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Onshore Wind: Exploring the Supply Chain Opportunities

"ISLES Feasibility Study and Main Findings"

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Agenda







Stakeholder Consultations



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ISLES – Study Road Map











ISLES Objectives

- Establish a credible marine resource that could be developed post 2020 comparable with technology maturity and market expectations for scale and timing
- Develop realistic credible concepts for an ISLES transmission network within the context of future offshore and onshore transmission capacity, environmental considerations, available technology cost and potential supply chain limitations
- Test the technical and economic feasibility of ISLES in relation to energy policy, planning and licensing/consenting regimes, regulatory and infrastructure scenarios and identify key sensitivities
- Inform government and industry thinking on policy and market changes required to facilitate and streamline the development of such a network in a technoefficient manner





ISLES Resource Assessment

- Resource Assessment based on interpretation of best available data (existing and ongoing studies)
- Considers West Coast Scotland and All Island.
- Combination of existing development and potential development













ISLES Resource Assessment

- Approximately 16GW considered within 'notional' ISLES Development Zone and ISLES Timeline
- Considers Wind, Wave and Tidal
- Short to medium-term focus on offshore wind



Wind Resource













Tidal Resource



Wave Resource

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ISLES Concept Selection - Objectives

- Demonstrate technical feasibility and economic viability under a range of energy policy, regulatory and infrastructure scenarios;
- Test the fundamental premise of an integrated offshore system connecting multiple offshore resources to the onshore network(s);
- Consider in the context of the potential generation & infrastructure landscape at different points in the future;
- Focus on cross jurisdictional Regulatory and Legislative implications;







Northern Isles Concept



Southern Isles Concept









Technology & Infrastructure

- There are no technological barriers to the development of an ISLES offshore network
- High Voltage Direct Current (HVDC) using Voltage Source Conversion (VSC) is a suitable transmission system for ISLES offshore networks
- There is sufficient onshore capacity in UK on the scale and within the timescale envisaged
- The ISLES offshore network design allows for shared construction





Planning & Environment

- There are no significant adverse environmental constraints to routing, positioning and construction although the landfall points will present challenges
- Co-ordination of build under an integrated network has the potential to reduce overall environmental impacts
- Due to the cross border nature of ISLES, there are particular challenges in navigating both complex and evolving onshore / offshore planning and licensing regimes across three jurisdictions





Regulatory (1)

- General movement towards harmonisation of markets in GB and SEM in alignment with EU Directives is removing regulatory barriers towards implementation
- ISLES has an opportunity to be a flagship project in the development of a pan-European market for renewable energy
- This work provides a body of evidence to move industry thinking forward and identify pathways for future regulation
- The cross jurisdictional nature of ISLES creates significant complexity across
 multiple regulatory authorities





Regulatory (2)

Key policy / regulatory areas to be addressed to allow ISLES become a reality:

- Create some form of anticipatory investment model for co-ordinated offshore build to allow phased build and commitment to future phases to support generation investment
- Develop regulatory model which redefines the fundamental distinctions between interconnection and connection for offshore generation
- Explore an approach to subsidies where they are paid for by the consumer state rather than the state generating the energy
- A transmission pricing regime which is seen to be equitable and affordable for generators while ensuring offshore network owner earns sufficient return
- Developing an approach acceptable to EU for cross border contributions to meeting targets











Regulatory (3)

The impact of Electricity Market Reform (EMR) in UK could have three significant impacts on ISLES business case:

- Replacement of Renewables Obligation Certificate (ROC) with Feed In Tariff (FIT)
- Introduction of the carbon price floor which will push up wholesale prices in the UK thus reducing the level of FIT subsidy but potentially reducing Anglo-Irish interconnector revenues
- Potential introduction of a single buyer for renewables which might have positive benefit for increasing investor certainty





Economics & Business Case (1)

- ISLES Capex is of order of £5.6 billion for combined Northern and Southern ISLES equating to circa £1 million / MW of offshore network capacity
- Level of subsidy required for generation connected to ISLES to be bankable is in region £79 – 85 / MWh equivalent to 1.8 – 1.9 ROCs
- ISLES combines interconnection and generation and thus a case can be made for synergistic benefits by increasing the utilisation of the network – thus saving approx £170 million per annum for Southern ISLES. This reduces subsidy to £74.5 / MWh.





Economics & Business Case (2)

ISLES network Capex is broadly of same order of magnitude potentially 15 – 20% higher than comparable stand alone projects under UK Government Round 3 Offshore Wind Development process but with added economic and market benefits:

- Enhanced network availability provided by integrated network build to reduce generation developer risk and subsidy costs
- Additional interconnection benefit to share amortised capital cost between interconnection users and generators
- ISLES presents opportunity to access EU grant / funding at potentially lower cost of capital than alternative schemes which do not qualify
- Interconnection element allows both Irish jurisdictions to develop renewable generation which otherwise have to identify an alternative route to market











Economics & Business Case (3)

- Level of renewable subsidy is sensitive to variations in wind turbine load factors for instance, wind resource supporting ISLES will have improved load factor over projects on East coast of England
- Lower planning risk considerations than stand alone projects
- ISLES is a transparent mechanism for trading of renewable subsidies between Member States
- Environmental benefits in the order of 100 million metric tonnes of CO₂ emissions result from implementation of Northern & Southern ISLES (42 million tonnes for Northern ISLES and 58 million tonnes for Southern ISLES)





Roadmap for Implementation

- ISLES will create the legislative, regulatory and technical framework to harness our renewable ocean energy to the greatest realistic extent
- The necessary legislative and regulatory mechanisms in the three jurisdictions need to be planned in a consistent joined-up manner
- On grid infrastructure more detailed work is required on system architecture, load factors and cost estimations
- Irish West coast developments cannot realistically be connected offshore and therefore need to come onshore for connection
- Regulatory regime needs reconfiguration as recommended
- We need the necessary port and other supply chain infrastructure deployment needed to service the ISLES ambition











Thank You

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