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BEIS and Ofgem have recently released a joint paper requesting stakeholder views on how offshore network development could be coordinated, including the interaction between interconnectors and offshore wind transmission infrastructure. The paper makes the observation that offshore wind projects to date have been connected into the GB transmission network by individual project specific connections. This may not be the optimal solution for the connection of future offshore wind projects, particularly given the potential for multi-purpose offshore transmission. This Trident Economics note discusses the challenges in coordinating offshore transmission, interconnection and generation and proposes a potential route forward that addresses this issue as well as other issues within the GB electricity market arrangements.

### The Coordination Challenge

Offshore wind projects are facilitated through contracts for differences (CfDs) that are allocated in periodic allocation rounds scheduled and sized according to the budget available for future support payments. Interconnectors are enabled through a cap and floor returns regime and to date organised through an application window during which various proposed interconnectors were assessed and approved. Offshore transmission has so far been linked to the development of specific wind farms.

Under current arrangements, the development of offshore transmission infrastructure that serves more than one purpose, or more than one project, would require the developer to coordinate with other projects and potentially additional types and rounds of regulatory application or auction. As an example, one developers offer into a CfD auction may become contingent on another developers success in the same auction. Even if both bids are successful, the economics of one project may then be dependent on the successful financing of another. Experience from the structuring of potential carbon capture and sequestration projects shows the difficulty of developing multiple projects in parallel with commercial dependencies on one another.

### A Single Truth

It is not just offshore transmission that needs to be coordinated, decisions on the siting and connection of large-scale offshore generation and interconnection will influence power flows, congestion and optimal investment for the onshore transmission network. National Grid ESO already runs an annual Network Options Assessment to decide onshore transmission investment, this should be extended to offshore assets of different types, creating a single coherent development plan for the UK power system. Such an optimisation would enable an overall power system optimisation informed by the range of costs involved in power system operation, commonly referred to as 'whole system costs'. The assets covered by this process could include generation,

both CfDs for low carbon generation and potentially thermal generation, demand side response etc currently catered for within the capacity mechanism.

Projects selected through the optimisation process should be commercially independent, i.e. their returns should not be dependent on the delivery of other projects, in the same way that onshore generation is protected from issues in onshore transmission. A process would need to be designed that gave developers an indication of what a future optimised system may look like to enable appropriate projects to be developed and subsequently bid into contract auctions.

There are multiple advantages to such an approach:

- Efficient coordination of offshore, and onshore, transmission and interconnection development and investment.
- Efficient allocation of contracts for differences and other support arrangements.
- An ability to optimise the system based on an appropriate assumed cost of CO2 emissions, potentially different from that the UK Government feels able to impose on thermal generation within the wholesale market if this is constrained by windfall gain and import distortion issues.
- An ability to make power sector investment decision methodologies consistent with the principles of Net Present Social Value outlined in the HM Treasury Green Book. Currently this is not the case. As an example, the National Grid Network Options Assessment, which produced the optimal interconnection volumes quoted in the BEIS / Ofgem letter, deviates from Green Book principles in important respects.
- If network performance and pricing risk is taken out of the contractual arrangements with generation, this will remove the need for developers to price this risk into offers. Given the uncertainty on factors such as future treatment of the negative residual price in generator transmission use of system charges, removing this uncertainty from generation investors will be beneficial.