



Stop Climate Chaos Scotland

Written evidence on Climate Change (Emissions Reduction Targets) (Scotland) Bill to Environment, Climate Change and Land Reform Committee

Summary

SCCS believes that the Bill, as introduced, fails to deliver the Government's own promise to implement the Paris Agreement¹. It doesn't increase ambition in the short-term, doesn't boost short-term action, and fails to set the date for when Scotland will stop contributing to climate change.

SCCS wants the Bill to do the following: set a net zero emissions target for 2050 at the latest; set a 2030 target of 77%; align finance budgets with climate targets; and progress policy action in energy efficiency and agriculture. We urge MSPs to seek to amend the Bill to deliver these objectives.

Our evidence covers the following topics:

1. About SCCS and this evidence
2. SCCS proposals for new climate targets
3. Scottish Government consultation on the Bill
4. Net zero greenhouse gas emissions by 2050
5. 77% reduction in emissions by 2030
6. Scope of the Bill including Bill implementation
7. Financial Memorandum and economic analysis
8. International impacts
9. Technical details

About SCCS

Stop Climate Chaos Scotland (SCCS) is a diverse civil society coalition of over 40 members campaigning for action on climate change. Members include environment and international development organisations, student unions and trade unions, community and faith groups.

Our coalition came together in 2007 to provide a strong civil society voice feeding into the development of the Climate Change (Scotland) Act 2009. We believe that the Scottish Government should take bold action to tackle climate change here at home and play its part in supporting climate justice around the world. We are grateful for the opportunity to share the views of our coalition on the aspects of the draft Climate Change Bill which relate to the remit of this Committee.

Our written evidence to this Committee

We acknowledge that this submission is considerably longer than the Committee indicated a preference for, but as a coalition we have long history of detailed work in this area and want to use the opportunity to provide valuable detailed arguments for the Committee to consider. This

¹ P9 of the 2016 SNP election manifesto: https://www.snp.org/manifesto_2016

SCCS evidence brings together the views of our member organisations. Several of our member organisations are submitting supplementary evidence on specific issues alongside this evidence. SCCS will also submit evidence to the Finance and Constitution Committee.

SCCS proposals for new climate targets

Climate change is not a far-off threat, it is happening now as evidenced by the multiple global-warming-induced catastrophes and extreme weather events this summer here in the UK and across the world.

The ambition enshrined in the Paris Agreement – committing nations to “holding” global warming to “well below 2°C” and pursuing efforts to limit warming to 1.5°C – represents a significant increase in ambition compared to previous global commitments reflecting advances in climate scientists’ understanding of climate change. This escalation must be reflected by a step change in the Scottish Government’s approach to tackling climate change, including national emissions reductions targets that reflect Scotland’s fair share of global efforts to limit warming to 1.5°C.

The Bill as introduced fails to deliver on the SNP manifesto commitment to “bring forward a new Climate Change Bill to implement the Paris Climate Change Agreement”² and does not realise the 2017 Programme for Government statement that “the Climate Change Bill will send a clear, long-term signal that this is the best place in the world to invest in low carbon business”³. Further, the First Minister has expressly committed to delivering on the ambition of the Paris Agreement in aiming to limit temperature increases to 1.5°C,⁴ including Scotland doing its 'fair share' of global efforts,⁵ reflecting the responsibility of our nation and other industrialised nations for bringing the climate to this point of crisis, as well as our increased capacity to act to address it.

Whilst Stop Climate Chaos Scotland (SCCS) welcomes some technical improvements to legislation, the new Bill does not strengthen Scotland’s near-term action, does not introduce new climate change policy, and does not send an iconic long-term signal of intent to global decision makers and markets by setting a deadline to end our contribution to climate change.

The next sections lay out the SCCS response to the Scottish Government’s position on new targets, and the UK Committee on Climate Change (CCC) advice it is based on. In particular, we highlight a number of gaps in the CCC advice. SCCS believes that the Bill can and must go further than the proposed 90% reduction by 2050 and the net zero in future proposal. We recommend that the Bill enshrines in law the following targets:

- Net zero greenhouse gas emissions by 2050 at the latest
- Emissions reduction of 77% (on 1990 levels) by 2030

² P9 of the 2016 SNP election manifesto: https://www.snp.org/manifesto_2016

³ P39 of *A Nation with Ambition: 2017 Programme for Government*, <https://www.gov.scot/Resource/0052/00524214.pdf>

⁴ First Minister’s speech to Arctic Assembly, Reykjavik, October 2016. <https://news.gov.scot/speeches-and-briefings/arctic-circle-assembly>

⁵ https://www.snp.org/first_minister_nicola_sturgeon_speech_to_the_un_climate_change_conference_in_bonn

Scottish Government consultation on the Bill

Over 19,000 responses calling for stronger targets than were proposed, and for a net zero target by 2050 at the latest, were submitted to the Scottish Government's consultation. SCCS analysis of the total consultation responses made publicly available suggests that 99% of consultation responses were in favour of a net zero target by 2050 at the latest. In addition:

- 50 organisations, farmers and experts jointly signed a letter calling for a just transition to carbon-neutral farming by 2050⁶.
- 13 eminent climate scientists and experts, including IPCC lead authors and professors from Columbia, Oxford, Edinburgh, Cambridge, Aberdeen, Dundee and other universities jointly called on the Scottish Government to set a net zero target by 2050 at the latest⁷.
- SCCS has collected the testimonies of 100 people from all over the world as '100 Voices' calling on Scotland to "Give it 100%" by setting a net zero target by 2050, and leading the world to stop climate catastrophe before it is too late⁸.

Despite this overwhelming response, Government did not change course and set a target date in the Bill for net zero, staying with a target of a 90% reduction by 2050. Indeed, we do not see any substantive changes that the Scottish Government has made to their plans for this Bill in response to the public consultation, despite clear dissatisfaction with the proposals.

Net zero greenhouse gas emissions by 2050 at the latest

International momentum towards net zero and likely IPCC findings

In a global context, developed countries such as Scotland have a responsibility to take the lead on climate action, because of their greater responsibility for causing the problem and greater ability and resources to tackle it. Even if global net zero emissions were to be achieved in the second half of this century, as required by the Paris Agreement, Scotland and the wider UK, along with other rich countries, would need to have got there well before other countries which are less responsible for the climate crisis.

International momentum towards net zero emissions is already building. Bhutan has already achieved net zero emissions and, as early as 2008, four countries, New Zealand, Iceland, Costa Rica and Norway, all pledged to achieve net zero emissions, launching a Climate Neutral Network. They have since been joined by France, The Maldives, Tuvalu, Sweden, Denmark, and the Holy See. The EU, is developing scenarios for net zero greenhouse gas emissions by 2050, publicly supported by 14 Green Growth Group countries, including the UK.

A further catalyst towards net zero emissions is likely to be the Special Report on Global Warming of 1.5°C, due to be published by the UN's Intergovernmental Panel on Climate Change (IPCC) this October. With the UK Government, the Scottish Government is jointly commissioning advice from the CCC following the IPCC 1.5°C report. We urge the Committee to do all in its power to ensure the Scottish Government and CCC make the new CCC advice available urgently, certainly in time for proper understanding and scrutiny of it during the progress of the Bill. The IPCC report is widely expected to reinforce the need for rapid action at a global level to reduce risk and the need to eliminate carbon emissions globally by 2050.

⁶ <http://www.scotlink.org/wp/files/documents/ag-cl-ch-letter-final-2.pdf>

⁷ <https://www.wwf.org.uk/sites/default/files/2018-04/Scientist%20Letter.pdf>

⁸ <http://www.stopclimatechaos.org/campaigns/100-voices>

Net zero emissions - the needs-based case

The Scottish Government made commitments to implement the Paris Agreement⁹, and to “increasing ambition of the emissions reduction targets in line with an appropriate contribution to limiting global temperature rises to 1.5 degrees Celsius above pre-industrial levels”¹⁰.

The CCC stated that global carbon dioxide emissions should reach net zero in the 2040s¹¹, and that Scotland’s total greenhouse gas emissions should reduce by 89-97% by 2050 in order to play our part in a goal of returning to 1.5°C¹². But in advising the Scottish Government on targets to set in the new Climate Change Bill, the CCC opted for the lower end of this range, based on what they considered was then at the limits of “known options to reduce emissions”¹³.

SCCS believes that Scotland’s ambition should not be bound by the limits of technical scenarios today. Technical innovation has consistently moved faster and further than predicted. Scotland must aim for net zero by 2050 at the latest, from the outset, in order to drive the innovation needed to deliver what science and equity demand. When the 2020 emissions target of 42% was passed unanimously by the Scottish Parliament in 2009, there was no clear and evidenced pathway to reach it. Parliament at the time understood the scale of the challenge and the moral obligation to act, and accordingly set ambitious targets which have already been surpassed.

A recent study by climate scientists has, for the first time, calculated Scotland’s fair contribution to the Paris Agreement “well below 2°C” commitment¹⁴. The report concludes that reaching net zero greenhouse gas emissions by 2050 is the minimum Scotland needs to do as an equitable share of the Paris Agreement ‘well below 2°C’ goal. The report shows that Scotland is rapidly running out of our equitable share of global emissions (300 MtCO₂) left to stay well below 2°C, and if we continue at the current rate of emissions, Scotland would use up this budget and exceed the Paris 2°C commitment in less than 10 years.

This report also overcomes three problematic assumptions inherent in the CCC advice regarding overshoot, equity and likelihood, as follows:

- The CCC analysis aims for overshoot and a ‘return to 1.5°C’ by 2100. There is growing scientific evidence about the irreversible damage overshoot is likely to cause to biodiversity and to natural systems, with knock-on impacts for the people who rely on them.¹⁵
- The CCC advice does not take equity into account and is instead based on an assumption that all countries have equal per capita emissions reductions. This does not take into account common but differentiated responsibilities, enshrined in UNFCCC and Paris Agreement statement regarding equity¹⁶.
- 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

⁹ P29 of SNP Manifesto 2016, <http://bit.ly/2Mvfltm>

¹⁰ Policy Memorandum to Climate Change (Emissions Reductions Targets) (Scotland) Bill, <http://bit.ly/2w3XzmK>

¹¹ UKCCC report: *UK climate action following the Paris Agreement*, Oct 2016. See p9, table 1, <https://www.theccc.org.uk/publication/uk-action-following-paris>

¹² UKCCC Advice on the new Scottish Climate Change Bill, March 2017. See pg 28, table 2.1 <https://www.theccc.org.uk/publication/advice-on-the-new-scottish-climate-change-bill/>

¹³ Blog by Chair of CCC, July 2018, <https://www.theccc.org.uk/2018/07/11/a-pivotal-moment-for-scottish-climate-action/>

¹⁴ Tyndall Centre for Climate Research & Uppsala University, *Quantifying the implications of the Paris Agreement: What role for Scotland?*, August 2018, <http://bit.ly/SCCS-Tyndall>

¹⁵ The following paper looks at the differences between 1.5°C and 2°C. <https://www.earth-syst-dynam.net/7/327/2016/>

¹⁶ Paris Agreement, Article 2.2 https://unfccc.int/sites/default/files/english_paris_agreement.pdf

inconsistent and unclear as to whether the Bill is aiming to limit temperature increase to 1.5°C or well below 2°C.

SCCS believes that Scotland must deliver on the Paris Agreement by acting with a high likelihood of remaining within the temperature limits, without overshoot, on the basis of equity and reflecting our historical emissions. That means setting a net zero target in this Bill by 2050 at the latest.

Net zero emissions - the feasibility case

Given how much the Scottish Government’s position on the 2050 target is reliant on the CCC’s advice¹⁷, we encourage the ECCLR Committee to explore the underlying assumptions with the CCC, Scottish Government, and stakeholders.

The CCC’s advice in 2017, that a 90% target for 2050 was appropriate, was developed from advice on the 5th Carbon Budget that the CCC provided to the UK Government in 2015¹⁸. With falling costs, new technologies and international momentum around net zero building, the boundaries of anticipated feasibility may well have shifted since 2015.

How could Scotland go further? The CCC pathway for 90% assumes 7.4Mt CO₂e remaining in 2050, made up of 16.8Mt of emissions, offset by 9.9Mt of emissions removed from the atmosphere by natural methods (e.g. tree planting) and technological methods (e.g. bioenergy with carbon capture and storage) (see Table below).

CCC Scenario for Scotland	1990 (Mt CO ₂ e)	2014 (Mt CO ₂ e)	2050 (High Ambition) (Mt CO ₂ e)
Power	14.8	9.8	1.6
Industry	21.1	10.1	4.0
Buildings	10.9	9.4	0.5
Surface transport	10.7	9.9	0.8
Agriculture	9.7	8.3	6.1
Waste and F-gases	9.8	3.7	1.1
Aviation and shipping	2.6	3.1	2.7
LULUCF	-2.3	-6.2	-5.0
Bioenergy with CCS	0.0	0.0	-4.4
Overall emissions	77.3	48.0	7.4

Following correspondence with the CCC to understand the scenario better, SCCS sees potential to go beyond 90% emissions reductions by 2050:

¹⁷ CCC advice on Scottish emissions targets 2028-32, March 2016, <http://bit.ly/2wn186S>

¹⁸ CCC advice on UK 5th carbon budget, November 2015, <http://bit.ly/2BDxwbj>

- New peer-reviewed research by leading Scottish academics shows the potential for land-based negative emissions in Scotland many magnitudes that of the CCC scenario – enough to offset up to 90% of present day emissions, let alone 2050 emissions¹⁹.
- The CCC envisages Scotland still having significant electricity generation from fossil fuels with CCS (approx. 28% of Scottish demand, though with very high export of renewables - 242% of demand). This is unlikely to be borne out, with CCS 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.
- In 2050, the CCC still see a small proportion of fossil fuel cars on the road (5%). The Scottish Government has since committed to phasing out the need for fossil fuel vehicles by 2032.
- The CCC scenario assumes no change in people’s diets by 2050. The trend towards healthier diets will help reduce food sector emissions²⁰.
- The CCC assumes only some reduction in demand for flights to 13% below 2005 levels. In addition, other than a small take up of biofuels, the CCC assumes no alternatively fuelled planes which are already in development in Norway.
- The CCC envisages tree-planting in 2050 (16k ha/pa) similar to the level the Scottish Government wants to see in 2032 (15k ha/pa) and does not include peatland restoration in its calculations.

The majority of remaining emissions in the 2050 CCC scenario are in sectors often referred to as ‘difficult to treat’, such as agriculture, aviation and industry. These sectors have the potential to decarbonise faster if policy enables behaviour change, erodes demand for high carbon products, and drives technology and innovation. Recent analysis by think tank Bright Blue shows the opportunities for deep decarbonisation in all sectors, including ‘hard to treats’²¹. Analysis by the Energy Transitions Commission, chaired by Adair Turner, former chair of the CCC, has started to map out opportunities for full decarbonisation in these sectors, including steel, cement, plastics and heavy transport²².

A clear market signal that all sectors will be expected to decarbonise as much as possible will in itself help to drive that innovation. If we fail to set a net zero target, each economic sector may choose to see itself as the exception to the rule and fail to innovate.

The role of negative emissions in achieving a net zero target

Negative emissions technologies (NETs) describes a broad range of activities and technologies that can actually or theoretically be deployed to suck carbon out of the atmosphere, from proven and multi-beneficial actions such as peatland restoration and reforestation, to highly controversial geoengineering technologies that could have seriously damaging impacts. To achieve the Paris Agreement aims of limiting warming to 1.5°C and a “balance” between emissions sources and sinks in the second half of the century, the world will likely need to pursue certain natural greenhouse gas removal solutions.

Urgent and ambitious action in the agriculture and land use sectors is key to realising Scotland’s huge capacity for such natural negative emissions, and the success of a net zero emissions target for Scotland. Reforestation, afforestation, peatland restoration, and reversing historical soil

¹⁹ *The potential for implementation of Negative Emission Technologies in Scotland*, Juan Alcade, Pete Smith, Stuart Hazeldine and Claire Bond, September 2018: <https://www.sciencedirect.com/science/article/pii/S1750583617310794>

²⁰ <https://link.springer.com/article/10.1007/s10584-015-1329-y>

²¹ <https://brightblue.org.uk/uk-adopt-leading-net-zero-emissions-target/>

²² www.energy-transitions.org/content/new-consultation-papers-decarbonizing-hard-abate-sectors

carbon losses²³, by increasing the amount of carbon matter in soils by 0.4% per year globally²⁴, are all part of the solution to achieving greater sequestration and negative emissions.

Recent peer-reviewed research²⁵ found that Scotland was “exceptionally well suited” for natural negative emissions solutions and the technical potential to abate 90-100% of its annual CO₂ emissions through land-based NETs. A report by the Tyndall Centre also points to the feasibility of increasing sequestration by the natural environment to balance emissions from the agriculture and land use sectors²⁶. However, the large potential for NETs should not be used as an excuse not to cut emissions from source, rather as enabling Scotland to go beyond current targets and play its fair share in reducing global emissions.

Emissions reduction of 77% (on 1990 levels) by 2030

77% by 2030 - the needs-based case

In order to avoid the most dangerous consequences of climate change, it is not only the date by which we reach net zero emissions that is important but the cumulative total of greenhouse gas emissions over time. Within a cumulative budget, it is important that significant emissions reductions are made early, as any delay in action may result in greater cumulative emissions overall. It has been calculated that Scotland’s equitable share of the global budget for a good chance of staying “well below 2°C” is 300MtCO₂, and continuing at the current rate Scotland would exceed this in less than ten years²⁷.

Scotland’s emissions target for 2032 is currently set at 26MtCO₂e, a 65.7% reduction on the 1990 baseline. The new Climate Change Bill sets the 2030 target at only 66%, a negligible increase in effort over the next decade compared to the targets set under the current Act.

SCCS believes that the target for 2030 should be set at 77% lower than 1990. This is based on the peer-reviewed analysis by Johan Rockström of the Stockholm Resilience Centre²⁸ who proposes halving emissions every decade in order to reach net zero by 2050, in order to have a 75% chance of keeping within 2°C warming. A 77% target is also in line with the Fair Shares approach²⁹, which requires industrialised countries to take a more ambitious path than those countries which have recently industrialised.

77% by 2030 - the feasibility case

The Scottish Government’s own analysis shows that a linear trajectory to net zero by 2050 means achieving a 71% reduction in emissions by 2030³⁰. SCCS believes that this is not only feasible but

²³ *Global Sequestration Potential of Increased Organic Carbon in Cropland Soils*, November 2017, <https://www.nature.com/articles/s41598-017-15794-8#Fig1>

²⁴ <https://www.4p1000.org/>

²⁵ *The potential for implementation of Negative Emission Technologies in Scotland*, Juan Alcade, Pete Smith, Stuart Hazeldine and Claire Bond, September 2018: <https://www.sciencedirect.com/science/article/pii/S1750583617310794>

²⁶ Tyndall Centre for Climate Research & Uppsala University, *Quantifying the implications of the Paris Agreement: What role for Scotland?*, August 2018, <http://bit.ly/SCCS-Tyndall>

²⁷ Tyndall Centre for Climate Research & Uppsala University, *Quantifying the implications of the Paris Agreement: What role for Scotland?*, August 2018, <http://bit.ly/SCCS-Tyndall>

²⁸ Stockholm Resilience Centre, Carbon Law <http://www.stockholmresilience.org/research/research-news/2017-03-23-curbng-emissions-with-a-new-carbon-law.html>

²⁹ <http://www.climatefairshares.org>

³⁰ Scottish Government, *When to set a net zero greenhouse gas emissions target*, May 2018: <https://www.gov.scot/Publications/2018/05/3939/downloads#res-1>

could be exceeded. SCCS was disappointed in the final Climate Change Plan because, alongside a lack of sufficient policy, it rowed back on sectoral ambition from the draft Plan in response to a ‘windfall’ of emission reductions created by accounting changes in the land use sector. Our analysis shows that if we instead banked that windfall, and ensured credible policy momentum in other sectors, a ‘realistic’ scenario could achieve a 73% reduction by 2032, and 77% in a more ‘ambitious’ scenario³¹.

Our analysis is based on CCC or Scottish Government sectoral envelopes, using the most ambitious but credible envelopes for each, and builds on the envelopes and policy recommendations of four Parliamentary committees on the draft Plan³². Achieving these envelopes would require substantial new policy effort, but well within the boundaries of what is technically, economically and socially feasible. The kinds of policies envisaged include no new large-scale gas for power, compulsory soil testing and nitrogen balance sheets and climate smart forestry.

The scope of the Climate Bill

SCCS is disappointed with the scope of the Bill and would like the Bill to explicitly include legislation to increase action needed to meet new targets. However, in the following section of evidence we propose policy action for inclusion in the Bill with the purpose of meeting the aim set out in the Bill’s introductory sentence (page 1) - to ‘*make provision about advice, plans and reports in relation to those targets*’.

Climate Bill implementation

In seeking advice on the setting of targets, the CCC has used models to assess the feasibility of meeting the targets. SCCS, therefore recommends that the following policies are needed to meet the targets, particularly they aim to boost policy action in areas, such as homes and agriculture which have up to now not delivered emission reductions through policy action.

SCCS’ priorities for policy action in this Bill:

A suite of policies to ensure greener farming

Create a Nitrogen Balance Sheet: SCCS is calling for the Bill to include a Duty on Ministers to produce a Nitrogen Balance Sheet for Scotland by 2020. Nitrous oxide accounted for 7% of Scotland’s net greenhouse gas emissions in 2016³³ with agricultural soils being the main source. These emissions can be mitigated by using nitrogen more efficiently, cutting losses to the natural environment, and recycling nutrients better³⁴. A Nitrogen Balance Sheet is an established technique for understanding how nitrogen flows through our environment at a national level and

³¹ The realistic scenario incorporates no new gas plant, which is unlikely to be built, incorporates the CCC’s scenario for buildings, waste, industry and transport, an amended version of the final CCP on agriculture and the latest inventory on land use. The ambitious scenario incorporates additional effort on agriculture (e.g. nitrogen balance sheet) and climate smart forestry, alongside the CCC envelope for electricity. We would be very happy to share more detail on this analysis with the Committee.

³² Scottish Government, Climate Change Plan, February 2018, <https://www.gov.scot/Topics/Environment/climatechange/climate-change-plan>

³³ Scottish Government: Scottish Greenhouse Gas Emissions 2016 <http://www.gov.scot/Resource/0053/00536542.pdf>

³⁴ A nitrogen budget for Scotland, Nourish Scotland briefing www.nourishscotland.org/wp-content/uploads/2017/03/A-Nitrogen-Budget-for-Scotland-Nourish-Scotland-briefing.pdf

is a prerequisite for effective policies and action to reduce nitrous oxide emissions. It will also inform the Climate Change Plan policy: “development of a... target for reducing Scotland’s emissions from nitrogen fertiliser.”

Duty to set methane emission reduction targets by 2020: Scotland emitted 6.5 MtCO₂e of methane in 2016, 16.8% of Scotland’s total greenhouse gas emissions, the majority originating from the agriculture sector. The 2018 Climate Change Plan commits to two relevant policy outcomes: “reduced emissions...through improved emissions intensity” and “reduced emissions from the use and storage of manure and slurry”. However, the policy proposals are at present undeveloped, vague and voluntary. A statutory reduction target for methane emissions would drive policy development and action.

Statutory targets for land in organic management: Research consistently demonstrates that organic farming uses less energy and delivers lower greenhouse gas emissions per unit of area and in most cases per unit of product³⁵. In addition, organic management typically leads to higher soil carbon sequestration³⁶. Land area under organic management in Scotland has dropped in recent years. Therefore, we recommend that the Climate Change Bill should set an ambitious statutory target for 20% of region 1 land³⁷ to be under organic management by 2030.

Duty for all agriculture and rural policies to contribute to mitigating climate change: As Scotland designs farming and rural policies for post-Brexit, we must ensure they contribute to the delivery of Scotland’s ambitious climate change targets. To ensure the majority of farmers adopt best practice, the Climate Change Bill should place a duty on Ministers to demonstrate how farming and rural policy is supporting the objectives of this Bill.

A target for reducing the climate emissions from housing

Emissions from heating account for 50% of all Scotland’s energy use. SCCS recommends that the Bill sets a target for all homes to be at least an Energy Performance Certificate (EPC) Band C by 2025. Such a target would increase the scale and pace of Scotland’s domestic energy efficiency programmes, cutting the climate emissions from homes more quickly, and giving proper effect to the 2015 designation of energy efficiency as a National Infrastructure Project. The Government’s recently published ‘Energy Efficiency Scotland: Route Map’, sets an EPC C objective for all homes for 2040, but this is too late for both climate change and fuel poverty purposes. Parliament has already voted in support of a 2030 objective, which we welcome.

Future finance budgets consistent with climate targets

SCCS believes the Bill should do more to ensure that the Scottish Government’s financial budgets are pulling in the same direction as our climate change targets. SCCS proposes solutions, to align Scotland’s financial and climate change plans:

- Reports published under Section 94 of the 2009 Act only provide a snapshot of the immediate emissions impact of the spend rather than the cumulative, ongoing impact. This Bill should amend Section 94 to close this loophole, and require Ministers to report on a

³⁵ Lynch, D. et al *The Carbon and Global Warming Potential Impacts of Organic Farming: Does It Have a Significant Role in an Energy Constrained World?*, Sustainability 2011, 3, 322-362; <https://doi.org/10.3390/su3020322>

³⁶ Gattinger, A. et al <http://www.pnas.org/content/109/44/18226>

³⁷ Region 1 land covers 1.8 million hectares in Scotland and is better quality, productive agricultural land <https://www.gov.scot/Resource/0045/00456286.pdf>

forecast of the annual changes in greenhouse gas emissions they expect their budget to cause in future years.

- The ECCLR Committee report on the Draft Climate Plan recommended a range of additional detail that Progress Reports should incorporate, including financial information³⁸. Since the Bill as introduced gives these annual Progress Reports a statutory basis³⁹, the Parliament has the opportunity to require the inclusion of clearer financial information.
- It is not clear how climate change targets are being taken into consideration when major capital investment or infrastructure decisions are being made. SCCS believes that the Climate Bill should include a duty to create a statutory Zero-Carbon Infrastructure Commission, with responsibilities for advising the Scottish Government of the major infrastructure projects that are needed for Scotland to achieve its zero carbon ambitions, and analysing the Scottish Government's capital budgets to ensure that they are aligned with meeting climate targets.

Other policies recommended for inclusion in this Bill:

Consumption emissions (Section 37)

The 2009 Act established a requirement to produce a report on emissions attributable to Scottish consumption of goods and services, *Scotland's Carbon Footprint Report*⁴⁰, which is also a National Performance Framework Indicator. Between 1998 and 2014, Scotland's carbon footprint reduced by only 8.5%, with only a 0.6% fall between 2013 and 2014 and there is no action plan in place to reduce this. In order to better understand what is driving Scotland's consumption emissions and how to tackle them, the Bill should require a report to be laid before Parliament each year outlining progress and listing the most significant goods and services contributing to Scotland's consumption emissions, and require Ministers to lay a statement in Parliament alongside the report, detailing actions taken to reduce consumption emissions.

Aviation multiplier (Section 16.3)

The 2009 Act gave Ministers the power to set an aviation multiplier to account for the additional impact of emissions at high altitudes. However, the multiplier was set at one and needs urgent review. The new Bill should set a requirement for Ministers to seek advice from the relevant body at least every five years on the level of the aviation multiplier.

Just Transition Commission

SCCS welcomes the Scottish Government's commitment to establish a Just Transition Commission. However we believe that the Commission should be set on a statutory basis in the Bill, for the duration of the climate targets laid out. It should enshrine a Just Transition approach to the delivery of climate change targets, and require future Climate Change Plans to report on employment and Just Transition measures.

A 'sunset clause' for old peat extraction sites

SCCS welcomed the Scottish Government's commitment in the Climate Change Plan to restore 250,000ha of peatland by 2030, thus securing the stores of carbon and preventing emissions.

³⁸ ECCLR Committee report on the Draft Climate Change Plan, see in particular pages 86 and 120 http://www.parliament.scot/S5_Environment/Reports/ECCLRS052017R03.pdf

³⁹ In Section 19 of the Bill in the new Section 35B

⁴⁰ Scotland's Carbon Footprint 1998-2014 <https://www.gov.scot/Resource/0052/00529095.pdf>

However around 0.5 million m³ peat is still extracted annually in Scotland⁴¹ from lowland bogs⁴², destined for the horticultural market (approximately 95% of peat extracted is destined for horticultural use), removing a carbon store formed over thousands of years.

Permissions are poorly regulated and act as a barrier to restoration. Periodic reviews under the Environment Act 1995 have struggled to draw conclusions on progress⁴³. The Climate Change Bill presents an opportunity to set legislation to fix a clear end date for peat extraction reviews via a 'sunset clause'. This would mean that all historic consents would need to be re-activated by a fixed date (e.g. 2020) or expire. It would remove long-term uncertainty for peatlands and reduce the burden on authorities to instigate reviews.

Behaviour change

Behaviour change is crucial to the reduction of climate emissions. As the Scottish Government's Climate Change Plan highlights, "individuals and households account for over three quarters of Scotland's consumption emissions"⁴⁴. To change behaviour, the ISM approach developed for the Scottish Government, focuses on the need to transform individual, social and material contexts for behaviour⁴⁵. The Bill should support, and be supported by, the necessary changes in context - such as the policy priorities we highlight above - working for and rewarding low, not high, emission behaviours.

Businesses and other organisations have their part to play too. SCCS member organisations, across Scottish society, are taking action. For example:

- Oxfam, set an absolute carbon reduction target of 30% by 2020 (from 2011/12 baseline), for their building energy in shops and transport logistics.
- RSPB over the past 7 years has seen CO₂ emissions per staff member reduce by 17.25%.
- UNISON has worked on green workplace initiatives, including working with employers and their own branches, on green travel and energy saving.
- SCIAF are integrating guidelines on Environmental Justice into policies including steps to enhance recycling capacity and to reduce staff flights.
- WWF food procurement policy is to provide food that exceeds 'Livewell' principles⁴⁶. All food provided to WWF must be meat-free. At least half of main dishes must be vegan. Policy also covers minimising waste, responsible procurement and packaging. WWF also operates a carbon budget approach to travel and a range of other environmental policies.

The Financial Memorandum and Scottish Government's economic analysis

Climate change poses extreme and chronic risks to natural and financial systems globally and domestically. More ambitious targets than proposed will ensure these economic risks are

⁴¹ Mineral Extraction in Great Britain 2014 <https://www.gov.uk/government/statistics/mineral-extraction-in-great-britain-2014>

⁴² Lowland raised bogs are a threatened habitat that at UK level are estimated to have diminished by 94% See: <https://scottishwildlifetrust.org.uk/2016/02/50-for-the-future-lowland-raised-bogs/> and <http://www.gov.scot/Topics/farmingrural/SRDP/RuralPriorities/Options/LowlandRaisedBogs>

⁴³ Brooks, S. (2003) Commercial Peat Extraction in Scotland, Review of Old Minerals Permissions, Scottish Executive Central Research Unit, 2002, IUCN review in 2016: http://www.iucn-uk-peatlandprogramme.org/sites/www.iucn-uk-peatlandprogramme.org/files/Summary%20of%20ROMP%20review%20findings_EG.pdf

⁴⁴ Scottish Government Climate Change Plan, page 38.

⁴⁵ as above - page 40

⁴⁶ wwf.org.uk/livewell

minimised and that Scotland realises the huge economic and social benefits of leading a just transition to a zero emissions nation.

As Lord Stern recently reflected, the economic case for strong action has only strengthened: *“The costs of inaction greatly exceed the costs of action ... Firstly, we must see this as an issue of the management of immense risks so that narrow or marginal cost-benefit analysis has only a limited contribution in the analysis. Second, the low-carbon transition is an attractive, dynamic growth story and an attempt at maintaining a high-carbon path is deeply damaging and unsustainable”*⁴⁷.

A new ClimateXChange report summarises how knowledge on the global economics of climate change has moved on since the seminal Stern Review⁴⁸:

- The risks of much higher than expected costs justify the cost of action.
- Climate change may impact GDP growth rates year on year, rather than just from extreme events, which threatens a much larger cumulative GDP impact over time.
- The range of abatement costs are roughly the same for 1.5°C or 2°C scenario.

SCCS is concerned that the Scottish Government has only very limited economic analysis in relation to: the domestic impacts of failing to hit 1.5°C temperature goals; the wider macroeconomic effects of its climate policy; and the many economic co-benefits of achieving a net zero target and associated pathway, such as increased employment and reduced healthcare costs.

The Scottish Government costings in the Financial Memorandum, that increasing the target to 90% will cost an additional £13bn through to 2050 (with the majority falling post-2040), are based solely on TIMES modelling. TIMES is designed to guide decisions rather than predict the uncertain future, and has its limitations, such as:

- It is an energy systems model not a macroeconomic model, so we don't know what wider economic impacts ambitious climate policy would have (e.g. how would reduced consumer bills from energy efficiency improvements affect consumer spending power?).
- It does not capture the economic or wider co-benefits of climate policies, such as avoided cost to the NHS from increased active travel and reduced air pollution, just the cost.
- It doesn't capture the costs/risk of not bringing climate change under control.
- It can't say where the costs and benefits are allocated (i.e. citizens, business, governments). This is ultimately a policy decision.

The Scottish Government has not, to our knowledge, attempted any wider macroeconomic modelling of the effect of any targets, whether 90% or net zero. Previous analysis by Cambridge Econometrics showed that meeting the UK's fifth carbon budget (roughly equivalent to Scotland's existing targets to 2032) would have positive wider effects: leading to 190,000 net additional jobs, 1.1% growth in GDP and households on average £565 better off, and an £8.5bn fall in oil and gas imports, compared to a scenario where climate goals were missed⁴⁹.

The New Zealand Government published a comprehensive package of economic analysis alongside its new climate law consultation⁵⁰. The studies overall conclude that the “economy can

⁴⁷ www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2014/12/Growth_Climate_and_Collaboration_Stern_2014.pdf

⁴⁸ ClimateXChange report commissioned by Scottish Government: www.climatechange.org.uk/research/projects/international-assessments-of-the-economic-impacts-of-climate-change/

⁴⁹ <https://www.wwf.org.uk/updates/meeting-carbon-budgets-will-strengthen-uk-economy>

⁵⁰ <http://www.mfe.govt.nz/publications/climate-change/our-climate-your-say-consultation-zero-carbon-bill>

continue to grow under any of the 2050 target options ... To keep our economy growing, we would need to substantially expand our forest estate while continuing to innovate. Unless the Government takes action to ensure a just and fair transition, which it intends to do, some households and sectors could face higher costs and more disruption than others.”

SCCS urges the Scottish Government to commission further analysis on the economics of this Climate Change Bill, modelled on the New Zealand package. SCCS will submit further evidence on the Financial Memorandum to the Finance and the Constitution Committee.

International impacts of climate change

Throughout the 21st century, millions of people will be affected by climate change, with impacts on food security, livelihoods, health and other basic needs⁵¹. Those already living in poverty will suffer the most. Historically, economic development has gone hand-in-hand with increasing energy use and growth of greenhouse gas emissions⁵². The model of development industrialised nations like Scotland have benefitted from is now hurting the poorest people in the world.

Climate change is causing an increased frequency of catastrophic weather events and natural disasters, causing humanitarian crises and significantly affecting poorer communities in developing countries. Some poor small-island states, like Tuvalu, Kiribati and the Maldives are already losing homes and vital infrastructure to sea level rises. The Maldives will disappear entirely if sea-levels rise by 1 metre⁵³.

Climate change is also transforming weather patterns and ecosystems, which is having devastating impacts on millions of people in developing countries who rely on rain-fed agriculture for their livelihoods. Daisy Bestam, a smallholder farmer from Lilongwe Malawi, told us this first-hand what happens when the rains don't come:

“What this means is that our crop yields keep going down. This year hasn't been good at all and many of the crops I planted like vegetables and pumpkins have wilted and died. My three grandchildren and I depend on this garden for vegetables and other foods to diversify our diet and that hasn't been the case lately because every time we plant, crops die due to dry spells. I am afraid because with this type of weather – I don't know what the future holds. What if someday we have a year without rains?”

It is in no doubt that climate change is already killing people. Nations like Scotland have reaped the economic benefits of industrialisation, and as a result poor countries like Malawi may never develop due to climate change, and efforts made in recent years to alleviate extreme poverty may be reversed.

Climate Bill - technical details

⁵¹ See for instance, World Bank, *Shockwaves: managing the impact of climate change on poverty*, 2016, <https://openknowledge.worldbank.org/bitstream/handle/10986/22787/9781464806735.pdf> and UNDP, *Scaling up Climate Action to achieve the SDGs*, 2016, <http://www.undp.org/content/undp/en/home/librarypage/climate-and-disaster-resilience/scaling-up-climate-action-to-achieve-the-sdgs.html>

⁵² IPCC, *Renewable Energy and Climate Mitigation: Summary for Policymakers and Technical Summary: Special Report of the Intergovernmental Panel on Climate Change*, 2012

⁵³ UNFCCC (2005) *Climate Change, Small Island Developing States*, UNFCCC (Bonn), page 18

This section of our evidence provides SCCS' views on the remaining sections of the Bill, including technical details such as reporting and monitoring, and other technical aspects.

Modification of the 2050 and interim targets (Section 4)

SCCS supports proposals made by the CCC in January 2018⁵⁴ to insulate future annual target results against baseline or inventory revisions, by using the same inventory for a period of five years. However, we would like to see protections for longer-term targets, such as the 2050 target or those targets further than 15 years away, so these would not be changed (particularly lowered) solely due to inventory changes, weakening the potency of the powerful 'direction of travel' signals these long-term targets provide. 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.

Target-setting criteria (Section 5)

In the target-setting criteria (Section 5), SCCS would like to see criteria (a), 'the objective of not exceeding the fair and safe Scottish emissions budget' tightened, to define both 'fair' and 'safe'. A definition of 'fair' should account for Scotland's position as a wealthier country that has benefited more than most from exploiting fossil fuels, and therefore has an even greater responsibility than other, poorer countries to cut climate emissions rapidly. There should also be a requirement, in section 6, for the Ministers to ask the CCC to recalculate Scotland's fair and safe budget at least every five years. SCCS would also like a reference to 'public health' added to this list, since unimpeded climate change will carry serious public health consequences, and since many climate change mitigation actions (e.g. better insulated homes or cleaner transport) have a public health benefit.

Duty to seek advice from the relevant body (Section 6)

We are concerned about the undue focus this section places on the undefined and loose term, 'achievable' (page 5, line 3). '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.

Under the 2009 Act, Ministers and the CCC were required to consider and balance together a number of factors in the target-setting criteria (i.e. Section 5 of this Bill). Given the necessity of ending our contribution to climate change so that we minimise the huge risks, we should not move further away, from a balanced consideration, to a situation where achievability has a paramount status in relation to a net zero target.

Annual targets: 2021 to 2049 (moving to expression in percentages)

SCCS supports setting all climate targets in percentage terms. However, Ministers should be required to regularly seek the CCC's advice (as part of section 6 of the Bill) on whether Scotland's cumulative emissions remain consistent with a fair and safe contribution to global climate change mitigation.

Sectoral Targets: If Ministers do not use the Bill to address the lack of policy in sectors which have seen little progress in emissions reductions, e.g. the agriculture sector, SCCS would support such the inclusion of sectoral targets in the Bill to force development of new policies.

⁵⁴ UK Committee on Climate Change, 2018, Letter advising on Scottish climate target framework, <https://www.theccc.org.uk/publication/letter-lord-deben-roseanna-cunningham-msp-advising-scottish-climate-target-framework/>

Revocation of previous targets (Section 9)

SCCS supports counting Scotland's progress using Scotland's actual domestic emissions. However, Scotland can and should continue to be a part of the EU ETS scheme, as it continues to be the main policy the Scottish Government relies on for reducing emissions in the industrial sector. We have no objection to the proposal to set interim targets on the basis of decadal targets, however to ensure early action this should not be a linear pathway as has been proposed, but a percentage decrease year on year resulting in a curved trajectory over time.

Climate Change Plans (Section 19)

A welcome innovation is the creation of a new reporting duty (s19, new section 35B) requiring a series of progress reports on the Climate Change Plan, relating to each emission producing sector. The Bill currently only requires each Minister's "assessment of progress towards implementing the proposals and policies set out in that chapter"⁵⁵. SCCS believes this is too vague and recommends the Parliament and Government should work together, using the first Climate Plan Monitoring Framework update that should be delivered this October, and the ECCLR Committee report on the Draft Climate Plan, to deliver a more prescriptive wording in the final Bill, setting out specifics of the annual progress reports for inclusion.

SCCS welcomes the extension of the period of Parliamentary Scrutiny for Climate Change Plans. However, we believe Government took too long to publish the final version of the most recent Climate Change Plan, at almost 12 months⁵⁶, and that engagement with the CCC, stakeholders and the public was weak⁵⁷. We 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.

The Bill leaves open the timing of the next Climate Change Plan to any point in the five years after Royal Assent of the Bill. SCCS would therefore like the next draft Climate Change Plan published within 12 months of Royal Assent of the final Bill, setting out how it will deliver on the stronger targets we hope to see the Parliament agree in the final Bill.

Removal of Section 36 (Schedule: Modifications of the 2009 Act)

SCCS is disappointed Section 36 of the 2009 Act is being repealed without adequate replacement. To date Ministers have never complied with this statutory requirement to bring forward a statement detailing new policies and proposals to compensate for missed annual targets, despite RACCE Committee concerns⁵⁸. Potentially a seven year lag from missed target year to the next Climate Change Plan is an inadequate safeguard.

⁵⁵ Page 17, lines 16-17, Bill as introduced

⁵⁶ The Scottish Government's final Climate Change Plan was published on 28 Feb 2018, the ECCLR Committee having published four Committees' reports on the draft Plan on 10 Mar 2017.

⁵⁷ The Scottish Government considered that it had only received three formal representations from external organisations, and did not seek the CCC's views before publishing the final version of the Climate Change Plan.
<https://www.gov.scot/Resource/0053/00532181.pdf>

⁵⁸ Letter from Rob Gibson MSP, Convenor of the Rural Affairs, Climate Change and Environment Committee, to the Minister for Environment, Climate Change and Land Reform, 9 Dec 2015, <http://bit.ly/2MQyvt4>