

March 2024

Progress in reducing emissions in Scotland 2023 Report to Parliament

Progress in reducing emissions in
Scotland 2023 Report to Parliament

Climate Change Committee
March 2024

© Climate Change Committee copyright 2024

The text of this document (this excludes, where present, the Royal Arms and all departmental or agency logos) may be reproduced free of charge in any format or medium provided that it is reproduced accurately and not in a misleading context. The material must be acknowledged as Climate Change Committee copyright and the document title specified. Permission from copyright holders must be sought before any photographs are reproduced.

Contents

Acknowledgements	5
The Committee	6
Executive summary	9
1. Emissions changes	12
2. Policy and delivery progress and next steps	15
Chapter 1 - Progress in reducing emissions	22
1.1 Progress in reducing territorial emissions	24
1.2 Progress in reducing Scotland's consumption emissions	36
1.3 Sectoral indicators of progress	38
Chapter 2 - Sectors' progress	45
2.1 Transport	48
2.2 Buildings	53
2.3 Agriculture and land use	57
2.4 Waste	60
2.5 Industry	63
2.6 Electricity supply	66
2.7 Engineered removals	67
Chapter 3 – Cross-cutting issues	73
3.1 Cross-economy policies	76
3.2 Adaptation	82
Annex 1 – Recommendations	86
Annex 2 – Methodology	89

Acknowledgements

The Committee would like to thank:

The team that prepared this report and its analysis:

This was led by Chris Stark, James Richardson, Emily Nurse, Eoin Devane, James Tarlton and Simona Battipaglia, and included Sasha Abraham, Rose Armitage, Florence Bates, Owen Bellamy, Sandra Bogelein, Marili Boufounou, Rachel Carr-Whitworth, Bianca de Farias Letti, Victoria de la Cruz, Ramesh Deonarine, Joshua Deru, Tom Dooks, Caitlin Douglas, Kim Dowsett, Kieron Driscoll, Ahmed Gailani, Francesco Giacomini, Ruth Gregg, Esther Harris, Cilla Hellgren, Robbie Herring, Gemma Holmes, Daisy Jameson, Luke Jones, Miriam Kennedy, Charley Lamb, Michael Lord, Luke Maxfield, Richard Millar, Bea Natzler, Chloe Nemo, Chris Parker, Finna Parkinson, Simon Rayner, Niki Rust, Viv Scott, Penny Seera, Olivia Shears, Joris Simaitis, Felicity Taylor, Seán Taylor, Indra Thillainathan, Emma Vause, Sophie Vipond, Zelna Weich, Chloe Welsh, Eveline White, Hannah Williams, Louis Worthington, Susie Wright, Ken Wright.

A number of organisations and stakeholders for their support, including the Scottish Government, and the Climate Emergency Response Group.

The Committee



Professor Piers Forster
Interim Chair

Piers Forster is Director of the Priestley Centre for Climate Futures and Professor of Physical Climate Change at the University of Leeds. He has played a significant role authoring Intergovernmental Panel on Climate Change (IPCC) reports, and is a coordinating lead author role for the IPCC's sixth assessment report.



Professor Keith Bell

Keith Bell is a co-Director of the UK Energy Research Centre (UKERC), a Chartered Engineer and a Fellow of the Royal Society of Edinburgh. He has been at the University of Strathclyde since 2005, was appointed to the Scottish Power Chair in Smart Grids in 2013 and has been involved in energy system research in collaboration with many academic and industrial partners.



Professor Michael Davies

Michael Davies is Professor of Building Physics and Environment at the UCL Institute for Environmental Design and Engineering (IEDE). At UCL his research interests relate to the complex relationship between the built environment and human wellbeing. He is also Director of the Complex Built Environment Systems Group at UCL and a member of the Scientific Advisory Committee of 'Healthy Polis'.



Dr Steven Fries

Steven Fries is a Senior Associate Fellow at the Institute for New Economic Thinking at the Oxford Martin School, University of Oxford, and Nonresident Senior Fellow at the Peterson Institute for International Economics. Steven has previously held roles as group chief economist at Shell and chief economist at the Department of Energy and Climate Change.



Professor Corinne Le Quéré FRS

Corinne Le Quéré is a Royal Society Research Professor at the University of East Anglia (UEA), specialising in the interactions between climate change and the carbon cycle. She was lead author of several assessment reports for the UN's Intergovernmental Panel on Climate Change (IPCC) and she currently Chairs the French Haut Conseil pour le Climat.



Nigel Topping CMG

Nigel Topping was appointed by the UK Prime Minister as UN Climate Change High Level Champion for COP26. In this role Nigel mobilised global private sector and local government to take bold action on climate change, launching the Race To Zero and Race To Resilience campaigns and, with Mark Carney, the Glasgow Financial Alliance for Net Zero.



Executive summary

1. Emissions changes	12
2. Policy and delivery progress and next steps	15

The Scottish Government is failing to achieve Scotland's ambitious climate goals. Annual emissions targets have repeatedly been missed and the publication of Scotland's draft Climate Change Plan has been delayed. As such, there is still no comprehensive delivery strategy for meeting future emissions targets and actions continue to fall far short of what is legally required.

The Scottish Government has ambitious targets and a welcome and necessary recognition of the importance of public engagement and a just transition. Now it is time to deliver. There are some early signs of good progress, including bold proposals in the Heat in Buildings consultation that, once agreed, must be delivered promptly and effectively to ensure Scotland can get as close as possible to meeting its targets.

In this report we monitor Scotland's progress in reducing emissions and assess the policies in place for delivering future emissions reduction. As a result of the Scottish Government delaying the publication of its draft Climate Change Plan, this Climate Change Committee (CCC) report is no longer assessing the draft Plan as was originally planned.

In Annex 1 of this report, and on our website, we set out the CCC's priority recommendations to the Scottish Government. These focus on the key actions that are needed to turn Scotland's ambitious targets into effective delivery and achieve the required levels of emissions reduction at the earliest date possible.

Our key messages are:

- **Scotland's annual target was missed again.** Scottish emissions in 2021 increased by 2.4% from 2020 as the economy rebounded from the pandemic, and were 49.2% below 1990 levels*. Scotland missed its 2021 annual legal target. This is the eighth target in the past 12 years that has been missed.
- **The acceleration required in emissions reduction to meet the 2030 target is now beyond what is credible.** The recent rate of emissions reduction outside the electricity supply, aviation and shipping sectors needs to increase by a factor of nine in the nine years from 2021 to 2030, compared to the preceding nine years, if Scotland is to achieve its 2030 target of a 75% reduction compared to 1990 levels.† This rate of reduction is nearly two times higher than that in the CCC's ambitious pathway for Scotland, which we updated in 2022. Given the pace at which supply chains and investment would need to develop, this rate of reduction is not credible. However, the Scottish Government should build on its high ambition and implement policies that enable the 75% emissions reduction target to be achieved at the earliest date possible.
- **Current overall policies and plans in Scotland fall far short of what is needed** to achieve the legal targets under the Scottish Climate Change Act. There are risks in all areas with significant policy powers devolved to the Scottish Government (transport, buildings, agriculture, land use and waste).

* The baseline against which targets are assessed is 1990 emissions for all sectors except fluorinated gases (F-gases), for which 1995 is used.

† This factor of nine increase represents the increase in the average annual percentage reduction in emissions that will be required over 2021-2030, compared to that achieved over 2012-2021.

However, the CCC welcomes the Buildings (Scotland) Amendment Regulations prohibiting the use of direct emissions heating systems for new homes, as well as the Heat in Buildings consultation and the strength of its proposals. Many of them, if successfully implemented, could be a template for the rest of the UK. As such, the Scottish Government should provide a timeline and avoid delays on the Heat in Buildings Bill and move towards its delivery.

- **The Scottish Government has delayed its draft Climate Change Plan.** The 2030 target is only six years away. The Scottish Government did not publish its draft Climate Change Plan in late 2023 as planned. This progress report had been delayed to assess it. At the time of writing, it is still unclear when a draft Plan will be published. Scotland is therefore lacking a comprehensive strategy that outlines the actions and policies required to achieve the 2030 target. The Scottish Government must publish the Plan urgently, with sufficient time to allow for consultation, setting out detail of how policies will work together to deliver the required levels of emissions reduction.
- **Most key indicators of delivery progress are off track**, with tree planting and peatland restoration rates, heat pump installations, electric van sales and recycling rates significantly so. There has been better progress in renewable electricity generation, with a ramp-up of offshore wind capacity in 2022.
 - By the end of this decade, Scotland will need to: treble the pace of roll-out of public electric vehicle charge points, reduce car traffic by 20%, increase heat pump installation rates by a factor of at least thirteen, and double onshore wind capacity. Woodland creation will need to more than double by the mid-2020s and peatland restoration rates need to increase significantly.
 - The Committee's recommendations in Annex 1 identify important actions to ensure effective delivery in these and other areas.

The rest of the executive summary is set out in two sections:

1. Emissions changes.
2. Policy and delivery progress and next steps.

1. Emissions changes

Emissions in 2021

Emissions increased by 2.4% in 2021, driven by an increase in surface transport emissions following the pandemic, and in buildings, in part due to colder than average temperatures.

- **Emissions in 2021 increased by 2.4%** compared to 2020 levels to 41.6 MtCO_{2e}, which is 49.2% below 1990 levels. This represents a higher reduction in emissions compared to the UK, where 2021 emissions were 47.2% below 1990 levels (Figure 1).
 - The increase in 2021 was driven by an increase in surface transport emissions following the pandemic, and in buildings emissions, with colder than average temperatures contributing to the rise.
- **The only sectors in which emissions reduced in 2021 were electricity supply and industry.** The emissions reduction in the electricity supply sector was due to reduced gas-fired generation. In the industry sector, the reduction was due to extensive maintenance in oil and gas production.
 - Electricity supply has been the main driver of emissions reduction in Scotland to date, with significant reductions seen in the last decade due to the phase-out of coal and ramp-up of renewables.
- **Scotland missed its 2021 annual target** of a 51.1% reduction in emissions compared to 1990 levels. Using the 'base inventory' accounting methodology (Annex 2), under which targets are assessed, emissions fell by 49.9%. This is the eighth target in the past 12 years that Scotland has missed.

Scotland missed its 2021 annual emissions reduction target. This is the eighth target that Scotland has missed in the past 12 years.

Emissions reduction needs to accelerate

The rate of emissions reduction will need to accelerate rapidly in almost all sectors for Scotland to meet its 2030 target.

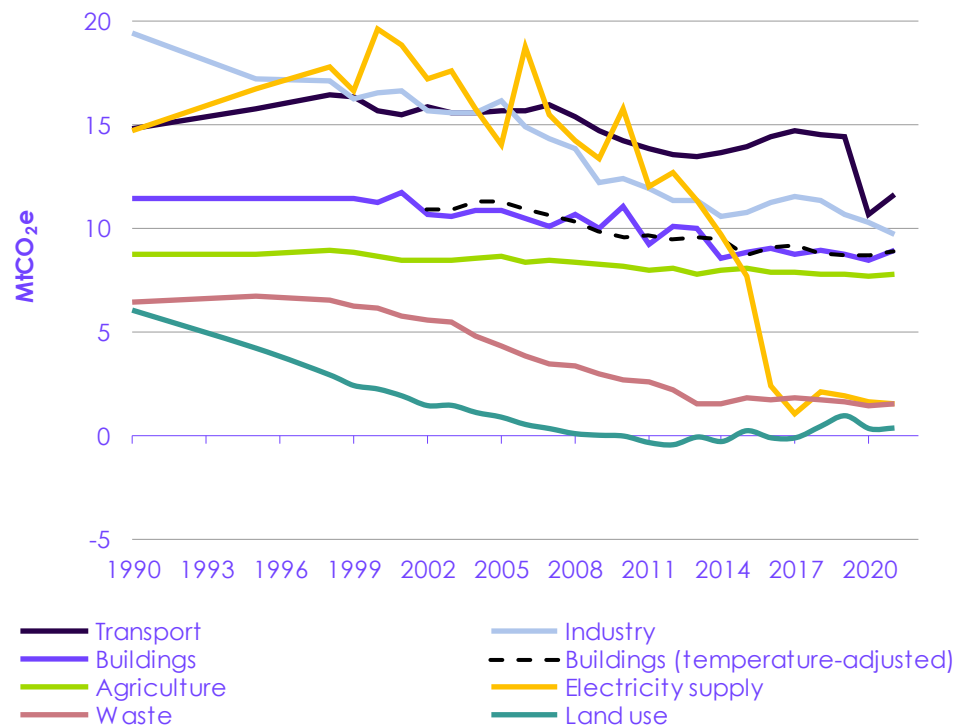
Emissions reduction needs to accelerate in almost all sectors. The overall pace needs to increase by a factor of nine over the nine years from 2021 to 2030, excluding electricity supply, aviation, and shipping emissions, compared to the prior nine years from 2012, if Scotland is to meet its 2030 target of a 75% reduction on 1990 levels (Figure 2).^{*} This is almost a factor of two faster than in the CCC's highly ambitious 2022 updated pathway for Scotland.

- **This will need to come from a rapid increase in the pace of decarbonisation** of emitting sectors, as well as a rapid deployment and ramp-up of engineered removals, on which the 2020 Climate Change Plan update (CCPu) and Scotland's 2030 target depend. A study published by the Scottish Government estimated that only around three-fifths of the engineered removals assumed in the CCPu will be feasible to deploy by 2030.

^{*} This assessment is based on emissions data up to 2021, which is the latest full year of final emissions data available for Scotland. Where data are available for more recent years (e.g. on some sectoral indicators), these do not yet show progress at the pace required, so our assessment remains unchanged. Electricity supply emissions were excluded because they have driven the bulk of reductions over this period and have limited potential for further reductions, while aviation and shipping were excluded because their emissions were significantly affected by the pandemic.

- **The buildings, transport and agriculture sectors will require a particularly rapid increase in the rate of emissions reduction**, to meet the emissions envelopes set out in the CCPu. For the buildings sector, the rate will need to increase by nearly a factor of ten over the nine years from 2021 to 2030 compared to that seen in the preceding nine years. This is not a credible increase. It is almost three times higher than in the CCC's ambitious pathway for Scotland, which we updated in 2022.
- **The Scottish Government should implement policies as soon as possible** to ensure Scotland reaches the 75% reduction target at the earliest possible date. The next section outlines some of the actions needed to achieve this.

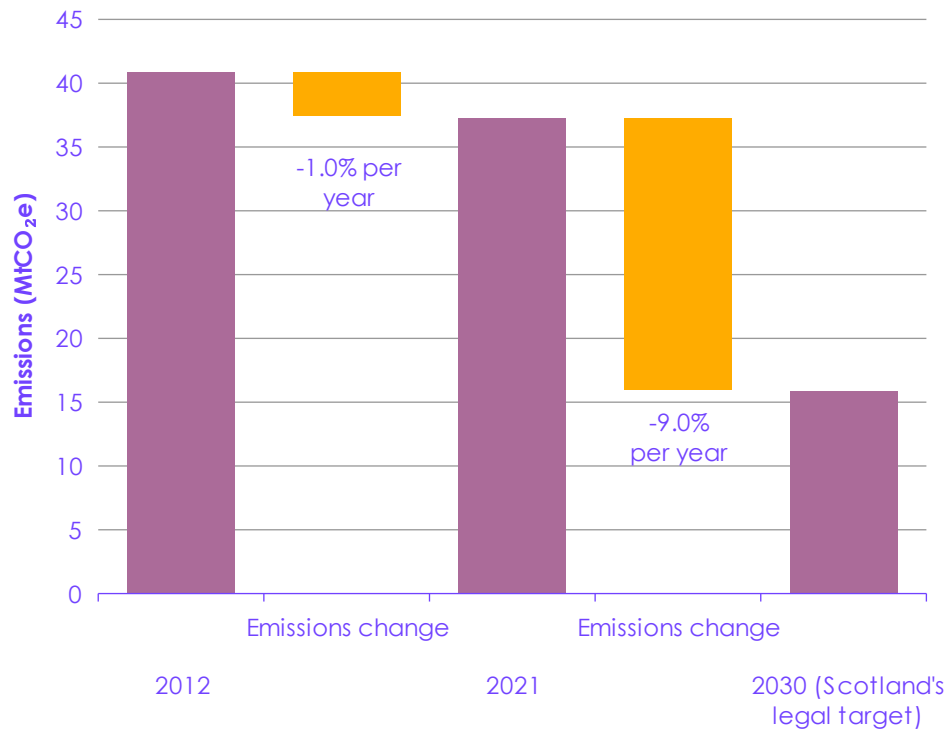
Figure 1 Scotland's historical emissions by sector (1990–2021)



Source: National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2021*; CCC analysis.

Notes: Historical emissions are not available for the years 1991-1993 and 1996-1997, so the values for these years are interpolated from the data points for 1990, 1995 and 1998. The dashed line shows temperature-adjusted buildings emissions, which are adjusted for differences in heating demand due to year-to-year variation in temperatures.

Figure 2 Change in emissions excluding electricity supply, aviation, and shipping: actual (2012–2021) and required (2021–2030)



Source: National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland 1990-2021*; Scottish Government (2019) *Climate Change (Emissions Reduction Targets) (Scotland) Act 2019*; CCC (2022) *Scottish Emission Targets – first five-yearly review*; Scottish Government (2020) *Securing a green recovery on a path to net zero: Climate Change Plan 2018–2032 – update (CCPu)*; CCC analysis. Notes: To adjust the 2030 target for this chart, estimated 2030 electricity supply emissions from the Scottish Government's CCPu has been used. As aviation and shipping pathways are not published in the CCPu, 2030 emissions from the CCC's 2022 updated pathway have been used for these sectors.

2. Policy and delivery progress and next steps

The Scottish Government had planned to publish its draft Climate Change Plan for consultation in late 2023, laying out quantified plans for emissions reductions. This Progress Report to Parliament was delayed to allow for an assessment of the new Plan. However, the Plan was not published in 2023 and, at the time of writing, a date for its publication has not been announced. Scotland is therefore still missing a coherent, transparent, and quantified plan on how it will meet its stretching 2030 target.

The Scottish Government's draft Climate Change Plan should be published soon, setting out details of how policies will deliver the required emissions reductions.

A list of key priority recommendations for the Scottish Government is provided in Annex 1 and on our website. One of these key recommendations (recommendation R2022-402) is that the draft Climate Change Plan should set out more details of how policies will work together to deliver the required emissions reductions. This should be published soon, with sufficient time to allow for a proper consultation. The other key recommendations identify important actions that are needed to turn Scotland's extremely stretching targets into effective delivery and achieve the required levels of emissions reduction at the earliest date possible.

Most delivery indicators are off track, and progress has been slow towards our key policy recommendations.

Most delivery indicators are off track, many significantly so (Figure 3), and overall policy progress has been insufficient over the past year. Only three of the 14 key recommendations from the CCC's 2022 Scottish Progress Report scored 'good progress'. Two scored 'moderate progress', seven scored 'some but insufficient progress', and two made 'no progress' at all.

Transport

The transport sector requires practical delivery plans in areas including charging infrastructure, car demand reduction and decarbonisation of aviation and shipping.

11.6 MtCO_{2e} in 2021, required in the CCPU to decrease by 44% by 2030, needing almost a factor of four increase in the annual emissions reduction rate. Transport is the highest emitting sector in Scotland.

Some significant policy powers in this sector are devolved to the Scottish Government, especially for demand reduction and modal shift.

Progress has been limited in the past year, with delivery plans now overdue:

- Electric car and van sales are off track, vans significantly so, with 10.5% of new car and 2.0% of new van sales being electric in 2022 (Figures 3a and 3b). Both are lower than for the UK as a whole.
- Charging infrastructure is on track, with almost 4,000 public charge points in 2022 (Figure 3c), although the deployment rate across the rest of the decade will need to nearly treble and reliability must improve. An implementation plan outlining how Scotland will deliver approximately 24,000 charge points by 2030 is needed (recommendation R2022-338).
- Car-kilometres increased in 2021 following the pandemic but remain 6% below 2019 levels (Figure 3d). Scotland has an ambitious target to reduce car-kilometres by 20% from 2019 levels, by 2030. However, a clear strategy on how this will be achieved is still missing (recommendation R2022-332).

- There is no strategy for decarbonising aviation in Scotland (recommendation R2024-004) and no progress in addressing aviation demand growth, with the Air Departure Tax yet to be implemented (recommendation R2022-348).
- The Islands Connectivity Plan is overdue and a plan for meeting the commitment for 30% of Scottish Government-managed ferries to be low-emission by 2032 is still needed (recommendation R2022-342).

Buildings

There are some early signs of good progress through the Heat in Buildings Bill, which, if implemented, could provide a template for the rest of the UK.

9.0 MtCO₂e in 2021, required in the CCPu to decrease by 71% by 2030, needing almost a factor of ten increase in the annual emissions reduction rate.

Some areas of the buildings sector have significant policy powers devolved to the Scottish Government. The CCC welcomes the Buildings (Scotland) Amendment Regulations and the Scottish Government's bold proposals for its Heat in Buildings Bill, which, if implemented, could become a template for other parts of the UK. The Heat in Buildings proposals recognise the importance of a long-term plan for low-carbon heat, with a very welcome focus on upgrading properties at the point of sale. There is also greater clarity on the role of low-carbon heat networks and tougher obligations on landlords to upgrade the energy efficiency of their properties.

There is still work needed to ensure the Bill comes into place and is deliverable in practice (recommendation R2024-001).

- There were just over 6,000 domestic heat pump installations in 2023, which is less than half those indicated in the CCC's pathway. This needs to increase to more than 80,000 per year by the end of the decade (Figure 3e). The point-of-sale switch of heating systems proposed in the Heat in Buildings Bill has potential to significantly accelerate this transition.
- The number of government-funded energy efficiency measures in households in Scotland has fallen to just over 7,600 in 2022, from a peak of more than 71,600 in 2013 (Figure 3f). The Heat in Buildings Bill is consulting on minimum energy efficiency standards for privately owned homes. The measurement of energy performance should be fit for purpose to ensure maximum impact from these standards.
- Scottish Government should finalise plans for decarbonising non-residential buildings, which received less focus in the Heat in Buildings Bill (recommendation R2022-384).

Agriculture and land use

Policy plans must address barriers to enable woodland creation and peatland restoration rates to scale up significantly.

8.2 MtCO₂e in 2021, required in the CCPu to decrease by 11% by 2030, needing a reversal of recent emissions increases.

Policy powers in the agriculture and land sector are mostly devolved to the Scottish Government.

There has been limited progress in the last year:

- The new Agriculture and Rural Communities (Scotland) Bill was introduced to replace the Common Agricultural Policy but lacks details on the financial support that will be offered to farmers and land managers during the transition. It is not yet clear how future support systems will integrate and address objectives for food, nature, and climate, and provide adequate long-term consistent support for the farming community (recommendation R2022-406).
- With just over eight thousand hectares of new woodland creation in 2022/23, Scotland needs to more than double this rate to reach its target of 18 thousand hectares per year from 2024/25 (Figure 3g). A quarter of approved new woodland was delayed or cancelled, likely due to skills and capacity issues. While £1 million was allocated to boost forestry skills, more is required to overcome all delivery barriers (recommendation R2022-356).
- Scotland has missed its peatland restoration target for the fifth consecutive year (Figure 3h), with the rate needing to nearly triple to reach the Scottish Government's own target, which is in turn lower in ambition than the CCC's recommended rate. A comprehensive delivery mechanism to address degraded peatland and extend current restoration ambition beyond the existing timeframe of 2030 is required (recommendation R2022-358).

Waste

Stronger action is needed to increase recycling rates and reverse recent increases in waste incineration.

1.6 MtCO₂e in 2021, required in the CCPu to decrease by 55% by 2030.

Policy powers in the waste sector are mostly devolved to the Scottish Government.

There has been some limited progress in the past year:

- Scotland is significantly off track to meet its 2025 70% recycling rate target, with no progress in rates over the last ten years (Figure 3i). The Scottish Government laid the Circular Economy (Scotland) Bill last year, which will provide the legislative framework for targets.
- Waste incineration, including energy from waste, has more than doubled since 2011. While restrictions on new energy from waste facilities set out in National Planning Framework 4 are welcome, stronger action is needed (recommendation R2022-329).

Industry

Coordination with the UK Government remains key for decarbonising industry, which is Scotland's second highest emitting sector.

9.7 MtCO₂e in 2021, required in the CCPu to decrease by 25% by 2030.

With most policy powers reserved to the UK Government, co-ordination with the UK Government remains key.

There has been some progress in carbon capture, utilisation, and storage (CCUS), but there has been minimal progress in other areas of industrial decarbonisation:

- The Acorn CCUS cluster in Scotland was awarded Track 2 status as part of the UK Government CCUS cluster sequencing process, subject to final assessments.

- The Circular Economy Bill will help reduce industrial emissions, but more measures are needed to increase efficiency of resource use, with particular opportunities in construction materials (recommendation R2022-376).

Electricity supply

The Scottish and UK Governments must work together effectively to ensure both the Scottish targets and the UK-wide objective of a decarbonised electricity system by 2035 are achieved.

1.6 MtCO₂e in 2021, required in the CCPu to be zero emissions in 2030.

Policy related to electricity supply is mostly reserved to the UK Government but is substantially influenced by devolved policies over planning and consenting of key infrastructure and leasing of offshore sites for renewable generation.

There has been some progress in delivering renewable electricity generation in Scotland:

- The Scottish Government aims to develop 8–11 GW of offshore wind capacity and 20 GW of onshore wind capacity, both by 2030. Offshore wind capacity in Scotland grew in the past year, putting it on track compared to the 2030 target (Figure 3j). The growth in onshore wind capacity has slowed, however, and it is slightly off track to deliver its 2030 target, which will require operational capacity to more than double (Figure 3k).
- The Scottish Government consulted on its draft Energy Strategy in January 2023, which included its ambition to deliver more than 20 GW of additional renewable generation capacity by 2030. The final plan due this year should include a delivery plan and the Scottish Government should work with the UK Government on practical measures to ensure both the Scottish targets and the UK-wide objective of a decarbonised electricity system by 2035 are achieved.

Engineered removals

The Scottish Government should assess the Acorn cluster's deployment potential against the ambitious requirements for engineered removals in its 2030 pathway.

No abatement in 2021, required in the CCPu to be -3.8 MtCO₂e in 2030.

Policy powers for engineered removals are mainly reserved to the UK Government.

Acorn receiving Track 2 status is positive progress for engineered removals in Scotland, and now the Scottish Government should assess Acorn's deployment potential against its aim to achieve -3.8 MtCO₂ engineered removals by 2030. A feasibility study published by the Scottish Government estimates potential for only -2.2 MtCO₂ by 2030 in Scotland.

Cross-cutting enablers

Clear agreement of roles and responsibilities and better coordination of actions across governments and local authorities is still needed.

- **Governance:** there has been some progress over the past year, with improved relationships between central and local government to deliver Net Zero. However, it is not yet clear what all the roles and responsibilities are, and better coordination of actions across Scottish and UK Governments and local authorities is still needed (recommendation R2024-002).

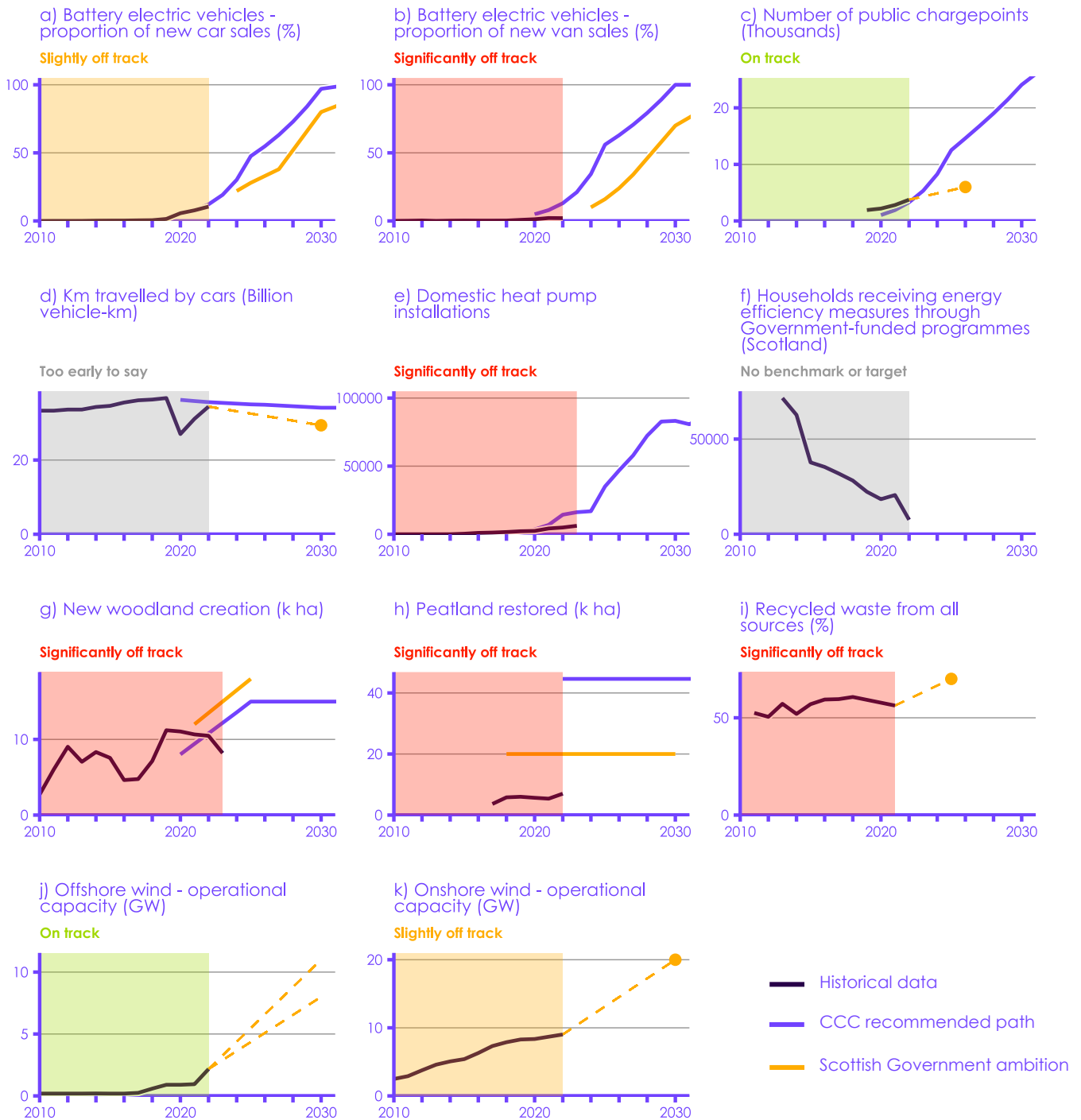
The Scottish Government has a welcome and necessary recognition of the importance of public engagement and a just transition.

- The UK and Scottish Governments need to work together effectively to deliver both Governments' climate targets. This requires greater transparency in the plans of both, clear responsibilities, and open and frequent consultation between Holyrood and Westminster.

- **People and business:** the Scottish Government has a welcome and necessary recognition of the importance of public engagement and a just transition. These policy areas have seen some progress, with the draft Energy Strategy and Just Transition Plan published in January 2023 and the Heat in Buildings Public Engagement Strategy published in December 2023. However:

- More should be done to communicate the most impactful ways for people to reduce emissions and to support them to make green choices, including around diet and aviation (recommendation R2024-003).
- Advice, engagement, and financial support are needed for Scottish businesses to improve energy efficiency and adopt low-carbon heating and electric vehicles.
- The mixed handling of plans to close the Grangemouth refinery underlines the risk of omitting meaningful dialogue between communities, industry and government and the important role for the Scottish Government in ensuring a just transition.

Figure 3 Key sectoral indicators of progress



Source: (a - b) Department for Transport (2023) *Vehicle licensing statistics data tables*; UK Government, Transport Scotland, Welsh Government and NI Department for Infrastructure (2023) *Zero emission vehicle (ZEV) mandate consultation: summary of responses and joint government response*; (c) Department for Transport (2022) *Electric vehicle charging device statistics: January 2022*; Transport Scotland (2023) *A network fit for the future: vision for Scotland's public electric vehicle charging network*; (d) Department for Transport (2023) *Road traffic statistics (TRA)*; Scottish Government (2023) *Securing a green recovery on a path to net zero: climate change plan 2018-2032 - update*; (e) MCS (2023) *MCS Data Dashboard*; (f) Department for Energy Security and Net Zero (2023) *Household Energy Efficiency Statistics, headline release April 2023*; (g) Forest research (2023) *Forestry Statistics and Forestry Facts & Figures*; Scottish Forestry, *Regional Strategic Woodland Creation Project*; (h) Scottish Government (2023) *Climate change monitoring report 2023*; Scottish Government (2018) *Climate Change Plan: third report on proposals and policies 2018-2032 (RPP3)*; (i) SEPA (2022) *Waste data for Scotland*; Scottish Government (2016) *Making Things Last: a circular economy strategy for Scotland*; (j - k) Department for Energy Security and Net Zero (2023) *Regional Renewable Statistics*; Scottish Government (2022) *Onshore wind: policy statement 2022*; Scottish Government (2022) *Offshore wind policy statement*.

Notes: The dashed lines show a straight line from the latest historical data to a Scottish Government ambition that has been stated as a single-year value. This has been drawn to show the average pace of change required to meet future targets compared to the historical change. The CCC's recommended paths are based on the deployment assumptions in the ambitious updated pathways for Scotland in the CCC's 2022 Scottish emissions targets - first five-yearly review, with the exception of chart (e) which uses the CCC's Balanced Pathway deployment for heat pumps.



Chapter 1- Progress in reducing emissions

1.1 Progress in reducing territorial emissions	24
1.2 Progress in reducing Scotland's consumption emissions	36
1.3 Sectoral indicators of progress	38

Introduction and key messages

Scotland has a legislated target to reach Net Zero greenhouse gas (GHG) emissions by 2045, with future interim targets in 2030 and 2040, as well as legal annual targets.

This chapter outlines Scotland's progress towards these targets based on the latest available territorial emissions data, which cover the period up to 2021. We also present the most recent data on Scotland's consumption emissions and monitor other indicators of delivery progress.

Our key messages are:

- **Emissions in 2021 increased by 2.4% compared to 2020 levels**, to 41.6 MtCO₂e. The increase in 2021 was driven by an increase in surface transport emissions following the pandemic and an increase in buildings emissions, with colder than average temperatures contributing to the rise.
- **Scotland narrowly missed its 2021 annual emissions reduction target** of a 51.1% reduction in emissions compared to baseline levels.* Using the 'base inventory' methodology for GHG emissions, under which targets are assessed, emissions fell by 49.9%.
- **Emissions reduction needs to accelerate in all sectors outside of electricity supply.** The rate needs to increase by a factor of nine over the nine years from 2021 to 2030 compared to the preceding nine years, if Scotland is to meet its 2030 target (for emissions excluding electricity supply, aviation, and shipping). This is now beyond what is credible. There has been no recent progress in emissions reduction in the buildings, agriculture, land use and waste sectors.
- **In 2019, Scotland's consumption emissions fell by 1% to 76 MtCO₂e**, which is 64% higher than Scotland's territorial emissions. Consumption emissions in 2019 were 24% lower than 1998 levels.
- **Almost all key indicators of delivery progress are off track**, with tree-planting and peatland restoration rates, heat pump installations, electric van sales and recycling rates significantly so. There has been better progress in renewable electricity generation, with offshore wind capacity ramping up significantly in 2022.

* Under Section 36 of the Climate Change (Scotland) Act 2009, emissions reductions in future years will need to be steeper in order to outperform future targets to compensate for the excess emissions in years in which targets were missed.

1.1 Progress in reducing territorial emissions

1.1.1 Total emissions and the 2021 target

- **Emissions in 2021:** emissions were 41.6 MtCO₂e in 2021, based on the 1990-2021 inventory. This is a 2.4% increase since 2020 but remains 10.0% below pre-pandemic levels in 2019. Emissions in 2021 were 49.2% lower than levels in 1990 (Figure 1.1). This represents a higher reduction in emissions compared to the UK, where 2021 emissions were 47.2% below 1990 levels.¹
- **Scotland's 2021 target:** using Scotland's 'base inventory' methodology for greenhouse gas (GHG) emissions accounting (Annex 2), under which the Scottish Government's targets are assessed, emissions in 2021 were 49.9% lower than baseline levels.* Therefore, Scotland has narrowly missed its 2021 annual target of a 51.1% reduction on baseline levels (Figure 1.1).^{†,2,3}
- **Scotland's previous targets:** Scotland has failed to meet eight of its twelve legislated annual targets since 2010 and three out of four since 2018 (Figure 1.2). Stronger action is needed to reduce emissions across the economy to be able to meet future targets. Failure to meet future annual targets will increase the risks of Scotland missing its long-term emissions reduction goals.

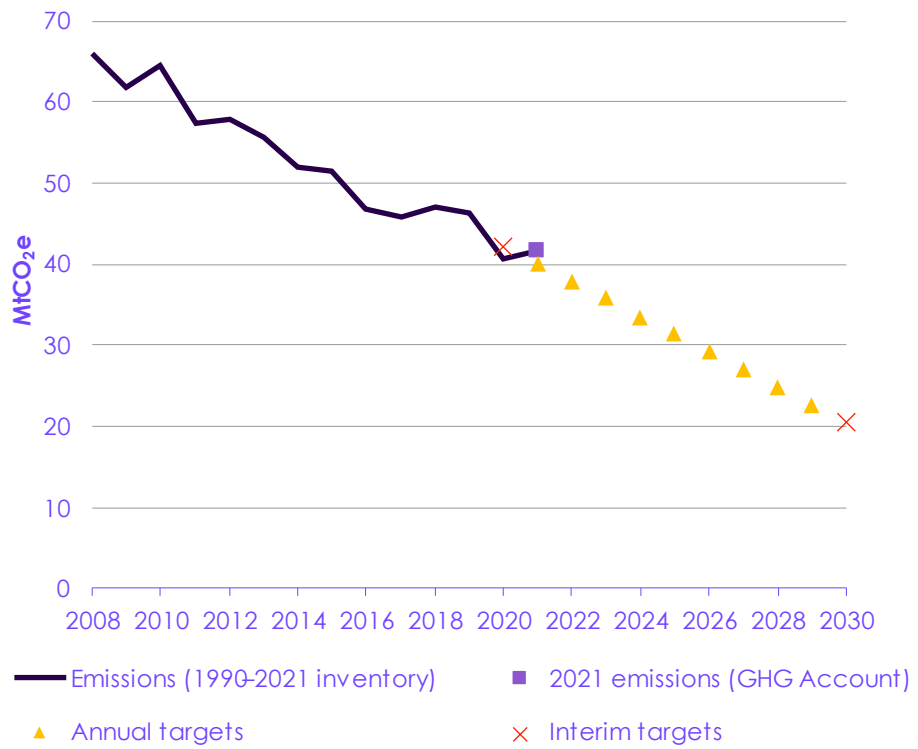
Scotland missed its 2021 annual emissions reduction target.

Scotland has failed to meet eight of its twelve targets since 2010. Failure to meet future targets will increase the risks of Scotland missing its long-term emissions reduction goals.

* The baseline against which targets are assessed is 1990 emissions for all sectors except F-gases, for which 1995 is used.

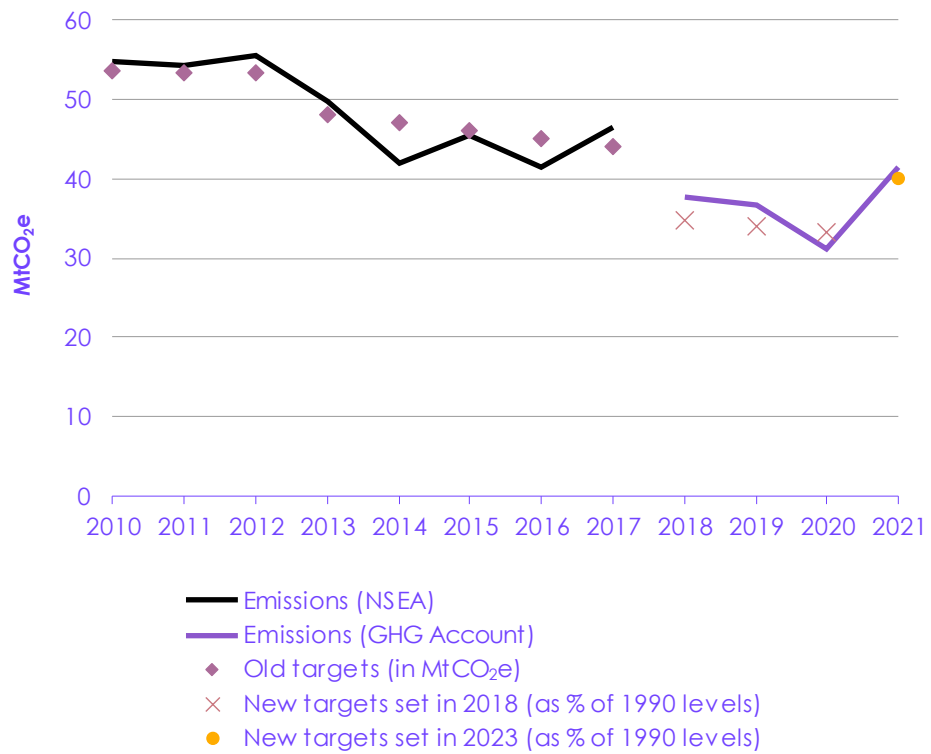
† Following the CCC's advice, the Scottish Government in 2023 updated its annual targets from 2020 onwards to account for the latest inventory methodology changes. Unless otherwise stated, this chapter refers to these targets. The 51.1% target was based on our recommendation to adjust annual targets in the 2020s to reflect changes in emissions accounting methodology.

Figure 1.1 Scotland's emissions (2008–2021) and targets (2020–2030)



Source: National Atmospheric Emissions Inventory (NAEI) (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland 1990-2021*; CCC analysis.
 Notes: The Scottish Government targets were updated in 2023 to account for inventory methodology changes. The 2020 interim target was also retrospectively updated (in line with our advice), which resulted in annual targets from 2021 to 2029 being updated as they are defined on a linear trajectory between the 2020 and 2030 interim targets.

Figure 1.2 Scotland failed to meet eight out of twelve of its legal targets between 2010 and 2021



Source: National Atmospheric Emissions Inventory (NAEI) (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland*; Scottish Government (2019) *Climate Change (Emissions Reduction Targets) (Scotland) Act 2019*; CCC analysis.

Notes: (i) The targets between 2010 and 2017 were set in absolute MtCO₂e, and emissions were reported after having been adjusted to account for EU ETS licenses, known as the Net Scottish Emissions Account (NSEA). (ii) Following advice from the Committee in 2017, the new set of targets was set on a percentage reduction basis from 1990 emissions and using the greenhouse gas (GHG) Account methodology to account for changes in the inventory methodology. (iii) New 2023 targets were updated to ensure consistency with the latest change in emissions reporting practices. This is why the 2021 target appears higher than the 2020 target.

1.1.2 Sectoral emissions

For consistency and to ensure comparability, this report categorises emissions by the sectors used in the Scottish Government's 2020 Climate Change Plan update (CCPu).⁴ The other chapters use CCC sectors. Annex 2 maps out the difference between the sectors used in this chapter and the CCC sectors.

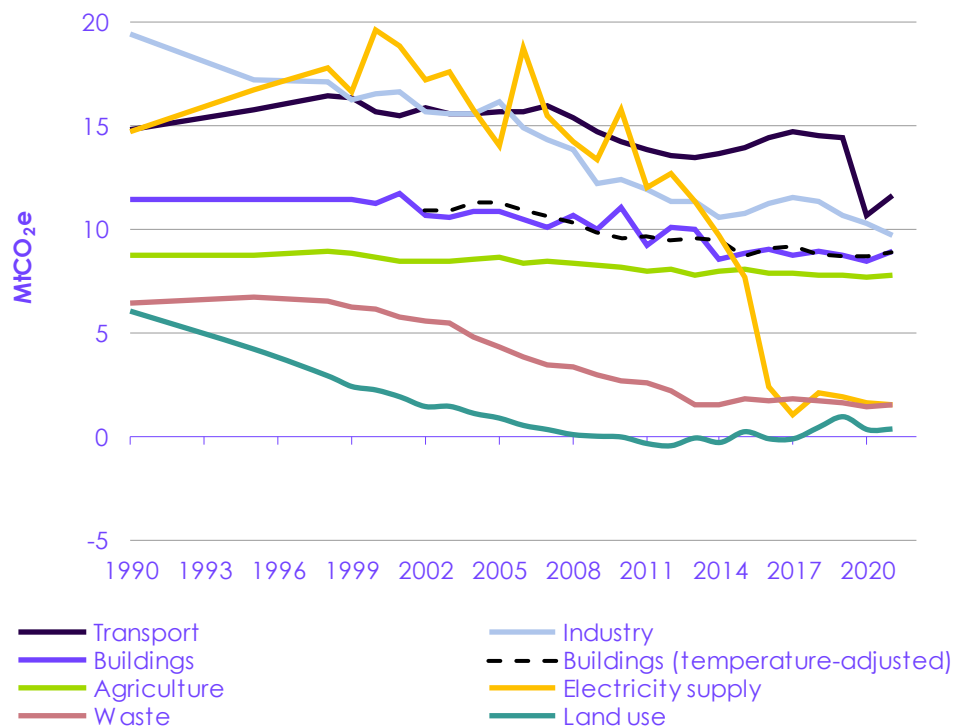
Emissions reductions since 1990 have been driven by electricity supply, with significant reductions also seen in industry, waste and land use.

- **Sectoral emissions changes in the last three decades:** since 1990, the electricity supply sector has contributed the most to emissions reductions in Scotland, driven by the phase-out of coal and the growth of renewable energy (Figure 1.3). Significant reductions have also been seen in the industry, waste, and land use sectors. Emissions reductions in other sectors have been modest.
- **Sectoral emissions from 2020 to 2021:** changes in sectoral emissions from 2020 to 2021 are shown in Figure 1.4.

- **Transport:** emissions increased by 9% from 2020 to 2021 but remain 19% below pre-pandemic levels in 2019. This was driven by a 15% rise in surface transport emissions, which remain 10% below 2019 levels. Aviation and shipping emissions fell slightly and remain 68% and 16% below 2019 levels, respectively (Figure 1.5).
- **Buildings:** emissions increased by 6% from 2020 to 2021, with colder than average temperatures contributing to the rise.
- **Industry:** emissions decreased by 6% in 2021 compared to 2020 levels, driven by a reduction in fuel supply emissions from petroleum refining and oil and gas extraction, likely due to extensive periods of maintenance (both planned and unplanned).
- **Electricity supply:** emissions fell by 8% in 2021 due to a reduction in gas-fired generation. Electricity generation from gas in Scotland fell by 0.7 TWh (13%) in 2021.
- **Agriculture, land use and waste:** emissions all increased from 2020 to 2021. There has been no progress in reducing emissions in these sectors in the last eight years.

There has been no progress in reducing agriculture, land use and waste emissions in the last eight years.

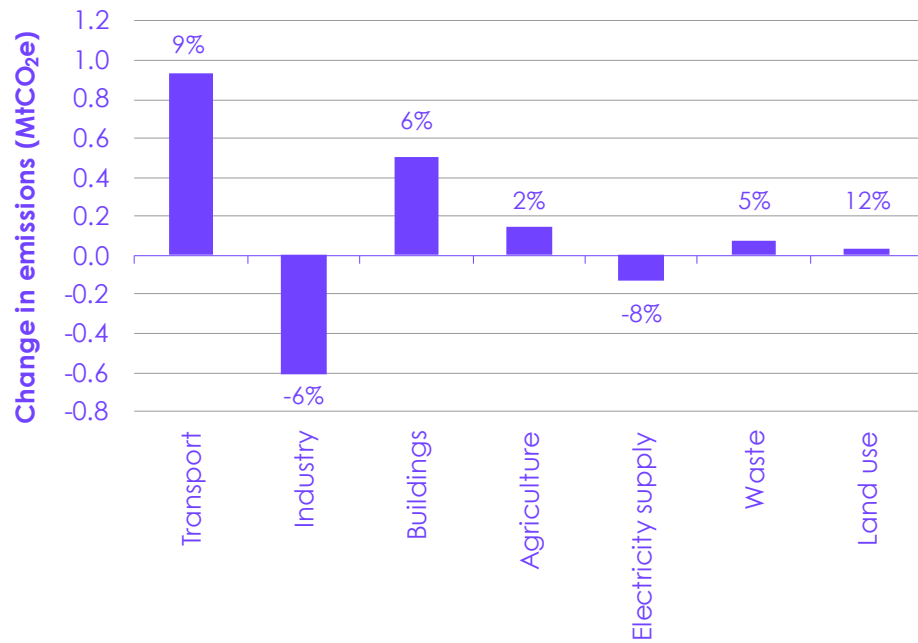
Figure 1.3 Scotland's historical emissions by sector (1990–2021)



Source: National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2021*; CCC analysis.

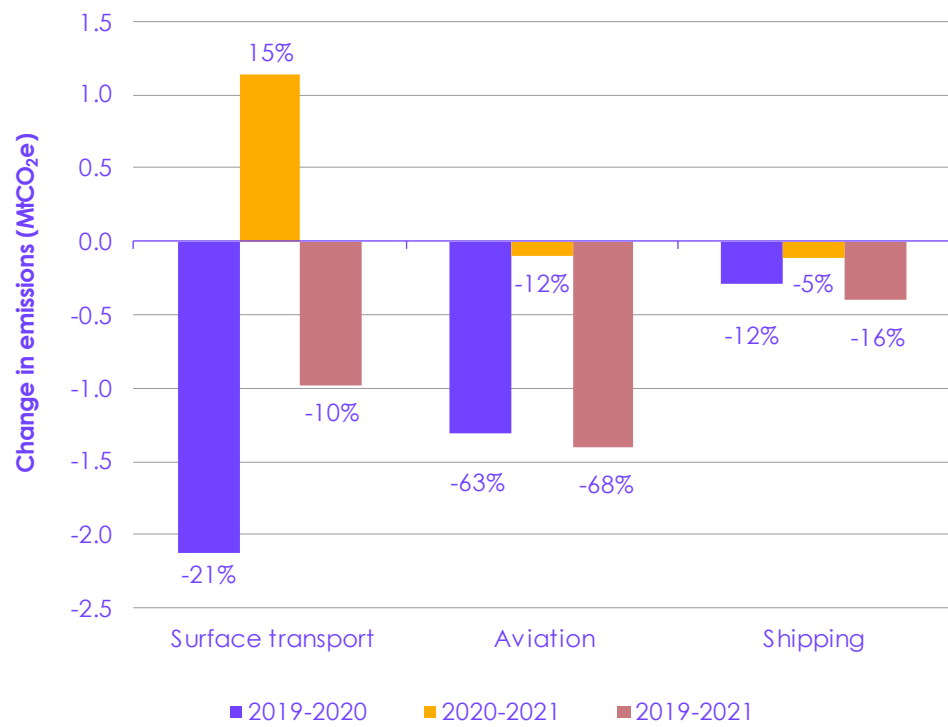
Notes: Historical emissions are not available for the years 1991-1993 and 1996-1997, so the values for these years are interpolated from the data points for 1990, 1995 and 1998. The dashed line shows temperature-adjusted buildings emissions, which are adjusted for differences in heating demand due to year-to-year variation in temperatures.

Figure 1.4 Change in Scottish emissions (2020–2021)



Source: National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2021*.

Figure 1.5 Change in Scottish transport emissions (2019–2020, 2020–2021, and 2019–2021)



Source: National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2021*.

1.1.3 Required pace of future emissions reduction

The rate of emissions reduction will need to accelerate rapidly for Scotland to meet its 2030 target.

The rate of emissions reduction will need to accelerate rapidly for Scotland to meet its 2030 interim target of a 75% reduction in emissions compared to 1990 levels.*

The annual reduction rate in sectors other than electricity supply, aviation and shipping will need to increase by a factor of nine. This is not a credible acceleration.

- Excluding emissions from aviation and shipping, which were significantly affected by the pandemic, emissions in 2021 have fallen by 14.7 MtCO_{2e} in the nine years prior to this (since 2012). This corresponds to a reduction of 3.5% per year on average. This will need to accelerate to an average of 9.1% per year for Scotland to achieve its 2030 target (Figure 1.6).
- If emissions from electricity supply, which have driven the bulk of reductions over this period and have limited potential for further reduction, are also excluded, emissions in the last nine years fell by only 3.6 MtCO_{2e}, corresponding to an average annual reduction of 1.0%. This will need to increase by a factor of nine[†], to an average annual reduction of 9.0%, for Scotland to achieve its 2030 target (Figure 1.7). This would require annual emissions reductions almost twice as fast as those assumed over this period in the ambitious updated pathway for Scotland set out in the CCC's 2022 advice on Scottish Emissions Targets.[‡] Given the pace at which supply chains and investment would need to develop, this rate of reduction is not credible.

Acceleration in emissions reductions is needed in all sectors apart from electricity supply. This will need to be particularly rapid in buildings and transport.

Emissions reductions will need to accelerate in all sectors apart from electricity supply, with a particularly rapid increase required in the buildings and transport sectors due to the ambitious decarbonisation pathways in those sectors in the Scottish Government's CCPu. Engineered removals will also need to be rapidly deployed and ramped up significantly (Figure 1.8 and Figure 1.9).

- The yearly percentage change in emissions reduction needed in the buildings sector in the nine years from 2021 to 2030 according to the CCPu is almost a factor of ten higher than the reductions seen over the previous nine years. This required pace of reduction is almost three times that in the CCC's ambitious 2022 updated pathway.
 - The Heat in Buildings consultation has potential to accelerate buildings decarbonisation, but its effective and prompt implementation is crucial to achieve the required steep emissions reductions.

* This target will be assessed against the GHG account for 2030.

[†] This factor of nine increase represents the increase in the average annual percentage reduction in emissions that will be required over 2021-2030, compared to that achieved over 2012-2021. These annual percentage reductions are calculated as the compound average rate at which emissions have fallen, or need to fall, over the relevant period.

[‡] This updated pathway includes a range of possible engineered removals in Scotland on the basis of the Acorn cluster receiving track 2 status and goes further in ambition than our Balanced Pathway by implementing measures from our highly ambitious Tailwinds scenario in areas of the transport, buildings, agriculture, land use and waste sectors that have sufficient devolved powers. This results in an ambitious pathway that achieves 65-67% emissions reduction by 2030 and 91-101% by 2040, relative to 1990 levels.

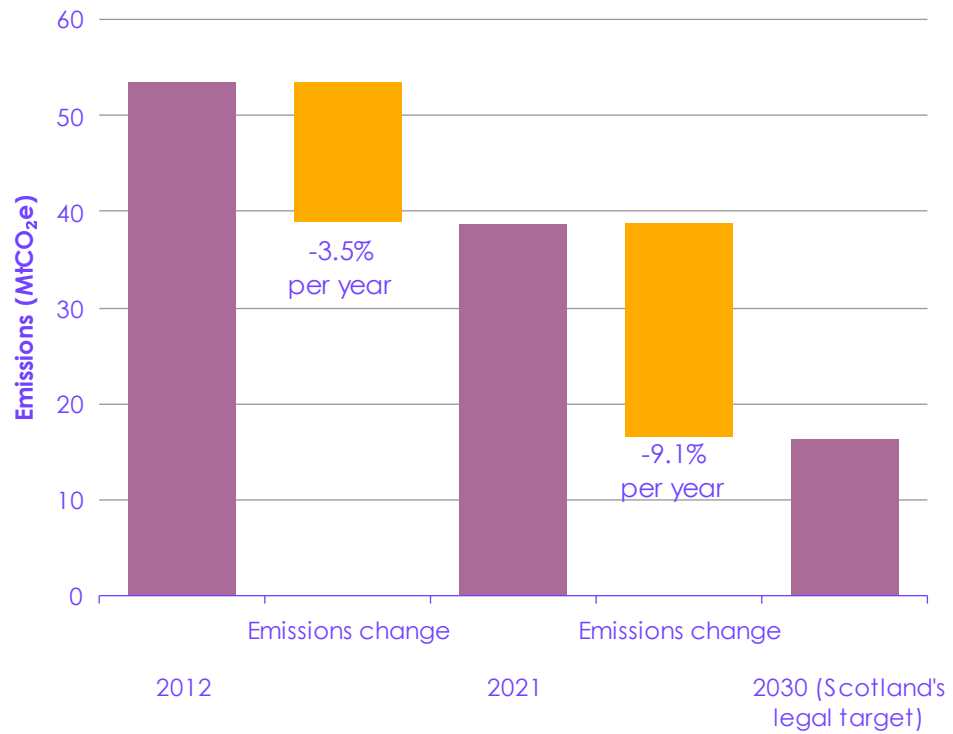
Meeting Scotland's CCPu pathway will require a rapid initial deployment and ramp-up of engineered removals.

- The annual rate of reduction in transport emissions will need to be almost four times higher from 2021 to 2030 than it was from 2012 to 2021 to meet the sector's contribution to the CCPu.* While a scale-up in this sector is expected as EV sales rise and measures are implemented to manage car and aviation demand, this pace would need to be almost twice as fast as in the CCC's 2022 ambitious updated pathway.
- The rate of emissions reduction in agriculture will also need to ramp up significantly to meet the CCPu pathway.
- The CCPu aims to achieve -3.8 MtCO₂ of engineered removals annually by 2030. As this is currently zero, it will require a rapid initial deployment and ramp-up to be achieved. A feasibility study published by the Scottish Government estimates potential for only -2.2 MtCO₂ by 2030 in Scotland.⁵

Our assessment on the credibility of the 2030 target is based on our sectoral assessment of policies and delivery indicators, and these comparisons showing how the decarbonisation rate required in the next nine years compares against that achieved over the preceding nine years and to the CCC's ambitious 2022 updated pathway for Scotland.

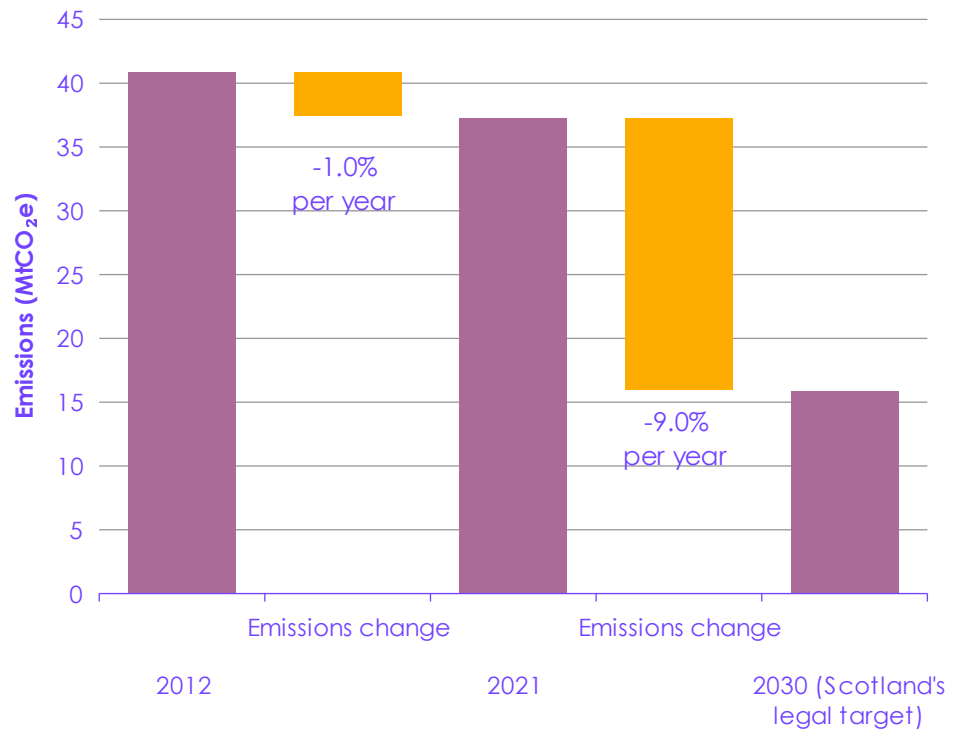
* As emissions fall, delivering the same absolute reduction requires progressively larger year-on-year percentage reductions. This is why the increases required shown in Figure 1.8, which are shown in absolute terms, appear smaller for some sectors than those discussed here, which consider annual percentage reduction rates.

Figure 1.6 Change in emissions excluding aviation and shipping: actual (2012–2021) and required (2021–2030)



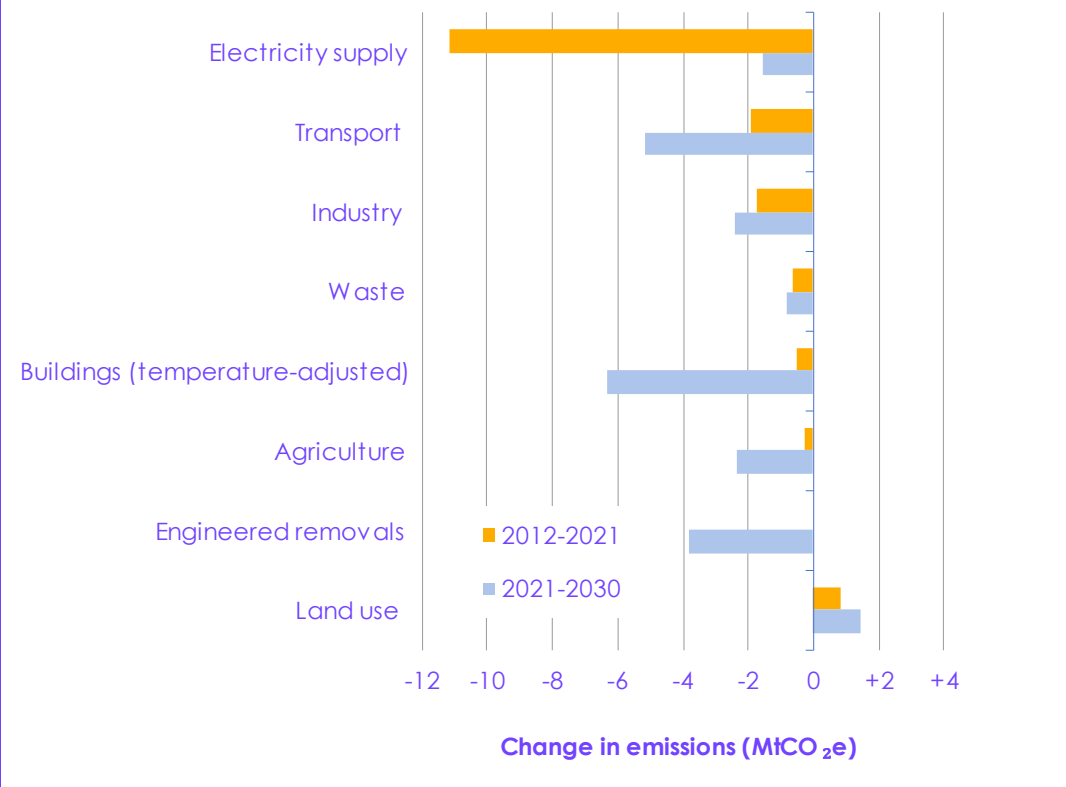
Source: National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland 1990-2021*; Scottish Government (2019) *Climate Change (Emissions Reduction Targets) (Scotland) Act 2019*; CCC (2022) *Scottish Emission Targets – first five-yearly review*; Scottish Government (2020) *Securing a green recovery on a path to net zero: climate change plan 2018–2032 – update (CCPu)*; CCC analysis.
 Note: To adjust the 2030 target for this chart, aviation, and shipping emissions from the CCC's 2022 updated pathway have been used as they are not published in the CCPu.

Figure 1.7 Change in emissions excluding electricity supply, aviation, and shipping: actual (2012–2021) and required (2021–2030)



Source: National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland 1990-2021*; Scottish Government (2019) *Climate Change (Emissions Reduction Targets) (Scotland) Act 2019*; CCC (2022) *Scottish Emission Targets – first five-yearly review*; Scottish Government (2020) *Securing a green recovery on a path to net zero: climate change plan 2018–2032 – update (CCPu)*; CCC analysis. Notes: To adjust the 2030 target for this chart, estimated 2030 electricity supply emissions from the Scottish Government's CCPu has been used. As aviation and shipping pathways are not published in the CCPu, 2030 emissions from the CCC's 2022 updated pathway have been used for these sectors.

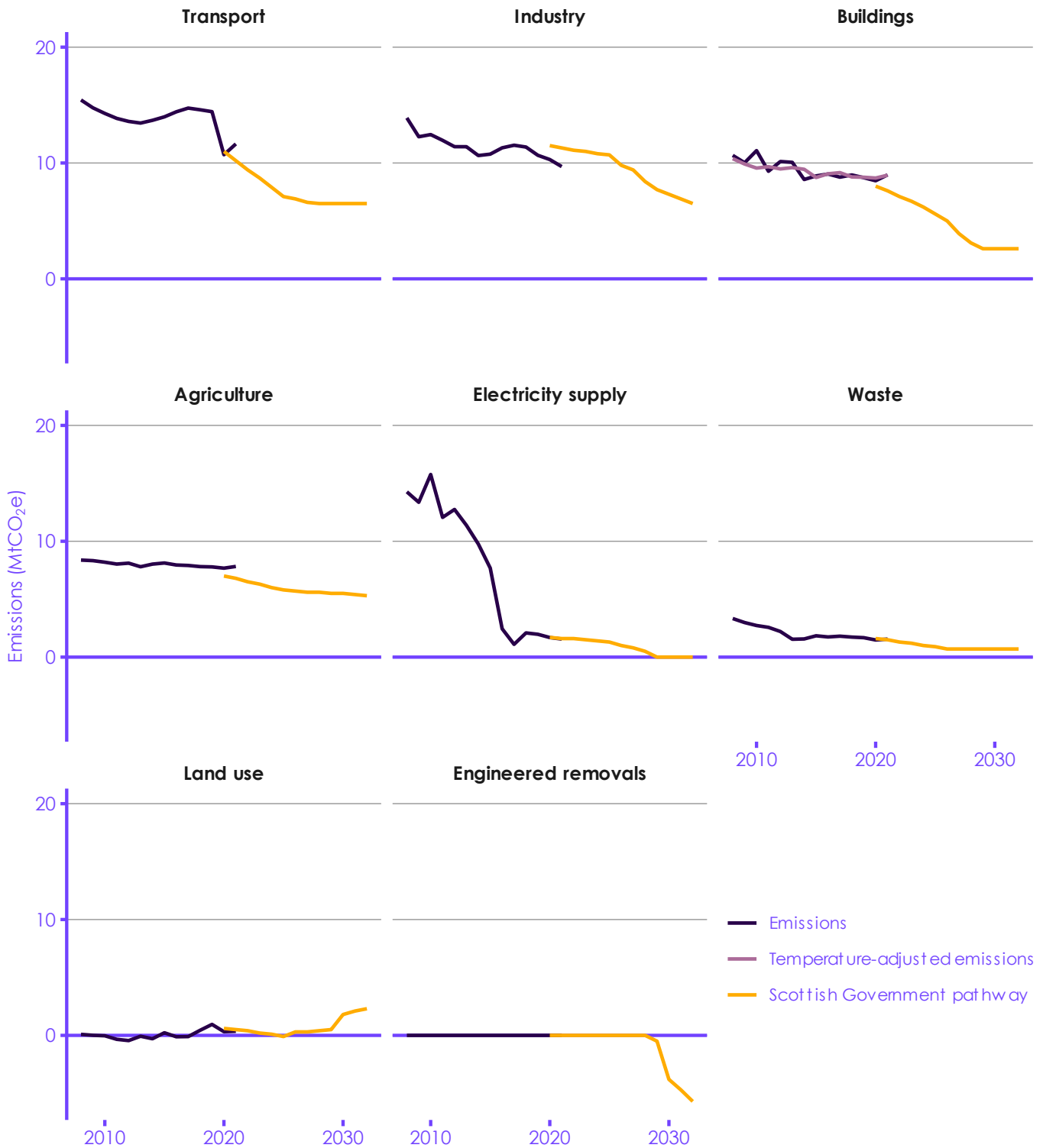
Figure 1.8 Scotland's sectoral emissions: historical emissions (2012–2021) and 2021 emissions to the 2030 target under the Scottish Government's pathway (2021–2030)



Source: National Atmospheric Emissions Inventory (NAEI) (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2021*; *Climate Change (Emissions Reduction Targets) (Scotland) Act 2019*; Scottish Government (2020) *Securing a green recovery on a path to Net Zero: Climate Change Plan 2018-2032 – update*

Notes: This chart shows the absolute change in emissions in each sector from 2012-21 and that required from 2021-2030 under the Scottish Government's pathway. As emissions fall, delivering the same absolute reduction requires progressively larger year-on-year percentage reductions. This is why the increases required appear smaller for some sectors here than in the discussion of annual percentage reduction rates in the text above. Buildings emissions are showing in temperature-adjusted terms, which adjust for differences in heating demand due to year-to-year variation in temperatures.

Figure 1.9 Scotland's historical emissions (2008–2021) by sector and Scottish Government pathways



Source: National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2021*; Scottish Government (2020) *Securing a green recovery on a path to Net Zero: Climate Change Plan 2018-2032 – update*; CCC analysis.
 Notes: The purple line in the buildings chart shows temperature-adjusted buildings emissions, which are adjusted for differences in heating demand due to year-to-year variation in temperatures.

1.2 Progress in reducing Scotland's consumption emissions

In this section we report on Scotland's progress in reducing consumption emissions, which measure emissions arising from Scottish consumption, regardless of where they occur globally.

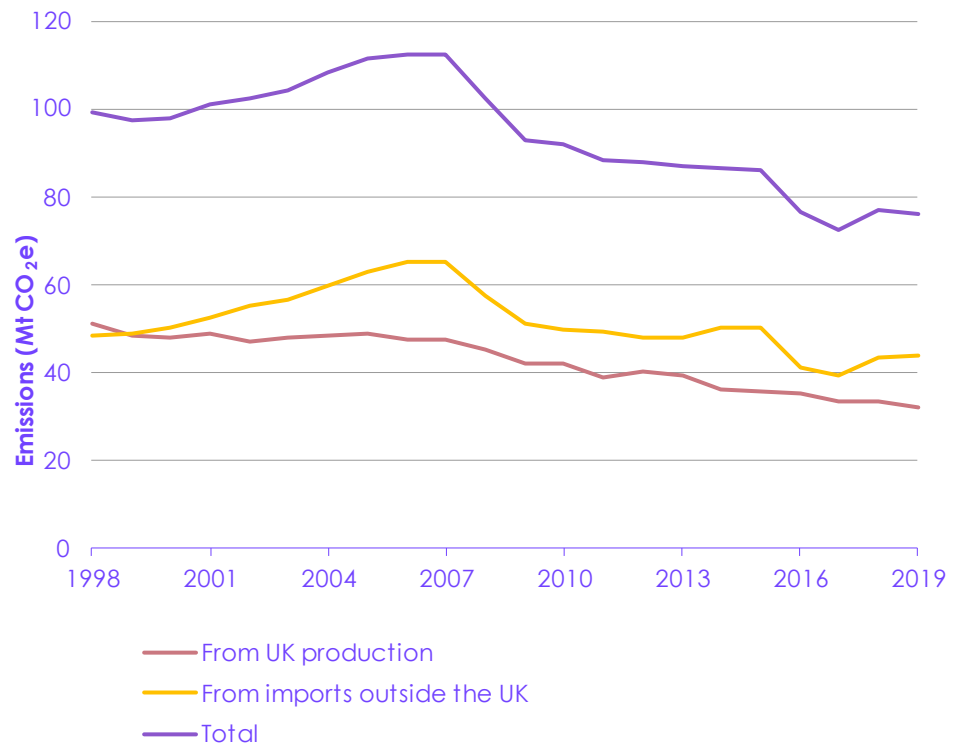
Scotland's consumption emissions in 2019 were 24% lower than in 1998.

- Scotland's consumption emissions fell by 1% to 76 MtCO₂e in 2019, which is 64% higher than Scotland's 2019 territorial emissions (46 MtCO₂e).^{*} Consumption emissions in 2019 were 24% lower than 1998 levels (Figure 1.10).
- Compared to 1998, Scotland's emissions from imports from outside the UK and from UK production in 2019 respectively fell by 9% and 37%. As a result, the share of Scotland's consumption emissions coming from imports from outside the UK, as a portion of total consumption emissions, has gradually increased over time.
- On a per-capita basis, Scotland's consumption emissions in 2019 were 14 tCO₂e per person, which is higher than the UK's 10 tCO₂e per-capita equivalent. This reflects the fact that both territorial and imported per-capita emissions are higher in Scotland than for the UK as a whole.

Both territorial and imported per-capita emissions are higher in Scotland than for the UK.

^{*} Due to their uncertainty, emissions from land use, land use change and forestry are not included in the consumption emissions data reported by Scotland or the UK. The CCC has recommended that the UK Government invests in improving data availability in this area, building on the progress made by the Joint Nature Conservation Committee.

Figure 1.10 Scotland's consumption emissions by origin (1998–2019)



Source: Scottish Government (2023) *Scotland's Carbon Footprint 1998-2019*.

1.3 Sectoral indicators of progress

Figure 1.11 shows some key indicators of sectors' progress in Scotland. With the exception of electric vehicle charge points and offshore wind capacity, all indicators are either significantly or slightly off track to meet Scotland's own targets, or it is too early to make a judgement. Delivery needs to accelerate extremely rapidly if the factor nine increase in the rate of emissions reduction required for the 2030 target outside the electricity supply, aviation and shipping sectors is to be achieved (Figure 1.7).

The pace of roll-out of charge points will need to treble by the end of the decade, to enable electric car and van sales to ramp up.

- **Battery electric vehicles and charge points:** The share of battery electric car and van sales are respectively slightly and significantly off track, while the provision of public charge points is on track. Sales of battery electric vehicles and public charge point installations will both need to ramp up to meet future targets.
 - In 2022, 10.5% of new car sales were battery electric, which is lower than both the CCC pathway of just over 12.2% (Figure 1.11a) and the UK whose share was 16.6% (Figure 1.12).
 - As only 2.0% of new vans sold were battery electric in 2022, Scotland is significantly off track and sales need to accelerate rapidly to exceed the zero-emission vehicle mandate's 16% target in 2025 (Figure 1.11b).
 - There were around 3,800 public charge points in 2022 (Figure 1.11c). As such, Scotland is on track compared to the CCC pathway of 3,300 in 2022. Yet, public charge point provision will need to increase rapidly to deliver Scotland's proportional share of required UK charging infrastructure. This is around 24,000 by 2030, which will require average annual deployment rates across the rest of the decade to be nearly three times current 2022 installation rates. Reliability must also improve.
- **Reduction in car-km:** in 2022, total kilometres travelled by car bounced almost fully back after the fall due to pandemic restrictions, with levels only 6% lower than in 2019 (Figure 1.11d). This is a slightly larger rebound than in the UK, where car-kilometres in 2022 were 7% lower than in 2019.
 - Scotland has a highly ambitious target to achieve a 20% reduction of car-kilometres by 2030, against a 2019 baseline, but it is too early to say whether it is on track to achieve it due to the impact of the pandemic.
 - There is currently a lack of clear policies to achieve this ambitious target. A delivery plan is needed to consolidate the post-pandemic reductions in car demand and introduce further incentives to switch journeys to more sustainable modes.
- **Domestic heat pump installations.** In 2023, just over 6,000 heat pumps were installed in Scotland, which is less than half of the installations in the CCC's pathway (Figure 1.11e). According to the CCPu, meeting Scotland's 2030 emissions reduction target requires heating system conversions of between 5% and 10% of homes, which equates to over 100,000 homes per year.⁶ Action needs to ramp up significantly and rapidly if Scotland is to meet its future targets.

Car traffic bounced almost fully back after the pandemic. Scotland has an ambitious 20% car-km reduction target, but currently lacks clear policies to achieve this.

The rate of installation of domestic heat pumps will need to increase by a factor of thirteen by 2030.

- **Energy efficiency measures:** the number of Scottish households receiving energy efficiency measures through government-funded programmes has fallen over time, with the peak reached in 2013 when more than 71,000 households received such measures, down to 7,600 in 2022 (Figure 1.11f).
 - The fall was driven by a fall in measures delivered through the UK Government's Energy Company Obligation fund (ECO) since 2014. England, Scotland, and Wales all experienced a similar decline in the number of measures delivered through ECO over this period.
 - The fall in measures delivered through ECO is down to a variety of reasons, including reduced funding from 2013, eligibility restrictions, and structural features of the scheme.
- **Woodland:** Scotland's planting rates currently exceed those of the other UK nations combined, having planted about 63% of UK's new woodland between 2022 and 2023 (Figure 1.13).
 - However, since 2019 there has been a decreasing trend, and in 2022/23, Scotland planted just over 8,000 hectares (ha) of new woodland, which is a decrease from the previous year (Figure 1.11g).
 - As such, the Scottish Government objective of 15,000 ha has been missed and Scotland is significantly off track to meet its target of 18,000 ha per year from 2024 to 2025, which would require current planting rates to more than double. The Scottish Government has stated that it expects to deliver only 9,000 ha per year following recent funding cuts.
- **Peatland:** Scotland has missed its peatland restoration target for the fifth year in a row, with 7,000 ha of peatland restored in 2022/23 (Figure 1.11h). Restoration rates have almost doubled over the last six years, but the rate needs to nearly triple if Scotland is to meet its target of 20,000 ha per year, which in turn is less than half of the CCC's recommended rate.
- **Waste recycling:** There has been no significant progress on the proportion of waste recycled or composted in Scotland, with levels fluctuating between 51% and 61% since 2011 (Figure 1.11i). Scotland is significantly off track to meet its ambition to recycle or compost 70% of all waste by 2025.
- **Onshore and offshore wind:** progress is on track to deliver on ambition for a total of 8-11 GW of offshore wind capacity by 2030 (Figure 1.11j). However, Scotland is slightly off track for its ambition to deliver 20 GW of onshore wind capacity by 2030 (Figure 1.11k).
 - Operational capacity of offshore wind increased by 1.2 GW in 2022, more than doubling total capacity to 2.2 GW. An average annual deployment rate of 0.7-1.1 GW is now required to deliver the 8-11 GW ambition of offshore wind by 2030.

Scottish tree-planting rates exceed those of the other UK nations combined. However, this rate will need to more than double by the mid-2020s.

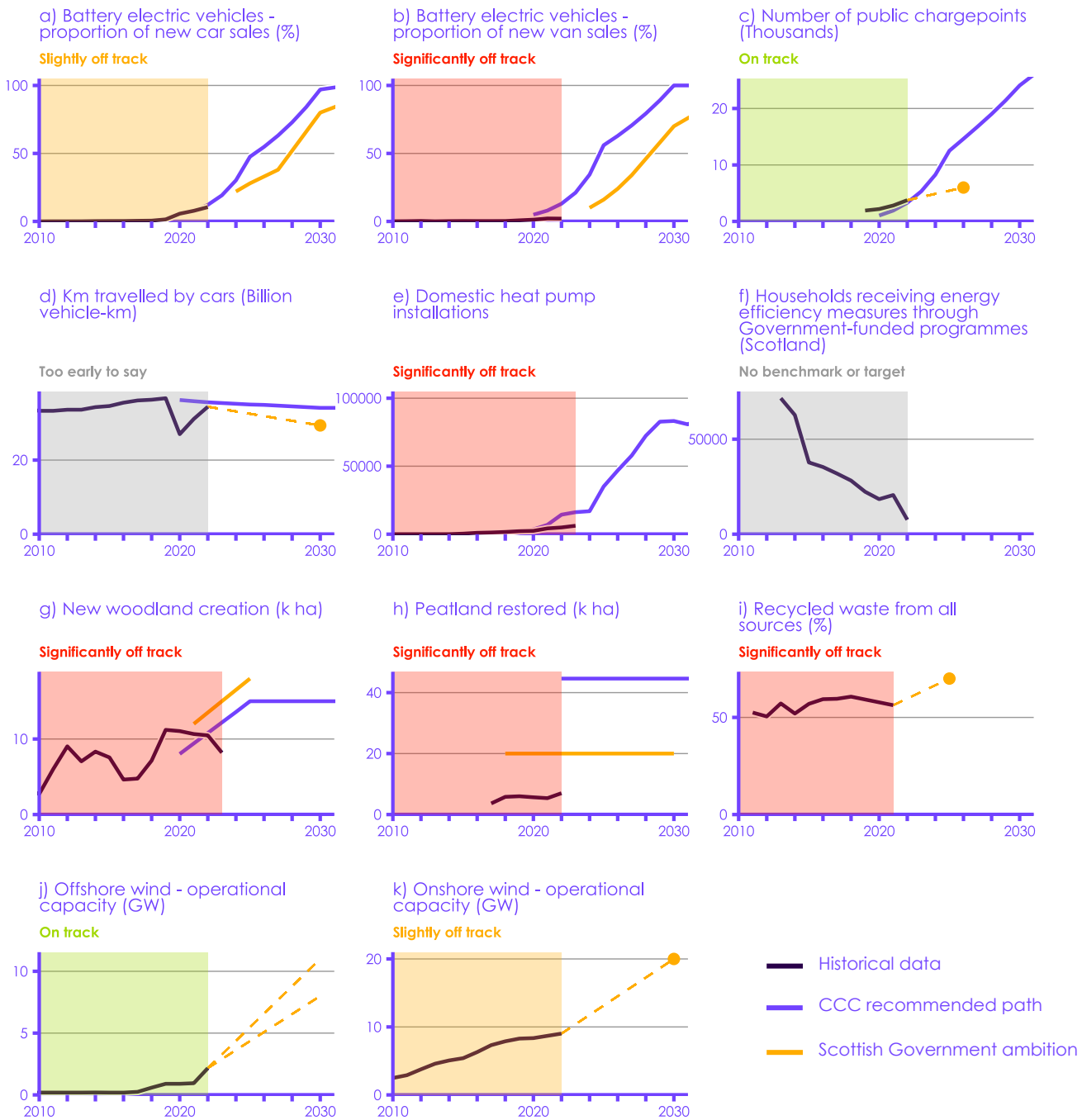
Peatland restoration targets have been repeatedly missed. Rates will need to increase significantly by the mid-2020s.

Onshore wind capacity will need to double by 2030, which will require annual deployment rates to increase to more than four times that installed in 2022.

- The growth of onshore wind in Scotland has slowed in recent years and only 0.3 GW was deployed in 2022.* To meet its 2030 ambition, Scotland must increase the deployment rate of onshore wind by more than a factor of four to an average annual rate of 1.4 GW.

* This refers to the capacity of onshore wind newly deployed in 2022, rather than to cumulative levels.

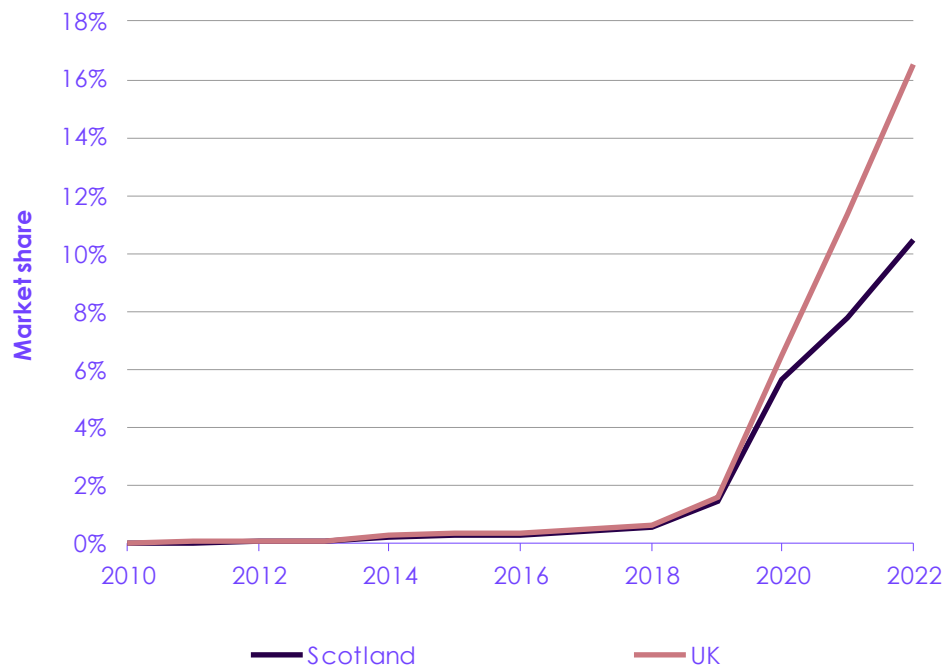
Figure 1.11 Key sectoral indicators of progress



Source: (a - b) Department for Transport (2023) *Vehicle licensing statistics data tables*; UK Government, Transport Scotland, Welsh Government and NI Department for Infrastructure (2023) *Zero emission vehicle (ZEV) mandate consultation: summary of responses and joint government response*; (c) Department for Transport (2022) *Electric vehicle charging device statistics: January 2022*; Transport Scotland (2023) *A network fit for the future: vision for Scotland's public electric vehicle charging network*; (d) Department for Transport (2023), *Road traffic statistics (TRA)*; Scottish Government (2023), *Securing a green recovery on a path to net zero: climate change plan 2018-2032 - update* (e) MCS (2023) *MCS Data Dashboard*; (f) Department for Energy Security and Net Zero (2023) *Household Energy Efficiency Statistics, headline release April 2023*; (g) Forest research (2023) *Forestry Statistics and Forestry Facts & Figures*; Scottish Forestry, *Regional Strategic Woodland Creation Project*; (h) Scottish Government (2023), *Climate change monitoring report 2023*; Scottish Government (2018) *Climate Change Plan: third report on proposals and policies 2018-2032 (RPP3)*; (i) SEPA (2022) *Waste data for Scotland*; Scottish Government (2016) *Making Things Last: a circular economy strategy for Scotland* (j - k) Department for Energy Security and Net Zero (2023) *Regional Renewable Statistics*; Scottish Government (2022) *Onshore wind: policy statement 2022*; Scottish Government (2022) *Offshore wind policy statement*.

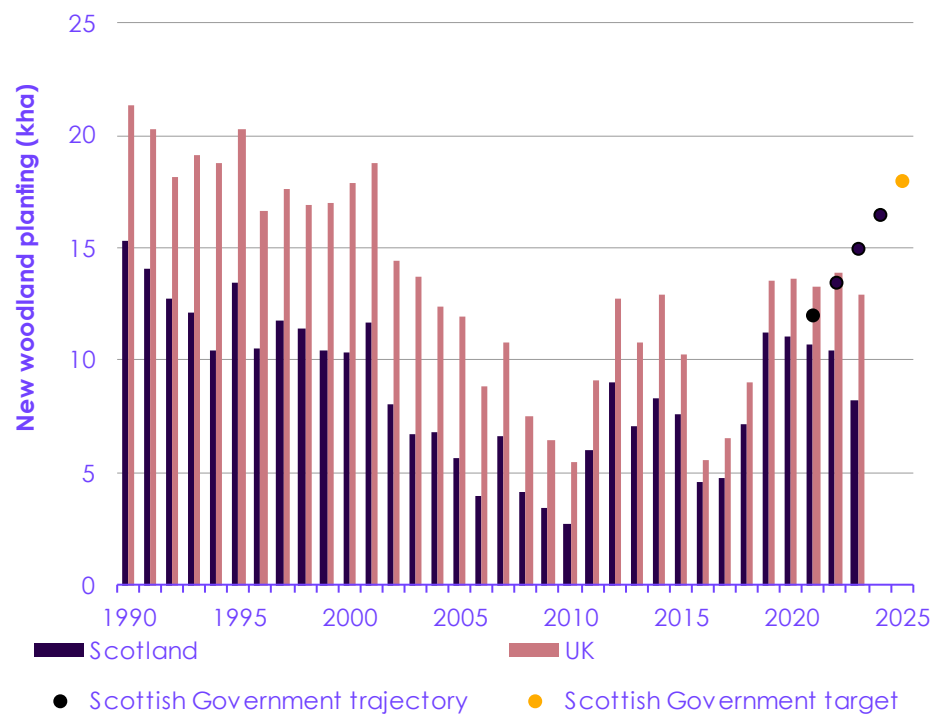
Notes: The dashed lines show a straight line from the latest historical data to a Scottish Government ambition that has been stated as a single-year value. This has been drawn to show the average pace of change required to meet future targets compared to the historical change. The CCC's recommended paths are based on the deployment assumptions in the ambitious updated pathways for Scotland in the CCC's 2022 Scottish emissions targets – first five-yearly review, with the exception of chart (e) which uses the CCC's Balanced Pathway deployment for heat pumps.

Figure 1.12 Battery electric cars market share compared to UK



Source: Department for Transport (2023) Vehicle licensing statistics data tables.

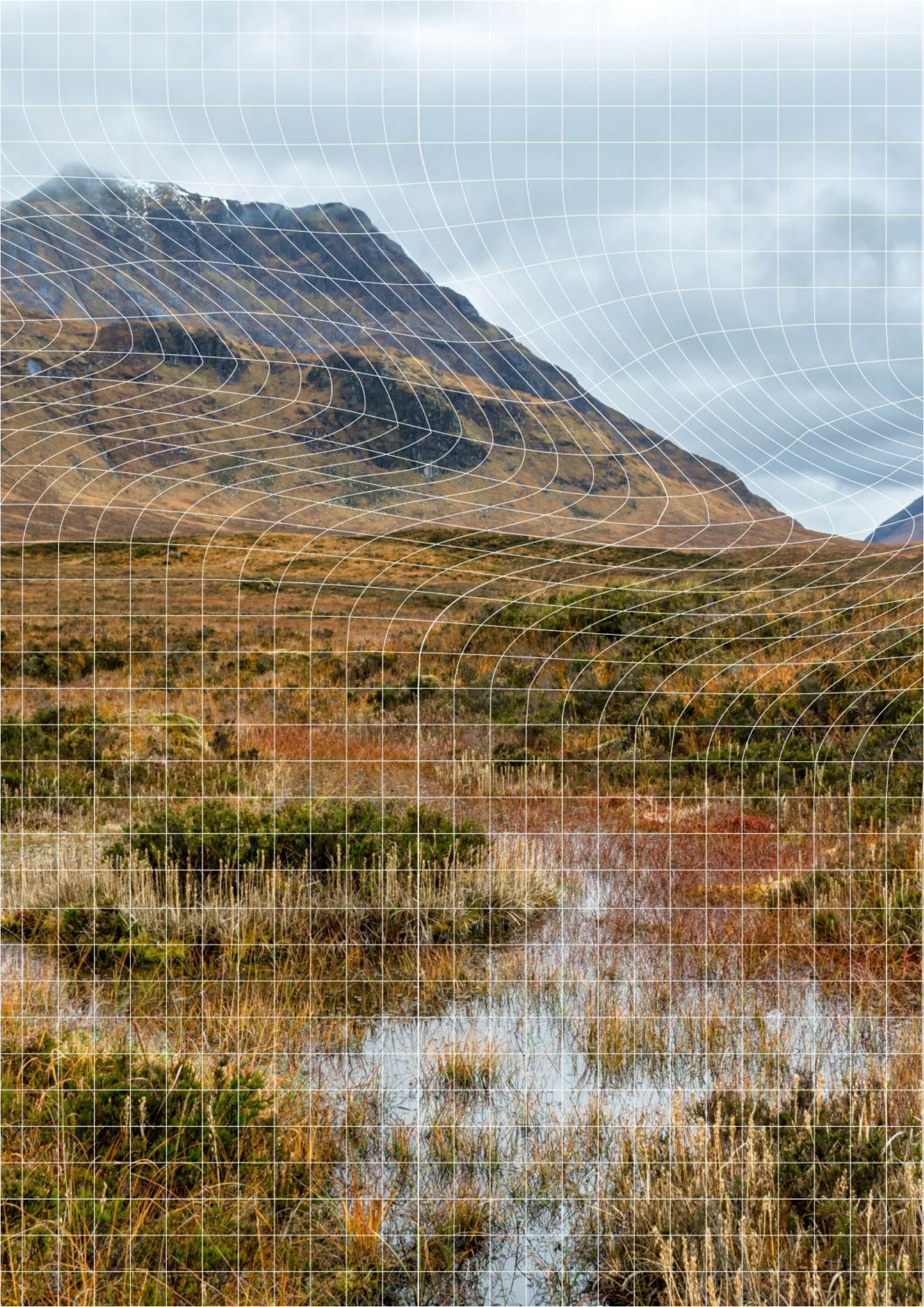
Figure 1.13 Afforestation rates in Scotland compared to the UK



Source: Forest research (2023) Forestry Statistics and Forestry Facts and Figures.

Endnotes

- 1 National Atmospheric Emissions Inventory (2023) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2021*, https://naei.beis.gov.uk/reports/reports?report_id=1110.
- 2 Scottish Government (2023) *Climate Change (Scotland) Act 2009 interim target amendment regulations 2023*, <https://www.gov.scot/publications/climate-change-scotland-act-2009-interim-target-amendments/>.
- 3 Climate Change Committee (2022) *Scottish Emission Targets – first five-yearly review*, <https://www.theccc.org.uk/publication/scottish-emission-targets-progress-in-reducing-emissions-in-scotland-2022-report-to-parliament/>.
- 4 Scottish Government (2020) *Securing a green recovery on a path of net zero: climate change plan 2018-2032 - update*, <https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/>.
- 5 Scottish Government (2023) *Negative Emissions Technologies (NETS): Feasibility Study*, <https://www.gov.scot/publications/negative-emissions-technologies-nets-feasibility-study/pages/1/>.
- 6 Scottish Government (2020) *Update to the Climate Change Plan 2018-2032*, <https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/>.



Chapter 2 - Sectors' progress

2.1 Transport	48
2.2 Buildings	53
2.3 Agriculture and land use	57
2.4 Waste	60
2.5 Industry	63
2.6 Electricity supply	66
2.7 Engineered removals	67

Introduction and key messages

The Scottish Government has ambitious decarbonisation targets, but progress in translating this into effective policy and delivery has been too slow. The draft Climate Change Plan, a statutory document required in section 35 of the Climate Change (Scotland) Act 2009, was planned to be published in 2023 but was delayed with no updated timeline announced. The draft plan should be published with sufficient time for a proper consultation. It should contain a comprehensive roadmap with quantified measures to meet Scotland's targets (recommendation R2022-402). A recent report commissioned by the Scottish Government makes some first steps in this process but demonstrates that current plans in Scotland fall well short of what is required to meet the 2030 target.¹

The rest of this chapter looks at progress across the sectors of the economy and lays out what needs to be addressed. Scoring criteria for assessing the Scottish Government's policies and plans can be found in Annex 2. The colours (from green, representing 'credible plans', to red, representing 'insufficient plans') in the scorecards represent our assessment of the credibility of the Scottish Government's policies and plans (see Table A3 in Annex 2). There are many sub-sectors or policy areas where decarbonisation also depends on actions taken by the UK Government, so we have separately included an assessment (low, medium, or high) of the extent of the risk posed by UK Government actions within the narrative for each sub-sector in the scorecards (see Annex 2).

Key priority recommendations are in Annex 1 and on our website, and they should be considered for the upcoming Climate Change Plan.

Our key messages are:

- **Current overall policies and plans fall short of what is needed** to achieve the legal targets under the Scottish Climate Change Act. Only three of the 14 key recommendations from the CCC's 2022 Scottish Progress Report scored 'good progress'. Two scored 'moderate progress', seven scored 'some but insufficient progress' and two made 'no progress' at all.
- **Mostly devolved sectors:** there has been some good recent progress in the buildings sector, through the publication of the Heat in Buildings consultation. Yet, there remain risks in all areas with significant policy powers devolved to the Scottish Government.
 - **Transport:** implementation plans are needed to scale up electric vehicle charging infrastructure, deliver the target of reducing car-kilometres by 20% by 2030, and enable decarbonisation of domestic aviation and shipping.
 - **Buildings:** if implemented, the strong proposals in the Heat in Buildings consultation could act as a template for the rest of the UK. The Scottish Government should provide a timeline and avoid delays on the Heat in Buildings Bill and move towards its delivery. Good progress was also made with the Buildings (Scotland) Amendment Regulations prohibiting the use of direct emissions heating systems, such as gas and oil boilers, for new homes.

- **Agriculture and land use:** clear implementation strategies, and action to address funding and skills barriers, are needed to rapidly accelerate woodland creation and peatland restoration rates. More detail is also required on how future agricultural support will integrate objectives for food, nature, and climate, and provide consistent long-term support for the farming community.
- **Waste:** stronger action is needed to reverse recent increases in the amount of waste being incinerated and to increase recycling rates to the 70% target at the earliest date possible.
- **Mostly reserved sectors:** in sectors where policy powers are mostly reserved, the Scottish Government should work with the UK Government on practical measures to ensure both Scottish and UK-wide targets can be achieved. This includes developing a delivery plan for the ambitions set out in its draft Energy Strategy and working towards deployment of the Acorn CCUS cluster. The Scottish Government should assess the feasibility of its target for engineered removals.
 - Working together effectively requires greater transparency in the plans of both governments, clear agreement of responsibilities, and open and frequent consultation between Holyrood and Westminster.

2.1 Transport

Policy power in the transport sector includes some significant policy powers devolved to the Scottish Government, especially for demand reduction and modal shift. There has been some progress in the past year, but key delivery plans are now overdue. Table 2.1 outlines progress and areas to be addressed for all the relevant transport sub-sectors and policy areas.

Progress on the delivery of a just transport transition can be found in the cross-economy section on just transition, in Chapter 3.

Table 2.1
Policy scorecard for transport

Sub-sector/ policy area	Sector/sub-sector assessment
<p data-bbox="97 819 288 913">Cars and vans – zero-emissions vehicles</p> <p data-bbox="97 965 280 992">Mostly reserved</p>	<p data-bbox="900 824 916 851" style="text-align: center;">Y</p> <p data-bbox="323 898 427 925">Progress:</p> <ul data-bbox="336 947 1485 1220" style="list-style-type: none"> <li data-bbox="336 947 1310 1003">• The UK, Scottish and Welsh Governments have confirmed the introduction of the zero-emission vehicle mandate from 2024 as planned. <li data-bbox="336 1025 1485 1115">• In June 2023, Transport Scotland published a charging network vision, and intends to publish an implementation plan in the coming year.² The vision includes choosing charge point locations to support use of active travel, shared and public transport. <li data-bbox="336 1137 1453 1220">• In 2023, the Scottish Government launched a £900,000 pilot Mobility and Scrappage Fund to help low-income households replace a high-emitting vehicle with more sustainable travel options. <p data-bbox="323 1243 523 1270">To be addressed:</p> <ul data-bbox="336 1292 1485 1518" style="list-style-type: none"> <li data-bbox="336 1292 1485 1382">• Support the market to move more quickly than set out in the UK-wide zero-emission vehicle mandate. This will be necessary if the Scottish Government is to achieve its aim of removing the need for people to buy new petrol and diesel cars, including hybrids, by 2030. <li data-bbox="336 1404 1485 1518">• Installation rates of charging points need to accelerate, and reliability must improve.³ A full implementation plan should be published in 2024 and should include details on how Scotland will meet its share of the UK-wide infrastructure strategy's goal of 300,000 chargers nationwide by 2030. That is 24,000 based on relative car- and van-kilometres (recommendation R2022-338). <p data-bbox="323 1541 831 1568">Risk due to UK Government action: medium</p> <p data-bbox="323 1590 1469 1736">Scotland's transition to zero-emission cars and vans is dependent on the establishment of a robust UK-wide market for electric vehicles (EVs). Despite progress in this area, the messaging around the UK Government's recent decision to delay the planned 2030 phase-out of new petrol and diesel vehicles risks undermining consumer and investor confidence in this transition, which could reduce opportunities for sales to increase.</p>

<p>Heavy-duty vehicles – zero-emission vehicles</p> <p>Mostly reserved</p>	<p style="text-align: center;">Y</p> <p>Progress:</p> <ul style="list-style-type: none"> In January 2023, Transport Scotland's Zero-Emission Truck Taskforce held two workshops on HGV decarbonisation. Future work will build upon real-world findings from the UK's zero-emission HGV demonstrator, whose winners were announced in November 2023. In May 2023, Transport Scotland opened phase 2 of the £58 million Zero-Emission Bus Challenge Fund, expanding eligibility to coaches and community transport providers.⁴ <p>To be addressed:</p> <ul style="list-style-type: none"> The Scottish Government should work with the UK Government to co-develop: <ul style="list-style-type: none"> An infrastructure strategy for deploying the required charging and refuelling infrastructure for zero-emission HGVs. Appropriate regulatory strategies for enabling operators to switch to zero-emission options, building on the car/van mandate and findings from demonstration projects. <p>Risk due to UK Government action: medium</p> <p>Decarbonisation of the fleet will depend on UK-wide markets, which are expected to expand through ongoing UK demonstrations and UK Government phase-out dates.</p>
<p>Rail – efficiency and technology</p> <p>Joint responsibility</p>	<p style="text-align: center;">Y</p> <p>Progress:</p> <ul style="list-style-type: none"> The 2023/24 Programme for Government (PfG) sets out plans to refresh the Rail Services Decarbonisation Plan and commits to electrifying the Glasgow to Barrhead line. In February 2023, the Scottish Government sets out its asks for Scotland's Railway over the next control period, including objectives on climate change adaptation and mitigation.⁵ Scotland's Railway addressed these as part of its July 2023 Strategic Business Plan.⁶ <p>To be addressed:</p> <ul style="list-style-type: none"> Further challenges remain around decarbonising rail freight, especially on less busy lines where network electrification is unlikely to be cost-effective. <p>Risk due to UK Government action: low</p> <p>Scotland is dependent on UK-wide decisions, through bodies such as Network Rail and the new Great British Railways, on cross-border infrastructure and services. Great British Railways is still being established, so there remain uncertainties around how it will operate and how it will work with Transport Scotland.</p>
<p>Conventional vehicle efficiency and hybrids</p> <p>Fully reserved</p>	<p style="text-align: center;">Reserved</p> <p>Regulation of the new vehicle market is reserved to the UK Government.</p> <p>Risk due to UK Government action: high</p> <p>Alongside the zero-emission vehicle mandate, the UK Government introduced regulations that require the average emissions of new non-zero-emission cars/vans to remain flat at 2021 levels.</p> <ul style="list-style-type: none"> This policy is insufficiently ambitious and will deliver weaker emissions savings than required to meet Scotland's targets. It misses opportunities to incentivise manufacturers to reverse recent trends towards heavier, more emissions-intensive vehicles. In the absence of more ambitious UK-wide regulations, the Scottish Government should explore opportunities to encourage Scottish drivers to purchase smaller vehicles and to discourage high levels of use of larger, more polluting ones.

<p>Cars – demand reduction and modal shift</p> <p>Mostly devolved</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <ul style="list-style-type: none"> • In December 2022, the Scottish Government published its second Strategic Transport Projects Review. It sets out 28 relevant recommendations across themes including improving active travel infrastructure, influencing travel choices, and enhancing public transport affordability. • In April 2023, the Scottish Government published a consultation on local living and 20-minute neighbourhoods. • There has been good progress on active travel, including publication of a cycling framework and delivery plan to promote active travel and establishment of funds, including the £20 million Active Travel Transformation fund.^{7,8,9} The 2023/24 PfG sets out plans to implement the Active Travel Transformation Project to realise the commitment to invest at least £320 million in active travel in future budgets. • The 2023/24 PfG sets out plans to: <ul style="list-style-type: none"> – Roll out 20 mph speed limits in built-up areas. – Publish a 20% car-km reduction route map. – Publish the Fair Fares Review, which has been delayed from 2021. – Enable bus franchising and partnerships. – Trial removing ScotRail peak-time fares from October 2023, as well as digitalising tickets and payments. <p>To be addressed:</p> <ul style="list-style-type: none"> • A clear strategy is urgently needed on how the 20% car-km reduction by 2030 target will be achieved and 20-minute neighbourhoods will be implemented. The Scottish Government should provide clear timelines of when these will be published and how the 2030 car-km target will be met (recommendation R2022-332). • Set out the impact on achieving the 20% car-km reduction target of the road-building plans, including road-dualling, set out in the 2023/24 PfG. • While Scotland has a strong system of concessionary public transport fares which have increased ridership, the Fair Fares Review must develop a wider plan to simplify fares, maintain and enhance services, and make public transport, including buses and trains, more attractive, increasing its frequency, reliability and cost-competitiveness against car travel. Concerningly, the end of the Network Support Grant Plus in March 2023 has led to some operators reducing services. <p>Risk due to UK Government action: low</p> <p>There remains a risk that UK Government's reluctance to consider demand-side measures could hinder public acceptance of the Scottish Government's demand-reduction plans (e.g. the recent Plan for Drivers, the review of low-traffic neighbourhoods).</p>
<p>Freight – demand reduction and modal shift</p> <p>Mostly devolved</p>	<p style="text-align: center;">R</p> <p>Progress:</p> <ul style="list-style-type: none"> • Scotland's Railway set a target for 8.7% rail freight growth over 2024–2029 in its Strategic Business Plan. <p>To be addressed:</p> <ul style="list-style-type: none"> • Van traffic has risen faster than that of any other vehicle type over the past twenty years. Alongside developing plans for the 20% car traffic reduction target, the Scottish Government must explore options to address this. It must ensure that the 20% target is not achieved at the cost of exacerbating van traffic, particularly in urban areas.

	<p>Risk due to UK Government action: medium</p> <p>Cross-border freight and UK-wide haulage companies will be influenced by policies imposed by both the Scottish and UK Governments. The cancellation of HS2 Phase 2b will reduce the connectivity and capacity benefits that the scheme would have brought to Scotland, which could reduce the scope to shift freight from road to rail.</p>
<p>Aviation – cross-cutting areas</p> <p>Mostly devolved</p>	<p style="text-align: center;">R</p> <p>Progress: There was no significant progress in this area.</p> <p>To be addressed:</p> <ul style="list-style-type: none"> The Scottish Government should set out how the aviation sector will decarbonise in line with Scotland's emissions targets, while managing technology risks (recommendation R2024-004). <p>Risk due to UK Government action: high</p> <p>Aviation decarbonisation will require UK-wide cooperation and progress across all aviation emissions mitigation solutions.</p>
<p>Aviation – demand</p> <p>Joint responsibility</p>	<p style="text-align: center;">R</p> <p>Progress: There was no significant progress in this area.</p> <p>To be addressed:</p> <ul style="list-style-type: none"> The Air Departure Tax should be implemented as soon as possible (recommendation R2022-348). <p>Risk due to UK Government action: high</p> <p>There is a lack of UK commitment to use policy to address aviation demand management.</p>
<p>Aviation – sustainable aviation fuel (SAF)</p> <p>Fully reserved</p>	<p style="text-align: center;">Reserved</p> <p>Progress:</p> <ul style="list-style-type: none"> Scottish Enterprise commissioned an independent assessment of capability and interest in Scotland to support the adoption of sustainable aviation fuel (SAF). The study found that Scotland has both the foundations to build a SAF supply chain and demand for SAF, but it will need joint public and private efforts around investment.¹⁰ <p>To be addressed:</p> <ul style="list-style-type: none"> Address how SAF uptake can be incentivised in Scotland. <p>Risk due to UK Government action: medium</p> <p>Risks remain regarding ensuring adequate SAF supply to the UK to meet the UK Government's SAF mandate target of securing 10% SAF supply of jet fuel by 2030.</p>
<p>Low- and zero-emission aircraft</p> <p>Mostly reserved</p>	<p style="text-align: center;">O</p> <p>Progress: There was no significant progress in this area.</p> <p>To be addressed:</p> <ul style="list-style-type: none"> Detail is required on how the Scottish Government intends to purchase low-emission aircrafts, which the Sustainable Aviation Test Environment concluded are well suited to serve the Highlands and Islands passengers and freight.¹¹ <p>Risk due to UK Government action: high</p> <p>The development of zero-emission aircraft will require extensive research and development and international cooperation, both of which are risks within the sector. The UK Government's Jet Zero Strategy aims for rollout by 2040.</p>

<p>System/airport efficiencies</p> <p>Joint responsibility</p>	<p style="text-align: center;">○</p> <p>Progress:</p> <ul style="list-style-type: none"> As part of its Sustainability Strategy 2023–2033, Highlands and Islands Airports Limited has set out a plan to decarbonise airport operations.¹² This sets out how airports will reduce their environmental impact to meet the Scottish Government's target of a net-zero aviation region by 2040 and how it will support the sector's decarbonisation goals. <p>To be addressed:</p> <ul style="list-style-type: none"> Set out how to ensure greater low-carbon connectivity to Scottish airports and how all Scottish airports will develop the infrastructure required for aviation decarbonisation. <p>Risk due to UK Government action: low</p> <p>The UK Government's second SAF mandate consultation considers mechanisms for airlines to avoid tankering.</p>
<p>Offsets/removals</p> <p>Joint responsibility</p>	<p style="text-align: center;">○</p> <p>Progress: There was no significant progress in this area.</p> <p>To be addressed:</p> <ul style="list-style-type: none"> The UK Government and devolved administrations will be consulting on the interactions between the UK Emissions Trading Scheme (UK ETS) and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). <p>Risk due to UK Government action: high</p> <p>There is a significant risk that CORSIA is not stringent enough and that offsets are of insufficient quality.</p>
<p>Shipping</p> <p>Joint responsibility</p>	<p style="text-align: center;">○</p> <p>Progress:</p> <ul style="list-style-type: none"> Transport Scotland published a draft for consultation of the Long-Term Plan for Vessels and Ports on the Clyde and Hebrides and Northern Isles Networks, including a section on decarbonisation, which considers low-carbon technologies for ferries.¹³ Transport Scotland's second Strategic Transport Projects Review recommended renewal and replacement of vessels on the Clyde and Hebrides Ferry Services and Northern Isles Ferry Services networks, including progressive decarbonisation by 2045. The Electric Orkney project and the Port of Aberdeen both won a share of the UK Government's £80 million Zero Emissions Vessel and Infrastructure fund, to begin commercial demonstrations of electric foiling vessels and shore power infrastructure.¹⁴ <p>To be addressed:</p> <ul style="list-style-type: none"> The Islands Connectivity Plan was due in 2023 but has not been published yet. Clarity is needed on the timeline to ensure the commitment to 30% of Scottish Government-managed ferries being low-emission by 2032 is met (recommendation R2022-342). To accelerate reduction of emissions at berth there is a need for a comprehensive assessment of the suitability of deploying shore power and electric recharging infrastructure at all Scotland's major ports and for a deployment plan. Deployment of these solutions can also offer co-benefits for local air quality. <p>Risk due to UK Government action: medium</p> <p>The Scottish Government holds direct influence over its ports policy and the ferry contracts that it controls. However, wider maritime decarbonisation is dependent on the uptake of zero-emission vessels by national and multinational shipping operators and on the provision of the required refuelling infrastructure at destination ports across the rest of the UK and overseas.</p>

2.2 Buildings

Some areas of the buildings sector have significant devolved policy powers in Scotland, and the sector has seen some good progress in the past year. The CCC welcomes the Scottish Government's Heat in Buildings Bill, now in the consultation stage, as it sets out a potential roadmap to decarbonising buildings in Scotland, noting, however, that there is significant work remaining to ensure the Bill comes into force following consultation and it is successfully delivered. Table 2.2 outlines progress and areas to be addressed for all the relevant sub-sectors and policy areas.

Progress on Scottish Government's guidance to local authorities on how to fulfil their duties to publish Local Heat and Energy Efficiency Strategies and Delivery Plans can be found in the governance section in Chapter 3.

Table 2.2
Policy scorecard for buildings

Sub-sector/ policy area	Sector/sub-sector assessment
Low-carbon heat in existing homes (non-fuel-poor) Joint responsibility	<div style="text-align: center; background-color: #FFD700; padding: 5px;">○</div> <p>Progress:</p> <ul style="list-style-type: none"> The Scottish Government is currently consulting on proposals for a Heat in Buildings Bill which would, subject to the outcome of the consultation, introduce powers to create a new 'Heat in Buildings Standard'.¹⁵ The Standard will prohibit the use of polluting heating from 2045 in all buildings (including non-domestic premises). To ensure fairness, the plans are to protect those who will struggle to pay through exemptions, to allow extra time to transition from direct emissions heating systems and make it easy for people to appeal where they feel the requirements under the proposed Bill are incorrect or unfair. <ul style="list-style-type: none"> – In order to achieve a smoother transition to this 2045 date, the consultation seeks views on a proposal which would require those purchasing a property to comply with the prohibition on direct emissions heating systems* within a specified amount of time following completion of the sale. The Green Heat Finance Taskforce published a report looking at finance options to cover the upfront costs for replacing direct emissions heating systems, with a second report due in 2024 that looks, among other things, at financing for social housing retrofitting (see the business and finance section in the people and business scorecard in Chapter 3).¹⁶ <p>To be addressed:</p> <ul style="list-style-type: none"> Provide clarity and a timeline, and avoid delays, on the Heat in Buildings Bill so that we move towards delivery (recommendation R2024-001). Work with lenders to provide financing options for those with and without mortgages. Continue to explore additional finance indicators that could be added to future iterations of the Heat in Buildings Monitoring and Evaluation Framework.¹⁷

* A direct emission heating system is a system (excluding heat networks) used for heating/cooling a building using thermal energy produced through any process that produces more than negligible amounts of direct GHG emissions during normal operation.

	<p>Risk due to UK Government action: high</p> <p>Dependencies on UK Government policy areas include:</p> <ul style="list-style-type: none"> • Decisions on the future role of gas networks in the transition to clean heat. • Regulations requiring the energy and installer markets to help accelerate the transition. • Rebalancing the cost of electricity so that clean heating systems become cheaper to run.
<p>Energy efficiency in existing homes (non-fuel-poor)</p> <p>Joint responsibility</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <ul style="list-style-type: none"> • Following a review of the Energy Efficiency Standard for Social Housing in 2023, the Scottish Government is consulting on a new Social Housing Net Zero Standard which is aligned to its commitment to achieve Net Zero by 2045. The consultation proposes and seeks views on a standard comprising a fabric efficiency rating, no direct emissions heating systems by 2045 and air quality systems. • The second Energy Performance Certificates consultation concluded in October 2023. The government response, which will confirm the timeline for revising the Performance of Buildings (Scotland) Regulations, is planned to be published later in 2024. • The Heat in Buildings Bill consultation seeks views on requirements for owner-occupied homes to meet a minimum energy efficiency standard by the end of 2033, and by the end of 2028 for private rented homes. This standard will not apply to non-domestic buildings as well as social rented houses, which make up 23% of dwellings in Scotland as of 30 March 2020.¹⁸ In addition, the consultation proposes: <ul style="list-style-type: none"> – A set of measures to achieve a good level of fabric energy efficiency as alternatives to an EPC assessment. – An exemption from the energy efficiency standards for owner-occupied homes if they stop using direct emissions heating systems by 2033. – No restriction on the sale of homes, although properties in the private rented sector which don't meet the energy efficiency standard by 2028 would not be allowed to be leased to a new tenant (should the existing tenant leave). – A cap on compliance costs, which could be set as a flat cap at different levels for homes and non-domestic buildings or based on property price or floor area. <p>To be addressed:</p> <ul style="list-style-type: none"> • Provide clarity and a timeline, and avoid delays, on the Heat in Buildings Bill so that we move towards delivery (recommendation R2024-001). • Consider carefully whether and how to create a ceiling or cap on the potential cost of meeting the Heat in Buildings Standard. <p>Risk due to UK Government action: medium</p> <p>Policy solutions which rely on regulation of finance providers require implementation by the UK Government.</p>
<p>Heat networks</p> <p>Joint responsibility</p>	<p style="text-align: center;">Y</p> <p>Progress:</p> <ul style="list-style-type: none"> • In September 2023, the Heat Networks (Heat Network Supply Target) (Scotland) Regulations 2023 were laid in the Scottish Parliament to set a target for thermal energy supply to heat networks in Scotland to be 7 TWh by 2035.¹⁹ • As part of the Heat Networks (Scotland) Act (2021), the Scottish Government's first set of regulations on heat networks came into force in May 2023. This requires local authorities to review the potential for heat networks in their area and requires people responsible for public buildings to assess their heat demand and ability to connect to heat networks through Building Assessment Reports.

	<ul style="list-style-type: none"> The Heat in Buildings Bill consultation proposes that local authorities and Scottish Ministers acquire powers to require buildings within a Heat Network Zone to end their use of direct emission heating systems by a certain date and with a minimum notice period. It also proposes investigating the same powers being applied in relation to developers connecting new builds to heat networks. <p>To be addressed:</p> <ul style="list-style-type: none"> Issues need resolving around aligning the UK and Scotland's regulatory frameworks and giving Ofgem authority over consumer protection and licensing. <p>Risk due to UK Government action: medium</p> <p>The appointment of Ofgem to regulate and license heat networks in Scotland is reliant on the UK Government. The required legislation has yet to be enacted.</p>
<p>New homes</p> <p>Mostly devolved</p>	<p style="text-align: center;">Y</p> <p>Progress:</p> <ul style="list-style-type: none"> In 2023 the Scottish Parliament passed the Building (Scotland) Amendment Regulations 2023 which require new buildings receiving approval on or after 1 April 2024 to no longer use direct emissions heating systems. Some developments will be permitted to complete the installation of direct emission heating systems for four months after that date if they had a contract in place before April 2024.²⁰ We welcome the reduction in the transition period for direct emissions heating, down from several years to the proposed four months. <p>To be addressed:</p> <ul style="list-style-type: none"> Energy standards could be improved by using absolute targets for energy use rather than comparison against notional buildings. Improvements to building standards enforcement are needed, including expanding the use of performance testing, to ensure that the actual performance of new buildings aligns with expectations and to hold contractors to account for quality and performance. <p>Risk due to UK Government action: medium</p> <p>The Scottish Government intends to adopt the UK calculation methodologies, SAP10 and SBEM (v6), however, the UK Government has just launched a consultation to significantly change these metrics.²¹ Improvements to the accuracy of modelled performance of new homes therefore rely on delivery of an updated calculation methodology from the UK Government.</p>
<p>Fuel-poor homes</p> <p>Mostly devolved</p>	<p style="text-align: center;">Y</p> <p>Modelled estimates from the Scottish Government suggest an increase in fuel poverty from 25% to 39% between 2019 and 2023, likely due to high energy prices and the pandemic.^{*22,23}</p> <p>Progress:</p> <ul style="list-style-type: none"> Up to £728 million was allocated to launch a refreshed Warmer Homes Scotland programme in October 2023, with increased household grant limits. This funding is for a seven-year programme, and forms part of the £1.8 billion committed over this Parliament. <p>To be addressed:</p> <ul style="list-style-type: none"> Policy solutions are required to enable the delivery of energy efficiency standards in tenements – 22% of fuel-poor households in inefficient homes live in tenements.²⁴ The Scottish Government must ensure a timely and effective delivery of the investment made under the Warmer Homes Scotland programme. <p>Risk due to UK Government action: low</p> <p>Risk level is low as the Scottish Government has committed its own funding, so ECO funding is now less critical to progress in Scotland.</p>

* According to the Scottish Government, a fuel-poor household is one where: more than 10% (20% for extreme fuel poverty) of net income is required to pay for their reasonable fuel needs after housing costs have been deducted.

<p>Commercial buildings</p> <p>Mostly devolved</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <ul style="list-style-type: none"> The Heat in Buildings Bill consultation also proposes giving Scottish Ministers the power to require non-domestic buildings to end their use of direct emission heating after the purchase of a property, as well as where they can connect to a nearby heat network. <p>To be addressed:</p> <ul style="list-style-type: none"> Consult on and finalise plans for delivering energy efficiency improvements and low-carbon heating in non-residential buildings (recommendation R2022-384). Although the Bill would prohibit the sale of direct emissions heating systems from 2045 for non-domestic buildings, there is a need for a clear plan for improving energy efficiency as the Bill currently does not propose minimum energy efficiency standards due to the 'extreme variety of size, construction, operating hours, business activity etc'. <p>Risk due to UK Government action: medium</p> <p>The dependency on UK Government policy areas comes from the clean heat market mechanism.</p>
<p>Public buildings</p> <p>Mostly devolved</p>	<p style="text-align: center;">Y</p> <p>Progress:</p> <ul style="list-style-type: none"> The Heat in Buildings Bill consultation is demonstrating public sector leadership by proposing that all buildings owned by a Scottish public authority must use a clean heating system by the end of 2038. Additional measures are being consulted on to decarbonise public sector buildings more quickly than the wider building stock. <p>To be addressed:</p> <ul style="list-style-type: none"> Consider whether to place a new statutory reporting duty on public sector organisations to demonstrate progress towards their 2038 objective. Consult separately on a potential new duty on public sector organisations to connect the buildings they own to a local heat network, where available. <p>Risk due to UK Government action: low</p> <p>Funding for public sector decarbonisation is determined by the Scottish Government.</p>

2.3 Agriculture and land use

Policy-making powers in the agriculture and land use sectors are mainly devolved to the Scottish Government. Table 2.3 outlines progress and areas to be addressed for all the relevant policy areas. There has been limited progress in the past year.

In addition to the developments outlined below, Scotland published a draft biodiversity strategy in September 2023, setting out its vision to stop biodiversity loss by 2030 and restore biodiversity by 2045.²⁵ The Scottish Government should set out how the support framework under its Common Agricultural Policy (CAP) reform will support delivery of these outcomes, alongside those for climate mitigation.

Table 2.3
Policy scorecard for agriculture and land use

Sub-sector/ policy area	Sector/sub-sector assessment
Productivity and low-carbon farming Mostly devolved	<div style="text-align: center; background-color: #FFD700; padding: 5px; border: 1px solid black;">○</div> <p>Progress:</p> <p>The Scottish Government has:</p> <ul style="list-style-type: none"> • Pledged to pay Scottish farmers and crofters £550 million in the coming year, starting from September 2024, to support an economically sustainable agricultural sector, in the 2023/24 PfG. • Announced a new round, which opened on 1 February 2024, of the Agri-Environment Climate Scheme (AECS) to promote land management practices to tackle climate change and restore nature. • In February 2023 (and updated in June 2023), published the Agricultural Reform Route Map which sets out what changes recipients of current farm payments will be expected to make from 2025 and beyond, introducing new support policies and conditions (from 2025) to the Basic Payment Scheme, which will end in 2026 when Tier 1 Base and Tier 2 Enhanced come in. <ul style="list-style-type: none"> – At the same time, it published a draft Agriculture Reform List of Measures that outlines the types of measures that are expected to be part of future support. • In September 2023, introduced the Agriculture and Rural Communities (Scotland) Bill to replace the current CAP and to deliver the key ambitions set out in the Scottish Government's Vision for Agriculture. <p>To be addressed:</p> <ul style="list-style-type: none"> • The Agriculture and Rural Communities (Scotland) Bill lacks detail on the financial support framework that will be offered to farmers and land managers as they transition to post-CAP agricultural policy. The Scottish Government should set out how future support systems will integrate and address the objectives for food, nature, and climate (recommendation R2022-406). <p>Risk due to UK Government action: low</p> <p>Agriculture policy is largely devolved to the Scottish Government.</p>

<p>Woodland creation</p> <p>Mostly devolved</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <ul style="list-style-type: none"> The Scottish Government allocated £1 million in funding to boost forestry skills, including training courses on planning and planting new woodland.²⁶ Scottish Forestry has run a consultation on the Scottish Forestry Grant Scheme on support for forestry post 2025.²⁷ In the 2023/24 PfG, the Scottish Government committed to restore and expand the Atlantic rainforest and Caledonian pinewoods, and to set out plans for Glenprosen Estate's integrated land management approach. <p>To be addressed:</p> <ul style="list-style-type: none"> Scotland missed the Scottish Government's 2022 to 2023 woodland creation target. A quarter of the approved woodland creation was delayed or not taken forward by landowners, with Scottish Forestry suggesting this is due to skills and capacity issues.²⁸ Plans are needed to address barriers to meeting future targets, which are also important for UK-wide planting targets (recommendation R2022-356). The Scottish Government needs to show how it will meet future woodland creation targets following the reduction in spending plans for 2024-25, from a budget of £103.7 million for Scottish Forestry in 2023-24, to £70.1 million in 2024-25.²⁹ <p>Risk due to UK Government action: medium</p> <p>The UK Government could support by addressing common issues such as nursery capacity, timber supply and finance, e.g. via carbon markets.</p> <p>The Scottish Government has stated that one factor in its reduction in spending plans for Scottish Forestry was the UK Government's 10% reduction in capital allocation, which forced it to reallocate funding from forestry to other areas. In the longer term, the Scottish Government should facilitate other funding streams alongside public funding, which would help mitigate the impact of such risks to woodland creation.</p>
<p>Agroforestry and hedges</p> <p>Mostly devolved</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <ul style="list-style-type: none"> In June 2023, Scottish Forestry introduced new measures to boost agroforestry: increasing the grant rate for agroforestry projects by 50% per hectare; expanding agroforestry funding to planting fruit, nut, and native trees; changes to tree protection measures; and more flexibility to adapt the planting thresholds for farmers.³⁰ <p>To be addressed:</p> <ul style="list-style-type: none"> There have been no updates on the future of funding for hedgerow creation and management, and small-scale tree planting after the AECS supports end in 2026. <p>Risk due to UK Government action: low</p> <p>Policy in this area is largely devolved to the Scottish Government.</p>
<p>Peatlands</p> <p>Mostly devolved</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <p>The Scottish Government has:</p> <ul style="list-style-type: none"> Published a report on mobilising private investment into peatland restoration. In February 2023, launched a consultation on the ban of sale of domestic horticultural peat for domestic use, which had been committed as part of the 2021/22 PfG. Introduced a Bill in March 2023 that extends licensing across all applications of muirburn and restricting when burning can be used on peat soils to limited circumstances.³¹

	<ul style="list-style-type: none"> In the 2023/24 PfG, committed to progress action to support peatland restoration on crofting land. <p>To be addressed:</p> <ul style="list-style-type: none"> Scotland missed the Scottish Government's peatland restoration target for the fifth year in a row. The Scottish Government should identify and set out how the current barriers will be addressed (recommendation R2022-358). <p>Risk due to UK Government action: low</p> <p>Policy is devolved. However, the UK Government could support upscaling action by addressing common areas relevant to both administrations such as skills gaps, contractor capacity and carbon finance to support restoration.</p>
<p>Biomass*</p> <p>Mostly devolved</p>	<p style="text-align: center;">R</p> <p>Progress:</p> <ul style="list-style-type: none"> In the Draft Energy Strategy and Just Transition Plan, the Scottish Government sets out that bioenergy should align with ambitions for nature and uses should support Net Zero. The potential to scale up domestic biomass supply is being reviewed. <p>To be addressed:</p> <ul style="list-style-type: none"> The Scottish Government should provide clarity on its bioenergy plans. In the 2020 Climate Change Plan update (CCPu), it committed to publish a Bioenergy Action Plan in 2023. This has not yet been published. <p>Risk due to UK Government action: medium</p> <p>Biomass is an area of devolved responsibility. However, the UK Government's Biomass Strategy, published in 2023, recognises that required actions such as research and development and deployment of biomass production and technologies are relevant across the UK.³²</p>
<p>Demand and consumption</p> <p>Mostly devolved</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <ul style="list-style-type: none"> The consultation on the National Good Food Nation Plan was published in January 2024, clearly articulating the connection between food and food systems and climate and biodiversity impacts.³³ The Plan recognises that population dietary shifts towards the Eatwell Guide would be expected to have a positive impact on GHG emissions. <p>To be addressed:</p> <ul style="list-style-type: none"> The next iteration of the Plan should seek to provide further detail on the emissions reduction potential of dietary choices, particularly relating to meat and dairy consumption. <p>Risk due to UK Government action: low</p> <p>The UK Government's reluctance to consider dietary shifts could hinder public acceptance of the Scottish Government's plans in this area.</p>

* This section relates to emissions and sequestration associated with land use to grow domestic energy crops. Policies relating to the use of bioenergy are in the industry sector.

2.4 Waste

Policy powers in the waste sector are mainly devolved to Scotland. The sector has seen limited progress in the past year. Table 2.4 outlines progress and areas to be addressed for all relevant sub-sectors and policy areas.

Table 2.4 Policy scorecard for waste	
Sub-sector/ policy area	Sector/sub-sector assessment
Waste prevention, recycling and circular economy Mostly devolved	○
	<p>Progress:</p> <ul style="list-style-type: none"> The Circular Economy (Scotland) Bill was laid in Parliament in June 2023. This will provide the legislative framework to develop a circular economy strategy and targets, alongside powers to set local recycling targets and a new waste and recycling code of practice. The Packaging Waste (Data Reporting) (Scotland) Regulations 2023 requires producers to collect and report on packaging data, which will be used to enact the Extended Producer Responsibility (EPR) reforms in Scotland, which are planned to start in 2024. The Scottish Government, alongside the other UK nations, launched a consultation on reforming the producer responsibility system for waste electrical and electronic equipment. The National Planning Framework 4 (NPF4) includes 'conserving and recycling assets' as one of its six overarching spatial principles that should inform the planning of places. It also includes circular economy materials management facilities as one of 18 national developments that will support the delivery of the spatial strategy.³⁴ The Scottish Government published a review of its food waste reduction action plan in January 2024.³⁵ <p>To be addressed:</p> <ul style="list-style-type: none"> Plans are urgently needed to increase recycling rates to the 70% target by 2025, given the slow progress made in recent years, with recycling rates in 2022 at just over 40%. It is not clear how including this in NPF4 will on its own be enough to drive up recycling rates and incentivise the circular economy. A Circular Economy and Waste Route Map was consulted on in 2022 with a final version expected in 2023.³⁶ This has not yet been published. Instead, an updated draft was published for a second consultation in January 2024, including proposals for mandatory public reporting of food waste and surplus to support businesses to reduce food waste. The Scottish and UK Governments should work together to avoid further delays in launching Scotland's Deposit Return Scheme. It was due in August 2023 but delayed to at least October 2025 due to the UK Government's refusal to fully exclude it from the Internal Market Act.³⁷ <p>Risk due to UK Government action: high</p> <p>There is high risk from the UK-wide approach to forthcoming waste management reforms, including the deposit return scheme, which are at risk of further delay.</p>

<p>Energy from waste incineration</p> <p>Joint responsibility</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <ul style="list-style-type: none"> The Scottish Government responded to the February 2023 Independent Review of the Role of Incineration in the Waste Hierarchy in Scotland in May 2023, accepting all recommendations either in full or in principle, and referring to the forthcoming Circular Economy and Waste Route Map to address these, which is yet to be published.^{38,39} NPF4 introduced restrictions on new energy from waste (EfW) facilities, which will not be supported except under limited circumstances where a national or local need has been sufficiently demonstrated and where accompanied by a heat and power plan that considers how to reduce emissions. As part of the Circular Economy and Waste Route Map consultation process, the Scottish Government gathered views on ensuring that new EfW plants are future-proofed for carbon capture and storage (CCS) technology. <p>To be addressed:</p> <ul style="list-style-type: none"> The quantity of waste incinerated, including EfW, in Scotland in 2022 was 5% higher than the previous year and more than double 2011 levels.⁴⁰ This growth needs to be addressed. While restrictions on new EfW in NPF4 are welcome, stronger action is needed. A moratorium on additional EfW capacity should be introduced subject to a review of capacity needs and how they align with emissions pathways and wider objectives, including on a more circular economy. Ensure the Circular Economy and Waste Route Map contains clarity on how the Scottish Government intends to address the recommendations from the Independent Review of the Role of Incineration in the Waste Hierarchy in Scotland (recommendation R2022-329). <p>Risk due to UK Government action: medium</p> <p>The UK Government's CCS business model to support an initial phase of industrial CCS projects includes EfW and the UK Government has announced plans to include EfW and waste incineration in the UK emissions trading scheme from 2028.⁴¹ However, UK-wide packaging reforms will be crucial to reduce the amount of waste that goes to EfW in Scotland and are delayed.</p>
<p>Landfill</p> <p>Mostly devolved</p>	<p style="text-align: center;">O</p> <p>Progress:</p> <ul style="list-style-type: none"> NPF4 introduced restrictions on new landfill sites while also introducing support for capture, distribution or use of gases captures from landfill sites. <p>To be addressed:</p> <ul style="list-style-type: none"> Scotland landfilled a quarter of waste generated in 2022, which is considerably worse than the Scottish Government's 2025 target of 5%. Further action is therefore urgently needed to reduce the amount of waste landfilled. The Scottish Government should outline clear plans and a timeline to address the intention to extend the ban on landfilled biodegradable municipal waste to biodegradable non-municipal waste by 2025, which was due to be subject to a 2022 consultation.⁴² <p>Risk due to UK Government action: low</p> <p>Landfill policy is mostly devolved, with the Scottish Government setting targets and restrictions.</p>

<p>Wastewater</p> <p>Mostly devolved</p>	<p>Y</p>
	<p>Progress:</p> <ul style="list-style-type: none"> • Scottish Water's Net Zero Emissions Route Map set out an aim to reduce process emissions by 20% by 2040, including actions to improve measurement accuracy and explore new technologies. Progress towards this in the last year includes installation of the first nitrous oxide monitors at two sites in Glasgow, piloting artificial intelligence software to reduce emissions and reviewing all wastewater treatment works to understand the risk of nitrous oxide production.⁴³ • NPF4 includes a policy intent to 'encourage, promote and facilitate development that is consistent with the waste hierarchy'. This includes a policy to support development proposals for the capture, distribution, or use of gases from wastewater treatment plants. <p>To be addressed:</p> <ul style="list-style-type: none"> • Scottish Water should publish the findings of its process emissions monitoring and other pilot schemes to inform the evidence base in this area. • The Scottish Government should develop plans to reduce industrial wastewater emissions. <p>Risk due to UK Government action: low</p> <p>Wastewater policy is mostly devolved with targets and action determined by Scottish Water, supported by Scottish Government.</p>

2.5 Industry

Policy powers in the industry sector are mainly reserved to the UK Government. The sector has seen limited progress in the past year. Table 2.5 outlines progress and areas to be addressed for all the relevant sub-sectors and policy areas.

Progress on the delivery of a just industry transition can be found in the cross-economy section on just transition in Chapter 3.

Table 2.5 Policy scorecard for industry	
Sub-sector/ policy area	Sector/sub-sector assessment
Industrial resource efficiency Joint responsibility	<p style="text-align: center;">Y</p> <p>Progress:</p> <ul style="list-style-type: none"> The Scottish Government published the Circular Economy Bill in June 2023 (see Table 2.4). This will give ministers powers to set statutory targets to measure progress in reducing waste and Scotland's carbon footprint. <p>To be addressed:</p> <ul style="list-style-type: none"> While some measures in the Circular Economy Bill will help to reduce industrial emissions, this is not its focus. There is limited funding available for resource efficiency in manufacturing, other than the £2 million Circular Textiles fund. More measures are needed to increase the efficiency of resource use, with particularly large opportunities in construction materials (recommendation R2022-376). <p>Risk due to UK Government action: high</p> <p>The CCC has identified urgent need for new policies to achieve the UK Government's ambition for industrial resource efficiency.</p>
Industrial energy efficiency Mostly reserved	<p style="text-align: center;">Mostly reserved</p> <p>Progress: There was no significant progress in this area.</p> <p>To be addressed:</p> <ul style="list-style-type: none"> The Scottish Industrial Energy Transformation Fund (SIETF) is expected to end by 2026. There is no clear strategy or timeline to incentivise industrial energy efficiency after this. <p>Risk due to UK Government action: medium</p> <p>This area is mostly reserved to the UK Government. The UK Government plans to extend existing energy efficiency schemes but there are no new measures planned.</p>
Industrial electrification Mostly reserved	<p style="text-align: center;">Mostly reserved</p> <p>Progress: There was no significant progress in this area.</p> <p>To be addressed:</p> <ul style="list-style-type: none"> There is no certainty on industrial electrification funding in Scotland once SIETF ends. There is currently no strategy or policy directly targeting industrial electrification in Scotland.

	<p>Risk due to UK Government action: high</p> <p>This area is mostly reserved to the UK Government. We have identified a lack of policy to support industrial electrification as a major gap in UK Government policy.</p>
<p>Industrial CCUS</p> <p>Mostly reserved</p>	<p style="text-align: center;">Mostly reserved</p> <p>Progress:</p> <ul style="list-style-type: none"> In July 2023, the Acorn project at St. Fergus was awarded Track 2 status as part of the UK Government's CCUS cluster sequencing process, subject to final assessments. Acorn also retains its Track 1 reserve cluster status.⁴⁴ The Scottish Government provides funding to stimulate innovation in CCUS, including the Emerging Energy Technologies Fund which will invest up to £80 million in the development of CCUS industries in Scotland, running until 2026. <p>To be addressed:</p> <ul style="list-style-type: none"> Current funding arrangements for CCUS are expected to end by 2026 or earlier. <p>Risk due to UK Government action: medium</p> <p>The UK Government has detailed policy mechanisms to support CCS in industrial clusters. It is less clear how Scottish industrial sites outside Acorn will be supported to adopt CCS.</p> <p>The UK Government is yet to set out the criteria for its final assessment of Track 2 clusters or confirm when the criteria will be published.⁴⁵ The uncertainty in timelines means the Scottish Government has been unable to allocate funding to CCS projects.</p>
<p>Hydrogen use and supply</p> <p>Mostly reserved</p>	<p style="text-align: center;">Mostly reserved</p> <p>Progress:</p> <ul style="list-style-type: none"> The Scottish Government set out its strategy for hydrogen in its December 2022 Hydrogen Action Plan.⁴⁶ The plan reaffirmed the Scottish Government's ambition of at least 5 GW of renewable and low-carbon hydrogen production capacity by 2030 and 25 GW by 2045. To support the ambitions outlined in the Hydrogen Action Plan, the Scottish Government has committed to provide £100 million to renewable hydrogen projects up to 2026. The first portion of this funding has been launched through the £10 million Hydrogen Innovation Scheme, to help develop and demonstrate renewable hydrogen technologies.⁴⁷ In December 2023, the UK Government announced the projects to be offered contracts under the hydrogen allocation round through the Net Zero Hydrogen Fund. This includes two projects in Scotland that will produce hydrogen for industrial users. <p>To be addressed:</p> <ul style="list-style-type: none"> The Scottish Government previously said it would release the remaining £90 million of its £100 million commitment via a Green Hydrogen Fund at the start of 2023. This launch is yet to happen. The Scottish Government should provide clarity on the fund details and timelines, and any interactions with UK Government funding where possible. <p>Risk due to UK Government action: high</p> <p>Key decisions (e.g. hydrogen for heat) that will shape the demand and scale of hydrogen production and storage are reserved to the UK Government.</p> <p>Furthermore, the overall fiscal regime for hydrogen is within the control of the UK Government and therefore the UK Government's hydrogen business model will be a key factor in determining the development of hydrogen use in Scotland.</p>

<p>Bioenergy*</p> <p>Mostly reserved</p>	<p style="text-align: center;">Mostly reserved</p> <p>Progress:</p> <ul style="list-style-type: none"> The Scottish Government's Draft Energy Strategy and Just Transition Plan outlines an aim to ensure bioenergy is only used where it can best support Scotland's goals for the climate and nature.⁴⁸ To facilitate this, a bioenergy policy working group was set up to inform development of a strategic framework for the most appropriate use of bio-resources.⁴⁹ <p>To be addressed:</p> <ul style="list-style-type: none"> As part of the 2020 CCPu, Scotland committed to publishing a Bioenergy Action Plan by 2023.⁵⁰ However, this has not been published yet. The Bioenergy Action Plan must clarify the Scottish Government's position on bioenergy, setting out its best use, delivery mechanisms, funding, licensing requirements, future timelines and sustainability and food security implications. The UK Biomass Strategy commits to consult on a cross-sectoral sustainability framework.⁵¹ Some of the proposals within the consultation may fall into an area of devolved responsibility in Scotland. The Scottish Government should work closely with the UK Government to further develop biomass governance and sustainability criteria. <p>Risk due to UK Government action: medium</p> <p>The majority of powers are reserved to the UK Government. The UK Government recently published its Biomass Strategy.</p>
<p>Fossil fuel supply</p> <p>Mostly reserved</p>	<p style="text-align: center;">Mostly reserved</p> <p>The Scottish Government has developed a series of policy positions regarding fossil fuels. In 2019, a finalised position of no support for onshore unconventional oil and gas, including hydraulic fracturing and dewatering for coal bed methane, was confirmed.⁵² This was followed by preferred policy positions against coal extraction and against the exploration and development of onshore conventional oil and gas in 2022.^{53,54}</p> <p>Progress:</p> <ul style="list-style-type: none"> The NPF4 aligns with these policy positions. It sets out that proposals that seek to explore, develop, and produce onshore fossil fuels (excluding unconventional oil and gas) will only be supported in exceptional circumstances aligned with national policy on energy and emissions targets. The development of unconventional oil and gas is not supported.⁵⁵ <p>Risk due to UK Government action: high</p> <p>The Scottish Government's powers on fossil fuel supply are broadly limited to planning and consenting of onshore exploitation. Powers relating to the licensing of onshore oil and gas were devolved in 2018 under the Scotland Act 2016, while offshore licensing is reserved through the North Sea Transition Authority.^{56,57} The UK Government is responsible for the fiscal regime and regulation of the oil and gas industry. For coal exploitation, environmental duties in connection with planning policy and determinations are devolved to the Scottish Government, but licensing is reserved through the Coal Authority.</p> <p>We have set out in letters to the UK Government and through two priority recommendations in our UK Progress Report our view of the evidence against new consents for coal exploration or production, and our support for tighter limits on UK oil and gas production, with stringent tests and a presumption against exploration.^{58,59}</p>

* This section relates to the use of bioenergy. Policies relating to the emissions and sequestration associated with land use to grow domestic energy crops are considered in the agriculture and land use sector.

2.6 Electricity supply

As electricity supply is mostly reserved to UK Government, policies in this area are not scored. However, the sector is substantially influenced by devolved policies over planning and consenting of key infrastructure and leasing of offshore sites for renewable generation on the Scottish Crown Estate. Table 2.6 outlines progress and areas to be addressed.

Table 2.6

Policy scorecard for electricity supply

Sub-sector/ policy area	Sector/sub-sector assessment
Electricity supply Mostly reserved	<p style="text-align: center;">Mostly reserved</p> <p>Progress:</p> <ul style="list-style-type: none"> In January 2023, the Scottish Government consulted on its draft Energy Strategy and Just Transition Plan (ESJTP).⁶⁰ The draft consults on an ambition to deliver more than 20 GW of additional renewable generation capacity by 2030, including 12 GW of onshore wind, as well as on setting a further offshore deployment ambition and a new ambition for solar, wave and tidal deployment. NPF4 is a key lever for considering major infrastructure and aims to encourage, promote, and facilitate all forms of renewable energy development onshore and offshore.⁶¹ The Scottish Government agreed the Onshore Wind Sector Deal with industry to deliver on the ESJTP ambition to install 20 GW of onshore wind capacity by 2030.⁶² In August 2023, the Scottish Government signed a cooperation agreement with the French region of Brittany to capitalise and share best practices on the expansion of offshore wind projects.⁶³ As part of the 2023/24 PfG, the Scottish Government set out its intention to streamline offshore wind consenting processes and shorten timelines and to publish a Solar Vision for Scotland.⁶⁴ <p>To be addressed:</p> <ul style="list-style-type: none"> The final ESJTP, due in Summer 2024, should include a delivery plan on how Scotland will achieve the vision for the energy system set out in the draft ESJTP. The Scottish Government should work with the UK Government to ensure that the targets for Scotland set out in the ESJTP are met and that the UK-wide objective of a decarbonised electricity supply by 2035 is achieved, subject to ensuring security of supply. This must include working closely as part of the new governance arrangements convened through the Connections Action Plan and the Transmission Acceleration Action Plan to accelerate the delivery of energy infrastructure in Scotland.^{65,66} <p>Risk due to UK Government action: high</p> <p>Almost all powers are reserved to the UK Government, including energy policy, regulation of energy markets and networks, and nationally significant infrastructure planning.</p> <p>The UK Government still lacks a delivery plan for its objective to decarbonise electricity supply by 2035. Scottish targets are therefore dependent on UK policy and supporting infrastructure (e.g. networks and grid connections) delivering at scale and to time.</p>

2.7 Engineered removals

Policy powers for engineered removals are mainly reserved to the UK Government, so policies in this area are not scored. The sector has seen some progress in the past year. Table 2.7 outlines progress and areas to be addressed.

Table 2.7

Policy scorecard for engineered removals

Sub-sector/ policy area	Sector/sub-sector assessment
<p>Engineered removals</p> <p>Mostly reserved</p>	<p style="text-align: center;">Mostly reserved</p> <p>Progress:</p> <ul style="list-style-type: none"> In July 2023, Acorn was awarded Track 2 status as part of the UK Government CCUS cluster sequencing process, subject to final assessments.⁶⁷ Acorn also retains its Track 1 reserve cluster status. The UK Government is provisionally targeting deployment by 2028–2029, depending on technical feasibility, affordability, and value for money. In November 2023, the Scottish Government published a feasibility study that estimates the potential to deploy Negative Emissions Technologies (NETs)* in Scotland from 2030 to 2045.⁶⁸ It estimates that, assuming that Acorn is active by 2030, the maximum NETs potential achievable in Scotland is 2.2 MtCO₂/year in 2030 and 6.8 MtCO₂/year in 2045, and that this requires joint UK and Scottish Government action. These updated figures are lower than the potential outlined in the CCPu of 3.8 MtCO₂/year by 2030. <p>To be addressed:</p> <ul style="list-style-type: none"> Once the UK Government provides a concrete timeline for the development of Track 2 CCUS clusters, the Scottish Government should assess the compatibility of Acorn's timeline and deployment potential with the Scottish Government's 2030 removals target. The Scottish Government needs to put in place policies and delivery and implementation plans to address barriers to the deployment of engineered removals highlighted by stakeholders as part of the 2023 feasibility study. This includes providing long-term financial support as well as upfront CAPEX support. Action should be taken this year as part of efforts to mitigate the substantial delivery risk to the 2030 engineered removals target. The Scottish Government should respond to the NET feasibility study recommendations as part of the upcoming Climate Change Plan. <p>Risk due to UK Government action: high</p> <p>Delivery of engineered removals in Scotland is reliant on the development of conveniently located CCS infrastructure with adequate capacity. The Scottish Government does not have all the necessary regulatory and legislative powers to develop these networks and is therefore reliant on UK Government processes in this area.</p>

* Negative Emissions Technologies (NETs) are also referred to as engineered removals or greenhouse gas removals (GGRs) in CCC analysis and reports.

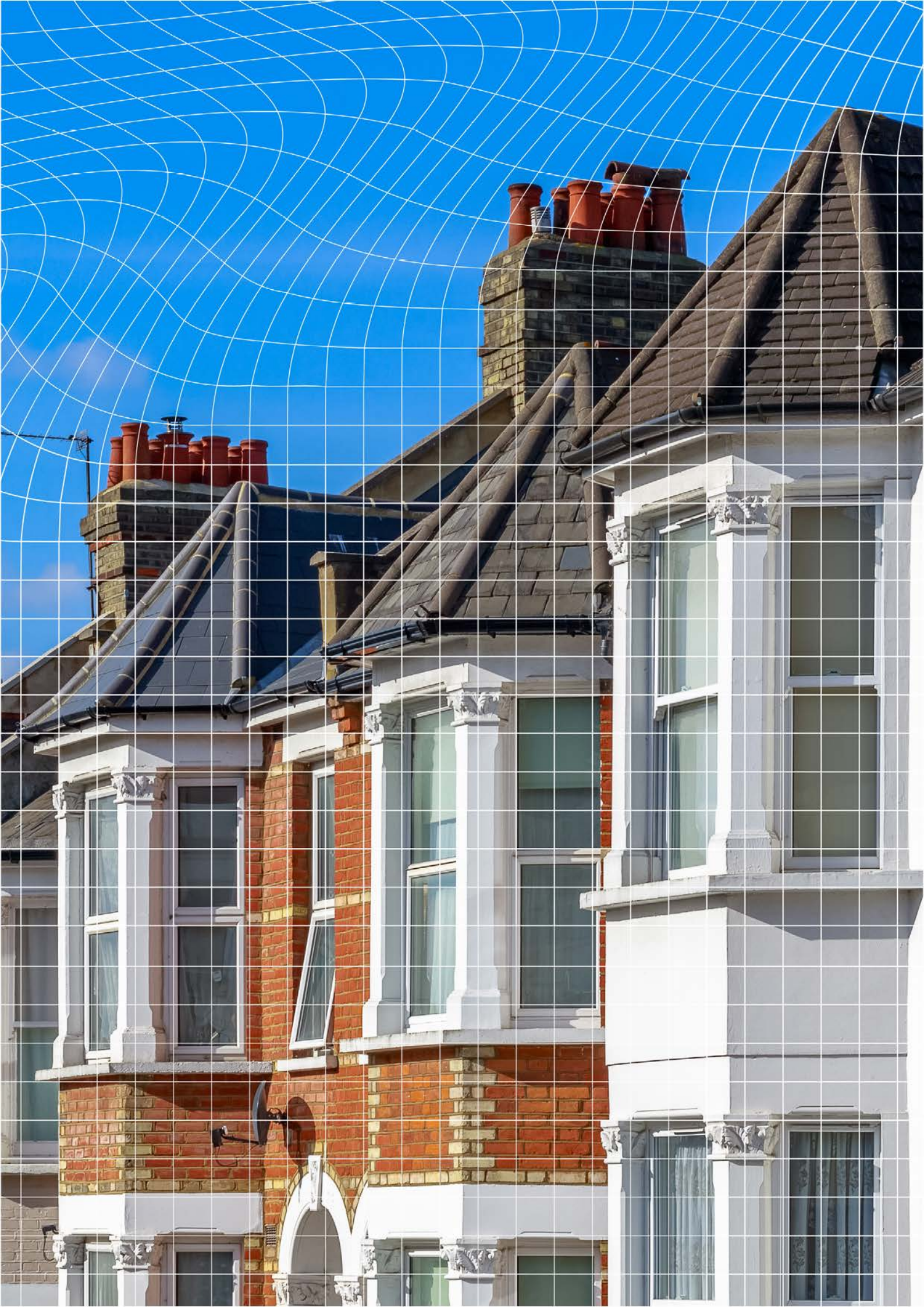
Endnotes

- 1 Scottish Government (2024) *Greenhouse Gas Emissions Projections: phase 1 and phase 2 modelling results*, <https://www.gov.scot/publications/greenhouse-gas-emissions-projections-scotland-results-phase-1-phase-2-modelling/pages/1/>.
- 2 Transport Scotland (2023) *A Network Fit For The Future: Vision for Scotland's Public Electric Vehicle Charging Network*, <https://www.transport.gov.scot/publication/a-network-fit-for-the-future-vision-for-scotland-s-public-electric-vehicle-charging-network/>.
- 3 ZapMap (2023) *EV charging survey*, <https://www.zap-map.com/news/best-en-route-charging-networks-2023-24>.
- 4 Transport Scotland (2023) *£58 million for zero emission buses*, <https://www.transport.gov.scot/news/58-million-for-zero-emission-buses/>.
- 5 Transport Scotland (2023) *Scottish Ministers' High Level Output Specification (HLOS) - Control Period 7 - 2024 – 2029*, [https://www.transport.gov.scot/publication/scottish-ministers-high-level-output-specification-hlos-control-period-7-2024-2029/#:~:text=This%20HLOS%20represents%20a%20formal,6%20\(2019%2D2024\)](https://www.transport.gov.scot/publication/scottish-ministers-high-level-output-specification-hlos-control-period-7-2024-2029/#:~:text=This%20HLOS%20represents%20a%20formal,6%20(2019%2D2024).).
- 6 Scotland's Railway (2023) *Strategic Business Plan*, <https://scotlandsrailway.com/assets/site/Scotland-CP7-Strategic-Business-Plan.pdf>.
- 7 Scottish Government (2023) *Programme for Government 2023 to 2024*, <https://www.gov.scot/publications/programme-government-2023-24/documents/>.
- 8 Transport Scotland (2023) *Cycling Framework for Active Travel – A plan for everyday cycling*, <https://www.transport.gov.scot/publication/cycling-framework-for-active-travel-a-plan-for-everyday-cycling/>.
- 9 Paths for all (2023) *£7 million to get Scots moving*, <https://www.pathsforall.org.uk/news/news-post/7-million-to-get-scots-moving>.
- 10 Scottish Enterprise (2023) *Synthetic/ Sustainable Aviation Fuel Mapping*, <https://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=816&taxonomy=BSK>.
- 11 Highlands and Islands Airports Limited (2023) *Low-emissions air travel can unlock new economic growth in the Highlands and Islands of Scotland, feasibility study finds*, <https://www.hial.co.uk/news/article/144/low-emissions-air-travel-can-unlock-new-economic-growth-in-the-highlands-and-islands-of-scotland-feasibility-study-finds#:~:text=Airlander%20represents%20a%20new%20category,regional%20air%20transport%20by%202040>.
- 12 Highlands and Islands Airports Limited (2023) *Sustainability Strategy 2023-33*, <https://www.hial.co.uk/news/article/99/hial-s-sustainability-strategy-2023-33>.
- 13 Transport Scotland (2022) *Draft for consultation - Long-Term plan for vessels and ports on the Clyde & Hebrides and Northern Isles networks (2023 – 2045) - Islands Connectivity Plan*, <https://www.transport.gov.scot/publication/draft-for-consultation-long-term-plan-for-vessels-and-ports-on-the-clyde-hebrides-and-northern-isles-networks-2023-2045-islands-connectivity-plan/>.
- 14 Department for Transport (2023) *Zero Emission Vessels and Infrastructure competition winners*, <https://www.gov.uk/government/publications/zero-emission-vessels-and-infrastructure-zevi-competition-winners>.

- 15 Scottish Government (2023) *Delivering net zero for Scotland's buildings - Heat in Buildings Bill: consultation*, <https://www.gov.scot/publications/delivering-net-zero-scotlands-buildings-consultation-proposals-heat-buildings-bill/>.
- 16 Scottish Government (2023) *Green Heat Finance Taskforce: report part 1 – November 2023*, <https://www.gov.scot/publications/green-heat-finance-taskforce-report-part-1-november-2023/pages/1/>.
- 17 Scottish Government (2023) *Heat in buildings monitoring and evaluation Framework*, <https://www.gov.scot/publications/heat-buildings-monitoring-evaluation-framework/>.
- 18 Scottish Government (2022) *Annual Housing Statistics, 2020-21*, <https://www.gov.scot/news/annual-housing-statistics-2020-21/>.
- 19 Legislation.gov.uk (2023) *The Heat Networks (Supply targets) (Scotland) Regulations 2023*, <https://www.legislation.gov.uk/sdsi/2023/9780111058206/contents>.
- 20 Legislation.co.uk (2023) *The Building (Scotland) Amendment Regulations 2023*, <https://www.legislation.gov.uk/ssi/2023/177/made>.
- 21 Department for Energy Security and Net Zero (2023) *Home Energy Model: Future Homes Standard assessment*, <https://www.gov.uk/government/consultations/home-energy-model-future-homes-standard-assessment>.
- 22 Scottish Government (2020) *Scottish house condition survey: 2019 key findings*, <https://www.gov.scot/publications/scottish-house-condition-survey-2019-key-findings/pages/6/>.
- 23 Scottish Government (2023) *Cost of Living (Tenant Protection) (Scotland) Act 2022: first report to the Scottish Parliament*, <https://www.gov.scot/publications/cost-living-tenant-protection-scotland-act-2022-first-report-scottish-parliament/pages/5/>.
- 24 Scottish Government (2021) *Tackling fuel poverty in Scotland: a strategic approach*, <https://www.gov.scot/publications/tackling-fuel-poverty-scotland-strategic-approach/pages/5/>.
- 25 Scottish Government (2022) *Biodiversity strategy to 2045: tackling the nature emergency – draft*, <https://www.gov.scot/publications/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/>.
- 26 Scottish Forestry (2023) *New forestry measures to include £1 million investment in skills*, <https://forestry.gov.scot/news-releases/new-forestry-measures-to-include-1-million-investment-in-skills>.
- 27 Scottish Forestry (2023) *Consultation Paper - Future Grant Support for Forestry*, <https://forestry.gov.scot/publications/1468-consultation-paper-future-grant-support-for-forestry>.
- 28 Scottish Forestry (2023) *Forestry summit to be held on woodland creation*, <https://forestry.gov.scot/news-releases/forestry-summit-to-be-held-on-woodland-creation>.
- 29 Scottish Government (2023) *Scottish Budget: 2024 to 2025*, <https://www.gov.scot/publications/scottish-budget-2024-25/pages/12/>.
- 30 Scottish Forestry (2023) *New measures to boost agroforestry*, <https://forestry.gov.scot/news-releases/new-measures-to-boost-agroforestry>.
- 31 Scottish Government (2023) *Wildlife Management and Muirburn (Scotland) Bill*, <https://www.parliament.scot/bills-and-laws/bills/wildlife-management-and-muirburn-scotlandbill>.
- 32 Department for Energy Security and Net Zero (2023) *Biomass Strategy 2023*, <https://www.gov.uk/government/publications/biomass-strategy>.
- 33 Scottish Government (2024) *National Good Food Nation Plan*, <https://www.gov.scot/publications/national-good-food-nation-plan/>.

- 34 Scottish Government (2023) *National Planning Framework 4*, <https://www.gov.scot/publications/national-planning-framework-4/documents/>.
- 35 Scottish Government (2024) *Food waste: review of 2019 waste reduction action plan*, <https://www.gov.scot/publications/review-2019-food-waste-reduction-action-plan/>.
- 36 Scottish Government (2023) *Delivering Scotland's circular economy: A Route Map to 2025 and beyond*, <https://consult.gov.scot/environment-forestry/scotlands-circular-economy-routemap/>.
- 37 Scottish Government (2023) *Deposit Return*, <https://www.gov.scot/news/deposit-return/>.
- 38 Scottish Government (2023) *Decarbonisation of residual waste infrastructure: report*, <https://www.gov.scot/publications/stop-sort-burn-bury-independent-review-role-incineration-waste-hierarchy-scotland-second-report-decarbonisation-residual-waste-infrastructure-scotland/>.
- 39 Scottish Government (2023) *Decarbonisation of residual waste infrastructure: Scottish Government response*, <https://www.gov.scot/publications/scottish-government-response-stop-sort-burn-bury-independent-review-role-incineration-waste-hierarchy-scotland-second-report-decarbonisation-residual-waste-infrastructure-scotland/>.
- 40 SEPA (2022) *Waste incinerated in Scotland – 2022*, <https://www.sepa.org.uk/media/5qfdaxwb/waste-incinerated-in-scotland-commentary.pdf>.
- 41 Department for Energy Security and Net Zero (2023) *Tighter limit on industrial, power and aviation emissions, as UK leads the way to net zero*, <https://www.gov.uk/government/news/tighter-limit-on-industrial-power-and-aviation-emissions-as-uk-leads-the-way-to-net-zero>.
- 42 Scottish Government (2023) *Delivering Scotland's circular economy: A Route Map to 2025 and beyond*, <https://www.gov.scot/publications/consultation-delivering-scotlands-circular-economy-route-map-2025-beyond/>.
- 43 Scottish Water Net Zero (2023) *Year three update*, <https://scottishwaternetzero.co.uk/annual-update/>.
- 44 Department for Energy Security & Net Zero (2023) *Update to industry on conclusion of the CCUS Cluster Sequencing Track-2 expression of interest*, <https://www.gov.uk/government/publications/cluster-sequencing-for-carbon-capture-usage-and-storage-ccus-track-2/update-to-industry-on-conclusion-of-the-ccus-cluster-sequencing-track-2-expression-of-interest>.
- 45 Department for Energy Security and Net Zero (2023) *CCUS Cluster Sequencing Track-2: Market update December 2023*, <https://www.gov.uk/government/publications/cluster-sequencing-for-carbon-capture-usage-and-storage-ccus-track-2/ccus-cluster-sequencing-track-2-market-update-december-2023>.
- 46 Scottish Government (2022), *Hydrogen Action Plan*, <https://www.gov.scot/publications/hydrogen-action-plan/>.
- 47 Scottish Government (2023) *Emerging Energy Technologies Fund – Hydrogen Innovation Scheme: successful projects*, <https://www.gov.scot/publications/emerging-energy-technologies-fund-hydrogen-innovation-scheme-successful-projects/>.
- 48 Scottish Government (2023) *Draft Energy Strategy and Just Transition Plan*, <https://www.gov.scot/publications/draft-energy-strategy-transition-plan/>.
- 49 Scottish Government (2021) *Bioenergy: update – March 2021*, <https://www.gov.scot/publications/bioenergy-update-march-2021/documents/>.
- 50 Scottish Government (2020) *Securing a green recovery on a path to net zero: climate change 2018-2032 – update*, <https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/documents/>.

- 51 DESNZ (2023) *Biomass Strategy 2023*, <https://www.gov.uk/government/publications/biomass-strategy>.
- 52 Scottish Government (2019) *Unconventional oil and gas: ministerial statement*, <https://www.gov.scot/publications/unconventional-oil-gas/>.
- 53 Scottish Government (2023) *Onshore conventional oil and gas: preferred policy position*, <https://www.gov.scot/publications/onshore-conventional-oil-and-gas-preferred-policy-position>.
- 54 Scottish Government (2022) *Coal extraction: preferred policy position*, <https://www.gov.scot/publications/coal-extraction-preferred-policy-position/>.
- 55 Scottish Government (2023) *National Planning Framework 4*, <https://www.gov.scot/publications/national-planning-framework-4/>.
- 56 Scottish Government (2023) *Oil and gas*, <https://www.gov.scot/policies/oil-and-gas/>.
- 57 UK Government (2016) *Scotland Act 2016*, <https://www.legislation.gov.uk/ukpga/2016/11/contents/enacted>.
- 58 Climate Change Committee (2022) *Climate compatibility of new oil and gas fields*, <https://www.theccc.org.uk/publication/letter-climate-compatibility-of-new-oil-and-gas-fields/>.
- 59 Climate Change Committee (2021) *Deep coal mining in the UK*, <https://www.theccc.org.uk/publication/letter-deep-coal-mining-in-the-uk/>.
- 60 Scottish Government (2023) *Draft Energy Strategy and Just Transition Plan*, <https://www.gov.scot/publications/draft-energy-strategy-transition-plan/pages/0/>.
- 61 Scottish Government (2023) *National Planning Framework 4*, <https://www.gov.scot/publications/national-planning-framework-4/pages/1/>.
- 62 Scottish Government (2023) *Onshore wind sector deal*, <https://www.gov.scot/publications/onshore-wind-sector-deal-scotland/>.
- 63 Scottish Government (2023) *Collaboration on green energy*, <https://www.gov.scot/news/collaboration-on-green-energy/>.
- 64 Scottish Government (2023) *Programme for Government*, <https://www.gov.scot/programme-for-government/>.
- 65 Department for Energy Security and Net Zero and Ofgem (2023) *Connections Action Plan*, <https://www.gov.uk/government/publications/electricity-networks-connections-action-plan>.
- 66 Department for Energy Security and Net Zero (2023) *Transmission Acceleration Action Plan*, <https://www.gov.uk/government/publications/electricity-networks-transmission-acceleration-action-plan>.
- 67 Department for Energy Security and Net Zero (2023) *Update to industry on conclusion of the CCUS Cluster Sequencing Track-2 expression of interest*, <https://www.gov.uk/government/publications/cluster-sequencing-for-carbon-capture-usage-and-storage-ccus-track-2/update-to-industry-on-conclusion-of-the-ccus-cluster-sequencing-track-2-expression-of-interest>.
- 68 Scottish Government (2023) *Negative Emissions Technologies (NETS): Feasibility Study*, <https://www.gov.scot/publications/negative-emissions-technologies-nets-feasibility-study/pages/1/>.



Chapter 3 – Cross-cutting issues

3.1 Cross-economy policies

76

3.2 Adaptation

82

Introduction and key messages

This chapter looks at cross-cutting issues in Scotland. Policy progress in governance, business and finance, just transition and skills, green choices and public engagement, UK emissions trading scheme, and adaptation is summarised.

Scoring criteria for assessing the Scottish Government's policies and plans can be found in Annex 2. The colours (from green, representing 'credible plans', to red, representing 'insufficient plans') in the scorecards represent our assessment of the credibility of the Scottish Government's policies and plans (see Table A3 in Annex 2). There are many policy areas where decarbonisation also depends on actions taken by the UK Government, so we have separately included an assessment (low, medium, or high) of the extent of the risk posed by UK Government actions within the narrative for each policy area in the scorecards (see Annex 2).

Key priority recommendations are given in Annex 1 and on our website, and they should be considered for the upcoming Climate Change Plan.

Our key messages are:

- **Governance:** there has been some progress in improving relationships between central and local government to deliver Net Zero. But more clarity on division of roles and responsibilities and better coordination of actions across Scottish and UK Governments and local authorities is still needed.
 - The Scottish Government and the Convention of Scottish Local Authorities signed the 'Verity House Agreement', establishing how central and local governments will work together on shared priorities including just transition.
 - The UK and Scottish Governments need to work together effectively to deliver both governments' climate targets. This requires greater transparency in the plans of both, clear responsibilities, and open and frequent consultation between Holyrood and Westminster.
- **People and business:** the publication of the draft Energy Strategy and Just Transition Plan and the Heat in Buildings Public Engagement Strategy represent good progress on public engagement and the just transition.
 - More should be done to communicate the most impactful ways for Scottish people and businesses to reduce emissions and support them to make green choices across all sectors.
 - In the context of a just transition, the mixed handling of plans to close the Grangemouth refinery underlines the risk of omitting meaningful dialogue between communities, industry and government and the important role for the Scottish Government in ensuring a just transition.
- **UK Emissions Trading Scheme:** the cap for traded emissions will be lowered from 2024, while the scheme will expand to domestic shipping, waste incineration and energy from waste sectors, and free allocations to aviation will be phased out from 2026.

- **Adaptation:** climate change evidence in Scotland shows increasing temperatures, rainfall and sea levels, clear effects on people and ecosystems, and inevitable further impacts. Although some steps have been taken on adaptation policy, further urgent action is needed.

3.1 Cross-economy policies

3.1.1 Governance

The past year has seen some progress around governance, notably on the relationship between central and local government in delivering Net Zero. But there is still much more to be done to set the whole system up to effectively deliver the changes needed. Table 3.1 outlines progress and areas to be addressed.

Table 3.1
Policy scorecard for governance

Sub-sector/ policy area	Sector/sub-sector assessment
Partnership with local government	<p style="text-align: center;">Y</p> <p>Progress:</p> <ul style="list-style-type: none"> In June 2023, the Scottish Government and the Convention of Scottish Local Authorities (COSLA) signed the Verity House Agreement, setting out how central and local government will work together to deliver on shared priorities, including a just transition. The Scottish Government published guidance to local authorities on how to fulfil their duties to publish Local Heat and Energy Efficiency Strategies and Delivery Plans by the end of 2023.¹ The Climate Intelligence Service was set up to help local authorities deliver local climate action and benefits for their communities.² This aims to provide practical support to help local authorities build capacity and capability but is still developing its plans at present. <p>To be addressed:</p> <ul style="list-style-type: none"> The Scottish Government and COSLA should together develop an agreed framework for delivery of the Verity House Agreement's priority of driving a just transition. This should include clear roles for each aspect of delivery and how this will be coordinated. <ul style="list-style-type: none"> The Verity House agreement commits to developing a fiscal framework to co-develop budgetary plans to deliver against its priorities. Further, the 2023/24 PfG aims to continue the joint working group on sources of local government funding to identify options for reforms to Council Tax and other revenue-raising levers. These processes should be used to align funding settlements to the roles local authorities are expected to play in delivering Net Zero. The Scottish Parliament's Net Zero, Energy and Transport Committee's report on the role of local government for Net Zero highlighted local authority access to capital and skills as key barriers to overcome.^{3,4} The Improvement Service identified more standardised national guidance, mechanisms for collaboration and support to align messaging, adapt resources and improve engagement as potential actions to address this.⁵ <p>Risk due to UK Government: low</p> <p>The Scottish Government is responsible for partnering effectively with its local authorities.</p>

Progress:

- The National Planning Framework 4 includes sustainability policies against which planning applications need to be assessed.
- The 2023/24 Scottish Budget included a high-level carbon assessment recording all spending that is linked to meeting emissions reduction targets.

To be addressed:

- The Scottish Government should set out clear roles and responsibilities for delivering aspects of Net Zero and adaptation, as well as details of how these will be coordinated and accountability mechanisms (recommendation R2024-002).
 - In several areas, the Scottish Government has repeatedly failed to stick to timelines for delivering key strategies and policies. Stronger accountability mechanisms should ensure commitments are met, which will help build confidence in the Net Zero transition.
- The Scottish Government should increase transparency and detail around its expected pathways to Net Zero, quantifying the abatement expected from the policies and plans in the new Climate Change Plan (recommendation R2022-402). This was one of the recommendations in Audit Scotland's 2023 report, alongside stronger collaboration mechanisms between departments.⁶
- As recommended by the Scottish Government's Joint Budget Review and building on a recommendation from the Fraser of Allander Institute, the Scottish Government should take forward development of a Net Zero assessment process that would apply during the early stages of policy development. The Climate Emergency Response Group has published a briefing considering what this could look like.⁷
- The Scottish Government should build on the approach in the 2023/24 Budget by assessing the expected emissions impact of each measure and capturing negative impacts.
- The Scottish Government should work with the UK Government and Ofgem to develop effective ways of working between national and local governments and the newly introduced Regional Energy Strategic Planners.⁸

Risk due to UK Government: high

The UK and Scottish Governments need to work together effectively to deliver both governments' climate targets. This requires greater transparency in the plans of both, clear responsibilities, and open and frequent consultation between Holyrood and Westminster. The lack of engagement prior to recent UK announcements undermines this.

3.1.2 People and business

Scotland has seen some progress in people and business areas, especially in the areas of just transition, green choices, and public engagement. Table 3.2 outlines progress and areas to be addressed across the areas of business, finance, just transition and skills, and green choices and public engagement.

Table 3.2 People and business policy scorecard	
Sub-sector/ policy area	Sector/sub-sector assessment
Business	O
	<p>Progress:</p> <ul style="list-style-type: none"> Scottish Enterprise announced a focus on the energy transition as one of its three long-term 'missions' for Scotland's economic development strategy. While no new incentives or funding were announced, existing schemes including the Green Jobs Fund and Business Energy Scotland continue to support Scottish business decarbonisation. <p>To be addressed:</p> <ul style="list-style-type: none"> The Scottish Government should build on the establishment of the new Small Business Unit to ensure sufficient incentives, advice, engagement, and financial support are available for Scottish businesses to improve energy efficiency, adopt low carbon heating and electric vehicles, for example by scaling up funding such as that provided by Business Energy Scotland. <p>Risk due to UK Government: medium</p> <p>The UK Government holds some important levers for guiding business decarbonisation, including corporate regulatory requirements. However, economic development policy including support for businesses to respond to Net Zero is largely devolved.</p>
Finance	Mostly Reserved
	<p>Progress:</p> <ul style="list-style-type: none"> While no significant progress has been made in the area in 2023, a number of existing schemes continue, including the Green Heat Finance Task Force and a partnership between NatureScot and private finance to support and enable large-scale native woodland restoration.^{9,10} In December 2022, the Scottish National Investment Bank committed to invest over £80 million in projects in offshore wind farm servicing, renewable energy skills development, energy management and storage and data analytics for reducing energy use. <p>To be addressed:</p> <ul style="list-style-type: none"> The Green Heat Finance Task Force recommended that the Scottish Government should provide a strategy to unlock private funding to install energy efficiency and low-carbon heating measures. <p>Risk due to UK Government: medium</p> <p>The UK Government holds some important levers for guiding finance decarbonisation, including regulation of financial markets.</p>

Progress:

- The draft Energy Strategy and Just Transition Plan, published in January 2023, consults on how the government will deliver a just energy transition by increasing access to affordable energy, prioritising households at risk of fuel poverty, offering community benefits and shared ownership opportunities on renewable energy projects, and shifting investment and employment to renewable sectors in fossil fuel dependent economic areas.
- In June 2023, three discussion papers were published on transport, buildings, and land and agriculture, providing evidence on the key risks for a just transition spanning impacts on jobs and skills, fuel and transport poverty, affordability issues, and biodiversity, among others.

In addition, the Scottish Government has:

- Published a discussion paper on just transition for the Grangemouth industrial cluster that sets out how the government proposes to retain the cluster's role within the energy supply chain while supporting jobs and local communities.¹¹
- Allocated £25 million from the Just Transition Fund to the Scottish National Investment Bank to leverage private investment in the energy transition in the North East.¹²
- Included, in the Heat in Buildings consultation, flexibility and protections for specific groups and circumstances through exemptions, additional time or a modified version of the Standard.¹³
- Committed, in the 2023/24 PfG, to a Green Industrial Strategy to realise the economic opportunities of the transition.
- NatureScot also published an action plan for nature-based jobs and skills in the context of an insufficient workforce to implement nature-based solutions.¹⁴

To be addressed:

- In November 2023, the Just Transition Commission raised concerns that there had been 'minimal engagement with workers, the community, or government ministers' in relation to the announcement that Petroineos will close the Grangemouth refinery from 2025. The Scottish Government has an important role to play in ensuring a just transition for workers and local communities.
- The Scottish Government should publish the Energy Strategy and Just Transition Plan in 2024. Building on the responses to the consultations that were published in 2023, this should include a plan that sets out specific actions and demonstrates how they will help make low-carbon options accessible and affordable.
- Sectoral just transition action plans for transport, buildings and construction, and agriculture and land use should be published in 2024, setting out how risks for households and workers will be addressed in each sector, as identified in the 2023 discussion papers.
- The Climate Emergency Skills Action Plan should be updated by the end of 2024, including specific timelines and responsibilities for developing education and skills policy that align with the upcoming UK skills strategy. The plan should specifically identify the skills required for the delivery of the Climate Change Plan and demonstrate how education and skills provision will help new entrants and existing workers meet changing skills requirements.¹⁵

Risk due to UK Government: medium

The UK Government can implement cross-economy policies that will affect the cost of low-carbon technologies, such as rebalancing energy costs which can reduce energy bills. It is also expected to deliver a skills strategy that should provide clarity on skills needs across the UK. The Scottish Government is best placed to identify the risks posed by the transition and develop policies to address them, including grants and training schemes.

Progress:

- Results from the first Scottish climate change public engagement survey were published in November 2022, while development of sectoral just transition action plans is being informed by workshops, engagement events and deliberative research.^{16,17,18,19,20}

Further, the Scottish Government:

- Published its Heat in Buildings Public Engagement Strategy in December 2023, which commits to further explore embedding public participation in policy making. It also commits to actions that will help people understand the changes they need to make, actively participate in shaping policy, and support household action to install clean heating.
- Launched the £550,000 Climate Engagement Fund to fund local and national climate change engagement projects and formed the Climate Policy Engagement Network to provide a framework for stakeholders to help shape climate policy.^{21,22,23} These initiatives aim to support organisations to act as 'trusted messengers' on regional climate action and to aid communication and engagement with a wide range of communities.
- Continues to use the public-facing 'Net Zero Nation' website to increase awareness and promote household green choices around travel, home heating and buying and waste.²⁴
- Continues to fund Climate Action Towns, the Scottish Communities Climate Action Network, community climate action hubs and smaller community initiatives.²⁵
- Announced policies to make green choices more accessible, attractive, and affordable:
 - In October 2023, a six-month trial commenced allowing customers to travel on Off-Peak tickets at any time of the day on ScotRail services to encourage modal shift.²⁶ Scotland has strong concessionary public transport fares, including free bus travel for under-22s.²⁷
 - Promoting active travel and funding loans for used and new e-bikes.²⁸
 - Continuing to fund free advice around home heating and energy efficiency through Home Energy Scotland, as well as grants and interest-free loans for heat pumps, energy efficiency improvements and energy storage systems.^{29,30,31}

To be addressed:

- Communication and engagement should highlight the impact of diet and aviation and support low-carbon choices in these areas (recommendation R2024-003).

Risk due to UK Government: low

Lowering of ambitions and reluctance to consider demand-side measures at UK level may undermine consumer confidence and could therefore weaken efforts made by the Scottish Government to raise awareness of climate change and promote green choices.³²

3.1.3 UK Emissions Trading Scheme

The UK Emissions Trading Scheme (ETS) covers some emissions in the electricity supply, industry and transport sectors. From 2021 to 2023, the cap on emissions for the traded sectors was set at 5% below the UK's expected notional share of the EU ETS cap.³³

The UK ETS Authority, which includes the Scottish Government, has announced the following changes to the UK ETS:

- The cap on emissions for the traded sector will be lowered from 2024, resulting in there being 989.5 million allowances (where one allowance allows for the emission of 1 tCO₂e) in total between 2021 and 2030, which includes:
 - 887 million allowances from the 'central' trajectory set out in the UK Government's Net Zero Strategy.
 - 49 million allowances which are stated in the response to the Developing the UK Emissions Trading Scheme consultation as being for the purpose of 'supporting a smooth transition for participants and enabling continued flexibility to mitigate market risks and carbon leakage'.
 - 53.5 million allowances to 'ensure there is no sudden drop in allowance supply between 2023 and 2024'.
- On top of this, an additional 29.5 million allowances will be retained in reserve 'for future market management'.
- The ETS will be expanded to the domestic shipping, waste incineration, and Energy from Waste sectors.
- Free allocations to aviation (i.e. flights within the UK and from the UK to the European Economic Area covered by the UK ETS) will be phased out from 2026.

We welcome the tightening of the ETS cap, which will now decline sharply over time. However, its level has been set at a looser amount than in the 'central' trajectory of the UK Government's Net Zero Strategy. This means that more effort will be required in areas of the economy not covered by the UK ETS.

3.2 Adaptation

The evidence of climate change in Scotland is already clear, with the average temperature 0.65°C warmer compared to 30 years ago, increased rainfall, and the sea level around the coast rising by 10-30 mm per decade. These changes are now having clear impacts on Scotland's people and ecosystems, and further climate change in Scotland over the coming decades is inevitable no matter how rapidly global greenhouse gas emissions are reduced.

The Committee assessed Scotland's adaptation progress in the November 2023 Scotland adaptation report.³⁴

Key messages include:

- There is a clear need for further urgent action on adaptation in Scotland. Since our previous adaptation progress report in 2022, recent weather events have continued to highlight Scotland's ongoing vulnerability to weather and climate extremes.
- Notable steps have been taken on adaptation policy, including the new Fourth National Planning Framework explicitly referring to climate resilience and nature-based solutions. Yet important gaps remain, including in water supply, drought resilience standards and leakage reduction targets.
- Delivery and implementation remain slow, with only one of the 33 climate resilience outcomes set by the Committee showing progress.
- Adaptation monitoring and evaluation is slowly improving but remains limited, preventing a full understanding of climate risks and adaptation progress.
- The next national adaptation plan must embed adaptation in upcoming legislation and Net Zero policies. It should focus on driving delivery and unlocking more public and private investment.

Endnotes

- 1 Scottish Government (2023) *Heat in Buildings: progress report 2023*, <https://www.gov.scot/publications/heat-in-buildings-progress-report-2023/pages/working-with-uk-and-local-government/>.
- 2 Improvement Service (2023), *Climate Intelligence Service will support councils to deliver local climate action*, <https://www.improvementservice.org.uk/products-and-services/consultancy-and-support/climate-change/climate-intelligence-service>.
- 3 The Scottish Parliament (2023) *The role of local government and its cross-sectoral partners in financing and delivering a Net-Zero Scotland*, <https://digitalpublications.parliament.scot/Committees/Report/NZET/2023/1/23/2c9752ff-eb3f-4273-8f78-e726676a3b6e#Introduction>.
- 4 The Scottish Parliament (2023) *Unless key barriers facing local government are dealt with, Scotland will not reach net zero by 2045, says Holyrood's Net Zero Committee*, <https://www.parliament.scot/about/news/news-listing/unless-key-barriers-facing-local-government>.
- 5 Improvement Service (2023), *Report into climate change training in Scottish local government*, https://www.improvementservice.org.uk/data/assets/pdf_file/0023/43349/Climate-Training-Action-Plan.pdf.
- 6 Audit Scotland (2023) *Net Zero and climate change scrutiny*, <https://www.parliament.scot/-/media/files/committees/public-audit-committee/correspondence/2023/climate-change-pac-to-nzet-6-nov-2023.pdf>.
- 7 Climate Emergency Response Group (2023), *Committing to delivery: certainty and leadership for a just transition to a Net Zero, climate resilient future for Scotland*, <https://cerg.scot/wp-content/uploads/2023/08/CERG-Briefing-Paper-Net-Zero-Test.pdf>.
- 8 Ofgem (2023) *Decision on future of local energy institutions and governance*, <https://www.ofgem.gov.uk/publications/decision-future-local-energy-institutions-and-governance>.
- 9 Scottish Government (2023) *Green Heat Finance Taskforce: report part 1 - November 2023*, <https://www.gov.scot/publications/green-heat-finance-taskforce-report-part-1-november-2023/pages/2/>.
- 10 NatureScot (2023) *£2 billion private finance pilot potential 'vital step in restoring Scotland's woodlands'*, <https://www.nature.scot/ps2-billion-private-finance-pilot-potential-vital-step-restoring-scotlands-woodlands>.
- 11 Scottish Government (2023) *Just Transition for the Grangemouth industrial cluster: discussion paper*, <https://www.gov.scot/publications/discussion-paper-transition-grangemouth-industrial-cluster/pages/1/>.
- 12 Scottish Government (2023) *Financing a just transition*, <https://www.gov.scot/news/financing-a-just-transition/>.
- 13 Scottish Government (2023) *Delivering net zero for Scotland's buildings - Heat in Buildings Bill: consultation*, <https://www.gov.scot/publications/delivering-net-zero-scotlands-buildings-consultation-proposals-heat-buildings-bill/>.
- 14 NatureScot (2023) *Nature-based jobs and skills Action Plan 2023-2024*, <https://www.nature.scot/doc/nature-based-jobs-and-skills-action-plan-2023-2024>.
- 15 This Scottish Government (2023) *Fit for the Future: developing a post-school learning system to fuel economic transformation*, <https://www.gov.scot/publications/fit-future-developing-post-school-learning-system-fuel-economic-transformation/>.

- 16 Scottish Government (2022) *Climate change – public engagement: survey results 2022*, <https://www.gov.scot/publications/public-engagement-climate-change-scotland-2022/>.
- 17 Just Transition Commission (2023) *Scotland's Retrofit Workforce*, <https://www.justtransition.scot/publication/scotlands-retrofit-workforce/>.
- 18 Just Transition Commission (2023) *Communicating Change*, <https://www.justtransition.scot/publication/communicating-change/>.
- 19 Just Transition Commission (2023) *Can We Reduce Car Use Fairly?*, <https://www.justtransition.scot/publication/can-we-reduce-car-use-fairly/>.
- 20 Public Contracts Scotland (2023) *Deliberative research to inform Just Transition Sector Plans*, https://www.publiccontractsscotland.gov.uk/search/show/search_view.aspx?ID=MAR474293.
- 21 Scottish Government, *Climate change*, <https://www.gov.scot/policies/climate-change/public-engagement/#:~:text=Climate%20Policy%20Engagement%20Network>.
- 22 Scottish Government (2023) *Climate Engagement Fund: application form*, <https://www.gov.scot/publications/climate-engagement-fund/pages/overview/>.
- 23 Scottish Government (2022) *Open Government Partnership Network for Climate Policy: terms of references*, <https://www.gov.scot/publications/open-government-terms-of-reference/>.
- 24 Net Zero Scotland, *Net Zero Nation*, <https://www.netzeronation.scot/take-action>.
- 25 Scottish Government, *Climate change – Community-led climate action*, <https://www.gov.scot/policies/climate-change/community-led-climate-action/>.
- 26 ScotRail, *Off-Peak fares all day long*, <https://www.scotrail.co.uk/off-peak-fares-all-day-long>.
- 27 Transport Scotland, *Young Persons' (under 22s) Free Bus Travel*, <https://www.transport.gov.scot/concessionary-travel/under-22s-free-bus-travel/>.
- 28 Home Energy Scotland, *New and Used eBike Loan*, <https://www.homeenergyscotland.org/funding/ebike-loan/>.
- 29 Net Zero Scotland, *Net Zero Nation*, <https://www.netzeronation.scot/take-action>.
- 30 Home Energy Scotland, *Let's talk*, <https://www.homeenergyscotland.org/contact-advice-support-funding/>.
- 31 Home Energy Scotland, *Grants and funding for heat pump installation*, <https://www.homeenergyscotland.org/heat-pumps/grants-and-funding/>.
- 32 CCC (2023) *CCC assessment of recent announcements and developments on Net Zero*, <https://www.theccc.org.uk/2023/10/12/ccc-assessment-of-recent-announcements-and-developments-on-net-zero/>.
- 33 Department for Energy Security and Net Zero, Welsh Government, The Scottish Government, Department of Agriculture, Environment and Rural Affairs (Northern Ireland), and Department for Business, Energy & Industrial Strategy (2023) *Developing the UK Emissions Trading Scheme (UK ETS)*, <https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets>.
- 34 Climate Change Committee (2023) *Adapting to climate change Progress in Scotland*, <https://www.theccc.org.uk/publication/adapting-to-climate-change-progress-in-scotland/>.



Annex 1 – Recommendations

Table A1 Sector priority recommendations			
ID	Sector	Priority recommendations	Timing
Priority: R2022-402	Cross-cutting: Delivery	<p>Increase transparency around government's expected pathways to Net Zero. This should involve publishing more details on the assumptions that underpin these pathways and how the abatement set out in the upcoming Scottish Climate Change Plan will be achieved by planned policies, setting out the quantified abatement expected to be achieved by each policy.</p> <p>Responsibility: Mostly devolved</p>	2024
Priority: R2022-338	Surface transport: Electric vehicle charging infrastructure	<p>Develop an implementation plan to deliver the Scottish Government's vision for the public EV charging network. This should ensure the EV transition works for all road users in Scotland and accelerates in line with EV uptake, delivering 6,000 charge points by 2026 and approximately 24,000 charge points by 2030.</p> <p>Responsibility: Mostly devolved</p>	2023 Overdue
Priority: R2022-332	Surface transport: Car demand	<p>Publish a detailed strategy, building on the Route Map consultation of 2022, setting out how the Scottish Government will achieve a 20% reduction in car-kilometres by 2030 and deliver 20-minute neighbourhoods. This should include investment in more sustainable modes of travel, improvements in the affordability and reliability of public transport and measures to reduce dependency on driving.</p> <p>Responsibility: Mostly devolved</p>	2023 Overdue
Priority: R2024-004	Aviation: Aviation cross-cutting areas	<p>Publish a detailed strategy for decarbonising aviation in Scotland as soon as possible in 2024. Amongst other things, this strategy should set out a roadmap of how the decarbonisation of scheduled flights within Scotland will be achieved by 2040, including which technologies will be prioritised to achieve this and when the capability of these technologies will need to be demonstrated.</p> <p>Responsibility: Mostly devolved</p>	2024
Priority: R2022-348	Aviation: Aviation demand	<p>The Scottish Government should Implement the Air Departure Tax (ADT) as soon as possible. Consider other policy levers, such as information provision, to encourage a reduction in the number of flights taken.</p> <p>Responsibility: Mostly devolved</p>	2023 Overdue

Priority: R2022-342	Shipping: Cross-cutting	Use the upcoming Islands Connectivity Plan to set out a plan for meeting the commitment for 30% of Scottish Government-managed ferries to be low-emission by 2032 and for achieving full decarbonisation of Scotland's maritime sector. This should include consideration of zero-carbon fuels, vessel technologies, and the necessary supporting infrastructure. Responsibility: Mostly devolved	2023 Overdue
Priority: R2024-001	Buildings: Non-residential buildings	Provide clarity and a timeline, and avoid delays on the Heat in Buildings Bill in order to move towards delivery. Responsibility: Mostly devolved	2025
Priority: R2022-384	Buildings: Non-residential buildings	Consult on and finalise plans for delivering energy efficiency improvements and low-carbon heating in non-residential buildings. These should include clear target dates for meeting standards and consider the role of targets that look beyond EPCs to more reliable measures of performance and emissions reductions, and clarify whether Scotland will be part of the UK performance-based rating scheme for non-residential buildings. Responsibility: Mostly devolved	H1 2023 Overdue
Priority: R2022-406	Agriculture and land use: CAP reform	Provide detail on how post-CAP agricultural subsidies and schemes in Scotland will target funding, supporting farmers and land managers to deliver for climate mitigation alongside wider environmental goals such as climate change adaptation and biodiversity. Responsibility: Mostly devolved	H1 2023 Overdue
Priority: R2022-356	Agriculture and land use: Forestry	Ensure that funding and incentives are set at the correct level to meet the Scottish Government afforestation target of 18,000 hectares per year, supporting farmers and land managers to engage at scale. How the expected delay to the 2025 target will be mitigated should be communicated. Responsibility: Mostly devolved	Ongoing
Priority: R2022-358	Agriculture and land use: Peatlands	Implement a comprehensive delivery mechanism to address degraded peatland and extend current restoration ambition set out by the Scottish Government beyond the existing timeframe of 2030. Peat restoration targets include the need to remove all low-productive trees (i.e. less than YC10) from peatland and restore all peat extraction sites by 2035. Responsibility: Mostly devolved	2025

Priority: R2022-329	Waste: Energy from waste / incineration	Set out further detail on actions and implementation timelines to ensure all recommendations from the incineration review can be delivered. This should include explaining how the projected residual waste capacity gap in 2025 will be managed while ensuring commitments to end the landfilling of biodegradable waste are met. Responsibility: Mostly devolved	H1 2023 Overdue
Priority: R2022-376	Industry: Resource efficiency	Develop policies to drive more resource-efficient construction and use of existing low-carbon materials. This should include setting out a plan for phasing in mandatory whole-life reporting followed by minimum whole-life standards for all buildings, roads, and infrastructure by 2025, with differentiated targets by function, scale, and public/private construction. Responsibility: Equal responsibility	2023 Overdue
Priority: R2024-002	Cross-cutting: Governance	The Climate Change Plan should set out clear roles and responsibilities for delivering aspects of emissions reduction and climate change adaptation, as well as details of how these will be coordinated and accountability mechanisms. This should cover coordination of actions across Scottish Government, collaboration with the UK Government, and partnership with local authorities. Responsibility: Mostly devolved	2024
Priority: R2024-003	Cross-cutting: Public engagement	Clearly communicate to the public the most impactful ways to reduce emissions, including the impact of dietary behaviours and reducing air travel. Support people to make green choices, including through regulation and incentives, where powers are devolved. Responsibility: Mostly devolved	2024 and ongoing

Annex 2 – Methodology

GHG Account methodology

Box A1 explains the Scottish Greenhouse Gas (GHG) Account, which is the methodology used to determine compliance with Scotland's legislated climate targets.

Box A1

Scottish GHG Account

Scotland's emissions targets are assessed against the Scottish Greenhouse Gas (GHG) Account, a methodological approach used to adjust annual emissions to the methodology of the 'base inventory', which is currently the 1990 to 2020 inventory. This way, the impact of changes in methodology in determining whether Scotland has met each annual target is minimised.

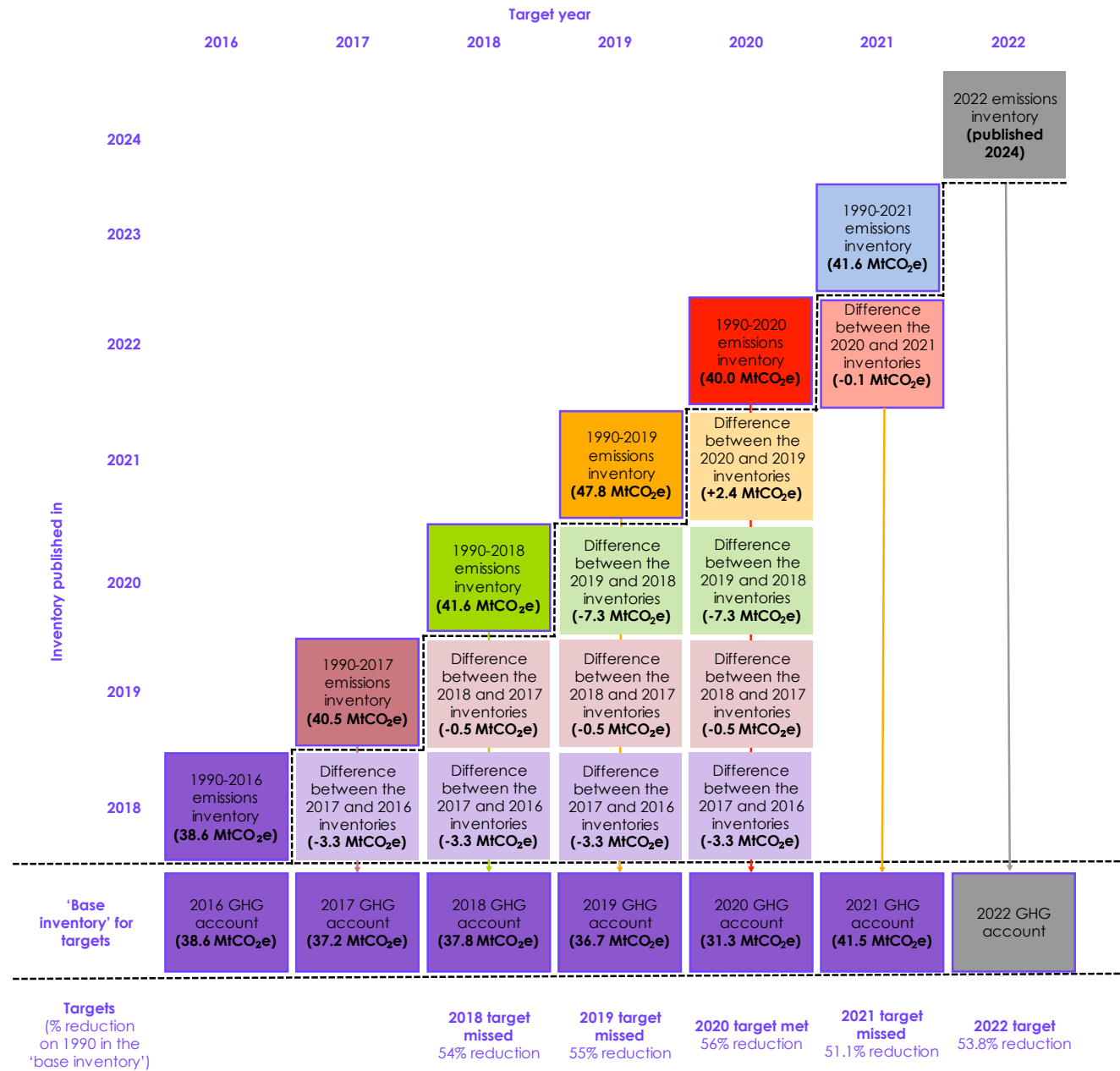
Methodology changes to the emissions inventory are designed to increase the transparency, accuracy, consistency, comparability, and completeness of emissions estimates. These can come from updates to use more accurate emissions factors and/or activity data, from changes to the internationally agreed global warming potentials of greenhouse gases, and to changes in the scope of the inventory, such as the recent update to the treatment of emissions from peatlands. Scotland is particularly susceptible to changes due to the large contribution from the land use sector, which has large uncertainties and tends to change more significantly than other sectors.

The GHG Account allows for annual emissions data to be assessed against targets while accounting for inventory changes, but not changing the target.

In any given year the GHG Account is estimated by the following steps (illustrated in Figure A1):

- Take the latest emissions inventory, which includes estimates of emissions in the most recent year and revised estimates of emissions in previous years (which had also been estimated in previous inventories).
- Take the base inventory, which is the inventory published when the targets were last updated, and which contains estimated emissions up to that year.
- Calculate the difference in emissions between the base inventory and the following inventories. Sum the differences between inventories for each overlapping year to have the combined revision between successive inventories.
- Subtract this combined difference from the latest year's emissions to estimate what they would have been if calculated with the older inventory methodology.
- Repeat steps one to four for each year until the baseline period is reached. This is the latest GHG Account.
- Express the GHG Account as a percentage of baseline period emissions as estimated in the GHG account and compare this to the annual percentage target to assess whether it was met.
- Every five years, reset the latest inventory to be the new base inventory (referred to in point 2). At this point the targets are also reviewed.

Figure A1 Scottish GHG Account



Source: CCC analysis.

Notes: (1) Following CCC's advice, the Scottish Government updated their annual targets in 2023 to account for inventory methodology changes, and the 2021 and 2022 targets in this chart are those updates in 2023. (2) The 2020 target was updated retrospectively, which means that the 2022 CCC Scotland Progress Report assessed emissions against the old 56% target rather than the new 48.5% target.

Source: CCC analysis.

Categorisation of sectors

Table A2 below sets out the differences between the CCC's sector categorisation and the one used by the Scottish Government for its Climate Change Plan update (CCPu), published in 2020. The analysis of emissions in Chapter 1 follows the CCPu's sector categorisation, while the policy assessments in the rest of the report are based on the CCC's sectors.

Table A2 Sectors in the Scottish Government's 2020 Climate Change Plan update (CCPu) vs CCC sectors	
CCPu sectors	CCC sectors
Transport	Surface transport, aviation, shipping
Industry	Industry, fuel supply, some of the F-gases
Buildings	Non-residential buildings, residential buildings, some of the F-gases
Agriculture	Agriculture
Electricity supply	Electricity supply
Waste	Waste
Land use	Land use
Engineered removals	Engineered removals

Key for policy scorecards

The assessments of policies and plans in Chapters 2 and 3 focus on the credibility of the Scottish Government's policies and plans for achieving the levels of emissions reductions that are required. This is a qualitative assessment and does not reflect a quantified gap in emissions reduction between the current status of policies and plans and the set targets. Criteria used for the assessments can be found in Table A3.

Table A3 Scoring criteria for assessing policies and plans	
	Overall score
Credible plans (G)	Credible plans with funding, enablers, and timelines in place.
Some risks (Y)	Some adjustment to plans may be needed to mitigate uncertainties and delivery or funding risks.
Significant risks (O)	Plans under development and/or further work needed to enact policies and overcome uncertainties and delivery or funding risks.
Insufficient plans (R)	Plans are either missing, clearly inadequate, or lack funding, and new proposals are needed.
Reserved	Plans have not been scored due to the policy area or sub-sector being fully reserved.
Mostly reserved	Plans have not been scored due to the policy area or sub-sector being mostly reserved.

In addition, as there are many sub-sectors or policy areas where decarbonisation also depends on actions taken by the UK Government, we have separately included an assessment (low, medium, or high) of the extent of the risk posed by UK Government actions within the narrative for each sub-sector in the scorecards.

This assessment is scored on the following criteria:

- **High:** there is a high dependency on the UK Government for progress in this area, and a high probability of them not taking the action necessary in time for Scotland to make sufficient progress.
- **Medium:** there is either a high dependency on the UK Government but a low probability of that being an issue, or a low dependency but a high probability of it being an issue.
- **Low:** there is both a low dependency on the UK Government and a low probability of that being an issue.

This is highly relevant in sectors or sub-sectors where policy is mostly reserved; for sectors or sub-sectors where decision-making is mostly devolved to the Scottish Government, the score is meant to account for indirect impacts that could affect progress in that area.

March 2024

Progress in reducing emissions in Scotland
2023 Report to Parliament

Climate Change Committee
1 Victoria Street
Westminster
SW1H 0ET

www.theccc.org.uk
[@theCCCuk](https://twitter.com/theCCCuk)