The value of INTOG

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Offshore wind has been a major success story for Scotland and the UK, with an established policy framework combining with long term, strategic private sector investment leading to significant cost reduction and decarbonisation of the economy. As well as providing opportunity to secure seabed rights to develop offshore projects and driving forward the decarbonisation of the UK's oil and gas sector, the Innovation and Targeted Oil and Gas leasing round will build on this success to deliver the next generation of offshore energy production.

In February 2022 Crown Estate Scotland announced plans for the Innovation and Targeted Oil and Gas (INTOG) leasing round in Scottish waters. INTOG comprises two distinct opportunities. Firstly, innovation (IN), whereby bidders can apply for seabed rights for small scale, sub 100MW innovation projects. Secondly, targeted oil and gas decarbonisation (TOG), which presents an opportunity to develop offshore wind projects specifically for the purpose of providing low carbon electricity for the production of oil and gas. In both cases, bidders are able to identify sites within the search area identified through Marine Scotland's Initial Plan Framework.

The objective of the innovation element of INTOG is to facilitate projects which support the cost reduction of commercial scale deployment of offshore wind, and to augment Scotland's position as a 'destination for innovation and technical development', supporting both risk reduction and supply chain opportunities.

IN projects do not require an interface with oil and gas. The scoring mechanism published by Crown Estate Scotland states that 40 per cent of points awarded to IN projects will relate to forms of innovation proposed through development of the project. This can, and most likely will, include both demonstrator floating foundations and alternative forms of offtake, including hydrogen.

IN projects present an opportunity to test, at scale, technical solutions, which will be used both domestically and globally to deliver the next generation of offshore wind. An innovation round such as this is essential for Scotland to deliver on both the capacity and supply chain ambitions promised by ScotWind.

The objectives of TOG are to reduce emissions that arise from oil and gas production through deployment of offshore wind, whilst also developing projects that deliver for both Scottish supply chain and just transition principles.

Emissions arising from oil and gas production in the UK coastal shelf represented 4 per cent of the UK's total emissions in 2019. The North Sea Transition Deal includes a commitment on behalf of the oil and gas sector to reduce this by 50% by 2030. This is an ambitious target which has focused the industry's attention on electrification of oil and gas infrastructure.

INTOG has been designed to deliver on these objectives. TOG projects are limited by seabed size rather than generation capacity, though this cannot exceed five times the power requirement of any oil and gas infrastructure.

Unlike IN projects, applicants are not obliged to present any innovative element within projects however, due to the depth and distance from shore, it is likely these projects will comprise floating foundations. Marine Scotland's Initial Plan Framework limits the cumulative generation capacity of TOG projects to 5.7GW.

Integration of offshore wind with oil and gas infrastructure presents unique and complex technical challenges, including integration with both brownfield and greenfield oil and gas, requirement for storage and/or alternative means of generation, including potentially, a grid connection, and potential for deep water technology. Furthermore, the timescales associated with both deployment of offshore wind, and life expectancy of oil and gas installations requires consideration.

These align with the Scottish Government's objective to deliver a Just Transition to a net zero economy and society, as well as the UK Government's Offshore Wind Industrial

Strategy and Ten Point Plan for a green industrial revolution.

Both IN and TOG projects present clear advantages to the Scottish offshore wind market, principally around the following areas.

Offshore wind development opportunity

The offshore wind market has expanded rapidly in recent years, with countries worldwide seeking to establish both a pipeline of generation projects and a domestic supply chain, with a number of new market entrants, the result of which is a highly competitive marketplace.

A product of this competitive market is that seabed rights for commercially viable, consentable offshore wind projects are a highly sought-after asset. This is significantly enhanced in an established market with strong natural resources and where policy, demand, and related and supporting industries are aligned to deliver projects.

Scotland has an established, tried and tested, pathway to consent for offshore wind farm projects. The successful award of the ScotWind sites in January 2022 demonstrated the interest in the market and included meaningful commitment to Scotland's domestic offshore wind supply chain.

Both IN and TOG present the opportunity to secure seabed rights for commercially viable, consentable offshore wind projects in an established market with strong natural resources and a mature policy regime is clearly appealing.

Alternative offtake arrangements

In general, deployment timescales for offshore wind projects are driven by their grid connection. The increase in speed and scale of deployment of offshore wind, to meet UK and Scottish Government targets, has driven the BEIS-led Offshore Transmission Network Review and National Grid ESO's Holistic Network Design.

Alternative solutions to grid connections are widely discussed, most notably inclusion of a hydrogen offtake. INTOG presents a number of potential solutions which avoid, or limit the need for, grid connection.

Potential solutions include onshore or offshore hydrogen facility, both IN and TOG projects, as well as off-grid connection between TOG projects and oil and gas infrastructure. This would incorporate storage and/or alternative means of production to balance supply and demand. This model would comprise a 100 per cent offtake agreement and would avoid the need for OFTO, associated transmission network use of system (TNUoS) costs and network reinforcement or timing constraints.

Another solution could be grid connection of TOG project(s) and oil and gas infrastructure. This would provide consistent supply to the oil and gas facility and allow for over planting of offshore wind, noting this capacity cannot exceed five times the annual oil and gas requirement, under Crown Estate Scotland's proposals.

This is comparable to a conventional offshore wind farm, but would allow full or partial offtake by the oil and gas facility. Given the likely distance to shore, the design would need to accommodate electrical losses and ensure compatibility between the different infrastructure, for example, some oil and gas installations use 60Hz rather than 50Hz.

Finally, it is feasible that INTOG projects could interface with ScotWind projects as a hub connection, maximising local generation and providing balance to the grid.

New participants in the offshore wind market

During the last two years the offshore wind industry has seen a realignment through significant investment from oil and gas operators. This has been driven by several forces, including the environmental, social, governance and ethical need to decarbonise production to reach net zero targets; the opportunity to play a role in an industry set to form a long-term solution to global energy needs. There have also been financial and regulatory reasons, including licensing conditions in decarbonisation and emission reduction, and Capital Asset Tax Allowances on infrastructure investments.

It is worth considering that TOG projects would replace conventional electricity generation for oil and gas platforms.

However, power generation does not form a core business aspect of the oil and gas sector. In contrast, the development, construction and operation of offshore electrical generators is the core business activity of conventional operators in the market. This raises a question about the roles each organisation may undertake.

Attracting new participants into offshore wind provides the opportunity for collaboration between topic expert organisations. From the perspective of the offshore wind industry, these will take the form of oil and gas owner/operators seeking to decarbonise their infrastructure, but without wider ambitions in offshore wind. This would likely provide opportunity for novel ownership and responsibility models.

It will also involve oil and gas organisations with little or no renewable energy experience, using INTOG as an opportunity to establish themselves in the renewables market. This will provide opportunity to existing developers and consultancies in the Scottish offshore wind market for collaboration.

It will also take the form of oil and gas organisations with a footprint in the offshore wind market. As we have seen through ScotWind, several oil and gas organisations have committed heavily to the offshore wind market. This presents an opportunity for partnership approaches in the same way as ScotWind.

As the industry has seen with fixed foundation offshore wind, the floating market will naturally reduce its risk profile with an increased number of projects moving into construction and operation. This will attract finance opportunities in due course. While not an INTOG-specific opportunity, this leasing round will form part of the de-risking process.

Opportunity for Scotland's offshore wind supply chain

ScotWind has seen meaningful commitment to Scotland's offshore wind supply chain, with 11 of 17 awarded sites seeking to deliver floating wind projects. INTOG will require a supply chain development statement similar to that included in ScotWind applications. This aligns with the ambitions of both the North Sea and offshore wind sector deals.

Enabling the supply chain to establish and deliver smaller scale projects, such as IN projects, is a key step in the process to ensure the local supply chain is investable and capable of delivering at volume in a global marketplace. The nascent stage of this industry provides Scotland with an early advantage in this area, which is fundamental in enabling the country to position itself as a global centre for manufacturing and fabrication capability.

About Natural Power

Natural Power is an independent consultancy and service provider that supports a global client base in the effective delivery of a wide range of renewable projects including onshore wind, solar, renewable heat, energy storage and offshore technologies. It has a global reach, employing more than 400 staff across 14 international offices. Its experience extends across all phases of the project lifecycle from initial feasibility, through construction to operations and throughout all stages of the transaction cycle - working together to create a better world powered by renewable energy.

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