

Introduction

The Marine Energy Council (MEC) welcomes the opportunity to respond to this request for information.

The MEC is the representative body for the UK's tidal stream and wave energy industries. Established in 2018 the MEC has over 60 members consisting of technology and project developers, consultants, associations, manufacturers, and small and medium sized enterprises working in the supply chain. Our vision is for the marine energy sector to support a secure, cost-effective, and fair transition to net zero, enabling investment, exporting great British innovation, and levelling up with employment opportunities across the UK.

The deployment of wave and tidal stream energy, like offshore wind, requires suitable port infrastructure, and the MEC is responding to this request to highlight synergies and opportunities to create the right environment to deploy stable, predictable, and reliable renewable energy resources.

FLOWMIS should seek where possible to support tidal stream and wave, as well as wind, taking account of:

- **Tidal stream energy** is entirely predictable and can provide 11%¹ of the UK's electricity demand. This baseload style energy resource can directly displace dependence on imports. Tidal can be deployed rapidly, with the construction time of a consented tidal stream farm being less than three years.
- **Wave energy** is more consistent and predictable than solar or wind and could provide up to 15%² of electricity demand. In addition, its harmonious relationship with wind means that wave energy will support a more cost-effective and efficient energy system.

The success of the recent renewable auction in contracting over 40MW of tidal stream energy is an important first step in delivering predictable, renewable energy and a homegrown industry. As the energy system becomes increasingly reliant on intermittent renewable sources, consistent and predictable sources with less variability will be critical in delivering the UK Government's net zero ambitions in a secure and cost-effective manner. This requires investment now to ensure the UK's infrastructure support these exciting changes rather than acting as a barrier to deployment.

¹ Coles et al (2021) 'A review of the UK and British Channel Islands practical tidal stream energy resource'. Available [online](#).

² Jin et al (2021) 'Wave energy in the UK: Status review and future perspectives'.

1. What constraints, risks and opportunities does the UK face in relation to the infrastructure requirements needed to meet the deployment ambition for floating offshore wind?

The Government is right to invest in its port and wider infrastructure to be able to deliver on its net zero ambitions.

The MEC welcomes this consultation to address potential issues that may be preventing higher levels of UK content playing a key role in installed renewable capacity.

The request for information is right to highlight that the UK is a global leader in offshore wind with the most installed capacity in Europe. However, projects are being delivered with low levels of UK content. Tidal and wave projects are currently being delivered with up to 90% UK content, whereas the domestic content of early offshore wind has been around 32%.³

Creating the right port infrastructure for wave and tidal energy, combined with consistent and clear support from the policy sphere, will mean the UK is strongly positioned to benefit from an export market forecast to be worth £76bn annually by 2050.⁴ The Danish Government's early support of the wind sector demonstrates that there are significant export opportunities to be seized in the transition to net zero. Denmark now benefits from an industry that creates €7bn in annual exports for its economy. The UK should learn from this example, by capitalising on its existing supply chains, capabilities, and expertise to enable its economy to export rather than import the technologies that will be critical in delivering a secure and cost-effective transition to net zero.

Deployment ambition requires a clear policy framework

The UK Government demonstrated international leadership in setting a £20m ringfence for tidal stream energy in Allocation Round 4 (AR4) of the Contracts for Difference (CfD) scheme. The industry responded strongly, and the four successful projects will deliver over 40MW of capacity at a strike price of £178.54MWh. It should be noted this is significantly below the £211 administrative strike price set by BEIS, marking a 15% reduction.

The sites for these projects, in Orkney, the Pentland Firth and Anglesey have benefited from investment that played a key role in the ability of these projects to deliver strong cost-reductions. The Government has the opportunity in the FLOWMIS to support the renewable industry continue down a competitive cost-reduction pathway by investing, and enabling investment, in the ports, local and network infrastructure critical to enabling renewable deployment.

A key ambition of the UK Government is to deliver net zero in a cost-effective and secure manner. Tidal stream is forecast to be cheaper than new nuclear at 1GW of deployment, and around £80MWh at 2GW of deployment.⁵ These cost reductions will require consistency and clarity from the policy sphere that can be achieved through committing to ongoing ringfenced support in the CfD mechanism.

To provide investors the certainty of an ongoing pipeline of projects and associated opportunities the Government should in addition set a 1GW 2035 wave and tidal stream energy target. This will accelerate the investment into both technology and project development, speeding up both deployment and cost reduction, bolstering the UK's energy security and reduce dependence on imports, realising the UK Government's ambition to fully exploit the potential afforded by its geography.

³ Catapult ORE (2017) The Economic Value of Offshore Wind, available [online](#).

⁴ Catapult ORE (2018) Ibid.

⁵ Catapult (2018) Ibid.

The transition to net zero provides an opportunity to level up coastal communities, and beyond, across the UK

Collectively the wave and tidal stream energy sectors could support over 22,000 UK jobs by 2040. 50-60% of the economic benefit in terms of GVA and jobs is expected to be generated in coastal areas.⁶

The Resolution Foundation in its Economy 2030 report notes that technologies like tidal ‘are not only likely to generate relatively high national economic returns, but also have the potential to contribute to regionally balanced growth.’⁷ Investments in tidal stream and wave energy technologies in less innovation-intense regions generate strong returns for those regions.

The ability of tidal stream to support jobs across the UK is recognised in the Government’s Levelling Up White Paper.⁸ However, these opportunities will not be realised unless there is clarity and strategic direction from the policy sphere.

The Prime Minister’s announcement of a £160m investment in port and manufacturing developments to scale up deployment of floating offshore wind is welcomed and should be undertaken in a manner that supports its wider net zero objectives, which should include levelling up in the process.

Supporting and developing UK companies across the value chain will create employment, reduce costs and accelerate the time taken for deployment. Developing these chains may take time and the Government should consider how it incentivises renewable projects to buy from local manufacturing facilities and these are supported to compete against imported solutions. This will have the additional benefit of reducing the carbon footprint of project delivery.

The UK should take a strategic approach to delivering its net zero ambitions

Electricity Market Reform, and the establishment of the Contracts for Difference scheme has been instrumental in the success the UK has had in decarbonising its energy supply. This has been delivered whilst reducing the levelised cost of energy. The MEC would advocate that further work is undertaken to consider measures to encourage a diverse energy supply, which will be critical to a secure energy system.

By increasing its ambition on floating and fixed offshore wind the UK will become increasingly dependent on intermittent energy resources. It is therefore prudent to consider the wider benefits of other renewable energy sources and their role in delivering a net zero system. Research by the University of Edinburgh shows that 1GW of tidal stream and wave energy will provide £114m of system benefit and 113kton of carbon emissions savings per annum.⁹ This benefit is not captured effectively in the current CfD mechanism. The risk is that the UK becomes overly reliant on energy sources that might be currently lower cost, but do not deliver wider benefits either to the economy in terms of jobs or to the energy system in increasing reliance on expensive or carbon intensive solutions.

⁶ Catapult ORE (2018) Ibid.

⁷ Resolution Foundation (2022) The Economy 2030 Inquiry, available [online](#).

⁸ UK Government (2022) *Levelling Up the United Kingdom White Paper*, available [online](#).

⁹ Pennock (2022) Ibid.

2. What constraints, risks and opportunities does the UK face in relation to the manufacture, fabrication and assembly requirements needed to meet the deployment ambition for floating offshore wind?

The Government should work closely with test and demonstrator facilities and sites to accelerate learning and understanding of what the UK requires.

Test and demonstration facilities are key to understanding the challenges and opportunities that technologies face in, and infrastructure requirements to, renewable deployment. Through supporting key sites, the Government can provide a route for technologies at different technology readiness levels and commercial readiness levels take the necessary steps in a cost-effective manner to commercialisation. The learnings at these sites can then be socialised across the UK to avoid an unnecessary duplication of efforts.

The UK Government has committed to increasing annual R&D spend to £22bn with the target of increasing public and private sector R&D expenditure to 2.4% of GDP. The Government should consider which areas it could be a world-leader in the transition to net zero and link R&D funding to deliver the manufacturing, fabrication, and assembly capabilities to make that a reality.

Testing and demonstrating how technologies will function improves investor confidence in innovative renewables and in accelerating commercialisation. The European Marine Energy Centre (EMEC) for example has been a world-leader in testing instability, survivability, operability, availability, maintainability, scalability, to support cost reduction. The benefits enabled by this support is also tangibly felt in the local area. EMEC has generated approximately £306 million gross value added (GVA) to the UK economy between 2003 and 2019; that includes £127.4 million GVA to the Highlands and Islands region alone.¹⁰

Part of the UK's infrastructure investment should be targeted at building and expanding the capabilities of UK test and demonstration sites. This will reduce dependency on overseas providers and develop our understanding on what interventions will be required support delivery of new and innovative technologies.

Policy uncertainty poses a risk to the ability of the UK's manufacturing sector to scale up with confidence

The Government's National Shipbuilding Strategy links the circular nature of investment in efficiency, R&D, skills and supply chains leading to and providing a continuous and stable pipeline from the manufacturing sector, which unlocks opportunities to reduce costs. This is enabled by a clear and stable policy framework.

The success of AR4 in contracting over 40MW of tidal stream capacity should be built upon and the UK Government should commit to ongoing ringfenced support in future allocation rounds. This will create the right environment for consistent orders from UK manufacturers and support their scaling up to deliver tidal stream projects. Furthermore, research by Catapult ORE has demonstrated that UK supply chains are strongly positioned to ramp up and accelerate delivery of marine energy projects.¹¹

As noted in the previous question, developing the UK's tidal stream and wave energy sectors will support the UK's levelling up ambitions. The Resolution Foundation in its Economy 2030 report notes that technologies like tidal stream:

¹⁰ Biggar (2020) Ibid.

¹¹ ORE Catapult (2022) *Tidal Stream Volume Manufacturing Roadmap*.

‘are not only likely to generate relative high national economic returns, but also have the potential to contribute to regionally balanced growth. Investments in these technologies in less innovation-intense regions generate strong returns for those regions.’¹²

A significant risk to achieving these cost reductions and wider system benefits is if there is inconsistency in support from the Government. The industry, like the wind sector in its earlier stages of development, requires a long-term commitment to maintaining a ringfence within the CfD mechanism for tidal stream, and putting one in place in future allocation rounds for wave energy.

Consistency will benefit the manufacturing sector, the development of critical port infrastructure and the full value chain that enables project delivery to take place.

There is ongoing uncertainty in the UK’s R&D environment with a detrimental impact on the manufacturers and facilities that support deliver of projects

MEC welcomed the inclusion of UK participation in Horizon Europe as part of the Cooperation Agreement with the EU. However, as this has not yet been implemented the long-term participation of UK projects in the scheme is uncertain.

MEC agrees with the conclusions of the House of Lords European Affairs Committee, which warned that delays in finalising the UK’s association were having a chilling effect whereby UK projects are being stalled and the lack of a clear route to accessing funding is causing significant disruption.¹³This in turn is having a negative impact on UK supply chains that support delivery of projects.

The Horizon scheme has been invaluable in supporting renewable technologies at different stages of development. In total UK marine energy companies have benefited from c. £50m of capital grant support over the past 5 years, and a further c.£100m is being made available to support tidal stream and wave energy through the Horizon Europe programme over the coming 2 years. In addition to Horizon Europe, billions of Euros will be invested through schemes like the Innovation Fund, to which the UK funding guarantee does not currently apply.

To support UK supply chains and manufacturers. the Government should consider how the existing guarantee can be strengthened and expanded (e.g. to cover the Innovation Fund), and how to design a UK innovation policy that attracts investment into UK-based emerging energy projects and companies, building on our global lead in technologies like wave and tidal stream energy.

The UK’s manufacturing sector will benefit from the UK Government setting a 1GW by 2035 target for tidal stream and wave energy

The FLOWMIS consultation is correct that clear targets for the offshore wind sector provides the certainty investors need that will unlock economies of scale and bring down technology costs. The same is true for the tidal stream and wave energy sectors. As noted, tidal stream will be cheaper than new nuclear at 1GW of deployment, and around £80MWh at 2GW of deployment,¹⁴ and is entirely predictable and provides renewable baseload-style energy.

By setting a 1GW target the UK Government will be providing certainty to the industry and the UK manufacturing sector that will be critical in delivering this target. This will be key in creating the environment that drives cost-reductions through:

- Economies of Volume – as observed in offshore wind, a clear pipeline of projects and a route to market generates investor confidence. This enables bulk orders to be placed resulting in reduced

¹² Resolution Foundation (2022) The Economy 2030 Inquiry, available [online](#).

¹³ House of Lords European Affairs Committee (2022) letter to the Foreign Secretary. Available [online](#).

¹⁴ Catapult (2018) Ibid.

production costs. This activity will support and sustain the growing UK supply chains that are emerging in the sector.

- Economies of Scale – larger projects and devices will unlock improved efficiencies in project consenting, development, management, balance of plant and in device performance, as has been clearly observed in the onshore wind, offshore wind and solar power sectors.
- Accelerated Learning – increased investor confidence will attract market-driven R&D investment, resulting in learning-driven cost reduction through novel designs, new materials, and innovations in construction and operation at the device and project level.

A key constraint in upscaling manufacturing and fabrication is access to sufficient high quality port space. Through proving long-term certainty and a clear strategic direction the wave and tidal stream energy sectors will be able to work with port facilities and the broader energy value chain to address any bottlenecks and barriers in realising the UK's energy potential.