UNIVERSITY of STRATHCLYDE
CENTRE FOR ENERGY POLICY

ScotWind Offshore Wind Leasing: Advisory Note

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Overview of issue and advice offered

The design of the ScotWind offshore leasing competition has faced a key challenge. This essentially involves the development of a new market for Scotland in the absence of a foundation of knowledge on the nature and level of demand. There is a dual challenge in terms of not underselling what are in effect public assets, while not risking a perception that Scottish assets command low values. The open auction approach now adopted elsewhere in the UK would address the former while risking the latter if demand is low. Implementing ScotWind involves consideration of the further challenge of how to maximise near term gains to the public purse from the initial auction of leases, while also securing future streams of sustained returns from rental incomes on the resulting projects. Less certain – but important for the Just Transition agenda - are the nature and magnitude of further socio-economic benefits that could be realised if those projects (at construction and operational stages) ultimately utilise domestic supply chain capacity.

The first major unknown is demand. While there appears to be significant interest in ScotWind, the timing and likelihood of the transition from a 'buyers market' to a 'sellers market' is difficult to judge. While emerging players such as oil and gas majors may have the appetite to enter the offshore wind market (because of the transferability of their expertise and capacity already established in Scotland), this may be limited when a number of development hurdles still exist and the route to market (the CfD) remains unstable and out of the Scottish Governments jurisdiction. This is a particular concern for Scottish projects where sites may be less desirable than in the rest of GB (e.g. due to distance from demand, water depth, transmission and connection charges). Projects will have to compete at an international level and are unlikely to be developed on a non-commercial basis in Scotland. This remains true for all 'types' of project developer.

Where demand in a new market may be low, a first step is to consider whether imposition of a price floor is appropriate. This is effectively already in place in the Crown Estate Scotland (CES) design of ScotWind, where Option Reserve Price is set at £2,000/km^2. The second step then involves considering the extent to which an open auction process is desirable as opposed to a fixed price approach. While in principle the former ensures the efficient operation of a market, in practice, particularly in a context such as leasing for offshore wind development and operating, the efficiency of the initial market process is not the only concern.

In short, as noted above, ScotWind needs to ensure delivery of projects that generate returns to Scottish taxpayers and society through subsequent rental income from sites, and ideally wage and profit incomes (and tax revenues), through jobs and supply chains. In this context, combining a fixed price approach with selection of desirable projects and developers is likely to have merit. The challenge lies in the design.

The current design of the ScotWind offshore leasing competition includes a mixed auction/fixed price approach where three pre-defined price options: the Option Reserve Price of £2,000/km^2, and two others of £6,000/km^2 and £10,000/km$^{2.}$ These three fixed price levels have been set by Crown Estate Scotland (CES), on the basis that if there is sufficient demand for any one option, bidders will enter at one of the higher two levels. CES believe that this route provides certainty that will attract more interest from developers, which in turn should lead to more projects moving into construction and operation sooner, thereby generating greater likelihood of sustained rental incomes and other socio-economic benefits.

However, there are key issues that need to be considered in finalising the design of this type of fixed price competition:

1. Are the higher price levels high enough? If not, leases could be undersold, sacrificing returns to taxpayers at leasing stage without compensating benefits at subsequent (and future) stages. Or, are they too high? If so, there will be a risk of limited bids at higher levels. If so, being forced to award to a single bidder, or to choose between a small number of bids where the risk of projects not completing as planned, may rise. One particular concern is that incurring a higher initial spend on leases negatively affects spending commitments over the lifetime of project, which could in turn affect the level of rental incomes linked to project revenues, and the realisation of other socio-economic benefits over the lifetime of projects. Of course, this may not happen if higher bids are associated with an industry player's desire to enter the offshore market and/or establish a market leader position, potentially justifying a spread of leasing costs across other activities rather than the lifetime costs of the project.

2. If two or more projects bid at the same fixed price level, how is the choice of who to award the lease to made? **We recommend assurance of a robust and transparent process that can be defended against challenge regarding information required from bidders to enable differentiation between competing bids at the same price level. Attention must be given to ensuring returns to the Scottish people, with clarity and confidence on what benefits are expected to accrue to whom, how and when, and what sanctions apply if these benefits do not transpire. There needs to be transparent criteria that focus on delivering returns to the Scottish people and taxpayers (who are ultimately the 'sellers' in this market for leasing of public assets) and involve a central role for government/the people's representatives in making decisions, or at least setting decision criteria.**

3. The fixed price approach has limitations in addressing the initial key challenge of understanding the level and nature of market demand, as expressions of demand reflected in market valuations here will be bounded by the upper price limit. One route to at least partially addressing this issue would be to introduce at least one higher price level. While this carries the risk set out under (1), it is not clear that this risk is not already in place via the £6k and £10k levels (i.e. even the second level is three times the Option Reserve Price). **We recommend that these two higher levels be fully justified, with consideration given to the option of introducing additional levels based on the same £4k increment considered (i.e. £14k and £18k), unless some critical turning point can be identified in terms of the risk to future returns. We also recommend that all levels be fully justified and explained, with consideration and clarity given on why there are no higher increments: e.g. why can the highest price level not be £20k/km^2? Would this breach some critical turning point? This needs to be transparent from the outset.**

Any near-term revenue gained will be important for building momentum and acceptance of actions towards net zero targets. Reviewing the approach will be important for subsequent rounds of ScotWind, where demand could increase with growing policy certainty; for example around CfD alterations, Scottish Government Offshore Wind Policy Statement and the Sectoral Marine Plan.

Finally, it is important to note that the impacts of the global Corona Virus crisis may be significant. It is difficult to predict what these may be specifically in relation to investment in offshore wind specifically, but a number of both positive and negative controlling factors may arise. Short to near term impacts are likely to have a negative effect on the sector but positive effects could arise in the medium to long term.

Future recommendations

- Opportunities to develop ScotWind in the context of a broader Scottish Marine Energy sector should be explored. This could include extending offshore leasing options to include other value generating activity – (e.g. powering offshore operations, hydrogen production and carbon storage etc.).
- Action to secure socio-economic gains from sustaining and evolving UK/Scottish supply chains should be a priority, with lessons drawn from previous renewables development in Scotland. We believe that there is potential for emerging sectors like offshore wind to help transition and diversify existing Scottish supply chains, expertise, infrastructure and jobs. This relates particularly (but not exclusively) to our considerable capacity, human and social capital associated with the current oil and gas industry, which directly employs and indirectly supports high numbers of UK/Scottish workers across a range of skill levels. That attention to ensuring this route is open and explored could play a potentially critical role in deliver Scotland's ambitions for a 'Just Transition'.
- There is a need for caution in action that may drive up the cost of electricity (already high relative to gas) for consumers and business. This is equally crucial to the need for a 'Just Transition'.
- However raising and securing public funds in the near term through leasing Scottish assets such as offshore wind capacity could be important in supporting actions to enable the 'Just Transition', especially if funds raised in a decarbonisation context can be 'ear marked' to support transition activity.

Specific points for consideration in setting context for this advice

1. High uncertainty remains around the extent and nature of market interest from a broad range of current and potential industry players in the ScotWind leasing round

1.1 Gauging the current market demand for offshore wind leases through ScotWind is challenging. The last leasing round run at UK level was in 2010 (Round 3), and on a very different basis. This is one of the reasons that the challenge considered here is anchored in uncertainly over demand levels. The CES consultation launched in July 2019 has elicited around 44 requests for information from potential developers, some of which may team up. There has also been dialogue with around 5-10 companies. Thus, there does seem to be clear interest in making applications. However, it remains somewhat uncertain as to what extent interest in acquiring offshore wind leases elicited through this process has been largely limited to established renewable/electricity industry actors with experience of developing large scale renewable energy projects. That is, it is not clear that consultation in Scotland to date has identified much in terms of potential interest/demand from potential new entrants/companies (particularly from the oil and gas industry) which may be looking now, or in the near future, to enter the offshore wind market.

1.2 Energy supply firms from a range of current industry sectors are developing tactics and strategies to change and shift what they aim to do in the evolving industry landscape as we embark on the net zero transition. There is evidence of this already happening. For example, Shell have already bought floating wind interests[1] and Equinor recently won a bid to develop an 816MW offshore wind farm off the coast of New York.[2] Similarly, traditional electricity industry actors are already moving into areas unfamiliar to their historical portfolios. For example, National Grid have secured carbon storage licenses[3], which is an activity well-suited to their regulated business model, but entirely new in terms of the offshore operational activity involved. In the context of operating offshore electricity generation, in practise this may in many cases

[1] https://www.nsenergybusiness.com/news/shell-floating-wind-developer-eolfi/
[2] https://www.equinor.com/en/what-we-do/empirewind.html
[3] https://www.thecrownestate.co.uk/en-gb/media-and-insights/news/2013-agreement-for-lease-for-an-offshore-co2-storage-site-signed-with-national-grid/

involve partnerships between actors experienced in generation and those experienced in operating safely offshore.

1.3 The outcome for Scotland could be a 'marine energy sector' (including offshore renewables, carbon storage, gas-to-hydrogen, electricity-to-hydrogen etc.). This would bring opportunities both for a range of current players in the current 'electricity', 'gas' and 'oil and gas' industry actors in evolving their businesses, and for the Scottish Government (and people) to progress the Just Transition agenda, where sustaining/evolving existing oil and gas driven supply chain jobs and wage incomes are recognised as important.[4] What future demand and supply conditions, and the type of business models involved (including nature of regulation of assets/operations), how supply chains may evolve (most likely requiring policy influence) etc., is yet to be determined, but potential players will be looking to position themselves.

1.4 However, just how and when different industry actors (most of which are international firms) are looking to do this, and whether this translates to interest in purchasing offshore wind licences in ScotWind as one potential route is not yet clear. This is made particularly uncertain given important drivers of and uncertainty in the future economic landscape such as Brexit and the Corona Virus pandemic. For example, the latter has depressed oil prices, which could have the effect of either making oil industry actors more risk averse, or encourage them to consider resetting of asset bases and/or divestment sooner than would otherwise be the case.[5]

2. A range of known and unknown factors will impact the development of offshore renewables leasing market over the next 2, 5 and 10 years.

2.1 The dynamics of any market are always hard to predict, particularly in the conditions like those faced now where the requirements of transformative change (net zero) begin to roll out in the context of great disruption (the Coronavirus emergency). Nonetheless, four key determining factors can be identified in the context of ScotWind.

1. Contract for Difference - Creating a route to market for offshore wind

CfD auctions will shape investment decisions. The consultation on the next CfD is currently open, and that could develop in a number of ways – with a particular potential to impact floating offshore wind. While the CfD process could impact interest in investing in offshore renewables, that this is taking place in a constantly changing environment means that there is little benefit in delaying decisions on ScotWind. The market for non-CfD projects is also quickly evolving. This will be heavily reliant on the appetite of investors to support such projects.

2. System wide energy and climate policy decisions

Ultimately, much will depend on policy directions/targets regarding the role of different energy supply options in achieving interim and long-term net zero targets. For example clear policy direction on pathways to decarbonising transportation and heat would obviously have a major impact on the demand for and, thus, supply of electricity. As long as pathways to decarbonisation are unclear, specific uncertainty remains around the demand for electricity generated through offshore wind in Scotland. The picture may become clearer as policy decision are made in the mid 2020's.

3. Offshore oil and gas market conditions

[4] https://www.gov.scot/publications/transition-commission-interim-report/

[5] https://www.energyvoice.com/coronavirus/234721/energy-transition-can-be-crucial-pathway-out-of-the-downturn-says-oga-chief/

Market conditions in the off-shore oil and gas sector also have potential to influence the offshore renewables leasing market in the coming years. Oil and gas companies could look to diversify their revenue streams and make continued use of the skills and infrastructure in which they have already invested by entering the offshore wind sector (in sole or partnership roles at different project stages). They could also look to develop offshore wind assets to power offshore oil and gas operations 'in-house'.

4. Policy certainty and market interest for a 'Scottish Marine Energy Sector'

A more fluid factor could be industry and policy interest in explicit strategic planning for the development of an identifiable 'Scottish Marine Energy Sector'. While the current ScotWind leasing focuses on offshore wind, the interest for other value added activities such as hydrogen generation or carbon storage could increase demand for offshore leases that incorporate a wider range of activities. Given the 6-10 year lead in time for project development, it is reasonable to consider that interest in leases that incorporate such activities could come sooner than expected. On the other hand, while uncertainty remains around sustainable business models for activities such as CCS and hydrogen production, it may be that interest in offshore leases remains only 'an interest' for the next decade. The timing of this is difficult to predict and will be largely driven by policy decisions made by relevant Governments.

3. The low carbon energy transition and climate change emergency will very likely affect the demand and appetite for ScotWind – the question of when still remains.

3.1 Arguably, if the UK and Scottish Governments do follow through on Net Zero commitments through robust policy development, the demand for offshore licences will naturally increase. However, whether this is the case will depend on two key factors. First, the role of, currently relatively highly priced, electricity in delivering heat in particular. Second, that opportunities for economic gain and competitive advantage exist due to Scotland's resource portfolio (e.g. renewable energy resource).

3.2 However, the timing of such interest and whether it equates to near term acquisition of offshore wind leases through ScotWind remains hard to predict. As a (current) net exporter of electricity, future electricity demand from and within Scotland will be a crucial factor. Uncertainty remains around decarbonisation policies for heat and transport and how much of a role electrification will play in each. It is likely that this policy landscape will evolve over the next decade and demand for licences will match that pace. However, medium-term climate targets that have been put in statute in Scotland, such as a 75% GHG reduction by 2030[6], may mean that policy signals for offshore wind development in Scotland come sooner and this may lead to higher demand for leases in the near future. Confidence in the market in Scotland may also increase through interventions such as the Scottish Governments soon to be published 'Offshore Wind Policy Statement', Climate Change Plan[7] and Scottish Sectoral Marine Plan.

3.3 It is worth noting that the appetite of industry players for offshore wind licences could be correlated with other opportunities in marine energy (e.g. powering offshore operations, hydrogen production, carbon storage etc.) more generally. This however may play a more significant role in subsequent ScotWind leasing rounds if a broader range of activities may be incorporated/linked in the future on the basis of Scotland having strong foundations to develop competitive advantage in a future low carbon marine energy sector.[8] This is already occurring in countries such as Norway where Equinor plan to develop a large scale offshore wind farm to power offshore operations in the Norwegian North Sea.[9] In the Norwegian context, narratives

[6] Climate Change (Emissions Reduction Targets) (Scotland) Act 2019
[7] https://www.gov.scot/news/climate-change-plan-update/
[8] We have previously considered this type of new industry opportunity in the context of CCS – see http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=showPromoted&id=689
[9] https://www.equinor.com/en/what-we-do/hywind-tampen.html

have also begun to develop around the potential for new large scale low carbon/CO_2 management industry development that builds on foundations laid through off-shore oil and gas extraction activity.[10]

4. Emerging market players may pay more to enter the market – but long-term profitability is key

4.1 New market players (such as oil and gas companies) may be interested in entering the offshore wind sector in Scotland – especially given the relevant experience of their workforce and the potential for floating offshore wind in particular. With broad portfolios and revenue streams from other activities, oil and gas firms could pay more than competitors to enter the market. They may also see ScotWind as an opportunity to develop floating wind projects with the desire to gain technology learnings and reduce costs – increasing the commercial opportunity to develop floating offshore wind projects internationally. This could be a crucial area of mutual benefit in the context of ensuring a 'Just Transition' given the significant share of Scotland's workforce currently dependent on jobs and wage income associated with oil and gas industry and/or supply chain activity.

4.2 However, the timing of this market entry remains uncertain and will be dependent on a range of wider conditions (as discussed under section 2). The appetite for market entry will also be dependent on whether companies predict sufficient profitability in GB offshore wind markets or subsequent activities (hydrogen production, carbon storage). Inevitably these projects will have to compete with others on an international scale and it is highly unlikely that projects would be developed on a non-commercial basis in Scotland.

5. The stage at which emerging players enter the market will be highly dependent on the type of players and motives.

5.1.The timing of market entry by emerging players will be varied and very dependent on the type of players and their motives. It is known that a number of oil and gas companies, who may be interested in the Scottish market, do currently have offshore wind development teams. However, this does not guarantee that all emerging players will approach at an early stage. There is also a risk that emerging players enter the market early through ScotWind and subsequently drop projects further down the line if market conditions change. For larger international companies 'sunk costs' do not guarantee continued participation, and there is a risk that companies who pay high to acquire leases may cut their losses' and pull back out. This could in turn impact future participation of other emerging players. An analogy can be drawn to the involvement of both BP and Shell in UK CCS commercialisation programmes where they entered the 'market' early but withdrew after (significant) changes were made to the commercial landscape. Given their relative inexperience in offshore wind project development, emerging players may choose to enter the market at a later 'lower risk' stage – for example during the construction and operational phase where they can make use of their skilled workforce.

6. Ofgem's charging reforms and proposals for an offshore grid are unlikely to have a significant impact in the short or medium future

6.1 Connection and Transmissions Network Use of System Charges (TNUoS) are a key challenge of developing offshore wind projects in Scotland, where generation is further from demand centres and network charges are higher than many projects in England and Wales. It is unlikely that Ofgem's 'cost reflective' approach will change significantly in the next decade and this will remain a challenge for Scottish projects for the foreseeable future. While commercial Power Purchase Agreements (PPAs) may offer another route to market for offshore wind projects, it is also unlikely that this will have a significant impact on the market in the short to medium term. Indeed, this is likely to impact on the onshore wind market first.

[10] https://www.nho.no/contentassets/e41282b08ceb49f18b63d0f4cc9c5270/industrial-opportunities-ccs_english.pdf

6.2 Nine actions are set out in Ofgem's Decarbonisation Action Plan[11] - one of which is to 'explore regulatory options to support development of an offshore grid to enable a four-fold increase in off shore wind generation by 2030.' At a high level this initiative aims to 'improve the coordination of the development of the transmission system in the future' which will ultimately reduce the cost of electricity by increasing efficiency of network development.

6.3 We believe this initiative is unlikely to transform the landscape and is likely to have its effects seen progressively over decade(s) rather than having a short-term high impact on the current offshore wind market. We agree with CES[12] view that 'innovation in turbines, installation methods, floating technology, O&M strategies (etc.) will likely have just as much impact on the sector over time'.

6.4 However we do note the positive impact that the energy regulator marking such an intention to promote a fourfold increase in offshore wind generation by 2030 has on the market and note the effect it will have on building confidence for developers in the sector.

7. The current economic fall-out could have a significant impact on the appetite to invest in offshore wind in Scotland

7.1 The impacts of the global Corona Virus crisis are undoubtedly going to be significant across a range of investment areas and sectors of the economy. Understanding of the situation is evolving on a daily basis. While predictions show that a global economic downturn is inevitable, the timeframe over which this will extend remains difficult to foresee. The impact on the energy sector has already been significant. In late April 2020, the US benchmark oil price reached negative values due to the drastic reduction in oil demand. While this demand is likely to return, 'pre Corona' demand may not recover for a number of years. This downturn is likely to lead to significant pressure and uncertainty for the existing oil and gas workforce in Scotland, where market conditions are likely to be worse than levels seen in the 2015 oil downturn, and where real concern is growing in terms of what the net zero transition may mean for their future employment and earnings capacity.

7.2 In relation to investment in offshore wind specifically a number of controlling factors may arise from the current economic situation:

Negative contribution (short to near term)

1. Governments may have to direct focus and funding towards what are considered to be more urgent economic actions, for example, supporting business related to the service industry. This may limit support for long term renewable energy developments
2. A global economic downturn could see less investor appetite across all sectors

Positive contribution (medium to long term)

3. To support profitability international energy (particularly oil and gas) companies may focus on renewable developments where returns may be low but stable
4. Economic stimulus packages may be directed towards industries that align with reaching net zero targets (offshore wind)

While it remains very difficult to predict, short to near term impacts are likely to have a negative effect on the sector but there may be positives effects that arise in the medium to long term.

[11] https://www.ofgem.gov.uk/publications-and-updates/ofgem-s-decarbonisation-action-plan

[12] Based on information provided directly to CEP by CES