Draft Offshore Wind Policy Statement

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Scottish Government
Riaghaltas na h-Alba
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Ministerial Foreword and Executive Summary

In April this year, in response to the latest evidence from the Intergovernmental Panel on Climate Change, the First Minister of Scotland, Nicola Sturgeon, declared a climate emergency and committed Scotland to meeting our nation's responsibility for tackling global climate change. Our landmark Climate Change (Emissions Reduction Targets) (Scotland) Act was passed in September, with Scotland once again demonstrating global leadership.

The Act committed us to the most ambitious, statutory climate targets anywhere in the world, and to reach net-zero emissions of all greenhouse gases by 2045, ahead of the UK target of achieving net-zero by 2050. We have also set bold interim targets to reduce emissions by 75% by 2030 and 90% by 2040. These targets are in line with what is required to meet Scotland's commitments under the 2015 Paris Agreement, to limit global average temperature increases to 1.5 degrees Celsius or less.

Scotland's targets are extremely challenging; meeting them will require developing as much of Scotland's renewable energy potential as possible to provide the anticipated growth in demand for low carbon electricity necessary to decarbonise Scotland's wider energy system. This will require progress in areas such as the energy needed for domestic and industrial heat supplies and our transport systems, as discussed in Scotland's Energy Strategy[1].

Offshore wind generation can play a very significant role in helping us meet this challenge, effectively and affordably, while taking into account wider environmental factors and the interests of other users of the sea.

Offshore wind is now demonstrably one of the lowest cost forms of electricity generation at scale, offering cheap, green electricity for consumers. Scotland, with 462,000 km^2 of waters within its Exclusive Economic Zone, has a huge potential offshore wind resource, with large, identified areas where we believe this technology can be successfully deployed.

The technology also offers significant economic opportunities. We have a growing, specialist offshore wind supply chain, augmented by a wealth of existing and transferable expertise across the 105,000 people within Scotland's oil and gas industry. We also have tremendous and growing experience in project management, finance, legal services, planning and environmental monitoring. Our enterprise and skills agencies seek to capitalise on these strengths, and support further infrastructure investment, to maximise the potential supply chain benefits that will flow from a strong and established pipeline of development.

Scotland has an excellent reputation for offshore wind expertise and is recognised as having one of the best wind regimes anywhere in the world in which to deploy projects. Allied to this, we have clear, supportive planning policies and a Scottish Government that is seen as a strong advocate for the technology and its deployment in Scotland's waters.

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[1] https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/

Scottish Government support has included grant funding for innovation and, until powers were revoked by UK Ministers, the unique use of our Renewables Obligation (Scotland) enabled the demonstration of vital technology breakthroughs and cost reductions across floating and fixed projects.

We are now taking another major step forward. Alongside this draft Offshore Wind Policy Statement, we are publishing for consultation Scotland's **Draft Sectoral Marine Plan[2],** the platform for a range of vast new opportunities in Scotland's seas. We estimate that up to 10 GW of offshore wind potential is represented in this plan alone, with specific leasing opportunities to follow in 2020 as part of Crown Estate Scotland's first ScotWind leasing round. Further opportunities will come forward in subsequent leasing rounds.

The vision adopted by the recently launched Scottish Offshore Wind Energy Council (SOWEC), but in advance of the publication of the Draft Sectoral Marine Plan, already included the delivery of at least **8 GW** of offshore wind in Scotland by 2030. We believe that this is a sector that is ready to deliver.

Of course we also understand the challenges facing this sector – including the vital importance of working in partnership to strengthen our supply chain by maximising economic benefit for our indigenous companies and potentially attracting inward investment. This is despite a Contracts for Difference (CfD) auction mechanism that has manifestly helped drive down electricity prices for consumers, but which has driven supply chain opportunities overseas to markets with low wages; we continue to argue that, to achieve the Sector Deal target of 60% UK supply chain content, UK Ministers should reform the CfD mechanism in a manner that better reflects total value added for the Scottish and UK supply chains.

Understanding and mitigating environmental impacts, resolving the effects of wind turbines on radar and overcoming the distortive effect of higher and, arguably, unfair transmission costs are other challenges that we must address. Addressing these, and fulfilling the sector's potential, will mean pulling together across Government, the industry and wider stakeholder community in a spirit of positive collaboration.

It is in this spirit that I urge you to join the conversation on our Offshore Wind Policy. We are very keen for you to feed in your views and experiences and to provide my colleagues and I in the Scottish Government with the necessary evidence to help shape a valuable, forward thinking and ambitious policy for offshore wind in Scotland – one that can deliver the energy we need, in a responsible manner, and which can, through supply chain growth, generate new economic activity across Scotland.

Paul Wheelhouse MSP
Minister for Energy, Connectivity and the Islands.

[2] http://consult.gov.scot

The Current Position

The Scottish Government has supported and promoted a positive policy landscape for renewables, balanced by a rigorous environmental impact assessment regime. These supportive policies, coupled with the efforts of investors, innovators and communities across Scotland, have seen our renewable capacity grow to **11.6 GW**, according to the most recent statistics[3] – with an estimated 76.3% of gross Scottish electricity consumption in 2018 capable of being met by renewable sources.

Ensuring Scotland's long and positive association with renewables continues to go from strength to strength is a priority for the Scottish Government. Key to this is our people, and the Scottish Government is committed to enabling our local communities to participate in, and benefit from Scotland's transition to net zero emissions.

We first published our Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments in 2014, and further Good Practice Principles for Community Benefits from Offshore Renewable Energy developments in 2015, in collaboration with the renewables sector, setting out national standards on community benefits, which we encourage renewable energy businesses and communities to use.

Scotland's expertise in wind energy planning and environmental impact assessment, supplemented by the transferable skills and experience gained across our highly efficient oil and gas sector, has resulted to date in the deployment of over 150 offshore turbines. These range from innovative test and demonstration sites, such as the 30 MW Hywind Scotland, right up to commercial scale, including the recently commissioned 588 MW Beatrice offshore wind farm. However, there is a strong development pipeline to come.

As of October 2019, the list of consented, operational and in-planning offshore wind projects in Scottish waters is as follows:

Name/ Location	Status	Consented Capacity (MW)
Neart na Gaoithe	Consented	450
Seagreen (Firth of Forth 1)	Consented	1,050
Inch Cape	Consented	700
Moray Firth Western Development Area	Consented	850
Forthwind OWF, Methil	Consented	30
Moray East	Under Construction	1,116
Kincardine	Under Construction	50
Dounreay Tri Demonstration Project	On hold	12
Robin Rigg	Operational	174
Levenmouth Turbine	Operational	7

[3] https://www2.gov.scot/Topics/Statistics/Browse/Business/Energy/EnergyStatsSep2019

Hywind Scotland	Operational	30
EOWDC, Aberdeen	Operational	93
Beatrice	Operational	588
Beatrice Demonstrator	Operational (decommissioning)	10
Firth of Forth 2	Planning	1,800
Firth of Forth 3	Planning	800
		7,760

* Marine Scotland can provide further detail on specific projects and/or images if required. Development map to follow in due course.

Marine Scotland's License and Operations Team is responsible for processing the necessary applications and licenses for offshore wind developments in Scottish waters.

Current statistics on the development pipeline, as of October 2019, demonstrate the known scale of deployment expected within Scotland in advance of the Draft Sectoral Marine Plan and ScotWind leasing round:

Status	Total capacity (MW)
Operational	902
Construction	1,166
Consented	3,079
Planning/on hold	2,612
Total	**7,760**

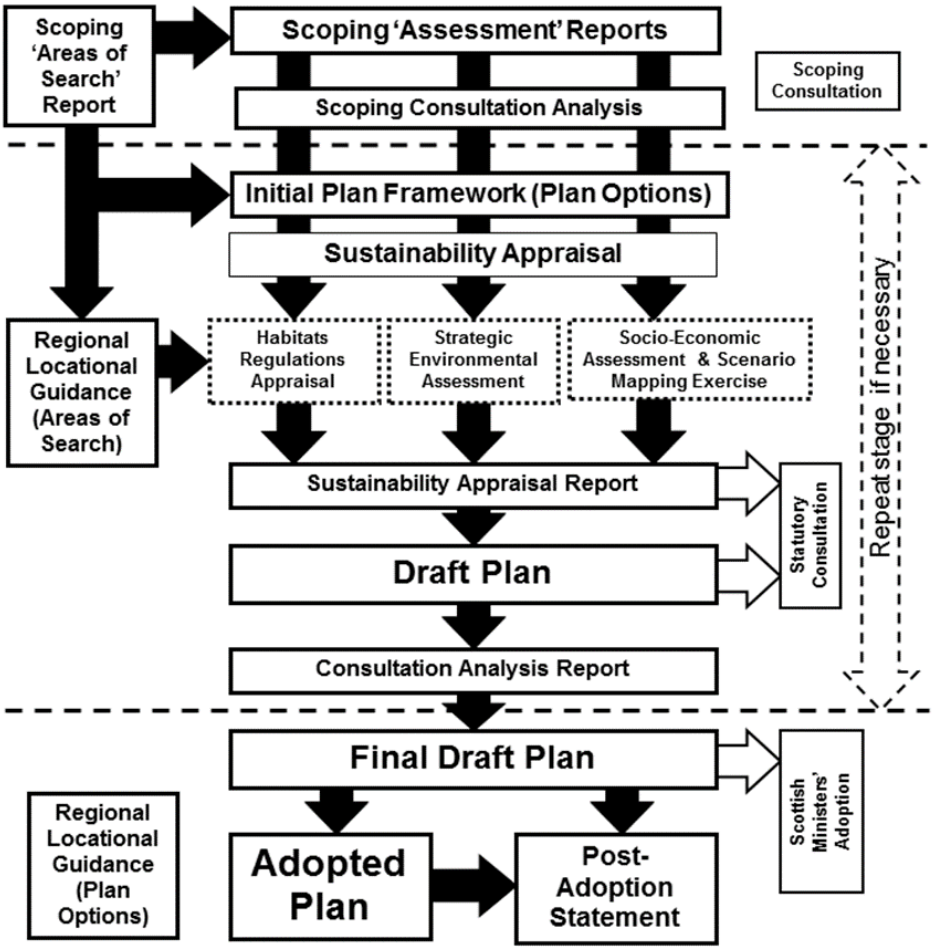
Draft Sectoral Marine Plan for Offshore Wind Energy

Marine Scotland's **Draft Sectoral Marine Plan for Offshore Wind Energy** (the draft Plan) is also being published in parallel with this document. The draft Plan sets out a strategic vision for future offshore wind energy development up to 2030 and beyond. It provides a spatial strategy to inform ScotWind seabed leasing for commercial offshore wind in energy in Scottish waters. The draft Plan:

- Minimises the potential adverse effects on other marine users, economic sectors and the environment resulting from further commercial-scale offshore wind development; and
- Maximises opportunities for economic development, investment and employment in Scotland, by identifying new opportunities for commercial-scale offshore wind development, including deeper water wind technologies.

The development process for the draft Plan, which identifies 17 "Draft Plan Options" (DPOs), has entailed significant stakeholder engagement and technical planning work to identify the most sustainable options for further offshore wind development (see the diagram below). We currently expect the draft Plan to be finalised and adopted in 2020, following this round of consultation. The Plan will be subject to iterative plan review, to ensure it remains up-to-date. The deployment of future

projects will present an opportunity to gather further data and grow our understanding of offshore wind development in Scottish waters.



The draft Plan consultation will run until **March 2020,** and all relevant and detailed documentation can be accessed on the Scottish Government website[4]**.**

ScotWind Leasing

In November 2017, Crown Estate Scotland ("CES") announced its intention to run a new leasing round for commercial-scale offshore wind energy projects in Scottish waters. Marine Scotland has therefore undertaken a spatial planning exercise to identify options for future leasing rounds.

This leasing process will provide a pipeline of new projects from the late 2020s onwards and provide an opportunity to introduce new companies to the UK market – boosting competition, driving innovation and unlocking new sources of investment.

While the Sectoral Marine Plans identifies areas of seabed considered suitable for future development, CES is responsible for administering the leasing system. CES will be able to lease areas of seabed located within the DPOs identified in the Sectoral Marine Plan (and any subsequent revised or amended Plans).

[4] http://consult.gov.scot

Offshore Wind Sector Deal and the Scottish Offshore Wind Energy Council

The UK Government published its Offshore Wind Sector Deal in March 2019. This document celebrated the success of offshore wind in the UK, and detailed specific actions to be undertaken by governments and industry, designed to promote and grow this sector.
The document included targets set by the industry, including improving representation of women and BAME in the sector, building early-stage skills and knowledge accessibility, and an aim to generate **30 GW** of offshore wind by 2030.

The Scottish Government believes that a flourishing offshore wind sector in the UK both implies and requires a strong and well-developed sector in Scotland. To that end, the Scottish Offshore Wind Energy Council (SOWEC) has been formed, co-chaired by Paul Wheelhouse MSP, Minister for Energy, Connectivity and the Islands, and SSE's Head of Offshore Project Development, Brian McFarlane.

SOWEC consists of subject-specific groups covering the following workstreams:

- Developers
- Skills
- Supply Chain and Clusters
- Innovation
- Barriers to the Deployment of Projects and Route to Market

The work of SOWEC is designed to maximise the economic benefits to Scotland of offshore wind deployment in Scottish waters.

SOWEC Vision

An offshore wind sector which plays to Scotland's strengths, delivering jobs, investment and export opportunities in line with the UK Sector Deal as a key part of the path to net-zero.

Goals:

1. Deliver at least **8 GW** of offshore wind in Scottish waters by 2030.
2. Create a competitive, commercially attractive offshore wind sector in Scotland which can deliver both domestically and in the global offshore wind market, with a focus on project development, deeper water capability and innovative technology solutions.
3. Work to increase local content in line with the ambitions set out in the UK Sector Deal, developing a sustainable, world class supply chain in Scotland.
4. Increase the number of offshore wind jobs in Scotland to more than 6,000, an increase of 75% on 2019 figures.
5. Develop a plan for offshore wind's contribution to achieving Scotland's climate change ambition of net-zero greenhouse emissions by 2045.

Consultation Questions

1. **Does the current pipeline and level of activity in the offshore wind sector in Scotland provide a sufficient platform upon which to build the greater contribution required to achieve our climate change goals?**

2. **Do you believe that the 2030 visions and aspirations described above are sufficiently ambitious?**

3. **What actions do you believe should be taken by the Scottish Government, UK Government and agencies in order to realise the full potential of Scotland's offshore wind sector?**

Barriers to Deployment

The Scottish Government is aware of the continuing technological and administrative barriers to the deployment of offshore wind. Addressing the climate emergency and achieving our net-zero emission goals will mean that Scotland **must** find – and implement at reasonable cost – practical solutions to these issues. This needs to happen within timeframes that keep us on course for Scotland's 2045 and interim targets, and meeting our 2030 target of meeting at least 50% of Scotland's total energy needs from renewable sources, in a manner consistent with the timescales for building out large-scale offshore wind projects.

From project inception to full deployment can currently take up to 10 years; we need to work together, across industry and government, to reduce these timeframes, while maintaining the rigour of our planning and environmental impact assessment regime.

In order to do this, we must take a holistic approach. The excellent work and achievements to date have been driven by necessity and innovation, with site-by-site considerations requiring and eliciting bespoke solutions. The Scottish Government believes that a more universal and collaborative approach, capable of looking beyond individual sites and issues wherever possible, can help fully realise the potential of sustainable energy production within Scotland's seas.

This will mean finding approaches and solutions which can be delivered at an affordable cost, thereby helping prevent these costs from deterring smaller companies from entering the market, and reducing Scotland's wider attractiveness to the offshore wind sector, despite our tremendous resource. Doing so successfully can mean getting the most from our potential, and maximising renewable generation in line with both Scottish and UK Government ambitions, while with due regard to both the marine environment and other economic users of Scotland's seas.

Transmission Charging

There is an established regulatory regime in the UK which requires the separation of offshore wind generation and transmission. Offshore Wind Transmission Owners (OFTOs), licensed by Ofgem following a competitive process, are responsible for the finance, maintenance, operation and ownership of an offshore development's transmission assets.

Some studies have suggested that transmission tariffs have remained relatively steady, due to increases in turbine efficiency and capacity factors, as well as upgrades in cable capacity. However, the dramatic reduction in overall project costs achieved by offshore wind at the last two CfD allocation rounds places more pressure than ever on the costs attributable to the transmission assets and charges.

The Scottish Government has long argued that the transmission charging model was developed to deal with a different landscape; our increasingly decentralised electricity generation system, as well as the context of a climate emergency and the anticipated growth of electricity demand arising from decarbonisation, strengthen the case for its reform.

This context makes it all the more important to recognise and tackle the challenges associated with offshore wind connection and system costs in Scotland, to ensure fairness and a level playing field.

The Scottish Government is already taking steps to help tackle these costs. Part of our current £2 million offshore wind innovation and skill funding package, confirmed in September 2019, will be used to help Offshore Renewable Energy Catapult (OREC) and its partners deliver a project aimed at these issues.

This project aims to identify the constraints imposed on Scottish offshore wind deployment by existing grid infrastructure, and to quantify the benefits of grid upgrades – highlighting the potential for off-grid applications for Scottish offshore wind in general, and for floating wind in particular. It will also map future leasing areas to suitable grid connections and quantify grid constraints in terms of connection and transmission capacity, taking into account planned upgrades.

The pressure to achieve reductions in these areas is more acute in Scotland due to the higher transmission use of system (TnUOS) costs faced by generators here, as a result of their greater distance from GB's main centres of demand in the south and south east of England. This means that processes such as Ofgem's **Targeted Charging Review**[5] must take fully into account their effects on renewables project costs, ensuring that these do not present barriers to investment and progress in Scotland – key to us addressing the climate emergency and delivering 'net zero'.

Another challenge, as well as an opportunity, for the offshore wind sector will be the extent to which technological and regulatory innovation can enable generators to contribute to the supply of ancillary and other system operability and balancing services.

Radar

The potential impact on radar (defence radar in particular) is a significant constraint to offshore developments, and may, if unresolved, restrict the sector's ability to contribute to our energy and delivery of our greenhouse gas emissions targets.

The Offshore Wind Sector Deal builds on the UK's global leadership in offshore wind and aims to maximise the advantages for industry from the global shift to clean growth. It contains the following wording and commitment:

"..the UK is able to meet its national security obligations, and that its radars can operate effectively as the offshore wind sector expands in the coming years. This will include working in partnership with the sector on innovation activity and development of a technical solution".

5 https://www.ofgem.gov.uk/electricity/transmission-networks/charging/targeted-charging-review-significant-code-review

This is a positive move towards collaborative working, intended to deliver effective and enduring solutions. We aim to ensure that Scottish interests, including radar issues which affect developments both offshore and onshore, are considered fully and in a way which fits with Scotland's timescales and ambitions.

The Scottish Government remains committed to continuing our strong working relationship with counterparts within the UK Government, Department for Transport, the Ministry of Defence, and with the developer community to establish and develop the enduring solutions that will be necessary. However, we recognise that short-term and/or temporary solutions may still be necessary to deploy projects in the short term.

Environmental and Planning Barriers

There are several environmental and planning barriers to future development, which will need to be addressed strategically as well as at a project level.

The Sustainability Appraisal process for Sectoral Marine Plans will identify plan-level mitigation measures to reduce, avoid or offset potential negative impacts arising from development. For example, this may include spatial planning within individual Plan Options to avoid areas of highest sensitivity, or directing that further project-level assessment is completed, once further details of individual project proposals are available to inform a meaningful assessment of the potential impacts.

Environmental Factors

The most recent licence and consent decisions for projects in the Moray Firth, Firth of Tay and Firth of Forth highlight concerns regarding the modelled in-combination impacts on key seabird species and highlight that the environmental carrying capacity in this region is highly constrained, based on current understanding of potential impacts. These concerns have also been raised and reflected in the Sustainability Appraisal for the 2019 draft Plan.

Marine Scotland and its advisors recognise that further work is required to address scientific uncertainty surrounding these potential biodiversity impacts before further development can progress in these regions. Stakeholders are now working together to identify the necessary steps and key actions required to address potential 'knowledge gaps' to allow advancement of our understanding of carrying capacity and other issues.

Environmental concerns may be identified during project-level assessment, and addressed at a project level by applying mitigation measures in areas including construction scheduling, installation/construction methods or adherence to best practice guidance. Implementation of these mitigation measures may be required via section 36 consent and/or marine licence conditions.

These conditions may require that the company and/or licence holder collects and submits post-consent monitoring data to Marine Scotland during the lifespan of the project. These monitoring requirements are usually articulated in the Project Environmental Monitoring Plan ("PEMP") or similar document, which is developed in

consultation with key stakeholders (such as SNH) and submitted for approval by Scottish Ministers prior to construction commencing.

These post-consent monitoring data can be used to inform future assessments and licence/consent decisions. For example, such data can provide further scientific certainty regarding the scale and type of potential environmental impacts.

As further offshore wind farm projects are constructed and become operational in the next few years, we expect further post-consent monitoring data to become available; for example, the European Offshore Wind Deployment Centre (EOWDC) and Beatrice Offshore Windfarm Limited (BOWL) are both fully operational, and construction activities are underway in the Moray Firth and Firth of Forth.

This type of post-consent monitoring, as well as considerations such as emerging assessment methodologies and best practice guidance, will be used to review and revise Sectoral Marine Plans. The Consenting and Licensing Manual for Offshore Wind, Wave and Tidal Energy Applications provides guidance on the application process, including pre-application engagement, which may help to identify and overcome potential barriers to development.

Interactions with other marine sectors/users

As the offshore wind industry grows, the potential competition for access to the Scottish Marine Area may cause conflict with other marine users. The sectoral marine planning process seeks to minimise these potential adverse impacts between sectors and identify opportunities for cooperation or increased alignment. However, there may still be competition for space with sectors such as commercial fishing, commercial shipping, and oil and gas (infrastructure and exploration).

The commercial fishing sector in particular is an important part of Scotland's economy and cultural identity. These two sectors may often compete for access to areas, given the likely overlap between fishing activity and areas suitable for offshore wind development. The National Marine Plan[6] sets out our policy to deliver sustainable development and to minimise impact on other users of the sea.

The views of local communities must also be considered and addressed. These can be linked to concerns over potential or perceived adverse seascape, landscape and visual impacts, and potential regional/local socio-economic impacts, depending on the location, nature and scale of the proposed development.

Dealing with these issues requires effective planning and detailed impact assessments, but also good communication and engagement from all sectors. Working together to resolve issues early will help to achieve our goals for renewable energy and minimise any impact on other sectors.

[6] https://www.gov.scot/publications/scotlands-national-marine-plan/

Contract for Difference (CfD) Framework and Innovation

The CfD auctions, run on behalf of the UK Government, have undoubtedly proved hugely successful in reducing costs in fixed-bottom offshore wind. However, the mechanism does little to support the supply chain or to help reduce the higher costs facing less developed technologies, including floating offshore wind.

The benefits of innovation reach far beyond cost reduction alone – continued research and development can improve health and safety standards and widen educational opportunities in offshore wind. There is also huge economic potential in developing our supply chain around new and innovative technologies, and creating first mover advantages, inward and export opportunities.

Scottish Ministers will continue to lobby the UK Government for an amended CfD regime which meaningfully and effectively targets and supports innovative technologies, including floating wind – exploiting the advantage and resource which Scotland has in these areas – and that supports supply chain development.

Consultation Questions

4. **What are the key regulatory and cost challenges facing the offshore wind sector?**

5. **What more can the sector and other key stakeholders do to tackle these?**

6. **What should the key Scottish priorities be in relation to Air Defence Radar, and towards radar mitigation more generally?**

7. **What more can the Scottish Government do, working with industry and other stakeholders, to address 'knowledge gaps' in environmental assessments for potential offshore wind developments?**

8. **What steps can be taken to improve interactions between offshore wind and other marine sectors?**

9. **How could a competitive market framework that promotes the development of floating wind be developed whilst still retaining value for money for the consumer?**

Future Position

Scotland is in an excellent position to benefit significantly from the deployment of offshore wind. The Draft Sectoral Marine Plan, which has been launched for consultation alongside this document, makes clear the near-term, practical ambitions of the Scottish Government and our agencies to grow this sector.

Offshore wind offers large scale, low carbon electricity at a relatively low cost and is not restricted by factors such as land availability that affect other low cost renewable sources. Scotland has a strong and consistent wind resource; however, its intermittency will require greater flexibility in our energy system to cope with the significant increase in deployment expected and needed in the coming years. Energy storage options such as onshore pumped storage hydro, as well as batteries and hydrogen production, alongside innovations in grid interconnections, could play a key role in managing these issues.

As robotics and autonomous systems become increasingly prevalent within the operation and maintenance of offshore wind projects, we are likely to experience a shift from traditional offshore technician jobs towards roles that are more focused on data and information management. Scotland should continue to build on expertise in these sectors to ensure that we remain able to react to the rapidly evolving technologies that will affect skills requirement in the future.

It will also become increasingly important to focus on how offshore wind farm components are reused and recycled as decommissioning begins to come into play. As we progress towards a net zero economy and society, we must ensure that projects coming towards their end of life are decommissioned in a responsible way that minimises carbon emissions, protects our natural environment and aligns with our policies on the circular and zero-waste economy.

Future Deployment

Scotland's 2 GW of operational and under construction offshore wind capacity could become more than 8 GW by 2030, based on current literature and estimated forecasts of growth trends. However, the most significant economic and supply chain benefits are likely to require substantially increased deployment in the future. Recognising this, and the challenge that net-zero by 2045 represents, we believe that we are going to need much more offshore wind deployment.

Considerations

SOWEC Vision – SOWEC's Vision includes the aspiration to "*Deliver at least 8 GW of offshore wind in Scottish waters by 2030"*. The Scottish Government views this industry-driven ambition as wholly realistic, given the scale of Scotland's resource and our shared commitment.

Committee on Climate Change – "*Net Zero The UK's contribution to stopping global warming*" estimated that **75 GW** of offshore wind would need to be deployed in the UK to achieve net-zero by 2050 (2045 in Scotland). We are working to quantify what Scotland's contribution to this might look like, taking into account the

potential effect of heat and transport decarbonisation on electricity demand. Although that remains uncertain, we expect that decarbonisation will require a **significant** increase in the deployment of offshore wind in Scotland out to 2050.

Strathclyde University Floating Wind Paper – the paper "*Offshore Wind, Ready to Float? Global and UK Trends in the Floating Offshore Wind Market*"[7] examines the progress of floating offshore wind as a key contributor to the global electricity supply mix. This report notes that the UK has 56% of a relatively limited supply of global floating offshore wind capacity, and that despite this being of very modest scale at present, floating wind could reach 4.3 GW by 2030. Scotland's deep waters and offshore wind resource, combined with transferable expertise and the need to decarbonise oil and gas production, mean that we should be competing for a large share of this potential market. Indeed, Scotland and the UK should lead this market.

IEA Offshore Wind Outlook 2019 – the IEA report finds that the global offshore wind market could increase 15 fold by 2040, with Europe positioned to be the powerhouse of future development. The 20 GW of offshore wind currently deployed across Europe is estimated to rise to 140 GW by 2040 under current policy conditions, and could rise to as high as 180 GW should policies adapt to more ambitious climate change goals.

National Grid's Future Energy Scenarios – two of National Grid's Future Energy Scenarios reach the UK Offshore wind sector deal target by 2030; "*Two Degrees*", which achieves 33.6 GW of installed offshore wind capacity, and "*Community Renewables*", which achieves 30 GW. However, neither of these scenarios comes close to the 2050 CCC target of 75 GW, as they are based on an 80% emissions reduction pathway rather than a net zero pathway. *Two Degrees* reaches 54 GW by 2050, and Community Renewables reaches 46 GW. In the FES Net Zero sensitivity update, offshore wind is not considered in detail, although the projected increase of electrification assumes that all levels of renewable generation will need to increase.

Impacts

There are many variables likely to affect future offshore wind deployment in Scotland. These include:

- Success of policy and innovation in continuing to drive down costs and tackle deployment challenges (especially for floating wind).
- Future electricity demand, including electrification of heat and transportation and future demand for off-grid electricity for hydrogen production.
- Black start capabilities, and the size of the market / requirement for balancing and ancillary services.
- Transmission charging, and the effect of net-zero on influencing future charging regimes.
- Supply chain and infrastructure capabilities.
- Skills, training and workforce availability.

[7] https://strathprints.strath.ac.uk/69501/ - accessed 29 October 2019

These aspects are considered within this document, and will remain a focus of attention for policy makers, regulators and industry. Their resolution will have a profound effect on future build and capacity scenarios.

Consultation Questions

10. **Considering the currently available literature and analysis, what do you consider a successful offshore wind industry in Scotland in the future would look like?**

11. **What scale of deployment would you estimate or believe to represent a successful outcome, and why?**

12. **What actions should industry and government take to address the issues described in this section and ensure the most positive future position for offshore wind in Scotland?**

Economic Opportunities – Supply Chain

The Offshore Wind Sector Deal set a target of 60% lifetime UK content in domestic projects (up from the current 50%), and a commitment to increase UK content in the capital expenditure (CapEx) phase.

Scottish Ministers are fully committed to ensuring that Scotland's supply chain benefits from this commitment by the sector. This means working with the sector, and particularly developers, original equipment manufacturers, tier 1 contractors and industry representatives, to ensure not only that this target is delivered, but that the benefits and effects of doing so are demonstrated and felt in areas across Scotland, maintaining the strong social licence which the sector has enjoyed.

As part of this process, we held an Offshore Wind Supply Chain Summit to consider options designed to increase the relatively low levels of Scottish content in projects to date, particularly during the CapEx phase.

The Summit concluded with a number of actions designed to establish a positive way forward for Scotland's supply chain. These were:

- An examination by the Scottish Government of the levers and regulatory instruments at its disposal to encourage developers to utilise the Scottish supply chain more widely;
- An assessment by the UK Government of current contracting practices in the offshore wind sector, and ways in which the CfD process could be restructured to promote the local supply chain; and
- An undertaking by the sector to conduct a strengths and capabilities assessment of the foundations sector in the UK via the Offshore Wind Growth Partnership (OWGP).

These options are still being explored and evaluated at the time of publishing this document. However, the Scottish and UK Governments have committed to hosting a follow up summit early in 2020 to set out our conclusions and ambitions in this area, and to ensure that our indigenous supply chain can maximise the benefit from developing Scotland's tremendous wind regime and where there is opportunity to do so attract inward investment.

Nevertheless, our supply chain companies must continually reflect on their performance to ensure that they remain competitive in a challenging offshore wind sector. They must also ensure that they are able to present innovative and compelling tenders to the Engineering, Procurement, Construction and Installation (EPCI) contractors and look to explore collaborative opportunities to present the strongest bids possible within their respective specialisms. The Scottish Government is keen to welcome new entrants into the market, as well as supporting established players.

We are also keen to explore how best to increase Scotland's success in winning orders for projects outside Scotland's waters, to leverage the wider pipeline of projects to deliver economies of scale in the Scottish supply chain.

Floating Wind Opportunity

There is huge economic opportunity attached to floating offshore wind – Crown Estate Scotland's *Macroeconomic Benefits of Floating Offshore Wind* report [8] suggests that the UK floating offshore wind market has potential to support 17,000 jobs and £33.6 billion of Gross Value Added (GVA), with particular potential for deployment in Scotland's 462,000 km^2 of waters, much of which are more than 60m in depth. Globally, the market is set to grow to at least 4 GW of capacity by 2030 and 55 GW by 2050, offering an export opportunity to Scotland 's supply chain which is estimated at around £550 million per annum by 2050.

The expertise gained through over 40 years of experience gained from oil and gas sector operations in Scottish waters, means Scotland is well placed to capitalise on this opportunity, and this is expanded upon further in the *Innovation* section of this document. We have an abundance of offshore skills and the capabilities necessary to manufacture specialised components such as moorings, chains and anchors.

As we transition to a net zero economy, it will be increasingly important that these skills can be seamlessly transferred to our growing renewables sector – retaining, and growing, the economic value of our energy industry. However, taking full advantage of the floating wind opportunity will – as well as a more targeted and effective approach through the CfD – require significant investment in critical infrastructure such as fabrication yards, ports and harbours.

The economic benefit of this technology will arise from achieving early mover advantage. This means that the Scottish supply chain must be fully prepared, with the capability and capacity required to deliver floating offshore wind at commercial scale and this also requires action on the part of UK Ministers to provide a commercially attractive environment for the sector to flourish here and to capture the market lead.

International Opportunity

Scotland's Energy Strategy[9] sets out internationalisation as a key area, and one that will contribute to sustainable economic growth as we transition to a net zero economy.

Offshore wind has rapidly become one of the UK's lowest cost renewable sources at scale, and the resulting international market for this technology is growing at an unparalleled pace. In 2018, the global offshore wind industry installed over 5.6 GW of capacity, whilst the global development pipeline (as of 31 December 2018) was 272 GW[10].

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[8]Macroeconomic Benefits of Floating Offshore Wind - http://www.crownestatescotland.com/maps-and-publications/download/219, accessed 29 October 2019

[9] https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/pages/0/

[10]2018 Offshore Wind Market Report, https://www.energy.gov/eere/wind/downloads/2018-offshore-wind-market-report, accessed 29 October 2019

We are world leaders in offshore wind innovation, and our oil and gas expertise means that we are as well placed as any country to address the engineering and manufacturing challenges presented by offshore wind and to remain at the forefront of floating wind technology

Scotland has already established strong collaborative relationships with California and New Jersey in the USA. Both of these states, are seeking to rapidly build out large scale offshore wind projects. However, due to gaps in the existing domestic supply chain more established Scottish companies through expertise in subsea engineering, environmental planning, consenting and project management can help achieve those ambitions.

The Scottish Government, along with our Enterprise Agencies, will continue to engage with international partners – strengthening existing relationships and seeking out new opportunities for our offshore wind industry to flourish in the global market.

Consultation Questions

13. **What areas of the Scottish supply chain do we excel at, and what could we do better?**

14. **Where are the new areas that Scotland can develop and exploit a competitive supply chain advantage?**

15. **What are the main challenges a company faces when tendering for a contract?**

16. **Subject to procurement law, what more should government and its agencies do to assist the supply chain secure contracts?**

Economic Opportunity – Skills

As we continue the transition to a low carbon economy and net-zero greenhouse gas emissions by 2045, the need for a skilled workforce is more important than ever.

With a history of oil and gas expertise in Scotland, and building on our existing onshore and offshore wind supply chains, we are uniquely placed to build on these existing skills, and provide skilled professionals to meet the increasing demands of the growing offshore wind industry, from planning through to development and, ultimately, operations and maintenance (O&M).

Through our STEM Strategy and our STEM Hub Partnerships, we are working with industry specialists to continue to inspire talented individuals from all backgrounds, including school leavers and career changers, and to promote the Scottish Offshore wind sector as an attractive industry for a future career.

Our current and future skills landscape must be able to incorporate the varying job requirements of the sector, across the supply chain, from leadership and management, project management and technical roles, project development and planning through to manufacture, construction and O&M. We must also continue to consider the export value that can be derived for the Scottish supply chain arising from exploiting our uniquely placed skills and established business networks in other countries.

The Scottish Government is fully committed to ensuring that our workforce remains ready for the skills demands of the industry, and has in recent years granted £460,000 to Energy Skills Partnership to provide valuable technology and expertise for college courses across the country. This has been used to establish relevant courses, with a high level of graduate employment creating demand for more.

The Scottish supply chain must be able to provide companies with access to the skills required to develop projects now, and as we look towards the future. To fully understand this, the industry must be able to indicate estimated job requirements to allow our skills capacity and capability to be fully prepared.

Scotland's clusters, DeepWind and Forth & Tay, will remain crucial forums for industry to collaborate and communicate in locations where the current demand for skilled offshore wind jobs is at its highest. Further to this, SOWEC is working to understand the anticipated demand for skills in Scotland, which will allow us to ensure that the skills supply is in place in line with industry demand.

By improving our understanding of job demand, our skills sector will be able to react appropriately and comprehensively to industry requirements – ensuring maximum benefit to Scotland's economy, especially in coastal and rural areas, where viable employment is crucial to the local communities.

We know that we must continue to increase gender diversity and BAME representation throughout the sector, and recognise the challenges in recruitment, and we are ensuring through SOWEC that our ambitions are in line with UK Sector Deal Targets.

Schools must lead by example to educate children on the vast array of jobs included within the sector, ensuring that children from all backgrounds consider offshore wind as a viable career option. Industry must also recognise these targets and ensure they are considered within their recruitment processes.

The Scottish Government and SOWEC will continue to engage with the UK Investment in Talent Group to ensure that Scotland's unique skills system is recognised and reflected when developing skills interventions intended for use across the UK.

Consultation Questions

17. **What are the key skills issues and gaps facing the sector over the coming years, in the short and medium term?**

18. **What more should government and the sector do to build on the progress made in recent years?**

19. **What can Scotland learn from the approach taken in other countries around the world in this area? Are there examples of best practice you can share?**

Innovation and Cost Reduction

Scotland's Energy Strategy set out a commitment to continue our support for offshore wind innovation in Scotland. Since then, we have committed up to £4 million in this area, including £2 million in 2019/20 aimed specifically at reducing costs in the floating wind sector.

Cost Reduction

Innovation is a key priority in achieving sustainable growth. Scotland is already a world renowned hub for innovation in offshore wind. We are home to the world's first floating offshore wind farm, Equinor's 30 MW Hywind Scotland, with a second, the 50 MW Kincardine project, currently under construction.

The most powerful turbines in commercial operation in the world are located in waters off Aberdeen, at Vattenfall's 93 MW European Offshore Wind Deployment Centre. The site demonstrates innovative foundations such as suction buckets – one of which was installed in a record breaking two hours and forty minutes.

The developments referred to above were made possible by unique legislation and support introduced by the Scottish Government in 2013. These changes supported offshore wind test and demonstration sites deploying innovative, new to market turbines, and pilot projects consisting of non-fixed turbines.

The legislation in question, which enabled Scotland to use Renewable Obligation Certificates to deliver demonstration projects, has since been closed by the UK Government. The higher costs of floating wind mean that without similar intervention or additional support (e.g. through changes to the successor CfD mechanism), this technology is unlikely to develop at the rate or scale required to retain early mover advantages and to exploit supply chain growth opportunities. A recent report by Strathclyde University[11] underlines Scotland's lead, but also the challenges facing the sector.

The Offshore Wind Sector Deal includes commitments from industry to support grid transformation, co-fund investment into research and development alongside UK Government, and to drive innovation in the UK supply chain. Scotland's potential – for floating offshore wind in particular (see below) – depends on these ambitions being delivered successfully.

Floating Offshore Wind

Floating wind pilot projects and test and demonstration sites are beginning to grow across the world. Indeed, Scotland has led the way here, hosting the first such project, Hywind Scotland, near Peterhead. Floating wind's ability to become cost competitive with fixed bottom structures will require continued effort and innovation.

[11] https://www.strath.ac.uk/humanities/centreforenergypolicy/energyblog/offshorewindreadytofloat/

Scotland's unique deep water profile and high, consistent wind resource means that our waters are ideally suited to floating wind. The Committee on Climate Change (CCC) report in May 2019[12], which includes a scenario requiring 75 GW of offshore wind in UK waters by 2050 to achieve net zero, suggests that we are likely to need floating wind in our energy system earlier than previously anticipated.

The Oil and Gas industry drive to decarbonise production, via Oil and Gas UK's 'Route Map 2035', seeks to eliminate more than 15 MtCO2e of emissions associated. The sector is looking closely at Equinor's Project Tampen, which will deploy 11 floating turbines to decarbonise the production of two adjacent oil and gas fields. The drive to make the UKCS the World's first 'net zero basin' by 2035 offers potential to drive new investment into floating wind innovation in Scotland's waters.

Scotland's Programme for Government 2019[13] announced Scottish Government funding of £1 million for the Floating Wind Technology Acceleration Competition, in partnership with Carbon Trust. This will invite companies to propose innovative solutions to some of the key technical challenges facing the sector.

The Scottish Government is also funding OREC to deliver a number of floating wind focused projects, such as the recently announced Scottish Floating Centre of Excellence. The Centre will bring together industry, Governments and academia to host a range of projects, including innovation challenges, to maximise the economic benefit of floating wind to Scotland and we understand it to be attracting strong industry interest.

Fixed Offshore Wind

Fixed-bottom offshore wind has seen incredible cost reduction in recent years, and increase in turbine sizes – helped in part by Scottish Government support for the Carbon Trust Offshore Wind Accelerator programme. This underlines the effectiveness of strategic government intervention during a time when the sector was less mature.

However, scope for innovation in fixed offshore wind remains, particularly in key areas such as turbines, operations and maintenance – balancing the development potential alongside the needs of the marine environment and other users of the sea.

Although Sectoral Marine Plans will seek only to identify sites suitable for projects with a generating capacity greater than 100 MW, the Scottish Government remains committed to considering opportunities for local, small-scale and innovative offshore wind development within Scottish waters. We recommend early and proactive engagement with Crown Estate Scotland, Marine Scotland and other stakeholders (as appropriate) to discuss any such development proposals.

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[12] https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf

[13] https://www.gov.scot/binaries/content/documents/govscot/publications/publication/2019/09/protecting-scotlands-future-governments-programme-scotland-2019-20/documents/governments-programme-scotland-2019-20/governments-programme-scotland-2019-20/govscot%3Adocument/governments-programme-scotland-2019-20.pdf

Future rounds of offshore wind development also present the opportunity to explore options for 'hybrid projects' – i.e. sharing transmission infrastructure and assets between projects. This approach may offer potential cost and space savings, as well as potential reductions in environmental impacts.

However, there are legal and regulatory barriers that would need to be addressed prior to deployment.[14] We would encourage developers to consider this approach early in their project planning stages, and discuss with Marine Scotland and other developers and operators as early as possible.

Synergies with other Sectors

Hydrogen

Developers are becoming increasingly interested in the concept of using electricity generated from offshore wind resources to produce **large scale green hydrogen** via electrolysis. This technology is also referred to as 'power-to-gas'.

We are assessing our policy response to this opportunity as part of a wider hydrogen assessment project, which will inform the publication of a Hydrogen Action Plan for Scotland during 2020.

Oil and Gas

Our oil and gas industry and heritage can provide much of the expertise and skills to support our transition to a different energy future. Scotland's oil and gas sector has 40 years' experience of operating in the North Sea, and possesses vital subsea skills which can help overcome the engineering and innovation challenges presented by the move to a low carbon future.

For example, Scotland's oil and gas industry has developed a cluster of companies with world class expertise in underwater engineering – approximately half of the subsea installations in the world today are in the North Sea, a strength that can be developed even further. Scotland has the necessary competitive advantage and the building blocks – a skilled, committed workforce, excellent port infrastructure and a strong innovation hub.

The sector also has extensive experience in heavy steel and concrete fabrication, the movement and placing of large structures on the sea bed, sub-sea engineering, trenching and cabling, marinisation of offshore plant and working in a hazardous environment within health and safety (HSE) guidelines. It also has access to onshore infrastructure which could be shared – including general service vessels, jack-up rigs and accommodation vessels, as well as geophysical survey kit and sea trenching plant.

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[14] See further, Roland Berger GmbH, *Hybrid Projects: How to reduce costs and space of offshore developments (North Seas Offshore Energy Clusters Study)* (December 2018). Available at: https://publications.europa.eu/en/publication-detail/-/publication/59165f6d-802e-11e9-9f05-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=37085&WT.ria_f=3608&WT.ria_ev=search (Last accessed: 17/09/2019)

The sector's considerable experience in the operation and maintenance of offshore structures, both above and below the sea surface, is also valuable. There is vast specialist knowledge in such matters as corrosion protection, remote monitoring, transfer and support of personnel, mitigation of adverse weather and sea conditions, and diving operations.

The sector has huge experience of managing large complex projects, surmounting planning and consenting hurdles, undertaking environmental audits and site assessments, managing logistics, training and so on. There are experts in business models and operational methods, reliability and availability enhancement, contractual arrangements, compliance procedures, safety management, cost and pricing structures, funding mechanisms, etc. which could be utilised for the continued development and growth of offshore wind.

There is also scope to reduce the offshore wind sector's development and operational costs. The oil and gas sector has made great progress in managing costs and improving efficiencies, and its experience could benefit the offshore wind sector in terms of managing costs and delivery of considerable project benefits.

As the floating wind example demonstrates, the energy transition also creates opportunities to more closely connect all forms of offshore energy production. The Oil and Gas Authority (OGA) has started an Energy Integration Project to explore the potential for a more integrated offshore energy sector, including innovative and closer links between oil and gas production and offshore renewables. This encompasses offshore hydrogen production and transportation, as well as carbon capture, transport and storage.

Consultation Questions

20. **What can the Scottish Government most usefully and feasibly do to build on the innovation support previously and currently available?**

21. **How can we support technologies and developments which reach a viable stage between leasing rounds and CfD auctions?**

22. **Where respondents believe that scope remains for innovation in fixed offshore wind, what areas should be prioritised?**

23. **What actions should be taken to address the key challenges facing the uptake of commercial scale floating in Scotland?**

24. **What can be done, on the part of government and / or others, to strengthen and benefit from the synergies with a) hydrogen and b) the oil and gas sector?**

Responding to this Consultation
We are inviting responses to this consultation by 25 March 2019.

Please respond to this consultation using the Scottish Government's consultation hub, Citizen Space (http://consult.gov.scot). Access and respond to this consultation online at https://consult.gov.scot/energy-and-climate-change-directorate/draft-offshore-wind-policy-statement/. You can save and return to your responses while the consultation is still open. Please ensure that consultation responses are submitted before the closing date of 25 March 2020.

If you are unable to respond using our consultation hub, please complete the Respondent Information Form to:

Large Scale Renewables
Scottish Government
4th Floor, 5 Atlantic Quay
150 Broomielaw
Glasgow, G1 4PD

Handling your response
If you respond using the consultation hub, you will be directed to the About You page before submitting your response. Please indicate how you wish your response to be handled and, in particular, whether you are content for your response to published. If you ask for your response not to be published, we will regard it as confidential, and we will treat it accordingly.

All respondents should be aware that the Scottish Government is subject to the provisions of the Freedom of Information (Scotland) Act 2002 and would therefore have to consider any request made to it under the Act for information relating to responses made to this consultation exercise.

If you are unable to respond via Citizen Space, please complete and return the Respondent Information Form included in this document.

To find out how we handle your personal data, please see our privacy policy: https://beta.gov.scot/privacy/

Next steps in the process
Where respondents have given permission for their response to be made public, and after we have checked that they contain no potentially defamatory material, responses will be made available to the public at http://consult.gov.scot. If you use the consultation hub to respond, you will receive a copy of your response via email.

Following the closing date, all responses will be analysed and considered along with any other available evidence to help us. Responses will be published where we have been given permission to do so. An analysis report will also be made available.

Comments and complaints
If you have any comments about how this consultation exercise has been conducted, please send them to the contact address above or at OffshoreWindPolicy@gov.scot.

Scottish Government consultation process
Consultation is an essential part of the policymaking process. It gives us the opportunity to consider your opinion and expertise on a proposed area of work.

You can find all our consultations online: http://consult.gov.scot. Each consultation details the issues under consideration, as well as a way for you to give us your views, either online, by email or by post.

Responses will be analysed and used as part of the decision making process, along with a range of other available information and evidence. We will publish a report of this analysis for every consultation. Depending on the nature of the consultation exercise the responses received may:

- indicate the need for policy development or review
- inform the development of a particular policy
- help decisions to be made between alternative policy proposals
- be used to finalise legislation before it is implemented

While details of particular circumstances described in a response to a consultation exercise may usefully inform the policy process, consultation exercises cannot address individual concerns and comments, which should be directed to the relevant public body.

Scottish Government
Riaghaltas na h-Alba
gov.scot

Draft Offshore Wind Policy Statement

RESPONDENT INFORMATION FORM

Please Note this form **must** be completed and returned with your response.

To find out how we handle your personal data, please see our privacy policy: https://beta.gov.scot/privacy/

Are you responding as an individual or an organisation?

☐ Individual

☐ Organisation

Full name or organisation's name

Phone number

Address

Postcode

Email

The Scottish Government would like your permission to publish your consultation response. Please indicate your publishing preference:

☐ Publish response with name

☐ Publish response only (without name)

☐ Do not publish response

Information for organisations:

The option 'Publish response only (without name)' is available for individual respondents only. If this option is selected, the organisation name will still be published.

If you choose the option 'Do not publish response', your organisation name may still be listed as having responded to the consultation in, for example, the analysis report.

We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Scottish Government to contact you again in relation to this consultation exercise?

☐ Yes

☐ No

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Any enquiries regarding this publication should be sent to us at

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