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**Environment, Climate Change and Land Reform
Committee**
**Comataidh Atharrachadh Clìomaid is Ath-leasachaidh
Fearann**

**Stage 1 Report on the Climate Change
(Emissions Reduction Targets)
(Scotland) Bill**



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Environment, Climate Change and Land Reform Committee

To consider and report on matters falling within the responsibility of the Cabinet Secretary for Environment, Climate Change and Land Reform.



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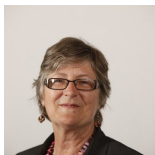
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Executive Summary

The Committee welcomes the introduction of the Climate Change (Emissions Reduction Targets) (Scotland) Bill and the opportunity to review Scotland's ambition for limiting global warming and tackling climate change.

The Bill was drafted ahead of the recent report of the Intergovernmental Panel on Climate Change (IPCC) on limiting global temperature rises to 1.5°C. The Committee supports the findings of this report and agrees that a net-zero target for all greenhouse gas emissions is necessary to achieving it.

The speed and scale of the changes needed in emissions reductions, emissions pathways and changes to social and technical systems has no precedent in human history. The Committee would like to see this reflected in a greater urgency of action across all parts of Government, across the public and private sectors and by individuals, to deliver the transformational change that is required.

Climate change is an intergenerational justice issue and the Committee believes we need to act now to help ensure future generations inherit a world that is sustainable.

The targets in the Bill are based on advice from the Committee on Climate Change (CCC) in 2017, before publication of the IPCC report. Updated advice on the targets will be published by the CCC on May 2, 2019.

Given the critical nature of this advice and its impact on the Bill, the Committee recommends that the Bill's journey through Parliament be timetabled to accommodate thorough and detailed scrutiny of the advice.

A 90% target is stretching and challenging and a net-zero target will present further challenges but there are likely to be great opportunities. The benefits and cost savings of early action outweigh the costs of the effects of climate change.

There is potential for innovation, jobs, the economy, the environment and for the well-being of the people of Scotland and beyond, by acting now. The Committee would like to see Scotland at the forefront in exploring, developing and investing in these opportunities and in the technology that will help us reach our emissions targets.

Investment in and support for innovation, knowledge exchange, technology transfer and support to key sectors such as agriculture and transport will be vital to meeting the targets. The Government needs to take a holistic approach and further work is needed on target setting and identifying pathways for key sectors and we need to increase and accelerate action in the near-term.

As a developed country Scotland has a responsibility to lead action on climate change. We need a greater focus on transformational behaviour change at individual, institutional and systemic levels. This should be prioritised, promoted and incentivised by the Scottish Government. Many small changes can have a significant impact.

The Committee makes a number of recommendations in its report:

- Clarity is needed on the temperature limit that the Bill is contributing to and seeking to achieve. The Committee recommends this should be 1.5°C and should reflect the most ambitious scenario of the forthcoming advice of the CCC.
- Target setting should be more transparent.
- There should be a presumption against lowering targets.
- Target setting, measurement and reporting for specific sectors could be improved.
- Further consideration should be given to setting sector specific targets within the Bill.
- Climate justice requires further focus to ensure that the most vulnerable are supported in the transition.
- Further consideration is needed on the possibility of establishing an independent Just Transition Commission, underpinned by statute.
- Further clarity and safeguards on the use of carbon credits is necessary.
- There should be no fixed period for parliamentary scrutiny of Climate Change Plans.
- Monitoring reports should be published in time for Parliamentary Committees to consider them within their budget scrutiny.
- The Scottish Government must give an explanation if it acts contrary to advice from the CCC.

The Committee looks forward to receiving the Scottish Government response to this report and to the forthcoming advice from the CCC and the Scottish Government's response to that advice. This response is crucial in advance of its consideration of the Bill at Stages 2 and 3 and the Committee will reflect on what changes may be required as a result.

Lord Deben of the Committee on Climate Change on the importance of the task at hand



Source: Scottish Parliament 2019

ENVIRONMENT, CLIMATE CHANGE
AND LAND REFORM COMMITTEE

#ClimateChangeBill

“The message is that, frankly, the scale of the changes that would be needed in the emissions pathways has no precedent in human history. There is no precedent for the rate of emissions reductions and the changes in social and technical systems that would be required—they really are extremely demanding.”



Jim Skea // Co-Chair IPCC Working Group III, Intergovernmental Panel on Climate Change

Source: Scottish Parliament 2019

ENVIRONMENT, CLIMATE CHANGE
AND LAND REFORM COMMITTEE

#ClimateChangeBill

“It is better to set high targets that force us to achieve more than to set achievable targets that could lead to planetary breakdown. Failure to meet a political goal is less of a disaster than failure to meet climate targets.”



Teresa Anderson // Action Aid International

Source: Scottish Parliament 2019

ENVIRONMENT, CLIMATE CHANGE
AND LAND REFORM COMMITTEE
#ClimateChangeBill

“As the IPCC report says, we have the crucial 12-year period and, if we do not get things in line, we will find it incredibly difficult to get back on track.”



Lord Deben // Chairman, Committee on Climate Change

Source: Scottish Parliament 2019

Introduction

Membership changes

1. The membership of the Committee changed during the course of the Committee's consideration of the Bill at Stage 1 (starting from the date of the referral by the Parliamentary Bureau to the Committee, 29 May 2018).
 - On 28 June 2018, the Convener, Graeme Dey MSP left the Committee. He was replaced as Convener by Gillian Martin MSP who joined on 6 September 2018.
 - On 6 September 2018, Donald Cameron MSP and Alex Neil MSP left the Committee.
 - On 30 October 2018, Alex Rowley MSP left the Committee.
 - Rhoda Grant MSP was a member of the Committee from 1 November 2018 to 20 November 2018.
 - Richard Lyle MSP left the Committee on 22 November 2018.
2. The Committee thanks its colleagues who are no longer on the Committee for their diligent work in scrutinising the Bill.

Committee consideration

3. The Climate Change (Emissions Reductions Targets) (Scotland) Bill was introduced on 23 May 2018.
4. The Scottish Government has published the following documents in relation to the Bill:
 - [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#)
 - [Policy Memorandum](#)
 - [Explanatory Notes](#)
 - [Financial Memorandum](#)
 - [Delegated Powers Memorandum](#)
 - [Statement on Legislative Competence](#)
5. In addition, the Cabinet Secretary for Environment, Climate Change and Land Reform wrote to the Committee to highlight an information and analysis documentⁱ to support discussion of the Bill.
6. Under [Rule 9.6](#) of the Parliament's Standing Orders, the Parliamentary Bureau referred the Bill to the Environment, Climate Change and Land Reform (ECCLR)

Committee on 29 May 2018 to consider and report on its general principles. No secondary Committee was appointed to consider the Bill.

7. The [Finance and Constitution Committee](#) considered the Financial Memorandum. It issued a call for views and received 4 submissions.ⁱⁱ
8. The Delegated Powers and Law Reform (DPLR) Committee considered the Bill at Stage 1 also and under [Rule 9.6.2](#) of the Standing Orders submitted a reportⁱⁱⁱ to the ECCLR Committee. The ECCLR Committee supports the recommendations of the DPLR Committee in that report.

Environment, Climate Change and Land Reform Committee consideration

9. At its meetings on 29 May 2018,^{iv} 26 June 2018^v and 25 September 2018,^{vi} the Environment, Climate Change and Land Reform Committee agreed its approach to consideration of the Bill. It agreed to issue a call for evidence on 27 June 2018 with a deadline of 23 August 2018 and agreed the following programme of scrutiny. The Committee received 101 written submissions on the Bill.
10. The Committee heard from the Bill team in June 2018 and took evidence from many stakeholders over six meetings in October and November 2018 before hearing from the Cabinet Secretary for Environment, Climate Change and Land Reform. The Committee also agreed to an extensive programme of engagement activities, which are detailed in the section of this report.
11. Detailed information on the Committee's evidence sessions is available at Annexe A. Responses to the call for evidence can be found at Annexe B. An outline of the timetable for scrutiny is provided below.

i Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR: Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#)

ii Responses to the Finance and Constitution Committee's call for views can be found [here](#).

iii Delegated Powers and Law Reform Committee. 57th Report, 2018 (Session 5). [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Bill: Stage 1](#) (SP Paper 423)

iv Environment, Climate Change and Land Reform Committee, [Minutes of Meeting, 29 May 2018](#)

v Environment, Climate Change and Land Reform Committee, [Minutes of Meeting, 26 June 2018](#)

vi Environment, Climate Change and Land Reform Committee, [Minutes of Meeting, 25 September 2018](#)

ECCLR Committee programme for scrutiny of the Climate Change (Emissions Reduction Targets) (Scotland) Bill

Date	Event
19 June 2018	Evidence session: Bill Team
27 June 2018	Launch of the call for evidence
23 August 2018	Close of call for evidence
23 October 2018	Evidence session: Intergovernmental Panel on Climate Change, ClimateXChange and the Committee on Climate Change
30 October 2018	Evidence session: International perspectives including witnesses from other countries
6 November 2018	Evidence session: Behaviour Change and Climate Change Governance
13 November 2018	Evidence session: Sectoral perspectives - Agriculture and Transport
15 November 2018	Evidence session: Innovation
20 November 2018	Evidence session: Content of the Bill (environmental and climate change groups and sectoral perspectives)
27 November 2018	Evidence session: Cabinet Secretary for Environment, Climate Change and Land Reform
18 December 2018	Draft report consideration
8 January 2019	Draft report consideration
22 January 2019	Draft report consideration
29 January 2019	Draft report consideration
5 February 2019	Draft report consideration
19 February 2019	Draft report consideration
26 February 2019	Draft report consideration and finalise report
4 March 2019	Publish report

Engagement

12. In developing its engagement strategy for the Bill, the Committee sought to go beyond the targets and understand what people felt needed to happen in order to increase ambition, as well as gauge the types of changes they would be prepared to make.
13. To promote its call for evidence, the Committee visited various locations in Edinburgh to ask people what they would do.

Video 1

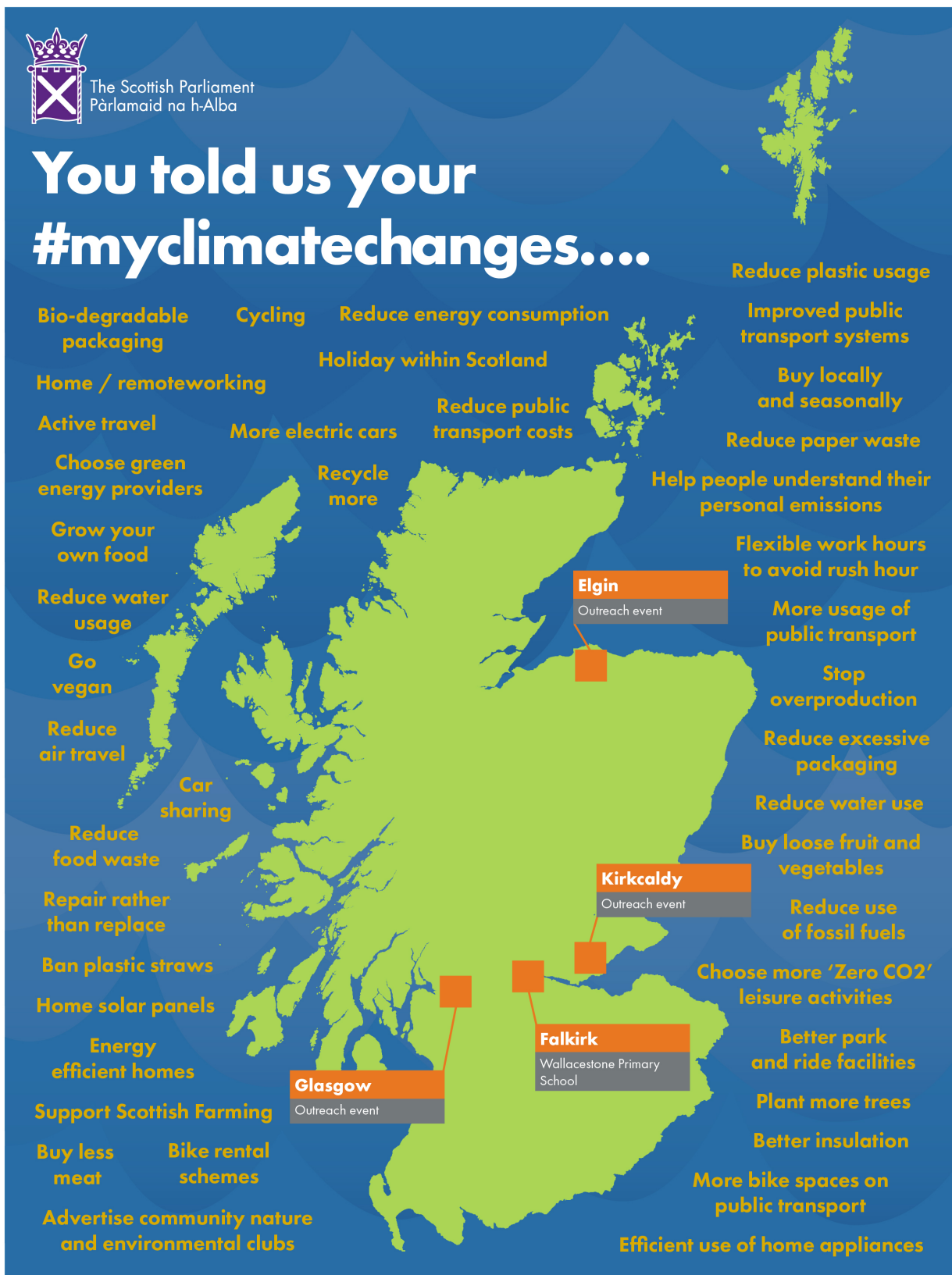


Source: Scottish Parliament 2019

Video 2



Source: Scottish Parliament 2019



Source: Scottish Parliament 2019

- The Committee travelled around the country to host a series of outreach events. A total of 74 people attended 3 community events looking at what behaviour change is required in order to help Scotland reach more ambitious Climate Change targets. 12 people in Glasgow, 38 in Elgin and 24 in Kirkcaldy participated with Members to explore this issue. Attendees came from local grassroots environmental organisations, youth groups, schools, church of Scotland and other charities and

community groups, as well as many interested members of the public. The Committee also held an event in the Scottish Parliament which a number of people engaged in the community events attended.

15. Questions around behaviour change were posed under 4 broad “themes” of Home, Work, Travel and Leisure and the discussions generated a varied and enthusiastic response - partly captured in the graphic above. Participants also noted the current barriers inhibiting progress, such as cost and convenience, and offered a range of solutions, including new incentive systems and infrastructure improvements. A full list of the suggestions provided can be found at Annexe E. Many of these suggestions could result in the transformational change that the Committee heard was required to tackle climate change. The Committee is aware that the Scottish Government plans action on many of these issues and opportunities but a number of the suggestions are new and innovative. The Committee encourages the Scottish Government to review these proposals as part of its future work on climate change and behaviour change, particularly in the context of the anticipated revisions to the Climate Change Plan. The Committee looks forward to pursuing this in its scrutiny of the revised Plan.
16. The Committee also visited Wallacestone Primary School in Brightons, where it met the school's Eco Group to find out what the young people thought about behaviour and climate change. Members found them brimming with ideas and are grateful for their helpful insights.



Source: Scottish Parliament 2019



Source: Scottish Parliament 2019



Source: Scottish Parliament 2019

17. The Committee thanks all those who contributed to its deliberations on the Bill by providing written evidence, by appearing in person to give evidence and by engaging in meetings across the country. This has been invaluable to the Committee's scrutiny.

Policy and financial memoranda

18. The lead Committee is required under [Rule 9.6.3 of Standing Orders](#) to report on the Policy Memorandum which accompanies the Bill. It is also required to report on the Financial Memorandum and has taken the opportunity to comment on the Explanatory Notes which accompanied the Bill.

Policy Memorandum

19. The Committee was satisfied by the content of the policy memorandum, other than the sections highlighting the impact assessments that have been carried out.

20. The Policy Memorandum states—

” Climate change directly and indirectly affects a range of human rights both in Scotland and globally, for example the rights to life, health, food, water and housing. However, as this is a framework Bill and does not set out how progress towards the targets will be delivered it is not possible to identify direct effects on human rights from the Bill proposals.”^{vii}

21. The document concluded—

- ” "It is not possible to assess the impact of the Bill provisions on specific groups in terms of protected characteristics, as it does not set out which actions must be taken to deliver the increased reductions in emissions."^{viii}
22. The EIA report^{ix} also suggested that every policy and proposal to implement the Bill would require an equalities impact assessment. However, it goes on to note—
- ” "The Bill is considered to be fully compatible with the European Convention on Human Rights (ECHR)."^x
23. It also does not assess the impact on island communities, which was requested^{xi} by Argyll and Bute Council, or on local authorities^{xii} due to the perceived technical nature of the Bill.
24. Although the Scottish Government is of the view that the Bill itself may not directly have an impact on these areas, the climate change plans (as the method of implementation) will. The Committee agrees with the Scottish Government that every policy and proposal to implement the Bill will require an EIA and climate change plans should be accompanied by impact assessments on these areas.

25. The Committee recommends the Climate Change Plans be accompanied by impact assessments for each of the policies and proposals on:

- island communities
- local authorities
- human rights

The impact assessments should also address the impacts on those groups identified in the Paris Agreement (indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations).^{xiii}

vii Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 63

viii Scottish Government (2018). Climate Change (Emissions Reduction Targets) (Scotland) Bill, [EIA results report](#)

ix Scottish Government (2018). Climate Change (Emissions Reduction Targets) (Scotland) Bill, [EIA results report](#)

x Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 65

xi Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 66

xii Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 68

xiii United Nations Framework Convention on Climate Change: Adoption of the Paris Agreement (FCCC/CP/2015/L.9/Rev.1)

Financial Memorandum

26. The Financial Memorandum^{xiv} to the Bill has caused the Committee considerable concern during its deliberation. While the memorandum discussed the costs of implementing the Bill, it did not address the substantial cost of inaction and this omission was a particular concern for the Committee. The Committee is aware that information on the costs of inaction was available when the previous Climate Change Bill (now Act) was under consideration.
27. The memorandum states—
- ” The current situation whereby plans for delivery of the targets must be set out in Climate Change Plans will remain the case, and as such the Bill does not specify how the targets must be achieved. Future Governments will decide what actions to take to deliver the targets, the costs of which will be affected by future scientific understanding and the availability of technology. It is therefore not possible to describe with accuracy what the cost of achieving higher targets will be.”^{xv}
28. The Committee on Climate Change (CCC) was similarly unable to produce costs for meeting a 90% target by 2050.^{xvi}
29. However, estimates of the costs of mitigating climate change have been provided by the Scottish Government through analysis produced by ClimateXChange^{xvii} and using the TIMES model—
- ” Scottish TIMES analysis indicates that the cost of moving from an 80% to 90% Greenhouse Gas reduction target is estimated to result in an additional system cost of approximately £13 billion over the period 2030-2050 (costs are discounted and in 2017 price). Prior to 2030, the estimated system cost of an 80% and 90% ambition are broadly aligned.”^{xviii}
30. Further detail on the expected additional costs of moving from 80% and 90% was provided, however this showed they were only anticipated within the energy sector and that £10bn was represented by investment.^{xix} In subsequent correspondence, the Government told the Committee—

xiv Climate Change (Emissions Reduction Targets) (Scotland) Bill, [Financial Memorandum](#). (SP Bill 30-FM, Session 5 (2018))

xv Climate Change (Emissions Reduction Targets) (Scotland) Bill, [Financial Memorandum](#). (SP Bill 30-FM, Session 5 (2018)), paragraph 17

xvi Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Chapter 2: Appropriate levels of emissions reductions, page 32

xvii ClimateXChange (2018). [International assessments of the economic impacts of climate change](#)

xviii Climate Change (Emissions Reduction Targets) (Scotland) Bill, [Financial Memorandum](#). (SP Bill 30-FM, Session 5 (2018)), paragraph 32

xix [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

” “TIMES was not able to find a pathway to a 90% target with the constraints of the Climate Change Plan included. In order for the model to find a solution to achieve a 90% target it was necessary to alter the constraints of the model. The constraints altered were chosen on the basis that they would allow for a 90% target to be met and a cost to be produced, as required for the Financial Memorandum. They do not represent a change in Scottish Government policy, or a revision to the Climate Change Plan.”^{xx}

and

” “For this reason, the cost of meeting the 80% target given here is not the same as the cost of delivering the Climate Change Plan.”^{xxi}

31. The Committee explored this with the Cabinet Secretary for Environment, Climate Change and Land Reform. When asked why the TIMES run to determine the difference between 80% and 90% only included assumptions relating to the energy sector and not to other areas, she said—

” “The short answer is that we considered those areas to be already at a point at which we could not see a pathway beyond that.”^{xxii}

32. Correspondence from the Scottish Government confirmed this—

” “As sector emission pathways in non-energy sectors (LULUCF, waste and most of agriculture) have not been modified between the 80% and 90% targets, there are no additional costs borne out by these in the £13 billion figure.”^{xxiii}

33. Simon Fuller, Deputy Director, Office of the Chief Economic Adviser, added—

” “Although there are options for increasing emissions reductions in all sectors, the most cost-effective way to proceed that we could identify was to focus primarily on industry, surface transport and, to an extent, buildings and property. That is the basis on which the modelling that fed into the financial memorandum was done.”^{xxiv}

34. The Committee is not clear why the cost effectiveness of additional sectors was ruled out prior to a TIMES run, as this is the stated purpose of the exercise. It is also not clear why the Government would decide what pathways TIMES would and would not suggest, prior to the run. The Committee is concerned that, once again, hugely significant sectors such as transport and agriculture have been omitted from TIMES modelling. As Friends of the Earth Scotland pointed out, the final climate

xx [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Financial Memorandum, 7 November 2018

xxi [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Financial Memorandum, 7 November 2018

xxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 43

xxiii [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Financial Memorandum, 7 November 2018

xxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 44

change plan moved backwards from the draft version, and so there are policies and proposals which could have been considered and would have cost more. The Committee believes it unfeasible that in moving from 80% to 90%, sectors beyond energy would not be asked to deliver more and therefore it is unclear why they have been omitted from model runs to determine costs.

35. The Committee has concerns about the inconsistencies in the way sectors are dealt with. The Committee recommends that the Scottish Government give further consideration to the effectiveness of relying on a partial model (TIMES) that excludes a number of the most significant sectors in terms of ensuring emissions reductions. Failure to include sectors such as agriculture and transport and the financial implications of this is a significant omission.
36. In evidence to the Committee, Sara Grainger from the Scottish Government said of the £13bn figure provided—
- ” There is a great deal of uncertainty around the cost estimates that are given—they are given as a best indication rather than anything more. The only thing that we can be absolutely certain of is that they will be wrong, but I cannot tell you in which direction.”^{xxv}
37. The Committee was concerned to discover^{xxvi} there was no detail on the robustness of the calculations, on their underlying assumptions and that detail was unavailable on a sectoral basis.
38. Having probed further, the Committee was also told by the Scottish Government that—
- ” Unadjusted for inflation, the cost of moving to a 90% target is estimated to be approximately £25bn.....adjusting for inflation and removing the impact of discounting, the estimated cost of moving to a 90% target is approximately £59bn.”^{xxvii}
39. Additionally, the Committee was told that: "Achieving an 80% target under the relaxed constraints necessary to achieve a 90% target, is estimated to cost £47 billion (relative to a baseline of no-action) whilst achieving a 90% target would result in additional costs of £13 billion"^{xxviii} meaning the £13bn is in addition to the cost of delivering an 80% target. Therefore the actual cost of delivering a 90% target in full is estimated to be £60bn.
40. Having been provided with three (or four) possible figures, after several prompts, the Committee called into question the Government's reliance on these figures. The

^{xxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 33

^{xxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 33

^{xxvii} [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

^{xxviii} [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Financial Memorandum, 7 November 2018

Committee explored this further with the Cabinet Secretary and her officials. Simon Fuller provided further detail^{xxix} on how the £59bn, £25bn and £13bn figures had been determined. The Committee believes these figures and an explanation should have been outlined in the Financial Memorandum for clarity.

41. Stakeholders also questioned the cost estimation process.
42. Paul Gray, Chief Executive of NHS Scotland, said—
- ” Calculations can be done, but they have a very big confidence interval. If we are serious about tackling climate change, we will need to plan for it and plan for affording it. If we are not willing to do that, the implications and impacts will be much more profound than whether we can afford to run a health service.”^{xxx}
43. In evidence, the Committee also heard concerns regarding whether the following had been accounted for:
- Pushing climate change up the agenda and providing certainty for organisations on how the costs of meeting the targets would be met;^{xxxi}
 - The changing tax base arising from changes designed to meet targets (for example, on energy);^{xxxii}
 - The cost of dealing with adaptation (the example^{xxxiii} given was of new diseases coming to the UK as a result of changing temperatures and movement of animal or insect species).

44. While the Committee acknowledges the limits of the TIMES model, it asks the Scottish Government to provide details on the assumptions and a more comprehensive analysis which takes all sectors and activities into account.

Cost of the climate change plans and the use of TIMES

45. The Committee's frustrations with the Financial Memorandum are fuelled by its experience of recommending costed policies be provided in the final Climate Change Plan. The Committee has been continually told that TIMES cannot produce such figures.
46. In correspondence to the Committee, the Scottish Government said—

^{xxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 44

^{xxx} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 53

^{xxxi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 53

^{xxxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 53

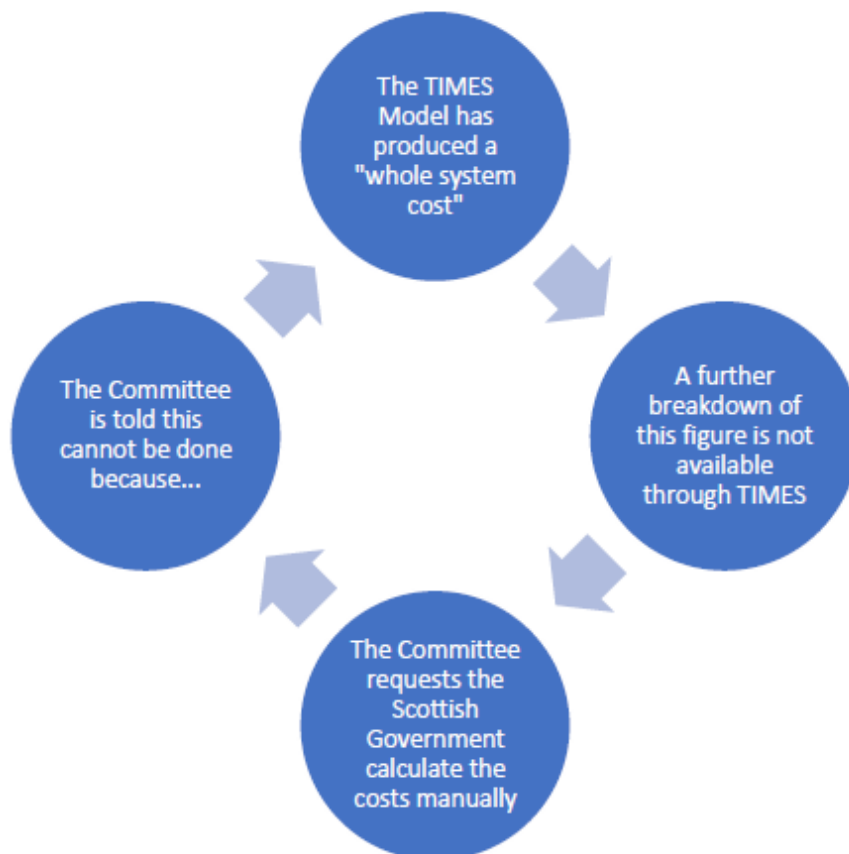
^{xxxiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 53

” "TIMES framework can only be used to provide a broad indication of cost, and is most helpful for framing what the magnitude of cost could be."^{xxxiv}

47. It continued—

” "TIMES specifies the most cost effective energy mix, and the associated cost, for achieving a given climate change target. It does not consider the policy options for achieving this energy mix or where the costs of doing so should ultimately fall (e.g. government, local authority, businesses or consumers). Who the costs fall to will be determined by the future design of policies and proposals that will deliver emissions reductions to achieve these stretching targets. There are many ways in which costs can be distributed."^{xxxv}

48. The Committee still believes this information should be provided, and once provided for each policy and proposal, it should be possible to break this down by sector. The Committee is currently receiving cyclical information from the Scottish Government that—



49. The Committee is of the view that the Scottish Government could calculate such figures based on what TIMES produces and the policies it has proposed in the climate change plans, and in particular, the costs which fall to the Scottish

^{xxxiv} [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

^{xxxv} [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

Government. This view was shared^{xxxvi} by Sara Grainger in evidence to the Committee.

50. The ability to do this was previously confirmed by the former Director for Energy and Climate Change at the Scottish Government, Chris Stark, who said "Where we are clear on how a policy will work, we are clear on the costs of that policy."^{xxxvii} The Committee requested such clarity be shared, calling for levels of funding for grants, funds and loan schemes be detailed in the final Climate Change Plan,^{xxxviii} as well as the costs of each policy and proposal.^{xxxix} The Committee seeks a greater degree of clarity in the costing process and believes the lack of detail on funding information for policies and proposals within the Climate Change Plan makes the pathways hard to assess.^{xl}
51. If it is the case that the Scottish Government is "clear on the cost" of policies within the Climate Change Plan, the Committee once again recommends detailed information be shared in the documents produced to ensure greater transparency. The Committee has recommended section 19 of the Bill be updated to reflect this (see [SECTION NINETEEN - CLIMATE CHANGE PLANS, CONTENT OF THE PLANS, COSTS](#) of this report). It was satisfied to hear^{xli} that this is already being considered by the Scottish Government, although believes this should have been done for the final Climate Change Plan as recommended previously.

Cost benefit and risk analysis

52. The Policy Memorandum states—

^{xxxvi} Environment, Climate Change and Land Reform Committee, [Official Report, 19 June 2018](#), Col 36

^{xxxvii} Environment, Climate Change and Land Reform Committee, [Official Report, 24 January 2017](#), Col 13

^{xxxviii} Environment, Climate Change and Land Reform Committee. 3rd Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the Draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 93), paragraph 198

^{xxxix} Environment, Climate Change and Land Reform Committee. 3rd Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the Draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 93), paragraph 199

^{xl} Environment, Climate Change and Land Reform Committee. 3rd Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the Draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 93), paragraph 197

^{xli} [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Financial Memorandum, 7 November 2018

” "The Strategic Environmental Assessment carried out on the Bill consultation proposals found that raising the ambition of Scotland's targets for reducing greenhouse gas emissions will enhance Scotland's efforts at tackling climate change, with likely benefits to climatic factors. In addition, positive secondary effects are expected for air quality, population and human health, and material assets, due in large part to the further decarbonisation of energy generation and transport."^{xlii}

53. However, it does not appear that the secondary or wider benefits of measures needed to meet the targets have been assessed for either their quantifiable benefits or the cost savings achieved from early, rapid action. This was confirmed^{xliii} in evidence to the Committee by the Cabinet Secretary. While "positive secondary effects are expected,"^{xliiv} there is no information presented on precisely what these are, what savings across the Scottish Government's budget can be anticipated and when this will be achieved.
54. Several stakeholders emphasised the need to quantify additional benefits, such as Aberdeen City Council.^{xliv}
55. Professor Andy Kerr of ClimateXChange noted the change of narrative in recent times from action to mitigate climate change being expensive to supporting cost savings.^{xlvi} He also noted the benefits to areas such as public health from improved air quality.
56. Stop Climate Chaos Scotland^{xlvii} expressed concern at the lack of analysis beyond the use of the TIMES model.
57. In correspondence^{xlviii} to the Committee, the Scottish Government outlined why it was inherently difficult to consider the costs of climate change mitigation from a cost-benefit perspective, and that this should be considered in terms of risk instead. This view was derived from the conclusions of a Government commissioned report^{xlix} by the ClimateXChange on the economic impacts of climate change.

xlii Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 71

xliii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 36

xliiv Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 71

xlv Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 52

xlvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 10

xlvii Written Submission. [Stop Climate Chaos Scotland](#).

xlviii [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

xlix ClimatexChange (2018). [International assessments of the economic impacts of climate change](#)

58. Anders Wijkman, Chair of Climate-KIC, and Stefan Nyström, of the Swedish Environment Protection Agency, agreed, noting that economic modelling and cost-benefit analysis, particularly in the long-term, was inherently unreliable as current models lacked the capacity to anticipate innovation, among other things.ⁱ
59. Other witnesses noted the scale of the task, while Dave Moxham of the Just Transition Partnership suggestedⁱⁱ that undertaking a cost benefit analysis of mitigating climate change could be a role for the Just Transition Commission.
60. The Committee welcomes the news that "the Scottish Government has also commissioned the University of Strathclyde, via ClimateXChange, to link UK versions of an economic model that they have to TIMES. This piece of work, to be completed over the next twelve months, will allow further analysis of the wider economic impacts of TIMES scenarios."ⁱⁱⁱ
61. The Committee accepts there can be a degree of uncertainty in long-term forecasting and there are challenges in capturing the effects of innovation. However it considers there is scope for more work on this. The Committee intends to engage in further discussion with the Scottish Government and the Committee on Climate Change to develop a more robust approach to assessing the impacts of mitigating and adapting to climate change. In particular, it would welcome a model that highlights the significant additional and secondary benefits to, among other things, health, industry, and employment. The Committee requests that the result of work commissioned by the Government, from the University of the Strathclyde, is shared with the Committee when available.

Cost of inaction

62. Despite the difficulties in determining the costs of the Bill and the costs of additional benefits, the Scottish Government^{liii} and other witnesses were certain that whatever the overall cost of mitigating and adapting to climate change, the cost of inaction and delayed action will be far greater.
63. Instead, the benefits of early action in terms of cost were consistently emphasised. Professor Jim Skea of the Intergovernmental Panel on Climate Change (IPCC) said: "everything that you do now will buy you benefits further down the line"^{liiv} and confirmed there were cost savings and additional benefits associated with early action.^{liv} Anders Wijkman said early action was not only preferable, but also the fundamental message of the IPCC report.^{lvi}

ⁱ Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 29

ⁱⁱ Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 28

ⁱⁱⁱ [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Financial Memorandum, 7 November 2018

^{liii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 33

64. The Committee notes the evidence it received on the cost-saving benefits of early action and believes this supports the argument for immediate action, outlined in [SECTION NINE - ANNUAL TARGETS 2021 TO 2049, MORE ACTION, THE SOONER THE BETTER](#) of this report.

Financial Memorandum - conclusions

65. The Committee has considered the issue of the Financial Memorandum and the presentation of the £13bn figure for the cost of delivering the difference between an 80% and 90% target in depth. It was initially concerned about the apparent inclusion of a figure with no basis or justification.
- Different assumptions have again been applied to different sectors when using the TIMES model, and the Committee believes all sectors should be considered in runs of the model.
 - There are difficulties in ascertaining the savings and additional benefits to be derived from action on climate change. The Committee examined this issue in its recent consideration of the Budget 2019/20 and indicated^{lvii} that it would welcome further discussion with the Scottish Government on the subject of leveraging additional funds into the ECCLR portfolio to derive efficiency savings and cost benefits elsewhere. The Committee understands the difficulties involved, but this does not justify inaction. The Committee would also welcome further discussion with the Scottish Government and the CCC on the approach to assessing impact and cost/benefit.
 - A consensus exists among stakeholders that it would be cost effective to tackle climate mitigation challenges sooner rather than later, which will also help prevent long-term or irrecoverable damage.

Explanatory Note

66. The Committee felt that the Explanatory Note accompanying the Bill could have been clearer, principally in detailing not only the function of each of the provisions but also what these meant in practice. Many of the descriptions referred to how the section amended the 2009 Act by reference to section numbers only, and did not state what the effect of these were.

lviv Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 8

lv Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 8

lvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 3

lviii [Letter](#) to the Cabinet Secretary for Finance and Constitution and the Cabinet Secretary for Environment, Climate Change and Land Reform Committee on the Budget 2019/20, 10 October 2018

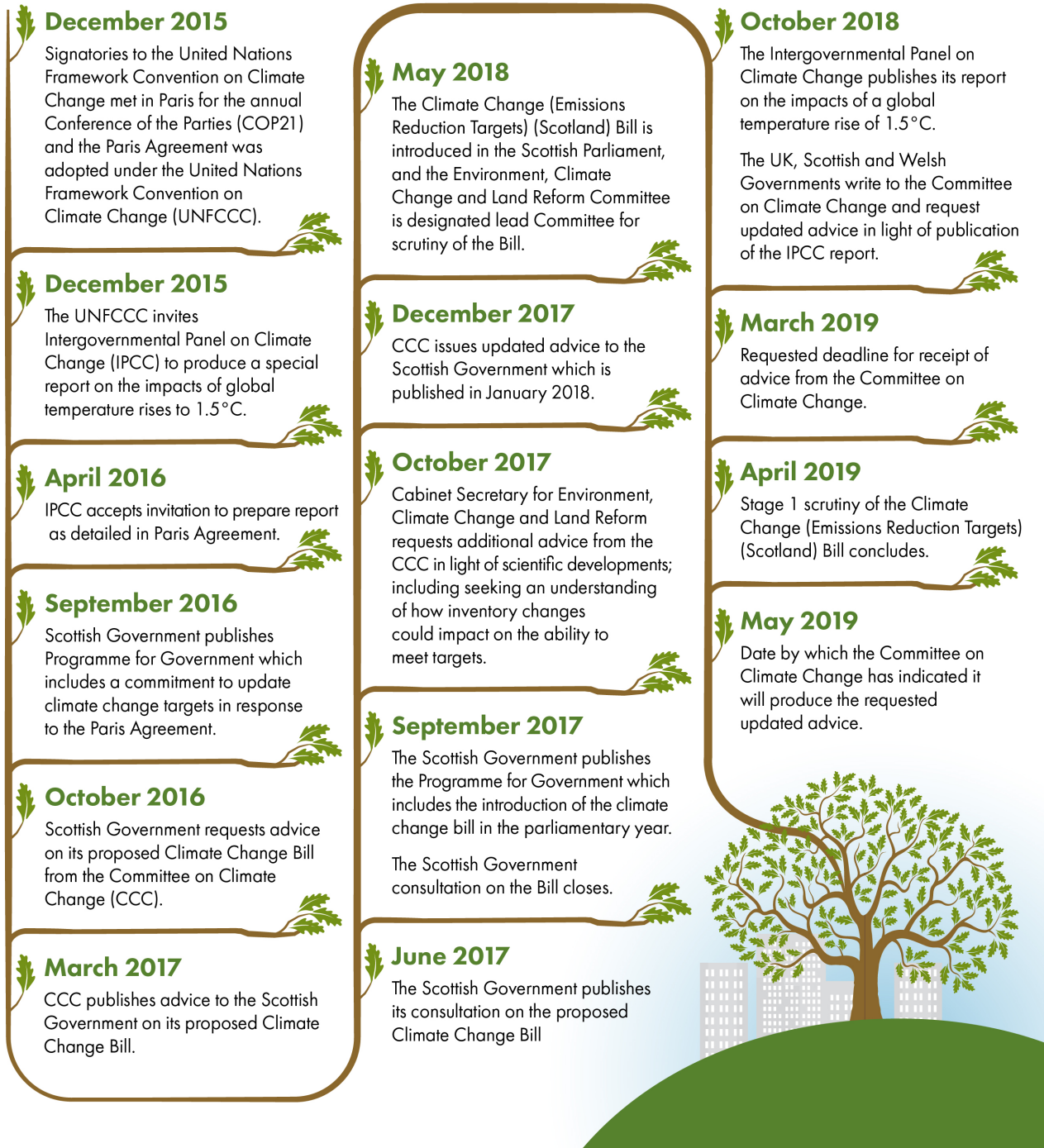
67. The Committee recommends the Scottish Government consider how the Explanatory Notes could be improved in future Bills to provide explanation on the effect of a particular section, as well as a technical, legalistic description of its function.

Timing of the introduction of the Bill

68. The Committee's ability to come to a view on many parts of the Bill, particularly on the targets, has been constrained by the fact that the advice upon which the targets are based is under further consideration by the Committee on Climate Change (CCC), following publication of the Intergovernmental Panel on Climate Change (IPCC) report in 2018.
69. An outline of the timescales for the advice on the Bill is provided below:



Development of Advice on the Bill



Source: Scottish Parliament 2019

70. As shown, it was predictable that the IPCC report and the request for updated advice would occur during the Bill's consideration.
71. When asked about the IPCC report, the Cabinet Secretary said—

” "Like everybody else, we are waiting with interest to see what the IPCC says and I expect that that will inform some of the discussions around the bill... I think that the CCC is already plugged into some of that conversation and is effectively feeding back, via its advice, its assessment of what we can and cannot do now."^{lviii}

72. The Committee explored^{lix} the impact that the publication of the IPCC advice would have on the timescales for consideration of the Bill at Stage 2 with the Bill team in June, prior to the request for advice from the governments of the UK to the CCC.

73. When he appeared before the Committee in October 2018, Lord Deben, Chair of the CCC, said that the updated advice was likely to be received by April.^{lx} Lord Deben subsequently wrote to the Cabinet Secretary confirming that the updated advice will be published on May 2.^{lxi}

74. Stakeholders such as Unison Scotland^{lxii} and Stop Climate Chaos Scotland^{lxiii} requested this advice be made urgently available to support scrutiny of the Bill.

75. The Committee heard from the Cabinet Secretary in November 2018 that—

” "neither the Government nor I want to tie the bill too tightly to a timetable that would mean that we would need to proceed without the necessary advice. That would be an absurd position to be in....it is more important that the bill is right and reflects the advice that we receive, than that we stick to a deadline in a timetable."^{lxiv}

76. The Committee recommends, and intends to request, a deadline for consideration of the Bill at Stage 2, which allows it sufficient time to consider and, if necessary, take further evidence on the advice received from the Committee on Climate Change prior to considering amendments.

^{lviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 32

^{lix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 3

^{lx} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 26

^{lxi} [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform, 14 February 2019

^{lxii} Written Submission. [Unison Scotland](#)

^{lxiii} Written Submission. [Stop Climate Chaos Scotland](#)

^{lxiv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 4

Background to and purpose of the Bill

Scotland's record on climate change and emissions reduction

77. The Climate Change (Scotland) Act 2009 was landmark legislation that set Scotland on course to be one of the most ambitious countries in the world, particularly in terms of reducing emissions.
78. As the First Minister told the Conveners of Scottish Parliament committees on 24 October 2018—
- ” “Already, our emissions are almost half of 1990 levels. We have met our last three annual targets and are on track to reach the increased 2020 target. We are outperforming the UK and I think that, across the EU, only Sweden performs better than Scotland. That is a track record to be proud of.”^{lxv}
79. The Committee recognises the progress made to date and commends the Scottish Government, and the public, private and voluntary sectors for the efforts made to date to reduce emissions and adopt low carbon behaviours.

Paris Agreement

80. In December 2015, signatories to the United Nations Framework Convention on Climate Change met in Paris for the annual Conference of the Parties. In December 2015 the Paris Agreement (UNFCCC 2015)^{lxvi} was adopted under the United Nations Framework Convention on Climate Change (UNFCCC). The Scottish Parliament Information Centre (SPICe) produced a briefing^{lxvii} on provisions of the Paris Agreement and what these might mean for Scotland. In relation to global temperature rises, the agreement states this should be limited to "well below" 2°C and to "pursue efforts" to limit temperature increase to 1.5°C above pre-industrial levels (See Article 2).^{lxviii}
81. Following the adoption of the agreement, the First Minister (who attended the summit)^{lxix} welcomed the statement—

^{lxv} Scottish Parliament Conveners Group, [Meeting with the First Minister, Nicola Sturgeon MSP, 24 October 2018](#), page 13

^{lxvi} United Nations Framework Convention on Climate Change: [Adoption of the Paris Agreement](#) (FCCC/CP/2015/L.9/Rev.1)

^{lxvii} Barlow. D. (2015) Paris 2015 Climate Summit: Outcomes and Implications for Scotland. Scottish Parliament Information Centre (SPICe) Briefing. SB 16-08, 21 January 2016

^{lxviii} United Nations Framework Convention on Climate Change: [Adoption of the Paris Agreement](#) (FCCC/CP/2015/L.9/Rev.1)

^{lxix} Scottish Government Press Release, [Paris COP 2015, 1 December 2015](#)

” "COP21 has, as we had hoped, achieved a big step forward in the international fight against climate change.....Devolved administrations, like the Scottish Government, will be strong drivers of a progressive climate agenda. We look forward to working with our international partners to secure the successful implementation of the Paris Agreement."^{lxx}

82. In its Programme for Government 2016-17,^{lxxi} the Scottish Government signalled its intentions to create new, more pressing climate change targets via new legislation in order to address the Paris Agreement. In its 2017-18 Programme for Government, the Scottish Government stated that the Bill would be included in the programme of legislation that year—

” "The Climate Change Bill will respond to the historic Paris Agreement by setting more ambitious targets to reduce greenhouse gas emissions. The Bill will increase transparency, demonstrate our commitment to sustainable economic growth and signal to the international community that Scotland is the place to do low carbon business."^{lxxii}

The Advice of the Committee on Climate Change

83. The CCC is an independent, statutory body established under UK legislation: the Climate Change Act 2008. The purpose of the CCC is to provide advice on emissions targets and report to the UK Government and Devolved Administrations on progress made in reducing greenhouse gas emissions. The CCC is jointly sponsored by the UK Government, the Scottish Government, the Northern Ireland Executive, and the Welsh Government.

84. The Scottish Government requested advice from the CCC on its proposed Climate Change Bill in October 2016 and received a response^{lxxiii} in March 2017.

85. Advice was requested in four areas—

” "the appropriate level of future emissions, the form of future emissions targets, the future accounting framework, and flexibility to update emissions targets."^{lxxiv}

86. Further advice was sought^{lxxv} in October 2017 following the publication of the latest emissions data for Scotland in June of that year, with anticipated changes to the

^{lxx} Scottish Government Press Release, [COP21 deal welcomed](#), 12 December 2015
^{lxxi} Scottish Government (2016), [A Plan For Scotland: The Scottish Government's Programme For Scotland 2016-17](#)
^{lxxii} Scottish Government (2017), [A Nation with Ambition: The Government's Programme for Scotland 2017-18](#)
^{lxxiii} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017
^{lxxiv} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 9

inventory. It sought advice on both the impact of this on the original advice and the suitable framework for emissions accounting.

87. Lord Deben, Chair of the CCC, wrote^{lxxvi} to the Cabinet Secretary for Environment, Climate Change and Land Reform to provide updated advice in December 2017. The Committee was advised^{lxxvii} of this by the Cabinet Secretary in January 2018.
88. In evidence to the Committee,^{lxxviii} Lord Deben explained how the CCC develops advice, noting that the organisation is unique among its worldwide contemporaries for being populated by experts, rather than representatives.
89. The detail of advice provided to date by the CCC is explored in subsequent chapters of this report.

Request for updated advice - October 2018

90. Following the publication of the IPCC's special report on 1.5°C, the UK, Welsh and Scottish Governments wrote^{lxxix} to the Chair of the CCC in October 2018 to request updated advice on targets. The letter requested receipt of that advice by March 2019. It stated—

^{lxxv} [Letter](#) from the Cabinet Secretary for Environment, Climate Change and Land Reform, Roseanna Cunningham, to the Chair of the Committee on Climate Change (CCC), Lord Deben, 12 October 2017

^{lxxvi} [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform providing updated advice on the content of the proposed Climate Change Bill, 20 December 2017

^{lxxvii} [Letter](#) from the Cabinet Secretary for Environment, Climate Change and Land Reform to the previous Convener of the Environment, Climate Change and Land Reform Committee, Graeme Dey, on the updated advice of the CCC, 15 January 2018

^{lxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 26

^{lxxix} [Letter](#) from the UK, Welsh and Scottish Governments to the Committee on Climate Change (CCC) requesting updated advice on targets in light of the IPCC special report, 15 October 2018

” I am now writing to request...an update to the advice you provided in October 2016, as part of your report on UK climate action following the Paris Agreement. Carbon budgets already set in legislation (Carbon Budgets 3-5 covering 2018-2032) are out of scope of this request. This advice will inform consideration of the UK’s long term targets, and should include options for the date by which the UK should achieve:

a) a net-zero greenhouse gas target and/or

b) a net-zero carbon target in order to contribute to the global ambitions set out in the Paris Agreement, including whether now is the right time for the UK to set such a target. Your advice should also provide options for:

- the range which UK greenhouse gas emissions reductions would need to be within, against 1990 levels, by 2050 as an appropriate contribution to the global goal of limiting global warming to well below 2°C above pre-industrial levels, and
- the range which UK greenhouse gas emissions reductions would need to be within, against 1990 levels, by 2050 as an appropriate contribution towards global efforts to limit the increase to 1.5°C above pre-industrial levels.

Your report should provide evidence on:

- how reductions in line with your recommendations might be delivered in key sectors of the economy; and
- the expected costs and benefits across the spectrum of scenarios in comparison to the costs and benefits of meeting the current target.”^{lxxx}

91. The Cabinet Secretary subsequently wrote^{lxxxii} to the Chair of the CCC to state that although the UK has sought to limit the scope of advice, this should not prevent the CCC from providing advice on all of Scotland's targets in relation to the IPCC report (including those up to 2032).
92. The Committee welcomes this approach from the Scottish Government, having heard evidence on the importance and cost effectiveness of short-term action to achieve long-term goals.
93. Lord Deben also stressed that longer-term goals could not be achieved without completing the required actions in the near-term carbon budgets.^{lxxxii}

^{lxxx} Letter from the UK, Welsh and Scottish Governments to the CCC requesting updated advice on targets in light of the IPCC special report, *15 October 2018*

^{lxxxii} Letter from the Cabinet Secretary for Environment, Climate Change and Land Reform to the Chair of the Committee on Climate Change, Lord Deben, on the scope of the updated advice sought in light of the publication of the IPCC report, *24 October 2018*

^{lxxxii} Environment, Climate Change and Land Reform Committee, *Official Report*, 23 October 2018, Col 25

94. Additionally, Lord Deben told^{lxxxiii} the Committee that, despite the request for the advice by the end of March 2019, it will likely be delivered in April 2019.

The Scottish Government's view on the advice of the Committee on Climate Change

95. The Committee explored the way in which the Scottish Government has considered and utilised the advice of the Committee on Climate Change (CCC) during its deliberations on the Bill.
96. The Scottish Government has taken a selective approach in responding to CCC advice. This has had an impact on the Bill, and on the policies and proposals which will be required to meet more ambitious climate change targets. Specifically, the Committee raises issues in relation to—
- Consideration of other sources of advice, beyond the CCC;
 - Citing the primacy of the CCC advice in relation to targets but not in relation to their advice on the content of the climate change plans or on policy considerations.

Consideration of other sources of advice

97. The Committee explored whether sources beyond the CCC had been taken into consideration in the development of the Bill.
98. According to Lord Deben, the CCC is "recognised internationally as being absolutely at the front on where the science is."^{lxxxiv} This view was echoed to the Committee by Anders Wijkman, Chair of the Climate-KIC in Sweden.^{lxxxv}
99. In evidence to the Committee on 19 June 2018, Sara Grainger of the Scottish Government said—
- ” “The UKCCC is therefore the ideal set of people to provide advice. However, there is nothing in the 2009 act that means that we cannot look more widely, and we certainly consider information, analysis and opinions from a much broader range of people.”^{lxxxvi}
100. The Committee explored the "information, analysis and opinion" that the Scottish Government drew upon to inform its setting of the targets and was told^{lxxxvii} that it

^{lxxxiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 26

^{lxxxiv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 27

^{lxxxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 9

^{lxxxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 27

only considered the scientific advice provided by the CCC, who base their evidence on the Intergovernmental Panel on Climate Change (IPCC) synthesis reports.

101. The Committee recognises the authoritative voice of the CCC as an expert advisor. It also understands that the scope of its advice can depend on the framing of the enquiry and the underpinning assumptions, and this can impact the advice provided.

The advice of the Committee on Climate Change on the content of climate change plans and policy

102. The Committee explored the approach of the Scottish Government to the advice of the CCC. The First Minister said: "We are obliged to take into account the advice of the Committee on Climate Change, and we do so, but its advice will not be the only factor that we take into account when we come to decisions."^{lxxxviii}
103. The Committee has encountered various examples of the Scottish Government either choosing a different path to the one proposed by the CCC or not seeking their advice in the first place. An example of this is the lack of opportunity for the CCC to review the most recent Climate Change Plan between the completion of parliamentary scrutiny of the draft and the publication of the updated final plan, as recommended by the Committee^{lxxxix} (explored further in [SECTION NINETEEN - CLIMATE CHANGE PLAN, SCRUTINY BY THE COMMITTEE ON CLIMATE CHANGE OF THE CLIMATE CHANGE PLANS](#) of this report). However, the area where divergence from CCC advice is most apparent is in relation to agriculture policy. In this case, the CCC recommended an approach which was subsequently rejected by the Scottish Government without an explanation provided to justify the decision.
104. In its most recent report for Scotland on progress towards meeting emissions reduction targets, the CCC again noted: "Not all our recommendations have been implemented. In the agriculture sector, ambitions for emissions reduction have been further scaled back from the draft Plan."^{xc}
105. On the attitude towards CCC advice, the Cabinet Secretary for the Rural Economy and Connectivity said: "Independent, expert advice from the CCC forms an important part of the Scottish Government's response to tackling climate change – alongside other considerations such as stakeholder views and available resources including financial budgets."^{xc}

^{lxxxvii} [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

^{lxxxviii} Scottish Parliament Conveners Group, [Meeting with the First Minister, Nicola Sturgeon MSP](#), 18 April 2018, page 6

^{lxxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 6

^{xc} 'Reducing Emissions in Scotland', 2018 Progress Report to Parliament, The Committee on Climate Change

^{xc} [Letter](#) from the Cabinet Secretary for the Rural Economy and Connectivity on the advice of the Committee on Climate Change, 24 May 2018

106. The Committee welcomes the recognition of the importance of stakeholder views, but has concerns about this response because:
- It does not fit with the narrative used to justify the setting of a 90% target over a net-zero target in the Bill (i.e. a desire not to diverge from the advice of the CCC);
 - The Scottish Government appears to take a selective (and at times inconsistent) approach to adherence to CCC advice.
107. The Cabinet Secretary for Environment, Climate Change and Land Reform committed to following the CCC's advice in terms of a pathway to setting a net-zero target, should this be presented in the advice due in May. She said—
- ” “We are asking the Committee on Climate Change to update its advice two years down the line and consider whether it thinks that there is a feasible way of doing it. If there is, we will do it that way.”^{xcii}

108. The Committee agrees with the purpose and role of an independent adviser on climate change issues, and understands why the Scottish Government has chosen to frame the Bill around the advice it has received. However, the Committee recommends that if the Scottish Government does not act on the advice of the Committee on Climate Change, it should provide an explanation of the rationale for rejecting that advice, to ensure the process is transparent.

International Comparisons

109. The Policy Memorandum to the Bill states—
- ” “In response to the United Nations Framework Convention on Climate Change Paris Agreement, the Bill reaffirms the Scottish Government’s commitment to remain at the forefront of global ambition.”^{xciii}
110. The Committee welcomes and shares the Scottish Government's ambitions for Scotland to be a world leader in action to reduce global emissions and it sought to understand how other countries are approaching the issue.
111. While the Paris Agreement represented a significant milestone in international cooperation on climate change, its interpretation and implementation among signatories has varied. In scrutinising the Bill, the Committee was keen to understand the international context, exploring how the proposals advocated by the Scottish Government compared with action taken around the world. In short, the Committee wanted to assess whether the proposals in the Bill rise to the challenge of being at the “forefront of global ambition.”^{xciv}

^{xcii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 28

^{xciii} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 4

112. Evidence was received from ClimateXChange, which highlighted the research work it had been commissioned to undertake by the Scottish Government on international comparisons. It produced four papers ^{xcv}, ^{xcvi}, ^{xcvii}, ^{xcviii}
113. This research highlights several points:
- International comparison is complicated by the fact that no two systems of setting targets or accounting for emissions are the same. Varied approaches by signatories to international agreements make assessment difficult.
 - Scotland "is in rather a unique position"^{xcix}, as it is not required to submit Nationally Determined Contributions (NDCs), is not a Members State with responsibilities directly to the EU, and is not a party to the United Nations Framework Convention on Climate Change (UNFCCC). It could therefore "devise something specifically tailored to Scotland's needs, but it also means that Scotland may not readily find comparable frameworks in other countries."^c
114. In its information and analysis document, the Scottish Government states—
- ” "Comparisons between different countries' legal frameworks are not straightforward. France, UK, EU, Sweden, Norway and Finland each have domestic legislation for reducing emissions by between 75 and 100%. Sweden's legislation is considered by some as being the most ambitious – with a net-zero target for 2045 – however, it reserves the right to make up a significant share (15%) of this reduction through payments to other countries. Scotland's proposed 90% reductions will come from domestic effort alone."^{ci}
115. The Committee recognises that comparisons between countries can be difficult as their approaches and how greenhouse gas emissions are accounted for differs from country to country. The Committee discusses later in this report the fact that Scotland retains the option to use carbon credits in the Bill.

^{xciv} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum \(SP Bill 30-PM, Session 5 \(2018\)\)](#), paragraph 4

^{xcv} ClimateXChange (May 2018) [Quality assurance of comparison of international climate change target frameworks](#)

^{xcvi} ClimateXChange (December 2017) [Greenhouse gas accounting for national climate change targets: A comparative study](#)

^{xcvii} ClimateXChange (November 2017) [International climate change target frameworks](#)

^{xcviii} ClimateXChange (July 2017) [A review of greenhouse gas reduction aspirations and their legislation across selected countries and regions](#)

^{xcix} ClimateXChange (November 2017) [International climate change target frameworks](#), page 1

^c ClimateXChange (November 2017) [International climate change target frameworks](#), page 1

^{ci} Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR: Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#), page 4

116. The Committee notes that Sweden is among those at the forefront of global ambition on climate change. The Committee is also aware that Sweden uses different mechanisms to calculate its emission standards, opting to exclude shares of aviation and shipping, which could make achieving targets easier. Anders Wijkman, Chair of Climate-KIC in Sweden, applauded Scotland for including aviation and shipping in its accounting and noted that Sweden has "...not yet come that far, but I think that we will get there."^{cii}
117. However, Stefan Nyström of the Swedish Environment Protection Agency also told the Committee that Sweden does not account for its forest area when calculating emissions, noting that—
- ” “In Sweden, we emit about 55 million tonnes of CO₂ each year, and the net uptake by our forests is about 45 million to 50 million tonnes. We do not count that at all, but we could do. We might begin to count the uptake by our forests in the future, but at the moment we look on it as a free service to the world, so to speak.”^{ciii}
118. The Committee is aware that excluding forestry from the calculations can make targets difficult to achieve.
119. Recognising the difficulty of comparing and contrasting the use of different models between countries, Andy Kerr of ClimateXChange used Sweden as an example when discussing how variations in approach or definition of net-zero creates huge difficulty: "...We have to be quite careful, therefore, about trying to make direct comparisons."^{civ}
120. However, various stakeholders such as David Reay, Lynsey Penny, the Aldersgate Group and the 2050 Climate Group said Scotland's setting of a net-zero target would send a signal to the international community and help maintain worldwide momentum.
121. Andy Kerr agreed and said "Scotland has been at the leading edge in setting targets."^{cv} He further noted Scotland was seen as a model of good practice in terms of "robust" monitoring and evaluation framework around targets.^{cvi}
122. Lord Deben, Chair of the CCC, remarked on Scotland's progress within the UK: "Scotland continues to be in advance of the rest of the United Kingdom in the way in which it is setting its targets."^{cvii}

cii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 24

ciii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 24

civ Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 8

cv Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 9

cvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 9

123. The Committee heard of a range of different approaches and mechanisms to account for GHG emissions internationally. The Committee recognises other countries employ different methods to define net-zero and choose to include or exclude certain emissions which makes a direct comparison with the approach taken in Scotland very difficult. The Scottish Government has taken the opportunity presented by the Bill to make accounting and target setting more transparent and accountable. The Committee welcomes this ambitious approach, including issues such as inventory, baselines, annual target years and types of greenhouse gases. The Committee notes this approach, and believes that setting a 90% target, will place Scotland among those at the forefront of global ambition on climate change.

Scope of the Bill

124. The Policy Memorandum states—

” Amongst a wide range of comments in this section, a number of respondents, and campaign responses called for delivery measures to be included in the Bill and many questioned the territorial basis for calculating emissions.”^{cviii}

125. The Bill does not include provisions for how the targets will be achieved, although various stakeholders (including Aberdeen City Council and the Royal Society for the Protection of Birds Scotland) believe it should and viewed the Bill as a missed opportunity to progress policy issues.

126. The accompanying documents make clear that implementation is intended to be delivered through climate change plans. When questioned on why there were no specific policy provisions in the Bill, the Cabinet Secretary said^{ciix} that this could have made the legislation unmanageably large and that there were implications for including policy in primary legislation, which was binding and focused on creating a framework.

127. In its advice to the Scottish Government, the CCC said—

” By adopting a more ambitious 2050 target than currently exists for Scotland, or for the UK as a whole, it would be important to identify the areas in which Scotland will go further than the rest of the UK.”^{cx}

128. In evidence to the Committee, the Cabinet Secretary said—

” Rather than just having the idea of ambition for ambition's sake, we want to be crystal clear about the implications of the targets: what they will actually mean in real life.”^{cxii}

129. Among those who described the consultation and the Bill as a missed opportunity were the Scottish Communities Climate Action Network, who argued that it was "essential" that the interim targets in the Bill reflect "the need for rapid, and early, emissions reductions.”^{cxiii}

130. Stakeholders such as the Existing Homes Alliance^{cxiii} argued that the Bill should have included policy measures.

cviii Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 59 (table)

ciix Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 8

cx Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 9

cxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 24

cxiii Written Submission. [Scottish Communities Climate Action Network](#)

cxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 30

131. The Committee agrees with the Cabinet Secretary that we need to be "crystal clear" about the implications of the targets and what they mean "in real life" but recognises that this may only be possible in the shorter-term as greater uncertainty exists in the longer-term. Nevertheless, the Bill and accompanying documents do not provide the necessary clarity to address this. The Committee also agrees with many stakeholders who expressed concern that the Bill and its accompanying documents fail to include specific costed policy measures and asks for an explanation, including costed measures, where possible.

Can targets be considered in isolation from the measures required to hit them?

132. The Committee explored whether increased targets for emissions reduction could be considered in isolation from the measures which would be required to meet them. Based on the volume and strength of evidence received on policy measures, the Committee considers that the two cannot be easily separated.
133. Jim Skea, Co-Chair of the Intergovernmental Panel on Climate Change Working Group III, said—
- ” The message is that, frankly, the scale of the changes that would be needed in the emissions pathways has no precedent in human history. There is no precedent for the rate of emissions reductions and the changes in social and technical systems that would be required—they really are extremely demanding.”^{cxiv}
134. Andy Kerr also stated—
- ” Ensuring that targets are set with practical outcomes that can be delivered—in terms of transport infrastructure and building infrastructure—over the next five or 10 years will be absolutely critical. That is more important than worrying too much about whether the net figure is zero by 2040, 2045 or 2050.”^{cxv}

135. The Committee is of the view that targets for emissions reduction cannot easily be considered in isolation from the measures that would be required to meet them. While including policy measures would undoubtedly result in a lengthier Bill, this should have been an integral part of it. The Committee notes from the IPCC report that the speed and scale of the changes needed in emissions reductions, emissions pathways and changes to social and technical systems has no precedent in human history. The Committee would like to see this reflected in a greater urgency of action across all portfolios and throughout the public and private sectors, to deliver the transformational change that is required.

cxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 6

cxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 12

Climate Justice

136. The Paris Agreement states—

” "Acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity."^{cxvi}

137. Climate justice and achieving the equity aims of the Paris Agreement factored heavily in discussions on the Bill. The Cabinet Secretary acknowledged Scotland's historical contribution to the problem and its work to ensure fairness—

” "I have made the point that Scotland was one of the cradles of the industrial revolution. The phrase that I have used is that our sticky fingers are all over climate change, because right from the get-go we were beneficiaries of it, although arguably the vast majority of the population did not benefit massively from the industrial revolution—a small number of fairly wealthy people benefited fairly massively. We have been very conscious of the climate justice side of things. I think that we were the first country in the world to identify climate justice as a specific funding stream and a specific issue that we should be pushing. We have done so at every level. We were one of the first sub-state contributors to the UN climate justice fund and I know that the UN was very grateful for that, because it was able to use Scotland as an example precisely for the reasons that you have laid out."^{cxvii}

138. The Aldersgate Group raised fuel poverty and health as an issue which could be addressed through the Bill, while the Energy Agency commented on the mental health impacts of this.

139. The importance of Scotland playing its part in terms of international justice and its responsibility to developing countries was impressed upon the Committee.

140. Mary Sweetland of the Eco-Congregations said "communities that are suffering the most are the ones that have done least to increase their carbon use. They want Scotland to share its knowledge and experience, rather than selling it to them for profit."^{cxviii} She further noted the importance of sharing the message of climate justice, in her case beyond the work of the churches.^{cxix}

^{cxvi} United Nations Framework Convention on Climate Change: [Adoption of the Paris Agreement](#) (FCCC/CP/2015/L.9/Rev.1)

^{cxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 31

^{cxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 12

^{cxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 13

141. Lord Deben, Chair of the CCC, noted—

” "When you look at the capacity of some countries to meet the targets that they are prepared to sign up to, it is clear that we in the richer countries have to do more. This is the kind of area in which we should be doing more. We should be saying that there is a little bit extra that we can contribute to the general good."^{cxx}

142. On the Bill, Dr Rachel Howell from the University of Edinburgh said the climate justice angle was attractive in terms of messaging to encourage action,^{cxxi} while Gina Hanrahan of WWF suggested a 90% target did not go far enough to address the "equity dimension."^{cxxii}

143. Professor Tahseen Jafry of the Centre for Climate Justice emphasised^{cxxiii} the need to develop structures to support the most vulnerable through a period of transition and for them to be involved in this process.

144. Written submissions, such as those from the Scottish Catholic International Aid Fund (SCIAF) and the Scottish Human Rights Commission,^{cxxiv} highlighted the fundamental importance of climate justice.

145. The Scottish Human Rights Commission^{cxxv} and Keep Scotland Beautiful called for the Sustainable Development Goals, to which Scotland is a signatory, to be reflected in the Bill.

146. The Committee welcomes the Scottish Government's recognition of the importance of ensuring climate justice. However, the Committee considers climate justice requires further focus to ensure Scotland has the necessary structures in place to engage and support the most vulnerable through the period of transition, as well as a responsibility to developing nations. The Committee recommends the Scottish Government give specific attention to this and identify priorities for early action. The Committee looks forward to further discussion on this with the Scottish Government.

Just transition to a low carbon economy

147. Of the climate justice issues discussed, the transition to a low carbon economy received the most attention during consideration of the Bill at Stage 1. The Policy Memorandum states—

^{cxx} Environment, Climate Change and Land Reform, [Official Report](#), 23 October 2018, Col 22

^{cxxi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 27

^{cxxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 5

^{cxxiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 10

^{cxxiv} Written Submission. [Scottish Human Rights Commission](#)

^{cxxv} Written Submission. [Scottish Human Rights Commission](#)

” “We will work to deliver an inclusive, socially just transition to a low carbon economy, based on equal opportunity, a fair and inclusive jobs market, regional cohesion and safe and secure communities.”^{cxxvi}

148. The Committee welcomed the Cabinet Secretary's remark on the opportunities associated with a transition to a low carbon economy—

” “We need to think about the fact that there are potential benefits and opportunities. That should all be harnessed in such a way that we end up with jobs and better working environments. Although some jobs and some job titles may disappear, they will be replaced by others.”^{cxxvii}

149. Some industries, such as transport, housing, and agriculture, were more prevalent than others in the discussion. Notably, support and planning for transition in the agriculture industry received considerable attention.

150. Pete Ritchie of Nourish Scotland described the need for a just transition in agriculture—

” “It means having a new deal with farmers and saying that we will support them if they will support us to deliver on our social objectives for climate change and the environment.”^{cxxviii}

151. While discussing dietary changes, Rachel Howell noted the impact this could have on rural areas and emphasised how important just transition would be.^{cxxix} However, she also noted more generally that—

” “I certainly do not feel that rural areas should be disadvantaged, but no policy can be brought in without some disadvantage to some people. We have to try to mitigate that disadvantage, but we cannot simply say that we cannot do anything because there will be some disadvantage to some people. We have to consider how to offset that. There are ways in which we might be able to do that. If we simply say that we cannot bring in the policies that we need in order to change behaviour at the required level, we are accepting 3°C to 4°C warming by the end of this century, which will be a tremendous disadvantage for everybody.”^{cxxx}

152. Several witnesses spoke of the potential negative impact a badly managed transition could have in rural areas and on those working in the agriculture industry.

^{cxxvi} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 72

^{cxxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 33

^{cxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 16

^{cxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 15

^{cxxx} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 15

153. Elizabeth Leighton of the Existing Homes Alliance spoke^{cxxxix} of the need for a transition to be just for energy consumers too, noting the balance between rural and urban areas could be redressed in this way.
154. Energy was discussed at length by many stakeholders, including Anders Wijkman of Climate-KIC, who noted the need for a European-wide debate regarding support for communities reliant on the coal industry.^{cxxxii}
155. Oil and gas was another area generating much discussion on the need for careful prior planning. As Will Webster of Oil & Gas UK noted, a just transition "means making the most of the expertise that we have in the traditional energy sectors, including the several hundred thousand jobs that there are in oil and gas."^{cxxxiii}
156. The advice of the CCC was based on an expectation that the oil and gas sector will continue to represent an important part of Scotland's energy mix for years to come. However, the Committee received mixed evidence on this.
157. Tom Thackray of the CBI said—
- ” "There is huge expertise and supply chain capability in the oil and gas industry that needs to be celebrated. There needs to be a managed transition as we get the most out of the resources that we have. The Scottish and Westminster Governments and the industry need to have an honest conversation about that. There are massive opportunities in new forms of energy generation that are particularly relevant to Scotland. We know the prowess of the wind companies here, and there are supply chain opportunities. There has to be a transition; I think that the industry accepts that. We are not yet exploiting the new generation capability that we have for renewables, particularly because we do not have the routes to market through, for example, the CFD.^{cxxxiv} If signals on that are sent early enough, that would enable industry to invest, which could pick up some of the slack in the overall economy. A signal of change to the CFD would be critical for the UK generally, but for Scotland specifically."^{cxxxv}
158. Mai Muhammad, of Aberdeen City Council, discussed the importance of transferable skills, of investing in hydrogen, district heating and air source pumps, and of training in her response^{cxxxvi} to how Aberdeen, as a city, was responding to decarbonisation and maintaining its reputation as the city of energy.

cxxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 39

cxxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 24

cxxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 40

cxxxiv CFD = Contract for difference

cxxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 57

cxxxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 23

159. Gina Hanrahan said there was a "managed decline" for the sector^{cxxxvii} while others had a more positive view of its future contribution.
160. Angus McCrone of Bloomberg New Energy Finance warned^{cxxxviii} against assuming the oil and gas sector would decline imminently. Will Webster described^{cxxxix} how the industry was viewing its future in two time-frames - up to 2035 and beyond. He was optimistic about the future and spoke^{cxli} of the expertise that existed in the sector and how this could be utilised across a low carbon economy. Fabrice Leveque of Scottish Renewables highlighted^{cxlii} the emerging partnership with the offshore wind sector to make the most of the skills that existed. Dave Moxham of the Just Transition Partnership predicted^{cxliii} a future for oil and gas, but noted that potential skills transfers needed to be identified and examined now.
161. Consumer choice and fair trade, as well as global jobs and skills, were also discussed^{cxliiii} as just transition issues.

162. The Committee supports the Scottish Government's objective of an inclusive, socially just transition to a low carbon economy. The Committee agrees with the Cabinet Secretary that there are potential opportunities arising from the transition and would like to see Scotland at the forefront of exploring, developing and investing in these opportunities. The Committee believes there is likely to be a role for the Just Transition Commission in looking at the skills required across the economy, and in working with educational institutions to support this. The Committee recommends the Scottish Government report progress on this work to the Committee at the earliest opportunity.

Just Transition Commission

163. The Scottish Government's Programme for Government in 2017 stated—

^{cxxxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 12

^{cxxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 27

^{cxxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 32

^{cxli} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 40

^{cxlii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 41

^{cxliii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 23

^{cxliiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 22

” “We will establish a Just Transition Commission to advise Scottish Ministers on adjusting to a more resource-efficient and sustainable economic model in a fair way which will help to tackle inequality and poverty, and promote a fair and inclusive jobs market.”^{cxliv}

164. Some stakeholders (such as Stop Climate Chaos Scotland, Keep Scotland Beautiful, Unite the Union, the Levenmouth Rail Campaign and Clear Buckhaven) suggested that the establishment of a Just Transition Commission should be included in the Bill.
165. When questioned in June 2018, Scottish Government officials said there was not evidence that the Commission would require statutory footing in order to provide valuable advice.^{cxlv} Still the Cabinet Secretary noted that she was open to having an "upfront debate"^{cxlvi} about it, including what the practical implications of this would be.
166. However, the Cabinet Secretary appeared to be more resistant to this in November 2018. She explained^{cxlvii} to the Committee that the Commission had already been established, with a chair appointed and members soon to be added. She anticipated the first meeting would take place in January 2019 and that the Commission would report within 2 years. She also suggested that placing the Commission on statutory footing via the Bill would mean having to halt the work of the informal Commission and begin a lengthy and expensive process of setting up a statutory commission.
167. The Cabinet Secretary made the point that legislation was not needed to set up the Commission. However, groups such as Friends of the Earth Scotland^{cxlviii} argued that the long-term nature of the group's work necessitated a statutory footing to guarantee its future. The Committee pressed this point and was told that the Commission was not the only place where important issues were considered.^{cxlix}
168. On the question as to whether the Commission should have statutory footing, Dave Moxham argued that the commission was a key way to bridge the gap between the idea and the delivery, and to engage with key institutions, such as the national investment bank, local authorities and enterprise agencies. He proposed that—

cxliv Scottish Government (2017), [A Nation with Ambition: The Government's Programme for Scotland 2017-18](#)

cxlv Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 16

cxlvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 31

cxlvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 9

cxlviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 12

cxlix Environment Climate Change and Land Reform Committee, [Official Report](#), 12 November 2018, Col 12

” “.the commission should be in legislation, because that would be a statement of future intent. It should be suitably independent, because that would make it operate more effectively.”^{cl}

169. Professor Tahseen Jafry questioned the clarity of what the "commission would be about and what it would involve."^{cli} Dave Moxham also told the Committee—

” "We need to ensure that the innovation from the R and D is properly built into an industrial strategy and that, if there are gaps between the technology and the delivery, we can deliver the plan, even if that involves Government investment. In advising the Government, the just transition commission has a real role in filling that gap."^{clii}

170. Furthermore, he suggested^{cliii} that undertaking a cost-benefit analysis of mitigating climate change could be a role for the Just Transition Commission and stated^{cliv} that it might support the work of the CCC in providing advice to the Scottish Government.

171. In its written submission, the Just Transition Partnership suggested the Commission should:

- "advise Government and all relevant agencies on making the transition to a prosperous low-carbon economy in which the costs and rewards are shared fairly; and report on measures put in place to ensure that livelihoods of workers and of communities are protected and social equity is enhanced."^{clv}
- Report to ministers and those reports should be laid before Parliament.

172. It suggested the Bill should include the establishment of the Just Transition Commission and said it should:

- "include a commitment that a Just Transition approach will be applied to the delivery of climate change targets, protecting livelihoods, enhancing social justice and contributing to a fairer and more equal Scotland;
- include reporting requirements on Just Transition in the Climate Change Plan i.e. on how proposals and policies will affect employment in different sectors, what measures should be put in place to support the transition of the workforce

^{cl} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 27

^{cli} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 11

^{clii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 9

^{cliii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 28

^{cliv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 29

^{clv} Written Submission. [Just Transition Partnership](#)

and related communities, and the scale and sources of investment. Ministers should report annually on progress towards this; and

- put the Just Transition Commission on a statutory basis in order to give it the status needed to carry out these functions effectively and help drive the changes needed, for the duration of the climate targets laid out in the Bill."

173. It is not clear to the Committee why an informal commission established to consider issues of just transition would have to cease its work were a commission on a statutory footing to be proposed. It considers there have been other areas, such as land reform, where informal work has led to the establishment of a formalised body, underpinned by legislation. It is also concerned about the short-term life span of the informal commission, given the significance of the issue. The Committee asks the Scottish Government to reflect on this and consider the points raised by stakeholders above.

174. The Committee recommends that the Scottish Government keep an open mind and, in advance of consideration of the Bill at Stage 2, reflect on the possibility of establishing a Just Transition Commission with statutory underpinning. The Committee would welcome further discussion on this and on the merits, or otherwise, of establishing a Just Transition Commission as an independent parliamentary commission.

Intergenerational Justice

175. Since its establishment, the Committee has made young people one of its key audiences for engagement in its work. Further detail of how it has incorporated this into its work on the Bill is available in the section of this report.

176. This included taking evidence from young people and groups working with young people to ensure their voices were reflected in the evidence received.

177. Siri Pantzar of the Climate 2050 Group told the Committee of the need for intergenerational justice to sit alongside international justice, and said—

” It will be much more just and productive to make the change at this point, when we have a bit of wriggle room and a bit of space for a managed transition, rather than in 2030 or 2040. We might not have that budget then, so our options would be different.”^{clvi}

178. Stakeholders such as Mary Sweetland of Eco-Congregation Scotland^{clvii} and Adam Price^{clviii} also told the Committee about the importance of acting to mitigate climate change in the interests of future generations. Siri Pantzar spoke of the need to focus on "intergenerational equity and justice"^{clix} now, while Alan Munro of Young Friends of the Earth Scotland urged the Government to revise the 2030 target, as

current legislation "passes the burden for the more radical transformative action to young people: we will have to address it in the future if you do not address it now."^{clx}

179. The Committee urges the Scottish Government to continue to place a priority on intergenerational justice and to ensure that the purpose of the Bill is underpinned by this. In advance of Stage 2 the Committee asks the Scottish Government to consider how this can best be reflected on the face of the Bill.

Review of the 2009 Act

180. The Climate Change (Scotland) Act 2009 was heralded for its consensual and ambitious approach to setting climate change targets and strategies to meet them. The Act was not limited to the target setting framework, but included policy measures. In considering the scope of the Bill, the Committee was keen to hear how these had been considered and reviewed.
181. Sara Grainger, the Scottish Government's Decarbonisation: Delivery Unit Team Leader, said—
- ” "there is a strong feeling that the 2009 act is working. The framework that we have in Scotland is achieving a great deal, and Scotland is doing very well at reducing emissions. The proof of the pudding is in the eating: the act is doing its job. The aim of the bill is really just to increase the targets."^{clxi}
182. However, the Committee notes that the Government has taken the opportunity presented by the Bill to update some parts of the 2009 Act it did not consider to be working well, mainly regarding reporting.^{clxii} Furthermore, the Cabinet Secretary informed^{clxiii} the Committee of work undertaken to review the engagement strategy under the Act, which she said needed revisions.

clvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 13

clviii Written submission. [Adam Price](#)

clix Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 4

clx Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 15

clxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 6

clxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 6

clxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 13

183. The Committee received evidence suggesting a review of the operation of the 2009 Act should have been undertaken, particularly when setting new targets.
184. The Committee also notes that whilst international aviation continues to be included in the Scottish Greenhouse Gas Inventory, further consideration of calculation methods (as recommended by the CCC in 2010), in particular in relation to a multiplier to reflect the direct and indirect non-carbon dioxide impacts of emissions at altitude, does not appear to have been carried out. This might have been resolved, had there been a review of the 2009 Act.
185. The Committee considers it challenging to set targets in isolation from consideration of implementation. While a review and setting of new targets is welcome, excluding or divorcing this from a full consideration of policy measures is a missed opportunity. The Committee is also aware there has been no review of the other elements of the 2009 Act. The Committee believes that a review of the operation of the 2009 Act should have been undertaken to inform the Bill and recommends that the Scottish Government now undertake this review.

Local Authority Energy Efficiency Discount Schemes

186. One of the areas of the 2009 Act the Committee was interested in was local authority energy efficiency discount schemes.
187. Sections 65 and 67 of the Climate Change (Scotland) Act 2009 provide for domestic and non-domestic energy efficiency discount schemes. Section 65 requires Local Authorities to—
- ” “[...] establish a scheme for reducing the amounts which persons are liable to pay in respect of council tax where improvements are made to the energy efficiency of chargeable dwellings.”
188. The Committee wrote to all 32 local authorities^{clxiv} regarding Energy Efficiency Discount Schemes, and asked how they had implemented the provisions, in particular:
- Details of the schemes running in their local authority area;
 - Uptake of the opportunity offered by the schemes; and
 - Evaluation and review of the success of the schemes.
189. Responses were received from 12 local authorities and the Scottish Parliament Information Centre (SPICe) produced a summary^{clxv} of these. In short, uptake under the schemes has been low; this appears, predominantly, to be because other energy efficiency schemes offered better value. Angus Council is the only local authority that responded to the Committee currently operating a scheme. A total of 651 properties have benefitted from this scheme, with a total Council Tax saving of £33,865.

clxiv [Letter](#) from the Environment, Climate Change and Land Reform Committee to local authorities on energy efficiency discount schemes, 29 June 2018

190. In written evidence on the Bill, the Energy Saving Trust states—

” It is important to point out that while the way in which these schemes was implemented (i.e. with CERT funding) was entirely understandable, it was not necessarily done in the way that was originally intended or in a way that was likely to maximise uptake. As noted above the 2005 Energy Saving Trust work saw the provision of this type of discount as an additional discount (i.e. a discount in addition to existing CERT offers) that would provide the “nudge” necessary to get certain householders to take action. However, funding these schemes solely under CERT meant that the discounts were essentially re-packaged CERT offers and not CERT offers plus a council tax discount and meant that these schemes competed with, as opposed to added to, existing CERT offers.”^{clxvi}

191. In relation to s67 and non-domestic rates. Highland Council states—

” [...] the Secretary of State has the power to set the non-domestic rate poundage. While section 67 of the 2009 Climate Change Act gives the additional power to prescribe the amount of non-domestic rate to those who are energy efficient, we are not aware that the Secretary of State has ever exercised this power i.e. introduced a different poundage for energy efficient non-domestic properties.”^{clxvii}

192. Similarly, Orkney Islands Council sought clarification, and stated—

” Section 67 of the 2009 Act refers to section 153 of the Local Government etc. (Scotland) Act 1994 which appears to be principally about the powers of the Secretary of State to prescribe the amount of non-domestic rates and it is not clear what discounts should be offered by the Council.”^{clxviii}

193. It appears there is confusion as to how such schemes should be implemented and questions as to whether these are being used as additional measures to effect behaviour change. This appears to be an area of the 2009 Act that is not working as effectively as it could and is worthy of further consideration by the Scottish Government.

194. The Committee recommends that the Scottish Government carry out a review of the operation of sections 65 and 67 of the Climate Change (Scotland) Act 2009 and consider how this could be improved across Scotland.

clxv Scottish Parliament Information Centre (2018). Climate Change (Emissions Reduction Targets) (Scotland) Bill – Stage 1 Energy Efficiency Discount Schemes, 5 October 2018

clxvi Written Submission. [Energy Savings Trust](#)

clxvii [Letter](#) from Highland Council to the Committee on local authority energy efficiency discount schemes, 24 July 2018

clxviii [Letter](#) from Orkney Islands Council to the Committee on local authority energy efficiency discount schemes, 5 July 2018

Public Sector Reporting

195. The Committee, and its predecessor, the Rural Affairs, Climate Change and Environment Committee, have taken an interest in the public sector reporting duty since its establishment.
196. Chris Wood-Gee of the Sustainable Scotland Network, which runs the public sector reporting duty, told the Committee that the duty was now in its third full year and—
- ” ”The process will need tweaking. We have worked with it for long enough to understand what the good bits are and where there are opportunities to improve it. It might be good for the Scottish Government to consider that.”^{clxix}
197. Paul Gray of NHS Scotland detailed the benefits of reporting and noted that "as public services are publicly accountable... there should be no resistance to reporting."^{clxx} When asked whether there should be penalties for public bodies failing to demonstrate progress, he noted that incentives should be built into the process in the first instance, while measures such as budget relocations could be applied if progress is still lacking.^{clxxi}
198. Mai Muhammad of Aberdeen City Council said—
- ” ”With the carbon reduction commitment, a lot of people make their reports and pay for the carbon—and that is it for the year. Because there are no incentives, penalties or whatever, the scheme has not delivered what it initially set out to deliver, and what is proposed might go down the same route.”^{clxxii}
199. Tom Thackray of the CBI provided background on the private sector experience of reporting and said they bought into the idea that "what gets measured gets changed."^{clxxiii}
200. Andy Kerr of ClimateXChange said—
- ” ”Public bodies report on climate change but the danger that we have seen with that is that reporting can become simply a tick-box exercise; organisations do not bring it back to the virtuous circle and say what they are going to do to drive further change. That is the challenge. It is not just about public bodies reporting well; they have to ensure that they go back and deliver the outcomes.”^{clxxiv}
201. Anders Wijkman of Climate-KIC described the situation in Sweden—
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clxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 41

clxx Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 42

clxxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 43

clxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 44

clxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 46

clxxiv Environment, Climate Change and Land Reform, [Official Report](#), 23 October 2018, Col 14

” "There is a provision in the law that each and every Government sector—each ministry—has to take account of climate law in all that it does. Climate mitigation and adaptation concerns have to be taken into account in all policy making. That is one of the strongest parts of the legislation and has led to much more integration than was previously the case."^{clxxv}

202. Keep Scotland Beautiful suggested that public sector reporting duty should be addressed within the Bill.

203. The Scottish Government indicated^{clxxvi} in July 2018 that it will review the public sector reporting duty over the coming year and that any action required as a result will be taken through secondary legislation. The Committee hopes the Scottish Government finds the evidence and correspondence it has received useful in its review.

204. The Committee welcomes the commitment from the Scottish Government to review the public sector reporting duty and considers this could have usefully informed the development and content of the Bill. The Committee has also agreed to consider the public sector reporting duty following the most recent publications. The Committee would welcome clarification from the Scottish Government on the timescales and remit of its review, including whether results will be available before the end of the parliamentary year in June 2019.

Land Use Strategy

205. Scottish Environment LINK advocated a strengthening of the land use strategy, a key commitment in the Climate Change (Scotland) Act 2009. It said—

” "the Strategy has not been properly implemented and the benefits arising from better and a more coherent land use policymaking has not been delivered, including emissions reductions in the agriculture and land use sectors. Despite the opportunities for climate change mitigation and adaptation through land use change, sectoral priorities continue to be set in isolation of each other, which fails to maximise the potential benefits to be gained from a more coordinated approach to land use in Scotland."

206. They suggested the Bill should legislate for—

^{clxxv} Environment, Climate Change and Land Reform Committee, *Official Report*, 30 October 2018, Col 27

^{clxxvi} [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

- ” • "A Land Use Strategy Action Plan, outlining the specific actions and milestones to deliver the policies and proposals;
- An annual progress report, to be laid before the Scottish Parliament; and
- A duty on Ministers to establish Regional Land Use Frameworks, in all parts of Scotland.^{clxxvii}

207. The Committee remains concerned that the potential benefits of the Land Use Strategy have not been fully realised and supports a more coordinated approach to land use in Scotland.

Other types of targets suggested for inclusion

208. While the Bill focuses on emissions reduction targets, there were many calls for other targets to be included within the Bill, some of these related to creating targets and frameworks for particular sectors.
209. There were also various suggestions for targets other than emissions reduction (relating to sectoral performance) to be included in the Bill:
- Energy performance certificates standard C by 2025 or 30 (suggested by WWF Scotland,^{clxxviii} Unison Scotland,^{clxxix} and Stop Climate Chaos Scotland,^{clxxx} among others -- although Suzy Goodsir of Greener Kirkcaldy suggested^{clxxxi} that education was required to make these a meaningful currency in terms of home purchases)
 - Zero carbon buildings by 2050 (as advocated by the Existing Homes Alliance)^{clxxxii}
 - Fossil fuel vehicles to be phased out by 2030 (as suggested by WWF Scotland)^{clxxxiii}
 - Nitrogen Budgets to be set for the agriculture sector (as proposed by WWF Scotland,^{clxxxiv} among others)
 - 100% renewable energy generation (Industrial Biotechnology Innovation Centre)^{clxxxv}
 - Statutory targets for land in organic management (Nourish Scotland)^{clxxxvi}
 - Increased targets for agroforestry in Scotland (Scottish Environment LINK)^{clxxxvii}

^{clxxvii} Written Submission. [Scottish Environment LINK](#)

^{clxxviii} Environment, Climate Change and Land Reform Committee, *Official Report*, 20 November 2018, Col 8

210. The Existing Homes Alliance^{clxxxviii} called for statutory targets and a framework to manage energy efficiency measures. Elizabeth Leighton argued for the inclusion of energy efficiency measures and targets relating to energy efficiency.^{clxxxix} She raised concerns about further delays and the implementation of the energy efficient Scotland programme, which will go into the implementation phase from 2020.^{cxc}
211. Unison Scotland and Stop Climate Chaos Scotland^{cxcj} called for the Bill to create a Zero Carbon Infrastructure Commission.

212. The Committee recommends that the Scottish Government consider the proposals and benefits of including additional types of targets within the Bill in advance of Stage 2.

clxxxix Written Submission. [Unison Scotland](#)

clxxx Written Submission. [Stop Climate Chaos Scotland](#).

clxxxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 24

clxxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 46

clxxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 8

clxxxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 8

clxxxv Written Submission. [Industrial Biotechnology Innovation Centre](#)

clxxxvi Written Submission. [Nourish Scotland](#)

clxxxvii Written Submission. [Scottish Environment LINK](#)

clxxxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 30

clxxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 35

cxc Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 35

cxcj Written Submission. [Stop Climate Chaos Scotland](#).

The Climate Change (Emissions Reduction Targets) (Scotland) Bill

213. The Climate Change (Emissions Reduction Targets) (Scotland) Bill was introduced in the Scottish Parliament on 23 May 2018. The Policy Memorandum to the Bill states that "The primary objective of the Bill is to raise the ambition of the greenhouse gas emissions reduction targets that are set out in the Climate Change (Scotland) Act 2009."^{cxcii} It also states that the target levels proposed in the Bill are "arguably the most ambitious legislative targets in the world given that they include international aviation and shipping and a default position that they must be achieved through domestic effort alone."^{cxci}
214. According to the Policy Memorandum, the Bill "reaffirms the Scottish Government's commitment to remain at the forefront of global ambition"^{cxci} and notes its secondary objective is to improve transparency in the way emissions are measured and targets are reported upon.
215. The following sections of this report will consider each of the parts and provisions of the Bill.

Part One - Emissions Reduction Targets

The current targets

216. Part one of the Bill is concerned with setting new targets for emissions reduction.
217. The current targets are set out in Part One the Climate Change (Scotland) Act 2009^{cxci} and are as follows—
- A 2050 target of 80%;
 - A 2020 target of 42% (known as the "interim target");
 - Secondary legislation setting annual targets between 2010 and 2050 which would "allow the interim target and the 2050 target to be met"^{cxci} and for the targets set between 2020 and 2050 to be "at least 3% less than the target for the preceding year"^{cxci};
 - A requirement on the Scottish Government to seek advice from the "relevant body"^{cxci} and consider the "target setting criteria"^{cxci} when setting annual targets;

^{cxcii} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 4

^{cxci} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 11

^{cxci} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 4

- Modification of—
 - the percentage of 3% by which annual targets between 2020 and 2050 should be made more challenging^{cc};
 - the dates by which annual targets should be set^{cci};
 - the target setting criteria^{ccii};
 - annual targets,^{cciii} but only to make them more challenging^{cciv};
- A requirement that at least 80% of the reduction in the net Scottish emissions account in any target year must be from net Scottish emissions reductions (known as the domestic effort target, its effect is to limit the amount of the target which can be met through carbon trading); and
- The Scottish Government to request a progress report from the relevant body each year.^{ccv}

218. It also provides for other matters, including:

- A definition of the greenhouse gases covered by the targets;^{ccvi}
- A definition of the baseline,^{ccvii}
- A definition of the net Scottish emissions account,^{ccviii}
- The inclusion of Scotland's share of international aviation and shipping emissions in calculating progress towards the target;^{ccix}
- The ability to include "removals" from carbon sequestration in the target,^{ccx}
- International carbon reporting practice;^{ccxi} and
- Carbon units and accounting,^{ccxii} and the limit on the use of carbon units.^{ccxiii}

^{cxcv} [Climate Change \(Scotland\) Act 2009 \(asp 12\)](#)

^{cxcvi} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 3\(2\)\(b\)](#)

^{cxcvii} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 3\(2\)\(c\)\(ii\)](#)

^{cxcviii} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 5](#)

^{cxcix} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 4\(4\)](#)

^{cc} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 6\(1\)\(a\)](#)

^{cci} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 6\(1\)\(c\)](#)

^{ccii} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 6\(1\)\(d\)](#)

^{cciii} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 6\(1\)\(b\)](#)

^{cciv} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 6\(8\)\(b\)](#)

^{ccv} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 9](#)

^{ccvi} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 10](#)

^{ccvii} [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 11](#)

The advice of the Committee on Climate Change on the form of future emissions targets

219. In March 2016, the Committee on Climate Change (CCC), which is the "relevant body" under the 2009 Act, provided advice to the Scottish Government on appropriate levels of targets for the years 2028 - 2032. This advice^{ccxiv} outlined a "central scenario" and a "high ambition scenario."
220. Following its commitment to set more challenging targets for emissions reduction via new legislation, the Scottish Government again sought the advice of the CCC in October 2016. It requested the CCC's view on four areas relating to the proposed legislation^{ccxv}—
- Appropriate level of future emissions;
 - Form of future emission reduction targets;
 - Future accounting framework; and
 - Flexibility to update emissions reduction targets.
221. The advice^{ccxvi} was published in March 2017. In October 2017, the Cabinet Secretary wrote to the Chair of the CCC, Lord Deben, to request updated advice and this was published^{ccxvii} in December 2017.
222. In its updated advice,^{ccxviii} the CCC noted that it had "re-examined whether a 90% reduction by 2050 is still consistent with our High Ambition Scenario" in light of new estimates for emissions released in June 2017 and "further information about planned developments in greenhouse gas measurement."^{ccxix} The CCC stated that its "updated analysis concludes that a 90% reduction on 1990 levels by 2050 is still feasible for Scotland on the basis of the current estimation methods and evidence published to date."^{ccxx}

ccviii [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 13](#)

ccix [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 16](#)

ccx [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 17](#)

ccxi [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 19](#)

ccxii [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 20](#)

ccxiii [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 21](#)

ccxiv [Committee on Climate Change \(2016\), *Scottish Emissions Targets 2028-2032: The high ambition pathway towards a low carbon economy*](#)

ccxv [Specification from the Scottish Government for the Committee on Climate Change advice \(2017\)](#)

ccxvi [Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017](#)

ccxvii [Letter from the Chair of the Committee on Climate Change \(CCC\), Lord Deben, to the Cabinet Secretary for Environment, Climate Change and Land Reform, Roseanna Cunningham, providing updated advice on the content of the proposed Climate Change Bill, 20 December 2017](#)

223. In its original advice, the CCC presented two options for setting the target levels in the Bill—

- ” 1. Keep the target for a reduction in greenhouse gas emissions of at least 80% by 2050 with subsequent reviews to increase ambition.
2. Set a ‘stretch’ target for a reduction in greenhouse gas emissions of 90% by 2050, potentially accompanied by a net-zero CO2 target for 2050.”^{ccxxi}

Option One

224. The CCC noted Option One was consistent with limiting the global temperature rise to around 2°C, and that options to go further should be maintained by setting a challenging 2030 target and setting review points, aligned with the pledge and review process created by the Paris Agreement. Option One recognised the need for high levels of ambition and suggested it was “appropriate to set targets at least to 2030 that keep open the option of more ambitious longer-term reductions.”^{ccxxii}

Option Two

225. Option Two represented a more ambitious path. This option was selected by the Scottish Government and is reflected in the Bill.

226. Option Two proposes a “stretch target for a greenhouse gas reduction of 90% by 2050, potentially accompanied by a net-zero CO2 target for 2050.”^{ccxxiii} It is described as being at the “limit of the measures the Committee has identified to reduce emissions in Scotland and would require strong progress across every area of the economy.”^{ccxxiv} On Option Two, the CCC also makes the following points—

- The CCC has not been able to calculate the cost of a “scenario that achieves this target.”
- Option Two means a reduction of CO2 to zero, “with the residual net positive emissions comprising non-CO2 greenhouse gases (primarily methane and nitrous oxide from farming)”^{ccxxv}

ccxviii [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform providing updated advice on the content of the proposed Climate Change Bill, *20 December 2017*

ccxix [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform providing updated advice on the content of the proposed Climate Change Bill, *20 December 2017*

ccxx [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform providing updated advice on the content of the proposed Climate Change Bill, *20 December 2017*

ccxxi Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 9

ccxxii Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 13

- Strong, well-designed policies would be required to achieve a 90% target and the CCC suggest "it would be important to identify the areas in which Scotland will go further than the UK as a whole, the role for greenhouse gas removal options (including afforestation, use of wood in construction, bioenergy with carbon capture and storage and a range of other options), and whether relevant policy levers are under Scottish or UK Government control."^{ccxxvi}
- Legislation should allow for the creation of a net-zero target "once the evidence base has been strengthened."^{ccxxvii}

227. The Bill's policy memorandum states—

- ” "The Scottish Government accepted the CCC high ambition scenario as Scotland's targets should be very challenging, and should reflect a fair contribution to maintaining global temperatures to well below 2°C above pre-industrial levels as set out in the Paris Agreement."^{ccxxviii}

228. The Committee recognises that the Scottish Government selected the more ambitious of the two options proposed by the Committee on Climate Change, which highlights what will be required from governments around the world to keep temperature rises closer to 1.5°C than 2°C. However, it notes that the Scottish Government is awaiting further advice from the Committee on Climate Change in light of the 2018 IPCC report.

Age of the advice

229. The Committee received various pieces of evidence commenting on the information the CCC had based its analysis on, including from WWF Scotland who stated—

- ” "That was based on 2015 advice developed for the fifth carbon budget at the UK level. There is a really exciting global conversation happening now about net-zero and 1.5°C, stimulated by the Paris Agreement, which means that a plethora of new research is being produced that tackles the feasibility question."^{ccxxix}

^{ccxxiii} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 13

^{ccxxiv} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 13

^{ccxxv} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 13

^{ccxxvi} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 13

^{ccxxvii} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 13

^{ccxxviii} [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Bill. Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 11

230. The Committee is mindful that previous CCC advice was based on the best evidence available at the time, and there will always be a cut off point. However, it is also aware that there have been significant developments in the period since the publication of the advice and the consideration of the Bill, which have been incorporated into its view of the proposed legislation. The Committee welcomes the Scottish Government's request for updated advice.

Section one - The Net-Zero Emissions Target

231. Section 1 of the Bill proposes to insert a new section into the 2009 Act which allows for a "net-zero" target of a reduction of greenhouse gas emissions of 100% from the 1990 baseline. Proposed section A1(1) states—

” The Scottish Ministers must ensure that the net Scottish emissions account for the net-zero emissions target year is at least 100% lower than the baseline (the target is known as the “net-zero emissions target”).”^{ccxxx}

232. Proposed section A1(2) states—

” The Scottish Ministers may by regulations specify a year which is to be the year in which the net-zero emissions target is to be met (the year specified in the regulations is known as the “net-zero emissions target year”).”^{ccxxx}

233. Ministers are also required to publish a statement^{ccxxxii} explaining their reasons for choosing the target year, the "extent to which the proposed net-zero emissions target year takes account of the target-setting criteria"^{ccxxxiii} and whether their actions are consistent with the most recent advice of the relevant body (in practice, the CCC).

234. The Delegated Powers and Law Reform (DPLR) Committee recommended in its Stage 1 Report on the Bill that the "Scottish Government brings forward an amendment for the power in section A1 (introduced by section 1 of the Bill), mirroring for that power the provision that is made at new section 2A(3) (introduced by section 4 of the Bill)."^{ccxxxiv} This is to ensure that in making the regulations setting the net-zero year, Ministers should have regard to the target setting criteria and whether this position is consistent with the most up-to-date advice from the CCC.

235. Much of the debate on the Bill has concerned whether a target year should have been included on the face of the proposed legislation. There were stakeholders who

ccxxix Environment, Climate Change and Land Reform Committee, *Official Report*, 20 November 2018, Col 5

ccxxx [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 1

ccxxxix [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 1

ccxxxii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 1, A1(3)

ccxxxiii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 1, A1(3)

ccxxxiv Delegated Powers and Law Reform Committee. 57th Report, 2018 (Session 5). *Climate Change (Emissions Reduction Targets) (Scotland) Bill: Stage 1* (SP Paper 423), paragraph 23

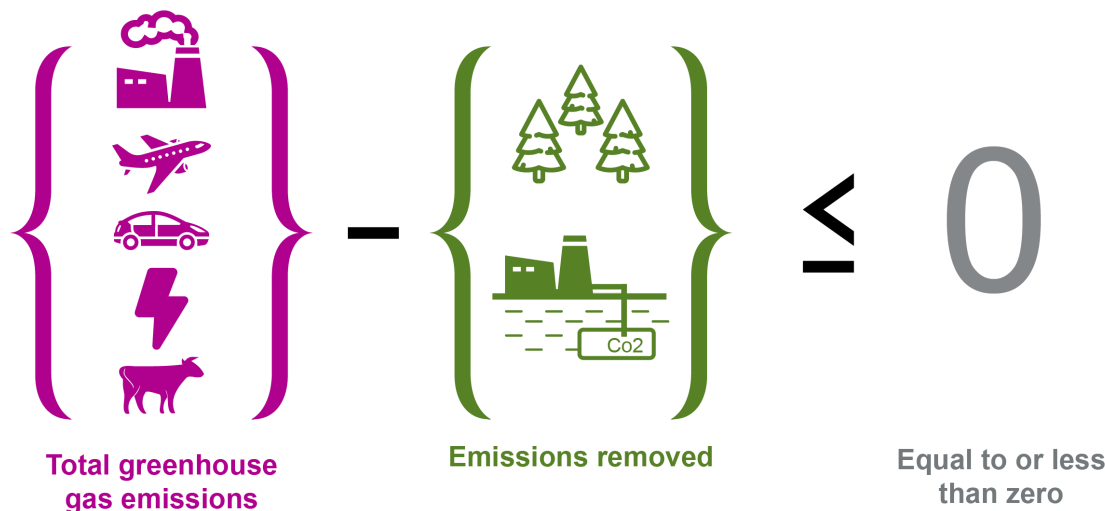
welcomed the approach taken by the Scottish Government in the Bill, such as the Scottish Hydrogen and Fuel Cell Association, NHS Lothian, the Scotch Whisky Association, the Soil Association, Keep Scotland Beautiful, the Industrial Biotechnology Innovation Centre, SSE and the Strathclyde Partnership for Transport.

236. However, other evidence received by the Committee suggested the net-zero year should be set now in the Bill, including from Action Aid International, Scottish Environment LINK, Friends of the Earth Scotland, the 2050 Climate Group and WWF Scotland.^{ccxxxv}

237. The Committee supports the recommendation of the Delegated Powers and Law Reform Committee and recommends that the Scottish Government bring forward an amendment to make it explicit that in preparing regulations to specify the net-zero target year, Ministers must have regard to the target setting criteria and whether the position is consistent with the most up-to-date advice from the Committee on Climate Change.

Definition of "net-zero"

What does “net zero” mean?



Source: Scottish Parliament 2019

238. The Committee is aware that the use of the term “net-zero” is used differently depending on what is being described, and the term is not always clearly defined. The Climate Change Bill states in Part 1 that—

” “The Scottish Ministers must ensure that the net Scottish emissions account for the net-zero emissions target year is at least 100% lower than the baseline (the target is known as the “net-zero emissions target”).”

239. In the context of the Bill, the Committee understands that “net-zero” means that the balance of greenhouse gas emissions *emitted* by sources, and *removed* by sinks across one year (as measured by the net Scottish emissions account) is equal to or less than zero. Generally, this means that those emissions which do take place must be counterbalanced by sequestration from other sources to achieve “net-zero.” The glossary of this report has an expanded definition.

240. Analogous terms to net-zero such as “zero carbon” or “carbon neutral” are not referred to in the Bill or 2009 Act. They are often used colloquially to refer to the net-zero emissions target as defined by the Bill. The Committee notes the distinction between “net-zero carbon” and net-zero for all greenhouse gases, made by the Scottish Government, in evidence to the Committee at its meeting on 19 June 2018 when it was confirmed that—

” “the plans... encompassed in the bill represent a net-zero carbon target for 2050 and that the 10 percentage points difference between 90 per cent and 100 per cent relate entirely to the five gases other than carbon, of which the predominant one is methane”

241. The Committee understands this distinction between “net-zero carbon” and net-zero for all greenhouse gases refers to the Scottish Government’s climate change mitigation plans, rather than a distinction made by the targets in the Bill. The Committee also notes that an additional gas (fluorocarbon) has been added since the 2009 Act (via secondary legislation) to the gases which the Bill seeks to address.

242. The Committee believes there are a number of ways to understand “net-zero” and numerous similar terms are used inter-changeably. The Committee considers it would be helpful to have clarity as to what the term “net-zero” means within the context of the Bill and recommends the Scottish Government make clear their definition of “net-zero.”

Is net-zero the right target?

243. The Committee heard a range of evidence on the targets that should be included in the Bill and when they should be set. This evidence is considered throughout this report, but it has led the Committee to ask the fundamental question of whether a percentage of emissions reduction by a certain date was the right objective.

244. When asked by the Committee if the Bill was adequate in terms of delivering the Paris Agreement, stakeholders noted the disconnect between the goal of reducing emissions and the aim of preventing global temperature rises. According to WWF Scotland—

” “one of the fundamental questions that needs to be answered about the bill is what temperature target it is aiming for. There has not yet been enough clarity about that from the Scottish Government.”^{ccxxxvi}

245. The Intergovernmental Panel on Climate Change published "*Global Warming of 1.5 °C - an IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*"^{ccxxxvii} in October 2018. The report sets out the consequences of temperature rises to 1.5°C, which is at the higher end of the ambition of the Paris Agreement.

246. The Committee believes that the Bill should be underpinned by the aims of the Paris Agreement and the international framework set out by the IPCC in terms of temperature. Therefore, a greater degree of clarity is needed from the Scottish Government on this issue.

What temperature target is the Bill aiming for?

247. The Policy Memorandum to the Bill states targets should "reflect a fair contribution to maintaining global temperatures to well below 2°C above pre-industrial levels as set out in the Paris Agreement."^{ccxxxviii}

248. The CCC has said "A 90% reduction in greenhouse gas (GHG) emissions would be more consistent with the temperature limits set out in the Paris Agreement" and "Aligning to the 1.5°C ambition also implies reaching net-zero CO₂ emissions by 2050."^{ccxxxix}

249. When questioned on whether the Bill was aiming to achieve actions associated with a 2°C or 1.5°C temperature rise, the Scottish Government Bill team echoed the wording of the Paris Agreement—

” **Sara Grainger**— ...the Paris Agreement references two targets—trying to keep to well below a 2°C temperature rise and to nearer 1.5°C.

Mark Ruskell— So what is the target? Is it well below 2°C? Is it 1.6°C or 1.5°C, or is it 2°C and then going back to 1.5°C? I am not really clear what we are aiming for.

Sara Grainger— I do not think that we can be any more clear than the Paris Agreement."^{ccxli}

^{ccxxxvii} Intergovernmental Panel on Climate Change. (2018) *Global Warming of 1.5 °C - an IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*

^{ccxxxviii} Climate Change (Emissions Reduction Targets) (Scotland) Bill. *Policy Memorandum* (SP Bill 30-PM, Session 5 (2018)), paragraph 11

^{ccxxxix} Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017, Chapter 2: Appropriate Levels of Emissions Targets, page 28

250. The Committee probed this further and was told by Sara Grainger: "we are sufficiently clear on that and understand the need and purpose of the Paris Agreement to limit temperature rise to well below 2°C."^{ccxli}
251. The question of what temperature the Bill is aiming for is important in light of the CCC's advice—
- ” "We concluded in our report on UK climate action following the Paris Agreement that aligning more closely to the 1.5°C ambition implies UK emissions of greenhouse gases in 2050 at least 86-96% below 1990 levels. For Scotland, this equates to a reduction of 89-97% on 1990 levels, as Scottish per-capita emissions in 1990 were above the UK average."^{ccxlii}
252. Tom Russon provided the Scottish Government's interpretation of the advice as—
- ” "The UKCCC's advice on those two options was that remaining at 80 per cent would stay in line with a 2°C goal, while the 90 per cent target would be more in line with a goal of 1.5°C."^{ccxliii}
253. The Scottish Government is of the view that the target of 90% would help limit the rise to 1.5°C and meet the aims of the Paris Agreement, which both the First Minister^{ccxliv} and the Cabinet Secretary^{ccxlv} confirmed. However, many stakeholders (including Friends of the Earth Scotland,^{ccxli} the Existing Homes Alliance,^{ccxlvii} Stop Climate Chaos, Scottish Catholic International Aid Fund, Nourish Scotland, the Scottish Communities Climate Action Network and Unison Scotland) disagreed with the Scottish Government's assessment that the proposed targets in the Bill would achieve the temperature rise limits required by the Paris Agreement.
254. The Committee does not consider the aims of the Bill with regard to temperature to be very clear. In evidence to the Committee, Gina Hanrahan of WWF also emphasised^{ccxlviii} the lack of clarity on the aims of the Bill.

ccxli Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 5

ccxlii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 5

ccxliii Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Chapter 2: Appropriate Levels of Emissions Targets, page 28

ccxliv Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 5

ccxlv Scottish Parliament Conveners Group, [Meeting with the First Minister, Nicola Sturgeon MSP](#), 24 October 2018, page 13

ccxlv Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 2

ccxlvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 2

ccxlviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 30

255. The Cabinet Secretary indicated that she understood these criticisms, but suggested they were of the CCC and not the Scottish Government, as it was on the former's advice that the Bill was based. She also noted that more specific information with regard to temperatures has now been sought from the CCC "on the range that emissions would need to be within to make an appropriate contribution to keeping warming to well below 2°C and to limiting it to 1.5°C."^{ccxlix} She spoke^{cci} further on how this might have an impact on the targets in the Bill and said this might cause the Scottish Government to consider where within the 89% to 97% range to pitch the targets in the Bill.
256. The Committee considered there are several issues with what the Bill is aiming for:
- It jeopardises our ability to contribute to restricting global temperature rises if we do not know what we are aiming for;
 - It weakens the message to the international community and the perceived levels of Scotland's ambition - a common denominator in terms of targets could be the temperature rise restrictions countries are seeking, regardless of how their target system is structured;
 - The Committee has received evidence suggesting a rise of more than 1.5°C which then reduces back to 1.5°C (an overshoot scenario) would be catastrophic; and
 - The environmental and social impacts of the difference between 1.5°C and 2°C are very significant.

^{ccxlviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 4


^{ccxlix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 2

^{cci} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 3

Overshoot scenario

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“The challenge with overshoot is that some climate impacts are irreversible. If we lose a species or a coral reef, we cannot get it back. The question of irreversibility in respect of overshoot is critical. Getting to 2100 having overshoot 1.5° would clearly be far worse than keeping below 1.5° throughout the 21st century.”



Jim Skea // Co-Chair IPCC Working Group III, Intergovernmental Panel on Climate Change

Source: Scottish Parliament 2019

- 257. The Committee believes it is important to be clear on the level of ambition in terms of temperature rises within the Bill as it has received evidence suggesting that a temperature rise of more than 1.5°C, but which then reduces to 1.5°C, endangers Scotland's environment. Therefore, aiming for somewhere in between 1.5°C and 2°C is not sufficient - the Scottish Government should be clear as to the aims and the impacts of those aims.
- 258. The Cabinet Secretary told the Committee: "We chose the tougher of the two targets—we chose a target within the range that would return to 1.5°C."^{ccli}
- 259. She also commented^{cclii} on overshooting as a "global" issue and spoke of the efforts which would be required on the adaptation side were such a thing to happen. However, stakeholders provided extensive evidence to suggest that overshooting and returning to 1.5°C would have disastrous consequences, including Jim Skea from the IPCC.^{ccliii} He explained that the IPCC had examined varying levels of overshoot scenarios and had come to the "robust conclusion that overshoot scenarios have worse outcomes than those in which there is no, or limited, overshoot."^{ccliv}

ccli Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 3

cclii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 5

ccliii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 4

ccliv Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 4

260. In oral evidence to the Committee, Scottish Environment LINK, represented by Jim Densham, warned of the threat of an overshoot scenario to wildlife and humans,^{cclv} with particular reference^{cclvi} to Scotland's biodiversity. Other stakeholders such as WWF and the Scottish Catholic International Aid Fund also warned of an overshoot scenario.
261. The Cabinet Secretary told^{cclvii} the Committee that she was reliant entirely on the view of the CCC when asked whether she thought overshooting 1.5°C was acceptable. The Committee's advice contains the following table:

Table 2.1. Scottish emissions in 2050 and time to reach net zero emissions for paths consistent with the range of ambition implied by the Paris Agreement, assuming Scottish emissions per person equal the global average (the basis of the current 2050 target)

	Below 2°C	Return to 1.5°C
Scottish 2050 GHG emissions (reduction on 1990 levels)	78-87%	89-97%
Year to reach zero Scottish CO ₂ emissions	2055-75	2045-50

Source: CCC calculations based on UNEP (2015) *The emissions gap report 2015*.
Notes: The reductions for Scotland 2050 of 78-87% and 89-97% on 1990 levels are greater in percentage terms than the UK equivalents (for reductions of 71-83% and 86-96% respectively), as Scotland had higher per-capita emissions in 1990 than the UK as a whole.

Source: Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017

262. This indicates a presumption of overshoot. The Cabinet Secretary said—
- ”As I indicated, the return to 1.5°C indicates a target range of between 89 per cent and 97 per cent reduction. The 90 per cent target is at the bottom end of that range, but the UKCCC says that it is at the limits of feasibility. There might, I suppose, be some discussion about the range, unless the UKCCC comes back with a more specific prognosis for net-zero emissions.”^{cclviii}
263. The Committee is concerned about an overshoot scenario given the evidence provided by several stakeholders on the impact this could have across society.

cclv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 6

cclvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 7

cclvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 31

cclviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 3

Difference between 1.5°C and 2°C

264. The IPCC special report lays out in great detail the difference between a 1.5°C and 2°C scenario, regardless of whether this is an overshoot. The Committee took evidence from Jim Skea on 23 October 2018, and he outlined some of these impacts for the Committee. The IPCC special report states that temperature rise to date has already resulted in profound alterations to human and natural systems, bringing increases in some types of extreme weather, droughts, floods, sea level rise and biodiversity loss, and causing unprecedented risks to vulnerable persons and populations.
265. Professor Tahseen Jafry of the Centre for Climate Justice outlined^{cclix} the human cost in terms of health and well-being but added there was also a need to build-up an evidence base. The Committee received extensive evidence from stakeholders such as the British Ecological Society Policy Group,^{cclx} Scottish Environment LINK,^{cclxi} Stop Climate Chaos^{cclxii} and the RSPB on the potential biodiversity impacts of climate change.
266. Some of the impacts highlighted in the IPCC report are summarised below:

Comparison of the impacts of climate change between 1.5°C and 2°C

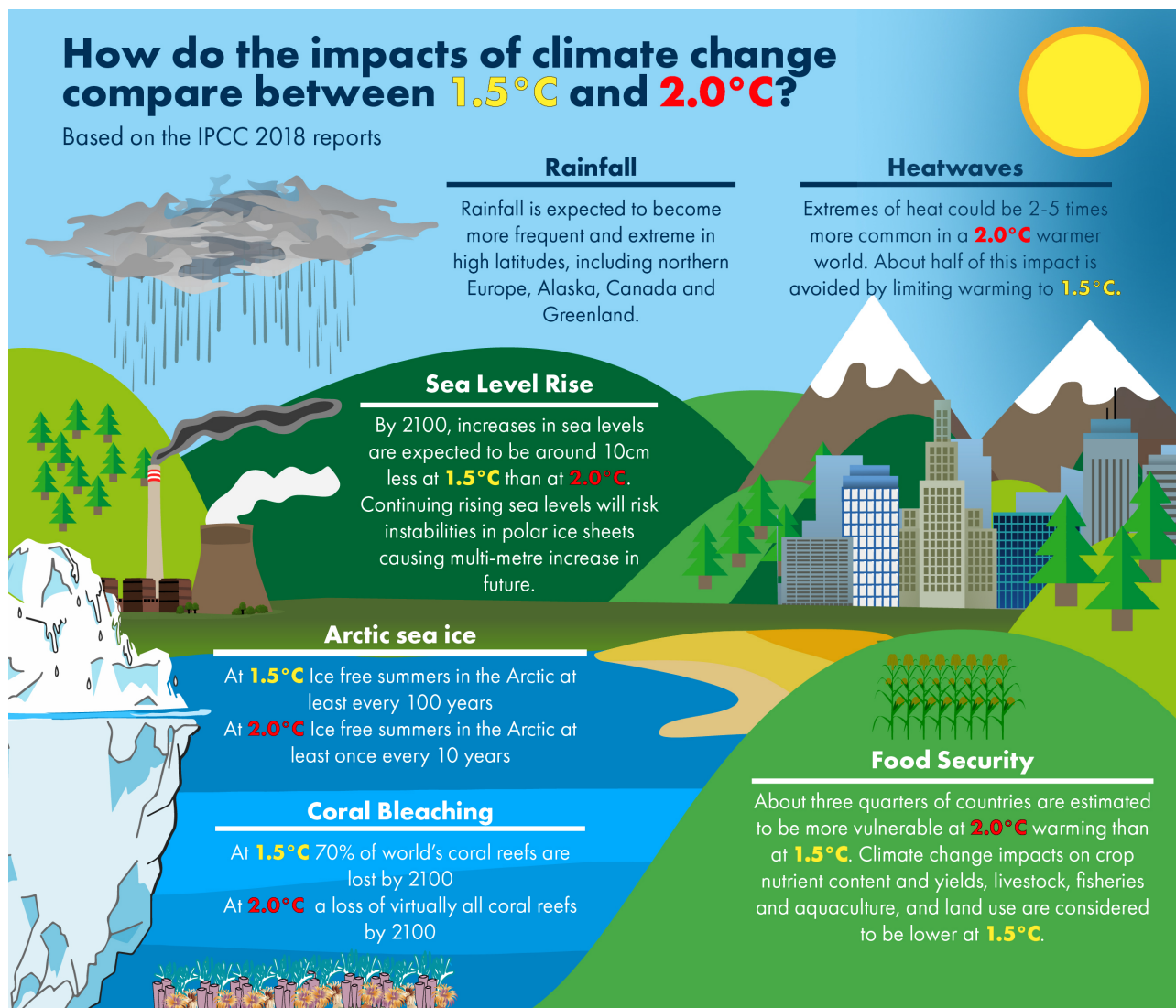
IMPACT	DIFFERENCE BETWEEN 1.5°C AND 2°C
Coral Bleaching	70% of world's coral reefs are lost by 2100 vs a loss of virtually all coral reefs by 2100
Arctic Sea Ice	Ice free summers in the Arctic at least every 100 years vs ice free summers in the Arctic at least once every 10 years
Heatwaves	Extremes of heat could be 2-5 times more common in a 2°C warmer world. About half of this impact is avoided by limiting warming to 1.5°C. Holding warming to 1.5°C rather than 2°C will see around 420 million fewer people being frequently exposed to extreme heatwaves, especially in central and southern Europe, the Mediterranean, and southern Africa.
Rainfall	Rainfall is expected to become more frequent and extreme in high latitudes, including northern Europe, Alaska, Canada and Greenland.
Drought	In the Mediterranean and southern Africa, increases in drought frequency and magnitude are substantially larger at 2°C than at 1.5°C.
Sea Level Rise	By 2100, increases in sea levels are expected to be around 10cm less at 1.5°C than at 2°C. Sea levels will continue to rise beyond the end of the century, with the risk that instabilities in the polar ice sheets will cause multi-metre increases in the centuries to come.
Island States	Even warming of 1.5°C might leave several atoll islands uninhabitable due to the combination of rising seas, larger waves and increasing aridity.
Food Security	About three quarters of countries are estimated to be more vulnerable at 2°C warming than at 1.5°C. Climate change impacts on crop nutrient content and yields, livestock, fisheries and aquaculture, and land use are considered to be lower at 1.5°C.
Malnutrition	The availability of water and food is greater at 1.5°C than at 2°C. At 2°C regions such as the African Sahel, the Mediterranean, central Europe, the Amazon, and western and southern Africa are especially vulnerable.

cclix Environment, Climate Change and Land Reform Committee, *Official Report*, 20 November 2018, Col 5

cclx Written Submission. [British Ecological Society Scottish Policy Group](#)

cclxi Written Submission. [Scottish Environment LINK](#)

cclxii Written Submission. [Stop Climate Chaos](#)



Source: Scottish Parliament 2019

View of the Intergovernmental Panel on Climate Change

267. In its recent special report on limiting global temperature rises to 1.5°C, the IPCC note—

” Reaching and sustaining net-zero global anthropogenic CO₂ emissions and declining net non-CO₂ radiative forcing would halt anthropogenic global warming on multi-decadal timescales.”^{cclxiii}

268. This suggests that the closer targets are to net-zero, the smaller the increases to global temperature rises.

269. Teresa Anderson of Action Aid International said—

cclxiii Intergovernmental Panel on Climate Change (October 2018), *GLOBAL WARMING OF 1.5 °C an IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty - Summary for Policymakers*, page 5

” If we take seriously the mission to limit the increase in warming to 1.5°C and to avert runaway climate change, we really need to listen to the science from the IPCC, which has told us that we will pretty much use up the carbon budget for 1.5°C within 12 years unless we take absolutely radical transformation action right now. There is no avoiding that—the science is very clear.”^{cclxiv}

What temperature is the Bill aiming for? - conclusions

270. The Committee considers it important that the intent with regard to temperature change be made explicit in the Bill. The Committee recognises the goals of the Paris Agreement and suggests that the Scottish Government commit to limit warming to the 1.5°C target, while seeking to avoid an overshoot scenario.
271. In order to create the plans and implement the actions required to meet targets, it is important to know what the targets are. While the Committee believes there should be emissions reductions targets, it also believes these should be demonstrably linked to the temperature they are trying to achieve and evidence from the IPCC's special report suggests this should be net-zero.

272. The Committee recommends the Bill include an explicit reference to the temperature the targets are seeking to achieve. The Committee recommends this should be 1.5°C, and it should reflect the most ambitious scenario in the forthcoming advice of the Committee on Climate Change (estimated to be in May 2019).
273. The Committee also recommends that the Scottish Government commit to a position that seeks to avoid an overshoot scenario.

The advice of the Committee on Climate Change on setting a net-zero target

274. As detailed in [PART ONE - EMISSIONS REDUCTION TARGETS - THE ADVICE OF THE COMMITTEE ON CLIMATE CHANGE CCC ON THE FORM OF FUTURE EMISSIONS TARGETS - OPTION TWO](#), the CCC advised the legislation should allow for the creation of a net-zero target "once the evidence base has been strengthened."^{cclxv} It also suggested that flexibility should be retained within the legislation and policy making for increased ambition in the future.^{cclxvi} There was substantial support for this position from stakeholders in written evidence to the Committee.

cclxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 2

cclxv Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 13

cclxvi Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Chapter 2: Appropriate levels of emissions targets, page 34

275. During its consideration of the Bill, the Committee explored various facets of the CCC's advice on the net-zero target:

- The perceived cautious nature of the advice;
- The assumptions in the advice;
- Feasibility;
- Whether a pathway to 2050 is required to set the target; and
- Whether scientists or politicians should be setting targets.

The cautious nature of the advice and strengthening the evidence base

276. The Committee received evidence to suggest the advice of the CCC was cautious in its outlook.

277. Lord Deben explained^{cclxvii} in detail to the Committee that the CCC's approach was not necessarily based on caution. Instead, as a science based organisation, the CCC could not give advice if the evidence base was not there to support it. When asked whether the advice of the CCC was cautious because progress was lacking in some sectors of the economy, he said—

” I do not think that the caution is just for that reason; it is as much for the wider reason that we have to explain to people that this is not an easy thing to do. It is not sensible to espouse a target without being clear about what it really means. You can have any old target, but it will not work if you cannot come down to the terms for how you will get there. That seems to me to be the fundamental reason for setting a target.”^{cclxviii}

278. The Committee appreciates the need for Scottish Government action to be underpinned by advice and for that advice, in turn, to be evidence-based. The Committee awaits updated advice from the CCC.

Assumptions in the advice of the Committee on Climate Change on a net-zero target

279. The Committee received evidence challenging some of the assumptions and predictions in the advice of the CCC and sought to explore this throughout its consideration of the Bill. The main challenges were:

- The extent of general reliance on fossil fuels in the future;
- The division of international effort;
- Demand for fossil fuelled vehicles; and
- Lack of assumption around dietary change.

cclxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 30

cclxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 30

280. SCIAF also noted—

” It is not clear what risk of breaching 2°C is written into the CCC advice, and what global carbon budget their calculations are based on. The policy memorandum of the Bill is also inconsistent and unclear as to whether the Bill is aiming to limit temperature increase to 1.5°C or well below 2°C.”^{cclxix}

Reliance on fossil fuels in the future

281. One of the main questions around the basis for CCC advice on the target was the extent to which the organisation foresaw a reliance on fossil fuels for energy.

282. The Cabinet Secretary said that the Scottish Government and the CCC were in a similar position in terms of predicting what may happen technologically within the industry: “We need to proceed on the basis of what we know now, as opposed to what we think might be the case in another 20 or 30 years’ time.”^{cclxx}

283. Will Webster of Oil & Gas UK was optimistic^{cclxxi} about the outlook for the sector over the next 15 years, noting the increased investment and research into the development of a hydrogen economy. He also said^{cclxxii} decarbonised gas and, to an extent, oil would always be part of the energy mix as there were certain industries, such as marine transport and aviation, which relied upon them.

284. However, others did not see such a large role for fossil fuels in the future, including Stop Climate Chaos Scotland (SCCS) who said the CCC’s predictions were “unlikely to be borne out, with CCS (Carbon Capture and Storage) likely to play a bigger role in industry rather than power generation, meaning a fully renewable, zero emission electricity sector is eminently possible in 2050.”^{cclxxiii}

285. While noting the importance of a fair transition across sectors, Will Webster told the Committee that—

” Scotland and the UK have become global leaders in climate policy by setting stretching but realistic targets and hitting them without damaging the consensus on the need to make progress in climate policy. Not every country has managed to do that. It is really important that targets are set in a flexible way that allows credible policies to be developed and brings about the investment that is needed in the conventional sector as well as the alternative sector, so that the transition will be something that consumers and the economy can take—albeit that it will be difficult. That is a really important feature of the climate policy that is needed.”

cclxix Written Submission. [Stop Climate Chaos Scotland](#)

cclxx Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 26

cclxxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 33

cclxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 33

cclxxiii Written Submission. [Stop Climate Chaos Scotland](#)

Division of international effort

286. SCCS were concerned that "The CCC analysis is based on a simple division of international effort (i.e. global equal per capita emissions), which does not make sufficient allowance for differentiation for poorer countries that have contributed less to climate change and have less capability to change their emissions trajectory."^{cclxxiv} SCIAF^{cclxxv} shared the concerns as to the equity of the calculations.
287. In evidence, Teresa Anderson from Action Aid International highlighted that several models currently exist that calculate different countries' fair share by taking into account historic per capita emissions.^{cclxxvi}

288. The Committee recognises that Scotland has a larger responsibility for global warming as a developed nation and recommends that the Scottish Government continue to focus its work on how Scotland should account for its fair share globally.

Land based sequestration potential

289. SCCS^{cclxxvii} and SCIAF^{cclxxviii} also disagreed with some of the assumptions made around the ability for the sector to sequester emissions. Both questioned the low levels of predicted tree planting, noting these were akin to the 2032 targets.

Demand for fossil fuelled vehicles and flights

290. SCCS^{cclxxix} also challenged the prediction that there would still be fossil fuelled cars on the road in 2050 by noting that the Scottish Government has "committed to phasing out the need for fossil fuel vehicles by 2032."

Dietary change

291. SCCS^{cclxxx} and SCIAF^{cclxxxi} both felt there would be dietary change beyond that envisaged by the CCC. Pete Ritchie of Nourish Scotland also highlighted how the consumer trend towards eating less meat could create opportunities for Scottish agriculture and sustainable livestock production: "The argument will be about eating

cclxxiv Written Submission for 19 June 2018 session. [Stop Climate Chaos](#)

cclxxv Written Submission. [SCIAF](#)

cclxxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 17

cclxxvii Written Submission. [Stop Climate Chaos Scotland](#)

cclxxviii Written Submission. [SCIAF](#)

cclxxix Written Submission. [Stop Climate Chaos Scotland](#)

cclxxx Written Submission. [Stop Climate Chaos Scotland](#)

less but better meat and will give us an opportunity to demonstrate that we do meat better here."^{cclxxxii}

Is it possible to set a net-zero target now?

292. In its explanation of Option Two, the CCC described it as the "limit of the measures the Committee has identified to reduce emissions in Scotland and would require strong progress across every area of the economy,"^{cclxxxiii} yet the Scottish Government has "committed to achieving net-zero emissions as soon as possible."^{cclxxxiv}

293. Jim Skea of the IPCC told^{cclxxxv} the Committee that his organisation had been concerned primarily with what was geophysically possible in terms of temperature rise and has been unambiguous in its findings: "it is geophysically possible to keep global warming below 1.5°C."^{cclxxxvi} He said of secondary concern had been technical and economic considerations, before finally taking into account social acceptability.^{cclxxxvii}

294. Lord Deben explained^{cclxxxviii} a range of considerations taken into account in the CCC's judgements, such as finance and availability of technology. He added—

” "All that one can do about what is achievable is to say that, taking everything into account, it is by no means impossible, but it is hard. That is as it should be, because we have a big job to do."^{cclxxxix}

^{cclxxxi} Written Submission. [SCIAF](#)

^{cclxxxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 25

^{cclxxxiii} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 13

^{cclxxxiv} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 8

^{cclxxxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 5

^{cclxxxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 5

^{cclxxxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 5

^{cclxxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 39

^{cclxxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 39

Possible vs. Political

295. The CCC has used the term "feasible" to describe what it believes could be done to achieve the targets it has suggested and the Bill refers to targets being "achievable."

296. Jim Skea said of the IPCC report—

” "the question of political feasibility is not one that we can answer. That question has to go back to Parliaments and Governments for them to decide whether they are up to the very great challenges that the report sets out."^{ccxc}

297. Dr Rachel Howell of the University of Edinburgh^{ccxci} was among the stakeholders to highlight the difference between politically possible and physically possible. Fabrice Leveque of Scottish Renewables drew a distinction between short-term and long-term goals with regard to feasibility.^{ccxcii}

298. However, Sara Grainger, Decarbonisation: Delivery Unit Team Leader, said the Scottish Government was of the view that "at this time, it would not be acceptable to the majority to impose policies that restricted aviation, shipping, agriculture, food production and industry to the levels that would be required to meet a net-zero target."^{ccxciii} The Cabinet Secretary discussed the importance of 'achievability', noting that "the net-zero target is not achievable because a pathway to it cannot be seen."^{ccxciv}

299. Therefore, while the CCC has said it cannot yet identify a pathway to a net-zero target, it has been shown it is *possible* to achieve this. In this context, achieving a net-zero target will require politically difficult decisions, which will not be universally welcomed, and the Committee believes that the Scottish Government should consider the difference between what is *possible* and what is *acceptable*. The urgency to mitigate and adapt to climate change may not allow time for these two ideas to merge, and the Committee has received a lot of evidence on this.

300. Teresa Anderson of Action Aid International said—

^{ccxc} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 5

^{ccxci} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 31

^{ccxcii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 36

^{ccxciii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 10

^{ccxciv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 29

” It is better to set high targets that force us to achieve more than to set achievable targets that could lead to planetary breakdown. Failure to meet a political goal is less of a disaster than failure to meet climate targets.”

and

”You cannot define everything on the basis of what is considered to be politically feasible at a particular time. If ever there was going to be a time for a bill to take a leap of faith, this would be the time.”^{CCXCV}

A pathway to 2050

301. In evidence to the Committee, Lord Deben said: "I do not think that one should set targets unless one has a very clear route to achieving them."^{CCXCVI}
302. When asked whether need, rather than practicality, should be the driving force behind targets, he emphasised that need was the driver and that climate change would not wait for decisions to become easier. However, he said: "we need to show the practical means of reaching the target at a point that is sufficiently soon to deliver what Paris has asked for."^{CCXCVII}
303. The Committee received evidence from stakeholders, such as WWF,^{CCXCVIII} to suggest that developments since the CCC's 2017 advice have provided a clearer idea of the action that could be taken to meet a net-zero target. Dr Rachel Howell^{CCXCIX} thought conflating feasibility and the ability to see a complete road map was an error.
304. Will Webster of Oil & Gas UK welcomed^{CCC} the approach to setting targets based on what was considered feasible and suggested that this encouraged investment. Both he^{CCCI} and Professor Paul Jowitt of Heriot-Watt University^{CCCI} described how targets based on what was known to be achievable fostered good policy making and investment.

^{CCXCV} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 9

^{CCXCVI} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 28

^{CCXCVII} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 29

^{CCXCVIII} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 5

^{CCXCIX} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 31

^{CCC} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 37

^{CCCI} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 37

305. As detailed above, the CCC has said that it cannot yet show a feasible pathway to 2050.

The difference between 90% and net-zero

306. One of the areas the Committee sought to understand during its deliberations on the Bill was the actions required between a 90% and a net-zero target. In other words, what were the pieces of the puzzle missing from the pathway to net-zero.

307. Dr Rachel Howell told the Committee that the difference between a 90% target and a net-zero target could be achieved by removing fossil fuels from heating and transport altogether.^{ccciii} Jamie Stewart of Citizens Advice Scotland said low carbon lifestyles and energy efficiency had to be "aspirational." He said it would rely on owner-occupiers making changes in order to achieve energy band C houses by 2040, which he noted would be required for even a 90% target.^{ccciv}

308. When asked for an example in the agricultural sector of an action that could make the difference between a 90% and net-zero target, the following examples were offered at the Committee's meeting on 13 November:

- Nitrogen-use efficiency (David Reay of the University of Edinburgh)^{cccv}
- Improved sequestration activities, including peatland restoration (Scottish Crofters Federation)^{cccvi} and grassland management (SEFARI)^{cccvii}
- Agroecology, including organics (Nourish Scotland)^{cccviii}
- Constructive working with those in the industry to bring about change (NFUS)^{cccix}
- Improved animal health, planting more clover, agroforestry (Nourish Scotland)^{cccx}
- Efficient management of livestock (Scottish Land and Estates^{cccxi} and SEFARI)^{cccxi}

^{cccii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 37

^{ccciii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 19

^{ccciv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 19

^{cccv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 14

^{cccvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 14

^{cccvii} Written Submission. [SEFARI](#)

^{cccviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 15

309. Martin Reid of the Freight Transport Association discussed various future technologies but noted that the industry was "beholden to the new technologies" in terms of lowering emissions. He added—
- ” "Saying what would be needed to make the difference between 90 per cent and net-zero would mean throwing a finger in the air. We are at a stage where we cannot predict, because of the lack of technological back up, although we have the industry's goodwill to do it."^{cccixiii}
310. Andy Cope of Sustrans said^{cccxiv} this would be achieved through investment in active travel. Bruce Kiloh of Strathclyde Partnership for Transport suggested^{cccxv} the difference would mean making cleaner technologies more available. Jess Pepper of Transform Scotland suggested^{cccxvi} the potential of train travel and expressed the view there was further to go with electrification.
311. The Committee asked Scottish Government officials for an indication of the difference between targets of 80%, 90% and net-zero in terms of actions required and was helpfully provided with an outline—

^{cccix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 15

^{cccix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 15

^{cccxi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 16

^{cccxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 15

^{cccxiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 34

^{cccxiv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 49

^{cccxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 50

^{cccxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 51

” "Under an 80 per cent scenario, there is a focus on buildings and industry—and also on aviation and shipping, which are crucial—and there is a little bit of wriggle room in other sectors. Under a 90 per cent scenario, there would be no wriggle room anywhere, although some emissions would remain in aviation and shipping—including international emissions, which are included in our targets but not in those of other countries—and in industry, beyond emission reductions that could be achieved through efficiency. We would also need to decarbonise buildings completely instead of almost doing so. We consider that there are three options for going further than that. One option is to purchase international credits to make up the differences between what can be achieved domestically and what cannot be done responsibly, in the view of ministers. The second option is to hope that technology will develop to deliver negative emissions. However, at this stage, experts tell us that that is unlikely to happen at the right pace, rate or scale in the near future. The third way is to introduce policies and proposals that remove emissions completely from industry, aviation, shipping and agriculture, which I have not mentioned before but which is crucial."^{cccxvii}

Technology and innovation



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**"I am not saying that it will be easy,
but it is possible and in most areas
we have the technologies."**



Anders Wijkman // Chair, Climate KIC

Source: Scottish Parliament 2019

312. One of the features of the CCC's advice was that it did not account for future technologies and this caused much debate on the Bill. In evidence to the Committee, the Cabinet Secretary said—

” "There have been astonishing technological changes in the last 25 years, but they have not necessarily been where we thought they would be. One of the challenges is that we do not know where things will come from and what the impacts will be. It is therefore challenging to work out how to proceed."^{cccxviii}

313. Sara Grainger said that despite the ambition of the Scottish Government to achieve net-zero as soon as possible, "putting a target into legislation that required us to achieve net-zero emissions by a specific date could create difficulties if the technology did not arrive at the pace or the scale that was necessary to enable us to achieve that."^{cccxi}
314. The Committee is of the view that if a statutory target of net-zero were missed, the difficulties would arise from the impact on the environment, not on the Scottish Government's statistics.
315. The Committee heard varied evidence, both in support of the Scottish Government's position and in opposition. The Committee has considered the following:
- A consistent approach to technology from the Scottish Government;
 - Funding for innovation post-Brexit;
 - Carbon Capture and Storage (CCS);
 - Whether a strong target would drive innovation; and
 - Assuming new technology will save the day and failing to act on that which can be achieved now.

Consistency of approach

316. Caution about relying on undeveloped technologies is understandable, but the Committee believes that the Scottish Government should take a consistent approach and foster an enterprise environment which supports low carbon innovation.
317. Sara Grainger agreed^{cccxi} with the former Convener of the Committee, Graeme Dey, when he asked her whether the Scottish Government was being contradictory by relying on technologies, such as CCS, in the climate change plan while being unwilling to do so in terms of targets beyond 2032.
318. However, the Scottish Government was willing to rely on this beyond the period covered by the plan in its TIMES modelling for the costs associated with a move from an 80% target to a 90% target. It explained to the Committee via correspondence:
- "We allowed the model to draw on carbon capture and storage technologies post-2025 (relative to post-2035 in the Climate Change Plan)
 - We allowed the model to deploy bioenergy with carbon capture and storage (a negative emission technology)."^{cccxi}

cccviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 28

cccix Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 11

cccxx Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 12

319. The Scottish Government has therefore shown that it will rely on such technologies in the long-term, as with the 2050 target. The Committee has received a significant body of evidence on the importance of CCS to meeting more challenging climate change targets, discussed in [SECTION NINETEEN - CLIMATE CHANGE PLAN, THE NEXT CLIMATE CHANGE PLAN](#) of this report.

Funding for innovation, research and development post withdrawal from the EU

320. One of the reasons for the uncertainty regarding the development of technologies, particularly at international level, is the UK's withdrawal from the EU and the implications that this may have on funding for innovation, research and development, and access to research networks. Dr Diana Casey of the Mineral Products Association said^{cccxxii} there were concerns about how post Brexit funding would continue when noting the need for investment in CCS technology, while John Ferguson of Eco IdeaM argued^{cccxxiii} that uncertainty of any kind was not good for research and development when asked about the impact of leaving the EU. The Committee has also written to the Scottish Government on this in its recent letter^{cccxxiv} concerning the Budget for 2019/20.

A net-zero target to drive innovation

321. Much of the evidence received by the Committee suggested that setting a net-zero target could drive innovation, sending a clear message to industry regarding what was required and the intent of the Scottish Government.
322. While Sara Grainger considered that a strong target may send a message triggering innovation, she stated that: "putting a target date into legislation that we would absolutely have to meet, regardless of whether the technology had become available, is a different kettle of fish altogether."^{cccxxv}
323. Jim Skea of the IPCC said—
- ” There is no precedent for the rate of emissions reductions and the changes in social and technical systems that would be required—they really are extremely demanding.”^{cccxxvi}

cccxxi [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Financial Memorandum, 7 November 2018

cccxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 38

cccxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 4

cccxxiv [Letter](#) to the Cabinet Secretary for Finance and Constitution and the Cabinet Secretary for Environment, Climate Change and Land Reform Committee on the Budget 2019/20, 10 October 2018

cccxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 11

324. When asked whether setting a net-zero target would send a strong message to innovators and investors, he said there was evidence to suggest this, but that it would need to be supported by specific policies. He added "If a long-term target is backed up by short-term ambition and a sense of urgency in moving forward across all sectors, that could be quite effective in moving the agenda on."^{cccxxvii} He also noted^{cccxxviii} that there a clear need for research and development into land management, bio energy, carbon capture and storage, and increased afforestation rates to set the direction for the long-term.
325. Lord Deben spoke^{cccxxix} of how offshore wind development has accelerated in recent times and said he believed this to be the result of setting demanding targets. He added—
- ” “We must set very demanding targets, not because we want them to be demanding but because they need to be demanding, and then create the atmosphere in which people will develop the technology that enables us to address the issue more easily than we thought.”^{cccxxx}
326. Fabrice Leveque of Scottish Renewables also said^{cccxxxi} setting a strong target had provided a significant signal to industries, such as renewables, to work towards solutions.^{cccxxxii}
327. Elizabeth Leighton of the Existing Homes Alliance said^{cccxxxiii} in order to retain economic benefits of climate change, certainty must be provided to businesses and homeowners.
328. Dave Moxham of the Just Transition Partnership,^{cccxxxiv} Suzy Goodsir of Greener Kirkcaldy,^{cccxxxv} Angus McCrone of Bloomberg New Energy Finance,^{cccxxxvi} Stop Climate Chaos, Jennifer Rogers, Rachel Chanarin, Scottish Catholic International Aid Fund, the Energy Agency, RSPB, Sustainable Aviation,^{cccxxxvii} and WWF also thought ambitious targets would send a signal and drive innovation.
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^{cccxxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 6

^{cccxxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 7

^{cccxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 8

^{cccxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 31

^{cccxxx} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 30

^{cccxxxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 31

^{cccxxxiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 30

^{cccxxxiv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 35

^{cccxxxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 11

329. The Committee put these proposals to the Cabinet Secretary, who did not share the view held by some stakeholders that you can draw a direct, positive correlation between setting a higher target and increasing innovation. She noted, "innovation is happening across the board now and the target sits at 80 per cent. I am not sure that an argument about this particular target will necessarily drive innovation any faster than it is already being driven."^{cccxxviii}

Utilising Existing Technologies

330. While the need for new technology and innovation was recognised in evidence to the Committee, some stakeholders, including Lord Deben, were cautious about prioritising this over action that could be taken now. Lord Deben stated—

” It is really important not to assume that innovation will deliver, partly because doing so is a jolly good excuse for getting out of doing what we ought to be doing, and partly because we have not been all that good at timing innovation.”^{cccxxxix}

331. This is a point later echoed^{cccxi} by Fabrice Leveque on the development of hydrogen energy technology and Andy Jefferson of Sustainable Aviation^{cccxli} on efficiency of existing models of transport.

332. John Ferguson of Eco IdeaM similarly warned against relying on undeveloped technologies. He said—

” For me, then, the issue is to find ways of applying the technological innovation that is already taking place. Things will keep changing; indeed, the offshore marine renewables that Angus McCrone mentioned are one area where we keep needing to innovate until we see things that work. We then need to get such projects transiting at scale, but our strategies are just not good enough to make such transitions happen. We have to find new ways of speeding that up.”^{cccxl}

^{cccxxxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 11

^{cccxxxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 11

^{cccxxxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 30

^{cccxxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 28

^{cccxxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 32

^{cccxl} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 44

^{cccxli} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 39

333. Several stakeholders also advocated caution in terms of predicting what types of technology would prove to be the most popular. The example of heat was used, where options such as district heating and heat source pumps are viable, but not yet widespread. Will Webster of Oil & Gas UK said—

” "...what will happen will depend on the circumstances and what consumers choose. Consumers do not always choose the best technology—they choose what they find to be most convenient or what looks nicest."^{cccxlvi}

334. Angus McCrone of Bloomberg New Energy Finance also highlighted^{cccxliv} the example of heat, stating there were technologies available which had the potential to decarbonise the sector, but it was not yet clear which ones would emerge as the most successful. He added—

” "As I have said, the issue with a long-term, very ambitious CO₂ reduction target, such as we are talking about here, relates to what happens on the heat side. Until there is a little bit more clarity on which technologies will win through, it is difficult to be certain about how the Government can bring that about."^{cccxlv}

335. Scottish Renewables described renewable heat as "the next frontier for emissions reduction and new industrial opportunities."^{cccxlvi}

Government support for innovation and adoption of new technologies

336. Various stakeholders advocated the need for Government support for development of new technologies and innovative practices through funding and incentives. Will Webster urged^{cccxlvii} the Government to consider regulatory and legislative frameworks as part of the research and development process, as well as finance issues. Dr Diana Casey spoke^{cccxlviii} on biomass, noting that there was a lack of incentives currently but that the technology was viable.

337. Evidence from Angus McCrone,^{cccclix} the Freight Transport Association,^{ccccl} Sustainable Aviation,^{ccccli} Scottish Renewables,^{ccccli} and Aberdeen City Council^{ccccliii} all supported the call for, and emphasised the importance of, consistent

^{cccxlvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 10

^{cccxlvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 48

^{cccxlvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 11

^{cccxlv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 14

^{cccxlv} Written Submission. [Scottish Renewables](#).

^{cccxlvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 43

^{cccxlvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 45

Government policy in support of research, innovation and development, and the need to give a clear steer to developers regarding intent.

338. The Committee heard of examples, such as the concrete market in Sweden,^{cccliv} and from Dr Diana Casey^{ccclv} and John Ferguson^{ccclvi} regarding the gaps between the development of low carbon technologies and their route to market.
339. Mai Muhammad of Aberdeen City Council spoke of the need for the Scottish Government to recognise the opportunities available and create a sense of excitement across industry.^{ccclvii}
340. Angus McCrone described^{ccclviii} the situation with regard to tidal energy development in Scotland over the last decade, noting that while mistakes had been made in terms of Government support, there were valuable lessons learned. Dave Moxham added: "There have been failures in the past, but it would be a mistake to think that, because we have had our fingers burned before, we should not try again. There is an element of risk taking here, but it is necessary risk taking because of the stakes."^{ccclix} Aberdeen City Council also suggested in its written submission that there should be less aversion to risk.
341. Suzy Goodsir of Greener Kirkcaldy told^{ccclx} the Committee that the Climate Challenge Fund would benefit from review, noting the risk of continually developing something new rather than letting successful projects embed and the good practice derived from them be disseminated.

cccxlix Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 8

cccl Written Submission. [Freight Transport Association](#).

cccli Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 32

ccclii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 47

cccliii Written Submission. [Aberdeen City Council](#).

cccliv Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 10

ccclv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 39

ccclvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 2

ccclvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 52

ccclviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 8

ccclix Environment, Climate Change and Land Reform Committee, [Official Report](#) 15 November 2018, Col 9

342. The Road Haulage Association highlighted^{ccclxi} the restrictive profit margins members were working to and suggested their appetite for moving to new technologies, especially if controversial or unproven, was limited. They welcomed^{ccclxii} the time provided by the Scottish Government for the industry to adapt to meet the requirements of low emission zones.

Technology and innovation - conclusions

343. The Committee understands technology will significantly affect the success of meeting future targets and that there is uncertainty in relying on something yet to be developed. However, it also believes that technologies facilitating a carbon friendly Scotland today were not imagined, or developed, decades ago.

344. The Committee also heard an argument for caution in terms of relying on future technology (as heard in evidence during both consideration of the Bill - from Professor Paul Jowitt^{ccclxiii} and Cycling Scotland for example^{ccclxiv} - and the draft climate change plans).^{ccclxv} It was also told that all other avenues for action should be maximised, such as individual behaviour change and partnership working.^{ccclxvi}

345. The Committee recognises that setting stronger targets would send a clear signal of intent from the Scottish Government on the innovation it wants to see in the future and may also act as a market driver. It is important that this statement of intent is backed up by Government support for research, development and knowledge exchange and is a priority for enterprise agencies and the National Investment Bank.

346. The Committee recommends that the Scottish Government and its enterprise agencies place greater emphasis and effort on the development of technology that could assist in reaching our emissions targets and recognises that there is a place for risk taking. The Committee would welcome further early discussion with the Scottish Government on its approach to and support for research and development, innovation and the transfer of knowledge and technology within

ccclx Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 9

ccclxi Written Submission. [Road Haulage Association](#).

ccclxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 30

ccclxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 38

ccclxiv Written Submission. [Cycling Scotland](#)

ccclxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 September 2016, Col 37

ccclxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 31 January 2017, Col 5

and across sectors. It would also welcome the Scottish Government's view on the operation of the Climate Challenge Fund and on whether this could benefit from review, particularly examining how solutions identified through the fund can be implemented to scale and in a sustainable way.

Carbon capture and storage

347. An area of technological advancement which received a lot of attention during the Committee' deliberations on the Bill was carbon capture and storage (CCS).
348. In evidence to the Committee, Tom Russon of the Scottish Government noted that in order to achieve negative emissions, CCS combined with biomass energy was required.^{ccclxvii} However, he noted that the development of such a technology was beyond the capabilities of a country of Scotland's size and that international research and collaboration was key. To this end, he added that Scotland was reliant on the pace of the international community. Stefan Nyström of the Swedish Environmental Protection Agency also spoke of the need for international cooperation in this area.^{ccclxviii}
349. Lord Deben suspected there would be problems associated with development as "the UK Government has been dilatory in dealing with carbon capture and storage, which will be crucial—for industry, in particular—in delivering what we need."^{ccclxix} He suggested alternatives were extremely expensive.
350. He was critical of the UK Government for its failure to invest in CCS,^{ccclxx} as was Tom Thackray of CBI Scotland who criticised "chopping and changing" in the policy environment.^{ccclxxi} The CCC noted the importance of planning certainty for business and investors in its advice^{ccclxxii} on the Bill, which was echoed by Oil & Gas UK—
- ” "That is where we really need the next stage of development of CCS and a clear Government policy of developing commercial and regulatory frameworks with legislation around CCS, the use of decarbonised gas and the development of the hydrogen economy. Our members are actively investing in and carrying out research and development in all those things; they are ready to enable some of the transition, particularly into the use of decarbonised gas and hydrogen. That has to be an important part of the climate change plans that are developed on the back of the bill."^{ccclxxiii}

ccclxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 13

ccclxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 12

ccclxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 30

ccclxx Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 31

351. Dr Diana Casey suggested^{ccclxxiv} CCS would decarbonise the cement industry. Dave Moxham also noted^{ccclxxv} the need for Government investment to make CCS happen and that it could not wait for business or markets to progress development.
352. Scottish Carbon Capture and Storage^{ccclxxvi} emphasised the viability of the technology, providing examples of where this was already working in Scotland. It highlighted Scotland's ability to deploy this technology and its research potential in the area. It was also critical of the Scottish Government's forecast of the cost of the technology in its information and analysis paper.
353. However, other evidence suggested mixed views on reliance of CCS.
354. Teresa Anderson of Action Aid International said—
- ” It is not only the technology that has limits; it is the scale. Even if the technical barriers are overcome, the scale of storage potential is still very limited. A lot of proponents believe that bio-energy with carbon capture and storage—BECCS—would be able to increase the potential, but that has massive socioeconomic costs because it would lead to conflict over land use.”^{ccclxxvii}
355. Jim Densham, representing Scottish Environment LINK,^{ccclxxviii} was also concerned about land use and biodiversity.
356. Gina Hanrahan of WWF Scotland said^{ccclxxix} development of bio-energy and CCS should not delay action that could be taken now. She added it was now known that CCS was not needed to decarbonise the power sector and the debate was rightly focused in the industrial sector.

ccclxxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 37

ccclxxii [Letter](#) from the Chair of the Committee on Climate Change (CCC), Lord Deben, to the Cabinet Secretary for Environment, Climate Change and Land Reform, Roseanna Cunningham, providing updated advice on the content of the proposed Climate Change Bill, 20 December 2017

ccclxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 32

ccclxxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 38

ccclxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 15

ccclxxvi Written Submission. [Scottish Carbon Capture and Storage](#).

ccclxxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 13

ccclxxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 13

ccclxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 13

357. The Committee has heard clear evidence that CCS technology should play a role in meeting tough targets in the future. The Committee's Convener, Gillian Martin, asked the First Minister about the issue at the Scottish Parliament committees Conveners Group meeting on the 24 October, particularly regarding what could be done to deploy such technology on a UK-wide scale. The First Minister said—

” ..we continue to try to work with the UK Government to make progress on carbon capture and storage. Some work on pilot projects is under way. We absolutely want investment in the technology that will allow us to move further and faster in reducing emissions. That requires the UK Government to give clarity on the replacement of EU funding streams and on its intentions. The area of responsibility is split between the Scottish Government and the UK Government. Because of the Great Britain-wide nature of the grid, we need to work together to deliver as quickly as possible. We will continue to try to get collaborative working, not just in the UK but across Europe. Given the nature of the issue that we are dealing with, we will make further and faster progress if all countries work together collaboratively. The need to ensure international collaboration is why the Paris Agreement and the conferences of the parties to the United Nations Framework Convention on Climate Change—one is coming up in December—are so important.”^{ccclxxx}

358. The Committee welcomes this statement and urges the Scottish Government to do all that it can to progress this within the UK and internationally. However, it is also mindful that development of this technology should not be at the expense of actions in other areas which can be taken now.

359. The Committee welcomes the recent shift in the UK Government's position on carbon capture and storage (CCS) and recommends that the Scottish Government continue to work with its UK and international counterparts on the development of CCS technology. Both Governments should utilise all levers at their disposal domestically to evaluate the merits of CCS and consider the merits of early development and implementation of this technology.

Ambition of the 2009 Act

360. One of the concerns the Committee heard in evidence was the difference in approach between the 2009 Act and the Bill.

361. The Bill's Policy Memorandum states—

” "Having reflected on the full range of consultation responses relating to net-zero the Scottish Government's view is that the more responsible course of action is to set the 2050 statutory target at 90%. This is both ambitious and credible. Achieving this target, and the annual targets that lead to it, will require challenging actions across all sectors of the Scottish economy to reduce emissions, while avoiding risking Scotland's credibility, economy and finances by putting a target into legislation without knowing how it can be achieved."^{ccclxxxix}

362. Requiring a clear pathway and relying on credibility was not present in discussions on the 2009 Act. The Committee asked the Cabinet Secretary for her view on this, and she said: "I have no problem with that, if that is where people want to go, but they have to be honest about what that will mean in practice."^{ccclxxxii}

363. Stakeholders were also keen to remind the Committee of the ambition of the 2009 Act.

364. Caroline Rance of Friends of the Earth Scotland said—

” "Staying with that theme of learning lessons from the past, I think that we should remember what happened with the 2009 act. The target of a 42 per cent reduction in emissions by 2020 was set not because we knew exactly how it would be met but because it was the right one based on climate science and Scotland's contribution to tackling climate change. In fact, the first report on proposals and policies, which was published in 2011, did not set out the entire pathway to meeting that target. Now we are well on course to exceeding it."^{ccclxxxiii}

View of the Scottish Government

365. The Scottish Government published an information and analysis document^{ccclxxxiv} to support scrutiny of the Bill. On pathways, the document stated—

^{ccclxxxix} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 45

^{ccclxxxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 28

^{ccclxxxiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 9

^{ccclxxxiv} Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR: Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#)

” "Putting a net-zero target year into legislation just now, before a credible pathway for achieving it through domestic effort can be shown, would require Scotland to compromise its existing framework in one or all of the following ways:

- by paying other countries to reduce emissions on our behalf through the purchase of international carbon credits, instead of focusing purely on domestic effort;
- by removing some sectors from the target;
- by making legally binding commitments that are dependent on as yet undeveloped technological advancement and cannot be properly scrutinised; and
- by taking steps that would have a substantial detrimental impact on people’s well-being and the economic growth of Scotland.”^{ccclxxxv}

366. The Committee has been told of the life-changing, transformational actions required by everyone to prevent catastrophic global temperature rises. The Committee agrees that transformational change is required but it is not convinced that the compromises outlined above are necessary to achieving a net-zero target. The Committee is particularly concerned with the wording in the fourth bullet point as it has received no evidence of a cost-benefit analysis and the Committee questions what data underpins the assumptions in the statement. While the Committee recognises that difficult decisions will have to be taken, the evidence indicates that significant opportunities exist and considerable benefits can be gained by early action.

A pathway to 2050 - conclusions

367. The CCC has been very clear that a target should not be set without a clear and feasible pathway present, and the Scottish Government has adopted its advice on this.

368. However, as the Committee has heard, there will always be unknowns. While future technology and innovation is clearly uncertain, there are tangible actions the Scottish Government can be pursuing now, such as investment in low carbon infrastructure and provision of investment and support in research and development supporting low carbon technologies, to ensure its goals are achieved. The deliberations on the 2009 Act were less concerned with whether there was an identifiable way to achieve the goals being set, but rather on the statement of ambition they sent.

369. The Committee is concerned that the Scottish Government has chosen to negatively express the actions involved in a pathway to net-zero, especially as it has committed to doing so as soon as possible. The Committee is of the view that

^{ccclxxxv} Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR: Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#), page 2

the opportunities and benefits of increased action to mitigate climate change should be the focus of discussion, albeit with acknowledgement of the difficult decisions and accompanying plans and strategies to ensure they are just and equitable.

Who should be setting targets?

370. Throughout the Committee's consideration of the Bill, the question was posed as to who should be responsible for setting targets - politicians or scientists.

371. The Cabinet Secretary considers the CCC as the best source of advice, but noted that she could not "bind"^{ccclxxxvi} parliamentarians if they took a different view on the stringency of the targets. The Scottish Government also acknowledged that the work of the CCC is based on the science produced by the IPCC.^{ccclxxxvii}

372. In response to questions on who should set the targets, scientists or politicians, Caroline Rance of Friends of the Earth Scotland said—

“It is pretty clear that our targets should be based on what climate science and climate justice demand as being Scotland’s fair and equitable contribution to our legal international obligations under the Paris Agreement and the United Nations Framework Convention on Climate Change. How we implement those targets is a political decision, which should be based on what is right for Scotland.”^{ccclxxxviii}

373. Angus McCrone of Bloomberg New Energy Finance thought it should be a mixture of scientists and politicians,^{ccclxxxix} while John Ferguson of Eco IdeaM suggested^{cccxc} it was not a job exclusively for either group, but part of a global community discussion.

The advice of the Committee on Climate Change on setting a net-zero target - conclusions

374. The advice of the CCC on setting a net-zero target is based on information now three years old.

375. As the CCC cannot provide detail of a feasible pathway to achieving a net-zero target, it has not recommended this as the goal of the Bill. The Scottish Government has adhered to this advice on this occasion. However, the Committee notes the

^{ccclxxxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 34

^{ccclxxxvii} [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

^{ccclxxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 4

^{ccclxxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 12

^{cccxc} Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 12

commitment of the Cabinet Secretary^{cccxcxi} and the First Minister^{cccxcii} to setting a net-zero target on the face of the Bill if that is the advice of the CCC.

376. The Committee has received a lot of evidence to suggest that it is possible for the Bill to go further and to set a net-zero target and it awaits with interest the CCC's updated view in this area.

Economic and sectoral perspectives of a net-zero target

377. The Bill's Policy Memorandum states—

” Sustainable development is integral to the Scottish Government's efforts to tackle climate change. A low carbon economy, which sustainably utilises natural resources to increase the well-being of people while acting against the threat of climate change, is a resilient economy better adapted to handle a changing climate and any disruption in global energy markets.”^{cccxciii}

378. However, the Committee does not consider the Scottish Government is sufficiently promoting the positive case for robust climate change targets. There is huge economic potential for Scotland to be a technological and innovative pioneer, championing best practice in terms of business and trade.

379. The Committee, however, is mindful of the need to balance pioneering, bold steps in terms of climate change with economical realities. Tom Thackray of CBI Scotland told the Committee—

” If the climate science says that we should go for a net-zero target, let us have a conversation about what policies we need to put in place to reach that. However, would we not rather set things that we will achieve than set things for which we do not at this stage have the scientific backing of the Committee on Climate Change...there are significant policy gaps in achieving current targets. We need to fill those gaps to meet 90 per cent, and we will need to go even further to meet net-zero. There needs to be some realism along with ambition.”^{cccxciv}

380. The Committee has received evidence on the potential positive and negative impacts of a net-zero target from various sectoral perspectives, including:

- Agriculture and land use;
- Transport; and

^{cccxcxi} Environment, Climate Change and Land Reform Committee, *Official Report*, 27 November 2018, Col 28

^{cccxcii} Scottish Parliament Conveners Group, *Meeting with the First Minister, Nicola Sturgeon MSP*, 24 October 2018, page 13

^{cccxciii} Climate Change (Emissions Reduction Targets) (Scotland) Bill. *Policy Memorandum* (SP Bill 30-PM, Session 5 (2018)), paragraph 70

^{cccxciv} Environment, Climate Change and Land Reform Committee, *Official Report*, 6 November 2018, Col 51

- Energy.

381. These, along with opportunities for the economy and keeping pace with international competitors, are explored in the following sections.

Agriculture

382. The role of the agriculture industry in achieving a net-zero target cannot be overstated. Lord Deben told the Committee—

” I do not believe that a net-zero target would be possible unless agriculture were to play an important part in reaching it.”^{cccxcv}

383. There was stakeholder support in the evidence received for this statement. However, the Committee also received evidence from various groups representing agricultural interests suggesting that not only was net-zero unfeasible for the sector, but that the targets in the Bill were also unrealistic. The National Sheep Association, Quality Meat Scotland, and the Soil Association were all concerned about the targets in the Bill and the potential impact they could have on the sector. The Agricultural Industries Confederation Scotland suggested the policies in the climate change plans had not yet had time to bed in, and to expect net-zero was unrealistic.

384. In evidence to the Committee on May 8, the Cabinet Secretary was asked about the changes required of the livestock and agriculture sectors as targets become more ambitious and said—

” I think that the more ambitious the targets are, the more challenging it will be to persuade people about dietary change, for example. Dietary change is pretty directly connected to the livestock sector and is, therefore, very significant. I do not think that people are necessarily drawing the lines between those dots. Folk have to be a little bit more honest about such things.”^{cccxcvi}

385. When asked^{cccxcvii} for her view on the outlook for the red meat sector were a net-zero target to be set, the Cabinet Secretary raised concerns on issues such as shifting production (and therefore emissions) elsewhere in the world, as well as dietary issues, just transition and the need to produce food.

386. While noting that the drive to eat less meat is an important social trend, Andrew Midgley of the NFUS told the Committee that Scottish agriculture has a lot to be commended for, pointing out that a more holistic approach to accounting for farming would provide a clearer picture of its overall, positive contribution.^{cccxcviii} Pete Ritchie of Nourish Scotland agreed, highlighting the opportunities in field horticulture and protective cropping, and noting the continued importance of livestock production in Scotland—

^{cccxcv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 34

^{cccxcvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 29

^{cccxcvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 19

” “We do not want to turn all land over to trees, because using it for grazing purposes not only has great amenity value but has great conservation value. There is a good story that we could tell about sustainable livestock production in Scotland, but at the moment, we are not on track to get that right; we are just not going down that road.”^{cccxcix}

387. The Scottish Government's information and analysis document paints a negative picture for the agriculture industry were a net-zero target to be set—

” “Requiring reductions in emissions from farming beyond what can be achieved through efficiency and technology would mean reducing the amount of food produced in Scotland. In particular, committing to substantial further reductions in agricultural emissions would imply livestock farming, for both meat and dairy production, becoming unviable in Scotland.”^{cd}

388. Sara Grainger said the Scottish Government was of the view that “at this time, it would not be acceptable to the majority to impose policies that restricted... agriculture, food production and industry to the levels that would be required to meet a net-zero target.”^{cdi}

389. The Scottish Government is evidently approaching the issue from the perspective of what would be acceptable to the industry under current circumstances. This was made by the Cabinet Secretary for the Rural Economy and Connectivity's response to the Committee on the value to the Government of CCC advice on agriculture policy, where he said this needed to be balanced with “stakeholder views.”^{cdii} As the Committee noted in its report^{cdiii} on the draft Climate Change Plan, agriculture is treated differently from other sectors in this regard, despite the fact it has the most progress to make. According to the NFUS, “tackling climate change is not necessarily at the top of the Scottish Government’s priority list for agriculture.”^{cdiv}

cccxcviii Environment, Climate Change and Land Reform Committee, *Official Report*, 13 November 2018, Col 25

cccxcix Environment, Climate Change and Land Reform Committee, *Official Report*, 13 November 2018, Col 25

cd Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR— Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#), page 9

cdi Environment, Climate Change and Land Reform Committee, *Official Report*, 19 June 2018, Col 10

cdii [Letter](#) from the Cabinet Secretary for the Rural Economy and Connectivity on the advice of the Committee on Climate Change, 24 May 2018

cdiii Environment, Climate Change and Land Reform Committee. 3rd Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the Draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 93)

cdiv Environment, Climate Change and Land Reform Committee, *Official Report*, 13 November 2018, Col 2

390. In its report, the Committee recommended^{cdv} the Scottish Government consider how best to work with farmers and share best practice, outlining practical actions to reduce emissions.
391. When asked about the role of Government in the sharing of best practice in agriculture, the Cabinet Secretary said—
- ” That is a two-way process—some of what we know and understand will come from industries informing us. A dialogue requires more than one partner, so there will be a constant dialogue. Again, there will be things that we have to be a little bit cautious about, such as negative impacts in some sectors if there is a feeling that the targets are going too far. We do not want to see people drifting out of Scotland as a result of that.”^{cdvi}
392. While the Committee recognises the challenges facing the sector, it also notes the potential opportunities and believes that the Scottish Government should promote and support the sector, focusing on the positive impact it can have and clarifying its objectives in terms of climate change.
393. The Cabinet Secretary told the Committee—
- ” we will never get emissions in that sector down to zero, because producing food—which is a fairly fundamental thing that we all have to do—will produce emissions.”^{cdvii}
394. However, stakeholders such as Andy Kerr of ClimateXChange emphasised the goal was not an emissions free agriculture sector, the goal was a net effect of zero emissions. He said “we are not trying to stop the sector having any economic value—we want it to continue—but we need to balance it with other outcomes.”^{cdviii}
395. The effect of getting to net-zero involves low carbon and sequestration activities, in which the agriculture industry has a role to play. Lord Deben highlighted the positive role land management and agriculture could play in sequestering carbon, through better soil fertility for example.^{cdix}
396. Lord Deben also said^{cdx} credit and gratitude should be afforded to the farming community. The Committee heard a wealth of evidence, including from Quality Meat Scotland^{cdxi} and SEFARI^{cdxii} to suggest the way agricultural emissions were counted meant the industry suffered a bad reputation in terms of climate change mitigation. Positive activities such as tree planting and hosting renewable energy

cdv Environment, Climate Change and Land Reform Committee. 3rd Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the Draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 93), paragraph 550

cdvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 30

cdvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 18

cdviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 13

cdix Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 34

generation were allocated to the emissions reduction of other sectors, meaning that despite the fact they were taking place on agricultural land, they were not supporting the emissions reductions of that sector.

397. Moreover, positive activities, such as improving efficiency or health of animals, were not taken into account in the inventory.

398. Kate Rowell of Quality Meat Scotland also discussed the farm assurance scheme for Scottish beef and lamb as a way of pushing sustainability into standards, but noted the difficulty of ensuring widespread support as it is a voluntary membership scheme.^{cdxiii}

399. Peter Ritchie of Nourish Scotland told^{cdxiv} the Committee agriculture was nowhere near at the limits of what it could do in terms of feasibility—

” “We could significantly increase the efficiency with which we produce the same amount of food while reducing nitrous oxide and methane emissions considerably through a mixture of genetics, animal health and the sensible use of fertiliser.”

400. Andrew Midgely of the NFUS noted that across industry, it is important to make climate change part of the collective agenda, because “if we are completely honest about it, climate change emissions reduction is still not right up there as a thing that people are judged on among their peers.”^{cdxv} He also said the approach to agriculture and its emissions levels was often confrontational, which was not an effective way to promote action.

401. The Cabinet Secretary said—

” “We need to acknowledge that farmers do much more than appears to be the case. Work is on-going in the industry and the scientific community on the potential for reducing emissions in agriculture, and we are talking to the sector about how we might better reflect its achievements. There is a conversation to be had about what we can do better in the food-production side, but there is also a question about how we assign emissions reductions sector by sector.”^{cdxvi}

cdx Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 40

cdxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 7

cdxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 7

cdxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 6

cdxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 22

cdxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 9

cdxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 32

402. The Cabinet Secretary also said—

” There is perhaps an opportunity for us, even though it is not part of the greenhouse gas statistics every year, to do a calculation that shows what agriculture is delivering, on the understanding that that cannot be used as a replacement for what appears in the greenhouse gas emissions stats, which measure a very specific thing, as opposed to wider matters.”^{cdxvii}

403. Stakeholders were clear that support, knowledge transfer and guidance for the agriculture industry were essential to reaching any target. Scottish Environment LINK,^{cdxviii} among others, expressed this view to the Committee. The Committee was also told^{cdxix} of the role and importance of a just transition for the agriculture industry.

404. Throughout its consideration of the Bill, one of the recurring messages received by the Committee was that there is a sense of urgency required about taking action to mitigate climate change and that despite the transformational and difficult nature of the changes required, they will be easier and more cost effective to make sooner rather than later. Agriculture is a sector that has much to contribute in terms of emissions reductions and should be prioritised in terms of support, encouragement and knowledge exchange, in order to avoid the need for mandatory action.

405. The Committee recommends that the Scottish Government give urgent consideration to the agricultural sector. The Scottish Government should take a holistic approach to emissions accounting, recognising the activities across the sector that play a positive role in reducing emissions, such as afforestation and peatland restoration, and highlighting the opportunities that can arise by developing new rural support mechanisms that encourage this. Emphasis should be placed on support, encouragement, and knowledge transfer in order to avoid the need for punitive mandatory action. The Committee intends to engage in early discussions with the Scottish Government and the sector to address this.

406. The Committee recommends that the Scottish Government account for the full extent of emissions reductions across the agricultural sector in the reports published each year under section 16 and 17. Doing so will actively demonstrate the full role of, and positively engage with, the sector in taking action to tackle climate change. This should include the wide range of land management contributions made by the agricultural sector.

^{cdxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 32

^{cdxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 22

^{cdxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 16

Energy

407. Will Webster of Oil & Gas UK, who supported the framework approach in the Bill to setting a net-zero target, described^{cdxx} his industry's plans for transition as supply and demand declined over the next 20 years and said—

” “We see the need for a flexible approach that can take account of how technology develops, how consumer acceptability develops and how society and political discussion move. That is why we appreciate the flexibility in the bill whereby the Government will be able to take account of advice and revise targets through an iterative approach to target setting.”^{cdxxi}

408. Fabrice Leveque of Scottish Renewables also spoke of the wider benefits for industry if investment is made in innovation when discussing the targets—

” “the point of the target should be to allow technical challenges to be recognised and to let industry innovate and work out what it needs to do in order to deliver the target.”^{cdxxii}

Keeping pace and carbon leakage

409. The Committee heard from the Cabinet Secretary that “It is probably important... that countries move forward at something like the same pace”^{cdxxiii} in terms of target setting.

410. She noted this was to do with the issue of carbon leakage, described in evidence to the Committee as—

” “...when businesses relocate to countries with more lax regulations or lower targets. If one country has a substantially higher target and tougher regulations than surrounding countries, that can have quite a negative economic impact and can affect the availability of jobs and so on.”^{cdxxiv}

411. The Cabinet Secretary described the potential economic consequences of progressing too far beyond other countries which may benefit economically from taking less stringent environmental measures.^{cdxxv} Closer to home she discussed the issue of “carbon leakage”^{cdxxvi} around the UK.

cdxx Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 32

cdxxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 32

cdxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 47

cdxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 26

cdxxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 19

cdxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 23

412. Dr Diana Casey of the Mineral Products Association described^{cdxxvii} concerns over the carbon tax announced in the recent UK budget and how a no-deal Brexit could affect the competitiveness of the industry in the UK. She also commended^{cdxxviii} the Scottish Government for setting ambitious targets but said the industry would like to be aligned with the rest of the UK.

413. On innovation, the Cabinet Secretary said—

” That is why, for example, Norway—which has not set a target, as it has not legislated—has said that it will reach net-zero emissions by 2030 if other countries do the same. What is driving its ambition is its need to ensure that it does not get itself so out of kilter with neighbouring countries that it ends up, in effect, causing itself a problem by having parts of its economy disappear over the borders.”^{cdxxix}

414. The Committee recognises the issue of carbon leakage and does not want Scotland, either within the UK or in the international market, to be disadvantaged by seeking ambitious climate change mitigation policies. However, neither does it want Scotland to lose the esteem in which its ambition is held by failing to act strongly. The Committee recognises the balance required between tough action and economic prosperity (taking into account the just transition issues discussed in the [SCOPE OF THE BILL, CLIMATE JUSTICE](#) section of this report). It proposes the route around this is development of a low carbon, innovative economy that sees climate change as an opportunity for growth.

A net-zero target as an economic opportunity

415. Some witnesses and written submissions emphasised the economic opportunities to be gained from setting a net-zero target.

416. Tom Thackray of CBI Scotland said—

” The most common response that we get from people who want to talk to the CBI about climate change is that they recognise that becoming more innovative in green technology is a business opportunity rather than a business risk.”^{cdxxx}

417. Mai Muhammad of Aberdeen City Council said the Government needs to recognise this and excite industry about opportunities.^{cdxxxi} She added—

cdxxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 23

cdxxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 38

cdxxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 42

cdxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 19

cdxxx Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 46

” “If there is more encouragement of the early adopters to try to push and accelerate innovation in the next 10 years, the technology that we thought would be too expensive may be viable. That is key. Today, there is just enough being done to encourage that innovation. If we encourage more, we can get the benefits of that innovation in 2040 and 2050.”

418. The concept of early adoption and innovation was also discussed by Stefan Nyström of the Swedish Environment Protection Agency who said—

” “We cannot be sure that the first to innovate will be the winner. We do not know how the Porter hypothesis works in reality—it works differently in different sectors—but we know that innovation is the key to our continued well-being and economic prosperity in Sweden. Nobody doubts that any longer, which is why we are going into the hydrogen project.”^{cdxxxii}

419. Anders Wijkman of Climate-KIC also said: “Our share of global emissions is very small, but we can make a difference by demonstrating good solutions. That would also allow us to benefit from future trade.”^{cdxxxiii} While Tom Thackray noted^{cdxxxiv} the need to cooperate on regulation across the world to ensure there was a level playing field for business development.

420. Mary Sweetland of the Eco-Congregation noted the economic possibilities for rural areas of remote working. She also stated that Scotland could “do more in green tourism” by improving its transport infrastructure across rural areas.^{cdxxxv}

421. Additionally, Paul Gray of NHS Scotland suggested^{cdxxxvi} that there were clear diplomatic and economic advantages to demonstrating leadership on climate change—

” “If we wish to be influential, it will be hugely important that we are pursuing targets that are demonstrably world leading. The more we do... the more influential we will be elsewhere in the world when we are talking about the trade terms that we might want. There is a clear diplomatic advantage in thinking carefully about what stance we want to take and what position we want to represent.”

422. Martin Reid of the Freight Transport Association noted that if cost benefits for businesses could be shown through mitigation activities, “people will jump at the

cdxxxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 52

cdxxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 18

cdxxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 18

cdxxxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 46

cdxxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 18

cdxxxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November, 2018, Col 51

idea.^{cdxxxvii} He also called^{cdxxxviii} for positive messaging around climate change activities.

423. Jess Pepper of Transform Scotland provided an example of where economic opportunity and low carbon behaviours could be aligned—

” I will give an example of an ambition that we might aim for. The climate change plan aims for a policy outcome of increasing to 50 per cent by 2032 the proportion of the Scottish bus fleet that is low-emissions vehicles. The projection for the world’s buses is that about 47 per cent will be electric by 2025, and 13 cities internationally are committed to buying only zero-emissions buses from 2025—Shanghai and Shenzhen are already buying only such buses. That action involves 80 million people and 60,000 buses. If we are asking whether we should lead and be ahead of the curve or wait and follow others, we might be mindful that Scotland is home to two international bus operator companies. Scotland also makes buses and is a leader in producing clean electricity, so there are huge opportunities not only for our national bus fleet but for international activity in relation to buses to gain economic advantages.^{cdxxxix}

424. WWF told the Committee that the 90 per cent target for 2050 would place Scotland behind those countries at the forefront of global ambition. According to WWF—

” [This] would not do enough to tackle the equity dimension. It would also not do enough to acknowledge Scotland’s huge economic potential from our vast renewable resources and vast carbon storage potential. If we cannot do this, I do not see which other country can do it. We would like the bill to set iconic long-term targets to eliminate our contribution to climate change entirely by 2050, and stronger early action.^{cdxli}

425. Professor Tahseen Jafry of the Centre for Climate Justice spoke of the "huge opportunities for the economy in terms of jobs if people get behind the development of the infrastructure for renewable energy technology."^{cdxli}

426. Elizabeth Leighton of the Existing Homes Alliance said—

cdxxxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 40

cdxxxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 42

cdxxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 47

cdxli Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 5

cdxli Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 6

” “Evidence has been provided during this Stage 1 scrutiny that we risk losing all the economic benefits—the jobs benefits and the benefits to the wider economy—if we do not provide certainty so that businesses and home owners invest. Having that clear pathway set in statute will give them more confidence to go ahead and invest. We can then win those jobs benefits rather than seeing them gradually leaking to other parts of the UK or even Europe because our supply chain has not developed.”^{cdxlii}

427. Dr Diana Casey echoed^{cdxliii} these sentiments with regard to biomass, noting there was a lack of incentives at the moment but the technology was viable. Additionally, Dr Casey pointed out that more work is needed to develop hydrogen technology.^{cdxliv}
428. In its written submission, Scottish Enterprise said: “Without support for industry it seems plausible that the targets may be challenging to achieve, and indeed the net-zero emissions target may continue to become aspirational rather than achievable.”^{cdxlv}
429. The Committee was concerned that the Cabinet Secretary did not offer any examples of positive features for Scotland's economy of setting a net-zero target when prompted.^{cdxlvi}
430. The Committee agrees that innovation is a key to well-being and economic prosperity and welcomes the view of the CBI that becoming more innovative in green technology can be a business opportunity rather than a business risk. The Committee considers that action to promote low emissions behaviour could result in significant economic opportunity.

Economic and sectoral perspectives of a net-zero target - conclusions

431. The Committee is concerned that the Scottish Government and enterprise agencies are not sufficiently assessing and promoting the positive opportunities for the economy of setting a net-zero target. Given the IPCC advice and the body of evidence the Committee has received noting the urgency of the task at hand, the Scottish Government should prioritise early action and investment and do more to assess and promote the benefits and opportunities to the economy and well-being.
432. The Scottish Government's view is that action beyond the 90% target is extremely challenging and would have a "substantial detrimental impact on people's well-

^{cdxlii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 35

^{cdxliii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 45

^{cdxliv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 45

^{cdxlv} Written Submission. [Scottish Enterprise](#)

^{cdxlvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 19

being and the economic growth of Scotland."^{cdxlvii} In the Government's information and analysis document for example, the discussion on carbon capture and storage (CCS), which underpins our ability to meet the targets, reflects this. The document provides detailed information on the 90% target, with reference to the level of CCS required, while simply noting that to reach net-zero: "the scale of carbon capture and storage, with or without bioenergy, would need to be far greater and begin much sooner."^{cdxlviii} Given the importance of CCS and the urgency of early action, greater detail could have been provided.

433. During its scrutiny of the Bill, the Committee heard little of what Scottish Enterprise, Highlands and Islands Enterprise, Scottish Development International or the National Investment Bank are doing to promote low carbon opportunities, despite them being named as delivery partners throughout the Climate Change Plan. Dave Moxham of the Just Transition Partnership told^{cdxlix} the Committee of the need for the involvement of such bodies in order to stimulate economic behaviour change.
434. The Committee recognises there are difficult decisions to be taken, but believes a level of practicality needs to be maintained around the debate. All sectors of the economy should be supported and encouraged to reduce emissions while capitalising on opportunities for growth within the context of mitigating climate change.

435. The Committee recommends the Scottish Government consider how it can present the economic opportunities of transitioning to a low carbon economy in a more positive light. The Committee recognises the need to accelerate the pace of work in this area and the need for a clear focus. The Committee would welcome early discussion with the Scottish Government on the priorities for action.
436. The Committee recommends the Scottish Government commission work to assess and evaluate the economic opportunities, or otherwise, to Scotland of setting a net-zero target and how these could potentially be embedded in the work of enterprise agencies and the Scottish National Investment Bank.
437. The Scottish Government should provide formal guidance on how it will further promote and enable a low emissions economy, as well as the criteria it sets for investment in low carbon emissions initiatives.

cdxlvii Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR: Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#), page 2

cdxlviii Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR: Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#), page 8

cdxlix Environment, Climate Change and Land Reform Committee, *Official Report*, 15 November 2018, Col 15

Which year should be the net-zero target year?

438. Although the results of the Scottish Government consultation and many of the views expressed to the Committee in both written and oral evidence support setting a net-zero target on the face of the Bill, there were differing opinions on when this should be set.
439. Some stakeholders, such as the 2050 Climate Group,^{cdl} suggested they would be content with the target being included in the Bill and were not concerned about which year was set as the target year, whereas others had definite views on when the date should be.

2040

440. Jim Skea of the IPCC said—

” ...it would be suggested that a country such as Scotland should probably aim for something a little earlier than the 2040 to 2070 bracket in order to make a reasonable and fair contribution to the global aim of net-zero.”^{cdli}

441. In evidence to the Committee, Friends of the Earth Scotland described^{cdlii} how it subscribed to the Fair Share methodology of setting emissions targets, developed by the Stockholm Environment Institute. Based on this, the organisation proposed a net-zero target for 2040, which was supported by Young Friends of the Earth Scotland^{cdliii} and Action Aid International.^{cdliv}
442. Professor Tahseen Jafry, Annie Nettleton, Bruce Taylor, Jennifer Rogers, Nourish Scotland and Centre for Climate Justice, among others, also supported a 2040 net-zero target year.^{cdlv}

2050

443. At the time the Committee took evidence in late-2018, several stakeholders, such as Scottish Environment LINK,^{cdlvi} the RSPB, Stop Climate Chaos and the Energy Agency suggested the net-zero target should be included in the Bill by 2050 "at the latest." WWF Scotland^{cdlvii} also noted that they had commissioned work with Vivid

cdl Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 15

cdli Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 4

cdlii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 14

cdliii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 14

cdliv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 17

cdlv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 15

Economics, an economics consultancy company, to determine an earlier date for net-zero.

444. There was also support from SCIAF, Archaeology Scotland, Plan B and Bright Blue for the year to be set at 2050.

Scottish Government consultation

445. The Committee heard that over 99% of respondents to the Scottish Government's consultation on the Bill called for a net-zero target to be set for 2050. A total of 19,365 responses to the consultation were received, including 273 non-campaign responses and 19,092 campaign responses.^{cdlviii}

446. The Scottish Government's analysis of its consultation showed that—

” “Most respondents, including all campaigns...agree the need for ambitious targets but believe that the proposed targets are not ambitious enough. Many respondents would rather have the proposed targets than no targets or lower targets.”^{cdlix}

447. These responses challenge the Scottish Government's determination that "at this time, it would not be acceptable to the majority to impose policies that restricted aviation, shipping, agriculture, food production and industry to the levels that would be required to meet a net-zero target."^{cdlx}

Net-zero as a clear message

448. The Committee heard in evidence that net-zero sent a clear message and was far easier to communicate than a 90% target.

449. Stefan Nyström of the Swedish Environmental Protection Agency said—

” “I would say that a net-zero target or a fossil-free target is much easier to communicate to anyone than a target of 86 per cent, 93 per cent or whatever percentage, because what is that a percentage of? A net-zero target is something to stand behind. It is like the Apollo project to launch a man to the moon—it is something that is needed in this period of transition.”^{cdlxi}

cdlvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 16

cdlvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 16

cdlviii Scottish Government. (2017) [Climate Change Bill: consultation summary report](#)

cdlix Scottish Government. (2017) [Climate Change Bill: consultation summary report](#)

cdlx Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 10

cdlxi Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 28

450. Jamie Stewart of the Citizens Advice Scotland said "Gaining public support for a net-zero 2050 target is the easy part; getting public support for the programmes that will come into place next year is the more difficult bit."^{cdlxii} Dr Rachel Howell^{cdlxiii} of the University of Edinburgh and Shane Donnellan^{cdlxiv} of Changeworks also suggested that communication should be about individual actions, while Mary Sweetland of the Eco-Congregation Scotland noted^{cdlxv} that a net-zero target would be well-received in Scotland and would "make people realise that they need to take some action."
451. Siri Pantzar of the Climate 2050 Group also thought a net-zero target expressed the extent of the situation—
- ” "A target of a 90 per cent reduction leaves a little bit of space, which allows everybody to think that they do not have to change by quite as much. A net-zero target would serve as a clear image for the public and would let all sectors know that they needed to look at what work they were doing. There is a public drive for having a net-zero target."^{cdlxvi}

452. The Committee accepts that a net-zero target is a clearer message to understand than 90% and would send a strong signal, emphasising the need for significant change.

Section one - The Net-Zero Emissions Target - Conclusions

453. The Committee heard evidence from both sides of the debate - that a net-zero target should be set on the face of the Bill or that it should be set at a future date after a clear pathway was determined.
454. The Committee agrees that the goal should be to reach net-zero but the question is when. The Committee considers it would be premature to make recommendations on whether the Bill should or should not contain such a target prior to receiving the advice of the CCC and hearing the Scottish Government's response. However, the Committee notes the Cabinet Secretary's commitment that—
- ” "If the UK Committee on Climate Change advises us that a net-zero target is now feasible, in March, April, May or whenever, we will do it."^{cdlxvii}

cdlxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 26

cdlxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 26

cdlxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 25

cdlxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 26

cdlxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 11

455. In relation to carbon emissions, the Committee heard the Cabinet Secretary say—

” I do not think that we require to amend the bill because of the IPCC report. We are already on track, with the bill, to achieve what the IPCC report is looking for, including being carbon neutral by—in our case—a set date of 2050. What we are proposing lies within the parameters of what the IPCC asks for.”^{cdlxviii}

456. However, she also stated that—

” The commitment in the bill to meet net-zero emissions as soon as practicable is such that it would be relatively easily amended if the Committee on Climate Change comes back with advice that that is a feasible pathway. Such an amendment at Stage 2—which is when we would see it happening—would be fairly straightforward.”^{cdlxix}

457. The Committee is of the view that the temperature limit the Bill is contributing towards achieving could be clearer and notes the warnings contained in the IPCC's report, which highlights the potential impacts of warming above 1.5 and the speed at which action is required to prevent that. It also notes the comments from Jim Skea on the need for Scotland to be achieving net-zero before the 2040 - 2070 period in order to meet this goal.

458. The Committee recommends that the Scottish Government give further consideration to how the Bill and accompanying documents could be amended to clarify the temperature limit the Bill contributing to.

459. The Committee believes that significant developments have taken place since the Committee on Climate Change first produced advice for the Government 18 months ago and notes that the content of the Bill may require reconsideration following receipt of the anticipated updated advice.

Section two - The 2050 target

460. Beyond the debate on the inclusion of net-zero target on the face of the Bill lies the establishment of new targets for 2050, as well as interim and annual targets. The former will be explored in this section of the report.

461. Section 2 of the Bill states "In section 1(1) of the 2009 Act, for "80%" substitute "90%.""^{cdlxx} While much of the debate around the Bill has focused on whether the target should be 100% (or net-zero), there has also been debate around raising the level of ambition from 80% to 90%, and the impact this will have.

cdlxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 29

cdlxviii Environment, Climate Change and Land Reform, [Official Report](#), 27 November 2018, Col 4

cdlxix Environment, Climate Change and Land Reform, [Official Report](#), 27 November 2018, Col 6

cdlxx [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 2

462. This section explores the evidence received by the Committee in relation to the 90% target.

Advice of the Committee on Climate Change

463. The increase from 80% to 90% follows the advice of the CCC, which said a 90% target would be commensurate with its "high level ambition scenario" outlined in its October 2016 advice^{cdlxxi} on target levels between 2028 and 2032. It also aligns with Option 2 in its advice on the Bill, which described 90% as being at the "limit of the measures the Committee has identified to reduce emissions in Scotland and would require strong progress across every area of the economy."^{cdlxxii}

464. On a 90% target, the CCC also makes the following points—

- It has not been able to calculate the cost of a "scenario that achieves this target" (this is addressed in the section of this report);
- Option 2 means a reduction of CO2 to zero, "with the residual net positive emissions comprising non-CO2 greenhouse gases (primarily methane and nitrous oxide from farming)"^{cdlxxiii}; and
- Strong, well-designed policies would be required to achieve a 90% target and the CCC suggest—

” it would be important to identify the areas in which Scotland will go further than the UK as a whole, the role for greenhouse gas removal options (including afforestation, use of wood in construction, bioenergy with carbon capture and storage and a range of other options), and whether relevant policy levers are under Scottish or UK Government control.”^{cdlxxiv}

Feasibility

465. In its March 2017 advice, the CCC described Scotland's current target of 80% by 2050 as "already stretching"^{cdlxxv} and—

”Setting more ambitious targets now to align to the aims of the Paris Agreement would require actions that are currently at the very limit of feasibility.”^{cdlxxvi}

cdlxxi Committee on Climate Change (2016), *Scottish Emissions Targets 2028-2032: The high ambition pathway towards a low carbon economy*

cdlxxii Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017, Executive Summary, page 13

cdlxxiii Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017, Executive Summary, page 13

cdlxxiv Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017, Executive Summary, page 13

cdlxxv Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017, Executive Summary, page 9

cdlxxvi Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017, Executive Summary, page 9

466. Organisations such as Scottish Enterprise, the Mineral Products Association, Tarmac and the NFUS concurred that a 90% target was at the current limits of feasibility.^{cdlxxvii}
467. However, the Scottish Government has opted for the most ambitious scenario within the comfort zone of the 2017 CCC advice and proposed to set the target for 2050 at 90%, which was met with support from the Scottish Hydrogen and Fuel Cell Association, the Industrial Biotechnology Innovation Centre, the Soil Association, Strathclyde Partnership for Transport, the NFUS and COSLA.
468. Notwithstanding what has been said in the previous section of this report on the potential to set a net-zero target, the Committee welcomes the Scottish Government taking the more ambitious of the options presented by the CCC in 2017. It also reiterates its conclusions about international comparisons and agrees with Keep Scotland Beautiful^{cdlxxviii} that the proposed legislation could represent some of the toughest in the world.

Section three - The interim targets

469. Section 3 is as follows—

” (1) For section 2 of the 2009 Act, substitute—

The interim targets (1) The Scottish Ministers must ensure that the net Scottish emissions account for the year—

- (a) 2020 is at least 56% lower than the baseline,
- (b) 2030 is at least 66% lower than the baseline, and
- (c) 2040 is at least 78% lower than the baseline.

(2) In this Act, each target set out in subsection (1) is known as an “interim 20 target”.^{cdlxxix}

470. The interim targets were welcomed by Argyll and Bute Council, among others. The Committee also received written evidence to suggest they should be stronger but with specific targets requested.

2020 interim target

471. The CCC noted that “Scotland is on course to outperform the interim emissions reduction target for at least a 56% reduction in actual emissions by 2020.”^{cdlxxx}

472. It also said—

cdlxxvii Written Submissions: [Scottish Enterprise](#), the [Mineral Products Association](#), [Tarmac](#) and the [NFUS](#)

cdlxxviii Written Submission. [Keep Scotland Beautiful](#)

cdlxxix [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 3

cdlxxx Committee on Climate Change (September 2018), [Reducing emissions in Scotland – 2018 Progress Report to Parliament](#), Executive Summary, page 6

” “The Scottish Government is therefore currently on track to meet the 2020 target and is largely implementing the Committee’s recommendations. In some areas Scotland’s progress is leading the UK, and providing examples to other parts of the UK on how to raise ambition cost effectively. However, in order to meet ambitious targets beyond 2020 much more is required to reduce emissions from transport and agriculture and land use, and increased uptake in renewable heat.”^{cdlxxxix}

473. It was later confirmed^{cdlxxxii} by Tom Russon that the 2020 target will be achieved because the climate change plan has aimed for the more difficult of the two targets.
474. There were questions raised in evidence to the Committee on whether the 2020 target represented progress from the previous position and on whether this should be made more ambitious. However, the Committee considers that in the context of other recommendations in this report, particularly on the climate change plans and the need for certainty, changing this could be potentially damaging so it should remain.

2030 interim target

475. The 2030 interim target received much attention throughout the Committee’s consideration of the Bill. For many, this target was more important than the 2050 or the net-zero debate, as the rate of action taken between now and 2030 would dictate whether or not targets beyond that could be met and whether an overshoot scenario could be prevented.

476. The CCC suggested that flexibility should be retained within the legislation and policy making for increased ambition in the future.^{cdlxxxiii} It proposed that a 2030 target be set and noted—

” “In order to keep in play reductions by 2050 consistent with our High Ambition scenario, it will be important to take actions over the period to 2030 (e.g. on low-carbon heat, ultra-low emissions vehicles, carbon capture and storage) that allow those very low levels emissions to be feasible in the longer term.”^{cdlxxxiv}

477. Groups such as the Scottish Hydrogen and Fuel Cell Association agreed with the level of the proposed 2030 target.
478. However, some stakeholders were concerned at the rate of action and the level of the 2030 target. Groups such as Nourish Scotland called for more action in the next five to ten years. Friends of the Earth Scotland expressed concern about the

^{cdlxxxix} Committee on Climate Change (September 2018), [Reducing emissions in Scotland – 2018 Progress Report to Parliament](#), Chapter 1 - Decarbonisation in Scotland, page 19

^{cdlxxxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 20

^{cdlxxxiii} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Chapter 2: Appropriate levels of emissions targets, page 34

^{cdlxxxiv} Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Chapter 2: Appropriate levels of emissions targets, pages 34-35

pathway to 2030 which it said^{cdlxxxv} represented little change from the 2009 Act and the 2050 Climate Group pressed for more action now while there is more "wriggle room" for a managed transition.^{cdlxxxvi}

479. In evidence to the Committee, Friends of the Earth Scotland described^{cdlxxxvii} how it subscribed to the Fair Shares methodology of setting emissions targets, developed by the Stockholm Environment Institute. Based on this, the organisation proposed a 77% target for 2030, which was supported by Young Friends of the Earth Scotland^{cdlxxxviii} and Action Aid International.^{cdlxxxix} Teresa Anderson said—

” “The 2030 target is the key issue. The graphs in the Intergovernmental Panel on Climate Change’s special report “Emissions Scenarios” are very clear, and scenario 1 is especially clear. If you look at the scenarios, you will see that the first scenario is the socially hopeful one for which we all want to reach. That curve is much steeper, and it does not rely on future technologies that have not yet been invented to solve the problem. If we want to keep in line with the IPCC, that steeper curve is critical. The focus should really be on the 2030 target, with 2040 as the net-zero emissions point.”^{cdxc}

480. WWF suggested a 77% target for 2030 and said the organisation had "based our analysis on the carbon law principle that was developed by Johan Rockström at the Stockholm Resilience Centre and which relies on our halving emissions every decade, as the science tells us we need to do."^{cdxci}

481. There were several supporters of a 77% target for 2030 including Scottish Environment LINK,^{cdxcii} the Energy Agency, Nourish Scotland, RSPB, Unison Scotland and Stop Climate Chaos Scotland.

482. In terms of increasing action between now and 2030, Friends of the Earth Scotland pointed out that because of the roll back on ambition between the draft and the final climate change plan, there are already a suite of proposals which the Government

^{cdlxxxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 2

^{cdlxxxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 4

^{cdlxxxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 14

^{cdlxxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 14

^{cdlxxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 17

^{cdxc} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 17

^{cdxci} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 19

^{cdxcii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 18

has considered and the Parliament had scrutinised, which could be deployed to go further by 2030.^{cdxciii}

483. In light of the IPCC report, which calls for "rapid, far-reaching and unprecedented changes in all aspects of society" in the next 12 years and the recent request for updated advice from the CCC, the Committee recommends that the Scottish Government should also request updated advice from the CCC on whether the 2030 target is appropriate.

2040 interim target

484. The CCC suggested in its 2017 advice to the Scottish Government that the value of setting a 2040 target depended on the likelihood of a 2050 target being revised and proposed that a 2040 target of 78% would be consistent with a 2050 target of 90%.^{cdxciv} Others such as Quality Meat Scotland suggested a 2040 target should not be set now, but should be part of the review of the 2050 targets in the future. There was also, as detailed above, support for making 2040 the net-zero target year or making the target more ambitious.
485. The Committee agrees with the CCC on the dependence of the 2040 target to the 2050 target, and notes the support it heard for 2040 being set as the net-zero target year. It will therefore await the outcome of the advice of the CCC and reserve judgement on the issue of the 2040 target. However, it does suggest this needs to maintain the ambition and level of action needed were a 77% target for 2030 to be set.

Sectoral targets

486. The Committee discussed sectoral targets with the Bill team in June 2018. Both the Committee and Scottish Government officials were of the view that emissions reduction targets and the effort required for each should depend upon the specific sector.
487. Lord Deben added, "We should be making clear to the sectors what they are supposed to do. In that sense, a certain disaggregation of the targets is required."^{cdxcv}
488. The Confederation of Paper Industries suggested targets should be set in the areas of the economy where the biggest gains were possible. Keep Scotland Beautiful welcomed a commitment to increase action across all sectors.

cdxciii Environment, Climate Change and Land Reform Committee, *Official Report*, 20 November 2018, Col 20

cdxciv Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017, Chapter 2: Appropriate levels of emissions targets, pages 34-35

cdxcv Environment, Climate Change and Land Reform Committee, *Official Report*, 23 October 2018, Col 37

489. The Committee considers we need to take a holistic approach to setting sectoral targets. Sectors need a clear understanding of what they are expected to deliver. The Committee agrees that a sectoral disaggregation of the targets is required and as our understanding of what is necessary in each sector develops, a move to sector specific targets may be appropriate. This could be considered through the work of the Just Transition Commission.
490. The Committee has considered the issue of sectoral targets and believes sectoral reporting on the overall target would be a more flexible approach to ensuring accountability for meeting targets within each sector, which is discussed later in this report.

491. The Committee recommends the Scottish Government give further consideration to setting sectoral specific targets within the Bill and respond to the Committee ahead of Stage 2 with clarification as to how target setting, measurement and reporting for specific sectors could be improved. The Committee would welcome further discussion with the Scottish Government on this and the potential implications of setting legislative targets for each sector. The Committee may wish to take further evidence on this, following receipt of the updated advice from the CCC.

Section four - Modification of the 2050 and interim targets

492. Section 4 of the Bill proposes to allow Scottish Ministers to amend the 2050 target^{cdxcvi} and any of the interim targets.^{cdxcvii} This can be done to make the targets more **or less** challenging.^{cdxcviii} However, a lower target may not be proposed if it is—
- ” (a) inconsistent with the most up-to-date advice the Scottish Ministers have received from the relevant body,
 - (b) lower than any percentage figure applying, immediately after the 35 regulations come into force, for an interim target for an earlier year, or
 - (c) lower than 100% for a year which is the same as, or later than, the net-zero emissions target year.^{cdxcix}
493. Subsections (4) and (5) provide that where a net-zero target year is set under A1(2), all subsequent targets following that year (if not 2050) should be updated by (affirmative procedure) regulations to 100%.^d According to the Explanatory Notes—

cdxcvi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 4 (2A)(1)(a)

cdxcvii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 4 (2A)(1)(b)

cdxcviii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 4 (2A)(1)

cdxcix [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 4 (2A)(2)

^d [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 4 (2A)(4) and (5)

” Subsection (4) provides that the duty in subsection (5) applies in the event that both: (i) the Scottish Ministers lay a draft of regulations under section A1(2) which propose to specify a net-zero emissions target year of 2050 or earlier, and (ii) one or more percentage figures applying for the purposes of the 2050 target, or any interim target for a year which is the same as or later than the proposed net-zero emissions target year, is lower than 100%. In this event, subsection (5) provides that the Scottish Ministers must, simultaneously or as soon as reasonably practicable afterwards, lay before the Scottish Parliament a draft of regulations under subsection (1) which modify to 100% each such lower percentage figure.”^{di}

494. Ministers are also required to publish a statement outlining their reasons for "proposing to modify the percentage figure,"^{dii} the "extent to which the proposed modification takes account of the target setting criteria"^{diii} and whether the "proposed modification is consistent with the most up-to-date advice they have received from the relevant body,"^{div} which, according to the Scottish Government, must also take into account the target setting criteria.^{dv}
495. There was support for this ability to modify targets, "with due regard" to CCC advice, from the Scottish Hydrogen and Fuel Cell Association.^{dvi}
496. The Scottish Government outlined^{dvii} examples of scenarios in which the targets may need to be modified, but also noted this was a "last resort"^{dviii} option as one of the benefits of targets was to provide long-term certainty and signalling.
497. Friends of the Earth Scotland told the Committee that the issue had been discussed at length in the Scottish Government technical working group on the Bill and that while it felt instinctively wrong to allow targets to be reduced, they were content that sufficient safeguards were in place within the Bill.^{dix} Professor Paul Jowitt of Heriot-Watt University suggested^{dx} it was "common sense" to be able to modify targets in both directions.

^{di} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Explanatory Notes](#) (SP Bill 30-EN, Session 5 (2018)), paragraph 23

^{dii} [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 4 (2A)(6)(a)

^{diii} [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 4 (2A)(6)(b)

^{div} [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 4 (2A)(6)(c)

^{dv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 16

^{dvi} Written Submission. [Scottish Hydrogen and Fuel Cell Association](#)

^{dvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 17

^{dviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 18

^{dix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 23

Lowering target levels

498. As the Bill states at section 2A 'Modification of the 2050 and interim targets'—

” (1) The Scottish Ministers may by regulations modify one or more of the percentage figures applying for the purposes of—

(a) the 2050 target, or

(b) any of the interim targets,

so as to substitute a higher or lower figure for the one for the time being mentioned in section 1(1) or, as the case may be, section 2(1)(a), (b) or (c).

(2) But regulations under subsection (1) may not substitute a lower percentage figure for the 2050 target or for an interim target if that figure is—

(a) inconsistent with the most up-to-date advice the Scottish Ministers have received from the relevant body,

(b) lower than any percentage figure applying, immediately after the regulations come into force, for an interim target for an earlier year, or

(c) lower than 100% for a year which is the same as, or later than, the net-zero emissions target year.”

499. Tom Russon offered an explanation as to why the ability to lower targets was required—

” [...] the science around how we measure emissions is changing all the time. The experience that we have had with the 2009 act is that that can change the figures in either direction—we can find out either that we have always had a lot more emissions than we thought or that we have had a lot less than we thought. On a year-to-year basis, which way those changes will go is entirely unpredictable. Control over the changes is almost entirely out of the hands of the Scottish Government, as decisions are made at a UK level, in line with the United Nations guidelines. In crude terms, these are things that happen to us that we have to respond to. Because those measurement changes can go in either direction, the issue is entirely policy neutral—at this level, it is purely technocratic. That is why the CCC advice is that it is important to be able to modify the targets both ways.”^{dx}

500. Stop Climate Chaos Scotland^{dxii} told the Committee it would like the Bill to rule out reductions in targets based on inventory changes. The group felt longer-term targets should be protected from this, adding that: "The Bill doesn't, but should, create a clear differentiation between the advice, Ministerial powers and processes that relate purely to inventory changes, and those for the general changing of targets."

^{dx} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 52

^{dxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 18

501. The Committee notes the advice from the CCC that it is important to be able to modify the targets both ways. However, the Committee remains unclear why changes to the inventory and measurement should impact the targets. The Committee considers increased policy action should be required to meet targets if they appear jeopardised by future inventory changes.
502. If a source of emissions is discovered to be larger than previously considered, this has a practical impact and the impact of that source of emissions can only be removed by greater action. The Committee is of the view that altering a target to fit changes in measurement science may mask the need for additional, urgent action as required.
503. The Committee understands the desire to maintain flexibility to modify target levels in both directions should there be a change in the science but considers there should be a presumption against lowering targets. The Committee is not persuaded that the safeguards in the Bill as currently drafted are adequate.
504. The Committee recommends the Scottish Government give further consideration to the drafting of the Bill in advance of Stage 2 to ensure it reflects a presumption against lowering of targets and provides only for modifications based on changes in the science rather than as a result of a failure of policy effort.

Section five - The target-setting criteria

505. Section 5 of the Bill updates the target setting criteria which exist in the current Climate Change (Scotland) Act 2009 to include reference to "European and international law and policy relating to climate change (including the United Nations Framework Convention on Climate Change and protocols to that Convention)."^{dxiii}
506. It also defines the "fair and safe emissions budget" as—
- ” "the aggregate amount of net Scottish emissions for the period 2010 to 2050 as recommended by the relevant body as being consistent with Scotland contributing appropriately to stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."^{dxiv}
507. It is proposed the target setting criteria can be amended by regulations.^{dxv} These can be added, removed or varied. The Committee considers that this should be subject to the affirmative procedure.

dxii Written Submission. [Stop Climate Chaos Scotland](#).

dxiii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 5 (2B)(1)(b)

dxiv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 5 (2B)(2)

dxv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 5 (2B)(3)

Development of the target setting criteria

508. The Scottish Government Bill team told^{dxvi} the Committee that the target setting criteria had not been reviewed in developing the new Bill, but that the original criteria as laid out in the 2009 Act had been transposed and updated to include reference to European and international law.^{dxvii}
509. The Scottish Government said of the consultation process on the Bill with regard to the criteria—
- ” “A wide range of views were put forward, including suggestions that further, more specific criteria should be added, and suggestions that the number of criteria should be reduced, or prioritised. The Scottish Government took the view that there was not a clear case for fundamentally amending the criteria in the 2009 Act.”^{dxviii}
510. The Committee questioned^{dxix} why energy policy had been included but other industries, such as agriculture and transport, had been omitted from the list and the Scottish Government said it was not intended to send a message as to the importance of one sector over another. In correspondence, it told the Committee—
- ” “The advice request must also seek views on the respective contributions that should be made by energy efficiency, energy generation, land use and transport (section 2C(3)(e) of the 2009 Act, as inserted by section 6 of the Bill). It is our view that these headings allow the Committee on Climate Change to provide advice across all sectors with flexibility for the advice to adapt as the respective importance of sectors changes over time.”^{dxx}
511. The Committee believes the Bill could have been an opportunity to review the list and suggests that the Scottish Government consider how this could be made more comprehensive by including other sectors.
512. The Committee does not wish to be in a position of scrutinising legislation which has not been thoroughly considered in the development and proposes the Scottish Government consider the list in its entirety based on the aims of the new Bill.

513. The Committee welcomes the addition of the new criterion, incorporating the United Nations Framework Convention on Climate Change, and recommends that the Scottish Government conduct considered analysis of its target setting

dxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 23

dxvii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 5 (2B)(1)(b)

dxviii [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

dxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 26

dxx [Letter](#) from Sara Grainger, Decarbonisation: Delivery Unit Team Leader, on the Climate Change (Emissions Reduction Targets)(Scotland) Bill, 27 July 2018

criteria, assessing whether these need updated in light of changes in emissions since the passage of the Climate Change (Scotland) Act 2009.

Fair and Safe

514. During the consultation process, the Scottish Government had considered the option of removing reference to the "fair and safe" emissions budget. The Bill's Policy Memorandum states—

” Some respondents expressed clear opposition to the proposal to remove fair and safe emissions budget from the target-setting criteria and called for the concept of a fair and safe budget to not only be retained, but strengthened through a clear definition also being given.”^{dxxi}

515. Sara Grainger, Decarbonisation: Delivery Unit Team Leader, outlined the reasons for considering removal of the phrase—

” Our thinking internally was that that criterion was no longer particularly necessary in the form that it was in because of the move to percentage-based targets. To be clear on that point, there was never any suggestion that we should move away from the importance of the concept of a fair and safe Scottish emissions budget—that remained absolutely central—but we did not think that the criterion in that form was necessary any more. However, the consultation responses were quite clear. Environmental stakeholder groups were very clear that they did not want to lose that criterion in that form and that they considered it to be very important. Therefore, the bill that we have introduced makes no change to that.”^{dxxii}

516. Stakeholders told the Committee that they were glad this element of the criteria had been retained. Friends of the Earth Scotland called for the definition to be tightened to have more of a focus on the "fair" element—

” At present, the definition refers more to the “safe” part of the fair and safe budget; it does not really reflect the “fair” aspect. We think that the UNFCCC principles of equity and common but differentiated responsibilities should be included, and we would like there to be a requirement for the CCC to consider our fair and safe emissions budget when it produces its five-yearly advice and to include it in its calculations.”^{dxxiii}

517. The Cabinet Secretary provided^{dxxiv} her own definition of "fair and safe" before indicating she was open to further discussion on defining this within the Bill. She said this meant "the total amount of emissions over the period that the Committee

dxxi Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 59 (table)

dxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 23

dxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 23

on Climate Change thinks would be consistent with an appropriate Scottish contribution to global efforts."^{dxxv}

518. The Committee notes it has received evidence questioning the CCC method of calculating Scotland's share of global emissions, which suggested this did not take into account the restricted ability of developing countries to mitigate emissions. Stop Climate Chaos Scotland also suggested it was not clear whether the fair and safe budget would be recalculated when the CCC provide advice on a five yearly basis.

519. The Committee welcomes the Cabinet Secretary's openness to discussion on the definition of fair and safe and recommends the Scottish Government explore a revised definition with stakeholders ahead of Stage 2.

520. The Committee also recommends the Scottish Government clarify whether and when the calculation of what is fair and safe will be revised.

Proposed Additions

521. The Committee heard several suggestions regarding updates to the target setting criteria.

522. WWF Scotland,^{dxxvi} Stop Climate Chaos Scotland^{dxxvii} and Unison Scotland^{dxxviii} proposed that public health should be added to the list of criteria and the Existing Homes Alliance called^{dxxix} for social, as well as health and well-being, factors to be considered.

523. Dr Diana Casey called^{dxxx} for an additional five criteria:

- whether the cost-effective technology exists to meet the targets;
- economic circumstances and the question of competitiveness to ensure "the burden of meeting those targets is shared across different sectors of the economy";
- policy;

^{dxxiv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 26

^{dxxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 26

^{dxxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 24

^{dxxvii} Written Submission. [Stop Climate Chaos Scotland](#).

^{dxxviii} Written Submission. [Unison Scotland](#).

^{dxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 52

- fuel availability and whether there is enough biomass to go around the decarbonised sectors that need biomass; and
- interaction with industrial strategy and clean growth.

524. The Cabinet Secretary said^{dxxxix} she was open to the inclusion of other criteria but warned against including so many elements that it become unworkable.

525. The Committee recommends the Scottish Government consider the proposals of stakeholders on the target setting criteria, particularly with regard to incorporating a public health benefit aspect, in advance of Stage 2.

Section six - Duty to seek advice from the relevant body

526. Section 6 proposes to impose upon Ministers a duty to seek advice from the relevant body at least every 5 years.^{dxxxix} Ministers are required to ask:

- Whether a net-zero emissions target is achievable and when;^{dxxxix}
- Whether the existing 2050 and interim targets are still appropriate (with reference to the target setting criteria);^{dxxxix}
- The extent to which targets should be met through domestic action or whether there is a need to use international carbon credits;^{dxxxix}
- The contributions which should be made in the next 15 years^{dxxxix} by:
 - Sectors of the economy covered by trading schemes and all other sectors of the Scottish economy.^{dxxxix}
 - Energy efficiency, energy generation, land use, transport.^{dxxxix}

Definition of Achievable

527. Section 6 (2C)(3) states—

dxxx Environment, Climate Change and Land Reform Committee, *Official Report*, 20 November 2018, Col 52

dxxxix Environment, Climate Change and Land Reform Committee, *Official Report*, 27 November 2018, Col 27

dxxxix Climate Change (Emissions Reductions Targets) (Scotland) Bill, section 6 (2C)(1)

dxxxix Climate Change (Emissions Reductions Targets) (Scotland) Bill, section 6 (2C)(3)(a)

dxxxix Climate Change (Emissions Reductions Targets) (Scotland) Bill, section 6 (2C)(3)(b)

dxxxix Climate Change (Emissions Reductions Targets) (Scotland) Bill, section 6 (2C)(3)(c)

dxxxix Climate Change (Emissions Reductions Targets) (Scotland) Bill, section 6 (2C)(4)

dxxxix Climate Change (Emissions Reductions Targets) (Scotland) Bill, section 6 (2C)(3)(d)

dxxxix Climate Change (Emissions Reductions Targets) (Scotland) Bill, section 6 (2C)(3)(e)

” (3) A request for advice under subsection (1) must request the relevant body’s views as to—

(a) whether the net-zero emissions target is achievable and, if so, what is the earliest achievable net-zero emissions target year (with views on both matters taking account of the target-setting criteria).^{dxlxxxix}

528. There was concern about the use of the term “achievable”, with Stop Climate Chaos Scotland stating—

” “Achievable’ could be interpreted as technological, social, economic etc, however Government’s intention is unclear. We interpret it as requiring a technological pathway, but there are inherent economic and social assumptions inbuilt into all technological pathways. And technological feasibility is in constant evolution.”^{dxli}

529. Gina Hanrahan of WWF said—

” “The bill gives achievability a status that it did not have in the previous legislation. Previously, feasibility of technology was one of the criteria that had to be balanced along with a number of other factors, including science and economics, when the CCC was giving advice. In the bill, the only reason why we would set the net-zero target is if we know that it is achievable.

[...] the IPCC has six layers with regard to how it considers feasibility, going from the geophysical issues, through the techno-economic issues to the socio-political issues. The really big question about whether something is achievable is whether there is enough political will to put it in place.”^{dxli}

530. Both Friends of the Earth Scotland^{dxlii} and Action Aid International^{dxliii} said the IPCC focus on what is necessary should be prioritised over what is deemed achievable, as this could have various interpretations.

531. Dr Diana Casey said achievable meant “decarbonisation without de-industrialisation.”^{dxliiv} Fabrice Leveque suggested^{dxliiv} that cost should be a factor of achievability.

^{dxlxxxix} [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 6 (2C)(3)(a)

^{dxli} Written Submission. [Stop Climate Chaos Scotland](#).

^{dxlii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 24

^{dxliii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 26

^{dxliiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 26

^{dxliiv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 53

^{dxliiv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 53

532. Sara Grainger of the Scottish Government stated—

” We will look to the UK Committee on Climate Change to advise us on what is “achievable.” Its current advice, on which the bill is based, is clear and explicit that going beyond a 90 per cent reduction is not feasible and stretches the bounds of credibility, so we interpret that as meaning that a reduction of more than 90 per cent is not achievable. That is what we mean by “achievable.”^{dxlvi}

533. The Cabinet Secretary said “We cannot set a target that is not achievable.”^{dxlvii} However, she offered no indication on when the target had to be achievable, noting—

” In effect, “achievable” means being able to show how we get from here to there in a way that is credible and realistic....Achievability has to be quite specific: it is not simply about setting a target without thinking about how you get there.”^{dxlviii}

534. However, she also indicated that “pointers”^{dxlix} on ‘acheivability’ would suffice—

” If it is financially possible, there is a technological pointer or they can put together a way of getting there that does not require what is in effect a leap in the dark, that is an achievable pathway. That is all that we are looking for. We cannot get absolute certainty, so we are looking for something that we can present to people, in practical terms, as how we get from here to there, what we need to do and what we need to be thinking.”^{dl}

535. The Committee shares stakeholder concern regarding the Bill's failure to define the term achievable sufficiently. As has been discussed elsewhere in this report, a net-zero target is achievable and possible, but the methods of doing so are not yet deemed acceptable. That is different from it being impossible. It is important, therefore, that a clearer understanding of the term achievable is provided, as well as an explanation of the criteria used to identify when something becomes achievable.

536. The Committee recommends the Bill be amended to include a definition of ‘achievable’ in relation to setting targets.

dxlvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 24

dxlvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 27

dxlviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 27

dxlix Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 27

dl Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 27

As soon as reasonably practicable

537. This section considers the phrase "as soon as reasonably practicable", which occurs throughout the Bill e.g. in section 8—

” "Scottish Ministers must publish any advice received in response to a request [...] as soon as reasonably practicable after they receive it."

538. The Committee asked what was meant by this term and was told this would depend on the "nature of the task."^{dli} For advice from the CCC, it was suggested by the Scottish Government that the requirement was to publish this on the same day "which is what has happened in the past."^{dlii}

539. The Committee notes that advice from the CCC has not always been published on the date of receipt, however, the Committee welcomes confirmation from the Scottish Government that CCC advice could be published on the date of receipt. The Committee considers this should be the expected practice.

Contributions towards meeting the target from sections of the economy

540. The Bill stipulates^{dliii} that the CCC should provide advice on the respective contributions to be made by the following sectors:

- energy efficiency;
- energy generation;
- land use; and
- transport.

541. The Committee considers the advice requested from the CCC should extend to include the sectors identified by the UNFCCC. There should be a read across from the advice of the CCC to the sectors and chapters in the Climate Change Plans. (See [SECTION NINETEEN - CLIMATE CHANGE PLANS, CONTENTS OF THE PLANS, CHAPTERS](#) of this report).

542. The Committee recommends the Scottish Government give further consideration to the list of sectors included in section 6 to determine what additional sectors should be included on the face of the Bill and to ensure that these align with the Climate Change Plan and annual reports. The Committee also recommends the

dli Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 24

dlii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 24

dliii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 6 (2C)(3)(e)

Scottish Government consider the need to include provision to add to the list by regulation.

Section seven - Power to seek additional advice

543. Under section 7 of the Bill, Ministers can seek additional advice from the relevant body (the CCC) at any time during the 5 year period on any matter in the list in section 6^{dliv} or any other matter they believe to be relevant. However, seeking advice on **every** aspect of the list in 2C(3) will be treated as a request made under that section and will trigger the start of a new 5 year period.^{dlv}

Section eight - Ministerial duties following request for advice

544. Section 8 imposes duties on Ministers following a request for advice from the relevant body (the CCC).
545. Firstly, this must be published as soon as reasonably practicable.^{dlvi} If the CCC recommend a new^{dlvii} net-zero target year^{dlviii} and the Scottish Government do not amend the targets to create a net-zero target within a year,^{dlix} the Scottish Government must make a statement^{dlx} to the Scottish Parliament setting out the reasons for not doing so.
546. If the CCC advice suggests modification of the 2050 or an interim target (see [SECTION FOUR - MODIFICATION OF THE 2050 AND INTERIM TARGETS](#)), and the Scottish Government do not introduce regulations within a year, they must again make a statement to Parliament explaining the reasons for this.
547. The Committee is unclear what will happen in the year between the publication of advice and the ministerial statement to the Scottish Parliament outlining the response. A year seems a long interval for there to be uncertainty concerning whether the Scottish Government will take the advice of the CCC. Regardless of whether there is a ministerial statement, the Committee believes there should be a

dliv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 7 (2D)(1)(a) and (b)

dlv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 7 (2D)(2)

dlvi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 8 (2E)(1)

dlvii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 8 (2E)(2)(b)

dlviii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 8 (2E)(2)(a)

dlix [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 8 (2E)(2)(c)

dlx [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 8 (2E)(3)

mechanism in the Bill whereby the Scottish Government has to announce its response to the advice sooner.

548. The Committee recommends section 8 be amended to include a mechanism providing clarity to Parliament and stakeholders on the Scottish Government's response to the advice of the CCC, whether setting a net-zero target year or modifying a target.

Section nine - Annual targets 2021 to 2049

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"My experience is that the annual targets have forced Parliament to address the issue every year in a way that has not happened to the same degree in the UK Parliament. There is political benefit in having the issue at the forefront of the conversation because the targets are annual, even if it makes little difference in an overall sense. So, from a political perspective, having annual targets has been more useful."



Professor Andy Kerr // ClimateXChange

Source: Scottish Parliament 2019

549. Section 9 of the Bill is concerned with the calculation of annual targets in percentage terms in relation to the interim and 2050 targets. It stipulates a linear path between each of these defined points. The Explanatory Notes provide an example—

” "...if the percentage figure applying for the purposes of the 2020 target remains at 56%, and the corresponding figure for the 2030 target at 66%, the difference is 10%. This 10% difference must be apportioned so that there is an equal percentage point change between the percentage figure for each consecutive year in the period beginning with 2020 and ending with 2030."^{dlxi}

550. It also states Ministers "must ensure that the net Scottish emissions account is at least the relevant target figure lower than the baseline for each year"^{dlxii} which is not an interim target year or 2050.

dlxi Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Explanatory Notes](#) (SP Bill 30-EN, Session 5 (2018)), paragraph 46

dlxii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 9 (new section 3)(1)

551. Once a net-zero target year has been identified, the annual targets must be updated to reflect the most recent interim target year and the net-zero target.^{dlxiii} Again, the Explanatory Note states—
- ” These subsections require, in effect, that, for the period containing the net-zero emissions target, a straight line is drawn between the percentage figure applying for the purposes of the target year which precedes this period and the 100% percentage figure applying for the purpose of the net-zero emissions target.”^{dlxiv}
552. Further rules concerning regulations on modifying targets or to setting a net-zero target year are described^{dlxv} in proposed section 3B of the Climate Change (Scotland) Act 2009. The Policy Memorandum describes the effect of this as—
- ” ...the Bill proposes that annual target levels will be automatically calculated by reference to the interim targets, the 2050, and the net-zero emissions target (if the year has been specified). The Bill ensures that future annual targets are automatically recalculated to take account of any changes to the interim targets, the 2050 target or the net-zero emissions target year. This allows the Scottish Ministers to adjust their policies in order to try to meet any modified targets. This situation described above applies in all cases apart from the situation where the CCC has advised that target levels should be amended solely due to a change in international reporting practice (an inventory change). Should this situation arise, then all targets that have not yet been reported upon will be adjusted to ensure that targets are not achieved, or missed, solely due to changes in the inventory. This is consistent with advice from the CCC.”^{dlxvi}
553. On annual targets, Lord Deben thought the concept of immediate targets and therefore immediate accountability was helpful, noting "It means that you cannot put off to beyond your electoral cycle the things that have to be done."^{dlxvii} He said annual targets could "focus the mind."^{dlxviii} However, he also acknowledged annual targets could make comparisons over a period of time difficult and the constant requirement to report potentially missed targets could be demotivating, both for the Government and the wider community.^{dlxix}

dlxiii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 9 (new section 3A)

dlxiv [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Bill](#). [Explanatory Notes](#) (SP Bill 30-EN, Session 5 (2018)), paragraph 47

dlxv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 9 (new section 3B)

dlxvi [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Bill](#). [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 23

dlxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 24

dlxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 40

dlxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 40

554. The benefits of annual targets in terms of maintaining momentum were extolled^{dlxx} by Andy Kerr of ClimateXChange. The comparative study of international accounting published by ClimateXChange also noted the benefits of annual targets for comparison with international counterparts.
555. Glasgow City Council^{dlxxi} expressed doubt about the value of annual targets, suggesting five yearly targets may be better.

556. The Committee welcomes the Scottish Government's commitment to continued annual targets and reporting on those targets.

Expression of targets as percentages

557. The Policy Memorandum states that the effect of this section is—

- ”
- "both interim and annual targets to be specified as percentage reductions, whereas in the 2009 Act the interim and 2050 targets are given as percentage reductions but the annual targets are given as a specific number of megatonnes of CO2 equivalent;
 - the interim and 2050 targets to replace annual targets in those years, unlike in the 2009 Act where for 2020 there is both an interim target (in percentage terms) and an annual target (in megatonnes); and
 - a mechanism to calculate the levels of annual targets directly from those of the interim, 2050 targets and, if applicable, the net-zero emissions target.

Taken together, these provisions will avoid the current situation under the 2009 Act where the annual targets and interim and 2050 targets have become misaligned."^{dlxxii}

558. The CCC suggested—

- ”
- "In addition to the technical difficulties relating to emissions estimates, it is clear that the complicated manner in which the calculations for the Net Scottish Emissions Account have been done mean that the targets and performance have lacked transparency and consequently have been difficult to communicate. Part of the motivation for the proposed change in Scotland from targets based on net emissions to those based on actual emissions is to make the target more transparent and easier to communicate."^{dlxxiii}

dlxx Environment, Climate Change and Land Reform Committee, *Official Report*, 23 October 2018, Col 13

dlxxi Written Submission. [Glasgow City Council](#)

dlxxii Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 13

dlxxiii Committee on Climate Change, *Advice on a new Scottish Climate Change Bill*, 22 March 2017, Chapter 1: Decarbonisation in Scotland, page 24

559. The Cabinet Secretary described the move to percentage-based targets as "a more straightforward and transparent way of presenting the information"^{dlxxiv} in response to questioning on the subject. Stakeholders such as Cycling Scotland agreed.
560. There was support for percentage-based targets from WWF Scotland^{dlxxv} and Stop Climate Chaos Scotland (SCCS).^{dlxxvi}
561. The Committee recommends that the Scottish Government continue to consider how it can make target setting more transparent.

Linear path between targets

562. Jim Skea of the IPCC told the Committee that "everything that you do now will buy you benefits further down the line"^{dlxxvii} and confirmed there were cost savings associated with early action.^{dlxxviii} Lord Deben agreed with this in evidence to the Committee,^{dlxxix} adding: "As the IPCC report says, we have the crucial 12-year period and, if we do not get things in line, we will find it incredibly difficult to get back on track."^{dlxxx}
563. Witnesses such as Anders Wijkman of Climate-KIC^{dlxxxi} and Teresa Anderson of Action Aid International^{dlxxxii} referenced the IPCC report and impressed upon the Committee the need for urgent action now.
564. Young Friends of the Earth Scotland expressed disappointment at the linear approach across targets and called for more action in the near-term.^{dlxxxiii} SCCS

dlxxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 34

dlxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 26

dlxxvi Written Submission. [Stop Climate Chaos Scotland](#).

dlxxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 8

dlxxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 8

dlxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 24

dlxxx Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 37

dlxxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 3

dlxxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 2

suggested^{dlxxxiv} there should be a "percentage decrease year on year resulting in a curved trajectory over time."

565. The Committee asked the Cabinet Secretary and her officials about the linear pathway at its meeting on 27 November 2018. Sara Grainger described^{dlxxxv} other approaches which could be taken, suggesting a staggered step approach, or a steeper curve. However, she said the Scottish Government believed "we already have the most ambitious targets in the world for 2020 and 2030 and, as the Cabinet Secretary has made clear, we think that credibility is very important" and did not believe anything more could be done in the nearer term.

566. The Cabinet Secretary added—

” “We are trying to progress and make changes while keeping in mind all the other issues, such as the consequences, a just transition, social justice and so on, that we need to think about. That is why everything needs to be credible and realistic, because we need to be in a position to make the changes in a way that will not damage sections of society.”^{dlxxxvi}

567. While the Committee agrees that a range of factors must be considered when proposing action to mitigate climate change, the IPCC is clear that "rapid, far-reaching and unprecedented changes in all aspects of society" is required. The Committee heard a range of stakeholders discuss the benefits associated with early action, and considers this to be of crucial importance to tackling climate change.

568. The Committee urges the Scottish Government to increase the pace of its thinking on this issue (see [SECTION NINETEEN - CLIMATE CHANGE PLAN, PARLIAMENTARY SCRUTINY OF THE DRAFT PLANS, THE NEXT CLIMATE CHANGE PLAN](#)) and consider what can be done to increase action between now and 2030. To this end, as has already been suggested, it proposes the Scottish Government consider the calls from stakeholders for the 2030 target to be increased to 77%.

569. The Committee recommends that, in light of the 2018 IPCC report, the Scottish Government should consider the need for more action in the near-term. As noted in an earlier recommendation, the Scottish Government should request updated advice from the CCC on whether the 2030 target is appropriate.

dlxxxiii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 14

dlxxxiv Written Submission. [Stop Climate Chaos Scotland](#).

dlxxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 24

dlxxxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 25

Section ten - Annual targets: 2017, 2018, and 2019 and section eleven - Revocation of previous annual targets

570. Section 10 updates the annual targets for 2017, 2018 and 2019 and allows for these to be modified by regulations subject to the affirmative procedure.^{dlxxxvii} Section 11 revokes the orders which set out the previous targets for these years.^{dlxxxviii}

Section twelve - Publication of targets

571. Section 12 proposed the insertion of a new section 3C into the 2009 Act which requires Ministers to "keep and maintain" a list of the targets and this list should be laid before the Scottish Parliament.

Part Two - Emissions Accounting

572. Part 2 of the Bill seeks to restrict the use of international carbon credits to meet the targets in Part 1. In effect, it limits the number of credits which can be used to zero, unless otherwise determined through the introduction of regulations. In that case, Ministers are restricted to using credits to account for a maximum of 20% of the total for the year. Expressed differently, 80% of the effort to meet targets must be from domestic sources. This proposed default position is a reversal of the approach in the 2009 Act whereby it stated at least 80% of effort had to be domestic (the 2009 Act domestic effort target is replaced),^{dlxxxix} and makes it harder for the Scottish Government to use credits by requiring Ministers to proactively legislate to do so.
573. Part 2 also effects, through section 15, the updated advice of the CCC on the creation of a Greenhouse Gas Account, based on methodologies at the time targets are set, for the purposes of assessing progress.

Advice of the Committee on Climate Change

574. In its advice of March 2017, the CCC—
- ” "recommend[ed] that the overall accounting framework shift to one based on actual emissions rather than adjusting for activity in the EU Emissions Trading Scheme as at present ('net' accounting)."^{dx}

dlxxxvii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 10

dlxxxviii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 11

dlxxxix [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Bill](#). [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 27

dx [Committee on Climate Change](#), [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 10

575. It listed^{dxci} the benefits of this as improved transparency and incentivisation of decarbonisation across the economy. However, it also urged consideration be given to maintaining a strong industrial sector, monitoring the levels of industrial activity and reviewing targets accordingly and the use of international credits where industrial activity was much higher than anticipated. It recommended the flexibility to purchase credits internationally be retained.
576. It also recommended^{dxcii} that Scotland's share of international aviation and shipping be included in the targets.
577. The Scottish Government has given effect to these proposals in the Bill and the move to basing emissions accounting on actual emissions, rather than adjusted emissions, is welcomed by the Committee.

Section thirteen - Net Scottish emissions account: restriction on the use of carbon units

578. Section 1 of the Bill repeals s13(2)-(4) of the 2009 Act. These state—

”(2) The net amount of carbon units credited to the net Scottish emissions account for a year for which an annual target has been set (a “target year”) must not exceed the allowable amount.

(3) The “allowable amount” is—

(a) the amount equal to the limit, set by virtue of section 21(1), on the net amount of carbon units that may be credited to net Scottish emissions accounts during the period which includes the target year; or

(b) where a net amount of carbon units has been credited to the net Scottish emissions account for any other target year in that period, the balance (if any) remaining of the amount referred to in paragraph (a).

(4) In subsections (2) and (3), the “net amount of carbon units” has the meaning given by section 21(3).^{dxciiii}

579. It also updates subsection s13(5) to read—

dxci Committee on Climate Change, [Advice on a new Scottish Climate Change Bill, 22 March 2017](#), Executive Summary, page 10

dxcii Committee on Climate Change, [Advice on a new Scottish Climate Change Bill, 22 March 2017](#), Executive Summary, page 10

dxciiii [Climate Change \(Scotland\) Act 2009 \(asp 12\), section 13 \(2\) - \(4\)](#)

” (5) The Scottish Ministers may, by regulations, make provision about—

(a) the circumstances in which carbon units may **or may not** be credited to the net Scottish emissions account for a period;

(b) the circumstances in which such units may **or may not** be debited from that account for a period;

(c) the manner in which this is to be done.^{dxcciv}

580. It inserts a new clause (5A) which states—

” But the amount of carbon units purchased by the Scottish Ministers that may, by virtue of regulations under subsection (5), be credited to the net Scottish emissions account for a period is zero, unless regulations under section 13A specify a higher limit in relation to that period.^{dxccv}

581. This gives effect to the policy position that Ministers should now proactively legislate in order to use carbon credits and that the default number of carbon units that may be credited to the net Scottish emissions account is zero.

582. Section 13 also proposes^{dxccvi} to repeal s96(7)(a) of the 2009 Act which is concerned with the delegated powers for Ministers to make "provision altering the amount by which a carbon unit credited or debited to the net Scottish emissions account for a period reduces, or as the case may be, increases the net Scottish emissions account for that period."^{dxccvii}

583. The position of the Scottish Government not to use credits was welcomed by ClimateXChange,^{dxccviii} Keep Scotland Beautiful and Aberdeen City Council, among others.

584. The Scottish Hydrogen and Fuel Cell Association and Bright Blue could foresee circumstances in which credits may still be used. Both WWF^{dxccix} and Friends of the Earth Scotland^{dc} questioned whether there would be need or opportunity to use these in the future, while Teresa Anderson told the Committee it will not be cost effective to use them in the future as all "low hanging fruit" will be gone.^{dcii}

dxcciv [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Bill](#), section 13 (1) (a-b)

dxccv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 13(1)(c)

dxccvi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 13(2)

dxccvii [Climate Change \(Scotland\) Act 2009 \(asp 12\)](#), section 96(7)(a)

dxccviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 16

dxccix Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 27

dc Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 27

dcii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 29

585. The Cabinet Secretary agreed^{dcii} that their use was prohibitively costly for Scotland, noting that using these to fill the gap between a 90% and net-zero target would cost £15 billion between now and 2050. In general, she was dismissive of the issue of credits, describing them as a "red herring"^{dciii} and suggesting that they would not be used. She also informed the Committee there had been no analysis or thought on why their use was limited to 20%, as opposed to any other amount, of the total emissions.^{dciv} The Committee has commented elsewhere in this report on the inclusion of elements of the 2009 Act without consideration of their applicability to the current Bill.
586. The Committee supports the Scottish Government's existing policy position that carbon units should not be credited to the Scottish emissions account. The Committee notes the change to the legislation making it a default position requiring proactive action to alter it. The Committee also notes the Cabinet Secretary's suggestion that they would not be used and that the 20% limit is an arbitrary level.
587. The Committee questions the inclusion of this provision if there is no intention to use it.

588. Ahead of Stage 2, the Committee asks the Scottish Government to provide further detail on the circumstances under which the Scottish Government considers carbon credits could be used and the necessary safeguards to ensure they are not used in response to policy failures. The Committee considers agreement on the use of carbon credits should be subject to an enhanced affirmative procedure and recommends the Scottish Government bring forward amendments to this effect at Stage 2.

EU Emissions Trading System (EU ETS)

589. It is also proposed that credits gained through a trading scheme may not be credited or debited from the net Scottish emissions account,^{dcv} except where this has been specifically legislated for.^{dcvi} The Policy Memorandum confirms this has no effect on the operation of the EU ETS within Scotland.^{dcvii} The Cabinet Secretary confirmed to the Committee "we intend to measure progress with targets that are based on actual emissions by removing the current accounting adjustment to reflect the operation of the EU ETS...that move will improve transparency."^{dcviii}

dcii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 30

dciii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 30

dciv Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 31

dcv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 13(3)

dcvi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 13(4)

dcvii [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Bill](#). [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 25

590. In 2016, this means that adjusted emissions were higher than actual emissions. The Scottish Government states in Scottish Greenhouse Gas Emissions 2016:

” In five of the last 12 years, the adjustment has increased reported emissions, with 2011, 2012 and 2016 showing sizeable increases from the adjustment. In 2013, 2014, and 2015 the adjustment has seen sizeable decreases for the reported cap. In 2016, the adjustment represented an increase of 2.907 MtCO_{2e}.^{dcix}

591. The Committee considers transparency in accounting for emissions to be vitally important and supports the move from tonnage to percentage reporting. The Committee would welcome clarification from the Scottish Government on the impact of discounting the EU ETS in meeting the targets. The Committee is also keen to ensure that there will be no reduction in domestic effort as a result of this. The Committee seeks assurance from the Scottish Government that accounting will be transparent and domestic effort will not be reduced.

592. The Committee recently considered EU exit legislation relating to the EU ETS and asks the Scottish Government to provide an update on the plan to replace the EU ETS following the UK's exit from the EU and the practical implications of this.

Section fourteen - Permitted use of carbon units purchased by the Scottish Ministers

593. Section 14 inserts a new section 13A into the Climate Change (Scotland) Act 2009. This allows Ministers to set a limit, through regulation, on the amount of carbon credits which can be credited to the net Scottish emissions account within a given year.^{dcx} This "must not exceed an amount which represents 20% of the planned reduction in the net Scottish emissions account for that year."^{dcxi} The method for calculating the planned reduction is also outlined,^{dcxii} and it is stipulated that the regulations should be subject to the affirmative procedure.^{dcxiii} These regulations should be accompanied by a statement outlining the Scottish Government's reasons for doing so^{dcxiv} and whether this is consistent with advice from the relevant body (the CCC).^{dcxv} It also replaces s96(7)(a) of the 2009 Act^{dcxvi} and revokes previous subordinate legislation on the limit of carbon units in emissions accounting.^{dcxvii}

dcviii Environment, Climate Change and Land Reform Committee, *Official Report*, 8 May 2018, Col 39

dcix Scottish Government, Scottish Greenhouse Gas Emissions 2016.

dcx [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 14(1)(13A)(1)

dcxi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 14(1)(13A)(2)

dcxii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 14(1)(13A)(3)

594. The Scottish Government has suggested—

” “The estimated cost of using credits to make up the gap between what is technically feasible domestically here in Scotland and a net-zero target in 2050 would be around £15 billion over the period to 2050.”^{dcxviii}

595. Lord Deben also raised the issue of the prohibitive cost of relying on carbon units and said—

” “If all the countries of the world are signed up to the Paris Agreement—even if some of them do not achieve what they say they will achieve—there will not be a lot of freebies around. There will be a lot of countries wanting to buy, which will mean that there will be considerable competition and, inevitably, that the price will rise. It is bad husbandry to think that we could depend on that.”^{dcxix}

596. The expense of purchasing credits may make this an unfeasible option even if it becomes the only way to reach a target for a given year.

597. In Sweden, up to 15% emissions can be covered by credits^{dcxx} and other than this, the Committee received no evidence providing views on the 20% figure and was told by the Scottish Government that it had accepted the position of the previous Bill. The Cabinet Secretary added that this had been an addition to the previous Bill based on an amendment.

598. Ahead of Stage 2, the Committee would welcome further detail on the justification for setting the limit of 20% of emissions which can be accounted for using carbon credits.

Nature of targets

599. In its advice of March 2017, the CCC said—

dcxiii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 14(1)(13A)(5)

dcxiv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 14(1)(13A)(5)(a)

dcxv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 14(1)(13A)(5)(b)

dcxvi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 14(2)

dcxvii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 14(3)

dcxviii Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR: Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#), page 8

dcxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 35

dcxx Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 20

” Beyond the role for purchase of credits in the case of increased industrial output outlined above, the option to purchase credible, international emissions credits should be retained to provide flexibility in the case that there is unexpected, sustained underperformance against annual targets. However, their role should be as a back-up option rather than their use being planned for and should require prior advice from the Committee.”^{dcxxi}

600. While this achieves the accounting goal of meeting a target, it does not actually reduce the emissions being produced in Scotland or globally. If there is an underperformance against annual targets, this suggests emissions have been higher than they should have been. If the purpose of being able to purchase credits is merely to achieve targets, it causes the Committee to question both the nature of target setting and whether this actually has an impact on the goal of limiting global warming to 1.5°C.
601. The Scottish Government has also stated in evidence to the Committee on various occasions that it has no intention of using carbon credits.
602. However, the Committee concurs with the Scottish Government that while the default position is to not use credits, flexibility should be maintained and the advice of the CCC should be deferred to.

Section fifteen - International carbon reporting practice

603. Section 15 gives effect to the advice of the CCC on accounting in its letter of December 2017. It suggested the establishment of a Greenhouse Gas Account (GHG Account) against which to assess compliance with targets.^{dcxxii} This account would measure GHGs using “the methodology in place at the time that targets were set”^{dcxxiii} and describes this as “target relevant international carbon reporting practice.”^{dcxxiv} This methodology would be reviewed every five years.

604. The Policy Memorandum describes this as—

” The Scottish Ministers have to request advice from the CCC on target levels at least every five years, and the Bill provides, through section 15 (international carbon reporting practice) that receipt of each set of advice will automatically update the set of inventory methods used for assessing target compliance to the most up to date methods at that time.”^{dcxxv}

dcxxi Committee on Climate Change, [Advice on a new Scottish Climate Change Bill](#), 22 March 2017, Executive Summary, page 10

dcxxii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 15(1)

dcxxiii [Letter](#) from the Chair of the Committee on Climate Change (CCC), Lord Deben, to the Cabinet Secretary for Environment, Climate Change and Land Reform, Roseanna Cunningham, providing updated advice on the content of the proposed Climate Change Bill, 20 December 2017

dcxxiv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 15(3)(b)

605. This provides a safeguard, ensuring that updates required to GHG emissions inventory by the UN Framework Convention on Climate Change will not prevent targets being achieved or missed. Although these changes are welcomed, as the CCC pointed out, Scotland will be "disproportionately impacted by [them]"^{dcxxvi} in the coming years as inventory revisions could "make it difficult to monitor Scotland's progress against climate change targets."^{dcxxvii}

The advice of the Committee on Climate Change

606. The CCC stated that where there were significant changes to the inventory, there were three options to address this—

- ” • "Adjust the amount of effort needed to meet the targets
- Adjust the targets
- Use an emissions estimate based on the methodology in place at the time that the targets were set."^{dcxxviii}

607. Lord Deben told^{dcxxix} the Committee that the approach would not eliminate risk of inventory changes altogether but would ease the issue.

Use an emissions estimate based on the methodology in place at the time that targets were set

608. This was the CCC's advised option and is reflected in section 15 of the Bill. The CCC said—

- ” "This option distinguishes between the emissions inventory based on the best scientific evidence currently available and a 'GHG Account' used, in the shorter-term, to assess target compliance."^{dcxxx}

609. It suggests to "prevent the inventory and the GHG Account from diverging too significantly over time" that the GHG account is revised every 5 years to bring this

dcxxv Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 13

dcxxvi [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform providing updated advice on the content of the proposed Climate Change Bill, *20 December 2017*

dcxxvii [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform providing updated advice on the content of the proposed Climate Change Bill, *20 December 2017*

dcxxviii [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform providing updated advice on the content of the proposed Climate Change Bill, *20 December 2017*

dcxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), *23 October 2018*, Col 41

dcxxx [Letter](#) from the Chair of the CCC to the Cabinet Secretary for Environment, Climate Change and Land Reform providing updated advice on the content of the proposed Climate Change Bill, *20 December 2017*

into line with the inventory and the latest scientific evidence. It also suggests the level of annual emissions targets should be reviewed simultaneously.

610. In response to questioning on the transparency of this approach, the Cabinet Secretary said—

” We are now trying to put things on an even keel. We have spoken quite widely with groups. We are not just clutching at a solution and applying it without considerable discussion having taken place. As members can understand, the issue is quite technical and it takes some explaining. However, I think that those people who understand what is going on here are unlikely to regard the solution as a get-out-of-jail-free card; it is not. The reality of the data changes will always be acknowledged. We will always have the reality of what the science has done, even on the annual basis. However, when it comes to the greenhouse gas statistics, we now have a way of managing them slightly better.”^{dcxxxix}

611. She described^{dcxxxix} the four main changes which could impact on how targets were measured as—

- Changes to international scientific guidelines;
- Improvements to UK methodologies (and noted the UK inventory is peer reviewed by the UN);
- Revisions to UK-wide data sources; and
- Improvements to methods used to disaggregate the UK inventory.

612. She further noted how changes to the inventory (in areas such as forestry and waste) had affected the inventory in the previous year, and how further changes to land use accounting (e.g. the forthcoming inclusion of figures on peatland) would disproportionately impact on Scotland.^{dcxxxix}

Use of the approach outlined by the Committee on Climate Change

613. The Policy Memorandum states—

” The Bill requires that any calculations needed to determine if a target outcome has been achieved under the new approach must, so far as reasonably practicable, be undertaken in line with the methods set out by the CCC. Any calculations would take place at the time the target is being reported on. The CCC has set out a calculation method for this purpose in their advice.”^{dcxxxix}

dcxxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 36

dcxxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 37

dcxxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 38

dcxxxix Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 32

614. The Committee believes that if the approach used is different from the mechanism set out by the CCC, the rationale for this should be clearly stated and reported on.

615. The Committee recommends that the Scottish Government explain the approach used to determine the target outcome and explain why the methodology to determine the target outcome is different from the method specified by the Committee on Climate Change, if that is the case.

Part Three - Reporting and Planning Duties

Section sixteen - Reports on emission reduction targets, section seventeen - Reports on emissions reduction targets: further content and section eighteen - Provision of further information to the Scottish Parliament

616. Section 16 establishes a new regime for annual reporting on emissions reduction targets.

617. It proposed such reports must include—

- ” (a) the emissions reduction target for the target year,
- (b) whether the emissions reduction target for the target year has been met,
- (c) the percentage by which the net Scottish emissions account for the target year is lower than the baseline,
- (d) the amount by which the net Scottish emissions account for the target year is lower or higher than the emissions reduction target for that year, and
- (e) the cumulative amount by which the net Scottish emissions accounts are lower or higher than the corresponding emissions reduction targets, calculated by adding each amount by which an account is lower or higher than the corresponding target for each year in the period beginning with 2017 and ending with the target year.”^{dcxxxv}

618. It also specifies that the "target-relevant international carbon reporting practice" should be used for the purposes of reporting^{dcxxxvi} and that the report must be laid before the Scottish Parliament as soon as "reasonably practicable after the information to be contained in the report becomes available."^{dcxxxvii}

619. The reports laid under the new s33 of the 2009 Act must also, according to section 17 of the Bill, include—

dcxxxv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 16 (33)(2)

dcxxxvi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 16 (33)(3)

dcxxxvii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 16 (33)(4)

” (i) the baseline,

(ii) the aggregate amount of net Scottish emissions of greenhouse gases for the year covered by the report,

(iii) the percentage by which the aggregate amount of net Scottish emissions of greenhouse gases for the year covered by the report is lower than the baseline,

(iv) the percentage by which the aggregate amount of net Scottish emissions of greenhouse gases for the year covered by the report is lower or higher than the equivalent amount for the immediately preceding year, and

(v) the methods used to determine the aggregate amount of net Scottish emissions, together with details of any changes to those methods.”^{dcxxxviii}

620. It should also include detail of any carbon units which were used in the year covered by the report,^{dcxxxix} the aggregate amount of the net Scottish emissions of greenhouse gases,^{dcxli} and the amount of the net Scottish emissions account.^{dcxli} The information in the proposed new section 34 must be based on current international reporting practices.^{dcxlii} It also contains provision for the detail of any adjustments to assess net Scottish emissions each year.^{dcxliii}

621. Section 18 of the Bill updates the 2009 Act requirements to report to the Scottish Parliament to take account of sections 16 and 17. It also includes the provision—

” If the emissions reduction target for the target year covered by the report has not been met, the statement made under subsection (1)(b) must explain why.”^{dcxliv}

622. The Committee questioned whether the move to percentage based reporting on targets and the assessment approach laid out in section 15 could have an impact on the transparency of the data produced and the ability for Parliament to assess progress to reducing actual emissions. Prior to the Bill's introduction, the Cabinet Secretary provided assurances^{dcxlv} that this data would still be published and this is reflected in section 17.

dcxxxviii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 17 (34)(1)(a)

dcxxxix [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 17 (34)(1)(c)

dcxli [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 17 (34)(1)(d)(i)

dcxli [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 17 (34)(1)(d)(i)

dcxlii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 17 (34)(2)

dcxliii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 17 (34)(3) and (4)

dcxliv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 18(3)

dcxlv Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 38

Changes to the reports

623. The Committee asked what had changed in terms of reporting under the Bill and was told^{dcxlv} by the Bill team these related mainly to:

- Allowing for all reporting and statements to take place in June each year;
- Remove the need to "report against electricity-related measures in section 34(4) of the 2009 Act;"^{dcxlvii} and
- Removal of reporting on the domestic effort target.

Publication dates

624. Section 16 (along with 17 and 18) "requires that a report is laid in the Parliament as soon as reasonably practicable, once the information required for the report is available. In practice this will occur when the annual Scottish Greenhouse Gas Emissions Statistics are published. This usually happens annually in June, however this publication date could vary in the future."^{dcxlviii}

625. The Committee is concerned about the flexibility in terms of the publication date of the annual target reports, as it believes these should be aligned with the publication of the annual monitoring reports on the climate change plans, which should be published in June each year (this is discussed in detail in [SECTION NINETEEN - CLIMATE CHANGE PLAN, MONITORING REPORTS](#) of this report). The Scottish Government Bill team also clearly outlined^{dcxlix} how sections 16 - 18 had been designed to allow for reporting in June.

626. Friends of the Earth Scotland^{dcl} supported the June publication date. Paths for All and Unison Scotland suggested the date should fit in with consideration of the Budget, which the June publication date will achieve.

627. The Committee considers the reports under section 16 and 17 of the Bill be published no later than June in each year to allow Parliament, Committees and stakeholders time to consider these ahead of the summer recess. The Committee considers a minimum of 28 days prior to summer recess is required. The Committee recommends the Scottish Government brings forward amendments to this effect at Stage 2.

dcxlv Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 29

dcxlvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 29

dcxlviii Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 34

dcxlix Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 29

dcl Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 28

Electricity related reporting

628. Under the 2009 Act, annual reports must include—

- ” (a) state the amount of Scottish gross electricity consumption for the target year;
- (b) state the amount of Scottish electricity generation for the target year;
- (c) state the average greenhouse gas emissions per megawatt hour of electricity generated in Scotland in the target year;
- (d) state the average greenhouse gas emissions per megawatt hour, and the estimated lifetime cumulative emissions, of any new electricity generation capacity greater than 50 megawatts approved in Scotland in the target year.”^{dcli}

629. When discussing changes which had been made to the reporting scheme, Calum Webster of the Scottish Government Bill team told the Committee—

- ” The first one that I will go into is the requirement to report against electricity-related measures in section 34(4) of the 2009 act. By removing that, we are able to make the statement and produce the report earlier than we would have been otherwise. We discussed that approach with the discussion group that we set up to look at technical elements of the bill. It was content with that proposal, because such issues are reported on under the energy statistics and also annually in relation to the energy strategy. Therefore they are not being lost; they will just be reported in another form.”^{dclii}

630. The Committee welcomes measures which allow the reports to be published in June and acknowledges reporting on electricity related measures will be reported on elsewhere.

Domestic effort target

631. The Bill team also noted alterations to the reporting requirements on the percentage of emissions reduction achieved through domestic effort—

- ” That has also come out of the requirements to be reported on under section 33, although we have retained in the bill a requirement to report on the percentage of year-on-year reductions that are related to domestic effort, in the event that a future Government should choose to move away from the default position that has been established under the 2009 act.”^{dcliii}

632. The Committee welcomes this approach.

dcli [Climate Change \(Scotland\) Act 2009 \(asp 12\)](#), section 34

dclii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 29

dcliii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 29

Sectoral reporting and ministerial statements

633. The former Convener of the Committee, Graeme Dey, took the opportunity at the 25 October 2017 Conveners' Group meeting^{dcliv} with the First Minister to ask about the possibility of each Cabinet Secretary making a statement to Parliament in October each year following the publication of statistics in June. She said—

” I am open-minded to proposals of that nature. That is not to say that I think that we will definitely take that proposal forward, but I will give a commitment that we will consider whether it has merit. [...] We absolutely recognise that, in order for us to perform against our targets, we need everybody across Government to play their part. There may well be merit in individual cabinet secretaries reporting on their actions within their own portfolio.”^{dclv}

634. Scottish Government official Sara Grainger told the Committee—

” We were not able to specify that the reports have to come from or be spoken to by particular cabinet secretaries, but the reports have to reflect different chapters in the climate change plan. A suite of reports will be laid in Parliament, and it will be for Parliament and its committees to consider how to make use of them and whether to call different ministers to discuss the reports.”^{dclvi}

635. The Committee considers there is merit in relevant Cabinet Secretaries providing a statement to Parliament in June each year following publication of statistics and reports. This will provide an opportunity for Cabinet Secretaries to present how each portfolio is responding to the challenges of climate change and will provide helpful context for committees in their consideration of climate change measures and related funding in the pre-budget reports.

636. The Committee recommends the Scottish Government bring forward amendments at Stage 2 to include a requirement for all relevant Cabinet Secretaries and Ministers to provide a statement in the Scottish Parliament on the contribution of their relevant portfolio area to the emissions target for that year and progress made in the annual monitoring reports on the climate change plans, in June each year.

Additional reporting requirements

637. The Committee received various suggestions for areas which should also be included in reporting requirements, including:

dcliv Scottish Parliament Conveners Group, *Meeting with the First Minister, Nicola Sturgeon MSP*, 25 October 2017, page 10

dclv Scottish Parliament Conveners Group, *Meeting with the First Minister, Nicola Sturgeon MSP*, 25 October 2017, page 10

dclvi Environment, Climate Change and Land Reform Committee, *Official Report*, 19 June 2018, Col 30

- On consumption emissions, including a suggestion of a Ministerial Statement on these to accompany the report (SCIAF,^{dclvii} the Scottish Hydrogen and Fuel Cell Association and Nourish Scotland).
- Recognising changes to calculations and inventory may not be within the gift of the Scottish Government, the Committee has also recommended (based on the Cabinet Secretary's suggestion) that along side the annual statistics each year, a full and detailed account of the contribution of the agriculture industry be produced to highlight all the activities farmers and landowners are undertaking to contribute to climate change mitigation (see the [ECONOMIC AND SECTORAL PERSPECTIVES OF A net-zero TARGET, AGRICULTURE](#) section of this report).
- The Scottish Human Rights Commission proposed^{dclviii} a human rights element to reporting.
- Chris Cook called for the Bill to “mandate energy accounting: that is to say that carbon accounting should be denominated in energy as well as in £ sterling or tonnes of CO2.”^{dclix}
- There was widespread support for the reports to include nitrogen balance sheets.

638. The Committee recommends that the Scottish Government reflects on the proposals for inclusion of additional reporting requirements in advance of Stage 2.

Section nineteen - Climate change plan

639. The proposed new arrangements for reports on policies and proposals (now to be known as Climate Change Plans) are outlined in section 19. This stipulates that the first plan under the Bill should be published within 5 years of the section coming into force^{dclx} and that each subsequent plan should be laid within 5 years.^{dclxi}
640. It calls for the plan to set out the Scottish Government's proposals and policies for hitting the targets^{dclxii} and for making up for any shortfall in this.^{dclxiii} Scottish Ministers are to organise these into chapters as they deem appropriate.^{dclxiv} The plans should include policies and proposals covering a period of 15 years from the year in which the draft plan is laid before Parliament.^{dclxv}

dclvii Written Submission. [SCIAF](#)

dclviii Written Submission. [Scottish Human Rights Commission](#)

dclix Written Submission. [Chris Cook](#)

dclx [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(1)(a)

dclxi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(1)(b)

dclxii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(2)(a)(i)

641. The Bill also stipulates what should be included in the plans, proposals for Parliamentary scrutiny of the plans, and arrangements for publication of monitoring reports on progress.

Content of the plans

642. The plans must include policies and proposals regarding the contributions which should be made by:

"(a) energy efficiency,

(b) energy generation,

(c) land use, and

(d) transport."^{dclxvi}

643. The plans should also state how the policies and proposals will impact on different sectors of the Scottish economy,^{dclxvii} and include an update on progress towards the policies and proposals in the previous plan, as well as "adjustments to those proposals and policies as the Scottish Ministers consider appropriate."^{dclxviii}

644. The Policy Memorandum describes the latter as—

” It provides that the policies and proposals in Climate Change Plans must compensate for shortfalls against previous targets, formalising what has occurred under the 2009 Act.”^{dclxix}

Documents relating to Climate Change Plans

645. In addition to the plans there may be a number of supporting or relevant documents. The Committee believes all documents relating to climate change plans, such as technical annexes and environmental reports, should be available at the same time as the plan itself.

646. The Committee recommends that the Bill be amended at Stage 2 to require all relevant documents relating to the Climate Change Plan be published at the same time as the plan itself.

dclxiii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(2)(a)(ii)

dclxiv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(b)

dclxv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(3)

dclxvi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(4)

dclxvii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(5)

dclxviii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(6)(b)

dclxix [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Bill. Policy Memorandum \(SP Bill 30-PM, Session 5 \(2018\)\)](#), paragraph 59 (table)

Chapters

647. The Committee discussed the content of the Climate Change Plans and annual reports with stakeholders.
648. ClimateXChange noted—
- ” The UNFCCC Guidelines specify that the inventory should be divided into the following sectors: Energy; Industrial processes and product use; Agriculture; Land use, land-use change and forestry; Waste; and Other (if applicable).”^{dclxx}
649. The Bill stipulates^{dclxxi} that the CCC should provide advice on the respective contributions to be made by the following sectors indicated in the previous section. As discussed, the annual reports have to reflect different chapters in the climate change plan. A suite of reports will be laid in Parliament, and it will be for Parliament and its committees to consider how to make use of them and whether to call different ministers to discuss the reports.”^{dclxxii}
650. The Committee notes that chapter headings have changed previously between the draft climate change plan and final document and from plan to plan. This is unhelpful and makes comparison difficult. The Committee believes it would be more helpful to have a consistent set of chapters (which could be added to if required) to allow for read across throughout the system, and from one climate change plan to the next. These should be defined and consistent throughout the system of setting, receiving advice on and reporting on Scotland's progress towards meeting its emissions targets. It would also be helpful if these were comparable with the inventory headers.
651. Unite the Union and Unison also called for the Climate Change Plans and annual monitoring reports to report on progress towards a just transition.
652. The Committee recommends the Bill be amended at Stage 2 to include a list of the chapters which, as a minimum, will appear in Climate Change Plans and the annual monitoring reports. These should be consistent with the UNFCCC guidelines, to include: Energy; Industrial processes and product use; Agriculture; Land use, land-use change and forestry; Waste; and Others (if applicable) and should be consistent with the areas on which the Scottish Government has sought advice from the Committee on Climate Change. Flexibility to add additional chapters should be retained, but a comprehensive set of chapter headers should be specified in legislation.
653. The Committee also recommends a chapter on just transition progress be included in the Climate Change Plan and the annual monitoring reports.

dclxx ClimateXChange (December 2017) [Greenhouse gas accounting for national climate change targets: A comparative study](#)

dclxxi [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 6 (2C)(3)(e)

dclxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 30

Costs

654. During its consideration of the Financial Memorandum, the Committee heard of the development of the overall system cost of £13 billion using the TIMES model. Detailed analysis of this is available in the section of this report, however the Committee's recommendations regarding information to be included in the content of future climate change plans with regard to costs are presented below.
655. The Committee is keen to ensure the full costs to deliver the Climate Change Plans are considered and appropriate detail is provided in the plans.

656. The Committee recommends the Scottish Government bring forward amendments to section 19 to require each Climate Change Plan to include an economic analysis of the estimated costs and benefits to be delivered by the plan. This should specify the detail of the costs to be incurred by the Scottish Government and the public sector for each policy and proposal and provide an indication of the estimated costs to the private sector. This analysis should be updated in the annual monitoring reports.

Adaptation

657. The current and proposed legislation in relation to Scotland's climate change plans focuses on action to be taken to mitigate climate change. However, the Committee believes consideration should be given to incorporating adaptation planning into Climate Change Plans so as to provide a comprehensive picture of Scotland's approach to tackling climate change.

658. The Committee would welcome further discussion with the Scottish Government on adaptation and recommends that the Scottish Government consider incorporating adaptation planning into the climate change plans to provide a comprehensive overview of Scotland's approach to tackling both prevention and adaptation.

Parliamentary scrutiny of the draft plans

659. Under the 2009 Act, the Committees of the Scottish Parliament have 60 calendar days in which to consider the draft plans.
660. The Bill proposes to extend this to 90 days, "of which no fewer than 60 must be days on which the Parliament is not dissolved or in recess."^{dclxxiii} Annexe D shows how many days and weeks would be available to Parliament for consideration of the plan if laid each week.
661. The Bill's consultation document stated—

dclxxiii [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35A)(1)(a)

” "The Committees recommended that the period be reviewed, with a view to removing or extending the 60 day limit...To assist scrutiny of future draft Climate Change Plans, the Scottish Government proposes to extend the period for Parliamentary consideration."^{dclxxiv}

662. The impetus to extend the scrutiny period arises from the recommendations of the Scottish Parliamentary Committees that considered the most recent draft Climate Change Plan in 2017. In their reports, the [Economy, Jobs and Fair Work \(EJFW\) Committee](#), the [Environment, Climate Change and Land Reform \(ECCLR\) Committee](#), the [Local Government and Communities \(LGC\) Committee](#) and the [Rural Economy and Connectivity \(REC\) Committee](#) unanimously called for the 60 day consideration period to be removed or extended.

663. All four Committees were subsequently consulted^{dclxxv} as part of the Bill development process on their views on the appropriate period for consideration of the draft plans. Summarised as follows:

- ECCLR: There should be no fixed period for parliamentary scrutiny defined in statute.
- LGC: Prescribing in legislation a specific timescale during which scrutiny and reporting should be concluded would be unhelpful. We would not recommend the inclusion in statute of a fixed timescale for Parliamentary consideration.
- EJFW: Either remove the fixed period or extend the current 60 day restriction.
- REC: At least 120 days are allowed to ensure thorough scrutiny.

The table in Annexe C outlines each Committee's recommendations on the timescales for consideration of future climate change plans.

664. The Committee welcomes the Scottish Government's recognition of the limitations of the current scrutiny period. However, the Committee notes the question posed in the consultation document: "How many days do you think the period for Parliamentary consideration of draft Climate Change Plans should be?"^{dclxxvi} focused on the retention of a fixed consultation period and did not provide the option of suggesting the time restriction be removed.

665. When questioned,^{dclxxvii} the Scottish Government Bill team was unable to provide further clarity on the decision to retain a fixed consultation period.

666. In evidence on the Climate Change Bill, Jim Densham, representing Scottish Environment LINK, said—

dclxxiv Scottish Government (2017). [Climate Change Bill - Consultation Paper](#), 30 June 2017

dclxxv [Letter](#) from the Scottish Government to the Environment, Climate Change and Land Reform Committee on the Parliamentary scrutiny of draft climate change plans, 21 August 2017

dclxxvi Scottish Government (2017). [Climate Change Bill - Consultation Paper](#), 30 June 2017

dclxxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 31

” "The problem with the most recent climate change plan is that the amount of time for consideration of the plan was far too short for us and other organisations to get comments in, and for the committee to look at it and the Parliament to give its opinion."^{dclxxviii}

667. The Committees of the Scottish Parliament recommended that the period for consideration for the draft plans be removed for various reasons, including:
- To allow Parliamentary committees to collaborate further and produce a collective, coherent and comprehensive view on the plan;
 - To improve the opportunities for engagement with the people of Scotland in the scrutiny of the plan reflecting the extensive recommendations of the Commission on Parliamentary Reform to enhance committee engagement; and
 - Recognising the autonomy of Parliament and reflecting the proposals of the Commission on Parliamentary Reform that Committees should have a greater say in legislative timetabling.

Deadline for the publication of a final Climate Change Plan

668. The Bill does not contain a time frame for the Scottish Government to respond to the recommendations of the Committees and finalise the climate change plan. This was acknowledged^{dclxxix} by the Scottish Government's Bill team in evidence to the Committee in June 2018. With previous reports on policies and proposals, the Scottish Government responded within a couple of months (ahead of the summer recess following parliamentary scrutiny) with a finalised document and responses to the committees' reports. With the draft climate change plan (the third report on policies and proposals), almost a year elapsed between the publication of the committee reports and the publication of the final plan.

669. Gina Hanrahan of WWF commented—

” "There is also an important point about the length of time between when the committees produced their final reports and when the Government published its final plan. That was a very long period in this context.....To be fair, very little changed; in fact, in some ways we went backwards from the initial plan in that nine-month period. We need to ensure that, during that period, there is an opportunity for constructive, substantive discussions on how to improve the plan."

670. In its written submission, Stop Climate Chaos Scotland^{dclxxx} told the Committee "we believe Government took too long to publish the final version of the most recent Climate Change Plan, at almost 12 months."

dclxxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 28

dclxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 32

dclxxx Written Submission. [Stop Climate Chaos Scotland](#)

671. The Committee believes it is inappropriate for legislation to attempt to restrict Parliament in how it conducts its scrutiny of Scottish Government policy. The Committee concurs with the view of Government that Scotland's people should contribute to the plans, and this includes the parliamentary process.
672. In both their reports on the draft climate change plans and their responses to the Scottish Government's request for views as part of the consultation process, committees were of the view that the legislation should define the date of publication of the draft reports on policies and proposals.
673. The Committee recommended^{dclxxxix} that the Bill should include the specified dates on which the reports will be published, and the LGC strongly urged^{dclxxxii} the Scottish Government to consider whether the date for the draft Plan's publication should be set in statute. This will enable committees to plan workloads and coordinate approaches and would allow for synergy between the publication of the draft Plans and other climate change publications such as: the Budget; the monitoring and evaluation reports (based on the new framework) and; the Committee on Climate Change Progress Reports on greenhouse gas emissions and adaptation.
674. The Scottish Government's response to the LGC Committee said—
- ” In meetings of the Technical Discussion Group (established for key stakeholders to discuss elements of the Bill in depth), a consensus emerged that the most important factor is that Plans should be developed at least every five years, but that the dates for publication should not be prescribed in statute, to allow for alignment with Paris Stocktake Processes, elections and other events to be managed flexibly.”^{dclxxxiii}
675. The Committee understands the desire for flexibility. Previous experience in working to extremely constrained timescales underpinned the Committee's earlier calls to include a publication date in statute. The Committee has reflected on this and is of the view that if the restriction of the parliamentary scrutiny period is removed, and Ministers undertake to notify Parliament of the publication date of the draft Climate Change Plan at the earliest opportunity to ensure parliamentary committees have sufficient time to plan for consideration of the Plan, the requirement for a statutory publication date is diminished.

dclxxxix [Letter](#) from the Convener of the Environment, Climate Change and Land Reform Committee to the Scottish Government on the period of consideration for Parliamentary scrutiny of the draft climate change plans, *19 September 2017*

dclxxxii [Letter](#) from the Convener of the Local Government and Communities Committee to the Scottish Government on the period of consideration for Parliamentary scrutiny of the draft climate change plans, *27 September 2017*

dclxxxiii Scottish Government (2018). [The Climate Change Plan Meeting the Emissions Reduction Targets 2018-2032 The Third Report on Proposals and Policies Written statement laid before the Scottish Parliament pursuant to section 35 of the Climate Change \(Scotland\) Act 2009](#)

676. The Committee has reflected on the issue of timescales for consideration of the climate change plans. The Committee considers neither the Parliament or the Scottish Government should be constrained in the time available to scrutinise and finalise the plan. The Committee recommends the Scottish Government bring forward an amendment at Stage 2 to remove the restriction on the period available for parliamentary scrutiny.

677. The Committee considered the merits of including a publication date in statute. On balance the Committee recognises the need for flexibility and recommends Ministers notify Parliament of the publication date of the draft climate change plan at the earliest opportunity to ensure parliamentary committees have sufficient time to plan for consideration of the plan. The Committee would welcome early discussion on this with the Scottish Government and other parliamentary committees to ensure this is effective in practice.

678. Further detail on this recommendation is covered in [SECTION NINETEEN - CLIMATE CHANGE PLAN, THE NEXT CLIMATE CHANGE PLAN](#) of this report.

The next Climate Change Plan

679. During consideration of the draft Climate Change Plan (RPP3), the Committee heard that the final plan would be revisited following the passage of the Climate Change Bill.

” **Claudia Beamish**— You have already highlighted it, but I seek clarification on the proposed climate change bill. If and when that becomes an act, will there be an opportunity to revisit the climate change plan if different targets or issues arise as a result of the new act?

Roseanna Cunningham— That would be mandated, absolutely. The current climate change plan comes out of the 2009 act, so the new legislation will drive its own set of forward plans. I have kind of said, albeit not formally because I do not want to be tied to it...we will probably start to look at another plan in 2019.^{dclxxxiv}

680. In May 2018, the Cabinet Secretary said—

” “very soon after the legislation is passed we will have to come up with a climate change plan showing how we will get there.”^{dclxxxv}

681. In November 2018, the Cabinet Secretary said—

dclxxxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 21 February 2017, Col 43

dclxxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 8 May 2018, Col 27

” "I have already indicated that the minute that the bill is through, we will revisit the current climate change plan, which, I remind you, was signed off not that long ago. We will have to consider it again, because it will have to be updated."^{dclxxxvi}

682. When questioned about the publication timetable for the next climate change plan, the Cabinet Secretary said^{dclxxxvii} the discussion on whether to produce a new plan or to update the previous one was still to take place. However, she noted it had taken 2 years to complete the previous plan and given the debate over the timescales for conclusions of consideration of the Bill, doubted whether a new plan could be produced prior to the next Scottish Parliamentary election. She also offered to enter into further discussions with the Committee on the subject.

683. Following the current climate change plan will only put Scotland on the road to achieving an 80% target and a new plan is needed in order to redirect this to a path to at least 90% . This was previously acknowledged by the Scottish Government and the Cabinet Secretary.

684. When discussing whether additional policy measures could have been included in the Bill, the Cabinet Secretary indicated—

” "Every one of my colleagues will be tasked on the basis of the targets in the bill to progress the necessary policies in their portfolio area. I have already begun bilaterals with colleagues about the implications of what the bill proposes."^{dclxxxviii}

685. She also added—

” "I have started to have direct conversations with colleagues in the areas that are most likely to be affected, to flag up the need for them to go back—notwithstanding the fact that they have just come through the climate change plan process—and start to think more ambitiously about what can be delivered in each of their portfolios."^{dclxxxix}

686. Anders Wijkman of Climate-KIC told the Committee that in Sweden "The vertical approach that has dominated so far, with each ministry focusing on its particular concerns, will not really work"^{dcxc} and the Committee urges the Scottish Government to take a cohesive approach to this.

687. The Committee heard that work has already begun on considering the next steps in terms of implementation, as it was noted that the current plans would still see

dclxxxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 26

dclxxxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 11

dclxxxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 8

dclxxxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 15

dcxc Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 3

Scotland miss its target by 5.7%. Lord Deben advised more action in transport and agriculture is needed.^{dcxci} Given the Scottish Government has said "we need the maximum level of decarbonisation in every sector to achieve the 90 per cent target"^{dcxcii} and Andy Kerr of ClimateXChange has said "The sort of infrastructure investments that we will make in the next 10 years will largely determine whether we are able to hit long-term targets,"^{dcxciii} the Committee believes this should start as soon as possible.

688. However, the Bill only commits to the production of a new plan within 5 years of the commencement of the appropriate section.^{dcxciv} As this process is designed to assess progress, it would make sense to the Committee for the draft climate change plan to come after the Paris stock take, which take will take place in 2023, to allow the Scottish Government to incorporate the results. Therefore, the Committee suggests the most recent climate change plan should be updated in 2019/2020, and the next plan should be published in 2024. These should be published every five years in the year following the Paris stock take process.

689. The Committee recommends the most recent climate change plan (RPP3) be updated in light of the commitments made in the Bill if approved by Parliament and that this should take place within 6 months of Royal Assent.

690. The Committee recommends a copy of this report be laid in the Scottish Parliament and signals its intent to scrutinise the updated version.

691. The Committee recommends the updated version of the report must increase or retain the carbon envelopes for each sector, but it should not reduce the effort required by any sector. Further consideration should be given to proposals included in the 2017 draft climate change plan which were not adopted in the final version.

692. The Committee recommends that the Bill includes the dates of publications of subsequent climate change plans (as covered by [SECTION NINETEEN - CLIMATE CHANGE PLAN, PARLIAMENTARY SCRUTINY OF THE DRAFT PLANS, DATE OF PUBLICATION OF DRAFT PLANS](#) of this report) and these should align with the Paris stock takes, starting in 2024, the year after the first Paris stock take.

693. The Committee heard evidence throughout its consideration of the Bill of the need for strong policies and leadership to back up ambitious targets, and:

dcxci Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 19

dcxcii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 9

dcxciii Environment, Climate Change and Land Reform Committee, [Official Report](#), 23 October 2018, Col 12

dcxciv [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35)(1)(a)

- The need for these in every sector of the economy, replicating the success in the energy sector across the board;
- For consistency and certainty in support for the long term to provide investors confidence, individuals with a clear goal and the public sector with advance planning opportunities;
- Developed in a holistic, whole-system manner (for example, through the planning system);^{dcxcv}
- For effective partnerships between the public and private sectors, as well as Government and individuals;
- Consideration of strategies such as carbon budgeting within public bodies (Mai Muhammad of Aberdeen City Council provided^{dcxcvi} detail of how this works in Aberdeenshire to the Committee and Paul Gray of NHS Scotland sent the Committee information on the Scottish Government's approach in follow-up correspondence).^{dcxcvii}

694. The Committee received a wealth of evidence during its consideration of the Bill regarding the policy proposals that stakeholders believe should be included in the next Climate Change Plan. In particular, it heard about the urgency required to strengthen policies in the agriculture and transport sectors, and the opportunities around heating and buildings. It has been stated that the current climate change plan is only equipped with policies to deliver an 80% target and transformational change is needed fast. The Committee urges the Scottish Government to consider the amount of evidence it has received at Annexe B.

695. The Committee recommends that the Scottish Government consider the amount of evidence it has received on policies and proposals which stakeholders believe will contribute to meeting more ambitious climate change targets in updating the current climate change plan.

Behaviour Change

696. It was emphasised to the Committee throughout its consideration of the Bill that change to mitigate climate change would need to be radical and transformational. The Committee also heard^{dcxcviii} of the need to engage widely on this and the importance of individual, as well as large scale, change.^{dcxcix}

dcxcv Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 39

dcxcvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 47

dcxcvii [Letter](#) from the Chief Executive of NHS Scotland, Paul Gray, to the Committee following the 6 November 2018 meeting of the Committee, 23 November 2018

dcxcviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 28

697. Shane Donnellan of Changeworks said behaviour change had been an "add-on" in the previous climate change plan^{dcc} and the Committee proposes that the Scottish Government reflect on how behaviour change required at all levels of society can be incorporated into the forthcoming revised Climate Change Plan.
698. Dr Rachel Howell of the University of Edinburgh spoke^{dcci} of how infrastructure could support behaviour change. She also said that of the Scottish Government's ISM Model (Individual, Social and Material), the S and the M were the most important factors in influencing positive change, rather than the role of the individual.^{dccii}
699. Jamie Stewart of Citizens Advice Scotland pointed out that small, individual changes, if scaled up across the population, could have a significant impact (such as turning down the thermostat). He said: "We need to help people to realise that they can have a positive impact. It is important to focus on positives. Small actions can facilitate change and a reduction in emissions."^{dcciii}
700. Incentivising behaviour change was another aspect that stakeholders claimed the Scottish Government should explore. The Committee heard^{dcciv} examples of how behaviour change was achieved in Sweden through a mixture of incentives and information.
701. Jamie Stewart told the Committee that if incentives were instituted, the Citizens Advice Network could be utilised to advise people and ensure widespread uptake of support schemes.^{dccv} John Ferguson of Eco IdeaM also used^{dccvi} the example of waste and landfill taxation to highlight how Government had effectively influenced behaviour change in that area, since industries adapted their structures following these measures: "It drove innovation towards reusing, recycling and finding cleaner ways of making energy."

dccxcix Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 29

dcc Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 1

dccci Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 2

dccii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 6

dcciii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 14

dcciv Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 13

dccv Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 16

dccvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 14

702. The Environmental Association for Universities and Colleges argued that "institutions should be equipping students with the skills and knowledge that will be required to contribute towards a low carbon Scotland."^{dccvii}
703. Both Jamie Stewart^{dccviii} and Rachel Howell^{dccix} pointed to the importance of clear communication, leadership, and strategies designed to embed habitual behaviour change, rather than one-off measures that miss the opportunity to scale up permanent shifts in societal behaviour.
704. Paul Gray of NHS Scotland described the reach and influence of the NHS in Scotland, not only to its staff but to its service users as well.^{dccx} He added: "If we are not demonstrating exemplary behaviours ourselves, it is quite hard for us to persuade the rest of the population when we say that they should take more exercise."^{dccxi} He later noted^{dccxii} that the Committee's interest in how the NHS was tackling climate change had prompted him to add this to the meeting agenda for the chief executives of health boards.
705. Chris Wood-Gee spoke of a disconnect between leadership and implementation in the public sector, noting the need for improvements to governance models and knowledge sharing on good practice.^{dccxiii} He was concerned^{dccxiv} that public bodies are not equipped with clear pathways to plan for the future.
706. Mary Sweetland of the Eco-Congregation Scotland noted^{dccxv} the importance of Scottish Government leadership in showing people what to do in behaviour change and that this needed to be a joined up effort across all departments, not just those working on environment and climate change issues.
707. The motivations for change were also promoted to the Committee. Both Mary Sweetland^{dccxvi} and Shane Donnellan^{dccxvii} spoke of motivating individuals within communities and emphasising the impacts on them and their families. The

^{dccvii} Written Submission. [Environmental Association for Universities and Colleges](#)

^{dccviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 22

^{dccix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 21

^{dccx} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 35

^{dccxi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 35

^{dccxii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 45

^{dccxiii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 44

^{dccxiv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 45

^{dccxv} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 23

Committee asked^{dccxviii} a panel convened to discuss innovation and technology about the role of consumer choice and whether this should be restricted, which was met with mixed views. The Committee heard about huge amounts of waste balanced against the need to allow people their freedoms.

708. The Cabinet Secretary stated^{dccxix} that behaviour change was not just about what Government could do and the role of the individual, but noted all the public, private and voluntary organisations who also had a role to play and said she had challenging discussions with companies and bodies about what they were doing to meet climate change targets and policy ambitions. Organisations such as UPS,^{dccxx} Environmental Association for Universities and Colleges,^{dccxxi} Sustainable Aviation^{dccxxii} and Scottish Water^{dccxxiii} provided the Committee with a list of measures they were taking to decarbonise their activities.
709. Having highlighted examples of where behaviour change had been brought about by legislation, such as minimum pricing of alcohol and the ban on smoking in public places, the Cabinet Secretary said^{dccxxiv} she did not think behaviour change could be legislated for.
710. Sara Grainger said^{dccxxv} discussions about how to influence behaviour change through voluntary or mandatory means were taking place within portfolios and gave the example of the Energy Efficient Scotland programme.
711. The Committee believes there is a value in legislating for behaviour change and thinks the examples provided highlight how this can have a profound impact on life in Scotland.
712. The Committee believes that the Scottish Government has a role in leading the transformational change required and that not all actions required can be voluntary.
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dccxvi Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 21

dccxvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 20

dccxviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 15 November 2018, Col 18

dccxix Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 13

dccxx Written Submission. [UPS](#).

dccxxi Written Submission. [Environmental Association for Universities and Colleges](#)

dccxxii Environment, Climate Change and Land Reform Committee, [Official Report](#), 13 November 2018, Col 30

dccxxiii Written Submission. [Scottish Water](#).

dccxxiv Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 14

dccxxv Environment, Climate Change and Land Reform Committee, [Official Report](#), 27 November 2018, Col 14

It calls on the Scottish Government to consider the next smoking ban or carrier bag levy within the context of reducing emissions.

713. The Committee recommends the Scottish Government prioritise the issue of behaviour change within the next climate change plan and consider how it can promote and incentivise transformational change, in order to reduce the need for mandatory measures. The Committee looks forward to further discussion with the Scottish Government on this.

Transformational change

714. Anders Wijkman of Climate-KIC told the Committee—

” We will not get close to zero emissions with incremental change; we need transformation in several of the major sectors. We need transformation not only in the energy sectors, but in sectors including cement, steel, aluminium, plastics, textiles—which is a horror story—electronics and agriculture. We need to do things in totally different ways in all those sectors. Most people do not realise what that transformation means.”^{dccxxvi}

715. He added—

” I do not think that any European country has cut its emissions by more than 1.5 per cent to 2 per cent from one year to the next, historically. Therefore, regardless of whether we are talking about 5 or 8 per cent a year, there is a huge difference. I stress that we are talking for many sectors about transformational change being needed in order for them to do things differently.”^{dccxxvii}

716. He also spoke^{dccxxviii} of the need to make system-wide changes and innovations, rather than looking at individual technologies, while Dr Rachel Howell of the University of Edinburgh spoke in similar terms about the need for structural changes rather than a focus on individual behaviour change.

717. Mary Sweetland of Eco-Congregation Scotland spoke^{dccxxix} of the role of communities in bringing around transformational change.

718. Jamie Stewart warned^{dccxxx} against scaring individuals through use of terms such as transformational change, saying at an individual level it was more about making small changes which would have a big impact, such as thinking about diet or heating. This relates to the previous section on behaviour change and the significant impact that scaling up small changes across society can have.

^{dccxxvi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 4

^{dccxxvii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 22

^{dccxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 30 October 2018, Col 23

^{dccxxix} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 23

719. In the context of planning, Mai Muhammad of Aberdeen City Council told the Committee—

” I hope that in the next 10 to 20 years, a transformational change will happen in how we deliver health, education and business services and how we think about people living in the same space, whether in an urban, rural or community environment. Today, that is not cohesive. A step change is required for us to get to where we want to be in 2050. There is still a lot of work to do.”^{dccxxx}

720. Small changes and individual changes can have a significant impact when they are scaled-up. The Committee recommends that the Scottish Government engages in wide discussion with stakeholders and sectors across Scotland on the need for transformational change and how wide-scale behavioural change could be achieved. The Committee looks forward to further discussion with the Scottish Government on this.

Monitoring reports

721. The Bill proposes—

” Whilst the annual greenhouse gas emissions statistics are the ultimate measure of progress in meeting our overarching aim to reduce emissions, the implementation and output indicators in the Climate Change Plan’s monitoring framework will gauge how the implementation of policies is progressing and whether the Scottish Government is on track to achieve its policy outcomes.”^{dccxxxii}

722. The Bill provides—

”(1) The Scottish Ministers must in each relevant year, lay before the Scottish Parliament a report on each substantive chapter of the most recent climate change plan laid under section 35.

(2) Each report laid under subsection (1) must contain an assessment of progress towards implementing the proposals and policies set out in that chapter.

(3) A report under subsection (1) must be laid by 31 October in each relevant year or, if the Scottish Ministers consider that is not possible because the information needed for the report is not available, as soon as reasonably practicable after that date.”^{dccxxxiii}

^{dccxxx} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 23

^{dccxxxi} Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 39

^{dccxxxii} Climate Change (Emissions Reduction Targets) (Scotland) Bill. [Policy Memorandum](#) (SP Bill 30-PM, Session 5 (2018)), paragraph 34

^{dccxxxiii} [Climate Change \(Emissions Reductions Targets\) \(Scotland\) Bill](#), section 19 (35B)

723. Stop Climate Chaos Scotland^{dccxxxiv} suggested that the wording - "must contain an assessment of progress towards implementing the proposals and policies set out in that chapter" - was too vague and urged the Parliament and Government to work together to assess the most recent monitoring report and more clearly define the content in the Bill.
724. The Committee was critical of the Scottish Government for the lack of detail as to the operation of the monitoring framework in the Climate Change Plan and requested the opportunity to consider this in advance of the publication of the final plan. However, the Scottish Government incorporated the monitoring framework into the final plan and so it was not possible to scrutinise this in advance.
725. The Committee has agreed to consider the monitoring report, which was published in October 2018 and further recommendations on the content of this will follow that scrutiny. The Committee would welcome a discussion with the Scottish Government on this. However, in the context of the proposals in the Bill, the Committee has considered several features of the report on which it feels it can currently comment:
- Timing of publication
 - The Governance Body

Timing of publication and the Draft Budget

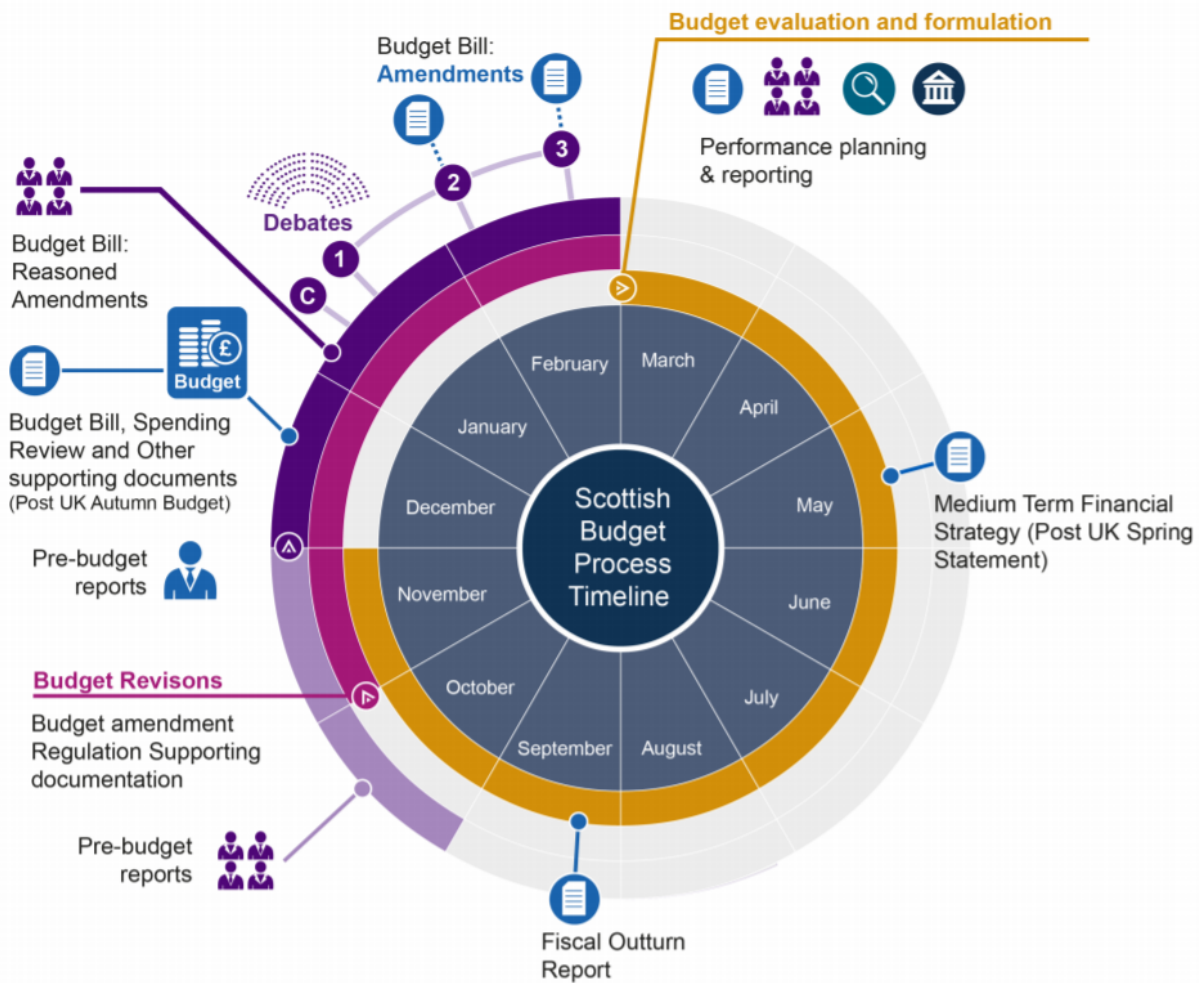
726. One of the recommendations of the Committee in its report on the draft climate change plan, was that the monitoring reports should be published to align with the budget scrutiny process.^{dccxxxv} In 2018, the Scottish Parliament adopted a new system^{dccxxxvi} of scrutiny of the draft Budget which allows Committees to influence the Budget prior to the publication of the Bill.

^{dccxxxiv} Written Submission. [Stop Climate Chaos Scotland](#).

^{dccxxxv} Environment, Climate Change and Land Reform Committee. 3rd Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the Draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 93), paragraph 375

^{dccxxxvi} For further detail on the new process for scrutinising the Budget, see the Scottish Parliament Information Centre. (2018) [Guide to the new Scottish budget process](#), SB 18/35

Scottish Budget consideration



Source: Scottish Parliament Information Centre (SPICe) 2019

727. As shown above, the Committees publish their pre-budget reports in October to November. For context, the Environment, Climate Change and Land Reform Committee sent its views^{dccxxxvii} to the Cabinet Secretary for Environment, Climate Change and Land Reform and the Cabinet Secretary for Finance and Constitution on 10 October in 2018.

728. Dr Diana Casey of the Mineral Products Association said—

”Taking sectoral reporting more for the climate change plan and how that has been broken down, it would be advantageous to have sectoral reporting so that we could understand progress against the targets. I presume that that would be supported by reports from the UKCCC. Such reporting would also show how progress aligns with the budget. We need adequate resources if we are going to make the targets credible. There also needs to be a plan for corrective action if the policies fall behind what they set out to achieve. That has been a failing of previous climate change plans, even though the detail is useful.”^{dccxxxviii}

dccxxxvii Letter to the Cabinet Secretary for the Environment, Climate Change and Land Reform and the Cabinet Secretary for Finance and the Constitution on its pre budget scrutiny, 10 October 2018

729. Stop Climate Chaos Scotland similarly called for reporting and the Budget to be aligned, calling for section 94 of the Climate Change (Scotland) Act 2009 to be updated "to require Ministers to report on a forecast of the annual changes in greenhouse gas emissions they expect their budget to cause in future years."^{dccxxxix}
730. The Committee is concerned that the proposed date of publication in October each year for monitoring reports is too late for this to usefully feed into the pre-budget scrutiny, as it recommended in its report on the draft climate change plan.
731. The monitoring report was published after the period for Parliamentary scrutiny of the draft budget for the 2019/20 budget had concluded, meaning there was no opportunity for Parliamentary committees and stakeholders to scrutinise that and make recommendations to the Scottish Government.
732. The new budget process has been designed to allow committees of the Scottish Parliament the opportunity to influence, in a meaningful way, how the Scottish Government constructs the budget and gives stakeholders the chance to be part of that discussion also. In order for the climate change monitoring reports to be of use, they must be published in advance of the proposed deadline of 31 October each year.
733. The Committee believes it would be useful if the monitoring reports were published in June each year, along with the emissions targets reports (see [SECTION 16 - REPORTS ON EMISSION REDUCTION TARGETS](#), [SECTION 17 - REPORTS ON EMISSIONS REDUCTION TARGETS: FURTHER CONTENT](#), AND [SECTION 18 - PROVISION OF FURTHER INFORMATION TO THE SCOTTISH PARLIAMENT, CHANGES TO REPORTS, PUBLICATIONS DATES](#) of this report). This would allow Parliament to consider both reports, take evidence if required and consider this in a meaningful way as part of the budget process. There was support for the alignment of the monitoring reports and the budget from stakeholders such as WWF Scotland^{dccxli} (who also called for documents accompanying the budget on carbon and climate change to be tidied up).^{dccxli}

734. The Committee is concerned that the proposed publication schedule does not enable the monitoring reports to be considered during the pre-budget scrutiny period. The Committee recommends the Bill be amended to ensure that the reports be published a minimum of 28 days before the summer recess each year, and looks forward to further discussion with the Scottish Government on the effective consideration of the monitoring reports and the budget.

^{dccxxxviii} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 57

^{dccxxxix} Written Submission. [Stop Climate Chaos Scotland](#).

^{dccxli} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 8

^{dccxli} Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 8

Governance Body

735. The Committee was interested to hear from panellists that they were unfamiliar with the proposals for the governance body. Paul Gray of NHS Scotland noted that^{dccxlii} he intended to discuss how the body would align with the governance arrangements for the NHS. In written evidence, COSLA spoke of the need for "strong national governance" to take forward the Climate Change Plans.
736. In its letter^{dccxlili} to the Scottish Government on the Draft Budget 2019/20, the Committee requested further information on "the body, its remit and membership and the proposed time frame to establish it." The Committee received a response from the Scottish Government in December 2018.^{dccxliv}

737. In advance of Stage 2 the Committee further requests detail on the remit and external membership of the governance body; its role in the production of the monitoring reports and; its role in addressing issues raised in the monitoring reports.

Shortfall in one sector

738. During its consideration of the Climate Change Plan, the Committee was concerned that better than expected results in one sector could result in a reduction in the level of ambition and action in another. The Committee sought assurances that all sectors would be required to meet their specific emissions envelopes. However, between the publication of the most recent draft and final plans, further sequestration potential was discovered within the Land Use, Land Use Change and Forestry sector. The CCC reported—

” "This increase in the LULUCF sink in the final Plan has created scope for emissions in other sectors to be higher than in the draft Plan whilst achieving the required level of economy-wide emissions... Estimates of LULUCF emissions and sinks have varied significantly from year to year, and this latest change should not be relied upon to allow reduced ambition in other sectors, especially given anticipated changes to the emissions inventory (e.g. relating to peatland) and the greater long-term ambition proposed in the current Bill."^{dccxlv}

dccxlii Environment, Climate Change and Land Reform Committee, [Official Report](#), 6 November 2018, Col 48

dccxlili [Letter](#) to the Cabinet Secretary for Finance and Constitution and the Cabinet Secretary for Environment, Climate Change and Land Reform Committee on the Budget 2019/20, 10 October 2018

dccxliv Letter from the Scottish Government the Committee on the Budget 2019/20, 19 December 2018

dccxlv Committee on Climate Change (September 2018), [Reducing emissions in Scotland – 2018 Progress Report to Parliament](#), Chapter 2: Policies to deliver emissions reductions, page 22

739. The Committee is concerned to ensure that sectoral ambition does not decrease between final and draft plans and seeks a commitment from the Scottish Government on this.

Scrutiny by the Committee on Climate Change of the Climate Change Plans

740. During its consideration of the most recent Climate Change Plan (RPP3), the Committee was surprised to learn that the CCC had not been consulted on the content of and revisions to the plan in the period between the Parliamentary consideration of the draft and the publication of the final plan.

741. The former Convener of the Committee, Graeme Dey, took the opportunity to ask the Scottish Government Bill team about this in June 2018.

” **“The Convener—**If the UKCCC is the adviser on one element, surely it would be reasonable to run the proposals past it. I realise that we have come past that point; I just make the point that, on one hand, you are saying that the UKCCC is terribly important and, on the other, you thought a few months ago that it was not important enough to merit having the plan run past it.

Sara Grainger— I do not agree that the UKCCC is not important enough to merit having the plan run past it; it is more that we see the UKCCC’s role slightly differently. The UKCCC has the overarching say on the appropriate target levels, but how targets are delivered and met is a matter for the Scottish ministers.”^{dccxlvii}

742. Gina Hanrahan of WWF Scotland also picked up on this point, noting that the CCC could be given a wider remit through the Bill to provide “stronger policy advice to the Scottish Government that considers factors... [such as climate justice], and rural and island communities and connectivity.”^{dccxlvii}

743. Stop Climate Chaos Scotland (SCCS) said “engagement with the CCC, stakeholders and the public was weak”^{dccxlviii} in the development of the final climate change plan.

744. SCCS “recommend an amendment the new section 35A (in section 19) to require Ministers not just to “have regard” to any representations, but to seek the public’s opinions, and to state the reasons for ignoring expert policy recommendations from the CCC.”

745. The Committee has previously commented on the transparency of the process of modelling climate change impacts and determining sectoral specific envelopes. The Committee continues to seek assurance that information used in the TIMES model,

dccxlvii Environment, Climate Change and Land Reform Committee, [Official Report](#), 19 June 2018, Col 6

dccxlviii Environment, Climate Change and Land Reform Committee, [Official Report](#), 20 November 2018, Col 10

Written Submission. [Stop Climate Chaos Scotland](#).

and other information used to arrive at a concluded view, is accessible and freely available.

746. The Committee recommends that the Scottish Government consult the CCC on revised versions of the Climate Change Plans. If the Scottish Government elects to reject the advice of the CCC, it must provide an explanation of the rationale for rejecting that advice, publish the advice it is relying on to bring clarity and transparency to the process and conduct a public consultation on the advice it is relying on. It recommends that the Scottish Government bring forward amendments to this effect at section 35A (in section 19) during Stage 2.
747. The Committee also recommends that the Scottish Government bring forward amendments at Stage 2 to require Ministers to consult the CCC on the final climate change plan, prior to publication.

Part Four - Minor and Consequential Modifications

Section twenty - meaning of certain terms

748. Section twenty provides definitions for key terms used throughout the Bill.

Section twenty one - Further consequentials: the 2009 Act

749. Section 21 introduces the Schedule to the Bill which contains modifications of the 2009 Act.

Schedule

750. Stop Climate Chaos Scotland said^{dccxlx} it was disappointed to see section 36^{dccl} of the Climate Change (Scotland) Act 2009 repealed without a replacement. Section 36 concerns where an annual report is laid showing a target is not met, a report containing policies and proposals must be laid as soon as reasonably practicable afterwards to indicate how the shortfall will be met.

Part Five - Final Provisions

Section twenty two - Meaning of the 2009 Act

751. This section defines the meaning of "2009 Act" as the Climate Change (Scotland) Act 2009.

^{dccxlx} Written Submission. [Stop Climate Chaos Scotland](#).

^{dccl} UK Government, [Climate Change Bill 2009](#), section 36 repeal

Section twenty three - Ancillary provision

752. Section 23 clarifies that Ministers may make "incidental, supplementary, consequential, transitional, transitory or saving provision" to alter the Bill and this should be via the affirmative procedure.

Section twenty four - Commencement

753. Section 24 provides that Ministers may by regulations appoint the date at which all but sections 22, 23 and 24 come into force.

Section twenty five - Short title

754. The short title of the Act is confirmed as "the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019."

Conclusions

755. Although the Committee has been presented with a framework Bill to consider, its exploration of the issues raised has taken it far beyond figures and percentages.
756. Climate change is an intergenerational justice issue. As a developed country, which has benefited economically from previous emissions, Scotland has a responsibility to lead on action to ensure, in so far as it can, future generations inherit a world that is sustainable. At the heart of what the Bill is trying to achieve is a secure and fair future for the planet and experts have advised that this will only come about via transformational change. The urgency of this task is highlighted by the Intergovernmental Panel on Climate Change (IPCC) report in 2018, which calls for "rapid, far-reaching and unprecedented changes in all aspects of society."
757. While this Bill was drafted ahead of the recent IPCC report, the Committee accepts its central recommendation to limit global temperature rises to 1.5°C and agrees that a net-zero target for all greenhouse gas emissions is necessary to achieving it. The speed and scale of the changes needed in emissions reductions, emissions pathways and changes to social and technical systems has no precedent in human history. The Committee has noted throughout the report that it would like to see this reflected in a greater urgency of action across all parts of Government, across the wider public and private sectors and by individuals, to deliver the transformational change that is required.
758. The benefits and cost savings of early action outweigh the cost of the effects of climate change. There is potential for innovation, jobs, the economy, the environment and for the well-being of the people of Scotland and beyond, by acting now. We need a greater focus on transformational behaviour change at individual, institutional and systemic levels. This should be prioritised, promoted and incentivised by the Scottish Government.
759. The Committee recognises the Scottish Government must take a holistic approach across all sectors and increase and accelerate action in the near-term. Investment in and support to innovation, knowledge exchange, technology transfer and support to key sectors such as agriculture and transport will be vital to meeting the targets.
760. While the Committee supports the general principles of the Climate Change (Emissions Reduction Targets) (Scotland) Bill, it notes throughout this report that several significant issues need to be addressed and provisions require strengthening to ensure Scotland fully contributes to meeting the challenge of limiting temperature rises to 1.5°C as set out by the IPCC. The Committee notes its deliberations were made more difficult due to a lack of information on a number of issues, including on the temperature limit the Bill is seeking to contribute towards and on several aspects in the Financial Memorandum.
761. The Committee has asked the Scottish Government to provide further clarity on the targets, the financial effects of the targets, on the challenge for and expectation of individual sectors, on the costs and opportunities of setting revised targets and on the limitations of the TIMES model that excludes a number of the most significant sectors in terms of ensuring emissions reductions.

762. The Committee looks forward to receiving the Scottish Government's response to this report, to the forthcoming advice from the Committee on Climate Change in May and to the Scottish Government's response to that advice. This is crucial in advance of its consideration of the Bill at Stages 2 and 3 and the Committee will reflect of what changes may be required as a result.

Glossary

Abbreviations

Abbreviation	Meaning
CCC	Committee on Climate Change Independent advisors to the UK and Scottish Government on "building a low-carbon economy and preparing for climate change."
ECCLR	The Environment, Climate Change and Land Reform Committee Committee of the Scottish Parliament with a remit to consider policy on climate change.
GHG	Greenhouse Gas.
IPCC	Intergovernmental Panel on Climate Change The "international body for assessing the science related to climate change."
UNFCCC	United Nations Framework Convention on Climate Change "United Nations entity tasked with supporting the global response to the threat of climate change." It is run by a secretariat.

Intergenerational Justice

763. The concept of intergenerational justice recognises that present generations have responsibilities for, and duties to, future generations across the globe. Climate change raises particularly pressing issues, such as which risks those living today impose on future generations and how available natural resources can be used without compromising the needs and aspirations of future generations.

Scottish Greenhouse Gas Emissions Inventory

764. The Scottish Government's most recent greenhouse gas emissions statistics publication^{dccli} describes the Scottish Greenhouse Gas Inventory as—

” The Scottish Greenhouse Gas Inventory is the key data source for understanding the origins and magnitudes of the emissions.”

765. This is updated annually and it contains details of emissions, between the baseline year and the most recent reporting year. Emissions are broken down by source and by type of greenhouse gas, and the Scottish Greenhouse Gas Inventory includes emissions from international aviation and shipping.

766. The emissions are also broken down into two types depending on how the information will be used. These are described as—

- Estimated net source emissions, sometimes referred to as “territorial” emissions, as they are produced within a country’s territory or economic sphere.
- Estimated net source emissions which have been adjusted to take account of trading in the EU Emissions Trading System (EU ETS).^{dcclii}

The baseline year for estimated net source emissions is 1990. The baselines for adjusted emissions varies depending on the type of emission. The baseline years for the purposes of reporting against climate change targets are—

dccli Scottish Government, ["Scottish greenhouse gas emissions 2016"](#) , 12 June 2018

dcclii Scottish Government, ["Scottish greenhouse gas emissions 2016"](#) , 12 June 2018

1990	1995
<ul style="list-style-type: none"> • Carbon dioxide (CO₂) • Methane (CH₄) • nitrous oxide (N₂O) 	<ul style="list-style-type: none"> • Fluorinated gases (F gases) • Hydrofluorocarbons (HFCs) • Perfluorocarbons (PFCs) • Sulphur hexafluoride (SF₆) • Nitrogen trifluoride (NF₃)

The EU Emissions Trading Scheme (EU ETS)

767. The Scottish Government's most recent greenhouse gas emissions statistics publication^{dccliii} describes the EU ETS as—

” “The EU ETS is a ‘cap and trade’ system. A limit (cap) is placed on the overall volume of emissions from participants in the system. Within the cap, organisations receive or buy emissions allowances which they can trade (1 emissions allowance equals 1 tCO₂e). Each year, an organisation must surrender enough allowances to cover its emissions. The cap is reduced over time so that by 2020, the volume of emissions permitted within the system will be 21 per cent lower than in 2005. The reducing cap, alongside the financial considerations of trading emissions allowances, incentivises organisations within the system to find the most cost effective way of reducing their emissions.”

Net-Zero

768. In the context of the Bill “net-zero” means that the balance of greenhouse gas emissions *emitted* by sources, and *removed* by sinks in Scotland across one year is equal to or less than zero. Generally, this means that those emissions which do take place must be counterbalanced by sequestration from other sources to achieve “net-zero.”

769. Measurement of what constitutes the “net Scottish emissions account”, as referred to in the Bill’s definition of net-zero, draws on the Scottish Greenhouse Gas Inventory. This Inventory includes all gases covered by the Kyoto Protocol: carbon dioxide, methane, nitrous oxide and the four fluorinated gases. These gases are weighted by Global Warming Potential (GWP), so that total greenhouse gas emissions can be reported on a consistent basis and in units of *carbon dioxide equivalent* (CO₂e). The accounting methods used are based on internationally-agreed guidelines. The inventory is regularly updated to include the latest data and methodology, with revisions backdated to the baseline year (the year against which targets are measured). The inventory includes the vast majority of sources and sinks (including, by policy choice, a Scottish share of international aviation and shipping) but it does not cover all sources and sinks. For example, not all sources of emissions from peatlands are included in the inventory at present.

770. The “net Scottish emissions account” can also be credited or debited by carbon credits. However, the Bill sets the default amount of carbon credits that can be credited to the account at nil. In other words, carbon credits cannot be used to help meet targets (unless specific regulations are made to allow this).

dccliii Scottish Government, [“Scottish greenhouse gas emissions 2016”](#), 12 June 2018

771. Related Terms:

- Zero carbon - causing or resulting in no net release of carbon dioxide into the atmosphere.
- Carbon neutral - making or resulting in no net release of carbon dioxide into the atmosphere, especially as a result of carbon offsetting.
- Net-zero CO₂ (as per IPCC recent 1.5 degrees report) - “Net-zero carbon dioxide (CO₂) emissions are achieved when anthropogenic CO₂ emissions are balanced globally by anthropogenic CO₂ removals over a specified period.”
- Net-zero goal (from the recent WWF commissioned report) - “Net-zero means working to strike a balance between greenhouse gas emissions and removals by sinks by the second half of the century. This is known as the net-zero goal.”
- Carbon offsetting - the action or process of compensating for greenhouse gas emissions arising from industrial or other human activity, by participating in schemes designed to make equivalent reductions of emissions elsewhere.
- Anthropogenic - of, relating to, or resulting from the influence of human beings on nature.

Net Scottish Emissions Account

772. According to the Committee on Climate Change—

” “The Net Scottish Emissions Account (NSEA) is calculated as the sum of—

- Non-traded emissions. Actual Scottish emissions in sectors not covered by the EU Emissions Trading System (EU ETS), such as buildings, transport and agriculture (around 64% of total Scottish emissions); plus
- Traded sector allocation. Scotland’s share of the EU ETS cap for sectors that are covered by the trading scheme, such as electricity generation and heavy industry.”

Greenhouse Gas Account (GHG Account)

773. The system proposed by the Committee on Climate Change for assessing progress towards targets. Rather than assessing this based on the Scottish Greenhouse Gas Emissions Inventory, it proposed establishing a separate account which was measured using the methodologies in place when the targets were set and revising this every five years. The purpose of this is to provide consistency and aid the ability to track progress each year. This new account is established by section 15 of the Bill.

TIMES Model

774. The TIMES Model is “an international standard for modelling of greenhouse gas emission reductions and energy issues.”^{dccliv}

775. The Scottish Government used the model to compile the most recent Climate Change Plan and provided a briefing to the Committee, which described the model—

” TIMES is a Whole System Energy Model (WSEM). Such models aim to capture the main characteristics of an energy system and are particularly useful for understanding the strategic choices that are required to decarbonise an economy. The Scottish TIMES model is a high level strategic model, covering the entire Scottish energy system and containing many thousands of variables covering existing and future technologies and processes. The model combines two different, and complementary, approaches to modelling energy: a technical engineering approach and an economic approach. The model uses this information to identify the effectiveness of carbon reduction measures in order to provide a consistent comparison of the costs of action across all sectors. The aim of the model is to capture the main characteristics which affect the deployment of technologies, their costs and associated greenhouse gas emissions for Scotland as a whole given a range of policy and other constraints. This allows consideration of the strategic choices which Scotland faces as it seeks to decarbonise its energy system.”^{dcclv}

Carbon Capture and Storage

776. According to the Scottish Government—

” Carbon capture and storage is a process whereby the CO₂ produced by combustion of fossil fuels and industrial processes is captured and transported offshore for safe and permanent storage in depleted oil and gas fields or deep saline aquifers. By using carbon capture and storage, energy can be generated and other products such as plastics, cement and steel can be produced using fossil fuels with minimal greenhouse gases being emitted to the atmosphere. Bioenergy with carbon capture and storage goes further as energy is produced while greenhouse gases are actively removed from the atmosphere. Biomass, such as maize or rapeseed, is grown as an input to the combustion process. While growing, the biomass absorbs CO₂ from the atmosphere. The emissions from combustion are then captured and stored.”^{dcclvi}

Nitrogen Balance Sheets

777. Several organisations called for a duty to be included in the Bill to produce nitrogen balance sheets, which according to Stop Climate Chaos Scotland are—

” A Nitrogen Balance Sheet is an established technique for understanding how nitrogen flows through our environment at a national level and is a prerequisite for effective policies and action to reduce nitrous oxide emissions.”^{dcclvii}

dcclv Scottish Government (2017). [Scottish TIMES Model - an overview](#)

dcclvi Scottish Government (2018). [WHEN TO SET A NET-ZERO GREENHOUSE GAS EMISSIONS TARGET YEAR: Information and Analysis to support discussion of the Climate Change \(Emissions Reduction Targets\)\(Scotland\) Bill](#), page 8

dcclvii Written Submission. [Stop Climate Chaos Scotland](#)

Annexe A - Extracts from the minutes

7th Meeting, Tuesday 26 February 2019

5. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee agreed its Stage 1 report.

6th Meeting, Tuesday 19 February 2019

1. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee continued its consideration of a draft Stage 1 report.

5th Meeting, Tuesday 05 February 2019

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee continued its consideration of a draft Stage 1 report.

4th Meeting, Tuesday 29 January 2019

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee continued its consideration of a draft Stage 1 report.

3rd Meeting, Tuesday 22 January 2019

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee continued its consideration of a draft report.

2nd Meeting, Tuesday 15 January 2019

6. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee continued its consideration of a draft report.

1st Meeting, Tuesday 08 January 2019

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee considered a draft Stage 1 report.

38th Meeting, Tuesday 18 December 2018

5. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee considered a draft Stage 1 report.

35th Meeting, Tuesday 27 November 2018

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill: The Committee took evidence on the Bill at Stage 1 from—

- Roseanna Cunningham, Cabinet Secretary for Environment, Climate Change and Land Reform;
- Clare Hamilton, Deputy Director, Decarbonisation Division, Sara Grainger, Decarbonisation Delivery Unit Team Leader, and Simon Fuller, Deputy Director, Economic Analysis, Office of the Chief Economic Adviser, Scottish Government.

34th Meeting, Tuesday 20 November 2018

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill: The Committee took evidence on the Bill at Stage 1 from—

- Teresa Anderson, Policy and Communications Officer on Climate and Resilience, Action Aid International;
- Jim Densham, Senior Land Use Policy Officer, Royal Society for the Protection of Birds on behalf of Scottish Environment LINK;
- Gina Hanrahan, Head of Policy, WWF Scotland;
- Professor Tahseen Jafry, Director, Centre for Climate Justice;
Alan Munro, Member, Young Friends of the Earth Scotland;
- Siri Pantzar, Policy Operational Volunteer, 2050 Climate Group;
- Caroline Rance, Climate Campaigner, Friends of the Earth Scotland;

and then from—

- Dr Diana Casey, Senior Advisor, Energy and Climate Change, Mineral Products Association;
- Professor Paul Jowitt, Heriot Watt University;
- Elizabeth Leighton, Director, Existing Homes Alliance Scotland;
- Fabrice Leveque, Senior Policy Manager, Scottish Renewables;
- Will Webster, Energy Policy Manager, Oil and Gas UK.

John Scott declared an interest as a farmer.

Richard Lyle indicated an interest due to having a relative employed by the oil and gas industry.

33rd Meeting, Thursday 15 November 2018

1. Climate Change (Emissions Reduction Targets) (Scotland) Bill: The Committee took evidence on the Bill at Stage 1 from—

- John Ferguson, EcoideaM Ltd;
- Dave Moxham, Deputy General Secretary, STUC, on behalf of Just Transition Partnership;
- Suzy Goodsir, Greener Kirkcaldy;
- Angus McCrone, Chief Editor, Bloomberg New Energy Finance (via tele conference).

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee considered evidence heard earlier in the meeting.

32nd Meeting, Tuesday 13 November 2018

1. Climate Change (Emissions Reduction Targets) (Scotland) Bill: The Committee took evidence on the Bill at Stage 1 from—

- Andrew Midgley, Environment and Land Use Manager, NFUS;
- Pete Ritchie, Director, Nourish Scotland;
- Katy Dickson, Head of Policy, Scottish Land and Estates;
- Kate Rowell, Chair, Quality Meat Scotland;
- Patrick Krause, Chief Executive, Scottish Crofters Federation;
- Professor David Reay, University of Edinburgh;
- Professor Eileen Wall, SEFARI;

and then from—

- Dr Andy Jefferson, Programme Director, Sustainable Aviation;
- Rebecca Kite, Environment Policy Manager, Freight Transport Association;
- Martin Reid, Policy Director, Road Haulage Association;

and then from—

- Ian Findlay, Chief Officer, Paths for All;
- Keith Irving, Chief Executive, Cycling Scotland;
- Andy Cope, Director of Insight, Research & Monitoring Unit, Sustrans;
- Bruce Kiloh, Head of Policy and Planning, Strathclyde Partnership for Transport;
- Jess Pepper, Enterprise Manager, Transform Scotland.

John Scott declared an interest as a farmer, land owner, member of the National Farmers Union Scotland and a bus pass holder.

Finlay Carson declared an interest as a member of the National Farmers Union Scotland. Stewart Stevenson declared an interest as the owner of a small agricultural holding.

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee considered evidence heard earlier in the meeting. The Committee agreed to write to the New Zealand Government regarding its consideration of the Bill and agreed to delegate to the Convener responsibility for finalising the letter.

31st Meeting, Tuesday 06 November 2018

3. Climate Change (Emissions Reduction Targets) (Scotland) Bill: The Committee took evidence on the Bill at Stage 1 from—

- Shane Donnellan, Senior Behaviour Change Specialist, Changeworks;

- Dr Rachel Howell, Lecturer in Sustainable Development, School of Social and Political Science, University of Edinburgh;
- Mary Sweetland, Chair, Eco Congregation Scotland;
- Jamie Stewart, Policy Officer, Citizens Advice Scotland;
- Paul Gray, Chief Executive, NHS Scotland;
- Mai Muhammad, Energy Manager, Aberdeen City Council;
- Tom Thackray, Director of Infrastructure and Energy, CBI Scotland;
- Chris Wood-Gee, Chair, Sustainable Scotland Network.

John Scott indicated an interest as a farmer.

5. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee reviewed the evidence heard earlier in the meeting.

30th Meeting, Tuesday 30 October 2018

2. Climate Change (Emissions Reduction Targets) (Scotland) Bill: The Committee took evidence on the Bill at Stage 1 via video conference from—

- Stefan Nyström, Director of Department for Climate Change and Air Quality, Swedish Environment Protection Agency;
- Anders Wijkman, Chair, Climate-KIC.

John Scott declared an interest as a farmer.

3. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee considered evidence heard earlier in the meeting.

28th Meeting, Tuesday 23 October 2018

1. Climate Change (Emissions Reduction Targets) (Scotland) Bill: The Committee took evidence on the Bill at Stage 1 from—

- Jim Skea, Co-Chair IPCC Working Group III, Intergovernmental Panel on Climate Change;
- Andy Kerr, Co-Director, Centre of Expertise on Climate Change – ClimateXChange (CXC);
- Lord Deben, Chairman, Committee on Climate Change.

3. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee considered evidence heard earlier in the meeting and received on the Bill. The Committee agreed to write to the Committee on Climate Change and the Scottish Government. The Committee delegated to the Convener responsibility for finalising the correspondence.

26th Meeting, Tuesday 25 September 2018

1. Decision on taking business in private: The Committee agreed to take items 4, 5 and 6 in private.

6. Climate Change (Emissions Reduction Targets) (Scotland) Bill (in private): The Committee considered written evidence received at Stage 1 and agreed its approach to evidence sessions.

21st Meeting, Tuesday 26 June 2018

3. Climate Change Bill (in private): The Committee considered its approach to scrutiny of the Bill at Stage 1 and agreed—

- The proposed timetable for Stage 1 consideration of the Bill;
- To issue and promote a call for evidence, with a deadline of 23 August 2018;
- To the content of the call for evidence.

20th Meeting, Tuesday 19 June 2018

2. Climate Change Bill: The Committee took evidence on the Bill at Stage 1 from—

- Mark Eggeling, Solicitor;
- Sara Grainger, Decarbonisation Delivery Unit Team Leader, Dr Tom Russon, Policy Officer, and Calum Webster, Bill Manager, Scottish Government.

John Scott declared an interest as a farmer.

5. Climate Change Bill (in private): The Committee considered evidence heard earlier in the meeting. The Committee agreed to write to the Scottish Government seeking further information on the Bill.

15th Meeting, Tuesday 08 May 2018

1. Decision on taking business in private: The Committee will decide whether to take items 5 and 6 in private.

4. Climate Change Bill - Advice of the Committee on Climate Change: The Committee will take evidence from—

- Roseanna Cunningham, Cabinet Secretary for Environment, Climate Change and Land Reform
- Dr Sara Grainger, Head of Decarbonisation Delivery Unit, Andrew Mortimer, Statistician, and Dr Tom Russon, Policy Officer, Scottish Government.

6. Climate Change Bill - Advice of the Committee on Climate Change: The Committee will consider evidence heard earlier in the meeting.

Annexe B - Written evidence

[Written submissions](#) for the [call for views](#).

Annexe C - Committee timescales for consideration of future Climate Change Plans

Scottish Parliamentary Committee Recommendations on the timescales for consideration of future climate change plans

Committee	Report on the Draft Climate Change Plan	Consultation response
EJFW	<p>The Committee joins the other Parliamentary Committees who have scrutinised the CCP in recommending that the Scottish Government reviews the time available for parliamentary scrutiny of future reports on proposals and policies. We ask that it use the opportunity afforded by the forthcoming Climate Change Bill to either remove the fixed period or extend the current 60 day restriction.^{dcclviii}</p>	
ECCLR	<p>The Committee recommends the Scottish Government review the time available for parliamentary scrutiny and use the opportunity afforded by the forthcoming Climate Change Bill to either remove the fixed period or extend the current 60-day restriction. The Committee would welcome further discussion with parliamentary committees and the Scottish Government on this issue in advance of the introduction of the forthcoming Climate Change Bill.^{dcclix}</p>	<p>There should be no fixed period for parliamentary scrutiny defined in statute.^{dcclx}</p>
LGC	<p>The Committee recommends that the Scottish Government should review the time available for parliamentary scrutiny and use the opportunity afforded by the forthcoming Climate Change Bill to either remove the fixed period or extend the current 60 day restriction.^{dcclxi}</p>	<p>In relation to how many days should be provided for Parliamentary consideration of future draft plans, the Committee is of the view that prescribing in legislation a specific timescale during which scrutiny and reporting should be concluded would be unhelpful. For consultation and scrutiny to be meaningful, the time available should reflect the significance and impact of the matter under consideration. You highlight the suggested timescale of 120 days however we would observe that this timescale could be insufficient if the draft plan was published immediately before the summer recess. For the reasons set out above we would not recommend the inclusion in statute of a fixed timescale for Parliamentary consideration.^{dcclxii}</p>
REC	<p>The Committee calls for the time frame permitted for parliamentary scrutiny under the Climate Change (Scotland) Act 2009 to be reviewed as part of the upcoming climate change bill. It suggests that at least 120 days are allowed to ensure thorough scrutiny.^{dcclxiii}</p>	<p>In its report on the draft Plan, the Rural Economy and Connectivity Committee also had concerns stating— ‘The Committee is of the view that the time frame allowed for scrutiny of the draft Plan is restrictive. It calls on the time frame to be reviewed and suggests that at least 120 days are allowed to ensure thorough scrutiny.’ The Committee considered your letter at its meeting of 4 October and agreed that its previous recommendation as detailed above should stand.^{dcclxiv}</p>

dcclviii Economy, Jobs and Fair Work Committee. 3rd Report, 2017 (Session 5). [Report on the draft Climate Change Plan](#) (SP Paper 103), paragraph 17

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- dcclix Environment, Climate Change and Land Reform Committee. 3rd Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the Draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 93), paragraph 550
- dcclx [Letter](#) from the Convener of the Environment, Climate Change and Land Reform Committee to the Scottish Government on the period of consideration for Parliamentary scrutiny of the draft climate change plans, *19 September 2017*
- dcclxi Local Government and Communities Committee. 5th Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the Draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 104), paragraphs 13-14
- dcclxii [Letter](#) from the Convener of the Local Government and Communities Committee to the Scottish Government on the period of consideration for Parliamentary scrutiny of the draft climate change plans, *27 September 2017*
- dcclxiii Rural Economy and Connectivity Committee. 5th Report, 2017 (Session 5). [Report on the Draft Climate Change Plan - the draft Third Report on Policies and Proposals 2017-2032](#) (SP Paper 105), paragraph 14
- dcclxiv [Letter](#) from the Convener of the Rural Economy and Connectivity Committee to the Scottish Government on the period of consideration for Parliamentary scrutiny of the draft climate change plans, *5 October 2017*

Annexe D - Example dates of publication and period of scrutiny for draft Climate Change Plans

Example dates of publication of draft climate change plans and the corresponding period of scrutiny - 90 days of which 60 must be outwith recess or dissolution

Date climate change plan laid in the Scottish Parliament(RPP3 - 19 January 2017 publication, 20 January 2017 formal laying)	Number of calendar days outwith recess for scrutiny(RPP3 - 51)	Number of days within recess(RPP3 - 9)	Number of sitting weeks (RPP3 - 8)
7 January 2019	80	10	12
14 January 2019	73	17	11
21 January 2019	66	24	10
28 January, 4 February 2019	65	25	10
11 February 2019	67	23	10
18 February 2019	74	16	11
25 February, 4, 11, 18 March, 25 March, 1 April 2019	74	16	11
8, 15, 22 April 2019	69	21	10
29 April 2019	62	28	9
6 May 2019*	55	35	8
13 May 2019*	48	42	7
20 May 2019*	41	49	6
28 May 2019*	34	56	5
3 June 2019*	27	63	4
10, 17, 24 June 2019*	26	64	4
1 July 2019*	27	63	4
8 July 2019*	34	56	5
15, 22, 29 July 2019*	40	50	6
5 August 2019*	46	44	6
12 August 2019*	53	37	8
19 August 2019	60	30	9
26 August 2019	67	23	10
2, 9, 16 September 2019	74	16	11
23 September 2019	73	17	11
30 September 2019	66	24	10
7 October 2019*	59	31	9
21 October 2019	67	23	10
28 October 2019	74	16	11
11 November 2019**	73	17	11
18 November 2019**	66	24	10
25 November, 2, 9, 16 December 2019**	65	25	10
23 December 2019**	67	23	10
30 December 2019**	74	16	11

* notes weeks in which the plan could not be laid as more than 30 days are consumed by a recess period

** Based on estimated February 2020 recess dates of 8 February to 16 February 2020 inclusive.

Annexe E - Outreach event conclusions

At its outreach events, the Committee discussed behaviour changes needed to achieve more ambitious targets under four themes: At Home, At Work, Leisure and Transport.

The following is a list of the ideas proposed at these events (please note some of these ideas were proposed more than once):

At Home

What behaviour change is required?

- More efficient cooking methods – cook from scratch
- Buy locally and seasonally
- Buy fair trade
- Use reusable nappies
- Bulk buy markets (able to buy loose goods locally = reduced packaging and miles)
- Reusable packaging that can be returned to shop
- Using low energy lighting
- Be smarter about what you buy – Use less packaging
- Recycle everything
- Upgrade your home (insulation, double/triple glazing etc)
- Install more efficient heating systems
- Install solar panels
- Composting of compostable goods at home
- Reuse rain water or water already used in home (i.e shower/toilet water)
- Small behaviour changes such as turn off tap when brushing teeth and have shorter showers etc
- Energy Use – Efficiency (Retrofits)
- Window glazing, insulation, air tightness
- Heating scheduling (consider social aspects inc. vulnerable people)
- Renewable and feed in tariffs
- Looking at extracting waste from circular economy to create heat & power instead of one use only waste

- Go Vegan (will reduce carbon emissions due to livestock)
- Awareness of where food comes from (food miles)
- Compost toilets
- Turn off devices when not in use
- Turn heating down
- Turn washing machine down (40 to 30)
- Read or play games more rather than use electronic devices
- Install solar panels in homes
- Install better insulation in homes
- Do 1 big wash rather than several small washes
- Don't buy more food than you need
- Repair rather than replace
- Grow your own
- Eat less meat
- Buy sustainable fish
- Use paper bags rather than plastic
- Don't buy multipacks
- Buy loose fruit and veg
- Use solar/thermal ground source heat
- Use energy storage systems
- Use local energy networks / microgeneration
- Compost/wormery

What are the barriers to these changes?

- Recycling uplifts not frequent enough
- Not enough variety in what recycling can be uplifted or available
- Building upgrades can be too expensive for homeowners
- If renting then would require landlord to do building upgrades
- Stigma around used goods and charity shop shopping
- Many boilers and heating systems are inefficient

- Cultural differences in terms of food consumption
- Rented property restrictions (changes to energy providers, bin parking etc)
- People not making the link from household activities to the environment
- People not feeling collectively responsible for the environment
- Lack of Awareness
- Lack of disposable income to invest/upgrade property
- Perceived cost
- Lack of motivation
- Lack of facilities (recycling, organic etc)
- Many existing homes are hard to upgrade
- Recycling can be problematic due to poor labelling of plastics
- Lack of knowledge and skills for example in how to repair things
- Costs of greener options – eg loss of feed-in tariffs
- Housing disincentives – i.e. VAT on upgrading old houses
- Lack of motivation to improve/change lifestyle
- Industry and consumers lack incentives to change
- Over production and over packaging on the supply side
- Lack of local supply chains for food
- Climate change is not seen as a moral issue
- Building standards are not ambitious enough
- Improved home insulation is costly
- Lack of awareness of climate change
- Costly/higher fuel bills

Solutions to overcome barriers?

- Campaign to break down stigma over re-use and charity shop shopping
- “Simplify” recycling and encourage “reuse” at recycling centres
- Install grey water systems in all new build properties
- More support for social enterprises in expanding operations which support re-use and recycling

- Property developers should consider District Heating – popular in Scandinavia
- Incentivise landlords to Upgrade properties
- Incentivise the use of re-usable nappies
- Ground source heating
- Provide community facilities for composting
- More education and awareness raising on subjects like biodegradable goods
- Better promotion of current schemes (in relation to home upgrades)
- Better promotion of financial benefits (build on “Blue Planet” which has motivated people)
- Images of waste vehicles taking separated waste away in single vehicles demotivates and sends negative signals
- Better education, regulation & legislation
- Grow as much food produce locally (see example of community gardens giving locally grown food away for free)
- Ban coloured plastic tops (unrecyclable)
- Ban film and single use plastic
- Grants for insulation (done by local and green suppliers and fitters – none in Fife trained)
- Partner communities with another low carbon one (twinning)
- Partner schools with other low carbon ones (twinning)
- Educate children to see climate change as a moral issue
- Include it in more subjects in the school curriculum
- Cross party/non political approach so it is seen as a long term priority
- Tier Tariffs / progressive taxation
- Better research on energy costs
- Better investment in green solutions (types of energy)
- New housing should be minimum Carbon Neutral
- Retrofit council owned buildings for energy efficiency & generation
- Legislate to ensure fixing of insulation problems
- Convert some park space in to allotments/community gardens

At Work

What behaviour change is required?

- Sharing of resources/databases
- Mixed planning systems (home, industry, schools etc mixed together rather than separate buildings)
- Live nearer your workplace – reduce transport impact
- Use biodegradable work materials
- Use goods designed to last and easy to repair – rechargeable goods
- Energy efficient workplaces
- Stop overproduction
- Paper free working
- More people working in renewable energy
- Reduce energy consumption in the workplace (power down appliances from CEO to employees, environmentally friendly workplace policies)
- Good daily habits at work (clear guidelines across all sectors)
- Cycling to work
- Environmentally friendly commuting
- Work closer to where we live
- Enjoy active travel
- Home working
- Shared workspace locally (hotdesking between local authorities)
- Reduce the need to travel in work (business conferences, car use, air flights)
- Workplace efficiency (energy, physical resources like desks etc)
- Flexible working – reduced hours
- Work less = earn less = less consumerism
- Don't use products with built in obsolescence

What are the barriers to these changes?

- Lack of public transport in rural areas
- Laziness – inefficient use of vehicles & fuel
- House prices are a barrier to living closer to work

- Distractions at home are a barrier to working from home
- Lack of trust in technology prevents paper free offices
- Cost, availability and quality of environmentally friendly goods
- Lack of electric vehicle charging points at workplaces
- Availability and security of cycling racks
- Lack of awareness of the health benefits of climate reductions in the work place
- Cost of making changes
- Public transport too expensive
- Parking too cheap
- Lack of housing near to jobs
- Job security (zero hours) and lack of jobs (especially Fife)
- Centralisation of jobs (i.e. council, oil industry – too local focus no “thinking globally)
- Childcare availability and employer flexibility on hours
- Flexibility in training opportunities with employers
- Lack of public transport (lack of flexibility in timing at start/end of day)
- Bus service reductions & connections
- Throw away stuff in schools (cups, plates etc...need more reduce/reuse)
- Rail a more expensive travel options than car

Solutions to overcome barriers?

- Encouragement and incentives for organisations to allow more flexible/home working
- Nationalise public transport (coordinated/affordable/reliable)
- Incentivise public transport (perks like 20% off coffee if use public transport to get to work)
- High speed broadband in rural areas would help home working and paper free options
- Improved cycle networks to encourage active travel
- No plastic/vegan lunch deals (keep cup and/or sandwich wrap as part of induction)
- Employee incentives
- Carbon offsetting
- Encourage work from home/closer to home

- Break through current workplace “norms” (required to come from CEO and changes filter down)
- Active travel schemes (Changing facilities, bike parking, charging points, parity of policy for bike and car users)
- Flexible hours to avoid rush hour making active travel easier
- Workplace lunch clubs (to avoid food waste, plastics etc)
- Car sharing schemes
- Sustainable consumables and office supplies
- Changes to culture of work (citizens wage, four day week)
- Enforce corporate responsibility
- Coordinated public transport overhaul to reduce price and make ticketing easier
- Free transport days (good pilot/promotion?)
- Transport to work (integrated bus/train; one card for travel to work; reduce/regulate parking options; support cycling; make public transport cheaper/free; more park and rides especially in east of Fife; car share)
- Sustainable places (building workplaces in to new developments; change in planning system to reflect climate change; mass travel from communities to work places)
- Economic system (Purpose to deliver growth or livelihoods? Automation – will people have to travel further? more local economic connections i.e. furniture social enterprises; public education around consumerism)
- Flexible jobs (Citizens right to work; sharing of good practice between employers; support homeworking; provide childcare at work; building standards to include passive housing; Designs of public buildings to be zoned for energy so people only pay for what they use; big open spaces need adapted and able to be not uses e.g. only 1 group using a community school at night)
- More railway options (Levenmouth, Newburgh, Alloa to Dunfermline)
- Housing/Childcare Options (New build housing should factor this in to a realistic level not minimum provision; Developers don't create mini villages with community spaces and opportunities they create miles of housing rows)
- Twinning with communities on 1st line of Climate Change effects so the effects “hit home” at least emotionally
- Politicians should lead by example

Travel

What behaviour change is required?

- Car sharing

- Bike rental systems
- More active travel
- Electric vehicle use
- Less air travel
- Put pressure on local governments to improve infrastructure (rail/cycling)
- Travel plan to allow for active travel (consider weather conditions)
- Push for flexible working to avoid rush hour to allow for active travel
- Use cars less
- Use public transport more
- Carbon lower fuel
- Real/good cost comparison
- Not fly/no air travel (assess the necessity)
- Shorter journeys (eg 3 miles or less) by active travel
- Live closer to work
- Work remotely (log in times count as work)
- Work/life balance
- Reduce car ownership by car sharing
- Pay the “true cost of travel” = carbon cost

What are the barriers to these changes?

- Electric cars too expensive
- Lack of charging points
- Lack of availability of safe cycling routes in cities
- Poor public transport (Edinburgh buses are better)
- Public transport not coordinated
- Buses too expensive, no night buses
- Train travel too expensive
- Young Scot Card is often denied
- Lack of resources to improve public transport
- Lack of legislation (i.e bus regulation)

- Cultural Norms (owning 2 cars is a measure of success)
- Cost of owning and running a car seems too cheap
- Bus travel too expensive for many
- Can't take bikes on buses
- Fear of safety regarding cycle lanes
- Lack of charging points for electric vehicles
- Cost of public transport (yet flying is cheap)
- Availability of public transport
- Reliability of public transport
- Winter issues (dark nights)
- Public transport too radial with cities as destinations
- Roads are not cycle friendly
- Not enough cycle paths
- Unsafe to cycle along with other traffic
- Car fumes are damaging if you are a cyclist
- Drivers attitudes to cyclists
- Workplaces are cyclist friendly (showers, lockers, security)
- Long commute distances from home
- City design is unfriendly
- People like their cars (mobile storage unit, convenience, status symbol)
- Car share is inflexible
- People like to travel to the sun (long haul flights)
- Expensive electric cars and not enough charging points/range is too low
- Hydrogen alternative not available yet
- People's attitudes
- People have too little spare time and need to get places fast
- Cycling in winter is hazardous
- We don't have enough knowledge of environmental costs of travel option (the carbon cost) as consumers when we choose

- Cost of carbon high options doesn't relate
- Disabilities and old age is a barrier to some active travel
- Bad broadband and employers poor attitude to working remotely (presenteeism)

Solutions to overcome barriers?

- Government investment to increase the number of electric charging points for vehicles
- Make public transport more accessible in terms of cost and ease of use
- Access tax rises to fund improvements in public transport
- Bike racks on buses
- More cycle paths and better organised
- Bike rental systems
- Smaller buses on less popular routes but more frequently
- Promote car sharing
- More accessibility for bikes on public transport
- Improved electric vehicle infrastructure
- Cycle to work schemes
- Incentivise other forms of transport
- Increase tax on air travel
- Contactless travel/smart ticketing (London system)
- Engage people on these issues at a grassroots level among many diverse groups
- More info about the good things happening (in the news – people need to see the changes happening and then vote for change)
- Subsidise with higher parking charges
- More frequent buses/trains (and on time)
- Improve rail lines
- Funding more railways instead of roads
- Transport on time
- More street lights in rural areas
- More cycle path lighting (solar)
- More connections

- Nationalise public transport
- More public pedestrian zones
- Multi ticketing for both bus companies
- End to end ticketing
- More road space for cycle paths
- Provide less parking at new developments
- In France all new car parks must provide 1 in 10 charge points for electric vehicles
- In Germany the trains can accommodate LOTS of bikes
- New developments should have shops, petrol stations, schools etc
- Create more bike shelters
- Car club/bike share
- Loan out bikes to try out before buying
- Employers to give bikes to workers (travel expenses 45p per mile for bike and 8p per mile for car)
- More local jobs
- More part time jobs/job share
- Free public transport
- Transport network like TFL
- Real time technology to improve use of public transport
- Emphasis on the central importance of climate change

Leisure

What behaviour change is required?

- More “staycations”
- Use public transport or car share to get to leisure pursuits
- Improve public transport at the weekends
- Run outside as opposed to using a treadmill
- Shopping – Shop local
- When eating out go places that source food locally and ask for smaller portions to reduce waste
- Get fit and enjoy your own body for exercise rather than rely on gym machines

- Shorter showers after exercise
- Rechargeable batteries for games console controllers etc
- Games that educate
- Rethinking where you spend your leisure time (keep it local)
- Take part in leisure pursuits that contribute to your community
- Active travel for leisure pursuits (reduce car use)
- Choose more “Zero Co2” leisure activities
- Will need to “green” our travel (air travel, coaches, car, train)
- Travel less
- Have more “staycations”
- Change our attitudes/culture around leisure activities
- Change the activities you do and move towards greener options (i.e. walking in nature)
- Become less car dependent

What are the barriers to these changes?

- Holidaying abroad often cheaper than at home
- Poor public transport and expensive trains
- Lack of trust in rail network and providers
- Unfair taxation of multinational corporations
- Consumer expectations (the “want everything now” culture)
- Often cheaper to replace than repair
- Taxation on house building compared to house repair
- Products designed to break
- Consumerism/capitalism
- Cheaper to use planes than sustainable transport
- Not enough investment in sustainable transport
- Lack of local resources for participation in leisure pursuits
- People’s leisure time often linked to “consumption”
- Cultural/political barriers

- Lack of local leisure facilities necessitates travel
- Consumer society
- Kids playing outside seen as unsafe
- Buses unreliable and expensive
- Being able to travel is seen as a form of entitlement, glamorous
- Link between leisure. Tourism and economic growth (air passenger duty too low, focus on economic growth, GDP measures the wrong thing, people need and like holidays, bucket list culture, sun seekers)

Solutions to overcome barriers?

- Make it more affordable to holiday in Scotland (all inclusive UK holidays, wildlife tourism, adventure holidays etc)
- Learn from good public transport examples in other countries and impose more fines for poor service/delays
- Tax multinational corporations
- Link health benefits with “energy gyms” where bikes produce energy
- Shared equipment for sports to reduce consumerism and waste
- VAT refunds on house repairs
- Safer cycling routes and improved community facilities
- More recycling facilities at big events
- Support for clubhouses/facilities to reduce costs through energy saving
- Improved public spaces to encourage people to spend leisure time locally
- Engagement/Outreach with diverse communities
- Free bikes for everyone
- Social encouragement for Zero Co2 activities
- Shake up public transport costs
- Nationalise public railways
- Cap on personal air miles
- Encourage staycations (more spending in Scotland)
- Carbon price connected to air travel & other leisure activities
- Limit foreign travel/flights over a lifetime – carbon rationing

- Rail travel to be more attractive than air travel
- Virtual reality holidays
- Air travel using bio fuels/electric
- More local amenities (i.e. cinemas, sports clubs, play parks)
- Work less, spend less, more free time, less consumerism, more time to walk
- Update planning regulations (active travel, sustainable infrastructure, charges for parking at out of town locations)
- New ownership models for vehicles (rent a car don't own a car)
- Increase tax payer spending on cycle routes
- Low carbon leisure activities (i.e. outdoor sports)
- Carbon labelling of everything
- Carbon tax on goods and services
- Decouple personal satisfaction/happiness with consumerism
- Tax air fuel/jet fuel
- Improved and affordable public transport
- Volunteer for holiday scheme (e.g. get a holiday as a reward)
- More local outdoor gyms

The Committee also visited Wallacestone Primary School's Eco Group which provided the following suggestions for low carbon behaviour changes:

Energy

- Encourage people to not use gas
- More hydro energy
- Loans to fit solar panels

Packaging and recycling

- Crisp packets are unnecessarily large – it is a rip off, because you get less than you think, but it is also a waste of packaging.
- Stop sale of one-use plastic toys like glo bands etc
- Get rid of unnecessary packaging eg KitKat and Club have foil or foil backed paper THEN a paper wrapper. Double packaging is a waste.
- More bio-degradable packaging options.

- Posters or pictures at bins to tell you what goes in them
- Stop plastic straws
- Recyclable, biodegradable or reusable bags
- Reduce paper by using computer / tablet / phones for notetaking etc

Transport

- Encourage use of electric cars and boats
- Reduce price of electric cars and use of charging stations
- Government subsidy to ensure good network of charging points, and to make electric cars affordable.
- Encourage people to use public transport or car sharing
- Laws to favour car sharing/ penalise lone drivers
- More electric trains
- Hydrogen powered vehicles
- Encourage people to have fewer cars / one car
- Self-charging buses and cars
- More bike spaces on trains
- Renting bikes
- Hybrid or electric planes
- More use of park and ride
- Discounts on trains if you park outside city
- Free parking at park and ride to make it more attractive to use

Domestic

- Store and use rainwater to water plants
- Reuse ziplock bags, jars, shoeboxes etc for storage
- Don't buy stuff you don't need

Community

- Organise community litter pick
- Where communities have nature and environmental clubs, advertise them better – social media. Example of Jupiter Wildlife Park nature group.

- Sweden – libraries also lend tools etc that people may wish to borrow for a time, but it would be wasteful to buy. Circular economy?
- Alternative building materials where appropriate
- Paper blocks, reuse or recycled materials
- Less meat, more meat alternatives like quorn – less land given over to grazing animals, less methane from cows.

School

- School dinners are ordered on paper slips – parents of children who always have packed lunches just bin or recycle them. Maybe email the choices, then only those ordering lunches will need to use paper to print them out?
- Schools to stop selling single use or non-recyclable items such as glo-sticks at school events
- Care taken that in ‘reusing’ items to make toys, you are not just making recyclable items into unwanted, unrecyclable (plastic bottle covered in glue and glitter) items that get sent to landfill once taken home.

