Consultation on Design Considerations for a Renewable Electricity Support Scheme for Northern Ireland

Marine Energy Council response

Introduction

The Marine Energy Council (MEC) welcomes the opportunity to respond to consultation on design considerations for a renewable electricity support scheme for Northern Ireland.

The MEC is the voice of the UK's tidal stream (TSE) and wave energy industries. Established in 2018, the MEC's membership spans 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 and Northern Irish innovation, and levelling up with employment opportunities across the UK.

Marine energy can play an important role in Northern Ireland's net zero future:

- **TSE** is entirely predictable and can provide 11%[1] of the UK's electricity demand. The predictability can reduce supply/demand mismatch in the energy system and directly displace dependence on fossil fuel and renewable imports. TSE can be deployed rapidly, with the construction time of a consented farm being less than three years.
- **Wave energy** provides a more consistent generation profile than solar or wind and could provide up to 20%[2] of the UK's current electricity demand. In addition, its harmonious relationship with wind means it can be co-located at offshore sites supporting a more cost-effective and efficient energy system. [3]

As Northern Ireland's energy system becomes increasingly dependent on intermittent renewable energy sources, TSE and wave energy will play key roles in maintaining energy security and delivering a just transition for coastal communities and beyond.

[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'.* Available online.
[3] In this response 'marine energy' is used to refer to tidal stream and wave energy.

Questions

11. Do you think that incentivisation within the renewable electricity support scheme for Northern Ireland should be tailored by technology type?

Yes, the MEC supports the renewable electricity support scheme for Northern Ireland being tailored by technology type. Without technology-specific targets or support the current market will favour technologies that may be cheaper today, but do not lead to the most cost-effective energy system in the future or develops and builds upon strategic advantages for Northern Ireland.

We strongly believe that the Northern Ireland Government should target a diverse energy generation portfolio. Diversity and developing a leadership position in emerging technologies will deliver significant benefits to energy system security, cost-effectiveness, and develop supply chains in Northern Ireland.

Delivering a diverse energy generation portfolio will support a cost-effective energy system.

Renewables are currently at different stages of development, maturity, and commercialisation and therefore there is not a level-playing field upon which they can compete. This is particularly problematic when the different services that renewables provide to the energy system are not understood or accurately valued. A completely predictable renewable resource like tidal stream is well suited to a role in the future energy system as it reduces curtailment, supply/demand mismatch and reserve capacity requirement. This ultimately reduces the cost of the whole energy system.[4]

The resource is also completely decoupled from wind and solar energy, with regular daily peaks. The recurring cyclical power generation profile gives tidal stream energy significant synergies with battery storage as the generation profile ensures batteries will stay topped up and mitigate against deep discharge.

Research by the University of Plymouth has shown that tidal stream can reduce the power rating and energy storage capacity of inter-seasonal energy storage which will be a key driver of cost in the future energy system. [5]

Research by the University of Edinburgh through Project EVOLVE has found that deployment of just under 13GW of marine energy will reduce annual dispatch cost from £13.54bn to £12.51bn. This is a saving of £1.03bn annually for UK and Welsh households. This cost reduction comes from a higher dispatch of renewable energy – by up to 27 TWh (+6%), and thus a lower requirement for expensive peaking generation – by as much as 24 TWh (-16%) when wave and tidal generation are part of the electricity mix, compared with a scenario without marine energy generation.[6]

The predictability of tidal nor the consistency of wave is properly valued in the UK energy system. The Northern Ireland Government has an opportunity to design a scheme that recognises and rewards the different services that renewable technologies provide to the energy system.

Delivering a diverse energy generation portfolio will support the Northern Ireland economy

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] Investment in wave and tidal technologies in less innovation-intense regions generate strong returns, imperative for a just net zero transition.

Wave energy has an annual global production at 29,500 TWh, equivalent of providing electricity for over 500 million homes. This is the market Northern Ireland Government should seek to lead.

Diversity and innovative deployment of renewable technologies will be key in optimising how the energy system is utilised. Waves provide a more consistent generation profile than wind and can be

[4] ORE Catapult (2022) *Tidal Stream cost reduction pathway report.*
[5] Coles et al (2022) *Impacts of tidal stream power on hybrid energy system performance: An Isle of Wight case study*. Available online.
[6] Supergen (2023) *What are the UK power system benefits from deployments of wave and tidal stream generation?* Available online.
[7] Resolution Foundation (2022) The Economy 2030 Inquiry, available online.

harnessed 3-8 hours after the energy is initially harnessed by wind farms. Co-locating offshore wind and wave energy converters allows technologies to share assets and can reduce costs by 14%.[8]

The renewable support scheme could seek to deliver a co-located site as part of Northern Ireland establishing a leadership position in innovative renewable deployment.

Northern Ireland also has an opportunity to create and support Northern Irish supply chains. For example, Nova Innovation's Shetland Tidal Array was delivered with over 90% of its supply chain spend with UK SMEs. Scottish-based companies including Proteus Marine Renewables and Nova Innovation are already exporting goods and services to the global TSE market, with a strong potential to scale up these exports in coming years.

Companies in the marine renewable sector will locate where Government's demonstrate ambition and support for the sector.

Northern Ireland should learn from the Danish example and aggressively seek first-mover advantage. In the 1980s Denmark invested heavily in wind, delivering projects with high levels of local content, and developing its domestic market. In the process it gained first mover advantage and in exports alone its wind sector generates over £7bn annually for the Danish economy. By contrast the UK's wind sector, Europe's largest generator of wind energy, exports less than £0.5bn annually.[9]

A diverse renewable energy generation portfolio supports energy security.

Modelling carried out by Research by Imperial College London shows that tidal stream can directly reduce natural gas capacity required to ensure energy security by about 40%.[10] As more than half of UK gas is imported, firmer power renewable energy resources like tidal stream will be key in supporting the UK's energy security, a cost-effective transition to net zero that protects UK households from international gas price shocks.[11]

The importance of a diverse generation mix was emphasised over a two day period in 2022. The UK energy system saw a record-breaking day on 2 November as wind generation exceeded 20GW for the first time, beating the 19.93GW record set in October 2022, which itself broke the 19.91 GW record set in May of last year.

The following day wind generation fell below 2GW with the shortfall covered by interconnection and gas-fired power generation. Energy security in a net zero world requires a diverse energy generation portfolio, so when the wind isn't blowing, or the sun isn't shining the shortfall can be addressed by renewable and low-carbon options rather that fossil fuels.

The marine energy industry will respond strongly to targeted support.

As evidenced by the UK Government's decision to set a ringfence for tidal stream in its 2022 renewable auction. This will deliver over 40MW of projects benefiting UK supply chains and energy security. The four projects will power the equivalent of over 40,000 homes and marks an important first step in delivering the 11.5GW of potential afforded by the UK's geography. **T**hrough targeted support the Northern Ireland Government can also benefit from a growing and increasingly important renewable resource.

12 If yes, what should the technology split look like and how should the budget be split across each technology type?

The budget should enable inward investment such that initial small-scale projects to be built, and set according to the unique role and broader benefits different technologies will deliver to Northern Ireland.

[8] Upcoming Wave Energy Scotland report.
[9] [9] State of Green (2021) *The economic benefits of wind energy.* Available online.
[10] Frost (2022) Quantifying the benefits of tidal stream energy to the wider UK energy system, available online.
[11] D. Pudjianto, G. Strbac (2022) *Role and Value of Tidal Stream Generation in the Future UK Energy Mix*.

The UK Government is considering non-price criteria in future rounds of the Contracts for Difference scheme. The Northern Ireland scheme could embed broader benefits into its mechanism from the outset.

Marine renewables are on a clear cost-reduction trajectory as taken by wind and solar. TSE is projected to reach £78/MWh by 2035 and 1GW of deployment, and below £50MWh by 2050 and 10GW of deployment.[12] Cost reduction will be achieved through economies of scale, volume and accelerated learnings as more technology is deployed. The trajectory set out by ORE Catapult means that TSE will be cheaper than new nuclear by 2035, whilst providing a unique service to Northern Ireland's energy system.

[12]ORE Catapult (2022) *Cost reduction pathway of tidal stream energy in the UK and France*. Available online.