

Ørsted IE

Irish Electricity Interconnection Policy Consultation

September 2022



Irish Electricity Interconnection Policy Consultation

We thank the Department of Environment, Climate and Communications for consulting on the critical topic of electrical interconnectors, a huge potential enabler or inhibiting barrier to the future development of large scale onshore and offshore renewable energy in Ireland.

Ørsted in Ireland

In Ireland, Ørsted employs over 90 people and holds 360 MW portfolio of onshore wind farms complemented by an active development pipeline including wind, solar and storage. Our ambition is for our Irish operations to significantly grow our asset base across wind, solar and storage in the coming decade to play a significant role in delivering Orsted's goal of 50MW by 2030.

Ørsted is also one of the largest suppliers of electricity to the Irish Industrial & Commercial (I&C) sector as a result of the extensive range of corporate PPAs we have signed to bring innovative solutions to help our customers decarbonise their businesses further. In addition, our power market team trades over 2 TWh of power in the Irish market.

In terms of offshore, which is of significant relevance to the delivery of interconnection in an Irish context, Ørsted is the largest owner and operator of offshore wind in the world. We built our first offshore wind farm Vindeby in Denmark in 1991 and now have over 1,500 offshore wind turbines accounting for over 7 GW of operational offshore assets worldwide, with 2 GW+ in construction and a further 7 GW+ in development. CfD was secured for the worlds single biggest offshore wind project, Hornsea 3 this July and the project will power 3.2 million homes in the UK. We have over 7,000 employees, 3,000 of which are solely dedicated to offshore wind farms, and we operate in over 15 different global markets. We have developed assets in both mature and fledgling markets. The distinction of our maturity in the market is important, especially in the Irish context, and it gives us a unique insight on the lead in times for large scale offshore wind programmes.

Our overall vision is to create a world that runs entirely on green energy and we commend the increased Government targets whereby the percentage of renewables in the electricity sector has been increased from 70% to 80% by 2030 in the most recent Climate Action Plan.

Introduction

We note that the consultation is consistent with multiple strands or Irish, EU and UK policy. Nationally it supports two objectives of the Climate Action Plan to ensure the delivery of three new transmission grid connections or interconnectors to Northern Ireland, Great Britain, and the EU and to explore further interconnection, including hybrid interconnectors (combined cross border transmission network with offshore renewable generation), to other countries. We also note the concurrent consultation on Shaping Our Electricity Future and on developing a hydrogen strategy for Ireland, which is another potential route to market for renewable electricity generation assets.¹

Finally, we note the strength of Interconnector Policy 1 in the National Marine Planning Framework which states:

¹ gov.ie - Climate Action Plan 2021 (www.gov.ie)



Subject to the appropriate environmental assessments, electricity transmission proposals that maintain or improve the security and diversity of Ireland's energy supply should be supported, including interconnectors, relevant EU Projects of Common Interest (PCIs), and projects in receipt of relevant alternative EU priority energy infrastructure classification provided for by the EU TEN-E regulations. This should include development of the offshore transmission system and connection with the onshore transmission system necessary to meet the Government's target of 5 GW of offshore renewables by 2030, as well as development of associated transmission system / interconnector infrastructure for hybrid offshore projects, connecting offshore renewable energy installations with Ireland and one or more other electricity transmission systems.²

Investment in interconnection must be complemented by a substantial upgrade of investment in national grid infrastructure beyond that committed to in the current iteration of Shaping Our Energy Future. If not, issues such as connection, curtailment, and constraint will continue to challenge the viability and pace of delivery.

Ireland can become a world leader in the percentage of renewables on the electricity grid with the ambition of 80% renewables by 2030. However, given the natural endowments of leading wind speeds, expansive maritime area, a temperate climate supportive of solar, and an agriculture base conducive to supporting technologies such as anaerobic digestion, 2030 targets cannot be the endpoint for the economic, environmental and social benefits that are primed for realisation beyond 2030. Ireland is uniquely positioned to become a substantial player in the export of renewable energy. This possibility is openly supported by our dynamic and responsive industry and moves closer to becoming a probability with every proactive policy, regulatory and support step taken.

By producing more renewable energy than is required domestically Ireland can move beyond securing national energy security to being a key player in the energy security of Europe. In this post 2030 scenario, where an enduring regime gives confidence to the renewable sector in Ireland, there is strong potential for routes to market beyond domestic requirements. There will be a role for interconnection and for storage, in all its forms, from battery to green hydrogen and fuels. It must equally be noted that if route to market cannot be supported through grid infrastructure and policy enhancements, a significant disadvantage will be built into the sector that inhibits investment in and deployment of renewables.

Earlier this year, the case for interconnection was supported in a study conducted by UCD. In a conservative scenario the reports sets out that a Pan-European 'supergrid' could cut 32% from energy costs³. The results from the analysis detailed in this paper indicate that overloading the existing transmission grid to meet future demand will result in very high costs due to necessary load shedding.

It is important for the Irish Government to set out a vision beyond 2030 not only to give confidence to investors but to help establish the infrastructural requirements for national transmission, interconnection, battery storage and PtoX. With this consultation there is an opportunity to set a pathway for interconnection to ensure it does not become an inhibiting factor for renewables in Ireland.

² gov.ie - National Marine Planning Framework (www.gov.ie)

³ Pan-European 'supergrid' could cut 32% from energy costs, says new UCD study



In February 2022 the European Parliament instructed its President to forward a resolution on a European strategy for offshore renewable energy to the Commission. This resolution included the following points all of which are particularly relevant to the development of Irish interconnection policy and supports:

- The urgency of improving and expanding existing infrastructure, without prejudice to the EU's Biodiversity Strategy for 2030 and EU nature legislation, to enable the increased use of renewables-based electricity;
- Regrets that a number of Member States have not yet reached their target of 10 % electric interconnection by 2020
- Calls on the Commission and the Member States to ensure adequate infrastructure, such as transmission lines, to integrate and transport offshore electricity from ORE
- Recalls the EU 2030 electricity interconnection target of 15 % by 2030, which is set out in Article 2 of Regulation (EU) 2018/1999
- Calls for the Commission to come up with a proposal that can speed up the deployment of the interconnection target
- Considers that the Union and its Member States should develop agreements on offshore energy infrastructure with neighbouring geographical regions
- Welcomes the Commission's proposal for a revision of the TEN-E Regulation to achieve the objective of the European Green Deal and make the legislation fit for 1,5 °C
- Welcomes the attention the Green Deal gives to the ORE sector's needs and priorities
- Stresses that the development of sustainable and efficient hybrid and radial offshore wind assets for generation, interconnection and transmission requires forward-looking public and private planning and investment;
- · Believes strongly that regulatory frameworks should facilitate anticipatory investments
- Stresses the need to secure coordination and alignment between onshore and offshore grid development plans, including through the identification of landing points for offshore connections and onshore grid uptakes
- Encourages the Member States to speed up the necessary grid infrastructure to facilitate the green transition, for which electrification is crucial
- Recognises that the huge investments made, which are often implemented simultaneously,
 will require carefully and precise planning
- Strongly believes that the EU and the Member States should support research into and the development of multipurpose interconnectors (MPIs)
- Stresses the need to create a long-term framework for MPIs that can efficiently integrate the offshore and onshore markets
- Calls on the Commission to assist manufacturers of different equipment in developing a
 common standard that can ensure compatibility and interoperability among interconnectors;
 highlights that new technologies, such as MPIs, need to be designed, tested, demonstrated
 and de-risked in order to speed up market entry
- Calls for suitable framework conditions to be created in order to ensure fast development of these technologies⁴

⁴ Texts adopted - A European strategy for offshore renewable energy - Wednesday, 16 February 2022 (europa.eu)



The EU Commission, in turn, estimates that investment of nearly €800 billion will be needed between now and 2050 to meet its proposed objectives to increase Europe's offshore wind capacity from its current level of 12 GW to at least 60 GW by 2030 and to 300 GW by 2050 and aims to complement this with 40 GW of ocean energy and other emerging technologies such as floating wind.⁵

With climate change, war in the east of Europe, and the concurrent alignment of EU and Irish policy, alongside Ireland's natural endowments, the opportunity for Ireland to play a pivotal leadership role in the European deployment of renewables is entirely possible and achievable.

Overarchingly, we make the following key points:

- Gov policy should focus on a long-term horizon such as net zero or beyond and ensure the necessary infrastructure is in place to achieve our full renewables potential
- Alternative asset structures such as hybrid, meshed or multipurpose interconnection should be endorsed
- A support model such as such as cap and floor is required for projects to be built effective sharing of risk for the developer and State
- Developers should be enabled and facilitated to actively deliver interconnection and multipurpose interconnection to ensure TSO delivery capacity does not constrain Government targets and wider opportunity

Q1: To what extent would a commitment by Government on delivery of further interconnection capacity, beyond the proposed Celtic and Greenlink interconnectors, impact achievement of Ireland's 2030 and post 2030 energy objectives?

Interconnection is widely recognised in EU policy and in UK policy as essential to the transition to both a low and zero carbon future. It is unlikely that additional interconnection that is not already in advanced stages of project planning can be delivered prior to 2030, but there is significant potential beyond this date. It is essential, that policy for interconnection looks beyond 2030 to net zero and beyond.

Without adequate interconnection the issue of oversupply will become a significant barrier to renewable development. The following table illustrates the potentially stark impact of an initial 3.9GW of offshore wind on the east coast.⁶

Non-Priority Di	Non-Priority Dispatch Wind - Dispatch Down levels for offshore wind nodes from ECP 2.1 constraints reports:							
Node	New capacity	Curtailment	Constraint	Oversupply	Total			
Belcamp	500 MW	4%	4%	15%	24%			
Carrickmines	700 MW	4%	4%	14%	23%			
Poolbeg North	450 MW	4%	4%	15%	24%			
Poolbeg South	1,000 MW	4%	4%	15%	24%			

⁵ Boosting Offshore Renewable Energy (europa.eu)

⁶ https://www.eirgridgroup.com/site-files/library/EirGrid/ECP-2.1-Solar-and-Wind-Constraints-Report-Node-Results.xlsx



	Arklow	520 MW	4%	2%	16%	22%
i	Oriel	370 MW	4%	1%	15%	21%
	Cashla	392 MW	4%	5%	13%	22%

In the UK, the world leading market for offshore wind, steps are being taken to support interconnection. We note the actions of Ofgem, to put a cap a floor system in place for interconnectors in the near term, stating,

"We believe MPIs are a key piece of the decarbonisation puzzle, and we are actively tackling some of the key barriers that have so far prevented these projects from being built. Therefore, we are pleased to announce that we will launch a dedicated cap and floor pilot scheme for near term MPI projects."

Longer term enduring clarity is being actively pursued through the Offshore Transmission Network Review, which is in active development with consultation this July 2022. We note that the introduction of network competition is proposed, but also that certain strategic projects will be exempt from this. This contrasts with the open bidding associated with renewables, and serves to underline the criticality of interconnection not only to the delivery of renewable targets but to energy security as a whole.⁸

In the UK, the Offshore Transmission Network Review sets out the policy path under three subject areas:

- 1. Early opportunities –to identify and facilitate opportunities for increased coordination in the near term, with a focus on "in flight" projects
- 2. Pathway to 2030 –to drive coordination of offshore projects that are progressing through the current ScotWind and Crown Estate Leasing Round 4 and will connect before 2030
- 3. Multi-Purpose Interconnectors (MPIs) –to make tactical changes to facilitate early opportunity MPIs and develop an enduring MPI regime for 2030 onwards.

The above is supported by the Holistic Network Design (HND) which sets out the blueprint for the strategic network infrastructure necessary to deliver the ambition for 50GW of offshore wind by 2030.9 It is anticipated that the revised Shaping Our Energy Future set for consultation this year will play a similar role in ensuring that all aspects of transmission infrastructure on and offshore can facilitate the path to 2030 and beyond.

For Ireland to be competitive in the deployment of interconnectors, to facilitate both existing targets and future opportunity, a similar pathway must be set to ensure infrastructural delivery is timely and does not inhibit the development of renewables. A firm commitment must be made and must include clear pathways to delivery.

⁷ https://www.ofgem.gov.uk/sites/default/files/2021-12/ICPR%20Decision%20Paper.pdf

⁸ Offshore Transmission Network Review: Update from project partners following publication of the Holistic Network Design (publishing.service.gov.uk)

⁹ The Pathway to 2030 Holistic Network Design | National Grid ESO



Q2: In the context of Ireland's increased climate and energy ambition, should Government establish future minimum interconnection targets, with capacity to be delivered by a specific point in time? If so, what should these targets be?

As an island nation, whose nearest neighbour is another island nation now outside of the EU which also holds the accolade of the world's leading market for offshore wind, Ireland has unique potential and requirements for interconnection that differ considerably from other mainland EU member states.

The EU has set a level of 15% interconnection by 2030, however it has not set a target beyond this. The % level in Ireland by 2030 will most likely be determined by the existing assets and current pipeline of interconnector projects (Greenlink and Celtic) and their ability to reach successful completion and it is unlikely that new projects will be originated or delivered within a 2030 timeframe.

If Ireland settles for 15% and does not plan for an enduring regime and targets for interconnection beyond this, the potential to attain and surpass net zero, to attain sovereign energy independence and to become a net exporter of renewable energy will be diminished.

As the Irish sector engages development and the UK continues to build its prowess in offshore renewables and the UK EU trade agreement and NI Protocol continue in evolution and interpretation, the case for strengthening practical synergies between both markets must be made and not taken for granted. Interconnection can play both a functional role for electrons adding value for the multiple reasons elsewhere in this submission, and a symbolic and relationship orientated role for the sector.

National scenario planning and target setting for interconnection will require consideration of the whole of renewable development timelines and GW targets, which will have a bearing on the requirement for interconnection and hybrid interconnection. Generation targets today, and those to be set for net zero and beyond will guide interconnection requirements. In a supportive policy environment, there is potential for exceptional growth in renewable energy generation capacity in Ireland.

Q3: Regarding the location of future interconnection, should priority be given to developing further interconnection with GB or the EU IEM, or both?

In planning for interconnection, the dual aim of reaching full renewable potential and pre-existing 2030 targets must be balanced with the need for energy security and resilience. Geography endures as politics and systems change and it would be logical to pursue both avenues. By providing clear development and funding pathways, the market will be well placed to invest in the most workable solutions.

The EU Commission expert group on interconnectors suggests four priorities in identifying interconnection priorities which factor in connection with non-EU countries.



Firstly, a well-functioning internal market is a key condition for the efficient use of interconnectors; it holds true both for the EU and for third countries, which are already, or planned to be, interconnected with the European Union. Secondly, addressing public concerns related to perceived risks to health or intrusiveness of electricity infrastructure in the natural landscape is crucial to avoid delays. Thirdly, interconnectors are usually capital-intensive projects and in some justified cases might require public lending hand to lift a project off the ground. Lastly, elements such as national energy mix, size of the energy market and geographical location can influence the socio-economic potential of interconnectors.

Q4: What are the primary benefits associated with increased interconnector capacity? For instance, would the primary benefit relate to enhanced security of electricity supply or de-risking future renewables development?

Interconnection is essential to ensuring there is not an oversupply or undersupply of renewable energy in national grid systems building dynamism in transmission to a regional level. They are an essential tool in making markets efficient, connecting high price to low price zones and helping the right technology to be built in the right areas. Overall they are part of the multi-technology composite solution required to reach net zero at national level and to reach beyond this to net export of renewables. In addressing oversupply, it helps ensure that renewable generation assets are not constrained by local/national grid capacity, resulting in better efficiency and value for money.

Efficiency in infrastructure development cost and O&M for offshore wind projects can also be attained by using hybrid models that avoid for example the duplication of landfall points from multiple projects. An offshore shared grid can bypass landing point constraints and enable more transparent and efficient connection process.

In a country such as Ireland, with demand limits far below generation potential, it creates the opportunity to be a net exporter of renewable energy. At a European level, Ireland can play a role in energy security and in reducing reliance on fossil fuels which are damaging from a climate and geopolitical perspective.

Q5: Is the existing legislative framework contained in the 1999 Act appropriate to secure future development of interconnector capacity?

A clear and facilitative policy for interconnection should be set forth for the period from now to 2030 and for an enduring regime beyond this, and the suitability of legislation reviewed in line with agreed policy. In particular, it must support multi-purpose interconnection and encourage innovation in private sector routes to market and operation.

Q6: What amendments if any are required?

See above.



Q7: To what extent will the development of future interconnection between Ireland and GB be impacted by the removal of GB from European Market Coupling?

We note that following Brexit, in relation to energy, the mechanisms and decision-making structures established to support energy market stability have been pragmatic at every stage relative to circumstance. We also note that they continue to evolve at devolved level in Northern Ireland and in significant steps such as the ongoing REMA consultation.

The Q&A on the EU-UK Trade Agreement published by the EU states that the multi-region loose volume coupling model is "different from and less efficient than" the market coupling used within the EU, but should still allow for maximisation of the mutual benefits of trade of electricity over interconnectors within the constraints of trading with a third country. In terms of efficiency, all actors must work to ensure the ultimate outcome will not fall too far short of the arrangements that applied before Brexit.

The EU-UK Trade and Cooperation Agreement encouragingly includes:

- provisions guaranteeing non-discriminatory access to energy transport infrastructure and a
 predictable and efficient use of electricity and gas interconnectors. These should allow
 energy providers to trade efficiently and competitively across the Channel.
- a new framework for cooperation between EU and UK Transmission System Operators (TSOs) and energy regulators (given that the UK will no longer participate, inter alia, in the European Network of Transmission System Operators for Electricity and Gas)
- provisions regulating subsidies to the energy sector to ensure they will not be used to distort competition
- provisions committing the Parties to ensuring the security of supply, particularly relevant for Ireland, which will remain isolated from the EU internal energy market until new interconnections become operational.
- a prohibition on export restrictions (including export monopolies and export licences) and on dual pricing of energy goods.¹⁰

With industry consultation, at each step of a process led approach, there is scope for viability of interconnection in an evolving market trading scenario.

Q8: To what extent will clarity over the future energy relationship between the EU and UK be necessary in order to provide for future interconnection between Ireland and GB?

The 2019 EU Commission Expert Group report on Interconnection states that interconnectors with countries that share a high level of regulatory convergence and have reliable and well-grounded political, technical and environmental cooperation with the EU should be particularly prioritised and promoted by the European Union and the concerned neighbouring countries.¹¹

¹⁰ Questions & Answers: EU-UK Trade and Cooperation Agreement (europa.eu)

¹¹ Electricity interconnections with neighbouring countries - Publications Office of the EU (europa.eu)



That said, detail, clarity and stability is always required to enhance investor confidence and the interconnection policy should seek to strengthen the Irish Government position in support of continued functional interconnection with GB and seek to collaborate and ensure reciprocal policy in GB. If Government policy on interconnection is clear, other Governments, developers and market actors will be empowered to find workable solutions and opportunities.

It must also be noted that Ofgem have already approved almost 16GW of interconnector between the UK and EU member states which serves to highlight the requirement for interconnection outside of an exclusively Irish context.¹²

Q9: Are the technical criteria employed by the CRU in assessing interconnector development applications appropriate?

It is important that the contribution of the interconnector as regards national and international climate targets is given appropriate weighting in decision making and that these targets align to net zero and beyond. The CRU should recognise the significant role the private sector can and must play in delivery.

Q10: What of the 3 regulatory models offers the most viable route for development of future interconnection between Ireland and neighbouring countries?

Merchant – the interconnector bears the entirety of the risk of investment with the entirety of revenue for the project coming from its congestion revenues.

Fully regulated – investment costs are recovered through network tariffs. The consumer bears the full cost of investment and receives all the revenues from the sale of interconnection capacity.

Cap and floor – interconnectors are partly regulated in this instance. Projects with this regulatory treatment have sales revenues that fall below the floor topped up by network tariffs while its sales revenues above the cap are returned to the consumer.

It is possible that more than one model should be supported to ensure interconnection can deliver and innovate. It must be noted however, that the cap and floor model has been successful in providing market confidence to the offshore renewable sector in GB to the extent that through the provision of continuity in auctions the mechanism has played a role in the UK becoming world leader in the deployment of offshore renewable energy. This option provides investors with confidence, as their minimum revenue is guaranteed.

The ongoing BEIS Review of Electricity Market Arrangements consultation in the UK notes that this kind of guarantee has been sufficient to unlock 10.9GW of interconnectors since 2013.¹³ This experience provides a strong and relevant case study in the consideration of the most appropriate

¹² UK Hybrid Project Forum (publishing.service.gov.uk)

¹³ Review of Electricity Market Arrangements (publishing service gov.uk)



model. We also note the Project of Common Interest mechanism which is providing confidence in the delivery of the Celtic Interconnector.

To deliver at the scale and pace required to reach net zero and push beyond to net energy export, the private sector must be enabled from a delivery and operational perspective.

Q11: To what extent can dual purpose hybrid interconnectors contribute to Ireland's post 2030 climate and energy objectives?

It would be advisable for Irish policy direction to facilitate Multi-Purpose Interconnectors (MPIs) as they will undoubtedly be part of the enduring regime for offshore wind, offering efficiencies on cost, and reducing the number of landfall points and onshore cable routes, which will undoubtedly increase in the early phases of the Irish offshore sector mobilisation.

The UK Offshore Transmission Network Review includes MPIs as the focal point for step 3 again signalling the criticality of MPI's to the delivery of renewables at the scale required to meet our 2050 targets. There is also strong support for MPI's in the EU Strategy for offshore Renewable Energy which states:

Offshore hybrid projects bring together offshore energy generation and transmission in a cross-border setting, yielding significant savings in terms of costs and space use compared to the current approach relying on radial connections and separately develop cross-border electricity interconnectors for trade, without connecting offshore generation. Hybrid projects will form an intermediate step between smaller-scale national projects and a fully meshed, offshore energy system and grid. In this context, the interoperability of the various national off-shore systems is necessary.¹⁴

It is clear that MPI's will play a significant role in the viability of the ongoing development of the offshore Irish sector post 2030.

Q12: What is the appropriate policy and regulatory framework to provide for development and operation of dual-purpose hybrid interconnectors?

In the UK, the cap and floor regime has awarded cap and floor regime in principal to 10.9GW of interconnection since 2013, and it is expected that the continuation of this regime will deliver on the 18GW total set forth in Government policy.

Ofgem note that "the hybrid design of the regime provides a balance between market-based commercial incentives and a regulated regime, ensuring projects can move forward whilst minimising risk to consumers and maximising incentives on developers. We also recognise the importance of regulatory certainty and continuity where appropriate and therefore consider that retaining the cap and floor regime supports the deliverability of future capacity." ¹⁵

¹⁴ offshore renewable energy strategy.pdf (europa.eu)

¹⁵ Interconnector Policy Review: Decision (ofgem.gov.uk)



In the interest of providing investor confidence, retaining alignment with Ireland's nearest neighbour, likelihood of regulatory and political support and industry support, an appropriate Irish adaptation of this approach would be advisable.

It is essential that the system is dynamic and can promote and facilitate private sector development of interconnection models, alongside the TSO as the only way to leverage the capital and resource required to ensure the sector is not constrained.

The bodies, legislation and decision making structures and processes being put in place to facilitate the roll out of offshore wind can be used to facilitate interconnection. An industry working group should be set up with Government to work through this process, as a single consultation

Q13: What if any amendments to national legislation may be necessary to provide for the above? Should hybrid interconnectors be considered as new electricity market infrastructure, separate from conventional point to point interconnectors?

It is important that forthcoming policy and legislation is progressive and supports innovative ideas and market solutions delivering on multipurpose interconnection.

We use the example of the North Sea Energy Island (in which Ørsted is a partner) as an example of the level of innovation currently being pioneered in multipurpose interconnection. Denmark will build an energy island in the North Sea to link the surrounding offshore wind farms and countries in a network. This island will become an epicentre for renewable energy and the development of new green technologies. Climate change requires new and ambitious solutions – like the world's first artificial energy island, which will soon be established in the North Sea, approximately 100km off the coast of Denmark. Surrounded by 10 offshore wind farms, the energy island will use the strong North Sea winds to collect and distribute huge amounts of green energy to Denmark, and into Europe. The energy island will play a key role in helping Europe phase out fossil fuels, accelerating the green transformation. The first phase will involve the connection of 3 GW of wind power from wind farms. This is subsequently expected to be extended to a capacity of 10 GW of wind power, equal to the power consumption of approximately 10 million households.

For future offshore wind project an approach such as this can considerably de-risk the investment associated with transmission, reducing cost of capital and delivery, and avoiding long term issues such as multiple landfall points and the sector develops and grows. In short the development of policy and legislation must look to the future, and not just to long established models.

Q14: What are the principal barriers in existing EU electricity market rules, most notably the Electricity Market Directive and Electricity Market Regulation, to development and operation of hybrid interconnectors?



The market structures and adequate regulatory models for meshed or hybrid solutions, and even simple hybrids require new models are being developed and accelerated in response to climate change and the acute energy security issues posed because of Russia's invasion of Ukraine.

It is important that at EU level, the role of the private sector in the delivery of all forms of interconnection is both recognised and supported, to ensure the required innovation, pace of delivery and significant resource is mobilised in pursuit of greater renewable led energy resilience.