Future Offshore Policy Framework Consultation

Net Zero Energy Response

19th February 2024

Introduction

Net Zero Energy (NZE) is a renewables and storage company operating in Ireland. The team consists of energy industry professionals who have a proven track record in building successful renewable energy companies and delivering some of the most complex renewable energy and storage projects in Ireland over the past two decades. We are now focussed on high-impact projects that will enable Ireland to meet not only it's 80% RES-E target for 2030 but will also accelerate the country towards a net zero energy system in advance of our current 2050 target (as set out in the National Development Plan 2021-2030).

If all goes according to the Climate Action Plan, in 2030 our electricity sector will be 80% RES-E with 7GW of offshore deployed and producing 3MtCO_2/year. In our view, this is not a good power system, it does not represent success, and it is not a great place to be starting out on a journey to full decarbonisation. Dig a little deeper and it is clear that the increased ambition of going from RES-E 70% to RES-E 80% was achieved by adding disproportionately large volumes of additional wind and solar, and then discarding the inevitable surplus. This does get us to the 80% figure, but it is a brute force approach. Our own modelling and estimates shared by EirGrid put the resulting wastage of renewables in the 20-35% range (or higher if you count surplus exported on interconnectors). Apart from the direct cost, the difficulty in forecasting this figure also drives up the cost of capital for renewables. The obvious solution would be to store this valuable renewable electricity and utilise it again when the wind isn't blowing and the sun isn't shining. This would bring the power system to full 100% decarbonisation, without actually building any more wind and solar or network than what is already planned for 2030/RES-E 80%. Fully decarbonised electricity is a magnificent building block for electrifying heat, transport and industry. It offers protection against energy crises such as that caused by the sudden loss of Russian gas last year. If sufficient electricity storage could be delivered in the period 2028 to 2035, and scaled thereafter with demand growth, the accelerated CO_2 savings achieved could buy headroom to allow solutions to be developed for the parts of the carbon economy that are proving harder to abate.

Response

This consultation paper initially seems to recognise the importance of grid build-out to the success of offshore wind in Ireland:

> "*Given the targeted increase in offshore capacity, Ireland's electricity grid must be strengthened leading up to 2040*."

But then it goes on to make a leap to the solution of private wires and bootstrapping but makes no reference to the role that Long Duration Energy Storage (LDES) can play to address this 'vast' need.

> *"To meet the vast demand for grid build-out, we anticipate a role for private wire development and bootstrapping connections*."

And later in Section 2.2 we read:

> *"Grid infrastructure is crucial to capturing as much energy in Ireland as possible. Grid capacity should not be a limiting factor leading up to 2040, as ORE targeted delivery has been established according to the Ten-Year Network Development Plan (TYNDP) and will therefore provide a roadmap for strategic development."*

We would like to understand the basis for this assessment since it is completely contrary to our analysis. EirGrid's recent LDES Call for Evidence[1] tells us that Shaping our Electricity Future (SOEF) 1.1 modelling forecasts the dispatch down of renewable energy in the 2030 system without LDES will be c. 35%. So, even if we succeed in building the renewable energy projects to hit our 80% RES-E targets, we will be throwing away c.35% of the energy they produce. And it is worth noting that even this result is based on the assumption that 2 new 700MW interconnectors are built by 2030- one to GB and 1 to France- we view this as highly optimistic. Recent EirGrid ECP2.3 constraint reports[2] indicate that the level of Dispatch Down will vary between 30% and 78% across the country in 2028 in the absence of these new interconnectors. Therefore, we simply do not see any basis for the statement that "*grid will not be a limiting factor*"- this is not the case today- and we certainly do not expect it to be the case in 2030 when we have 24GW of renewable energy connected to our grid. There has never been a shortage of land, sea or wind in Ireland. The limiting factor always has been, and always will be grid, even more so given the enormous offshore ambition. If the issue of connecting the offshore wind to the grid and matching it to demand is not resolved, much of the rest of the aspiration in the Offshore Policy Framework becomes moot.

This NZE response seeks to draw attention to what we see as the major gap in this consultation- that it does not acknowledge the very significant risk grid capacity presents to the success of offshore in Ireland and that it fails to recognise the significant role LDES can play in mitigating that risk.

Responses

1(a). Has this section adequately identified the general key priorities for ORE delivery in Ireland? Are there additional priorities that should be integrated into the holistic, plan-led approach?

We note that there is reference to grid build-out in this section, but grid capacity will be a critical priority for the delivery of Ireland's offshore wind energy ambitions. The consultation fails to recognise the very real constraint grid capacity is already placing and will continue to place on offshore wind

[1] https://www.eirgrid.ie/site-files/library/EirGrid/LDES-Call-for-Evidence-EirGrid.pdf
[2] https://www.eirgrid.ie/industry/customer-information/ecp-constraint-forecast-reports

development. In the South Coast DMAP area currently undergoing consultation, the auction volume will be dictated by the available grid capacity- there is no other reason to restrict the area to 900MW- this is down to the physical constraint on the local grid network. Grid is already a limiting factor to our offshore wind build-out.

We believe that long duration energy storage is a key mitigation for grid constraints and a key enabler to the delivery of both 2030 and post-2030 targets. It should be included in any offshore delivery pathway as a critical priority.

Section 1.2 on Pathway to Success lists 8 important factors in the success of offshore but fails to list grid or storage which is a huge gap, in our view.

It must be acknowledged that new grid build-out is time-consuming, complex, risky and costly. It makes little sense to allow grid connections for offshore wind projects that result in 50% Dispatch Down- a very real prospect given the most recent ECP-2.3 constraint reports from EirGrid. Given this reality, the most pragmatic approach to grid allocation is to limit access in constrained areas until the constraint has been eased by creating new capacity. We note that there is precedent for this plan-led approach in what has been done for ORESS-2 and we support this approach.

There are then 2 ways to release further capacity in a constrained region:

- **LDES**-EirGrid procures LDES in the region which creates additional capacity.
- **New Grid-** EirGrid progresses a grid upgrade or builds new grid infrastructure in the region.

Our response to the recent CRU connection policy consultation provides further detail on this proposal. We recommend adding 'Grid Capacity and LDES' as an item to the factors listed in the 'Pathway to Success' to assure these 2 interlinked topics are adequately tracked and managed.

It's easy to forget that when people say that "the grid is full" in a wind constrained part of the network, the grid is underutilised whenever it is less windy. NZE has modelled network constraints in Donegal using hourly wind, solar, load and summer/winter network, per the table below:

Scenario	Wind (MW)	Storage (MW)	Constraint	Network Utilisation
0. Baseline	602	0	6%	47%
1. EirGrid 2030 est	891	0	21%	59%
2. Short duration	980	400MW x 4hr	21%	65%
3. Long Duration	1650	400MW x 100hr	21%	83%

These results show how poor short-medium duration storage (4hr) is in alleviating wind constraints. LDES is much more effective. The results above were for Donegal but would be very similar for any typical 220kV node where offshore wind is connecting. The capacity of the network is increased 2x to 3x. LDES projects can be delivered in similar timeframes to offshore wind. New 220kV circuits cannot.

1(b). Has each key priority been adequately described and considered all relevant components?

See response to 1(a)

1(c). How best should the 2GW of non-grid limited offshore wind capacity be procured?

Cautiously. The hydrogen strategy is clear that electrification is preferable for heating and industry where possible. Ireland has no chemicals or fertiliser industry to absorb large volumes of green hydrogen and is unlikely to be able to achieve the scale these industries require to be competitive from a standing start. That leaves export. We would question the value of investing scarce policymaking and regulatory resources in supporting export until Ireland has achieved the decarbonisation of its own energy system. It is not clear to us that floating Irish offshore wind will ever be able to compete with Namibian or Chilean wind/solar. It is however clear that the price paid for such wind must be set by the price that can be achieved internationally, and an Irish levy (and certainly no subsidy) should apply.

1(d). What are your views on the design parameters for the successor scheme to ORESS, what else should/should not be considered?

We are glad to see that Section 1.2.1.3 on Route-to-Market sets out the key dependency on grid- or more specifically curtailment, although we think it should more correctly take account of all dispatch down- in the ORESS design parameters.

"Design parameters for this new scheme are broad, but at a minimum the development phase, to take place in 2024, will consider:

- *accounting for the very high levels (80%+) of variable renewable electricity on the Irish system from the mid-2030s, including by considering variable support levels depending on time of generation or the level of curtailment on the Irish electricity system at a given interval;"*

As stated previously, it makes little sense to allow grid connections for renewable projects that result in 50% dispatch down - a very real prospect given the most recent ECP-2.3 constraint reports from EirGrid.

We think that an additional parameter needs to be added here which looks at the committed deployment of LDES in parallel with each future round of ORESS. Since varying LDES technologies may have around 3 years construction once they receive planning permission and a route-to-market, and this period is roughly equivalent for an offshore wind project, then it should be possible to align grid access in a region to LDES deployment and to ORESS auctions.

Since we are already in a plan-led approach then we should fully align the three streams of LDES, grid and ORESS such that:

- **LDES**- EirGrid procures LDES (with locational signals in constrained regions of the grid) in a region and this creates additional capacity- once this project has achieved planning, grid connection and an LDES contract award it should be baked into the next ORESS auction capacity.
- **Grid**- EirGrid may (in some cases supported by LDES deployment) progress a grid upgrade or build new grid infrastructure in the region- once the project has progressed through EirGrid's 6-step Framework for Grid Development and achieved planning permission and land rights then it should be baked into the next ORESS auction capacity.
- **ORESS**- ORESS looks at a range of parameters like volumes required to meet targets, DMAPs etc. but also looks at grid capacity in regions to determine the capacity to be auctioned in a given round.

We are not convinced of the importance of a parameter aligning ORESS to capacity or system service auctions:

"integration with other electricity market interventions such as capacity auctions and procurement of system services"

We see little impact on ORESS bid prices from either of these revenue streams:

- The capacity market must ultimately build fully dispatchable plant to cover the periods of low RES-E and that includes offshore. Any energy limited (storage) or non-dispatchable plant (wind) must have its capacity value trend to zero.
- In terms of system services, we see that these will be full provided by already-deployed or soon-to-be-deployed zero-carbon technologies like batteries and synchronous compensators.

There is little point in attempting to align these markets for what we see a minimal benefit.

1(e). What frameworks and/or supports are required for alternate routes to market such as CPPAs, Power-to-X projects, interconnector-hybrid projects and export projects?

See separate, confidential response on this question.

1(f). What additional capacities and responsibilities should be held by industry in the context of the plan-led approach?

As highlighted previously, we see the main gap in this strategy to be the lack of recognition of the importance of LDES to offshore. For offshore wind to be a success in Ireland, it requires a thriving LDES development industry to deliver LDES in parallel with offshore wind. This will further require the provision of a clear, transparent and reliable route-to-market framework by EirGrid but work on this framework must begin without delay.

1(g). How can Government facilitate a more comprehensive and streamlined engagement process with developers to ensure national ORE targets are delivered?

No comment

2(a). What grid infrastructure should be of particular focus in facilitating the build-out of capacity to support ORE generation targets?

Deploying LDES of sufficient duration at the right location, in the volume required and in a timeframe that runs in parallel with offshore build-out is the only way to avoid unacceptable levels of Dispatch Down of our offshore wind and the associated costs to consumers.

2(b). In relation to National Security/Department of Defence interaction with ORE development, are there any issues you would like to highlight?

No comment

4(a). What structures, measures, and interventions can the State and State agencies implement to assist in the development of a long-term, sustainable skills and workforce pipeline? Provide any recommendations on what the State can do to promote careers in ORE across a range of educational backgrounds and movement from other relevant sectors.

No comment

4(b). Are you aware of initiatives in other jurisdictions or at a European level that would be relevant to Ireland's ambition of building a sustainable skills and workforce pipeline for offshore wind?

No comment

4(c). To what extent should an emphasis be placed on multipurpose sites for ORE delivery, including the colocation of devices? What Government structures should be developed to encourage and facilitate progress in this aspect?

See our response to Q 1(e)

4(d). How can Government ensure policy is kept in line with evolving technological innovation and developments in ORE devices? What structures and government procedures should be implemented to future-proof the ORE planning process and account for technological shifts?

No comment

Conclusion

Grid capacity and the ability to match offshore wind output with demand are very real limiting factors to the deployment of renewable energy in Ireland today and will certainly constraints in the future as Ireland seeks to build our offshore ambitions. It needs to be acknowledged as such and then tracked and managed as part of this framework. LDES provides a key mitigation. It therefore makes sense to align the offshore framework with the LDES procurement framework to ensure Ireland sees maximum benefit from these technologies in the future.

For offshore to be successful, and to enable the Irish consumer to see the true value of 100% decarbonisation and energy independence, the policy and procurement effort around LDES needs to be put on a equal footing with that currently seen by offshore wind.

- End -