

Draft Onshore Wind Policy Statement Refresh: Analysis of Responses to Consultation

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Introduction 1

 Background..... 1

 Respondent Profile 1

 Methodology 2

Chapter 1: Current Position 4

Chapter 2: Future Position and Net Zero..... 18

Chapter 3: Barriers to Deployment: Technical and Reserved Matters 27

Chapter 4: Barriers to Deployment: Environmental Factors 35

Chapter 5: Economic Opportunities..... 49

Annex 1: Eskdalemuir Working Group and Policy Proposals..... 66

Annex 2: Aviation and Renewables Collaboration Board 73

 Additional comments 77

Appendix 1: Respondent Organisations 78

Appendix 2..... 82

Introduction

Background

1. Scotland has one of the most ambitious climate targets in the world, with its Climate Change Bill setting out a legally binding target of reaching net-zero emissions by 2045. By 2030, Scottish Ministers want renewable energy generation to account for 50% of energy demand across electricity, heat and transport. Renewable energy is one of the best tools Scotland has to combat climate change, alongside other low carbon energy solutions; these will provide the basis of Scotland's future energy resource and contribute to meeting emissions reduction targets. In 2020, renewables accounted for 98.6% of Scotland's electricity, mostly from wind power. Onshore wind is the biggest single technology within the renewables sector, although other technologies include offshore wind, hydro and solar.
2. Onshore wind is one of the most cost-effective approaches to renewable technology and thus is an integral element of the renewables sector, which, according to [recent statistic updates from Scottish Government](#), accounts for around 60% of capacity. Moving forward, there is also significant additional capacity in onshore wind developments across Scotland, with many projects either currently in planning or already consented. Closure of the Renewables Obligation in 2015 and lack of Pot 1 auction in the Contracts for Difference (CfD) process has had significant impact on the scale of onshore wind projects delivered in recent years. However, the UK government decision to reopen Pot 1 from AR4 onwards is a positive step towards enabling effective competition for projects and reduced costs to consumers.
3. In December 2017, the Scottish Government (SG) published its Onshore Wind Policy Statement, setting out its ambitions for the future of onshore wind in Scotland. Given the recent commitment to net-zero by 2045, the SG has recently drafted an updated Onshore Wind Policy Statement which reflects net-zero ambitions.
4. In October 2021, a consultation was launched to gather views on the draft Onshore Wind Policy Statement. Findings will be used to help the SG better understand public views on the role of onshore wind in contributing to the net-zero target and how economic opportunity can be maximised while also protecting Scotland's natural heritage.

Respondent Profile

5. In total, there were 160 responses to the consultation, of which 111 were from organisations and 49 from individuals. Respondents were assigned to respondent groupings to enable analysis of any differences or

commonalities across or within the various different types of organisations and individuals that responded. Table 1 below shows the number of respondents in each organisational category.

Table 1: Respondent Groups

	Number
Acoustics	3
Aviation Specialists	5
Communities	18
Government funded bodies and regulators	7
Legal	2
Lobby and interest groups	13
Local authorities & planners	14
Renewable Energy	43
Third sector (e.g. Charities and other NGOs)	2
Other	4
Total organisations	111
Individuals	49
Total respondents	160

6. A list of all those organisations that submitted a response to the consultation and agreed to have their name published is included in Appendix 1.

Methodology

7. Responses to the consultation were submitted using the Scottish Government consultation platform Citizen Space, or by email.
8. It should be borne in mind that the number responding at each question is not always the same as the number presented in the respondent group table. This is because not all respondents addressed all questions. This report indicates the number of respondents who commented at each question.
9. The researchers examined all comments made by respondents and noted the range of issues mentioned in responses, including reasons for

opinions, specific examples or explanations, alternative suggestions or other comments. Grouping these issues together into similar themes allowed the researchers to identify whether any particular theme was specific to any particular respondent group or groups.

10. Throughout the report, when referring to respondents who made particular comments, the terms 'a small number', 'a few' and so on have been used. While the analysis was qualitative in nature, as a very general rule of thumb it can be assumed that: 'a very small number' indicates around 2-3 respondents, 'a small number' indicates around 4-6 respondents; 'a few' indicates around 7 to 9; and 'some' indicates 10 or more but fewer than half of those who commented at any question. Where larger numbers of respondents are referred to, a 'significant minority' represents 10-25% of respondents, a 'large minority' is denoted by 25-50% of respondents, and 50%+ is 'a majority'.
11. When considering group differences however, it must also be recognised that where a specific opinion has been identified in relation to a particular group or groups, this does not indicate that other groups did not share this opinion, but rather that they simply did not comment on that particular point.
12. While the consultation gave all who wished to comment an opportunity to do so, given the self-selecting nature of this type of exercise, any figures quoted here cannot be extrapolated to a wider population outwith the respondent sample.

Chapter 1: Current Position

When referring to respondents who made particular comments, the terms ‘a small number’, ‘a few’ and so on have been used. While the analysis was qualitative in nature, as a very general rule of thumb it can be assumed that: ‘a very small number’ indicates around 2-3 respondents, ‘a small number’ indicates around 4-6 respondents; ‘a few’ indicates around 7 to 9; and ‘some’ indicates 10 or more but fewer than half of those who commented at any question. Where larger numbers of respondents are referred to, a ‘significant minority’ is 10-25% of respondents, a ‘large minority’ is denoted by 25-50% of respondents, and 50%+ is ‘a majority’.

- 1.1. The consultation paper noted that the Scottish Government (SG) expects the next decade to see a substantial increase in demand for electricity to support net-zero delivery across all sectors, including heat, transport and industrial processes. At present, there is 8.4GW of installed onshore capacity in Scotland, which provides 19.5GWh of total electricity generation in 2020. Scotland hosts the majority of operational onshore wind capacity in the UK and intends to increase this further.
- 1.2. Preparation of Scotland’s fourth National Planning Framework (NPF4) is currently underway. This will incorporate Scottish Planning Policy (SPP) which contains detailed national policy on a number of planning topics. For the first time, spatial and thematic planning policies will be addressed in one place. NPF4 will have a stronger role in informing day to day decision making.
- 1.3. In collaboration with renewable energy developers and local communities, the Scottish Government published [Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments](#) and [Shared Ownership of Onshore Renewable Energy Developments](#). This promotes the provision of community benefits at a national level equivalent to £5,000 per installed megawatt per annum, index linked for the operational lifetime of the project. The renewables industry is encouraged to consider, explore and offer shared ownership opportunities on all new renewable energy projects.
- 1.4. Scotland’s onshore wind industry has proved capable of delivering wind farms using alternative mechanisms including the use of Power Purchase Agreements (PPAs), merchant projects and the use of private finance. However, the SG is of the view that the investment cost and risk facing many of the projects and capacity which are needed require a revenue stabilisation mechanism. The proposed reintroduction of established technologies to Pot 1 of the Contracts for Difference (CfD) auction

process is welcomed, although it is believed that access to a wide range of financial mechanisms will be necessary.

1.5. The first question asked:

Q1: Does this chapter provide a fair reflection of the current situation faced by Scotland's onshore wind industry?

Summary (Q1)

- Opinions were very split as to whether chapter 1 provided a fair reflection of the current situation; slightly greater numbers of respondents disagreed than agreed.
- Onshore wind was generally thought to have a crucial part to play in increased power generation, with hopes that this would be reflected in the draft National Planning Framework (NPF4).
- Concerns were voiced that there needs to be more on the role of planning, and in particular about the compatibility of the NPF4 with the draft OnWPS.
- Other problems raised concerned the electricity grid, the financing of projects, and a lack of support for community owned energy schemes.
- Criticisms were levelled concerning the lack of mention of the adverse impacts of onshore wind farms and that other ways of meeting climate change goals were being ignored.

1.6. A total of 101 respondents answered the first part of this question. As shown overleaf, **opinions were very split as to whether chapter 1 provided a fair reflection of the current situation**; slightly greater numbers of respondents disagreed than agreed. There was almost a 50:50 divide within the renewable energy group of respondents.

Q1	Number					
	Strongly agree	Mostly agree	Neither agree nor disagree	Mostly disagree	Strongly disagree	No response
Acoustics (3)	-	-	1	-	1	1
Aviation specialist (5)	-	-	-	-	-	5
Communities (18)	1	1	1	4	1	10
Governmental funded bodies & regulators (7)	-	3	-	-	1	3
Legal (2)	-	-	-	-	-	2
Lobby and interest groups (13)	-	2	1	2	1	7
Local authorities & planners (14)	2	7	-	-	1	4
Renewable Energy (43)	3	12	-	12	4	12
Third sector (e.g. Charities and other NGOs) (2)	-	-	-	-	2	-
Other (4)	-	1	-	-	-	3
Total organisations (111)	6	26	3	18	11	47
Individuals (49)	2	10	4	11	10	12
Total respondents (160)	8	36	7	29	21	59

1.7. A total of 123 respondents went on to give reasons for their answer or to make further comments at this question.

1.8. The main key themes emerging from respondents agreeing that the chapter provided a fair reflection were that **onshore wind will have a crucial part to play in increased power generation, with hopes that this would be reflected in the draft National Planning Framework (NPF4).**

1.9. Larger numbers of respondents pinpointed areas of disagreement; a large minority, mostly consisting of renewable energy organisations, thought that there needed to be **more on the role of planning.** Comments indicated the need for this to be efficient, with complaints about a lengthy consent process (with an average of 7 years quoted), too

many rejections of developments because of visual or landscape impacts, cuts to planning department budgets, a lack of engagement with the process by key consultees and the high cost of application fees.

Concerns about the content of the NPF4 were expressed by similar numbers of respondents, again consisting mostly of renewable energy organisations; issues raised were a perceived lack of compatibility with the draft OnWPS, lack of a supportive policy for enabling targets, and the absence of a requirement to develop spatial frameworks.

- 1.10. **Issues were raised regarding the electricity grid** by significant numbers of mainly renewable energy organisations; investment in grid infrastructure was perceived to be needed, with problems cited about grid constraints, obtaining grid connections for developments, and in particular grid transmission charging having a significant impact on wind farm operating costs.
- 1.11. Similar numbers of these mainly renewable energy respondents cited **pressures regarding the financing of projects**, with some concerned about a hiatus in financial support mechanisms, with the use of Power Purchase agreements (PPAs) perceived as being only a limited fix for this. Smaller but still significant numbers of mainly renewable energy respondents cited other barriers preventing developments including MoD and aviation-related constraints (such as time taken to discharge technical planning conditions such as aviation lighting and surveillance capabilities), and the best sites for wind farms already having been developed.
- 1.12. Significant minorities consisting mainly of communities' organisations and individuals were **concerned about the lack of mention or support for community ownership or shared ownership energy schemes**, citing the CfD scheme excluding projects of less than 5MW, and the Feed-in-Tariff (FiT) and Renewables Obligation (RO) schemes having been closed to new applicants. Similar numbers **disagreed with the statement about communities being central to developments at 1.4**, complaining about a lack of consultation with, and benefits for, communities local to wind farms, with mentions of a lack of regard for residents, the planning system being biased towards developers and applications creating hostility within and between communities. A few respondents noted adverse effects on rural communities e.g. by way of reduced tourism.
- 1.13. A significant minority, almost entirely consisting of renewable energy industry respondents, said the **chapter painted too positive a picture without sufficient room given to the challenges facing the industry**; doubts were expressed, again mainly by renewable energy organisations,

as to whether the onshore wind (addition of 12GW by 2030) or net-zero carbon (by 2045) targets will be met amid concerns that the scale of the challenge has been underestimated.

1.14. A **lack of mention of the adverse impacts of onshore wind farms** was cited by a large minority of respondents from a broad mix of sub-groups; these included noise (a clear statement was requested about the status of ETSU-R-97 noise assessments), visual, landscape, cultural heritage, and environmental issues (specifically the removal of peat and protection requirements for flora and fauna).

1.15. Finally, significant numbers of mainly individuals and lobby and interest groups thought there was **too much bias in favour of onshore wind and that other ways of meeting climate change targets were being ignored**, with suggestions for an overall strategy incorporating onshore wind, offshore wind, tidal, wave, hydro, battery storage, green hydrogen and energy saving methods. Slightly smaller numbers of individuals, lobby and interest groups and communities organisations, advocated a halt to expanding wind farm capacity, noting scepticism as to onshore wind farm benefits or recommending offshore wind as being a more reliable source of energy. Concerns were also expressed about increasing power costs to consumers.

1.16. Question 2 of the consultation then asked:

Q2: How can the maximum number of developments be enabled to build-out without finance acting as a barrier?

Summary (Q2)

- Instigation of shorter or more streamlined planning and consenting processes for developments was the key theme.
- Ensuring that policies impacting upon projects do not undermine their financial viability was also a concern, in particular perceived outdated limitations on the use of larger turbines which can generate more electricity.
- A further issue identified was costs and constraints on development incurred from requirements for grid reinforcement works to increase capacity, connections and access.
- An important enabler was deemed to be more financing of community energy developments including shared ownership.
- The reintroduction of CfD auction rounds was welcomed.

- 1.17. A total of 104 respondents made comments at this question. The most often quoted theme was **instigating a shorter or more streamlined planning process for developments**, as stated by a large minority of respondents, almost all of whom were renewable energy organisations. Requests included adjusting the planning system balance to address climate change rather than visual impact, solving planning department resource issues and a renewed focus on the content of NPF4. Concerns were also noted about the **need to take technological developments into account and the perceived restrictiveness of Landscape Capacity and Sensitivity Studies**. The need for a **shorter consenting process** or **increasing the time length of consents** were also cited as a means to increase developers' confidence. A specific issue also raised by these respondents was that of perceived **outdated limitations on the use of longer or larger turbines which can generate more electricity**, given that the technology is constantly evolving such that the production of turbines of less than 180m is being discontinued.
- 1.18. More generally, there was a desire by a large minority, again dominated by renewable energy organisations, to **ensure that policies impacting upon projects do not undermine their financial viability**, with references to a lack of policy clarity and consistency and rising regulatory costs relating to public local inquiries, appeals and planning fees.
- 1.19. A large minority, including many communities' groups and renewable energy organisations, cited a **need for more financing of community energy developments including shared ownership**. Support from the Community and Renewable Energy Scheme (CARES) and the Energy Investment Fund was regarded as insufficient, and developments were regarded as less attractive with the ending of the FiT scheme. Advantages from these schemes were pointed out including community empowerment and Just Transition enablement. Ideas for financing were put forward including a Community Energy subsidy, capital grants, low interest loans and support from the Scottish National Investment Bank (SNIB). A significant number of mainly renewable energy organisations did however welcome the reintroduction of CfD auction rounds as a reliable route to the overall onshore market, with requests for more frequent rounds and onshore wind to be included in 'Pot 1' of the process. Suggestions for rebalancing the CfD process to support the UK supply chain, increased deployment caps and lengthened deployment windows were also made.
- 1.20. A significant minority from a broad range of respondents commented on the **negative effects of costs and constraints on development incurred from requirements for grid reinforcement works to increase**

capacity, connections and access; many of the same respondents urged a change to network charges, citing high Transmission Network Use of System (TNUoS) charges making projects unviable and noting these are lower in England putting Scottish projects at a competitive disadvantage.

1.21. A few respondents from a broad range of respondent sub-groups made the following points:

- Scotland lacks powers over financial support mechanisms or to regulate electricity markets.
- Development costs (e.g. fabrication, installation) are declining, making investment more effective, with suggestions that better collaboration between developers, agencies and planning authorities can help reduce these further.
- Other suggestions of financial support for onshore wind included tax incentives, a National Energy company, Scottish Government funding, enterprise company loans and community bond or share schemes; albeit other respondents saw funding capital as being readily available with the prime need being for economically viable projects.
- A perceived need for a revenue stabilising mechanism, with energy price fluctuations seen as a disincentive to investment.

1.22. Small numbers of mainly individuals and lobby and interest groups thought there should be no need for further financial support and that the industry should stand on its own merits.

1.23. There were also reiterations of views, mostly from individuals, against the expansion of onshore wind, urging attention to be paid to the opinions of communities, and perceiving a need for a whole energy system approach.

1.24. The next question, which was in two parts, asked:

Q3: Can more be done to support the use of PPAs/Private Sector Finance? Is there a need for more policy signals from SG, and/or UKG, to provide investment security/surety?

Summary (Q3)

- The largest numbers of respondents agreed that more can be done to support the use of PPAs or private sector finance. Support for project competitiveness was the main action proposed. It was however noted that PPAs can be an additional route to market, but the viability of long term PPAs decreases with both increasing project cost and increasing penetration of renewables.

- A number of adjustments were recommended including corporate PPAs or direct PPAs from the Scottish Government or public bodies.
- Policy signals recommended were a need to involve or streamline the planning system, a need to help community owned or shared ownership projects, reductions in grid charging and improved ease of obtaining grid connections and widening PPA opportunities.

1.25. A total of 84 respondents answered the first part of this question, with the **largest proportion agreeing that more can be done to support the use of Power Purchase Agreements or Private Sector Finance, or that there is a need for more policy signals from the Scottish and UK Governments**, albeit with nearly as many answering ‘don’t know’. Renewable energy respondents who responded were almost unanimously in favour.

Q3	Number			
	Yes	No	Don't know	No response
Acoustics (3)	-	-	2	1
Aviation specialist (5)	-	-	-	5
Communities (18)	1	1	6	10
Governmental funded bodies & regulators (7)	1	-	-	6
Legal (2)	-	-	-	2
Lobby and interest groups (13)	1	2	-	10
Local authorities & planners (14)	2	-	10	2
Renewable Energy (43)	20	2	1	20
Third sector (e.g. Charities and other NGOs) (2)	-	-	-	2
Other (4)	2	-	-	2
Total organisations (111)	27	5	19	60
Individuals (49)	10	12	11	16
Total respondents (160)	37	17	30	76

1.26. Sixty-five respondents proceeded to elaborate on actions to support the use of PPAs or Private Sector Finance; the greatest number of these

responses – a large minority consisting of mainly renewable energy respondents – cited **support for project competitiveness, in particular ensuring that policies impacting upon projects do not build in unnecessary costs**. In a related point again made mainly by renewable energy organisations, it was noted that PPAs can be an additional route to market but the viability of long term PPAs decreases with both increasing project cost and increasing penetration of renewables.

1.27. Similar numbers of mainly renewable energy respondents said that Corporate PPAs can provide revenue stability, but several cited the caveat that **finding corporates in Scotland with sufficient long-term buying power and credit ratings to make these bankable was a problem**; a few respondents therefore suggested that the Scottish Government and/or public bodies with sufficient demand could commit to buying 100% renewable energy from Scottish projects through direct PPAs.

1.28. A significant minority of mainly renewable energy organisations suggested a number of other adjustments to, or broadening of, PPAs to support or increase their usage as follows:

- Encouraging the use of cross-border PPAs.
- The Scottish Government taking on an aggregator role whereby they bring together smaller corporates into a framework to increase the Corporate PPA market.
- A levelling up between mainland PPA or merchant schemes which may be viable and island PPA or merchant schemes which are not.
- Carrying out an investigation as to whether PPAs for domestic consumption are feasible at scale.
- Providing credit guarantees for corporate off-takers thereby increasing the pool of potential buyers that could enter into long term PPAs.

1.29. Small numbers of respondents particularly consisting of renewable energy and communities organisations suggested or reiterated other forms of (mainly financial) support as follows:

- Reductions in project development phase costs (e.g. planning delay costs, grid connection issues).
- Support for community wind projects, with suggestions that these need a specific financing scheme.
- Measures to mitigate revenue and pricing instability to help reduce risk.
- Advocating the CfD scheme as the best mode for delivery of developments, as the security for investors is not seen as matched by PPAs.

- The removal or alleviation of other financial barriers, particularly grid transmission charges and business rates.
- Other alternative financing suggestions including joint ventures by local authorities, private investors and crowdfunding, and Renewable Energy Guarantee of Origins (REGO).

1.30. A few comments were made by mostly individual respondents who disagreed with extra support for the use of PPAs or Private Sector Finance; most of these thought that developments should be self-financing or felt that the benefits go to foreign companies or landowners. A small number thought that little more support was needed as the PPA market was felt to be robust and competitive.

1.31. Forty-nine respondents made comments in response to the second part of the question regarding a need for more policy signals from the Scottish or UK Governments to provide security or surety; most of these reflected the same areas discussed at the first part of the question including a need to involve or streamline the planning system, a need to help community owned or shared ownership projects, reductions in grid charging and improved ease of obtaining grid connections and widening PPA opportunities. There were also a small number of comments urging more allowance for energy technology flexibility (e.g. encouraging the use of battery storage and hydrogen production technology by removing payment of constraint payments when wind farm operators are paid to switch off).

1.32. Small numbers of mainly individual respondents were against the need for more policy signals, perceiving generous help already being available in the form of subsidies or constraint payments. It is worth noting that both subsidies and constraint payments remain reserved to the UK Government.

1.33. Question 4 then went onto ask:

Q4: This section also underlines the Scottish Government's strong commitment to the role of community energy, and to community benefit and shared ownership. In what ways can we maximise the benefits of these policies as onshore wind development and repowering increases over the coming decade?

Summary (Q4)

- There was a broad desire for support to be given to community wind and local ownership of developments, and that renewable energy projects should benefit local communities, with requests to increase community

benefit funds and provide flexibility and variety in the use of community benefits.

- Among suggestions for helping to mobilise community or local wind farm ownership were increased community collaboration with developers and better access to expertise for communities.

1.34. A total of 119 respondents chose to respond to this question. An overarching theme expressed across all respondent sub-groups was a **broad desire for support to be given to community wind and local ownership of developments**. A majority of respondents sought encouragement for these with suggestions of providing incentives such as an increase in community benefits, more involvement from local authorities and suggestions that all new developments should be obliged to provide an opportunity for community ownership. There was also a consensus that **renewable energy projects should benefit local communities**, with a focus on alleviating fuel poverty and enabling a Just Transition. A few respondents stated that there was a need for an increase in commitment to the aforementioned aims generally.

1.35. Other **suggestions for helping to mobilise community or local wind farm ownership** were made by a large minority of respondents from across all sub-groups and these included the following:

- Adopting a collaborative approach between communities and developers (albeit it was noted that current FCA rules do not allow developers to promote opportunities).
- Adopting a statutory minimum percentage of any development to be in community ownership (as in Denmark).
- Provision of clear guidance or reviewing current Scottish Government guidance (e.g. provision of a community power 'toolkit').
- Easy access for communities to financial and professional support.
- Analysing other possible enablers such as alternative financing mechanisms (e.g. support from the Scottish National Investment Bank (SNIB), incorporating the supply of green hydrogen into developments, encouraging self-build, and use of the proposed Scottish Guaranteed minimum export rate).
- Supporting specified programmes which promote community energy (e.g. Local Energy Scotland (LES), Resource Efficient Scotland Small and Medium Enterprise Loan (RES SME loan), Low Carbon Infrastructure Transition Programme (LCITP), Energy Investment Funding (EIF/REIF), Community and Renewable Energy Scotland (CARES), and Scottish Enterprise assistance).

- 1.36. A small number of mainly renewable energy organisations and communities' organisations noted concern over the loss of FiTs as making growth in community energy projects more challenging. Similar numbers pinpointed CfD schemes as holding back community ownership expansion as these exclude projects of less than 5MW. A lobby and interest group wished to see *“a requirement in a CfD contract that community benefit payments and energy subsidies to the nearest residents are a mandatory requirement.”*
- 1.37. A large minority of respondents across all respondent types were in favour of **increased community support to enable more projects and community capacity building**. It was put forward that ongoing support to foster a legacy of employment and expertise would be advantageous though caution was also advised due to a lack of community skills or time to handle benefits within communities.
- 1.38. A large minority, again across all respondent types, requested **increases to, or full realisation of, community benefit funds**. £5000/MW or less was regarded as too little, as well as benefits claimed to be often falling short of those pledged, though there were also cautions that any increases would impact wind farm financial viability through increased costs or reduced revenue. There were also suggestions that community benefit funds need to be contractually bound and have better standards of governance.
- 1.39. **More flexibility by way of a variety of other forms of community benefits** were suggested by a large minority of respondents from across the sub-groups; these included community education, training, local infrastructure improvements, community endowments, meeting local economic and social needs, creation of community spaces, biodiversity / nature-related visitor centres, broadband connectivity and EV charging facilities. In particular there were a few mentions urging benefits to go to those who are most affected by wind farms in the form of free or subsidised power, and also ensuring community benefits via making planning permission decisions contingent (in part) on securing these.
- 1.40. A significant minority of mainly individual respondents were against community benefit funds, stating these can be viewed as “a bribe” for not opposing neighbouring wind farms, or a cause of divisiveness both within communities and between different community areas where wind farms straddle these.

1.41. A small number of mainly individual respondents noted increased opposition if communities feel overwhelmed by the number of developments in their area.

1.42. The final question in regarding the Current Position section of the consultation asked:

Q5: What more can be done to ensure that financial mechanisms are available to support development at differing scales?

Summary (Q5)

- Reiterating previous points, support for shared ownership of community energy was recommended as well as for small and medium-sized developments more generally, though larger schemes, being regarded as cost competitive, required more in the way of policy support rather than financial support.
- Subsidies were suggested as well as maintaining the Community and Renewable Energy Scheme and minimum power pricing amongst other mechanisms.

1.43. 80 respondents answered this question; in similar vein to the previous question the dominant theme noted (by a large minority of respondents from across all groupings) was **a need for support of shared ownership or community energy**; financial mechanisms were suggested including subsidies, maintaining the existing Community and Renewable Energy Scheme, EIF, local authority investments or PPAs and help with the governance of financing.

1.44. Suggestions for financial mechanisms were also made for **small or medium-sized developments more generally**; these included FiT certificates payments similar to the ROC scheme, minimum power pricing (e.g. obligatory buying of small-scale renewables at an administered price to compensate for lack of economies of scale), and a low interest or interest free loans scheme. A small number of requests were made for CfD to support smaller (<5MW) wind farms.

1.45. Regarding larger schemes, a very small number of mentions were made that policy support was needed rather than financial mechanisms, as these developments were regarded as cost competitive and already benefit from merchant and PPA finance opportunities. However, there were a few mentions of more frequent CfD auctions being needed for large scale or repowering projects.

1.46. Other financial mechanisms were recommended, each by small numbers of respondents, without pertaining to any particular type or size of development, as follows:

- Joint public / private investment (e.g. via a state energy company or in association with local authorities).
- Capital grants.
- Tax incentives (e.g. on capital expenditure, removal of VAT on renewables, supportive business rates).
- Risk reduction or underwriting support (e.g. government guarantees).
- Support provision from the Scottish National Investment Bank or a Scottish Renewable Energy Bank.
- A more holistic approach to focus financial mechanisms on other renewable energy sources where appropriate (e.g. hydro, battery storage).
- An area-based approach (e.g. City Region Deals or Regional Economic Partnerships).

1.47. Support to reduce costs was mentioned by a few respondents, including grid charges, grid upgrade and connection works, planning costs, radar mitigation costs and instrument flight procedure (IFP) assessment costs.

1.48. Other non-financial support measures were proposed by a significant minority of respondents across all groups, chief amongst which were long term pricing visibility and policy stability to provide certainty to invest in projects, and simplification of the planning regime.

1.49. A few individuals and communities' organisations were adamant that no more financial support or mechanisms should be needed as taxpayers already contribute an environmental subsidy.

Chapter 2: Future Position and Net Zero

When referring to respondents who made particular comments, the terms ‘a small number’, ‘a few’ and so on have been used. While the analysis was qualitative in nature, as a very general rule of thumb it can be assumed that: ‘a very small number’ indicates around 2-3 respondents, ‘a small number’ indicates around 4-6 respondents; ‘a few’ indicates around 7 to 9; and ‘some’ indicates 10 or more but fewer than half of those who commented at any question. Where larger numbers of respondents are referred to, a ‘significant minority’ is 10-25% of respondents, a ‘large minority’ is denoted by 25-50% of respondents, and 50%+ is ‘a majority’.

2.1. The consultation paper noted that the transition to net-zero means that demand for green electricity will increase substantially over the next decade. The UK currently has 14.1GW of installed onshore wind, with 8.4GW of this in Scotland. Scotland additionally has around 9.7GW of onshore wind currently in the pipeline, across 202 projects. The Scottish Government (SG) Climate Change Plan Update noted the need to develop 11-16GW of renewable capacity through to 2032. The Climate Change Committee (CCC) has additionally developed four exploratory scenarios for emissions to 2050. The SG is seeking views on an ambition for an additional 8-12GW of onshore wind to be installed in Scotland by 2030 to help meet the binding net zero commitment.

2.2. There were significant numbers of **concerns from the onshore wind industry that the currently consented 4.5GW or the 4GW in the planning system will not actually be developed**; reasons included a lack of financial routes to market, having to re-enter the consenting process as the original consent was under the Renewables Obligation scheme, and developments predicted as not being viable without the reintroduction of heavy subsidies like the RO or early CfD rates.

2.3. There are significant potential advantages to repowering which include the environmental benefits of re-using existing infrastructure together with maximising the generation of established sites. The consultation paper also noted that the views of the local community are important in the smooth transition of repowering proposals through the planning and consenting system.

2.4. Question 6 of the consultation asked:

Q6: What are your views on the installed onshore wind capacity that will be necessary over the coming decade, recognising the ambition Scottish Government have proposed for 8-12 GW? Please share any evidence.

Summary (Q6)

- General support was expressed for the target, though there was some disquiet over the use of the word 'ambition' as it could allow for backsliding.
- A need was seen for a more holistic approach to target setting in concert with other renewable energy forms, in particular offshore wind.
- Repowering existing onshore sites with larger and more efficient turbines was favoured in order that the task of realising the ambition is not undermined by the end of lives of currently operational wind farms.
- Planning system support and a quicker process for consents were reiterated as enablers.
- There were some concerns from the renewable energy industry that the currently consented 4.5GW or the 4GW in the planning system will not actually be developed because of a lack of viability or routes to market.

2.5. A total of 127 respondents chose to respond to this question. **General support from a large minority (including a large number of renewable energy respondents) was expressed in favour of the 8-12GW target**, with comments that it meets the levels of output defined by the Climate Change Committee (35GW), and recommended by RenewableUK in the [Onshore Wind Prospectus](#) (30GW). Furthermore, a significant minority of mostly renewable energy and communities' organisations continued on to say that this was a good starting point for more ambitious long term targets (e.g. beyond 2030). A significant minority mostly consisting of renewable energy organisations had **concerns over the use of the word 'ambition'**, thinking this might allow for backsliding or be a reason for projects to be refused; these respondents preferred a fuller commitment to the 12 GW target. At the same time similar numbers of respondents from across the sub-group spectrum expressed doubts that the targets can be met, with a few stating that the **share prescribed to onshore wind was unattainable**. A small number of mainly local authorities and planners were concerned to know how the targets were arrived at.

2.6. The largest numbers of respondents – a large minority with at least 25% of respondents from each of the communities, government funded, lobby and interest, local authority and planning and individuals sub-groups - saw a **need for a more holistic approach to target setting**, i.e. that there should be a joined-up approach between renewable energy solutions including solar, tidal, nuclear and community-owned renewables as well as electricity conservation measures; many of these respondents

wanted a **particular focus on offshore wind** which was regarded as having greater potential capacity having just sold 25GW of offshore sites.

- 2.7. **Repowering existing onshore sites with larger and more efficient turbines** was favoured by a significant minority of mainly renewable energy and local authority and planning respondents as a means of either ensuring that realisation of the ambition was not undermined by the problem of a number of currently operational wind farms coming to the end of their lives, or (as perceived by a small number of respondents across several sub-groups including two from the renewable energy industry) in itself making a large contribution towards the target. Several advantages were cited including fewer environmental impacts compared to new sites, little requirement to expand acreage or access roads and sites already having grid connections. There were however a few concerns that repowering alone will not sufficiently increase onshore capacity to meet the climate change targets, and that larger turbines need more space (such that some sites may not be appropriate) and an increase in grid connection capacity, as well as needing to go through the same planning process as new developments.
- 2.8. **Planning system support** was recommended by a large minority of mainly renewable energy respondents, especially in order to adapt to the use of longer turbine tip heights and to review the approach to assessing visual impacts and landscape capacity. A quicker process for consents (currently averaging 7 years) was urged, together with more resources for planning authorities.
- 2.9. On a related point, further potential detrimental impacts on the possibility of achieving the 8-12GW target were raised concerning the draft NPF4; implicit support was urged within this for onshore wind, with a disconnect with the OnWPS being identified. A need to ensure positive biodiversity effects within both documents was pinpointed, as well as the effectiveness of peatland management plans. The loss of the onshore wind spatial framework was regarded as a backward step.
- 2.10. Further issues were raised concerning attempts to increase the number of wind farm developments in order to achieve the 2030 target, mostly by a large minority comprising mainly local authorities and planners, individuals, communities' organisations and lobby and interest groups. These were as follows:
- Concerns over some areas becoming saturated with onshore wind farms (e.g. Aberdeenshire) with suggestions to try to locate more wind farms close to areas of high electricity consumption.
 - Concerns over choosing the best designs for the right sites.

- Concerns over the best sites already having been developed and there being not enough unconstrained land available to meet targets because of factors including aviation, MoD sites, grid access, environmental constraints, landscape, designated Wild Land areas and industrial use policy.
- Concerns over other detrimental impacts incurred by the presence of large numbers of wind farms and larger turbines, such as the destruction and exploitation of rural areas and communities, biodiversity and peatland impacts, and tourism impacts.
- Concerns about a lack of base load or back up power.
- Concerns over household affordability in terms of increasing energy charges.

2.11. A few respondents (mainly renewable energy and local authority and planning bodies) were of the opinion that much would depend on grid infrastructure investment in terms of transmission lines and connections.

2.12. A few communities' groups and individuals reiterated that there should be no more onshore wind developments, citing intermittency of energy, ruined landscapes and the benefits accruing to private investors despite public money input.

2.13. Several respondents including renewable energy, government funded, lobby and interest and local authority and planning bodies and individual respondents, referred to research, reports and other analysis within their answers. The Committee on Climate Change estimates of requirements was most regularly referred to by respondents; other references are listed in Appendix 2.

2.14. Question 7 then went on to ask:

Q7: What more can be done to capture the potential and value of hydrogen production from onshore wind and how best can we support the optimal integration of these technologies?

Summary (Q7)

- Support was expressed for hydrogen production in theory as a good use of excess power generation, albeit it was noted that hydrogen production technology still has a long way to develop.
- Recommendations for development were that it needs to be done at scale to be economic, be carried out close to demand centres, requires large scale storage and needs financial, planning and strategic support.

- Concerns were noted regarding the use of resources to produce green hydrogen, transportation and storage difficulties and costs of production; a focus on other already available energy storage solutions was mooted.

2.15. A total of 96 respondents answered this question. A large minority from all sub-groups were **supportive of hydrogen production in association with wind farms, at least in theory**, with some of these supportive of the Scottish Government's green renewable hydrogen target of 3GW by 2030. However, similar numbers of respondents, including many of the supportive respondents, noted that **hydrogen production technology still has a long way to develop**, with queries over its expense, whether this is feasible to carry out at large scale and where to build hydrogen production facilities.

2.16. A large minority of respondents mainly consisting of renewable energy, local authority and planning, and government-funded bodies and regulators, made comments outlining **recommendations as to what needs to be done to enable value to be gained from hydrogen production**, as follows:

- Hydrogen production, whether by electrolysis or fuel cell technology, needs to happen at scale as there is a critical mass required to be economically viable.
- There is a need to view hydrogen as part of the overall energy production landscape regarding energy demand, with a few remarks that it should be reserved for applications where there are no other options.
- Large scale storage needs to be available, with recommendations for the development of hydrogen hubs.
- Hydrogen production should be carried out close to demand centres, where there are known and reliable offtakers for energy produced (e.g. ferry terminals or distilleries) and costs of storage and transportation can be kept down.
- Financial support to be provided (e.g. financial mechanisms, subsidies, tax breaks, incentives, allowances or minimum market price provision).
- Planning and consenting support (e.g. additional weight given in planning to projects involving hydrogen production, new permitted development rights introduced for hydrogen production and storage in existing wind farms).
- Support should be ingrained in NPF4 and other strategies or plans such as Regional Spatial Strategies and Local Development Plans (e.g. in order to co-locate with other renewable energy projects). A few respondents saw a need for a specific hydrogen action plan such as the Scottish Government's draft plan to establish processes and guidelines for projects.

2.17. **Benefits from hydrogen production** were foreseen by a significant minority of respondents from a wide range of sub-groups; in particular that it would be a good use of excess power generation such that constraint payments can be reduced or eliminated, with a small number of mentions that hydrogen can potentially replace natural gas, or supplant LNG in areas off the mains gas network. There were also a few calls for localised or community-led hydrogen generation.

2.18. There were a small number of calls from renewable energy respondents to distinguish between blue and grey hydrogen, and green (renewable) hydrogen production, such that blue hydrogen production should not be regarded as low carbon. A similar number of mainly individual respondents perceived that hydrogen production does not all need to come from onshore wind, citing an array of other means including offshore wind, microbes using light, converting biomass into gas or liquid and separating the hydrogen, production using carbon capture, stable hydropower and slurry. Equally, a few mainly communities' respondents perceived that onshore wind can support other renewable energies such as hydro and clean motor fuel.

2.19. A significant minority of respondents from across almost all sub-groups, nearly half of whom were otherwise generally supportive, perceived the following concerns and issues with hydrogen production:

- Worries about the resources needed to produce green hydrogen with clean water availability, rare earth elements use in electrolyzers and the large amounts of renewable energy needed for conversion all specifically mentioned.
- Transportation difficulties.
- Storage difficulties (e.g. costs, leakages, security).
- Fire hazard potential.
- Costs of production.
- Emissions of nitrogen oxides when burned.

2.20. A similar number of respondents – communities' organisations and local authority / planners in particular – thought it better to **focus on other, already available, energy storage solutions such as pumped hydro storage and battery storage**. A small number of respondents voiced a preference to develop other technologies (e.g. small modular nuclear reactors, fusion energy or fuel cell technology).

2.21. The consultation paper then noted Scotland's ambition to produce low-cost, clean hydrogen as a potential replacement for fossil fuel feedstock in industrial and chemical processes, and the use of onshore wind to support a future hydrogen infrastructure. The Local Energy Policy Statement

Delivery Framework set out a number of actions to be taken forward to enhance Scottish Government support for community led activity.

2.22. Question 8 then went on to ask:

Q8: In what way(s) can we maximise the benefits of repowering over the coming decades?

Summary (Q8)

- General approval was expressed for repowering as a means to avoid capacity losses due to the end of life of existing wind farms, and of alleviating the need to build in new areas resulting in fewer environmental impacts.
- Help to maximise the benefits included enshrining a presumption in favour of repowering within consent and planning regulations and extending or removing time limited consents in order to extend the life of wind farms.
- Further actions recommended were working with communities to mitigate issues arising from larger turbines or to have a stake in projects and their benefits, and exploiting circular economy opportunities to recycle or reuse turbine materials.

2.23. A total of 120 respondents made comments about repowering. A large minority across most respondent sectors stated **general approval of repowering**, commenting that it was a substantial opportunity to avoid the undermining of increased capacity goals caused by the end of life of currently operational wind farms, or (as perceived by a few mainly onshore wind respondents) would help in delivering the additional power capacity required, given the chance to use advances in technology. A significant minority from all sub-groups added that **repowering was better than building in new areas** as this would impact less on wildlife and peat bogs and lead to fewer potential conflicts and therefore should be encouraged over new onshore developments.

2.24. A large minority, mostly comprising renewable energy organisations, wished to **enshrine a presumption in favour of repowering within consent and planning regulations**; it was thought there was a need to acknowledge that wind farms were already in operation on a repowering site. Support, it was inferred, would be needed from the NPF4 and OnWPS, with suggestions for a proportionate approach to EIAs or permitted development rights. To help facilitate repowering activity, almost as many respondents, again dominated by renewable energy

organisations, urged the **extension or removal of time limited consents to extend the life of wind farms**. A significant minority (almost all of them renewable energy respondents) foresaw a need to consent larger and more efficient turbines and larger site areas to accommodate them in place of smaller ones; landscape capacity studies were seen as being a particular impediment to this. Furthermore, it was pointed out by similar numbers of respondents that not all developments are suitable for being consented for repowering projects because of the greater scale required and longer life needed.

- 2.25. A large minority of respondents from most sub-groups, but particularly including communities bodies, focused on the **need to work with communities in order to maximise repowering benefits**, citing increased turbine heights as requiring an increased buffering distance to avoid being detrimental. Further comments included requests to let communities have a stake in, or ownership of, repowering projects and reiterating possible uses of community benefit packages such as free or subsidised electricity, training, improved broadband and directing benefits towards climate action.
- 2.26. A significant minority of respondents, particularly including local authorities and planners, were keen to exploit **circular economy benefits from repowering**; specific facets mentioned were the opportunities to recycle or reuse turbine materials and components, refurbish old turbines with more efficient blades and reuse old grid infrastructure and access roads. However, there were a few concerns expressed about a perceived need for new cabling and transmission infrastructure and new foundations.
- 2.27. Other advantages of repowering were mentioned by a significant minority of mainly renewable energy respondents, as follows:
- The opportunity to deploy technology developments (e.g. more efficient turbines, capturing more energy from the same heights).
 - Economic benefits (e.g. creating jobs in the supply chain).
 - Benefits from reduced development costs and risks.
 - Increased opportunities for hydrogen production.
- 2.28. A significant minority of respondents from a mix of sub groups including notable proportions of local authorities / planners and lobby and interest groups had concerns about increased negative effects emanating from repowering projects such as environmental and visual impacts, noise and shadow flicker all being exacerbated by the presence of larger turbines.

2.29. A small number of comments perceived that repowering on its own will not achieve Net-Zero Carbon targets without new wind farms and extensions being added. Similar numbers continued to advocate the use of other renewable technologies in preference to onshore wind.

Chapter 3: Barriers to Deployment: Technical and Reserved Matters

When referring to respondents who made particular comments, the terms ‘a small number’, ‘a few’ and so on have been used. While the analysis was qualitative in nature, as a very general rule of thumb it can be assumed that: ‘a very small number’ indicates around 2-3 respondents, ‘a small number’ indicates around 4-6 respondents; ‘a few’ indicates around 7 to 9; and ‘some’ indicates 10 or more but fewer than half of those who commented at any question. Where larger numbers of respondents are referred to, a ‘significant minority’ is 10-25% of respondents, a ‘large minority’ is denoted by 25-50% of respondents, and 50%+ is ‘a majority’.

- 3.1.** The consultation paper noted that the impact of wind turbines on aviation operations at both civil and military aerodromes has been the subject of significant work and investment over many years. Onshore and offshore wind turbines have the potential to disrupt radar as they are tall objects whose blades rotate at speed. This can cause distracting false returns for operators which can mask the true position of aircraft. Mitigation solutions have been used in the past but, as these have not been coordinated, opportunities to learn from good practice have not always been available. Previously it has been the responsibility of the renewables industry to invest in mitigation solutions. However, wind farms are now an established part of the landscape and it is now expected that responsibilities for mitigation solutions will transition from the renewables sector to the aviation sector.
- 3.2.** The Aviation 2030 Vision Taskforce was set up and has the aim of bringing the civil aviation and renewables sector together to focus on a transition of responsibility by 2030. While COVID-19 issues affected the development of the Aviation 2030 Vision Taskforce during 2020, progress has been made on developing positive relationships, encouraging collaboration and considering the policy and regulatory framework these sectors operate in. However, the demands of net-zero require both aviation and renewables sectors to make still greater efforts to establish mutually beneficial collaboration, as well as to set and specify goals and agree how these will be achieved. The Scottish Government (SG) proposed to form a high-level group tasked with mapping the opportunities, risks and challenges associated with continued development and co-existence of these sectors.
- 3.3.** Aviation lighting is becoming more of an issue which could have a significant effect on the development of onshore wind, and a wide variety of different stakeholders hold different views on how to resolve this issue. The SG has set up a short-term working group to consider this issue and,

ultimately, to deliver practical and consistent guidance to aid both the renewables sector and decision makers in assessing these impacts.

3.4. Question 9 of the consultation paper, asked:

Q9: We would be grateful for comments on the issue of aviation lighting and suggestions for the focus and outputs of the Aviation Lighting Working Group – what are your views on the assessment of aviation lighting and how this should be undertaken?

Summary (Q9)

- A key theme was support for the transition of responsibilities for mitigation solutions to the aviation sector, although there were some concerns over resources to support this.
- There were references to a need for collaboration across a wide range of stakeholders; along with some comments on the structure of the Working Group.
- A number of respondents, primarily individuals and communities groups, commented that they believed there could be damaging impacts to the tourism sector from onshore wind.
- The provision of guidance to help with assessing impacts and providing information on mitigation measures was welcomed, although there were requests for this to be in line with other guidance and there were concerns over the cost of these measures.
- There were some requests for better engagement with the aviation industry at the pre-application planning stage.

3.5. A total of 84 respondents opted to respond to this question. A key theme emerging from a significant minority of respondents within the renewable energy sector was **support for the transition of responsibilities for mitigation solutions to be transferred to the aviation sector**, albeit that a small number of respondents noted that there will need to be adequate resources to support this. A few respondents in the renewable energy sector also noted their support for this approach but felt the focus of the approach is too narrow and that it should cover aviation lighting and surveillance capabilities.

3.6. Some respondents, primarily those in the renewable energy sector and local authorities, referred to the **need for collaboration**, with references of the need for developers to work closely with the CAA and the aviation industry; for the Scottish Government, the UK Government and BEIS to work together to overcome the challenge of costs; and for collaboration

between the CAA and the Aviation Lighting short-term Working Group. There were also a small number of references of a need to include the views of individuals and residents who may be impacted by wind turbines.

- 3.7.** Linked to the issue of collaboration, a few respondents – primarily those involved in renewable energy – commented on the structure of the Working Group. Comments focused mainly on the organisations represented on this Group, with comments on the need to include relevant policy, regulatory and industry stakeholders and technical experts while ensuring the Group can focus on its remit and avoid becoming too large. A need to focus on delivering against priorities using a time-limited approach was also highlighted by a small number of respondents.
- 3.8.** Perhaps not surprisingly, some respondents, mostly those in the renewable energy sector, focused specifically on roles that should be adopted by the Scottish Government. A range of different roles were noted, including the need to provide strong leadership, in establishing relevant guidance to allow the granting of planning permission or consent with conditions permitting the deployment of light minimisation strategies or supporting and promoting the use of radar activated lighting.
- 3.9.** Another key theme emerging from a significant minority of respondents, primarily those within communities and individuals, was that of the **damaging impacts of onshore wind**. A number of respondents commented that they believed there could be damaging impact on the tourism sector and an allied loss of income. A key issue for many of these respondents was the impact of light pollution on Dark Sky Parks and views from wild areas, although there was also comments about the impact on residents. There were a few comments that aviation lighting presents a night-time visual nuisance, particularly where there is a strobing effect.
- 3.10.** The **provision of guidance which can help with assessing impacts and providing information on mitigation measures was welcomed** by a significant minority of respondents (mostly local authorities and the renewable energy sector). There were also a few references to the need for any guidance produced to tie in with other guidance such as GLVIA3 or NatureScot Siting and Design Guidance; and to recognise environmental concerns and ensure safety standards are met. There were some comments that visualisations of night-time views of aviation lighting are not accurately represented in the planning process; for example, that showing red dots in dark environments do not present an accurate representation of how lighting is perceived by the human eye.
- 3.11.** Allied to the issue of planning and visualisations, there were a few comments of the need for **better engagement with the aviation industry at the pre-application planning stage** and in dealing with the

discharge of technical planning conditions to meet the 12GW of new onshore wind capacity that is required by 2030, as well as in securing repowering consents for existing operational sites. There were a small number of comments that some aviation bodies are reluctant to engage at this stage of the planning process and that this can result in delays and increased costs to developers.

3.12. The **costs of mitigation measures** were highlighted by some respondents within the renewable energy sector, with comments that any measures adopted need to be bound by fair and transparent processes that support a cost-neutral principle.

3.13. While the costs of mitigation measures were of concern to some respondents, a wide range of suggested measures were offered by respondents. These included:

- Ensuring that lights are placed on outlying perimeter turbines (cardinal turbines) to guide aircraft and to limit the number of lights on individual turbines.
- Adoption of transponder technology which is only operational when aircraft are in the area and thus limits the length of time that lights are visible on a turbine(s).
- Changes to flight paths and heights, for example to exclude aircraft from flying over turbines or flying at a height of over 5000 feet.
- The use of infra-red lights which are not visible to the naked eye.
- Limiting the height of turbines to a maximum of 150 metres so that they do not require lighting. That said, there was general acknowledgement from some respondents that turbines of more than 150 metres have become the norm for both new and repowered windfarms and that the majority of recently consented windfarms will require at least one aviation light; so this needs to be an intrinsic element of any Landscape Visual Impact Assessment (LVIA).

3.14. The consultation paper noted that the required uplift in onshore wind capacity will create demands for the energy infrastructure, both within Scotland and across the UK as a whole. Question 10 asked:

Q10: We would also be grateful for your views on network charging and any of the other aspects set out under section 3.4

Summary (Q10)

- A significant minority of respondents across most sub-groups noted concerns over Transmission Network Use of System (TNUoS) costs as

well as their volatile and unpredictable nature; these were seen as a barrier to investment in new projects.

- There were requests for TNUoS reform to reduce charges, and a perception that Scotland is disadvantaged due to its distance from demand centres.
- In terms of network investment and planning, comments focused on a need for substantial investment in the grid along with significant upgrades to the grid network to allow for projects of greater capacity to connect.
- Respondents perceived a need for the Scottish Government to work with industry, TOs, DNOs, Ofgem and other UK administrations.
- In relation to security of supply / storage potential, there was general agreement with the co-location of onshore wind with battery storage and hydrogen production, although there were some concerns that storage potential is problematic.

Network Charging

- 3.15.** The consultation paper highlighted that a particular disadvantage for projects in Scotland is network charging whereby there are higher transmission charging costs faced by generators as a result of their greater distance from Britain's main centres of demand. Furthermore, a number of reviews currently in place risk increasing some of these costs. While Ofgem has recently signalled that it intends to review transmission charges, it has also signalled that it intends to apply TNUoS to small (less than 100MW) distribution-connected generation.
- 3.16.** This was the area attracting most comments from respondents, with a number of key themes emerging. A significant minority of respondents across most sub-groups, with the exception of respondents in the acoustics, aviation specialists and third sector sub-groups, commented that **TNUoS costs are too high** due to the higher transmission charging costs because of the distance from the centre of demand. Respondents in the renewable energy sector commented that this represents the biggest single operational cost and is a **barrier to investment in new projects** where natural resources are plentiful.
- 3.17.** Allied to this point, there were also comments from a significant minority of respondents – mostly respondents in the renewable energy sector – on the volatile and unpredictable nature of TNUoS which is not cost reflective of actual investment in the networks and presents another barrier to renewable generators.

- 3.18.** There were suggestions from some respondents across a range of sub-groups of a **need to quickly bring about TNUoS reform and reduce charges to create a more even playing field.** One respondent in the Governmental funded bodies & regulators sub-group noted that current TNUoS changes are based on an outdated system which does not reflect the decentralised generation model that has developed.
- 3.19.** While there was a general perception that Scotland is disadvantaged due to its distance from demand centres, there were some specific references to the very high charges imposed on island generators, particularly those outwith the Main Interconnected Transmission System (MITS). There were a small number of comments welcoming the recent Ofgem decision to approve the Shetland HVDC link project. Allied to this issue, there were a small number of comments that projects are being pointed towards England as a centre of demand which is at odds with the Holyrood and Westminster governments approach to direct projects towards Scotland and Wales.
- 3.20.** A small number of renewable energy organisations noted the next set of RII02 price controls (Revenue = Incentives + Innovation + Outputs) need to deliver investment to ensure enough reinforcement of the grid is in place for renewable generators to connect and re-power.
- 3.21.** The consultation paper noted that the Scottish Government has been engaging closely with the process of developing the next set of regulatory price controls (RII02), focusing on particular in ensuring that Scottish energy policies, targets and priorities are taken into account as fully as possible. Two key themes emerged in relation to this specific issue.
- 3.22.** The first theme focused on the **need for substantial investment in the grid, and significant upgrades to the grid network** to allow projects of greater capacity to connect, cited by respondents across most sub-groups. There were some concerns that the additional low carbon generation that is needed to deliver net zero ambitions will be delayed by a lack of grid capacity. There were a small number of suggestions for decentralised generation capacity.
- 3.23.** The second key theme which emerged was a perception that **energy generation should be sited close to the source where it is needed**, purportedly in order to minimise transmission losses (mentioned primarily by communities and individuals). That said, in most cases this would not be possible given a lack of wind power – and therefore an inability to produce energy – in many areas such as cities and towns.
- 3.24.** A few respondents in the renewable energy sector and local authorities referred to the need for a **strategic approach to onshore wind.** This includes identifying areas with potential capacity where large schemes

can be delivered and capacity can be built into nearby substations or distribution networks to assist in delivering projects and outputs more quickly. One energy company noted the need to have a national strategy plan that would set out the necessary investment in the UK transmission system to achieve 2030 goals. An organisation in the lobby and interest group sector noted the need to plan for additional energy infrastructure which will minimise transmission losses and avoid sensitive environmental areas.

Aligning Policy and Regulation

- 3.25.** The consultation paper commented that the Scottish Government welcomed the commitment in the UK Energy White Paper to consult this year on a draft Strategy and Policy Statement (SPS) for Ofgem, which will include a requirement for Ofgem to carry out its regulatory functions in a manner consistent with net-zero, and the delivery of an energy system which can enable that outcome.
- 3.26.** The key theme emerging here from some respondents, mostly in the communities and renewable energy sector, was of a **need for the Scottish Government to work with industry, TOs, DNOs, Ofgem and the other UK administrations** to discuss the grid infrastructure, transmission networks, regulation and charging policy. A few respondents, primarily from the renewable energy and legal sectors reiterated the need for regulatory policy to align with the UK and Scottish Government net-zero targets and of a need for this to be embedded in Ofgem's decision making framework.
- 3.27.** There were a small number of comments that there may be opportunities through NPF4 to secure greater collaboration between stakeholders and ensure a better fit between renewable energy capacity and infrastructure investment. However, an energy organisation noted that at present NPF4 is misaligned with what is proposed in this consultation paper, and that planning and consenting needs to be recognised as a possible delivery barrier.
- 3.28.** Once again, there were references to the need for strategic, anticipatory investment across the onshore and offshore transmission networks, for co-ordination between energy networks and for centralised planning to deliver net-zero ambitions.
- 3.29.** The consultation paper noted that onshore wind can play a greater part in helping to address the challenges of maintaining security of supply and network resilience in a decarbonised electricity system. It also noted the potential of co-location with forms of storage, such as hydrogen electrolyzers; additionally on-site battery storage removes pressures from

the grid and also enables more locally focused energy provision as well as reducing costs to consumers.

- 3.30.** The key comment in relation to this was **agreement with the co-location of onshore wind with battery storage and hydrogen production** and that this would help to take pressure off transmission and distribution constraints that are currently in place. However, there were also some comments that storage potential is problematic and there is a need to consider how to develop storage facilities. There was also a comment that TNUoS is currently a major barrier to large scale storage projects.
- 3.31.** A few respondents, mostly individuals, pre-empted some of the questions in the following section of the consultation paper and highlighted environmental concerns. These primarily focused on onshore cabling causing damage to scenery and wildlife and a greater need to consider the natural heritage in relation to windfarm applications. For example, there is a need to assess the risks to sensitive soils and watercourses where co-location is being considered; modifications made to the carbon calculator on peatland sites; or to ensure that appropriate economic, environmental safety and carbon calculations are included in EIAs.

Chapter 4: Barriers to Deployment: Environmental Factors

When referring to respondents who made particular comments, the terms ‘a small number’, ‘a few’ and so on have been used. While the analysis was qualitative in nature, as a very general rule of thumb it can be assumed that: ‘a very small number’ indicates around 2-3 respondents, ‘a small number’ indicates around 4-6 respondents; ‘a few’ indicates around 7 to 9; and ‘some’ indicates 10 or more but fewer than half of those who commented at any question. Where larger numbers of respondents are referred to, a ‘significant minority’ is 10-25% of respondents, a ‘large minority’ is denoted by 25-50% of respondents, and 50%+ is ‘a majority’.

4.1. The consultation paper explained the Scottish Government is aware of the varying demands on land-use in Scotland and that a balance needs to be struck to best serve net zero targets. There will need to be significant land use change from current uses to forestry and peatland restoration, alongside ensuring space for other essential activities such as food production and onshore wind generation, and the protection and enhancement of habitats and diversity.

4.2. Question 11 of the consultation paper asked:

Q11: What are your views on the integration of taller turbines in forested areas?

Summary (Q11)

- Onshore wind bodies regarded the integration of taller turbines in forested areas favourably, noting these will generally become the norm; there were reiterations to cease prescribing turbine heights in planning rules.
- Other respondents thought integration should depend on the site, in particular being restricted to plantation forests rather than natural forest or woodland.
- Comments were expressed over visual, biodiversity and environmental impacts caused by infrastructure requirements.
- Opportunities were seen for compensatory tree planting, habitat restoration and keyholing.

4.3. 107 respondents made comments at this question. **A large minority of mostly renewable energy respondents were generally favourable**

regarding the integration of taller turbines in forested areas, calling it a sensible solution and noting that taller turbines will generally become the norm with the advantage of a higher installed capacity per turbine resulting in fewer being needed. Renewable energy organisations also said that turbines need to be taller in forested areas to mitigate canopy turbulence. Once again there was consensus amongst the renewable energy industry that more support was needed in planning and the NPF4, specifically to cease prescribing turbine heights and not overprotect wild land and local landscapes.

- 4.4. A significant minority of from most sub-groups of respondents foresaw **opportunities for compensatory tree planting and habitat restoration arising in forested areas**, in particular to replace commercial forestry with native woodland at wind farm sites or to restore peatland. Opportunities for keyholing (creating open areas around taller turbines to help minimise the need for tree felling) were also suggested by a significant minority of renewable energy and local authority / planning respondents; however, a very small number of mainly renewable energy respondents said this would depend on the rotor diameter.
- 4.5. However, slightly larger numbers of respondents, from all subgroups, thought that **integration of taller turbines should depend on the site**, with some comments that this activity should be restricted to plantation forests rather than in natural forest or mixed woodland areas, or in conservation areas and Sites of Special Scientific Interest (SSSIs). There was also commentary on a need to consider local Forestry and Woodland Strategies, forestry management plans and other tree-related guidance as a material consideration for planning applications, as well as landscape impacts and bird impacts.
- 4.6. Concerns were expressed by a significant minority, mostly individuals and local authority/planners, over the **visual impact issues** caused by the presence of taller turbines. A few individuals and communities' groups were against integration in forested areas, perceiving it as an out of place setting. Similar numbers were worried about the impact on biodiversity in forested areas, in terms of habitat and fauna and flora loss. Other perceived environmental impacts were also mentioned including; the release of particulates arising from the erosion of leading edges of turbine blades, and larger areas of trees (which would otherwise be capturing carbon) needing to be removed to make way for taller turbines and larger foundations, as well as to eliminate wind shear effects.
- 4.7. Very small numbers of respondents across all sub-groups each highlighted other areas for concern including the need for larger foundations, access roads and other infrastructure, tourism impacts, peat removal, access for recreation, increased fire risks (e.g. fire tenders unable to reach taller turbine heights) and water supply effects.

4.8. Question 12 then asked:

Q12: Can you provide best practice examples for effective peatland restoration (with carbon benefits) alongside the development of onshore wind?

Summary (Q12)

- The largest proportions of respondents (made up of individuals, communities, and lobby and interest groups) advocated that there should be no building of windfarms on peatland, also stating that it is not possible to restore peatland and that restoration is a token gesture.
- Renewable energy organisations were supportive of building wind farms where peatland is already degraded and some respondents were supportive of peatland restoration as long as this has high standards.
- Examples of rewetting restoration techniques were provided including reprofiling dams, opening up lochans and bog pools, and installing peat bunds for water retention.

4.9. A total of 64 respondents chose to answer this question. The main theme, mentioned by a large minority consisting almost entirely of individuals, lobby and interest groups and communities' organisations, was that **there should be no building of wind farms on peatland whatsoever**. A small number of these respondents claimed examples of peatland destruction by wind farms; the Viking Wind Farm on Shetland was mentioned by four respondents from all three sub-groups¹, and Windy Rig Wind Farm (Dumfries & Galloway) where a communities' group claimed to have witnessed hundreds of tonnes of peat excavated and abandoned and left to dry out beside the access track. There were also requests that the OnWPS and NPF4 should say more about strengthening peatland protection, amid concerns about losses of carbon to the atmosphere. Furthermore, these respondents **disagreed that it is possible to restore peatland**, saying that permanent damage is inevitable and that restoration is inevitably a token gesture only.

4.10. However, a significant minority of mainly renewable energy respondents were **supportive of building wind farms where peatland is already degraded** (e.g. over time due to land uses such as muirburn, drainage and overgrazing); with some stating that peatland is left in a

¹ The following references were quoted:

Mind the peat bog... <https://www.bbc.co.uk/news/uk-scotland-58464439>,
<https://www.shetnews.co.uk/2020/11/02/letters-the-risk-of-flooding-and-peat-slides/>

better condition after access development due to the original degradation being restored.

- 4.11. A significant minority of respondents (mainly renewable energy, local authority and planning, and government-funded bodies) were **supportive of peatland restoration**, stating that this should be part of future agreements with developers to minimise impacts (e.g. through Habitat Management Plans), and that there was a need for expertise, together with a small number of calls for peatland restoration standards (and high standards of peatland care during wind farm development) to be invoked to help ensure embedding of consistency of measures and best practices and to streamline approval of measures by local planning authorities. There was a concern from a lobby and interest group over whether pristine peat is in fact classified as degraded.
- 4.12. Respondents, particularly renewable energy organisations, also provided examples of best practice for restoration; the highest numbers (a significant minority, almost all of whom were renewable energy organisations) detailed **techniques for restoring peatland by rewetting it or raising the water table**. Practices included:
- Reprofiling dams (e.g. through a ‘wave damming’ technique to increase the speed at which peat dams can be constructed).
 - Opening up lochans and bog pools.
 - Installing peat bunds for water retention.
 - Using the peat excavated during construction to block a network of drainage grips (which starts to act as a carbon sink).
 - Flattening the ground to raise the water table.
- 4.13. There were also a few mentions (all from renewable energy organisations) of work to stabilise erosion and subsidence by reprofiling slopes, peat hag reprofiling and utilising the growth of on-site vegetation. Small numbers of renewable energy organisations provided other tips for best practices; these included leaving wind farm tracks in-situ (as the activities associated with removal could damage the areas around the tracks which were restored), moving fences for grazing land, infilling and blocking ditches, pulling up trees and tree stumps, reducing livestock and stopping muirburn. There were also a small number of references (mostly from renewable energy organisations) to bespoke solutions being needed as every site is different; and to ongoing monitoring (e.g. of hydrology and development of vegetative communities) of restoration works being important to measure success.
- 4.14. A few references were made to the Scottish Renewables’ publication [Wind Power and Peatland: Enhancing Unique Habitats](#), which looks at work carried out by three renewable energy businesses at sites across the country. Other examples of wind farms purported to have good practices

were Glen Kyllachy and Dunmaglass (several mentions each), Muirhall, Corriemoille, Whitelee and Black Law.

4.15. Question 13 went onto ask:

Q13: What, if anything, is not currently reflected in the good practice guidance for constructing windfarms, in relation to building on peat and other carbon-rich soils?

Summary (Q13)

- Avoidance of building windfarms on peatland and particularly deep peat areas was again advocated by the largest number of respondents. Renewable energy organisations were in favour as long as appropriate methods are followed, maintaining that there can be positive peat and soil benefits from restoration work.
- Within the guidance, a wide range of respondents perceived deficiencies in the carbon calculator for understanding carbon emissions; there were some suggestions to use the carbon intensity of the whole energy system (including heat and transport) as its reference point.
- There was also a perceived need to include best practice techniques for bog restoration on windfarm sites, and a few areas where more detail was desired.

4.16. A total of 66 respondents opted to respond to this question. Again the greatest numbers of respondents – a large minority consisting of individuals, lobby and interest groups, communities’ organisations and local authority/planning bodies – urged **avoiding building wind farms on peatland, and deep peat areas** in particular as these are especially carbon-rich and have significance to biodiversity and as a natural store of carbon. It was felt that the priority should be avoiding peat damage in the first place before considering restoration or compensation; a very small number of comments focused on damage caused by access roads, concrete and steel in terms of drying out peat so that it cannot function as a carbon sink.

4.17. Alternatively, a significant minority of mainly renewable energy respondents were in favour of continued wind farm developments on peatland as long as an appropriate method was followed, seeing these as necessary to meet net-zero carbon targets. These respondents desired more recognition that **constructing onshore wind farms can lead to positive peat and soil benefits from restoration work**. It was felt by many of these respondents that onshore wind has a strong track record in peatland and carbon-rich soil areas.

4.18. As far as the guidance was concerned, the greatest numbers of comments – a significant minority from a wide range of respondents – concerned **perceived deficiencies in the carbon calculator for understanding carbon emissions**; particular issues were specified including difficulties predicting the extent of drainage, potential overestimates of carbon savings from peat restoration, underestimates of emissions from damaged peatland, carbon dioxide payback time being a relative measure, and peat drying resulting in carbon capture being severely reduced on reuse or replacement. A small number of renewable energy respondents suggested using the carbon intensity of the whole energy system (including heat and transport) as its reference point.

4.19. Other comments on the guidance made by a few mainly renewable energy respondents cited a need to include best practice techniques for bog restoration on wind farm sites (e.g. by including [Conserving Bogs: The Management Handbook](#) in the good practice guide), and a few specific areas where more detail was felt to be needed, including more account of the impact on other land users such as crofters and the public water supply, the impact of landslides, and assumptions to be made for the areas of influence of direct peat degradation from a development. There was also a request for flexibility in the guidance given that each situation is unique.

4.20. Other more general comments made – each by a few respondents from across all sub-groups – included the following:

- Requests for more consistency about the consenting process relating to building on peat or carbon rich soils.
- Requests to make peatland and carbon rich soil plans integral to the construction and design process of wind farms (e.g. proposals for restoring and improving peatland areas and minimising soil disturbance).
- The need for accurate peat and soils survey data (e.g. to enable a decision on wind farm construction).
- The need to have a system for characterising levels of degradation (subject to differing anthropomorphic activities such as agricultural fields and commercial forestry).
- The need for more robust testing and monitoring of enhancement and restoration measures.
- The need for more regulation and enforcement to increase developer and operator accountability.

4.21. Question 14 then asked:

Q14: From your own experience, what can wind farm developments offer in terms of protecting and enhancing the natural environment, in particular

through the planting of trees to compensate for those lost during windfarm development and through peatland restoration?

Summary (Q14)

- A large minority of respondents of mostly renewable energy industry and local authority/planning respondents agreed that onshore windfarms can and should provide environmental benefits, even where tree felling and peat removal has not taken place. Forms this could take were stated as being enhancement of peatland, forestry or biodiversity where there might not otherwise be the opportunity. Peatland restoration was favoured though there were reports of supply chain constraints on meeting restoration targets.
- Compensatory planting of indigenous trees to replace commercial forestry was regarded as preferable in terms of carbon capture and diversity.
- However, a large minority consisting of individuals, lobby and interest groups, and communities' organisations maintained that windfarms offer nothing meaningful to the natural environment, citing destruction caused by turbines and access tracks.

4.22. A total of 83 respondents made comments at this question. A large minority of mostly renewable energy industry and local authority/planning respondents **agreed that onshore wind farms can and should provide environmental benefits**, even where tree felling and peat removal has not taken place and the environmental footprint is small. Forms this could take were stated as being enhancement of peatland, forestry or biodiversity where there might not otherwise be the opportunity, or creating new habitat areas and carbon storage improvements on previously degraded habitat. Many of the same respondents noted the role of sound planning and design in this endeavour, through the consent process and then, for the longer term, through a Habitat Management Plan, a Land Management Plan or an Environmental Management Plan, perhaps working alongside environmental agencies.

4.23. More specifically, a large minority from across most sub-groups were **in favour of peatland restoration** with developers amassing greater technical knowledge with experience of undertaking these activities. However, a few renewable energy respondents reported that there were supply chain constraints to meeting restoration targets (e.g. a lack of trained civil contractors). The voluntary carbon market for peatland restoration was also seen as an issue, as landowners will no longer be as keen to give up their peatlands beside and within wind farm areas for additional restoration thus making it more difficult for developers to deliver planning gain.

- 4.24. Respondents, in slightly smaller numbers mainly consisting of communities, government-funded, lobby and interest groups, and local authority and planning respondents, were also **in favour of compensatory planting of trees**, particularly indigenous trees like native broadleaves to replace commercial forestry, citing these as preferable in terms of carbon capture, hydrology, and biodiversity. A small number of mostly local authority and planning respondents thought compensatory planting should be restricted to areas close by or adjacent to wind farm development sites, as it would be easier to enforce and to see any biodiversity net gain; however, very small numbers from across sub-groups thought compensatory planting should not be limited to the areas of the wind farm as this was perceived as precluding opportunities to achieve the most beneficial forestry plans.
- 4.25. A significant minority, mainly consisting of renewable energy respondents, saw **over-complications and disincentives caused by planning system rules**. Various facets of these included the lack of quantification of biodiversity enhancements as a material benefit, lack of a mechanism for positive environmental effects, and conflicting demands between peatland, forestry and carbon-rich soils; more general remarks included requests for more clarity and flexibility in the rules.
- 4.26. A few respondents (almost entirely renewable energy) recommended that mitigation and enhancement of the environment was best done through full stakeholder engagement to get cooperation (e.g. involving farmers, landowners, developers, communities, NatureScot, SEPA and other statutory consultees). A small number of local authority/ planning and lobby and interest groups reiterated that mitigation and enhancement plans need monitoring and enforcement.
- 4.27. A few respondents from across most sub-groups noted that attention should be paid to the knock-on effects of environmental mitigations and enhancements – both positive and negative. Positive effects foreseen included recreation opportunities, connecting people with nature, a supportive community and mitigation of flood risks through water retention in peat. Negative effects noted were land use conflicts and increases in bird and bat collisions with turbines.
- 4.28. A small number of renewable energy and local authority / planning respondents specified particular wind farm developments as enhancing and protecting the environment; a couple of specific examples included comprehensive implementation of a Habitat Management Plan and replanting after putting in place wildfire prevention measures.
- 4.29. A large minority of individuals, lobby and interest groups, and communities' organisations maintained that **wind farm developments offer nothing meaningful to the natural environment**, citing destruction

caused by turbines and access tracks, negative effects on flora and fauna, a lack of compensation for the loss of mature trees, and the planting of replacement trees taking many years before they have a positive effect on removing carbon.

4.30. Question 15 then asked:

Q15: Can you provide best practice examples of encouraging biodiversity protection and enhancement, including connectivity between natural areas in windfarm sites?

Summary (Q15)

- Best practice provision was advocated in the form of habitat restoration and management as implemented from Habitat Management Plans, Environmental Management Plans, Land Management Plans, development frameworks and/or spatial frameworks.
- The most frequently mentioned examples were of bird conservation projects such as provision of nest sites.
- Actions to enhance connectivity (e.g. new hedgerow planting and management), peatland restoration examples and planting projects were other examples provided.
- There were a few concerns about more being needed in terms of monitoring and enforcement of measures.

4.31. A total of 55 respondents replied to this question. A large minority of mainly renewable energy and local authority/planning organisations cited that **best practice provision was best carried out in the form of habitat restoration and management as implemented from Habitat Management Plans, Environmental Management Plans, Land Management Plans, development frameworks and / or spatial frameworks.**

4.32. Various particular actions to encourage biodiversity protection and enhancement were proffered, again mainly by renewable energy industry organisations and local authorities/planners. Most frequently mentioned were **bird conservation projects**, examples of which were given by a large minority of respondents, as follows:

- Protection of black grouse leks and / or creation or enhancement or connection of black grouse habitats.
- Ensuring turbine layouts don't hinder bird flight paths.
- A scheme to attract pink-footed geese away from turbines.
- Rafts for red and black-throated divers to provide nest sites.

- Construction of artificial nests for merlins and golden eagles; however, in the case of the latter a lobby and interest group cited evidence that the birds avoid turbines, leading to range displacement.

4.33. Other examples of best practices were each advocated by significant minorities of respondents, as follows:

- Actions to **enhance and promote connectivity** (e.g. new hedgerow planting and management, increasing the diversity of field boundary habitats, creating a mosaic of moorland bordering native broadleaf woodland, linkage of nesting and feeding sites, and creating development frameworks for wind farm clusters).
- **Peatland restoration examples** (e.g. Peatland Management Plans being implemented, encouraging and regenerating blanket bog habitats, drainage blocking by either reusing dug up peat or using plastic grips, and removing commercial forest).
- **Planting projects or encouraging native, mixed or riparian plant growth** (e.g. grazing management for protection of new trees, encouraging Scottish Primrose growth, encouraging wetland scrub, seeding of grassland).

4.34. Small numbers of mainly renewable energy respondents cited other specific biodiversity projects; these included enhancing foraging habitat, creation of pond systems, flood management measures, bat-related projects (e.g. reducing mortality through a curtailment regime), construction of a fish ladder and Great Yellow bumblebee habitat creation. A small number (again mainly renewable energy respondents) also mentioned close working with environmental organisations such as Friends of the Earth, the RSPB and Sea Shepherd.

4.35. A significant minority of mainly renewable energy respondents expressed **concerns regarding enforcement of measures to ensure biodiversity plans are implemented**, stating that more was needed in terms of ongoing monitoring and publishing reports on progress. It was thought that these are essential to understand the effects of wind farms and to record biodiversity gains and benefits from the work carried out. Examples given included measurements to ensure the peatland water table is rising (e.g. using groundwater monitoring devices) and tagging of golden eagles. A few respondents mentioned the need for more on-site surveys (e.g. soil or nature impact studies). An energy organisation mentioned the use of their own Biodiversity Net Gain toolkit metric to measure biodiversity improvements.

4.36. A few mainly renewable energy respondents cited positive mentions of specific wind farms where projects have been or are being carried out. These were: Berry Burn, Twentysilling Hill, Kype Muir, An Suidhe,

Glendevon, Corriemoille, Rothes II and III, Whitelee, Black Law, Calder Water Community, Clyde, Middle Muir, Thurso South, Forss, Burgar Hill, Sanquhar and Dunmaglass.

4.37. A few respondents, consisting mainly of individuals, gave a range of negative examples of wind farm effects on the natural environment. These included changes in flora due to local temperature increases, bird and bat turbine collisions, lack of connectivity of habitats, deaths of wildlife generally, the effects of infrasound, turbine blades shedding plastic detritus, and vibrations affecting earthworms. Other mainly individual respondents said they were unaware of any best practice examples, stating negative comments about wind farm effects on biodiversity without elaborating further.

4.38. Question 16 then asked:

Q16: What is your organisation doing to go above and beyond when it comes to biodiversity protection, conservation and enhancement in wind energy development sites?

Summary (Q16)

- Most answers reiterated measures given at the previous question.
- There was a perceived need for quantification of biodiversity mitigation and additionality in windfarm developments (i.e. in terms of numerically defining the appropriate levels of environmental mitigation or enhancement works required of the developer).

4.39. A total of 50 respondents responded to this question; a significant number of these from across all respondent groups reiterated their response to Question 15. The pattern of answering was similar to the previous question, the largest numbers of respondents cited **peatland restoration, best practice provision being through delivery of habitat management, restoration and environmental schemes or plans, and bird-related projects**. In the case of the latter a couple of new examples were given consisting of enhanced hen harrier habitat increasing the local population, and participation in the Scottish Windfarm Bird Steering Group.

4.40. A significant number of renewable energy organisations again cited the **importance of ongoing monitoring of activities**, including feeding back information into future planning applications. At the same time there was a perceived need for quantification of biodiversity mitigation and additionality in wind farm developments (e.g. clear measures needed to numerically define the appropriate levels of works required of the

developer to either mitigate or enhance peatland habitats at the planning stage).

4.41. Other actions, each stated by a few respondents, included the following:

- Activities (in general) over and above those specified in planning documents or as minimum best practice (e.g. suggestions identified by the Ecological Clerk of Works, Biodiversity No Net Loss incorporated as a minimum requirement on newly consented wind farm projects).
- Integrated or connected approaches within wind farm clusters (e.g. activities over wider areas and areas adjacent to wind farms such as trails and path networks, habitats around wind farms, and pooling investments into larger projects, for example as part of a national nature network).
- (Securing from developers) Mitigation or compensatory measures or biodiversity enhancements.
- Additional planting projects (e.g. in a 3 to 1 ratio of planting to trees and flora removed).
- Undertaking surveys and research (e.g. into peat depth and condition, mapping drainage channels).
- Use of, or employment of, technical specialists, organisations or experts (e.g. to oversee implementation, devise plans and methods of bog restoration, ecology specialists and working with the Association of Environmental Clerk of Works).
- Collaboration between developers, consultees and stakeholders to ensure biodiversity and conservation commitments are maximised and implemented, or to ensure compliance with guidance.
- (Reiterations of) Bee and bat-related projects.
- Provision of specific guidance (e.g. locational guidance on environmental constraints, having wind farm areas of search within a local authority's Local Development Plan, or for carrying out biodiversity offsetting projects).

4.42. Very small numbers of renewable energy and local authority / planning respondents also mentioned work to alleviate flood risks, educational outreach activities at schools, and provision of assistance to community conservation and biodiversity groups.

4.43. Finally, there were a few queries as to what constitutes 'going above and beyond', viewing this as being unnecessary if all the action needed was contained within planning requirements; and a few individuals who reiterated their opposition to wind farm developments.

4.44. The final question in this chapter asked:

Q17: How can habitat management plans better balance protection of the environment with connectivity and the operational requirements of a site?

Summary (Q17)

- Respondents mostly viewed Habitat Management Plans as working well, giving examples of their positive biodiversity effects.
- Suggested improvements were for a more holistic approach (e.g. aligning plans to help with connectivity) and offsite delivery to optimise areas outside windfarm infrastructure which can lead to greater environmental gains.

4.45. A total of 61 respondents replied to this question. A large minority consisting almost entirely of renewable energy and local authority / planning respondents **commented favourably on Habitat Management Plans (HMPs), saying these were a good means of helping protect the environment and enhance biodiversity**. The same groups of respondents also viewed HMPs as working well, having a positive track record and as providing clear commitments in supporting planning applications. A small number of examples of the positive biodiversity effects of HMPs were given including restoring peat bog to be an effective carbon repository, moorland restoration, planting of native woodlands and improving conditions for birdlife. A few others considered them as effective as long as they are comprehensive (e.g. contain coverage of the full wind farm lifecycle and consider other plans already in place such as those for deer and forestry and landowners' own plans).

4.46. However, significant numbers of mainly renewable energy respondents suggested improvements to HMPs; most frequently mentioned was the need for a **more holistic approach**, for instance involving collaborative working, ensuring a joined-up approach to give extensions to existing schemes, aligning of individual HMPs or making Regional Habitat Plans to help with connectivity; a lobby and interest group suggested that thought be given to a national Nature Network which would help to identify connectivity opportunities. In a related point, similar numbers of mostly renewable energy and local authority / planning respondents suggested a positive role for **offsite delivery of HMPs** (i.e. optimising areas outside wind farm infrastructure); it was inferred that this can assist with easing the operational requirements of a site and can lead to greater environmental gains overall.

4.47. Smaller numbers of respondents from across sub-groups also made the following recommendations to improve HMPs:

- More focus on undertaking reporting and monitoring of progress to share successes and failures (e.g. by creating a Habitat Management Group) and allowing the results to inform future HMPs.
- Developing additional guidance to help with a more holistic and integrated approach to renewable energy and land use.
- More flexibility in HMPs, as solutions need to be tailored to the specific circumstances of individual sites.
- Better balance between site operations, environmental protection and other land uses in HMPs.
- Including habitat maps early on in the process to help reveal opportunities for improving conservation networks and connectivity, and gap areas where the greatest improvements can be made.
- Make the consequences of adverse issues known to developers beforehand.
- Consideration of human as well as environmental effects in HMPs (e.g. noise, vibrations, effects on community health).

4.48. A small number of mostly individual respondents made negative comments about HMPs, accusing them as being weak, a token gesture and offering little protection due to a lack of enforcement; a point was also made perceiving that planning authorities had little time or resource to evaluate them.

4.49. A significant minority, again mainly individuals, reiterated their opposition to wind farm building, saying that **no amount of mitigation can compensate for losses and destruction caused by wind farm infrastructure.**

4.50. There were also a few negative comments, almost all of which were from renewable energy organisations, about the nature of questioning for this chapter of the consultation, firstly pinpointing the lack of questions about the landscape and visual impacts section and secondly viewing the phrasing of Question 17 as problematic because HMPs are not seen as designed to better balance protection with other issues.

Chapter 5: Economic Opportunities

When referring to respondents who made particular comments, the terms ‘a small number’, ‘a few’ and so on have been used. While the analysis was qualitative in nature, as a very general rule of thumb it can be assumed that: ‘a very small number’ indicates around 2-3 respondents, ‘a small number’ indicates around 4-6 respondents; ‘a few’ indicates around 7 to 9; and ‘some’ indicates 10 or more but fewer than half of those who commented at any question. Where larger numbers of respondents are referred to, a ‘significant minority’ is 10-25% of respondents, a ‘large minority’ is denoted by 25-50% of respondents, and 50%+ is ‘a majority’.

5.1. The consultation paper outlined a number of economic opportunities available to Scotland, either directly or indirectly, from the onshore wind industry. These included supply chain opportunities, manufacturing opportunities, refurbishment and recycling opportunities, development of capacity and skills within the workforce, tourism and cultural development and promotion of a diverse, inclusive industry.

5.2. Question 18 of the consultation asked:

Q18: What support do Scottish companies need from Scottish Government and agencies in order to successfully bid for and win contracts?

Summary (Q18)

- Respondents voiced support to develop supply chains by way of both capacity and support for small and medium-sized enterprises.
- Reiterating previous answers, a more efficient windfarm consenting system was desired.
- Further suggestions were made to build on good relationship-building practices, to reinvigorate otherwise declining industries with the manufacture of large scale windfarm infrastructure, help with bidding and help to meet accreditations.
- There were also some views that Scottish companies do not need further support or that support should be given to rural or local communities impacted by windfarms.

5.3. A total of 66 respondents made comments at this question. The most mentioned aspect, from a large minority consisting of renewable energy organisations, local authorities and planners, and government funded bodies and regulators, was **support to develop supply chains by way of both capacity and support for small and medium sized enterprises**

(SMEs). The best way of doing this, it was inferred, was to incorporate a strategic or national approach, specifically to ensure a reliable pipeline of projects is established to realise the targeted 12GW of extra onshore wind by 2030. Clear identification of opportunities was recommended, particularly in relation to aspects of the circular economy such as blade repurposing and refurbishment of components. That said, over half of these respondents maintained that **development, construction and operations of wind farms already have a high proportion of local content**, pinpointing strength in Balance of Plant (i.e. supporting components and auxiliary systems), with renewable energy organisations alluding to advantages of local inputs by way of minimising transport emissions and generating local economic benefits. A few respondents from across sub-groups but consisting of a majority of individuals advocated a mandatory proportion of minimum input from Scottish or UK businesses, or procurement process help in the form of subsidies or incentives to use local suppliers.

5.4. Reiterating previous answers, a significant minority of mainly renewable energy respondents desired a **more efficient wind farm consenting system**, with improvements by way of speed, cost, predictability, provision of enough planning officers and weight given to the socioeconomic impact of projects.

5.5. Smaller numbers of mainly renewable energy respondents cited the following measures to aid Scottish companies:

- Building on good relationship–building practices, for example making available local supplier registers or company databases for developers to use or having ‘meet the buyer’ events. An example was suggested (by a local authority / planning body) to create an onshore equivalent of the DeepWind Cluster for Offshore Wind or the Open4Business portal that used to operate in the Highlands.
- Having frequent CfD auctions, and reducing the threshold limit in future auction rounds to 300MW.
- Opportunities to manufacture turbines, towers, electrical equipment and cabling in Scotland (e.g. by reinvigorating declining industries).
- Help with bidding and tendering (e.g. provision of specialist advisors, help from the Enterprise network or Skills Development Scotland).
- Help for SMEs and supply chain organisations to meet accreditations and certifications (e.g. relevant HSSE or other courses or policies required to work on a large infrastructure project).
- A consistent and stable policy environment, to reduce risks.

- Financial support to investors and developers to help with equipment purchasing and recruitment (e.g. from a Scottish Green Investment Bank).

5.6. A few renewable energy organisations cited a more competitive environment and pressure to drive costs down, such that any policy should take account of these factors as this situation acts as a constraint on limiting local content.

5.7. A significant minority of, mainly individual respondents maintained that **Scottish companies should not get support or already had sufficient support**; concerns were expressed about a perceived poor record of governmental success in supporting companies (e.g. Bi Fab, Campbeltown Windtowers). Similar numbers thought the focus should be on **support being given to rural or local communities which are impacted**, for instance giving communities more development resources where they are involved in wind farm developments.

5.8. Question 19 then asked

Q19: Should government consider options for introducing a sector deal similar to that of the Offshore Wind sector and if not, why is that your view?

Summary (Q19)

- Respondents agreed more than disagreed that the government should introduce options for a sector deal, stating it would help support the realisation of environmental targets, have socioeconomic benefits, provide opportunities for a partnership approach between government and industry and provide certainty for stakeholders.
- Development of the supply chain, standard setting for enhancement or restoration of biodiversity and tackling barriers to deployment such as the planning and consenting processes were advocated as part of the content of a deal.
- Respondents not in favour of a sector deal preferred a focus on offshore wind.

5.9. A total of 72 respondents answered the first part of the question; as shown **below two in five respondents agreed that the government should introduce options for introducing a sector deal, albeit nearly as many did not know while just under a quarter disagreed**. A majority of the responding renewable energy and local authority/planners groupings were in favour of the proposal; half of the individual respondents were against.

Q19	Number			
	Yes	No	Don't know	No response
Acoustics (3)	-	-	1	2
Aviation specialist (5)	-	-	-	5
Communities (18)	1	1	5	11
Governmental funded bodies & regulators (7)	3	-	-	4
Legal (2)	-	-	-	2
Lobby and interest groups (13)	2	1	-	10
Local authorities & planners (14)	6	-	5	3
Renewable Energy (43)	13	2	5	23
Third sector (e.g. Charities and other NGOs) (2)	-	-	-	2
Other (4)	-	-	1	3
Total organisations (111)	25	4	17	65
Individuals (49)	4	13	9	23
Total respondents (160)	29	17	26	88

5.10. Fifty-seven respondents went on to answer the second part of the question, although despite the question terminology nearly half of these had agreed that the government should consider options for introducing a wind sector deal at the first part.

5.11. A significant minority, consisting almost entirely of renewable energy, local authority / planning and government-funded bodies, each provided the following reasons for introducing a sector deal as follows:

- It would help support and realise environmental targets (e.g. the additional 12GW of onshore wind by 2030), financial targets for capital expenditure, and growth and biodiversity targets.
- It would have socio-economic benefits (e.g. business benefits for local companies).
- It would provide opportunities for a collaborative or partnership approach between government and industry (e.g. to develop details for the sector deal).

- It would provide certainty for stakeholders (e.g. firm long term commitments giving the confidence for business to build infrastructure and supply chains).
- It would provide a strategic framework for progress (as long as the sector deal is well formed).

5.12. Significant numbers across most sub-groups also advocated the following facets to be included as part of the content of an onshore wind sector deal:

- Tackling barriers to deployment (e.g. those caused by the grid, aviation, lack of CfD auction frequency, visual landscape, landscape change and business rates).
- Development of the supply chain (e.g. local content specification, circularity).
- Standard setting for restoration or enhancement of biodiversity (e.g. principles around deploying HMPs).
- Measures to speed up the planning and consenting process.

5.13. Small numbers of those in favour of a sector deal across most sub-groups also each desired content incorporating skills training and educational opportunities (e.g. for repairing and servicing), defining and identifying land areas which can be used for wind farm developments, and a review of wind farm community benefits. Small numbers of mostly government-funded bodies and regulators also commented positively about the UK Government's Offshore Wind Sector Deal, suggesting an onshore deal should be similar.

5.14. There were also a few recommendations from the renewable energy industry about how to form an onshore wind deal: in particular several of these were in favour of an Onshore Wind Prospectus discussion document, developed by collaboration with Renewables UK and Scottish Renewables, followed by the establishment of an Onshore Wind Strategic Leadership Group to develop the details, as the way forward. A small number of these respondents urged an accelerated timescale for setting the sector deal up, as the offshore equivalent took four years to establish.

5.15. Only a relatively small number of comments (mostly individuals and renewable energy respondents) were made giving reasons for not supporting an onshore wind sector deal; the largest numbers of these preferred a focus on offshore wind rather than onshore expansion. Small numbers of the same respondent groups thought it was not needed, citing a lack of benefits without elaborating; very small numbers (again from the same groups) each thought the benefits would only favour large developers at the expense of communities' rights, that it would not provide value for money and that it would be difficult to create, given the

fragmented nature of onshore wind farm sizes, localities and land ownerships.

5.16. Question 20 went onto ask:

Q20: How can individual organisations (including onshore wind developers, tier 1 suppliers, and the domestic supply chain) work collaboratively to ensure that key manufacturing projects for Scottish onshore wind stays in Scotland?

Summary (Q20)

- There were differences of opinion as to where the focus of manufacturing facilities and jobs in Scotland should be; firm commitments to onshore wind targets could encourage a business case for a turbine, blade and/or tower manufacturing facilities, whereas it may be more realistic to focus Scottish work on supply chain requirements with opportunities seen in high voltage direct current (HVDC) technology, electrical and control equipment, battery manufacturing plants and generally smaller manufacturing.
- Respondents recommended enforcing the use of local content, government intervention to create the necessary business ecosystems and a coordinated approach with the offshore wind and emerging tidal sectors to create a large scale of supply chain requirements.

5.17. A total of 64 respondents made comments at this question. Many of the main themes echoed those advocated at previous questions.

5.18. A large minority of respondents (almost all renewable energy) agreed that **creating manufacturing facilities and jobs** is the way to go to ensure that key manufacturing projects stay in Scotland, but there were **considerable differences of opinion as to where the focus of these facilities and jobs should be**. A firm commitment for 12 GW to give confidence about the market opportunity could be used to **engage with an original equipment manufacturer on the business case for a Scottish turbine, blade and / or tower manufacturing facility** according to several renewable energy organisations, with advantages of large scale job creation; but others felt that it would be more realistic to **focus Scottish work on supply chain requirements with specific opportunities** seen in high voltage direct current (HVDC) technology, electrical and control equipment, battery manufacturing plants and generally smaller ancilliary manufacturing.

5.19. A significant minority of renewable energy, communities' bodies and individual respondents advocated engaging domestic companies by **enforcing the use of Scottish suppliers**. A small number of

respondents (mostly individual and local authority / planning) thought there should be a specified minimum proportion of local content, with suggestions for incentivising this by steering procurement policies to favour Scottish companies, tax incentives, or a point scale on marking tenders based on their proposed local, regional or national employment.

- 5.20. A significant number of (almost all renewable energy) respondents noted that developers already work closely with Tier 1 suppliers to maximise Scottish content or to overcome obstacles to investment decisions; areas with high levels of local content were mentioned including civil and electrical works, maintenance and servicing, albeit without mentioning manufacturing.
- 5.21. A consistent and clear approach to policies was again urged, particularly in regard to planning and the use of contemporary (larger) turbines.
- 5.22. Similar numbers of respondents from across most groups foresaw that **governmental intervention or intervention at a national scale** was needed; a need was seen to create the necessary business ecosystems which developers, Tier 1 suppliers and regional supply organisations cannot directly control.
- 5.23. A **coordinated approach with the offshore wind and the emerging tidal sector** was advocated by similar numbers of mainly renewable energy organisations. It was felt this would create a bigger scale of supply chain requirements thereby strengthening the supply chain investment case. It was suggested that lessons could be learned from the work undertaken by the Scottish Offshore Wind Energy Council (SOWEC) in this regard, to perhaps create an equivalent body for onshore wind.
- 5.24. A few respondents most from the renewable energy industry agreed that there should be more collaboration and partnership forming between the industry and other stakeholders, with specific mentions of Skills Development Scotland, ESP (formerly Energy Skills Partnership), Scottish Renewables, Chambers of Commerce, Business Gateway, industry federations and local renewable engineering and manufacturing firms. In particular a role was seen for the enterprise companies and local authorities.
- 5.25. Small numbers of mainly renewable energy respondents also suggested the following:
- Creating regional or strategic hubs or clusters, for instance by expanding the two clusters created by the Offshore Wind Industry.
 - More Scottish ownership of wind farm developers.

- Support for skills development and training.

5.26. A very small number of individuals felt pessimistic about manufacturing projects staying in Scotland, thinking that it was too late for this to happen and that large companies will inevitably use their own supply chains.

5.27. Question 21 asked:

Q21: Circular economy and zero-waste are core principles that the Scottish Government are promoting. Where do you see the economic opportunities in relation to these policy issues lying with onshore wind? And are there any practical issues you think need to be addressed in order to maximise the benefits?

Summary (Q21)

- Opportunities were perceived from the recycling and refurbishment of turbines and their components, innovations, development and research into recycling facilities and from the repowering of sites.
- Positive knock-on effects on local economic opportunities were foreseen.
- Barriers included a lack of recyclability of turbine blades and windfarm foundations as well as general concerns over affordability and a lack of recycling infrastructure.

5.28. A total of 73 respondents replied to this question. A large minority from across all sub-groups gave their **support to the circular economy and zero-waste principles**. There was widespread recognition that these would help with the wind industry's carbon footprint and should be part of any development proposals and be part of the planning process.

5.29. Almost half of those answering the question, spread across all sub-groups, saw **opportunities from recycling and refurbishment of turbines and their components**. It was foreseen that there could be a lot of scope for growth in a home-grown recycling industry, noting current work already carried out by companies such as Renewable Parts and Reblade, and research being carried out by a Strathclyde University consortium into recycled material applications. It was perceived that there were high value materials such as steel, copper and rare earth metals to be recovered from turbines, though the fibreglass content in turbine blades presents a problem needing to be overcome.

5.30. A large minority of respondents from most sub-groups also cited **opportunities relating to innovations, development and research into recycling facilities**, with a view to making Scotland a world leader for

solutions; there were suggestions that government, industry and the enterprise agencies should work together towards this aim.

5.31. Smaller but still significant numbers of respondents, particularly communities' bodies, saw **opportunities arising from repowering of sites**, particularly by way of reusing civil and on-site infrastructure and existing grid facilities to minimise new additional construction activities.

5.32. **Positive impacts on local economic opportunities** were also cited, by way of creating local jobs in the circular economy and helping to alleviate fuel poverty, with the Local Energy Bill mentioned as potentially being a key enabler for this.

5.33. Other opportunities each mentioned by small numbers of mostly individuals and renewable energy respondents were as follows:

- Opportunities for a more home-grown turbine and turbine components production industry to help with the circular economy (with opportunities for developing recyclable turbine blades, components, wooden towers, etc.).
- Partnership working and cross industry collaboration, and creation of synergies with other energy forms (e.g. between onshore and offshore wind technologies for components to be recycled for use in the latter, and with hydrogen and battery storage technologies).
- Positive impacts of the circular economy on the supply chain (e.g. helping create an additional stream of suppliers).

5.34. Slightly fewer respondents, represented by all sub-groups, made comments relating to the second part of the question; those that did raised possible problems without (in general) suggesting solutions. The perceived **lack of recyclability of turbine blades** was the main practical issue raised, by a large minority of respondents from across most sub-groups. There was a desire to develop recyclability or reusability for blades with landfill seen as a major problem; there was a suggestion that in instances where repowering was taking place, smaller turbines including blades could be passed onto smaller community wind farms or to areas where modern larger turbines would be too big. A small number of mainly individual respondents cited further concerns related to the toxic plastic and microplastic content of blades which are unrecyclable and bad for the environment; requests were made for components to be made free from such plastics.

5.35. A variety of other practical issues and concerns were expressed by small number of respondents as follows:

- General concerns over costs and affordability, with suggestions that incentives will be needed such as tax breaks and loans for circular economy businesses; amendments to the CfD auction process were also suggested as well as project viability potentially being impacted by a requirement to provide restoration bonds.
- Concerns over whether a circular economy and zero waste is truly achievable, with points made about the quality of recycled goods not being the same as new, and toxic wastes being produced through mining overseas.
- Practical concerns over the non-recyclability of wind farm foundations (e.g. concrete not being recyclable, with re-excavation perceived as having more environmental impact than non-recovery). Challenges over decommissioning wind farms in general were also cited.
- Concerns over a lack of recycling infrastructure in Scotland (either at scale or for metals recycling).

5.36. A very small number of respondents from various sub-groups pointed out that extending the lives of wind farms could help as this would reduce the frequency of reuse or recycling of turbines or components.

5.37. A few respondents - mostly individuals and communities' groups - urged for profit not to be the driver of the circular economy, perceiving this tends to go overseas at the expense of local communities.

5.38. Question 22 then went onto ask:

Q22: How can the Scottish Government best support skills for the future of the onshore wind sector? Specifically we would be interested in oil and gas transition, apprenticeships and entry-level positions for young people, as well as any other experiences you can share.

Summary (Q22)

- Respondents from all groups favoured apprenticeships with a view to getting practical experience.
- Support was also expressed for university and graduate courses, technical and local colleges, the reskilling of oil and gas workers and those from other sectors, as well as general action for education promoting the onshore sector such as investment in STEM subjects.

5.39. Sixty-five respondents commented at this question. A large minority from most sub-groups **welcomed Scottish Government support for skills**, saying that government-funded education in the area should continue and be enhanced.

5.40. The largest proportion of respondents, a large minority from across all sub-groups, were **in favour of apprenticeships**, with comments supporting young people getting practical experience and recommendations for on the job provision from developers and a job guarantee for a period after apprenticeship provision.

5.41. Large minorities of respondents, again from across most groupings, also voiced support for the following actions on skills:

- **General support for education promoting the onshore wind sector** (e.g. to encourage new entrants by investing in STEM subjects).
- **Support for university and graduate courses** (e.g. ones incorporating industrial placements, such as those at Heriot-Watt and Strathclyde universities, etc.).
- **Support for the reskilling and upskilling of oil and gas workers**, and those from other sectors such as the armed forces and automotive sector by way of more sector engagement and directed support.
- **Support for technical and local colleges** and local opportunities for young people to learn technical and wind farm skills, e.g. suggested roles for Nigg Skills Academy, North Highland College, UHI, or to set up a dedicated Wind Energy College for Scotland.

5.42. Very small numbers of local authorities and planners recommended strong links to skills programmes with the offshore wind sector; and various sub-groups for putting monies from community benefit or shared ownership funds towards training schemes or supporting public transport to and from colleges.

5.43. A few mainly renewable energy respondents also saw a need for other ways to promote recruitment to the onshore wind sector. Prime amongst these were a call for better wages and salaries, noting these are currently below those earned by oil and gas workers. Other facets recommended to promote the industry to workers were the longevity and growth of the industry, environmental considerations and a perceived better work / life balance compared to working offshore.

5.44. A large minority from a range of sub-groups pinpointed **a wide variety of roles and skill areas for which demand is predicted**; there were several mentions of town and landscape planners, and smaller numbers of mentions for ecologists, ornithologists, engineers, fabricators, technicians, managers, R&D around retrofitting and repowering existing schemes, heavy lifting engineers and office staff as well as jobs in operations, maintenance and project management.

5.45. A significant minority of respondents from a broad range of groups wished **to instil Just Transition principles in upskilling and reskilling**, citing potential improvements in the diversity of the workforce.

5.46. Finally, a significant minority of individuals and communities' organisations were sceptical that onshore wind will replace jobs in the oil and gas sector, citing that fossil fuels will still be needed or that most jobs are only created during the initial development and construction phase of a wind farm.

5.47. Question 23 then asked:

Q23: Do you have any views on the impact of windfarms on tourism?

Summary (Q23)

- Views were polarised. Those who said tourism has not been impacted said this was a consistent finding from research studies; furthermore, there were claims that windfarms themselves can be tourist attractions or enhance the tourism experience by way of visitor centres and greater access to the outdoors via windfarm access tracks.
- Those who said tourism was negatively impacted cited concerns over ruined landscapes, the natural environment and visual impacts, saying that research paints a conflicting picture.
- Other views were that tourism impacts depend on where windfarms are sited.

5.48. This question elicited the views of 110 respondents. **Views were extremely polarised** with the same numbers perceiving no or positive impacts (mainly renewable energy organisations) as those perceiving negative impacts (communities, lobby and interest groups, local authority and planners, and individuals).

5.49. A large minority of respondents, almost all of whom were renewable energy organisations, said there was **no evidence of tourism impacts and that tourism (prior to Covid) was in a healthy state**, saying this was a consistent finding from research studies, for instance that tourism in local authority areas which have had the largest increases in onshore wind farms has performed just as well as in other areas. A significant minority of respondents (almost all of whom were again renewable energy organisations) referred to the Biggar Economics report [Onshore Wind and Tourism in Scotland](#) which concluded that there was no evidence of a link between wind farm development and trends in tourism employment (employment in tourism increased by 20% from 2009-2019 despite turbines increasing from 1082 to 3772 in the same period).

5.50. Furthermore, a large minority of particularly renewable energy respondents claimed **that wind farms themselves are tourist attractions or can enhance the tourism experience**. Examples were provided as follows:

- Opportunities for wind farm visitor centres.
- Greater access to walking, cycling, running spaces and local recreation via wind farm tracks.
- Possibilities of synergies with other initiatives e.g. the North Coast 500.
- Promotion of energy history and Scotland's climate action attributes.
- Community benefit funds contributing to tourism-related projects.

5.51. Amongst the large minority of mainly individual, local authority / planning, communities and lobby and interest respondents who said **tourism was negatively affected by wind farms**, most were concerned about ruined landscapes, the natural environment and visual impact issues, with a few mentions that the draft OnWPS should pay this more attention. A small number of mostly individuals commented on tourism numbers and income declining, with South-West Scotland specifically mentioned in this regard.

5.52. A large minority from across most sub-groups **queried the results of research** and identified a need for definitive assessments and methodology. Different reports have had different conclusions thus painting a conflicting picture, according to these respondents. Very small numbers of mostly individual respondents pointed to research as showing that tourism has been negatively impacted, or perceived survey results as misleading.

5.53. Finally, there was a large minority of respondents from most sub-groups who thought the **impact on tourism from wind farms depends on where they are sited**. These respondents urged that strict controls on sites should be taken using an evidence-based planning approach, particularly for very large wind farms. Avoiding building developments in tourist or national park areas was recommended, with attention paid to the local authority planning landscape and sensitivity and capacity studies.

5.54. Question 24 asked:

Q24: What is your organisation doing specifically to promote diversity and inclusion in the onshore wind sector?

Summary (Q24)

- Most respondents stated a commitment to diversity and inclusion in their workforce, with equal opportunities employment and workplace policies largely in place.

5.55. Only 37 respondents answered this question. A majority consisting of mostly renewable energy respondents stated a **commitment to diversity and inclusion in the workforce**, for example through communications, updates and goal setting for a minimum proportion of minority groups. A large minority (again consisting mostly of renewable energy respondents) said they had an **equal opportunities employment and workplace policy**, with promotion of opportunities irrespective of background. A few (almost all renewable energy respondents) stated that they had implemented or were implementing an equality, diversity or inclusion strategy or plan throughout their organisation.

5.56. Examples of other specific actions were mentioned by just under half of the respondents, and these included:

- Promoting gender neutral language.
- Highlighting barriers faced by women.
- Support for faith groups.
- Consistency with delivering a Just Transition (e.g. fair / decent jobs) to net-zero carbon.
- Provision of facilities for the disabled.
- Diversity and inclusion training for managers.
- STEM subject ambassadors or outreachers at schools and for those returning to work.
- Expecting equality of opportunity from suppliers.
- Mental health support for staff.
- Supporting remote or flexible working practices or a family-friendly approach.

5.57. Finally, there were a very small number of complaints about developers in general excluding rural and local communities from benefits.

5.58. The final question in this section of the consultation paper asked:

Q25: Given the significant contribution onshore wind is expected to make to our net-zero ambitions, and the structure of the ScotWind process for offshore development, should Supply Chain Development Plans be introduced for onshore wind developments in Scotland?

Summary (Q25)

- Roughly equal numbers were for and against SCDPs being introduced, though most did not know.

- Those in favour felt that SCDPs would help the growth of companies in Scotland’s supply chains through preferential opportunities to tender for work and benefits from increased sector scale.
- Those against urged that SCDPs be reserved for offshore development only and foresaw a lack of benefits due to the fragmentation of the onshore industry and developers already having supply chains in place.

5.59. As the following table shows, among the 71 respondents who replied to the first part of the question, **slightly fewer were in favour of Supply Chain Development Plans (SCDPs) being introduced for onshore wind developments than were not in favour**; however the greatest numbers of respondents said they did not know. More renewable energy sector respondents were not in favour than in favour, but government funded bodies and regulators and local authorities and planners who voiced an opinion were all in favour.

Q25	Number			
	Yes	No	Don't know	No response
Acoustics (3)	-	-	1	2
Aviation specialist (5)	-	-	-	5
Communities (18)	2	2	3	11
Governmental funded bodies & regulators (7)	2	-	-	5
Legal (2)	-	-	-	2
Lobby and interest groups (13)	2	1	-	10
Local authorities & planners (14)	4	-	6	4
Renewable Energy (43)	4	8	7	24
Third sector (e.g. Charities and other NGOs) (2)	-	-	-	2
Other (4)	-	1	1	2
Total organisations (111)	14	12	18	67
Individuals (49)	6	10	11	22
Total respondents (160)	20	22	29	89

5.60. A total of 55 respondents gave open-ended answers to the question. Amongst those who responded positively to the idea, the greatest

numbers, a significant minority across most sub-groups said that **Supply Chain Development Plans would help the growth of companies in Scotland's supply chains**; advantages foreseen included being given preferential opportunities to tender for work, scaling up benefits, cost reductions, supply chain robustness, skills development and increased refurbishment work and minimisation of waste. Very small numbers of mostly renewable energy respondents pointed out that other schemes such as ScotWind and Warmer Homes Scotland (efforts to promote renewables installers) have worked and suggested that the Plan should be aligned closely with the whole range of energy options, including those in the rest of the UK.

5.61. Small numbers of (mostly individual or renewable energy) respondents were favourable towards Supply Chain Development Plans (SCDPs) as long as:

- Onshore wind developments are sensibly situated.
- Sustainability and embodied carbon impacts are considered.
- There are measurable outcomes (e.g. a transparent scoring system giving a level for community benefits per MW installed).

5.62. Amongst the slightly larger number of respondents who were not favourable towards Supply Chain Development Plans, a significant minority, almost all of whom were renewable energy or individual respondents, urged that these be **reserved for offshore development only**, where it was considered that a greater amount of supply chain development is needed. Similar numbers, of almost entirely renewable energy respondents, foresaw a **lack of materially positive impacts on the supply chain**, as onshore wind farms are too small and fragmented by nature to influence the size of supply chains, and developers have supply chains already in place, much of this with local suppliers.

5.63. Other negative reasons were highlighted by small numbers of mainly renewable energy respondents as follows:

- It is better for industry and the Scottish Government to work together to identify the most effective mechanism for ensuring high levels of local content and a thriving supply chain.
- It would create a significant additional burden on the sector, as delivering on commitments is a long, resource intensive administration burden, which will not reduce costs and might reduce the number of projects.
- It is better to have a consented portfolio or critical mass of developments for long term planning.
- It will not positively contribute to net-zero ambitions (e.g. new wind farms hardly displace non-renewable energy as most energy in Scotland already comes from renewable sources).

- The market for onshore turbines is too mature for new local entrants.

5.64. There were also a few queries as to the weight of SCDPs in planning, and a few comments which noted that supply chain statements also exist within the CfD bidding system – a UK Government mechanism.

Annex 1: Eskdalemuir Working Group and Policy Proposals

When referring to respondents who made particular comments, the terms ‘a small number’, ‘a few’ and so on have been used. While the analysis was qualitative in nature, as a very general rule of thumb it can be assumed that: ‘a very small number’ indicates around 2-3 respondents, ‘a small number’ indicates around 4-6 respondents; ‘a few’ indicates around 7 to 9; and ‘some’ indicates 10 or more but fewer than half of those who commented at any question. Where larger numbers of respondents are referred to, a ‘significant minority’ is 10-25% of respondents, a ‘large minority’ is denoted by 25-50% of respondents, and 50%+ is ‘a majority’.

1. The consultation paper outlined information on the Eskdalemuir Seismic Array (EKA), a seismological monitoring station in the Scottish Borders which forms part of the UK’s obligations under the Comprehensive Test Ban Treaty (CTBT); and the impact that wind turbines can have on this. Current safeguards provide limits on seismic disturbance and ensure an exclusion zone of a 10km radius. However, at present the noise budget for the zone has been breached and the MoD will object to any and all developments within the consultation zone of 50 km in order to protect the operations of the array. This is currently preventing any further developments in a significant area of Scotland. The Scottish Government is committed to the most efficient use of Scotland’s regenerating potential and recognises that EKA is acting as a barrier to deployment at present. Four potential policy options were outlined.
2. Four questions were asked on the Eskdalemuir Seismic Array.

Summary (Qs26-29)

- Equal numbers of respondents agreed with the accuracy of the content as disagreed or neither agreed nor disagreed.
- There was an issue reported regarding a difference in process between local applications and Section 36 applications whereby the EKA noise budgets are secured at different stages of development.
- Renewable energy organisations agreed that there needs to be a new approach to the noise budget, with Option 3 garnering the most support. At the same time, there were views that achieving or calculating an acceptable level of impact was a matter for more research and analysis, and that there is a need to take account of wind farm innovations in budget allocations.

- There was a consensus that the EWG needed restructuring to a smaller core working group with a secondary open forum of stakeholders.

3. The first question in this section asked:

Q26: Does the above accurately reflect the current position in relation to the Eskdalemuir Seismic Array and the barrier it presents to deployment in Scotland?

4. Out of 64 respondents who answered the first part of this question, **nearly half strongly or mostly agreed that the position accurately reflected their view in relation to the Eskdalemuir Seismic Array.** However, nearly as many respondents neither agreed nor disagreed. Renewable energy respondents almost unanimously strongly or mostly agreed.

Q26	Number					
	Strongly agree	Mostly agree	Neither agree nor disagree	Mostly disagree	Strongly disagree	No response
Acoustics (3)	-	-	1	-	-	2
Aviation specialist (5)	-	-	-	-	-	5
Communities (18)	1	1	4	-	-	12
Governmental funded bodies & regulators (7)	-	-	1	-	-	6
Legal (2)	-	-	-	-	-	2
Lobby and interest groups (13)	-	-	-	-	1	12
Local authorities & planners (14)	-	2	4	-	-	8
Renewable Energy (43)	3	16	1	-	1	22
Third sector (e.g. Charities and other NGOs) (2)	-	-	-	-	-	2
Other (4)	-	-	-	-	-	4
Total organisations (111)	4	19	11	-	2	75
Individuals (49)	1	6	13	3	5	21
Total respondents (160)	5	25	24	3	7	96

5. 52 respondents proceeded to make further comments; a large minority (mostly renewable energy organisations) reiterated that the annex accurately reflects their view of the current situation.
6. An issue raised by a large minority of mainly renewable energy industry respondents was an omission from the OnWPS draft statement that there is a **difference in process between local applications and Section 36 applications whereby the noise budgets are secured at different stages of development**; Section 36 schemes can enter the scoping process early and be awarded budget prior to a planning application being submitted, a situation regarded as unfair. It is worth noting that this issue lies within the MoD's remit.
7. A further concern expressed by a few of the same respondents as above referred to where any threshold is 'to the satisfaction of the Ministry of Defence'. This was regarded as too vague; respondents urged that the MoD's process for assessing its satisfaction with mitigation measures is clear and transparent.
8. More generally, a few mostly renewable energy respondents urged a review of current policy as a solution was needed to unblock wind farm potential; these respondents agreed that the current situation was a barrier to a large number of projects in the wider area which would have a lower impact getting held up because projects closer to the array are taking years to get rejected.
9. Other small numbers of respondents made the following observations:
 - As the barrier that the Eskdalemuir Seismic Array (EKA) presents is significant, this needs to be acknowledged in the NPF4 and other pieces of spatial planning framework, in order to help find mitigating measures.
 - There is a need to protect against sound levels as noise is important (e.g. more research is needed).
 - Progress would be welcome by way of a policy solution.
10. A significant minority, mostly consisting of individuals and communities' organisations tending towards disagreement with the view presented at the first part of the question, advocated that **MoD requirements and national security were the overriding concern and must be upheld**. Slightly fewer respondents from the same sub-groups mooted that the Scottish Government and developers were trying to get round regulations and ignore obligations in order to build more onshore wind farms; these respondents were against any loosening of the limits.

11. Finally a very small number of individual respondents were not in favour of more developments in the area because of the potential loss of wetlands and associated increased flood risks, irrespective of military requirements.

12. The next question asked:

Q27: Acknowledging that the Scottish Government require further evidence before taking a policy decision, at this point and reflecting the options outlined above do you / your organisation have any thoughts?

13. This question elicited 50 responses. A large minority of mainly renewable energy industry organisations agreed that **there needs to be a new approach to the EKA noise budget**. There was an urge for rapid progress so that constrained projects can be deployed; suggestions included new calculations, using low seismic turbines to ensure optimal use of the noise budget, allocating noise budget at the consent stage of projects rather than scoping, and trying mitigations where turbines are less seismically quiet than predicted by modelling. However, many of the same respondents took the view that existing projects with noise budget should be entitled to retain any noise budget allocated to them with respect to any subsequent design revisions, such as blade tip height extensions.

14. A majority of mainly renewable energy respondents focused their opinions on the four policy options. The greatest number – a significant minority in all consisting of mainly renewable energy respondents – voiced **support for Option 3**, citing that developments beyond 15km would be able to progress and that this would ensure that budget is not reached by projects located 15-20km from the EKA. A few of these however thought the distance should be informed by the Phase 4 technical report. A very small number of respondents cited problems with Option 3, saying it included areas where wind farms are consented but not implemented which could involve financial compensation, additional administration for developers and timing delays.

15. **Regarding Option 1**, more respondents expressed support than disapproval; those in favour supported a 15km safety margin, stating this would enable progression of 1200MW or more capacity beyond 15km, and noted support via the research from the initial technical assessment by Xi Engineering. Those voicing disapproval cited that a large portion of land would be out of bounds for development, that it includes areas where wind farms have been consented but not implemented, that it will not on its own guarantee greatly increased deployment capacity, and that if large projects

are consented at 15km the noise budget would be reached preventing deployments in the wider area.

16. **Regarding Option 2**, almost all comments were negative. There were concerns about the terminology 'to the satisfaction of the MoD', about the need for full cooperation of the MoD to work with developers and consenting authorities, and about a need to know the weight of the MoD in planning decision-making as well as more general administration workload and timing delay issues.
17. **Regarding Option 4** – the status quo – there were a couple of mentions of support from an individual and a lobby and interest group, with an added small number of mentions from these subgroups favouring the MoD retaining its remit to safeguard the array and have no developments in the seismic recording area generally. A few negative comments were received, mainly from the renewable energy industry, about the lack of viability of this option as it is perceived as acting as a barrier to deployment.
18. A few other comments were made from a mix of respondent groups. These consisted of:
 - Preferences to leave decisions about where the ultimate exclusion zone should be to technical experts, rather than making it a political decision.
 - Suggestions to relocate the EKA elsewhere, in order for the area to meet its wind farm potential.
 - Requests to take the views of local people into account.
 - A few individuals reiterated views against more wind farms.
19. Question 28 then asked:

Q28: If Option 2 or Option 3 were to be selected, how could we best achieve or calculate an acceptable level of impact? (One example being an agreement of a standard noise budget to MW generated proportional allocation i.e. for X MW generated = X amount of budget allocated).

20. A total of 44 respondents replied to this question. The largest numbers (a large minority consisting mainly of the renewable energy industry) said **achieving or calculating an acceptable level of impact was a matter for more research and analysis**. In particular, waiting for the results of the Phase 4 work to determine the appropriate distances was recommended. Further comments urged monitoring and theoretical re-evaluation of actual impacts so that unused budget can be released, the need for a more realistic calculation for budgeting as the current method

likely overestimates effects, or cited a lack of industry consensus about the best option. A small number of respondents reinforced this view by saying it was a technical matter perhaps best left to the MoD to decide.

21. A large minority of almost entirely renewable energy respondents perceived a need **to take account of innovations in budget allocations**. It was purported that this would help encourage the uptake of low seismic, newer and improved turbines as well as other mitigations.
22. Difficulties with the standard noise budget to MW-generated proportional allocation method were noted by a few mostly renewable energy respondents; these included administration difficulties, the project by project agreement basis being slow, insecurity of budget allocation preventing confidence to proceed, the creation of barriers to development of a large number of projects in the wider area further from the array and a failure to reflect wind farm proximity to the EKA. An individual suggested that the relevant measure should be MW/hr per nm, not installed capacity.
23. However a small number of renewable energy respondents agreed with the budget allocation per WTG or MW, as long as there was no limit of procurement options to a single manufacturer which would remove competition. Other small numbers reiterated that allocation of budget should be at application submission rather than at the scoping stage. Two renewable energy organisations foresaw that extending the exclusion distance beyond 15 km would create a problem for future repowering of operational wind farms, because Scottish Planning Policy states that areas identified for wind farms should be suitable for use in perpetuity.
24. A few mostly renewable energy or individual respondents chose to focus on or reiterate their views on the four policy options; the largest number (as previously) preferred Option 3, citing this as providing optimum balance in terms of transparent and consistent implementation. Smaller numbers stated a preference for Option 1, giving reasons that it is definitive, practical, a situation that developers are used to, that anything within the 15km area uses up a disproportionate amount of budget, and that they had a preference for a hard boundary beyond which no consultation is allowed.
25. A few individuals and communities' groups were not in favour of mitigating impacts on national security grounds; two individuals were concerned about other impacts, in particular clustering of wind farms around the buffer zone.
26. The last question in this section went onto ask:

Q29: Do you / your organisation have any thoughts on how the EWG might be restructured to ensure continued engagement for interested parties whilst maintaining the core purpose of the group?

27. 36 respondents replied to this question. There was some consensus in that around half of these (almost all being renewable energy respondents) **recommended a restructuring to a smaller core, working, or executive group of active members, but with a secondary more open forum to include wider numbers of stakeholders, developers and interested parties** to whom reports and updates can be issued. It was further suggested by a few renewable energy respondents that the Scottish Government should select and / or administer the group, perhaps based on applications or previous membership. A couple of comments suggested that the EWG was currently too large to function efficiently.
28. Suggestions for inclusions to the proposed core group were made; organisations put forward for having representation included the MoD, the Scottish Government, BEIS, Scottish Renewables, Renewables UK, the RUK Aviation Working Group, AIFCL and developers who were happy to fund the previous Phase 4 study or willing to contribute to evidence gathering. There were also a small number of requests to include local communities. A couple of respondents urged involvement for groups with a range of views, rather than just those with vested interests; one renewable energy organisation saw a need to remove developers from the EWG to ensure impartiality in decision-making. However, there were also a very small number of requests to keep projects updated for clarity of budget allocation, a task that would be the responsibility of developers.
29. Small numbers from a range of sub-groups thought the EWG did not need restructuring, regarding it as “working well in safeguarding national security” and not wanting the Scottish Government to “gain control”; the increasing number of members was thought to reflect the increasing numbers of developers affected by the budget breach. It is worth noting that these statements do not correspond with the remit of EWG and safeguarding of the array falls solely within MoD’s remit. EWG is a collaborative group that seeks to maximise renewable deployment within the Eskdalemuir consultation zone whilst maintaining appropriate safeguards for the array.
30. A small number of individuals who were against wind farm developments thought the EWG should be disbanded.

Annex 2: Aviation and Renewables Collaboration Board

When referring to respondents who made particular comments, the terms ‘a small number’, ‘a few’ and so on have been used. While the analysis was qualitative in nature, as a very general rule of thumb it can be assumed that: ‘a very small number’ indicates around 2-3 respondents, ‘a small number’ indicates around 4-6 respondents; ‘a few’ indicates around 7 to 9; and ‘some’ indicates 10 or more but fewer than half of those who commented at any question. Where larger numbers of respondents are referred to, a ‘significant minority’ is 10-25% of respondents, a ‘large minority’ is denoted by 25-50% of respondents, and 50%+ is ‘a majority’.

1. The Scottish Government is proposing the formation of a high-level group tasked with mapping the opportunities, risks and challenges associated with continued development and co-existence of these sectors and outlined a number of issues for consideration.

Summary (Qs30-31)

- There was a broad welcome, mainly from renewable energy respondents, to the idea of the Aviation and Renewables Collaboration Board and the proposed restructuring of activity in the aviation area. A collaborative approach was supported in order to involve as wide a variety of stakeholder groups as possible.
- Aviation safety was urged to be paramount.
- Clear terms of reference and a more technical focus was advised regarding the policy remit. Equal numbers of respondents thought windfarm developers and the government should meet the financing of technical or strategic investments.

2. Question 30 asked:

Q30: We are clear on the value and importance of strategic and productive collaboration between the aviation and wind energy sectors. What are your thoughts on our proposed restructuring of the current effort and activity in this area, and the proposed Aviation and Renewables Collaboration Board?

3. A total of 48 respondents from most sub-groups made comments at this question. A majority, particularly from the renewable energy grouping, **welcomed the proposed Aviation and Renewables Collaboration**

Board and proposed restructuring of efforts in the area, also welcoming a transition of responsibility for aviation issues to the aviation industry. A majority, consisting mainly of renewable energy, aviation and individual respondents, also **supported a collaborative approach, with comments about being open to as wide a variety of stakeholder groups as possible** to ensure a range of views, and a UK-wide approach as aviation is a reserved sector to the UK Government. In particular, collaboration was seen as needed with the BEIS-led Aviation Management Board, the Offshore Wind Industry Council (OWIC) and the RenewableUK Aviation Working Group.

4. A significant minority made up of entirely renewable energy respondents suggested representation; bodies mentioned included the Defence Infrastructure Organisation (DIO), Defence Airspace and Air Traffic Management (DAATM), RAF Capability Strategy (RAF Cap Strat), Defence Equipment and Support (DE&S), and in particular the MoD. Developer and community representation was also recommended.
5. A significant number of respondents, including all the aviation specialist sub-group and a range of other sub-groups, urged that **aviation safety be paramount**, highlighting the following:
 - Concerns that only a third of the proposed board have connections to aviation.
 - Airports may not have the money to spend on the upgrades required to safeguard flights through busy windfarm territory.
 - Radar interference needs total mitigation.
 - Concerns about distractions on operators' displays.
 - A need to clearly demarcate areas where turbines cannot be built for aviation reasons.
 - A need to mention aerodrome safeguarding and other safeguarding impacts (e.g. Communication, Navigation and Surveillance (CNS) equipment and turbulence and issues with increased turbine height due to repowering).
6. A few respondents, again consisting mainly of aviation specialists, had concerns that the aviation industry will now share costs; these respondents felt that the commercial companies promoting their developments should pay.
7. On the proposed policy topics, a significant number consisting almost entirely of renewable energy and aviation respondents thought the list was too broad a remit (e.g. areas such as carbon neutral campuses and electric vehicle usage not being under the specific remit of aviation) and that more technical focus and clear terms of reference were needed. A very small number (all of whom were aviation specialists) felt that the

policy issues were too prescriptive and that the Board needed flexibility to develop its own terms of reference.

8. Further comments from a few mostly renewable energy respondents recommended that the Board should learn from the (successful) equivalent offshore wind programme (OWIC), and urged that barriers to deployment of wind farms caused by aviation need to be addressed, in particular advocating that aviation objections on radar interference grounds should not be valid where the operator already uses – or is in the process of procuring – a wind farm tolerant radar or radar feed, or ensuring the aviation and defence sectors take responsibility for procuring windfarm tolerant radar in their next procurements.
9. The final question in the consultation paper then asked:

Q31: The work of the Aviation and Renewables Collaboration Board may identify and agree the need for technical or strategic investment to achieve specific goals or outcomes. What are your views on how work of this kind might be financed?

10. A total of 49 respondents from most sub-groups made comments at this question. Opinions on funding technical or strategic investment were polarised: **equal numbers vouched for wind farm developers (mainly aviation specialist and individuals), and for the government (broad mix of sub-groups) to meet all costs, with fewer respondents (from a broad mix of sub-groups) stating funding should be by the aviation industry.**
11. Reasoning for wind farm developers meeting all the costs, advanced mainly by individuals, aviation specialists and community groups, were that airports and aircraft were in use before wind farms; that those who benefit commercially should pay; and that there is little justification for aviation stakeholders to invest in resolving the impacts of third party commercial activities. There were suggestions of a mandatory levy on developers to fund the Board's activities, or an annual charge for air traffic mitigation requirements.
12. Government funding was recommended by a broad spectrum of subgroups, albeit with suggestions that there could be contributions from developers and the aviation industry. There were suggestions of funding mechanisms (e.g. a tax on energy producers or air departure tax proceeds) to release a central pot of money to cover the costs of mitigation actions. There was broad agreement from a range of sub-groups on the need for good governance, transparency and accountability if the government-funded approach to costs was taken. A very small number of individuals stated they were against taxpayers meeting costs.

13. A few respondents, almost all from the renewable energy industry, recommended financing by the aviation industry, particularly in the long term. Suggestions were for a tax on aviation fuel or air passenger duty, with comments that the aviation sector needs to ensure their assets are updated to a net-zero carbon world.
14. Suggestions about a joint funding approach between the renewables and aviation industries were made by a small number of respondents to help build a collaborative approach. Further mentions were made regarding a collaborative approach more generally to reach a mutually satisfactory settlement.

Additional comments

1. 30 respondents from almost the full range of sub-groups opted to provide additional information. **A majority of these remarks outlined the background, role, and activities of the respondent, or reiterated their general position regarding onshore wind.**
2. There were a few concerns expressed – almost all by renewable energy respondents - over planning reforms such as the need to align NPF4 with the OnWPS and perceived planning issues hindering progress towards the 2030 target.
3. Small numbers of mainly communities and lobby and interest respondents advocated a need to have more protection for and take more heed of communities, perceiving bias in favour of the renewables industry.
4. There were also small number of statements regarding individual projects and the difficulties they have faced from individual and renewable energy respondents.
5. There were a very small number of requests for greater coverage of noise issues from acoustics, legal and individual respondents.

Appendix 1: Respondent Organisations

Abei Energy Group Ltd

Aberdeenshire Council

Aberdeen University Centre for Energy Law

AGS Airports

Airport Operators Association

Ampyr Energy UK Development Ltd

Ardross Community Council

Argyll and Bute Council

Ascog Farm

Banks Renewables

BayWa r.e. UK Ltd

Belltown Power UK Limited

BiGGAR Economics

Caithness West Community Council (CWCC)

Campbeltown Community Council

Coimhearsnachd Bharraidh agus Bhatarsaidh (Barra & Vatersay Community) Ltd

Comhairle nan Eilean Siar

Community Energy Scotland

Community Windpower Limited

Coriolis Energy Limited

Defence Infrastructure Organisation, Ministry of Defence

Dick Bowdler Acoustics

DS Consulting GmbH

Dumfries & Galloway Council

Eddleston and District Community Council

EDF Renewables

Edinburgh Airport

EDPR

EKREG Ltd

Energiekontor UK Ltd

Energy Saving Trust
E Power Limited
ERG UK
ESB Asset Development UK Limited
European Energy Development Limited
Falkirk Council
Farm Energy Consulting Ltd
Fife Council (Planning Services)
Fisheries Management Scotland
Force 9 Energy
Foundation Scotland
Fred. Olsen Renewables
GGE Scotland Ltd
Glasgow Community Energy
Glasgow Prestwick Airport Ltd
Glenrath Farms Ltd
GreenPower International Ltd
Heads of Planning Scotland
Help Save Mochrum Fell
Heriot Community Council
Highlands and Islands Enterprise
Historic Environment Scotland
Horshader Community Development
Infinergy Ltd
Institute of Acoustics - Scottish Branch
Inverclyde Council
IREGG
John Muir Trust
Kilmuir & Logie Easter Community Council
Law Society of Scotland
MERED Limited
Mountaineering Scotland

Muirhall Energy
Murieston Community Council
National Farmers Union Scotland (NFUS)
NATS
NatureScot
North Ayrshire Council
North East Mountain Trust
Orkney Sustainable Energy Ltd
Point and Sandwick Trust
Red Rock Power Limited
REG Power Management LTD
RenewableUK
RES
Ripple Energy
RSPB Scotland
RTPI Scotland
RWE
Save Shetland
Scotland Against Spin
Scottish Borders Council
Scottish Hydrogen and Fuel Cell Association
ScottishPower Renewables
Scottish Renewables
Scottish Water
Scottish Wild Land Group
Scottish Women's Convention
Shetland Community Benefit Fund Tld
Shetland Islands Council
Soirbheas
South Lanarkshire Council
South of Scotland Enterprise
SP Energy Networks

SSE Renewables
SSEN Transmission
Statkraft UK Ltd
Storas Uibhist
Teindland Wind Farm Ltd
The Highland Council
The National Trust for Scotland
The Royal Environmental Health Institute of Scotland
UK Noise Association
Urras Oighreachd Ghabhsainn
Vattenfall
Ventient Energy
West Kintyre Community Council
Wind2 Ltd
WKN GmbH
Zero Waste Scotland

Appendix 2

Question 6

Reports, Research and other analysis referred to by respondents

North of Scotland Future Energy Scenarios ([North of Scotland Future Energy Scenarios \(NoSFES\) \(ssen-transmission.co.uk\)](https://www.ssen-transmission.co.uk)) show that 10.4GW-11.1GW of onshore wind will be necessary in the north of Scotland by 2030 to contribute to Scotland's wider decarbonisation goals. To put this into perspective, we currently have 3.2GW of onshore wind connected to our network (*Energy Org*)

Achieving the 8-12GW target will also require significant investment in Scotland's Transmission network to connect and then deliver this clean electricity to areas of demand all over GB. It should be noted that this level of investment in new onshore wind projects is currently not accounted for in strategic network planning documents such as National Grid ESO's latest Network Options Assessment for 2022 ([Network Options Assessment \(NOA\) | National Grid ESO](#)) (*Energy Org*)

Our Energy Transition Group report, 'Powering the Change' ([powering-change-calling-the-south-of-scotland-to-action-final.pdf \(southofscotlandenterprise.com\)](#)) estimated that decarbonisation of the regions heating, and transport would require, depending on the level of energy efficiency investment undertaken in parallel, between 408 GWh and 565 GWh per annum more power than at present, in order to meet the South of Scotland's own needs in decarbonising heating for off gas grid homes, social housing and to convert the region's car fleet on a one-to-one basis from fossil fuels to EVs. This means that, even in regions such as the South of Scotland, comprised of Dumfries and Galloway Council and the Scottish Borders Council area, which already hosted some 1.318 GW of installed capacity (15.6% of the Scottish total) by 2020, there may require to be further capacity and/ or sites to meet future Scottish demand while also meeting growth in local demand. (*Govt funded body / regulator*)

The ambition set out in the draft OWPS to accelerate deployment of onshore wind must be done in a way that does not undermine efforts to tackle the loss of biodiversity and to reach the target of extending the protected area in Scotland to at least 30% of land by 2030 ('30x30'), as set out in the Scottish Biodiversity Strategy post-2020 Statement of Intent

(<https://www.gov.scot/publications/scottish-biodiversity-strategy-post-2020-statement-intent/>) (*Lobby / Interest Group*)

However, we do not believe that the 8-12GW target currently set out is sufficient to meet the binding net zero commitments. Renewable UK's Onshore Wind Industry Prospectus (Oct 2021) ([onshore_wind_prospectus_fina.pdf \(ymaws.com\)](https://ymaws.com/onshore_wind_prospectus_fina.pdf)) sets out that the Scottish Government needs to set out a target of 12GW of new development by 2030. (*Renewable Energy*)

The (*North Ayrshire*) Council's own Landscape Capacity Study shows that most capacity for additional development would be achieved through repowering. (*Local Authority / planner*)

SR asserts that Scotland should fully commit to an additional 12GW of onshore wind by 2030, and adopt a 12GW minimum target, instead of terming it an 'ambition'....A more detailed analysis of how it would be achieved and the socio-economic benefits it will deliver are set out in the Onshore Wind Industry Prospectus (Oct 2021) ([onshore_wind_prospectus_fina.pdf \(ymaws.com\)](https://ymaws.com/onshore_wind_prospectus_fina.pdf)) produced in collaboration with Scottish Renewables. In summary, 12GW of additional onshore wind deployment would create 17,000 jobs and generate £27.8 billion GVA to the Scottish economy. (*Various*)

SSER fully support the target as we believe it will be necessary in order for the UK to meet its net zero targets. We also support Scottish governments target of achieving 30% protection of Scotland's land and ... we are already at 35% protection from Group 1 and 2 and wild land. We have looked closer at the wild land category as it is by far the largest new constraint and we discovered that far more land is allocated to wild land than for renewable energy.

We have looked closer at the wild land category as it is by far the largest new constraint and we discovered that far more land is allocated to wild land than for renewable energy.

In looking closer at the makeup of wild land we discovered that 76% of wild land was already covered by existing designations of one type or other. This left 24% of wild land with no other qualification other than wild land. To meet the targets SSER believe that wild land must be revisited such that some areas will be needed to accommodate development that helps meet the net zero targets (*SSE Renewables, Renewable Energy,*

GIS mapping exercise to identify suitable areas for onshore wind farm development)

We welcome the Scottish Government's ambition in achieving climate action objectives.

This notwithstanding, due consideration must be given to the landscape and visual impact of each proposal. In general terms, proposals will be supported as long as they do not

result in unacceptable significant adverse impacts on Fife's landscapes.

For guidance, we look to:

- Low Carbon Fife SG ([Low-Carbon-Fife-Supplementary-Guidance-Jan-2019.pdf](#)) which sets out landscape capacity to accommodate wind turbines in

Fife.

- Siting and Designing Wind Farms in the Landscape, Nature Scot, ([Siting and designing wind farms in the landscape - Version 2 | NatureScot](#))

(Local Authority / planner)

Even with the progress elucidated in the Community Energy State of the Sector Report 2021, which included Wales, Scotland and England (see: <https://www.communityenergyengland.org/pages/state-of-the-sector>) community energy remains a small fraction of renewable energy generation and supply in this country *(Individual)*

How to access background or source data

The data collected for this social research publication:

- are available in more detail through Scottish Neighbourhood Statistics
- are available via an alternative route <specify or delete this text>
- may be made available on request, subject to consideration of legal and ethical factors. Please contact onshorewindpolicy@gov.scot for further information.
- cannot be made available by Scottish Government for further analysis as Scottish Government is not the data controller.



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