19 December 2017

Marine Renewables Industry Association

Submission to *Department of Communications, Climate Action and Environment about the 'Mid-term Review of the Offshore Renewable Energy Development Plan (OREDP)'* Consultation

1. Forward

An important step on Ireland's journey to decarbonisation will be to seek additional renewable energy sources off the West and South West coasts, providing further renewable energy, higher load factors and more diversity in the renewables mix. Options at the moment include nascent technologies such as wave, some tidal, floating offshore wind and hybrids of these. It is likely that a mix of these innovative, emerging technologies will be required. The ultimate mix will depend on the relevant commercial and technology developments, grid availability, system technology and diversity requirements, consenting factors and the extent to which they are supported through their early development stages.

There is also the added attraction of both potential electricity export and capitalising on Ireland's 'early mover' advantage in the innovative technologies with all of the positive implications this may have for supply chain income and job creation, particularly along the West coast of Ireland. Irish marine renewables resources present a unique opportunity both to reduce significantly our national carbon footprint and also to supply the technology and services to reduce global emissions. Continued support and enhancement of the *Offshore Renewable Energy Development Plan* (OREDP) is key to achieving these goals.

2. Preface

The Marine Renewable Industries Association (MRIA) represents wave, tidal and floating offshore wind and hybrid device (floating wind + wave) interests on the island of Ireland i.e. the new marine renewable technologies also known as Marine Renewables Emerging Technologies (MRET). As has been pointed out in respect of ocean energy (wave + tidal) alone:

'Ocean energy is abundant, geographically diverse and renewable. Under favourable regulatory and economic conditions, ocean energy could meet 10% of the European Union's (EU) power demand by 2050……Ocean energy can be an EU industrial success story. With favourable support over the coming decade, Europe will obtain leadership in a global market, worth a potential €653bn between 2010 and 2050 and an annual market of up to €53bn, significantly benefiting the European economy. The successful development of a

competitive European ocean energy industry would also place the European industry in a prime position to seize export opportunities in the global market…Today, 45% of wave energy companies and 50% of tidal energy companies are from the EU…. The global market for ocean energy could see 337GW of installed capacity by 2050, a third of this would be in Europe'[1].

The opportunity in marine energy -resource rich Ireland has several possible dimensions – the ENTERPRISE and the ELECTRICITY MARKETS as well as LOCAL ELECTRICITY SUPPLY. The ENTERPRISE element ranges from research and development and device manufacture to operations and maintenance, finance and legal support. All of the stakeholders in marine renewables accept that the enormous scale of the Irish wave and offshore wind resource (together with a limited resource in tidal in the Republic, although not in Northern Ireland where substantial tidal projects are in train) represents a potentially huge opportunity for ELECTRICITY 'EXPORT' via grid interconnectors. This is based on the likely emergence of an EU energy market and a European grid; potential demand for Irish electricity in England in particular; the development of wave, tidal, floating offshore wind and hybrid technology and other factors

Opportunities for MRET – once they reach maturity - to meet LOCAL MARKET OPPORTUNITIES in Ireland must not be ruled out. A lot of technical issues could be resolved over the next ten years: the intermittency of renewables will be addressed by new electricity storage solutions, particularly in the field of batteries; there may be technical breakthroughs which make, for example, wave competitive with traditional energy feedstocks; etc. One emerging element that may have a positive impact are 'hybrids': devices that combine (floating) offshore wind and wave energy devices.

The journey down the 'learning curve' of fixed offshore wind is illustrative of what can happen to an energy technology once it 'industrialises'. This point is well made by the recent UK Contract for Differences (in Irish terms, RESS) auction which delivered dramatically lower prices (on average, 47% lower in offshore wind) compared to the last auction in 2015. The nascent MRET technologies have the potential to reduce their costs significantly once their technologies mature and the related MRET sub-sectors start to scale.

For years to come, the emerging marine technologies will march to a different drumbeat to their mature cousins. MRET is at an early stage although promising progress is being made in all areas.

MRET is being pursued in a strategic manner by Irish policy-makers in light of the following factors:

- the economic potential of our great natural resources of offshore wind and waves (*the resultant electricity can potentially contribute to national needs and be exported*);
- we have a significant investment and even a competitive edge in R&D and other facilities (*we need to spur the development of devices to exploit the resource and also to create a strong Irish position on the value chain which would have a large impact on jobs and income creation*);

[1] *Ocean Energy Strategic Roadmap Building Ocean Energy for Europe*. Prepared for the European Commission, 2016. Available at https://webgate.ec.europa.eu/maritimeforum/en/frontpage/1036

- a national ambition to capitalise on our early-mover position (*create a global supply base in Ireland in wave, tidal and other early technologies)*.

In short, Ireland's support for MRET reflects a long-term and complex development goal which will not be realised to any significant degree until the mid-2020s at the earliest The MRIA is advocating the continued special treatment of wave and tidal (and extending this principle to floating wind and hybrids too) because of the job and income creation potential involved. Interpreted in this way, the OREDP should continue to mark out Ireland as being 'open for business' in marine renewables to the global energy community and to do so when the current de facto leader, Scotland, may be locked out of the world market by a potentially calamitous policy approach which prioritises the political imperative of lowest possible cost electricity immediately (and that is before the impact of Brexit is factored in). The impact of this on UK marine renewables represents a major opportunity for Ireland.

3. Questions on Actions

The Consultation sets a number of Public Consultation Questions on the Actions set out in the original OREDP and the MRIA responses to these Questions is set out below

ACTION 1: PUT IN PLACE A ROBUST GOVERNANCE STRUCTURE FOR THE OREDP
Q1. Do you have any suggestions or additional measures to support and enhance the governance structures of the OREDP?

In MRIA's view, the principal *practical* purpose of the Offshore Renewable Energy Steering Group (ORESG) is to provide a forum for various Departments and Agencies in the public sector to meet and co-ordinate their approach to offshore energy. The Association endorses this purpose which is at the heart of ensuring that offshore energy moves forward. The liaison discussions which take place immediately after each meeting with industry representatives are satisfactory insofar as a full and frank discussion usually takes place.

However, on a broader plane, the infrequency of meetings allows concerns and issues to build up at local level in the various offshore renewable energy sub-sectors which would be mitigated to some extent by more frequent meetings, say at the level of three per annum.

The overall Association does not agree with the suggestion that a separate body be established for offshore wind. The relevant officials in Government bodies are stretched and the establishment of a further body could be counter-productive for all sub-sectors in marine renewables.

It is recommended that targets are set by the ORESG out to 2030 for all marine renewables (and obviously fixed wind and floating wind will predominate) and that an early commitment be made towards Initial Development Zones (see 8.) for floating wind and wave. The provision of a revised tariff support regime (see 3.) and a pre-commercial fund for MRET (see2.5) as well as an early dedicated mainstream auction for FIP for fixed offshore wind (not a direct concern of MRIA but see 2. below) are critical to maintain investor/developer/supply chain interest.

The work programmes set by the ORESG for its various working parties are acceptable so far as they go. But, unfortunately, progress outside of this structure seems disjointed – the impact on overall progress of the slow movement on consenting legislation (and MRIA accept that this is a complex issue) is a case in point. It would be helpful if the ORESG in the context of this Review would in early 2018 adopt and publish an *indicative* timetable or set of targets for the progress of various key items in offshore renewables e.g. an indicative date for the first competition for support for the Initial Market Support Tariff for ocean energy (hopefully, amended in accordance with the suggestions made in MRIA's submission to the recent RESS Consultation and set out here at 3.); date for amendment of the lease at AMETS to enable floating wind to test at the Site etc; enactment of consenting legislation etc.

ACTION 2: INCREASE EXCHEQUER SUPPORT FOR OCEAN RESEARCH, DEVELOPMENT AND DEMONSTRATION

Q2. Do you think that the Exchequer support for Ocean Energy RD&D has been sufficient?

Current indications are that the earliest demonstration projects for wave will not be operational before 2020. We would expect to see a small number of demonstration wave projects (4-5MW) in operation over an initial 5-8 years period from 2020 before larger (e.g. 20 -30 MW) projects emerge in the late 2020's to early 2030's. There will also be a series of small-scale tidal projects in the next few years as well as demonstration projects in floating wind although 'hybrids' are unlikely to emerge until the mid-2O20s at earliest.

Against that backdrop, we believe that the level of support to date has been about right and the Association notes the fact that in the past support budgets (e.g. from SEAI) were not always fully expended.

Q3. Has the distribution of the Exchequer support been appropriate and can you suggest alternative areas that require additional Exchequer support?

All aspects of MRET are at the early experimental, prototype stage and this demands that scarce State investment funds must simultaneously support research, provision of new infrastructure and individual promoter's ideas for energy conversion devices. This, of course, leads to tension between the three components but MRIA does not agree with the Identified Challenge that '.... academic institutions receive excessive funding compared to industry'.

There is a concern in the Identified Challenges about the attention and resources given by the OREDP to the experimental technologies compared to (fixed) offshore wind. This is unwarranted as the two sectors are in entirely different positions – the emerging technologies are just that and are focused on R&D while fixed offshore wind is a mature commercial technology. The ambitions for MRET extend beyond connection to the local grid or indeed to export opportunities: they represent a unique opportunity for Ireland to establish a global lead in a new and potentially job-rich technology.

Although it is not an area of direct interest to the MRIA, nonetheless the Association believes that the cause of marine renewables generally, including MRET, would be well

served by early progress in fixed offshore wind. In practical terms, this should include the inclusion of fixed offshore wind, even for a moderate level of capacity (MW), in the first round of RESS auctions, the establishment of early capacity targets for fixed offshore wind, zoning and baseline assessments etc

ACTION 2.1: ATLANTIC MARINE ENERGY TEST SITE (AMETS)

Q4. Do you think sufficient progress has been made on the development of the Atlantic Marine Energy Test Site in County Mayo?

The development of AMETS is being progressed in a satisfactory fashion. Three further initiatives are required, however. First, urgent attention should be given to seeking permission to expand the lease at the site to allow for testing of floating wind devices and 'hybrids' i.e. combined floating wind and wave machines.

Second, attention needs to be given *now* to communicating to the *national* audience that AMETS is a strategic investment which may not attract projects immediately (floating wind may be the exception if the consenting at the site can be amended to accommodate it) but which must be put in place in advance if we are to realise our national ambitions in MRET. A failure to deal with this matter before AMETS becomes the subject, as it almost inevitably may, of a 'white elephant exposé' would be very damaging to Irish MRET.

Third, the grid connection needs to be much greater than the proposed 10MW if it is to allow larger devices to be tested there and the possibility of having several devices use the test facility at the same time.

MRIA do not agree with the suggestion that WestWave and AMETS are in some way conflicted and that they should be merged. AMETS is a State provided test site serving a need for early stage technologies and will provide them with a fully serviced and safe test centre to 'plug and play' their devices.

WestWave is a pre-commercial demonstration array project which

- requires an extensive multi-year operational asset life; and which
- will be subject to strict technical and commercial hurdles, like any other large capital investment in a commercial company.

WestWave is designed to fulfil a different need (both for ESB and for the sector) to AMETS. It will provide ESB with experience and capability building as a pre-requisite to undertaking larger scale projects when it is technically and commercially economic to do so. It provides the sector with a market bridging opportunity between successfully proving full scale prototypes at test sites, such as AMETS, and the large scale roll out of devices to larger arrays in the 2030's.

AMETS and WestWave are entirely different projects, do not conflict with one another and any effort to 'merge' them would be counterproductive and unworkable. It would neither serve the needs of utilities such as ESB nor the needs of the nascent marine renewables sector.

The suggestion that AMETS and WestWave be 'merged' illustrates the ongoing requirement to communicate marine renewables policy effectively.

Finally, it is recommended that timelines should be set for the development of AMETS including the provision of cabling and full commissioning of the Site to maintain confidence and momentum.

ACTION 2.2 GALWAY AND CORK TEST SITES

Q5. Do you agree that significant progress has been made on the Galway Bay Marine and Renewable Energy Test Site and that it is having a positive impact on the development of the offshore renewable energy sector in Ireland? NOTE: This section of the *Consultation* deals only with Galway and Cork is dealt with at Action 2.3 below.

The Galway Bay Marine and Renewable Energy Test Site (GBMRETS but popularly known as 'SmartBay') is a well-run and a vital piece of our national MRET development tapestry. It is critical that the lease at SmartBay be renewed (an announcement is understood to be imminent) and that it allows for the use of the facility to support floating wind and 'hybrid' devices under test at a scale that is appropriate to the particular technology. Some of the larger floating wind devices will be tested on a smaller scale than the quarter scale that is likely to apply to wave devices. The lease should also allow multiple units to be tested using a single platform when this is appropriate.

Second, the Association is not in favour of the provision of a 1:15 test site unless a modest study, which might be commissioned by SEAI, recommends it. Such a site, *if justified*, should be provided through one of the established structures – LiR, SmartBay or AMETS.

Finally, the Challenge identified in the Consultation about the 'Transition from GBMRETS to AMETS is too challenging' is potentially an issue as is the concern that projects that move to a facility such as EMEC or Hawaii may not return to Irish waters. It is recommended that the Department of Communications, Climate Action and Environment (via SEAI) should commission a consultancy exercise to identify the extent of the need for an intermediate facility in the less challenging waters of the Irish Sea or the Celtic Sea, what its capabilities ought to be and ways and means of integrating it into one of the existing testing institutions.

Action 2.3: Integrated Maritime Energy Resource Cluster

Q6. Do you think that there is a positive impact from the development of the MaREI Centre and Lir National Ocean Test Facility?

The facilities and programmes based out of Cork – LiR and MaREI are crucial and have made a major impact. Ireland's credibility in MRET is partly based on the natural resource, particularly off the West coast, and to a large extent on the facilities and academic reputation of the MRET team in MaREI which spans both industry and academia. The importance of the access and reputational impact provided by MaREI EU leadership of international projects such as MARINERG-i should not be underestimated.

MaREI has 180 researchers across six academic partner institutions, working with 46 industry partners. It is coordinated by the Environmental Research Institute (ERI) at

University College Cork. MaREI has built upon the excellent track record of well-established marine and energy-based research groups across each of their academic partners, covering a range of cross-cutting topics across seven main research areas.

MaREI offers unique world class marine renewable energy testing infrastructure, state-of-the-art structural laboratories, novel prototypes and measurement equipment that allow the systematic identification and reduction of development risks through a structured 'Technology Readiness Level' (TRL) development cycle. This, combined with the technical competence of its employees, makes MaREI a preferred research and development partner for companies and research institutes across the world.

ACTION 2.4: PROTOTYPE DEVELOPMENT FUND

Q7. Do you believe that the PDF is a suitable funding structure for the sector?

The current Prototype Development Fund (PDF) is an appropriate, flexible, demand-driven and well-established scheme which caters for the needs of projects, particularly at the inception and early prototyping stages. It supports feasibility studies; very early stage projects and it serves to inform both promoters and SEAI about the merits of various technical approaches. It might also be called into use as the platform needed to support major *prototype* projects e.g. WestWave which would lie outside the boundaries of the pre-commercial financing initiative proposed at Q9 below. The Technology Readiness Level (TRL) boundaries to the tried and trusted PDF system should not be set at this stage.

The PDF does not, however, easily meet the needs of promoters in the middle ground i.e. from the upper end of TRL 3 to cTRL6 where, for example, the requirement for a promoter to fund (e.g. to provide 'matching' or 'part-matching' funding to State support) a substantial proportion of a project's cost is beyond the means of many start-up and early R&D focused companies…….and this funding gap gets even tougher to bridge as the TRL ladder is ascended. The new 'Apple' fund may ease this issue but it amounts only to €1m at this stage. There is clearly a need for a next, pre-commercial stage to the financial roadmap for this nascent industry to follow i.e. a route which if successfully navigated will open up appropriate funding at various stages to qualified projects. Moreover, once 'pre-commercial' funding is dealt with, the roadway on to a final financial destination must be laid i.e. how to fund the early commercial arrays using TRL 8 + technology.

In the view of at least some experts, TRL 7 tends to be bypassed i.e. it is not relevant. Thus, there is consistency in the suggestion here that:

- the PDF deals with TRL 1-3/early 4 projects
- the pre-commercial initiative proposed at Q9 below deals with the space up to TRLc6
- however, one complication here is that, in the early years at least, the initiative suggested may focus on technology issues and sub-systems rather than stand-alone devices – see Q9 for more on this
- the early commercial financing proposal (suggested in MRIA's 2016 funding paper[2]) deals with early arrays at TRL8+….and that the PDF mechanism should also be held in

[2] *Funding the Development of the Ocean Energy Industry in Ireland-Discussion Paper* February 2016 www.mria.ie

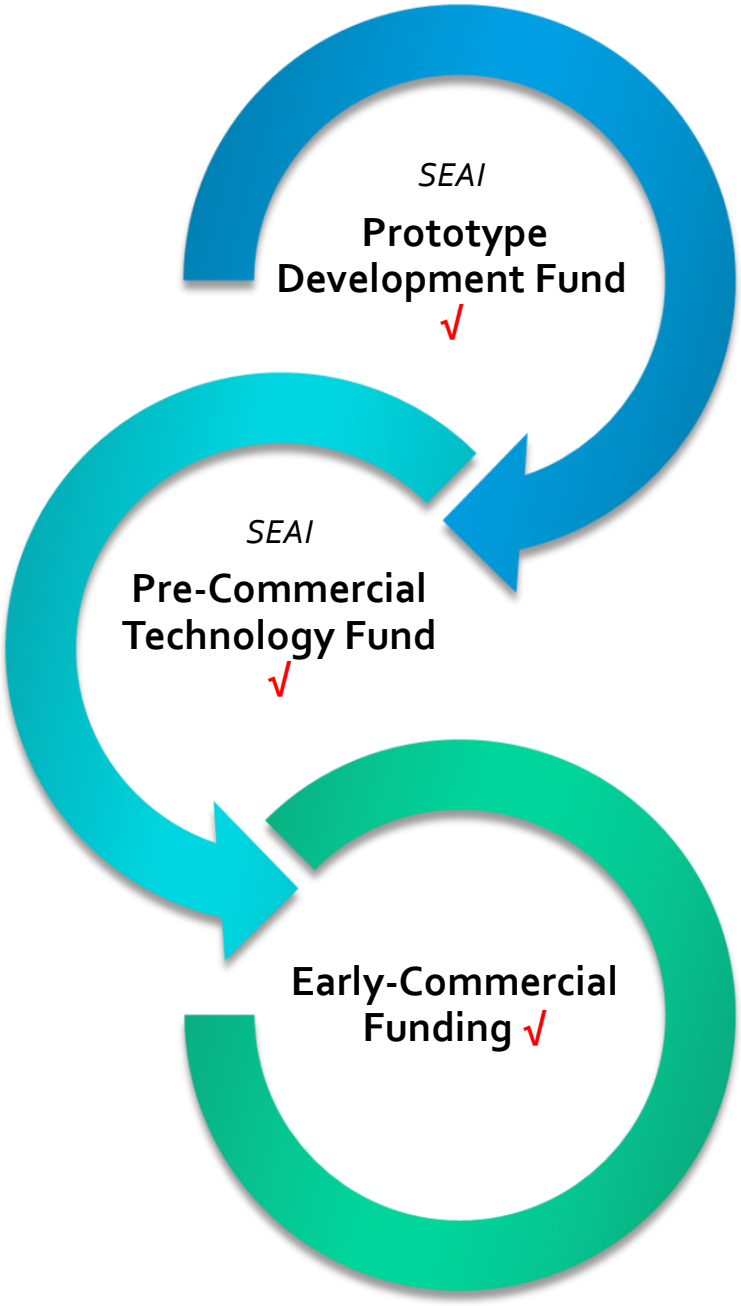
readiness to deal with e.g. a TRL 8 prototype which should be expected to be partly private-financed but which may be premature and, indeed, too small to be dealt with under the early financing methods. The illustration later shows how these components might fit together.

8 What if any improvements would you suggest?

The main improvements sought are set out above while a new initiative is suggested at Q9 below.

The MRIA believes that the general structure and operation of the PDF should not be confined to early TRL projects as suggested in the Identified Challenges but should be held in reserve (as outlined in the response to Q7 above) to support TRL 8 prototypes as well.

***SIF** = Strategic Infrastructure Fund managed by the National Treasury Management Agency. See footnote to 2.5 for explanation of **SBIR**



- Tried and tested
- Meets early stage needs in particular
- c€5m pa + 'Apple'
- Keep flexible-could be key to finacing major prototypes later

- For TRL 3+-c6 area
- Involve agencies; ties in to OREDP
- Draws on SBIR but made fit for purpose
- Build up to 2 x €2.5m calls pa on issues/sub-systems; 100% funding; 1 x pa call for project funding- *total* €2.5m

- Financing the early commercial deployment projects at TRL 8+
- Engage SIF* etc
- Start design soon

ACTION 2.5 ADDITIONAL EXCHEQUER SUPPORT REQUIREMENT

Q9. Do you have any suggestions for additional Exchequer support required for the development of the offshore renewable energy sector in Ireland?

It is recommended that a *Pre-Commercial Technology Fund* (PCTF) be launched. The case in favour of this State initiative is that it would leverage Ireland's investment in MRET R&D, test facilities, policy developments etc. It would also represent a major step towards securing a global supply chain position for Ireland and, indeed, give IDA and Enterprise Ireland extra tools with which to 'sell' the country as an MRET hub[3]. It is feasible to support an initial PCTF from within the extra funding envisaged in the OREDP. For industry, the new Fund should help to bridge the 'valley of death' encountered by many promoters and to provide the immediately needed next steps along the financial roadmap. But there will be a 'tough love' element involved too, notably in the rigorous engineering reviews envisaged.

The PCTF should have the following features:

- Design to address funding needs from about late-TRL 3 up to early Prototyping (say, TRL 6)
- Provides 100% funding broadly utilising the SBIR model[4]
- Open to all relevant promoters in Ireland and overseas but work must be undertaken in Ireland primarily. Promoted internationally by IDA Ireland and Enterprise Ireland with support from SEAI
- A competitive process focused on specific topics (ideally complementary) to the Wave Energy Scotland (and a putative EU initiative in the same field) agenda but Ireland should also allow for involvement of MRETs apart from wave energy, including floating offshore wind and hybrid technologies.
- Extra points for collaborative (between companies etc) applications
- All applications subject to strict engineering reviews by a panel of internationally regarded experts at the commencement and completion of projects…. with pre-determined metrics of success
- Designed to generate solutions - projects cannot proceed to any further rounds of funding without success at this stage
- Intellectual Property Rights must be commercially exploited in a pre-defined fashion by a specified date
- But…. deal in an innovative way with the IPR issue where the central point is to share learning in an 'open book' fashion and to ensure that IPR created under the PCTF is commercially exploited
- Focus should probably be directed in the early years to sub-systems, components, technical roadblocks rather than devices but the latter should be given attention too -see below

[3] An interesting trend lies in the interest shown by start-ups elsewhere (notably the US) in establishing an Irish location e.g. www.orpc.co

[4] Small Business Innovation Research. This has already been applied by SEAI to an Electric Vehicle Smart Charging scheme. It involves what is essentially Pre-Commercial Procurement (PCP). PCP, as defined by the European Union, involves the purchase of research by a Government entity which is undertaken with the objective of stimulating innovation that the contracting authority or some other party may benefit from at a later stage when goods or services not currently available are developed from the outcomes of the research - see more at: http://www.seai.ie/SBIR

- Perhaps two calls annually worth c€2.5m in total each
- Also, annual competition that involves a working small output device. Ideally, this might be linked in to a wider project e.g. it could serve as a power source for activities in SmartBay in Galway. Annual value = €2.5m
- Comply with EU State Aids requirements

The PCTF would be operated by SEAI (who will need some extra staff resources to run the scheme) - the agency also operates the PDF and is well geared and experienced in operating complex funding schemes as well as being knowledgeable about MRET.

The Pre-Commercial Technology Fund[5] would represent a major step forward in both resources for MRET and in 'TRL coverage'. It would be a natural partner to the Prototype Development Fund. The two funds, PDF (at about €5m pa) and PCTF (at c€7.5m pa) plus whatever ongoing investment may be required in the research and testing infrastructure, will readily account for the €30m envisaged over 3 years for device and sub- system development by the OREDP. *It will be important for policy-makers to view the PDF, PCTF and infrastructure etc as flexible and complementary and not to become a 'prisoner' of a pre-determined split of the €30m 'pot'.* Note also that WES had a budget of Stg£10m in 2015-2016 and was slated to have Stg£13.5m annually thereafter.

ACTION 3: INTRODUCE INITIAL MARKET SUPPORT TARIFF FOR OCEAN ENERGY

Q10 Do you have any suggestions on how to enhance or further implement support tariffs for this sector?

The mainstream approach (e.g. competitive auctions for RESS involving a Floating feed In Premium - FIP) emerging in the RESS Consultation paper should not be applied to MRET. It could in fact damage the progress made under the OREDP where part of the attraction of Ireland to the Irish and global MRET community is the availability of an Initial Market Support Tariff (IMST) for wave and tidal. The provision of an IMST in the OREDP was intended *'….to unlock the economic growth and job creation opportunities offered by ocean energy development*[6]*'* and this approach is vital to Ireland's stated ambition to become a force in marine renewables.

The MRIA believes that the best approach to supporting the development of the emerging technologies (defined as wave, tidal, floating wind and hybrids of these) by means of a fixed FIT for demonstration units. It is noteworthy that EU State Aids rules specifically require RES-E support levels to be set at auctions and to provide support in the form of a FIP '……except for small scale or demonstration projects'. Thus, there is no obstacle in principle to providing RESS to MRET in the form of a fixed FIT

The MRIA advocates the continued special treatment of wave and tidal (and extending this principle to floating wind and hybrids too) because of the job and income creation potential

[5] Note that the proposal here differs from MRIA's 2016 funding Discussion Paper (op cit) insofar as it suggests expanding the scope of the PCTF to make some provision for a wider definition of MRET and, also, suggests that is should have a specific mechanism to support an annual small output device competition.

[6] Department of Communications, Energy and Natural Resources
Offshore Renewable Energy Development Plan February 2014, p21

involved. This approach could serve to mark out Ireland as being 'open for business' in marine renewables to the global energy community and to do so when the current de facto leader, Scotland, may be locked out of the world market by a potentially calamitous policy approach which prioritises the political imperative of lowest possible cost electricity immediately (and that is before the impact of Brexit is factored in). The impact of this on UK marine renewables represents a major opportunity for Ireland.

The IMST currently takes the form of a fixed FIT which was set by the OREDP at €260/MW hr, up to 30MW. It was also confined to wave and tidal energy in the OREDP. It is the view now of MRIA that this approach should be extended to the other experimental technologies, floating wind and hybrids, because:

- Floating wind and hybrids are still at the experimental stage – there are serious engineering challenges to be overcome and the technologies involved are still emerging and should be supported by a FIT on that basis.
- They are suited to Ireland's R&D facilities and skills and to exploitation of our offshore natural resource
- Both areas are consistent with the long-term goal of building a global hub in Ireland for the currently emerging marine renewables technologies

The IMST is vital if Ireland is to develop a wave/tidal/floating wind/hybrids industry (focused on the enterprise element) and this will involve both local device developers and early stage companies from abroad attracted here by the Tariff, the offshore resource and the R&D/test facilities.

The considerations that should be taken into account in designing a support tariff regime for MRET should include:

a) If the tariff is too low, it simply will not attract any development.
b) Revenue support cannot be a *cliff edge* (i.e. a Feed-In Tariff - FIT - for the first *X* MW and then…… nothing). There needs to be a long-term view that the revenue support is to develop an industry, not one particular project or technology approach.
c) In any case, a *runway* approach is required which will allow a significant support for the first phases and then a longer-term view to provide baseline support for a time period whilst the industry gets down the cost curve towards being competitive to other forms of energy generation.

The original allocation of 30MW x €260MWh was deemed sufficient by industry at the time of the OREDP to get wave and tidal started but that view has since been revised on reflection and it is now considered unattractive for early projects. The level of FIT should be the subject of a short, focused consultation with MRET interests prior to each competition. Moreover, it is recommended that 'coverage' be extended out to 70 MW with 40 MW ringfenced for wave and tidal and the balance assigned to other emerging marine renewables technologies, floating wind and floating wind/wave 'hybrids'.

The MRIA recommends that there should be a separate regime for MRET and suggests that the allocation of the IMST-supported 30MW assigned to wave and tidal in the OREDP (to 2020) should be extended to 70MW as follows:

- The scheme should be open to 2025 (reflects e.g. the time needed to secure finance, consenting, changing state of the technologies etc). This will support the small number of demonstration projects expected to materialise over that timeframe. Current indications are that the earliest demonstration projects for wave will not be operational before 2020. We would expect to see a small number of demonstration wave projects (4-5MW) in operation over an initial 5-8 years period from 2020 before larger (e.g. 20 -30 MW) projects emerge in the late 2020's to early 2030's. There will also be a series of small-scale tidal projects in the next few years as well as demonstration projects in floating wind although 'hybrids' are unlikely to emerge until the mid-2O20s at earliest
- 40MW ring-fenced for wave and tidal…but see below
- 30MW ring-fenced for floating wind and hybrid…but see below
- The Scheme to be reviewed as part of the OREDP renewal process scheduled for 2020 and regularly thereafter. The admirable flexibility shown by DCCAE in developing MRET policy should continue to be employed here so that, for example, the possibility to extend the scheme out to 100MW or to reassign support between the technology types should be open to consideration as the innovative marine renewables technology sector evolves
- Projects seeking support should participate in a series of competitions – note: not auctions
- The choice of projects to support in each competition should be made by reference to technical, developmental criteria (e.g. likelihood of success in terms of reliability, output, LCOE) rather than by reference to the FIP approach – e.g. a focus on price alone could exclude a worthwhile technology approach
- To give certainty to promoters, the support should take the form of a series of fixed FITs.
- The level of FIT should be the subject of a short, focused consultation with MRET interests prior to each competition

The selection of projects by reference to an auction-clearing FIP would aim the RESS at the wrong target in the case of MRET i.e. it would support technologies that can immediately meet or beat the auction clearing price rather than address development goals which are the very point of supporting MRET in a tailored way.

ACTION 4: DEVELOP RENEWABLE ELECTRICITY EXPORT MARKETS

Q11 Do you think that Ireland should develop offshore renewable energy resources to export electricity?

The island of Ireland has one-third of all of Europe's renewable energy resource[7]; the West of Ireland wave resource is the most energy intensive in the world.....Ireland has the

[7] Siemen's presentation

potential to become a major source of energy for Europe over the next 30 years with all of the profound political and economic implications that such a development implies. It is obvious, therefore, that electricity export must be a foundation stone of Irish energy policy and that all necessary arrangements to facilitate this – interconnectors, grid development etc – are put in place. It also requires much more joined up thinking in policy formulation e.g. the recent Commission for Regulation of Utilities 'Enduring Connection Policy ECP-1' would hinder the DCCAE policy of encouraging MRET deployment by requiring even experimental installations offshore to have 'planning permission' before seeking a grid connection. This is a difficult requirement due to the delays in concluding the Maritime Area and Foreshore (Amendment) Bill!

It is now timely to develop plans for a renewed export development effort so that the Irish energy export 'ecosystem' is ready to act as opportunities are identified. The earliest opportunity of scale is likely to be the United Kingdom where electricity shortages are almost inevitable due to the age of the generation infrastructure; the precarious balance between supply and demand at peak times which arises as a consequence; and the very high-risk bet made by UK policymakers on several major nuclear projects (based on challenging new technology) to underpin future supply.

Wind projects in the Irish Sea would be a quick and hopefully uncontroversial (from an environmental viewpoint) way to enter the UK market – the South Irish Sea is closer to the major UK centres of population than many wind developments in UK waters e.g. Northern Scotland.

Apart from measures advocated in this submission and elsewhere by the Association to advance MRET, MRIA believes that early steps (e.g. in the first post-RESS consultation auction in c2019) should be taken to facilitate the development of fixed wind for the benefit of marine renewables as a whole.

Q12 Do you have any suggestions on further measures that can be taken to support the implementation of this action?

MRIA endorses the Stakeholder Suggestions made in the Consultation document- execute the defined priorities; develop interconnectors at a faster pace and with greater capacity; consider alternatives to grid interconnectors e.g. in storage. In addition, steps should be taken to zone areas for deployment of marine renewables technologies including baseline assessments etc. The recent initiative in regard to marine spatial planning is most welcome in this regard – see Action 8 also.

ACTION 5: DEVELOP THE SUPPLY CHAIN FOR THE OFFSHORE RENEWABLE ENERGY INDUSTRY IN IRELAND

Q13 Do you think that sufficient progress has been made to develop the supply chain for the offshore renewable energy industry in Ireland?

The supply chain will develop in line with exploitation of the offshore opportunity. The key issue at present and for the immediate future is to keep Ireland's wider industrial base informed of the opportunity and the steps being taken to develop it. An important step in

this direction is the recent formation of the Irish Marine Industry Network in which Enterprise Ireland, the Marine Institute and other agencies are playing a leading part.

Q14 Do you have any suggestions on how to further implement this action?

The various Stakeholder Suggestions made under this heading are worthy of consideration. It should be noted that the resources available to the Local Enterprise Offices are limited in their scope and particularly in their supply (in MRIA's experience, LEOs often have no money available to back up their Schemes)

The key initiatives required to spark off supply chain development are to complete outstanding 'business' i.e. MAFA, SmartBay lease renewal etc and to move on to early practical development of marine renewables including zoning of early development sites (see Action 8 for more on this), provision of a revised FIT for MRET, development of pilot projects etc. Overall, a clear signal is needed of the commitment of Government to offshore energy and, thus, including fixed wind in the earliest RESS -based auction round for mainstream technologies would be an early and achievable indicator of this.

ACTION 6: COMMUNICATE THAT IRELAND IS OPEN FOR BUSINESS

Q15 Do you think that Ireland has been presented at home and abroad as open for business in offshore renewable energy?

There are many positive aspects to Ireland's international standing in MRET. Ireland has a clear policy umbrella in the form of the OREDP, our R&D and test facilities are first class and our record in international competitions e.g. for Horizon 2020 funding is impressive.

Unfortunately, the Irish reputation in marine renewables is affected by the MAFA Bill issue and that reputation took further damage on board by the SmartBay situation where the facility has had to close while the lease renewal process was followed.

Q16 Do you have any suggestions on how to further implement this action?

Ireland needs some early 'wins' in offshore renewable energy. The aim for 2018 should be to get devices deployed in the sea in Galway at the renewed SmartBay site, pass the MAFA Bill and endorse the approach suggested at Actions 2.5 and 3 above about the Initial Market Support Tariff and a Pre-Commercial Technology Fund. The net effect would be to transform our international image and it would kick start an inflow of new and start-up companies from abroad (e.g. to escape the effects of Brexit and general Government policy on MRET in Scotland) and, thus, we could assume the mantle of global leader in MRET from Scotland. Initiating the laying of interconnectors with large carrying capacity between Ireland and the UK and, second, between Ireland and mainland Europe would also send a clear signal that Ireland is open for business in the offshore renewable energy sector.

ACTION 7: EXPLORE POTENTIAL FOR INTERNATIONAL COLLABORATION

Q17 Does the progress section capture all the relevant information and activities that have taken place since publication in 2014?

Ireland has done well in international collaboration in both the academic and industrial fields. The Ocean Power Innovation Network (OPIN) is Irish by origin and is potentially an important instrument to encourage collaboration among MRET firms both at a local and an EU level.

In late 2015, representatives of development agencies[8] from several EU regions, a utility[9] and MRIA met to discuss the progress of ocean energy. The participants agreed that the sector was being held back by the focus on solving problems by individual companies and by a generally weak value chain. The group concluded that collaboration on innovation (e.g. to sort out the technology development element of ocean energy's value chain) between companies and the involvement of firms from other industries (i.e. bring related industry value chains to bear) was a key to moving European ocean energy forward. It was decided to establish the *Ocean Power Innovation Network* (OPIN) on a pilot basis. The original partners have been joined in this project by others, including new partners from France and Sweden. As the project develops, other European innovation actors, clusters and intermediary organisations with an interest in ocean energy, or in related sectors which could contribute to building a new ocean energy value chain, will be sought for collaboration projects and for the expansion of the OPIN network.

The original founding bodies have acted as a temporary steering group for OPIN and have organised three OPIN Symposia and one Cross Sector Workshop to date. OPIN Symposium Dublin (September 1st 2016) was about introducing OPIN and its approach to ocean energy and a number of case studies in collaboration were showcased e.g. the Industry Research Development (IRDG) group told the story of their innovation group while Siemens spoke of their experiences in collaboration and innovation. OPIN Symposium Edinburgh (December 1st 2016) dealt with the 'learnings', in different areas such as operations and maintenance, for ocean energy from other industries – drinks, aerospace and oil and gas. OPIN Symposium Belfast (March 9th /10th 2017) initiated a Share Fair (brokerage between companies) and, also, the OPIN *Linked In* group. It involved a site visit to a real collaborative project (which had been prompted by a meeting at OPIN Symposium Dublin) between two companies, QED Naval and Cimpina. Speakers experienced in high-end innovation (Bombardier) and a range of marine renewables projects (e.g. B9) spoke at the main event. OPIN Cross Sector Workshop Aberdeen (June 14TH 2017) was the first OPIN event focused on briefing and networking with another sector – oil and gas. The event was designed to attract the oil and gas value chain where there is perceived potential for collaboration with ocean energy. It involved a series of briefings, discussion groups and networking sessions about ocean energy – the current R&D effort, the way in which the ocean energy supply chain works and updates on the latest ocean energy projects such as MeyGen, Open Hydro and WestWave. Technology. The attendance at OPIN has steadily increased from about 50 in Dublin to about 80 in Aberdeen with the attendance largely drawn from industry.

[8] Principally, Sustainable Energy Authority of Ireland (SEAI), Scottish Enterprise and Invest Northern Ireland (InvestNI)
[9] Ireland's ESB which promotes the NER 300-supported WestWave project to develop a 5MW wave array off the Irish west coast

Q18 Do you have any suggestions on how to further implement this action?
It is understood that Ireland is leading the preliminary work on the formulation of an EU Horizon 2020 project to extend the approach embodied in Wave Energy Scotland and the proposed Irish Pre-Commercial Technology Fund to an EU initiative and this is to be welcomed and hopefully it will come to fruition in 2018.

The OPIN initiative is an important one as it gets to the heart of two related obstacles to enterprise development in MRET: companies are all too often duplicating their R&D efforts and thus wasting resources and time; the companies in MRET are typically very small and will struggle to scale up as technology develops. The OPIN approach is vital to promoting collaboration among companies and that, in turn, will support upscaling.

The current pilot OPIN model does not have the resources or delivery structure and capacity to achieve the objective set out above. Support for OPIN is being sought from various EU funding schemes but this will take time. Initial seed funding under OREDP for a small support team would allow scaling up of activity, an effective delivery structure and strong partnership working across the countries / regions, increasing the opportunities for learning from cluster and cross-sectoral models which have worked in any countries, and enable both wider and deeper engagement with and between SMEs and other innovation actors. Above all, it would send a strong signal out to the industry world-wide that Ireland is taking up the baton of leadership in this new technology field

ACTION 8: INTRODUCE A NEW PLANNING AND CONSENT ARCHITECTURE FOR DEVELOPMENT IN THE MARINE AREA

Q19 Do you think that sufficient progress has been made on the action to introduce a new planning and consent architecture for development in the marine sector?

The failure to finalise a Maritime Area and Foreshore (Amendment) Bill – 'MAFA' – over many years is a disappointment and affects Ireland's international credibility as well as the confidence of the local investment and developer communities in the seriousness of the Government's intent to develop marine renewables. It is a prime example of how, for many and complex reasons (notably, the lack of sufficient senior policy makers dealing with marine issues in the various Departments), there is an insufficient 'whole of Government' approach to marine renewables at this important stage of the sector's development

Q20 Do you have any suggestions on how to best implement this action?

A top priority for all involved Departments in 2018 should be to finalise the MAFA and to bring it through the Oireachtas process to the statute books. Closely allied to this is the urgent need to restart SmartBay following the lease renewal and to undertake an examination of the case for a demonstration site for full scale MRET models in the Irish Sea or the Celtic Sea where the weather conditions are much less challenging than at AMETS.

Once MAFA is published, attention should be given to developing a 'manual' which sets out the process involved in securing the various consents required for MRET and sets indicative timelines for each step. Industry needs a clear road map to consent and a reliable indication of the timing involved.

The Association has, from its outset, pushed hard for the establishment of Initial Development Zones[10] (IDZ) for marine renewables. This would enable planners and developers alike to focus their efforts on a small number of areas with potential significant benefits arising from such an early focused approach. It is not necessary to develop all of the IDZ's originally advocated by MRIA at the same time. In fact, there would be considerable merits (e.g. it could act as a learning ground for all parties concerned) if just two Zones were initially finalised and developed quickly with consenting, cabling and grid. The most likely candidates are West Clare and West Mayo. The Clare site has a possible grid connection nearby, the seabed is 'user friendly' and the weather conditions are a little milder than at AMETS, the second Zone, which will require robust devices to survive its tough local climate.

The Association welcomes the recent publication of the Government's intentions in regard to marine spatial planning[11]. The should result in a strategic plan to guide other (more local) development including IDZs and should 'future-proofs' those initiatives. There is an urgent need for a marine spatial plan and the identification of development zones for marine renewables coupled with a target for licencing round(s). Once the Zones have been identified the government could use existing programmes, infrastructure and expertise to undertake baseline assessments e.g. INFOMAR, Marine Institute vessels etc This would be welcomed by industry as a clear signal that Ireland intends to develop the marine renewables industry.

ACTION 9: ENVIRONMENTAL MONITORING

Q21 Does the progress section capture all the relevant information and activities that have taken place since publication in 2014?

Yes

Q22 Do you have any suggestions on how to further implement this action?

The MRIA supports the Stakeholder Suggestions made under this heading

ACTION 10: ENSURE APPROPRIATE INFRASTRUCTURE INVESTMENT

Q23 Does the progress section capture all the relevant information and activities that have taken place for this action since its publication in 2014?

Yes

Q 24 Do you have any suggestions on how to further implement this action?

The principal concern of MRIA under this heading is the need to pre-plan a new port on the West Coast.

[10] *Initial Development Zones To Focus On Realizing Ireland's Ocean Energy Potential: White Paper* www.mria.ie
[11] Department of Housing, Planning and Local Government *Towards a Spatial Plan for Ireland – A roadmap for the delivery of the national marine spatial plan* www.housing.gov.ie

Ireland's best wave energy resource is off the West coast alongside a major wind resource. It should, with significant further investment, be possible to support the development of these resources at least at the southern end of the coast from Shannon Foynes and Cork. Beyond a certain level of deployment, the much smaller ports to the north of County Clare would struggle to cope with developments off Mayo in particular.

Steps must be taken quickly to undertake all necessary planning to provide at least minimum facilities (200m quay, heavy-loading laydown area etc) to support ocean energy, perhaps at a port location in Mayo or at Rossaveal in Galway or at the (planned) redeveloped Galway Port. The Association is conscious of the need to avoid raising expectations and to avoid land speculation. It must be emphasised that this recommendation is made in a measured fashion and it is made only in light of the particularly long lead-time typically encountered in port developments. It represents a 'hedge' on future port needs.