance of existing technologies.

For more information contact:

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