

Submission from Bluwind Power Limited to the Mid-term review of the Offshore Renewable Energy Development Plan (OREDP)

Preamble:

Bluwind Power Limited is an Irish company that is currently testing technology for the offshore floating wind energy industry. The technology has been developed by a German company that has designed over twelve percent of all the wind turbines that exist in the world and currently it is being tested in Ireland and also in Japan. Once the technology is proven, a production plant will be established in Ireland (probably at the port of Foynes, Co. Limerick) to service the European market.

The technology consists of a semi-submersible concrete platform that floats eighteen metres below the surface of the sea and twin turbines that are mounted on each platform. Each of the turbines will have a capacity of 7.5MW, so each platform structure will have capacity to generate 15MW of renewable electricity.

The units are suitable for deployment in water depths ranging from forty to one hundred and eighty metres. The design features incorporated into the turbines make them especially well suited for sea conditions found off the coasts of Ireland.

Testing on a 1:36 scale has been completed at the LIR test facility in Cork. Testing on a 1:10 scale is planned to take place at the Smartbay test facility (Galway) in mid-2018. Afterwards it is planned to test a full-scale unit in the Irish or Celtic sea in advance of rigorous testing at the AMETS facility in Mayo. It is expected that the full scale model of the twin turbine structure will be ready for testing in Ireland in 2020, subject to the appropriate infrastructure being available at that time.

Answers to the questions posed in the OREDP review:

Q1. Do you have any suggestions or additional measures to support and enhance the governance structures of the OREDP?

Bluwind fully supports the establishment of a dedicated offshore wind working group under the ORESG and firmly believes that wind is the offshore energy resource that will deliver earliest results for the Irish economy, ahead of both wave and tidal energy.

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

While Bluwind welcomes the investment already made by the Irish exchequer, it believes that greater investment is required in offshore wind development, especially supports for floating offshore wind where the technology is not yet proven. The OREDP identified that the offshore renewable energy sector has the potential to become a major industry, on a par with the food and drinks sector, and that it would allow Ireland to replace its fossil fuel imports by indigenous renewable energy and later become a major supplier of renewable electricity to the UK and mainland European markets. The OREDP also identified that within the offshore energy sector, offshore wind (especially floating offshore wind) is the most abundant resource that we have

available in Ireland. Hence, the returns for the Irish taxpayer arising from the harnessing of our offshore wind resource will more than justify the initial capital investment that is required.

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

To date, the emphasis has been on wave and tidal devices and offshore wind technology has been largely ignored. Technology developments in the offshore wind sector in recent years have been dramatic and the cost of developing offshore wind farms has fallen sharply, so that offshore wind will soon be a realistic alternative to fossil fuels. The offshore wind sector has two sections: one that uses fixed bottom structures for shallow-water wind farms and the other that uses floating platforms for usage in deeper waters. In the Irish sea both structures can be deployed but in the case of the deeper waters in the Atlantic ocean and the Celtic sea it is only floating structures that will be able to operate. The OREDP report identified that Ireland's offshore wind resource is greatest in the latter regions. The fixed-bottom structures use technology that is already proven on land, notably the use of steel monopiles that are drilled into the seabed. In the case of floating wind platforms the technology is still at developmental stage. The use of exchequer funds to develop suitable testing facilities for floating wind devices and to assist early-stage companies that have a strong focus on the floating wind energy sector would allow Ireland to become a market leader in the rapidly growing offshore wind energy sector. The size of Ireland's offshore wind resource is such that Ireland could, in addition to using renewable energy to meet our national needs, become a major exporter of renewable electricity to markets throughout Europe. Furthermore, a manufacturing plant in Ireland employing hundreds of people could supply technology to harness offshore wind in other European waters.

The development of offshore floating wind devices will also assist the future development of wave devices. The addition of wave devices to floating wind platforms to create hybrid structures offers the best way forward to the wave energy sector, as progress towards the generation of low-cost energy from wave devices is falling well behind the progress being made in the offshore wind sector.

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

There is much more work to be done to develop the AMETS facility and the ancillary infrastructure:

- The test facility permit needs to accommodate wind devices as well as wave and tidal devices,
- Each of the test locations at the facility needs to be connected by cable to the sub station,
- The cable must have a capacity much greater than the proposed 10MW. The Bluwind floating wind turbine will on its own require 15MW and the facility should be able to test several devices at the same time,
- Alongside future planning of AMETS, the grid structure connecting different parts of Ireland needs to be reviewed in order for the renewable electricity generated off the west coast of Ireland to be transported to the east coast and further afield.

Separately from AMETS there is a need to develop a test site in the Irish sea or the Celtic sea (possibly off the coast of Wexford or Waterford) where full scale devices can be tested. Here the devices can be tested in normal sea conditions instead of being exposed at the outset to the extreme weather conditions at the AMETS facility. The reality is that the sea conditions at AMETS are not representative of the normal conditions off the coasts of Ireland. Technology developers will feel much more comfortable if they can, in the first instance, test their devices on a full scale basis in more benign conditions before exposing them to the extremely challenging conditions, and associated dangers, at AMETS.

Any new test facility needs to have a permit that will allow wind, wave, tidal and hybrid structures to be tested on a full scale basis and, as with AMETS, proper capacity and grid connectivity are of the utmost importance.

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?

Bluwind attaches great importance to the Smartbay test facility in Galway, where testing at an intermediate level after the LIR test facility can be carried out before progressing to full-scale testing.

Bluwind notes that a new foreshore license is being issued for the Smartbay test site. It is of the utmost importance that the terms of the license will allow all suitable devices to be tested there.

The original foreshore lease was confined to wave and tidal devices, thus excluding floating wind and/or hybrid structures. The new lease needs to be extended to cover floating wind and hybrid devices and in the case of floating wind structures the lease needs to be sufficiently flexible to allow single turbine and/or multiple turbine structures to be tested there.

To date, very few renewable energy devices have been tested at the Smartbay facility. It needs to play a much more dynamic role in the future development of the offshore renewable energy industry in Ireland and to do so the testing facility must be available at all times to service the needs of technology developers.

A further issue, as mentioned under Q4 above, is that the transition from Smartbay to AMETS is too challenging and this may cause some technology developers to transfer their testing to other international test sites. The licensing of a full scale test facility in the Irish sea or Celtic sea would allow Ireland to become a “one-stop” testing location for new technologies and it would make the Smartbay test site more attractive to international technology developers.

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

Of the three testing locations in Ireland, LIR has had the greatest impact to-date.

Bluwind has used the LIR National Ocean Test Facility on three separate occasions and it has been satisfied both with the work undertaken and the commitment of senior staff.

Bluwind would encourage closer collaboration between the LIR test facility and test facilities elsewhere in the world (e.g. Japan for floating wind devices) and believes that this could form part of EU-promoted technology transfer arrangements on a global basis.

EU-funded programs such as Marinet offer scope for collaboration between LIR and other test locations in Europe such as the Flowave facility in Edinburgh and Bluwind believes that such collaboration would further enhance the attractiveness of the LIR offering.

Bluwind is in favour of greater technical supports being made available at MaREI to help early-stage technology companies with a focus on the indigenous ORE industry.

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

Bluwind believes that the Prototype Development Fund (PDF) plays a vital role in funding early-stage technology companies.

Without the PDF, Bluwind would not be testing its floating wind energy platforms in Ireland. Instead, the technology would be tested in the locations where effective funding supports are available.

Q8. What if any improvements would you suggest?

Bluwind suggests that:-

- the time periods involved in processing applications and making payments be shortened by deploying additional human resources in SEAI to this activity,
- additional exchequer funding be made available to the PDF to enable grants at 85% of the development and testing costs to be made available, and in the case of testing carried out at Smartbay the arrangements with Apple Inc for supplementary funding should be properly secured,
- a Pre-Commercial Technology Fund (PCTF) be established to supplement the PDF and help technology developers to fund the additional testing that has to be carried out in order to bring the technology from TRL3 to TRL6-7. This is the “valley of death” period that is not covered by the PDF and developers will not be able to access commercial funding for the research and development work that must be undertaken. The PCTF should be made available to all emerging technologies i.e. floating offshore wind, wave, tidal and hybrid devices,
- the ability of the individual project to reduce the LCoE (Levellised Cost of Energy) and the scale to which the technology will contribute to harnessing Ireland’s offshore renewable energy should be key determinants when deciding whether/not to allocate support to a particular project.

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

Yes.

As technologies progress up the TRL scale the cost of testing increases dramatically. In the case of Bluwind the cost of building a prototype of the 15MW (i.e. 2*7.5MW) floating wind structure is estimated to be €60 million. Bluwind will be relying on exchequer and EU funding in order to build and test this unit, as funding for research and development activity cannot be sourced in the commercial market.

The PCTF referred to in the reply to Q8 coupled with a Feed-In-Tariff (FIT) for emerging technologies such as floating wind (see reply to Q10 below) would help Bluwind to fund the major capital investment that is required to get from testing in Galway to the point where a full scale unit is being tested in the sea. Until such time as the product is fully tested in marine conditions none of the utilities will purchase it and technologies such as that being developed by Bluwind that have the potential to become the flagship technologies for the offshore renewable energy industry in Ireland will never get developed.

If Ireland is serious about developing its offshore renewable energy sources then the exchequer will have to provide additional funds for testing. Furthermore, it will have to invest in infrastructure where the units can be built (e.g. port facilities) and grid connections that will enable the electricity to be brought on shore for domestic usage and/or for export to international markets.

As with the food industry, there has to be a route for Irish renewable electricity to be transferred to export markets as the size the domestic market is much smaller than the resource that is available. In that context, the creation of a fully inter-connected EU-wide electricity network, using the Juncker fund for “projects of common interest”, must be an essential part of Ireland’s future strategy for its offshore renewable energy sector. When installing cables in the sea it is vital that provision is made for future growth. For example, the cable linking Ireland to France should have a capacity of approximately 3,000MW instead of the suggested 750MW and now is the time to put that infrastructure in place.

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

Yes.

Bluwind suggests the following:

- support tariff arrangements for emerging technologies (such as floating offshore wind, wave, tidal and hybrid technologies) should differ from the auction support arrangements that will be available for proven technologies under the Renewable Electricity Support Scheme,
- for emerging technologies the tariff should be a pre-determined Feed-In-Tariff (FIT), so that the technology developers can budget on the amount in advance,
- the tariff (FIT) should be a fixed amount per MW (suggested initially at €330 but to be reviewed periodically) and paid on the electricity that is generated by demonstrator units, as permitted under the EU guidelines on State Aids,
- all emerging technologies should receive the same FIT per MW delivered to the grid,

- the quantum of FIT should be set at 80MW, of which 40MW would be for floating offshore wind and hybrid devices and the other 40MW would be for wave and tidal devices,
- any FIT ear-marked for wave and tidal devices that remains unused after a defined period should be made available to floating offshore wind and hybrid devices. Likewise, any allocation of FIT to floating offshore wind and hybrid structures that remains unused should be made available to the other emerging technologies,
- the FIT should remain unchanged for the duration of the demonstration period of the technology,
- the rate of FIT should be 10% higher for technologies that undergo demonstration during the early stages of the FIT scheme in order to incentivise risk-takers into the industry,
- there should be no impediments such as size or location of the demonstrator units that would restrict access to the FIT,
- when accessing FIT for prototype units there should be no requirement to have local community involvement in the project, unlike that suggested in the case of established wind farms that might receive support in the form of Floating Feed-In-Premium (FIP) under the RESS,
- floating offshore wind technologies should continue to attract support after the demonstration period but at a much reduced amount per MWh,
- to be eligible for support the projects should fulfill certain conditions as follows:-
 - they would benefit from learning and cost reductions if built
 - they would reduce the cost of support in the longer term
 - the project would contribute to economic growth
 - support at the Irish level would align with support at EU level
 - they would have planning permission and grid connection

The above conditions are based on recommendations put forward to the EU Commission in 2015 by Cambridge Economic Policy Associates when advising on supports for the renewable electricity market. The Bluwind project meets all of the above criteria and is likely to become a major flagship project for the Irish offshore renewable energy sector.
- separately from the FIT for floating offshore wind there should be a Floating Feed-In-Premium (FIP) for fixed-bottom offshore wind, made available through an auction system, in order to encourage utilities to support the development of an offshore wind industry in Ireland.

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

Most definitely.

The DCCAIE estimated that a properly developed ORE sector in Ireland could sustain 70,000 jobs and generate €15 billion/year in export earnings instead of expending €8 billion/year on fossil fuel imports.

Achieving the above results would put the offshore renewable energy industry on an equal footing with the food and drinks industry, Ireland's largest indigenous industry.

An additional attraction is that the offshore renewable energy resource is available free-of-charge on a permanent basis and unlike other sectors, once the industry is established, there is no requirement to import raw materials to service it's needs.

In short, the offshore renewable energy industry and in particular the offshore wind energy sector can do for Ireland what oil did for Saudi Arabia in the past and market trends suggest that the market for "green" energy will continue to grow rapidly well into the future.

Failure to address this export opportunity would be akin to adopting a national agriculture strategy focussed solely on domestic consumption and advising farmers and food processors to restrict their activities to 10% of their current output, bringing about a major reversal in our national economic performance.

As mentioned at point 9 above, the size of the cables that are installed should facilitate large export volumes and Bluwind recommends that from the outset the capacity on the Ireland-France inter-connector be set at 3,000MW instead of the proposed 750MW.

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

Bluwind recommends that:

- grid connections within Ireland be strengthened to facilitate the transfer of renewable energy from production locations offshore to onshore users throughout the island,
- multiple grid connections to be put in place between Ireland and the UK and with mainland Europe (the planned connection between Ireland and France to be only one of many connections between Ireland and mainland Europe), with the capacity to carry large volumes of electricity, so that Ireland's ORE industry will be able to bring it's product to market,
- additional storage possibilities to be researched, including the possibility of storing the energy in the form of hydrogen.

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

No real progress has been made to-date.

This is understandable as the technology for floating wind, wave, tidal and hybrid devices is still at a developmental stage.

The development of the offshore renewable energy resource will bring much needed jobs to the west of Ireland and it will help to address the regional imbalance that exists between different parts of the country. In addition to the jobs that are created in building and deploying the units, there will be good jobs available along the western seaboard in maintenance activity.

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

Bluwind wishes to put together a consortium of Irish and foreign companies that will become the supply chain for the floating offshore wind energy industry.

The Bluwind consortium would deal with all elements of the final wind turbine structure and it would then be in a position to deliver a turnkey solution to the utilities that are developing floating offshore wind farms throughout Europe. A wind turbine manufacturer, a blade manufacturer, a tower manufacturer, a concrete manufacturer with previous marine experience, a moorings expert, an assembly and marine deployment expert, an operations and maintenance company would all be part of the consortium. In the first instance much of the experience will be provided by established foreign companies but the jobs will be created in Ireland and as was the case with other industries in Ireland such as the pharma and ICT industries the expertise among the Irish participants in the consortium will be built up over time.

To achieve this, Bluwind must be able to access supports through Enterprise Ireland on a similar basis as FDI companies can access supports through IDA. Furthermore, a specific section needs to be established within Enterprise Ireland with the sole mandate of developing the ORE sector.

Other Irish companies should be encouraged to take on a similar role as Bluwind but with a focus on non-wind elements of the ORE industry.

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

No.

The failure to deal promptly and effectively with the lease issues at the Smartbay test facility and indecision both on support arrangements for developers and the future role of the AMETS facility have all inflicted damage to Ireland's reputation. Delays in adopting the Marine Area and Foreshore Amendment Bill have also been damaging to Ireland's reputation. The experience of Apple Inc when seeking planning permission for a data centre in Athenry as compared with their parallel experience in Denmark further compounds our image problem.

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

Bluwind recommends the following:

- the foreshore licensing legislation be made much more user-friendly,
- infrastructure associated with the ORE industry such as the creation of suitable port facilities should be treated as strategic infra-structure,
- greater clarity on the testing facilities that will be available and the role that they will play,
- meaningful supports be put in place for technology developers and for wind farm developers, and a long-term commitment to the sector be made known,

- grid connection with plenty of capacity between Ireland and export markets to become a key element of government policy so that companies that invest in the sector can see the full potential of their investment,
- collaboration arrangements to be put in place between Ireland and other countries that are interested in working together on technology development for the ORE industry. For example, Japan is especially interested in floating offshore wind and in the context of Brexit Ireland is a very attractive location for Japanese investment.

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

No comment.

Q18. Do you have any suggestions on how to further implement this action?

The EU has recently introduced under Horizon 2020 measures to encourage technology transfer between EU member states and countries in Africa. Corresponding measures should be introduced to encourage collaboration between EU countries and Asian countries and possibly the USA.

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?

No.

Our recent experience with the foreshore lease for the Smartbay test facility indicates that major improvements are necessary. The closure of the Smartbay facility for testing activity during the past nine months casts a long shadow over Ireland's claim to be "open for business" for international companies that want to get involved in the ORE sector in Ireland.

Other companies with longer experience in the marine sector have voiced their complaints about the delays they experienced in getting planning decisions made. Problems encountered by port companies in getting permits for infrastructure works also indicate the need for major procedural changes to be introduced. Delays that impact on any part of the supply-chain will impact on the future development of the overall marine sector in Ireland.

Finally, a legal system that allows individuals at little or no cost to themselves to block developments of critical national importance is not fit for purpose and must be over-hauled if Ireland is going to compete at international level for major projects.

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

Appoint a "Michael O'Leary" to sort out the problems and give him/her the powers that are required.

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

No comment

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

The lack of ORE development in recent times is identified in the consultation document as the key reason for our lack of progress in environmental monitoring.

The suggestions put forward in the responses to Q8, Q9, Q10 and Q12 above, if acted upon, would help to invigorate activity in the sector.

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

The progress section report is accurate but very disappointing as it points to things that have yet to be done instead of identifying meaningful actions that have been taken.

In the case of the test centres, the LIR facility is functioning but the Smartbay test site has been out of action since March 2017 and serious doubts are being cast over the suitability of AMETS as the follow-on test location for devices that performed well in Smartbay.

The need to identify a suitable port that would support the development of an ORE is long overdue. Given the limited number of ports in Ireland that have deep water and the space required to provide the additional infra-structure that is required, the selection process should not be onerous.

As regards the grid, EirGrid has a major job to do if it is to provide the route to market for ORE companies that are located off the west, north and south coasts of Ireland. Eirgrid is a key component of the supply chain and it has to buy-in to the enterprise if the ORE sector is to develop.

Q24. Do you have any suggestions on how to further implement this action?

Bluwind supports the view that Ireland needs a flagship project where people can see metal in the sea and renewable electricity delivered to the grid. To achieve this we need world-class technology and people with business acumen who are willing to commit their money and their time to the endeavour. Bluwind fulfils all of these criteria and is willing to rise to the occasion. However, more is needed in terms of national policy if success is to be achieved. There needs to be a national plan with committed support from all the stakeholders. This plan would address inter-alia funding priorities, ports infra-structure, grid connectivity with ample capacity to allow for future growth in exports, test facilities, licensing legislation and the ability to communicate a message to major industry players at home and abroad that Ireland is “truly open for business” and that the development of the ORE sector is and will remain a key government priority. Drive and leadership is needed to steer the right course. Someone needs to do for this industry what Horace Plunkett did for agriculture when he established the first creamery at Dromcollogher in West Limerick in 1889. The seed that he planted then produced not one but many mighty oak trees!
