ENTERPRIZE ENERGY

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Offshore Wind Phase Two Consultation,
International and Offshore Energy Division,
Department of the Environment Climate and Communications,
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Dear DECC

Submission by Enterprize Energy Group on the Offshore Wind Phase Two Consultation Paper

In response to your invitation for submissions on the Offshore Wind Phase 2 Consultation Paper, I first wanted to take this opportunity to introduce Enterprize Energy Group (EEG) to the Department. EEG is looking at opportunities to invest in Ireland to help develop its exceptional offshore wind resource to generate green hydrogen. We believe this will become essential both for domestic use in helping decarbonise Ireland's energy / transport sectors and/or be used to produce green ammonia, all of which could also support the export market. EEG is in the process of applying for a foreshore licence in respect of seabed surveys in the South Celtic Sea and is also considering a second location off the southwestern coast, to acquire data which will allow the Company to move forward with the necessary design and development of these innovative projects.

EEG Background

EEG has a record of successfully conceiving and developing innovative offshore wind developments since 1999, beginning with the Ormonde development in the UK East Irish Sea, which was originally designed as an offshore wind and natural gas hybrid development. Ultimately, only the wind farm was developed, featuring the industry leading and largest 5MW turbines (at the time) on steel 'jacket' structures.

EEG, through its subsidiary companies, has subsequently initiated and is undertaking offshore wind developments in Taiwan (Hai Long Offshore Windfarm, 1,044 MW) and Vietnam (Thang Long Offshore Wind, 3,400 MW). The Hai Long Offshore Wind Farm (Hai Long 2 and Hai Long 3) off the coast of Taiwan is being developed by Yushan Energy and Northland Power. Yushan Energy, a consortium led by Enterprize Energy and Mitsui & Co, are co-developers of the portfolio, owning 40 percent, with Northland Power owning 60 percent. The two sites will deliver more than 1 GW of wind energy once commissioned, currently planned for 2025-26. Contracts have recently been placed with a consortium of Vietnamese contractors for the design, engineering, procurement, construction, and commissioning of the two offshore substations. The deal represents the largest offshore substation contract awarded for a Taiwanese project to date, and the first in Vietnam. Offshore installation is planned for 2024, and commissioning in 2026.

The Thang Long Wind Power Project is a project led by Enterprize Energy Group. The project is located approx 50 km off the coast of the Binh Thuan province, Vietnam and covers an area of over 2,000 km^2. The proposed total capacity of the project is 3,400MW, to be delivered in up to five phases. Total investment for the entire project is currently estimated at approx 11.9 billion USD, not including the investment for new transmission system links. EEG has ongoing discussions with the Vietnamese Authorities for the additional development of a 2GW offshore hydrogen project. Thang Long is the only large-scale offshore wind project to be granted a survey licence by the Vietnamese government to date.

EEG's Energy Plus

Anticipating a significant growth in demand for renewable energy, and in particular, green fuels such as hydrogen and ammonia at scale as a part of the transition from fossil fuels to renewable energy and for decarbonization of fertilizer in the agricultural sector, EEG has developed its 'Energy Plus' concept. This involves using offshore wind to electrolyse sea-water and

create hydrogen at the offshore site. Critically important is that this process can be done without the need for an electrical grid connection. The hydrogen can then be injected into existing natural gas pipelines or transported by tanker vessels to the point of use as hydrogen or ammonia.

EEG's two prospective projects in Ireland are based on the Energy Plus concept, with an output which allows for energy transport and storage via green hydrogen and/or ammonia and/or the provision of energy to an island mode system (no grid electrical connection required). The lack of capacity in the onshore grid is not a uniquely Irish problem, we find that many countries are experiencing capacity constraints in their electricity grid as they select electrification as a way of reducing carbon emissions from the energy, heat and transport sector.

EEG believe that the timing of the demand growth for green fuels now overlaps with the development cycle time for offshore wind farms. As a consequence, it is now appropriate to commence early development of these projects.

EEG has contracted the engineering consultancy Tractebel-Overdick, who have considerable renewable energy and offshore engineering expertise to design and detail the capital and operating costings for offshore hydrogen and ammonia production platforms and export facilities powered by offshore wind. Energy export will be possible via cable, pipeline or tanker vessel, offering flexibility to meet market demand and timing. Particularly the latter provides another mechanism to meet Ireland's ambition of being a future net exporter of energy, without the necessary reinforcement of the grid.

Accessing the wind resource along the coast of Ireland and being able to extend this access into deeper waters away from the more sensitive coastal environment is essential to the economic performance of the project. This will be achieved by using either a 'gravity-spar' design or by floating turbine foundations as an alternative. Specifically, EEG have been working with ODE Ltd., one of Europe's most experienced offshore wind engineering, design and project management contractors for a number of years on the development of an Articulated Wind Column (AWC), an adaption of the Articulated Loading Column design proven in the offshore oil and gas sector in the deeper water and hostile environments such as the northern North Sea. We believe this design to be particularly suitable for EEG's proposed areas of interest in Irish waters and a more advantageous means to access the most viable wind resources in areas such as the South Celtic Sea and off the West Coast of Ireland. AWC offers technical and environmental advantages over other conventional floating options, and benefits from the ability to construct locally, so allowing a higher Irish content. EEG is currently reviewing AWC demonstration projects for the UK and S.E. Asia.

Consultation Paper

Wind Energy Ireland's paper 'Hydrogen and Wind Energy, 'The role of green hydrogen in Ireland's energy transition' published in January 2022 sets out the potential position of green hydrogen in the Irish context, and highlights the need, both for early demonstration projects and for the inclusion of such projects pre-2030 i.e. in Phase II. Ireland's planning process, which we acknowledged is being revised to allow An Bord Pleanála to provide the development consents also in Irish waters is known for the risk of delays, both due to the significant level of detail that is required to be submitted and committed at application stage, as well as the material risk of being held up in the court system due to judicial reviews of the decisions.

EEG is of the view that the inclusion of projects which promote the use of floating wind energy generation and green hydrogen production in the Offshore Wind Phase II is critical for the following reasons:

- The dramatic pace of change required to effect a meaningful energy transition (Ireland cannot wait).
- The critical role of hydrogen in effecting that transition.
- The limitations of the existing national electricity grid and the importance of facilitating projects that can support that system either directly or indirectly.
- The geography and wind resources of Ireland mean floating wind and green hydrogen will be vital for the future offshore build-out and realisation of any meaningful energy transition.
- The current rapid pace of development and early deployment of floating wind technologies and green hydrogen generation/distribution projects in other markets.
- The opportunity Ireland has to gain a strong foot hold in the rapidly emerging global green hydrogen market (largely as a result of its favourable wind resources and geographical location).
- The ability of green hydrogen to be incorporated into the Irish gas network to facilitate industrial and domestic heat transition (GNI Vision 2050). A key domestic opportunity is hydrogen injection into existing natural gas pipelines where a blend of up to 20% is considered technically achievable (WEI, 2022). Meeting this demand in Ireland would require c. 4.2 GW of wind energy generation dedicated to the production of green hydrogen (WEI, 2022). Whilst long term it is projected that natural gas demand will fall due to increased electrification, pipeline injection represents a unique opportunity to rapidly stimulate a domestic hydrogen market.
- The need for early projects to develop an Irish supply chain to support future Irish floating and green hydrogen projects and global opportunities.
- Countries all around the world are trying to transition which means competition for industrial facilities and expertise will be in short supply. This is likely to be exacerbated in the current volatile energy market where short to medium

security of supply is a significant concern. Ireland needs to be an early adopter or it will risk losing out to global competition.

Directly Relevant Questions from the Consultation Paper:

11. Should any special allowances for innovation technologies be included in the Phase Two process? Yes.

1. What technologies should be provided with special allowances and why?

   Floating Wind and Green Hydrogen should be included:

   - The nature of Ireland's EEZ means that to develop enough offshore wind to drive the Net Zero energy transition to which Ireland is committed means floating technology or alternative deep-water solutions are required to ensure security of supply of energy in the medium to long term. Early floating wind projects are essential in the 2020-ies to establish the supply chain and expertise to ensure further rapid deployment through the 2030-ies.
   - We believe that green hydrogen will be essential for the decarbonisation of the heat, agricultural and transport sectors. The majority of the energy to drive the production of green hydrogen will come from offshore wind, so it is essential to encourage early projects (pre-2030) that have the ability to combine offshore electricity generation and hydrogen production.

2. What allowances should be made? At what stage(s) of the Phase Two process? Should capacity be reserved in the MAC and ORESS processes for any of these technologies?

   Yes, capacity must be reserved in the MAC process with an acknowledgement that the process will need to consider offtake arrangements that will differ from the conventional ORESS type process or typical CPPA. There should also be consideration of ringfencing some ORESS support for these technologies so that they are not competing directly with conventional fixed offshore wind.

   The Phase II process must consider the fact that some of these projects may not require any electrical grid connection. The consenting process must also take account of the primary and ancillary infrastructure that will be required to enable offshore green hydrogen production for example, and ensure that associated infrastructure such as platforms and pipelines can also be consented within the framework.

   The Phase II process must recognise that developers of Innovation projects are taking a higher degree of risk and therefore should not be expected to commit to the same level of early-stage financial commitment as conventional fixed offshore wind.

3. Should these types of projects also be required to deliver by 2030?

   Yes. Our expectation is that both the market and the necessary technology to enable commercially viable large-scale floating wind and green hydrogen production will be established before 2030. However, given the difference in risk profile between conventional fixed offshore wind and the Innovation projects, we recommend that Innovation Projects would require a higher degree of flexibility around delivery deadlines.

   However, the consultation paper states that: - To incentivise swift deployment, discourage speculative hoarding of the marine space, discourage MAC applications by projects incapable of delivering by 2030, and facilitate the coherent transition to a plan-led Enduring Regime, *it is proposed that all MACs awarded in Phase One and Phase Two will expire prior to the Enduring Regime, should the holders of these consents be unsuccessful in securing a route to market.* Although the outlined MAC licence award process itself appears clear, there is a significant risk that complex projects could be delayed in the planning system. Therefore, this proposed mechanism of expiration beyond Phase II appears to add to the risk of participation, and it would be advantageous if a less blunt instrument could be applied to prevent speculative hoarding of the marine space.

4. What level of offshore wind capacity could be deployed before and after 2030 that does not depend on the Irish grid for offtake? i.e. generation that is instead utilised for non-grid offtakes such as green fuel generation or export by cable to another jurisdiction?

We believe that 1 – 2 GW of projects could be built for non-grid offtakes before 2030. This means projects that do not need grid connection either to Ireland or another jurisdiction. These are projects that can operate in Island-mode with a connection directly to a hydrogen production platform either offshore or onshore. The potential beyond 2030 is very significant given the excellent wind resources offshore Ireland and its geographic position to fulfil domestic requirements and service the International Hydrogen market.

We trust that these comments will be considered during the review and the Phase II process allow these innovative green hydrogen projects to proceed alongside those dedicated to providing power only to the grid.

Yours sincerely,