Marine Energy Plan for Wales - Unlocking the Energy in Our Seas

ACKNOWLEDGEMENTS

This is the report of the Energy Wales Marine Energy Task and Finish Group (the Group) to the Minister for Economy, Science and Transport (the Minister).

The Group was convened following the Minister's statement on marine energy in September 2015 and its remit was to advise the Minister on a sustainable approach to deliver jobs, growth and wealth from the emerging marine energy sector, and the key output of the Group was a Marine Energy Plan for Wales.

Grateful thanks are extended to all those involved in the production of the Marine Energy Plan for Wales, for their continued support and input.

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1. Introduction

Welsh Government is strongly committed to working closely with the marine energy industry and other stakeholders to unlock the energy in the seas around Wales, and that is why the Minister for Economy, Science and Transport set up an industry-led Marine Energy Task and Finish Group (the Group) to establish how best to support the growth of the marine energy sector in Wales, position it as a world leader, and maximise the benefits of the growth of the industry for the Welsh economy.

This Marine Energy Plan for Wales is intended to highlight the current status of the sector and the opportunity for Wales, explore where we want to get to, and make recommendations as to the action required to achieve this.

1.1. The Potential of Marine Energy

Increasing renewable energy generation is essential to the de-carbonisation of electricity generation, and increasingly important to the necessary shift to a low carbon economy. With the right regulatory and economic conditions, marine energy has the potential to meet 10% of the European Union's power demand by 2050. It is also possible that by 2050, power generated by the marine energy sector in Europe could avoid the equivalent of 276M tonnes of carbon dioxide emissions every year [1].

Recent European Commission (EC) policy support for renewable energy has provided a stable platform for the development of renewable energy technologies across Europe, particularly in the countries that have built on this foundation with further supportive policies to facilitate development.

The Department of Energy and Climate Change (DECC) estimates that the UK has around 50% of Europe's tidal energy resource. Furthermore, DECC believes that wave and tidal stream energy has the potential to satisfy up to 20% of the UK's current electricity demand with an installed capacity of 30 to 50GW[2]. In addition to this, it is estimated that six fully operational tidal lagoons in the UK could have a combined installed capacity of 16GW which could generate approximately 30TWh of electricity per annum, equivalent to approximately 8% of UK electricity production [3].

There is potential for significant commercial reward through the development of a new indigenous industry focused on marine energy and its associated supply chain. With the right support over the coming decade, Europe could maintain leadership in a global wave and tidal stream market worth a potential £460bn between 2010-50 and an annual market of up to £40bn[4]. And a fleet of six tidal lagoons proposed by Tidal Lagoon Power Ltd in the UK could contribute £27bn to UK GDP, £3bn per annum once operational[3]. Developing a competitive marine energy industry would also place UK companies in a prime position to seize export opportunities in the global market.

[1] Ocean Energy Europe (2015), Draft Ocean Energy Strategic Roadmap, building ocean energy for Europe.
[2] Department of Energy and Climate Change (2011), UK Renewable Energy Roadmap
[3] The Centre for Economics and Business Research (2014), The Economic Case for a Tidal Lagoon Industry in the UK.
[4] Carbon Trust (2011), Marine Renewables Green Growth Paper

1.2. The Opportunity for Wales

Wales is well positioned to play a global leading role in marine energy with 1,200km of coastline, up to 6GW of generating capacity potential for wave and tidal stream[5], €100.4M of EU structural funding prioritised for marine energy in Wales over the next 5 years, the potential for four tidal lagoons proposed by Tidal Lagoon Power Ltd, and accessible grid infrastructure in close proximity to the areas of interest.

This is supported by an existing supply chain in Wales, built around well-established industries including oil and gas refining and steel production, which has the transferable skills and capabilities required to support a new "blue growth" industry in Wales. These capabilities cross between manufacture, assembly, electrical, mechanical and marine civil engineering activities. Wales has seven strategically located ports (including the third largest in the UK at Milford Haven), with good road and rail links to other major cities and transport hubs, hence there is the existing infrastructure to meet the needs of the potentially significant increase in offshore development activity.

Wales is therefore particularly well-placed to take advantage of this potential with significant long term benefits in jobs and growth.

1.3. Progress to date

The marine energy industry is still at an early stage, however the UK is leading the world in the deployment of large scale tidal stream and wave prototype devices, and in the development of tidal lagoons. Despite the sector still being in its infancy, it has already had a positive effect on the low carbon economy in Wales, providing green jobs and growth in a challenging economic climate. A study carried out in 2014 by Marine Energy Pembrokeshire (MEP) highlighted that technology developers had already spent over £34M, helping to create over 174 person years of employment[6]. This contribution increases when gross value total added effects are considered and demonstrates the important contribution the sector has already made to the economy.

One of the most recent deployments is Tidal Energy Ltd's (TEL) 400kw full-scale Deltastream tidal energy demonstrator deployed in Ramsey Sound, Pembrokeshire in December 2015. This fully consented project received £8m of EU funding through the Welsh European Funding Office (WEFO) towards development and construction of the site, and the manufacture and installation of the turbine.

There are presently seabed agreements in place for two other tidal stream projects (TEL and Eco2 Ltd's St. Davids Head and Minesto's Holyhead Deep), a tidal stream Demonstration Zone in Anglesey managed by Morlais, and a wave Demonstration Zone in Pembrokeshire managed by Wave Hub.

There are also proposals for series of tidal lagoons within Wales that have the support of Welsh Government. This includes the high profile Tidal Lagoon Swansea Bay that was granted a Development Consent Order by DECC in June 2015 and could provide a global platform for Wales to be seen as a leader in marine energy.

Welsh Government has invested £1M through the Marine Renewable Energy Strategic Framework (MRESF) to understand our resource, and commissioned the Marine Renewable Infrastructure Study[7] which identified some of the key infrastructure requirements of the industry. In addition, Welsh Government continues to work

[5] Welsh Government (2012), Energy Wales: a Low Carbon Transition

[6] Marine Energy Pembrokeshire (2015), Marine Energy Pembrokeshire Prospectus

[7] Welsh Government, Halcrow (2012), Marine Energy Infrastructure Study: Stage B – Final Report

with The Crown Estate to open the seas around Wales that have promising potential for moving towards commercial deployment of marine renewable energy devices.

Marine Energy Pembrokeshire (MEP), a partnership between the public and private sector and academia, has been working to establish Pembrokeshire and Wales as a 'centre of excellence' for marine energy. A Working Group has been established for a number of years that brings together all of the key stakeholders and supply chain companies involved in the marine energy sector in Wales, and attracts all of the key project and technology developers.

The Welsh European Funding Office (WEFO) has allocated €100.4M of ERDF Structural Funds for 2014-2020 specifically for Welsh wave and tidal stream developments demonstrating a firm commitment across government and in Europe to seeing the industry progress. WEFO funding has already supported Marine Power Systems, Minesto, and the Tidal Energy Ltd DeltaStream project, as well as funding the SEACAMS and LCRI Marine projects to undertake marine energy related research.

1.4. Where we want to be

Wales was once seen as a global centre for energy, driving the industrial revolution. The marine energy sector could represent a unique opportunity for Wales to be at the forefront of another energy revolution, a new low-carbon economy that would help deliver economic growth, energy security and diversity of supply, and assist in meeting important climate change targets.

The Environment and Sustainability Committee of the National Assembly for Wales (NAW) recently published a report calling for all of Wales' energy needs to be met from renewable energy [8]. Clearly, to achieve this, as much of the natural resources available should be harnessed, and marine energy will have an important role in this.

There are also wider benefits to maximising the potential of an indigenous marine industry - sustainable employment opportunities in the Welsh coastal regions and beyond can contribute to community cohesion, and the ripple effect could see positive benefits for communities, the Welsh language and culture and demand for public services in the locality. These outcomes are closely aligned to the principles set out in the Well-being of Future Generations (Wales) Act 2015.

Ultimately, the Group believes that Wales should be striving to be a world-leader in marine energy - as a significant generator, and just as importantly, as an exporter of marine energy knowledge, technologies and services.

[8] National Assembly for Wales Environment and Sustainability Committee (2016), A Smarter Energy Future for Wales

2. Marine Energy Plan Priorities

2.1. Political Leadership

Introduction

When established in 1999, the National Assembly for Wales was one of a few countries in the world with a legal duty for sustainable development, more recently enshrined in the ground-breaking Well-being of Future Generations (Wales) Act. Together with a supportive policy background that sets out the strategic ambition for a Welsh marine energy sector (in Energy Wales: A Low Carbon Transition[9]), the basic building blocks are there to attract marine energy developers to Wales.

With €100.4M of EU structural funding prioritised for marine energy in Wales over the next 5 years, two wave and tidal stream Demonstration Zones, seabed agreements in place for four separate tidal stream projects, and a number of proposals for significant tidal range projects, Wales is well positioned to play a global leading role in marine energy.

Due to the significant opportunity Wales needs a strong voice at a UK and EU level to support and champion the industry, particularly as the sector develops. This starts with a strong strategic vision and policy framework in Wales, practical support and, critically, leadership and a resolve to influence outcomes for the Welsh marine energy sector (such as those relating to subsidies) where decisions are taken in Westminster or in Brussels.

Where Are We Now?

Political influence

The Energy Wales Low Carbon Transition Action Plan includes marine energy but the outputs and strategic direction is not as clear as for other sectors, which prompted the formation of the Task & Finish Group. Alongside this energy specific policy the Environment (Wales) Act strengthens Wales' climate change commitments and together with the Well-being of Future Generations (Wales) Act could frame development of a sustainable marine energy industry in Wales.

Critical subsidies for renewable energy schemes in the form of Contracts for Difference (CfD) remain the responsibility of the UK Government, which is focussed on reducing consumer energy bills. If CfD, or some other subsidy mechanism, is not available for the range of marine energy projects planned for Welsh waters, the ambitions of many renewable energy developers will stall, irrespective of Wales' own aims and targets.

European profile

Currently the European Commission views France and Scotland as the leading countries for marine energy, which in turn means they have a strong influence on European marine energy policy and funding programmes, whilst the international profile of Wales is lower compared with others active in marine energy.

Industry support

Support for the marine energy industry in Wales primarily comes from Marine Energy Pembrokeshire (MEP). Since inception in 2010, MEP has experienced rapid growth - Working Group membership has expanded from

[9] http://gov.wales/topics/environmentcountryside/energy/energywales/?lang=en

8 original members to present levels of 80 which include tier 1 Welsh supply chain companies and all the key stakeholders. There are 25 technology and project developers engaged including world-leading companies from the EU, Australia, Singapore and America.

As a delivery focused partnership, MEP activities are driven directly by the needs of industry. A five year business plan (2015-20) has been prepared following a comprehensive review of activities and a membership survey in early 2014. The survey clearly stated the considerable value that industry places on the work of MEP and the need for its ongoing activities to support the sector at this critical phase of growth.

Where Do We Want To Get To?

- A practical yet forward thinking policy framework for the marine energy industry that provides stability and assurances to encourage investor confidence, whilst being capable of being responsive to opportunities as they arise.
- A coherent and responsive/adaptive long-term marine energy plan/roadmap, based on priorities that have been informed by evidence, with co-ordinated activity across all sectors, which delivers against clear timescales.
- A Welsh Government with stronger devolved powers and resources to deliver these new responsibilities, and a strong influence on UK and EU policy and funding programmes to facilitate the marine energy industry opportunity.
- Welsh Ministers and Assembly Members with an informed appreciation and understanding of the potential marine energy can play in Wales and who will provide strong, clear messages and champion the industry, which will instill investor confidence and provide a clear “Wales is open for business” message.
- A vibrant marine energy industry that delivers tangible outcomes against well-being goals and policies, driving new sustainable jobs and growth.
- A new Marine Energy Wales organisation established to represent the sector and country on a UK and EU level, building on work already done by MEP including current MEP workstreams undertaken on a pan-Wales basis. MEW to have an industry-led board to continue collaboration with Welsh Government and stakeholders to deliver recommendations detailed in this report.

Recommendations

1	Welsh Government’s Marine Energy policy should be updated with particular consideration given to the recommendations within this Marine Energy Plan.	WG
2	Welsh Ministers should take all available opportunities to promote the marine energy sector domestically and internationally.	WG
3	The interests of the Welsh marine energy sector should continue to be supported in discussions with UK Government, European Commission and devolved nations.	WG
4	Wider Welsh Government policies (e.g. Welsh National Marine Plan and National Development Framework) should be reviewed to ensure they are compatible with the growth of the marine energy sector.	WG
5	The establishment of Marine Energy Wales should be supported with initial seed funding, with the intention of creating an independent self-sustaining body as industry matures.	WG

2.2. Jobs & Growth

Introduction

It has been estimated that with the right support over the coming decade, Europe could maintain leadership in a global market worth a potential €653bn between 2010-50. Developing a competitive European marine energy industry would also place European companies in a prime position to seize export opportunities in the global market. On a worldwide scale there are more marine energy projects being developed in the UK than any other country creating approximately 1,700 high skilled jobs which has the potential to grow to over 20,000 in the next decade for wave and tidal stream alone. Development of six tidal lagoon power stations in the UK could contribute an average of 35,000 direct full time equivalent (FTE) jobs over a 12-year construction period. Once indirect and induced impacts are taken into account, there could be as many as 70,000 jobs sustained in the peak year of construction.

As the marine energy sector expands and matures there will be significant opportunities for Welsh supply chain companies to diversify into providing the specific services and products required for marine energy projects, and then to export new skills and knowledge gained from involvement at this early stage.

A Welsh Government commissioned study[10] highlighted the impact the wave and tidal stream sector could have in Wales. The study found that a 30MW wave installation and a 30MW tidal stream installation has the potential to support 2,000 person-years of employment associated with development and installation with 50 FTE per annum during generation, and the potential to support over £70M of GVA across Wales based on a total investment of £150M. Scaling up to commercial arrays of up to 300MW in total could generate 8,500 person-years of employment during development and installation, delivering just over £300M for Wales with an investment of £500M with scenario 3 providing £840M of GVA based on an investment of £1.5bn. Development and installation of 1GW could support 24,000 person – years and 440 FTE per annum during generation.

For tidal range energy a separate report 'The Economic Case for a Tidal lagoon Industry in the UK'[11] estimates that the Swansea Bay Tidal Lagoon project will involve an investment of £1,046M (in 2014 prices) with half of this investment retained within the Welsh economy. Approximately 1,900 jobs will be created at the height of the construction programme with annual operation of the lagoon amounting to approximately 181 FTE jobs.

TLP is working with Welsh Government, Semta and the Construction Industry Training Board, to establish a labour forecasting tool specifically related to the construction, turbine installation, manufacture and assembly of Tidal Lagoon Swansea Bay project that could be rolled out for other tidal lagoon projects.

Investment in the development of six tidal lagoon power stations is expected to contribute an average of 35,000 direct full time equivalent (FTE) jobs over the 12-year construction period with a contribution of £27bn to UK GDP. Once indirect and induced impacts are taken into account, there could be as many as 70,900 jobs sustained in the peak year of construction.

At its peak in 2021, the programme is expected to sustain up to 71,000 jobs. It will create an estimated 6,400 jobs across the UK in the operation and maintenance of the lagoons and throughout the supply chain that

[10] http://gov.wales/docs/desh/publications/130816economic-impact-of-developing-marine-energy-en.pdf

[11] http://www.cebr.com/wp-content/uploads/2014/07/The-Economic-Case-for-a-Tidal-Lagoon-Industry-in-the-UK_final.pdf

supports these activities. Operation of the lagoons (which have a design life of 120 years) and the electricity they would generate could contribute £3.1bn per year to the UK economy.

Where Are We Now?

Wales has a strong existing supply chain built around well-established industries including oil and gas, refining and steel production, and nuclear energy, which has the transferable skills and capabilities required to support a new "blue growth" industry in Wales. These capabilities cross between manufacture, assembly, electrical, mechanical and marine civil engineering activities. Wales has seven strategically located ports (including the third largest in the UK at Milford Haven), with good road and rail links to other major cities and transport hubs, hence there is the existing infrastructure to meet the needs of the potentially significant increase in offshore development activity.

Welsh-based companies are already engaged in the marine energy sector, making significant contributions to Wales' initial marine energy projects, providing surveys and consultancy services during the development of projects including TEL's Ramsey Sound project and TLP's Tidal Lagoon Swansea Bay, as well as the fabrication and assembly of wave and tidal stream devices themselves. To date the Welsh supply chain has been involved in this new sector at levels of almost 50% for tidal stream and 60% for wave energy. In 2014, Marine Energy Pembrokeshire carried out a survey[12] that highlighted that the marine energy industry has already had a positive effect on the Low Carbon Economy in Wales providing green jobs and growth in a challenging economic climate. Technology developers had spent £34.5M, helping to create over 174 person years of employment. This contribution increases when gross value total added effects are considered and demonstrates the important contribution the sector has already made to the economy.

Although project developers are consistent in providing messages of a future minimum Welsh supply chain content of 50%, the Welsh supply chain is considered unprepared for the scale of opportunity if the sector progresses as hoped. Efforts are being made to better understand the supply chain in Wales across all sectors, but there is currently a lack of understanding of the capability and capacity of the supply chain specific to marine renewables. There is a general lack of understanding of the supply chain requirements of the marine energy sector which is crucial in engaging with the supply chain, identifying opportunities for diversification, and addressing any gaps. There is also a lack of understanding of the challenges experienced by the supply chain that could exclude companies from participating such as financial constraints, resources, skills, experience, risk management.

It is currently unclear whether businesses have an understanding of the wider potential of the marine sector; nor whether there is an understanding of what skills, expertise and processes are required to meet market demand to realise the opportunities, particularly longer term opportunities (e.g. export markets).

Skills and training needs specific to the marine energy industry are considered to be under-developed if Wales is to be prepared to take advantage of the opportunities.

[12] http://www.marineenergypembrokeshire.co.uk/wp-content/uploads/2010/03/MEP-Brochure-2015-Update_V4.pdf

Where Do We Want To Get To?

Opportunities, jobs, growth, sustainability

- Wales to be recognised as a global leader in the marine energy industry, as a driver of sustainable economic development.
- All key stakeholders in Wales to have a thorough understanding of the marine energy opportunity (projects in Wales and export potential), and a responsive strategy for realising these opportunities over the short, medium, and long term.

Supply Chain

- A marine energy industry in Wales supported by a supply chain that optimises benefit to Wales.
- Wales as a global leader in marine energy expertise and resources/workforces.
- A coherent and responsive strategy, based on a thorough understanding of the supply chain requirements and opportunities, to inform supply chain co-ordination and development in the short, medium and long term.
- A supply chain centre of excellence in Wales that supports Wales as a global leader in marine energy (supporting investment in marine energy projects, and realising the opportunities arising from marine energy projects).
- Being able to realise the 'big ticket' opportunities to realise benefits to Wales (and to improve industry profile).
- Advocacy and support from political leaders to inspire and instil confidence in the industry.
- Attractive marketplace for marine energy industry and supply chain to encourage new businesses and diversification of existing business.

Skills & Training

- A skills and training sector focused on supporting the marine energy industry global centre of excellence in Wales.
- A holistic perspective to enable planning of education, skills development and training alongside a short, medium and long-term strategy for delivering marine energy projects in Wales and as an export industry.

Recommendations

6	Supply chain requirements of the marine energy sector, and current supply chain capability in Wales, should be better understood to determine the capability/capacity gaps	WG
7	Support should be provided to marine energy developers to maximise Welsh supply chain content, including highlighting Welsh supply chain capabilities and exploring other ways in which to encourage the use of Welsh businesses.	WG
8	Welsh supply chain companies should be made aware of opportunities and support provided to ensure they are able to take advantage of them, including support for diversification where needed.	WG
9	Skills and training requirements for the marine energy sector, and current education capabilities in Wales, should be better understood to determine the capability/capacity gaps.	WG
10	Education, training and skills policies should be aligned with marine energy industry requirements, with particular reference to Regional Skills Partnerships.	WG

11	Investment in skills and training should be maintained to prepare Wales for the emerging marine energy industry – inform and inspire young people to consider and take up career paths within the industry, upskilling of the current labour force and those currently unemployed, support for apprenticeships.	WG
12	An approach should be developed to identify the broader benefits arising from marine energy projects, and this should be used to support and deliver a range of policies.	WG

2.3. Finance & Funding

Introduction

Where Are We Now?

The nascent marine energy is gaining momentum in Wales with notable recent progress including the deployment of the Tidal Energy Limited (TEL) DeltaStream device at Ramsey Sound in December 2015, the establishment of demonstration zones in Pembrokeshire and Anglesey, and the significant progress made by Tidal Lagoon Swansea Bay to this point.

The move to a Contracts for Difference (CfD) approach under the Electricity Market Reform has come at a critical time for the wider sector, and particularly for the sector in Wales when it is starting to build momentum. It is important this change does not introduce increased uncertainty and provides the support required to ensure the early demonstration projects can proceed. And it is important to ensure that CfD is fit for purpose for the Demonstration Zones. Long term market signals required for continued investment are currently missing and could quickly move towards a funding hiatus if the industry does not receive clarity soon on the support it can expect.

Where Do We Want To Get To?

- It is essential that the available revenue support mechanism underpins growth in the wave and tidal sector so that Wales can capitalise on its marine energy potential.
- UK Government in the short term to ensure the CfD mechanism is workable with demonstration and test sites, and that it can support emerging technologies which also rely on capital grants.
- A longer term market signal for continued investment beyond 2019 is also required to ensure continued investment. Without these revenue support measures the opportunity to develop a viable and economically beneficial marine energy sector in the UK will be lost.
- Clear message from government at all levels that it will continue this support going forward, albeit with an assumption that industry can, in turn provided a realistic and credible plan to reduce the Levelised Cost of Energy (LCOE) going forward as has been the case in offshore wind.

Recommendations

13	Novel funding approaches should be explored to address capital funding gaps for emerging marine technologies that are unable to attract sufficient commercial funding at this stage.	WG
14	Engagement with DECC should continue to ensure Contracts for Difference (CfD) support the demonstration of wave and tidal technology in the short-term, and provide a strong market signal to investors beyond 2019.	WG
15	Public funding should not be limited to established technologies, and should be directed at a range of technology at different technology readiness levels and other innovation that supports development of the sector.	WEFO
16	Engagement with DECC and its independent review on tidal lagoon energy in the UK should highlight the unique longevity of tidal lagoon schemes, and the opportunities this represents for innovation of existing financial support mechanisms.	WG

2.4. Research & Development

Introduction

Research priorities have become more focussed at a UK-level for the marine energy sector. For technology innovation the Low Carbon Innovation Co-ordination Group (LCICG) produced the Technology Innovation Needs Assessment (TINA)[13]. And for environmental research needs the Offshore Renewables Joint Industry Programme (ORJIP) for Ocean Energy has been established and environmental research priorities have been identified[14].

Due to the increase in focus on marine energy in Wales, academia in Wales can play an important role in answering short and mid-term priorities with a collaborative industry-led approach. This could position and promote Welsh research at the cutting edge of a new sector providing knowledge and skills exportation.

Where Are We Now?

Marine energy has been a priority area for a number of academic programmes in Wales for a number of years with multi-million pound projects being developed including SEACAMS, LCRI Marine and MAREN. However, many of these EU backed programmes have now come to an end at a time when industry development, and the associated need for R&D support, is increasing. This gap in EU funded projects causes previous expertise built up through the programmes to be lost as funding ceases and the expertise built up by academics in these programmes is often lost. SEACAMS2 has been planned and will focus entirely on marine energy but it is still awaiting approval from WEFO.

MEP has catalogued over 200 Welsh marine energy research projects to ensure the work is the accessible and in 2014 carried out a review of previous EU funded research in Wales. MEP gathered industry and stakeholder feedback provided a series of recommendations on maximising the benefit of future Welsh R&D.

Where Do We Want To Get To?

- A vibrant research community making a direct contribution to answering short and mid-term priorities to reduce project risk and cost, collaborating with industry and regulators.
- Welsh universities playing a lead worldwide in marine energy research, exporting knowledge and skills and attracting research students into Wales.
- Wales as an exemplar of, and a location for, innovation - lowering the cost and increasing the reliability of energy generation, sharing technology advancement.

Recommendations

17	All future marine energy-related research in Wales should align with relevant sector-led recommendations e.g. MEP, ORJIP Ocean Energy.	WG WEFO SEACAMS
18	An industry-led Welsh Marine Energy Research Group (WMERG) should be established to	MEW

[13] http://www.lowcarboninnovation.co.uk/working_together/technology_focus_areas/marine/

[14] http://www.nerc.ac.uk/innovation/activities/infrastructure/offshore/nerc-crown-estate-workshop/

	ensure early industry and regulatory input into project scoping.	
19	All WEFO funded research outputs should be made publically available to deliver wider sector impact.	WEFO
20	Involvement and support for R&D programmes that support the marine energy sector e.g. SEACAMS, ORJIP Ocean Energy etc. should continue.	WG

2.5. Consenting & Leasing

Introduction

The marine energy industry's new and innovative approaches to generating electricity means there is a shortage of data available on the potential environmental impact. Understandably, this in turn can make it difficult for regulators to balance the needs of development with the imperative to protect the marine environment.

The Crown Estate has awarded a number of seabed leases in Welsh waters and has plans for these areas to increase further. This presents us with an opportunity to become a leader in marine energy environmental science and research and for the industry to make an ever more meaningful contribution to the energy mix and economy in Wales, but only if we enable technology to be installed and tested.

Where Are We Now?

Consenting

Natural Resources Wales (NRW) administers Marine Licences on behalf of Welsh Ministers and the Marine Management Organisation (MMO) currently issues Section 36 Electricity Consents. Projects over 100MW are deemed to be Nationally Significant Infrastructure Projects and therefore they also require a Development Consent Order from the Secretary of State and not planning permission from a local authority.

Within this system two marine energy projects have been consented in Wales to date – Tidal Energy Limited at Ramsey Sound and Marine Current Turbines at the Anglesey Skerries. Tidal Lagoon Swansea Bay has received its Development Consent Order from DECC however determination by NRW of the Marine Licence application on behalf of Welsh Ministers has experienced delays. Four further projects in Wales have started the consenting process - Tidal Lagoon Cardiff received the Scoping Opinion from PINS in April 2015 but is still waiting for the Screening Decision from NRW, Minesto for their Holyhead deep project, Tidal Energy Ltd for their St. Davids Head project and Morlais has received the Scoping Opinion from NRW for the Anglesey Tidal Demonstration Zone.

In March 2014 the Commission on Devolution in Wales (Silk Commission) published a set of recommendations which included encouraging development of energy projects in Wales by:

a) Devolving responsibility for all energy planning development consents for projects up to 350MW onshore and in Welsh territorial waters to the Welsh Government;
b) Creating a statutory obligation for the UK Government to consult the Welsh Government and take account of Welsh planning policies when granting consents for projects over 350MW;
c) Aligning associated development consents with responsibility for the main project; and
d) Devolving responsibility for issuing marine licences in Welsh offshore waters to Wales.

The Government responded to this in March 2015 with the St David's Day Agreement, which provided a blueprint for the future of devolution in Wales. All four of the energy related Silk Commission recommendations were accepted.

In parallel to this devolution debate a consenting sub-group has been meeting, chaired by MEP, with the primary aim of reviewing best practice on a UK level and providing recommendations to Welsh Government and NRW on how Wales could streamline the consenting process. The recommendations were published in 2015 and have been endorsed by the Marine Energy Task & Finish Group.

At a UK level, a collaborative programme has been established to address key consenting issues for wave, tidal stream and tidal range projects. The Offshore Renewables Joint Industry Programme (ORJIP) Ocean Energy is

co-funded by The Crown Estate, the Scottish Government and the Welsh Government, and aims to identify and co-ordinate research that will help de-risk the consenting process. Welsh Government and NRW are both heavily engaged in the programme, and ORJIP Ocean Energy has been working closely with SEACAMS to align its planned environmental research with the priorities identified through extensive industry consultation.

Leasing

The Crown Estate has lease agreements for four tidal stream sites in Wales enabling deployments ranging from 1.2MW - 10MW. Tidal Energy Limited has successfully installed its DeltaStream tidal device at one of these sites in Ramsey Sound, Pembrokeshire. The Crown Estate has also leased two Demonstration Zones for wave and tidal stream, potentially enabling a number of projects up to 30MW to be deployed within each zone, and in September 2015, The Crown Estate launched a further leasing process for small scale projects up to 3MW. The outcome of The Crown Estate's leasing round for tidal range projects is still awaited.

Where Do We Want To Get To?

Consenting

- An overarching policy context that guides and supports marine energy development and is supported by the necessary strategic environmental assessments. The process should be proportionate and assist in reducing project risk, making it easier to carry out scientific studies and research to support the consenting process whilst at the same time increasing the speed of deployment of marine energy projects in Wales.
- Clear and accountable timescales for determination of consents that are set in Regulations, as is the case in the land use planning system.
- A 'one-stop-shop' could be introduced for all necessary consents to achieve this aim. This should be focussed on reducing costs, enabling greater coordination of documentation and consultation, and establishing a clear decision making process and timeframe. It is particularly important that developers of Nationally Significant Infrastructure Projects, such as tidal lagoons, are not disadvantaged by the way marine licensing is administered in Wales.
- Ultimately, the consenting process needs to support the Welsh Government's commitment to 'unlocking the energy in our seas'. The outcomes we should strive for are two fully consented Demonstration Zones, projects with seabed agreements fully licensed, nursery support sites available and tidal lagoons installed and generating electricity.

Leasing

- Management of the seabed estate that supports Welsh public policy objectives. There is now a clear strategic offer of demonstration sites for the sector to deploy and test wave and tidal stream technology but the focus now needs to be on developing these zones.
- Appropriate commercial wave and tidal stream sites identified and a plan developed for future leasing of these sites so there is a clear route to market in Wales for technology companies.
- The opportunity for Wales to be a global leader in tidal range should be embraced and a portfolio of seabed leases developed. This portfolio should include but not be exclusive to tidal lagoons.
- As the opportunities are realised from wave, tidal stream and tidal range, a revenue stream from Welsh seabed assets should be reinvested in the sector.

Recommendations

21	A stronger marine energy policy should be introduced that enables NRW to take a more risk-based, proportionate and phased approach to consenting.	WG
22	Specific policy support should be adopted for wave, tidal stream and tidal lagoons including best practice guidelines and clarity on advice given at pre-application	WG NRW

23	Adequate resourcing should be put in place to ensure there is timely robust advice and consenting approval for marine energy projects as well as developing any necessary guidance.	WG NRW
24	Adequate resourcing should be put in place to ensure NRW is able to properly engage and steer future environmental research, prioritising R&D to de-risk consenting uncertainties, address potential barriers and share lessons learnt.	WG NRW
25	Steps should be taken to improve co-ordination of terrestrial and offshore consents	NRW
26	A single consenting route should be secured for NSIP projects so that Marine Licence requirements are addressed through the DCO process	WG NRW
27	Target timeframes to determine both planning and Marine Licence applications should be adopted.	WG NRW
28	A Memorandum of Understanding (MoU) should be established between Welsh Government and The Crown Estate, establishing future priorities for joint working on marine energy.	WG TCE
29	A mechanism should be introduced for lease holders in Wales to address potential issues together and share lessons learnt.	TCE
30	An Enabling Actions Fund should be established to support work that accelerates and de-risks development of the wave and tidal projects in Welsh waters, facilitating successful and timely construction and operation.	TCE

2.6. Infrastructure

Introduction

As plans for marine energy activity in Welsh waters rapidly accelerate there is a need to ensure that the necessary infrastructure is in place, with sufficient capacity, to support the delivery of the aspirations set out in this plan. This will require smarter and more innovative solutions that at the same time can help future-proof our current energy infrastructure. Although 'infrastructure' is a wide ranging heading the key issues related to securing a sustainable marine energy future are around cost effective and timely provision of suitable grid capacity, ports capabilities, transport links and communications.

Alongside this, installation of new onshore and offshore electrical infrastructure is required for marine energy projects. There are costs and requirements associated with this type of infrastructure such as insurance and decommissioning liabilities, and it needs to be ensured these are proportionate to the project risk and reflect any wider environmental and public benefits.

Where Are We Now?

Grid capacity

There are several ways of connecting to the grid network 11kV, 33kV and 132kV infrastructure provided by the Distribution Network Operator (DNO) and 275kV-400kV infrastructure provided by National Grid. 11kV would normally only be suitable for small scale technology, 33kV infrastructure can support up to 20MW projects, and 132kV and above is able to support hundreds of MW. Connection costs increase with higher voltage therefore the most optimum infrastructure to connect wave and tidal stream demonstration arrays, and the demonstration zones is 33kV and 132kV. Wales benefits from extensive high voltage infrastructure in North Wales associated with the Wylfa nuclear power station, and in south and west Wales associated with the refineries and other heavy industry. However there is limited capacity on the 32kV and 132kV infrastructure. The resource is in a fixed location and must be connected as closely as possible to keep costs down and whilst there is some 33kV capacity around coastal Wales it is currently limited to a few 10-15MW sites and even fewer in close enough proximity to the required point of generation. Increasing the capacity available meets a 'cliff edge' in the costs as the DNO would need to 'significantly upgrade' the network which adds significant time and costs to a project.

Under current OFGEM rules DNO's cannot provide pre-emptive grid capacity which means that marine energy developers who need grid capacity may have to compete with established technology for a connection point. Interactivity rules come into play and 'who pays first wins' which could disadvantage marine generators unable to finance a full grid connection at that time. The DNO would always remain cash neutral on a project, the developers paying in stages until the connection is complete. Marine generators are also likely to require an 'export capacity ramp' that may not see full output for 10 years. But in order to meet investor needs, may need to have agreement for that full capacity now, to demonstrate capability and prevent future grid cost escalation risk. Having that capacity available means paying for it when installed capacity and therefore revenue is far below the rated capacity of the connection.

The principle with an NGT connection is basically the same regarding timescales, and interactivity rules. Again NGT cannot provide pre-emptive capacity at all, whether earmarked for a specific technology or not. However NGT can provide capacity, it may not be bound by the same planning restrictions, so could be attractive, although it is considered a more expensive option and the charging methodology is different. A new generator (not Big 6) would be seen as a commercially high risk by NGT and it is likely that NGT would require cash, cash in escrow, a bond or similar in order to mitigate this risk. Once capacity is installed by the generator the security paid to NGT is returned and NGT takes its revenue over the life of the project through TNUoS charging. Possibly a big risk to the generator if the capacity promised is not realised.

Whilst OFGEM rules currently prevent strategic reinforcement, it is interesting to note that this has been successfully done in other countries to support new generation. The Danish government, in order to support Denmark's offshore wind activity, provided a High Voltage connection point out at sea to connect the wind farms to the onshore grid.

Where Do We Want To Get To?

Grid capacity

- Current grid rules do not support a power generation industry that needs a clearly mapped and secure future grid capacity to support its long term needs. Ideally there should be spare grid capacity at locations where marine activities are strongest so that developers can show investors that additional capacity is or will be available in line with business plan aspirations.
- Mechanisms should be in place to help with guarantees. Alternatives such as soft loans should be available to developers for grid, or other areas of mutual benefit, if supporting more than one project.
- Marine projects should be able to work with NGT on the same terms as the conventional major power generators.
- Better understanding of actual project specific decommissioning plans to allow actual costs to be used

Recommendations

31	Alternative approaches to grid charging and allocation of capacity should be explored with OFGEM.	WG OFGEM
32	Options for strategic grid reinforcements should be explored to ensure sufficient grid capacity is available when the sector needs it, including building a robust needs-case where necessary.	WG OFGEM NG
33	An Infrastructure Guarantee Fund should be established to provide security to underwrite grid works.	WG
34	Opportunities to utilise EU support for the funding of electrical infrastructure for early marine energy projects should be explored.	WG
35	Focussed research should be undertaken on smart energy solutions and storage infrastructure, including how to optimise the potential for marine energy to contribute to future grid scenarios.	WG
36	Potential mechanisms should be explored for underwriting decommissioning requirements, and consideration given to future ownership of assets.	WG

2.7. Marketing & Communications

Introduction

Communication should be a priority for all. As a nation, we need proactive political leadership that inspires confidence and encourages development.

Our aim must be to raise awareness, build confidence and demonstrate support for the marine industry in Wales. We should be positioned as World leaders; capitalising on the natural advantage that we have as a Country with the second highest tidal range in the World and building on the success of the existing industry.

This needs to begin with the development of a Marine Energy Wales brand.

Where Are We Now?

Marketing and communication related to marine energy in Wales is currently fragmented and reactive as opposed to proactively promoting Wales' position and potential.

Marketing and PR is currently being driven by individual players in the market as opposed to a joined-up industry approach with the endorsement of Government.

Where Do We Want To Get To?

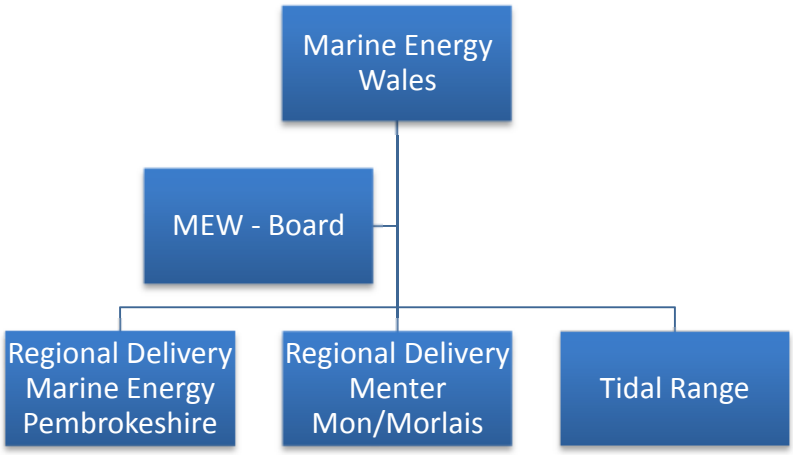
- Capitalise on the success and profile of projects such as Tidal Lagoon Swansea Bay Plc as the platform for raising awareness, demonstrating support for the marine industry and building confidence in Wales
- Capitalise on work done by MEP on promoting Wales as a location for wave and tidal stream highlighting Structural Funding and DZ
- Development of a Marine Energy Wales 'brand' that unites current players in the sector and attracts future investment
- Political leadership at all levels

Recommendations

37	A cohesive marketing and communications plan should be produced, incorporating: • Agreed key messaging and communication themes across Welsh Government and partners to raise awareness, build confidence and demonstrate support for marine energy in Wales, supported by adequate resourcing • A Marine Energy Wales 'brand' that unites current players in the sector and attracts future investment • Approach for promoting export opportunities – technologies and skills • Detailed PR strategy that incorporates global, regional, business and sector media.	WG MEW
38	Industry 'champions' should be identified to support the implementation of the Marketing & Communications Plan.	MEW

3. Next steps

The Group has agreed that a Marine Energy Wales (MEW) organisation should be formally established to represent the marine energy sector in Wales on a UK and EU level. The Group membership will be installed as the MEW Board, with the current MEP Working Group Chair and Vice-Chair taking up similar roles within MEW.



MEW will take ownership of the Marine Energy Plan and be responsible for ensuring that recommendations contained within the Plan are followed-up with the appropriate stakeholders.

Glossary

bn	Billion
CfD	Contract for Difference
DECC	Department of Energy and Climate Change
DCO	Development Consent Order
EC	European Commission
ERDF	European Regional Development Fund
GW	Gigawatt
LCRI	Low Carbon Research Institute
M	Million
MEP	Marine Energy Pembrokeshire
MEW	Marine Energy Wales
MRESF	Marine Renewable Energy Strategic Framework
NAW	National Assembly for Wales
NG	National Grid
NSIP	Nationally Significant Infrastructure Project
NRW	Natural Resources Wales
OFGEM	Office of Gas and Electricity Markets
ORJIP	Offshore Renewables Joint Industry Programme
SEACAMS	Sustainable Expansion of the Applied Coastal and Marine Sectors
TCE	The Crown Estate
TWh	Terawatt Hour
WEFO	Welsh European Funding Office
WG	Welsh Government
WMERG	Welsh Marine Energy Research Group