

Written evidence submitted by Marine Energy Wales (REW0039)

Marine Energy Wales (MEW) welcomes the opportunity to represent our membership and provide evidence to this inquiry on the role of emerging offshore renewable energy in Wales. We look forward to presenting oral evidence and would welcome continued engagement with the Welsh Affairs Committee on this emerging sector and the opportunities it presents. This consultation response seeks to provide a brief summary of the industry, to highlight the importance of the emerging offshore renewables sector to drive decarbonisation and the green recovery here in Wales, and to answer the questions posed.

MEW is *the* industry led stakeholder group representing the wave, tidal (stream and range) and floating offshore wind industries in Wales. **Please note that our response covers multiple perspectives from multiple sectors due to the diverse nature of our membership.**

MEW brings together project and technology developers, test centres, wider sectoral alliances, the supply chain, academia and the public sector to establish Wales as a global leader in sustainable emerging offshore energy generation. Our vision is to create a thriving and diverse emerging offshore renewables industry in Wales that brings with it the combined benefits of climate change mitigation, reliable contributions to the national energy mix, jobs and economic development in coastal, peripheral zones along with large-scale future export potential. We currently have a 60+ strong membership.

Emerging Offshore Renewable Energy in Wales – The Potential

The Welsh Opportunity

MEW champions a green economic recovery with emerging offshore renewable energy playing a pivotal role. Harnessing the power of the sea will provide a clean, low carbon and sustainable source to meet the UK's energy demands and contribute to a successful, resilient and diverse UK energy mix which aims towards net zero. Wales has a unique offer with abundant tidal, wave and wind resource right on our doorstep (see Figure 2 below). According to the Offshore Renewable Energy Catapult (OREC), the UK's practical resource has been estimated at 15GW for tidal stream and 23GW for wave energy¹. Furthermore, there is 20GW of tidal range resource (including 6GW in Wales) and at least 50GW in the Celtic Sea alone in Irish and UK waters for floating offshore wind. Emerging offshore renewable energy presents an opportunity for Wales to keep its own renewable energy technology value locally by supporting a currently homegrown industry to deliver a low carbon economy, with its own jobs and prospects, and export the knowledge, skills and expertise globally.

The pursuit of offshore renewable energy is an important pathway to support Wales to achieve UN Sustainable Development Goals as well as Welsh and UK Government climate targets. Increasing renewable energy and resource efficiency has been identified by Welsh Government as one of three national priorities. According to DECC, marine energy has the potential to supply 20% of the UK electricity and avoid 30 million tonnes of CO₂ emissions each year².

With sufficient revenue support driving cost reduction in the 2020s, the full potential of tidal stream, wave, floating offshore wind and tidal range energy can be realised for Wales in the 2030s. It will provide market certainty for investment in project development and establish supply chain capacity and diversification in Wales to deliver these emerging offshore energy projects. Wales has the potential to establish an early mover advantage and position itself and the UK as a global leader for the emerging offshore energy sector; an export market worth an estimated £76 billion by 2050³.

- This emerging offshore energy sector offers an **untapped solution to climate change**. Our technologies offer the possibility of harnessing an abundance of predictable, clean energy from Welsh waters and beyond which can contribute to net zero targets and commitments.

¹ [OREC \(2018\) Tidal Stream and Wave Energy Cost Reduction and Industrial Benefit](#)

² DECC figure of 318TWh of electricity consumed in UK in 2013 and carbon saving figure 430g/kWh

³ [MEW \(2020\) State of the Sector Report](#)

- Furthermore, they can contribute to a **diverse and resilient global energy mix**. The wind is not always blowing and the sun is not always shining. Marine renewables can address fluctuations in these energy sources to ensure that the lights stay on. They also enable energy independence by reducing our reliance on fuels imported from abroad. Generating power from multiple diverse sources is key to delivering a continuous uninterrupted supply of renewable energy to our homes. Unlocking the opportunities on the west coast of the UK will enhance energy systems benefits across a wider geographical area.
- But most crucially, this sector could become a **national export, bringing prosperity to Wales**. Aligning our rich maritime and industrial heritage with 21st Century needs could enable Wales to become a major exporter of marine renewable technologies and services, tapping into an ocean of wealth and opportunity.
- Long-term and sustained emerging offshore energy projects can continue to create **high skilled, quality and innovative jobs in peripheral economies** and provide supply chain diversification, clustering and resilience. With over 737-person years¹ of employment to date in Wales, the sector is providing employment, regeneration of rural communities and ports and encouraging low carbon economic growth in coastal regions across the country.

The Offshore Renewable Energy Catapult (OREC) published a new evidence-based assessment that shows the UK's marine energy industries, specifically wave and tidal stream, can meet the requirements of the UK Government's 'Triple Test' for determining support for new technologies. The tests are: achieving maximum carbon reduction; showing a clear cost reduction pathway, and demonstrating that the UK can be a world-leader in a global market². To date the sector has provided value for money with every £1 of public money invested in major UK marine energy businesses leveraging £7 of private investment, and more than 77% of this investment has been spent in the UK supply chain. The OREC report has demonstrated that the tidal stream industry could generate a net cumulative benefit to the UK of £1.4billion and 4,000 jobs by 2030. Wave energy could add a net cumulative benefit to the UK of £4 billion and 8,100 jobs by 2040. Predictions for the UK as a whole see the sector supporting a total of 22,600 jobs by 2040. Crucially, 50 – 60% of the economic benefit of both GVA and jobs is expected to be generated in coastal areas in need of economic regeneration². The OREC report states that tidal stream has the "potential to reach LCOE of £150 per MWh by 100MW installed, reducing to £90 per MWh by 1GW and £80 per MWh by 2GW". Further reductions are possible with additional focus on innovation and continued reductions in cost of capital similar to levels being achieved in offshore wind. Significant cost reductions are expected in the near-term as the industry takes the step from pre-commercial arrays to commercial projects."

2

The Celtic Sea Potential

MEW represents Wales on the Celtic Sea Alliance which is a collaborative programme between Cornwall, Wales and Ireland to progress the development of utility scale floating offshore wind development in the Celtic Sea. The Celtic Sea provides a significant opportunity for floating offshore wind projects and supply chain development; with benefits for the regions going far beyond the supply chain and site developers. With up to 50GW of electricity capacity available in the Celtic Sea in Irish and UK waters for floating wind⁴, it can make a significant contribution to the Green Recovery, long term growth and decarbonisation. Welsh projects will be key in enabling the UK Government to reach the target of delivering 1GW of floating offshore wind energy by 2030. The rapid progress of this sector in Wales, not only represents a floating offshore wind opportunity, but also brings significant supply chain synergies to bear for the wave and tidal export potential in Wales. Encouraging investment in the early 2020's could become multi-purpose with the advent of the predicted wave and tidal boom of the late 2020's and beyond.

With the correct support, floating wind has the potential to provide 17,000 UK jobs by 2050, with significant cross-over from employment in oil and gas, and £33.6bn of economic activity (GVA) according to OREC. These benefits will be particularly apparent in the hubs of the industry in Wales, Scotland and the South West of England with an UK export value of at least £230m by 2031 and £550m by 2050⁴.

⁴ OREC (2020) Benefits of Floating Offshore Wind to Wales and the South West

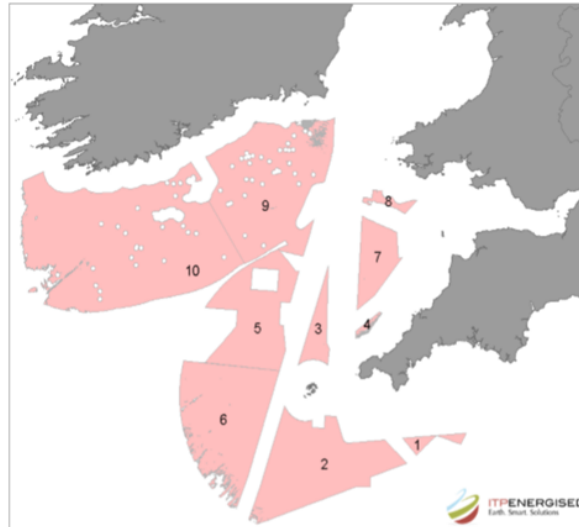


Figure 1 Zones of potential in the Celtic Sea (ITP Energised report)

Progressive Research & Infrastructure

A number of Welsh universities are conducting world leading emerging offshore energy research alongside projects such as SEACAMS2 and Selkie which aim to support the industry in their technological and commercial endeavours. Furthermore, Wales has eight strategically located ports and facilities strategically sited along the entire coastline. R&D trials are currently underway to assess the potential opportunity that hydrogen production, storage and handling may also represent to Wales. There is significant storage and pipeline capacity at a number of Welsh ports which could represent a solution for alternative use of emerging offshore energy power; to be used to produce green hydrogen instead of being exported to grid. This green hydrogen could contribute to Ofgem's minimum 80TWh hydrogen requirement to decarbonise shipping and HGV sectors by 2050 in net zero scenarios. Wales has accessible 400kV transmission lines adjacent to resource areas which are of significant strategic benefit compared to other areas of the UK and Europe. Wales is also an important net exporter of power to the UK grid, generating more than double the electricity it consumes. Historic energy industries in Wales such as nuclear in the North and oil and gas in South mean that we can draw on established supply chain and an experienced workforce; providing diversification opportunities. All this means Wales is well on its way to becoming a centre of excellence for emerging offshore energy technology and enabling those cross-industry linkages and economies of scope cross sector.

International and National Activity in Wales

There has been significant investment already in the sector, with over £123 million¹ spent to April 2020 in Wales, this figure is increasing annually with rising interest to invest in Wales and a strong policy drive from Welsh Government to support the industry. The industry has the ability to deliver competitively priced, predictable and secure energy. Furthermore, the sector is poised to deliver significant economic and societal benefits to Wales *if* it remains ahead of international competition. With its foundations rooted in both European Funding and more recently City and Growth deals, this demonstrates the stimulation of activity from the funding received to date, and with further funding will enable the acceleration of commercialisation and the delivery of a diverse energy mix.

The MEW 2020 State of the Sector Report details that a total of 16 emerging offshore energy developers are actively progressing projects in Wales with seabed agreements in place for over 532MW of sites¹. Through the Morlais tidal energy project in North Wales, the Marine Energy Test Area in Milford Haven, TIGER's Ramsey Sound site and the Pembrokeshire wave and floating wind Demonstration Zone in South Wales along with the ORE Catapult Marine Energy Engineering Centre of Excellence, Wales will have an excellent world-class suite of Test, Innovation and Demonstration sites. Provided continuity of available funding mechanisms for R&D is achieved, coupled with experienced supply chains and integrated infrastructure developments, these test and demonstration zones will continue to attract not only the interests of UK based technology developers, but also further the inward investment successes already achieved from countries including Australia, Sweden, France and Spain.

Upcoming investment from the £60 million Pembroke Dock Marine project as part of the Swansea Bay City Deal highlights the potential associated with wave and floating offshore wind interests and opportunities for the tidal industry are apparent as part of the North Wales Growth Deal which altogether further enhance the development of the sector across Wales.

The unique offer from Wales has led to significant activity over the past few years (see Figure 2):

- **Minesto**, a Swedish low flow tidal technology company with UK fabrication in their recently opened Assembly Hall at Stena in Holyhead, Anglesey creating over 30 direct jobs and circa £10m in UK contracts. Future plans and funding are in place for their phase 2 project totalling £23million and an 80MW commercial site in Welsh waters.
- 10 tidal power developers from around the world have been awarded berths at **Morlais’s 240MW Anglesey Tidal Energy Demonstration Zone** where they are provided with pre-consented sites and grid connection.
- **Marine Power Systems**, are underway with Phase 2 of their wave technology demonstration project and a technology range which includes Wales and the UK’s only Floating Offshore Wind platform solution – representing an £18million pound investment.
- **Nova Innovation**, a tidal technology developer going from strength to strength has recently announced their £1.2million Blue Energy Island project at Ynys Enlli – aiming to eliminate diesel generators from Bardsey Island and supply clean predictable electricity to the Llŷn Peninsula.
- **Bombora Wave power**, an Australian company now headquartered in Pembrokeshire with an £18million RD&I project well underway, 26 highly skilled staff destined to deploy later this year in META (Wales’ newly established test centre).
- **Blue Gem Wind’s** first stepping stone 96MW “Erebus” and subsequent 300MW “Valorous” floating offshore wind projects in the Celtic Sea. Blue Gem Wind is a joint venture between Simply Blue Energy and Total; demonstrating significant interest in this market from oil and gas players.

Wales is poised and we have the foundations in capability and capacity and the ambition to deliver for this industry. MEW’s answers below highlight what is needed to progress the sector forward.

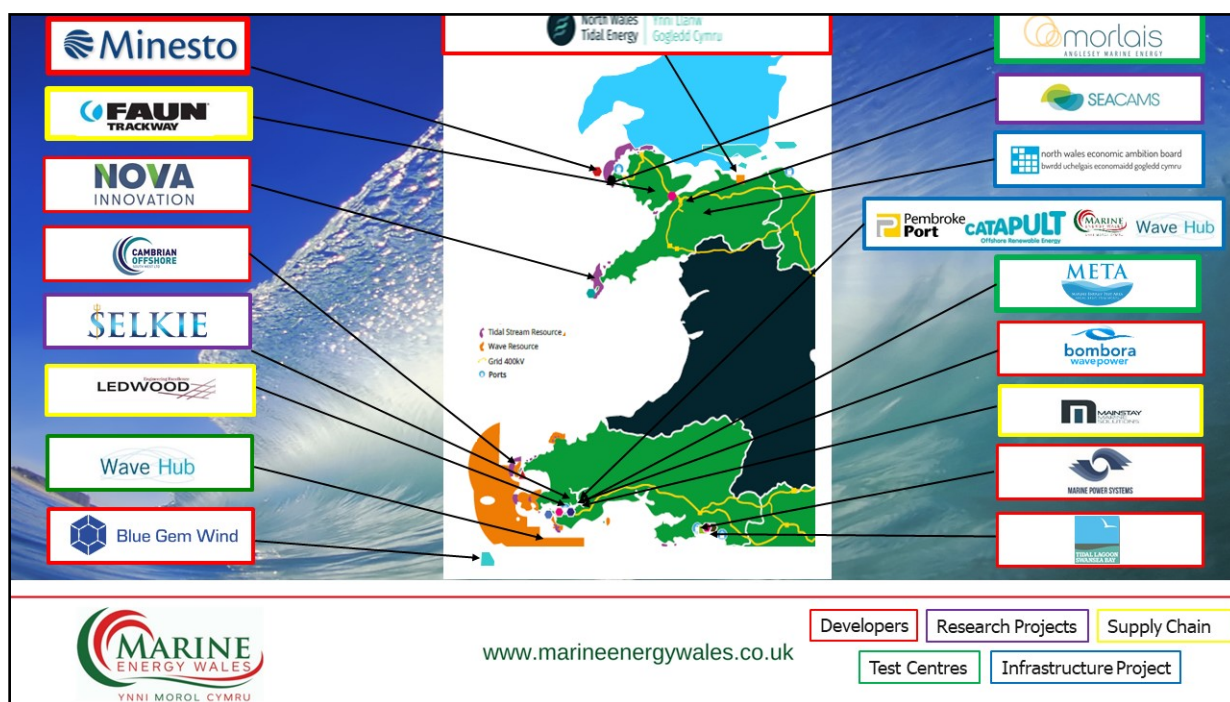


Figure 2 – Resource areas for wave, tidal stream and wind and emerging offshore energy projects in Wales from MEW members including examples of supply chain companies.

Question 1: How can the UK Government best support the deployment of renewable generators in Wales?

Despite a natural competitive advantage, innovative initiatives within this sector, and significant maritime experience developed over centuries, lack of policy certainty and consistent financial support mean both UK companies and international companies which had relocated to the UK to use the UK's world leading test facilities are currently considering locating to alternative, overseas markets. Resulting in the forfeit of the associated jobs, prosperity and economic growth for the UK as well as the provision of secure and predictable energy to the energy mix. Whereby we risk once inherent strengths, including know-how, technology, economic value and employment prospects, leaving the UK and being drawn overseas².

As highlighted by the recent OREC report, the UK's wave and tidal stream industries are at a key point. Rather than allow other countries to capitalise on our achievements and investments, we must act now to anchor the Welsh and UK industry that will supply the UK and the world in the future. With adequate and consistent policy and financial support from UK government, we will be able to capitalise on this innovative maritime opportunity that supports supply chain resilience and clusters, in some of our most peripheral economies across the UK. Which, as we are already seeing, represents significant global export potential. This would deliver on the UK Government's Industrial Strategy.

Wales' ongoing ability to benefit from this new low carbon opportunity will ultimately depend on;

- a UK Government policy providing a route to market and appropriate revenue mechanism for the sector.
- ensuring the infrastructure required to build the technology and export the power is available at the right time and to the right scale,
- enabling the upskilling and up-tooling of our supply chains; and
- timely deployment of our technology that is not unduly constrained by the consenting regime.

As a representative body we have undertaken extensive stakeholder engagement with our members, seeking collective inputs and a collaborative approach to defining the sector's needs and we have six headline asks. As clear as the opportunities, that tidal stream, wave and floating offshore wind (FLOW) are bringing to Wales, are, there is a need to maintain support and investment for these technologies now to realise the full potential these opportunities represent for Wales in the 2030s and beyond. Our asks are;

1. Revenue Support

Tidal Stream and Wave energy

Wales has the potential to be a world leader for emerging offshore renewable activity and development. Whilst the opportunities outlined are currently very apparent and are the result of significant effort and investment into the sector, the overarching need for a **route to market** remains and **revenue support** is the key to unlocking these opportunities for Wales. Reform of the Contracts for Difference Scheme by providing a 'minima' of 100MW for tidal stream technologies in Pot 2 and an Administrative Strike Price of £250/MWh will drive further development, increase scale of deployment, reduce costs and enable these technologies to compete with mature technologies. Furthermore, an Innovative Power Purchase Agreement (IPPA) as shared with BEIS and HMT will support early-stage development and can plug the time gap between CfD rounds. Encouraging the deployment of more devices will build on the **evidence base** needed to understand environmental interactions and streamline the **consenting** process.

Floating Offshore Wind

Revenue support will be required for at least the next ten years for floating wind projects. The UK Government will need to set pot capacities, create minima and maxima and use Administration Strike Prices (ASPs) to ensure the delivery of projects at suitable value for money. However, as with tidal stream and wave energy it is important this is done in the context of a local supply chain strategy. It should be understood that currently there is not a mechanism that rewards the use of local supply chain.

RISK: The lack of a meaningful revenue support mechanism hampers developers' route to market, stalls investment needed to commercialise and risks companies relocating and developing their projects outside the UK.¹

2. Infrastructure and Supply Chain

Supporting the building of required infrastructure and developing grid capacity is **key** to enable the growth and progression of the industry to deliver projects. Port development needs to be able to accommodate large scale technology components to be able to maximise opportunities for the sector in the 2030s. Furthermore, to address grid constraints integration with broader SMART energy systems and with the hydrogen economy should be encouraged. Emerging offshore renewable energy presents an opportunity for Wales to keep its own renewable energy technology value locally and export the knowledge, skills and expertise globally. MEW believes that supporting the development of these technologies will encourage the use of a high-content local supply chain. According to the Institute of Welsh Affairs' report 'A plan for Wales' renewable future', "Wales must capitalise on the future economic growth and jobs benefit of the (marine energy) sector by developing Welsh focused supply chains that are competitive." Further support for local Welsh companies to become competitive is needed by encouraging the building of infrastructure, providing training and using stepping stone projects to build supply chain capacity and enable diversification, clustering and resilience.

RISK: For floating offshore wind in particular, Welsh supply chain will struggle to compete with large established offshore wind construction and operations and maintenance contractors without significant government support, and there is a risk of missing out on a large proportion of the economic benefits. This is why MEW supports stepping stone projects such as those in the Celtic and Irish Seas which help the supply chain develop a staged process along with government support in port investment. For wave and tidal, the demonstration zones will act as the equivalent stepping stones, enabling supply chain players to become manufacturers as volumes increase in line with the commercialisation of these technologies and deployments succeed in the array demonstration zones.

3. Grant Funding

It is key that funding for this industry remains through the UK Shared Prosperity Fund and Regional Investment for Wales Framework in order to provide a legacy and commercial route to market for Wales' most promising developing industries. Funds should consider the progression of the industry to commercialisation; not only enabling continued R&D but taking projects beyond the innovation stage to a commercial pathway.

RISK: Continuity of funding from EU grants is important to avoid hampering the ability of developers to progress and take advantage of established regional benefits. Many companies that have invested in and nurtured localised supply chain development may be forced to walk away if funding incentives are insufficient compared to overseas offerings. Furthermore, without access to the EU's €10 billion Innovation Fund, the same level of opportunity and funding availability needs to remain for Welsh based companies through the Shared Prosperity Fund. This will enable projects in Welsh and UK waters to meaningfully progress, and for companies to be able to remain based in the UK and compete with the European market.

4. Collaboration

MEW are strong advocates of working collaboratively with partners and across nations. In line with the International Strategy, this is key to strengthening Wales' reputation as an outward looking and innovative nation as well as provide emerging offshore renewables expertise. We would encourage cross-border learning between the nations of the UK especially in terms of consenting and sharing of data to build the evidence base. There is also significant opportunity for Welsh supply chain in supporting floating wind projects in Ireland with the potential for the creation of a Celtic Sea Economic Zone for floating wind across Ireland, Wales and the South West of England.

RISK: At present, there is a wealth of knowledge and experience around UK shores that can be utilised across the sector to accelerate learning and progress to the benefit of UK players and the UK sector, developing in isolation risks losing out on these benefits currently inherent to the UK, undermining the early mover advantage currently available.

5. Enabling Floating Offshore Wind Project Pipeline

To realise the potential of floating offshore wind in the Celtic Sea, the development process, grid capability and port infrastructure need to be developed to deliver this industry for regional benefit. At present a limit of 100MW exists as a ceiling for the development of FLOW. Within Welsh waters the minimum for a stepping stone site needs to be increased to 300MW and we are encouraged that The Crown Estate are considering early commercial projects of this size. However, we are concerned that this process is taking too long and that if sites are not progressed rapidly, they will not go ahead due to competition from the large ScotWind sites in CfD rounds from 2027 onwards. Furthermore, a commercial Crown Estate Leasing Round for the Celtic Sea is required so that large projects can be developed in the 2020s for delivery in the early 2030s. This would enable the progression of the Celtic Sea as a floating wind development zone allowing cross border benefits with Ireland through collaborative working between Wales, South West of England and our European neighbours.

RISK: Without developing UK assets to support the FLOW sector in the Celtic Sea, the associated economic growth, supply chain diversification prospects and early mover learning will be fulfilled elsewhere, and, once established, will be difficult to lure to the UK; meaning projects in the Celtic Sea could be delivered without any of the industrial activity occurring in the UK.

6. Tidal Range

Wales can lead the way in developing the necessary framework to demonstrate the value of tidal range to the UK. Rather than concentrating on simple cost of energy models, there needs to be broad recognition of tidal range's unique multi-generational operating life, extensive co-benefits and contribution to Wales and the UK's energy security, stability and Net Zero targets. A fresh assessment of tidal range, recognising these factors and using up-to-date independent engineering and financial models would not only provide the much-needed evidence needed to compare tidal range's unique features and benefits against other forms of low-carbon energy, but also provide the technical, environmental and financial models to guide Government and investor decisions.

RISK: We run the risk of overlooking a low carbon, sustainable energy source that is intrinsic to our heritage as a maritime island nation that offers multi-generational benefits for society, leisure and coastal protection as well as energy security and stability.

In summary, by addressing these key concerns, the sector's potential contribution to the blue economy **can be recognised as pivotal in the green recovery**; in the development of a successful and diverse Welsh energy mix which aims to deliver net zero by 2050, in the establishment of strong supply chain capacity and diversification, and to 'level up' and support the peripheral coastal economies where these developments take place.

Question 2: How should the UK and Welsh Governments work together to support the development of renewable energy projects in Wales?

There are a number of key areas where there are common interests and opportunities to further collaborate between UK and Welsh Governments. Existing programmes and schemes to develop the supply chain's capacity and capability through clusters such as the South Wales Industrial Cluster and Celtic Sea Cluster will continue to enable cross-border working. Upgrades to infrastructure such as grid and ports will need to take places through cooperation to make sure they are fit for purpose. Therefore, a number of our members have suggested the

creation of an Emerging Offshore Energy Programme Board that is inter-governmental and seeks to align common interests for the sector at the two levels of government activity. Members of this Board could comprise of national and devolved parliamentary representatives, civil servants and advisors. This would encourage this cross-border collaboration to focus on the key areas of influence that may constrain the opportunity available; there is an opportunity for a collaborative approach to infrastructure strategy in Wales to support renewables through both grid and port development. Welsh Government and UK Government should identify areas for co-operation and potential co-investment. The role ports will play in local supply chain benefits cannot be overstated. The Swansea Bay City Deal's Pembroke Dock Marine Project and the tidal energy opportunities of the North Wales Growth Deal can act as anchoring projects and avenues for UK and Welsh Government to build on existing collaborative work together.

In addition to regional funding, a member has suggested that the Development Bank of Wales could act as a conduit for initiatives that are less traditional grant mechanisms. This could be in the form of funding programmes that encourage developers to identify realistic but ambitious pathways to commercialisation and bankability i.e., high value funding pots that have performance-led deliverables, for example, energy production and / or CO2 emissions avoidance. Another member suggested that complementary support schemes could be devolved to Wales to accelerate the specific deployment of devices. This would provide nascent industry with continuous support rather than wait for a CfD auction round every 2 years which can be prohibitive for development.

Clear lines of communication and transparency will also be key in enabling effective collaboration. Due to the Welsh Affairs Committee's cross-party nature, it could provide an additional path to improve communication between UK and Welsh Governments. We have recently suggested that a Cross-Party Group for Emerging Offshore Renewable Energy be set up in the Senedd. As well as departments focused on emerging offshore energy in the UK and Welsh Governments meeting regularly, the All-Party Parliamentary Groups for Marine Energy and the Celtic Sea could meet quarterly with the above cross-party group to enable flow of information and decision-making opportunities.

Question 3: What mechanisms can ensure that subsidies for renewable generators are good value for money?

The significant success from the Contracts for Difference scheme in reducing the costs of renewable energy is clear. We were encouraged that BEIS has decided to move fixed offshore wind in to Pot 3 which works well with established technologies but does not allow space for new technologies to develop. For new technologies, value for money should be looked at over the lifetime of the technology rather than at the cost of electrons in the early projects. As outlined in the introduction with figures from OREC's cost reduction reports, with suitable support, the levelised cost of energy for these technologies can reduce dramatically over the next decade. Value for money must be considered in the context of holding a lead in the only renewable energy technology that is the UK's to own and export into growing global markets. The UK has a history of being a renewable energy project importer versus a technology led exporter. Security and predictability of supply must also have a place when discussing value for money. To leverage the economic benefits from investments in low carbon electricity generation for our coastal and peripheral communities and achieving net zero emissions by 2050, more focus should be placed on creating skilled jobs and building a resilient UK homegrown industry rather than competition alone. These emerging offshore energy projects are delivering GVA benefit by enabling local ports and supply chain to participate in smaller projects before the larger projects are delivered. This would support the Industrial Strategy and develop the capacity and capability of local, sustainable supply chains. Investment in the 2020s would lead to harnessing innovation, investing in skills, driving regional growth and subsequently boosting UK companies' competitiveness and productivity at home and internationally in the 2030s.

Furthermore, streamlined and efficient consenting processes will facilitate achievable value for money. A Scientific and Evidence funded pot which is ringfenced for developers to collate useful and available data to inform regulator decision making would support this.

The Welsh Government are currently working on opportunities through the Marine Energy Programme to explore revenue support mechanisms to deliver nascent marine technologies (tidal stream and wave) and a ‘first of a kind’ project to enable the development of a tidal range programme in Wales.

Tidal Stream and Wave energy

To progress the sector from early-stage development to deploying arrays into the water, an appropriate **CfD revenue support mechanism** is essential for larger projects. Reform to the scheme is needed to provide a route to market for projects that are on the cusp of commercialisation and to develop a world-leading industry in Wales and the UK. This will enable commercial confidence, attract private investment and secure local benefits.

- 1. To create a thriving marine energy sector in Wales, we propose the consideration of a 100MW ‘minima’ within Pot 2 for tidal stream where allocated capacity can provide a cost-effective way for government to support the industry. Importantly, the creation of technology minima will prevent the CfD programme from delivering the cheaper established technologies in Pot 2 (remote island wind, biomass and CHP) with increased costs incurred as a result of the clearing up process. This would be triggered as a result of supporting any tidal stream, FLOW and wave energy without a ‘minima’. Any further concerns about value for money can be managed using an **Administrative Strike Price** of £250/MWh.*
- 2. We propose that changes to the CfD scheme are complemented by the introduction of an Innovation Power Purchase Agreement (IPPA) by the UK Government. This will enable the progression of early-stage technology development and cost reduction in smaller projects up to 5MW. Furthermore, it will plug the gap between grants and the CfD process and prevent having to wait for auctions. It will also limit costs to HMT as payment is only made if power is delivered and there is a ratchet mechanism to reduce costs over time as more projects come on stream. It is estimated that it will cost £50m in tax rebates each year for twenty years for tidal stream (and similar for wave energy) whilst delivering a net benefit of ~£22b by 2050.*

Further financial support is also required through grant funding provisions that drive continued innovation and research. It is key that funding for this industry remains through the UK Shared Prosperity Fund and targeted innovation funds, in order to provide a legacy and commercial route to market for the UK’s most promising developing industries. Funds should consider the progression of the industry to commercialisation; not only enabling continued R&D but taking projects beyond the innovation stage to a commercial pathway. Continuity of funding from EU grants is important to avoid hampering the ability of developers to progress and take advantage of established regional benefits, for example supply chain development. Continued support will provide the ability to compete with European companies that have access to the EU’s €10 billion Innovation Fund, and therefore remain in Wales, to develop projects in Welsh waters.

Floating Offshore Wind

A report published in January 2021 by the Offshore Renewable Energy Catapult established that floating wind could be subsidy free by 2030, aligning it with fixed offshore wind⁵. This means that after the stepping stones projects in the 2020’s the Celtic Sea will be delivering competitive energy to the market. Of the nine sites analysed, one of the Celtic Sea sites came out as top priority based on levelised cost of energy. The stepping stone projects themselves offer value for money in two ways. Firstly, they are part of the learning curve for the industry to go through on the cost reduction activities required to achieve the 2030 position. Secondly, and importantly for Wales, they are delivering GVA benefit by enabling local ports and supply chain to participate in smaller projects before the larger projects are delivered. The OREC report, “Benefits of Floating Wind to Wales and the South West”⁶ commissioned by Welsh Government and the Cornwall LEP in 2020 focussed on the importance of “deploying a number of pre-commercial floating offshore wind projects in the mid to late 2020s, increasing in size from 32MW at Wave Hub to 90MW at Pembrokeshire Development Zone (PDZ) or equivalent site (see Erebus) then a 300MW project and a 500MW project”.

The stepping-stone approach was again identified as “providing opportunities for the supply chain to prove capability on smaller projects before investing in larger facilities to support commercial scale sites”. This stepping

⁵ OREC (2021) [Floating Offshore Wind: Cost Reduction Pathways to Subsidy-Free](#)

⁶ OREC (2020) [Benefits of Floating Offshore Wind to Wales and the South West](#)

stone approach provides a clear pipeline of projects for Supply Chain; enabling key investment decisions and providing a catalyst for upskilling and up-tooling to meet the needs of the industry and retain local content in future larger projects. Therefore, going straight to larger scale (>500MW) would not be optimum for local supply chain development. OREC, in this research estimated that a programme that enabled 1GW of stepping stone projects could deliver 3000 jobs and £682m of GVA over a ten-year period.

There will also be a challenge in CfD allocation rounds AR4 (2021), AR5 (2023), AR6 (2025) for BEIS in its support for the floating wind sector is that there will be stepping stone projects in both Scotland and Wales that will be supporting the development of their local supply chains respectively. A tendency towards competition over supply chain development in Pot 2 could mean a loss of these development projects to either nation.

Tidal Range

For tidal range, financial support needs to be considered in two phases:

Phase 1

Much has changed since the Government's 2018 decision to overrule the advice given in the Independent Review of Tidal Lagoons, led by Charles Hendry - which concluded that "Tidal lagoons would help deliver security of supply; they would assist in delivering our decarbonisation commitments; and they would bring real and substantial opportunities for the UK supply chain." There have been significant advances in tidal lagoon construction processes and turbine technology which substantially enhance the industry's financial model and value for money. These make previous assessments in 2010 and 2011, upon which much government policy is based, redundant.

A fund of £20 million is requested from the Government to stimulate private investment of £20+ billion. This will finance pre-feasibility assessments of the most promising tidal lagoon proposals, providing technical, engineering, environmental and financial models and evidence to guide and support Government and investor decisions on each project.

Phase 2

For energy sources, such as tidal range schemes, that have a very high capital cost and long construction period, *"The cost of capital is so dominant that it can explain as much as almost half the costs of a project."*⁷

BEIS has issued a consultation paper on using the Regulated Asset Base (RAB) method for funding nuclear development and has raised the possibility of applying the RAB method to other energy generation systems; *"We are also considering whether a RAB model could be applied to other firm low carbon technologies such as transport and storage infrastructure for carbon dioxide."* Tidal range projects would be ideal candidates for RAB, given their very long operating life (twice that of a nuclear power plant and four times a wind farm), high front end capital cost and long-term investment returns.

Question 4: What opportunities are there for renewable generators in Wales of greater interconnection with other electricity markets?

As an island nation, developing emerging offshore energy generation establishes export potential and wider energy system benefits that open new geographical areas to those currently used; primarily on the East coast. This will broaden the market base. Below are a number of opportunities outlined:

- Tidal energy, given its predictability, will be a strong part of an integrated electricity market. Given that tidal power will generate at different times of the day around the south, west and northern coasts of the UK, this will add value to the network and provide a diverse and predictable energy mix. For floating offshore wind, pressure in the Celtic Sea will be varying to that in the North Sea, providing increased power generation at different times and reinforces the importance to developing the Celtic Sea region for the energy strategy⁸. There is also a significant wave energy resource for future input. Emerging offshore

⁷ Dieter Helm (2018) The Nuclear RAB model, page 3

⁸ Wave Venture (2020) Analysis of combined Celtic Sea and North Sea offshore wind variability

energy therefore, can help address peaks and troughs in renewable energy supply, balance the grid and aid in the delivery of net zero.

- Collaboration with Europe - Builds bridges with European partners, improve our standing internationally and increase potential export routes. The IPPA mechanism would enable technology providers to access projects in electricity markets outside of Wales.
- Links to industrial decarbonisation through the South Wales Industrial Cluster.
- Community scale projects opens up the opportunity for more distributed and local generation.
- Interconnectors will play an increasingly important role in the coming decades with the drive towards net zero. The UK is expected to be a net exporter from the mid-2030s onwards with most power going to Europe. Given the scope for co-operation proposed in the Brexit deal, it is hoped that some of this could be provided by UK projects in the Celtic Sea but also by projects in Irish waters delivered by UK supply chain. The Ireland Wales interconnector would open up another market for electricity generated in Wales as would hybrid floating wind energy sites with connections into both Ireland and Wales.
- New developments in energy storage and the associated trading of this commodity could open up new opportunities for generation in Wales.
- Interesting opportunities associated with linking energy conversion (hydrogen as vector for electricity transmission and storage) with local renewables potential onshore and offshore. This is an opportunity in North and South Wales through the Milford Haven Energy Kingdom and Ynys Môn Energy Island. We are increasing collaboration with HyCymru; a trade association for the hydrogen economy sector in Wales.
- Celtic Sea hubs could act as collector stations for FLOW interests but also serve as interconnector vectors between Ireland, Wales and potentially Cornwall; supporting security of supply, improving resilience to intermittency and allowing flexible capability for network operators.

Question 5: How can the UK Government facilitate Welsh contributions to COP26?

In this, the year that the UK hosts COP26, we have a key opportunity to showcase Wales' activities, promise and action to deliver net zero the world's stage. Offshore marine energy will play a key role in both net zero and energy diversity demands in the renewable landscape and making this a truly homegrown Welsh industry is something we believe strongly that we can show to the world at COP 26.

We look forward to representing Wales and the sector at COP26. We will be submitting an Expression of Interest for a stand and hope that the UK Government will be able to provide us with this opportunity. Fringe events will also provide the opportunity to showcase Welsh contributions and present Wales as a case study of progress to date in leading the emerging offshore sector would be valuable. We intend to collaborate with other UK wide trade associations and also bring developers and members to the table. We would welcome any opportunity for the sector to be involved in working with the UK and Welsh Governments in the lead up to COP26.

We would welcome the setting of a Welsh and UK target for tidal energy to facilitate a parameter or goal for Wales to achieve in a given timeframe. We believe that now is the time to turn commitment in to action before COP26; enabling significant deployment of devices in Welsh waters and move towards commercialisation in the near future. A target set before COP 26 will demonstrate action on delivering net zero using a diverse energy mix and not relying on a few renewable sources.

Finally, we consider that the UK, Welsh and Irish governments should announce the creation of a Celtic Sea Economic Zone for floating wind so as create a post-Brexit project of co-operation that helps all parties achieve Net Zero.

Question 6: What implications is COP26 expected to have for Wales?

The Low Carbon Delivery Plan that is anticipated to be published by Welsh Government in the Autumn of this year, ahead of COP26, will outline the implications for Wales in terms of action towards lowering carbon emissions. We hope that the delivery of emerging offshore energy will have a prominent place in this plan.

Through COP26, significant commitment and action is needed from both UK and Welsh Government to lower carbon emissions and transform our energy systems. Enabling Wales to make a contribution to slowing climate change impacts of increased storms and rising sea levels will be key. The world will be watching and we hope that this expectation will enable the UK to make bold decisions as well as set robust, transparent SMART targets for delivery.

COP26 will place a spotlight on Wales' uniqueness – Wales could be THE example for emerging offshore energy generation and demonstrate to the world how delivery can be done by demonstrating the progress made in Wales to date and ambitions for the future. However, it is worth noting that the upcoming Senedd election may have implications on what can be set and delivered before COP26 in November.

Question 7: Has the COP26 Year of Climate Action had any significant implications for Wales?

Coronavirus has had a significant impact on the COP26 Year of Climate Action as understandably time and resource has been focused on addressing the pandemic. We anticipate that announcements have been hampered and progress delivery has been slowed. However, a focus on a green recovery and increased awareness of climate change issues has reinvigorated the discussion and accelerated the need to deliver to provide sustainable economic opportunities post-Covid.

We are aware of schemes such as Arbed, the energy efficiency programme of Welsh Government that has been set at this time and the targets set by UK Government to deliver floating offshore wind. However, there have not been specific programmes for the emerging offshore energy sector linked to the COP26 Year of Climate Action.

Question 8: What opportunities are there for renewable energy to aid Wales post-COVID-19 economic recovery?

We have over 1680 miles of coastline around Wales with phenomenal opportunities to harness energy in varying ways on our doorstep. The decarbonisation, economic growth and job opportunities have already been outlined but furthermore, linking renewable generation with cleaning up industry and offsetting carbon use and exporting net power to the UK grid are additional key benefits.

Wales can lead the Green Recovery. Developing emerging offshore renewable energy offers Wales the realistic opportunity to establish a Low Carbon Economy, deliver secure, stable and predictable energy and reduce carbon emissions in response to the Climate Emergency declaration by Welsh Government in 2019. However, the benefits for Wales go beyond clean energy. The emerging offshore renewables sector also provides opportunity for existing local supply chain companies to diversify into a new industry, retaining jobs and upskilling staff. Particularly in sectors such as aerospace and petrochemicals affected by both the pandemic and net zero aspirations, whereby synergies in skills and specialties can be easily transferred into the marine renewable sector. By supporting these national supply chain companies, value from the sector can be kept locally in Wales which will make positive contributions to addressing the impacts on businesses as a result of the Covid-19 pandemic.

Already we've seen tidal stream and wave technology developers deliver projects with over 80% UK content in their supply chain. Furthermore, others have been able to localise further and utilise over 70% Welsh supply chain content, well above the UK government's 60% UK content targets for offshore wind by 2030. One of our floating offshore wind members' projects has awarded 85% of their £13million of contracts to UK companies, with £1.8million allocated to businesses in Pembrokeshire. International companies looking to bring their technology to Wales have expressed strong interest in using Wales' existing local supply chains due to their high levels of experience, knowledge and expertise. Further investment and diversified support opportunities would incentivise the manufacturing sector to upskill and up-tool, therefore aiding in the establishment of a truly world class manufacturing supply chain feeding into a world leading marine energy industry. Furthermore, supply chain companies need financial assistance to enable them to improve and upgrade facilities for the sector. There needs to be a push at universities and across sectors to ensure that highly skilled workers are aware of the opportunities available to them and the transferability of their skills and expertise to the regions where emerging offshore

energy developments are taking place. Providing incentives to mobilise this workforce could reinforce the opportunity for skilled engineering staff to relocate to coastal communities or facilitate remote working to enable expertise external to Wales to be utilised regionally within Wales.

In Wales, we have significant examples of supply chain companies diversifying in to the marine energy sector over the last 5 years, a reflection of the appetite, adaptability and ambition present to support the sector. As well as the synergies for the supply chain between emerging offshore technologies.

- Pembroke Dock based Mainstay Marine, traditionally a boat builder has built three wave devices and one tidal energy device with another one due to start imminently.
- Pembroke Dock based Ledwood Mechanical Engineering, traditionally an oil and gas supply chain contractor, has also successfully built a device and are in active discussions with FLOW technology developers.
- Llangefni based Faun Trackway, traditionally a fabrication company specialising in defence, has developed bespoke mooring anchors for a tidal energy device
- North Wales based Jones Brothers, traditionally a land-based civil engineers were a key player in Minesto's first phase project, delivering gravity base foundations for the Minesto kite.

Growth deals are providing anchor projects that attract further innovation and create specialist hubs in coastal areas. We need to make the most of this early mover advantage, which is a strategic opportunity that can be exploited to national advantage as can be witnessed elsewhere in the renewables sector; Denmark's wind industry has seen in excess of €9billion generated this year alone. Further support for local Welsh companies to become competitive is needed by encouraging the building of infrastructure, providing training and using stepping stone projects to build supply chain capacity and enable diversification, clustering and resilience.

Many tidal range schemes are planned in areas where the coast is liable to the impact of storms, waves and tidal surges; a threat that is increasing due to the effects of climate change. Barrages can also provide a structure for new transport links. As well as with all emerging offshore renewable technologies, each tidal range project will provide direct employment in research, development, construction and operation. The availability of affordable energy will encourage the development of sectors such as hydrogen electrolysis and data storage, while sectors such as tourism, recreation, biodiversity and aquaculture will thrive. Tidal range projects offer significant non-energy benefits and wide system analysis is required to determine the full value of their creation. The supply chain needed for each project will be extensive, providing long term employment and business support in sectors such as steel production, turbine manufacture, civil construction and engineering throughout the UK.

As an example, the North Wales Tidal Lagoon (NWTL) will enclose approximately 156 sq km of sea, with an installed capacity of 2.5GW, generating in excess of 4 TWh pa – enough to power 90% of Wales' homes. Independent studies have shown that the NWTL will create over 20,000 jobs, protect over £3 billion of infrastructure and assets, liberate 500ha of land for development and reduce insurance premiums for thousands of businesses and households.

In summary, emerging offshore renewable energy can provide diverse contributions to baseload and reliable energy production to support future energy security. For Wales and the UK to capitalise on the early mover advantages realised to date and maximise the economic potential, early projects are needed throughout the 2020s to realise the full potential in the 2030s.

Brexit and Covid-19 have caused uncertainty for some UK offshore renewable energy technologies and projects. Erosion of the funding available for this nascent industry through EU grants only emphasises the need for a revenue support mechanism; one that restores confidence in the UK for emerging technologies and provides an opportunity to bridge the 'chasm' between UK innovation and application, which sees this nation's technology resulting in billion-dollar companies and jobs in the UK rather than abroad (as outlined in the UK Prime Minister, Boris Johnson's recent Dudley speech). This is key for the UK Government's levelling up agenda and the 10-point plan for a Green Industrial Revolution.