Written evidence submitted by Energy UK

About Energy UK

Energy UK is the trade association for the energy industry with over 100 members spanning every aspect of the energy sector – from established FTSE 100 companies right through to new, growing suppliers and generators, which now make up over half of our membership.

We represent the diverse nature of the UK's energy industry with our members delivering almost all (90%) of both the UK's power generation and energy supply for over 27 million UK homes as well as businesses.

The energy industry invests over £13.1bn annually, delivers around £85.6bn in economic activity through its supply chain and interaction with other sectors, and supports over 764,000 jobs in every corner of the country.

Introduction

Energy UK welcomes the opportunity to respond to the Environmental Audit Committee's Inquiry: Technical Innovations and Climate Change: Offshore Wind. The UK is recognised as a global leader in offshore wind with 9.9GW of installed capacity and the ambition for 40GW by 2030. The success of offshore wind in the UK has been underpinned by clear government policy and messaging that has attracted innovation and investment from industry on a scale that is unrivalled globally.

Leading the Way

The UK currently has 9.9GW of installed capacity, a dominant 45% share of the overall installed capacity in Europe, and a further 2.5GW in construction to be completed by 2021. A further 5.5GW was procured in the recent Contracts for Difference (CfD) Allocation round 3 (AR3). Overall, this amounts to an installed capacity of around 20GW by the mid-2020s. This is an impressive feat given there only 1GW of offshore wind a decade ago, however, capacity would have to grow by a further 20GW in the following five years to reach the target of 40GW by 2030. It is clear that, if the UK is to reach this target, actions needs to be taken in the near-term to remove the barriers to that deployment.

One of the Cheapest Forms of New Electricity Generation

The third allocation round of the CfD saw record low prices for offshore wind in the UK, with the 5.5GW of capacity procured at £39.65/MWh and £41.61/MWh for projects that will commission around 2023 to 2025. These prices represent a 65% reduction in the cost of offshore wind since the first allocation round in 2015. This is a rate of price discovery that has far surpassed the expectations of forecasts from the first half of the decade, with the most ambitious pre-CfD predictions suggesting a cost of £95/MWh by the early to mid-2020s[1] [2]. The AR3 prices were so low that there BEIS reported zero impact on the Monetary Budget due to the fact that the strike prices are below the forecast power market prices[3]. As a result, when the AR3 projects become operational, and if power prices develop in line with government forecasts, consumers can expect to pay up to £250m less per year than if the contracts had not been awarded.

Capitalising on the Momentum

The Offshore Wind Sector Deal (OWSD), published in March 2019, set out an ambitious partnership between government and industry to raise the productivity and competitiveness of UK companies and ensure the UK continues to be a global leader in the sector into the future. The OWSD was well received by industry and is seen as being particularly effective for collaborative work between

[1] https://bvgassociates.com/wp-content/uploads/2016/07/BVGA-RUK-Costs-and-benefits-1106-1.pdf
[2] https://spiral.imperial.ac.uk/bitstream/10044/1/12649/6/Great%20Expectations%20-%20The%20cost%20of%20offshore%20wind%20in%20UK%20waters.pdf
[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/838914/cfd-ar3-results-corrected-111019.pdf

government and industry to overcome a number of barriers to offshore wind deployment at the rate required to satisfy the 2050 net zero target.

It was positive to see government raise the UK offshore wind ambition from 30GW to 40GW by 2030 following the 2019 election process. Industry would now welcome formal recognition from government of the new 40GW target, and a joint discussion on how the increased ambition will impact the aspirations within the OWSD.

Should you have any questions regarding this consultation response then please do not hesitate to get in touch via the details below.

Philip McNally

Policy Manager, Power

Energy UK

020 7024 7633 philip.mcnally@energy-uk.org.uk

Response to Questions

1. How effective has the Government's Offshore Wind Sector Deal been in moving the sector towards becoming an integral part of a low-cost, low-carbon, flexible grid system and boosting the productivity and competitiveness of the UK supply chain?

The UK is recognised as a global leader in offshore wind with 9.9GW installed capacity and the ambition for 40GW by 2030. The success of offshore wind has been underpinned by clear government policy support that has attracted innovation and investment from industry on a scale unrivalled globally. The launch of the OWSD in March 2019 was a positive move, formalising collaboration between industry and government to maximise the domestic opportunities from the sector.

Energy UK firmly believes that the OWSD is an excellent platform for addressing the key barriers the industry faces to mass deployment of the technology. The OWSD has fostered a culture of collaboration across industry, the supply chain and government that is attractive to international investors and has cemented the UK as a global leader in offshore wind.

The OWSD contains a number of aspirations that build on the UK's global leadership in the sector, maximising the advantages for UK industry from the global shift to clean growth. It was positive to see industry sign onto these aspirations and begin work to progress towards the goals, however, given the subsequent 1/3 increase in the headline target of offshore wind capacity by 2030, from 30GW to 40GW, it stands to reason that the underlying aspirations should be reviewed to ensure they are still appropriate.

Since the launch of the OWSD in March 2019, there have been a number of major developments in the sector that have led to positive outcomes. The cost of offshore wind has continued to fall as seen with the 5.5GW of offshore wind procured in the CfD AR3 at record low prices of £39.65/MWh and £41.61/MWh for projects that will commission around 2023 to 2025. Much of the work of the OWSD is progressed through targeted groups that aim to maximise collaboration to overcome specific challenges. These groups include:

- The Offshore Wind Innovation Group
- The Offshore Wind Growth Partnership
- The Investment in Talent Group
- The Joint Windfarm Mitigation Task Force
- Aviation Taskforce
- Future of Offshore Transmission Workgroup

Detail on the progress since the implementation of the OWSD and the focus of some of these groups above can be found in the BEIS Policy Paper – Offshore wind Sector Deal – one year on published on 4 March 2020[4].

2. What level of output can the sector deliver in the UK, and what Government support would be needed to achieve this?

It was particularly encouraging to see the Conservative Manifesto commit to raising the UK offshore wind ambition from 30GW to 40GW by 2030 following the 2019 election process. Industry would now welcome formal recognition from government of the new target and a joint discussion on how the increased ambition will impact the aspirations and pace of delivery under the OWSD.

Looking further ahead, the Committee on Climate Change (CCC) has suggested that at least 75GW of offshore wind could be deployed by 2050 and that historical deployment rates and a growing global market suggest this level of deployment should not be an issue.

Floating offshore wind, which opens up access to deeper waters, can significantly increase total offshore wind deployment with studies suggesting an additional resource of up to 350GW[5]. It should be noted that any deployment towards this potential is dependent on overcoming a number of barriers to offshore wind deployment. Before entering the commercial phase, floating offshore wind will have to demonstrate novel technologies (floats, anchors, dynamic high-voltage cables and connectors), adapted to the turbines of the future and to extreme sea conditions.

In addition, the work being undertaken as part of the OWSD will be key to overcoming barriers such as lack of suitable grid infrastructure, system integration, aviation and radar, which present challenges for both fixed foundation and floating offshore wind.

As offshore wind sites are opened up in deeper waters and at greater distances from shore, it will also be important that the UK Government prioritise this barriers work now, to ensure that solutions are delivered in time to facilitate the additional capacity required to meet the 40GW target. The government should also work with its European neighbours to develop efficient, interconnected offshore grids that will yield economic and system security benefits. In order to maximise the efficiency and potential of offshore wind, the planning and development of wind farms – as well as broader maritime spatial planning – should be intelligently coordinated across national borders.

The certainty given by the CfD scheme has been a key factor underpinning the cost reductions achieved by the UK offshore wind industry in recent years. To maintain momentum in offshore wind deployment and retain investor confidence, it is important that the scheme is maintained through the 2020s for offshore wind. In the longer term, it is likely that both renewable support schemes and electricity market design will need to evolve. Changes should be developed in consultation with all stakeholders with as much advance notice as possible. This will enable both developers and investors to prepare for the changes while ensuring continuity in offshore wind deployment in the meantime.

3. How might the UK take advantage of further technological advances in offshore wind technology, particularly in relation to floating arrays?

We strongly support the government's proposal to introduce floating offshore wind as a standalone technology in the current consultation issued by the Department for Business, Energy and Industrial Strategy (BEIS)[6]. It is vital that floating offshore wind is defined separately from fixed-bottom projects with a distinct Administrative Strike Price (ASP) to allow projects to successfully compete in future allocation rounds. BEIS has rightly recognised that pre-commercial technologies, such as floating offshore wind, will have a levelised cost of electricity that is higher than more mature technologies and

[4] https://www.gov.uk/government/publications/offshore-wind-sector-deal/offshore-wind-sector-deal-one-year-on

[5] https://www.theccc.org.uk/wp-content/uploads/2019/05/CCC-Accelerated-Electrification-Vivid-Economics-Imperial-1.pdf

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/869778/cfd-ar4-proposed-amendments-consultation.pdf

therefore require separated definitions to facilitate the same price discovery that those mature technologies have experienced.

The next step to realise the potential of floating offshore wind in the UK is for government to set a clear deployment ambition. The announcement that the 2030 target for offshore wind will increase from 30GW to has sent a helpful signal to the international investment community that the UK is committed to the technology and a similar long-term target for floating wind, alongside regular CfD auctions, is essential to attract further investment and competition in the floating wind space. It is now essential that this target is formally recognised by government as soon as possible to eliminate any uncertainty for investors. The UK offshore wind market has already scaled up from almost no deployment a decade ago to ~10GW of capacity today, lessons can be learnt from this success in the development of the floating wind market and improvements can be made in terms of UK economic value.

4. What support does the sector require to keep pace with the most cutting-edge innovations, such as in blade technology?

Technological innovation has played a key role in driving the impressive cost reduction seen in offshore wind over the past five years. The Offshore Renewable Energy Catapult (ORE Catapult) has also facilitated cutting-edge innovation with projects focused at solving specific challenges from remote robotic turbine inspections to blade erosion shields.

The Offshore Wind Innovation Competition launched by ORE Catapult in 2018 was a good example of how to connect high-growth potential SMEs with potential investors. The competition issued a call for solutions to specific innovation challenges identified by industry, thereby attracting innovations against real issues. We encourage government, through Innovate UK to provide the funding to ORE Catapult for further competitions following this framework.

Another example of good practice in the offshore wind innovation arena is the Offshore Wind Accelerator (OWA), the Carbon Trust's flagship collaborative RD&D programme. The OWA is a joint initiative set up between the Carbon Trust and nine offshore wind developers back in 2008. Technology challenges are identified and prioritised by the OWA partners and projects are then carried out to address these challenges. The OWA is highly regarded within the industry and has been a key facilitator of the substantial innovation-driven cost reductions seen in recent years.

The OWA core programme is part-funded by the Scottish Government with the remaining funding coming from industry. Energy UK encourages the Scottish Government to explore the option of providing additional funding to the Carbon Trust for the OWA programme as part of a COVID-19 recovery plan. Industry would welcome the opportunity to discuss the appropriate level of funding and the potential for match funding.

There is a need for pre-commercial demonstrator projects, as these provide a means of accelerating technological industrialization. One successful example of such a project is the Blyth Offshore Wind demonstrator. This demonstrated the design, manufacture, installation and maintenance of float and submerge gravity base foundations. This type of foundation had never been installed before and has the unique characteristic of floating during transport from the construction site to the operating site, thus avoiding the high cost of traditional installation vessels. The experience gained from the construction of Blyth have been collected and is available to future developers.

5. What is the UK industry doing to promote the sustainability of offshore wind arrays throughout their entire life-cycle from development through to decommissioning, and to improve maintenance and end-of-life repair?

The UK offshore wind industry places great emphasis on the sustainability of offshore wind arrays throughout the entire life-cycle and individual companies have specific target on sustainability. Innovations in turbine design and maintenance mean that arrays are now being planned for a 30 year life rather than 20/25 year. There are numerous examples of innovative approaches to inspection and maintenance with a general movement towards automation utilising drones and robots, which facilitate more efficient and therefore sustainable life-cycle management. The maintenance and decommissioning of offshore arrays holds a lot of value for the domestic supply chain and such innovations and expertise can be exported abroad to emerging markets.

Energy UK recognises the importance of driving reductions in the carbon intensity of supply chains and welcomes the move from BEIS to consider the carbon footprint of supply chains in the current consultation on amendments to the CfD scheme 2020[7]. With respect to methodologies, an immediate challenge is that there is no universally accepted methodology for assessing the carbon intensity of supply chains. A very useful first step in considering how SCPs could assist would be the development of a common methodology which could form the basis for the promotion of carbon intensity reductions in the supply chain. The Greenhouse Gas Protocol is one of the most widely used of the suite of existing methodologies and this could form a starting point for further development

6. How well is the UK industry managing the environmental and social impacts of offshore wind installations, particularly on coastal communities with transmission-cable landing sites?

The industry has so far successfully adhered to the robust policies and processes designed to manage the impact of connections for offshore wind. Some 9.9GW of offshore wind is successfully operating and currently a further 2GW is under construction. Altogether, 43GW of connection agreements are now in place with wind developers across GB and this provides one of the pre-requisites to meeting Government targets for 2030. While it would be unhelpful to create risks and uncertainties for the developers pursuing these projects, Energy UK believes that now is the right time to review the current processes and adopt a more strategic approach to offshore transmission, which minimises environmental and social impact. Work on this has begun through a specially-formed Future of Offshore Transmission Workgroup, as part of the OWSD. Energy UK encourages BEIS to lead all stakeholders, to proceed at pace with creating the frameworks for a more coordinated and integrated approach to connecting offshore wind to the electricity networks.

Ofgem also highlighted the need for review. In its recently published *Decarbonisation Action Plan*, Ofgem states "the current frameworks relating to developing and connecting offshore wind generation need to be reviewed in light of the government's expectations for offshore wind." The Plan goes on to say "we do not consider that individual radial offshore transmission links for the amount of offshore generation are likely to be economical, sensible or acceptable for consumers and local communities."

To improve the prospects for meeting the longer-term 2050 target without jeopardising the 2030 target, we suggest an industry group is formed comprising BEIS and Ofgem with The Crown Estates, planning authorities, developers of generation and network owners. Such a group can immediately progress actions which will establish relevant security and interoperability standards ready for establishing an interconnected offshore network. It can also identify changes to the regulatory framework that will facilitate use of such network solutions where they bring economic and environmental benefits in relevant timescales. Such a group has already been recommended by the OWSD's Future of Offshore Transmission Workgroup at a high level as part of the ESO's work plan.

7. How well is Government policy supporting innovation in transmission technology to improve the efficiency of electricity transmission?

Given the scale of development required to deliver at least 75GW of offshore wind as recommended by the CCC, all potential new approaches to make best use of onshore landing points, connections and onshore infrastructure capacity need to be assessed and any changes necessary to existing plans identified as soon as possible. Such thinking is necessary to ensure that infrastructure has minimal impact on local communities and the environment, whilst delivering value to developers and consumers.

The OWSD's Future of Offshore Transmission Workgroup and NG ESO's planned work stream on Offshore Coordination, are working together to consider what the potential solutions could be, based on cost-benefit analysis. BEIS also have a work stream in development on this, which will also be joined up via the OWSD. The aim is to create a framework which enables investment in and connection of the GWs the UK needs for 2030 and net zero at lowest overall cost to the consumer,

[7] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/869778/cfd-ar4-proposed-amendments-consultation.pdf

whilst also bearing in mind the environmental and socioeconomic impacts of this on coastal communities.

An integrated offshore grid could also include already available interconnector technology. Multi-purpose interconnectors combine the benefits of market-to-market interconnection with the capability of connecting offshore wind to the interconnector. By adapting this technology to integrate offshore wind into new interconnectors, Britain can pioneer and lead the way in developing meshed grids in the North Sea. Under this approach, adjacent wind farm developments could be linked together as hubs, and the electricity generated is brought ashore via shared transmission infrastructure. A meshed offshore transmission grid connecting offshore wind farms to shore could provide significant financial, technical and environmental benefits to the UK and European electricity markets[8].

The combined availability of generation and market connection could improve security of supply and drive efficiencies, creating the potential for delivery at least cost to both developers and consumers through shared access to assets, and minimising the associated onshore construction impacts.

Ofgem recently committed to "Explore regulatory options to support development of an offshore grid to enable a four-fold increase in offshore wind generation by 2030"[9]. The clear policy direction set by government, alongside the engineering solutions described, now need an effective regulatory framework to unlock funding, drive investment decisions and enable delivery at the best cost for consumers.

The Future of Offshore Transmission Workgroup, established under the OWSD, is working alongside BEIS, Ofgem, NG ESO and TCE to examine these considerations, whilst making recommendations and decisions on how to best develop the key infrastructure required for deployment of offshore wind out to 2050. BEIS needs to take a lead role in the group setting an overarching programme overseeing the approach to design technical solutions and establish the timely delivery of the policy and regulatory frameworks required to develop both onshore and offshore infrastructure, which minimises the impact on local communities whilst delivering the best value for consumers and developers.

Embracing innovations in technology can act as a catalyst to accelerate the transition to net zero. With the right policy and regulatory frameworks, coordination of infrastructure can be vital in enabling the creation of high skilled jobs associated with offshore wind and the industry's broader supply chain. Developing these green technologies and supply chains will create well paid jobs and could help the UK economy recover following the coronavirus pandemic.

8. Looking to the future, what can the onshore wind sector learn from the offshore success story?

The success of onshore wind prior to 2015 paved the way for the subsequent success of offshore wind. Onshore wind has a range of positive impacts in terms of community benefit, job creation and the addition of low-carbon electricity generation capacity. It is for these reasons that Energy UK has firmly supported the reintroduction of Pot 1 technologies for CfD AR4.

The offshore wind sector has achieved significant reductions in unit costs (as evidenced by falling CfD auction prices) by accessing a dependable but competitive support framework to enable adoption of new technology. A stable combination of policy and support for offshore wind has in turn enabled a stable pipeline of new projects, which has delivered cost savings and efficiencies, with the OWSD providing a tangible statement of the commitments from both industry and government.

A similar statement of industry and government commitments to take actions to enable onshore wind development could deliver similar benefits for the onshore wind sector. This statement need not be as a formal as a sector deal publication. It could be a protocol or other form of agreement that sets out the intentions and commitments of industry and government.

The flexibility for projects to proceed when the many project interactions are aligned has also been very important (and is a key challenge for facilitating shared network infrastructure). The government's OWSD, demonstrates that clearer policy direction can drive investment in renewable technologies.

[8] https://www.msp-platform.eu/projects/progress-meshed-hvdc-offshore-transmission-networks

[9] https://www.ofgem.gov.uk/system/files/docs/2020/02/ofg1190_decarbonisation_action_plan_revised.pdf

There are other parallels with offshore wind, when considering the grid infrastructure required to connect onshore and therefore a joined up approach across the sectors would be the most appropriate way of ensuring efficiencies both in terms of volume of grid infrastructure required and therefore cost to consumers. Where required, the further development and improvement of grid infrastructure must be viewed as an integral and essential part of both offshore and onshore wind deployment which, done strategically, offers consumers clean energy at lowest cost.

Government should work closely with industry to plan positively for and articulate to the public why energy infrastructure is required, and the benefits that come with ensuring a safe, secure, affordable and sustainable energy future.

May 2020