Consultation on a Scottish Energy Strategy: The future of energy in Scotland: Analysis of Responses: November 2017
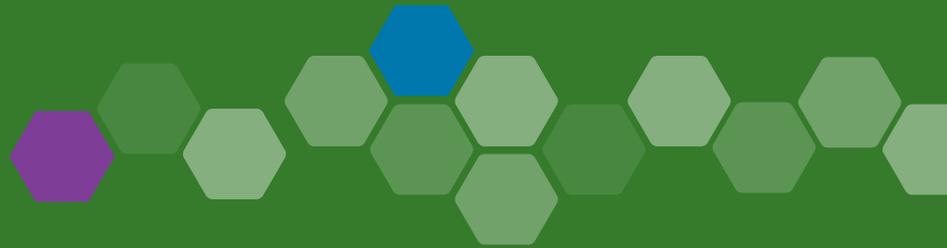
BUSINESS AND ENERGY

social research

Analysis of Responses to the Consultation on a Scottish Energy Strategy: The future of energy in Scotland

Why Research, November 2017

Contents

Glossary of Terms

BEIS	Department for Business, Energy and Industrial Strategy
CARES	Community and Renewable Energy Scheme
CCS	Carbon Capture and Storage
CfD	Contracts for Difference
CHP	Combined Heat and Power
CPP	Community Planning Partnership
DNO	Distribution Network Operator
DSO	Distribution System Operator
EIS	Enterprise Investment Scheme
EPC	Energy Performance Certificate
ESCo	Energy Service Company
EV	Electric Vehicle
GCOEC	Government and Community-Owned Energy Company
GOEC	Government-owned energy company
HGV	Heavy Goods Vehicle
ISA	Individual Savings Account

LCITP	Low Carbon Infrastructure Transition Programme
LHEES	Local Heat and Energy Efficiency Strategies
LOIP	Local Outcomes Improvement Plan
MEC	Municipal Energy Company
NPF	National Planning Framework
PBCE	Project Bond Credit Enhancement
PPA	Power Purchase Agreement
REIF	Renewable Energy Investment Fund
RHI	Renewable Heat Incentive
RTFC	Renewable Transport Fuel Certificates
SEA	Strategic Environmental Assessment
SEAB	Scottish Energy Advisory Board
SEC	Scottish Energy Company
SEEP	Scotland's Energy Efficiency Programme
SEIS	Seed Enterprise Investment Scheme
SMART	Specific, Measurable, Achievable, Relevant, Timebound
Solar PV	Solar Photovoltaic
SPP	Scottish Planning Policy

SREB	Scottish Renewable Energy Bond
STEM	Science, Technology, Engineering and Mathematics
TRIG	The Renewables Infrastructure Group
UKCCC	UK Committee on Climate Change
UOG	Unconventional Oil and Gas

Executive Summary

Introduction

1.   The Scottish Government consultation on a Scottish Energy Strategy: The future of energy in Scotland ('draft Energy Strategy') was one of four consultations in relation to the energy sector published by the Scottish Government in January 2017:

- Consultation on a draft Energy Strategy.
- Consultation on a draft Onshore Wind Policy Statement.
- Consultation on Scotland's Energy Efficiency Programme (SEEP).
- Consultation on Local Heat and Energy Efficiency Strategies and District Heat Regulation (LHEES).

2.   This report focuses on the draft Energy Strategy only. Separate reports have been prepared on each of the other consultations.[1]

3.   The consultation document on the draft Energy Strategy set out the vision for the future energy system in Scotland to 2050. The long-term vision set by the draft Energy Strategy is for a modern, integrated, clean energy system, delivering reliable energy supplies at an affordable price in a market that treats all consumers fairly.

4.   The consultation asked seventeen questions and covered a range of issues under four chapter headings: Meeting our Energy Needs, Transforming Energy Use, Smart Local Energy Systems and Delivery, Monitoring and Engagement.

5.   The consultation ran from 24 January until 30 May 2017.

Respondent Profile and Methodology

6.   There were 252 responses analysed in this report: 200 from organisations and 52 from individuals Respondents were assigned to respondent groupings in order to enable analysis of any differences or commonalities across or within the various different types of organisations and individuals that responded.

7.   The table provides details of the overall groupings that were applied across the consultation on the draft Energy Strategy. Given the wide range of different organisations categorised under Business / Industry and Network / Professional / Trade, these two categories were divided into sub categories to allow for more in-depth comparison and contrasting of views. Full details of the methodology are available in the Introduction chapter of this report.

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[1] Links to the other consultation reports can be found on the draft Energy Strategy webpage http://www.gov.scot/draftenergystrategy

Respondent Groups	
Main Categories	**Number**
Academia / Research / Training	17
Community	7
Business / Industry	68
Network / Professional / Trade	48
Local Government	21
Public Sector / Delivery Agency / Regulator	14
Third Sector / NGO	24
Other	1
Total organisations	**200**
Individuals	52
TOTAL	**252**

8.   The following paragraphs provide a summary of responses to each question. This is followed by a summary of the cross-cutting themes emerging across this consultation.

Meeting our Energy Supply Needs (Chapter 3)

The priorities for energy supply (Question 1)

9.   There was broad overall support, across all sub-groups, for the five priorities set out in Chapter 3, with particular support for the whole systems approach taken in the draft Energy Strategy and the flexibility shown to adapt to changes in emerging technologies. However, there were a number of caveats regarding the weight of emphasis on certain priorities, a perceived lack of detail or perceived areas of omission.

10.   Only a small number of respondents disagreed with any of the priorities.

11.   There were mixed views regarding the extent of support that should be given to the recovery of North Sea oil and gas, with some respondents welcoming continued support for the sector due to its vital importance in delivering reliable energy and economic value, while some others felt there is too much emphasis on this sector given the draft Energy Strategy's focus on decarbonisation.

12.   A relatively large number of respondents welcomed the development and commercialisation of Carbon Capture and Storage (CCS), although they also highlighted perceived technical and / or financial challenges in the development of large-scale CCS on a cost effective basis.

13.   A number felt that renewables should be supported as a significant, cost-effective resource and that Scotland should continue to build on its successes in promoting renewable electricity. There were references to onshore and offshore wind, as well as solar thermal energy and pumped hydro storage, as providing competitive cost-effective options.

14.   A number of respondents focused on the 2030 renewable target and the relative effectiveness and efficiency of existing and emerging technologies that might contribute to meeting this target.

15.   Some respondents felt that Priority 5 (increasing the flexibility, efficiency and resilience of the energy system as a whole) should underpin the other 4 priorities.

16.   There were references to the need to give greater recognition of the interdependencies between Scottish and UK energy systems and the role of European Union policy.

17.   There were requests for more integration of Scottish Government strategy across planning and energy; and that the full range of devolved policy levers should be closely aligned with the Energy Strategy.

The actions regarding energy supply (Question 2)

18.   Many respondents, across groups, simply voiced support for the actions in general or for specific actions; these supportive comments were all brief, along the lines of 'the respondent supports x'.

19.   A number also gave their views on actions under each of the priorities (albeit small numbers commented on each) and / or suggested additional actions. These comments and suggestions are outlined in Appendix 2.

The proposed target to supply the equivalent of 50% of all Scotland's energy consumption from renewable sources by 2030 (Question 3)

20. There was overall support for this target, although there was a perception from several respondents that this is too ambitious. A small number disagreed with setting targets altogether.

21. There were requests for the target to apply to all low carbon sources of energy, not just renewables; a range of different technologies were cited for inclusion in the energy mix (see Question 4).

22. There were requests for more detail on different aspects of the target – particularly on the effort required in the heat and transport sectors which were perceived to be much more challenging to decarbonise with current renewable technologies.

23. A need was identified for strategic and / or strong leadership, clear guidance and consistent, stable and clear fiscal policy support in order to deliver the 2030 target.

The development of an appropriate target to encourage the full range of low and zero carbon technologies (Question 4)

24. Many of the responses echoed points made under question 3, with several references to the need for any target to be flexible and encourage innovation in emerging technologies which may or may not be classed as 'renewable'.

25. There were suggestions for setting targets for specific technologies, together with interim targets that can be used for ongoing monitoring. Several respondents made suggestions for alternative targets that could be applied.

Ideas on how the onshore wind industry can achieve the commercial development of onshore wind in Scotland without subsidy (Question 5)

26. Respondents outlined a number of key elements needed to create the commercial development of the onshore wind industry without subsidy. These included a more streamlined and consistent consenting and planning process, the use of spatial planning for projects, and continually updated guidance.

27. There were requests for stability in terms of grid connections, grid management and charges.

28. Some suggestions were made for alternative funding options to mitigate against the loss of subsidies. These included Power Purchase Agreements and a route to market under a zero-subsidy Contracts for Difference mechanism. There were also several suggestions for maximising economies of scale.

29.   There were suggestions for a number of actions to be undertaken by the Scottish Government including close working with the UK Government.

30.   There were several comments on the need for continuing subsidies until the onshore wind sector is established; particularly within remote and rural locations because of a lack of enabling infrastructure and grid connection.

Views on the potential future for Scotland's decommissioned thermal generation sites (Question 6)

31.   Respondents felt that a capacity to use the existing infrastructure is a key benefit of Scotland's decommissioned thermal generation sites. Key reasons given for this are that many are in strategic locations, they offer an already skilled workforce, they have existing grid capacity and community support. Respondents also suggested that the existing grid capacity can also be made available to other generators.

32.   Only a small number of respondents felt there were disadvantages in using existing sites.

33.   There were also suggestions that the existing infrastructure can be used as centralised energy storage to help mitigate against the intermittent nature of renewable energy.

34.   There were a number of references to a need for enhanced policy support within the planning system to ensure opportunities for re-purposing these sites were not lost.

Ideas for the role of hydrogen in Scotland's energy mix and the development of hydrogen production in Scotland (Question 7)

35.   There was overall support for developing the role of hydrogen in Scotland's energy mix; and a key benefit is the capacity to use the existing gas distribution network.

36.   Hydrogen is perceived to be a flexible source of energy in that it can be used across different sectors including transport, heating and power, although there were some suggestions that hydrogen is best suited to the transport sector and / or specific modes of transport.

37.   There were suggestions that hydrogen capacity can be set up on sites adjacent to large scale wind energy sources to enable use of surplus energy, although there would also be a need for storage facilities to enable this.

38.   Although views were generally positive about the role of hydrogen, there were a number of provisos or concerns noted by respondents, with some requests for hydrogen to be produced from non-fossil fuels. There were also comments that

Carbon Capture and Storage (CCS) is needed to optimise the use of hydrogen but that at present this has not been developed at sufficient scale.

39.	There were also many calls for the Scottish Government to be involved in and / or provide support for demonstration projects.

40.	It was also felt that there is a need to increase public awareness, engagement and perceptions so that hydrogen can be accepted as a possible energy source.

41.	There were also calls for the further development of the UK Hydrogen and Fuel Cell Roadmap, with a number of suggestions for a similar Scottish-based roadmap.

Transforming Scotland's Energy Use (Chapter 4)

The priorities for transforming Scotland's energy use (Question 8)

42.	There was overall support for the priorities outlined.

43.	A number of overriding themes emerged across the priorities, including:
- a need to create a priority towards a reduction in energy demand as well as increased energy efficiency,
- a need to highlight the importance of behaviour change and public buy-in,
- the potential role for a central agency to deliver Scotland's Energy Efficiency Programme, and
- a need for further integration across policy areas.

The actions for transforming Scotland's energy use (Question 9)

44.	Many respondents, across groups, simply voiced support for the actions in general or for specific actions.

45.	Reference was made to the need for the energy strategy to match the objectives of the draft Climate Change Plan (CCP) which sets out an objective of near zero carbon building stock by 2032. Further detail is provided in Appendix 3.

Views on the energy efficiency target to be set for Scotland and how to measure this (Question 10)

46.	There was overall support for an energy efficiency target, although several respondents felt this needs to be more ambitious and there were requests for clarification of the baseline year.

47.	Many noted the need to align this with the EU ambition to implement an effective energy efficiency target of 30% by 2032.

48.   Respondents outlined a number of key elements that are needed for any target. These included for this to be explicit and transparent, to have a clear pathway and to be long term with interim targets based on specific milestones, with regular monitoring and reporting.

49.   There were requests that any target should represent the 'whole system' approach of the strategy and include energy efficiency in transport, heat and electricity.

Delivering Smart, Local Energy Systems (Chapter 5)

Views on the priorities for delivering smart, local energy systems (Question 11)

50.   Many respondents noted their support for these priorities.

51.   A key benefit of smart, local energy systems, identified by respondents, is that they will be more robust and quicker to decarbonise than current energy sources. There were also comments that local projects offer the potential to develop into clusters and regional initiatives.

52.   Respondents referred to the need for a whole systems approach which is collaborative in nature, with initiatives that enable local and community projects to be developed, and with regular monitoring and evaluation.

53.   There was support for the use of Energy Masterplanning as a strategic approach to bring forward energy projects, although there were comments on the need to ensure the regulatory landscape allows for a decentralised and flexible energy system.

Views on the actions for delivering smart, local energy systems (Question 12)

54.   There was overall support for the actions, across all groups of respondents. Only a small number of respondents disagreed with these actions. However, there were calls for available funding sources to be simplified and streamlined.

55.   There were suggestions of a need to accelerate a transition from Distribution Network Operators (DNOs) to Distribution System Operators (DSOs) to provide the right control of infrastructure investment and grid services to support local systems.

56.   There were some comments on the need for collaboration and partnership working to ensure an integrated approach to smart, local energy systems. Further detail on the actions is in Appendix 4.

Views on the idea of a Government-owned energy company (GOEC) to support the development of local energy (Question 13)

57.	Many respondents identified a need for some form of public agency to support an energy transition. There were some suggestions for a centralised energy agency along the lines of the Danish Energy Agency.

58.	Many suggestions were made for alternative mechanisms; these included Energy Service Companies (ESCos), Government and Community-Owned Energy Companies (GCOECs) and Municipal Energy Companies (MECs).

59.	A number of roles were identified for a GOEC; these included the provision of finance to support community-ownership, shared ownership or the development of energy systems projects; as a supplier of last resort; or information provider.

60.	It was suggested that a GOEC would operate efficiently, on a not-for-profit basis and allow for innovative energy systems. This would help to overcome some existing market barriers.

61.	A small number of respondents queried the need for a GOEC and several suggested that a GOEC would detract from the existing range of initiatives and activities undertaken by other organisations.

Views on a Scottish Renewable Energy Bond (SREB) (Question 14)

62.	Many respondents, across all respondent groups, expressed support for a Scottish Renewable Energy Bond, although several noted that the Bond should focus on a wider range of energy sectors and not just renewables. Very few respondents were opposed to this concept.

63.	Key advantages were that it could be an important delivery mechanism in instances where finance from other sources is a challenge, and that it would allow savers and investors to have a stake in the sector and open up ownership to a broader range of audiences. Respondents cited little by way of disadvantages.

64.	Despite the support for a Scottish Renewable Energy Bond, there were several cautionary comments on issues that will need to be considered given that delivering a new project to market would represent a sizeable challenge.

Delivery, Monitoring and Engagement (Chapter 6)

Ideas for how the Scottish Government, the private sector and the public sector can maximise the benefits of working in partnership (Question 15)

65.   There was overall support from respondents for the Scottish Government and the private and public sectors to work in partnership, although a wide range of stakeholder organisations were suggested for inclusion in partnership working, so as to maximise use of expertise, skills and knowledge.

66.   There was also support for the proposal to refocus the Scottish Energy Advisory Board (SEAB) on the new themes of the Energy Strategy, and suggestions to extend the composition of this Board.

67.   There were also several suggestions that co-operative models of delivery, shared ownership and involvement of local communities in the design and development of projects would be important.

Monitoring delivery of the Energy Strategy (Question 16)

68.   Respondents welcomed the commitment to publish an Annual Energy Statement although it was felt this would need to be accessible, provide an appropriate level of detail, encompass a whole energy system and provide a robust monitoring and evaluation framework, with interim targets and milestones against which to measure progress.

69.   There were also requests for a clear process for parliamentary scrutiny of the Energy Strategy.

70.   Respondents felt that all stakeholders should be involved in setting targets, and that targets should be SMART (specific, measurable, achievable, relevant, timebound), consistent across sectors and allow for co-ordinated implementation.

Views on the proposed approach to deepening public engagement (Question 17)

71.   Respondents welcomed the commitment to greater public engagement, with only a small number disagreeing with the suggested approach.

72.   There were suggestions of a need to include a wide range of groups, such as local community organisations, in helping to deepen public engagement.

73.   Respondents focused on a need to ensure a consistent, well developed, co-ordinated and long term national awareness campaign, using a range of different media channels.

Cross cutting themes

74.   Across the questions asked in this consultation paper, a number of key themes emerged. The draft Energy Strategy was perceived as a high level document and, as such, there were a number of requests for greater detail and depth of information across various elements of it. The following paragraphs highlight the key themes.

The need for recognition of the interdependencies between the Scottish and UK energy systems

75.   There was reference to the need for greater recognition of the interdependencies between the Scottish and UK energy systems, despite the perceived divergence in some areas of Scottish, UK and European policies and strategies.

76.   Given that many issues relating to energy are reserved matters, respondents noted the need for the Scottish Government to work with the UK Government and other organisations such as BEIS, Ofgem and the National Grid. There was also some reference to the need for the Scottish Government to adopt a stronger influencing role towards the UK Government.

The need for integration across devolved policy areas

77.   Respondents noted the need for integration across different devolved policy areas within the Scottish Government in order to provide a holistic approach to the Energy Strategy, with some respondents defining a need for more clarity on how the different policy areas will interact. Additionally, there was specific reference to ensure the final Energy Strategy aligns with the Climate Change Bill.

78.   Respondents also focused on the need for consistency in the Scottish Government's approach to regulatory support. This includes a consistent approach for the planning system, non-domestic rates and building standards to help deliver various proposed aspects of the Energy Strategy, albeit that flexibility is required to allow for the development of innovative technologies.

Maintaining a flexible approach towards local energy systems

79.   While there was broad support across all respondent groups for harnessing the benefits of a decentralised, low carbon energy sector, there were comments on the need for flexibility to ensure that differing local needs can be met.

80.   Furthermore, although there was broad support for deeper involvement of local communities and community-owned projects, there was also a preference from many for national co-ordination and support for a centralised body that could provide funding, advice and resources on a consistent basis across Scotland.

81.   When considering rural energy issues, there were some requests for a greater focus on better energy provision in rural off-gas grid areas of Scotland. There was also a perception from some respondents of the need to simplify Scottish Government funding and deliver mechanisms, particularly given the need to engage community groups to a greater extent.

Supporting a range of technologies within Scotland's energy mix

82.   While there was support for energy from renewable sources and / or for hydrogen to be part of the energy mix in Scotland, many respondents noted that a range of technologies will be required in order to maintain security of supply in the future.

83.   There were also calls to ensure a suitable infrastructure across these technologies, in particular grid management, grid improvement and additional connection to the Scottish Islands.

Need for a clear roadmap and decision points

84.   There are a number of requests for a clear roadmap for the direction of travel and to clarify when decisions will be made at a national level for key sectors and for rolling out new energy choices. This should support the investment required to deliver the energy transition and deliver Scottish Government targets for 2030 and the long term vision expressed in the draft Energy Strategy.

Greater focus on innovation, investment, skills, resources and workforce matters

85.   Many respondents referred to the importance of the Strategy to give certainty to investors about the economic value from the energy sector, and to continue to enhance the Scottish supply chain with respect to energy.

86.   Respondents referred to the need for ongoing business-led innovation and demonstration projects across the energy sector; again noting the need for flexibility in offerings so that when innovative technologies are further developed, these can be incorporated into Scotland's energy mix.

87.   Throughout the consultation respondents noted the need for a greater focus on skills, resources and workforce matters to ensure the industry is well-supported and equipped to deliver the Energy Strategy vision. Some respondents thought the industry were facing challenges in this area; particularly in light of Brexit.

1. Introduction

1.1.   The Scottish Government consultation on a draft Energy Strategy was one of four consultations in relation to the energy sector published by the Scottish Government in January 2017:

- Consultation on a draft Scottish Energy Strategy.
- Consultation on a draft Onshore Wind Policy Statement.
- Consultation on Scotland's Energy Efficiency Programme (SEEP).
- Consultation on Local Heat and Energy Efficiency Strategies (LHEES) and District Heat Regulation.

1.2.   This report focuses on the draft Energy Strategy only. Separate reports have been prepared on the other consultations.[2]

1.3.   The consultation document on the draft Energy Strategy set out the vision for the future energy system in Scotland to 2050. The long-term vision set by the draft Energy Strategy is for a modern, integrated, clean energy system, delivering reliable energy supplies at an affordable price in a market that treats all consumers fairly.

1.4.   The consultation asked seventeen questions and covered a range of issues under four chapter headings: Meeting our Energy Needs, Transforming Energy Use, Smart Local Energy Systems and Delivery, Monitoring and Engagement.

1.5.   The consultation ran from 24 January until 30 May 2017.

Respondent Profile

1.6.   There were 252 responses analysed in this report: 200 from organisations and 52 from individuals.[3]   A list of all those organisations that submitted a response to the consultation is included in Appendix 1. A small number of the responses submitted by organisations will not be published.

1.7.   The first column in the following table provides details of the overall groupings that were applied across the consultation on the draft Energy Strategy.

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[2] Links to the other consultation reports can be found on the draft Energy Strategy webpage http://www.gov.scot/draftenergystrategy

[3] The total number of responses published on the Scottish Government's consultation platform is 254, accounting for two responses which did not have sufficient content relevant to the draft Energy Strategy Questions.

Respondent Groups		
Main Categories	**Categories for draft Energy Strategy**	**Number**
Academia / Research / Training	Academia / Research / Training	17
Community	Community	7
Business / Industry	Energy - engineering / network	15
	Energy - non-renewable	8
	Energy – renewable	25
	Energy – utility	8
	Energy – other	10
	Non-energy	2
Total Business / Industry		**68**
Network / Professional / Trade	Energy - engineering / network	4
	Energy - non-renewable	2
	Energy – renewable	8
	Energy – other	10
	Non-energy	19
	Third Sector / NGO	1
	Trade Union	4
Total Network / Professional / Trade		**48**
Local Government	Local Government	21

Public Sector / Delivery Agency / Regulator	Public Sector / Delivery Agency / Regulator	14
Third Sector / NGO	Third Sector / NGO	24
Other	Other	1
Total organisations		**200**
	Individuals	52
Total respondents		**252**

1.8.   Given the wide range of different organisations categorised under Business / Industry and Network / Professional / Trade, additional sub-categories were applied to these two categories and the second column shows the numbers of responses to the draft Energy Strategy in each analysis category and sub-category; these are the categories that are referred to throughout this report.

1.9.   Breaking down the sample into different sub-groups enables the analysis to reflect the wide range and depth of views expressed by respondents at both an overall and sub-group level. This also allows for themes and sub-themes to be identified across the consultation as a whole and at individual questions, as well as highlighting any instances of consensus or disagreement between different sub-groups.

Methodology

1.10.   Responses to the consultation were submitted using the Scottish Government consultation platform Citizen Space or by email or hard copy.

1.11.   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; some commented only on those questions or sections of relevance to their organisation, sector or field of interest. The report indicates the number that commented at each question.

1.12.   Many respondents did not use the consultation questionnaire and, instead, presented their views in a report or letter format. Wherever possible, researchers assigned relevant sections of these documents to the relevant questions in order that all comments on similar issues could be analysed together.

1.13.   Comments made by respondents were examined and the range of issues mentioned in responses were noted; including reasons for opinions, specific examples or explanations, alternative suggestions or other related comments.

Grouping these issues together into similar themes allowed the researchers to identify whether any theme was specific to any respondent sub-group or groups.

1.14.   Wherever a particular comment came from respondents in one or two specific sub-groups, this has been highlighted. Where no sub-groups are mentioned, it can be assumed that the comment was noted in responses from several different groups. When looking at group differences however, it must be also borne in mind 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.

1.15.   When referring to respondents who made particular comments, the terms 'a small number', 'several' and so on have been used. While the analysis was qualitative in nature, as the questionnaire did not include any quantifiable questions, as a very general rule of thumb it can be assumed that: 'a small number' indicates fewer than 10 respondents; 'several' indicates around 10 to 20; and 'many' indicates over 20 but fewer than half of those who commented at any question.

1.16.   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.

1.17.   The views presented in this analysis have not been vetted in any way for factual accuracy. The opinions and comments submitted to the consultation may be based on fact or may, indeed, be based on what respondents perceive to be accurate, but which others may interpret differently. It is important for the analysis to represent views from all perspectives. The report may, therefore, contain analysis of responses which may be factually inaccurate or based on misunderstanding or misinformation but nevertheless reflect strongly held views. In some instances, such inaccuracies and misunderstandings will be relevant findings in themselves.

1.18.   A small number of verbatim comments, from those who gave permission for their responses to be made public, have been used in the report to illustrate themes or to provide extra detail for some specific points.

1.19.   Throughout the analysis a number of cross cutting themes were identified by respondents. Where these points have been noted at various questions in the responses, they are referenced and discussed in the final chapter in order to avoid repetition.

2. Meeting our Energy Supply Needs

2.1. Chapter 3 of the draft Energy Strategy consultation set out the Scottish Government's vision for transforming the energy sector, as part of the drive to tackle climate change and to bring about new economic, environmental and social opportunities to individuals, businesses and communities.

2.2. To achieve these ends, the draft Energy Strategy outlined five priorities and 27 actions.

2.3. The priorities were:

- **Priority 1**: Continuing to support the recovery of North Sea oil and gas as a highly regulated source of hydrocarbon fuels.

- **Priority 2**: Supporting the demonstration and commercialisation of Carbon Capture and Storage and CO_2 Utilisation.

- **Priority 3**: Exploring the role of new energy sources in Scotland's energy system.

- **Priority 4**: Increasing renewable energy generation.

- **Priority 5**: Increasing the flexibility, efficiency and resilience of the energy system as a whole.

2.4. This chapter also posed questions relating to a new 2030 'all energy' renewables target, the role of hydrogen and the prospects of commercial development of onshore wind in Scotland.

Priorities for energy supply

Q1   What are your views on the priorities presented in this chapter for energy supply over the coming decades? In answering, please consider whether the priorities are the right ones for delivering our vision.

Summary of main themes:

- Broad overall support, across all sub-groups, for the five priorities, particularly for the whole systems approach and flexibility to adapt to emerging technology.
- A number of caveats were raised regarding the weight of emphasis on certain priorities, a perceived lack of detail or perceived areas of omission.
- There were mixed views regarding the extent of support that should be given to the recovery of North Sea oil and gas, with some respondents welcoming continued support for the sector, while some others felt there is too much emphasis on support for this sector.
- Although a relatively large number of respondents welcomed the development and commercialisation of Carbon Capture and Storage (CCS), they highlighted perceived technical and / or financial challenges in the development of large scale CCS on a cost effective basis.
- There were some views that renewables should be supported as a significant resource in that it provides a competitive and cost-effective option.
- Some respondents felt that Priority 5 (increasing the flexibility, efficiency and resilience of the energy system as a whole) should underpin the other 4 priorities. Consideration for security of supply was also mentioned.
- There were references to the need to recognise the interdependencies between Scottish and UK energy systems and the role of European Union policy.
- Devolved policy levers should be further aligned to Energy Strategy objectives, in particular with regards to land-use planning.

2.5.   192 respondents, from across all groups, commented at this question.

2.6.   The major theme in responses is one of broad overall support, from many respondents across all groups, for the five priorities presented in Chapter 3. Many respondents noted that they welcomed the whole systems approach and flexibility to adapt to emerging technologies. Several respondents commented that whilst they welcome the vision and priorities identified, they believe it will be challenging to deliver.

2.7.   Many respondents commented in general terms, several commented individually on each of the five stated priorities and many focused only on the priorities that were most pertinent to their role or particular area of interest in the

energy sector. A very small number of respondents actively disagreed with any of the principles.

2.8. However, there was a strong tendency for respondents to caveat their support with comments regarding the weight of emphasis on certain priorities, a perceived lack of detail or perceived areas of omission in the content of the draft Energy Strategy. Once again, this typically related to the respondent's role or particular area of interest in the energy sector.

2.9. The main sub themes in responses relating to each priority, which go some way to demonstrating differences in perspectives across respondent groupings, are detailed in the following paragraphs. Respondents expanded on many of the sub-themes raised here at later questions in the consultation.

Priority 1: Continuing to support the recovery of North Sea oil and gas as a highly regulated source of hydrocarbon fuels

2.10. There were a mixture of views regarding the extent of support that should be given to the recovery of North Sea oil and gas. A number of respondents, particularly from the Academia / Research / Training and Local Government groupings, commented positively on the proposed balance between climate change mitigation and recognition and support for the importance of North Sea oil and gas.

2.11. Several Energy respondents, particularly in the Non-Renewable sub-group, noted that they welcome continued support of the sector, recognition of its economic significance and its importance in meeting energy demand in the foreseeable future.

2.12. Several respondents, notably those in the Energy sub-group as well as Individuals, reiterated the importance of the Scottish Government helping to support and encourage transfer of skills from the oil and gas sector and its supply chain to the renewables sector, albeit a small number commented on challenges in this respect.

2.13. Other respondents, particularly from the Third Sector / NGO grouping and those in the Renewable sub-group, felt there is too much emphasis on supporting North Sea oil and gas.

2.14. A small number of respondents, particularly in the Public Sector / Delivery Agency / Regulator and Third Sector / NGO groups commented on their support for realising economic benefits from decommissioning.

Priority 2: Supporting the demonstration and commercialisation of Carbon Capture and Storage and CO2 Utilisation

2.15.   A relatively large number of respondents from across respondent groups, whilst welcoming support for development and commercialisation of Carbon Capture and Storage and CO2 Utilisation, highlighted perceived technical and / or financial challenges in the development of large scale CCS on a cost effective basis. In particular, a lack of funding was cited by several respondents. Others felt that CCS is ready for wider deployment with appropriate support.

2.16.   Other respondents from a small number of groups expressed concerns that a focus on CCS suggests too great an emphasis on fossil fuels going forward and others questioned whether there will be sufficient demand across industries to warrant CCS.

2.17.   A small number of respondents commented on the need for support from / alignment with the UK Government to effectively move forward with CCS.

Priority 3: Exploring the role of new energy sources in Scotland's energy system

2.18.   Respondents from across groups, particularly Academia / Research / Training, several Energy sub-groups and Local Government, commented in detail regarding hydrogen as a means to decarbonise heat (please refer to Question 7 for more information in relation to the use of hydrogen). Their comments often linked this to the development of CCS for successful implementation and potential decarbonisation of heat and transport.

2.19.   A number of respondents, from the Community, Local Government, Public Sector / Delivery Agency / Regulator and Third Sector / NGO groupings welcomed references to the role of land use planning and / or marine planning. In particular, several focused on the need for more integration of Scottish Government strategy across planning and energy.

2.20.   Several respondents in the Academia / Research / Training group commented on Biomass and CCS as an opportunity to be approached with caution given uncertainties around technology and economic benefits and some identified a need for further research.

2.21.   A small number of respondents commented on unconventional oil and gas (UOG) at this question. Among these respondents there was some opposition to any development of UOG in Scotland's energy mix, some in favour of development of UOG, and some were keeping an open mind on exploring its potential (see Box on page 21 for more information on the range of views).

Priority 4: Increasing renewable energy generation

2.22.   There was widespread explicit or implicit support for increasing renewable energy generation, albeit that many respondents' comments focused on specific aspects of renewables linked to their particular interest or perspective. A number of respondents commented on the 2030 renewable target and the relative effectiveness and efficiency of both existing and emerging technologies that might contribute to meeting that target. Some respondents commented on the importance of energy efficiency savings in also helping to achieve the target. Others noted that the target will be challenging (further views are explored under Question 3 and 4).

2.23.   A small number of respondents, particularly in the Renewable and Utility sub-groups, noted their belief that renewables, particularly onshore and / or offshore wind, can provide competitive cost-effective options when compared with traditional fuels, particularly given the costs associated with CCS. The importance of specifically supporting offshore wind and marine renewables as a significant resource was also mentioned by respondents in the Third Sector / NGO group and others.

2.24.   The cost effectiveness of solar thermal energy was particularly noted by some respondents in the Renewable and Other Energy sub-groups. A respondent in the Public Sector / Delivery Agency / Regulator group and a Local Government respondent commented positively on the role of solar PV.

2.25.   Several respondents commented positively on the recognition of the role for pumped hydro storage.

2.26.   A small number of respondents commented positively on the role of renewable electricity and renewable heat, albeit recognising challenges. For example, the challenging route to market that has been acknowledged by the SG for onshore wind projects and grid connection for remote sites generating surplus renewable electricity.

Priority 5: Increasing the flexibility, efficiency, and resilience of the energy system as a whole

2.27.   A number of respondents across groups, particularly Energy sub-groups, highlighted this as a key priority or the priority that underpins the remaining four.

2.28.   There was comment on the need for greater integration between the electricity, transport and heat sectors and use of technologies to facilitate integration of renewables.

2.29.   A small number of respondents made specific comments relating to the importance of considering security of supply and factors that might improve security of supply.

Additional recurring sub-themes

2.30.   There were a number of recurring sub-themes in comments at this question. Most commonly these included:

- **The need to recognise the interdependencies between Scottish and UK energy systems, a perceived divergence in some Scottish and UK policies and strategies, the role of European Union policy and regulation to date and lack of clarity on relationships with the EU going forward**. These comments were particularly common across Energy sub-groups as well as the Academia / Research / Training group. Some respondents noted the importance of collaboration between the Scottish Government and the UK Government going forward and others commented on the importance of the Scottish Government's lobbying role.

- **The need to focus more on energy efficiency**, whether linked to domestic, non-domestic or transport; some respondents noted that this is addressed elsewhere but would like to see greater emphasis on energy efficiency within the priorities.

- **The need to offer greater certainty over future direction of Scottish Government priorities** in order to encourage and facilitate investment from the private sector.

- **The need for the planning system to support and facilitate developments** necessary to deliver the long term changes to the energy system.

- **The need for nuclear to form part of the energy mix** going forward and suggestions that the Scottish Government should review its stance regarding nuclear.

- **The need to foster and encourage involvement of communities** in the transformative process.

Unconventional Oil and Gas

35 respondents across sub-groups commented on unconventional oil and gas (UOG) at various questions throughout the consultation.

A small number commented that they had replied to the separate consultation on unconventional oil and gas (Talking "Fracking" – a consultation on Unconventional Oil and Gas).

18 respondents were against the development of UOG, shale gas or fracking (including the use of fracking to produce hydrogen) activities in Scotland. These respondents were primarily from the Third Sector / NGO, Community and Individual sub-groups. Two others described the use of UOG as problematic or as a short term solution.

The main reasons given for opposition were that UOG recovery has a negative effect on the environment and on public health and safety. There were also comments that the process is uneconomical and concerns about the regulations and licensing arrangements currently in place. There was support for the current moratorium and calls for a total and permanent ban to include all forms of UOG.

Nine respondents (mainly from the Non-Renewable and Other Energy sub groups) supported the recovery of UOG or said it requires consideration. Another (from the Engineering / Network sub-group) said that the Scottish Government should keep an open mind.

Comments from this group were more in-depth than from those opposed to UOG and are summarised below:

- The need to look at ways to ensure supplies in the light of dwindling North Sea production and the impact on the economy of importing foreign supplies.
- That importing oil and gas also comes with environmental impacts.
- Requests for a more favourable attitude in order to allow a debate on the subject.

Five other respondents (from a variety of sub-groups) commented without saying whether they support or oppose the use of UOG. Their comments included queries as to whether future production levels will make the use of UOG a necessity and the need to look at environmentally responsible ways of extracting unconventional resources.

Actions for energy supply

Q2   What are your views on the actions for Scottish Government set out in this chapter regarding energy supply? In answering, please consider whether the actions are both necessary and sufficient for delivering our vision.

Summary of main themes:

- Many respondents, across groups, simply voiced support for the actions in general or for specific actions; these supportive comments were all brief, along the lines of 'the respondent supports x'.
- There were few recurring themes relating to the actions overall, however some suggestions made were relevant to all the actions.
- A more detailed breakdown of comments appears at Appendix 2.

2.31.   There were comments in 171 responses on the actions set out in this chapter.

2.32.   There were a total of 27 actions set out under these 5 priorities, and a full listing of these is in Appendix 2. The number of actions under each priority were as follows:
- Priority 1: Oil and Gas – 5 actions
- Priority 2: CCS and CO_2 Utilisation – 5 actions
- Priority 3: New Energy Sources – 3 actions
- Priority 4: Renewable Energy – 10 actions
- Priority 5: Flexibility and Resilience – 4 actions.

2.33.   Several respondents, from various sub-groups, reiterated comments made at the previous question regarding the overall priorities or meeting energy supply needs in general.

2.34.   Many respondents, across groups, simply voiced support for the actions in general or for specific actions; these supportive comments were all brief, along the lines of 'the respondent supports x'.

2.35.   A number also gave their views on actions under each of the priorities (albeit small numbers commented on each) and / or suggesting additional actions. These comments and suggestions are outlined in Appendix 2.

2.36.   Some suggestions made cut across the actions overall, including:
- **The need for more detail on the investment from the Scottish Government** that will be available to support the Strategy and, in particular, innovation around renewable technology.

- **The need for specific actions relating to the Scottish Islands**, in particular energy supply and generation and energy independence.

- **The need to support planning authorities** to deliver the 'infrastructure first approach'.

- **The need for detail on the legislative powers** that will be required to deliver the Strategy.

- The need for an action aimed at increasing, or utilising existing, manufacturing of technologies and infrastructure to help reduce supply-chain costs.

- **The need for an energy system modelling tool** for assessing current and future market viability of specific offering.

Proposed renewable energy target for 2030

Q3:   What are your views on the proposed target to supply the equivalent of 50% of all Scotland's energy consumption from renewable sources by 2030? In answering, please consider the ambition and feasibility of such a target.

Summary of main themes:

- Over a third of those who commented voiced support for setting a new 'all energy' renewables target, although there was a perception from some that it is too ambitious. A small number disagreed with setting targets of any kind.
- There were requests for the target to apply to all low carbon sources of energy, not just renewables.
- There were requests for more detail on different aspects of the target, e.g. the balance of effort between transport, heat and electricity.
- A need was identified for strategy and strong leadership, clear guidance and consistent, stable and clear fiscal policy support.
- Respondents thought there had to be a clearer articulation of the balance of roles between Scottish Government and others in achieving the target.

2.37.   Comments on this question came from 187 respondents across all respondent groups.

2.38.   **Support for the proposed target:** Many (73) of these respondents, across all sub-groups, voiced support for the proposed target, with comments such as 'this positions Scotland as a leader in terms of renewable energy generation' or 'welcome Scottish Government's commitment to tackling climate change'. Several respondents quoted research undertaken by Ricardo AEA which supports this target; as noted by an organisation in the Third Sector / NGO sub-group:

"The 50% target is consistent with independent research for WWF Scotland, Friends of the Earth Scotland and RSPB Scotland by Ricardo AEA – The Energy of Scotland report – which found that a 50% renewable energy target for 2030 was a

cost optimal pathway for delivering on the Scottish Climate Change Act based on MARKAL modelling. This echoes further analysis for Scottish Renewables showing a strong case for setting a 50% target."

2.39.   **Views on the credibility of the target:** Many respondents, primarily those in various Energy sub-groups or Individuals, felt the target is unrealistic or too ambitious. The key comment emerging across these respondents was that while decarbonisation of the electricity sector is largely complete, that the heat and transport sectors will be much more difficult. As noted by an organisation within the Public Sector / Delivery Agency / Regulator sub-group:

"The decarbonisation of the electricity sector is largely complete, however, that can be viewed as 'the easy bit'. Tackling the heat and transport sectors will be much more difficult, and will require a concerted effort from both public and private sectors."

2.40.   **Target is unambitious:** Several respondents, primarily those in the Community sub-group or Individuals, noted that this target is unambitious, with some suggesting a more ambitious target of 75% by 2030 and with total net decarbonisation by 2040. Several respondents commented that it will be difficult for all sectors to achieve this target and a small number of Local Government organisations noted the target is ambitious given the lack of progress in meeting heat demand from renewables to date.

2.41.   **Disagreement with the target**: A small number of respondents disagreed with this target on the grounds that it is an expensive form of energy for consumers, that it suffers from intermittent supply issues and that alternatives such as gas or other forms of conventional power generation are preferable.

2.42.   **A need for the target to apply to all low carbon sources of energy**: Many respondents commented that this target should not apply solely to renewables but to all low carbon sources of energy**.** They cited a number of different technologies that could form an effective low-carbon energy system and these included hydrogen, CCS, combined heat and power (CHP), solar, nuclear and district heating. However, a small number of respondents did note their concern over the emphasis of CCS in the strategy or that this could make the target very challenging.

2.43.   **A need for more detail:** Many respondents across all sub-groups requested further information or detail. These requests included:
  * More / additional detail, including timescales, on how the target might be met so as to give developers and suppliers market confidence to invest and provide further cost reductions.
  * Further modelling to show how demand for energy from other sources will be reduced or replaced and what this will cost.
  * Scenarios on how the target will be achieved.

- The anticipated contributions from each area (electricity, heat and transport).
- A need for unambiguous and quantifiable measures to achieve the target – a detailed action plan for electricity, heating and transport describing how energy consumption can be supplied from renewable sources.

2.44.   **The role of the Scottish Government:** Several respondents commented on the role of the Scottish Government in delivery of this target, with comments on the need to provide:
- Strategic and / or strong leadership, clear guidance and consistent policy support.
- Stable and clear fiscal policy support for energy generation and energy storage to attract investment and a supportive regulatory regime.
- Appropriate financial incentives such as Renewable Energy Investment Fund (REIF) or Renewable Heat Incentive (RHI).
- Encouragement for greater levels of investment in heat generation and new technologies, such as more support for electric vehicles (EVs), investment in research, facilities and engineering and so on.

2.45.   **Decision making powers**: Several respondents commented on the issue of devolved policy to Scotland, with some of these noting that some energy decisions will be outwith the remit of the Scottish Government and subject to acceptance by the UK Government. Some of these respondents also noted the need for the Scottish Government to work closely with the UK Government given that Scotland's energy policy is directly linked and interconnected with the rest of the UK. A small number of respondents also noted their concerns over the impact of Brexit.

2.46.   **The need for interim targets, regular reviews and ongoing monitoring:** Several respondents suggested the imposition of interim targets and / or regular reviews, with ongoing monitoring. There was a suggestion from a small number of respondents for short and medium targets to 2030 and then longer term targets to 2050, with continued use of gas in the short term while other technologies are still being developed.

2.47.   **A need for separate sectoral targets**: A small number of Local Government organisations noted a need for separate heat and transport sectoral targets and a Third Sector organisation noted that sectoral pathways would offer transparency and clarity on how sectoral targets will be achieved.

2.48.   **The role of enabling policies**: A number of areas were raised by several respondents under this question as being necessary to support the delivery of the target, including (discussed in full elsewhere in the report):
- The planning system.
- Energy efficiency and demand reduction.

- The importance of behaviour change and public engagement (see later chapter on Delivery, Monitoring and Engagement for more detail on public engagement).
- The potential for improved grid management and flexibility (including storage) and the necessary changes to the regulatory regime.

2.49. **Changes to grid management:** Several respondents, many of whom were within Local Government or the Energy sub-groups, referred to necessary changes to the National Grid, with those in the Local Government sub-group requesting a grid connection from the Scottish Islands to the mainland. There was also reference to the need for the existing grid structure to be modernised so as to deal with increased renewable power on the grid, or improvements to the distribution grid in Scotland so that it can cope with different generation types and technologies.

Target for low and zero carbon energy technologies

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Q4:   What are your views for the development of an appropriate target to encourage the full range of low and zero carbon energy technologies?

Summary of main themes:

- Many voiced support for considering a 2030 target that included a wide range of low carbon technologies. A small number disagreed with setting targets of any kind.
- There were suggestions for setting targets for specific technologies, together with interim targets that can be used for ongoing monitoring.
- There were some suggestions for alternative targets.

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2.50.   Comments on this question came from 161 respondents across all respondent groups.

2.51.   **Supportive of the development of an appropriate target**: Many (36) of those responding to this question were supportive of the development of an appropriate target to encourage the full range of low and zero carbon energy technologies. Key reasons were that it would inform SEEP targets and guide the ways in which incentives, grants, support and regulation could be used to achieve this, or that it provides a clear investment signal.

2.52.   **Disagreement with setting targets**: A small number of respondents disagreed with setting targets. Key reasons for this included that they can provide negative consequences in favouring specific technologies that might not be the most effective in the long term and which could serve to distort the market, or that there should not be targets on technologies which are as yet not proven to be the most effective. Also, decarbonisation should be achieved in a cost effective way rather than specifying the means by which this is to be achieved. A small number

of respondents, mostly Individuals, also noted that investment would be more important than setting targets or that supporting mechanisms need to be in place.

2.53.   **Setting targets for specific technologies**: Many respondents across a number of sub-groups commented on the need to set targets for specific technologies, to help to attract investment and / or enable cost reductions, or that targets are necessary to help guide future policy decisions. That said, a small number commented on the need for targets to be flexible and encourage innovation.

2.54.   Other suggestions, each from a small number of respondents included the need for:
- A long term perspective for targets.
- Interim targets to be used for ongoing monitoring.
- Targets to be combined with broader policy and fiscal measures.
- A target for community energy or one that will offer potential to encourage uptake at a community or local level.

2.55.   **Possible alternative targets**: Many respondents, while in agreement with the setting of targets in general, made suggestions for alternative targets that could be used. Most of these suggestions came from respondents within the Energy and Third Sector / NGO sub-groups. These included:
- Net zero emissions target for 2050.
- An overarching low and zero carbon target or a low carbon target.
- A target for installed Energy storage.
- The use of electric vehicles or the phasing out of fossil fuel car sales.
- The vast majority of homes should achieve EPC rating of 'C' by 2025.
- The uptake of renewable or low carbon technologies within public sector buildings.
- A carbon reduction target for each local authority.
- A proportion of heat, or district heating, to be delivered from renewable sources.

Reduction of carbon dioxide emissions, as set out in the Climate Change Act and the Climate Change Plan.

2.56.   **Need for targets to cover a wide range of technologies**: Many respondents requested this so that all options can be included in the energy mix, albeit there would be a need for effective co-ordination and focus on innovative technologies as they develop.

2.57.   **The need for long term targets, with interim targets**: There were also calls from several respondents for any targets to be long term, and with interim

targets. A small number also noted that targets need to be realistic, achievable, and flexible. A small number also commented that whatever target(s) is set, it will need to encourage innovation and the ongoing development of technologies.

2.58. **A need for more detail**: There were calls from several respondents across a range of sub-groups for further information or clarity. At a basic level, there were a small number of requests for a definition of what is meant by 'low' and 'zero carbon technologies' or clearer definition of any targets set. There were also requests for more detail on how policies will help to deliver targets or how targets outlined in the Scottish Government's Climate Change report will be achieved.

2.59. **The need for support or incentives**: Several respondents noted the need for support or incentives to be provided, to help bring certainty and stability to the market.

2.60. **A need for Scottish Government involvement**: Once again, there were also some requests for the Scottish Government's involvement in delivery of any target(s); including published information on whether targets are being met, targeted policies to allow support to reflect the risks of technological development, and deployment and strategic channelling of fiscal and institutional support to technologies demonstrating effectiveness.

2.61. Other points raised by relatively small numbers of respondents included the need for:
- Collaboration between local and central government, or between the public and private sectors or between the public and private sectors and communities (covered in greater detail elsewhere in the report).

- A need to engage with the public in order to increase public awareness of the need to change lifestyle.

- A need to engage with landlords to adopt new technology (covered in greater detail elsewhere in the report).

- A need to have a system of review or monitoring in place in order to assess progress and ensure that resources are used effectively.

- A need for pathways for delivery of policies and actions.

- A national roadmap to clarify when decisions will be made at a national level for rolling out new energy choices.

2.62. There were also some queries as to how the Scottish Government will work with the UK Government, particularly as some of the low carbon technology policies are within the remit of the UK Government.

Commercial development of onshore wind

Q5   What ideas do you have about how the onshore wind industry can achieve the commercial development of onshore wind in Scotland without subsidy?

Summary of main themes:

- A number of key issues were outlined that are needed to create the commercial development of the onshore wind industry without subsidy, including a more streamlined and consistent consenting and planning process, the use of spatial planning for projects, together with updated guidance, stability in terms of grid connections, grid management and charges and alternative funding options to mitigate against the loss of subsidies, including Power Purchase Agreements and a route to market under a zero-subsidy Contracts for Difference mechanism.
- There were some suggestions for maximising economies of scale, for example, through extensions to existing projects, opportunities for smaller projects to establish links with a neighbouring high-energy user capable of utilising energy or more efficient turbines.
- There were suggestions for a number of actions to be undertaken by the Scottish Government including close working with the UK Government.
- There were some comments on the need for continuing subsidies until the onshore wind sector is established; particularly within remote and rural locations because of a lack of enabling infrastructure and grid connection.

2.63.   124 respondents, across all groups, commented at this question.

2.64.   Allied to this consultation was one on the draft Onshore Wind Policy Statement. This provides further detail and should be read in conjunction with this report.

2.65.   Some respondents to this consultation noted support for the Scottish Government's ambition to achieve a subsidy-free onshore wind sector in Scotland. Some noted that costs are falling across the sector and that onshore wind is now among the lowest cost forms of new power generation.

2.66.   Respondents focused on a number of key issues that are needed in order to create the commercial development of the onshore wind industry without subsidy; outlined in the following paragraphs.

2.67.   **Role of the Scottish land use planning framework**: Many respondents referred in some way to the current land use planning framework, with some of these – across most respondent groups – requesting a more streamlined planning process. These respondents referred to the need for a faster, more efficient, streamlined and consistent consenting process, to allow for a more co-ordinated

and plan-led approach to development, which in turn would provide more certainty for investors and reduce the risk of costly and lengthy challenges to planning applications. There were also a small number of requests not to increase planning fees.

2.68.   **The use of spatial planning**: Several respondents, primarily in the Third Sector / NGO sub-group, commented on the need to use spatial planning for renewable energy projects as this would help to identify the most suitable sites for development and to help guide sites for future development that have the lowest costs in terms of initial financial set up and the least impact on wildlife and the environment; and thus help to de-risk projects. There were also a small number of comments that local development plans need to be fully aligned with the Scottish Government vision for energy in Scotland.

2.69.   **The planning process and the development of energy generation should be more closely aligned**: A small number of respondents in the Renewable sub-group also commented on the current lack of coordination between the planning process and energy development, with some sites at the pre-planning application stage having grid capacity ahead of sites that already have planning and consents in place. A small number of respondents also noted there should be less stringent planning permissions on visual impact restrictions. Several respondents suggested the need to cut back on community benefits, shared ownership and / or the mitigation required by National Air Traffic Services.

2.70.   **Need for updated guidance**: There were requests from several respondents, primarily in the Renewable sub-group, for Renewables Guidance, particularly the online renewable energy planning guidance, to be updated and kept updated. Again, this should be consistent with the Energy Strategy and the ambitions outlined in the draft Onshore Wind Policy Statement and should include guidance on extending or amending consent on existing sites.

2.71.   **Maximising economies of scale**: There were a small number of suggestions for opportunities to maximise economies of scale by extending existing projects, or through smaller projects establishing links with neighbouring high users of energy. Allied to this, there were suggestions from several respondents across the Energy sub-groups, in the Public Sector / Delivery Agency / Regulator sub-group and in Local Government that it should be possible to repower where this is economically viable as this would offer additional capacity, with a small number suggesting the Energy Strategy needs to provide more support for repowering. Another means by which to maximise economies of scale cited by respondents, many of whom were in the Renewable Energy sub-group, was the need for the planning system to support more efficient turbines, that are higher and with longer blade lengths. A small number of respondents noted this is already practice in some other countries and would increase the output, efficiency and therefore the viability of onshore wind. There were also some suggestions that there would be economies of scale if turbines are co-located. This would help to open up more predicable income streams and maximise the efficiency of onshore wind.

2.72.   **Role of Scottish Government in setting the UK policy framework**: Several respondents commented on actions that need to be undertaken by the Scottish Government to monitor developments in the UK policy framework and the need for it to work closely with UK government on a market stabilisation mechanism in the short term and on a future price control framework so there is a route to market for onshore wind projects.

2.73.   A small number of respondents felt the Scottish Government should encourage the UK government to extend the obligation set out to 2030 and to allow new renewable projects to be eligible for receiving Renewable Transport Fuel Certificates (RTFC) which can help provide an alternative revenue stream.

2.74.   A small number of respondents also commented that the UK Government's commitment to nuclear power and a centralised strategy for energy supply will obstruct the granting of licenses for major Scottish energy projects or that UK Government energy policy is already restricting the commercial potential of wind energy in Scotland.

2.75.   A small number of respondents also noted that the Scottish Government should continue to support Remote Island Wind being classed as a separate technology from UK Mainland Onshore Wind to allow access to the Contract for Difference (CfD) support mechanism and help to mitigate inequitable transmission charges.

2.76.   **Alternative funding options**: Many respondents made suggestions for alternative funding options to mitigate against the loss of subsidies. These included:
- Shared / community ownership, although there were some suggestions that subsidies would still be required for community ownership projects as these tend to be on a smaller scale.
- The allocation of capital grant funding for community organisations promoting renewables.
- The reintroduction for community share offers of Seed Enterprise Investment Scheme / Enterprise Investment Scheme (SEIS / EIS) subsidies which were phased out in 2015.
- Introduction of a Scottish Renewable Energy Bond (this is covered in greater detail in a later question).
- Crowdfunding.
- Introduction of a carbon tax that penalises other forms of energy and which is supported by import tariffs.
- A small number of respondents referred to the ongoing Barclay Review into business rates.
- Power Purchase Agreements (PPAs) under a 'sleeve arrangement' would offer a potential route to market.

- Contracts for Difference (CfD) offer a low risk route to market and help to provide a level playing field for onshore wind (mentioned mainly by respondents in the Renewable Energy sub-group).

- Scottish Investment Bank or a Scottish Energy Company which could back projects that commercial investors might not wish to back.

- Investing ongoing profits to replace existing turbines and to provide ring fenced funding for onshore wind to support the sustainability of the sector.

- Some form of floor price guarantee.

- Inward investment in turbine manufacture to mitigate fluctuations in supply chain uncertainty and to reduce costs.

2.77.   **A need for ongoing investment / incentives for energy research**: There were also requests from a small number of respondents for ongoing investment and / or incentives in energy research, smart grids, other technologies such as storage, the construction of hydrogen producing electrolysis plants to facilitate exploitation of under-utilised renewable resources or investment in the skills required in this sector. There were also suggestions for an end to subsidies for fossil fuels.

2.78.   **Grid / transmission:** Many respondents, often from the Renewable sub-group, commented that without subsidies there would need to be stability in terms of grid connections, grid management and charges. There were some suggestions for a grid charging regime for demand to be allowed to vary by transmission zone or for lower connection costs through flexible local connection.

2.79.   **Need for partnership working / collaboration:** As at previous questions, several respondents noted the need for engagement and partnership working between the Scottish Government and various other organisations. This is covered in more detail elsewhere in this report.

2.80.   **A case for continuing subsidies**: There were comments, primarily from respondents in the Third Sector / NGOs, in Local Government or in Public Sector / Delivery Agency / Regulator, about the need for continued subsidies for the onshore wind sector as subsidy is an effective tool to enable the onshore wind market to deliver policy objectives during periods of change and that subsidies should not be removed until the industry is established. For example, the comparative size of some developments does not allow costs to be driven down enough to enable them to be subsidy free, particularly smaller developments that are community-owned.

2.81.   There were also some comments about the need for continued subsidies for rural and remote locations, particularly the Islands, because of the lack of enabling infrastructure and grid connection. A small number also noted that the easiest sites have now all been developed and that it will be more costly to develop future sites.

2.82.   Other issues raised by small numbers of respondents included:

- The need for devolution of energy policy to meet Scotland's carbon free energy targets.
- Reference to Everoze Report commissioned by Scottish Renewables (this report notes that costs can be reduced and investment encouraged significantly via a smarter planning system, a transformed grid and a revolution in revenue model).

Decommissioned thermal generation sites

Q6:   What are your views on the potential future for Scotland's decommissioned thermal generation sites?

Summary of main themes:

- A capacity to use the existing infrastructure is perceived as a key benefit; this is due to a combination of their strategic locations, a skilled workforce, their existing grid capacity and community support.
- There were also suggestions that the existing infrastructure can be used as centralised energy storage to help mitigate against the intermittent nature of renewable energy.
- There were some references to a need for additional policy support within the planning system such as the need for these sites to be highlighted in the National Planning Framework as priority energy development sites.
- Only a small number of respondents felt there were disadvantages in using existing sites.

2.83.   Comments on this question came from 106 respondents across all respondent groups.

2.84.   **Benefits of using existing infrastructure**: Most of the comments made by respondents related to the benefits of using the existing infrastructure. The advantages of using the existing infrastructure include strategic locations which offer good access to transport routes using rail, road or water, as well as access to water for cooling, a skilled workforce and community support. Several respondents focused on the need to try and maintain existing jobs for the benefit and welfare of the local communities, particularly as the relevant skillset already exists in these locations. A Trade Union respondent noted that these sites are substantial employers and that the draft Energy Strategy needs to give greater consideration to the employment provided by these sites within local communities. Furthermore, these lost jobs will not be replaced by the renewables sector.

2.85.   **Usage of the existing infrastructure**: Many respondents noted ways in which the existing infrastructure could be used, with reference to the capacity for centralised energy storage from several respondents as this can help to overcome the intermittent and reliability issues related to renewable energy. A small number

of these respondents referred specifically to Longannet being a possible location for hydrogen production and storage.

2.86.   Another benefit to using the existing infrastructure mentioned by a small number was that of the existing grid capacity, which could be made available to other generators.

2.87.   A respondent within the Academic / Research / Training sub-group and reflecting comments made by a number of other respondents noted a number of advantages:

"Their primary advantage is their grid connectivity and the fact that these sites have already been used for industrial power generation, both of which should facilitate the potential for co-use in these locations. This should be geared towards renewable / low carbon options. Innovative, site specific renewable generation solutions should be sought for these sites to continue generating electricity. In addition to this these sites are often surrounded by residential areas and therefore co-generation and district heating solutions should be encouraged."

2.88.   **Use of decommissioned sites**: Many respondents noted specific forms of energy that would be suited to these locations and these included:
- Renewable energy generation such as wind or solar.
- Nuclear energy, with some reference to the use of Small Modular Reactors (SMRs).
- Gas fired power stations (such as Combined Cycle Gas Turbines (CCGTs), with some references to CCS.
- Biomass applications.
- Hydrogen production.
- Capturing heat for district heating systems, as some of these sites are surrounded by residential areas.

2.89.   Other potential non- energy uses cited by two or more respondents included:
- Maritime construction / decommissioning.
- Research / development / training.
- Helping wildlife, for example in creating SSSIs or managing environmental risks.
- Business hubs.

2.90. **The disadvantages of using existing infrastructure**: A small number of respondents felt that as some of these sites are in remote locations, they might not be ideally positioned in respect of the efficient distribution of heat networks. A similar number noted the need to assess the potential value of sites, particularly in

respect of emerging and developing technologies. A small number also cautioned on the need to ensure that any future use must meet the tests of keeping the system within carbon budgets while providing energy security at the lowest possible cost.

2.91. **The need for policy support**: Once again, there were several references to the need for the planning system to attach planning importance to these sites so they are not lost to non-energy development or that they should be highlighted in the National Planning Framework (NPF) as priority energy development sites. Indeed, two local authorities noted that these are national assets and that this should be reflected in the NPF and development plans. A key benefit to this is that the use of existing brownfield sites can avoid the timescales and costs associated with obtaining planning permission and environmental permits.

2.92. While there is a preference from many respondents to continue to use these sites for energy generation, a small number cautioned that the decision to redevelop these sites remains with the owner.

The role of hydrogen

Q7: What ideas do you have about the role of hydrogen in Scotland's energy mix and the development of hydrogen production in Scotland?

Summary of main themes:

- There was overall support for developing the role of hydrogen in Scotland's energy mix.
- Hydrogen can be used across different sectors including transport, heating and power, although there were some suggestions that hydrogen is best suited to the transport sector.
- There were suggestions hydrogen capacity can be set up on sites adjacent to large scale wind energy sources to enable use of surplus energy, although there would also be a need for storage facilities.
- Although views were generally positive about the role of hydrogen, there were some provisos or concerns noted by respondents, with some requests for hydrogen to be produced from non-fossil fuels. There were also some comments that Carbon Capture and Storage (CCS) is needed but that at present is has not been developed at sufficient scale.
- There were some calls for the Scottish Government to be involved in and / or provide support for demonstration projects.
- It was also felt that there is a need to increase public awareness, engagement and perceptions so that hydrogen can be accepted as a possible energy source.
- There were also calls for further development of the UK Hydrogen and Fuel Cell Roadmap, with some suggestions for a similar Scottish-based roadmap.

2.93.   Comments on this question came from 140 respondents across all respondent groups.

2.94.   Overall, there was support for developing the role of hydrogen in Scotland's energy mix, with many respondents pointing out various advantages that this brings with it.

2.95.   Only a small number of respondents – primarily Individuals – were against the use of hydrogen in Scotland's energy mix; key reasons were that they felt it would be unsafe, it would be expensive to replace infrastructure and equipment such as boilers and that it is dependent on CCS which is as yet unproven as a technology.

2.96.   **Advantages of hydrogen**: A key advantage noted by many respondents was use of the existing gas distribution network, which would help to avoid huge capital investment in a new infrastructure. Some of these respondents commented that it is possible to blend a proportion (c. 5-15%) of hydrogen in the natural gas grid. A smaller number of respondents suggested that in the short term it would be possible to have a mix of hydrogen and natural gas in the existing gas grid with no significant impact; then in the longer term the distribution networks should be converted to transport 100% hydrogen. The downside of this approach – noted by a small number of respondents – was that the switch to hydrogen could be a greater challenge than the switch to natural gas in the 1970s.

2.97.   Some respondents, primarily within the Energy and Academic / Training / Research groups, along with some Individuals, noted that hydrogen can make a contribution as a fuel source for a number of different sectors including transport, heating and power.

2.98.   **Use of hydrogen in electric vehicles**: Many respondents – many from the Energy sub-groups – cited a number of benefits to using hydrogen for transport including that:
- It produces no harmful emissions and thus can improve air quality.
- Hydrogen electric vehicles are quieter and smoother to run.
- Hydrogen electric vehicles have a better range of travel than battery electric vehicles, and a shorter refuelling time.

2.99.   There were also some comments that an infrastructure would need to be in place to encourage development and take up of hydrogen electric vehicles.

2.100. Several respondents felt that **hydrogen was suited to specific types of vehicles** and that further development of this technology should focus on these vehicles. These included buses, large commercial vehicles, coaches, vans and heavy duty transport. There were also a small number of mentions of ferries. A small number of respondents suggested the public sector should set an example to other sectors by making use of hydrogen forms of transport.

2.101. Another advantage cited by several respondents was that **hydrogen capacity could be set up on sites adjacent to large scale wind energy sources**. This provides opportunities to use surplus electricity produced from wind or renewables to generate hydrogen, although there would need to be storage facilities co-located so as to store excess renewable generation at times of high renewable output. There were a small number of suggestions that storage facilities could be located adjacent to the main truck routes for gas grid conveying, with some references to St Fergus and Bacton.

2.102. **Reducing fuel poverty**: Given that many renewable sources of energy are located in more rural and remote locations in Scotland, and that these areas tend to have higher proportions of individuals in fuel poverty, producing hydrogen from renewable energy, would also serve to help reduce fuel poverty in households unable to access the grid. This comment came primarily from respondents within Local Government and the Academic / Research / Training sub-groups.

2.103. A small number of respondents also noted the need for a supply chain to support the development of the hydrogen sector in Scotland.

2.104. Other advantages cited by small numbers of respondents included:
- There is significant potential for the hydrogen sector to harness the skills and expertise that have been developed within the offshore oil and gas industry.
- There are opportunities to produce hydrogen from water when large wind farms and other renewable energy generation facilities are facing constraints.
- Hydrogen is low carbon / zero carbon at point of use.
- The combination of hydrogen from steam methane reformers along with CCS technology could mean a very low carbon fuel source that can be used to help address the traditionally hard-to-decarbonise sectors of heat and transport.
- Hydrogen can be delivered at constant prices irrespective of wider fossil fuel energy market price movements.

2.105. **Concerns about hydrogen**: While views were relatively positive over the role of hydrogen in Scotland's energy mix, respondents noted some provisos and / or concerns. Many respondents, primarily in the Energy sub-groups, the Third Sector / NGOs and Local Government, said hydrogen should be produced from low carbon sources such as electrolysis using renewable energy. Some of these respondents noted they did not want hydrogen produced from fossil fuels, with the reason being that it will not contribute to the renewable energy target of 50% if fossil fuels are used. One felt the draft Energy Strategy did not focus enough on the benefits of green hydrogen over brown, with another suggesting consideration of Power to Gas (P2G) which generates hydrogen from surplus renewable energy and then combines it with carbon dioxide to make methane.

2.106. Many respondents also made comments in relation to Carbon Capture and Storage (CCS), in that hydrogen needs to be integrated with CCS to be an effective energy source. Comments included that there will need to be development of CCS at sufficient scale but there were some comments that this would have cost and infrastructure challenges and that CCS is, as yet, an unproven technology. A small number of respondents noted concerns that the energy generation projections from BEIS do not include CCS in the UK's energy mix until 2032; others noted concern that there is not a long enough timescale to meet the 2032 target in the draft Climate Change Plan.

2.107. A small number commented on challenges in respect of scale, geographic spread and regulatory burdens.

2.108. **Role for Scottish Government**: Given that for many respondents, hydrogen technology is still relatively untested and new, there were several comments relating to the need for the Scottish Government to be involved in, and / or provide support for competition and demonstration projects. These projects are seen as needed to fully test assumptions and clarify the potential for hydrogen and to look at the wider use of hydrogen in Scotland's energy mix and to look at technical delivery mechanisms for gas network upgrades to accommodate higher mixtures of hydrogen. Additionally, respondents saw a need to carry out cost benefit analysis and consider associated costs and benefits. Some respondents also made positive reference to demonstration projects already underway utilising the use of hydrogen technology; these included projects in Aberdeen, Fife, Orkney, Leeds and Levenmouth.

2.109. **Increasing public awareness, engagement and perceptions**: Several respondents commented on the need to increase awareness of hydrogen as a potential energy source, to create public engagement and to improve public perceptions of hydrogen (see later chapter on Delivery, Monitoring and Engagement for more detail on public engagement). These comments came primarily from respondents in the Energy sub-groups and Local Government. There were also a small number of suggestions for support to businesses, in the form of subsidies and incentives.

2.110. Some respondents, primarily in the Energy sub-groups, referred to the need to develop the UK Hydrogen and Fuel Cell Roadmap further, with suggestions that Scotland could align its work with this and work with the UK Government, BEIS, industry and other stakeholders. There were also several requests for a Scottish-based roadmap.

2.111. As at previous questions, several respondents also noted the need for a supportive policy framework and changes to regulation, for example in updating building regulations to require low carbon heating in properties, or amending the Gas Safety & Management Regulations (GSMR) to allow a higher proportion of hydrogen to be mixed into the gas grid.

2.112. Several respondents reiterated points made to earlier questions and these included the need for a range of technologies within Scotland's energy mix.

3. Transforming Scotland's Energy use

3.1.   Chapter 4 of the draft Energy Strategy focused on the consumption of energy in Scotland and outlined an energy efficiency target in line with the European Commission's proposed 30% target for 2030. Four priorities and 23 actions were outlined; respondents were asked to comment on these. These priorities were:

- **Priority 1**: Addressing the need to reduce demand and increase energy efficiency through the development of Scotland's Energy Efficiency Programme (SEEP).

- **Priority 2**: Helping energy consumers to manage their bills, harnessing smart technology in the home and supporting new business models in the retail energy market.

- **Priority 3**: Supporting the introduction of viable, lower carbon alternatives across all modes of transport.

- **Priority 4**: Delivering enhanced competitiveness and improved energy efficiency in Scotland's manufacturing and industrial sectors.

Priorities for transforming energy use

Q8:   What are your views on the priorities presented in Chapter 4 for transforming energy use over the coming decades? In answering, please consider whether the priorities are the right ones for delivering our vision.

Summary of main themes:

- There was overall support for the priorities outlined.
- A number of overriding themes emerged across the priorities, including:

  - a need to create a priority towards the reduction in energy demand as well as increased energy efficiency;
  - a need to highlight the importance of behaviour change and public buy-in;
  - the potential role for a central agency to deliver Scotland's Energy Efficiency Programme; and
  - a need for further integration across policy areas.

- There were a few suggestions for additional priorities to be incorporated into the final Strategy.

3.2.   Comments on this question came from 162 respondents across all respondent groups.

3.3.   There was support for the priorities coming from most of these respondents (127). Comments from these respondents included that the priorities are aligned with the vision or that they support local heat and energy efficiency strategies. Only two Individuals felt these were the wrong priorities.

Key themes common to all priorities

3.4.   There are a number of overriding themes across the four priorities, some of them simply reiterating the priority, and these are addressed below. Additional themes relating to individual priorities are then outlined in the following paragraphs.

3.5   **A need for a reduction in energy demand as well as increased energy efficiency**: Many respondents referred to the need for this, with some concerns that increased energy efficiency could actually lead to an increase in demand. Allied to this, some of these respondents commented that the Scottish Government targets within the draft Climate Change Plan of a 6% reduction in the domestic sector and 10% in the commercial sector are too modest and at odds with the aim of decarbonising the heat supply in 80% of residential buildings and 94% of non-domestic buildings.

3.6   Linked to this, there were a small number of references to the need for the draft Energy Strategy to include an integrated whole systems benefits analysis.

3.7.   Similarly, there were a number of calls to set more ambitious targets to reduce demand by 2030, for example, the UK Committee on Climate Change (UKCCC) recommends that 65% of new car sales should be electric by 2030, compared with only 27% as set out in the draft plan.

3.8.   **A need for behaviour change and public buy-in**: Many respondents from across most sub-groups commented on the need to bring about behavioural change to ensure the uptake of technology and the programmes required to achieve these priorities.

3.9.   Linked to this, there were also comments from some respondents on the need for the provision of advice to consumers, businesses and communities.

3.10.   **A need for a central agency**: Several respondents, mostly within the Third Sector / NGO or Community sub-groups noted the need for a central agency or national centre with responsibility for overall collaboration within the sector and to work with industry in the development of commercially viable energy efficiency solutions. Some of these respondents felt this role would sit well with Scottish Environment Protection Agency (SEPA) who could be responsible for the collective development (along with other statutory bodies and other publicly-funded bodies such as CPPs) of strategies and implementation plans that reduce the carbon

footprint of existing building stock and ensuring that new developments have low or net zero carbon levels.

3.11.   **The need for integration across policy areas**: A small number of respondents noted that the draft Energy Strategy is fragmented at present. For example, one respondent noted the need for a holistic approach, not focusing only on energy but also incorporating environmental, economic and fuel policies.

3.12.   Some respondents within the Energy sub-groups (mostly in the Non-Renewable sub-group) noted their concerns over the UK Government proposed increase to the Climate Change Levy from 2019, noting that this will increase charges to businesses as well as having the potential to undermine engagement with consumers and prevent new market entrants; this also runs counter to the UK's and the Scottish Government's decarbonisations objectives.

3.13.   A small number of respondents noted the need for a greater emphasis within the Strategy using an "energy efficiency first" principle.

3.14.   As at earlier questions many respondents reiterated points they had already raised, and which are covered in the cross-cutting themes chapter.

3.15.   The following paragraphs outline key points made in relation to each specific priority.

Priority 1:   Addressing the need to reduce demand and increase energy efficiency through the development of Scotland's Energy Efficiency Programme (SEEP)

3.16.   This section of the report should be read in conjunction with the consultation analysis of responses to the Consultation on Scotland's Energy Efficiency Programme (SEEP), which provides greater detail on views of SEEP.

3.17.   A number of key points were raised by a small number of respondents, most of whom were in the Third Sector / NGO, Community and Local Government sub-groups. A small number of respondents welcomed the inclusion of energy efficiency as a National Infrastructure Priority; although there were also a few calls for a statutory foundation for SEEP, which would incorporate targets, clear pathways and governance arrangements; with some comments that SEEP needs further development to ensure it can deliver on aspirations to reduce demand and increase energy efficiency. In relation to energy efficiency, a small number of respondents felt that greater priority needs to be given to energy efficiency, for example, all homes to be band C rated by the year 2025. A small number also commented on the need for a larger supply chain as well as opportunities for the supply chain.

3.18.   There were some calls for SEEP and LHEES to be integrated, primarily because local authorities are not seen to have the necessary skills and resources

to be able to manage these initiatives on their own. A small number of respondents also noted that there would need to be careful management for this priority.

3.19.   A small number of respondents commented that progress to date can be attributed to 'low hanging fruit' (measures such as double glazing or loft insulation) and that it will not be easy to maintain the pace of progress to date without the adoption of new technologies.

Priority 2:   Helping energy consumers to manage their bills, harnessing smart technology in the home and supporting new business models in the retail energy market

3.20.   A small number of respondents noted that this priority needs to acknowledge the role played by smart technology in the non-domestic sector in order to ensure that the benefits of smart technology are realised beyond the domestic sector.

3.21.   There were a few comments on the need for a fabric-first approach to existing buildings.

3.22.   A small number of respondents noted that there is too much focus on smart meter roll out and that there is a need to consider other elements such as the development of the Internet of Things, remote access or new technologies. Allied to this, there were a few comments that more discussion is needed on smart meters and smart city energy systems, with one or two comments that smart technology is currently overrated and there should be industry-standardisation of smart meters. There was also comment that there needs to be stronger recognition of the wider range of enabling functions of smart meters, although a small number of respondents noted that some rural properties will not benefit from smart meters due to a lack of connectivity.

3.23.   A small number of respondents noted their support for specific initiatives such as Our Power and Tower Power which have been used to reduce heat and fuel costs.

3.24.   A small number of Individuals felt there should be more focus on renewables.

Priority 3:   Supporting the introduction of viable, lower carbon alternatives across all modes of transport

3.25.   Several respondents, primarily within the Local Government and Energy sub-groups noted there is too much focus on electric vehicles (EVs) and asked for more support for a wider range of transport types, including heavy goods vehicles (HGVs), buses and other public vehicles. They also felt there needs to be more emphasis on active travel and cycling and less overreliance on cars. However,

some of these respondents noted that there are significant challenges around the electrification of HGVs.

3.26.   A small number of respondents, within the Local Government and Third Sector / NGO sub-groups, felt that there is no clear strategic direction from the Scottish Government or Transport Scotland at present and suggested there is a need for a national approach in order to achieve maximum impact; linked to this, there is also a need for clear policies and pathways, with the Scottish Government mapping out more significant progress in the transport sector.

3.27.   A small number of respondents, primarily within the Local Government and Energy sub-groups felt that the issue of grid constraints have not been dealt with under this priority. For example, they noted concerns that the electrification of the transport sector will place pressure on the existing grid in terms of capacity.

Priority 4:   Delivering enhanced competitiveness and improved energy efficiency in Scotland's manufacturing and industrial sectors

3.28.   There were few common threads emerging specifically in relation to this priority, with comments made by only a small number of respondents.

3.29.   A small number of respondents noted that there is no discussion as to how this priority will be achieved, for example, what subsidy arrangements might be provided and / or for what industries. Allied to this, there were suggestions of introducing a carbon tax that recognises energy or carbon in imported goods so that businesses will be encouraged to be based in Scotland and / or avoid carbon leakage.

3.30.   A small number of respondents also commented that this priority should also include reduction in waste, particularly in relation to energy in the manufacturing and industrial sectors.

3.31.   A small number of respondents felt that the potential for energy savings in some sectors is limited and that it would be better to focus on sectors offering greatest potential (public sector and domestic) for energy efficiency improvements.

Additional priorities

3.32.   A small number of respondents made suggestions for additional priorities or issues that need to be covered in the Energy Strategy. These included:
- Engaging all elements of civic society in bringing the priorities into a holistic national programme.

- Greater focus on fuel poverty; fuel poverty should be as integral to the whole programme as carbon reduction targets.

- Food / agriculture not specifically considered; for example agriculture is a significant source of greenhouse gas emissions, and there is a need for research on how to reduce the impact of these sectors.

- No reference to passive measures to reduce energy consumption through design of new developments; this is needed as part of an integrated approach.
- The actions identified should include specific reference to developing the supply chain opportunities that arise from investments. Also, that there is a need for a much larger supply chain to meet these priorities.

Actions for transforming energy use

> **Q9:   What are your views on the actions for Scottish Government set out in Chapter 4 regarding transforming energy use? In answering, please consider whether the actions are both necessary and sufficient for delivering our vision.**
>
> **Summary of main themes:**
>
> - Many respondents, across groups, simply voiced support for the actions in general or for specific actions.
> - Some suggestions made reiterated points made to the previous question; some cut across all the actions.
> - Respondents noted a number of cross-cutting themes.

3.33.   Comments on this question came from 138 respondents across all respondent groups.

3.34.   There were a total of 23 actions set out under these 4 priorities, and a full listing of these is in Appendix 3. The number of actions under each priority were as follows:
- Priority 1: Reduce demand and increase energy efficiency – 5 actions
- Priority 2: Smart technology and new business models – 5 actions
- Priority 3: Lower carbon transport alternatives – 8 actions
- Priority 4: Scotland's manufacturing and industrial sectors – 5 actions

3.35.   There was support for some or all of these actions coming from almost half of these respondents, many of whom, across various sub-groups, reiterated comments made at the previous question regarding the overall priorities, or noted their support for the actions. A very small number noted their opposition to these actions.

3.36.   Many respondents, across groups, simply voiced support for the actions in general or for specific actions; these supportive comments were all brief, along the lines of 'the respondent supports x'.

3.37.   A number also gave their views on actions under each of the priorities (albeit small numbers commented on each) and / or suggesting additional actions. These comments and suggestions are outlined in Appendix 3.

3.38.   Some suggestions cut across the actions overall, many of which are referenced in the cross-cutting themes chapter. These suggestions related to:

- A need for more ambitious targets to encourage the modal shifts on a scale necessary to make notable reductions in energy demand.

- The need for consistent approaches to be adopted across Scotland, albeit that they need to allow a degree of flexibility to meet local needs.

- The need for awareness raising among customers, and for public engagement, allied to access to advice and support.

- The need for collaboration and partnership working across all relevant stakeholders.

- A need for monitoring / evaluation / appraisal.

Setting an energy efficiency target

> **Q10: What ideas do you have about what energy efficiency target we should set for Scotland, and how it should be measured? In answering, please consider the EU ambition to implement an energy efficiency target of 30% by 2030 across the EU.**
>
> **Summary of main themes:**
>
> - There was overall support for an energy efficiency target, although several respondents felt this needs to be more ambitious and there were requests for clarification of the baseline year.
> - Key elements for any target included a need for this to be explicit, to have a clear pathway, to be transparent, and to be long term with interim targets based on specific milestones, with regular monitoring and reporting.
> - There were requests for integration across the transport, heat and electricity sectors.

3.39.   Comments on this question came from 126 respondents across all respondent groups.

3.40.   Many of these (55), across all respondent groups, noted their support for an energy efficiency target for Scotland, with some commenting on the need to align this with the EU ambition to implement an energy efficiency target of 30% by 2030 across the EU.

3.41.   **A need for a more ambitious target**: Several respondents, primarily within the Third Sector / NGO, the Community and Local Government sub-groups and

Individuals, commented that this target should be more ambitious, with some comments that the target needs to incorporate efficient energy use across a wide range of energy sources. A small number of these respondents provided an alternative target, mainly that this should be raised to 40%, although one Individual suggested it should be set at a level of 50%. Reasons given included that the energy efficiency actions outlined in the draft Climate Change Plan for 2018-2032 should be delivered by 2025 and there is scope for additional savings from energy efficiency to be made in the domestic sector.

3.42. A small number of respondents noted the need to clarify the baseline year. For example, a respondent in the Local Government sub-group noted:

"It is unclear from the consultation document what the baseline year is for the 30% energy reduction target. Is the baseline 2005-07 and the 30% target is building on the success in reaching the 12% reduction target by 2020? Or will the Scottish Government set a new baseline year for this 30% target?"

3.43. A small number of respondents did not support the EU target.

3.44. **Setting an energy efficiency target**: In considering how an energy efficiency target for Scotland should be set and measured, some respondents made general comments about a number of issues they felt would impact on this. A small number of respondents noted that there is a need for any target set to be explicit, to have a clear pathway and be transparent, and that the target would need to be long term with interim targets based on specific milestones. There were also a small number of requests for regular or annual reporting and with progress being monitored using a range of indicators linked to an understanding of other factors that are influencing any change.

3.45. Several respondents, primarily within the Energy sub-groups, felt that integration between the transport, heat and electricity sectors is key, with some also noting that there need to be links across different policy areas. That said, some respondents commented on the need for individual sector targets as it would be unfair to expect all sectors of the economy to contribute equally. Allied to this, there were some calls – primarily from the Local Government sub-group – for recognition of local conditions in target setting.

3.46. Small numbers of respondents referred to measurements that could be used in monitoring an energy efficiency target; and these included:
- Should be measured in same way as EU target.
- Reduction of carbon dioxide emissions, as set out in the Climate Change Act and the Climate Change Plan.
- Reduction in the number of households in fuel poverty.
- Variables including the weather, economic cycles and energy prices (mainly from respondents in the Local Government sub-group). This could also

include additional factors such as the number of miles travelled or the number of homes heated.

- The intensity of energy use (mainly from respondents in the Local Government sub-group).

- Behaviour change such as increased energy efficiency on the part of consumer.

- Setting a minimum EPC standard, for example, that all homes should be EPC Band C by 2025, together with penalties for social landlords who fail to comply. That said, there were also a small number of comments that an alternative data source should be used or that there needs to be changes and improvements to the EPC methodology.

- The reduction of energy use in building stock, with some reference to the need for retrofit in existing residential and non-residential buildings; or passive energy measures such as improved insulation.

- The elimination of waste energy such as by-product heat.

- The number of households or businesses switching to renewable energy.

- The amount of energy needed to generate a unit of GDP.

- A target linked to the Climate Change Plan's ambition for energy efficiency.

- Improvements to the overall system efficiency of energy supply.

3.47.   A small number of respondents noted that any target should be informed by past trends and available resources and pointed to the need for data sharing.

Additional recurring sub-themes

3.48.   There were a number of recurring sub-themes in comments at this question. Most commonly these included:

- Uncertainties around Brexit and the need for clarity on this before signing up to a new EU based energy efficiency target.
- The role(s) that could be adopted by the Scottish Government in support of any target, including close working with local authorities and other stakeholders in delivery of the Strategy, the provision of financial investment and / or incentives.
- A need for changes to building regulations and building standards.

4. Delivering Smart, Local Energy Systems

4.1.　The consultation paper noted that the Scottish Government is committed to supporting the development of local energy economies as part of a varied and proportionate response to Scotland's energy system. Chapter 5 of the draft Energy Strategy outlined the 2050 vision, and included two priorities and four actions to meet this vision. The priorities were:

- **Priority 1**: Directly supporting the demonstration and growth of new innovative projects.

- **Priority 2**: Develop future energy systems in partnership between communities, the private and public sectors.

4.2.　This Chapter also sought views on the role of a Government-owned energy company and Renewable Energy Bond in Scotland.

Priorities for developing smart, local energy systems

Q11: What are your views on the priorities presented in Chapter 5 for developing smart, local energy systems over the coming decades? In answering, please consider whether the priorities are the right ones for delivering our vision.

Summary of main themes:

- Many respondents supported smart, local energy systems as being more robust and quicker to decarbonise than current energy sources, and local projects offer the potential to develop into clusters and regional initiatives.
- Respondents referred to the need for a whole systems approach which is collaborative in nature, with initiatives that enable local and community projects to be developed, and with regular monitoring and evaluation.
- There was support for the use of Energy Masterplanning as a strategic approach to bring forward energy projects. There was also reference to the need for a more supportive regulatory environment.

4.3.　Comments on this question came from 142 respondents across all respondent groups.

4.4.　Many of these (63), across all respondent groups, noted their support for the priorities, with some also referring to their support for the vision and actions within this chapter. There were some qualifying statements, however, primarily from respondents within the Energy sub-groups, relating to concerns that the current regulatory landscape does not allow for the development of a decentralised and flexible energy system.

4.5.   **The benefits of smart, local energy systems**: Several respondents outlined a number of benefits of local energy systems including their potential to be more robust and quicker to decarbonise than current energy sources, or that local energy projects will have the potential to develop into clusters and regional initiatives. One respondent in the Local Government sub-group commented:

"We welcome the investigation into alternative funding solutions for community led projects. Local energy systems will help tackle issues of security of supply, reducing energy usage, less expensive and stimulates regeneration."

4.6.   Several respondents provided examples of smart, local energy systems that are already in place in different communities across Scotland and further afield.

4.7.   Several respondents commented on the need for the Scottish Government to provide support in a number of ways. These included:
- Communication with the general public to demonstrate the benefits of local ownership / shared ownership / co-operative business models.

- Providing support for research on smart, local energy systems and innovative projects, for example, in enabling early markets for such as hydrogen and district heating to develop.

- Continuing to provide funding and support streams and investment mechanisms.

- Providing technical support.

- Acting in an advisory capacity.

- Support mechanisms in place to help enable communities to play a role in development of smart, local energy systems.

- Supporting local supply chains.

- The Scottish Government needs to work with the UK government to consider a broad view of how to optimise smart local energy systems.

4.8.   The following paragraphs report comments made by respondents on each specific priority.

Priority 1:   Directly supporting the demonstration and growth of new innovative projects

4.9.   Several respondents, primarily in the Academia / Research / Training and Energy sub-groups noted the need to take a whole system approach.

4.10.   A similar number, primarily within Energy, Local Government and the Third Sector / NGO sub-groups noted their support for initiatives that enable local and community projects to be developed, with the Community and Renewable Energy Scheme (CARES) and the Low Carbon Infrastructure Transition Programme (LCITP) being the most frequently mentioned.

4.11.   There were some comments of the need to monitor and evaluate funding on a regular basis; and several respondents noted the importance of a strategic approach that can ensure innovative projects can become commercial businesses. As noted by an organisation in the Third Sector / NGO sub-group:

"We think that it is important the first priority recognises the need to ensure that where demonstration projects are successful there are clear mechanisms in place to ensure wider deployment where appropriate."

4.12.   There were a small number of comments on the need for energy companies to work together collaboratively rather than operating as silos, so as to allow for the integration of energy networks.

Priority 2:   Developing a strategic approach to future energy systems in partnership between communities, the private and public sectors

4.13.   Several respondents, mostly in the Third Sector / NGO, Public Sector / Delivery Agency / Regulator and Non-Energy sub-groups, were supportive of the use of Energy Masterplanning as a strategic approach to bring forward energy projects.

4.14.   There were also some comments on the need to link this into local authority strategies and development plans as well as the National Planning Framework (NPF) and Scottish Planning Policy (SPP). Aligned to this, there were several comments, primarily from organisations within the Energy sub-groups and Third Sector / NGO sub-groups, relating to concerns that the current regulatory landscape does not allow for a decentralised and flexible energy system. Furthermore, a small number of respondents noted their support for a national framework that supports smart, local energy systems.

4.15.   While there were a number of comments that local authorities will play a key role in development of this strategic approach, some respondents, mostly in the Local Government sub-group, noted they will need resources in terms of funding, the development of relevant skills and expertise, and access to advice to help deliver the priorities.

4.16.   Several respondents also commented on the use of Scotland's Heat Map to help deliver the Strategy's vision.

4.17.   There was support for a Government-owned energy company (GOEC) and for a Scottish Renewable Energy Bond. These are covered in greater detail later in this chapter.

4.18.   There were a small number of comments, primarily from those in the Academia / Research / Training sub-group that the approach to shared ownership outlined in the draft Energy Strategy focuses too much on financial incentives and

that there is a need to also consider the broad range of economic, social and environmental benefits that smart local energy systems can bring.

Actions regarding smart, local energy systems

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Q12: What are your views on the actions for Scottish Government set out in this chapter regarding smart, local energy systems? In answering, please consider whether the actions are both necessary and sufficient for delivering our vision.

Summary of main themes:

- There was overall support for the actions, across all groups of respondents.
- Only a small number of respondents disagreed with these actions.
- There were calls for available funding sources to be simplified and streamlined.
- There were suggestions of a need to accelerate a transition from Distribution Network Operators (DNOs) to Distribution System Operators (DSOs) to provide the right control of infrastructure investment and grid services to support local systems.

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4.19.   Comments on this question came from 125 respondents across all respondent groups.

4.20.   There were a total of 4 actions set out under these 2 priorities, and a full listing of these is in Appendix 4. The number of actions under each priority was as follows:
- Priority 1: Supporting demonstration and innovative projects – 2 actions

- Priority 2: Partnership working – 2 actions

4.21.   Around half of respondents to this question (62) noted their support for one or more of the actions outlined in Chapter 5 regarding smart, local energy systems. Support for these actions came from respondents across all sub-groups. Only a small number of respondents disagreed with any of these actions. Some respondents provided cross-cutting comments relating to all four actions, while others commented on specific actions.

4.22.   **A need for local solutions to supplement larger scale generation**: While some respondents focused on local issues, a small number commented that local solutions should supplement larger scale generation, because larger scale generation and national policy may provide better economies of scale and better security of supply to ensure affordability.

4.23.   **Need more ambition**: A small number of respondents, primarily Individuals, felt these actions needed to be more ambitious, for example, that there is a need

for a stronger vision for the role of communities in the delivery of energy transition, particularly in low carbon heat and transport.

4.24. **A need to simplify funding sources**: Several respondents called for available funding sources to be simplified and streamlined, with a perception from some respondents that the range of funding streams currently available can be confusing to those who want to apply for funds. There were also a small number of suggestions for the development of a single point of contact for the range of finance and assistance available.

4.25. **Distribution Network Operators**: There were a small number of references, primarily from the Renewables sub-group, to Distribution Network Operators (DNOs) and the need to accelerate a transition from DNOs to Distribution System Operators (DSO) to provide the right control of infrastructure investment and grid services to support local systems and allow local projects to provide network, generation and demand side management services.

4.26. **A need to review regulations**: There was also a suggestion on the need to review the regulations so that DNOs have the authority and ability to invest in smartgrid technology and skills to be able to operate a more complex network as local energy companies emerge. A small number noted the need to consider options for local communities to take over ownership and operation of existing local distribution grid networks from DNOs if this could assist in delivery of a specific project.

4.27. Other issues raised by small numbers of respondents included:
- Connection constraints can be an impediment to local energy project development.
- The need for co-location of energy storage with energy generation to bring flexibility to the grid.
- Innovation in energy tariffs required.
- Charging regime set by Ofgem and National Grid should be adapted to allow local variation.
- The requirement for simplification of network charging principles that are cost-reflective and represent fair recovery of costs.

4.28. Some suggestions are relevant to the actions overall and have been included in the cross-cutting themes chapter. Other suggestions included:
- **A need for flexibility across all elements of smart, local energy systems**. This included flexibility in funding so that viable projects can be taken forward, flexibility in guidance so that changes can be introduced in the light of demonstration projects and flexibility in the energy system so that local energy objectives to be met in a cost effective way, while still allowing for new models and technologies to emerge. Also, that there will need to be a degree of consistency across local energy plans to allow for comparability.

- **Support from the Scottish Government**, including support for the provision of network data to help with project scoping and development and improvements to data in the Scotland Heat Map; and the sharing of data across stakeholders.

4.29.   A brief summary of key points made in relation to each of the specific actions is provided in Appendix 4.

A Government-owned energy company

Q13: What are your views on the idea of a Government-owned energy company to support the development of local energy? In answering, please consider how a Government-owned energy company could address specific market failure or add value.

Summary of main themes:

- Many respondents identified a need for some form of public agency to support an energy transition. A number of these supported a Government-owned energy company (GOEC) for the development of local energy, although some others queried the need for a GOEC or suggested alternatives to a GOEC.
- A small number of respondents queried the need for a GOEC and several suggested that a GOEC would detract from the existing range of initiatives and activities undertaken by other organisations.
- A number of roles were identified for a GOEC; these included, the provision of finance to support community-ownership, shared ownership or the development of energy systems projects; as a supplier of last resort; or information provider.
- The added value that a GOEC would bring includes the facilitation of community energy development on a long term basis, and with the use of Power Purchase Agreements (PPAs) to ensure long term planning as well as being of use in more remote locations.
- It was suggested that a GOEC would operate efficiently, on a not-for-profit basis and allow for innovative energy systems. This would help to overcome some market barriers.
- Some suggestions were made for alternative mechanisms; these included Energy Service Companies (ESCos), Government and Community-Owned Energy Companies (GCOECs) and Municipal Energy Companies (MECs).
- There were some suggestions for a centralised energy agency along the lines of the Danish Energy Agency.

4.30.   Comments on this question came from 137 respondents across all respondent groups.

4.31.   Many of these respondents – again, across all respondent groups – noted their support for a Government-owned energy company (GOEC) to support the development of local energy. Some of these respondents reiterated that a GOEC must add value to existing organisations and schemes, and address specific market failures.

4.32.   **Potential roles for a GOEC**: Many respondents cited a number of roles that could be undertaken by a GOEC. A key role was the provision of finance to support community-ownership, shared ownership or the development of energy systems projects. This could also provide significant benefits in levering investment, and in providing grants or low interest loans, which is of particular importance in areas where there may be little by way of economic incentives for the commercial development of projects or in generating capacity. Additionally, some respondents noted that a GOEC could provide guarantees or joint funding for shared ownership projects. In turn, this would help to create security of supply and overcome poor access to the grid.

4.33.   **Supplier of last resort:** Several respondents also noted that a GOEC could be a supplier of last resort in instances where district housing scheme operators have gone into administration or in taking forward a project that a developer or an Energy Service Company (ESCo) does not wish to take on. One organisation noted that a GOEC would not need to be involved in every scheme but should only act where a development is unable to match with an existing heat network provider. These comments came primarily from Third Sector / NGOs and Local Government respondents.

4.34.   **Providing advice, information and support:** Several respondents also suggested that a GOEC could provide information, advice and support on tariffs and energy use to help address the current lack of switching and engagement on the part of the general public.

4.35.   **Adding value**: Respondents noted a number of ways in which a GOEC could add value. Key was that a GOEC could facilitate community energy development on a long term basis; the long term nature of energy supply was a key theme emerging at this question. Several respondents suggested that Power Purchase Agreements (PPAs) are a good way to ensure long term planning; this comment came primarily from Third Sector / NGOs and a small number of respondents within the Local Government, Public Sector/ Delivery Agency/ Regulator, Energy (Renewable) and Energy (Utility) sub-groups.

4.36.   **Potential in remote geographic locations**: Several respondents – mainly from a range of different Energy sub-groups – felt that a GOEC could be useful in more remote geographic locations which have a high level of resources but poor grid access and where there is likely to be market failure. There was also a suggestion from a respondent in the Energy (Other) sub-group that a GOEC also offers potential to bring together off-the-grid gas customers to encourage group buying of oil to bring down prices or even in selling their resources to others.

4.37.   **Other benefits of a GOEC:** A small number of respondents felt that a GOEC would operate efficiently, keep energy prices down, and help to alleviate fuel poverty and help to increase consumer confidence. Another benefit was that the GOEC would operate on a not-for-profit basis and offer support at a social level, which is preferable to privately owned companies that exist primarily to make profits for external shareholders. Some respondents also commented that this business model would mean that trust is built between communities and the Scottish Government, and where the focus can be on social and ecological benefits. It was also felt that a GOEC would allow for innovative energy systems and projects, and act as a catalyst for new developments and accelerate the development of renewable heat technologies. It was suggested that a GOEC could support renewable energy by sourcing power from local energy providers.

4.38.   There were also a small number of comments that a GOEC would be able to acquire and share data as well as provide technical support.

4.39.   **Barriers to be overcome**: A small number of respondents also noted there are a number of market barriers that a GOEC would overcome; this included current economic disincentives to the commercial development of generating capacity in Scotland or transaction costs; that barriers are less likely to impact on a Government-owned organisation because of the focus on social benefits and the long term nature of their planning. In turn, this will encourage local energy production. As noted by an organisation in the Public Service / Delivery Agency / Regulator sub-group:

"Establishing an arm's length GOEC with roles in supporting existing and new energy schemes and initiatives, and delivering energy infrastructure including district heating, could remove some of the barriers from establishing district heating that have been identified by the development industry. These barriers include the financial burden and long term involvement associated with installing, managing, maintaining and operating a district heating network."

4.40.   **Working within the planning process:** Throughout responses to this consultation, respondents have referred to the planning system, and there were a small number of comments that a GOEC would help to get developments through the planning process or that the Masterplanning process could benefit from the impetus and discipline that a government body could bring.

4.41.   Other ways in which small numbers of respondents felt a GOEC could add value included:
  • The regulation of district heating and providing advice on the development of LHEES.

  • Delivery of SEEP at a national level through branding and associated marketing campaigns.

  • Scotland would benefit greatly from community ownership of energy generation and supply at local and national level.

- Would encourage developers to connect to networks.
- Will help reduce the gap left by reduced subsidies for renewable energy.

4.42.   A small number of respondents noted a preference for government in the energy market being used to support a GOEC rather than providing subsidies for large scale energy projects such as Hinckley Point nuclear power station and / or Swansea Bay tidal barrage, both of which are perceived to be expensive, supporting the wrong type of energy development and offering little or no social benefit.

4.43.   **Questioning the need for a GOEC:** While many respondents were supportive of the concept of a GOEC to support the development of local energy, a small number queried the need for a GOEC. Two organisations in the Engineering / Network sub-group felt that central expertise is needed but that this could be provided directly by government or by a Scottish Green Investment Bank.

4.44.   Some respondents requested further clarity on what is intended by a GOEC before offering a view on the benefits of a GOEC to support the development of local energy. For example, what form a GOEC would take, what role(s) it would adopt, how it would operate, what benefits it would bring, and so on.

4.45.   **Opposition to a GOEC:** There was opposition from several respondents, primarily Individuals and those within various Energy sub-groups. A key reason for this was that the creation of a GOEC would detract from the existing range of initiatives and activities undertaken by other organisations, with some of these noting their support for initiatives already in place such as CARES, LCITP or the Innovation Fund. As such, there was some commentary that a GOEC should meet gaps in the market rather than replicate existing resources.

4.46.   A small number of respondents within the Utility, Engineering / Network and Renewable sub-groups also felt the private sector has a record of success and should be the primary vehicle for the delivery of the Energy Strategy. Comments included that a GOEC would have a conflict of interest between its role within policy and its role as a business owner, and that public ownership of energy generation is not appropriate at a larger scale as it risks distorting the market and deterring private investment.

4.47.   **Possible alternatives:** Several respondents made suggestions for alternative models that could be used instead of a GOEC, although most noted support for a GOEC to retain some sort of regulatory role which would not conflict with a role as a supplier or developer of energy.

4.48.   A small number of respondents felt that it would be better for the Scottish Government to support the growth of community not-for-profit energy supply companies and thus the growth of developments in the district heating or CHP markets.

4.49.   **Potential for an ESCo:** The most frequently cited alternative model – often by respondents in the Local Government sub-group – was ESCos (Energy Service Companies). The advantage of an ESCo is that it might be easier to roll out locally and will have an understanding of local community needs. Also, an ESCo can help to provide energy and tariffs to customers at a lower cost while at the same time providing a source of income for local authorities, which in turn may reduce the burden on the Scottish Government financing of local authorities. An ESCo could also seek to address the issue of the current energy market that penalises individuals living in more remote areas. Finally, an ESCo would allow for the procurement of energy infrastructure on a national scale to achieve economies of scale. A number of respondents also cited examples of successful ESCos that are already being run by local authorities.

4.50.   **Support for Government and Community-Owned Energy Companies:** There was also some limited support for community-owned schemes or for Government and Community-Owned Energy Companies (GCOECs). As with an ESCo, there was a perception that it would be possible to get better buy-in to a community-owned scheme. As with the GOEC, key benefits were lower prices and social benefits such as reductions in fuel poverty.

4.51.   **Other alternatives to a GOEC**: There were a small number of mentions of **Municipal Energy Companies (MECs)**, with comments that these would allow for the Scottish Government to remain in a regulatory role and support intervention in areas of failure. There was also support – primarily from Community or Third Sector / NGO respondents for a **Scottish Energy Company (SEC)**, with some suggestions that SEPA could be a stepping stone towards creation of a SEC. A key benefit to this model is that local initiatives would benefit from collective knowledge, skills exchange and access to capital through some sort of consortium.

4.52.   **The potential for an Energy Agency:** Several respondents suggested a need for a centralised Energy Agency; often citing the example of the Danish Energy Agency. It was suggested that an Agency like this could focus on delivery, measurement and verification of projects and offer the services of a 'one-stop-shop', acting as a centralised planning authority, offering procurement services, expertise and managing relationships with other national bodies. There were also some comments of the range of funds and initiatives that are available within this sector and the need for an organisation to simplify and offer advice on what support is available and how this can be accessed.

4.53.   It was also suggested that this Agency could have responsibility for the delivery of SEEP and that LHEES could learn lessons from the Danish model. There were also a small number of mentions of other countries operating central agencies along similar lines and these included the Sustainable Energy Authority of Ireland and Sweden.

Additional comments

4.54.   A number of other comments were made by small numbers of respondents and these included:

- Requests to simplify the number of agencies that exist within the sector and to reduce the complexity of the range of support and funds that is available and how to access these.

- There is a role for a Scottish Renewable Environment Bond (this issue is covered in the following question).

- The Scottish Government should have responsibility for running the National Grid in Scotland.

A Scottish Renewable Energy Bond

Q14: What are your views on the idea of a Scottish Renewable Energy Bond to allow savers to invest in and support Scotland's renewable energy sector? In answering, please consider the possible roles of both the public and private sectors in such an arrangement.

Summary of main themes:

- Many respondents, across all respondent groups, noted support for a Scottish Government Renewable Energy Bond, although some noted that the Bond should focus on a wider range of energy sectors and not just renewables. Very few respondents were opposed to this concept.
- Key advantages were that it could be an important delivery mechanism in instances where finance from other sources is a challenge, and that it would allow savers and investors to have a stake in the sector and open up ownership to a broader range of audiences. Respondents cited little by way of disadvantages.
- Some respondents felt this is not a new concept and cited examples of successful projects elsewhere.
- There were some suggestions for alternative options for raising capital including crowdfunding and Individual Savings Accounts (ISAs).
- There were some cautionary comments on issues that will need to be considered given that delivering a new project to market would represent a sizeable challenge.

4.55.   Comments on this question came from 123 respondents across all respondent groups.

4.56.   Over half (73) across all respondent groups noted their support for a Scottish Government Renewable Energy Bond to allow savers to invest in and support Scotland's renewable energy sector.

Advantages of a Scottish Renewable Energy Bond

4.57.   Respondents cited a number of advantages to this Bond. Several respondents noted that finance is likely to be a key challenge for complex local energy schemes and a Bond could be an important mechanism to deliver such schemes. Several others noted that it will allow savers and investors to have a stake in the renewable energy sector and open up ownership to a broader range of audiences. As noted by an organisation in the Energy Renewables sub-group:

"This will allow savers to generate a rate of return on investment from the growth of the industry and bring in capital to finance future development at an attractive rate to developers."

4.58.   Other advantages cited by small numbers of respondents were that a Scottish Government Renewable Bond could:

- Allow savers and local communities to support and profit from the development of the energy sector.

- Be financially secure, environmentally desirable and socially acceptable.

- Be attractive to a range of different audiences including pensions investors and pension funds, local authorities, savers and local communities.

- Help to educate and engage people about energy issues or raise awareness of energy issues, with a small number of comments that this needs to offer accessibility for all individuals, including low income households.

- Allow investment in new technologies that are not yet mature enough to attract funding, or that the Bond would need to be willing to lend to riskier projects.

- Open up ownership of renewable energy projects to a wider range of communities or other groups.

- Offer a good rate of return, although two organisations in the Energy – Engineering Network noted that it the Bond focuses on specific emerging technology projects, it might not offer the levels of return demanded by corporate bonds.

- Be done at a local community level so that local people reap the benefits and obtain an income (cited primarily by Engineering / Network and Other Energy sub-groups).

- Overcome the issues of limited funding and high borrowing costs that often act as barriers to the development of community-scale generation.

- Provide a good way for the Scottish Government to forge a stronger relationship with businesses.

- Raising funds through a nationwide mechanism has the advantage of achieving scale and enabling investment in large projects.

- This can be used to provide guarantees to investors.

4.59.   A number of respondents noted this is not a new concept and that there have been a number of community share issues to date to raise capital for local energy projects. Some organisations, mainly in the Energy – Renewables sub-group, commented specifically on green bonds that have become a growing source of finance for local community projects in recent years.

4.60.   While a small number of respondents agreed that this Bond should focus on renewable energy investments, several others across other sub-groups including Energy - Other and Non-Energy groups, felt this should include all low carbon technologies.

4.61.   Examples provided of successful projects, cited mainly by respondents in the Third Sector / NGO or Community sub-groups, included:
- The Edinburgh Community Solar Co-operative.
- The Property Assessed Clean Energy (PACE) project in California.
- Climate Bonds.
- Qualified Energy Conservation Bonds from the US Department of Energy.
- Energy Efficiency Green Bonds in Mexico.

Alternative options

4.62.   Alternative suggestions on ways to raise capital and included:
- Crowdfunding.
- Promoting mechanisms which support local energy bonds.
- Individual Savings Accounts (ISAs).
- Aligning with the Scottish Local Government Pension Scheme.
- Investing through The Renewables Infrastructure Group (TRIG) which is listed on the Stock Exchange.
- Creation of an energy fund as outlined in a Scottish Renewables discussion paper (suggestion came mainly from organisations in the Energy – Renewable sub-group)
- Project Bond Credit Enhancement (PBCE) which has been adopted elsewhere to assist in the development of a bond market where market appetite was low.

Concerns

4.63.   Respondents cited very little by way of disadvantages to the setting up of a Scottish Renewable Energy Bond, although a small number of respondents noted concern that this could be to the detriment of local projects, with a risk that

communities could find themselves competing with the Scottish Government for investors' money.

4.64.   Only a small number of respondents noted any opposition to the establishment of this Bond and these were mostly Individuals, with some scepticism over likely rates of return or a dislike of government bonds.

4.65.   Several respondents, while being supportive of a Bond, noted some caution or highlighted issues that will need to be considered if it is decided to go ahead with a Bond. For example, a small number of respondents commented that delivering a new financial project to market would represent a sizeable challenge needing significant legal and commercial expertise; or that consideration would need to be given to risk management, governance, liquidity, tax treatment or structuring.

4.66.   There were also a small number of concerns that bonds might be taken up by investors out with the local community because of their attractive returns and that the bond sales need to be structured in such a way as to ensure that local communities benefit, regardless of who owns the Bonds.

4.67.   Several respondents, while generally supportive of the concept, noted that further exploration and detail is required.

Possible roles of the public and private sectors

4.68.   Respondents provided little commentary on the role of the public and private sectors. There was a degree of support for the private sector to be involved but with a preference that they are regulated regarding their rates of return and they would need to consider the social and environmental objectives of any project. Another respondent commented that while there may be a role for the private sector, the public sector should take the lead.

5. Delivery, Monitoring and Engagement

5.1.   Chapter 6 of the draft Energy Strategy noted the importance of deep collaboration between the public and private sectors and the part this will play in reaching the 2050 vision.

The benefits of working in partnership

Q15: What ideas do you have about how Scottish Government, the private sector and the public sector can maximise the benefits of working in partnership to deliver the 2050 vision for energy in Scotland?

Summary of main themes:

- There was support from some respondents for the Scottish Government and the private and public sectors to work in partnership, although a wide range of stakeholder organisations were suggested for inclusion in partnership working, so as to maximise use of expertise.
- There were also some suggestions that co-operative models of delivery, shared ownership and involvement of local communities in the design and development of projects would be important.

5.2.   Comments on this question came from 129 respondents across all respondent groups.

5.3.   Many of these respondents (37) voiced their support for the Scottish Government and the private and public sectors working in partnership to deliver the 2050 vision for energy in Scotland. Key reasons for this support included that partnership working will be the only way to meet the challenging targets of the Strategy, that sectors need to work together to maximise opportunities, or that it will help to deliver confidence in the future of the market.

5.4.   Respondents referred to a wide range of different stakeholder organisations, with a full spread of expertise, which should be involved in partnership working and these included:
- Consumer groups.
- Colleges and universities.
- Local enterprise agencies.
- The private rented sector.
- Housing associations and commercial landlords.
- Local authorities.
- Trade unions and representative bodies.
- Professional organisations.

- Chambers of Commerce.
- Enterprise and skills agencies.
- The NHS.
- Community organisations.
- Consumer groups.
- The general public.
- Industry.

5.5.   Several respondents provided examples of ways in which the Scottish Government could collaborate with the private and public sector to deliver solutions to market.

5.6.   **A need to develop Science, Technology, Engineering and Mathematics (STEM) training**: Several respondents commented on the need for the development of Science, Technology, Engineering and Mathematics (STEM) training so that there will be a skilled workforce.

5.7.   **A need for strategic partnerships**: A small number of respondents suggested a need for strategic partnerships between the Scottish Government and industry or for the use of co-operative models of delivery and shared ownership between developers, communities and the government. It was noted by a small number of respondents that if local communities are fully involved in the design and development of projects that it will help with investment returns and reinforce local economic development.

5.8.   A small number of respondents noted that public sector investment alone will not be sufficient to deliver the vision for energy in Scotland as set out in the Strategy.

5.9.   **A need for co-operation**: A small number of respondents within the Community and Third Sector / NGO sub-groups commented that public bodies need to co-operate on major energy infrastructure opportunities as a condition of any funding. These respondents also felt it is important to get the public bodies co-operating on major energy infrastructure opportunities like heat networks as a condition of allocating funding to them; and requested that the Scottish Government reinstates the Sullivan Report timetable for low and zero carbon technologies as this would provide a clear timetable and targets.

Monitoring delivery

Q16: What ideas do you have about how delivery of the Energy Strategy should be monitored?

Summary of main themes:

- Respondents welcomed the commitment to publish an Annual Strategy Energy Statement although it was felt this would need to be accessible, provide an appropriate level of detail, encompass a whole energy system and be flexible.
- There were also requests for parliamentary scrutiny of the annual report.
- Respondents were supportive of robust monitoring and an evaluation framework, with interim targets and milestones against which to measure progress.
- All stakeholders should be involved in setting targets, and targets should be SMART, consistent across sectors and allow for co-ordinated implementation.

5.10.   Comments on this question came from 115 respondents across all respondent groups.

5.11.   The key comment made by many respondents was that they welcomed the commitment in the Strategy to publish an Annual Energy Statement which will take account of the Climate Change Plan (CCP) monitoring framework and relevant energy indicators, although there were a small number of qualifying statements. These referred to the need for the document to:

- Be accessible to all.
- Provide an appropriate level of detail and information that will allow for external scrutiny and inform any debate.
- Have a framework that encompasses a whole energy system.
- Be balanced between energy demand and supply actions.
- Be flexible so as to respond to developments in technology, with the potential for new indicators to be included as new technologies emerge.

5.12.   **Monitoring and evaluation**: Many respondents across all sub-groups commented on the need for robust monitoring and an evaluation framework, with interim targets and milestones against which progress can be measured. There were some suggestions that an interim review should be undertaken every five years as this will allow flexibility to include any future developments in emerging technologies to be taken into consideration. It was also felt that this would enable stakeholders to have confidence in the process and offer robust scrutiny of the strategy and its implementation.

5.13.   A small number of respondents within the Academia / Research / Training sub-group felt that evidence reviews and policy reviews and assessments will be important in supporting delivery of the Strategy.

5.14. **Setting targets**: Several respondents, primarily within the Third Sector / NGO and Renewable Energy sub-groups, requested that any targets set are SMART (specific, measurable, achievable, relevant, timebound) targets, with some suggestions that all stakeholders should be involved in setting targets for electricity, heat and transport. One respondent in the Third Sector / NGO group noted that the involvement of stakeholders will mean that targets set will be consistent across sectors and allow for co-ordinated implementation; another that this will mean the process of target setting is inclusive and allow for joint ownership across all relevant sectors.

5.15.   **Monitoring via the Annual Climate Change Declaration Report**: A small number of respondents within the Local Government sub-group suggested that targets could be monitored through the Annual Climate Change Declaration Report.

5.16.   Some respondents suggested specific targets that could be introduced, with some referring to the need for measures to include a range of different areas including demand side, building stock, transport, industry demand, energy generation and land use.

5.17.   **Potential additional measures**: More specific measures to monitor delivery and mentioned by more than one respondent included:
- Monitor energy used.
- Source of energy provision.
- Cost of producing energy.
- Fuel poverty.
- Social benefits, including health and jobs created.
- CO_2 reductions across sectors.
- Environmental impacts.

5.18.   **A need to set robust high level objectives**: A small number of respondents in the Third Sector / NGO sub-group commented on the need to set robust high level objectives but not to 'to micro-manage every step of the way'. The same organisations also noted the need *"to encourage innovation in developing open-hearted delivery vehicles which bring especially the public bodies together and in due course private and commercial interests for mutual benefit."*

5.19.   **A need for parliamentary scrutiny**: There were suggestions from several respondents that the annual report should be brought before the Scottish Parliament for scrutiny, with oral statements from Ministers.

5.20.   While not an explicit commitment in the draft Energy Strategy, respondents would like the Scottish TIMES whole energy model made available. However, there were requests for greater clarity to be provided in this Strategy and the final CCP on the assumptions and constraints applied to (and outwith) TIMES as well as on the outputs of TIMES across different sectors. The perceived benefit of this is that it would enable constructive scrutiny of overall targets and help to monitor progress across technologies.

5.21.   A small number of respondents noted a need for a publicly accountable and expert independent agency to monitor delivery of the energy strategy. There were a small number of references that this role would sit with the Scottish Energy Advisory Board (SEAB) or a similar type of organisation, with one respondent in the Energy sub-group suggesting this should be a committee similar to that set up for Climate Change.

Approach to deepening public engagement

Q17: What are your views on the proposed approach to deepening public engagement set out in Chapter 6?

Summary of main themes:

- Respondents welcomed the commitment to greater public engagement, with only a small number disagreeing with the suggested approach.
- There were suggestions of a need to include a wide range of groups in helping to deepen public engagement; this included local community organisations.
- Respondents focused on a need to ensure a consistent, well developed, co-ordinated and long term national awareness campaign, using a range of different media channels.

5.22.   Comments on this question came from 134 respondents across all respondent groups.

5.23.   Many of these respondents welcomed the commitment to greater public engagement and the approaches that were suggested in the draft Energy Strategy, with some simply reiterating the importance of public engagement. Only two Individuals disagreed with the approach being suggested.

5.24.   **A need to include a wide range of different stakeholder groups:** There were several comments on the need to include a wide range of different groups in helping to deepen public engagement and to work in collaboration and co-operation with each other. These groups included community organisations, the public sector, the private sector, NGOs, landowners and academia.

5.25.   **Information dissemination**: Many of the respondents commenting at this question made suggestions for communication channels that could be used to

contact and engage with the public. Many focused on the need for a consistent, well developed, co-ordinated and long term national awareness campaign, using a range of different media channels. While there was some support for using digital channels some respondents, particularly those in the Third Sector/ NGO sub-group, noted the need to communicate information via a range of channels so as to ensure the inclusion of all.

5.26. Several respondents noted the need for dissemination at a local level, via local community organisations such as Community Planning Partnerships (CPPs), community councils and other community groups. There was also reference by some of these organisations for resources to be provided to local groups in order to help with public engagement. These comments came primarily from respondents within Third Sector / NGO and Local Government sub-groups. There were also a small number of references to the involvement of businesses, the workforce and / or trade unions or representative bodies, schools and curricula and representative groups such as Chambers of Commerce or the Federation of Small Businesses.

5.27. **Involve Local Energy Scotland:** Several respondents referred to involving Local Energy Scotland as it works with local communities and as such already has strong links.

5.28. **Alternative routes to involve the general public:** In order to encourage the general public to become more involved, there were a small number of suggestions to actively promote the financial opportunities that may be available via shared ownership or to share data and information. A small number of respondents in the Energy - Other sub-group suggested use of collective switching schemes for residents in local authorities.

5.29. There was also some reference of the need to link public engagement with the Community Empowerment Act and Local Outcomes Improvement Plans (LOIPs).

5.30. **The use of toolkits:** Several respondents, mostly within the Third Sector / NGO or Local Government groups referred to the use of toolkits, with the ISM (Individual-Social-Material) Behaviour Change Model referred to most frequently.

5.31. **A need for local energy champions.** There were also a small number of suggestions for local energy champions or community energy officers who could offer impartial advice to the general public.

5.32. Other comments made by very small numbers of respondents at this question included:
- The need to ensure that the public is listened to and their comments are acted upon ie that the Scottish Government is not just seen to 'talk the talk'.
- Concerns that it will be difficult to reach all of the general public as some have little or no interest in the topic of energy.

- Link this Strategy to other policy areas such as Clear Air for Scotland (CAFS) or planning.
- There is a need for further consultation to consider the engagement process that will be adopted.
- A need for honesty in media debates.

5.33.   Several respondents indicated their desire to work with the Scottish Government on any further work in engaging with the public.

5.34. **Additional recurring sub themes**
- The need to bring about a cultural change in attitudes and behaviour.
- The need to provide transparent illustrations of the true costs of all energy types, including indirect costs, or to provide practical examples of the ways in which energy bills and carbon usage can be cut (Energy sub-groups).
- The need to publicise successful projects (Energy or Local Government sub-groups).
- The need for further detail and information.

6. Cross cutting themes

6.1.   Across the questions asked in this consultation paper, a number of key themes emerged. The draft Energy Strategy was perceived as a high level document and, as such, there were a number of requests for greater detail and depth of information across various elements of it. The following paragraphs highlight the key themes.

The need for recognition of the interdependencies between the Scottish and UK energy systems

6.2.   There was reference to the need for greater recognition of the interdependencies between the Scottish and UK energy systems, despite the perceived divergence in some areas of Scottish, UK and European policies and strategies.

6.3.   Given that many issues relating to energy are reserved matters, respondents noted the need for the Scottish Government to work with the UK Government and other organisations such as BEIS, Ofgem and the National Grid. There was also some reference to the need for the Scottish Government to adopt a stronger influencing role towards the UK Government.

The need for integration across devolved policy areas

6.4.   Respondents noted the need for integration across different devolved policy areas within the Scottish Government in order to provide a holistic approach to the Energy Strategy, with some respondents defining a need for more clarity on how the different policy areas will interact. Additionally, there was specific reference to ensure the final Energy Strategy aligns with the Climate Change Bill.

6.5.   Respondents also focused on the need for consistency in the Scottish Government's approach to regulatory support. This includes a consistent approach for the planning system, non-domestic rates and building standards to help deliver various proposed aspects of the Energy Strategy, albeit that flexibility is required to allow for the development of innovative technologies.

Maintaining a flexible approach towards local energy systems

6.6.   While there was broad support across all respondent groups for harnessing the benefits of a decentralised, low carbon energy sector, there were comments on the need for flexibility to ensure that differing local needs can be met.

6.7.   Furthermore, although there was broad support for deeper involvement of local communities and community-owned projects, there was also a preference from many for national co-ordination and support for a centralised body that could provide funding, advice and resources on a consistent basis across Scotland.

6.8.   When considering rural energy issues, there were some requests for a greater focus on better energy provision in rural off-gas grid areas of Scotland. There was also a perception from some respondents of the need to simplify delivery mechanisms, particularly given the need to engage community groups to a greater extent.

Supporting a range of technologies within Scotland's energy mix

6.9.   While there was support for energy from renewable sources and / or for hydrogen to be part of the energy mix in Scotland, many respondents noted that a range of technologies will be required in order to maintain security of supply in the future.

6.10.   There were also calls to ensure a suitable infrastructure across these technologies, in particular grid management, grid improvement and additional connection to the Scottish Islands.

Need for a clear roadmap and decision points

6.11.   There are a number of requests for a clear roadmap for the direction of travel and to clarify when decisions will be made at a national level for key sectors and for rolling out new energy choices. This should support the investment required to deliver the energy transition and deliver Scottish Government targets for 2030 and the long term vision expressed in the draft Energy Strategy.

Greater focus on innovation, investment, skills, resources and workforce matters

6.12.   Many respondents referred to the importance of the Strategy to give certainty to investors about the economic value from the energy sector, and continue to enhance the Scottish supply chain with respect to energy.

6.13.   Respondents referred to the need for ongoing business-led innovation and demonstration projects across the energy sector; again noting the need for flexibility in offerings so that when innovative technologies are further developed, these can be incorporated into Scotland's energy mix.

6.14.   Throughout the consultation respondents noted the need for a greater focus on investment, skills, resources and workforce matters.

7. Environmental Report

7.1.   Views were invited on three questions concerning the Strategic Environmental Assessment (SEA) Environmental Report.

7.2.   Responses were received from the SEA consultation authorities – Scottish Environmental Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Environment Scotland (HES) – individuals, third sector / NGO groups and organisations in the Local Government sub-group.

7.3.   A summary of responses from individuals, third sector / NGO groups and organisations in the Local Government sub-group are outlined below. More detailed responses from the SEA consultation authorities are included in a summary box at the end of each question in this section.

Accuracy and scope of information

Q18:   What are your views on the accuracy and scope of the information used to describe the SEA environmental baseline set out in the Environmental Report? (Please give details of additional relevant sources)

7.4.   Only 13 respondents provided any commentary to this question; 5 of these were Individuals.

7.5.   Two respondents in the Third Sector / NGO group felt that the current draft Energy Strategy is weak on environmental / biodiversity issues including spatial impacts.

7.6.   An organisation in the Local Government sub-group noted that the accuracy and scope of the SEA are reasonable for its purpose, and a Community based organisation that this is a reliable document.

7.7.   Of the responses from Individuals, one respondent commented that they did not agree with the baseline; another that the baseline pays insufficient attention to the need for renewable energy generated to meet demand or to consider energy footprint and energy consumption.

7.8.   Another Individual felt that the SEA focuses on the uptake of renewable energy or decarbonisation but the Strategy also focuses on other sources such as continuing to support North Sea oil and gas and CCS development.

7.9.   A respondent from the Academia / Research / Training group said they were unable to access this document while one from the Local Government sub-group said poor signposting had meant they had not responded to the SEA questions [4].

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Summary of the SEA consultation authorities' responses to Question 18:

All three Consultation Authorities were content with the accuracy and scope of the baseline material used in the Environmental Report.

HES highlighted their own published guidance which can help to ensure a number of policies identified in the draft Energy Strategy are implemented without impacting negatively on the Historic Environment.

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Predicted environmental effects

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Q19:   What are your views on the predicted environmental effects as set out in the Environmental Report?

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7.10.   Only 16 respondents, 11 of which were Individuals, commented on this question.

7.11.   While there was agreement with the predicted environmental effects as set out in the Environmental Report, there were also some qualifying comments.

7.12.   An organisation in the Renewable sub-group commented that for these to be achieved, there needs to be strong policy support and that this needs to be recognised in the SEA.

7.13.   A Local Government organisation felt that while the predicted environment effects are reasonable, any assessment needs to be carried out in the context of socio-economic benefits. They also commented that: *"Fragile communities live and work in the areas of best wind resource and their human interests should be a factor in decision making"*.

7.14.   One Individual noted that the Environmental Report focuses on renewable energy but that there should be flexibility with the scope and environmental effects as more information becomes available and as the Energy Strategy is actioned at a project level.

7.15.   Another Individual felt that the predicted environmental effects are understated as the draft Energy Strategy does not consider / mention:
- the embedded energy and related emissions from exports and;
- water usage from CCS

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[4] These respondents were subsequently given the opportunity to comment on the Strategic Environmental Assessment Report.

Summary of the SEA consultation authorities' responses to Question 19:

All three consultation authorities were generally content with the predicted environmental effects.

Both HES and SNH felt that the assessment would have benefited from a more nuanced approach to the potential for negative and positive effects to arise from the draft Energy Strategy: For example, the potential for negative impacts from the retro-fitting of energy efficiency measures to traditional or historic buildings, and the risk that not all biomass feedstocks would be produced sustainably was noted. The reuse of infrastructure was supported, and the recognition of the potential for new effects on heritage assets and their setting from actions to meet the new target for generating electricity from renewables was also welcomed. In particular, the potential for negative effects to arise from larger onshore wind turbines was noted.

SEPA considered that the summary tables in the Environmental Report were useful, and felt that it would have been beneficial for these tables to have set out the full range of effects. Further they suggested the summary tables be revisited and included in the Post Adoption Statement, in addition to being used for monitoring and future strategy review exercises. SEPA also noted that a number of uncertainties were set out in the Environmental Report with regard potential impacts and that these would benefit from further consideration during the finalisation of the draft Strategy. In particular, they considered that issues that would benefit from the drawing out of specific impacts and areas of uncertainty at a strategic / national level include CCS, biomass, network management and infrastructure management. Whilst SEPA recognised that it may not be possible to specifically address these issues at present, they felt that it would be helpful for the Post Adoption Statement to highlight these important strategic considerations and uncertainties to ensure that they are effectively monitored and addressed as future details emerge.

Mitigation and monitoring of the environmental effects

Q20: What are your views on the proposals for mitigation and monitoring of the environmental effects set out in the Environmental Report?

7.16.   Only 18 respondents, across a range of sub-groups but including a few Individuals, commented on this question and most reiterated points made to earlier questions or noted their support for the Strategy as a whole.

7.17.   A Public Sector / Delivery Agency / Regulator respondent agreed with the conclusion that many of the effects identified will be mitigated through existing mechanisms.

7.18.   Two Individuals were concerned that the proposals for mitigation and monitoring environmental effects are inadequate.

Summary of the SEA consultation authorities' responses to Question 20:

SEPA were of the view that further clarity on where responsibility lies for specific mitigation should be provided in the Post Adoption Statement. They also highlighted that some identified effects will require strategic consideration, especially ones that are not covered by planning or other regulation at the local level. They recommend that the Post Adoption Statement provide clarification on how the data produced from the proposed monitoring mechanisms will be used in monitoring the environmental effects of the strategy.

HES considered there was scope for a more nuanced assessment of potential negative and positive impacts. However they welcomed the recognition in the assessment findings that the installation of energy efficiency measures have the potential to have an adverse impact on traditional buildings and their character, having noted that this consideration was missing in other sections of the Environmental Report. Further, they noted that it will be important for the final Strategy to recognise that impacts arising from sectors will also require to be addressed as part of the relevant decision making processes, including Environmental Impact Assessment.

SNH recommended that a programme of awareness raising among contractors be developed to reduce disturbance to bats.

8. Consultation

8.1.   At the end of the questions, respondents were asked if they would like to provide feedback in order to help improve future consultations and this section outlines the findings from these responses.

> **How satisfied were you with this consultation?**

8.2.   Of those providing an answer, more respondents (78) were satisfied with the consultation than were dissatisfied (12):

- 40 said they were 'Very satisfied'
- 38 said they were 'Slightly satisfied'
- 27 said they were 'Neither satisfied nor dissatisfied'
- 8 said they were 'Slightly dissatisfied'
- 4 said they were 'Very dissatisfied'

8.3.   Only 42 respondents provided any additional commentary. Key points raised by more than one respondent, in response to this question included;

- Well written document / straightforward / comprehensive.
- Praise for the meeting in Glasgow / workshops held by Scottish Government.
- Consultation did not highlight questions in relation to SEA and / or link to SEA did not work and / or no reference to Environmental Report in the consultation paper.
- Would like to be able to create offline document to be shared with colleagues.
- Need space for general comments.
- Consultation was a political statement / results will be ignored by Scottish Ministers.
- Biased / leading questions.
- Would prefer open forums or presentation sessions to an appropriate body of the Scottish Parliament.

How would you rate your satisfaction with using this platform (Citizen Space) to respond to this consultation?

8.4.　　Of those providing an answer, more respondents (80) were satisfied with the consultation than were dissatisfied (9):

- 43 said they were 'Very satisfied'

- 37 said they were 'Slightly satisfied'

- 26 said they were 'Neither satisfied nor dissatisfied'

- 5 said they were 'Slightly dissatisfied'

- 4 said they were 'Very dissatisfied'

8.5.　　Only 33 respondents provided any additional commentary. While there were comments that Citizen Space is easy to use, there were also comments on issues and restrictions such as:

- A need for a mechanism that allows the sharing of a response with colleagues, and a capacity to save the response.

- A request to be able to upload supporting documentation, including tables and figures.

- A request to be able to format responses eg emboldening, italicising etc.

- A lack of online support to deal with queries.

8.6.　　In terms of the consultation questions, a small number of respondents noted they would have liked to see reference numbers for individual actions in the draft Energy Strategy and a section where general comments, supplementary comments or contextual information can be provided. One respondent also suggested links to an online discussion about the consultation.

Appendix 1: Respondent organisations

2020 Renewables Ltd

2050 Climate Group

7 Scottish Cities coordinated by the Scottish Cities Alliance

A grassroots industry and community based organisation

ABB Ltd

Aberdeen City Council

Aberdeen Heat & Power Co. Ltd

Aberdeenshire council

ABO Wind Ltd

Aldersgate Group

ALIenergy (Argyll, Lomond and the Islands Energy Agency)

Argyll and Bute Council

Artemis Intelligent Power

Arup

Association for Decentralised Energy

Atlantis Resources Ltd

AvantiGas

Ballachulish Community Company Ltd

Banks Renewables

Baxi Heating UK

Begetube UK

Biofuelwatch

British Geological Survey

Brookfield Renewable UK Ltd

Buccleuch

Business Improvement Districts Scotland

Calor Gas Ltd

Carbon Capture and Storage Association

CBI Scotland

Centre for Alternative Technology

Centre for Energy Policy, University of Strathclyde

Centrica/Scottish Gas

Changeworks

Chartered Institute of Housing Scotland

Chemical Sciences Scotland

Church of Scotland

ClimateXChange

Comhairle nan Eilean Siar

Common Weal

Community Chartering Network

Community Energy Scotland

Community Windpower

Confederation of Paper Industries

Consumer Futures Unit, Citizens Advice Scotland

COSLA, Convention of Scottish Local Authorities

Crown Estate Scotland

Cycling Scotland

Decarbonised Gas Alliance

Department for Social Responsibility and Sustainability, University of Edinburgh

Doosan Babcock Energy Ltd

DP Energy

Dunelm Energy

E.ON

EDF Energy

Edinburgh Centre for Carbon Innovation (ECCI)

Eishken Ltd

Elmhurst Energy

Energy 4 Scotland Team

Energy Action Scotland

Energy Agency

Energy Intensive Users Group

Energy Saving Trust

Energy Skills Partnership

Energy Systems Catapult

Energy Technology Partnership

Energy UK

Energy4All

ENGIE

Existing Homes Alliance Scotland

Falck Renewables

Falkirk Council

Fife Council

Floating Power Plant Ltd

Foundation Scotland

Friends of Floating Offshore Wind

Friends of the Earth Scotland

Glasgow City Council

Glass and Glazing Federation

Global Carbon Capture and Storage Institute

GMB Scotland

Green Cat Renewables Ltd

Heads of Planning Scotland

Highlands and Islands Enterprise

Historic Environment Scotland

Homes for Scotland

iChoosr Ltd

IEMA Institute of Environmental Management and Assessment

IES Ltd

IESIS

INEOS Infrastructure (Grangemouth) Ltd

INEOS Shale

Innogy SE

Institute for Energy Systems

Institution of Gas Engineers and Managers

Institution of Mechanical Engineers

Inverclyde Council

iPower Energy Ltd

Keep Scotland Beautiful

Landscape Institute Scotland

Local Energy Action Plan (LEAP)

Local Energy Scotland

Lomond Environment Ltd

MEG Renewables

Mineral Products Association

Mineral Wool Insulation Manufacturers Association

Minus7

Muirhall Energy

National Grid

National Trust for Scotland

NIBE Energy Systems UK

North Ayrshire

North Lanarkshire Council

NorthConnect KS

Nova Innovation Ltd

Nuclear Free Local Authorities Scotland Forum

Nuclear Industry Association

Nuclear Institute Scotland Branch

OFGEM

Oil and Gas UK

Orkney Islands Council

Orkney Renewable Energy Forum

Pale Blue Dot Energy

Petrofac

Prospect

Red Rock Power Ltd

RenewableUK

RES

RJ McLeod (Contractors) Ltd

Royal Society for the Protection of Birds (RSPB)

RTPI Scotland

S&C Electric Company

School of Engineering and the Built Environment, Glasgow Caledonian University; School of Law, University of Stirling; and Centre for Energy Petroleum and Mineral Law and Policy (CEPMLP), University of Dundee (group of academics)

Sciotech Projects

SCOTE3

Scotland's 2020 Climate Group

Scotstream Generation Ltd

Scottish Carbon Capture and Storage

Scottish Catholic International Aid Fund (SCIAF)

Scottish Communities Climate Action Network (SCCAN)

Scottish Council for Development and Industry

Scottish Enterprise

Scottish Environment Protection Agency (SEPA)

Scottish Federation of Housing Associations

Scottish Futures Trust

Scottish Green Party

Scottish Hydrogen and Fuel Cell Association

Scottish Land & Estates

Scottish Natural Heritage

Scottish Power

Scottish Renewables

Scottish Rural Action

Scottish Science Advisory Council (SSAC)

Scottish Water

Scottish Environment, Food and Agriculture Research Institutes (SEFARI)

SEStran

SGN

Siemens Gamesa Renewable Energy

Smart Energy GB

Social Investment Scotland

Society of Chief Officers of Transportation Scotland (SCOTS)

Solar Trade Association

South East Scotland Area Meeting of the Religious Society of Friends (Quakers)

South Edinburgh Quakers Local Meeting

South Lanarkshire Council

SP Energy Networks

SSE plc

Statkraft UK Ltd

Stop Climate Chaos Scotland

Summit Power Caledonia UK Ltd

Sustainable Energy Association

Sustainable Marine Energy Ltd

Sweco UK Ltd

Tarmac

The Anaerobic Digestion and Bioresources Association

The Big Deal

The European Marine Energy Centre

The Highland Council

The Institution of Engineering and Technology

The Scotch Whisky Association

Toshiba

Total E&P UK Ltd

Transform Scotland

Transition Black Isle

Transition Edinburgh

Transition Linlithgow

UK Energy Research Centre (UKERC)

UK Hydrogen and Fuel Cell Association

UK Oil and Gas

UKLPG

UNISON

Unite the Union

Vattenfall Wind Power Limited

Veitch Cooper Limited

Vestas Celtic Wind Technology

West Dunbartonshire Council

West Lothian Council

Wind Farm Analytics Ltd

Wood Group Clean Energy

WWF Scotland

Zero Waste Scotland

52 individuals

Appendix 2: Chapter 3 – Meeting Our Energy Supply Needs: Question 2: Priorities and Related Actions

Priority 1: Continuing to support the recovery of North Sea oil and gas as a highly regulated source of hydrocarbon fuels	
General support for the actions under this priority came from a range of respondents and especially from the Non-Renewable and Engineering / Network groups. A number of respondents, however, wanted to see a reduced reliance on oil and gas and an increased focus on renewables with comments that support for fossil fuels is incompatible with the Scottish Government's commitment to act in accordance with the aims of the Paris Agreement. Comments on specific actions, all from small numbers, are summarised below:	
Action: continue to work with the Oil and Gas Authority (OGA), the UK Government and industry to avoid premature cessation of production and maximise economic recovery of oil and gas through encouragement of innovation and investment, in line with Scotland's Oil and Gas Strategy, the OGA Corporate Plan and its Sector Strategies.	A small number of Third Sector / NGO respondents commented that this action is contrary to the commitment to a low carbon economy.
Action: with input from the Energy Jobs Task Force, provide continued ongoing support for the oil and gas	There were comments that this should be Scotland-wide and not just apply to the North East and should prioritise

Priority 1: Continuing to support the recovery of North Sea oil and gas as a highly regulated source of hydrocarbon fuels	
industry as it adapts to the current economic challenges, ensuring that the sector can be competitive for decades to come.	the need to re-purpose this highly-skilled workforce for the CCS industry and sub-sea engineering. A respondent from the Third Sector / NGO group suggested this should be reworded as: *"provide support for the current oil and gas industry to transition from fossil fuels to more sustainable technologies."*
Action: maximise opportunities for the transfer of skills and knowledge from the offshore oil and gas sector to support the development of manufacturing and low carbon industries – through the Energy Jobs Taskforce and the Energy Skills Action Groups and supported by the Transition Training Fund, and through the implementation of the Skills Investment Plan.	A respondent from the Engineering / Network group felt that this should be key as *"skills and knowledge acquired in the North Sea are very applicable to the development and implementation of a low carbon transport and heating strategy".* An Energy – Other respondent wanted to see opportunities maximised for transferring skills and knowledge to support the development of manufacturing and low carbon industries. There was also a comment on the need for further improvements to education and skills development, particularly in relation to innovation and decommissioning.
Action: support investment in the Oil and Gas	An Energy – Other respondent wanted to see a focus on

Priority 1: Continuing to support the recovery of North Sea oil and gas as a highly regulated source of hydrocarbon fuels	
Technology Centre, creating the conditions which help realise the ambition for Scotland to be the "go to" place for oil and gas technology solutions.	research as well as investment.
Action: work with our enterprise agencies to implement the Decommissioning Action Plan, maximising the economic benefits from decommissioning of oil and gas assets for the Scottish supply chain – developing the infrastructure and capability to secure Scotland as an international decommissioning centre of excellence.	There was a comment on the need to grow the Decommissioning Challenge Fund to improve physical infrastructure. A Public Sector / Delivery Agency / Regulator group respondent commented on the need for *"requirements for end-of-life planning (focusing on reuse and remanufacturing rather than disposal or low-value recycling) to boost the adoption of Circular Economy practices in the energy sector".*

Priority 2: Supporting the demonstration and commercialisation of Carbon Capture and Storage (CCS) and CO$_2$ Utilisation	
General support for the actions under this priority came from a range of sub-groups. There was, however, some concern that there is an over-reliance on CCS. For example, a Third Sector / NGO respondent commented: *"the Scottish Government may be over reliant on Carbon Capture and Storage (CCS) in both the draft Energy Strategy and the draft Climate Change Plan in achieving negative emissions by 2027 and in using CCS in the short-medium term in conjunction with other technologies such as biomass".* There was also concern, from a respondent in the Academia / Research / Training group, that the actions may not be sufficient to deliver the vision for CCS. Comments on specific actions, all from small numbers, are summarised below:	
Action: work with industry to assess opportunities for small scale CCS demonstration and CO$_2$ utilisation projects in Scotland across a range of sources including the application of CCS within industrial processes.	A small number commented on the need for more focus on low-carbon industrial clusters.
Action: explore the opportunity to combine bioenergy production and CCS – with a view to maximising the benefits for the energy system as a whole. **Action: maintain pressure on the UK Government to align its CCS strategy with Scottish energy priorities.**	Respondents from various groups commented on the need for the Scottish Government to take the lead in demonstrating the benefits of CCS and developing a CCS industry; this could include financing a CCS demonstration project.

Priority 2: Supporting the demonstration and commercialisation of Carbon Capture and Storage (CCS) and CO_2 Utilisation	
Action: support the commercialisation of CCS through securing a demonstrator project, building on the conclusions of the Scottish and UK Government funded research into CCS.	A respondent from the Public Sector / Delivery Agency / Regulator group suggested: *"a full-time resource/individual whose role is dedicated to co-ordinating CCS activities across multiple sectors and organisations".*
Action: work with industry and the Oil and Gas Authority to ensure the retention of existing critical infrastructure, including key oil and gas pipelines suitable for use with CCS.	A Non-Energy respondent commented: *"the Scottish Energy Strategy needs to be adaptable so that key outcomes can be delivered even if the UK Government does not support CCS. The final Scottish Energy Strategy should also explain the Scottish Government's policy for requiring the use of CCS in new thermal generation".*

Priority 3: Exploring the role of new energy sources in Scotland's energy system	
Several respondents commented on the actions under this priority; most were supportive. Comments on specific actions, all from small numbers, are summarised below:	
Action: following publication of the final Climate Change Plan, review the role for new technologies and energy sources as transitional fuels for use in transport, heat and industry, with practical demonstrations where necessary.	Comments on this action included, again, the need for more focus on low-carbon industrial clusters.
Action: consider how planning can support the future energy system, through policies within the current and future iterations of Scottish Planning Policy and the National Planning Framework.	This action received several comments, from various groups, and these included: • That this should be an overarching priority rather than an action. • The need for statutory timescales within the planning regime. • The need for Fuel Cells to be listed in Planning Guidance. • Consider any reforms necessary to account for the development of emerging technologies such as battery storage. • The need to look at the role of local authority woodlands and timber production.

Priority 3: Exploring the role of new energy sources in Scotland's energy system

	- The need for "*national strategic spatial planning to identify suitable locations and set regional targets for renewable energy development*" (Third Sector / NGO).
	- Proposals, from a respondent in the Local Government group, for "*a national mechanism with statutory responsibility to audit national infrastructure demand and provision, and supervise by collaboration with colleagues across government the delivery of new projects [… and …] the introduction of a new non-local infrastructure levy*".
	A small number of respondents, mainly from the Renewables group, gave lengthy and detailed responses in relation to actions for planning particularly in respect of onshore and offshore wind. These included: - The need for a more coherent consenting process.
	- The need for confirmation of the proposed interventions to improve the efficiency of the process in light of the impending increase in fees.
	- Ensure guidelines consider the most efficient technologies aimed at maximising yield (for example taller wind turbines).
	- The need for supportive policy for redevelopment of existing wind farms.
	- The need for a comprehensive review of the

Priority 3: Exploring the role of new energy sources in Scotland's energy system	
	offshore renewables consenting process to ensure competitive Scottish projects. • Streamline the planning system to avoid delays. • Set out what is expected for long term (25 year+) projects. A small number voiced concern over the restrictions posed by Wild Land Areas. There was a call to include a role for the National Marine Plan, local development plans and regional marine plans.
Action: collaborate with UK government, local government, industry and academia on the UK hydrogen routemap, establishing the strategic basis for hydrogen in the energy system, whilst continuing to fund innovative projects involving hydrogen.	This action also received several comments. Many of these, from various groups, were supportive of the development of a hydrogen routemap with comments on the need for Scotland to develop its own route map and stay 'ahead of the game' in the approach to the widespread rollout. There was a request, from Third Sector / NGO respondents, to ensure that *"exploration of the role of hydrogen does not displace, delay or detract from the use of proven low carbon technologies, particularly in the short term"*.

Priority 4: Increasing renewable energy generation

This section saw the largest number of comments. Respondents, from across groups, commented not only on the actions listed under the priorities but, in some cases, also commented on the actions mentioned under each of the technology headings.

There was a view, from the Renewable sub-group, that the actions need to be more transformational rather than 'business as usual'.

A Third Sector / NGO respondent wanted to ensure that incentives for increasing energy from renewables work for both nature and the climate; they pointed out that *"many renewable energy technologies can have significant impacts on wildlife if they are sited in the wrong place"*.

There were also calls for stability in financial support measures for renewables, with a comment that changes, for example in Feed in Tariff rules, have hindered further deployment of renewables.

There was, again, some comment on the need to focus efforts on reducing fuel poverty.

Comments on specific actions, all from small numbers, are summarised below:

Action: call on the UK Government to provide a stable, supportive regulatory regime to provide certainty to renewable investors and developers – giving appropriate support for investment in renewable energy, establishing a route to market for onshore wind, and clarifying the future for the Levy Control Framework.	A respondent from the Renewable group saw this as the number one priority for the tidal sector.

Priority 4: Increasing renewable energy generation	
Action: seek to address grid constraints in Scotland for distributed power generation at local, regional and national level, through engaging with the National Infrastructure Commission and working with local authorities, Ofgem, National Grid and Distribution Network Operators.	There was a call, from a Utility respondent, for changes to the charging system. There were comments on the need to address fuel poverty, and acknowledgement that distributed power generation could contribute to this aim.
Action: put in place measures which ensure that at least half of newly consented renewable energy projects will have an element of shared ownership by 2020.	A Utility respondent voiced concern about this action; over how this would be quantified and whether it is realistic; they asked for work to gauge the interest amongst communities. An Engineering / Network respondent made a similar comment. A Non-Energy respondent said that lack of community interest should not disadvantage any private development proposals. A respondent from the Academia / Research / Training group, however, said there is a lack of evidence as to why shared ownership is a target and what benefit it provides.
Action: support the future development of a wide range of renewable technologies through addressing current and future challenges, including market and wider policy barriers (see box on pages 41-43).	There was a call for support to be extended to low carbon technologies such as stationary fuel cells and for CCS generation to be considered alongside other forms of low carbon generation. A Non-Energy respondent wanted to see a specific action defining an appropriate role for solar

Priority 4: Increasing renewable energy generation	
	energy. Comments on specific technologies, all made by one or two respondents, are summarised below: Suggestions for supporting **solar technologies**, included: • The need to look at ways to assist the delivery of solar PV such as the use of Power Purchase Agreements. • The need for actions to support the solar industry such as encouraging public bodies to develop a strategy for solar energy. • Suggestions for a planning requirement to maximise installation of solar (PV and solar thermal) in new buildings. Suggestions for supporting **onshore wind**, included: • The need to establish a new route to market through a Contract for Difference (CfD) mechanism. • Removing or reducing business rates. • The need for actions to support combining assets. • That the Strategy should recognise interconnection. • Reducing expectation on community benefits. • Managing environmental expectations.

Priority 4: Increasing renewable energy generation	
	communicating the potential for developments in restoring or improving natural environments.
	• Facilitating a more co-ordinated approach to grid connections.
	• The need for a "*coherent commercially based long-term Power Purchase Agreement (PPA) offering which enables the Scottish Government to procure and offer renewable electricity delivering positive externalities*".
	• That Land Use Planning should be mentioned in relation to onshore wind.
	There was also a comment, in relation to both onshore and offshore wind support, on the need for a more proportionate and affordable approach to radar mitigation.
	In relation to **offshore** wind:
	• The need to ensure the new Crown Estate Scotland can support the delivery of offshore renewable energy projects in Scottish waters.
	• A Local Government respondent felt that action for offshore wind should include "'*reduce the risk to consenting through marine planning'. Likewise for marine renewables*".
	• A respondent from the Public Sector / Delivery Agency / Regulator group commented on the

Priority 4: Increasing renewable energy generation	
	closure to new applications of support under the Renewables Obligation (Scotland) and wanted to see consideration given to other opportunities to incentivise developers. • There were also comments on the need for actions in relation to support for floating offshore wind, such as the provision of support following the closure of the Renewable Obligation Certificate system. Comments in relation to **marine technologies** included: • That tidal power technologies need to be considered separately from wave energy and given specific support. • The need for a suitable revenue support mechanism for the tidal energy sector. Comments on **other technologies** included: • The need for a strategy to support geothermal energy. • The need for a bioenergy action plan.
Action: building on the successes of REIF, design future support to meet energy priorities.	A small number commented in support of schemes such as REIF. There was a comment, from an Engineering / Network respondent, on the need to also give consideration to the social costs of pollution.

Priority 4: Increasing renewable energy generation	
Action: following the final Climate Change Plan, begin work on a Bioenergy Action Plan to enhance our understanding of the opportunities of bioenergy for Scotland's energy system.	There was a call, from a Non-Energy respondent, for this to look at biomass sources and potential users. A respondent from the Engineering / Network felt this should not include *"any study on direct firing of biomass as an energy source in urban areas"*. A Non-Energy group respondent said the action plan *"should make explicit reference to the value of biomass for heating in rural areas and the opportunities to create and sustain local employment, using local resources. The plan should also take into account issues of local air quality and sustainability in the supply chain of biomass."* A respondent from the Third Sector / NGO group wanted to see a presumption against importing biomass and biofuels.
Action: continue to offer financial support and advice to domestic and business customers of all sizes to uptake renewable heat technologies and asks that the RHI continue to cover a wide range of technologies including, biomass, heat pumps and solar thermal renewables to allow all potential Scottish investors and customers to obtain the benefits of the RHI scheme.	A small number of respondents commented on the need for additional actions to explore barriers and opportunities for heat pumps. There was a request to include fuel cells and other low carbon technologies within the RHI.

Priority 4: Increasing renewable energy generation	
Action: work closely with the UK Government to ensure adequate incentives are put in place to continue to encourage the uptake of emerging renewable heat technologies post 2021 when the current RHI will end. **Action: carefully consider with local government the role for regulation in the development of District Heat Networks on a large scale, and for the development of Local Heat and Energy Efficiency Strategies as part of Scotland's Energy Efficiency Programme.**	A small number of Renewable respondents gave lengthy and detailed responses relating to heat; main comments included: • The need for immediate steps to maximise uptake of renewable heat projects. • The need for grant and loan schemes to ensure schemes such as REIF are properly resourced. • The need for a clear action plan for the decarbonisation of heat. • The need to consider the recommendations set out in Scottish Renewables' Vision for Low-Carbon Heat in Scotland and Biomass Heat in Scotland policy papers. • The need for targets for renewable and low-carbon heat in the public sector. • The need to work with major private sector energy users to decarbonise their energy use. • The need to develop a low-carbon energy strategy for each sector. • The need to ensure business rates to not disproportionately affect on-site energy use. • Strengthen regulation and support to build investor and consumer confidence in respect of heat

Priority 4: Increasing renewable energy generation	
	networks.
	• The need for targets for the proportion of renewable heat supplying heat networks.
	• The need for assessment of building standards to assess impact on the uptake of low-carbon heat technologies.
	• The need for a strategy for heat innovation; the need to build on the success of existing innovation demonstrators; the need to ensure successful innovation can be rolled out.
	• The need to make best use of existing infrastructure in order to lower cost and increase access to the electricity network.
	• The need to look at the potential offered by digital solutions and 'big data' analysis in relation to managing the network more effectively.
	• The need for support for infrastructure where there is aging equipment; and to increase overall efficiency.
	A small number commented that they would like to see incentive schemes widened to include all low carbon heat technologies. A Utility respondent suggested an action urging the UK Government to take forward recommendations from the Energy and Climate Change

Priority 4: Increasing renewable energy generation	
	Committee on future funding priorities under the RHI. An Energy – Other respondent commented on the need for the RHI to be redesigned in order to provide an upfront subsidy to overcome cost barriers. This respondent also wanted to see incentives to promote uptake of installing low-carbon heating systems as well as for training for installers. A Non-Energy respondent wanted to see the position on Energy from Waste in the transition to renewable heat set out clearly in the Strategy. A Public Sector / Delivery Agency / Regulator group respondent recommended that: *"action to increase the deployment of heat networks is aligned with the development of green infrastructure and active travel networks"*. They also mentioned the potential offered by colocation with digital infrastructure. There were also comments on the need for stronger regulation and support to build investor and consumer confidence in heat networks.
Action: following the current consultation, work with the UK Government to ensure the RTFO provides an important long term contribution to the	A Third Sector / NGO respondent said they would prefer an increase in sustainability criteria and support for biofuels, rather than a new target.

Priority 4: Increasing renewable energy generation	
decarbonisation of transport.	A respondent from the Energy – Other group commented: *"Action on RTFO should consider extending the scope of the legislation to include fuels produced using sustainable feedstocks with lower overall lifecycle carbon footprint. This should include the use of sustainably produced hydrogen to achieve lower carbon footprint in refined fuels"*.
Additional actions suggested under this priority included:	- Promotion of projects that combine the installation of renewables at the same time as other energy efficiency improvements. - A request for a price mechanism to make fossil fuels more expensive than renewable energy. - The need to address any barriers, including planning, to the hybridisation of renewable energy generation. - The need to acknowledge the continuing role of low carbon generating technologies such as nuclear; although there were also responses opposing the use of nuclear. There were comments on the need for specific actions relating to renewable energy for the Scottish Islands; there was a comment that current policy is not helpful to renewable energy generation in these areas.

Priority 5: Increasing the flexibility, efficiency, and resilience of the energy system as a whole.	
The actions related to this priority received several comments, from across groups, and were again mostly supportive. One respondent, from the Non-Renewable group, however, said they did not agree with the statement that the 'Scottish Government supports a balanced mix of electricity supply' as they felt this to be absent from the Strategy. Comments on specific actions, all from small numbers, are summarised below:	
Action: work in collaboration with BEIS and Ofgem in developing the Smart Energy Plan for the UK: seeking a fair treatment for storage and flexibility mechanisms, including pumped hydro storage (PHS).	An Engineering / Network respondent stressed the need for a joined-up approach between the parties named; this respondent also wanted to see more focus on the potential benefits of digital. Another, from the same group, wanted to see any regulatory or commercial barriers to electricity storage removed.
Action: reiterate the proposal for the UK Government to implement a 'cap and floor' regime to provide a more appropriate regime for PHS and work with key stakeholders to realise the opportunities and overcome the barriers to deploying new PHS capacity in Scotland.	Views were mixed from the small number who commented, both within and across respondent groups, on the 'cap and floor' proposal. While most comments were supportive, a respondent from the Engineering / Network group did not support a separate mechanism for new pumped storage capacity as, they felt, *"current market mechanisms provide revenues to support this technology"*. A Renewables respondent wanted to see more efforts to show what PHS could contribute to the delivery of the Strategy.

Priority 5: Increasing the flexibility, efficiency, and resilience of the energy system as a whole.	
	Respondents from the Utility, Renewables, Engineering / Network and Individual groups made supportive comments, including a comment that a cap and floor mechanism has already been established for interconnectors. However, respondents from the Engineering / Network, Renewables and Utility groups disagreed. Comments included: the need to consider optimisation of the existing pumped storage assets before introducing a new capacity; that a cap and floor mechanism is uncompetitive; and that pumped storage should access support on the same basis as other technologies.
Action: support innovation and demonstration of new forms of storage – including support for The Power Networks Demonstration Centre (PNDC) – a unique world-class facility designed to accelerate the adoption of new, 'smart' technologies within advanced power grids – and work under the Energy Technology Partnership.	There was support for innovation in storage, particularly for the Island regions. There was a suggestion to consider hot water as an energy store.
Action: work with industry, academia, local authorities and environmental groups to consider proposals for	A small number suggested that the application of CCS to existing large-scale sites would be beneficial. One

Priority 5: Increasing the flexibility, efficiency, and resilience of the energy system as a whole.	
re-powering existing large-scale electricity generating sites – recognising their potential strategic role in future system design and planning as part of the transition to a low carbon energy system.	respondent, from the Engineering / Network group, suggested the use of existing large sites such as Longannet for use within a district heating network; they also suggested the potential for electricity storage from green power generated on site. A Third Sector / NGO respondent was keen to ensure sites, especially those designated for conservation, are used sensitively.
Additional actions suggested under this priority included:	- A request, from a small number, for an additional action on the need for specific actions in relation to grid connection and energy independence for the Scottish Islands. - A Third Sector / NGO respondent wanted to see consideration given to actions to reduce transport demand.

Appendix 3: Chapter 4 – Transforming Scotland's Energy Use: Question 9: Priorities and Related Actions

> **Priority 1: Addressing the need to reduce demand and increase energy efficiency through the development of Scotland's Energy Efficiency Programme**
>
> Comments have been grouped collectively as many respondents did not specify relevant actions, and some comments could apply to more than one action.

Action 1: make significant investment and employ targeted regulation to make Scotland's buildings near zero carbon by 2050, in a way that is socially and economically sustainable and supports Scotland's long-term inclusive growth **Action 2: consult upon district heating regulations and local heat and energy efficiency strategies** **Action 3: consult upon the minimum standards of energy efficiency in private rented sector housing** **Action 4: review the Assessment of Energy Performance of Non-domestic Buildings (Scotland) Regulations 2016, with the intention of further regulations from 2020 to improve the performance of existing non-domestic buildings**	Key points made in relation to these actions included: • Consideration of how the EPC SAP rating system is working, with some suggestions that all homes should be EPC band C by 2025 or that Display Energy Certificates (DECs) should be introduced, at least for public buildings. • A need to tackle energy inefficiencies in older buildings. • A need for staffing and support systems to enable delivery of energy efficiency as a National Planning Priority. • Alignment of different delivery mechanisms. • Enforcement of standards in the private rental sector. • Additional legislation that will target trigger points for

Action 5: continue to provide funding and support streams to drive domestic, commercial and public sector energy efficiency retrofit	owner-occupiers; for example, at point of sale. • Information from smart meters can be overlaid with other data to maximise effectiveness. • Need to consider co-location of heat networks with other infrastructure.

Priority 2: Helping energy consumers to manage their bills, harnessing smart technology in the home and supporting new business models in the retail energy market

Comments have been grouped collectively as many respondents did not specify relevant actions, and some comments could apply to more than one action.

Action 6: Engage with the UK Government, Ofgem and consumer groups to secure effective regulation of the retail energy market **Action 7: Support the development of robust new business models that offer reduced costs to energy consumers, through existing support mechanisms** **Action 8: Work collaboratively with energy suppliers to explore ways of helping low income households with their energy bills** **Action 9: Explore opportunities to achieve synergies between energy efficiency programmes and the Smart Meter roll out**	Key points made in relation to these actions included: • Smart meter technology needs to be future proofed. • Existing systems of smart meters are limited in their technological application. • There is a need for faster deployment of smart meters and access to data. • A need for local energy companies to be established and use non-traditional business models for energy retail markets. • Support for progressive tariffs. • Introduce diesel scrappage scheme. • Increase tax for the most polluting vehicles / introduce a carbon tax.

Action 10: Support Home Energy Scotland to improve consumers' understanding of their consumption patterns and help reduce energy bills, to enhance the consumer experience of Small Meter roll out	

Priority 3: Supporting the introduction of viable, lower carbon alternatives across all modes of transport Comments have been grouped collectively as many respondents did not specify relevant actions, and some comments could apply to more than one action.

Action 11: fund active travel infrastructure and behaviour change programmes at record levels until at least 2021 **Action 12: refresh 'Switched on Scotland – A Roadmap to Widespread Adoption of Plug-in Vehicles' by Spring 2017** **Action 13: with the EU and UK Government, negotiate stretching emission standards for new cars (and vans) beyond 2020 (2021)** **Action 14: with the UK Government, negotiate vehicle excise duty differentials between ultra low emission vehicles (ULEVs) and conventional vehicles support**	Key actions in relation to Priority 3 included: • A need for a supportive infrastructure to allow for development of alternatives across all modes of transport; for example, a road charging network. • A need for a supportive infrastructure in rural areas. • There is too much focus on EVs, the Strategy should also include additional funding for active travel. • Consider links with multi-modal transport behaviours and opportunities from smart travel planning and ticketing. • Support for hydrogen boilers and hydrogen vehicles.

Priority 3: Supporting the introduction of viable, lower carbon alternatives across all modes of transport Comments have been grouped collectively as many respondents did not specify relevant actions, and some comments could apply to more than one action.	
and encourage the take up of ULEVs **Action 15: enhance the capacity of the electric vehicle charging network (ChargePlace Scotland)** **Action 16: provide interest-free loans through the Energy Saving Trust to enable the purchase of Evs by both consumers and businesses until at least March 2020** **Action 17: with local authorities, review licensing regulations and consider introducing incentives to promote the uptake of ULEVs in the taxi and private hire sector, with loan funding for vehicle purchase until at least March 2020** **Action 18: promote the benefits of EVs to individuals and fleet operators and increase awareness and confidence in the viability of EVs as an alternative to petrol and diesel vehicles**	

Action 19: support business, industry and public sector collaboration through working with Scottish Enterprise, Highlands and Islands Enterprise, Scottish Environment Protection Agency and the Scottish Manufacturing Advisory Service – providing a platform to explore ways to improve industrial competitiveness and productivity, as a key route to decarbonisation **Action 20: provide new incentives and packages of business support to help facilitate industrial decarbonisation, through Scotland's Manufacturing Action Plan and SEEP** **Action 21: seek to provide leadership and advice to industry through the Scottish Energy Advisory Board, and associated leadership groups, pooling expertise from the key industrial sectors in Scotland and providing a strategic framework for managing this transition** **Action 22: work with the UK Government and EU institutions to minimise the impact of Brexit on progress towards industrial decarbonisation –**	Key actions in relation to Priority 4 included: • Actions should not impact on the viability of rural businesses; support and incentives should be suitable for remote rural and island based businesses. • The success of SEEP and the wider energy efficiency programme will depend on the willingness of private domestic and business sectors to engage with opportunities to reduce energy usage or take up measures aimed at producing low carbon energy. • Work with SEPA to develop appropriate environmental regulation.

Priority 4: Delivering enhanced competitiveness and improved energy efficiency in Scotland's manufacturing and industrial sectors Comments have been grouped collectively as many respondents did not specify relevant actions, and some comments could apply to more than one action.	
maintaining a level playing field on regulation **Action 23: enable local authorities to take a strategic approach to decarbonising heat and improving energy efficiency at local level, including identifying and developing opportunities to reduce or utilise energy waste from industrial processes**	
Additional actions suggested under this priority included:	A number of respondents made suggestions for additional actions. These included: • Introduction of a carbon tax or new initiatives to reduce industrial transport-related carbon footprints. • Inclusion of off-gas grid households in collaborative actions. • More recognition to the role of mutual benefit from heat networks serving multiple buildings and classes of building. • Reference to low emission public transport and improvements to cycle networks. • Inclusion of actions linking specifically to agriculture or food production. • Greater focus on addressing fuel poverty.

Priority 4: Delivering enhanced competitiveness and improved energy efficiency in Scotland's manufacturing and industrial sectors Comments have been grouped collectively as many respondents did not specify relevant actions, and some comments could apply to more than one action.	
	- Greater focus on behaviour change. - More focus on the interplay of energy use across sectors and between fuels to provide a strategic view across the entire system. - Additional actions relating to promotion and adaption of hydrogen powered transport vehicles. - Commitment to improved construction standards. - Reference to the development of skills and training. - Reference to the Scottish Government's aspiration for a rolling programme of overhead wire rail electrification.

Appendix 4: Chapter 5 – Delivering Smart, Local Energy Systems: Question 12: Priorities and Related Actions

Priority 1: Directly supporting the demonstration and growth of new innovative projects	
Action 1: continue to support low carbon investors through a variety of existing Scottish Government grant and loan support schemes – including REIF – carefully assessing projects in order to maximise the wider system benefits of low carton investment	Key points in relation to Action 1 included: • The need for the Scottish Government to work with industry to maximise the benefits of available funding. • A process that will enable a full appraisal of energy projects, including the wider social, economic and environmental costs and their benefits. • Analysis of potential costs and cost effectiveness of projects. • The need for a national mechanism for financial support to offer access to projects.
Action 2: under CARES continue to support community and local renewable energy schemes	Key points raised about Action 2 included: • Where possible, CARES should be used to leverage additional funding from industry and wider public funding sources.

Priority 1: Directly supporting the demonstration and growth of new innovative projects	
	• This should include projects using hydrogen and / or fuel cells and include low carbon transport.
	• A need for more support under CARES to achieve the ambitions set out in the Strategy.
	• A need to consider the effectiveness of REIF and / or why there has been limited take up of this.

Priority 2: Develop future energy systems in partnership between communities, the private and public sectors	
Action 3: explore the potential to create a Government-owned energy company (GOEC) to help the growth of local and community energy projects	Key points raised on Action 3 included: • A GOEC will help to deliver long term and co-ordinated solutions, acting as a central body with oversight of local energy projects. • There is a role for local authorities to play in the development and running of publicly-owned energy companies (a number of respondents provided examples of these, often citing Aberdeen Herat and Power Company as a successful model involving the local authority). • A GOEC could be based on the Danish Energy Agency model. • A GOEC can help bring together different groups of stakeholders and provide advice and support. • A small number of respondents disagreed with the creation of a GOEC, citing that it is not clear there is a market failure that needs a GOEC or that it will offer limited intervention with little benefits.
Action 4: explore the development of a regulatory framework for Local Heat and Energy Efficiency Strategies that will support area-based energy efficiency programmes, in conjunction with COSLA	Key points raised in relation to Action 4 included: • The need for a balance between a consistent framework and meeting the requirements of local communities.

Priority 2: Develop future energy systems in partnership between communities, the private and public sectors	
and local authorities	- A need for a consistent technical framework for LHEES that includes the use of hydrogen and fuel cell technologies. - Would welcome an action plan for a spatial approach. - The need for a national roadmap and detailed delivery plan. - The need for local authorities to be provided with the necessary skills, support and resources needed to implement LHEES.