



10 September 2015

Renewable Electricity Support Scheme Technology Review Consultation

Submission by Marine Renewables Industry Association

Process Layout and Approach

1. *Is the structure and approach to the process to develop the support scheme appropriate?*

Yes

2. *Are there any additional considerations to build into the process plan?*

Ocean energy has both an electricity supply and an enterprise dimension. Ocean energy technology is emerging but is it unlikely to be deployed at commercial scale until c2030. Thus, it is unrealistic to forecast now the exact scale and nature of ocean energy's place in the national generation mix. This will be determined by a variety of factors such as the actual LCoE achieved by mature wave energy (tidal energy will play only a small part in Republic of Ireland electricity generation), export market demand etc.

There is another, unique, aspect to ocean energy: the enterprise dimension. Ireland has a bountiful wave resource; is home to at least two of the world's global leaders in ocean energy (OpenHydro Ltd; Ocean Energy Ltd) as well as a number of other promising young companies; and has developed (and continues to do so) at considerable cost leading R&D and test facilities. Numerous authoritative reports¹ forecast that ocean energy (wave and tidal) will become a major source of jobs and income creation, probably from the late 2020s or the early 2030s. The recently published Ocean Renewable Energy Development Plan (OREDPP) captures this economic development opportunity for Ireland when it set a high level goal for the Plan: *'Ireland harnesses the market opportunities presented by offshore renewable energy to achieve economic development, growth and jobs (p7)...the scale of opportunities ultimately achieved is conditional on early involvement in the sector and the putting in place of appropriate policy supports for the sector (p17)'*.

The position of ocean energy in Ireland is possibly unique – we have both a leading position as a developer of this emerging technology and a huge natural resource. The provision in the OREDPP of an Initial Market Support Tariff (IMST) for ocean energy was the most recent recognition of this *'...to unlock the economic growth and job creation*

¹ See, for instance, *European Ocean Energy Industry Vision Paper 2013* European Ocean Energy Association 2013 (EOEA is now known as Ocean Energy Europe); *Marine Renewables Green Growth Paper* Carbon Trust 2011; *Energy Technology Perspectives 2014* International Energy Agency; *Rising Tide – global trends in the emerging ocean energy market EY 2013*; *Economic Study for Ocean Energy Development in Ireland SQW, 2010*

opportunities offered by ocean energy development'. The IMST is vital to Ireland's stated ambition to become a force in ocean energy and to open up our West coast wave resource in particular.

Policy Context

3. Are there any additional aspects, such as policies, publications or reports that should be considered?

The Marine Renewables Industry Association (MRIA) believes that the national ocean energy policy framework has developed in a satisfactory manner recently with one exception. The failure to finalise the Maritime Area and Foreshore (Amendment) Bill and bring it through the legislative process is a disappointment. This failure to modernise the ocean energy 'consenting' system damages Ireland's credibility (the Association is aware of one notable international firm who will not consider Ireland as an ocean energy prototype development location because of the consenting situation). Moreover, a failure to bring the Bill into law soon will de facto hinder any efforts that the Department of Communications, Energy and Natural Resources (DCENR) may make in regard to, for example, a 'leasing round' for ocean energy.

4. Are there any particular support schemes in other Member States that would be beneficial to consider in an Irish context? If so please provide evidence and reasoning. Ireland's immediate need is to 'get metal wet' i.e. to get prototype small and medium scale devices deployed and tested. One hindrance is the 'funding gap' encountered as companies move up the Technology Readiness Level ladder. In practice, the current Prototype Development Fund is adequate for the early stage laboratory and some deployment work

It does not, however, meet the needs of promoters, from around the upper end of TRL 3 onwards, where the requirement for a promoter to fund a substantial proportion of the cost is often beyond the means of most start up R&D focused companies.....and this funding gap gets even tougher to bridge as the TRL ladder is ascended.

Wave Energy Scotland is one model to address the funding gap, at least in part. In essence, WES is currently focused on developing solutions to particular issues i.e. power take offs via a competitive process which provides 100% funding on condition inter alia that various requirements for IPR exploitation are met.

It is recommended that a similar initiative be launched here during 2016, with modifications where necessary to reflect the experience of both government and particularly of industry of WES. It should have the following features:

- Designed to address funding needs from about late-TRL 3 up to early Prototyping (say, TRL 6)
- Provides 100% funding utilizing the SBIR model² with any necessary modifications to make it fit for purpose in the ocean energy context.

² Small Business Innovation Research. This has already been applied by SEAI to an Electric Vehicle Smart Charging scheme.

- 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
- A competitive process focused on specific topics which ideally would be complementary to the Wave Energy Scotland agenda..... but the Irish initiative should also allow for tidal energy
- All applications subject to strict engineering reviews by a panel of international experts at the commencement and completion of projects with pre-determined metrics of success
- Designed to generate solutions - projects cannot proceed to a further round of funding without success at each stage
- IPR shared with the State from the outset (more onerous than the Scottish practice) and must be commercially exploited by promoters in a pre-defined fashion by a specified date or ownership reverts to the State alone without compensation
- Mainly focused but not exclusively in the first 3 years (2016-18) on sub-systems, technical roadblocks rather than devices but the latter should not be ruled out.
- Perhaps two calls annually worth c€2.5m each

This new funding initiative would be operated by SEAI (who may need extra staff resources to run the scheme).

It would represent a major step forward in both resources and ‘TRL coverage’ and would be a natural partner to the Prototype Development Fund. It would go a long way to bridging the funding gap. The two funds, 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.

MRIA is completing a major study on the funding of ocean energy development and this will be available shortly.

Technology related

5. What technologies should be considered for support?

The Initial Market Support Tariff (€260/MW hr, up to 30 mw) is confined to wave and tidal energy in the OREDP and this should remain the case. The Tariff is vital if Ireland is to develop a wave and tidal industry (focused on the enterprise element but also allowing for early exploitation of local wave resources in particular) and this will involve both local device developers and early stage companies from abroad attracted here by the Tariff, the funding opportunities, the resource and the R&D/test facilities

6. What are the likely characteristics of deployment?

It is difficult to generalise at present. Tidal technology is facing technology convergence and the OpenHydro device is typical of this. Wave energy, on the other hand, has a diverse range of solutions on the drawing board or in the laboratory or at a test site. Deployments will be on a small scale (e.g. WestWave at 5MW), probably up to the mid or even late 2020s

a) *Is there a range of potential deployment characteristics, for example in terms of technology type, installed capacity, fuel etc?*

See 6 above

b) *What is the anticipated energy yield of the technology?*

Not known to any useful level as this is still an emerging technology

7. *What potential categorisation of technologies would be appropriate?*

The categorisation employed in the OREDP including wave and tidal is suitable

8. *How could technologies that can generate heat and electricity be best supported?*

Given Ireland's ambition to generate substantial jobs and income from ocean energy, principally by developing a leading global supply chain position, it is important that a long term and holistic support system be developed which enables developers to develop the supply chain and/ or deploy devices and early arrays. This has two aspects. First, support in the form of capital grants etc and this is catered for by the current Prototype Development Fund and the proposed new fund (see 4). The MRIA will publish a major discussion paper on this issue in the near future. Second, there must be support tariffs including the IMST introduced by the recent OREDP.

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

- a) If the tariff is too low, it simply will not attract any development.
- b) Revenue support cannot be *cliff edge* (i.e. a REFIT for the first 30MW and thennothing). 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, moderate support on the second to third 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 €260MW hr was deemed sufficient by industry but that view has since been revised on reflection and it is now considered unattractive for early projects. It is proposed that the allocation should be split between a higher rate for initial projects and a lower one for a second round of allocations while always accepting that the overall cost cannot exceed the quantum of the original i.e. any revision must lie within the boundaries of 30MW X €260MW hr.

While admiring the robust timetable set by this Consultation, it will be challenge to secure State Aids approval and hold a first round competition for the IMST before early 2017. Even then, consenting legislation may not be in place to allow a proper leasing round, even for a designated Initial Development Zone(s). However, given that the timetable set by the Consultation is adhered to, it would be prudent to hold an initial competition as early as possible and a second Round perhaps towards 2020.

This outcome of this consultation process should allow for an outline solution to the key 'runway' problem i.e. there is a need to indicate to investors at this stage the State's willingness to consider a further scheme in the 2020s to follow on from the IMST for a further 100MW. The exact scale, tariff level etc of this scheme could be determined once the IMST is close to full allocation and initial lessons have been learned and 'next steps' required to bring energy technology to maturity (and thus more attractive to mainstream financing models) are clear.

9. What is the Levelised cost of energy (LCOE) per MWh for each category? Do you foresee these costs changing—how and over what timeframe? Please provide a breakdown of what costs have been included and how these costs have been derived

It must be emphasised that the LCoE of wave and tidal is unknown at this stage as the technology is still under development and technology convergence has not yet been reached. A panel of experts is currently considering the path to industrial roll out for ocean energy technologies under the *Ocean Energy Forum* umbrella with sponsorship from the EU Commission. In its initial work, the panel have considered an LCoE of €c10kW hr as being possible for all forms of ocean energy in their 'industrial roll-out' phases which are deemed to be c2030 and onwards for tidal stream; about the mid-2020s for tidal range and about the mid2030s for wave.

10. Should repowering of existing sites be considered?

Yes as per 10 a)

a) If so, how would the cost of deployment vary from the use of new technology?

There are no commercial sites to repower in wave and tidal at present. Resources should be focused on the latest technology. Strictly speaking, this might involve repowering test sites at SmartBay and AMETS- this is part of the nature of supporting an emerging technology and should be allowed for.

b) What types of repowering could occur?

See 10.a

11. Should the use of reconditioned plant and equipment be supported?

There should be provision for this in the first phase of development of ocean energy insofar as this would permit prototype and experimental devices to be modified and rebuilt for use again in a further step along their development path.

a) If so how would the cost of deployment vary from the use of new technology?

Unknown at this point and quite possibly no reduction in cost: modifying machines can be an expensive business in an evolving technology with demonstration devices and prototypes.

Eligibility

12. Based on the guidelines for state aid, what aspects of the cost of deployment should be eligible for support?

There are two types of support involved here: the IMST, the case for which is made in the OREDP and elsewhere in this submission; and grant and other forms of support for companies in this emerging technology including R&D and test facilities, device and

component/sub system developers, early array developers. A major initiative in this regard is proposed at 4 above

13. Is the current definition of eligible electricity appropriate?

Not appropriate to prototype etc deployment of wave and tidal- 1. Wave and tidal is not part of REFIT 2 and 2. Confining eligibility to purely new equipment is not appropriate to this emerging technology – see 11.

14. What criteria should be utilised to assess eligibility for support?

Given the unique new technology and enterprise dimensions to ocean energy, it is recommended that eligibility for support under the IMST should be tied to an applicant's actual and planned economic development 'footprint' in Ireland e.g jobs (actual and forecast); use of test etc facilities; TRL level of the technology i.e. need for the IMST; innovation, overall likely benefit to the Irish economy; views of appropriate development agencies e.g. SEAI.

a) Are there any particular criteria that should be applied to individual technology categories?

Wave and tidal projects should be treated equally - for economic development reasons - although the local resource is predominately a wave one.

Support mechanism

15. Do you think a single support mechanism should apply to all applications?

No. Ocean energy is already supported by the Prototype Development Fund and a further, complementary funding initiative is recommended – see 4. The IMST should be provided at different levels as recommended at 8.

16. What are the key components you would like to see in the support mechanism?

a) Retention of the recently announced IMST scheme with modifications (which are cost neutral) as suggested at 8 and b) support with grants via the Prototype Development Fund and the new funding initiative – see 4.

17. Taking account of the objectives of the new scheme what type of mechanism do you think would achieve this within the overall objectives of the scheme and the State Aid guidelines?

1) The IMST as announced but subject to the cost neutral amendment suggested at 8. 2) Continuation of the grant scheme operated by the Prototype Development Fund and 3) a new funding initiative– 100% funding via a Strategic Business Innovation Scheme type approach which provides for pre-commercial procurement –see 4

18. Do you consider that the State Aid guidelines will necessitate a competitive bidding process for allocation?

Regardless of State Aid guidelines requirements in this regard, MRIA are in favour of a competitive bidding process for the allocation of the IMST between ocean energy developers only. This will ensure transparency in the allocation of a fixed scheme; will generate international interest in Irish ocean energy; and will ensure that only the most promising technologies will receive an allocation and that value-for-money is achieved.

The award of IMST to any individual project should be confined to 5MW in at least the first Round of IMST.

19. Do you foresee any exemptions under the conditions outlined in the State Aid guidelines?

Only insofar as these are deemed necessary to meet the development needs of Irish ocean energy.

20. Do you have any concerns regarding the introduction of a competitive bidding process and how do you see these concerns being addressed?

No. As already stated at 18, the MRIA consider a competitive allocation of IMST within ocean energy to be important and in keeping with the later likely allocations of commercial sites at sea under competitive ocean energy leasing rounds which are the norm in e.g. the UK

However, a competitive bidding process between different energy sources (e.g. wind, solar) would be a disaster for ocean energy, an emerging technology for which Ireland has significant supply chain ambitions. It cannot compete on an LCoE or any other basis at this stage- apart from huge local economic value added potential - and nor should it be expected to do so.

Scheme Limits / Cost controls

21. What would be appropriate scheme limits to introduce –should it be a single limiting factor or a combination including volume, capacity or budgetary?

The IMTS is already volume limited at 30MW and will remain so in the revised format suggested at 8. Given that the ultimate purpose of the IMST is to support the growth of the enterprise dimension to ocean energy in Ireland as well as to enable judgements to be made about the suitability of this new technology to the Irish generation mix, the Association does not recommend the sub- allocation of the IMST between wave and tidal or its allocation on the basis of resource availability. Wave and tidal are principally global supply chain opportunities at present in the Irish context and even-handed treatment is needed. However, MRIA recommends that no one project should receive support for more than 5MW of the IMST in order to ‘hedge’ the State’s risk and also in the interests of supporting a variety of solutions in a technology where engineering convergence has not yet taken place. The amount of €30m of extra support in 2016-2018 indicated in OREDP should be assigned to the Prototype Development Fund and to the new funding initiative suggested at 4 and the matter reviewed towards the end of that period.

22. What would be appropriate backstop dates for the scheme given the pipeline of potential projects and estimated connection timeframes?

Given that the next 10 years + may be taken up with R and D etc, it is recommended that the backstop date for wave and tidal be set at 2045 (see 23 below).

23. Does the 15 year support duration still remain an appropriate support period and if not why?

A 15 year period of support is unsuitable when hugely risky trials and experimentation are involved in a complex, immature technology set like wave and tidal. It is recommended that a 20 year support period be adopted.

24. Should a project be eligible to receive support under RHI and the electricity support scheme and if so how might this be structured?

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Tariffs

25. Given your submission to the allocation methodology, do you have any suggestions on the process for determining tariffs?

This is dealt with at 8.

26. Do you think that degression should be introduced to a new support scheme and, if so, please suggest if only for certain categories? If so, how you see it being introduced such as degression methodology and degression periods?

It would be unrealistic to introduce degression arrangements for a technology that right now cannot generate electrons reliably or at all and which will take another ten years at least to get to a reasonable level of commercial operation and deployment.

27. Should the tariff retain an element of reference to market revenue?

No. It is extraordinarily difficult to attract investors at present to ocean energy device and system development. A market revenue reference element would introduce more uncertainty and complexity for already reluctant investors.