

European Regional Development Fund (ERDF)

Renewable Energy and Energy Efficiency



EU funds have increased the use of renewable energy and energy efficiency in Wales to reduce the carbon emissions on the environment and help tackle fuel poverty by supporting small scale energy schemes, improving energy efficiency in housing for the most fuel poor and helping to establish Wales for a centre for marine energy production.

ERDF Priority 3: Renewable Energy and Efficiency

Specific Objectives

- Increase the number of wave and tidal energy devices being tested in Welsh waters
- Increase the number of small scale renewable energy schemes being established.
- Increase the energy of the welsh housing stock, particularly in areas of fuel poverty

Minesto Project

Holyhead Deep marks the starting point of the industrialisation of Minesto's unique marine energy technology Deep Green. It is a utility scale project and also the first low-velocity tidal energy project in the world. Developing Holyhead Deep into a commercial tidal energy array will be achieved in phases 1 & 2

Mentor Môn – Morlais Consent, Development & Infrastructure (Phase 1 & 2)

Morlais is run by Anglesey, Mentor Môn based social enterprise and is a tidal stream energy project. Generating clean electricity from one of the strongest tidal resource to power homes once fully operational.

Nova Innovation Ltd Enlli Project (Phase 1 & 2)

To deliver an array of offshore tidal devices generating locally renewable electricity that will create significant benefits for local people and communities. It will incorporate a Direct Drive Tidal Turbine, innovative marine energy subsea-hub; and energy storage to link with demand.



Renewable Energy and Energy Efficiency



Holyhead Deep – the world’s first low-flow tidal stream project

Holyhead Deep marks the starting point of the industrialisation of Minesto’s unique marine energy technology. It is not only Minesto’s first utility-scale project – but also the first low-velocity tidal energy project in the world. Holyhead Deep has been identified as an optimal location for a utility-scale installation. The area matches all the site requirements by providing low-flow tidal velocities (1.5–2 m/s mean peak flow) at a depth of 80–100 metres. The offshore site is only 8 km from the port and town of Holyhead where Minesto UK head offices are located. Developing Holyhead Deep into a commercial type energy array will be in phases one and two.

In 2018, Minesto scaled up its patented concept for generating green electricity from low-flow tidal streams and ocean currents. Off the coast of Holyhead, North Wales Minesto installed, commissioned and verified its Deep Green technology for the first time with a commercial-scale unit.

This film [DG500 – The Launch of a World's First Subsea Kite](#) showcases not only the great work performed by the Minesto team over the course of the year, but also how it all started and why Minesto's technology is a needed complement to other renewable energy in the global transition to a sustainable future energy system.

The DG500 project is supported by EU funds through the Welsh European Funding Office.

Minesto’s long-term plan is to expand the Holyhead Deep site to a commercial tidal energy array with a total installed capacity of up to 80MW. Minesto intends to develop the site in phases as part of a deploy-and-monitor approach. This gradual expansion would see us taking the technology from demonstrator to full industrial roll-out in North Wales.



Since 2020, Minesto's state-of-the-art Assembly Hall located in Holyhead, Wales has been fully operational, serving as the hub of Minesto's engineering and operational activities.



Holyhead Deep is the name of a large depression in the seabed, located west of Anglesey, North Wales. Besides having optimal oceanic requirements, the site also benefits from the proximity of good port facilities at Holyhead Port, onshore grid connection via the Morlais development and good offshore and onshore transport links.

In May 2015, Minesto was awarded a €13m grant from the European Regional Development Fund through the Welsh European Funding Office (WEFO), part of the Welsh Government, for the commercial rollout of Minesto's technology. As part of this contract, Minesto's U.K. head office was established in Holyhead. In May 2019, the Welsh government announced their continued support for Minesto's commercial development in Wales following the award of €14.9 million of EU funding through WEFO for the next phase of Minesto's tidal energy scheme in Wales.

The vision of the Holyhead Deep project is to contribute to the transition from fossil fuels to renewable energy, making Wales and the UK a global leader of a sustainable energy future. Once fully installed, a 10 MW array will supply local and clean electricity to the equivalent of more than 8 000 Welsh households. The planned increase of the site to 80 MW installed capacity would increase that figure to almost 70 000 households.

The investment linked to building, commissioning, and operating the first commercial-scale array with Minesto's tidal kites will also make a significant positive contribution to the creation of new employment opportunities and stimulating long-term growth and investment in Anglesey. The establishment of Minesto U.K. head office in Holyhead has seen several full-time jobs created to date and the Holyhead Deep project is already stimulating businesses through the local supply chain.



Mentor Môn – Morlais Consent, Development and Infrastructure

Morlais is a Menter Môn project which aims to benefit local communities, the economy and help tackle climate change by using renewable energy to generate clean low carbon electricity.

The Morlais project manages a 35 km² area of seabed off the coast of Holy Island, Anglesey and has the potential to put Ynys Môn on the map in terms of tidal stream energy.

The first stage of the project focussed on securing consent from Welsh Government and Natural Resources Wales. Community and stakeholder consultation and engagement was key part of this process. The application was submitted in the autumn of 2019 consent was awarded in December 2021.

The second stage of the project will put the necessary infrastructure in place for developers of tidal stream energy devices to deploy their technology in the zone. Implementation will be phased which means devices will be installed gradually to ensure that the development does not negatively impact marine wildlife.

Morlais will provide the infrastructure for developers of tidal energy converters to deploy their tidal devices on a commercial scale. There will be a very controlled phased deployment, with the first turbines being carefully and extensively monitored – only when it is confirmed that there are no negative impacts will further devices be installed.

Morlais has the potential to generate up to 240 MW of electricity. The electricity will be transmitted from the Morlais site to the National Grid. Depending on the types of tidal devices used, some may be visible above the sea surface and others will be fully submerged and hidden from view. Any moving turbine parts or rotors will be below the sea surface. For safety purposes there will be some navigation markers showing the location of the devices. Any devices on the surface will have lights similar to the navigation lights on small boats. Electricity will be brought to a substation on shore via a maximum of 9 sub-sea cables.



Electricity will be exported from this landfall substation to the existing electricity network via buried cables to grid substation.



Morlais has the potential to create around 100 well paid jobs in the first ten years. It will help tackle climate change by generating clean electricity from renewable energy. The project will improve local skills with apprenticeships and training opportunities and work with developers for guaranteed maximum local spend. Morlais will create new supply chain opportunities for local business during the construction and operation. Menter Môn supports local businesses to secure contracts as the main onshore infrastructure contract is a north Wales based civil engineering company (Jones Bros Civil Engineering UK). All profits will be reinvested locally through a new community benefit fund and through Menter Môn environmental and community projects.

Morlais contractor enrolls new cohort of higher apprentices



Morlais' contractor, Jones Bros Civil Engineering UK, has reinforced its commitment to provide local opportunities by welcoming a new intake of 10 higher apprentices. They will work on different projects including on Morlais. One of the latest recruits is 19-year-old Twm Tudor, from Bryngwran, Anglesey, who has started working on Morlais this month.

On working on the scheme, which is around 10 miles from his home, the fluent Welsh speaker said: ***"I can't wait to be a part of the team on Morlais, it is a very exciting opportunity and one that I am relishing. Being able to work in the civil engineering industry in my local area is something I've always wanted to do.***

By starting on this project, I'm hoping that I'll be able to progress my career by working with experienced civil engineers who are also from the area. I'm really looking forward to being out onsite and learning on the job."

Gerallt Llewelyn Jones, a director with Morlais added:

"Benefiting the local community is extremely important to us, so it's great to hear that the next generation of workers coming to work on the Morlais project are from this community. Jones Bros offer great opportunity for young civil engineers in north Wales, and opportunities that I hope will continue for years to come."

Morlais is funded by the European Regional Development fund through the Welsh Government. It is also supported by the Isle of Anglesey County Council, North Wales Growth Deal, as well as The Nuclear Decommissioning Authority.



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Tidal Stream Energy

The tides are caused by the gravitational forces of the sun and moon moving the seas around the surface of the earth. It is this movement of water that is used to generate electricity.

In a few places the location of land masses and the shape of the seabed magnifies the movement of the sea to create an area of great tidal energy. The west coast of Anglesey and Holy Island is one of these places with currents of up to 3.7 m/s or 7 knots.

Electricity generated from tidal energy is renewable, low carbon, clean and reliable.

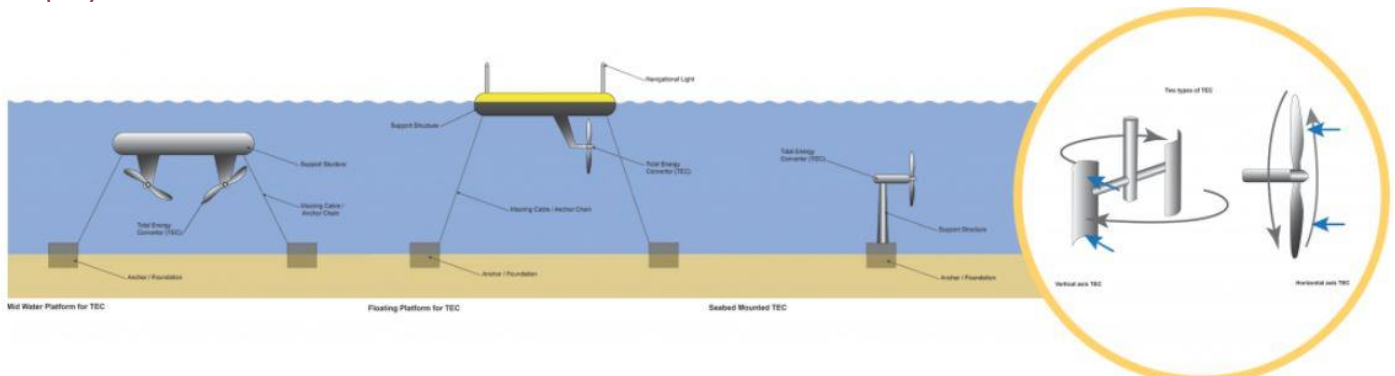


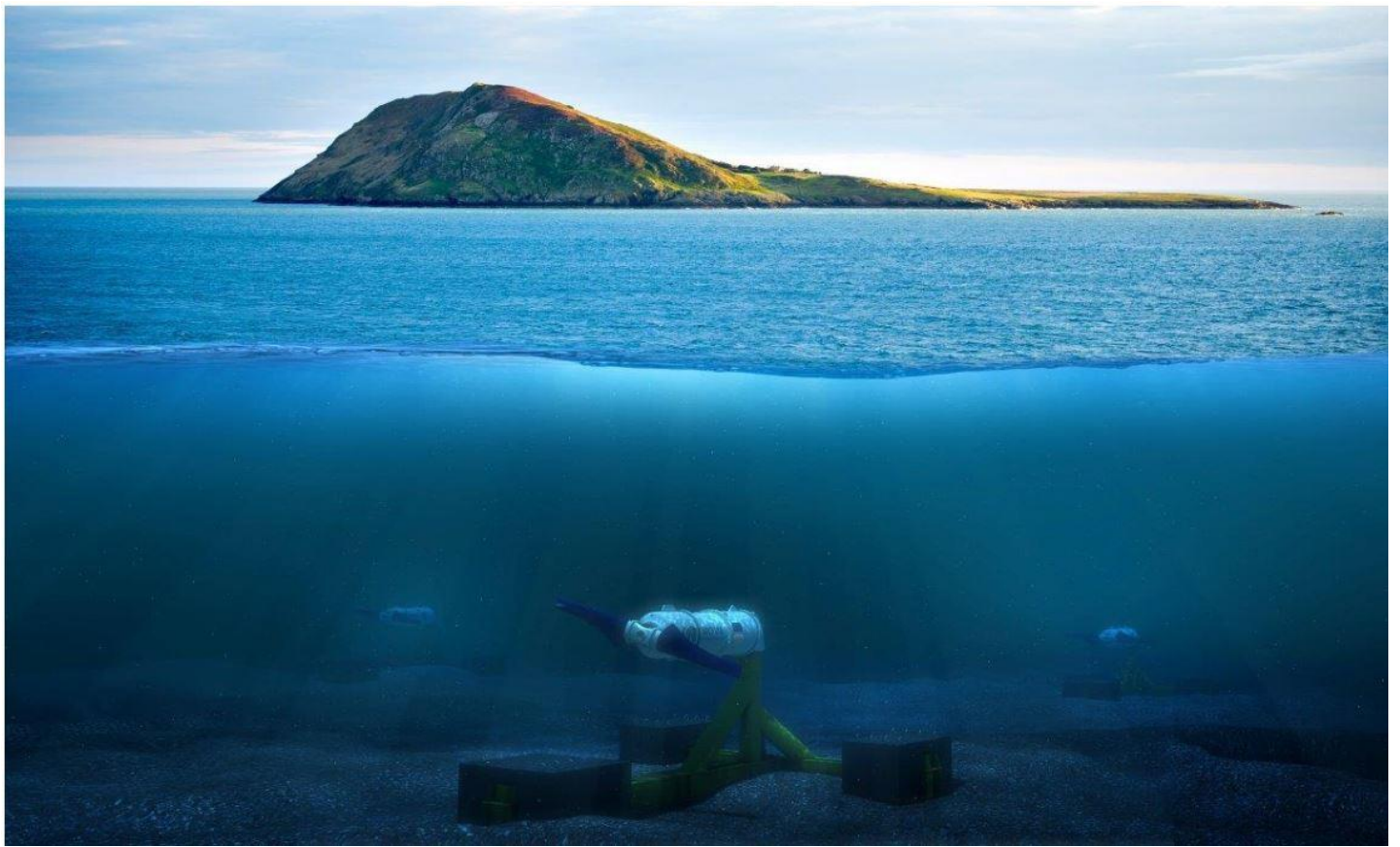
Tidal energy devices contain three components:

- Tidal energy converters which use the movement of the water to slowly rotate a generator which then produces electricity
- A structure to hold the tidal energy converters in the water
- A foundation or anchor to hold the device in place

Moving and electricity-generating parts of the devices are underwater.

There are many different designs of tidal energy converters – some are fully submerged in the sea and have parts that may or may not be seen above the surface; others float on the surface whilst others may be anchored mid water. The images below are only illustrative examples of the types of technology that could be deployed at the Morlais zone.





Nova Innovation – Enlli Project (Phase 1 & 2)

Welsh Government invests in the world's first Blue Energy Island

WORLD leading tidal energy company, Nova Innovation, has secured an investment of £1.2 million from the Welsh Government for its Enlli tidal energy project in north Wales.

The Enlli project creates the opportunity to generate electricity from the natural ebb and flow of the tide between Ynys Enlli – ‘The Island in the Currents’ – and the mainland of the Llŷn Peninsula. It has the potential to help the ‘Island in the Currents’ switch from a dependency on diesel generation to become the world’s first blue energy island.

The funding provided by the Welsh Government, through the European Regional Development Fund (ERDF), will support the environmental consenting and engineering design work for this ground-breaking project. Award-winning Nova plans to install five 100 kW turbines on the seabed with a view to install more turbines in the future.

In addition to developing a new source of clean energy, the £1.2 million investment creates opportunities for sustainable business and jobs for local people in the new low carbon economy.

Lesley Griffiths, the Welsh Government Minister for Environment, Energy and Rural Affairs, said:



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“As Wales looks to respond to the challenges posed by the climate emergency, we need to harness the ambition and innovative spirit of renewable energy providers like Nova, ensuring that their expertise and experience can be put to good use in Wales.

“As such, I am very pleased that we have been able to support Nova in their Ynys Enlli tidal energy project. Wales was at the leading edge of the first industrial revolution and through projects like these we can play a leading role in the green industrial revolution taking place today.”

Nova’s tidal turbines are completely hidden beneath the surface of the sea, with none of the visual siting issues faced by wind, solar and conventional fossil fuels. Environmental monitoring of Nova’s Shetland Tidal Array in Bluemull Sound, which includes regular seabird and marine mammal surveys of the area and use of underwater cameras to monitor wildlife around the turbines has not detected any negative impacts on marine wildlife.

Simon Forrest, Nova’s Chief Executive Officer said:

“Harnessing the immense, natural power of the tides in Swnt Enlli (Bardsey Sound) will provide clean ocean energy for the local community and help regenerate the local economy. Our tidal turbines have been powering the Shetland grid for over four years and we are very excited about helping drive the blue economy in north Wales.”

Tidal energy is unique among renewable energy resources as it is predictable ahead of time, helping to meet and balance local demand. Nova’s unique project provides an opportunity for local communities to power their homes, businesses and vehicles using the power of the tide.

Jess Hooper from Marine Energy Wales added:

“This is yet another boost for the marine energy sector in Wales, and helps us deepen our Celtic connections as this project draws on expertise and learning from the world’s first offshore tidal array – three tried, tested and monitored turbines installed in the Shetland Islands, Scotland.

“Transferring this knowledge and experience to North Wales will have far reaching benefits, for communities, business, the sector and, crucially, for wider action on climate change. Following on from Wales’ Climate Week, it’s great to see the blue economy contributing to the green recovery with action translating to real progress in Wales’ bid to achieve net-zero.”



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