Balancing Act

How farming can support a net-zero emission target in Scotland

Summary for Policymakers

Italic numbers in brackets refer to sections in the full Balancing Act report.

Introduction

Climate change is a huge threat to Scotland's wildlife *(1)* and to Scotland's ongoing agricultural production *(3)*. In 2018 alone farming in Scotland has experienced multiple hardships and tragedies as a result of extreme weather events. These IPCC[1] predicts that these impacts will increase in frequency and intensity because of global warming.

Agriculture and related land use is the second largest source of emissions in Scotland, 26.1% in 2016[2] *(2)*. Actual emissions have reduced by 27.8% since 1990, although this trend has flatlined in recent years[3].

Agriculture is by some distance the largest source of the greenhouse gases (GHGs) methane (68%) and nitrous oxide (79%) in Scotland (Fig 1) and therefore there needs to be a particularly focussed effort from Government and the agriculture industry on reducing these non-CO_2 emissions *(2.1)*

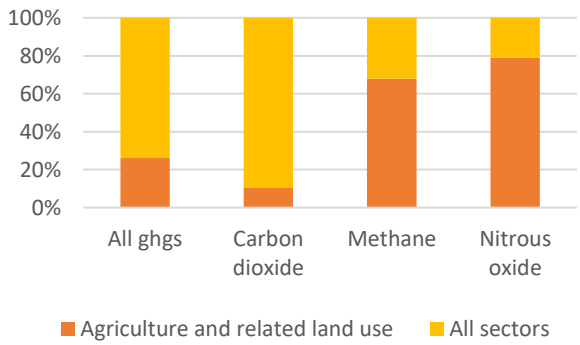

Figure 1. Scottish Greenhouse Gas Emissions from agriculture as % of total emissions, 2016.

Some farming activities also sequester carbon from the atmosphere and lock it away in soil and vegetation, positively benefiting Scotland's climate footprint. However, not all of these sequestering activities are counted in the agriculture sector's footprint *(2.2)*. Farmers have traditionally farmed the land with the purpose of growing food but there is now the potential for farmers to balance this with more action to store carbon in soils, trees and habitats for the long-term.

The Climate Change Bill in Scotland must set ambitious new emission reduction targets to comply with the Paris Agreement but these cannot be met without more action in farming to reduce non-CO_2 emissions and sequester carbon. The urgent focus now must be on finding and employing methods to do this. The Scottish Government needs to put in place policies to realise these outcomes and bridge the gap to net-zero GHGs by 2050 – a figure we believe is the very minimum needed if Scotland is to be compliant with the Paris Agreement.

Agriculture and land use can help achieve a net-zero target

A number of studies have shown the potential for farming and land use to provide significant levels of abatement and sequestration through 'natural climate solutions' *(4.1 & 4.2)* - Scotland is

[1] IPCC, 2018, Global Warming of 1.5C http://ipcc.ch/report/sr15/

[2] Scottish Government, Scottish Greenhouse Gas Emissions 2016 https://www.gov.scot/Publications/2018/06/6601

[3] As above – Agriculture and related land use sector.

"exceptionally well suited" for these[4]. The Tyndall Centre and Uppsala University outlined the pathways needed in Scotland for non-CO2 emissions and for sequestration[5]. Their diagram (reproduced here as Figure 2) shows figuratively the balance in emissions and sequestration that RSPB Scotland believes is needed and is possible in Scotland's rural environment by 2050 and beyond. Sequestration in the rural environment can significantly outweigh emissions from farming and the rural environment, and help to ensure Scotland can achieve a net-zero target for all emissions by 2050 at the latest *(4.3)*.

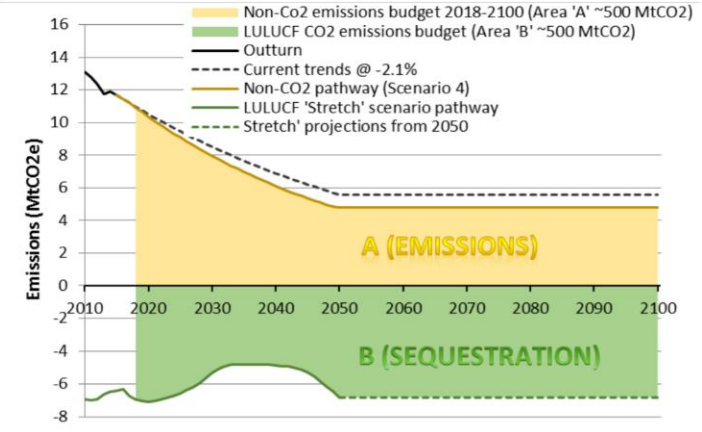

Figure 2. Projected emissions pathways for Scotland's LULUCF sector and non-CO2 emissions.

Untapped potential in farming

There is a large untapped potential in farming to reduce emissions. This is shown by examples of farmers already reducing emissions in Scotland *(5.1)* and in other countries *(5.2)*, and the broad support for climate action from organisations, farmers and academics *(5.3)*. There is potential to use less nitrogen fertiliser *(5.4)*, and for efficiency savings to reduce emissions, including methane from the livestock sector *(5.5)*.

Farmers must not be seen as powerless in the face of climate impacts or the nationwide movement to cut emissions. There must not be a false dichotomy of food production vs cutting emissions – both can happen together. Farmers must be supported to do both in ways which are resilient and sustainable. Government leadership is needed to make this happen *(7).*

10 things to start now to achieve long-term targets

RSPB Scotland recommends that Government focuses on the following 10 actions which will put Scotland's agriculture sector in the right place to contribute to achieving new climate targets by 2050:

1. **Aim for minimising emissions from farming**, especially methane and nitrous oxide. To guide and drive this we propose 3 new targets are set *(8.1)*
    a. **A more ambitious emission reduction target for 2032**. *(8.1.1)*
    b. **A target for reducing nitrous oxide emissions from nitrogen fertiliser by 2020**. *(8.1.2)*
    c. **A target to reduce methane emissions**. *(8.1.3)*
2. **Calculate Scotland's emission floor** – the level to which emissions can fall without compromising food production. *(8.2)*
3. **Calculate the full potential for sequestration in Scotland** to drive policies aimed at increasing sequestration on farmland *(8.3)*
4. **Pay farmers for meaningful action to meet Scotland's emission targets** through a post-Brexit Rural Policy[6]. This should reward farmers for reducing emissions on farm and for action to create, restore and maintain carbon-rich habitats. *(8.4)*
5. **Establish regional land use frameworks** in all areas of Scotland under Scotland's Land Use Strategy (LUS) to guide implementation and funding in priority areas *(8.5)*

[4] *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
[5] http://www.stopclimatechaos.org/sites/www.stopclimatechaos.org/files/TyndallReport.pdf
[6] A post-CAP policy.

6. **Skill and train farmers to meet the challenge**. *(8.6)*
7. **Ensure the Just Transition Commission[7] advises on farming**. *(8.7)*
8. **Create a circular economy for biological materials in Scotland** which recycles the valuable nutrients in farm manures and slurry, and in food waste back onto the land. *(8.8)*
9. **Reprioritise research and solution design to meet the climate targets**. *(8.9)*
10. **Research long-term scenarios for change,** e.g. healthy eating trends which change demand for farm products. *(8.10)*

10 ways to strengthen policies in the Climate Change Plan

The Climate Change Plan's 9% reduction target for agriculture is one of the lowest emissions reduction projections in the Plan[8]. It shows that Government is deliberately giving agriculture 'an easy ride' on climate action. We recommend that the package as it stands is strengthened in the following 10 ways:

1. **Turn all proposals into policies**. *(10.1)*
2. **Strengthen commitment to ensure outcomes are met**. *(10.2)*
3. **Include indicators of uptake and abatement for all policies**. *(10.3)*
4. **Start all policies by 2020**. *(10.4)*
5. **Stop relying on the Voluntary Approach**. The UKCCC[9] concluded that '*the voluntary approach has not worked so far'* and called for regulation. We want to see smart regulation which does not increase unnecessary burden but provides a clear signal of long-term policy intent. *(10.5)*
6. **Introduce a Nitrogen Balance Sheet for Scotland** to understand the best ways to reduce emissions from fertiliser and cut other sources of nitrous oxide[10]. *(10.6)*
7. **Introduce compulsory soil testing** for pH on a regular basis. This is a bare minimum requirement to aid appropriate fertiliser planning that all farmers should be doing. *(10.7)*
8. **Roll out carbon audits to all farmers by 2024** along with the advice needed to interpret audit findings and support behavioural change based on the results. *(10.8)*
9. **Set a target for emissions intensity for livestock by 2020** to drive down emission intensity of products (emissions per unit of product) from the livestock sector where there are many opportunities[11] . *(10.9)*
10. **Research optimal agroforestry systems** to optimise climate benefits. *(10.10)*

10 additional things to do now to achieve short-term targets

The Climate Change Plan must go much further than a 9% reduction in emissions by 2032 so that Scotland is on the right trajectory to meeting short and long-term targets. Introducing the following 10 measures in addition to the Climate Change Plan policies, by 2020, is needed to ensure we realise the untapped potential of farming to reduce emissions and to put farming on a sure future footing:

1. **Develop a national farm climate footprint indicator** to recognise the positive action farmers are taking and support positive behaviour change in farming. *(11.1)*
2. **Promote alternatives to inorganic nitrogen fertilisers**, to make them more attractive, trusted and available as a source of nitrogen and other nutrients. *(11.2)*

---

[7] Programme for Government 2017 https://www.gov.scot/Resource/0052/00524214.pdf p39

[8] Scottish Government, Climate Change Plan https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/

[9] UKCCC – Reducing emissions in Scotland, 2018 Progress Report to Parliament, Sept 2018

[10] A nitrogen budget for Scotland, Nourish Scotland briefing http://www.nourishscotland.org/wp-content/uploads/2017/03/A-Nitrogen-Budget-for-Scotland-Nourish-Scotland-briefing.pdf

[11] http://www.saiplatform.org/uploads/Modules/Library/lrg-sai-livestock-mitigation_web2.pdf

3. **Commit to increasing soil carbon** so that farm soils become a greater store of carbon rather than a source. *(11.3)*
4. **Modernise manure management** to reduce emissions from slurry stores and spreading practices. *(11.4)*
5. **Champion improved livestock feeds and diets** which can reduce methane emissions[12] *(11.5)*
6. **Involve the poultry and pig industries** *(11.6)*
7. **Facilitate low-cost or no-cost loans for new equipment** needed to modernise and reduce emissions *(11.7)*
8. **Set a target for organic production,** a system known to be effective in reducing emissions[13] and increasing carbon sequestration in soils[14]. *(11.8)*
9. **Boost advisory schemes** in a new Rural Policy post-Brexit. *(11.9)*
10. **Manage farm woodlands better** to ensure they improve as a carbon sink[15]. *(11.10)*

Conclusion

Farming and land use will be key to meeting a net-zero target in future by performing a delicate balancing act of emission reduction and sequestration. Only farmers can make significant cuts to the non-CO_2 greenhouse gases - methane and nitrous oxide. Farmers are also well placed to use land for sequestration and storage of carbon in soils, vegetation and trees. This will need all farmers, land managers and the wider agriculture industry to take action, and will require a wide range of measures to be developed and rolled out so that famers can adopt the ones best suited to their business.

In its Climate Change Plan, the Scottish Government is expecting a mere 9% reduction in emissions to 2032 from the agriculture sector. This does not realise the untapped potential that farming has, provide the vision and leadership needed, or help farming modernise, become more efficient and secure for the future. RSPB Scotland recommends a suite of measures to be started now to achieve long-term targets, to improve the current measures in the Climate Change Plan, and additional measures needed now for the short-term to put farming on the right trajectory.

If farmers are to keep farming into the future climate change must be halted, however it cannot be tackled without farmers. RSPB Scotland is calling on the Scottish Government to change course and provide the leadership that farming needs for the future so that it can help Scotland meet a net-zero target, and continue to flourish up to 2050 and beyond.

RSPB Scotland

November 2018

For more information contact jim.densham@rspb.org.uk

[12] Griscom et al., 2017. Natural Climate Solutions, 114 (44) 11645-11650. http://www.pnas.org/content/114/44/11645

[13] 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; doi:10.3390/su3020322

[14] Gattinger, A. et al http://www.pnas.org/content/109/44/18226

[15] https://www.wur.nl/upload_mm/c/4/6/4fc6f12c-1dae-4d83-9557-20008c311498_forests-08-00484.pdf