UCD Energy Institute response to the Department of the Environment, Climate and Communications - Offshore Wind – Phase Two Consultation

09 March 2022

The UCD Energy Institute welcomes the opportunity to respond to the Department **of the Environment, Climate and Communications - Offshore Wind – Phase Two Consultation**. The UCD Energy Institute is Ireland's leading research institute focussed on decarbonisation of Ireland's energy systems. This has expanded from a focus on electricity system research to recognise the increasing need for integration of energy systems as we move to higher levels of renewables. The NexSys Programme (a Science Foundation Ireland funded research programme and flagship project of the Energy Institute) is focussed on the integration of energy systems and defining pathways to a Net Zero Carbon Energy system. This programme includes researchers from a range of disciplines across 9 research institutions across the Island in partnership with the leading players in the energy industry.

In respect of this consultation the UCD Energy Institute would like to offer a response on two of the listed questions closely related to our expertise and fields of research.

10. Hybrid grid connections are defined in this paper as single grid connections which facilitate the connection of both an existing or proposed thermal generation plant and a proposed offshore wind project.

a. Do you support the facilitation of such connections, as defined? Why?

The UCD Energy Institute would support the facilitation of hybrid grid connections. The principles of maximising the utilisation of grid assets at its core provides an efficiency gain and benefit for society. If planned and operated appropriately they can achieve the benefit of lower connection costs and better use of grid assets. Given the imperative to deliver on Ireland's Climate Action targets they may also serve to accelerate progress. The extent to which each hybrid grid connection could accelerate renewable integration and enhanced security of supply could be considered as a criteria in their assessment. As outlined in the consultation document it will be important to prioritise renewable generation at such connections.

c. Are there potentially unintended consequences associated with permitting hybrid grid connections, such as potential impact on grid system services provided by the associated thermal plant or potential impacts on the reliability of the thermal plant?

As with almost all grid connection issues there is often a locational aspect to grid connection and each hybrid connection will require consideration by the System Operator and/or CRU to determine the efficiency gain and societal benefit will accrue in each case. Such consideration can form part of the standard grid planning process, but should be defined as an early step in any assessment process for hybrid grid connections.

Delivering on Ireland's climate ambition requires maximising the integration of renewable energy onto the electricity grid. This includes efficient use of grid infrastructure, prioritising renewable generation and an effective market for system services. The interaction between system services and the integration of renewable generation needs more detailed analysis to determine the appropriate ruleset to apply.

As with almost all grid connection issues there is often a locational aspect. While a general policy is needed it is unlikely that a "one size fits all" approach will be adequate to deal with all the complexities and circumstances that may arise with hybrid connections. For example, some thermal plant, notably combined cycle gas turbines, can have relatively high minimum generation levels, which may mean, for some locations with limited export capacity, that the thermal plant can only be online for moderate (rather than high) levels of offshore wind output (assuming no dispatch down). If some of these thermal plants also contribute to various "must run" constraints, notably in the Dublin region, there may be a need to dispatch down offshore wind to facilitate certain plant to be placed online.

d. How should proposed projects with hybrid connections be treated so as not to distort competition or afford undue competitive advantage to the incumbent owners and operators of the associated thermal generators?

As outlined in the consultation document, the auction process must be a level-playing field for all auction participants. One question raised is whether hybrid connection points should be competed for openly by all potential users. While this would help to create a more level playing field, which is necessary under state aid clearance, there are significant complexities associated with this which would need to be addressed.

Hybrid grid connections can ensure more efficient use of grid capacity, however how this capacity is allocated will have implications for the business case for each part of the hybrid connection.

Careful consideration of the post connection operational regime of each of the connected resources ensuring that renewables are prioritised and that each resource is provided with a viable and adequate connection availability into the grid. A hybrid connection may impact on a range of revenue streams and contractual obligations for the connecting resources and the existing plant (where applicable), e.g. market revenues, capacity payments and system services obligations. A ruleset on the availability/capacity allocation of each connecting resource would need to be defined. Clarity on each of these items would be important for each connecting resource but also to help clarify any questions arising about the potential for undue competitive advantage.

e. Do you support the facilitation of such connections, if the definition was adjusted to, e.g. an existing or proposed onshore battery, solar or other generator?

Yes, we would support this broadened definition. The principle of maximising the utilisation of grid assets should extend to all renewables, generators or storage technologies that may wish to connect to the grid.

11. Should any special allowances for **innovation technologies** be included in the Phase Two process? a. What technologies should be provided with special allowances and why?

The UCD Energy Institute believes that innovation technologies at a relatively early stage of development should be included in the Phase two process. There are several technology options in development, e.g. grid-forming converter technologies are developing rapidly, so we would recommend either a long list or a broad definition to allow inclusion of technologies not yet foreseen to play a significant role and to guard against backing technologies that may not mature as quickly as planned/expected. The pace of technology development is accelerating, in general, but it is very difficult to accurately predict the development curve of any technology.

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

We support that allowances should be made for innovation technologies to be included in the Phase Two process. However, we do not believe that these types of projects should be required to deliver by 2030. The Climate Action Plan is built around known and relatively mature technologies which will need to connect by 2030. The inclusion of innovation technologies/projects should be structured in a way that enables Ireland to capitalise on emerging technologies as they develop into fully fledged technology/resource options of scale, and which will contribute to future energy targets.

d. 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?

There is significant offshore wind capacity that could be deployed that does not depend on the Irish grid for offtake. Options such as the production of Green Hydrogen and increased interconnection can provide significant opportunities for Ireland to become a net exporter of clean energy. A longer term strategy identifying the opportunities for Ireland should be developed. This needs to be done in parallel with developing our offshore wind resources to meet our 2030 targets.