

# CLIMATE CHANGE PLAN

Monitoring Reports

May 2023



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## Introduction

This annual monitoring report is the third progress report on the [Climate Change Plan update \(CCPu\)](#) which updated the [2018 Climate Change Plan \(CCP\)](#) and was finalised in March 2021. The report is a statutory requirement set out in the [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Act 2019](#).

The 2019 Act is one of the most ambitious and comprehensive legislative frameworks on climate change in the world, increasing the ambition of Scotland's emissions reduction targets (from the Climate Change (Scotland) Act 2009) in response to the global climate emergency and UN Paris Agreement, committing Scotland to a 75% reduction in greenhouse gas emissions by 2030, and to reaching net zero by 2045.

The 2019 Act also placed the monitoring framework for climate change plans on to a statutory footing for the first time, with sector by sector reports on progress and the inclusion of matters relevant to a just transition. Two monitoring reports were published on the 2018 CCP prior to the commencement of the 2019 Act; in [2018](#) and [2019](#). No monitoring report was produced in 2020, as this fell during the process of updating the CCP. Monitoring reports were produced in [2021](#) and [2022](#).

Scotland's climate ambition is exemplified by the ambitious policies laid out in our landmark CCPu, which includes over 200 policies. As highlighted in the sector reports, many of these policies and proposals have been further developed since via delivery plans. These include:

- the [Heat in Buildings Strategy](#),
- the [route map](#) to achieve a 20% reduction in car kilometres by 2030.
- The [Vision for Agriculture](#) and the [National Test Programme](#), aiming to transform agriculture, ensuring Scotland become a global leader in sustainable and regenerative agriculture and a consultation on a new Agriculture Bill.

We have also consulted on a variety of measures including: the [Circular Economy Bill](#), the [Waste Route Map](#) and Land Reform Bill in a Net Zero Nation.

The revised [National Planning Framework 4](#), the [Joint Budget Review](#), the [draft Energy Strategy and Just Transition Plan](#) and the [Biodiversity Strategy](#) have also been published.

To see what else Scotland is doing to help meet the goals of the Paris Agreement, including on climate change adaptation and international climate action, please also see the [indicative Nationally Determined Contribution](#) published in advance of COP26 in 2021.

On green jobs, Scotland is the best performer across the UK according to [PWC's Green Jobs barometer](#) which is a tool to track job creation, wider employment benefits, job loss, and worker perceptions with relevance to the green transition.

## Overview

This set of monitoring reports on the CCP is complementary both to the CCPu (which in itself updates the 2018 CCP) and the most recent Official Statistics on Scotland's greenhouse gas emissions (which are for 2020), and is best read alongside these documents.

The Monitoring Framework for each of the sectors of the CCPu is structured on three levels: greenhouse gas emissions statistics provide the highest level measure of progress at an economy wide and sectoral level; a suite of policy outcome indicators measure the success of policies in achieving the changes that are needed; and a policy tracker monitoring implementation of specific policies and proposals.

## Greenhouse Gas Emissions Statistics

Official Statistics on Scottish greenhouse gas emissions determine progress towards national emissions reduction targets and also provide information on total annual emissions at a sectoral level.

Statistics are published annually, typically in June, and two years in arrears. For example, the most recent figures, published in [June 2022](#), cover emissions during 2020.

Those figures show that, on the basis used for reporting progress to Scotland's statutory economy-wide targets, emissions are now down by 58.7% (between the 1990 baseline and 2020). The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 specified a target of a 56.0% reduction over the same period.

We recognise that emissions during 2020 were significantly influenced by the impacts of COVID-19 - in particular in the transport sector. We remain absolutely committed to ensuring Scotland plays its full part on delivering on the Glasgow Climate Pact, which reaffirmed the global goal of limiting warming to 1.5 degrees Celsius. The latest emissions data for 2020 shows that Scotland's emissions are down by over 50% since the 1990 baseline, over half way to net zero. While there can be no satisfaction taken in emissions reductions resulting from such economic and social harms, the data highlights the scale of the transformational changes needed in response to the climate emergency and the centrality of transport emissions to achieving that aim. The challenge is to achieve these outcomes in ways that are sustainable and just. The latest emissions data does not yet reflect the strengthening of action through the CCPu.

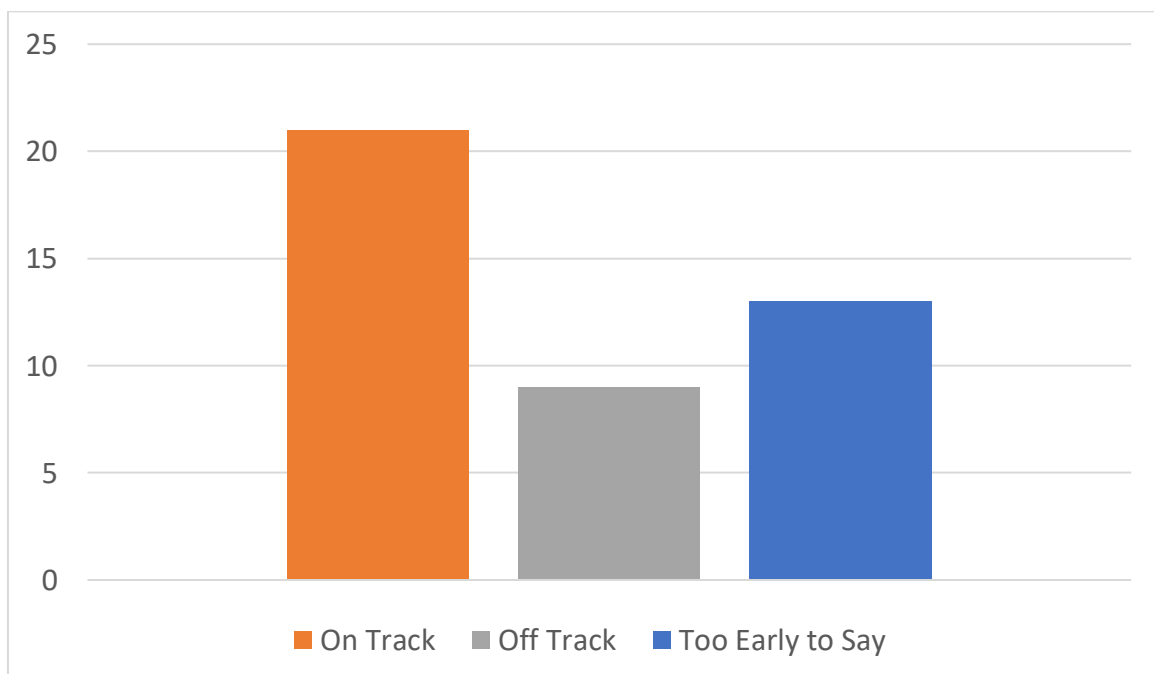
Future monitoring reports alongside the published sets of emissions statistics, will allow us to keep the progress under regular review and make further adjustments as needed. It should be noted that the indicators set out in this monitoring framework largely relate to policies within the control of the Scottish Government. Nonetheless, the overall economy-wide emissions outcomes, and therefore whether statutory targets are able to be met, also depends on a range of wider actions – including

action taken by the UK Government – given, as the CCC has noted, many key levers are reserved to the UK Government -and the private sector, and the pace of development and availability of technologies required to decarbonise certain sectors.

## Policy Outcome Indicators

The CCP includes key policy outcomes for each sector, defined as a measurable change on the ground resulting from a policy or combination of related policies. The Framework will measure progress towards achieving these with a set of policy outcome indicators. A policy outcome indicator is a specific, objective measure closely aligned to achieving the outcome. It will underpin monitoring of long-term progress towards the outcome, but should also be responsive to change in the near term, so that it can be used to evaluate whether the CCP is on track. Specific milestones (or targets) are set, where appropriate, for the level of the indicator to be achieved at a given time.

In the CCPu, the set of outcome indicators from the 2018 CCP were reviewed to ensure that they reflect the updated policy commitments and to improve the quality and clarity of indicators. This led to new outcome indicators being identified, others being revised, and a few being removed where they were no longer appropriate or there were significant issues with robustness. In the last year of reporting, we have amended several indicators meaning there are now 43 indicators in total. An explanation of where indicators have been amended is included in each sector's chapter. The following figure and table show the overview of progress against all policy outcome indicators across the sectors.



Compared to last year's report, more indicators are now assessed as "too early to say". The reasons for such assessments on an individual basis are laid out in more detail in sector chapters, reasons for such an assessment include lack of available data in some cases, cases where indicators measuring technologies not yet on-

stream (e.g. % reduction in emissions from scheduled flights within Scotland ) and cases where monitoring frameworks are yet to be established.

Summary Table 1: Progress against policy outcome indicators

	On Track	Off Track	Too Early to Say
<b>Chapter 1: Electricity</b>			
Electricity grid intensity (CO <sub>2</sub> e per kilowatt hour)	X		
Installed capacity of renewable generation (GW)	X		
Renewable capacity at planning stages (GW: 3 categories)	X		
Loss of Load Expectation (hours per year)	X		
<b>Chapter 2: Buildings</b>			
Number of existing domestic properties using low and zero greenhouse gas emissions heating (LZDEH) systems			X
Services sector fossil fuel heat consumption			X
% of non-electrical heat consumption met from renewable sources			X
Energy intensity of residential buildings (MWh per household)		X	
Emissions intensity of non-domestic buildings (tonnes of CO <sub>2</sub> e per £ million Gross Value Added)		X	
% of homes with an EPC <sup>2</sup> (EER, <sup>3</sup> or equivalent) of at least C			X
% new homes built with a calculated space heating demand of not more than 20 kWh/m <sup>2</sup> /yrT	X		
Percentage of households in fuel poverty			X
<b>Chapter 3: Transport</b>			
% reduction in car kilometres	X		
% of new car registrations that are ULEV	X		
% of new van registrations that are ULEV	X		
% of new HGV registrations that are ULEV			X
% of new bus registrations that are ULEV	X		
% reduction in emissions from scheduled flights within Scotland			X
% of ferries that are low emissions	X		
% of single track kilometres electrified	X		
% of train kilometres powered by alternative traction			X
<b>Chapter 4: Industry</b>			
Industrial energy productivity (£GVAm per GWh)		X	
Industrial emissions intensity (tCO <sub>2</sub> e per £GVAm)		X	

<sup>2</sup> Energy Performance Certificate

<sup>3</sup> Energy Efficiency Rating

% of Scottish gas demand accounted for by biomethane and hydrogen blended into the gas network			X
<b>Chapter 5: Waste</b>			
Total amount of landfilled waste (tonnes)		X	
Total amount of biodegradable landfilled waste (tonnes)	X		
Number of closed landfill sites with exploratory landfill gas capture/ flaring		X	
Household and non-household food waste reduced (tonnes)		X	
Total waste generated (tonnes)	X		
<b>Chapter 6: LULUCF</b>			
Hectares of woodland created per year		X	
Woodland ecological condition			X
Woodland Carbon Code: Projected carbon sequestration (validated credits)	X		
Annual volume (in millions of cubic metres) of Scottish produced sawn wood and panel boards used in construction			X
Hectares of peatland restored per year		X	
Peatland Carbon Code: Projected emissions reduction (validated units)	X		
<b>Chapter 7: Agriculture</b>			
Increased engagement with Farm Advisory Services on environmental issues and climate change	X		
Use of Nitrogen fertilisers	X		
Spreading precision of Nitrogen fertilisers	X		
Nitrogen use efficiency for crop production			X
Time taken from birth to slaughter and increased efficiency through improved health and reduced losses	X		
Improvement in covered slurry storage	X		
Precision application of manure and slurry			X
Area of woodland on agricultural land	X		

## Policy Tracker

The CCPu includes a set of specific policies and proposals for each sector to achieve the policy outcomes. Part C of each policy chapter monitors progress towards implementing policies and developing proposals. This consistently records progress and next steps for policies, and where possible includes implementation indicators for specific policies.



# Climate Change Plan Monitoring Report 2023: Electricity

## Part A - Overview of sector

The 2020 annual emissions envelope published in the 2018 CCPu for this sector was for 1.7 MtCO<sub>2</sub>e<sup>4</sup>, whereas the outturn emission statistics for this year (published in June 2021) show a position of 1.7 MtCO<sub>2</sub>e. On the basis of comparing these figures, the sector was **within** its envelope in 2020.

The CCPu sets out the following three policy outcomes for this sector, the indicators for which are summarised below:

The electricity system will be powered by a high penetration of renewables, aided by a range of flexible and responsive technologies.	On Track	Off Track	Too Early to Say
Electricity grid intensity (CO <sub>2</sub> e per kilowatt hour)	X		
Installed capacity of renewable generation (GW)	X		
Renewable capacity at planning stages (GW: 3 categories)	X		

Scotland's energy supply is secure and flexible, with a system robust against fluctuations and interruptions to supply.	On Track	Off Track	Too Early to Say
Loss of Load Expectation (hours per year)	X		

Scotland secures maximum economic benefit from the continued investment and growth in electricity generation capacity and support for the new and innovative technologies which will deliver our decarbonisation goals.

There are no indicators for this policy outcome. More information is provided in Part C.

## Just transition and cross economy impacts

We wish to understand and report on the broader just transition and cross-economy impacts of our emissions-reduction activities in addition to these sector specific policy outcomes and indicators. To do this, in this report we use data from the Office of National Statistics (ONS): Low Carbon Renewable Energy Economy (LCREE) publication. The LCREE data presented in this report is based on survey data of businesses which perform economic activities that deliver goods and services that are likely to help generate lower emissions of greenhouse gases, for example low carbon electricity, low emission vehicles and low carbon services.

<sup>4</sup> Emissions data for baseline and 2020 have been updated to reflect a forthcoming change in the global warming potentials for non-CO<sub>2</sub> greenhouse gases.

The LCREE indicator is narrowly defined and, while useful within its limited scope, does not give us the full picture of the impacts on workforce, employers and communities and progress towards a just transition.

Over the next few years we will work to develop a more meaningful set of success outcomes and indicators aimed at tracking the impacts of our policies on a just transition to net zero.

## Sector commentary on progress

Scotland has made significant progress decarbonising the electricity sector, and has maintained an electricity grid intensity of below 50 gCO<sub>2</sub>e/kWh for the years 2017-2020. The overall downward trend from a carbon intensity of 320 gCO<sub>2</sub>e/kWh in 2010, is chiefly the result of the closure of two coal fired power stations in 2013 and 2016, as well as reduced reliance on gas for power generation.

The Scottish Government has set an ambition of up to 12 GW of additional onshore wind capacity by 2030, as set out in our Onshore Wind Policy Statement published December 2022. We are also consulting on setting solar and tidal & wave energy deployment ambitions as part of our final Energy Strategy and Just Transition Plan (ESJTP).

The ScotWind Offshore Wind Leasing Round resulted in a developer ambition of delivering 27.6 GW of offshore wind generating capacity across 20 projects, which if approved, would deliver far in excess of our current planning assumption of 10 GW of offshore wind. ScotWind is by far the world's largest commercial round for floating offshore wind and breaks new ground in putting large-scale floating wind technology on the map at GW scale. In light of the market ambition expressed in the ScotWind leasing round, we are consulting on increasing our existing ambition of 8 – 11 GW of offshore wind by 2030 through the draft ESJTP, as well as setting an ambition by 2045.

On 24 March 2023, 13 projects were offered Exclusivity Agreements in the Innovation and Targeted Oil and Gas (INTOG) leasing round. Exclusivity Agreements will cover projects with a proposed capacity of up to 499 MW for IN and 5 GW for TOG. This milestone in the INTOG leasing round is the next step in realising another world leading opportunity for Scotland's energy transition: helping both decarbonise our existing oil and gas operations while helping our offshore wind sector to expand, innovate and deliver on our ambition to be a renewables powerhouse.

The Scottish Government is also committed to reviewing its energy consenting processes and to continuing efforts to ensure a sustainable security of electricity supply. Significant powers required to decarbonise electricity in Scotland remain reserved to the UK Government. In particular, the Scottish Government is calling for

a reform to the Contract for Difference mechanism and to transmission charging. To modernise and accelerate consenting of electricity infrastructure, we are also seeking further powers from the UK Government.

[Developments in monitoring arrangements since last report](#)

N/A

## Part B – Progress to policy outcome indicators

**Policy Outcome:** Cross-sectoral social and economic

**Indicator:** FTE employment in Low Carbon Renewable Energy Economy Indicator

**On-Track Assessment (Milestones/Targets):** Year-to-year change

**Most Recent Data:** 2021

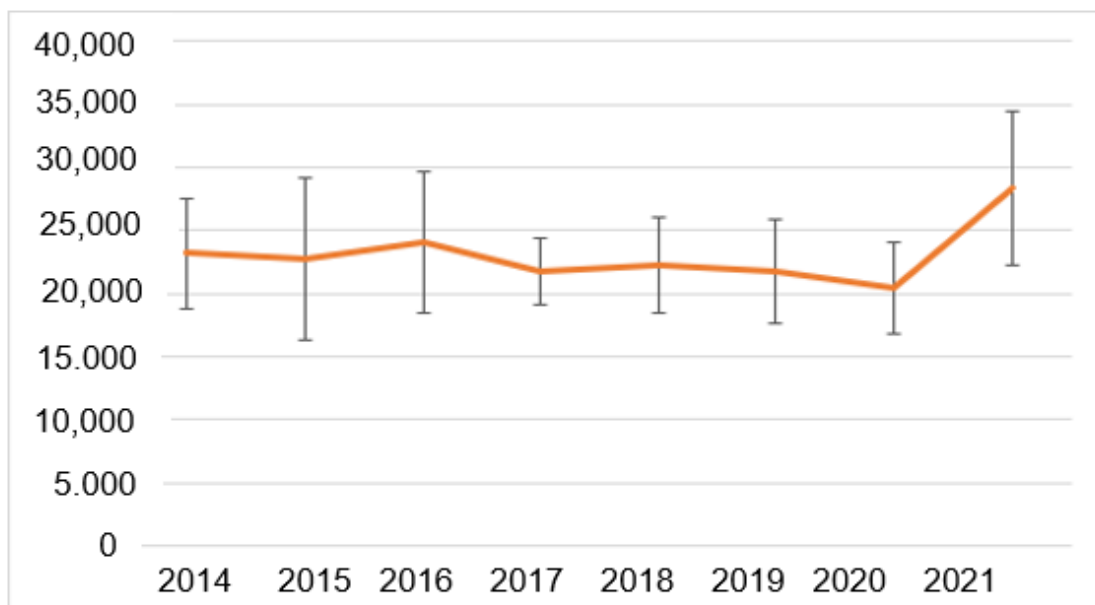
**Data Source(s):** Office of National Statistics: Low Carbon Renewable Energy Economy (LCREE), Time spent of Green Tasks

**Assessment:** Too Early to Say

### Commentary:

- In 2021, the Scottish low carbon renewable energy (LCREE) sectors were estimated to provide 28,300 jobs, the highest in the published data.
- The estimates of LCREE are based on a relatively small sample of businesses and hence are subject to a wide confidence interval. Scottish LCREE employment in 2021 is substantially higher than previous years but the difference is not statistically higher than 2020.

Employment in Low Carbon Renewable Energy Economy, FTE



- LCREE only shows employment in roles in industries directly involved in the transition to net zero.
- The ONS also released experimental statistics on a wider perspective of green activity in the economy with their time spent on green tasks release.
- These stats reflect green activities in both LCREE and non-LCREE sectors. The 2023 data have not yet been published.

- Last year's publication showed that in 2019 Scotland achieved an all-time high of hours spent on green tasks and proportion of workers doing green tasks, including workers who spend more than 20% of their time on green tasks.
- The proportion of workers doing green tasks in Scotland was 36% in 2019, up from 23.8% in 2004. Workers who have spent more than 20% of their time doing green tasks was 14%, up from 9% in 2004.
- The proportion of overall hours spend doing green tasks in Scotland was 7%, up from 4.9% in 2004.

Policy Outcome: 1

Indicator: Electricity grid intensity (CO<sub>2</sub>e per kilowatt hour)

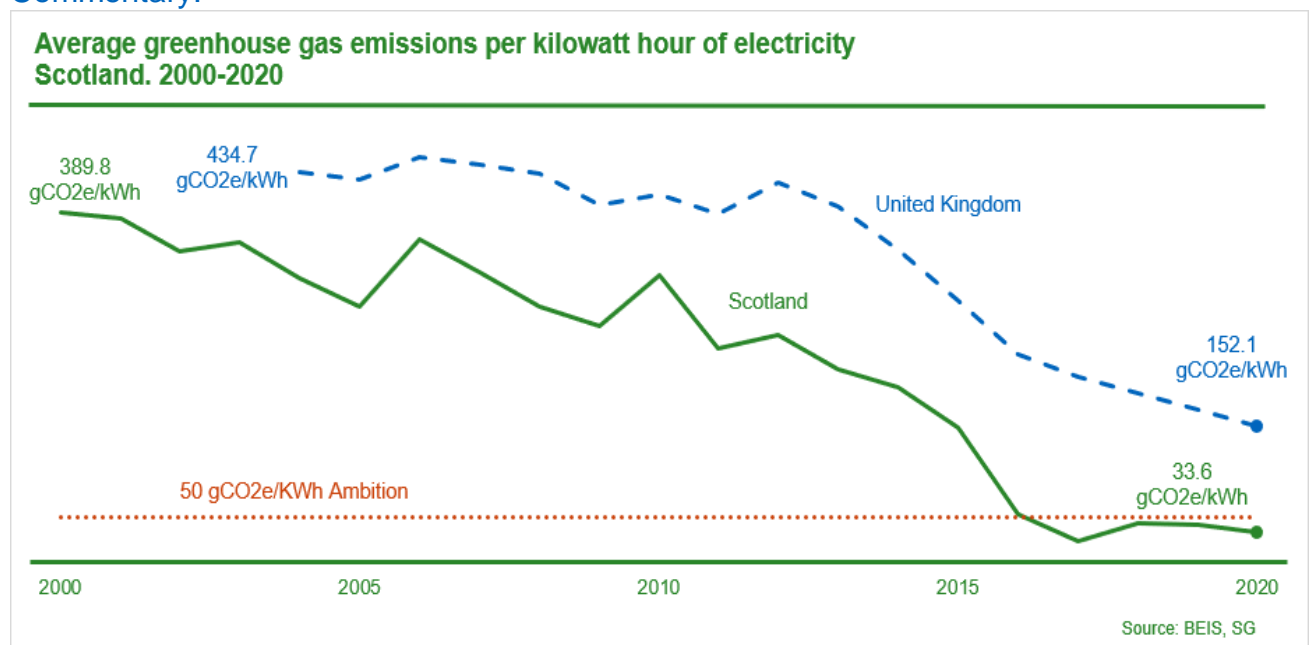
On-Track Assessment (Milestones/Targets): Maintain below 50g CO<sub>2</sub>e per kilowatt hour

Most recent data: 2020

Data source(s): DESNZ Energy Trends, Scottish Greenhouse Gas Statistics

Assessment: On Track

Commentary:



- Scottish Grid emissions are calculated by taking emissions from the electricity sector divided by total electricity generated.
- Scotland has maintained an electricity grid intensity of below 50 gCO<sub>2</sub>e/kWh since 2017.
- 2020 saw grid emissions fall on 2019 levels from 41 to 34 gCO<sub>2</sub>e/kWh.
- The overall downward trend observed from a carbon intensity of 320 gCO<sub>2</sub>e/kWh in 2010, is chiefly a result of the closures of Cogenzie and Longannet coal fired power stations in 2013 and 2016 respectively, as well as a reduced reliance on gas for power generation.
- With the closure of Hunterston B Nuclear power station in 2022, Scotland now has just one nuclear power plant left at Torness that is due to close in 2028.
- Emissions from power generation are now concentrated in one large gas fired power plant at Peterhead and a handful of small sites across the country, primarily on the Islands.

- Our expectation is that with an increased penetration of renewables, and no planned expansion of unabated fossil fuel power generation, Scottish grid intensity will remain consistently below 50 gCO<sub>2</sub>e/kWh in the future.

Policy Outcome: 1

Indicator: Installed capacity of renewable generation (GW)

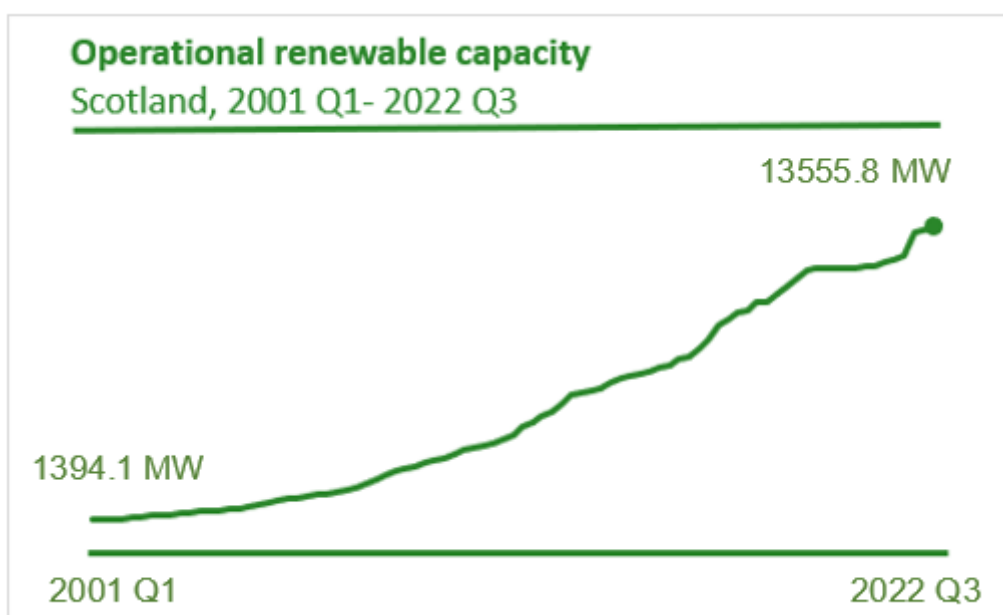
On-Track Assessment (Milestones/ Targets): Year-to-year change

Most recent data: Q3 2022

Data source(s): DESNZ Energy trends, DESNZ Renewable Energy Planning Database (REPD)

Assessment: On Track

Commentary:



- Scotland had 13.6 GW of installed renewable electricity generation capacity operational in 2022 Q3.
- The bulk of this capacity (8.8 GW) is onshore wind with the next largest capacity coming from offshore wind (2.1 GW) which has overtaken large hydro in terms of capacity since the 2022 monitoring report.
- Offshore wind has grown from 0.2 GW in 2017 to 2.1 GW in 2022 Q3. This is expected to rise considerably in the 2020s and 2030s with developer ambitions of almost 28 GW of offshore wind capacity across the 20 ScotWind projects successful in the leasing round.
- From the 2015 baseline total renewable capacity has grown by around 78% to 2022 Q3.
- The capacity of other renewable technologies has also risen. Solar capacity has increased almost 90% from 2015 from 264 MW to 411 MW.
- The largest share of solar capacity is from sites of 50 MW or greater, which make up around 46% of total solar capacity. Smaller sites less than 5 MW make up around 20% of capacity. These small projects could provide an important contribution to the development of smart, decentralised and local energy markets in Scotland.



Policy Outcome: 1

Indicator: Renewable capacity at planning stages (GW: 3 categories)

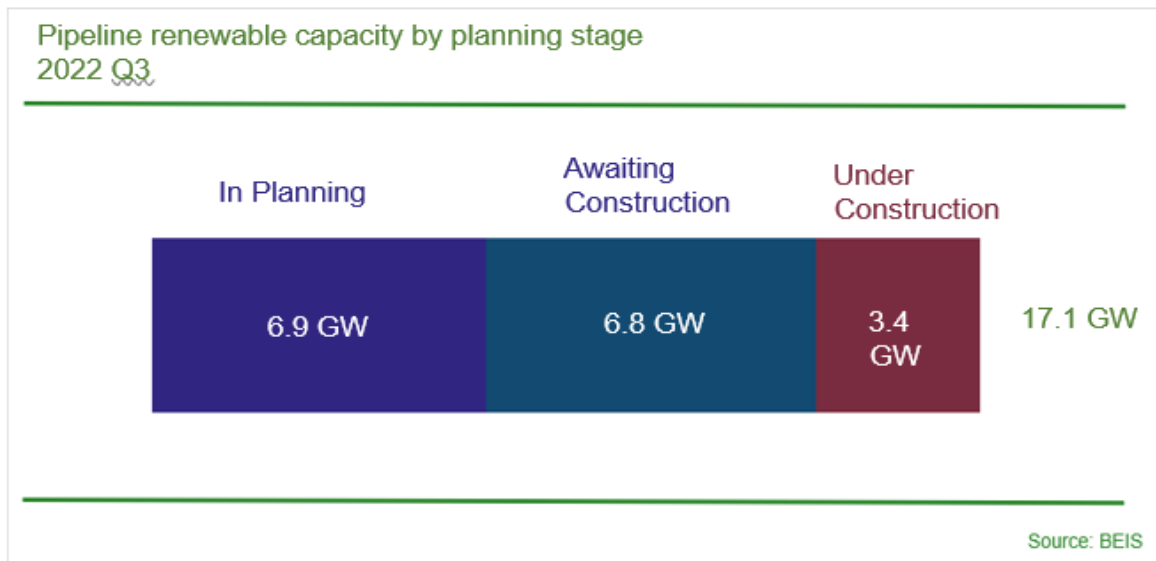
On-track Assessment (Milestones/Targets): Year-to-year change

Most recent data: 2022 Q3

Data source(s): DESNZ renewable Energy Planning Database (REPD)

Assessment: On track

Commentary:



- Total Renewable capacity in the pipeline for Scotland was around 17.1 GW in 2022 Q3.
- There are 397 projects in the pipeline in Scotland. The majority of these projects are onshore wind farms which make up around 55% of projects and 66% of capacity (11.2GW).
- After wind, bioenergy and solar are the next biggest contributors to capacity with 501 MW and 317 MW respectively.
- Pipeline estimates do not include all of the potential 28GW of offshore wind that the ScotWind leasing round, or INTOG, could add. This is due to projects not yet being included in the REPD, which is used for calculating pipeline capacity, as these projects are still subject to planning and consenting decisions.
- Total renewable capacity in the pipeline in Scotland has fluctuated between 10 GW and 17 GW for the past decade.
- Of the total capacity of 17.1 GW, 3.4 GW is under construction, most of which are offshore wind farms in the Moray firth. 6.8 GW are awaiting construction and 6.9 GW in planning.
- Were all capacity in the pipeline to be delivered it would more than double the level currently deployed, and could generate an estimated 40.3 TWh of renewable electricity per year. However, there are a number of factors that

may mean that projects in planning and consented may not progress to commissioning.

Policy Outcome: 1

Indicator: Loss of Load Expectation (hours per year)

On-track Assessment (Milestones/Targets): Maintain GB standard below 3 hours per year

Most recent data: October 2022

Data source(s): National Grid Winter Outlook

Assessment: On Track

Commentary:

- Loss of Load Expectation (LOLE) is a measure of security of supply of the GB electricity system. This is measured through the number of probability projected hours of a year in which demand could exceed supply, and which would require measures be taken by National Grid Electricity System Operator.
- Given the ongoing conflict in Ukraine, National Grid Electricity System Operator (ESO) modelled several different demand and supply scenarios to assess the GBs Security of Supply going into Winter 22/23.
- Their modelling indicates that across the scenarios the GB grid should remain within the GB standard of 3 hours LOLE per year.

## Part C - Information on implementation of individual policies

Outcome 1: The electricity system will be powered by a high penetration of renewables, aided by a range of flexible and responsive technologies

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Support the development of a wide range of renewable technologies by addressing current and future challenges, including market and policy barriers.	CCP 2018	<p><b>Onshore Wind:</b> In December 2022 SG published its final onshore wind policy statement setting an ambition of 20 GW of onshore wind by 2030. SG continues to maintain its focus on tackling barriers to deployment- such as aircraft and seismological radar issues - working in partnership with the industry and other stakeholders through our recently established onshore wind strategic leadership group. The onshore wind strategic leadership group will focus on the development of an onshore wind sector deal. This will form the basis of a commitment between industry and SG to enable the delivery of the 20 GW ambition, whilst ensuring maximum benefits to the people of Scotland.</p>	N/A	<p>Onshore wind – sector deal in 2023.</p> <p>Offshore wind – consulting on revised offshore ambitions in the draft ESJTP</p> <p>INTOG exclusivity agreements offered in April 2023.</p> <p>Solar – final solar vision as part of final ESJTP.</p>

	<p><b>Offshore Wind:</b> In January 2022, CES announced the winners of the ScotWind leasing round. The developer ambitions for ScotWind add up to almost 28 GW of offshore wind across 20 projects. A further offshore wind leasing round, Innovation and Targeted Oil and Gas (INTOG) is currently in progress in Scottish waters. This leasing round is designed to enable development of projects that will specifically deliver green energy to oil and gas installations, and to test new technology or solutions in Scottish waters.</p> <p>In light of the new market ambitions, we are consulting on updating our ambition of 8 – 11 GW of offshore wind by 2030 through the draft ESJTP. We are also seeking views on establishing a new ambition for deployment by 2045. We are continuing to work with UKG and the offshore wind industry through the Scottish Offshore Wind Energy Council (SOWEC) to tackle barriers to deployment.</p> <p><b>Solar:</b> Solar power has an important role in continuing to decarbonise our heat and electricity supply. Our draft ESJTP set out a vision for the future of solar in Scotland and requested</p>		
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		<p>stakeholder views on whether a deployment ambition for solar should be set. We expect a final solar vision to be published as part of the final ESJTP. Solar projects are also supported through a range of Scottish Government funding programmes; including Home Energy Scotland / the SME Loan Fund &amp; the Community and Renewable Energy Scheme (CARES).</p> <p><b>Hydro:</b> Scotland has a proud history of hydro power and it has the potential to play a significantly greater role in the energy transition.</p> <p>We will continue to advocate for the UK Government to provide a proper support mechanism for the further development of hydro projects through a cap and floor regime.</p>		
Support improvements to electricity generation and network asset management, including network charging and access arrangements that encourage the deployment and viability of renewables projects in Scotland.	CCP 2018	<p>Network charging and access is an area of policy reserved to the UK Government.</p> <p>The Scottish Government continues to make the case to Ofgem and the UK Government for a change to the transmission charging methodology and for assurances that charging and access rights create a level playing field that will support both an accelerated</p>	N/A	Ongoing, though the powers in this space are largely reserved to the UK Government.

		<p>transition to net zero and protect consumers.</p> <p>The Scottish Government is engaging in a number of different ways in relation to these complex policies including:</p> <ul style="list-style-type: none"> <li>• Responding to the UK Government's REMA consultation in October 2022. We continue to engage with the UK Government and Ofgem to ensure Scotland's needs and interests are represented in wholesale electricity market reform.</li> <li>• Supporting the work of Ofgem's Transmission Network Use of System (TNUoS) Charges taskforce.</li> </ul> <p>Engaging with the ESO, Ofgem and the UK Government regularly to make clear what is needed to support further renewables deployment in Scotland and consumers in Scotland.</p>		
Publish a revised and updated Energy Strategy, reflecting our commitment to net zero and key decisions on the pathways to take us there.	March 2020	The Scottish Government published its draft ESJTP on 10 January 2023, and the ESJTP will be open for consultation until 9 May 2023. The final ESJTP will be published in due course.	N/A	The final ESJTP will be published once we have conducted a thorough review of the consultation responses and engaged with the full range of stakeholders.

<p>Develop and publish a Hydrogen Policy Statement by the end of 2020, followed by a Hydrogen Action Plan during 2021.</p>	<p>2020/21 PfG</p>	<p>Hydrogen Policy Statement published November 2020. Draft Hydrogen Action Plan published November 2021. Finalised Hydrogen Action Plan published in 2022.</p>	<p>N/A</p>	<p>Ongoing implementation of the Hydrogen Action Plan to support the development of the hydrogen economy to meet an ambition of 5 GW of renewable and low carbon hydrogen production capacity by 2030.</p> <p>SG will ensure the regulatory / planning / consenting framework for renewable energy &amp; hydrogen developments support the scale -up of hydrogen going forwards.</p> <p>We will also ensure our ambitions for onshore/offshore wind development in Scotland support our 5 GW by 2030 hydrogen ambition.</p> <p>Work will continue to build on our evidence base understanding the extent of the role hydrogen is likely to play in both domestic / global markets.</p>
<p>A new renewable, all energy consumption target of 50% by 2030, covering electricity, heat and transport.</p>	<p>CCP 2018</p>	<p>In 2020 Scotland, total renewable energy met the equivalent of 26.7% of total nationwide consumption. (This is an increase of 2.7 percentage points since 2019; when the figure stood at 24.0%)</p> <p>This rise is largely attributable to greater renewable electricity</p>	<p>N/A</p>	<p>Ongoing</p>



		<p>generation. Around 1,800 GWh extra renewable electricity was generated between 2019 – 2020 – much of this as a result of increased wind generation.</p> <p>In 2020:</p> <ul style="list-style-type: none"> <li>• The amount of electricity generated in Scotland from renewable sources was the equivalent of 21.9% of total energy consumption.</li> <li>• The amount of heat generated in Scotland from renewable sources was the equivalent of 3.4% of total energy consumption.</li> <li>• The amount of energy from renewable sources used by transport was the equivalent of 1.3% of total energy consumption.</li> </ul>		
Introduce a new framework of support for energy technology innovation, delivering a step change in emerging technologies funding to support the innovation and commercialisation of	CCPu 2020	SG established the Scottish Marine Energy Industry Working Group as a forum for the sector to speak with one voice about its priorities and the steps needed to maintain Scotland’s competitive advantage. The group was reconvened to produce a suite of papers on the key opportunities, barriers and collective actions needed	N/A	<p>The current consultation of the ESJTP provides an opportunity to engage further with the sector and to develop our strategic approach to marine energy.</p> <p>We expect a final marine vision to be published as part of the final ESJTP.</p>

<p>renewable energy generation, storage and supply.</p>		<p>to build on the sectors achievements to date. Published January 2023 the papers include several industry recommendations for consideration.</p> <p>These recommendations helped to shape and develop an outline marine 'vision' for the future of marine in Scotland which was published in the draft ESJTP.</p> <p>The draft also includes questions about the introduction of a new level of ambition for marine energy and potential near-term action to achieve those aims.</p>		<p>SG will continue to support the Wave Energy Scotland programme, which runs from 2022-26, as it drives further innovation and international collaboration, and prepares for the larger-scale demonstration of wave energy technology in Scotland.</p>
<p>Renewed focus on developing local energy projects and models, including through CARES, supporting the achievement of 2 GW of renewable energy being in Local Community ownership by 2030.</p>	<p>CCP 2018</p>	<p>Local and community energy projects and models continue to be supported through the Scottish Government CARES Programme.</p>	<p>Annual report on Community and Locally Owned Energy in Scotland, produced by EST through the CARES contract on SG's behalf (which monitors progress toward targets).</p> <p>As of December 2021, an estimated 896 MW of community and locally owned</p>	<p>A new CARES contract began in 2021, and runs until 2025, which has an increasing focus on heat decarbonisation. Support such as the Community Buildings Fund and Community Heat Development Programme were launched in 2022 and will run until the end of the contract, subject to funding availability.</p>

			renewable energy capacity was operational in Scotland.  This represents 45% progress towards the 2030 target.	
We will carry out detailed research, development and analysis during 2021 to improve our understanding of the potential to deliver negative emissions from the electricity sector.	CCPu 2020	Research has been undertaken to better understand the potential for negative emissions technologies in Scotland. See NETs chapter.	See NETs chapter	Ongoing.
We will continue to review our energy consenting processes, making further improvements and efficiencies where possible, and seeking to reduce determination timescales for complex electricity generation and network infrastructure applications.	CCPu 2020	The Scottish Government's Energy Consents Unit continues to ensure a fully resourced unit, which will deliver efficiencies on determination timescales following the implementation of increased application fee regulations. The officers within the Energy Consents Unit continue to receive training- from internal / external resources in relation to key aspects of assessment and decision-making. External stakeholder engagement has taken place to explore mechanisms to accelerate determination timescales. The Scottish Government is calling for	SG and stakeholders continue to work together and implement actions to accelerate determination timescales for electricity generation and network infrastructure applications.	Energy Consents Unit is reviewing its current processes and engaging with planning authorities and statutory consultees with the aim of streamlining processes. Energy Consents Unit is undertaking further work on standardisation of consent conditions.

		regulatory changes by the UK Government to allow the grid onshore consenting process to be reformed, to accelerate timescales.		
We will deliver the actions from our Offshore Wind Policy Statement, published in 2020. These actions, ranging from support for supply chain, planning, innovation and skills, will support the development of between 8 and 11 GW off offshore wind capacity by 2030.	CCPu 2020	The results of the ScotWind offshore wind seabed leasing process were announced on 17 January 2022. The combined ambition of ScotWind projects is almost 28 GW of generating capacity. The planning and consenting processes that lie ahead means it is not possible to know now exactly what scale of development will be permitted ultimately. However, we are seeking to maximise the opportunities from ScotWind and deliver on the ambition set out in the Offshore Wind Policy Statement. We recognise that the ambition set out in the OWPS needs to be reviewed in light of the market ambition expressed in response to the ScotWind leasing round. We are using the draft ESJTP to consult on increasing this ambition, and we are also consulting on establishing a 2045 ambition for offshore wind in Scotland.	N/A	Ongoing

Accelerate our work with aviation, energy and other stakeholders to ensure that all radars are wind turbine tolerant/neutral during the coming decade	CCPu 2020	<p>The finalised Onshore Wind Policy statement was published in December 2022. The Onshore Wind Aviation Radar Delivery 2030 group (OnWARD 2030) has now been formed, led by RenewableUK, and formed at the request of the DESNZ led Aviation Management Board.</p> <p>The aim of this group is to create a more collaborative and strategic relationship between the aviation &amp; renewables industries; delivering mutual benefit and allowing for strategic solutions to barriers for deployment.</p> <p>The SG has maintained continuous official level representation on the Air Defence and Offshore Wind Programme Board, part of the OWIC Aviation and Radar workstream, in order to maintain engagement and seek solutions for defence and civil radar issues to co-ordinate and oversee delivery of the mitigation of impacts.</p>	OnWARD 2030 meets monthly and feeds into the UKG led Aviation Management Board. The Scottish Government is an active member of both of these groups.	To follow up with RUK group 'ONWARD' as their membership and workplan develops.  Offshore wind – ongoing.
Review and publish an updated Electricity Generation Policy Statement ahead of the next CCP.	CCPu 2020	The draft ESJTP sets out a strategic vision for the future of the electricity sector in Scotland and actions to deliver that.	N/A	The final ESJTP will provide further detail on the future of Scotland's electricity sector.

Outcome 2: Scotland's electricity supply is secure and flexible, with a system robust against fluctuations and interruptions to supply

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>Support the development of technologies which can deliver sustainable security of supply to the electricity sector in Scotland and ensure that Scottish generators and flexibility providers can access revenue streams to support investments</p>	<p>CCPu 2020</p>	<p>The Scottish Government continues to engage with Ofgem / Department for Energy Security &amp; Net Zero on the need for support for long duration energy storage.</p> <p>The Scottish Government provided £550,000 of match funding (through the Low Carbon Infrastructure Transition Programme) to support demonstration of wind energy providing services (including frequency response and black start) at the Dersalloch Wind Farm in Ayrshire.</p> <p>This is the first example in the world of a commercial wind farm demonstration black start, and it highlights opportunities to operate the electricity system in line with net zero ambitions.</p> <p>The Cabinet Secretary opened</p>	<p>N/A</p>	<p>We continue to press the UK Government on plans to support long duration energy storage.</p> <p>We continue to engage with ESO to apply lessons learned from Dersalloch.</p>

		Statkrafts Greener Grid Park in Moray, which will provide balancing services to National Grid and reduce reliance on gas.		
Press the UK Government for market mechanisms and incentives which recognise locational value, both for energy and for security of supply, and which do not create undue barriers for investment in Scotland.	CCP 2018	<p>National Grid ESO has set a target to be able to operate a net zero system by 2045. This will require new market mechanisms that support net zero technologies.</p> <p>The Scottish Government has responded to the UK Government's initial consultation on the Review of Electricity Market Arrangements (REMA) recognising the importance this work could have on the ability to deploy further renewable energy projects in Scotland.</p> <p>The Scottish Government continues to make the case to Ofgem and DESNZ for a change to the transmission charging methodology and for assurances that charging and access rights create a level playing field that will support both an accelerated transition to net zero and protect consumers.</p>	N/A	<p>Engage with Ofgem's strategic review of network charges.</p> <p>Continue to input to the UK Government's work relating to REMA.</p> <p>Engaged with UKG on any changes related to CfD or introduction of support for long duration energy storage.</p>

		<p>The SG engages with the ESO, Ofgem and the UK Government regularly to make clear what is needed to support further renewables deployment in Scotland and consumers in Scotland.</p> <p>We continue to press the UK Government to maintain the Contracts for Difference (CfD) mechanism in a manner that captures economic benefits for Scottish and UK supply chains.</p> <p>We continue to lobby the UK Government to provide a proper support mechanism for the further development of hydro projects through a cap and floor regime.</p>		
Collaborate on actions to support investment in new pumped storage hydro capacity.	CCP 2018	Continue to lobby the UK Government to provide an appropriate support mechanism for the further development of hydro projects through a cap and floor regime.	N/A	Continue to engage with UKG on any changes related to CfD or introduction of support for long duration energy storage.



<p>Work with all parties to secure maximum benefits from the move towards smarter and more flexible electricity systems and networks, as set out in the UK Smart Systems and Flexibility Plan (2017).</p>	<p>CCP 2018</p>	<p>In 2022 SG engaged with the Distribution Network Operators (DNOs) to support the development of the electricity distribution price control (Revenue = Incentives + Innovation + Outputs. ED2 stands for: Electricity Distribution 2. RIIO ED2) business plans. This led to a fair RIIO ED2 outcome for the DNOs and consumers which can support the network investment necessary to meet SG decarbonisation goals.</p> <p>The SG has established a new forum to enable developers to directly communicate any concerns with the DNOs through a local electricity network engagement group. This will identify consider and address overlapping, and strategic issues and opportunities related to the decarbonisation of heat and transport.</p> <p>In 2022 research was taken forward to understand the impact of heat decarbonisation on the electricity networks.</p>	<p>N/A</p>	<p>Ongoing.</p>
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<p>Encourage and support increased interconnection which can enhance Scottish system security while considering effects on domestic capacity and investment.</p>	<p>CCP 2018</p>	<p>We have established a Major Energy Network Projects Group (MEPG) – which brings together Scottish Government energy policy / planning &amp; consents unit officials / Scotland’s transmission network owners / the electricity system operator / key stakeholders.</p> <p>The Group’s key purpose is to maintain a focus on the progress of major electricity transmission projects, while widening its focus to other major energy network projects / developments as required.</p> <p><a href="#">Shetland</a> cable is underway.</p> <p><a href="#">Orkney</a> ‘Needs Case’ was provisionally approved by Ofgem in March 2023.</p> <p><a href="#">Western Isles</a> ‘Needs Case’ – was approved.</p>	<p>N/A</p>	<p>Quarterly meetings of the MEPG</p>
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<p>Launch a call in 2021 for evidence and views on technologies that can transform our electricity system, including energy storage, smart grid technologies, and technologies to deliver sustainable security of supply. This will help ensure that our funding and interventions support world leading activity in Scottish based companies.</p>	<p>CCPu 2020</p>	<p>Requirement for a call for evidence has been superseded by research commissioned into security of supply and the consultation process that is being undertaken as part of the draft Energy Strategy and Just Transitions plan.</p>	<p>N/A</p>	<p>Final ESJTP to be published in due course, once we have conducted a thorough review of the consultation response and engaged with the full range of stakeholders.</p> <p>Security of supply report to be published in due course.</p>
<p>Develop a series of whole system energy scenarios to guide infrastructure investment decisions for Scotland.</p>	<p>CCPu 2020</p>	<p>Energy Systems Catapult have produced a comprehensive set of Scotland-specific whole energy system scenarios providing options to reach the 2030 and 2045 energy system targets.</p> <p>These scenarios are not exclusive pathways to net zero, nor are they 'preferred options'. They provide important insights to inform discussions on the trade-offs needed to meet statutory targets.</p>	<p>N/A</p>	<p>The final report was published in September 2022. <a href="https://climatexchange.org.uk">Scottish whole energy system scenarios (climatexchange.org.uk)</a></p>

<p>Ensure that sustainable security of electricity supply is included as a priority within future Scottish Government energy innovation funding programmes.</p>	<p>CCPu 2020</p>	<p>Scottish Government provided £550,000 of match funding through the Low Carbon Infrastructure Transition Programme to support demonstration of wind energy providing services including frequency response and black start, at the Dersalloch wind farm in Ayrshire.</p> <p>This is the first example in the world of a commercial wind farm demonstration black start and it highlights opportunities to operate the electricity system in line with net zero ambitions.</p>	<p>National Grid ESO is working with industry to apply lessons learned from Dersalloch.</p>	<p>Ongoing</p>
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Outcome 3: Scotland secures maximum economic benefit from the continued investment and growth in electricity generation capacity and support for the new and innovative technologies which will deliver our decarbonisation goals.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Press the UK Government to further reform and maintain the CfD mechanism in a manner which better captures the economic benefits and total value added for the Scottish and UK supply chains.	CCPu 2020	<p>The SG continues to press the UK Government to maintain the CfD mechanism in a manner that captures economic benefits for Scottish and UK supply chains.</p> <p>This included responding to the UK Government consultation which proposed changes to various elements of the CfD regime in February 2023.</p>	<p>UKG confirmed that annual auctions will take place.</p> <p>The process for Supply Chain Plans has been strengthened since consultation in 2021.</p>	CfD AR5 to open end of March 2023
Introduce new requirements for developers to include supply chain commitments when applying to the ScotWind leasing process run by Crown Estate Scotland.	CCPu 2020	<p>We will use every lever within our devolved competence to support &amp; grow the offshore wind supply chain here in Scotland.</p> <p>Each ScotWind applicant was required to include a Supply Chain Development Statement (SCDS) setting out its supply-chain goals, &amp; committing the developers to meeting these through various stages of their</p>	<p>Developers have committed to investing an average of £1.4bn in the Scottish supply chain for per project, amounting to a potential of £28bn of investment into the Scottish supply chain.</p>	<p>We see these statements as the expectation of what the bid winners will deliver for Scotland.</p> <p>Long standing project, as it will take some time to get everything in motion.</p>

	<p>projects.</p> <p>Failures to deliver on commitments will trigger remedies ranging from financial penalties to an inability to progress to a seabed lease.</p> <p>This has produced a leasing round focused on quality &amp; deliverability of bids, and the long term prize of supply chain investment – which promises to transform the Scottish economy in coming decades.</p> <p>SCDS are also a requirement for the INTOG leasing round, currently in progress.</p>		
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# Climate Change Plan Monitoring Report 2023: Buildings

## Part A - Overview of sector

The 2020 annual emissions envelope published in the CCPu for this sector was for 8.0 MtCO<sub>2</sub>e, whereas the outturn emission statistics for 2020 (published in 2022) show a position of 8.7 MtCO<sub>2</sub>e.<sup>4</sup> These figures show that the sector was outside its envelope in 2020.

The CCPu sets out the following three policy outcomes for this sector, the indicators for which are summarised below:

The heat supply to our homes and non-domestic buildings is very substantially decarbonised, with high penetration rates of renewable and zero emissions heating	On Track	Off Track	Too Early to Say
Number of existing domestic properties using low and zero direct emissions heating (LZDEH) systems (1.1)			X
Services sector fossil fuel heat consumption (1.2)			X
% of non-electrical heat consumption met from renewable sources (1.3)			X

Our homes and buildings are highly energy efficient, with all buildings upgraded where it is appropriate to do so, and new buildings achieving ultra-high levels of fabric efficiency.	On Track	Off Track	Too Early to Say
Energy intensity of residential buildings (MWh per household) (2.1)		X	
Emissions intensity of non-domestic buildings (tCO <sub>2</sub> e per £ million Gross Value Added) (2.2)		X	
% of homes with an EPC <sup>5</sup> (EER, <sup>6</sup> or equivalent) of at least C (2.3)			X
% new homes built with a calculated space heating demand of not more than 20 kWh/m <sup>2</sup> /year (2.4)	X		

The heat transition is fair, leaving no-one behind and stimulates employment opportunities as part of the green recovery.	On Track	Off Track	Too Early to Say
% of households in fuel poverty (3.1)			X

<sup>4</sup> Emissions data for baseline and 2020 have been updated to reflect a forthcoming change in the global warming potentials for non-CO<sub>2</sub> greenhouse gases.

<sup>5</sup> Energy Performance Certificate

<sup>6</sup> Energy Efficiency Rating

## Just transition and cross economy impacts

We wish to understand and report on the broader just transition and cross-economy impacts of our emissions-reduction activities in addition to these sector specific policy outcomes and indicators. To do this, in this report we use data from the Office of National Statistics (ONS): Low Carbon Renewable Energy Economy (LCREE) publication. The LCREE data presented in this report is based on survey data of businesses which perform economic activities that deliver goods and services that are likely to help generate lower emissions of greenhouse gases, for example low carbon electricity, low emission vehicles and low carbon services.

The LCREE indicator is narrowly defined and, while useful within its limited scope, does not give us the full picture of the impacts on workforce, employers and communities and progress towards a just transition.

Over the next few years we will work to develop a more meaningful set of success outcomes and indicators aimed at tracking the impacts of our policies on a just transition to net zero.

## Sector commentary on progress

The Scottish Government published its ambitious [Heat in Buildings Strategy](#) in October 2021, which set out our programme for delivering emissions reductions in the buildings sectors (Residential and Services) while ensuring a just transition and maximising the economic opportunities for Scotland.

The cost of living crisis and surges in energy costs have added to the challenge of decarbonising our building stock. However, these factors also underline the importance of moving to cleaner heating systems and improving energy efficiency, ending our reliance on fossil fuels and delivering enduring savings for homes and businesses.

The emissions reported above of 8.7 MtCO<sub>2</sub>e for 2020 relate to the period one year prior to the publication of the Heat in Buildings Strategy.

In Part B below, we set out progress against indicators relating to specific outcomes of our heat decarbonisation programme. Five of our eight indicators are marked as “Too Early to Say.” This is largely due to a lack of access to up-to-date outturn statistics for some of the indicators. For Indicators 1.1 and 2.3, this is as a result of them using the Scottish House Condition Survey (SHCS) as their input, for which fieldwork had been [adversely affected by the COVID-19 pandemic](#). As such, outturn data for these two indicators are still from 2019. Indicator 3.1 is also based on Scottish House Condition Survey data, but we have estimated current outturn data using scenario modelling until more up-to-date data are available. The Scottish House Condition Survey is a nationally representative survey of Scottish households, and represents a key source of information on primary heating fuel,



energy performance, and energy demand across the domestic building stock. Due to the suspension of face-to-face interviewing in March 2020, no data for 2020 was collected. Data for 2021 is due to be published shortly after this report, however given the adoption of an external-only approach results will not be comparable with previous years. For Indicator 1.2, we use the most recently available data from DESNZ.

To comply with existing statutory requirements, our Heat in Buildings Strategy set out a provisional target (22%) for the proportion of non-electrical heat demand in buildings supplied by renewable sources (either directly, or via a heat network). The Renewable Heat Target (RHT), as currently defined, is an important factor in monitoring Scotland's wider 2030 renewable ambitions. However, we believe that the current RHT alone is insufficient to measure progress towards our Heat in Buildings ambitions. These are to displace Direct Emissions Heating with Zero Direct Emissions Heating, which could include, but not be restricted to, non-renewable sources. As part of the development of the ESJTP, we are therefore considering alternative approaches to measure our progress. As such, we consider this indicator to be "Too Early to Say".

The [CCP: Monitoring Report 2022](#) saw Indicators 2.1 and 2.2 rated as being "On Track." They are now "Off Track."

The only indicator of the eight marked as "On Track" this year is Indicator 2.4, on the grounds that it has increased in percentage-point terms from [7.51% in 2020](#) to 7.7% in 2021.

This year, we will publish a Monitoring and Evaluation Framework for our Heat in Buildings strategy, which will provide further detail on how we are monitoring progress. In October 2023, we will also publish a progress report update on the Heat in Buildings Strategy, as required under the Climate Change (Scotland) Act 2009 (here is last year's progress report: [Progress - Heat in Buildings Strategy: 2022 update - gov.scot \(www.gov.scot\)](#)).

### Developments in monitoring arrangements since last report

Since the publication of the [CCP: Monitoring Report 2022](#), the Climate Change Committee (CCC) has provided [written feedback](#) suggesting improvements to the monitoring arrangements of reducing emissions in the Buildings sector. We have taken this feedback into account when updating and developing our indicators for this year's publication.

Given the constraints of devolution and the Scottish Government's view that hydrogen will not play a central role in the overall decarbonisation of domestic heat, the previous outcome <sup>37</sup> has been removed.

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<sup>7</sup> "Our gas network supplies an increasing proportion of green gas (hydrogen and biomethane) and is made ready for a fully decarbonised gas future."

## Part B - Progress to Policy Outcome Indicators

**Policy Outcome:** Cross-sectoral social and economic

**Indicator:** FTE employment in Low Carbon Renewable Energy Economy Indicator

**On-Track Assessment (Milestones/Targets):** Year-to-year change

**Most Recent Data:** 2021

**Data Source(s):** Office of National Statistics: Low Carbon Renewable Energy Economy (LCREE), Time spent of Green Tasks

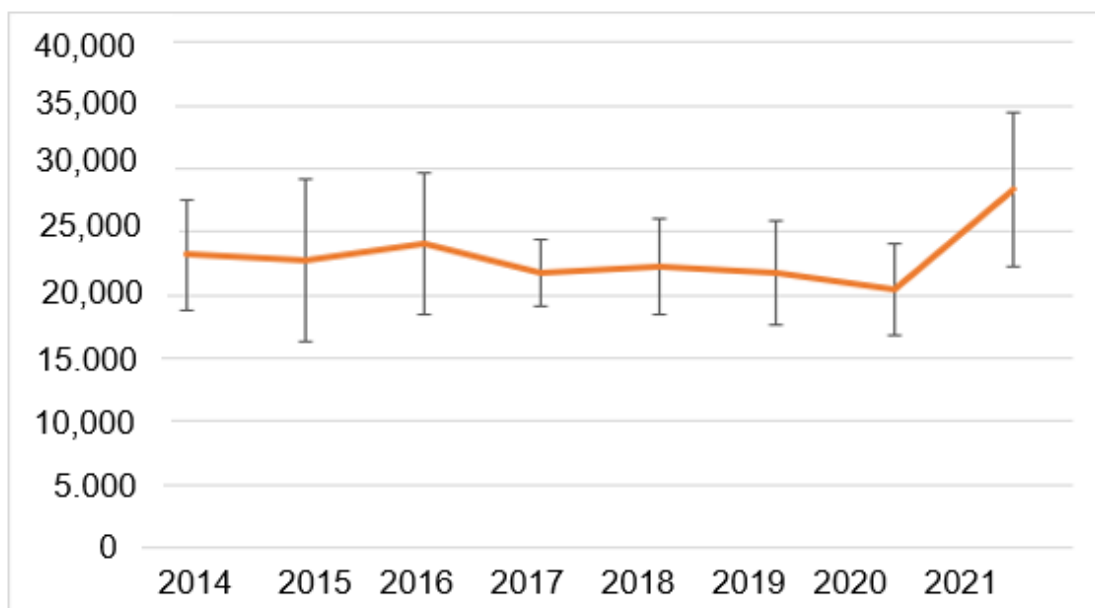
**Assessment:** Too early to say

### Commentary:

In 2021, the Scottish low carbon renewable energy (LCREE) sectors were estimated to provide 28,300 jobs, the highest in the published data.

- The estimates of LCREE are based on a relatively small sample of businesses and hence are subject to a wide confidence interval. Scottish LCREE employment in 2021 is substantially higher than previous years but the difference is not statistically higher than 2020.

Employment in Low Carbon Renewable Energy Economy, FTE



- LCREE only shows employment in roles in Industries directly involved in the transition to Net Zero.
- The ONS also released experimental statistics on a wider perspective of green activity in the economy with their time spent on green tasks release.
- These stats reflect green activities in both LCREE and non-LCREE sectors. The 2023 publication has not yet been published.
- Last year's publication showed that in 2019 Scotland achieved an all-time high of hours spent on green tasks and proportion of workers doing green tasks, including workers who spend more than 20% of their time on green tasks.

- The proportion of workers doing green tasks in Scotland was 36% in 2019, up from 23.8% in 2004. Workers who have spent more than 20% of their time doing green tasks was 14%, up from 9% in 2004.
- The proportion of overall hours spend doing green tasks in Scotland was 7%, up from 4.9% in 2004.

**Policy Outcome:** 1

**Indicator:** Number of existing domestic properties using low and zero direct emissions heating (LZDEH) systems.

**On-track Assessment (Milestones/Targets):** At least 1.5 million by 2030

**Most recent data:** 312,000 domestic properties use low and zero direct emissions heating (LZDEH) systems as of 2019.

**Data source(s):** [Scottish House Condition Survey \(SHCS\): 2019 Key Findings, Table 5](#). Comprises households for which their primary heating fuel is (a) Electricity, (b) Communal Heating, or (c) Biomass.

The latest available data is for 2019 as, due to the COVID-19 pandemic, fieldwork for the 2020 SHCS was suspended in March 2020 and was not resumed. The methodology used in the 2021 SHCS was also impacted by the pandemic, with findings due to be published shortly after this report.

**Assessment:** Too early to say.

**Commentary:** In 2019, there were 312,000 domestic properties using low or zero direct greenhouse gas emissions heating systems. These were properties with either electricity, biomass or communal heating as their primary heating fuel.

The baseline year for this indicator is 2019. As no more recent data is available, it is not possible to assess progress towards the target of at least 1.5 million households using LZDEH systems by 2030.

Since 2019 we have continued to support the uptake of more climate friendly heating systems in Scotland through our broad range of delivery schemes. For example:

- We introduced a grant in December 2022 to replace the cashback element of Home Energy Scotland Loans to support energy efficiency and zero emission heating.
- We doubled our funding for the Home Energy Scotland Grant and Loan Scheme in 2022-23 and the full allocation was taken up.
- Our Warmer Homes Scotland scheme made its highest ever level of investment in 2022-23 (£42m).

While the SHCS is the best data source to monitor this target, other data sources such as the Microgeneration Certification Scheme (MCS) suggest that we are continuing to see increases in the uptake of renewable heating sources / LZDEH systems. Recent renewable heat monitoring through MCS has shown a 42% increase in domestic renewable heat installations between 2019 and 2022. This comes with the following caveats:

- MCS certification is not a mandatory requirement, so MCS data does not capture all small-scale renewable energy installations in Scotland. However, as MCS is often a route to government incentives, it is likely to represent a significant proportion of deployment.

- Most installations registered with MCS are in the retrofit market. However, MCS may capture some new-build installations if contractors have chosen to register their installations with MCS.
- Renewable heat monitoring likely underestimates installations in 2022 as a full calendar year of MCS data was not available.

**Policy Outcome:** 1

**Indicator:** Commercial<sup>8</sup> sector fossil fuel heat consumption

**On-track Assessment (Milestones/Targets):** To reduce to 5,000 GWh or less by 2030

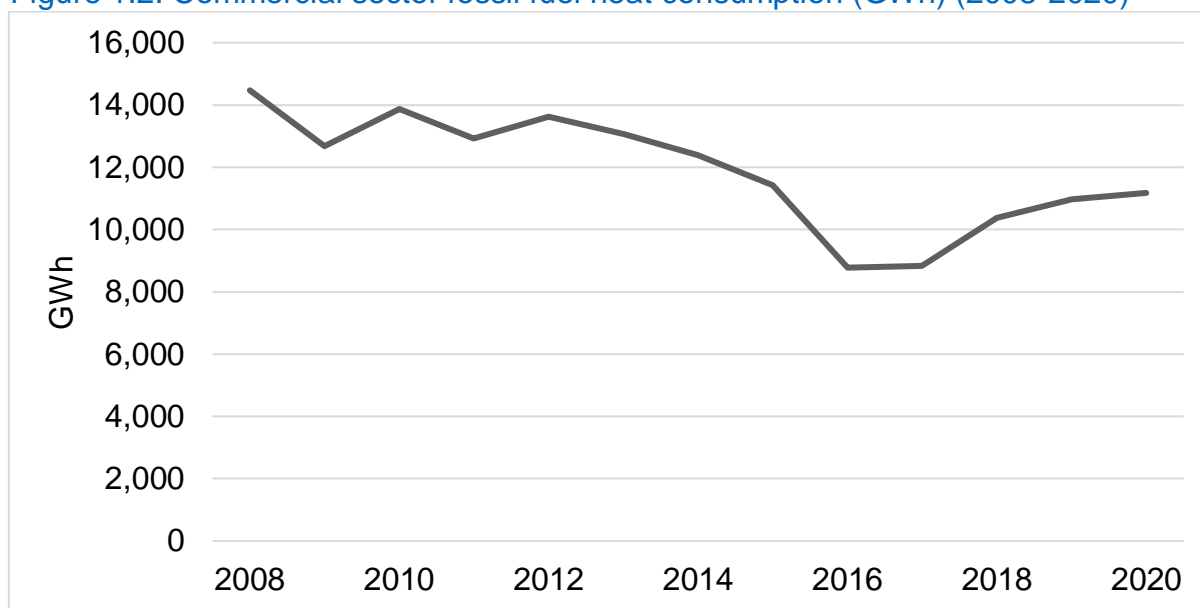
**Most recent data:** Commercial sector fossil fuel heat consumption was 11,170 GWh in 2020.

**Data source(s):** [Scottish Energy Statistics Hub \(SESH\)](#) > Energy Efficiency > Heat Consumption > Data – Non-electrical heat demand by sector (GWh). Internal analysis was conducted to remove Bioenergy & Wastes from the figure of 12,998 GWh presented on SESH.

**Assessment:** Too early to say. The Heat in Buildings Monitoring and Evaluation Framework, due to be published this year, will include an assessment of progress in reducing emissions from space heating in non-domestic buildings.

**Commentary:** In 2020, commercial sector fossil fuel heat consumption was 11,170 GWh.<sup>9</sup> This includes consumption of coal, manufactured fuels, petroleum products, and gas. This is almost a 2% increase on 2019, when commercial sector fossil fuel heat consumption was 10,983 GWh.

**Figure 1.2: Commercial sector fossil fuel heat consumption (GWh) (2008-2020)**



<sup>8</sup> Commercial sector heat consumption includes consumption other than Industrial, Transport and Domestic consumption, and will include some Agriculture and Public Sector consumption depending on the end-use.

<sup>9</sup> The [Climate Change Plan: Monitoring Report 2022](#) included a provisional figure for 2020. This figure has subsequently been finalised.

**Policy Outcome:** 1

**Indicator:** % of non-electrical heat consumption met from renewable sources

**On-track Assessment (Milestones/Targets):** The target is under review as part of the ESJTP, see commentary below.

**Most recent data:** 1st of May publication

**Data source(s):** Renewable Heat Dataset from Energy Saving Trust

**Assessment:** Too early to say

**Commentary:**

In order to comply with existing statutory requirements, our Heat in Buildings Strategy set out a provisional target (22%) for the proportion of non-electrical heat demand in buildings supplied by renewable sources (either directly, or via a heat network). The Renewable Heat Target (RHT), as currently defined, is an important factor in monitoring Scotland's wider 2030 renewable ambitions.

As set out in the Heat in Buildings Strategy, the scope of the reporting against this target differs from the previous reporting by not including industrial heat. These statistics (that exclude industrial heat) are part of a new time series, available on the Energy Statistics Hub<sup>10</sup>. When describing non-industrial, non-electrical heat, we report on both an upper and lower estimate. This is because it is not always possible to determine whether or not heat is used for industrial purposes.

In 2021 the percentage of non-electrical, non-industrial heat demand met by renewable sources is estimated at between 3.2% and 7.1%. Between 1.4 and 3.2 TWh of renewable heat output was produced in 2021, when demand for non-electrical, non-industrial heat was estimated at 45.4 TWh.

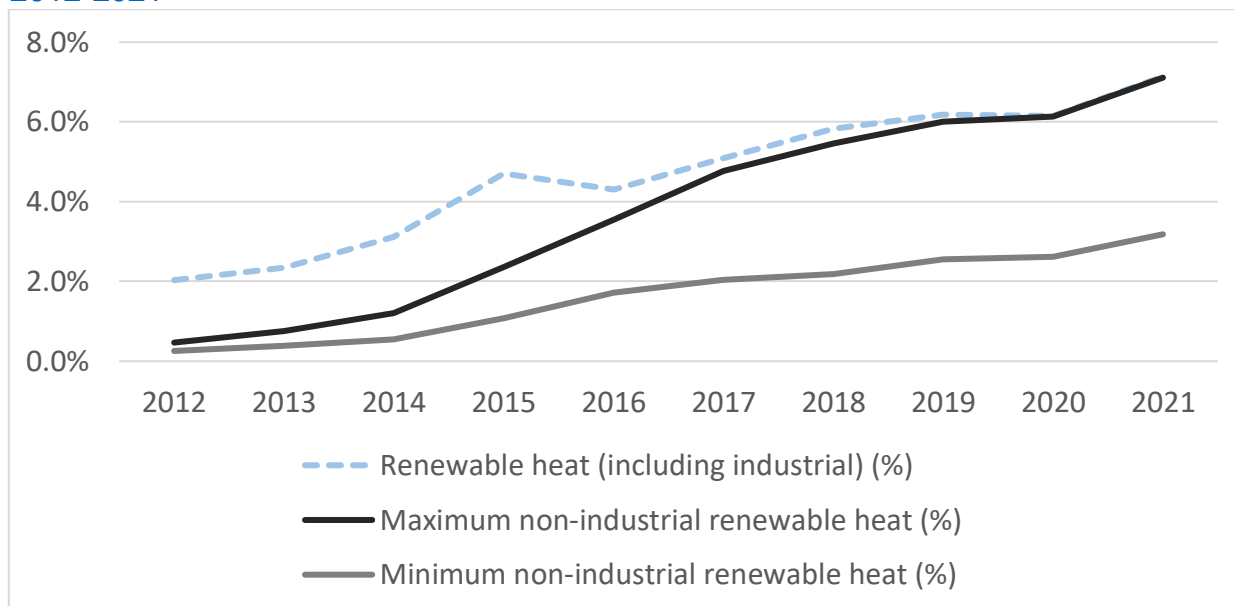
Renewable heat output in 2021 was between 13% and 18% higher than the previous year, while estimated demand was 3% lower. These estimates demonstrate a continued rise in renewable heat output over the longer term. Since 2016, the output of renewable heat has increased by between 87%-103%. While demand for non-electrical heat is slightly higher now than in 2016 (by 1%), this has fallen in recent years and is the lowest it has been since 2016.

Estimates of renewable heat output continued to increase in 2022 to between 1.6 and 3.4 TWh in 2022. We are not able to provide 2022 data in percentage terms since consumption estimates for 2022 will not be available until released by DESNZ in September 2023. In Figure 1, we have included a time series for these minimum and maximum estimates for the percentage of non-electrical, non-industrial heat demand since 2012, alongside historic data for non-electrical heat, including industrial heat until 2020.

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<sup>10</sup> [Scottish Energy Statistics Hub \(shinyapps.io\)](https://shinyapps.io)

Figure 1: Percentage of non-electrical heat demand met by renewable sources: 2012-2021



For both renewable heat statistics, the headline percentage reported in 2021 is dependent on overall non-electrical heat demand. This continues to underline the importance for progress against this metric of improving the energy efficiency of Scotland’s buildings.

**Renewable technologies:**

Although we cannot separate all renewable heat used for industrial purposes from those used in other sectors, trends in renewable output that include industrial heat provide insight into the contribution of different technologies to renewable generation.

2021 showed significant growth in overall renewable heat output (including industrial heat), with a gain of 650 GWh. Most of this (374 GWh) came from biomass installations, with roughly 100 GWh of this coming from installations newly operational in 2021, and the rest from changes in operation at existing sites. However, the majority of biomass output gain was in the industrial sector, rather than in domestic or non-domestic sectors. This technology remains the largest share of output and capacity, which is likely due to biomass installations being typically larger and/or run for longer throughout the year.

Biomethane is the second largest contributor to total renewable heat output (16%). Biomethane output increased by 152 GWh, with nearly all biomethane sites in operation in 2020 reporting an increase in output. This output gain is attributed to domestic, non-domestic and process heat according to the relative gas grid consumption of each sector. Heat pump output also increased by 122 GWh. Around 100 GWh of this was installations newly operational in 2021. As in previous years, heat pumps remain the technology with the most installations.

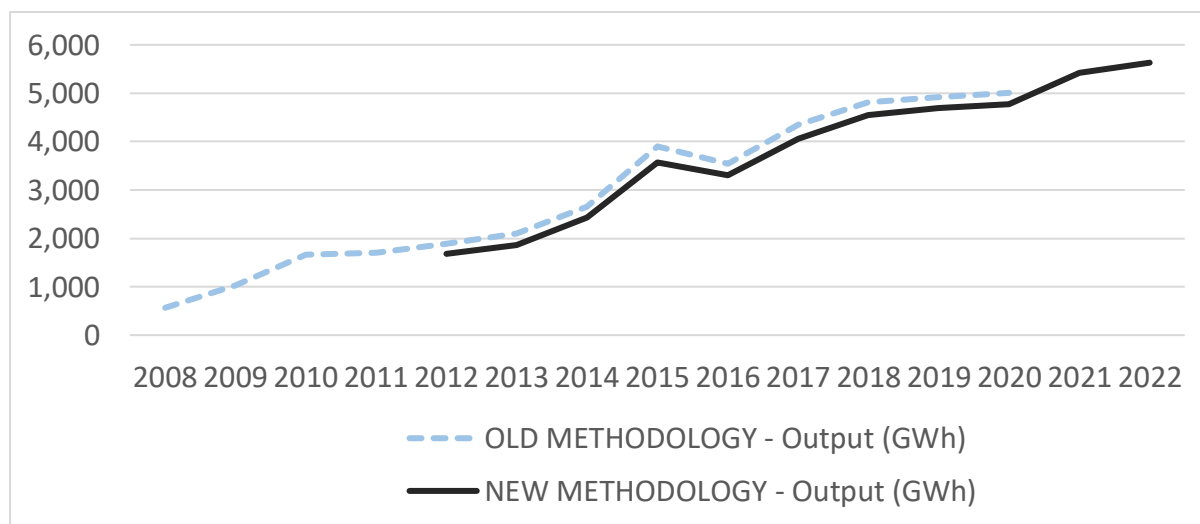


Heat pumps have shown a relatively steady growth between 2013 and 2019, and there is evidence of an increased growth rate in more recent years, with 3,205 new installations in 2020, 5,100 in 2021 and 3,446 for the first eight months of 2022. Heat pumps make up a relatively small share of overall output (11%) because they are mostly installed in domestic settings where capacities are likely to be small and usage throughout the year is low compared to other potential heat uses. A number of other technologies contribute to the output attributed to renewable heat sources, including biogas, bioliquid, solar thermal and waste combustion.

#### Methodology update:

We have made adjustments to the overall methodology we use to calculate the percentage of renewable heat compared to previous years<sup>11</sup>. For example, we have implemented a stricter criteria for matching between datasets, which reduces possible double-counting of installations between data sources and reduces the estimated output values. Some source datasets were also replaced by alternative sources in order to improve the accuracy of estimates. These methodological changes result in a more conservative estimate of output, but otherwise follow the same trends over the time series. Comparing 2020 output estimates between the current and previous methods, and including industrial uses for comparison on a consistent basis, shows that the new method results in a value of 4,770 GWh, 5% less than under the previous methodology.

Figure 2: Renewable heat output, as measured by the previous and current methodologies (both include industrial heat for a like-for-like comparison): 2012-2021



#### Future reporting

We will continue to report on renewable heat statistics against the provisional target as required by the Climate Change (Scotland) Act 2009. However, we believe that the current RHT alone is insufficient to measure progress towards our Heat in Buildings ambitions.

<sup>11</sup> See appendix file: [Renewable heat in Scotland, 2020](#)

As part of the development of the ESJTP, we are therefore considering alternative approaches to measure our progress.

Statistics on all renewable heat, including industrial heat are available on the Energy Statistics Hub<sup>12</sup>.

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<sup>12</sup> [Scottish Energy Statistics Hub \(shinyapps.io\)](https://shinyapps.io):

Policy Outcome: 2

Indicator: Energy intensity of residential buildings (MWh per household)

On-track Assessment (Milestones/Targets): To fall by at least 30% by 2032 (relative to 2015).

Most recent data: Residential energy intensity was 17,393 kWh/household in 2020

Data source(s): Scottish Energy Statistics Hub ([shinyapps.io](https://shinyapps.io)), using input from:

DESNZ: Sub-national total final energy consumption data

DESNZ: Energy Consumption in the UK: end use

Scottish Government: Scottish Greenhouse Gas Emissions

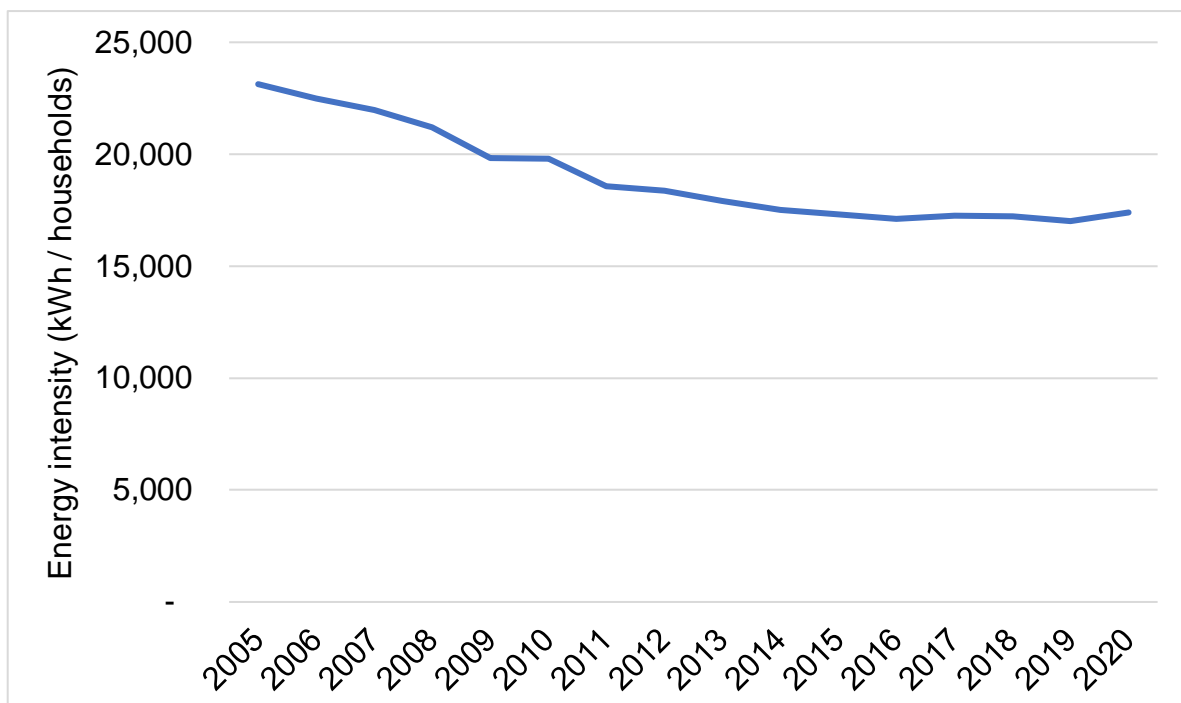
NRS: Estimates of Households and Dwellings in Scotland

Assessment: Off track

Commentary:

In 2020, average energy for a Scottish home was 17,393 kWh/household. This is an increase of 0.5% since 2015, and 2.25% on 2019. As suggested by the [Digest of UK Energy Statistics \(DUKES\)](#), this is likely driven by a rise in home working during 2020.

Average household energy intensity, 2005-2020



**Policy Outcome:** 2

**Indicator:** Emissions intensity of non-domestic buildings (tCO<sub>2</sub>e per £ million Gross Value Added)

**On-track Assessment (Milestones/Targets):** To fall by at least 10% by 2020, 20% by 2025, and 30% by 2032 (relative to 2015)

**Most recent data:** 31.1 tCO<sub>2</sub>e/£mGVA in 2020

**Data source(s):** [Scottish Energy Statistics Hub](#) > Energy Efficiency > Energy productivity of industry and services > Data - Services energy productivity. It should be noted that the £mGVA figure used as the denominator excludes Services sectors 49.1 through 49.5, 50, 51, and 68.2 IMP (transport and imputed rent).

**Assessment:** Off-Track

**Commentary:**

Prior to discussing the outturn data, it must be pointed out that the Climate Change Committee has provided the following feedback on the inclusion of this indicator in last year's [Monitoring Report](#):

“The ‘emissions intensity of non-domestic buildings’ data is a measure of CO<sub>2</sub>e emissions per unit of economic activity. While this can usefully demonstrate decoupling of economic output from emissions, it should be considered alongside overall non-domestic emissions, as an increase in economic activity would mask a lack of progress in reducing overall emissions. Emissions must eventually reach zero, making it important to track simple total emissions figures.” ([page 99](#))

We acknowledge the points made by the CCC concerning this indicator, and intend to review its design and usefulness ahead of next year's monitoring report.

The emissions intensity of the Services sector was 31.1 tCO<sub>2</sub>e/£mGVA in 2020, representing an increase of 2.2 tCO<sub>2</sub>e/£mGVA compared to 2019. While Services emissions fell by 7% between 2019 and 2020 (from 2.9 MtCO<sub>2</sub>e to 2.7 MtCO<sub>2</sub>e), Services GVA fell by 14% (from £99,225m to £85,731m). This reverses a trend of decreasing emissions intensity for the sector, namely due to the effect of the COVID-19 pandemic on economic activity and hence the denominator of the indicator.

The CCP published February 2018, set ambition in the Services sectors to reduce emissions intensity by 10% by 2020, 20% by 2025, and 30% by 2032, relative to a 2015 baseline of 30.3 tCO<sub>2</sub>e/£mGVA.

A simple pathway to meet the 2020, 2025, and 2032 targets is shown below. As the recorded emissions intensity of the Services sector in 2020 is above the target of 27 tCO<sub>2</sub>e/£mGVA by 3.8 tCO<sub>2</sub>e/£mGVA, progress is currently considered to be off-track. This primarily reflects a sharp decline in Services GVA resulting from the COVID-19 pandemic. It is unlikely that this indicator, in its current form, will return be on-track in coming years due to forecast low economic growth. To note, the figure also plots the outturn of Services emissions in MtCO<sub>2</sub>e on the right-hand side axis.

Figure: Emissions intensity of the Services sector (tCO<sub>2</sub>e/£mGVA)

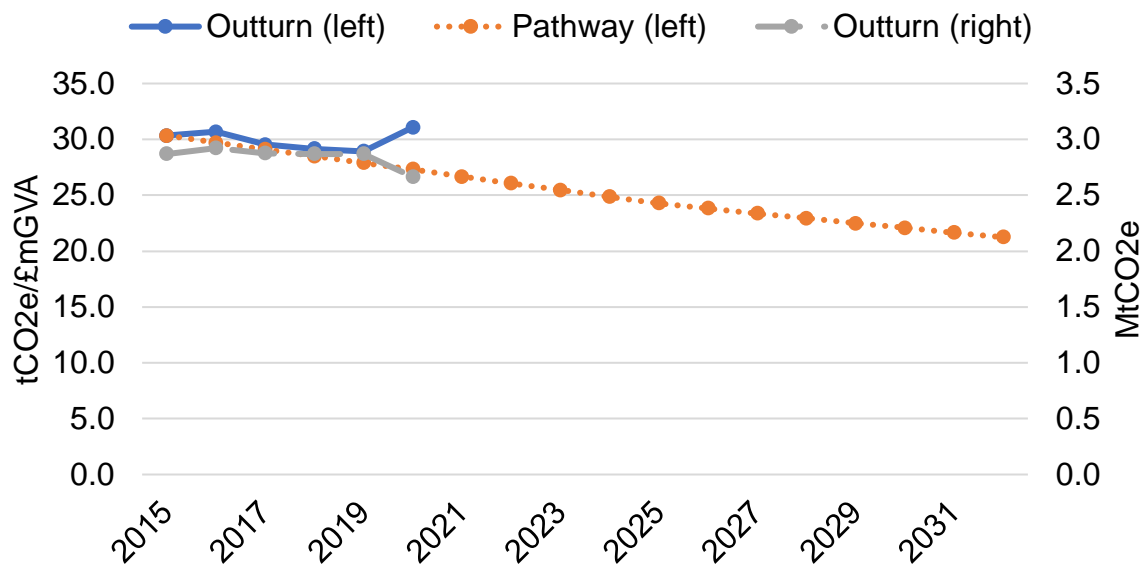
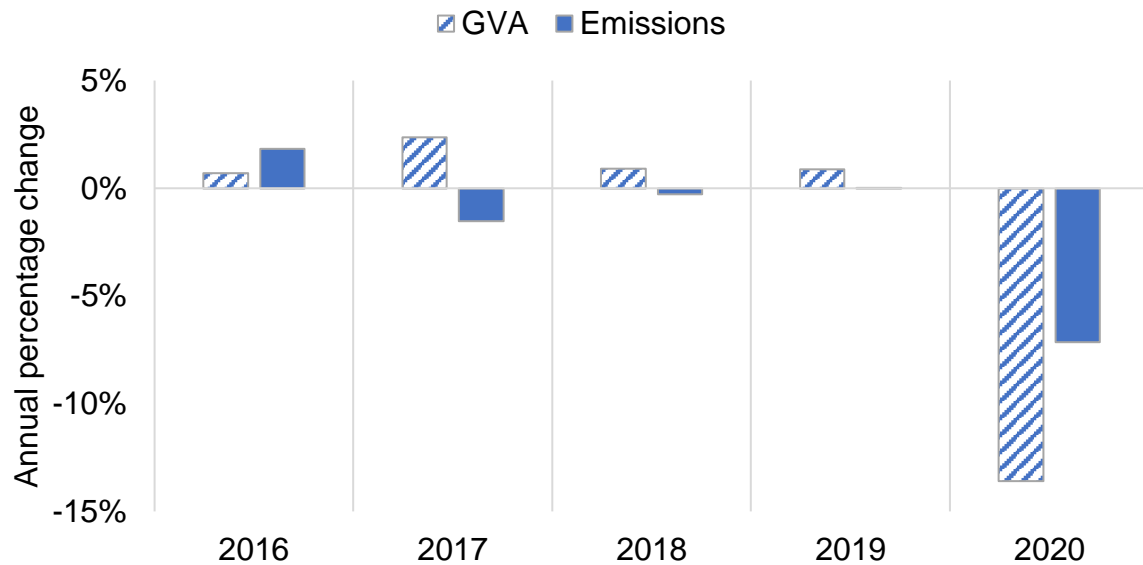


Figure: Drivers of changes in emissions intensity (Services GVA; Services emissions)



**Policy Outcome:** 2

**Indicator:** % of homes with an EPC (EER, or equivalent) of at least C

**On-track Assessment (Milestones/Targets):** To reach 100% by 2035, subject to technical feasibility and cost-effectiveness

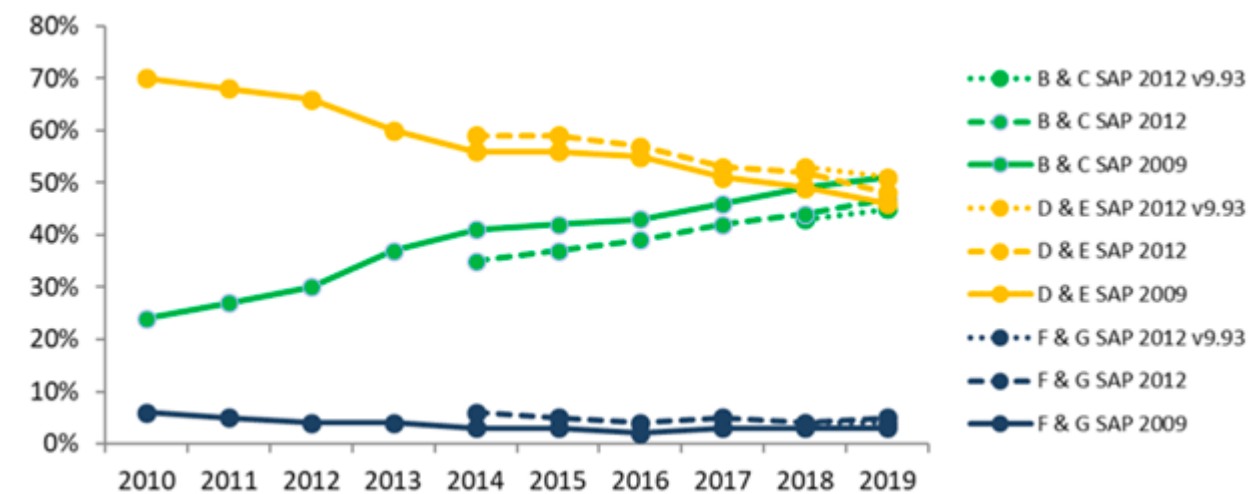
**Most recent data:** 45% of Scottish homes rated as EPC band C or better under SAP 2012 (RdSAP v 9.93) in 2019 similar to 2018.

**Data source(s):** Scottish House Condition Survey (SHCS) 2019. Energy efficiency ratings are calculated under different versions of Standard Assessment Procedure (SAP), the SAP 2009 methodology and the most recent SAP 2012 methodology applying two different versions of RdSAP. Using SAP 2009 enables us to examine the longer term trend in the energy efficiency of the housing stock since 2010. SAP 2012 (RdSAP v9.93) was first used in reporting data from the SHCS in the 2018 Key Findings Report and therefore only 2 years of data are available. For this reason SAP 2012 (RdSAP v9.92) is also included with data from 2014.

The latest available data is for 2019 as, due to the COVID-19 pandemic, fieldwork for the 2020 SHCS was suspended in March 2020 and was not resumed. The methodology used in the 2021 SHCS was also impacted by the pandemic, with findings due to be published shortly after this report.

**Assessment:** Too early to say/ Evidence and data is so far inconclusive

**Commentary:** Grouped EPC Bands under SAP 2009, SAP 2012 (RdSAP v9.92) and SAP 2012 (RdSAP v 9.93), 2010 to 2019.



The figure shows a strong trend of improvement in the energy efficiency profile of the housing stock since 2010. The proportion of dwellings rated C or better increased from 24% in 2010 to 51% in 2019 (SAP 2009), and 35% in 2014 to 47% in 2019 (SAP 2012, RdSAP v 9.92).

An improvement in the energy efficiency profile of the domestic building stock will contribute to reducing energy intensity and emissions intensity in the residential sector

Policy Outcome: 2

Indicator: % new homes built with a calculated space-heating demand of not more than 20 kWh/m<sup>2</sup>/yr

On-track Assessment (Milestones/Targets): Positive year-to-year change

Most recent data: Analysis of new-build domestic Energy Performance Certificates (EPCs) lodged in 2021.

Data source(s): EPC data for Q1 to Q4 2021 lodged with the [Scottish Energy Performance Certificate Register \(SEPCR\)](#).

Assessment: On-track

Commentary: Without applying any moderation to remove potentially erroneous values, 1,829 records reported a space-heating demand intensity of 20 kWh/m<sup>2</sup>/year or less. This represents 8.1% of new-build domestic EPCs lodged for 2021. In both absolute and relative terms, this is an increase on previous years.<sup>13</sup>

Minimum	1 <sup>st</sup> Quartile	Median	3 <sup>rd</sup> Quartile	Maximum
0.0	27.9	35.7	42.7	337.5

Adjusting the flow to account for any potentially erroneous values:

Removing the 0.5% of lodged records with the lowest space-heating demand intensity and the 0.5% with the highest space-heating demand intensity in effect removes all records with a space-heating demand intensity of less than approximately 8.7 kWh/m<sup>2</sup>/year, and removes all records with a space-heating demand intensity of greater than approximately 113 kWh/m<sup>2</sup>/year. This leaves 1,716 records (7.7%) with a space-heating demand intensity of 20 kWh/m<sup>2</sup>/year or less. This adjusted figure in previous years was 5.96% in 2019 and 7.51% in 2020 (please see footnote below to previous CCP Monitoring Reports).

Minimum	1 <sup>st</sup> Quartile	Median	3 <sup>rd</sup> Quartile	Maximum
8.7	28.0	35.7	42.6	113.0

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<sup>13</sup> As per our previous two annual CCP Monitoring Reports, 2019 saw 1,513 (6.4%) new-build domestic EPCs with a space-heating demand of 20 kWh/m<sup>2</sup>/yr or less. Likewise, 2020 saw 1,191 (7.9%).



**Policy Outcome:** 3

**Indicator:** % of households in fuel poverty

**On-track Assessment (Milestones/Targets):** 2030: No more than 15%, 2035: No more than 10%, 2040: No more than 5%

**Most recent data:** estimated 920,000 (37%) in April 2023.

**Data source(s):** Scenario modelling based on 2019 SHCS data.

**Assessment:** Too early to say. As required by the Fuel Poverty 2019 Act, we are required to prepare a periodic report, 3 years from publication of our Fuel Poverty Strategy, and subsequently each 3 year period thereafter. The first date this will commence from is December 2024, with respective timescales for this report publication in the Act.

**Commentary:** In April 2023, an estimated 37% of all households (920,000 households) were in fuel poverty with around 29% (720,000) in extreme fuel poverty.

The Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019 received Royal Assent in July 2019. The Fuel Poverty Strategy, required by the Act was published in December 2021 and sets out how the targets will be achieved. As the 2019 Act requires the Scottish Government to formally consult with the panel on the strategy, we are presently working with them to seek their views in relation to appropriate next steps, which includes strengthening the consultation and reporting processes for the strategy.

The most recent data for this indicator is from scenario modelling and was carried out using updated data from the 2019 Scottish House Condition Survey (SHCS). For further details see [Cost of Living \(Tenant Protection\) \(Scotland\) Act 2022: first report to the Scottish Parliament](#). Though note that the scenario modelling presented here was based on the Energy Price Guarantee rising to £3,000 from April 2023. These estimates have been superseded by those provided here which are based on the Energy Price Guarantee remaining at £2,500 for a further three months from April to June 2023.

Following the suspension of face-to-face interviewing in March 2020, there was no further data collection for the 2020 SHCS. The 2021 SHCS was carried out by an [external+](#) approach, supplemented with alternative sources of data (e.g. from the Energy Performance Certificate) and the householder providing information to surveyors via telephone. The results of this will be published in May 2023.

Due to the issues with the 2021 external+ SHCS we intend to publish the key findings as experimental statistics and present the results as a snapshot for 2021. We will not be making comparisons with the National Statistics from the SHCS for earlier years as the results are not directly comparable due to the methodological differences. This is consistent with the approach taken for the 2020 SHS and the 2021 SHS.

The 2022 SHCS returned to full in-home surveying in April 2023.

## Part C - Information on implementation of individual policies

Outcome 1: The heat supply to our homes and non-domestic buildings is very substantially decarbonised, with high penetration rates of renewable and zero emissions heating

Outcome 2: Our homes and buildings are highly energy efficient, with all buildings upgraded where it is appropriate to do so, and new buildings achieving ultra-high levels of fabric efficiency

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Energy Company Obligation (ECO) requires obligated energy supply companies to deliver energy efficiency measures in homes – mainly insulation-based measures and boiler replacements.	CCP 2018	The UK Government retains responsibility for the design and delivery of the ECO scheme on a GB basis. Delivery of Scottish Government programmes is broadly aligned with eligibility for ECO finance. The Area Based Schemes programme supports Scottish councils to establish and administer local ECO flex schemes.	As part of our Area Based Schemes, councils are asked to publish a Statement of Intent to enable local ECO flex schemes to operate. Every council in Scotland operated a flex scheme as part of ECO3 and this is the aim for the ECO4 scheme launched in August 2022.	We continue to engage with the UK Government about the design of the ECO scheme in Scotland.

<p>Energy Efficient Scotland Delivery Schemes:</p> <ul style="list-style-type: none"> <li>• Area Based Schemes and Warmer Homes Scotland.</li> <li>• Home Energy Scotland Advice Service</li> <li>• Home Energy Scotland Grant and Loan Scheme for zero emissions heating technologies and energy efficiency measures - boosted.</li> <li>• Business Energy Scotland</li> <li>• SME Loans and cashback scheme for zero emissions heating technologies and energy efficiency measures - boosted.</li> </ul>	<p>2020-2021 PfG</p>	<p>In line with our commitments in the Programme for Government, the Scottish Government has maintained our annual investment in Area Based Schemes (ABS) at £64m in 2022/23. Funding remains at the same level as in 21/22 and is up by £9m from £55m in 2020/21.</p> <p>ABS funding was increased in 21/22 to enable more whole house retrofits. This includes the installation of zero emissions heating systems and renewables.</p> <p>The eligibility criteria for Warmer Home Scotland was reviewed, resulting in widening the criteria to enable more households in fuel poverty to benefit from the assistance available under the scheme. In addition, a fabric only stream was introduced to</p>	<p>Information about delivery of our Area Based Schemes is published <a href="#">here</a>. ABS projects have improved over 104,000 properties since 2013. In 2020/21, councils reported installing over 6,000 energy efficiency improvements.</p> <p>Warmer Homes Scotland has supported over 30,000 customers since it started in 2015, with the current contract due to expire in 2023.</p> <p>SME Loan and cashback scheme: since inception the scheme has paid out almost £40 million in loan and cashback finance and supported over 1700 projects.</p> <p>Home Energy Scotland now has the capacity to advise over 130,000 households this year - an increase of around 13,500 on 2021-22.</p>	<p>The Scottish Government and local councils are exploring how they can provide greater certainty about funding and delivery contracts to help accelerate delivery and expand local supply chains.</p> <p>The current Warmer Homes Scotland contract is due to expire in 2023, with procurement of a successor underway</p> <p>Measures supported and funding amounts available through the HES Grant and Loan will be kept under review to ensure they align with forthcoming regulations on energy efficiency and heat.</p> <p>SME Loan and cashback scheme: we</p>
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		<p>allow a wider number of households to benefit from the installation of grant funded energy efficiency measures</p> <p>The HES Loan and Cashback scheme was superseded by the HES Grant and Loan in December 2022. Homeowners are now able to access standalone grant support for the installation of energy efficiency measures and zero direct emissions heating systems as well as an optional interest free loan. The new scheme also introduces a rural uplift to address higher installation costs in those areas.</p> <p>The Advice and support service was rebranded as Business Energy Scotland in April 2022 and continues to be in high demand. Measures were introduced in 22/23 to enable more</p>		<p>anticipate the SME advice service will remain in high demand and will continue to work with delivery stakeholders to maintain support levels and develop advice and guidance in line with SG Policy.</p> <p>SME Loan and cashback scheme: the scheme is under review with the aim of launching a SME Grant and Loan Scheme in 2023/24.</p> <p>The Home Energy Scotland advice service remains in increasingly high demand and we will continue to work with delivery partners to provide the best form of advice and guidance to meet the needs of the public, in</p>
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		<p>businesses to access advice and energy assessments, including increased funding for additional energy advisors and qualifying energy reports and launching fast track energy assessments for specific installations.</p> <p>In 22/23 the SME Cashback grant for energy efficiency measures was increased to 75% up to a maximum of £20K to further incentivise the uptake of measures.</p> <p>Home Energy Scotland Advice Service: In 2022/23 we committed to expanding the Home Energy Scotland advice service by 20%.</p>		line with SG Policy.
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<p>Review support programmes: We will review existing Scottish Government funding schemes to ensure that they support the deployment of low and zero emissions heat. We will expand the provision of loans to the SME sector, and enhance the wider energy efficiency and heat advice service and provision of tailored start-to-end support</p>	<p>2020-2021 PfG</p>	<p>The successor to the Warmer Homes Scotland scheme will follow a whole house retrofit process and a zero emissions heating first approach to maximise the number of households able to install zero emissions heating where not detrimental to fuel poverty objectives.</p> <p>The HES Grant and Loan, launched in December 2022 provides grant funding of £7500 for the installation of heat pump and £7500 for 75% of the eligible costs of energy efficiency measures. This replaced the previous loan and cashback offer, allowing homeowners a more flexible way to access funding, with a clear headline offer.</p>		<p>The successor to Warmer Homes Scotland is due to go live in 2023.</p>
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<p>Procure a new national delivery scheme, to replace the existing Warmer Homes Scotland contract, to open in 2022.</p>	<p>CCPu 2020</p>	<p>The invitation to tender for the successor scheme was published in July 2022 with the contract due to be awarded and commenced in 2023.</p>	<p>N/A</p>	<p>The successor contract is due to commence in 2023 once the current contract expires. The next steps in the procurement process are contract award, followed by a mobilisation period for the winning bidder.</p>
<p>Energy Efficiency Standard for Social Housing: will be met by social landlords by 2020.</p>	<p>CCP 2018</p>	<p>88% of social homes are compliant with EESSH.</p>	<p>The Scottish Housing Regulator has reported in the most recent SHCS data (2019) that 88% of social homes have met EESSH. This is the most recent data because the physical survey was suspended in 2020 due to the pandemic. Data for 2021 is due to be published shortly after this report is published<sup>14</sup>.</p>	

<sup>14</sup> [Climate Change Plan: monitoring reports 2022](#)



<p>New Build Heat Standard (NBHS): requiring new buildings, applying for a building warrant from 2024 onwards, to use zero direct emissions heating (ZDEH) systems.</p>	<p>2020-2021 PfG + CCPu</p>	<p>We have analysed results from our initial Scoping Consultation<sup>15</sup>, published December 2020, and subsequently published and analysed our second consultation (Part II)<sup>16</sup>.</p> <p>We engaged throughout the consultation process with key stakeholders, holding workshops and individual meetings.</p> <p>Both the main working group and non-domestic sub-group continued to meet during this period.</p> <p>We have completed and published the following further research projects: GHG emissions associated with low and zero carbon heating systems<sup>17</sup>; and Phase 2 of our affordable</p>	<p>We committed to launching a second consultation on the NBHS. This was achieved.</p> <p>We have committed to introducing regulations in 2023 to be in force for April 2024. We are on track to meet this target.</p>	<p>We aim to lay the required regulations in the first half of 2023 and for the NBHS to be in force from April 2024.</p>
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<sup>15</sup> [New Build Heat Standard - scoping consultation: analysis - gov.scot \(www.gov.scot\)](http://www.gov.scot)

<sup>16</sup> [New Build Heat Standard: consultation - part two - gov.scot \(www.gov.scot\)](http://www.gov.scot)

<sup>17</sup> [Direct greenhouse gas emissions from low and zero carbon heating systems \(climatexchange.org.uk\)](http://climatexchange.org.uk)

		<p>housing ZDEH evaluation<sup>18</sup>.</p> <p>An additional research project, to consider the challenges and opportunities of installing ZDEH systems in new buildings across Scotland's islands, has also concluded. This will be published prior to the laying of the NBHS legislation in Parliament.</p>		
<p>Review of energy standards within building regulations. The review investigates the potential for further, significant improvement on 2015 standards and how building standards can support other carbon and energy policy outcomes, including our decarbonisation of heat agenda.</p>	CCP 2018	<p>Review commenced in 2020 now completed, outcomes published in June 2022. Revised standards and guidance applicable to new construction from 1 February 2023, setting more challenging energy and emission targets for new development and enable early adoption/response to the components of the pending 2024 New Build Heat Standard.</p>	<p>Revised standards and guidance from 1 February 2023 are expected to improve outcomes reported under indicator 2.4 – ‘% new homes built with a calculated space heating demand of not more than 20 kWh/m<sup>2</sup>/yr’ from 2024 onward.</p>	<p>Review complete and revised standards in force. Ministerial commitment to Parliament on further review of standards to deliver ‘a Scottish equivalent to Passivhaus’, including laying of regulations in December 2024.</p>

<sup>18</sup> [Renewable and zero direct emissions heating systems in affordable housing projects \(phase 2\): evaluation - gov.scot \(www.gov.scot\)](https://www.gov.scot/renewable-and-zero-direct-emissions-heating-systems-in-affordable-housing-projects-phase-2-evaluation)

Heat in Buildings regulation: Put in place regulation to increase uptake of zero emissions heating systems and improve energy efficiency standards across owner occupied and private rented homes to come into force from 2025.	Heat in Buildings Strategy	<p>We committed in the 2022 Programme for Government to consult on proposals for a Heat in Buildings Bill in 2023.</p> <p>We have committed in the Bute House Agreement to have legal provisions in force from 2025 to provide the necessary framework to drive action.</p>	The next milestone is to consult on proposals for a Heat in Buildings Bill in 2023. We are on track to meet this commitment.	The next step is to consult on proposals in 2023.
Low Carbon Infrastructure Transition Programme (LCITP) - supports investment in decarbonisation of business and the public sector.	2020-2021 PfG	The LCITP is now closed to applications but is supporting projects that are currently under construction that will deliver significant carbon savings including strategically important low carbon heat networks.	N/A	The LCITP formally drew to a close in April 2022.
Expanded £1.6bn Heat in Buildings capital funding over the next parliament building on the Low Carbon Infrastructure Transition Programme (LCITP) and existing energy efficiency and	2020-2021 PfG	<p>As set out in the Heat in Buildings Strategy, we have boosted our ambition to invest at least £1.8 billion in heat and energy efficiency over the course of the current parliament.</p> <p>This includes Scotland's</p>	N/A	<p>The budget for these funding programmes is committed over the course of the current parliament.</p> <p>Programmes will remain open to applications and aim</p>

zero emissions heat support programmes		Heat Network fund, which was launched 21 February 2022 making available £300 million capital over this parliament to support the development and roll out of zero emission heat networks across Scotland. The £1.8 billion also includes at least £465m to support those least able to pay, £200m for the Social Housing Net Zero Heat Fund, and £200m Scottish Green Public Sector Estate Scheme.		to support an accelerated deployment of energy efficiency measures and zero emission heating systems.
Non Domestic Public Sector Energy Efficiency (NDEE) Framework: A four year framework launched in March 2016, designed to support public and third sector organisations to procure Energy Efficiency retrofit work. The Framework will continue for a further	CCP 2018	Public Sector bodies are continuing to use the Framework for the development of pipelines of projects looking at energy efficiency and heat decarbonisation. 17 projects received pre capital support enabling the development of more strategic projects.	The Framework will be extended for a year from 1 April 2023.	A new Framework will be developed during 2023 and launched 1 April 2024. This will improve the current Framework and ensure it is fit for purpose and reflects the objectives for net zero emissions.

<p>four years commencing in 2020. NDEE Support Unit accelerates the number of projects and delivery timescales of public sector energy efficiency projects using the NDEE Framework and supports our wider ambitions around energy demand reduction.</p>				
<p>The Renewable Heat Incentive (RHI) - a GB-wide scheme created by the UK Government (with the agreement of the Scottish Government). UK Government is extending both the domestic and nondomestic RHI out to 2022</p>	<p>August 2020</p>	<p>1,126.9 MW<sup>19</sup> of accredited capacity under the non-domestic RHI (NDRHI) between November 2011 and December 2022.</p> <p>1,770 GWh of heat had been paid for between April 2014 and end December 2022 under the domestic RHI scheme in Scotland.</p>	<p>Scotland consistently attracted more than its pro-rata share under both the NDRHI and DRHI, with around 19% of non-domestic and 18% domestic accredited installations being in Scotland.</p>	<p>The NDRHI closed as scheduled on 31 March 2021, though qualified extensions for both Tariff Guarantee and non-Tariff Guarantee applications were implemented prior to its closure. These extensions were due to end on 31 March 2023.</p>

<sup>19</sup> Last year's report (published 26 May 2022) reported 1,130.7 MW of accredited capacity under the non-domestic RHI (NDRHI) between November 2011 and January 2022. This is actually the figure for full applications; the correct figure for accredited capacity between November 2011 and January 2022 is 1,095 MW.

				<p>The Domestic Renewable Heat Incentive (<u>DRHI</u>) formally closed on 31 March 2022, and was replaced by the Boiler Upgrade Scheme. The Scottish Government opted out of the Boiler Upgrade Scheme in favour of boosting our existing programmes.</p>
<p>UK Green Gas Support Scheme – a GB-wide Green Gas Scheme is planned to come into force in 2022, stimulating biomethane injection into the gas grid</p>	<p>UK Government announcement.</p>	<p>The GGSS provides tariff-based support for biomethane produced using anaerobic digestion (AD) and injected into the gas grid, as a direct replacement for natural gas.</p> <p>The scheme opened for applications on 30 November 2021 and at present runs to 30 November 2025.</p>	<p>N/A</p>	<p>The UK Government is consulting on proposals to extend the GGSS scheme by four months to 31 March 2026</p>

<p>UK Clean Heat Grant - a GB-wide Clean Heat Grant is planned to come into force in 2022, supporting uptake of heat pumps (and limited biomass boilers) via upfront grants.</p>	<p>UK Government announcement</p>	<p>The UK Government launched the Boiler Upgrade Scheme (formally the Clean Heat Grant) in April 2022.</p> <p>The Boiler Upgrade Scheme (BUS) provides upfront capital grants to support the installation of heat pumps and biomass boilers in homes and non-domestic buildings in England and Wales.</p> <p>£450 million of grant funding has been made available through the scheme over three years from 2022 to 2025.</p>	<p>N/A – statistics for the scheme published monthly<sup>20</sup>.</p>	<p>Scheme will run until 2025 in England and Wales.</p>
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<sup>20</sup> [Boiler Upgrade Scheme statistics](#)

<p><b>UPDATED POLICY:</b> Support for Heat Networks: continue providing funding towards the capital costs of heat networks through Scotland's Heat Network Fund, which offers £300m in grant funding until 2026, and through low interest loans offered by the District Heating Loan Fund.</p>	<p>Originally: CCP 2018 Updated 2023</p>	<p>Scotland's Heat Network Fund was launched in February 2022. Together with the funding awarded under the Low Carbon Infrastructure Transition Programme, £41.4 million has been awarded to heat network projects since the CCP was published, resulting in carbon savings, affordable heating for end users and growth of the supply chain.</p> <p>The District Heating Loan Fund (DHLF) continues to offer low interest loans to help overcome the financial barriers to the delivery of low carbon infrastructure projects.</p>	<p>N/A</p>	<p>We expect demand for Scotland's Heat Network Fund to increase due to the activity of the Heat Network Support Unit.</p> <p>We will consider how the DHLF can be best utilised to cover any future gaps in support for heat networks.</p>
<p>Implement the provisions of the Heat Networks (Scotland) Act 2021 to create a strong regulatory framework to support delivery in 2024.</p>	<p>2020-2021 PfG</p>	<p>The Heat Networks Delivery Plan, was published in March 2022, as required by the Heat Networks Scotland Act.</p> <p>Public consultation on the setting of a 2035 target</p>	<p>The Act creates two statutory deadlines:</p> <p>1 April 2022: Publication of Heat Networks Delivery Plan (with a review and reporting required every 2 years from the last report)</p>	<p>We will:</p> <p>lay regulations and guidance on building assessment reports and heat network zoning and consult on regulations for consenting and key</p>



		<p>occurred between December 2022 and March 2023.</p> <p>We will continue to work with the heat networks sector and local government as we develop detailed regulations and aim to put in place a functioning regulatory system, subject to public consultation in 2024.</p> <p>Discussions are underway with local authorities on feasibility of completing the review of zones by end of 2023 (to coincide with submission of Local Heat and Energy Efficiency Strategies).</p> <p>Significant progress has also been made on heat network consents and heat network assets.</p>	<p>1 October 2023: Laying of SSI to set 2035 target for heat network supply. Further milestones on development of regulatory packages are provided in the Heat Networks Delivery Plan.</p>	<p>heat network assets in Spring 2023. Consultations on heat network permitting and licensing are due to occur in late 2023 / early 2024.</p> <p>Review of the Heat Network Delivery Plan by March 2024. This will provide a further update on progress.</p> <p>We are working to deliver the regulations during 2024, but may need to keep timelines under review to ensure alignment, where practicable, with UK Government plans to regulate on the reserved areas.</p>
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<p><b>UPDATED POLICY:</b> Continue supporting the development of heat network projects in Scotland through the Heat Network Support Unit, which is a collaboration between organisations offering advice, guidance and funding to heat networks projects in the pre-capital stages of development.</p>	<p>Maintained</p>	<p>The Scottish Government launched its Heat Network Support Unit (HNSU) in 2022. It is a partnership between the Scottish Government, Zero Waste Scotland and Scottish Futures Trust and acts as the successor to the Heat Network Partnership.</p> <p>The HNSU supports the growth of heat networks by addressing key challenges in the pre-capital stages of heat network development and building capacity across the public sector to deliver successful projects.</p> <p>Working primarily with public sector organisations, the HNSU identifies and supports prospective heat network projects. It offers advice and grant funding for pre-capital stages of works, for example developing feasibility studies and Outline Business Cases, as well as for procuring technical, financial and legal</p>	<p>No</p>	<p>The HNSU will see an increased budget in the financial year 2023-24, allowing the support of more projects.</p>
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		<p>advisors.</p> <p>The HNSU is supporting at least 15 projects across Scotland through the feasibility and Outline Business Case stages.</p>		
<p>Net Zero Carbon Public Sector Buildings Standard will be introduced in 2021 and progressively rolled out across the public sector, as announced in the Programme for Government 2019.</p>	<p>2020-2021 PfG + CCPu</p>	<p>The new build Net Zero Carbon Public Sector Buildings Standard is now live and several public sector organisations have expressed an interest in implementing the standard.</p> <p>We are still developing a retrofit version of the standard.</p>	<p>N/A</p>	<p>We are aiming to launch the retrofit standard in 2023.</p>
<p>Local Heat and Energy Efficiency Strategies (LHEES) will be in place by the end of 2023, setting out preferred heat solutions zones, guiding building owner decision making about replacement heating systems, and forming</p>	<p>2020-2021 PfG + CCPu</p>	<p>A Scottish Statutory Instrument was passed by the Scottish Parliament to require all local authorities to produce a draft Local Heat and Energy Efficiency Strategy and Delivery Plan by the end of 2023 and then update them every five years. This came into force on 21 May 2022.</p>		<p>Local Authorities to publish their first Local Heat and Energy Efficiency Strategies and Delivery Plans by the end of 2023.</p>

<p>the basis for local delivery plans targeting heat and energy efficiency investment.</p>		<p>Guidance setting out what is required when developing an LHEES was published in October 2022 alongside an updated version of the LHEES Methodology. This sets out how Local Authorities can fulfil the requirements; however this approach is not mandatory.</p> <p>Multi-year funding (until 2027/28) for local authorities to resource the development of their LHEES has been agreed in partnership with COSLA.</p>		
<p>Assessment of Energy Performance and Emissions Regulations (Non-Domestic Buildings) - The Assessment of Energy Performance of Non-domestic Buildings (Scotland) Regulations 2016 require assessment of the energy</p>	<p>CCP 2018</p>	<p>As set out in the last Climate Change Plan monitoring report, the change in context since publication of the CCP means that instead a call for evidence was issued around three broad regulatory approaches:</p> <ol style="list-style-type: none"> <li>1. Measures based approach <ul style="list-style-type: none"> <li>– increase the ambition of the existing 2016 Regulations</li> </ul> </li> <li>2. Set a minimum EPC</li> </ol>	<p>The long term milestones for delivery are set in the Heat in Building Strategy which commits to introducing regulations to achieve this by 2025.</p>	<p>We will consult on this as part of our proposals for a Heat in Buildings Bill in 2023.</p>

<p>performance and emissions of larger non-domestic buildings (those over 1,000 m<sup>2</sup>). A review programmed for 2021 will investigate and consult upon amended scope of standards and more challenging improvement targets to create a viable pathway for all existing non-domestic buildings to deliver the level of energy demand and emissions reductions needed</p>		<p>standard</p> <p>3. Regulate based on actual energy consumption (operational ratings)</p> <p>The findings of the evidence review was published in August 2022.</p> <p>An independent <a href="#">Evidence Review</a> was commissioned to identify possible sources of information relating to heat use in individual non-domestic buildings. We have been developing proposals with an independent Working Group, towards these headline proposals being included in the consultation on the Heat in Buildings Bill.</p> <p>Revisions to the existing Energy Assessment process are being carried out alongside revisions for the domestic energy assessment process and those for the other UK</p>		
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		<p>nations.</p> <p>The proposed framework will allow alignment with the revised EU Energy Performance of Buildings Directive.</p>		
<p>Support for community low and zero emissions heat projects through CARES.</p>	CCPu	<p>Heat decarbonisation is a key focus of the current CARES contract, with tailored packages of support available to eligible applicants.</p> <p>The scheme provides free advice, and loan and grant funding to assist community groups in developing renewable energy, heat decarbonisation and energy efficiency projects, supporting the growth of community and locally owned energy in Scotland.</p>	<p>Strategic policy direction will be provided to the contract delivery body through the Scottish Government's contract manager in consultation with wider heat policy colleagues, to ensure CARES is aligned with Scottish Government heat decarbonisation objectives, with feedback on progress monitored through regular engagement and reporting commitments.</p> <p>The scheme has, since inception in 2010, offered advice to over 900 organisations and supported over 600 community and locally owned renewable projects throughout Scotland, offering funding of over £58 million to date.</p>	<p>Duration of CARES contract April 2021 – March 2025. Learning gathered from projects supported and then used to inform future projects.</p>

Salix financing facility to support investment in non-domestic buildings retrofit.	CCP 2018	Salix Finance continues to deliver the Public Sector Energy Efficiency Loan Scheme on behalf of Scottish Government.	N/A	Scottish Government and Salix are currently in discussion to review the existing funding model with a view to announcing a new scheme in 2023.
Work with social landlords to bring forward the review of the existing Energy Efficiency Standard for Social Housing (EESH2) with a view to strengthening and realigning the standard with net zero requirements.	CCPu 2020	In June 2022, the Scottish Government confirmed it would accelerate the review of EESH2 in order to bring it in line with Net Zero.	EESH2 set a target for energy efficiency in social housing of EPC B by 2032. This target has been temporarily put on hold pending the outcome of the review. <a href="#">Interim Guidance</a> for social landlords during the review of EESH2 was published in October 2022.	The review commenced in September 2022 and is due to complete during 2023.
Work with our partners, including the UK Government, local authorities and utility providers to determine the best approach to heat decarbonisation for buildings currently heated by natural gas.	CCPu	We continue to work with the UK Government, local authorities and utility providers on areas of mutual interest.  Work is underway to develop an understanding of the options for buildings currently using gas. Local Heat and Energy Efficiency	N/A	Local authorities are required to produce a draft Local Heat and Energy Efficiency Strategy and Delivery Plan by the end of 2023.

		<p>Strategies (LHEES), being developed by local authorities, will set out the long-term plan for decarbonising heat in buildings and improving their energy efficiency across an entire local authority area. LHEES will identify strategic heat decarbonisation zones and set out the principal measures for reducing buildings emissions within each zone. LHEES are designed to evolve over time as policy and regulations are introduced and new technologies become available. They will initially focus on strategic technologies that are already tried and tested, such as energy efficiency measures, heat pumps and heat networks.</p> <p>We are engaging with SGN and National Grid to understand the role hydrogen can play in meeting our heat</p>		
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		<p>decarbonisation targets.</p> <p>We also continue to call on the UK Government to accelerate reserved decisions on the role of hydrogen and the future of the gas network, and to take urgent action on rebalancing gas and electricity prices, which we believe will have a profound influence on the cost of zero direct emissions heating systems and their uptake.</p>		
<p>Review the system of building assessments and reports on energy performance and heat to ensure a system that is fit for purpose in meeting net zero emissions objectives for heat in buildings.</p>	CCPu	<p>In Summer 2022 we published a response to our 2021 consultation. This set out our intention to bring forward final revised proposals for EPC reform in 2023.</p>	<p>We published our consultation response in Summer 2022.</p>	<p>We plan to publish a final consultation on EPC reform in 2023.</p>
<p>Work with stakeholders to further understand and support the application and use of low and zero emissions heating within</p>	CCPu	<p>The Tenements Short Life Working Group (SLWG) undertook a workshop with stakeholders on traditional and protected buildings on 26 October 2022, and this has informed the</p>	<p>The milestones are being met and we will continue to work closely with Historic Environment Scotland on policy in this area.</p>	<p>We will consult on this as part of our proposals for a Heat in Buildings Bill in 2023.</p>

designated historic environment assets and hard to treat buildings.		recommendations of the SLWG which will be submitted to the Minister.		
Develop and introduce future regulation for non-domestic buildings and launch a consultation on these proposals.	CCPu 2020	We issued a Call for Evidence on three possible approaches to regulating heat in non-domestic buildings in December 2021. The findings of the evidence review was published in August 2022. We have been developing proposals with an independent Working Group, towards these headline proposals being included in the consultation on the Heat in Buildings Bill.	The long term milestones for delivery are set in the Heat in Building Strategy.  The Heat in Buildings Strategy commits to introducing regulations to achieve this by 2025	We will consult on this as part of our proposals for a Heat in Buildings Bill in 2023.  Subject to passage of the Bill we will consult further on the regulations themselves with an aim to have them take effect by 2025.

<p>Undertake work to identify the capacity and output of renewable electricity generation required in Scotland to support the projected rollout of heat pumps.</p>	<p>CCPu 2020</p>	<p>As part of research we have commissioned into the energy transition in Scotland, we have assessed potential ranges of energy demand and generation, including for electricity, out to 2045 under three future energy scenarios. These scenarios have informed the roadmap included in the draft Energy Strategy and Just Transition Plan and further assessments are underway as part of the next CCP. We will continue to update our assessments.</p>	<p>N/A</p>	<p>Ongoing</p>
<p>Consider whether to extend Permitted Development Rights for zero-emission heat networks and micro-renewable technologies.</p>	<p>CCPu 2020</p>	<p>We are carrying out a multi-phase review of permitted development rights (PDR) in Scotland.</p> <p>PDR for renewable energy equipment, including micro renewables, to be considered through Phase 3 in Spring 2023. Heat networks PDR are now in phase 4.</p>	<p>Work is in part dependent on progress with the wider legislative framework on heat networks.</p>	<p>Once the legislative framework for heat networks is adequately developed, we will consider how PDR might best align with the statutory process.</p>

<p>Undertake work to better understand the impact on electricity networks of projected heat pump deployment. Work with the Distribution Network Operators through the Heat Electrification Partnership to build an evidence base to inform business planning. Work with industry and networks to understand need for heat pumps systems to be smart enabled, and identify options to integrate smart systems into our delivery programmes; and to explore how innovation can help to improve the consumer experience.</p>	<p>CCPu 2020</p>	<p>We have worked closely with Distribution Network Operators to help their business plans for the next five years reflect the scale and pace of low carbon technology deployment (including heat pumps) required to meet Scottish Government targets.</p> <p>Ofgem has now finalised these plans and provided a mixture of up front allowances and uncertainty mechanisms that will support our ambitions and allow DNO's to respond to increasing demand for connections.</p> <p>We have also commissioned research looking into the network investments of the heat transition for Scotland, which is due to publish shortly. It will form part of the evidence base for how we approach decarbonising our buildings in Scotland.</p>	<p>N/A</p>	<p>Ongoing</p>
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Support heat networks through: Introducing a Non-Domestic Rates Relief for renewable and low carbon heat networks until 2023/24.	CCPu	The Non-Domestic Rates (District Heating Relief and Renewable Energy Generation Relief) (Scotland) Amendment Regulations 2021 introduced a 90% relief for district heating networks powered wholly or mainly by renewable generation.	The relief is available from 1 April 2021 and ending on 31 March 2024.	A review of Rates Relief regulations for district heating networks will take place in 2023.
Through National Planning Framework 4 (NPF4), ensure that local development plans take account of where a Heat Network Zone has been identified	CCPu	NPF4, which was adopted in Feb 2023 contains a policy for Local Development Plans to take account of HNZ. The policy states 'LDPs should take into account the area's Local Heat & Energy Efficiency Strategy (LHEES). The spatial strategy should take into account areas of heat network potential and any designated Heat Network Zones (HNZ).	N/A	Complete
Explore how local tax powers could be used to incentivise or encourage the retrofit of buildings, and commission further	CCPu 2020	We will continue to explore options to incentivise buildings retrofit / transition to zero emissions heat using local tax powers.	N/A	Ongoing

analysis to identify potential options.				
Design future delivery programmes to ensure significantly accelerated retrofit of buildings, with new programmes to be in place from 2025.	CCPu 2020	In December 2022, we launched our improved Home Energy Scotland grants and loans scheme. The successor to our Warmer Homes Scotland scheme will also start operations later this year. This will increase the number of households supported annually to install the robust insulation measures needed to support lower carbon heating systems.	N/A	Our delivery programmes will evolve over the course of the decade to meet the scale of change required and align with any regulations we introduce.

Outcome 3: Our gas network supplies an increasing proportion of green gas (hydrogen and biomethane) and is made ready for a fully decarbonised gas future.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Hydrogen for heat demonstrator – providing £6.9m support for SGN’s H100 hydrogen for domestic heat demonstrator.	2020-2021 PfG	<p>SGN’s H100 project continues to make good progress towards their expected launch date of 2024.</p> <p>Key contracts have been awarded, and the threshold of 270 customer sign-ups has been reached and surpassed.</p> <p>SG representatives remain engaged with this work, attending monthly board meetings and inputting providing views on risk and policy where appropriate.</p>	N/A	The H100 Fife hydrogen network is scheduled to go live in 2024; the project will be operational until March 2027.
Work with UK Government on product standards, with a view to making new gas boilers hydrogen-ready.	CCPu 2020	The UK Government’s recent Improving Boiler Standards and Efficiency consultation included a potential requirement for new gas boilers to be ‘hydrogen-ready’ from 2026.		

		Product standards for boilers are a reserved matter but the Scottish Government has written to the UK Government to welcome the proposals within the consultation, while calling for the phase-out of gas boilers to be expedited from the mid-2030s.		
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Outcome 4: The heat transition is fair, leaving no-one behind and stimulates employment opportunities as part of the green recovery

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Develop a long-term public engagement strategy and begin implementation of early actions.	CCPu 2020	<p>Advice on good practice approaches to public engagement has been collated from a range of communication and behaviour change experts.</p> <p>Feedback from a Call for Evidence will inform finalisation of the strategy, to publish in Summer 2023.</p> <p>Research projects, to build a wider evidence base for the strategy, included exploring:</p> <ul style="list-style-type: none"> <li>• trusted messengers and communication channels,</li> <li>• the experience of early adopters of ZDEH systems, and</li> <li>• a series of in-depth public focus groups on proposed</li> </ul>	Development of an appropriate monitoring approach is underway, in line with the strategy.	Publish in 2023

		<p>regulations, future support needs and public engagement tactics.</p> <p>A national marketing campaign to promote existing advice and support for heat and energy efficiency improvements was delivered November 2022 to March 2023.</p>		
<p>Smart Meter installation: All homes and businesses will be offered a smart meter by 2020 under a UK Government initiative, providing the opportunity for a greater understanding of final energy consumption.</p>	CCP 2018	<p>The smart meter programme is owned and led by the <u>UK</u> Government who have responsibility for the policy, regulatory and commercial framework.</p> <p>The Scottish Government is working to deliver a Smart Meter Advice Portal (<u>SMAP</u>) through Home Energy Scotland (<u>HES</u>), to enable customers to make the most of the energy use data provided by their smart meters.</p> <p><u>HES</u> has successfully developed <u>SMAP</u>, which has all the functionality needed</p>	<p>In February 2023, the UK Government published the <a href="#">Mid-Point Review</a>, which sets proposals for the second half of the Framework (2024/2025). The proposals are summarised below:</p> <ul style="list-style-type: none"> <li>• Mixed portfolio suppliers being required to meet both the domestic and non-domestic components of their installation requirement.</li> <li>• Updates to the</li> </ul>	Ongoing

		<p>to operate as intended, however data issues that are in the control of the Data and Communications Company (DCC) restrict HES' ability to use the tool's full functionality and it is not currently able to fulfil its potential.</p>	<p>rollout model used to set the tolerance levels for Year 3 and Year 4 of the Framework.</p> <ul style="list-style-type: none"> <li>• The adjustment to the formula used to set supplier targets in order to mitigate the impact of customers switching suppliers applied to all targets in Year 2 (2023) will continue to apply to non-domestic installation requirements in Year 3 (2024).</li> </ul> <p>The consultation closed on 21 March 2023, and the UK Government will issue a response in due course.</p> <p>According to the latest statistics provided by Smart DCC in February 2022, 47.7% of all meters in Scotland are now smart meters.</p>	
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<p>Work with the Scottish Cities' Alliance and the seven cities on the opportunities to accelerate activity on heat and energy efficiency.</p>	<p>CCPu 2020</p>	<p>The Scottish Government provided funding support to the Scottish Cities Alliance (SCA) to deliver a Carbon Scenario Tool to support both the cities net zero ambitions and the production of LHEES.</p> <p>The Carbon Scenario Tool project has now completed and reported in May 2022<sup>21</sup>. Recommendations from this report have fed into further work by SG, SCA, Improvement Service, ECCI, Sustainable Scotland Network and CoSLA. This has resulted in a partnership proposal to establish a local government facing 'Climate Intelligence Service' and this is currently being considered by SG and CoSLA, with the prospect of establishing the service in 2023.</p>	<p>N/A</p>	<p>Complete</p>
<p>Provide capital investment for Scottish colleges for</p>	<p>CCPu 2020</p>	<p>We published our Heat in Buildings Supply Chains</p>		

<sup>21</sup> [The Carbon Scenario Tool \(CST\)](#)

<p>equipment to deliver training for energy efficiency and heat.</p>		<p>Delivery Plan in November 2022, including ongoing support for skills and training.</p> <p>Recent investments means that there is broadly sufficient infrastructure in Scottish Colleges at current levels of demand for training. However, training is not equally available across all geographic areas.</p> <p>Scottish Government's therefore invested in a new mobile training centre for heat pump installation, accessible to any college in Scotland while being hosted by South Lanarkshire College, which will be capable in delivering on site training across Scotland.</p>		
<p>Respond to the recommendations of the Expert Advisory Group on a heat pump sector deal for Scotland, by Q1 2022</p>	<p>CCPu 2020</p>	<p>Scottish Government's response was published on 11 November 2022.</p>	<p>N/A</p>	<p>Complete</p>

<p>Bring forward and support demonstrator projects, such as: hybrids and high temperature heat pumps; the use of hydrogen for space and water heating; projects to understand the impact of heat transition on existing energy networks.</p>	<p>CCPu 2020</p>	<p>Our Heat in Buildings Supply Chain Delivery Plan announced a new Green Heat Innovation Support Programme that makes available £17.6 million in funding for Scottish based companies to develop ideas that support growth of the green heat sector. This includes funding for feasibility studies as well as large-scale R&amp;D and capital investment projects.</p>	<p>No</p>	<p>We will continue to identify opportunities that can support research and development in Scotland's heat transition.</p>
<p>Publish a 'Heat Network Investment prospectus' in 2021/22 - a first-cut of HN Zones across Scotland, combined with information on decarbonisation needs of existing networks.</p>	<p>CCPu 2020</p>	<p>We published a First National Assessment of Potential Heat Network Zones on 13 April 2022.</p> <p>Work on the decarbonisation of existing networks will be taken forward in 2022/2023.</p>		<p>Complete (renamed as "First National Assessment of Potential Heat Network Zones")</p>
<p>Establish a short life working group on finance for the heat transition.</p>	<p>CCPu 2020</p>	<p>We have established a Green Heat Finance Task Force in 2021 to explore potential new and value for money innovative financing mechanisms for both at - scale and individual level</p>		<p>The Taskforce meetings began in February 2022. Their recommendations to the Scottish Government will be published through an</p>

		investment in heat		interim report this spring and a final report this autumn.
Establish principles to underpin our commitment to 'no-one being left behind' in the heat transition, ensuring our approach neither increases the fuel poverty rate nor increases the depth of existing fuel poverty. This will include the effective design and targeting of our fuel poverty and heat in buildings programmes.	CCPu 2020	<p>The Heat in Buildings Strategy sets out the principles that will guide our delivery programmes, to assess the impacts of our programmes on fuel poverty rates, and to ensure only take forward actions where they are found to have no detrimental impact on fuel poverty rates, unless additional mitigating measures can also be put in place.</p> <p>We published research in October 2022 which explored the role energy storage might play in reducing energy costs when installed alongside zero emissions heat: <a href="#">Building-level energy storage: reducing consumer bills to deliver zero-emissions heat.</a></p>	N/A	Ongoing

		<p>This will form part of the evidence base for how we approach decarbonising our buildings in Scotland.</p> <p>We aim to make sure that the heat transition happens in a way that protects those who need it most, and leaves no-one behind. As part of this, we will publish a draft Buildings a Construction Just Transition Plan later this year.</p>		
<p>Ensure Local Heat and Energy Efficiency Strategies are developed through extensive engagement with local communities.</p>	CCPu 2020	<p>Guidance setting out what is required when developing an LHEES was published in October 2022.</p> <p>The Guidance included a requirement for extensive engagement as local authorities develop their LHEES including with local communities.</p>		
<p>Continue delivery of energy efficiency investment to support fuel poor households and conduct further modelling and analysis to better understand the potential</p>	CCPu 2020	<p>We are conducting internal analysis to understand the intersection of fuel poverty and heat decarbonisation and we continue to evolve our schemes to ensure</p>	N/A	Ongoing



<p>impact of the heat transition on fuel poor households and the scale of, and options for, mitigation that may be required.</p>		<p>solutions are tailored to the specific circumstance of households.</p>		
<p>Urge the UK Government to rebalance levy costs on energy bills to make gas and electric systems relatively more cost comparable.</p>	<p>CCPu 2020</p>	<p>We continue to press the UK Government on this.</p> <p>In its recent consultation and Net Zero plan – Powering Up Britain, the UK Government restated its ambition to publish soon proposals on how to rebalance energy bills away from electricity to incentivise electrification across the economy.</p>	<p>N/A</p>	<p>Ongoing</p>

# Climate Change Plan Monitoring Report 2023: Transport

## Part A - Overview of sector

The 2020 annual emissions envelope published in the CCPu for this sector was for 11.0 MtCO<sub>2</sub>e, whereas the outturn emission statistics for this year (published in June 2022) show a position of 10.3 MtCO<sub>2</sub>e<sup>22</sup>. On the basis of comparing these figures, the sector was **within** its envelope in 2020.

The CCPu sets out the following policy outcomes for this sector, the indicators for which are summarised below:

To address our overreliance on cars, we will reduce car kilometres by 20% by 2030	On Track	Off Track	Too Early to Say
% reduction in car kilometres	X		

We will phase out the need for new petrol and diesel cars and vans by 2030	On Track	Off Track	Too Early to Say
% of new car registrations that are ULEV	X		
% of new van registrations that are ULEV	X		

To reduce emissions in the freight sector, we will work with the industry to understand the most efficient methods and remove the need for new petrol and diesel heavy vehicles by 2035	On Track	Off Track	Too Early to Say
% of new HGV registrations that are ULEV			X

We will work with the newly formed Bus Decarbonisation Taskforce, comprised of leaders from the bus, energy and finance sectors, to ensure that the majority of new buses purchased from 2024 are zero emission, and to bring this date forward if possible.	On Track	Off Track	Too Early to Say
% of new bus registrations that are ULEV	X		

<sup>22</sup> Emissions data for baseline and 2020 have been updated to reflect a forthcoming change in the global warming potentials for non-CO<sub>2</sub> greenhouse gases.

We will work to decarbonise scheduled flights within Scotland by 2040.	On Track	Off Track	Too Early to Say
% reduction in emissions from scheduled flights within Scotland.			X

Proportion of ferries in Scottish Government ownership which are low emission has increased to 30% by 2032	On Track	Off Track	Too Early to Say
% of ferries that are low emissions	X		

By 2032 low emission solutions have been widely adopted at Scottish ports.

There are no indicators for this policy outcome. More information is provided in Part C.

Scotland's passenger rail services will be decarbonised by 2035.	On Track	Off Track	Too Early to Say
% of single track kilometres electrified	X		
% of train kilometres powered by alternative traction			X

## Just transition and cross economy impacts

We wish to understand and report on the broader just transition and cross-economy impacts of our emissions-reduction activities in addition to these sector specific policy outcomes and indicators. To do this, in this report we use data from the Office of National Statistics (ONS): Low Carbon Renewable Energy Economy (LCREE) publication. The LCREE data presented in this report is based on survey data of businesses which perform economic activities that deliver goods and services that are likely to help generate lower emissions of greenhouse gases, for example low carbon electricity, low emission vehicles and low carbon services.

The LCREE indicator is narrowly defined and, while useful within its limited scope, does not give us the full picture of the impacts on workforce, employers and communities and progress towards a just transition.

Over the next few years we will work to develop a more meaningful set of success outcomes and indicators aimed at tracking the impacts of our policies on a just transition to net zero.

## Sector commentary on progress

2020 was the first-time transport emissions have been within its envelope of 11.0 MtCO<sub>2</sub>e, and this was mainly as a result of COVID-19 lockdowns and restrictions. This demonstrates the scale of the emissions reduction required to be achieved but without the extraordinary impact of a pandemic.

Cars continue to account for the largest share of all transport emissions, 38% in 2020. A draft route map was published in January 2022 and a consultation was undertaken to support the policy outcome to reduce car kilometres by 20% by 2030. A finalised route map will be published later this year.

We need plans to deter car use to accompany plans to encourage active travel and the use of public transport.

We continue to provide funding through the Bus Partnership Fund for bus priority measures, building on the £25.8m awarded to date. The Young Person's Free Bus Travel Scheme launched in January 2022, providing free bus travel for young people under the age of 22. By early May 2023, two-thirds of young people had a valid Young Scot or NEC card to access free bus travel. We have committed to a record level of increased investment in active travel of at least £320 million a year by 2024-25 or 10% of the total transport budget. However, the evidence is clear that incentivising sustainable alternatives alone will not be sufficient to bring about the behaviour change to deliver the scale of 20% car KM reduction therefore we have commissioned research exploring equitable options for demand management to discourage car use.

Alongside car KM reduction, increased ULEV adoption is important to drive a reduction in emissions from cars. Electric vehicle sales remain strong against a challenging global supply chain. Additionally, with many companies and households now leasing vehicles that are often registered south of the border, UK Government statistics may understate the progress being made by Scotland.

We are consulting with the other nations of the UK on the introduction of a Zero Emission Vehicle mandate, as a possible means to support increased zero emission vehicle adoption. Our Low Carbon Transport Loan has provided over £185m of interest free loans to individuals and businesses across Scotland supporting the transition to low carbon vehicles. The ChargePlace Scotland network continues to grow and to date there are over 2400 charging points across the network with investment now over £65m.

Significant investment continues to be made in decarbonising the bus fleet: £62m in capital funding was awarded through the Scottish Zero Emission Bus Challenge Fund (ScotZEB), the Bus Decarbonisation Taskforce has published its pathway to a zero-carbon bus sector, with the Scottish Government launching a new £500,000 scheme to support its delivery.

At present 40.7% of single track kilometres on Scotland's rail network is electrified and we continue to make progress on decarbonising Scotland's Railway with completion of electrification of the Barrhead Line due to complete in December 2023.

Modal shift remains a priority for rail freight and this is supported through investment and regulatory targets. The regulatory growth target of 7.5% in the current rail control period which runs from 2019 to 2024 has driven a focus on rail freight and changed behaviours. This, along with a growing understanding from companies of the "brand value" of moving goods sustainably, has resulted in a number of new rail freight services in the last year. With this in mind, we have set a further challenging growth target of 8.7% for the next rail control period (2024 to 2029) with the expectation that growth of 10% may be achievable.

We also continue to work with industry partners and third-party investors, to grow rail freight on the Scottish network. A key example of the result of this work is Highland Spring's new rail freight facility at Blackford which was opened in August 2022. This terminal, which was facilitated by Scottish Government policies and investment, will remove a minimum of 10.02 million lorry miles from Scotland's roads in the first 10 years of operation.

In addition, in relation to road freight, we have established the Zero Emission Truck Taskforce, a group of senior leaders spanning haulage operators, trade bodies, government, energy, commercial finance and manufacturers. The Taskforce will identify the hurdles and opportunities offered by the transition to zero emission trucks. Working collaboratively, they will set out the steps required to enable a swift and just transition to new technologies, identifying where further development is required and exploring new business models.

#### Developments in monitoring arrangements since last report

N/A

## Part B- Progress to Policy Outcome indicators

**Policy Outcome:** Cross-sectoral social and economic

**Indicator:** FTE employment in Low Carbon Renewable Energy Economy Indicator

**On-Track Assessment (Milestones/Targets):** Year-to-year change

**Most Recent Data:** 2021

**Data Source(s):** Office of National Statistics: Low Carbon Renewable Energy Economy (LCREE), Time spent of Green Tasks

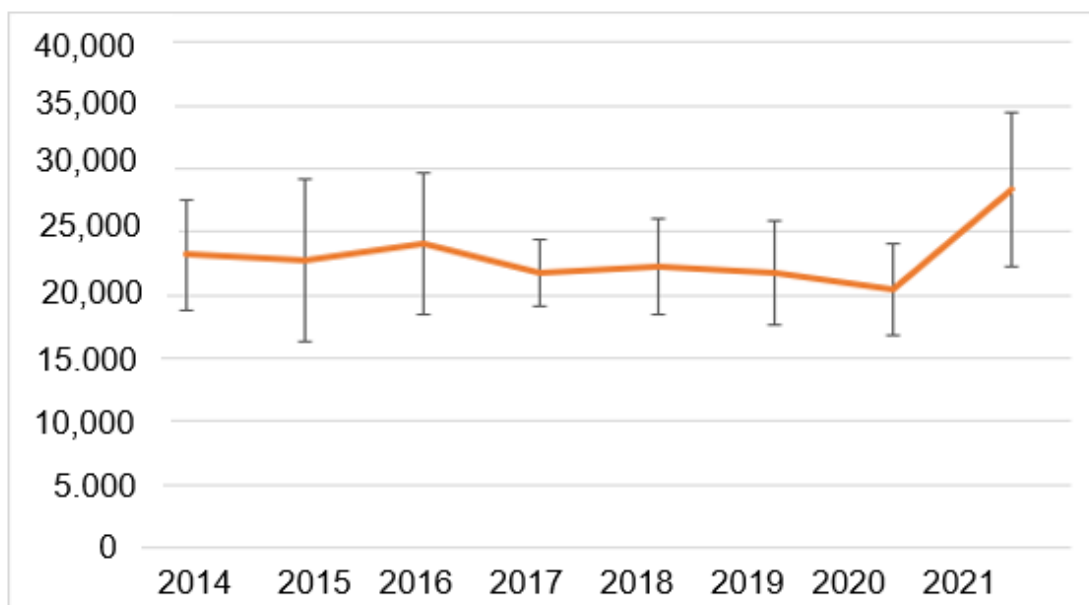
**Assessment:** Too Early to Say

### Commentary:

In 2021, the Scottish low carbon renewable energy (LCREE) sectors were estimated to provide 28,300 jobs, the highest in the published data.

- The estimates of LCREE are based on a relatively small sample of businesses and hence are subject to a wide confidence interval. Scottish LCREE employment in 2021 is substantially higher than previous years but the difference is not statistically higher than 2020.

Employment in Low Carbon Renewable Energy Economy, FTE



- LCREE only shows employment in roles in Industries directly involved in the transition to Net Zero.
- The ONS also released experimental statistics on a wider perspective of green activity in the economy with their time spent on green tasks release.
- These stats reflect green activities in both LCREE and non-LCREE sectors. The 2023 publication has not yet been published.

- Last year's publication showed that in 2019 Scotland achieved an all-time high of hours spent on green tasks and proportion of workers doing green tasks, including workers who spend more than 20% of their time on green tasks.
- The proportion of workers doing green tasks in Scotland was 36% in 2019, up from 23.8% in 2004. Workers who have spent more than 20% of their time doing green tasks was 14%, up from 9% in 2004.
- The proportion of overall hours spend doing green tasks in Scotland was 7%, up from 4.9% in 2004.

Policy Outcome: 1

Indicator: % reduction in car kilometres

On-track Assessment (Milestones/Targets): Progress to target [20% reduction by 2030]<sup>23</sup>

Most recent data: -15.3% (2019-2021)

Data source(s): Scottish Transport Statistics 2022

Assessment: On track

#### Commentary:

Following significant pandemic-related car traffic reductions in 2020, the latest figures show that as expected, car use began to rebound as COVID-19 restrictions eased, with car kilometres increasing by 14.9% between 2020 and 2021. Nevertheless the 15.3% reduction against the 2019 baseline reflects ongoing changes to travel patterns through 2021, including increased use of digital connectivity which enables people to work and connect with others remotely.

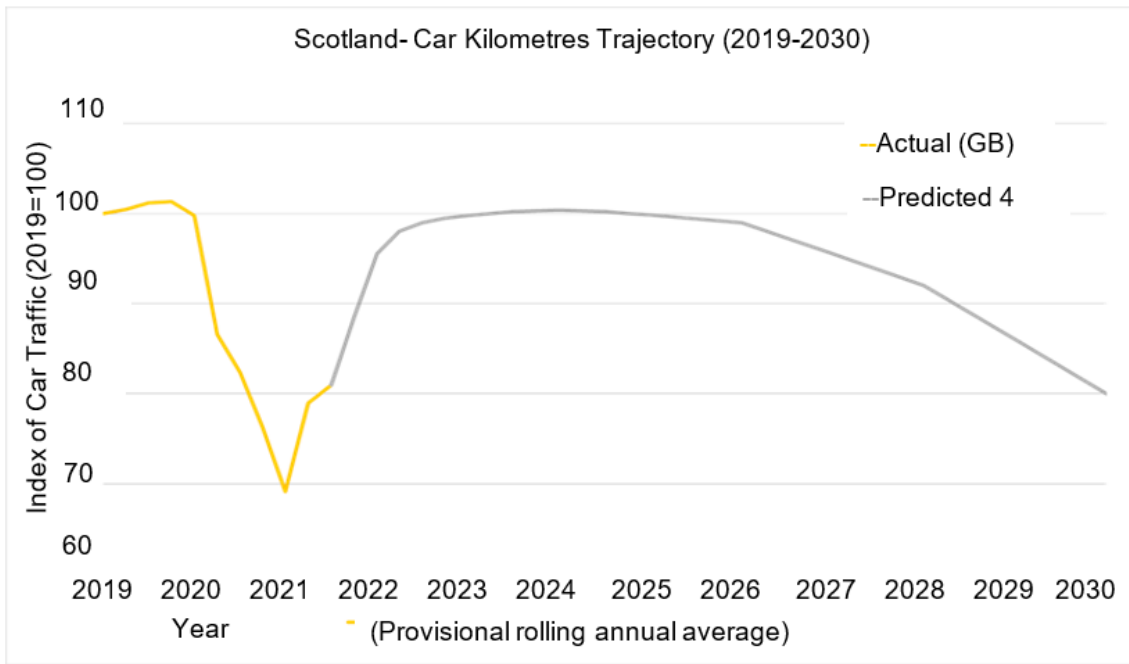
There remains a significant amount of uncertainty regarding the travel patterns in the medium- and long-term, but it is expected car traffic will continue to rise over the next 2-3 years before interventions to deliver reductions in car traffic start to make an impact.

Sustained reductions in car use are expected to occur post-2025, on the assumption that demand management measures are designed, approved and implemented in the intervening period. These will be supported by our early route map interventions, including free bus travel for the under-22s and Low Emission Zones, as well as further enhancements to digital connectivity, increased emphasis on the importance of reducing unnecessary travel, and a supportive approach to flexible and local working.

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<sup>23</sup> From 2019 baseline





Policy Outcome: 2

Indicator: % of new car registrations that are ULEV

On-track Assessment (Milestones/Targets): Year-to-year change

Most recent data: 14.0% (Year to Q3 2022)

Data source(s): Department for Transport (DfT) and Driver and Vehicle Licensing Agency (DVLA)

Assessment: On track

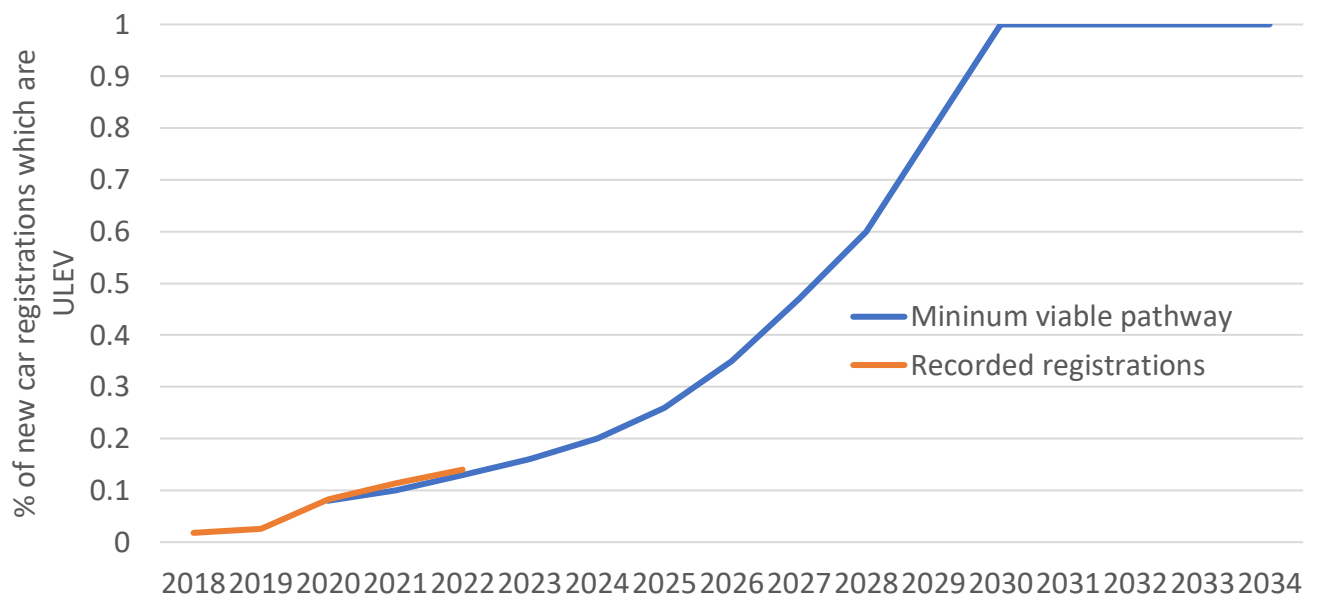
Commentary:

ULEVs accounted for 14.0% of new car registrations in the 12 months to September 2022. This is an increase from 11.4% in the previous twelve-month period.

The number of new ULEV car registrations in Scotland has increased every year since records began in 2010. Over the past year, the number of ULEV cars registered for the first time in Scotland increased by 19% compared to the previous year, with nearly 19,000 ULEVs registered over the past 12 months. Additionally, with many companies and households now leasing vehicles that are often registered south of the border, UK Government statistics may understate the progress being made by Scotland.

The minimum viable pathway shows the minimum rate of ULEV car registrations that is considered to be required each year in order to remain on-track for achieving this policy outcome. As of Q3 2022, the rate of ULEV car registrations is greater than the minimum viable rate for 2022, therefore progress towards this policy outcome is currently considered to be on track. This pathway may be reviewed and refined in future years.

Minimum viable pathway for ULEV car sales



**Policy Outcome:** 2

**Indicator:** % of new van registrations that are ULEV

**On-track Assessment (Milestones/Targets):** Year-to-year change

**Most recent data:** 2.1% (Year to Q3 2022)

**Data source(s):** Department for Transport (DfT) and Driver and Vehicle Licensing Agency (DVLA)

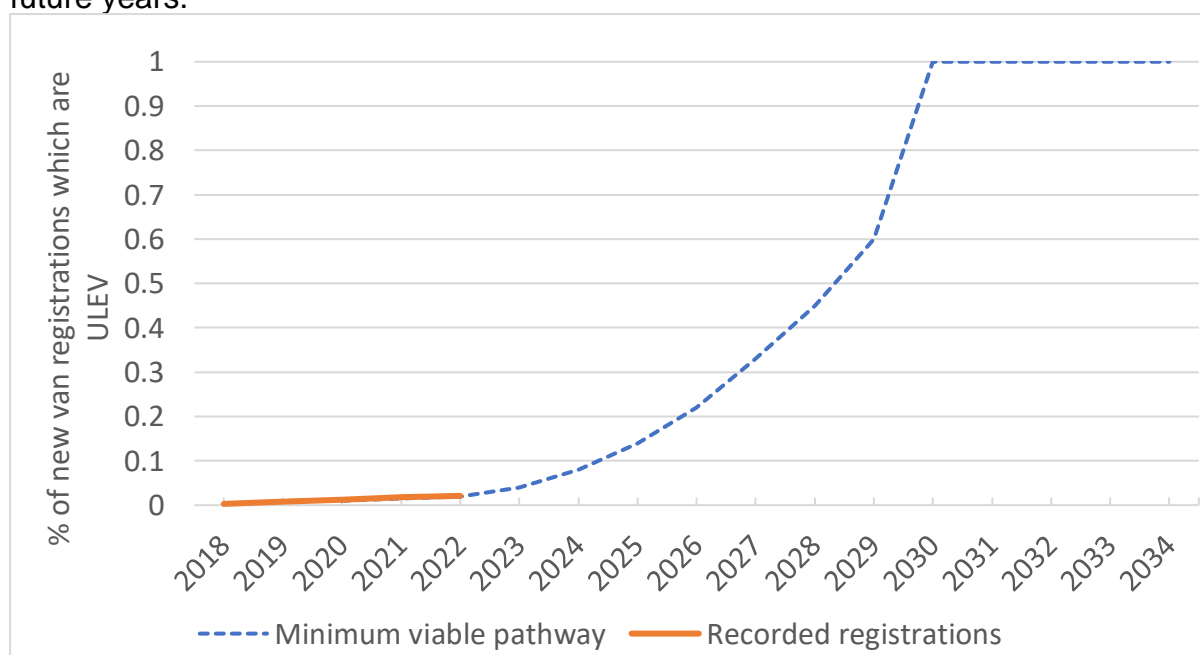
**Assessment:** On track

**Commentary:**

ULEVs accounted for 2.1% of new van registrations in the 12 months to September 2022. This is an increase from 1.8% in the previous twelve-month period.

Although ULEV vans currently represent a small proportion of all new van registrations, the number of new ULEV vans registered in Scotland has increased by 15% over the past year, compared to the previous 12 months.

The minimum viable pathway shows the minimum rate of ULEV van registrations that is considered to be required each year in order to remain on-track for achieving this policy outcome. As of Q3 2022, the rate of ULEV van registrations is in line with the minimum viable rate for 2022, therefore progress towards this policy outcome is currently considered to be on track. This pathway may be reviewed and refined in future years.



Policy Outcome: 3

Indicator: % of new HGV registrations that are ULEV

On-track Assessment (Milestones/Targets): Year-to-year change

Most recent data: 0% (Year to Q3 2022)

Data source(s): DVLA/DfT

Assessment: Too early to say

#### Commentary:

There were a very small number of ULEV HGV registrations in the year to Q3 2022. This is to be expected given the rate at which technology and energy infrastructure have developed to date.

These vehicles are now becoming more widely available and the Zero Emission Truck Taskforce (comprising senior leaders across operators, manufacturing, commercial finance, energy infrastructure, government and unions) has met 6 times, moving from an information gathering phase to working groups developing actions. The expected output from the group is a pathway to zero emission HGVs in Scotland, with agreed collaborative actions to unlock transition to zero emission HGVs at pace.

Hauliers are keen to transition as soon as there is sufficient energy infrastructure and it is commercially viable to do so. Manufacturers recognise that Scottish fleets are innovative and enthusiastic; there is an increasing number of vehicles available for urban and regional use cases; and commercial finance partners are beginning to develop products which make the vehicles more accessible to operators. However high energy costs, a high initial purchase price and lack of experience of the vehicles in real world settings allied to a lack of energy infrastructure continue to provide substantial hurdles which the developing pathway will seek to overcome.

Policy Outcome: 4

Indicator: % of new bus registrations that are ULEV

On-track Assessment (Milestones/Targets): Year-to-year change

Most recent data: 37% (Year to Q3 2022)

Data source(s): DVLA/DfT

Assessment: On track

#### Commentary:

ULEVs accounted for 37% of new bus registrations in the 12 months to September 2022. This is an increase from 13% in the previous twelve-month period.

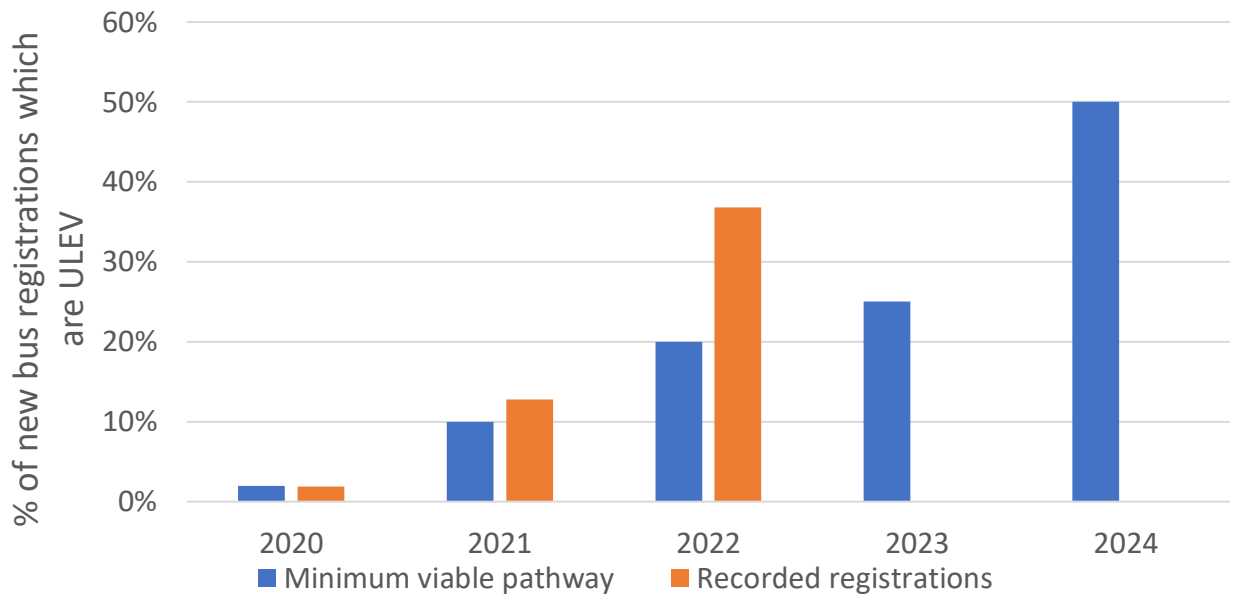
The number of new ULEV buses has increased considerably in the past year, with 68% of all ULEV bus registrations to date having taken place in the 12 months to Q3 2022.

The minimum viable pathway shows the minimum rate of ULEV bus registrations that is considered to be required each year in order to remain on track for achieving this policy outcome. As of Q3 2022, the rate of ULEV bus registrations is above the minimum viable rate for 2022, therefore progress towards this policy outcome is currently considered to be on track. This pathway may be reviewed and refined in future years.

To date, the Scottish Government has supported the Scottish bus sector on the journey to Net Zero by supporting the acquisition of 548 zero-emission buses and their supporting infrastructure, through the Scottish Ultra Low Emission Bus Scheme (SULEBS) and the Scottish Zero Emission Bus Challenge Fund (ScotZEB). The Bus Decarbonisation Taskforce concluded its lifespan with the publication of the Pathway to Zero Emission Buses in Scotland, with actions for industry leaders from manufacturing, operating, energy and finance sectors to work together to maintain momentum, and overcome the challenges towards a Just Transition to a zero-emission future for bus in Scotland.

The Market Transition Scheme, worth £500,000, was launched in August 2022 and ran until December 2022, and was designed to support SME, community, and coach tour operators, as well as larger operators, DNOs, manufacturers and financiers to come together to establish consortia and develop innovative business models in advance of any potential second round of ScotZEB. By encouraging the industry to collaborate and engage with private financing, opportunities for aggregating demand and unlocking economies of scale are presented, demonstrating strong value-for-money and driving momentum for the market to become self-sustaining.

Minimum viable pathway for ULEV bus registrations.



Policy Outcome: 5

Indicator: % reduction in emissions from scheduled flights within Scotland

On-track Assessment (Milestones/Targets): Year-to-year change

Most recent data: +91% (2021-2022)

Data source(s): Loganair

Assessment: Too early to say

#### Commentary:

As expected, emissions from scheduled flights within Scotland grew significantly over the period as COVID-19 restrictions relaxed, with a return to work and resumption of other previously restricted activities.

Maintaining connectivity within the Highlands and Islands whilst reducing emissions will require the use of new types of aircraft (such as hydrogen, electric or hybrid), and/ or the greater use of Sustainable Aviation Fuel (SAF).

Loganair, which operates the vast majority of flights across the Highlands and Islands, expects the first small, zero-emission commercial flights to be operating across Scotland by the end of this decade. It reportedly has an ambition for all its fleet to be zero-emissions aircraft by 2040.

A significant breakthrough occurred in January this year with the test flying of the largest aircraft in the world to be powered by a hydrogen-electric engine. While there are many regulatory, funding and testing stages to be gone through before low/ zero emission craft can be operated commercially, it is expected that 19-seater aircraft such as the one test flown could potentially be used on a range of Scottish routes.

The UKG recently published its 'Jet Zero' aviation strategy. As regulation of aviation is reserved, various policy measures will apply to Scotland, for example, the introduction of a SAF mandate and the establishment of SAF production facilities in the UK. We would expect these – and other global measures to stimulate SAF production – to reduce significantly the cost differential between SAF and current aviation fuel. In turn, this should reduce emissions from scheduled flights within Scotland. Jet Zero also includes an aim for net zero domestic aviation by 2040 and an aspiration for zero emission routes connecting different parts of the UK by 2030.

The exact impact of these and other measures to encourage low/ zero emission flights cannot be fully determined at this stage, and this indicator therefore remains assessed as 'too early to say'.



**Policy Outcome:** 6

**Indicator:** % of Government owned ferries that are low emissions.

**On-track Assessment (Milestones/Targets):** Progress to target [30% by 2032]

**Most recent data:** 8% of the current Scottish Government Fleet consists of low emission vessels.

**Data source(s):** Caledonian Maritime Assets Ltd (CMAL) & Transport Scotland

**Assessment:** On track

**Commentary:**

An advance copy of the draft Long-Term Plan for Vessels and Ports was published at the end of 2022, as a first part of the Islands Connectivity Plan, set out proposals for fleet modernisation and port upgrades to 2045 and includes a section on carbon reduction.

The Small Vessel Replacement Programme, which is approaching business case decision, will increase the number of low emission vessels within the Scottish Government's ferry fleet. The programme will deliver vessels that utilise the latest proven battery and on shore charging technologies.

The indicative share of low emission ferries in each year is set out below. This trajectory has been updated to align with current programme timelines, but as plans and programmes are in place to deliver a sufficient number of low emissions vessels by 2032, progress towards the target is currently considered to be on-track.

Expected share of vessels in Scottish Government fleet that are low/zero emission:

2018 - 8%	2029 - 24%
2019 - 8%	2030 - 24%
2020 - 8%	2031 - 24%
2021 - 8%	2032 - 30%
2022 - 8%	
2023 - 8%	
2024 - 8%	
2025 - 8%	
2026 - 12%	
2027 - 17%	
2028 - 24%	

**Policy Outcome:** 8

**Indicator:** % of single track kilometres.

**On-track Assessment (Milestones/Targets):** Progress to target [70% electrified by 2034]

**Most recent data:** : In July 2020 Network Rail advised that 40.7% of single track kilometres on Scotland's rail network were electrified

**Data source(s):** Network Rail Scotland Route

**Assessment:** On Track

**Commentary:**

No electrification project has been completed since the most recent data was sought and therefore the proportion of the network able to support electric traction is unchanged since the previous monitoring report.

Year by year changes are unpredictable since whole lines effectively become electrified upon completion of long term projects and therefore the indicator will undergo discrete increases rather than following a smooth continuous increase.

The first route planned to be newly electrified is the Barrhead Line by the end of 2023. The East Kilbride Line is next in line to be electrified in 2025. There is an aspiration to electrify more routes by 2030, in line with the Rail Services Decarbonisation Action Plan and rolling stock replacement schedules and therefore the indicator is assessed as on track.

Policy Outcome: 8

Indicator: % of train kilometres powered by alternative traction

On-track Assessment (Milestones/Targets): Year to year change

Most recent data: 0%

Data source(s): n/a

Assessment: Too early to say

**Commentary:**

It is envisaged that a small number of remote routes with low service frequency will be served by hydrogen trains or possibly battery trains relying on different charging methods. Due to the relatively infrequent use of rural lines, these lines only generate a small percentage of Scotland's train kilometres.

It is unlikely to be technically feasible to introduce such technologies until around 2030, therefore the indicator is assessed at too early to say.

## Part C - Information on implementation of individual policies

Outcome 1: To address our overreliance on cars, we will reduce car kilometres by 20% by 2030

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>If the health pandemic has moved to a phase to allow more certainty on future transport trends and people's behaviours – and work and lifestyle choices future forecasting – we will publish a route-map to meet the 20% reduction by 2030 in 2021.</p>	<p>CCPu 2020</p>	<p>Route map published in draft 13 January 2022, along with public consultation launch and draft impact assessments. Following the public consultation on the draft route map, Transport Scotland is currently working with CoSLA to prepare a final version of the route map.</p>	<p>Complete.</p>	<p>Public consultation closed 6 April 2022. Consultation analysis and finalised route map will be published in the coming months.</p>

<p>Commit to exploring options around remote working, in connection with our work on 20minute neighbourhoods and work local programme.</p>	<p>2020/21 PfG</p>	<p>Transport Scotland and Scottish Government commissioned and published research through which we explored options around remote options: one a <a href="#">socio-economic analysis of home working</a> (published October 2021), and another on the <a href="#">emissions impact of home working</a> (published August 2021). NPF4, adopted February 2023, sets out a series of spatial principles for Scotland 2045 including 'local living', bringing thinking about 20 Minute Neighbourhoods into everyday decisions in the future planning of our places.</p>	<p>No.</p>	<p>Trends on home and remote working remain uncertain, but we will continue to strongly encourage employers to work with their employees to consider, for the longer term, hybrid working models where this is possible and appropriate. We will publish a draft of Local Living and 20 Minute Neighbourhood Guidance to assist those keen to adapt or develop their place as a 20 Minute Neighbourhood, following the adoption by Scottish Ministers of NPF4. The guidance will include resources and support on how to deliver neighbourhoods that support the ability to live well locally.</p>
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<p>COVID-19 has impacted on how we work. We launched a Work Local Challenge to drive innovation in work place choices and remote working to support flexible working and our net zero objectives.</p>	<p>2020/21 PfG</p>	<p>The Work Local Challenge Programme ran between July 2020 and March 2022 to support innovation and address the challenges caused by the shift in workplace settings and working patterns resulting from the COVID-19 pandemic.</p> <p>Supported Construction Scotland Innovation Centre's NearHome project - achieved early stage commercialisation within the timescales of the project, and became viable without further public funding.</p> <ul style="list-style-type: none"> <li>• Publication of Scottish Futures Trust Local Work Hub research at the end of March 2022.</li> </ul>	<p>No</p>	<p>N/A (complete outputs and outcomes being taken forward by project partners such as Built Environment – Smarter Transformation and Scottish Futures Trust).</p>
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<p>We will work with the UK Government on options to review fuel duty proposals, in the context of the need to reduce demand for unsustainable travel and the potential for revenue generation.</p>	<p>2020/21 PfG</p>	<p>Scottish Ministers have written on several occasions to UK Government ministers requesting meaningful engagement on plans for structural reform of reserved motoring taxation, which the UK Government itself acknowledged is inevitable and required in their recent Net Zero Review. To date, the UK Government has been unwilling to set out its plans or a timescale for engagement.</p>	<p>No.</p>	<p>Timeframes on engagement are at the discretion of the UK Government, who have so far been unwilling to discuss. However, Scottish Government ministers and officials will continue to press for meaningful dialogue.</p>
<p>We will work with local authorities to continue to ensure that their parking and local transport strategies have proper appreciation of climate change, as well as the impact on all road users, including public transport operators, disabled motorists, cyclists and pedestrians.</p>	<p>CCPu 2020 Although continuation of work already underway</p>	<p>Transport Scotland has engaged with local authority and RTP stakeholders on development of updated Local Transport Strategy guidance.</p>	<p>No</p>	<p>Draft guidance was published 22 March 2023 for stakeholder review until 15 June, to inform the final guidance expected to publish in the Autumn 2023.</p>

<p>To support the monitoring requirement for the National Transport Strategy set out in the Transport (Scotland) Act 2019, and to further our understanding of how and why people travel, we will develop a data strategy and invest in data.</p>	CCPu 2020	None	No	<p>The Transport Scotland Data Strategy will continue to be developed in 2023.</p>
<p>Continue to support the Smarter Choices, Smarter Places (SCSP) programme to encourage behaviour change. Continue to support the provision of child and adult cycle training, and safety programmes including driver cycling awareness training through Bikeability.</p>	CCP 2018	None	<p>Monitored and evaluated against the <a href="#">Active Travel Framework</a> on an ongoing basis through Transport Scotland's direct grant management of the programmes with the delivery partners.</p>	N/A



<p>We will grant fund CoMoUK to increase awareness of the role and benefits of shared transport and look at the barriers to uptake of car clubs.</p>	<p>PfG 2018</p>	<p>None</p>	<p>Monitored and evaluated against the <a href="#">Active Travel Framework</a> on an ongoing basis through Transport Scotland's direct grant management of the programmes with the delivery partners.</p>	<p>N/A</p>
<p>Support transformational active travel projects with a £500 million investment, over five years, for active travel infrastructure, access to bikes and behaviour change schemes. Enabling the delivery of high quality, safe walking, wheeling and cycling infrastructure alongside behaviour change, education and advocacy to encourage more people to choose active and sustainable travel. Support the use of E-bikes and adapted</p>	<p>2020/21 PfG</p>	<p>The Scottish Government announced record funding for active travel (AT) in its draft budget proposal, with almost £190m allocated to AT for 2023-24, against a budget of £150m in 2022-23, the majority of which will be allocated to deliver new and upgraded infrastructure.</p> <p>PfG of 2021 has also committed that at least £320m or 10% of the total transport budget will be allocated to active travel by 2024-25.</p>	<p>The Cycling Action Plan for Scotland will be replaced by a new cycling framework for active travel, setting out the strategic priorities for cycling for transport and the key actions that we will take forward in partnership to achieve our aims.</p>	<p>The new cycling framework for Active Travel will be published in 2023</p> <p>The review of Active Travel delivery model will report in first half of 2023, followed by a restructure of TS active travel delivery to prepare for increased funding</p>

<p>bikes through interest free loans, grants and trials</p>		<p>TS has been working with key delivery partners to prepare a new cycling framework for active travel, setting out the strategic priorities for cycling for transport and the key actions that we will take forward in partnership to achieve our aims.</p> <p>Transport Scotland is reviewing the delivery model for active travel (AT) in preparation for increased funding and will bring evidenced proposals for an alternative, holistic system for AT delivery, including recommendations on the delivery models needed.</p> <p>A Transformation Fund, in the region of £20m-£25m, has been launched to accelerate AT projects for partners who have eligible construction-ready AT</p>		
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		<p>schemes in 2023/24.</p> <p>Existing programmes including behaviour change continue to be supported.</p>		
<p>We have re-purposed almost £39 million of active travel funding for the Spaces for People; this is enabling local authorities to put in place the temporary measures such as pop-up cycle lanes and widening walkways that are needed to allow people to physically distance during transition out of the COVID-19 lockdown.</p>	<p>2020/21 PfG</p>	<p>Whilst this fund has been closed to new applications since July 2020, additional funding of £2m has been released in 2022-23 to enable some schemes to become permanent; work is ongoing and expected to conclude in early 2023-24. Evaluation for programme was published in September 2022 showing the successes and positive changes in travel choice behaviour that the schemes have enabled.</p>	<p>This programme is now closed and no further milestones are set.</p>	<p>No further action planned, subject to completion of permanency work</p>

<p>Support increased access to bikes for all including the provision of public bike and ebike share.</p>	<p>2019-2020</p>	<p>Throughout 2022 we have developed a policy response to increase access to bike for those who are experiencing barriers to cycling, including financial, physical or accessibility barriers. The Access Bikes scheme is delivered through CyclingUK and aims to provide access to cycles through a number of mediums, including bike share and ownership models.</p> <p>In Glasgow we have supported the creation of a bike subscription model based on a successful project run in the City of Paris.</p>	<p>No</p>	<p>N/A</p>
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<p>Mobility as a Service and increased use of peer to peer car sharing which will help reduce the number journeys made by car. To do this we are harnessing innovation within our transport system through investing up to £2 million over three years to develop 'Mobility as a Service' (MaaS) in Scotland</p>	<p>PfG 2018</p>	<p>Five projects have been awarded funding as part of the MaaS Investment Fund (MIF). All projects are due to complete in 2023.</p>	<p>Monitoring and evaluation plans were created for each MIF project</p>	<p>All projects are due for completion by end 2023, with the overall MIF evaluation report due early 2024. This report will be used as the basis for future MaaS policy and investment.</p>
<p>We will work to improve road safety, ensuring people feel safe with appropriate measures in place to enable that. We will publish Scotland's Road Safety Framework to 2030, following consultation on an ambitious and compelling long-term vision for road safety where there are zero fatalities or serious injuries on Scotland's roads by 2050.</p>	<p>2020/21 PfG</p>	<p>We have continued to work with partners to ensure that road safety delivery remains a priority, however, due to the cost of living crisis of Road Safety Improvement Fund of £15 million did not go ahead. We were also not able to proceed with road safety marketing and education campaigns. Whilst there is no direct evidence to demonstrate the lack of activity with recent road collision data, we have</p>	<p>Continually monitoring road casualty data and in particular fatalities week on week with the previous year.</p> <p>20 mph task group meeting in April to agree next steps</p> <p>Programme agreed with WSP on the NSMR</p>	<p>We are investing in the region of £26 million of road safety initiatives this financial year across engineering, marketing and education. This includes local and trunk road measures</p> <p>Delivery will be taking place through 23/24 and the 20 mph task group will monitor progress of the reduction of speed limits in Scotland as we approach the 2025 deadline.</p> <p>The process will include a stakeholder and public consultation later this year to consider their views</p>

		<p>seen a stark rise in road fatalities since traffic flows have returned to normal after the pandemic</p> <p>We have continued to make good progress on the National Speed Management Review (NSMR) with the milestone 2 report now complete with a view to modelling the reduction in speed limits through to completion in November 2023. We issued £1.4 million of funding to support LA's to assess what streets within their respective areas should have a safer speed limits of 20 mph.</p> <p>Implementation of the safer speed limits will take place from 23/24 through to the end of 2025</p>		<p>of whether any changes to speed limit policies and speed management measures should be introduced as part of our speed management plan.</p>
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<p>We are committed to taking forward policy consultation in advance of drafting supporting regulations and guidance to enable local authorities to implement workplace parking levy schemes that suit their local circumstances.</p>	<p>2019-2020</p>	<p>Regulations came into force in March 2022 and guidance was published in June 2022, so local authorities are now able to use their discretionary powers to implement WPL schemes.</p>	<p>The milestones (regulations in force and guidance published) have been completed in 2022.</p>	<p>It is now a decision for local authorities whether to take forward local schemes.</p>
<p>We will bring forward a step change in investment with over £500 million to improve bus priority infrastructure to tackle the impacts of congestion on bus services and raise bus usage. We will launch the Bus Partnership Fund in the coming months to support local authorities' ambitions around tackling congestion.</p>	<p>2019-22 PfG</p>	<p>A number of measures have been implemented and work to identify and develop business cases for further measures is also underway. The Scottish Government remains committed to funding further bus priority projects, subject to completion of robust business cases and in line with available funding.</p>	<p>Monitoring and evaluation plans are being developed for bus priority measures.</p>	<p>Long term investment in bus priority infrastructure.</p>
<p>We remain committed to delivering a national concessionary travel scheme for free bus travel for under 19s, and</p>	<p>2020/21 PfG &amp; Budget 2020</p>	<p>The Young Persons Free bus Travel Scheme was extended to all aged under 22. The Scheme went live on 31 January 2022 with</p>	<p>By the end of February 2023, there were 590,178 valid Young Scot or NEC cardholders able to</p>	<p>SG focus remains on encouraging as many young people as possible to take advantage of the free bus travel offer. The Young Persons Scheme has</p>

<p>have begun the necessary preparations including planning, research, legal review and due diligence.</p>		<p>the potential to benefit up to 930,000 young people.</p>	<p>access free bus travel. Over 63% of children and young people eligible for free bus travel are now benefiting. Uptake is much higher amongst those who can use the scheme independently, with over 72% of 12-15 year olds and 75% of 16-21 year olds having a valid card. In addition, of over 50 million journeys made, around 60% were taken by those aged 16-21, showing huge interest and usage of the scheme and representing significant cost savings for young people accessing education and work.</p>	<p>cost around £93.5 million to date. The forecast spend on the scheme in the next financial year has been estimated at up to £189.5 million.</p>
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<p>We are also carrying out a review of discounts available on public transport to those under the age of 26 – due for completion end of December 2020 (with consultation planned on young people’s views on the impacts of COVID 19 and post lockdown measures on public transport usage and behaviour).</p>	<p>2020/21 PfG</p>	<p>Scottish Government has carried out analysis on a range of options including the cost of extending free bus travel and on concessionary travel across all modes of public transport to those under the age of 26. This included cost and benefit analysis. The review has concluded and was published on the Transport Scotland website on 22 September 2022 at <a href="#">Under 26 Concessionary Fares Review   Transport Scotland</a></p>	<p>N/A</p>	<p>Completed</p>
<p>Delivery of our first Active Freeways - segregated active travel routes on main travel corridors connecting communities and major trip attractors.</p>	<p>CCPu 2020</p>	<p>Work is progressing in parallel with wider changes to the way that active travel infrastructure is delivered in Scotland.</p>	<p>Not currently, linked to the wider monitoring of active travel.</p>	<p>The delivery and next steps are dependent on the outcomes of the Active Travel delivery model reporting expected in spring 2023.</p>

Outcome 2: We will phase out the need for new petrol and diesel cars and vans by 2030.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
We will consider and develop new financing and delivery models for electric vehicle charging infrastructure in Scotland and working with the Scottish Future Trust to do so.	Boosted 2019/20 PfG	Launched the EV Infrastructure Fund in summer of 2022, engaging with local authorities, private electric vehicle charge point operators and other stakeholders through a series of workshops and direct engagement. Made funding available to all Scottish Local Authorities to develop EV Strategy and Expansion Plans that would support development of business cases that support an application to the EV Infrastructure Fund and identify opportunities to lever private sector finance.	£30m of new funding programme aimed to be leveraged from commercial sector and doubling public charging provision from current baseline of approximately 2,800 over next 4 years.	Funding awards anticipated to be made from Q1 2023/24.

<p>We have invested over £30m to grow and develop the ChargePlace Scotland network which is now the 4th largest in the UK. We will continue to develop the capacity of the electric vehicle charging network.</p>	<p>CCP 2018</p>	<p>Investment in the ChargePlace Scotland network has now risen to over £65m, continuing to expand the network</p>	<p>Number of chargepoints on the CPS network now exceeds 2400</p>	<p>Awards under the EV Infrastructure Fund anticipated Q1 2023/24.</p>
<p>Our Low Carbon Transport Loan has provided over £185m of interest free loans to individuals and businesses across Scotland supporting the transition to low carbon vehicles. We have now refocused the scheme to focus on used vehicles as well as targeting Small and Medium Enterprises along with Third Sector Organisations.</p>	<p>CCP 2018</p>	<p>Last year's budget for the LCTL was fully utilised and the scheme continues to be promoted by EST and other stakeholders, currently we have provided over £185m worth of funding since the LCTL started.</p>	<p>No</p>	<p>We are currently reviewing the schemes from last year to ensure they still meet their intended policy objectives, We have been engaging with EST in creating a new workplan for our existing schemes and will be seeking sign off from the Minister.</p>

<p>We will continue to promote the uptake of ULEVs in the taxi and private hire sector.</p>	<p>CCP 2018</p>	<p>Energy Saving Trust (EST) through annual funding from TS continue to provide support, guidance and access to appropriate financial schemes to taxi owners and operators across Scotland. This year the taxi loan will be expanded to include used private hire and hackney vehicles, EST will also run a number of forums to bring the taxi industry and licence teams from LAs together to discuss the barriers impacting uptake of EVs.</p>	<p>No</p>	<p>Annual workplan with EST is currently being reviewed with TS for proposed schemes for FY 23/24</p>
<p>Continue to promote the benefits of EVs to individuals and fleet operators (exact nature of promotion to be decided annually).</p>	<p>2018</p>	<p>EST continue to provide support and guidance to the Arnold Clark Innovation Centre through providing material and signposting to streams of financial support available through TS/EST, the centre is also used by EST to deliver targeted training to stakeholders to support EV uptake.</p>	<p>No</p>	<p>Annual workplan with EST is currently being reviewed with TS for proposed schemes for FY 23/24.</p>

We will work with public bodies to phase out the need for any new petrol and diesel light commercial vehicles by 2025.	2019/20 PfG	Continued financial support to public bodies to support fleet decarbonisation. £8m of funding in 22/23.	Not currently available. Data collection exercise underway	We will continue to work with public bodies providing support, guidance and funding to enable decarbonisation of public sector fleets.
We will support the public sector to lead the way in transitioning to EVs, putting in place procurement practices that encourage EVs. In the Programme for Government we committed to work with public bodies to phase out the need for any new petrol and diesel light commercial vehicles by 2025.	2019/20 PfG	We are supporting a small number of public sector fleet pathfinder projects that will explore opportunities to accelerate decarbonisation of public fleets and to demonstrate the value of collaboration.		Pathfinder projects expected to complete Q2 23/24. Switched on Fleets will continue to support the public sector.
Create the conditions to phase out the need for all new petrol and diesel vehicles in Scotland's public sector fleet by 2030.	New [2019-2020 PfG]	Continued financial support to public bodies to support fleet decarbonisation. £8m of funding in 22/23.	N/A	We will continue to work with public bodies providing support, guidance and funding to enable decarbonisation of public sector fleets.

<p>We will continue to invest in innovation to support the development of ULEV technologies and their adoption.</p>	<p>CCP 2018</p>	<p>As part of the Heavy Duty Vehicle Programme with Scottish Enterprise, Transport Scotland has funded 27 R&amp;D projects to develop a feasibility or prototype zero emission system, component or vehicle.</p>	<p>No</p>	<p>Continue to work with Team Scotland to identify zero emission transport innovation needs, to maximise Scottish economic benefit and contribute to the decarbonisation policies set out by the Scottish Government.</p>
<p>Take forward the initiatives in respect of connected and autonomous vehicles set out in A CAV Roadmap for Scotland.</p>	<p>CCP 2018</p>	<p>Transport Scotland continues to work with our Project CAVForth partners to progress towards the commencement of the passenger trial service.</p> <p>Transport Scotland has also been liaising with UKG in relation to future legislative changes to facilitate the use of autonomous features in vehicles, in response to the Law Commissions' recommendations.</p>	<p>Transport Scotland has completed all of our commitments in advance of the trial. The commencement of the trial itself has been delayed as a result of various impacts on tasks that are in partners control and over which Transport Scotland has no control.</p>	<p>The passenger trial is expected to commence in spring 2023 and Transport Scotland will continue to identify other opportunities to take forward the initiatives set out in the CAV Roadmap.</p>

<p>With local authorities and others, evaluate the scope for incentivising more rapid uptake of electric and ultra-low emission cars and vans.</p>	<p>CCP 2018</p>	<p>Supported public EV charging and fleet EV charging pathfinder projects to explore new ways to invest in EV infrastructure that supports an accelerated switch to zero emission vehicles,</p>	<p>Demand for electric vehicles continues to grow and investment in public charging infrastructure has increased the number of public charge points now exceed 3750</p>	<p>Continued support for EV infrastructure and provision of funding to EST to provide independent advice on EV purchase. Continued engagement across the public sector to improve access to EV charging.</p>
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Outcome 3: To reduce emissions in the freight sector, we will work with the industry to understand the most efficient methods and remove the need for new petrol and diesel heavy vehicles by 2035.

Policy	Date announced	Progress on implementation since time of last report / CCPu.	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
To support businesses we will establish a Zero Emission heavy duty vehicle programme and will invest in a new zero drivetrain testing facility in 2021.	2020/21 PfG	Transport Scotland Officials established a heavy duty vehicle programme in partnership with Scottish Enterprise. This programme has undertaken research to understand and map the Scottish heavy duty vehicle supply chain. This research has enabled economic opportunity identification for Scottish companies. Transport Scotland has invested over £3 million into the University of Strathclyde's Driving the Electric Revolution- Industrialisation Centre Transport Hub to enable companies to test, validate and calibrate their zero emission drivetrain technology.	No	Transport Scotland will continue to work with Scottish Enterprise in the Heavy Duty Vehicle sector to identify and maximise on opportunities for Scottish economic growth.
Explore the development of green finance models to help	CCPu 2020	The Zero Emission Truck Taskforce considered a paper on 13 October 2022 that set out the range of current, emerging and potential future finance models that would support the transition	no	Continued engagement with the finance, energy and vehicle sector.



business and industry to invest in new road transport technologies.		to zero-emission HGVs. The Road Haulage Association agreed to undertake conversations with members on finance models to ascertain appetite and awareness. <a href="#">HGV financing models</a>		
We will engage with industry to understand how changing technologies and innovations in logistics (including consolidation centres) can help to reduce carbon emissions, particularly in response to the increase in ecommerce.	CCPu 2020	4 stakeholder events held in 2022 across public, private and academic sectors to seeks views.	No	N/A
Continue to investigate the role that other alternative fuels, such as hydrogen, and biofuel can play in the transition to a decarbonised road transport sector.	CCP 2018	Transport Scotland are continuing to review the evidence for the opportunities around the role of alternative fuels. The focus for decarbonising the transport sector remains on zero emissions technologies but we are considering how alternative fuels can be used in the transition where they do not affect the uptake of zero emission technologies.	None	Will continue to review evidence on the use of alternative fuels.

Consider the scope for testing approaches to alternative fuels infrastructure and supply.				
Launched the new Hydrogen Accelerator (H2A) Programme to attract technical experts to help scale up and quicken the deployment of hydrogen technologies across Scotland.	July 2020	The Hydrogen Accelerator has provided support to a number of hydrogen projects since it was set up, including the Hydrogen Train Project and LOCATE test centre, providing access to academic expertise. The current programme is due to end in March 2023	None	Reviewing the case for continuing the current programme.

Outcome 4: We will work with the newly formed Bus Decarbonisation Taskforce, comprised of leaders from the bus, energy and finance sectors, to ensure that the majority of new buses purchased from 2024 are zero-emission, and to bring this date forward if possible.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
We have introduced a revised green incentive of the Bus Service Operators Grant.	April 2019	The incentive was paid from April 2019 to 31 March 2022 when a new grant scheme replace the Bus Service Operators Grant (BSOG). The incentive is payable for a maximum of 5 years from an eligible bus being brought into service Operators had indicated upfront costs were what was required when purchasing zero emission buses and this is a reflection of that policy change	The incentive is no longer paid to new buses being brought into service from and including 1 April 2022. A new grant scheme, the Network Support Grant was introduced with no green incentive. Those buses already receiving the BSOG incentive have their payments honoured for a total of 5 years in accordance with the scheme rules.	As operators had indicated that higher upfront costs of purchasing new zero emissions was important, this was reflected in the funding awarded through the Scottish Zero Emission Bus Challenge Fund. There are no current plans to reintroduce a new green incentive through the Network Support Grant.

<p>We launched a £9 million Scottish Ultra Low Emission Bus Scheme (SULEBS).</p>	<p>August 2020</p>	<p>Over 2020/21 we awarded £50.7 million through the Scottish Ultra Low Emission Bus Scheme and unlocked over £71 million of private investment, to support 272 new zero emission buses and associated infrastructure. 207 of those buses have been manufactured in Scotland, supporting green jobs.</p>	<p>N/A.</p>	<p>The Scottish Ultra Low Emission Bus Scheme has been replaced by the Scottish Zero Emission Bus Challenge Fund.</p>
<p>In the context of the National Transport Strategy Delivery Plan and Transport Act, we will examine the scope for climate change policies, in relation to buses, across the public sector in high-level transport legislation strategies and policies.</p>	<p>CCP 2018</p>	<p>Section 34 of the Transport (Scotland) Act 2019 came into force in June 2022, meaning local authorities now have the power to run their own bus services.</p>	<p>Regulations Public Service Vehicles (Registration of Local Services)(Provision of Service Information)(Scotland) coming into force on 1 April 2023.</p>	<p>Regulations for BSIPs and Franchising are expected to be laid later in 2023. We are engaging with local authorities, operators, and others to inform this complex suite of legislation.</p>

<p>We will work to align government financial support of £120 million over the next 5 years with private sector investment to drive forward a fully decarbonised future for Scotland's bus fleet and support the Scottish supply chain.</p>	<p>CCPu 2020</p>	<p>£62m in capital funding was awarded through the Scottish Zero Emission Bus Challenge Fund (ScotZEB). An additional £500,000 Market Transition Scheme (MTS) was made available to support SME operators prepare for decarbonisation by developing consortia and collaborative business models with private sector financiers.</p>	<p>276 ZEBs and their supporting infrastructure were supported through ScotZEB. 19 bus and coach operators are being supported through the MTS to explore their options for decarbonisation and to develop innovative bids which will establish the step-change in the market required to accelerate the uptake of ZEBs and to remove the need for government subsidy. The Bus Decarbonisation Taskforce (BDT) held 6 meetings between Nov 2021 and Aug 2022 to establish the challenges the sector faces and an agreed route to overcome those challenges. The Taskforce published the Pathway to Zero Emission Buses, which demonstrated a joint commitment to achieve a zero-emission future for the bus sector.</p>	<p>Next steps are being considered as to how to help the bus sector transition to zero-emissions once final reports from the Market Transition Scheme have been assessed.</p>
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Outcome 5: We will work to decarbonise scheduled flights within Scotland by 2040.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
We will aim to create the world's first zero emission aviation region in partnership with Highlands and Islands Airports Limited (HIAL). This will include taking action to decarbonise airport operations in the HIAL region.	Green New Deal 2019	<p>HIAL recently published its Sustainability Strategy, which covered key objectives such as introducing a programme of activity to decarbonise airport operations, infrastructure and flights, and incentivising low carbon aircraft at HIAL airports.</p> <p>HIAL will publish a Net Zero Roadmap in 2023, which will set out a programme of carbon reduction measures required to achieve Net Zero by 2040.</p>	No	<p>HIAL hosted a stakeholder event in March to understand how the Highlands and Islands zero emission ambition can best be progressed.</p> <p>HIAL will publish a Net Zero Roadmap in 2023.</p> <p>Transport Scotland will have regular contact with HIAL to discuss progress, and provide support where appropriate.</p>
We will begin trialling low or zero emission planes in 2021.	2020/21 PfG	The sustainable aviation test environment (SATE) project allows for the testing and demonstration of low/ zero emissions craft and is playing	No	This SG commitment could be considered as delivered, as a test flight took place in 2021 (attended by the then Minister for Transport)

		<p>an important role in creating the zero-emission aviation region.</p> <p>HIAL is leading on the SATE project and was recently awarded funding for the next phase of this project.</p>		<p>SATE project is ongoing and we receive regular updates from HIAL on progress being made.</p>
<p>The Scottish Government will continue to engage with Aviation sector to encourage sustainable growth post COVID-19.</p>	<p>CCPu 2020</p>	<p>The SG engages with the aviation sector in line with our PfG commitment to work with Scotland's airports to help restore lost connectivity, and grow international connectivity, while not returning to previous levels of emissions. Transport Scotland continues to lead on our route development work, which involves close working with Scotland's airports. Our forthcoming aviation strategy will consider further measures the SG could take to help improve connectivity while reducing the emissions from aviation.</p>	<p>N/A</p>	<p>N/A</p>

<p>Explore the potential for the purchase of zero/low emission aircraft by the Scottish Government, for lease back to operators, with more detailed assessment in the forthcoming Aviation Strategy.</p>	<p>CCPu 2020</p>	<p>This option was explored in our consultation on the aviation strategy. While there was some public support, most aviation stakeholders questioned whether the SG should be involved in buying aircraft. However, we will continue to explore this option in the aviation strategy as the situation may change when zero/low emission aircraft become available.</p>	<p>No</p>	<p>We will continue to explore this option as part of the aviation strategy.</p>
<p>Explore options for incentivising the use of more sustainable aviation fuel as we develop our Aviation Strategy, recognising that significant levers in this area are reserved.</p>	<p>CCPu 2020</p>	<p>SAF was also considered in the aviation strategy consultation, with strong support for its increased production. Scottish Enterprise is conducting a SAF mapping exercise to understand the potential Scottish SAF supply chain. The UKG intends to introduce a SAF mandate and is exploring options for providing support with the additional costs of SAF. The SG will wish to be clearer on progress before considering its own possible options, in what</p>	<p>No</p>	<p>SAF will continue to be explored as part of the aviation strategy. We will also write to the UKG to question its position on introducing a price stability mechanism for SAF, which is something the sector has consistently encouraged.</p>



		is an issue where some relevant levers are reserved.		
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Outcome 6: Proportion of ferries in Scottish Government ownership which are low emission has increased to 30% by 2032.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>Continue to examine the scope for utilising hybrid and low carbon energy sources in the public sector marine fleet as part of our vessel replacement programme.</p>	<p>CCP 2018</p>	<p>The proportion of ferries which are low emissions is still 8% as no new, low emission vessels have entered the fleet. There are currently 3 low emission vessels in a fleet of 40.</p>	<p>No indicators / milestones have been set for which there is progress data.</p> <p>Milestones will be set through the ferries decarbonisation plan.</p>	<p>The first vessel of the Small Vessel Replacement Program is currently programmed for delivery at the end of 2025, with 6 further vessels being delivered at 4-6 month intervals including 2 in 2026. The completion of Phase 1 will see 7 vessels of the existing fleet replaced with low emission, electric vessels by 2029, increasing the proportion of SG owned ferries which are low emission to 25%.</p> <p>The second Phase of the SVRP, which is anticipated to begin toward the end of this year, will see 4 more vessels replaced with low emission vessels.</p> <p>As outlined in the Long Term Plan for Vessels and Ports, several other vessels are planned for replacement</p>

				before 2032 and we will continue to explore all options available to decarbonise the fleet. These options will be set out in the Low Carbon Plan being produced as part of the Islands Connectivity Plan.
Working with the UK Government to support proposals at the International Maritime Organisation (IMO) to significantly lower shipping carbon emissions in the global sector, including the option of introducing a global levy on marine fuel to fund research in cleaner technologies and fuels.	2020/21 PfG	UKG has initiated a number of Calls for Evidence and consultations to explore options for decarbonising the maritime sector. TS officials are working closely with DfT on evaluating the responses and possible next steps. Shipping policy is reserved, UKG are the member state in IMO, so SG does not have a direct role.	No	<p>Officials will continue to work closely with DfT.</p> <p>UK are one of the most proactive members of IMO in pushing for ambitious global shipping legislation. Scottish and wider UK shipping stakeholders agree with this approach, as they support a global solution to decarbonising the shipping sector.</p>

Outcome 7: By 2032 low emission solutions have been widely adopted at Scottish ports.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones	Timeframe and expected next steps been set for this policy? If so, most recent data for progress against these.
Working with individual ports and the British Ports Association to consider a process for encouraging shared best practice initiatives for reducing emissions across the sector.	CCPu 2020	Officials continue to work with ports and the British Ports Association (BPA) through regular meetings to share best practice and encourage new initiatives.	No	Challenges such as the technology gap are very evident in this policy. But many ports are implementing emission reducing solutions that are available such as shore power and installing solar farms.
Working with the ports sector and with its statutory consultees through the Harbour Order process to ensure future port developments are environmentally underpinned.	CCPu 2020	Officials continue to work with the port sector and environment statutory consultees such as SEPA, Marine Scotland and Nature Scot . Our environment statutory consultees are fully consulted in the Harbour Order process.	No	Consultation with these consultees is written into Harbour Order legislation.

Outcome 8: Scotland's passenger rail services will be decarbonised by 2035

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>Our commitment to decarbonise (the traction element of) Scotland's railways by 2035 will be delivered through investment in electrification and complementary alternative traction systems. Transport Scotland has published the Rail Services Decarbonisation Action Plan (July 2020) which will be updated as appropriate. Work is ongoing by</p>	<p>2020-2021 PfG</p>	<p>Good progress on decarbonising Scotland's Railway continues to be made.</p> <p>Works to decarbonise the Barrhead Line have commenced. Orders have been placed for six new electrical Feeder Stations to support decarbonisation through electrification.</p> <p>The schemes to electrify the Fife Circle route, Borders Line and East Kilbride are in design development.</p>	<p>No decarbonisation schemes have reached commissioning stage since publication of the 2020-2021 PfG.</p> <p>We continue to develop the programme for decarbonisation. We expect the Barrhead Line to be decarbonised through electrification by December 2023.</p> <p>The schemes to electrify the Fife Circle route, Borders Line and East Kilbride are in design development.</p>	<p>The Rail Services Decarbonisation Action Plan is due to be updated in 2023. This update will reflect future anticipated budget allocations.</p> <p>The next milestone in decarbonising Scotland's Railway will completion of electrification of the Barrhead Line. This is due to complete in December 2023.</p>

industry partners to develop the initial schemes.					
We will establish an international rail cluster in Scotland to unlock supply chain opportunities using the interest at Longannet as a catalyst. This will be built around existing strengths in rail in Scotland and will seek to enhance the innovation and supply chain in the decarbonisation of our rolling stock and wider network.	Part of Rail Services Decarbonisation Action Plan July 2020	Following the successful completion of Phase 1, the second phase – which began in July 2022 – will see a strong focus on skills development for the first year as well as continuing cluster of businesses and research centres in Scotland, collaborating to deliver a world-class manufacturing capability in low-carbon rail transport with both online and in person events and workshops.	Deliverable	Progress To Date	Contract is due to complete summer 2025.
		To date 737 individuals have registered with the rail cluster project, 552 registered companies and 254 SME's registered.	Produce 3 new reports in the 3-year project duration.	In development	
		Design and deliver 8 industry events (4 in-person, 4 digital) by the end of the contract (est. June 2025).	<ul style="list-style-type: none"> <li>• In person launch event at Progress Rail's site in South Queensferry on 17 August, 2022</li> <li>• Event programme being finalised with a range of</li> </ul>		

Furthermore, the rail cluster has been accepted as a partner of the European Rail Cluster Initiative providing links to 2000 SME's across Europe.

	companies and RIA Scotland for events over the remainder of the contract.
Engage with demand-side companies in the first 12 months of the contract to understand levels of demand.	Actively engaging with several suppliers in the rail sector currently:
Deliver up to 6 supply chain workshops (3 in-person, 3 digital) over the life of the	Actively engaging with several suppliers in the rail sector currently.

		project.	
		150 Scottish companies supported over the 3-year project.	51 1-2-1 meetings held.
		Update 2 existing Rail CB reports over the life of the contract.	In progress
		Manage and provide secretariat to the Rail Skills Leadership Group in Year One only.	Completed



			Monthly progress reports.	In progress	
Continue to deliver our Rail Freight Strategy.	CCP 2018	<p>On-going work, in conjunction with industry partners and third-party investors, continues to grow rail freight on the Scottish network. This work is achieving results and a number of new rail freight services have started over the last year. Also, in August 2022, Highland Spring's new rail freight facility at Blackford was opened by the former First Minister. This project, which was facilitated by SG policies and investment, will remove a minimum of 10.02 million lorry miles from Scotland's roads in the first 10 years of operation bringing significant environmental benefits.</p> <p>We have also been working with rail industry partners to</p>	<p>There are no official annual targets or indicators but Network Rail monitors the targets for the current control period (2019 – 2024) on a quarterly basis. These targets include a requirement to grow rail freight on the Scottish network by 7.5% by 2024. This target was on track to be met but factors including industrial action, the cost of living crisis and slowing down of investment may impact on the ability to achieve it.</p>		<p>There are no defined or specific timescales for completing the actions. Network Rail's regulatory targets have their own associated milestones and timescales and evaluation will take place at the end of the control period (March 2024).</p> <p>In addition, Network Rail is expected to publish its Strategic Business Plan by summer this year. This will outline how it will achieve the targets set out in the HLOS for 2024 -2029, including the rail freight growth target.</p>

		develop regulatory targets for the next rail control period which runs from 2024 to 2029. These targets, which were published in the Scottish Ministers' High Level Output Specification (HLOS) on 3 February 2023, include a requirement to grow rail freight by 8.7% with an expectation that 10% may be achievable.		
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# Climate Change Plan Monitoring Report 2023: Industry

## Part A - Overview of sector

The 2020 annual emissions envelope published in the 2018 CCPu for this sector was for 11.5 MtCO<sub>2</sub>e, whereas the outturn emission statistics for this year (published in June 2022) show a position of 10.1 MtCO<sub>2</sub>e<sup>24</sup>. On the basis of comparing these figures, the sector was within its envelope in 2020.

The CCPu sets out the following two policy outcomes for the sector, the indicators for which are summarised below:

Scotland's industrial sector will be on a managed pathway to decarbonisation, whilst remaining highly competitive and on a sustainable growth trajectory.	On Track	Off Track	Too Early to Say
Industrial energy productivity (£GVAm per GWh)		X	
Industrial emissions intensity (tCO <sub>2</sub> e per £GVAm)		X	
Technologies critical to further industrial emissions reduction (such as carbon capture and storage and production and injection of hydrogen into the gas grid) are operating at commercial scale by 2030.			
% of Scottish gas demand accounted for by biomethane and hydrogen blended into the gas network			X

## Just transition and cross economy impacts

We wish to understand and report on the broader just transition and cross-economy impacts of our emissions-reduction activities in addition to these sector specific policy outcomes and indicators. To do this, in this report we use data from the Office of National Statistics (ONS): Low Carbon Renewable Energy Economy (LCREE) publication. The LCREE data presented in this report is based on survey data of businesses which perform economic activities that deliver goods and services that are likely to help generate lower emissions of greenhouse gases, for example low carbon electricity, low emission vehicles and low carbon services.

The LCREE indicator is narrowly defined and, while useful within its limited scope, does not give us the full picture of the impacts on workforce, employers and communities and progress towards a just transition.

<sup>24</sup> Emissions data for baseline and 2020 have been updated to reflect a forthcoming change in the global warming potentials for non-CO<sub>2</sub> greenhouse gases.

Over the next few years we will work to develop a more meaningful set of success outcomes and indicators aimed at tracking the impacts of our policies on a just transition to net zero.

## Sector commentary on progress

There has been a considerable decline in Scotland's industrial emissions since 1990, falling by 50% (10.2 MtCO<sub>2</sub>e) between 1990 and 2020. Research estimates<sup>25</sup> that emissions from Scotland's large industrial sites could feasibly reduce by 80% or more by 2045, while maintaining output.

At present, around 30% of total Scottish GHG emissions are generated by a diverse range of industrial sub-sectors, predominantly manufacturing, as well as mining and construction. Our CCPu estimates that by 2032 industrial emissions need to decrease by 43% on 2018 levels to meet Scotland's Climate Change targets, whilst ensuring Scottish industry remains globally sustainable and competitive.

However, due to the significant disruption across the Scottish economy, and therefore to GVA, during the COVID-19 pandemic, indicators are unlikely to be back on track unless the indicator is updated.

The balance of reserved and devolved responsibilities for industrial decarbonisation means that progress is often dependent on UK Government and/or international policy and markets. For example, UK Government decision-making on where to focus its support to develop carbon capture and storage (CCS) infrastructure, and the lack of clarity this is delivering for Scottish projects, is beginning to negatively impact on investor confidence for Scottish decarbonisation projects, putting jobs at risk and compromising Scotland's ability to meet our net zero commitments. The UK Government recently announced its intention to provide further details on Track 2 of the Cluster Sequencing Programme in Spring 2023. It is vitally important that this announcement sets out a clear and accelerated timeframe for Track 2, to give Scottish industry the certainty needed to progress CCS deployment in Scotland at pace.

There remains a significant risk of carbon leakage: if the Scottish industrial sector were to have a less supportive policy environment for decarbonisation than their competitors in the rest of the UK, Europe and beyond, they could be faced with higher costs as a result of carbon pricing mechanisms which could push production, and therefore jobs, overseas.

Significant parts of the industrial sector are subject to the UK Emissions Trading Scheme (ETS), which remains the key carbon pricing tool across the UK. The UK ETS is managed by the ETS Authority, comprising of the UK Government and three Devolved Administrations. The Authority consulted last year on strengthening the

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<sup>25</sup> [Deep decarbonisation pathways for Scottish industries: research report - gov.scot](https://www.gov.scot/publications/deep-decarbonisation-pathways-scottish-industries/)  
(<https://www.gov.scot/publications/deep-decarbonisation-pathways-scottish-industries/>)

ETS (including by aligning it with net zero objectives) and will respond to that consultation later this year.

### Developments in monitoring arrangements since last report

There have been no changes to the methodology since the last report. However, we are continuing to look at ways to improve our monitoring arrangements for forthcoming reports.

## Part B - Progress to Policy Outcome Indicators

**Policy Outcome:** Cross-sectoral social and economic

**Indicator:** FTE employment in Low Carbon Renewable Energy Economy Indicator

**On-Track Assessment (Milestones/Targets):** Year-to-year change

**Most Recent Data:** 2021

**Data Source(s):** Office of National Statistics: Low Carbon Renewable Energy Economy (LCREE), Time spent of Green Tasks

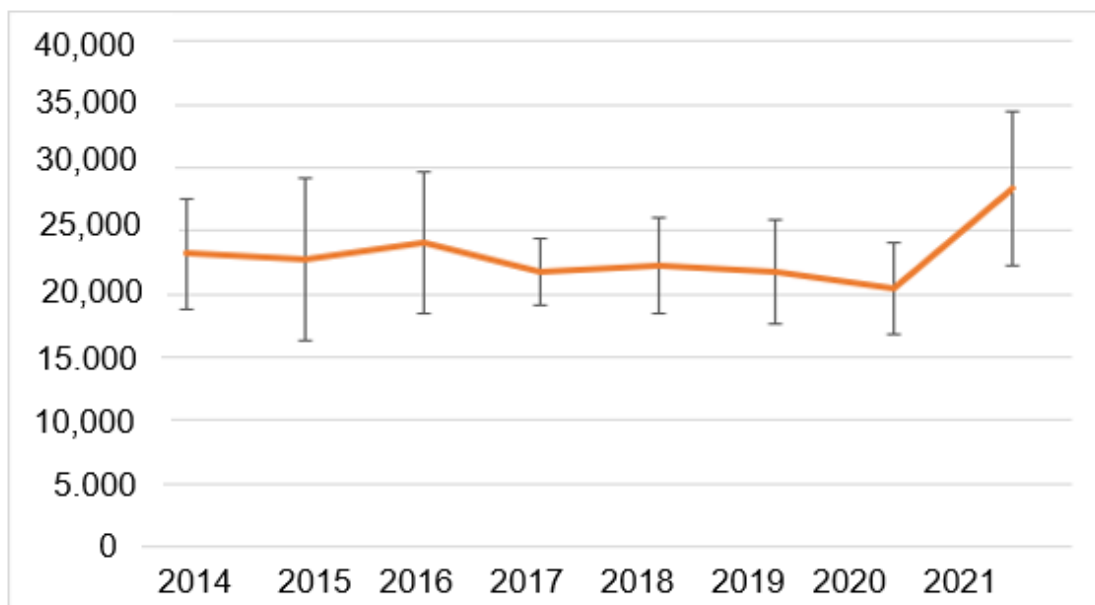
**Assessment:** Too Early to Say

### Commentary:

In 2021, the Scottish low carbon renewable energy (LCREE) sectors were estimated to provide 28,300 jobs, the highest in the published data.

- The estimates of LCREE are based on a relative small sample of businesses and hence are subject to a wide confidence interval. Scottish LCREE employment in 2021 is substantially higher than previous years but the difference is not statistically higher than 2020.

Employment in Low Carbon Renewable Energy Economy, FTE



- LCREE only shows employment in roles in Industries directly involved in the transition to Net Zero.
- The ONS also released experimental statistics on a wider perspective of green activity in the economy with their time spent on green tasks release.
- These stats reflect green activities in both LCREE and non-LCREE sectors. The 2023 publication has not yet been published.

- Last year's publication showed that in 2019 Scotland achieved an all-time high of hours spent on green tasks and proportion of workers doing green tasks, including workers who spend more than 20% of their time on green tasks.
- The proportion of workers doing green tasks in Scotland was 36% in 2019, up from 23.8% in 2004. Workers who have spent more than 20% of their time doing green tasks was 14%, up from 9% in 2004.
- The proportion of overall hours spend doing green tasks in Scotland was 7%, up from 4.9% in 2004.

Policy Outcome: 1

Indicator: Industrial energy productivity (£GVAm per GWh)

On-track Assessment (Milestones/Targets): [Increase 30% by 2032]<sup>26</sup>

Most recent data: 2020

Data source(s): DESNZ sub-national energy consumption statistics, DESNZ Energy Consumption in the UK statistics, Scottish Government Quarterly National Accounts Sectoral breakdown – unpublished..

Assessment: Off track – however, it should be noted that there is a high level of uncertainty with this assessment rating. The most recent data for 2020 will reflect the significant disruption to GVA across the Scottish economy during the COVID-19 pandemic. In addition, fundamental decisions on the Scottish CCUS Cluster status and UK ETS could have a material impact on the assessment of this indicator.

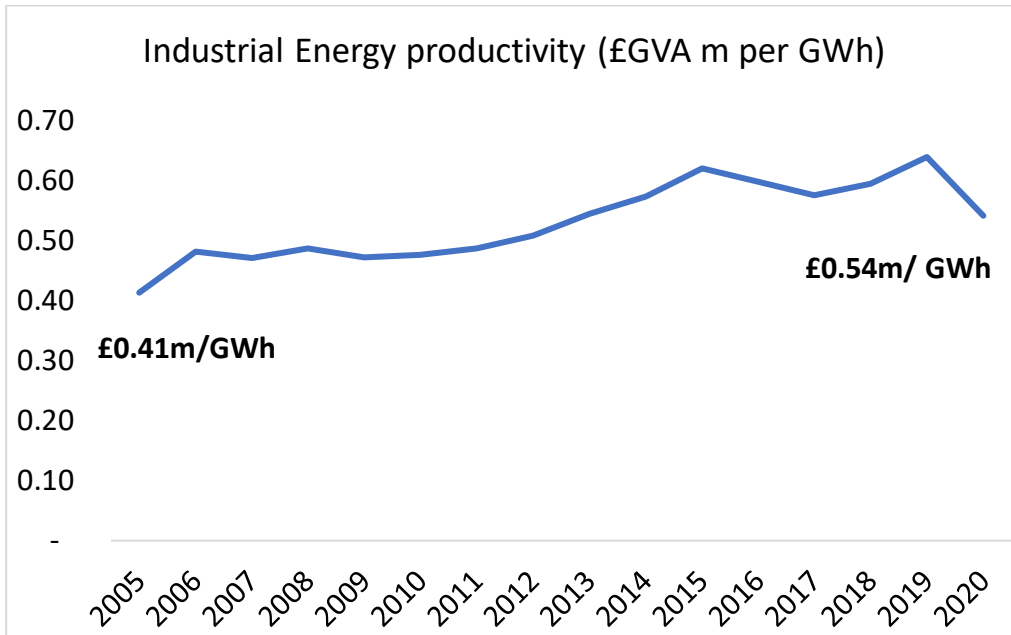
Commentary:

- Industrial GVA comprises the manufacturing, construction and mining sectors.
- Industrial energy productivity in Scotland (the GVA obtained through each GWh of energy used in the industrial sector) grew steadily, by over 50%, from 2005-2015, followed by a 7.3% decline over the next two years, and an uptick of 11.1% over 2018-19 before declining 15.3% in 2020.
- Compared to the 2015 baseline year industrial energy productivity has fallen by 12.7%, this is compared to a 3% increase on the baseline in 2019. This is driven by the 15% fall in industrial GVA between 2019 and 2020, which will reflect the significant disruption to the Scottish economy during the COVID-19 pandemic. The period 2015 to 2019 saw an increase of 3% in industrial energy productivity.
- Industrial GVA fell by 7.5% over the period 2005 to 2020, however this is impacted by the 15.0% fall in GVA between 2019-2020. The period 2005 to 2019 saw industrial GVA increase 8.9%.
- Industrial energy consumption fell by 29.6% over the period 2005 to 2020, with a small increase in 2019-20 of 0.3%.
- Improvements on this indicator are likely to be stepped, or lumpy, rather than gradual year-year changes, as success depends on substantial process changes at a small number of large sites. We'll continue to review the suitability of the indicators used to reflect success in the sector and refine these as needed

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<sup>26</sup> From a 2015 baseline





Policy Outcome: 1

Indicator: Industrial emissions intensity (tCO<sub>2</sub>e per £GVAm)

On-track Assessment (Milestones/Targets): [Reduce 30% by 2032]<sup>27</sup>

Most recent data: 2020

Data source(s): Scottish Government Greenhouse Gas Emissions publication, Scottish Government Quarterly National Accounts Sectoral breakdown - unpublished

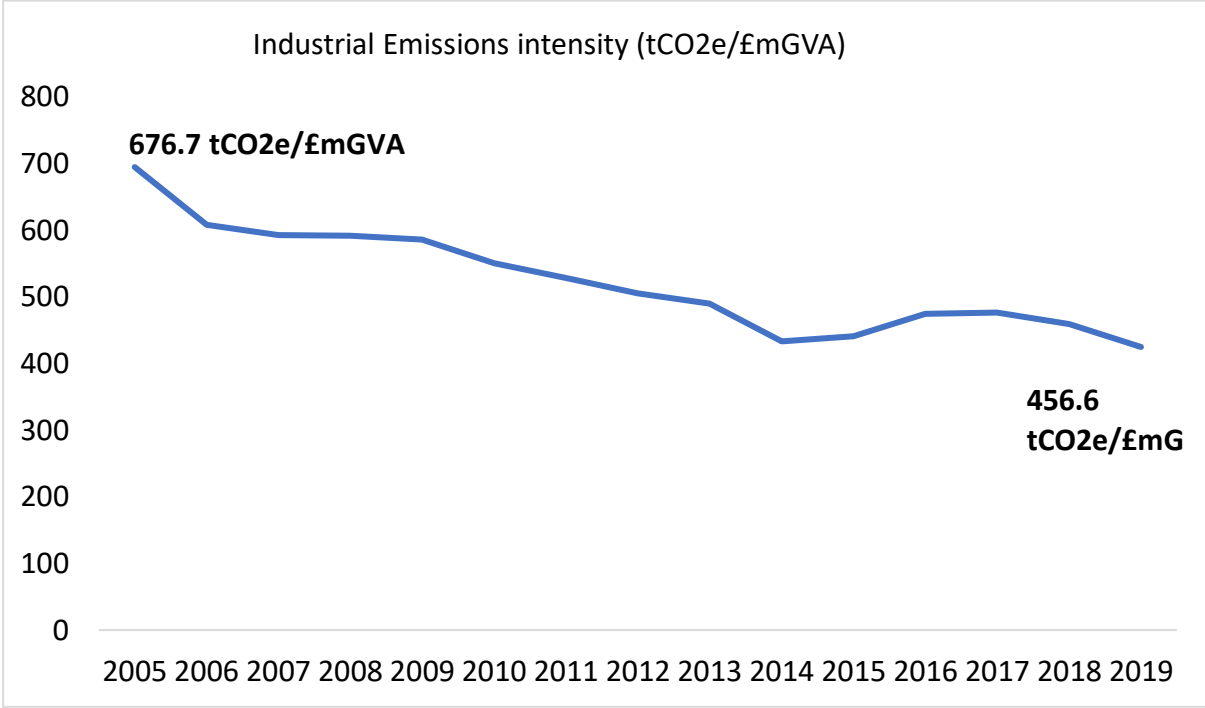
Assessment: Off track – however, it should be noted that there is a high level of uncertainty with this assessment rating. The most recent data for 2020 will reflect the significant disruption to GVA across the Scottish economy during the COVID-19 pandemic. In addition, fundamental decisions on the Scottish CCUS Cluster status and UK ETS could have a material impact on the assessment of this indicator.

Commentary:

- Industrial emissions intensity in Scotland (the volume of emissions produced through each £1m of GVA in the industrial sector) fell by 40.3% 2005- 2015, rose 10.5% to 2017, decreased 9.5% to 2019, then increased by 12.9% in 2020.
- Improvements on this indicator are likely to be stepped, or lumpy, rather than gradual year-year changes, as success depends on substantial process changes at a small number of large sites.
- Compared to the 2015 baseline year industrial emissions intensity has increased by 12.9%. This is driven by the 15% fall in industrial GVA between 2019 and 2020, which will reflect the significant disruption to the Scottish economy during the COVID-19 pandemic. The period 2015 to 2019 saw industrial emissions intensity remain flat, after a 9.1% fall between 2015 to 2018.
- Total industrial emissions fell by 38% between 2005 and 2020, this is reassuring given 2017-2018 saw a rise in industrial emissions before they fell by 11.9% between 2018 and 2020.
- We'll continue to review the suitability of the indicators used to reflect success in the sector and refine these as needed.

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<sup>27</sup> From 2015 baseline



**Policy Outcome:** 2

**Indicator:** % of Scottish gas demand accounted for by biomethane and hydrogen blended into the gas network.

**On-track Assessment (Milestones/Targets):** Based on trend

**Most recent data:** 2022

**Data source(s):** Scottish Gas Network and Department for Energy Security and Net Zero (DESNZ) Sub-national gas consumption statistics

**Assessment:** Too early to say

**Commentary:**

- In 2021 1.7% of Scottish gas demand was accounted for by biomethane blended into the gas grid up from 0.3% in 2015.
- Although moderate, this growth in biomethane levels has contributed to a lower emissions intensity of the gas grid.
- The most recent data shows that there was 126 GWh of biomethane injected into the SGN in 2015 and 802 GWh in 2021, a 536% increase

## Part C - Information on implementation of individual policies

Outcome 1: Scotland's Industrial sector will be on a managed pathway to decarbonisation, whilst remaining highly competitive and on a sustainable growth trajectory.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>Emissions Trading Scheme (ETS): following EU Exit we will work with UK Government and other devolved administrations on maintaining carbon pricing that is at least as ambitious as the EU ETS. The Scottish Government's preference is to establish a UK ETS will have an interim cap 5% tighter than the EU ETS, and will be reviewed for consistency with Net Zero in 2021.</p>	<p>June 2020</p>	<p>The <a href="#">UK ETS</a>, established jointly by Scottish Ministers with the <a href="#">UK Government</a> and the other devolved administrations, became operational on 1 January 2021. It currently mirrors the <a href="#">EU ETS</a> to provide a smooth transition for the new market, but with clear commitment to review it for consistency with net zero.</p> <p>During Spring 2022 the UK ETS Authority – formed of the four governments – consulted on a set of proposals to increase the climate ambitions of the ETS. The main proposals of the consultation included aligning the</p>		<p>The ETS Authority is working to publish a government response (GR) to the ETS consultation later this year. The Authority will deliver legislative changes across the four parliaments shortly after the GR is published, aiming for the net zero cap trajectory to be in force by January 2024.</p>

		scheme cap (total number of allowances for auctioning) to net zero commitments and reviewing the industry cap (the proportion of allowances given for free to industries at risk of carbon leakage). The consultation also included initial proposals for expanding the scope of the ETS within the existing and to new sectors.		
Deliver an Energy Transition Fund (ETF) to provide support for a sustainable, secure and inclusive energy transition in the North East.	June 2020	<p>Funding has been expanded to £75m.</p> <p>4 projects currently in delivery</p> <ul style="list-style-type: none"> <li>○ The Global Underwater Hub (£6.5m)</li> <li>○ The Energy Transition Zone based in Aberdeen (£26.3m)</li> <li>○ Aberdeen Hydrogen Hub (£15.05m)</li> <li>○ Net Zero Transition Technology Project led by NZTC's Net Zero Solution Centre (£16.7m)</li> </ul>	Monitoring and evaluation development underway – approval to proceed issued by steering group on March 9 <sup>th</sup> 2023.	<p>Completion of Monitoring and evaluation approach Q1 23/24.</p> <p>All 4 projects in delivery and working to agreed timescales for milestone completion. Fund currently runs until end 24/25 financial year.</p>
Establish and deliver a Scottish Industrial Energy Transformation Fund (SIETF) – to support the	June 2020	Through the £34 million Scottish Industrial Energy Transformation Fund (SIETF) which co-invests with a diverse range of Scottish	The 2022 Programme for Government committed us to continue SIETF which	During 2023 a review of the programme will consider number and value of projects

<p>decarbonisation of industrial manufacturing through a green economic recovery.</p>		<p>manufacturers to reduce energy costs and emissions through increased energy efficiency and deep decarbonisation</p> <p>Our SIETF programme continues to receive significant applications from a wide range of industrial manufacturing sectors across the country. By enhancing energy efficiency it cuts energy costs, in particular for Scotland's diverse food and drink sector.</p> <p>Up to 2022, over 20 projects have been offered grants totalling £12m with many more to be offered during 2023</p>	<p>leverages over £100m of total investment to directly reduce emissions from industrial processes.</p> <p>Industries in scope currently emit around 8.3 MtCO<sub>2</sub>e. The fund in its current form should cut emissions by c.0.15 MtCO<sub>2</sub>e.</p> <p>Estimates of annual cumulative carbon savings resultant from co-investment from SIETF will be annually reviewed. However actual savings are unlikely to evidence until 2024 after significant energy efficiency or decarbonisation deployments are operational.</p>	<p>supported, projected emissions and energy productivity savings, and consider impacts against policy objectives.</p>
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<p>Making Scotland's Future: multi-faceted programme will boost manufacturing productivity, innovation, and competitiveness, supporting manufacturing businesses to make the transition to net zero and realise the opportunities of a low carbon economy</p>	<p>December 2020</p>		<p>No. MSF is more about the collective, collaborative approach to supporting manufacturing that has been adopted across partners. Indicators and milestones will vary for individual projects/work packages in each workstream.</p>	<p>Currently refreshing the programme. Expect to complete by end-April.</p>
<p>Low Carbon Manufacturing Challenge Fund: to support innovation in low carbon technology, products and processes. Will be delivered as a R&amp;D scheme with focus on implementing product circularity through design, reducing product/process waste and reducing emissions through product lifecycle</p>	<p>2020-2021 PfG</p>		<p>For projects of over 0.5 million the gross impacts of the project are estimated, in particular Gross Value Added (GVA) and employment. Additionality adjustments are then made to drive the net impacts of each intervention. Impact ratio (net GVA per £1 of support) cost per job created or safeguarded.</p>	<p>Fund delivery is over CSR period so will continue delivery. Additional announcements likely. Pipeline of projects exceeds budget so are exploring scope for additional funding through consolidated budget exercise.</p>



<p>The Renewable Heat Incentive (RHI) is a GB wide scheme created by the UK Government (with the agreement of the Scottish Government).</p>	<p>August 2020</p>	<p>1,126.9 MW<sup>28</sup> of accredited capacity under the non-domestic RHI (NDRHI) between November 2011 and December 2022.</p> <p>1,770 GWh of heat had been paid for between April 2014 and end December 2022 under the domestic RHI scheme in Scotland.</p>	<p>Scotland consistently attracted more than its pro-rata share under both the <u>NDRHI</u> and <u>DRHI</u>, with around 19% of non-domestic and 18% domestic accredited installations being in Scotland.</p>	<p>The NDRHI closed as scheduled on 31 March 2021, though qualified extensions for both Tariff Guarantee and non-Tariff Guarantee applications were implemented prior to its closure. These extensions were due to end on 31 March 2023.</p> <p>The Domestic Renewable Heat Incentive (<u>DRHI</u>) formally closed on 31 March 2022, and was replaced by the Boiler Upgrade Scheme. The Scottish Government opted out of the Boiler Upgrade Scheme in favour of boosting our existing programmes.</p>
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<sup>28</sup> Last year's report (published 26 May 2022) reported 1,130.7 MW of accredited capacity under the non-domestic RHI (NDRHI) between November 2011 and January 2022. This is actually the figure for full applications; the correct figure for accredited capacity between November 2011 and January 2022 is 1,095 MW.

<p>Scottish Industrial Decarbonisation Partnership (SIDP): Scottish Government convened cross-sector energy-intensive industrial (EII) stakeholder forum with representatives from manufacturing sites. Initial objectives: bring together other initiatives; build a shared narrative between government/industry on decarbonisation' and disseminate best practice.</p>	<p>CCPu 2020</p>	<p>The NECCUS network and the Grangemouth Future Industry Board (GFIB) continue to capture industry and wider views and commission vital evidence, thus many of the proposed SIDP functions are carried out by others partnerships or groups.</p>	<p>Too early to set indicators or milestones</p>	<p>The proposal's purpose mission and governance, in relation to other partnerships in this policy space, will be kept under review as industrial decarbonisation policy needs develop during 2023.</p>
<p>Deliver a Net Zero Transition Managers Programme to embed Managers in organisations tasked with identifying, quantifying and recommending decarbonisation opportunities for the business.</p>	<p>CCPu 2020</p>	<p>Pilot project underway with partners from Scotland's food and drink sector</p>	<p>N/A</p>	<p>Support to sector-specific pilot during 2022/23 will inform analysis to tackle the skills and capacity challenges to deliver industrial decarbonisation.</p>

<p>Establish a Grangemouth Future Industry Board (GFIB) – forum to coordinate public sector initiatives on growing economic activity at the Grangemouth industrial cluster, whilst supporting its transition to our lowcarbon future.</p>	<p>2020-2021 PfG</p>	<p>Have since committed to the development of a Just Transition Plan for the Grangemouth industrial cluster (2022 PfG), which will outline a co-developed vision for the future of the site, and actions/policy developments to help achieve it.</p> <p>The Board delivered its workstream priorities during 2022 and agreed that these workstreams should be repurposed to have a greater emphasis on net zero delivery.</p>	<p>No, but as part of the JTP monitoring framework, indicators for progress will be developed.</p>	<p>In 2023 GFIB will engage the active participation of industry and elicit business-focussed contributions on strategic issues facing the Grangemouth cluster.</p> <p>JTP to be published April 2024.</p>
<p>Develop policy on providing market-benefit for Scottish industries that invest to decarbonise production.</p>	<p>CCPu 2020</p>	<p>In June 2022, UK Government published a summary of responses from their Call for Evidence '<a href="#">Towards a market for low emissions industrial products</a>', but we await consultation on measures such as product standards and a carbon border adjustment mechanism which require UK action.</p>	<p>Sector or product specific measurement and benchmarking is noted in 2021 Scottish Government research: <a href="#">Improving the market benefits for lower-carbon industrial production in Scotland (climatexchange.org.uk)</a></p>	<p>N/A</p>

<p>Green Jobs Fund, to help businesses create new, green jobs, working with enterprise agencies to fund businesses that provide sustainable or low carbon products and services to help them develop, grow and create jobs. Further funding will help to ensure that businesses and supply chains across Scotland can capitalise on our investment in low carbon infrastructure such as the decarbonisation of heating and green transport.</p>	<p>2020-2021 PfG</p>	<p>We will not have updated figures for the Green Jobs Fund till Q2.</p> <p>SG and the three Enterprise Agencies are still in ongoing contractual negotiations with companies who will be awarded funding for 2022/2023, therefore we will not have confirmed figures until the new financial year.</p> <p><b>Latest figures to be quoted are:</b> Between the Enterprise Agencies and Scottish Ministers, 57 projects have been supported with grant funding of £16.8m through the Green Jobs Fund. Figures provided by the recipients of these awards estimated this fund will support up to 3,886 jobs over the life of the individual projects.</p>	<p>ONS are expected to release their “Green jobs update, current and upcoming work: March 2023” on the 13<sup>th</sup> March.</p> <p>The Green Jobs Fund is a <b>five year</b> capital fund of up to £100m. £50m baselined to the Enterprise Agencies and up to £50m allocated to Scottish Ministers.</p> <p><b>NB With Confidence:</b> As a result of budget cuts post spending review etc please ensure you include the words <b>up to</b> £100m when referencing the Green Jobs Fund_to ensure accurate representation of the fact that this fund is no longer guaranteed to be</p>	<p>Green Jobs Fund is expected to have awarded up to £100m by 2026 to support businesses and their supply chains to help them better transition to a low carbon economy and create new green jobs.</p>
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			£100m.	
<p>Seizing the economic opportunity, we will work across government, enterprise agencies and the innovation system to identify strengths that can be built on as part of the decarbonisation journey, for example on The Clyde Mission and continued support for the Michelin Scotland Innovation Parc (MSIP).</p>	CCPu 2020	<p>MSIP has established 14 tenants and 135 jobs since its formation. In August 2022 the MSIP Skills Academy was formally opened by Ms Slater to provide training and learning in support of the emerging needs of sustainable mobility and renewable energy industries. It will accept its first intake of students in Spring 2023.</p> <p>MSIP is an exemplar of industrial transformation and is a key reference point for the Net Zero Industrial Clusters Exchange (NICE) launched by SG and Michelin at COP26, bringing together a range of European partners to share practical knowledge between private companies, public authorities and other stakeholders in supporting the drive for industrial transformation undertaking decarbonisation towards net zero.</p>		<p>In support of Innovation, MSIP will open in 2023 its Innovation Labs and Innovation Hub. The Labs will provide businesses with flexible space for product development and prototyping while the MSIP will open in 2023 its Innovation Labs (March) and Innovation Hub (October). The Labs will provide businesses with flexible space for product development and prototyping while the Hub will provide a focal point for collaboration, demonstration and business support.</p>

Outcome 2: Technologies critical to further industrial emissions reduction (such as carbon capture and storage and production and injection of hydrogen into the gas grid) are operating at commercial scale by 2030.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
ACORN CCS Project: support the delivery of the CCS and Hydrogen capability at St. Fergus Gas Processing complex by 2025.	CCP 2018	<p>In October 2021, UK Government failed to award the Scottish Cluster (led by the Acorn Project at St Fergus) Track 1 status in their CCUS cluster sequencing process. The Scottish Cluster was instead given “reserve status”.</p> <p>In response, SG called on UK Government to reverse its decision and grant the Scottish Cluster Track-1 status, and also provide urgent clarity on the timelines for Track 2.</p> <p>SG notes the UK</p>	<p>There are no specific indicators in the CCPU. However, it does note that “...Acorn CCS is anticipated to be operational by 2024 and is well placed to attract support from the UK Government’s £1 billion CCUS Infrastructure Fund” (3.4.35). UK Government’s failure to award the Scottish Cluster Track 1 status has delayed Acorn CCS’ ability to become operational.</p>	<p>SG will continue to engage with UK Government on how the Scottish Cluster’s planning and development can best be supported. Further clarity from UK Government on the Track-2 cluster sequencing process (anticipated in Spring 2023) will impact timeframes and next steps.</p>

		<p>Government's intention to provide further details on Track 2 in Spring 2023 and has make UK Government aware it is vitally important that this announcement sets out a clear and accelerated timeframe for Track 2, to give Scottish industry the certainty needed to progress CCUS deployment in Scotland.</p> <p>SG have continued to advocate for the Sottish Cluster in their engagement, and have offered £80 million from the Emerging Energy Technologies Fund to accelerate its deployment.</p> <p>Due to delays with UK Government announcing the Scottish Cluster, SG have re-profiled their offer of financial support into subsequent years.</p>		
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Establish and deliver a Carbon Capture and Utilisation (CCU) Challenge Fund.	2020-2021 PfG	Fund launched in April 2022 and remains open for applications.	There are no specific indicators in the CCPu.	The Fund launched in April 2022 and is currently open for applications.
Emerging Energy Technologies Fund – to support the development of Hydrogen, CCUS and Negative emissions technologies.	CCPu 2020	First tranche of EETF funding, the £10m Hydrogen Innovation Scheme, launched in 2022. Grant awards expected to be made in Spring 2023. Second tranche of funding, the £90m Green Hydrogen Fund to follow shortly.	There are no specific indicators in the CCPu.	Grant awards to be made in March and April 2023 to applicants to the Hydrogen Innovation Scheme. In March and April 2023 to applicants to the Hydrogen Innovation Scheme. In March and April 2023 to applicants to the Hydrogen Innovation Scheme.  Green Hydrogen Fund to launch shortly.
Carbon Capture Utilisation and Storage (CCUS): work closely with the UK Government to achieve commercial, policy and regulatory frameworks required to support CCUS at scale in the UK.”	2020-2021	SG have continued to engage with UK Government on the development of relevant frameworks (e.g., business models) required to support CCUS at scale in the UK.	There are no specific indicators in the CCPu.	SG is continuing to engage with UK Government on the development of relevant frameworks, including how business models could effectively support the Scottish Cluster to



				continue its development.
Forums for CCUS and Blue (low-carbon) Hydrogen: to bring together industry, academics and membership organisations to promote and attract investment in CCUS and Blue Hydrogen.	NECCUS 2019	North East Carbon Capture, Utilisation and Storage Alliance (NECCUS) has become established as a major industry led membership forum and the Scottish Government has delivered grant funding to NECCUS between the 2021/22 and 2022/23 financial years.	Scottish Government has delivered grant funding to NECCUS between the 2021/22 and 2022/23 financial years.	SG is now exploring the potential for further grant funding to support NECCUS in the 2023/24 financial year.
Evidence for CCUS and Blue Hydrogen: building the evidence base on impact of technology, regulatory and market barriers.	2020/21 PfG	<p>Contribution from CCUS:</p> <p>SG has commissioned a study into the potential for CO2 shipping in Scotland (ongoing).</p> <p>SG has commissioned a CCUS regulatory mapping exercise by external legal consultants (ongoing).</p>	There are no specific indicators in the CCPu.	The Shipping Study and NETs Feasibility Studies are expected to conclude in Q1/Q2 2023.

		SG has commissioned a NETs feasibility study by external consultants (ongoing).		
Strategic development of Scotland's hydrogen economy - This is a cross-portfolio proposal that will impact on the delivery of multiple outcomes.	Hydrogen Assessment and Policy Statement 2020, draft Hydrogen Action Plan	The final Hydrogen Action Plan was published in December 2022.	There are no specific indicators in the CCPu.	The actions set out within the Hydrogen Action Plan cover this Parliamentary term.
Hydrogen Demonstration: to replicate and scale-up demonstration projects and the evidence base for hydrogen based technologies.	Hydrogen Assessment and Policy Statement 2020, draft Hydrogen Action Plan 2021	The £10m EETF Innovation Scheme (HIS), launched in 2022. The HIS is aimed at providing support for the production, storage and integration of renewable hydrogen including feasibility and demonstration projects.	There are no specific indicators in the CCPu.	HIS Grant awards expected to be made in Spring 2023.

# Climate Change Plan Monitoring Report 2023: Waste and the Circular Economy

## Part A - Overview of sector

The 2020 annual emissions envelope published in the CCPu for his sector was 1.6 MtCO<sub>2</sub>e, whereas the outturn emission statistics for this year (published in June 2022) show a position of 1.5 MtCO<sub>2</sub>e<sup>29</sup>. On the basis of comparing these figures, the sector was **within** its envelope in 2020.

The CCPu sets out the following four policy outcomes for the sector:

Reduction in waste sent to landfill	On Track	Off Track	Too Early to Say
Total amount of landfilled waste (tonnes)		X	
Total amount of biodegradable landfilled waste (tonnes)	X		

Reduction in emissions from closed landfill sites	On Track	Off Track	Too Early to Say
Number of closed landfill sites with exploratory landfill gas capture/ flaring		X	

A reduction in food waste	On Track	Off Track	Too Early to Say
Household and non-household food waste reduced (tonnes)		X	

Reduce waste and establish a more circular economy, where goods and materials are kept in use for longer	On Track	Off Track	Too Early to Say
Total waste generated (tonnes)	X		

<sup>29</sup> Emissions data for baseline and 2020 have been updated to reflect a forthcoming change in the global warming potentials for non-CO<sub>2</sub> greenhouse gases.

## Just transition and cross economy impacts

We wish to understand and report on the broader just transition and cross-economy impacts of our emissions-reduction activities in addition to these sector specific policy outcomes and indicators. To do this, in this report we use data from the Office of National Statistics (ONS): Low Carbon Renewable Energy Economy (LCREE) publication. The LCREE data presented in this report is based on survey data of businesses which perform economic activities that deliver goods and services that are likely to help generate lower emissions of greenhouse gases, for example low carbon electricity, low emission vehicles and low carbon services.

The LCREE indicator is narrowly defined and, while useful within its limited scope, does not give us the full picture of the impacts on workforce, employers and communities and progress towards a just transition.

Over the next few years we will work to develop a more meaningful set of success outcomes and indicators aimed at tracking the impacts of our policies on a just transition to net zero.

## Sector commentary on progress

While Scotland has already made significant strides in reducing emissions from waste, with more than 40% reduction in waste management emissions between 2011-2020, our CCPu recognised that progress needs to be accelerated to deliver our ambitious waste reduction and recycling targets, and to enable us to meet updated waste sector emissions envelopes. Emissions from the waste management sector are currently around 1.4 million tonnes per year (2020). We aim to reduce these emissions to 0.9 million tonnes by 2025, and 0.7 million tonnes by 2030.

To achieve this, we must: accelerate action across society to reduce the demand for raw material in products; encourage reuse and repairs through responsible production and consumption; and recycle waste and energy to maximise the value of any waste that is generated.

As a result of the December 2020 cyber-attack on SEPA, publications from 2019 and 2020 covering statistics on waste from all sources are not available, but this year it has been possible to update indicators with 2021 data on waste from all sources.

While we have made progress in delivering key policy measures set out in our Climate Change Update, based on available information it is clear that, for many of the indicators, Scotland is not on track.

For example, while the reduction in landfilled waste in recent years is encouraging, achieving the 5% to landfill target represents a significant challenge. The indicator to

reduce biodegradable landfilled waste (tonnes) to zero is judged as on track, as work with partners to prepare local authorities and the wider sector for the forthcoming ban on landfilling biodegradable municipal waste (which comes into force at the end of 2025) continues to be prioritised.

However, across all of the other targets, we still have a significant challenge ahead and it is unlikely that these can be met in full without large-scale, significant and rapid system changes. As we set out in the CCPu, we are developing a route map focussed on actions to deliver our waste reduction and recycling targets to 2025 and beyond, in a way that maximises carbon savings potential. In May 2022, we consulted on our draft route map<sup>30</sup> and set out proposed new and boosted measures to accelerate progress towards existing targets. We will publish a final Route Map later this year. We also consulted on proposals for a circular economy bill, to ensure legislation is in place to support Scotland's transition to a circular economy ([Delivering Scotland's circular economy: a consultation on proposals for a Circular Economy Bill – Scottish Government – Citizen Space](#)). Consultation analysis has been published and we will be bringing forward legislation this parliamentary term ([Delivering Scotland's circular economy: Proposed Circular Economy Bill – Consultation analysis – gov.scot \(www.gov.scot\)](#))

These actions will complement the existing, wide-ranging measures we have in place to support delivery of these targets, set out in the CCP. For example, Scotland's Deposit Return Scheme will go live on 1 March 2024; and we have established our £70m Recycling Improvement Fund to improve local authority recycling infrastructure – one of the biggest investments in recycling in Scotland in a generation. To date, over £53 million has been awarded to 17 local authorities to increase the quantity and quality of recycling, with initial projects estimated to deliver an annual carbon saving of 49,000 tCO<sub>2</sub>e.

## Developments in monitoring arrangements since last report

Work continues to develop more robust reporting for some of the indicators, including landfill gas capture and food waste measurements. Another key development will be the planned UK wide introduction of mandatory digital waste tracking. Improvements in waste data are overseen by the multi-stakeholder Scottish Waste Data Strategy Board. In addition, the Circular Economy Bill and Waste Route Map consultations highlighted our intention to develop a monitoring and indicator framework that will allow for tracking of Scotland's consumption and wider measures of circularity.

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<sup>30</sup> [Delivering Scotland's circular economy - route map to 2025 and beyond: consultation - gov.scot \(www.gov.scot\)](#)

## Part B – Progress to Policy Outcome Indicators

**Policy Outcome:** Cross-sectoral social and economic

**Indicator:** FTE employment in Low Carbon Renewable Energy Economy Indicator

**On-Track Assessment (Milestones/Targets):** Year-to-year change

**Most Recent Data:** 2021

**Data Source(s):** Office of National Statistics: Low Carbon Renewable Energy Economy (LCREE), Time spent of Green Tasks

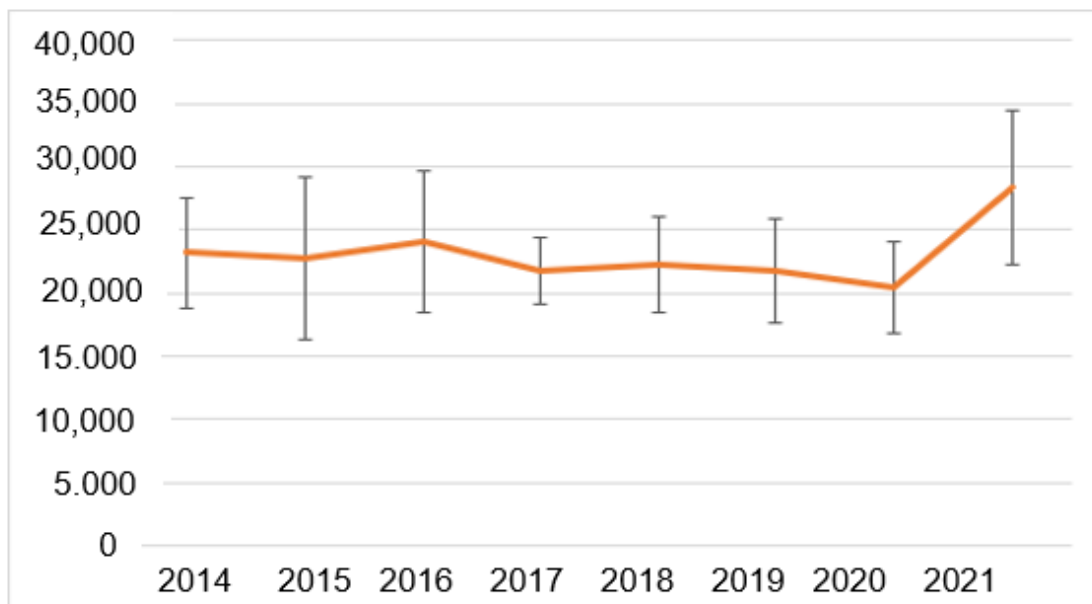
**Assessment:** Too Early to Say

### Commentary:

In 2021, the Scottish low carbon renewable energy (LCREE) sectors were estimated to provide 28,300 jobs, the highest in the published data.

- The estimates of LCREE are based on a relative small sample of businesses and hence are subject to a wide confidence interval. Scottish LCREE employment in 2021 is substantially higher than previous years but the difference is not statistically higher than 2020.

Employment in Low Carbon Renewable Energy Economy, FTE



- LCREE only shows employment in roles in Industries directly involved in the transition to Net Zero.
- The ONS also released experimental statistics on a wider perspective of green activity in the economy with their time spent on green tasks release.

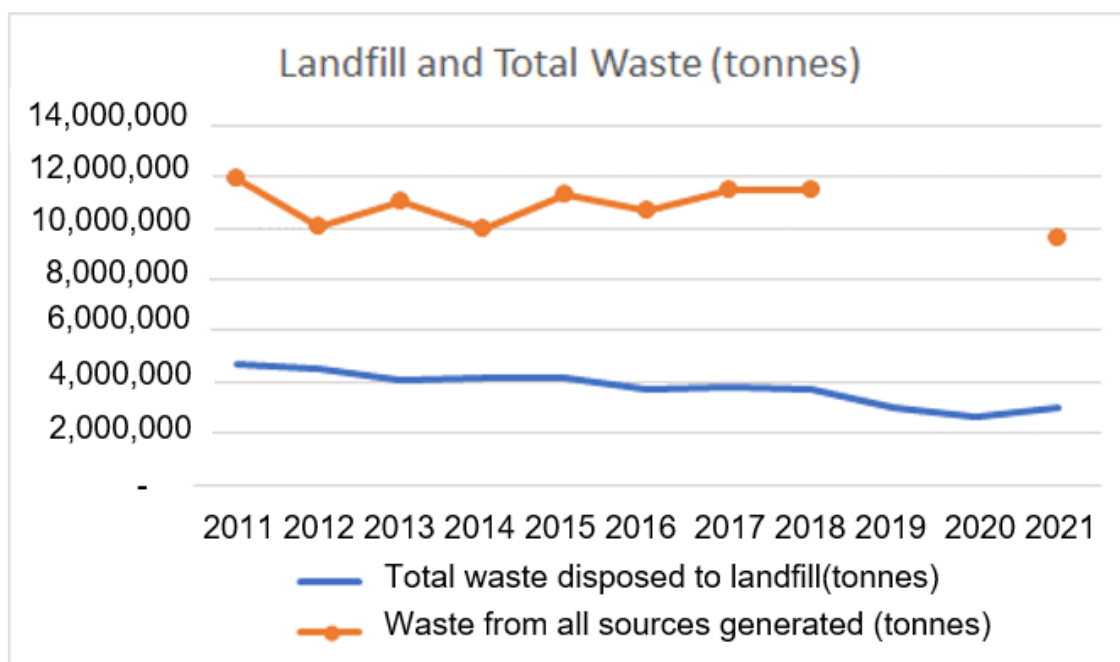
- These stats reflect green activities in both LCREE and non-LCREE sectors. The 2023 publication has not yet been published.
- Last year's publication showed that in 2019 Scotland achieved an all-time high of hours spent on green tasks and proportion of workers doing green tasks, including workers who spend more than 20% of their time on green tasks.
- The proportion of workers doing green tasks in Scotland was 36% in 2019, up from 23.8% in 2004. Workers who have spent more than 20% of their time doing green tasks was 14%, up from 9% in 2004.
- The proportion of overall hours spend doing green tasks in Scotland was 7%, up from 4.9% in 2004.

Policy Outcome: 1

Indicator: Total amount of landfilled waste (tonnes)

On-track Assessment (Milestones/Targets): Progress to target [no more than 5% of all waste to landfill by 2025]

Most recent data: Landfilled waste reduced from 3.74 million tonnes in 2018 (32.7% of waste generated) to 3.00 million tonnes (31.3% of waste generated) in 2021. The percentage of total waste sent to landfill in 2019 and 2020 cannot be calculated due to the absence of total waste figures for those years.



Data source(s): SEPA official statistics – Waste landfilled in Scotland 2021: Waste from all sources 2021

Assessment: Off Track

Commentary: Currently, Scotland landfills less than half of what it did in 2005, with waste sent to landfill falling from around 7 million tonnes in 2005 to around 3 million tonnes in 2021. Scottish waste landfilled in 2021 was 31.3% of total waste generated (or, similarly, 30.2% of total waste managed).

Achieving the weight-based, 5% to landfill target represents a significant challenge and the pace of reduction would need to accelerate markedly to meet the target. It should be noted however, that the types of waste being landfilled have changed significantly, with 'household and similar waste' (responsible for much of the biodegradable waste, which produces landfill gas) reducing from 46% of waste landfilled in 2005 to 25% of waste landfilled in 2021.

In 2022, we consulted on proposals for a route map to drive progress towards our



2025 targets and beyond. This set out proposed additional actions to accelerate the pace of waste reduction and recycling, building on existing measures we have in place to meet this target. The final route map will be published later this year, taking account of the outcome of public consultation on proposed measures.

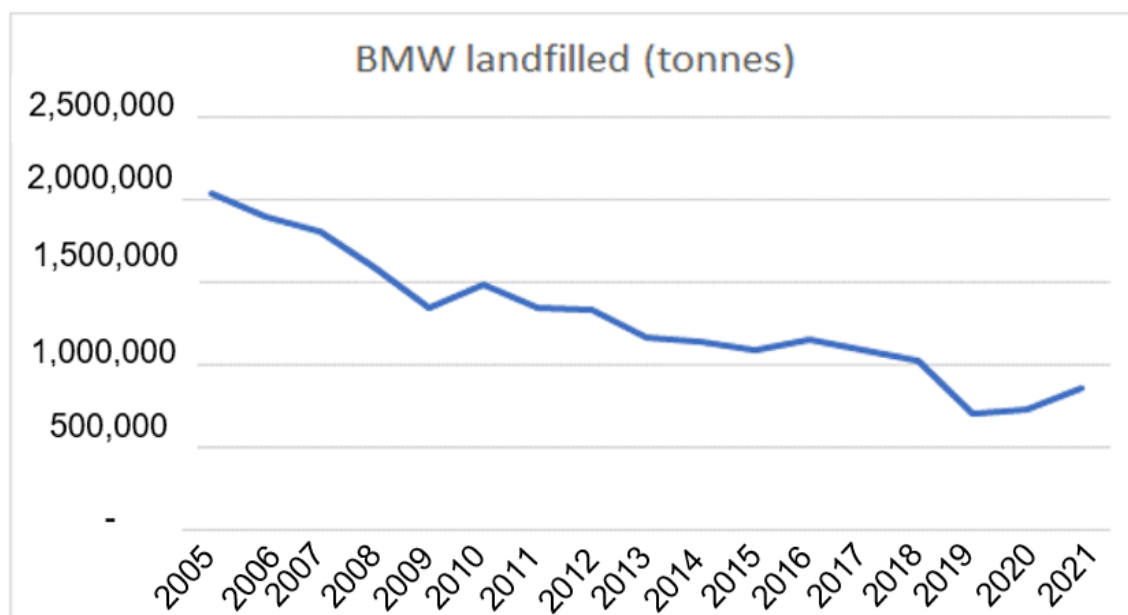
Policy Outcome: 1

Indicator: Total amount of biodegradable landfilled waste (tonnes)

On-track Assessment (Milestones/Targets): Year-to-year change +

Progress to interim target [0 tonnes of biodegradable municipal waste landfilled by 31<sup>st</sup> December 2025]

Most recent data: Biodegradable municipal waste (BMW) landfilled has reduced from 2.0 million tonnes in 2005 to 0.86 million tonnes in 2021.



Data source(s): SEPA official statistics – waste landfilled in Scotland

Assessment: On track

Commentary:

Clear reductions have been seen over the past 15 years in the amount of BMW landfilled. The amount of biodegradable municipal waste (BMW – the biodegradable component of Municipal Waste) disposed to landfill in 2021 was 856,000 tonnes, an increase of 122,000 tonnes (17%) from 2020 and a reduction of 1.2 million tonnes (58%) since 2005. The increase between 2020 and 2021 was likely due to the effects of Covid-19, however, the longer term trend is expected to continue as we move towards the ban on landfilling biodegradable municipal waste, which will come into force on 31 December 2025. Work continues to support remaining local authorities to put in place alternative solutions to comply with the ban.

Policy Outcome: 2

Indicator: Number of closed landfill sites with exploratory landfill gas capture/ flaring

On-track Assessment (Milestones/Targets): Progress to target [12 by2025]

Most recent data: n/a

Data source(s): To be determined

Assessment: Off Track

**Commentary:**

This was a new policy, as outlined in the CCPu, to accelerate Landfill Gas Capture, working with SEPA and key industry partners to scale up the existing landfill gas capture programme to mitigate effects of landfill and environmental impact of closed landfill sites. This is supported by additional funding from the Low Carbon Fund, with the aim to harness the energy generated from landfill gas capture and maximise circular economy opportunities. Due to other unavoidable resource implications, including COVID-19 contingency work, progress on this policy outcome has been paused, but roll out of the programme will begin from 2023.

**Policy Outcome:** 3

**Indicator:** Household and non-household food waste reduced (tonnes)

**On-track Assessment (Milestones/Targets):** Progress to target [reduce all food waste by 33% by 2025]<sup>31</sup>

**Most recent data:** An estimated 987,890 tonnes (baseline year) of food and drink in Scotland was wasted. As part of work on the Food Waste Reduction Action Plan (FWRAP), Zero Waste Scotland is currently developing updated estimates of food waste in Scotland.

**Data source(s):** 'How much food is wasted in Scotland?' – Zero Waste Scotland, November 2016.

**Assessment:** Off track

**Commentary:**

A review of Scotland's Food Waste Reduction Action Plan has been undertaken and refreshed plans to drive progress towards the 33% target will be published in 2023. The review will provide updated estimates of total food waste in Scotland and further sector specific data will also be published. Scotland does not currently collect waste data at the granular level necessary to report annually or by supply chain sector.

According to our 2013 baseline data, the two largest sector sources of food waste are Household & Consumer (61%) and Food & Drink Manufacturing (25%). While the Scottish householder is a clear target for change, the relationships between the consumer, the retailer and the supply chain are complex, with each influencing the others' decisions and behaviour. The remaining 14% is food waste generated by the Hospitality & Catering, Wholesale & Retail, Education, and Healthcare sectors.

A waste compositional analysis across several local authorities will inform the updated estimate for household food waste in Scotland.

In May 2022, we consulted on proposals for a Circular Economy and Waste Route Map<sup>32</sup> to accelerate progress towards our 2025 waste and recycling targets, including food waste reduction. This proposed additional measures to tackle food waste, including intensifying action to tackle household food waste; providing enhanced support for businesses and organisations to reduce food waste and promote a circular bioeconomy and through the proposed Circular Economy Bill taking additional powers to introduce mandatory public reporting of food surplus and waste. The final Route Map will be published later in 2023, taking account of the outcome of public consultation on proposed measures.

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<sup>31</sup> Reduce all food waste arising in Scotland on a per capita basis by 33% by 2025, based on 2013 baseline;

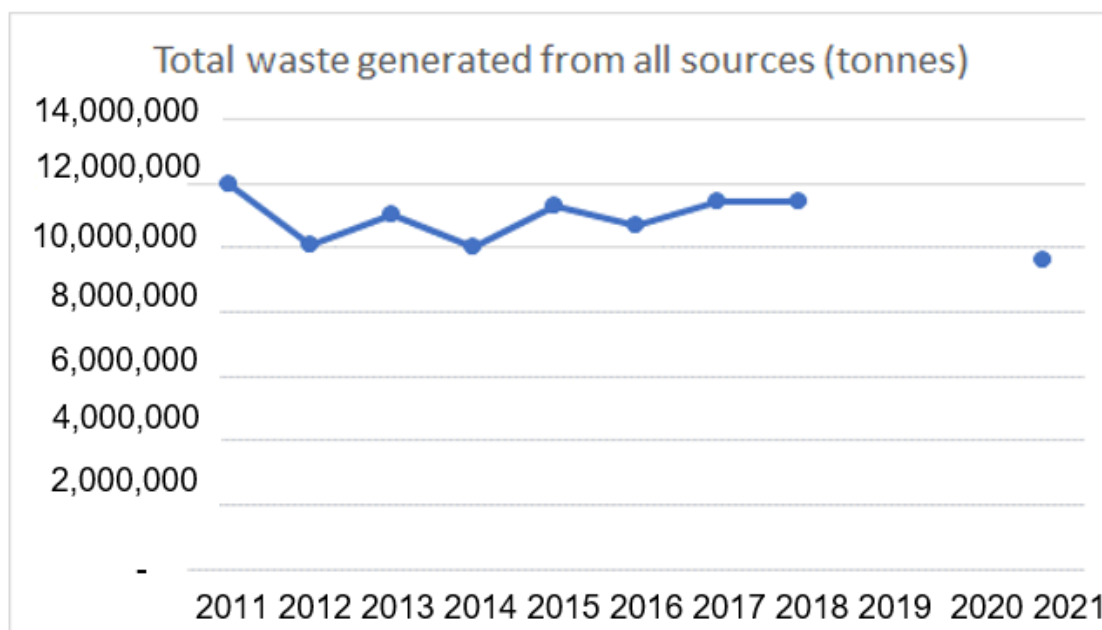
<sup>32</sup> [Delivering Scotland's circular economy - route map to 2025 and beyond: consultation - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/delivering-scotland-s-circular-economy-route-map-to-2025-and-beyond-consultation/pages/20)

Policy Outcome: 4

Indicator: Total waste generated (tonnes)

On-track Assessment (Milestones/Targets): Progress to target [reduce total waste by 15% by 2025 against 2011 baseline]<sup>33</sup>

Most recent data:



Data source(s): Official statistics publication by SEPA- waste from all sources 2021.

Assessment: On track

Commentary: The total amount of waste generated in 2021 was 9.6 million tonnes, the lowest figure to date in SEPA's statistics, which provide data from 2011 onwards. This equates to a 20% reduction compared with 2011.

However, it should be noted that 2021 was an atypical year due to the impact of COVID and, even in years not affected by COVID, year-to-year changes in waste can be marked – generally driven by year-to-year variability in construction and demolition waste. Due to the level of year-to-year fluctuation, the target has been met in 3 years (2012, 2014, 2021) but not the other 5 years for which data are available. Excluding construction and demolition waste, the trend is clearer with a decline in combined household and commercial & industrial waste from 6.8 million tonnes in 2011 to 5.6 million tonnes in 2021, a drop of around 18% in 10 years. As a result of the December 2020 cyber-attack on SEPA, waste from all sources publications for 2019 and 2020 are not available.

<sup>33</sup> By 2025 reduce total waste arising in Scotland by 15% against 2011 levels;

In May 2022, our route map consultation set out some proposed additional measures to accelerate progress towards our 2025 waste prevention and recycling targets and deliver a circular economy in Scotland. Building on measures already in place or underway, the consultation proposed a range of additional legislative and non-legislative measures that can positively contribute to the delivery of the targets and make progress towards carbon reduction. Proposals were grouped into seven change packages, which span action across the whole circular economy, including promoting responsible consumption and production (including reducing consumption of single-use items, promoting product design and stewardship and mainstreaming reuse); reducing food waste from households and businesses; and embedding circular construction practices. The final route map will be published later in 2023, taking account of the outcome of public consultation on proposed measures.

## Part C – Information on implementation of individual policies

### Outcome 1: Reduction in waste sent to landfill

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>End landfilling of biodegradable municipal waste by 2025, reduce the percentage of all waste sent to landfill to 5% by 2025 and recycle 70% of all waste by 2025 by:</p> <ul style="list-style-type: none"> <li>Developing a new route map to reduce waste and meet our waste and recycling targets for 2025 in a way that maximises their carbon</li> </ul>	2020-2021 PfG	<ul style="list-style-type: none"> <li>Our £70 Recycling Improvement Fund was launched in March 2021. So far over £53 million has been awarded to 17 local authority projects to improve recycling infrastructure.</li> <li>A public consultation on proposals for a Route Map to reduce waste, and meet our 2025 targets was published in May 2022.</li> </ul>	<p>Annual official waste statistics are published by SEPA, which indicate progress against these commitments, as outlined above at Part B.</p> <p>The projects funded through the Recycling Improvement Fund are projected to save over 49,000 tonnes of CO<sub>2</sub>e per year.</p>	<p>Recycling Improvement Fund is a five-year fund, further investments will be made across the lifetime of the Fund.</p> <p>Publish final Route Map later in 2023, taking account of responses to consultation and further research.</p>

<p>savings potential.</p> <ul style="list-style-type: none"> <li>• Developing a post 2025 route map for the waste and resources sector, identifying how the sector will contribute towards Scotland's journey towards net zero in the period to 2030 and beyond.</li> <li>• Establishing a £70m fund to improve local authority recycling collection infrastructure.</li> <li>• In line with EU requirements, further promoting reuse and recycling ensure separate collection of textiles by 2025; and ensuring that biowaste (e.g. garden waste), is either separated and recycled at source, or is collected separately and is not mixed with other types of waste by 2023.</li> </ul> <p>In response to the Committee on Climate Change's (CCC's) latest</p>		<ul style="list-style-type: none"> <li>• Work is ongoing to support remaining local authorities to put in place alternative solutions to comply with the ban on landfilling biodegradable municipal waste (BMW).</li> <li>• Work is ongoing to identify and quantify waste streams that could fall within an extension of the landfill ban to include biodegradable non-municipal waste and provide assurances over the feasibility of including these in a landfill ban.</li> </ul>		<p>Ban on landfilling BMW comes into force on 31 December 2025.</p> <p>Extending forthcoming ban on landfilling biodegradable municipal waste: We intend to undertake the necessary impact assessments and consult on extending the ban during 2023-24.</p>
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<p>recommendations, it is our intention to extend the forthcoming ban on biodegradable municipal waste to landfill to include biodegradable nonmunicipal wastes, subject to appropriate consultation and work to provide assurance around some specific waste streams.</p>				
<p>Work with COSLA in the coming year to evaluate the Household Recycling Charter and review its Code of Practice as a key step in developing a future model of recycling collection.</p>	<p>2020/21 PFG</p>	<p>This work was delayed by the Covid-19 pandemic. Actions relating to the Household Recycling Charter and its supporting Code of Practice were included in the consultation on the Waste Route Map (May 2022).</p>	<p>N/A</p>	<p>The Waste Route Map consultation proposed a recycling services co-design process, and development of statutory guidance for provision of high-performance household waste services in different contexts, using the findings and outputs from the co-design process. Evaluation of the Household Recycling Charter and findings from the review of its Code of Practice, will</p>

				be key to informing this process. Timings will be confirmed in due course through our final Waste Route Map to be published later in 2023.
Underpinning this we will take steps to improve waste data, continuing to work with UK Government, other devolved governments and agencies to develop electronic waste tracking, which will help deliver a step change in the quality and usefulness of waste data for decision making. This will include taking the necessary steps alongside SEPA to drive implementation of the system in Scotland.	Low Carbon Fund 2020	<p>Following a 4-nations consultation on the <i>Introduction of Mandatory Digital Waste Tracking</i>, (21 Jan to 15 April 2022), we have worked jointly with partners to published a summary of responses (<a href="#">Implementation of mandatory digital waste tracking – GOV.UK (www.gov.uk)</a> and continue to work to develop the system further, taking into account stakeholder feedback.</p> <p>An IT supplier has been contracted to build the waste tracking service.</p>	N/A	Publish a 4-nations response to the consultation, in 2023/24.

Outcome 2: Reduction in emissions from closed landfill sites.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Accelerate Landfill Gas Capture and Landfill Legacy Management: we will work with SEPA and key industry partners to scale up the existing landfill gas capture programme to mitigate effects of landfill and environmental impact of closed landfill sites	Low Carbon Fund 2020	Due to other unavoidable resource implications, including COVID-19 contingency work, progress on this policy outcome has been paused, but we are looking to begin roll out of the programme from 2023.	Double the number of landfill gas capture sites that undertake investigative or development work (from 12 to 24 sites) by 2025.  SEPA has already identified 12 sites for potential investigative work.	Landfill gas capture: Engagement with sector and key stakeholders in first half of 2023/24, alongside research on opportunities.
Landfill gas capture on closed sites: in association with SEPA and the waste industry, double the number of landfill gas capture sites that undertake investigative or development work (from 12 to 24 sites) by 2025, in order to harness energy generated from landfill	Low Carbon Fund 2020	As above	As above	As above

gas capture and maximise other circular economy opportunities. SEPA has already identified 12 sites for potential investigative work.				
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Outcome 3: A reduction in food waste.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>We will lead collaborative efforts to deliver Scotland's landmark Food Waste Reduction Action Plan (FWRAP). To reduce food waste by 33% from the 2013 baseline by 2025. Actions include:</p> <ul style="list-style-type: none"> <li>Improving monitoring and infrastructure by considering a mandatory national food waste reduction target and mandatory reporting of Scotland's food surplus and waste by food businesses.</li> </ul>	<p>FWRAP published 2019; 2020/21 PfG</p>	<p>Zero Waste Scotland – our programme partners – have continued to build evidence to inform decisions to reduce food waste. Evidence gathering exercises have included stakeholder mapping across household and business sectors, and more broadly across the food system, to determine at what stage of decision-making interventions can be made to reduce food waste.</p> <p>In 2022 we undertook a food waste recycling marketing campaign. This was focused on increasing consumer awareness of food waste recycling and the harm food</p>	<p>N/A</p>	<p>The FWRAP was designed to help meet our reduction targets by 2025.</p> <p>As of March 2023, next steps on the FWRAP include publishing a review of progress to date. This will include the publication of a co-created action plan designed by, and for the benefit of, key stakeholders across various food sectors to deliver targeted and impactful results.</p>

		waste going to landfill does to the environment.		
Improving local authority segregated food waste collections to help break down barriers to food waste reuse and recycling. Supporting leadership, innovation, effectiveness and efficiency in Scotland's public, private and hospitality sectors by expanding pilot programmes across the education sector and public sector buildings; Support the development and implementation of an NHS Scotland national action plan on food waste; Develop best practice guidance for public sector procurement teams to drive new ways of working and more transparent supply chains. A sustained approach to public engagement and communications to enable the public to make changes in their choices		<p>Consulted on mandatory public reporting of waste and surplus as part of a Circular Economy Bill consultation.</p> <p>Through Zero Waste Scotland a range of projects are being delivered in partnership with stakeholders. These projects have focussed on: behavioural change in households; raising awareness across communities; and improving food waste recycling rates to deliver FWRAP priorities. Separately, we are funding a food redistribution programme to reduce waste from producers.</p>	N/A	Next steps include refreshing our proposals to address food waste through the development of our Waste Route Map. This is due to be published later in 2023.

and behaviours around food and food waste, in partnership with Zero Waste Scotland.				
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Outcome 4: Reduce waste and establish a more circular economy, where goods and materials are kept in use for longer.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
We will work with local authorities and the future DRS scheme administrator(s) to explore options that will unlock reprocessing investments, including pricing and incentive schemes, to create jobs and a ready supply of recycled material for new packaging.	2020/21 PfG	<p>Biffa, the official logistics partners to the DRS scheme administrator, is investing more than £80m to develop the infrastructure needed to deliver the scheme. This is expected to create around 500 jobs.</p> <p>We continue to work with inwards investment colleagues to follow-up on wider opportunities for materials reprocessing.</p>	Contractual obligations associated with reprocessing contracts rest entirely with CSL as the private sector scheme administrator	DRS is due to go live on 1 March 2024.
Measures to encourage more sustainable consumer purchasing, including plans to take further steps to consult on a charge on single use disposable beverage cups and to increase	Boosted [2020-2021 PfG]	The Circular Economy Bill consultation included questions relating to charging for single-use items.	N/A	The Circular Economy Bill will be brought forward in this parliamentary term  The Waste Route



<p>the carrier bag minimum charge from 5p to 10p in this parliamentary session.</p>		<p>Scottish Ministers committed to introduce a charge on single-use cups by 2025.</p> <p>The Waste Route Map consultation included a package on promoting responsible consumption, production and re-use</p>		<p>Map will be published in 2023</p> <p>Develop detailed proposals for the planned charge on single use disposable beverage cups.</p>
<p>Banning priority single use items: We will consult on banning a number of problematic plastic items identified in the EU's Single Use Plastics Directive (with a view to introducing legislation in 2021) and outline how we will give effect to the wider requirements of the Directive before the end of 2020</p>	<p>2020/21 PfG</p>	<p>The Environmental Protection (Single-use Plastic Products) (Scotland) Regulations 2021 came into force in June 2022, banning some of the most problematic single-use plastic products.</p> <p>A call for evidence on tackling consumption of single-use food containers and other commonly littered or problematic single-use items was undertaken to inform consideration of how we can align with or exceed the standards of the EU Directive. This closed in</p>	<p>N/A</p>	<p>SG has committed to implementing a minimum charge on single-use beverage cups by 2025 which will partially align Scotland with Article 4 of the Directive.</p> <p>Further work will be undertaken to determine the most appropriate approach to reducing consumption of single-use food containers which will fully align SG with Article 4 of the Directive</p>

		<p>June 2022</p> <p>The Single-Use Disposable Cups Charge Advisory Group was established to provide expertise and advice on the implementation of a minimum charge on single-use disposable beverage cups</p>		
<p>Implementation of our Deposit Return Scheme (DRS) for single use drinks containers.</p>	<p>CCP 2018</p>	<p>Implementation is at an advanced stage, with very significant investment (money, resource, time) by industry in the scheme.</p> <p>Circularity Scotland established and approved by the Scottish Ministers in March 2021 as scheme administrator. Start-up funding of £18m secured from investment banks, significant additional investment from members, approx. 70 staff.</p> <p>Operations, logistics, and plastics reprocessing</p>	<p>Producer registration opened Dec 2022. Over 670 producers have registered accounting for &gt;95% of articles placed on market in Scotland. Deadline for registration has been extended.</p> <p>Retailer registration opened March 2023</p>	<p>End to end testing to commence early 2024</p> <p>Scheme due to launch 1 March 2024</p>

		<p>contract signed in 2022. Contract worth approximately £100m over 10 years, estimated to create 500 jobs. Leases secured and work underway on counting and bulking centre sites (10 in total). Counting centre equipment and vehicle fleet ordered, recruitment (administration, drivers) underway.</p> <p>Producers representing 95% of scheme articles now registered for DRS. Investment made in updating packaging, systems and supply chain.</p> <p>Retail collection infrastructure implementation programmes underway, including reverse vending machine orders placed, construction underway to adapt stores, trial stores operating, updates to sale</p>		
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		<p>systems, shelf labelling etc. underway.</p> <p>Planning underway across local authorities, including changes to kerbside recycling, cleansing, infrastructure in schools, council estate.</p> <p>Announced on 18 April 2023 that scheme launch has been pushed back to 1 March 2024 to provide additional time for businesses to prepare, and to allow for a number of changes to the Regulations.</p>		
<p>We will also work collaboratively across the public sector developing tools and guidance and a practical approach to influence and empower buyer, supplier and key stakeholder communities to use public procurement to support a green recovery and our wider climate and circular economy ambitions through procurement, embedding</p>	<p>2020/21 PfG</p>	<p>Continued support of the National Climate and Procurement Forum and associated work streams.</p> <p>Ongoing promotion and development of a suite of <a href="#">Sustainable Procurement Tools</a> and associated guidance to help public sector bodies embed</p>	<p>At 31/12/2022, 999 individuals mostly from the public sector in Scotland had completed Climate Literacy e-learning. For the 2020 to 2021 Annual Procurement reporting cycle, 85 of 118 public bodies (71%) provided</p>	<p>Ongoing development and promotion of tools and guidance</p>

<p>climate considerations in organisational procurement strategies by 2021 and reporting progress in annual procurement reports.</p>		<p>relevant and proportionate sustainability requirements into the procurement process</p>	<p>evidence in their annual procurement reports of how they are addressing environmental wellbeing and climate change through procurement.</p>	
<p>Reforming extended producer responsibility schemes: We will continue to work with the UK Government and other devolved administrations on reforms to the packaging extended producer responsibility regime, which we expect will deliver improved funding for local authorities in the future.</p>	<p>2020/21 PfG</p>	<p><a href="#">The Packaging Waste (Data Reporting) (Scotland) Regulations 2023</a> are now in force. These require producers of products to collect and report data on the amount and type of packaging that they place on the market. These data are required to calculate the fees that these producers will be required to pay as part of packaging EPR which is planned to start in 2024.</p>	<p>N/A</p>	<p>Packaging EPR is planned to start in 2024. The next step will be UK-wide regulations to implement the scheme.</p>

<p>We are boosting our commitment to building a circular economy, where goods and materials are kept in use for longer. We will deliver this by embedding circular recovery principles in the wider green recovery. Through Zero Waste Scotland and Scottish Environment Protection Agency (SEPA), we will intensify our work with industry and businesses to address emissions associated with production, consumption and waste of products/resources; and to promote resource efficiency.</p>	<p>CCPu 2020</p>	<p>Publication of the Circular Economy Bill consultation (<a href="#">Delivering Scotland's circular economy: a consultation on proposals for a Circular Economy Bill - Scottish Government - Citizen Space</a>) and analysis of responses (<a href="#">Delivering Scotland's circular economy: Proposed Circular Economy Bill - Consultation analysis - gov.scot (www.gov.scot)</a>)</p> <p>Publication of Waste Route Map (<a href="#">Delivering Scotland's circular economy: A Route Map to 2025 and beyond - Scottish Government - Citizen Space (consult.gov.scot)</a>)</p>	<p>N/A</p>	<p>The Circular Economy Bill will be brought forward in this parliamentary term</p> <p>The Waste Route Map will be published in 2023</p>
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<p>In the context of the latest CCC recommendations and building on progress already made by the sector, we will consider measures to ensure new energy from waste plants are more efficient, and 'future-proofed' for Carbon Capture and Storage technology.</p>	<p>CCPu 2020</p>	<p>The second report of the Independent review of the role of incineration in Scotland's waste hierarchy was published in January 2023. This report is considering options to decarbonise residual waste treatment in Scotland, including for existing Energy from waste plants.</p> <p>NPF4 was formally adopted on 13 February. This includes updates to the Zero Waste policy on energy-from-waste facilities which includes the requirement to show consideration was given to methods to reduce carbon emissions of the facility (for example through carbon capture and storage) and supplying an acceptable decarbonisation strategy aligned with the Scottish Government decarbonisation goals.</p>	<p>N/A</p>	<p>Publication of Scottish Government's response to the second report is due shortly.</p>
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<p>As part of our work on developing a route map to 2025, we will undertake a specific and focused piece of work to examine the range of fiscal measures used by other countries to incentivise positive behaviours and to develop proposals to go further in this area.</p>	<p>CCPu 2020</p>	<p>Alongside our Circular Economy and Waste Route Map consultation, published in May 2022, we published new research which reviewed international evidence regarding the policies and practices underpinning high household recycling performance. This work analysed case studies of high-performing recycling systems, and included fiscal measures as part of its review.</p> <p>Follow up research, building on these findings, is now underway to review the specific impact and implementation of fiscal incentives in other countries.</p> <p>Through the Route Map consultation, we proposed to conduct a review of waste and recycling</p>	<p>N/A</p>	<p>Follow up research, building on these findings, is now underway to review the specific impact and implementation of fiscal incentives in other countries.</p> <p>Findings will be considered as part of development of the final Circular Economy and Waste Route Map.</p>
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		<p>service charging by 2024 to ensure that we have the right incentives to reduce waste and maximise use of recycling and reuse services. To complement this, the 2022 Circular Economy Bill consultation sought views on further measures that could be taken to incentivise positive household behaviours, to support waste reduction and increased recycling in Scotland.</p>		
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## Change Plan Monitoring Report 2023: LULUCF

### Part A - Overview of sector

The 2020 annual emissions envelope published in the CCPu this sector was for 0.6 MtCO<sub>2</sub>e, whereas the outturn emission statistics for this year (published in June 2021) show a position of 0.8 MtCO<sub>2</sub>e<sup>34</sup>. On the basis of comparing these figures, the sector was outside its envelope in 2020.

The CCPu sets out the following three policy outcomes for the sector, the indicators for which are summarised below:

We will introduce a stepped increase in the annual woodland creation rates from 2020-2021 to enhance the contribution that trees make to reducing emissions through sequestering carbon.	On Track	Off Track	Too Early to Say
Hectares of woodland created per year		X	
Woodland ecological condition			X
Woodland Carbon Code: Projected carbon sequestration (validated credits)	X		

Increase the use of sustainably sourced wood fibre to reduce emissions by encouraging the construction industry to increase its use of wood products where appropriate.	On Track	Off Track	Too Early to Say
Annual volume (in millions of cubic metres) of Scottish produced sawn wood and panel boards used in construction			X

To enhance the contribution of peatland to carbon storage, we will support an increase in the annual rate of peatland restoration.	On Track	Off Track	Too Early to Say
Hectares of peatland restored per year		X	
Peatland Code: Projected emissions reduction (validated units)	X		

We will establish pilot Regional Land Use partnerships (RLUPs) over the course of 2021.

While this is an enabling policy outcome which does not have any indicators, it is progressing. Five RLUP pilot regions have been established and the Scottish

<sup>34</sup> Emissions data for baseline and 2020 have been updated to reflect a forthcoming change in the global warming potentials for non-CO<sub>2</sub> greenhouse gases.

Government is working collaboratively with them as they work with stakeholders to produce their Regional Land Use Frameworks by end-2023. More information is provided in the body of this report.

## Just transition and cross economy impacts

We wish to understand and report on the broader just transition and cross-economy impacts of our emissions-reduction activities in addition to these sector specific policy outcomes and indicators. To do this, in this report we use data from the Office of National Statistics (ONS): Low Carbon Renewable Energy Economy (LCREE) publication. The LCREE data presented in this report is based on survey data of businesses which perform economic activities that deliver goods and services that are likely to help generate lower emissions of greenhouse gases, for example low carbon electricity, low emission vehicles and low carbon services.

The LCREE indicator is narrowly defined and, while useful within its limited scope, does not give us the full picture of the impacts on workforce, employers and communities and progress towards a just transition.

Over the next few years we will work to develop a more meaningful set of success outcomes and indicators aimed at tracking the impacts of our policies on a just transition to net zero.

## Sector commentary on progress

### Forestry:

New woodland planting has continued at pace in Scotland. In 2021-22, 10,480 hectares of new woodland were planted. This represents over 75% of all new woodland planting in the UK. Severe winter storms caused disruption in the planting season although woodland creation levels were maintained at the level of the previous year. Woodland creation figures for 2022-23 will be released in June 2023. The additional £150 million allocated to forestry in this parliamentary session is maintaining Scottish government funding for woodland creation at record levels. Scottish Forestry approvals for planting new woodlands exceeded actual planting, showing that capacity in the sector may have been a constraint. Both large and small schemes are important in contributing towards climate change objectives. Planting objectives are being increased from 15,000 hectares (30 million trees) in 2023/23 to 18,000 hectares (36 million trees) each year by 2024/25. We are also increasing private sector investment in woodland creation via the Woodland Carbon Code. Interim statistics show that 6.5M woodland carbon credits had been validated in Scotland at December 2022, with an 18% increase between April and December 2022. A rapid rise in registrations under the Woodland Carbon Code indicates a major increase in activity in the coming years.

### Peatland:

In 2022-23, an estimated 7000 hectares of peatland were restored by delivery partners as part of the Scottish Government-funded Peatland ACTION programme.

This estimate is subject to change; final data on restoration completed in 2022-23 will be available in early Summer 2023, following quality assurance processes. However, it is clear that we are off track against the relevant target indicator of 20,000 hectares per year.

A number of factors have contributed to restoration rates being off track in 2022-23. This includes limited demand for restoration from landowners and managers, delays in Peatland Code verification and planning processes, limited contractor capacity, and increasing costs across supply chains which led to some requests for price reviews that delayed works. This reflects the fact that the peatland restoration sector is in its infancy, though work is being progressed to build capacity at pace.

Since publication of the last progress report, the Peatland Programme has developed a new Delivery Plan which is taking action on a number of fronts to increase restoration rates. This includes actions to increase uptake of Peatland Code projects in Scotland, and we are continuing to examine a variety of financial mechanisms to support increased private sector investment in peatland restoration.

Work has progressed on establishing a pilot for peatland restoration on crofting land. 13 Scottish Government Estates, covering a total area of 38,804 ha, have been assessed through a combination of desk-based assessments and site visits. Three potential sites have been selected and grazing committees are starting initial discussions with Peatland ACTION officers. Work is also progressing to ensure peatland restoration principles are imbedded into the agriculture reform support system as this is developed.

NatureScot, our key delivery partner in Peatland ACTION, have also progressed work on engaging with landowners through a new Communications Plan and on increasing the capacity of designers and implementers of restoration works through their Skills Plan. A number of training courses and demonstration events were delivered by Peatland ACTION in 2022-23, reaching more than 400 participants, and a “New Entrants Scheme” has been developed to expand capacity and knowledge of restoration techniques.

Throughout 2022-23 we continued work with Environment Systems Ltd. on our CivTech challenge, utilising technology to identify and prioritise peatland sites that will optimise costs and benefits. The solution, a single easy-to-use webapp, provides data on the extent and condition of deep peat (>50) across Scotland, which can enable better targeting of sites for maximum benefits.

Between February and May 2023, we ran a consultation on “Ending the Sale of Peat in Scotland”. Whilst the central focus of the consultation was on horticulture, as the main commercial use of peat, we also considered other uses of peat that drive commercial extraction and sought wider views through the consultation and stakeholder engagement. Consultation responses will inform plans and timescales for moving away from using peat products in order to protect peatlands from further damage.

## Developments in monitoring arrangements since last report

N/a

## Part B - Progress to Policy Outcome Indicators

**Policy Outcome:** Cross-sectoral social and economic

**Indicator:** FTE employment in Low Carbon Renewable Energy Economy Indicator

**On-Track Assessment (Milestones/Targets):** Year-to-year change

**Most Recent Data:** 2021

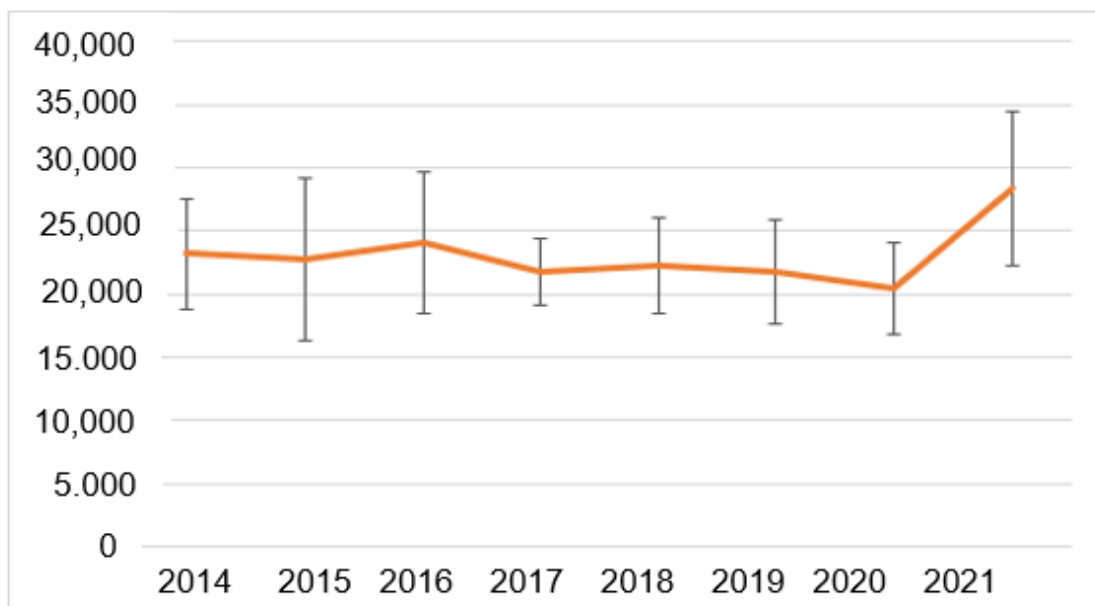
**Data Source(s):** Office of National Statistics: Low Carbon Renewable Energy Economy (LCREE), Time spent of Green Tasks

**Assessment:** Too Early to Say

### Commentary:

- In 2021, the Scottish low carbon renewable energy (LCREE) sectors were estimated to provide 28,300 jobs, the highest in the published data.
- The estimates of LCREE are based on a relative small sample of businesses and hence are subject to wide confidence intervals. Scottish LCREE employment in 2021 is substantially higher than previous years but the difference is not statistically higher than 2020.

### Employment in Low Carbon Renewable Energy Economy, FTE



- LCREE only shows employment in roles in Industries directly involved in the transition to Net Zero.
- The ONS also released experimental statistics on a wider perspective of green activity in the economy with their time spent on green tasks release.
- These stats reflect green activities in both LCREE and non-LCREE sectors. The 2023 publication has not yet been published.
- Last year's publication showed that in 2019 Scotland achieved an all-time high of hours spent on green tasks and proportion of workers doing green tasks, including workers who spend more than 20% of their time on green tasks.

- The proportion of workers doing green tasks in Scotland was 36% in 2019, up from 23.8% in 2004. Workers who have spent more than 20% of their time doing green tasks was 14% in 2019, up from 9% in 2004.
- The proportion of overall hours spent doing green tasks in Scotland was 7%, up from 4.9% in 2004.

**Policy Outcome:** 1

**Indicator:** Hectares of woodland created per year

**On-track Assessment (Milestones/Targets):** 2020/21 = 12,000 ha/yr,  
2021/22=13,500 ha/yr, 2022/23 = 15,000 ha/yr, 2023/24 = 16,500 ha/yr,  
2024/25 = 18,000 ha/yr

**Most recent data:** Forestry Statistics 2022

**Data source(s):** Forestry Statistics

**Assessment:** Off track

**Commentary:**

Current levels of woodland creation applications are consistent with a pipeline of projects at historically high levels. Delivery is dependent upon land managers implementing their projects once approved by Scottish Forestry. Official data on woodland creation for 2022-23 will be released in June 2023.

Policy Outcome: 1

Indicator: Woodland ecological condition

On-track Assessment (Milestones/Targets): Year-to-year change

Most recent data: Published February 2020

Data source(s): National Forest Inventory (NFI)

Assessment: Too early to say

### Commentary:

Published as official statistics by the National Forest Inventory (NFI), the study into Woodland Ecological Condition is the largest and most in-depth assessment of the ecological condition of any habitat in Great Britain.

It reveals that in Scotland 442,611 hectares are now classified as native woodland and that the majority of this is North East and West Scotland. The statistics reveal that over 430,000 ha of these native woodlands are in overall 'favourable' or 'intermediate' condition.

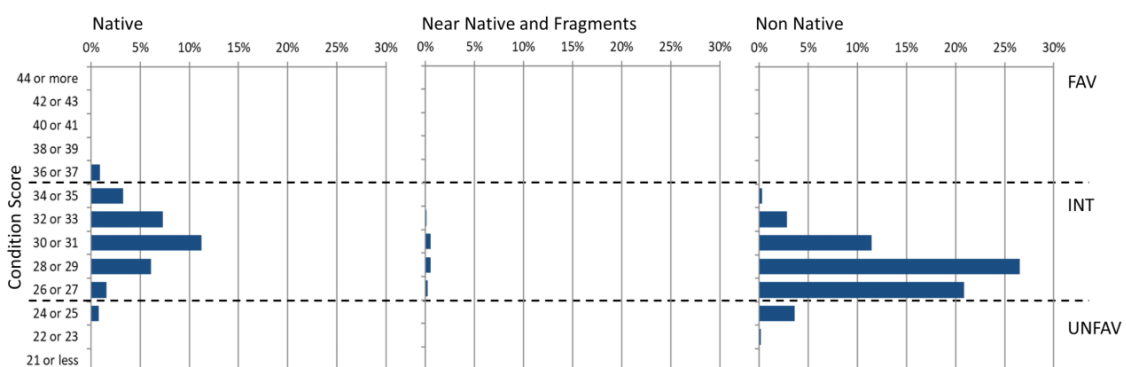
They also show that Scotland's non-native woodlands make a positive ecological contribution, with less than 6% in 'unfavourable' ecological condition.

Furthermore, the survey demonstrates that the active management of a forest for wood production delivers higher biodiversity as well as a renewable supply of wood to help sustain an industry that benefits climate change mitigation, jobs and the economy - at minimal cost to the public purse.

The last WEC report was published in 2019 and was based on data collected in the first cycle of field survey 2010 to 2015, so the analysis has a time stamp of 2013 (the average age of the data). The plan is for the next report on WEC in 2024/25.

## 7 Condition scoring distribution

Figure 7.1 The overall distribution of ecological condition class by woodland type in Scotland



Notes: 1. Native = native woodland area, Near native and fragments = Near native woodland area and fragments, non-native = non-native woodland area. 2. The NFI calculator is used to score each of the 15 ecological condition indicators that can then be combined and used to give an overall score, and classification as favourable (fav) score 36-45, intermediate (int) score 26-35 or unfavourable (unfav) score 16-25 by woodland type. 3. Dashed line = threshold of each condition classification. To inform where to set the thresholds for each of the three classification categories published evidence was used. 4. Woodland types are defined in Section 1.3.6. 5. Refer to the methodology report for more information.



**Policy Outcome:** 1

**Indicator:** Woodland Carbon Code: Projected Progress to target carbon sequestration (validated credits).

**On-track Assessment (Milestones/Targets):** Progress to target (increase 50% by 2025)<sup>35</sup>

**Most recent data:** Forestry Statistics 2022, and [Woodland Carbon website](#) for latest unofficial data

**Data source(s):** UK Land Carbon Registry, Forestry Statistics (Forest Research)

**Assessment:** On track

**Commentary:**

- There has been an 18% increase in the number of validated credits in Scotland under the Woodland Carbon Code between April and December 2022.
- Interim Statistics note that 7.1M carbon credits had been validated in Scotland at March 2023.
- Official statistics for 2022-23 will be released in the publication of Forestry Statistics in June 2023.

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<sup>35</sup> Carbon sequestration baseline March 2020

**Policy Outcome:** 1

**Indicator:** Annual volume (in millions of cubic metres) of Scottish produced sawn wood and panel boards used in construction.

**On-track Assessment (Milestones/Targets):** Progress to Targets [2020/21 = 2.6 million m<sup>3</sup>, 2026/27 = 2.8 million m<sup>3</sup>, 2031/32 = 3.0 million m<sup>3</sup>]

**Most recent data:** 2.37 million m<sup>3</sup> estimated in construction in 2021

**Data source(s):** Forestry Statistics 2023

**Assessment:** Too early to say

**Commentary:**

- Official Statistics on timber are published annually in September. These provide the best dataset to estimate volume of Scottish timber used in construction.
- The figure reported here, of 2.37 million cubic metres of timber used in construction in 2021, is based on these statistics.
- Covid had an effect on the sector and the data for 2020 and 2021 is lower than it would be if on previous trend, however there is a 13% increase in the volume used in construction since 2020. Defra are now working to support the use of timber in construction in England which is the primary market for Scottish timber. This engagement should help to support meeting the target.

**Policy Outcome:** 3

**Indicator:** Hectares of peatland restored per year

**On-track Assessment (Milestones/Targets):** 20,000 ha/y<sup>36</sup>

**Most recent data:** Estimated 7,000 hectares restored in 2022-23

**Data source(s):** NatureScot, Cairngorms National Park Authority, Loch Lomond and the Trossachs National Park, Scottish Water, Forestry and Land Scotland

**Assessment:** Off track

**Commentary:**

The Scottish Government has committed to restore 250,000 hectares of degraded peatlands by 2030. Against this overall target, around 64,000 hectares have been put on the road to recovery since the 1990 baseline.

In 2022-23, around 7,000 hectares of degraded peatland were restored through collective work by Peatland ACTION (NatureScot, Cairngorms National Park Authority, Loch Lomond and the Trossachs National Park Authority, Scottish Water and Forestry Land Scotland). This estimate is subject to change; final data on restoration completed in 2022-23 will be available in early Summer 2023, following quality assurance processes.

Estimated delivery for this year indicates an increase on the previous year (5,370 hectares restored) but remains short of our annual target of 20,000 hectares. There are a number of reasons for this shortfall, including the fact that peatland restoration is a sector in its infancy and has not yet developed significant supply capacity. Contractor capacity is limited, as is the field of technical advisers and agents to support land owners and managers through restoration projects.

Through the Scottish Government's Peatland Programme, we are working with partners and experts to significantly increase rates of restoration and to address the many barriers to delivery. Our new Delivery Plan sets out the actions we are taking to boost supply and demand, to create new levers and incentives through agriculture and land reform, and to increase private investment in peatland restoration.

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<sup>36</sup> Area of peatland restored is a proxy measure which doesn't directly represent the reduction in emissions, an emissions reduction indicator may be adopted in the future. Also, the current per annum area restoration target figure is under review and may be increased, updates will be reflected in future annual reporting.

Policy Outcome: 3

Indicator: Peatland Code: Projected emissions reduction (validated units)

On-track Assessment (Milestones/Targets): Year-to-year change

Most recent data:

454,954 validated units from 10 Peatland Code projects in Scotland in 2022-23.

These projects, their validation date and associated units are as follows:

Project Name	Date Validated	Net emission reductions (tCO <sub>2</sub> e)
Achnacarry Estate (Phase 1)	3/10/2022	41432
Ceannacroc (Phase 1)	3/17/2022	16490
Strathconon Phase 1-3	2/3/2022	114,066
Fannich (Phase 1-3)	3/10/2022	86631
Totto Hill	12/10/2022	34651
Wemyss and March Phase 2	1/9/2023	37874
Glenfeshie peatland restoration - Phase 4	11/8/2022	9095
Glenfeshie peatland restoration - Phase 5	11/8/2022	10494
Kinlochdamph Phase 1	11/30/2022	40162
Scaliscro Peatland Restoration	2/13/2023	64059
<b>Total</b>		<b>454,954</b>

Data source(s): Peatland Code, IUCN Peatland Programme

Assessment: On track

Commentary:

The CCPu acknowledges that Government cannot fund on its own the scale of peatland restoration and management that will be needed to deliver on our emissions reduction targets. Alongside the funding we make available through grants for peatland restoration and agri-environment schemes, private investment in Scotland's natural capital will also be essential. It will also be necessary to ensure long-term sustainable management of restored peatland so that the carbon it stores remains locked up in the long term.

As well as our commitment of £250 million of funding over ten years, we are working to attract increased private investment. The Peatland Code is a recognised standard for businesses to purchase and report on carbon units for peatland restoration.

We will increasingly work to integrate public and private funding for peatland restoration and management through better coordination between the Peatland Code and government grants to landowners and land managers via our delivery partners.

The data reported above represents the total validated units from projects in Scotland in the year 2022-23. The total validated units in the year 2022-23 (454,954) represents an increase of 221% from the previous year's total (141,595).

## Part C - Information on implementation of individual policies

Outcome 1: We will introduce a stepped increase in the annual woodland creation rates from 2020-2021 to enhance the contribution that trees make to reducing emissions through sequestering carbon.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Forestry grants: we will provide funding via a grant scheme, to support eligible land owners establish appropriate woodlands.	2020-2021 PfG	This policy has been boosted through an additional £100M of funding (announced in the PfG in 2020) to support an increase in woodland creation up to 2025. There is a currently a strong pipeline of woodland creation projects.	The indicator for woodland creation is hectares planted per year. Approvals by Scottish Forestry indicate a sustained high level of applications for woodland creation.	The targets for woodland creation consist of stepped increases until 2024-25 when the target will reach 18,000 hectares per year.
Woodland creation on Scotland's national forests and land: Forestry and Land Scotland will deliver an annual contribution towards the overall woodland creation target by creating new sustainable woodland on	CCP 2018	FLS continues to create woodlands and is developing partnerships with a range of potential partners to undertake woodland creation for carbon capture	In 22/23 FLS will create around 500 ha of woodland	FLS will continue to create woodlands each year on an ongoing basis

Scotland's national forests and land, including through partnerships with external organisations to scale carbon capture opportunities.				
Awareness-raising: We will continue to deliver a programme of farm based events to demonstrate and support improved productivity through integration of farming and forestry enterprises.	CCP 2018	This policy has been maintained, with a series of events to demonstrate the benefits of trees on farms	No Hard indicators. But a series of events is underway associated with the establishment of a monitor farm network that includes farm forestry.	Ongoing – annual series of events and developments to increase uptake of farm forestry eg through the Integrating Trees Network
Woodland standards: The Scottish Government will lead on the work with the UK and other UK Governments to maintain and develop a UK Forestry Standard that articulates the consistent UK wide approach to sustainable forestry. The Standard defines how	CCP 2018	The four administrations of the UK are revising the current UK Forestry Standard (UKFS). The review takes place every five years. The revised version will be published in 2023.  The review will ensure the Standard is up to date and continues to safeguard and promote sustainable forestry	No	Next edition of the UK Forestry Standard is due to be published in 2023

<p>woodland should be created and managed to meet sustainable forest management principles and provides a basis for monitoring.</p>		<p>practice in the UK, whilst reflecting the international context in which forestry operates. The UKFS is the technical standard which underpins the delivery of the forestry policies of the four UK countries.</p>		
<p>Woodland carbon capture: The Scottish Government will further develop and promote the Woodland Carbon Code in partnership with the forestry sector, and will work with investors, carbon buyers, landowners and market intermediaries to attract additional investment into woodland creation projects and increase the woodland carbon market by 50% by 2025.</p>	<p>CCPu 2020</p>	<p>Scottish Forestry is providing technical support to private sector investors, land managers and advisors, and intermediaries in the woodland carbon market. We are taking further measures to develop the Code to facilitate further expansion of the market.</p>	<p>Quantity of validated carbon units under the Woodland Carbon Code</p>	<p>50% increase in validated carbon units by 2025</p>



<p>Forestry and woodland strategies: Forestry and woodland strategies continue to be prepared by planning authorities, with support from Scottish Forestry. They provide a framework for forestry expansion through identifying preferred areas where forestry can have a positive impact on the environment, landscape, economy and local people.</p>	<p>CCP 2018</p>	<p>A number of current strategies are being reviewed and updated. The Forestry Strategy Implementation Plan 2022-25 has an action to review the SG FWS guidance by 31 March 2025.</p>	<p>N/A</p>	<p>Planning to initiate review of SG FWS guidance .</p>
<p>Support forestry sector on plant and seed supply strategy to help meet the increased planting targets: A programme of technical innovation to develop and adapt modern horticultural practices will help improve seed preparation and handling, techniques to reduce environmental impacts, and increase nursery production. Funding to support</p>	<p>Scottish Forestry Implementation Plan</p>	<p>There has been good take up of the grant scheme. We are still working with Confor and other stakeholders to obtain better data on plant production. Defra has introduced its own grant support scheme for the forest nursery sector that will also support the forest nursery sector</p>	<p>No</p>	<p>N/A</p>

<p>increased production of young trees is available through the Harvesting and Processing grant.</p>				
<p>Forestry and Land Scotland will begin development of a new approach to woodland investment with a view to acquiring more land to establish further woodland on Scotland's national forests and land for the benefit of future generations and to optimise carbon sequestration. This includes partnering with private sector and other organisations to enhance scale and funding of carbon capture projects.</p>	<p>CCPu 2020</p>	<p>Acquisition Strategy has been prepared setting out FLS approach to investing in new woodland and is being applied. Disposal criteria are being reviewed to reflect FLS' strategic asset management approach and sustainability objective.</p> <p>SG funds from LCIF have been allocated against new land purchases along with left-over NWIP funds which FLS now holds in a Strategic Acquisition Fund for strategic land and asset purchases.</p> <p>A number of carbon off-setting agreements and partnerships are being explored and are at various stages of discussion.</p>	<p>Key indicator for land acquisition is to fully invest the SG funds available. For FY 22/23 this is projected to be £15.5M.</p> <p>The largest acquisition in FY 22/23 was the purchase of the 3434 hectare Glenprosen Estate in the Angus Glens.</p> <p>The immediate adjacency of Glenprosen to Scotland's national forests and land, and that of other public bodies will result in Scottish Ministers</p>	<p>New Governance and business Rules have been set up and are now being implemented. Monitoring is undertaken by the Strategic Acquisition Board</p>

		<p>Variations in market pricing along with a strong demand for land make this a challenging area of business.</p>	<p>owning a 10,400 hectare block of land, much within the Cairngorm National Park. Providing landscape scale land management / restoration opportunities.</p> <p>The estate has the potential for the creation of approximately 2000 hectares of woodland, making a significant contribution to the SG's woodland creation target and/or the target for native woodland creation as set out in the Bute House Agreement. In addition, it has the potential for peatland restoration and/or significant habitat restoration opportunities.</p>	
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Outcome 2: Increase the use of sustainably sourced wood fibre to reduce emissions by encouraging the construction industry to increase its use of wood products where appropriate.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>In collaboration with the private forest sector and other public sector bodies the Scottish Government will implement the Timber Development Programme through an annual programme of projects that support the promotion and development of wood products for use in construction.</p>	<p>CCP 2018</p>	<p>SF have funded a number of projects this year arising from the Roots for Further Growth economic strategy produced by SFTT ILG, including:</p> <ul style="list-style-type: none"> <li>○ Research project by Edinburgh Napier University into domestic potential for Wood Fibre Insulation (£23.5k)</li> <li>○ Economic study on the local impact of forestry and timber micro-businesses (£18k)</li> <li>○ Ongoing co-funding for 3 PhDs – 2 in biorefining and 1 around tree</li> </ul>	<p>N/A</p>	<p>On-going</p>

		genetics (3 * £7k = £21k)		
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Outcome 3: To enhance the contribution of peatland to carbon storage, we will support an increase in the annual rate of peatland restoration

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>Restoration grants: We will provide grant funding to support eligible land managers to deliver peatland restoration. Levels of funding will enable at least 20,000 hectares of peatland restoration per year. We will undertake research to inform where restoration can deliver the greatest emission savings per hectare.</p>	<p>Budget 2020/21, Reinforced in 2020-2021 PfG</p>	<p>Funding available for peatland restoration in 2022-23 rose to a record high of £23.72 million.</p> <p>Work continued with Environment Systems Ltd. on our CivTech challenge to explore how technology can help us to identify and prioritise peatland sites that will optimise costs and benefits. The solution, a single easy-to-use webapp, provides data on the extent and condition of deep peat (&gt;50) across Scotland, and can enable better targeting of sites for maximum benefits.</p>	<p>In 2022-23 progress against the annual target is off track and is forecast to remain so in 2022-23.</p>	<p>A new Delivery Plan is being managed through the Peatland Programme to drive action on a number of fronts to address systemic barriers to upscaling of peatland restoration.</p>

<p>Awareness raising: Working through partnership, we will put in place tools and information to promote peatland restoration and develop the capacity, skills and knowledge of land owners, land managers, contractors and others to deliver peatland restoration.</p>	<p>CCPu 2020</p>	<p>NatureScot, a key delivery partner in peatland restoration, is leading on work to promote peatland restoration. By communicating the benefits from restoration and the processes to support it – technical and financial - it is stimulating demand. Their Communications Plan has identified key messages for different audiences and targeted media approaches have been implemented. For example, Peatland ACTION were represented at over 25 different events in 2022/23. These include large-scale events such as the Royal Highland Show, small-scale local events and specialist events like the NFUS conference. NatureScot have engaged with a wide range of stakeholders including contractors and consultants, policy and decision makers, landowners, and staff from partner organisations. These events have taken place</p>	<p>Plans are in place to:</p> <ul style="list-style-type: none"> <li>• work with stakeholder groups to engage with c300 largest landowners in Scotland to promote Peatland Restoration</li> <li>• engage with the crofting community and upskill them for Peatland restoration.</li> </ul>	<p>NatureScot are working with Scottish Crofting Federation to employ a Project Officer who can help to stimulate demand for peatland restoration amongst the crofting community. They are also planning to employ an additional 6 Project Officers to assist the landowners with design and implementation of restoration projects (2 internal and 2 external)</p> <p>NatureScot will continue to implementing communication plan to stimulate demand through media opportunities</p>
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		<p>across the length and breadth of the country.</p> <p>NatureScot also developed a Peatland ACTION Skills Plan to increase the capacity of both designers and implementers. They have designed and run various trainings including a “New Entrants Scheme” and demonstration events to showcase work delivered on the ground. Peatland ACTION has provided training to 405 people so far in 2022-23, ranging from 2 hour online courses, to 2 day courses covering the theory, principles and practicalities of peatland restoration.</p> <p>A New Entrant scheme is up and running, providing 5 new machine operators with detailed training on restoration techniques over a 6-week period. 7 people are being trained in hand labour skills for bare peat restoration via a 12-day course.</p>		<p>and engagement at stakeholder events.</p> <p>Implementation of the skills plan will see a focus on ‘training the trainer’ – facilitating a greater number of people to gain skills in peatland restoration. NatureScot are working with the Scottish Plant Owners Association and existing contractors to develop a competency framework for machine operators.</p> <p>NatureScot are developing an ‘aftercare’ programme for the candidates finishing the SRUC course. This programme will</p>
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		<p>NatureScot supported SRUC to develop and run a short course (2 x 1 week blocks) for peatland restoration design. It ran twice in 2022-23 and was attended by 25 people working in Scotland.</p> <p>NatureScot have also employed 5 new Peatland Action Project Officers (both with in NatureScot and with external partner organisations) to support land managers with the design and delivery of peatland restoration.</p>		<p>form the basis of a CPD programme for designers across the sector.</p>
<p>With partners, refresh our vision for Scotland's peatlands and review peatland restoration support mechanisms to overcome embedded barriers and improve how we fund and deliver this activity.</p>	CCPu 2020	<p>In October 2021, we established a Scottish Government-led Peatland Programme that is working to provide strategic direction and address systemic barriers to upscaling of peatland restoration.</p> <p>We are reviewing and strengthening governance arrangements for the Programme, with a focus on peatland restoration. This review will consider next</p>	<p>New Governance arrangements will be in place by Summer 2023.</p>	

		steps towards an updated vision for Scotland's peatlands.		
Phase out the use of peat in horticulture by increasing uptake of alternative materials, undertaking stakeholder engagement to understand transitional challenges, to improve the uptake of alternatives and develop a timescale plan.	2019-2020 PfG	Between February and May 2023, we ran a consultation on "Ending the Sale of Peat in Scotland". This was supported by impact assessments including a Strategic Environmental Assessment, released concurrently with the consultation.	Our consultation will inform policy and timescales for banning the sale of peat for various purposes.	Analysis of responses will start in May 2023 after the consultation closes. Depending on outcomes of the consultation, we expect to begin the legislative process after analysis and we are determining the most appropriate legislative vehicle in preparation for this.

<p>Our Position Statement on NPF4 confirmed our current thinking that through the planning system we will not support applications for planning permission for new commercial peat extraction for horticultural purposes, we are looking at strengthening controls on development on peatland and we will help facilitate restoration through permitted development rights.</p>	<p>CCPu 2020</p>	<p>The NPF4, which was adopted February 2023, sets out that development proposals for new commercial peat extraction, including extensions to existing sites, should not be supported unless: the extracted peat is supporting the Scottish whisky industry; there is no reasonable substitute; the area of extraction is the minimum required; the proposal aims to retain an in-situ residual depth of peat of no less than one metre across the whole site; the time period for extraction is the minimum necessary; and the proposal is supported by a comprehensive site restoration plan which will aim to return the area to a functioning peatland. The NPF4 also outlines support for the protection of soils, including peat and carbon rich soils which have a critical role to play in helping the country reach its net zero target by sequestering</p>	<p>N/A</p>	<p>New Local Development Planning guidance</p>
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		<p>and storing carbon. Our soils policy also set out that; Local development plans should protect locally, regionally, nationally and internationally valued soils. The policy goes on to state development on peatland, carbon rich soils and priority peatland habitat should not be supported unless it is essential and in a limited range of circumstances, with such proposals being subject to further assessment.</p> <p>Scottish Government officials have been involved in discussions, led by Peatland Action officials in NatureScot, on implementation of the permitted development rights for peatland restoration, which were introduced in April 2021.</p>		
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<p>Develop opportunities for private sector investment in peat restoration, engaging with sectors to establish investment pathways, enabling both public and private sector to invest in a range of measures to help mitigate effects of climate change</p>	<p>CCPu 2020</p>	<p>454,954 validated units from 10 Peatland Code projects in Scotland in 2022-23. The total validated units for this year represents an increase of 221% on the previous year.</p>	<p>The indicator Peatland Code: projected emissions reduction (validated units) shows that there have been 454,954 tCO2e net emissions reductions from Peatland Code projects in 2022-23.</p>	<p>We will continue to examine a variety of financial mechanisms to support increased responsible private investment in peatland restoration. We will develop any proposals alongside investors, landowners, community groups and other interested stakeholders, in line with the <a href="#">Interim Principles for Responsible Investment in Natural Capital</a>.</p>
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<p>Explore how best to restore all degraded peat in the public estate and also within formally designated nature conservation sites, including through statutory mandate.</p>	<p>CCPu 2020</p>	<p>Peatland restoration delivery partners are working to restore peat in the public estate.</p> <p>Scottish Water has a commitment to restore peatland, where appropriate on all Scottish Water land, as laid out in their Net Zero Route Map. Forestry Land Scotland is developing an ambitious programme to restore all the peatland on Scotland's Forest and Land by 2045 in support of the Scottish Government's net zero emissions target. NatureScot are restoring peatlands on their own estate – to promote best practice.</p> <p>Officials have been working to understand the extent of and its condition across the public estate, using data from the CivTech sponsored peatland tool. Once completed, this work will be able to help public landowners, and delivery</p>	<p>Work is progressing to restore degraded peat in the public estate. We are assisting RPID to develop a pilot project on their crofted estates – this will hopefully provide valuable tools and templates for developing peatland restoration projects on common grazings.</p> <p>We are progressing a Peatland Code application to learn at first hand the process to attain carbon credits and the challenges of attracting private investment.</p>	<p>We will explore options to increase peatland restoration in the public estate, including through statutory mandate.</p>
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		<p>partners, to identify opportunities on their land. Work has progressed on establishing a pilot for peatland restoration on crofting land. 13 Scottish Government Estates, covering a total area of 38,804 ha, have been assessed through a combination of desk-based assessments and site visits. Three potential sites have been selected and grazing committees are starting initial discussions with Peatland ACTION officers.</p>		
<p>Explore the development of a Peatland Restoration Standard to ensure best practice and continuous development in the success and effectiveness of peatland restoration.</p>	<p>[CCPu 2020]</p>	<p>NatureScot, has worked with a range of delivery bodies, agents and stakeholders to develop technical and practical advice across all phases of peatland restoration. This advice is included in a new Technical Compendium that provides the basis for the standards of peatland restoration expected in Scotland. NatureScot also published new guidance on operating during the bird breeding</p>	<p>NatureScot are running Grassland demonstration projects to understand the scope for peatland restoration on these types of site.</p> <p>Following the publication of Technical compendium, NatureScot have had discussions with the IUCN UK Peatland Code team to consider</p>	<p>We are considering the next steps to build on the Technical Compendium which will be based upon the feedback we get from its users over the course of 2023-24.</p>

		<p>season and thereby extend the operational period of peatland restoration.</p> <p>NatureScot have also rolled out a Monitoring Strategy and a Monitoring Network on Peatland Action sites. This included funding partnership monitoring projects such as Carbon Flux Towers and gathering the evidence needed to understand the co-benefits for biodiversity.</p>	<p>the development of a common Peatland Standard.</p>	
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Outcome 4: We will establish pilot Regional Land Use partnerships (RLUPs) over the course of 2021.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Establishment of pilot Regional Land Use Partnerships to help ensure that we maximise the potential of Scotland's land to help achieve net zero.	CCPU 2020	RLUP pilots have been established in five areas across Scotland. They are presently working with communities and stakeholders to develop their Regional Land Use Frameworks (RLUFs), which they are aiming to produce by the end of 2023. The Cairngorms National Park pilot has produced its strategic RLUF, which has been incorporated within the 2022-27 Cairngorms National Park Partnership Plan.	N/A	The RLUP pilots will work with communities and stakeholders during 2023 to produce their RLUFs.

Publication of Scotland's third Land Use Strategy (LUS3) by statutory deadline of 31 March 2021.	CCPu 2020	LUS3 was published as planned.	N/A	LUS3 has now been published.
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# Climate Change Plan Monitoring Report 2023: Agriculture

## Part A - Overview of sector

The 2020 annual emissions envelope set in the CCPu for this sector was for 7 MtCO<sub>2</sub>e, the actual emission statistics for this year show a position of 7.6 MtCO<sub>2</sub>e<sup>37</sup>. As such, the sector was **outside** its envelope during 2020.

The CCPu sets out the following six policy outcomes for the sector, the indicators for which are summarised below:

A more productive, sustainable agriculture sector that significantly contributes toward delivering Scotland's climate change, and wider environmental, outcomes through an increased uptake of climate mitigation measures by farmers, crofters, land managers and other primary food producers.

There are no indicators for this policy outcome. More information is provided in the body of this report.

More farmers, crofters, land managers and other primary food producers are aware of the benefits and practicalities of cost effective climate mitigation measures	On Track	Off Track	Too Early to Say
Increased engagement with Farm Advisory Services on environmental issues and climate change	X		

Nitrogen emissions, including from nitrogen fertiliser, will have fallen through a combination of improved understanding efficiencies and improved soil condition	On Track	Off Track	Too Early to Say
Use of Nitrogen fertilisers	X		
Spreading precision of Nitrogen fertilisers	X		
Nitrogen use efficiency for crop production			X

Reduced emissions from red meat and dairy through improved emissions intensity	On Track	Off Track	Too Early to Say
Time taken from birth to slaughter and increased efficiency through improved health and reduced losses	X		

Reduced emissions from the use and storage of manure and slurry.	On Track	Off Track	Too Early to Say
Improvement in covered slurry storage	X		
Precision application of manure and slurry			X

<sup>37</sup> Emissions data for baseline and 2020 have been updated to reflect a forthcoming change in the global warming potentials for non-CO<sub>2</sub> greenhouse gases.

Carbon sequestration and existing carbon stores on agricultural land have helped to increase and maintain our carbon sink.	On Track	Off Track	Too Early to Say
Area of woodland on agricultural land	X		

### Just transition and cross economy Impacts:

We wish to understand and report on the broader just transition and cross-economy impacts of our emissions-reduction activities in addition to these sector specific policy outcomes and indicators. To do this, in this report we use data from the Office of National Statistics (ONS): Low Carbon Renewable Energy Economy (LCREE) publication. The LCREE data presented in this report is based on survey data of businesses which perform economic activities that deliver goods and services that are likely to help generate lower emissions of greenhouse gases, for example low carbon electricity, low emission vehicles and low carbon services.

The LCREE indicator is narrowly defined and, while useful within its limited scope, does not give us the full picture of the impacts on workforce, employers and communities and progress towards a just transition.

Over the next few years we will work to develop a more meaningful set of success outcomes and indicators aimed at tracking the impacts of our policies on a just transition to net zero.

### Sector commentary on progress

Our [Vision for Agriculture 2022](#) outlines our aim to transform how we support farming and food production in Scotland to become a global leader in sustainable and regenerative agriculture.

To deliver the ambitions set out in the Vision, we published an [Agricultural Reform route map](#) on 10 February 2023 which sets out the timescales to share more information with farmers, crofters, and landowners to help them plan and prepare for changes which will come into force from 2025. The [Draft Agriculture Reform List of Measures](#) was also published in February 2023 and is a supporting document for farmers and crofters, intended to show the measures currently being appraised by Scottish Government. This list of measures has been built on academic research and recommendations of the Farmer Led Climate Change Groups. They will continue to be refined as part of the ongoing co-design process.

The first track of the National Test Programme ‘[Preparing for Sustainable Farming](#)’ began in April 2022 with funding for conducting Carbon Audits and Soil Sampling. This was followed in December 2022 with the launch of [MyHerdStats](#) and in February 2023 with support for Animal Health and Welfare activity. It is designed to help farmers and crofters future proof their farms, to create environmental and economically resilient businesses and to start to prepare now for future conditionality.

'Testing Actions for Sustainable Farming (TSF)' will design, test, improve and standardise the tools, support and process necessary to reward farmers, crofters and land managers for the climate and biodiversity outcomes they deliver. This will create a robust understanding of how new conditions or activities could be applied to future support, and ensure delivery of environmental outcomes in a way that supports sustainable businesses. The first phase of TSF, completed in August 2022 with a survey of almost 950 farming and crofting businesses providing invaluable data for the next phase of testing actions, is outlined in this [report](#).

To inform the introduction of a new Scottish Agriculture Bill in 2023 which will provide a replacement for CAP, a public consultation on our proposals, "[Delivering our Vision for Scottish Agriculture](#)" ran from 29 August 2022 to 5 December 2022.

We continue to fund actions on farm which support climate change: the [Sustainable Agricultural Capital Grant Scheme \(SACGS\)](#) 2022 had 554 offers worth £4.60m accepted to fund slurry spreading equipment and slurry store covers and £285 million has been committed through the [Agri-Environment Climate Scheme](#) since 2015.

We also continue to deliver extensive advice and support for farmers and crofters on how to mitigate their emissions through the [Farm Advisory Service](#) and [Farming for a Better Climate](#).

#### [Developments in monitoring arrangements since last report](#)

N/A

## Part B - Progress to Policy Outcome Indicators

**Policy Outcome:** Cross-sectoral social and economic

**Indicator:** FTE employment in Low Carbon Renewable Energy Economy Indicator

**On-Track Assessment (Milestones/Targets):** Year-to-year change

**Most Recent Data:** 2021

**Data Source(s):** Office of National Statistics: Low Carbon Renewable Energy Economy (LCREE), Time spent of Green Tasks

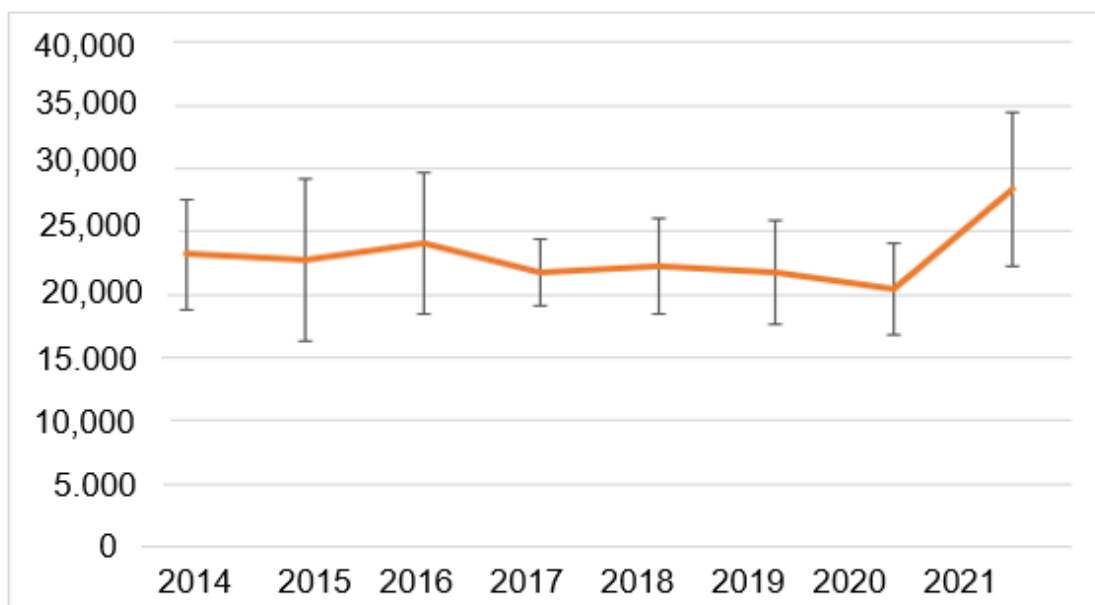
**Assessment:** Too Early to Say

### Commentary:

In 2021, the Scottish low carbon renewable energy (LCREE) sectors were estimated to provide 28,300 jobs, the highest in the published data.

- The estimates of LCREE are based on a relative small sample of businesses and hence are subject to a wide confidence interval. Scottish LCREE employment in 2021 is substantially higher than previous years but the difference is not statistically higher than 2020.

Employment in Low Carbon Renewable Energy Economy, FTE



- LCREE only shows employment in roles in Industries directly involved in the transition to Net Zero.
- The ONS also released experimental statistics on a wider perspective of green activity in the economy with their time spent on green tasks release.
- These stats reflect green activities in both LCREE and non-LCREE sectors. The 2023 publication has not yet been published.

- Last year's publication showed that in 2019 Scotland achieved an all-time high of hours spent on green tasks and proportion of workers doing green tasks, including workers who spend more than 20% of their time on green tasks.
- The proportion of workers doing green tasks in Scotland was 36% in 2019, up from 23.8% in 2004. Workers who have spent more than 20% of their time doing green tasks was 14%, up from 9% in 2004.
- The proportion of overall hours spend doing green tasks in Scotland was 7%, up from 4.9% in 2004.

**Policy Outcome:** 2

**Indicator:** Increased engagement with Farm Advisory Services on environmental issues and climate change.

**On-track Assessment (Milestones/Targets):** Based on trend

**Most recent data:** Farm Advisory Service (FAS) reporting / website engagement. Farming for a Better Climate reporting and website engagement.

**Data source(s):** Farm Advisory Service Annual Reports

**Assessment:** On track.

**Commentary:**

The FAS continues to see an increase in engagement and uptake on a range of advice the service offers. The structure of the service continues to support farmers and crofters through a period of significant uncertainty and change, whilst innovating and continuing to evolve the service to address future challenges, in particular the Scottish Government target for net-zero greenhouse gas (GHG) emissions by 2045, and reduction of 75% by 2030.

This includes advice to: improve biodiversity; increase awareness of habitat and carbon sequestration benefits of woodland planting; promote climate change adaptation and mitigation opportunities; improve business management and efficiency; encourage inclusivity by supporting new entrants and women in agriculture; and helping to support the industry and Scottish government to evolve to meet future challenges.

FAS One to One 2022/23 delivery to Jan 2023:

	Reports Complete												Total in 2022/23
	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	
ILMP	14	7	2	1	3	3	2	4	7	7			54
Specialist Advice	14	21	11	14	19	12	21	21	27	12			200
Carbon Audits	21	11	20	49	50	57	81	58	43	35			446
Mentoring	2	0	2	2	1	2	2	2	4	3			22

FAS One to Many 2022/23 delivery to Jan 2023:



	Contract Parameters	Business Plan	January 2023	2022/23 YTD	2016 to date
FAS Connect Group Events	250-350	120	8	80	80
FAS Live events		131	22	108	1,305
FAS Webinars		44	5	30	
Publications	250-350	298	23	208	1,374
Videos	100-200	159	9	126	644
Podcasts & Audio	80-120	90	7	71	277
Tools		13	2	5	40
Event Participants			764	3,910	29,594
Video Views			21,326	308,988	1,203,661
Podcast Listens			2,745	24,128	75,826
Publication Downloads			22,982	254,028	755,585
Website Views			122,130	1,357,413	4,809,115
Advice Line Enquiries			140	843	8,760

- From April 2022 to January 2023, there have been just under 4,000 event participants.
- More than 97% of those completing a post-event feedback form rate the overall quality and relevance of the event as 'excellent' or 'very satisfactory'.
- Additionally, more than 90% of the feedback forms note that the attendee will implement changes to their farm/croft management because of information gained at the event.

### Farming for a Better Climate Year 2022/23

Farming for a Better Climate (FFBC) has generated engagement from the sector through:

- FFBC received over 40,400 webpage visits and more than 203,000 page views. Page visits count the number of sessions per visitor, so the 40,400 visitors to Farming for a Better Climate have looked at over 203,000 pages, suggesting that visitors to the Farming for a Better Climate webpages find the content engaging.
- The FFBC newsletter has 430 subscribers, a 15% increase and has an open rate of 32 – 39.1% (sector average is 40%)
- Four podcasts were produced with 350 listens. There were an additional 389 listens of podcasts produced in previous years.
- Two new videos were produced with 354 views. There were an additional 1,560 views of videos produced in previous years.
- Three roadshows were held across Scotland focusing on nutrient use and energy, with a look at economics going forward:
  - 5 Dec in Stirling, 25 attendees
  - 7 Dec in Larkhall, 37 attendees
  - 26 Jan in Inverurie, 28 attendees
  - A webinar is planned for 13 March 2023

- An open event at Backboath Farm (one of the Soil Regenerative Agriculture Group farmers) had around 100 participants:
  - 70% were aware of FFBC before attending the event
  - 75% rated the event as either excellent or very good, with 25% rating the event as good.
  - 74% said they would make a change to current farming practices as a result of this event
  - 89% wished to be added to the FFBC newsletter
- There were over 3600 downloads of the over 240 downloadable practical guides, case studies and information notes held on the webpages.
- Seven new Practical Guides were produced and updates were made to eight guides and one case study
- The website is currently being updated to modernise the webpages and improve the ease of use and capability of the pages.

Policy Outcome: 3

Indicator: Use of Nitrogen fertilisers

On-track Assessment (Milestones/Targets): Based on trend

Most recent data: 2021

Data source(s): British survey of fertiliser practice (BSPF) 2021, BSFP Table 2.7

Assessment: On track

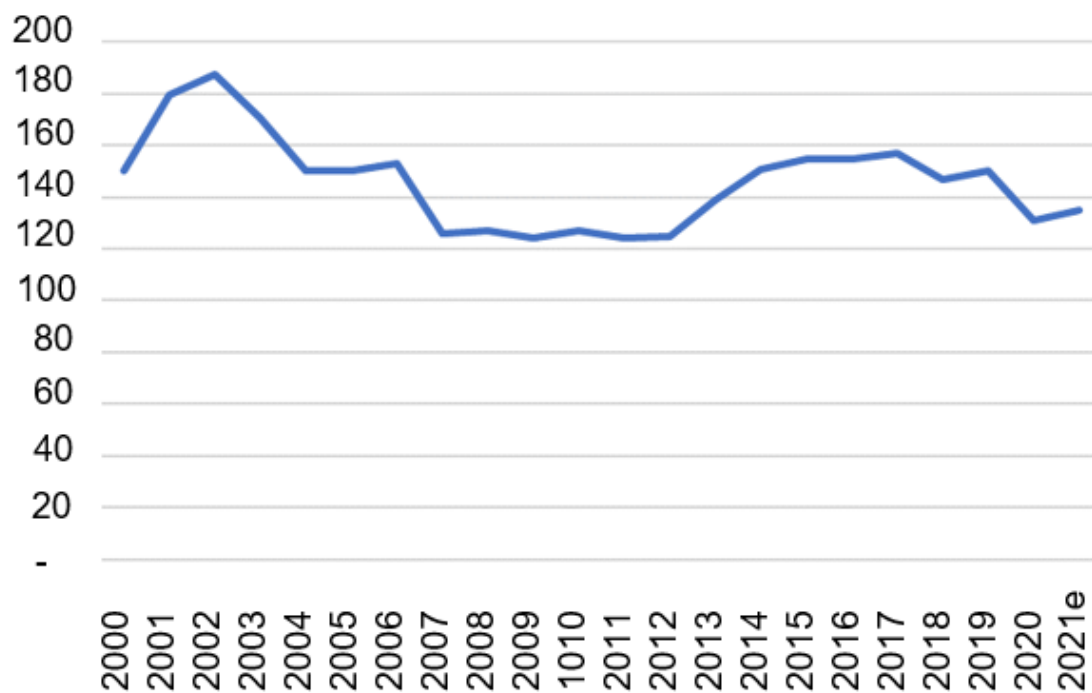
Commentary:

This data shows that from 2000, the use of nitrogen fertilisers has decreased overall, with some fluctuation.

Nitrogen use decreased between 2002 and 2007, then remained largely stable until 2012 when it began to increase. Since 2017, there has been a downward trend from 157 kt total nitrogen use in 2017 to an estimated 135 kt total nitrogen use in 2021. This is an increase from 131 kt in 2020, but is lower than in 2019 (150 kt).

Total nitrogen use (kt), Scotland 2000 to 2021

2000	150
2001	180
2002	187
2003	170
2004	150
2005	150
2006	153
2007	126
2008	127
2009	124
2010	127
2011	124
2012	125
2013	139
2014	151
2015	155
2016	155
2017	157
2018	147
2019	150
2020	131
2021e	135



Note: Years are harvest rather than calendar years (e.g. 2021 refers to the 2020/21 cropping years, fertiliser consumption period July to June). Data for 2021 are provisional.

Policy Outcome: 3

Indicator: Spreading precision of Nitrogen fertilisers.

On-track Assessment (Milestones/Targets): Based on trend

Most recent data: 2021

Data source(s): British survey of fertiliser practice (BSPF) 2021, Table B2.1

Assessment: On track

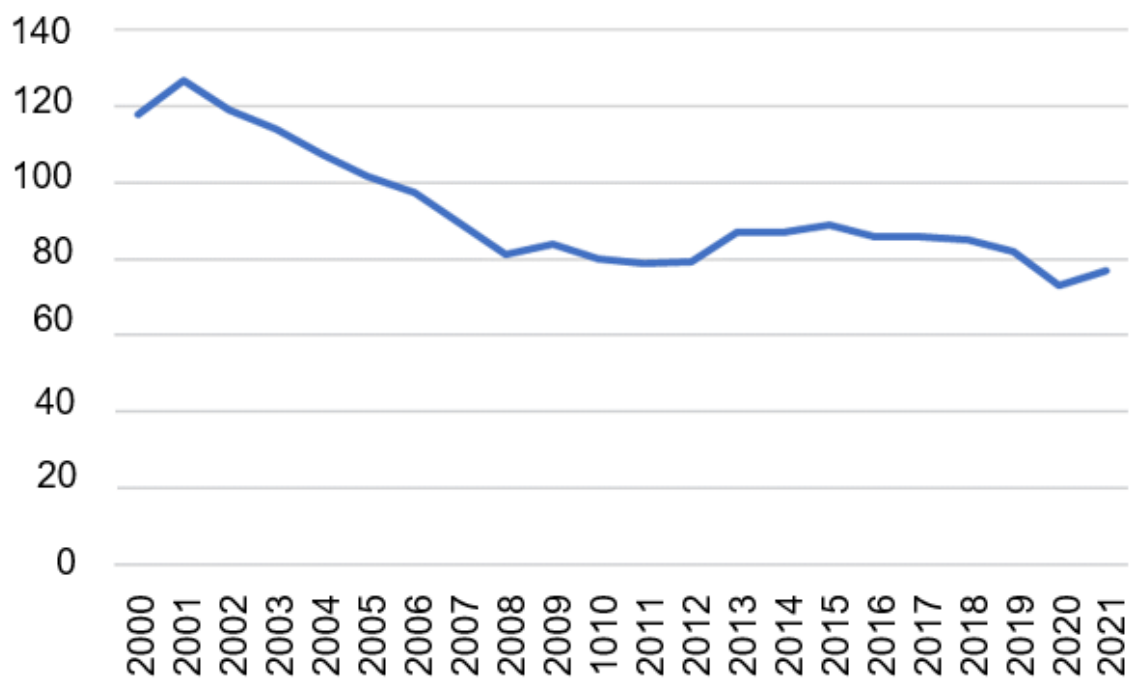
Commentary:

This data shows that from 2000, the overall application rates of nitrogen fertilisers have decreased, with some fluctuation.

The trend shows that the overall nitrogen application rates decreased from 118 kg/ha in 2000 to 77 kg/ha in 2021. This is an increase from 73 kg/ha in 2020, but is lower than in 2019 (82 kg/ha).

Total overall nitrogen application rates (kg/ha), Scotland 2000 to 2021

2000	118
2001	127
2002	119
2003	114
2004	107
2005	102
2006	98
2007	89
2008	81
2009	84
2010	80
2011	79
2012	79
2013	87
2014	87
2015	89
2016	86
2017	86
2018	85
2019	82
2020	73
2021	77



**Policy Outcome:** 3

**Indicator:** Nitrogen use efficiency for crop production.

**On-track Assessment (Milestones/Targets):** Based on trend

**Most recent data:** 2019

**Data source(s):** [Scottish Nitrogen Balance Sheet \(SNBS\)](#) which was published on 15 December 2021

**Assessment:** Too early to say (baselining)

Crop production NUE for Scotland (all data 2019, except for N deposition which is 2018)

<b>Inputs to arable land</b>	<b>kt N</b>	<b>Useful outputs</b>	<b>kt N</b>
mineral fertiliser	62.1	Food crops (inc. human-edible crops that end up as livestock feed, seed materials or biomass)	56.3
slurry/manure	17.8	Fodder crops harvested (turnips, kale etc.)	1.9
atmospheric N deposition	4.0	<b>total N outputs</b>	<b>58.2</b>
seeds (sowing/planting)	1.7	<b>Recycling terms (not included in either inputs or outputs for the purpose of this NUE calculation):</b> digestate from crops, crop residues	
digestate (non-crop/crop waste feedstocks only)	1.7		
Biological N fixation (BNF) by arable crops	1.6		
sewage sludge	1.2		
Compost	0.9		
<b>total N inputs</b>	<b>90.2</b>		

**NUE = 65%**

**Commentary:**

Following the publication in December 2021 of the Scottish Nitrogen Balance Sheet (SNBS), we have committed to review and update the SNBS on an annual basis from 2023 onwards, helping us to keep track of progress in improving the use of nitrogen. The next SNBS is expected to be published May 2023.

Crop production underpins much of wider food production, which in turn is the main engine of overall national nitrogen use in Scotland. Nitrogen Use Efficiency (NUE) is an important summary indicator metric that can be calculated from the comprehensive dataset on nitrogen flows assembled in the SNBS.

It is important to note that NUE in arable production inherently varies depending on farm type/systems, management, environmental conditions (soils, climate), etc. While good management can reduce losses, in practice some losses are inevitable due to continuous nitrogen transformation processes in soils and leaching. As such, crop production NUE values between 50-90% can generally be considered desirable but there is no simple one size fits all “good value.”

Policy Outcome: 4

Indicator: Time taken from birth to slaughter and increased efficiency through improved health and reduced losses.

On-track Assessment (Milestones/Targets): Based on Trend

Most recent data: 2022

Data source(s): Cattle Tracing Scheme, analysis by SRUC

Assessment: On Track

Average age of prime animal slaughter by farm type, Scotland 2015 to 2022

All	Mean Age (months)	Number of Animals
2015	22.89	363,127
2016	22.52	371,308
2017	22.41	360,367
2018	22.37	354,308
2019	22.39	356,507
2020	22.17	352,635
2021	21.90	346,825
2022	21.96	344,194
Beef	Mean Age (months)	Number of Animals
2015	21.86	150,699
2016	21.56	156,265
2017	21.41	147,736
2018	21.37	139,691
2019	21.43	145,925
2020	21.31	144,469
2021	21.10	144,405
2022	21.08	129,351
Dairy		
2015	22.35	17,345
2016	22.16	17,316
2017	22.12	14,214
2018	22.41	12,145
2019	21.98	12,386
2020	22.10	10,649
2021	21.95	8,811
2022	22.24	9,156
Finisher		
2015	23.73	176,864



2016	23.32	183,390
2017	23.15	182,712
2018	23.11	185,505
2019	23.13	182,408
2020	22.81	183,307
2021	22.48	182,470
2022	22.47	190,481
Trader		
2015	23.71	14,837
2016	22.75	10,794
2017	23.29	11,181
2018	22.01	12,458
2019	22.63	11,682
2020	22.39	11,023
2021	22.16	8,615
2022	22.63	11,516
Grower		
2015	24.53	3,382
2016	24.78	3,543
2017	23.63	4,524
2018	23.56	4,509
2019	23.94	4,106
2020	24.16	3,187
2021	24.00	2,524
2022	23.58	3,690

#### Commentary:

The average age of prime animal slaughter has shown a downward trend for all farm types between 2015 and 2022. In the most recent year, there was a small increase overall and for dairy and trader specifically, while the other farm types showed a decrease. Overall the trend is still downwards over the reported period.

We expect this to continue to reduce towards around 18 months. However, as most calves are spring born, we do not expect the whole industry to shift to an 18-month age of slaughter and so we expect the mean age of slaughter to remain above 18 months.

Policy Outcome: 5

Indicator: Improvement in covered slurry storage

On-track Assessment (Milestones/Targets): Based on trend

Most recent data: 2016

Data source(s): Farm Structure Survey 2016

Assessment: On track

Manure and slurry storage, Scotland 2013 and 2016

		2013			
		all holdings with storage		...of which are covered as a	
		number of holdings	percentage of all holdings	number of holdings	percentage of holdings with storage
Storage for solid dung		8,936	27.1	1,253	12.7
Storage facilities for slurry...	in a tank	3,838	11.6	2,354	61.3
	in a lagoon	641	1.9		
Total		9,882	29.8	8,482	85.8
		2016			
		all holdings with storage		...of which are covered as a	
		number of holdings	percentage of all holdings	number of holdings	percentage of holdings with storage
Storage for solid dung		6,172	19.2	720	11.7
Storage facilities for slurry...	in a tank	3,007	9.3	1,872	62.3
	in a lagoon	571	1.89		
Total		9,882	22.2	6,204	86.6

### Commentary:

The data show a small overall increase in the percentage of holdings with covered slurry stores between 2013 (85.8%) and 2016 (86.6%).

We expect the percentage of slurry stores that are covered to continue to increase over time. This is likely to increase at a similar rate to that of the change between 2013 and 2016 due to the significant investment required to cover slurry stores or build new slurry stores with covers.

This data was gathered as part of the Scottish Survey of Farm Structure and Methods in 2016. Data on the storage and use of slurry and manure will be collected as part of the 2023 June Agricultural Survey and will be published in late 2023.

The Sustainable Agricultural Capital Grants Scheme (SACGS) 2022 focused on providing support for low emission slurry spreading equipment and slurry store covers that are proven to reduce harmful ammonia emissions and reduce adverse impacts on water quality resulting from the storage and spreading of livestock slurry and digestate. 554 offers worth £4.60m, were accepted by the deadline of 26 July 2022.

There is also funding available through the Agri-Environment Climate Scheme (AECS) for slurry stores and between 2015 and 2022, 196 contracts for slurry stores through AECS have been accepted since 2015 with a total value of £7.3 million.

In addition, in 2023 the ATF budget which underpins SACGS is being used to provide an extension of support for slurry storage across Scotland (except in Nitrate Vulnerable Zones (NVZ) which have previously been supported to meet regulatory requirements). This will be administered through AECS.

Policy Outcome: 5

Indicator: Precision application of manure and slurry

On-track Assessment (Milestones/Targets): Based on trend

Most recent data: 2016

Data source(s): Farm Structure Survey 2016

Assessment: Too early to say (baselining)

Commentary:

Method of manure and slurry application by tonnage, Scotland 2016

	2016	
	holdings	tonnes
<b>Broadcast</b>		
Ploughed in or injected within four hours	920	385,842
ploughed in after four hours	5,146	2,117,346
Not ploughed in or injected	4,957	9,322,483
<b>Bandspread</b>		
Trailing hose	550	4,178,295
Trailing shoe	294	602,161
<b>Injection</b>		
Shallow/open slot	63	576,821
Deep/closed slot	11	31,043
<b>Total applied</b>	<b>9,246</b>	<b>17,213,991</b>

This data was gathered as part of the Scottish Survey of Farm Structure and Methods in 2016. Data on the storage and use of slurry and manure will be collected as part of the 2023 June Agricultural Survey and will be published in late 2023.

The Sustainable Agricultural Capital Grants Scheme (SACGS) 2022 focused on providing support for low emission slurry spreading equipment and slurry store covers that are proven to reduce harmful ammonia emissions and reduce adverse impacts on water quality resulting from the storage and spreading of livestock slurry and digestate. 554 offers worth £4.60 m, were accepted by the deadline of 26 July 2022.

Policy Outcome: 6

Indicator: Area of woodland on agricultural land.

On-track Assessment (Milestones/Targets): Based on trend

Most recent data: 2021

Data source(s): Forestry Statistics 2022 Table 1.12

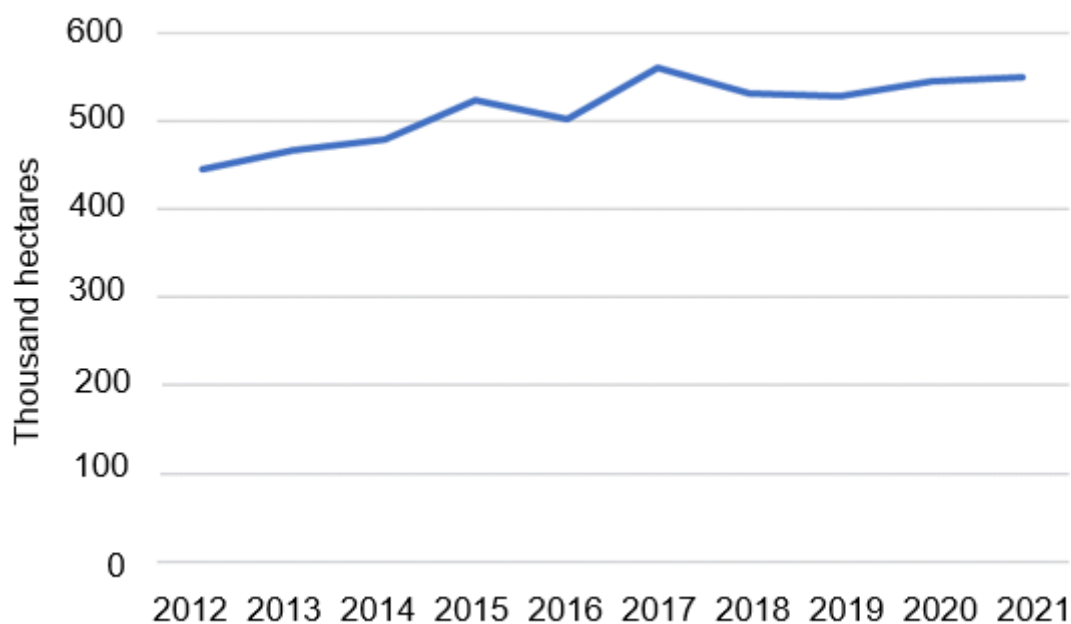
Assessment: On track

Commentary:

The area of farm woodland in Scotland increased between 2012 and 2021. The area of farm woodland in Scotland increased from 445 thousand hectares (ha) to 550 thousand ha over the period 2012 – 2021.

Area of farm woodland, Scotland 2012 to 2021 (thousand hectares)

2012	445
2013	467
2014	479
2015	524
2016	502
2017	560
2018	532
2019	529
2020	546
2021	550



## Part C - Information on implementation of individual policies

Outcome 1: A more productive, sustainable agriculture sector that significantly contributes towards delivering Scotland’s climate change, and wider environmental, outcomes through an increased uptake of climate mitigation measures by farmers, crofters, land managers and other primary food producers

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Scale up the Agricultural Transformation Programme across all the policies, including monitoring to assess the effectiveness of the pilot Sustainable Agricultural Capital Grant Scheme that will enable farmers and crofters to purchase equipment that should assist in reducing their greenhouse gas emissions, and	2019-2020 PfG	<p><a href="#">Preparing for Sustainable Farming</a> (PSF) under the National Test Programme (NTP) launched in Spring 2022. Central to this track is the provision of funding for conducting Carbon Audits, Soil Sampling Testing and support for Animal Health and Welfare (AHW). <a href="#">Testing Actions for Sustainable Farming</a> (TASF) will design, test, improve and standardise the tools, support and process necessary to reward farmers, crofters and land managers for the climate and biodiversity outcomes they deliver. It began in July 2022 with a survey to test awareness, attitudes, and outcomes in sector. Over three years (until 2025) the NTP will deliver Scottish Government investment of up to £51 million.</p> <p>The NTP sits in the wider context of the agricultural transformation to support farmers and crofters to transition from the EU CAP regime to a future rural</p>		<p>The NTP will run until 2025. It will increase awareness of timescales for Agricultural Reform via promotions throughout 2023.</p> <p>A new Agriculture Bill is to be introduced to Parliament in 2023 and the Scottish</p>

<p>support practice change</p>		<p>support mechanism which will deliver our <a href="#">Vision for Agriculture</a> that was published March 2022.</p> <p>To deliver the ambitions set out in that vision, we announced an <a href="#">Agricultural Reform route map</a> on 10 February 2023 which sets out the timescales to share more information with farmers, crofters, and landowners to help them plan and prepare for changes which will come into force from 2025.</p> <p>The route map provides greater clarity and confidence to the agriculture industry on key dates, the measures being considered and the support that will be available to prepare for change. It provides a clear set of programme dates to explain when current schemes will transition or end and when more guidance, support and information will be available.</p> <p>To inform the introduction of a new Scottish Agriculture Bill in 2023 which will provide a replacement for CAP, a public consultation on our proposals, "<a href="#">Delivering our Vision for Scottish Agriculture</a>" ran from 29 August 2022 to 5 December 2022.</p> <p><a href="#">The Agriculture Reform Implementation Oversight Board</a> (ARIOB) continues to support the implementation of policy reform, incorporating the relevant recommendations from the farmer-led groups to cut emissions across agriculture, support the production of sustainable, high-quality food,</p>		<p>Government aims to publish a report on the findings of the Agriculture Bill consultation in Spring 2023.</p> <p>Initial evaluation of successful SACGS applicants from the pilot project is intended to be undertaken in 2023.</p> <p>In 2023 the ATF budget which underpins SACGS is being used to provide an extension of support for slurry storage across Scotland (<u>except</u> in Nitrate Vulnerable</p>
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		<p>address the twin crises of climate and nature/loss of biodiversity, and design a new system and approach.</p> <p>The Board are an example of the Scottish Government's commitment to co-development, having contributed to the development of a new agricultural support system and continue to feedback on the development of future agricultural policy overall.</p> <p><a href="#">The Sustainable Agricultural Capital Grant Scheme (SACGS) 2022</a>, which is part of the wider agricultural transformation intentions, was focussed on support for low emission slurry spreading equipment and slurry store covers to help farmers, crofters and agricultural contractors comply with new regulatory requirements reducing harmful ammonia emissions and adverse impacts on water quality resulting from the storage and spreading of livestock slurry and digestate.</p> <p>Applicants for SACGS 2022 were required to get a Carbon Audit and/or a Nutrient Management Plan (based on soil analysis) by the time their claim is submitted. 554 offers worth £4.60 m, were accepted by the deadline of 26 July 2022.</p> <p>Following reports of difficulties in some places in securing equipment the deadline for claims was extended to 31 March 2023.</p>		<p>Zones (NVZ) which have previously been supported to meet regulatory requirements). This will be administered through AECS.</p>
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<p>Develop rural support policy to enable, encourage and where appropriate, require the shift to low carbon, sustainable farming through emissions reduction, sustainable food production, improving biodiversity, planting biomass crops and appropriate land use change developed in line with just transition principles.</p>	<p>CCPu 2020</p>	<p>To inform the introduction of a new Scottish Agriculture Bill in 2023 which will provide a replacement for CAP, a public consultation on our proposals, “Delivering our Vision for Scottish Agriculture” ran from 29 August 2022 to 5 December 2022.</p> <p>To deliver the ambitions set out in that vision, we announced an Agricultural Reform route map on 10 February 2023 which sets out the timescales to share more information with farmers, crofters, and landowners to help them plan and prepare for changes which will come into force from 2025.</p> <p>The ARIOB was established to support the implementation of policy reform, incorporating the relevant recommendations from the farmer-led groups to cut emissions across agriculture, support the production of sustainable, high-quality food, address the twin crises of climate and nature/loss of biodiversity, and design a new system and approach.</p> <p>Since Spring 2022 through the PSF, we have been offering farmers and crofters the ability to claim funding towards carbon audits and soil analysis to improve their knowledge of current environmental performance and improve efficiency. Overall claim levels have been lower this year than initially anticipated, but there was a late surge of claims in the final days before the closing date. This reflects the customer claim behaviour seen with other</p>		<p>A new Agriculture Bill is to be introduced to Parliament in 2023 and the Scottish Government aims to publish a report on the findings of the Agriculture Bill consultation in Spring 2023</p> <p>The NTP will run until 2025</p> <p>February-March 2023 Promotion of the AHW interventions to farmers, crofters, vets, and agricultural consultants</p> <p>Will increase awareness of timescales for Agricultural Reform via</p>
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		<p>schemes. Anecdotal feedback is that more farmers and crofters are engaging for the 2023 scheme year, and we will build on this foundation year to increase awareness and uptake.</p> <p>The PSF has been updated to include a <a href="#">package of animal health and welfare</a> (AHW) interventions to help farmers improve sheep and cattle efficiency. Instigated in March 2022 and co-designed with ARIOB and industry experts, it was launched 10 February 2023. The AHW interventions will be available until 31 December 2024, with claims system open until 28 February 2025.</p> <p>TASF began in July 2022 with a survey to test awareness, attitudes and outcomes in sector is a national pilot to develop and test actions that may become a requirement of direct support from 2025 onwards. It resulted in this <a href="#">report</a>.</p> <p>The NTP sits in the wider context of the agricultural transformation to support farmers and crofters to transition from the EU CAP regime to a future rural support mechanism which will deliver our Vision for Agriculture that was published March 2022.</p> <p>We have committed to publish a draft Land Use and Agriculture Just Transition Plan (LAJTP) alongside the new Climate Change Plan in November 2023. Work is underway to develop this Plan. As this will be the first Just Transition Plan for the land use and agriculture sectors, it will introduce, consult on, and</p>		<p>promotions throughout 2023.</p>
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		outline our approach and policy actions, setting the direction of travel for future LAJTP plans as we journey towards 2045.		
Develop new schemes and approaches to support low carbon, sustainable farming, including through the Programme Board for the Beef Suckler Climate Group, other farmer-led groups on arable, dairy and high value, nature farming and crofting which will report in 2021.	2020-2021 PfG and Agriscot 2020	<p>PSF launched in Spring 2022. While the TASF began in July 2022. Over three years (until 2025) the NTP will deliver Scottish Government investment of up to £51 million.</p> <p>Under PSF, we have been offering farmers and crofters the ability to claim funding towards carbon audits and soil analysis. Overall claim levels have been lower this year than initially anticipated, but there was a late surge of claims in the final days before the closing date. Anecdotal feedback is that more farmers and crofters are engaging for the 2023 scheme year, and we will build on this foundation year to increase awareness and uptake.</p> <p>The PSF has been updated to include AHW interventions to help farmers improve sheep and cattle efficiency. Instigated in March 2022 and co-designed with ARIOB and industry experts, it was launched 10 February 2023. The AHW interventions will be available until 31 December 2024, with claims system open until 28 February 2025.</p>		<p>The NTP will run till 2025 and we will increase awareness of timescales for Agricultural Reform via promotions throughout 2023.</p> <p>The 2023 round of AECS opened on 20 January 2023.</p> <p>Initial evaluation of successful SACGS applicants from the pilot project</p>

		<p>The NTP sits in the wider context of the agricultural transformation to support farmers and crofters to transition from the EU CAP regime to a future rural support mechanism which will deliver our Vision for Agriculture that was published March 2022.</p> <p>To deliver the ambitions set out in that vision, we announced an Agricultural Reform route map on 10 February 2023 which sets out the timescales to share more information with farmers, crofters, and landowners to help them plan and prepare for changes which will come into force from 2025.</p> <p>We have committed £285 million through the <a href="#">Agri-Environment Climate Scheme</a> (AECS) since 2015. As set out in the Agricultural Reform Route Map published by the Scottish Government on 10 February 2023, once the Enhanced tier of the future agricultural support framework is established, the Elective and Complementary Support elements will be delivered from 2027 and may build on current schemes such as AECS.</p> <p>The SACGS 2022, which is part of the wider agricultural transformation intentions, was focussed on support for low emission slurry spreading equipment and slurry store covers to help farmers, crofters and agricultural contractors comply with new regulatory requirements reducing harmful ammonia emissions and adverse impacts on water quality resulting from the storage and spreading of livestock</p>		<p>is intended to be undertaken in 2023.</p> <p>There will be no SACGS round offered in 2023. The ATF budget which underpins SACGS is being used to provide an extension of support for slurry storage across Scotland (<u>except</u> in Nitrate Vulnerable Zones (NVZ) which have previously been supported to meet regulatory requirements). This will be administered through AECS.</p>
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		<p>slurry and digestate.</p> <p>554 offers worth £4.60 million , were accepted by the SACGS 2022 deadline of 26 July 2022. Following reports of difficulties in some places in securing equipment, the deadline for claims was extended to 31 March 2023.</p> <p><a href="#">The Farming with Nature programme</a> is a suite of partnership pilot projects led by NatureScot to test natural capital and outcomes-based approaches to land use at a variety of scales. The pilots will inform the development of future support and enables the testing of innovative approaches to natural capital investment and how that might support business resilience, job creation, quality food production and Scotland’s response to climate change and biodiversity priorities.</p>		
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<p>Introduce Environmental Conditionality, from 2021 via implementation of the Beef Suckler Climate Report and, more widely from 2022, through the review of existing CAP Greening which will extend the requirements to all farmers and crofters to undertake environmental actions.</p>	<p>CCPu 2020</p>	<p>PSF launched in Spring 2022. While the TASF began in July 2022. Over three years (until 2025) the NTP will deliver Scottish Government investment of up to £51 million.</p> <p>The NTP sits in the wider context of the agricultural transformation to support farmers and crofters to transition from the EU CAP regime to a future rural support mechanism which will deliver our Vision for Agriculture that was published March 2022.</p> <p>To deliver the ambitions set out in that vision, we announced an agricultural reform route map on 10 February 2023 which sets out the timescales to share more information with farmers, crofters, and landowners to help them plan and prepare for changes which will come into force from 2025.</p>		<p>The NTP will run till 2025 and we will increase awareness of timescales for agricultural reform via promotions throughout 2023.</p>
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<p>Further provision of advice for farmers and crofters who wish to retire: A new commitment to work with stakeholders to provide advice, including further extending the Land Matching Service and guidance for farmers and crofters who wish to step back from agricultural businesses by providing an opportunity to consider alternative land-uses or alternative agricultural uses</p>	<p>CCPu 2020</p>	<p><a href="#">The Scottish Land Matching Service</a> (SLMS) has sought engagement from a range of stakeholders including the James Hutton Institute, Scottish Land Trust, the Soil Association, North East National Farmers Union Scotland, <a href="#">Scottish Crofting Federation</a>, Tenant Farming Commissioner, <a href="#">Farm Advisory Service</a> (FAS) and <a href="#">the Scottish Agricultural Arbiters &amp; Valuers Association</a>. The SLMS team are working hard to ensure the crofting counties are being further supported and aware of the service by linking up with the Crofting Commission. SLMS advisors have also been attending FAS events to speak to farmer/crofters on issues of succession and joint ventures. The SLMS website is also being promoted by the FAS Programme.</p> <ul style="list-style-type: none"> <li>• The total number of enquiries stands at 553 since the service launched in October 2019.</li> <li>• Of the 18 enquires received 14 were from seekers of opportunities and 4 were from potential providers.</li> <li>• 1 additional agreement concluded since December 2022. (26 in Total).</li> </ul>		<p>In 2023, we will continue to evaluate and consider how we can further develop the SLMS.</p>
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Outcome 2: More farmers, crofters, land managers and other primary food producers are aware of the benefits and practicalities of cost effective climate mitigation measures.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>The dissemination of information and advice on climate change mitigation measures in agriculture through a range of communication methods utilising technology and all media to best effect.</p>	<p>CCPu 2020</p>	<p>The FAS has continued to offer easy access, up to date and relevant climate change mitigation knowledge and information (for example on improve biodiversity; increase awareness of habitat and carbon sequestration benefits of woodland planting; promote climate change adaptation and mitigation opportunities; improve business management and efficiency; encourage inclusivity by supporting new entrants and women in agriculture; and helping to support the industry and Scottish Government to evolve to meet future challenges) to all farmers and crofters through a network of advisory centres, online resources and a telephone advice facility.</p>		<p>Scottish Government have procured another year of the FAS to run April 2023 to March 2024. It will be reframed to focus further on climate change and support farmers to contribute further to both mitigation and adaptation. It is envisaged that new FAS contracts will be procured in 2023/2024 for delivery up to and including 2026/27.</p> <p>We have also extended FFBC for a further two</p>



		<p>Since 2016, the programme delivered produced 1,374 publications, 664 videos, 277 podcasts and 40 online tools, as well as 1,374 events and across the board we would conservatively estimate that more than 50% of this activity will be around climate change adaptation and mitigation support. Event attendees highlighted an improved knowledge of climate change, improved soil/nutrient management, and improved knowledge of environmental issues and opportunities.</p> <p>In terms of FAS one to one support since 2016 they have delivered Carbon Audits to over 2,000. A number of specialist advice outputs covering precision farming and nitrogen use have been undertaken under this FAS programme including: 23% improved farm efficiency, 12% woodland management and conservation, 11% biodiversity habitat landscape management, 4% climate change adaptation and mitigation, 3% on organics, 16% on soil and nutrient management.</p> <p>Officials and the FAS suppliers have been concerting efforts to improve communications. This has involved regular interaction with existing, new stakeholders and SG departments to ensure</p>		<p>years until end of March 2025.</p>
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		<p>communications are consistent, accurate and up to date.</p> <p><a href="#">Farming for a Better Climate (FFBC)</a>, is a Scottish Government funded initiative, run by SAC Consulting and continues to provide a key source of information and support for Scottish farmers to encourage the uptake of climate mitigation and adaptation measures. FFBC continues to promote practical and cost-effective climate change mitigation and adaptation measures to farmers and land managers. Messages are promoted via a project webpage, social media accounts, a regular podcast and other press and promotional material as well as a series of roadshow events over the last year focused on nutrient use and energy.</p> <p>Farming for a Better Climate Soil Regenerative Agriculture <a href="#">Group</a> continues to focus on positive actions that can be taken on Scottish farms to support, enhance and protect their soils.</p> <p>We continue to communicate, educate, and demonstrate the benefits of climate change mitigation and adaptation measures with peer-to-peer engagement through initiatives like the <a href="#">Agriculture, Biodiversity and Climate Change (ABCC) Network</a> and the <a href="#">Integrating Tree Network (ITN)</a>.</p>		
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		<p><a href="#">The Climate Mitigation and Adaptation Practical Training Fund</a> was established in February 2022 and was supported by Scottish Government who provided funding of up to £250,000 to Lantra Scotland to administer the Fund. The Fund aimed to contribute to Scotland gaining the skillset to become a global leader in sustainable and regenerative practices. The Fund was open to applications from people (aged over 13 years old) who were part of a land/ nature based industry, re-training to enter a relevant land based sector or seeking the skills to join a sector in the future. This included those working in agriculture, crofting, wildlife management, environmental conservation, equine, horticulture, land-based engineering, and forestry. Lantra Scotland utilised the Skillseeder platform so people could access information on the range of eligible training courses and apply online. This Fund is closed at this time.</p>		
<p>An agri-tech group will be established to share, disseminate and encourage adoption of advances in agricultural science and technology as widely as possible.</p>	<p>CCP 2018</p>	<p><a href="#">Completed</a> The agri-tech group has concluded and engagement with industry on agricultural science and technology has continued through the farmer led groups, ARIOB and the NTP.</p>		

<p>Launch a new and expanded peer to peer knowledge transfer initiative based on the success of our Young Climate Change Champions work.</p>	<p>CCPu 2020</p>	<p><b>Completed</b> The ABCC Network was launched in June 2022.</p>		
<p>Realign and enhance our established programmes and initiatives such as the Farm Advisory Service, the Knowledge Transfer and Innovation Fund and Monitor Farm Programme to create a more cohesive approach to ensure advice and support is focussed on helping industry to professionalise to support sustainable farming.</p>	<p>CCPu 2020</p>	<p><b>The Knowledge Transfer and Innovation Fund (KTIF)</b> continued to deliver skills development and knowledge transfer in the primary agricultural sector. The most recent round of KTIF funding was for projects which focus on promoting resource efficiency and support the shift toward a low-carbon and climate resilient economy in the agriculture sector and/or aim to restore, preserve and enhance ecosystems in the sector.</p> <p>Since 2015, Scottish Government has supported 45 projects under KTIF to a tune of approximately £7.5 million. The Fund has supported just under 20 different organisations and in 2021 the knowledge transfer-based projects alone ran training events which had a total attendance of over 1,500.</p> <p>Five years of additional funding for the <b>Monitor Farm Programme</b> was announced in February 2022 (to a sum of £1.9M over a five year period). Officials are currently considering a business case for a new</p>		<p>A further application window for KTIF will open in February 2023 which will accept project applications up to a value of £200K for both innovation and knowledge transfer-based projects ending in March 2024. The funding window will accept applications focusing on any of the rural priorities under KTIF including: fostering knowledge transfer and innovation in agriculture, forestry and rural areas;</p> <ul style="list-style-type: none"> <li>enhancing the viability and competitiveness of all types of agriculture, and promoting innovative farm technologies and sustainable forest management;</li> </ul>

		<p>Monitor Farm Programme where there will be an element of Continuous Professional Development and qualifications for each participating farm. One of which includes the development of a 'marketing plan' for each monitor farm which will guide ambition and business decisions over the lifespan of the business. This was a key recommendation of the Suckler Beef Climate Group. In light of the climate change emergency and biodiversity crisis, officials and Quality Meat Scotland have been working together to ensure the programme delivers outcomes aligned to priorities. This will involve detailed data collection, and enhancing the knowledge, skills, and competence of the industry through collaborative industry buy-in. In particular the programme is expected to provide the information that is essential for driving Scotland's food and drink sector forward, through strengthening rural economies and meeting Scotland's climate change targets.</p> <p>FFBC continues to promote practical and cost-effective climate change mitigation and adaptation measures to farmers and land managers. Messages are promoted via a project webpage, social media accounts, a regular podcast and other press and promotional material as well as a series of roadshow events over the last year focused on nutrient use and energy.</p>		<ul style="list-style-type: none"> <li>• promoting food chain organisation, animal welfare and risk management in agriculture;</li> <li>• promoting resource efficiency and supporting the shift toward a low-carbon and climate resilient economy in the agriculture, food and forestry sectors; and</li> <li>• restoring, preserving and enhancing ecosystems related to agriculture and forestry.</li> </ul> <p>We have also extended FFBC for a further two years until end of March 2025.</p>
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		<p>The farmer-led soil regenerative agriculture network continues to focus on positive actions that can be taken on Scottish farms to support, enhance and protect their soils.</p> <p>We continue to communicate, educate, and demonstrate the benefits of climate change mitigation and adaptation measures through initiatives like the ABCC Network and the ITN.</p>		
Carbon Audits: in 2018, we will consult on how best to ensure maximum take up of carbon audits and how to enable tenant farmers and crofters in particular to benefit.	CCP 2018	Under the PSF farmers and crofters can claim funding towards carbon audits to improve their knowledge of current environmental performance and improve efficiency. Uptake in 2022 has been slower than expected but with 428 funded under PSF in the first year, we will build on this by raising awareness of the opportunity and benefits it creates for the environment.		PSF continues to be open for claims during 2023
We will explore with stakeholders, including the Scottish Tenant Farmers Association and the Tenant Farming Commissioner, how best to engage tenant farmers to increase understanding of the environmental and	CCP 2018	Scottish Forestry, in partnership with the Scottish Tenant Farmers Association (STFA) and a Crown Estate Scotland (CES) tenant, has produced a woodland creation financial analysis, including the woodland carbon code, based on full rotations of different forestry types. The “Helping tenant farmers grow trees for their business” output was part of the Tenant and Trees group and was highlighted in an edition of STFA		The partnership with Scottish Forestry, STFA and CES tenant and the Tenants and Trees group will continue in 2023.

<p>economic benefits of low carbon farming.</p>		<p>magazine.</p> <p>Scottish Forestry have taken on the work of the Tenants and Trees group from CES and continue to co-ordination discussions involving stakeholders. They also work closely with the Tenant Farming Commissioner on this topic via the <a href="#">Tenant Farming Advisory Forum (TFAF)</a>.</p> <p>The Small Farm Grant Scheme is now closed. A Small Producers Pilot Fund is currently being developed in partnership between the Scottish Government and members of the Small Producers Pilot Steering Group. The Group's work will also include consideration on the range of climate change related activities which could be undertaken by small holders.</p>		
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<p>Marketing scheme: Determine the feasibility of a Low Carbon Farming marketing scheme.</p>	<p>CCP 2018</p>	<p>We funded research, through the Scottish Agricultural Organisation Society, to consider the development of a consistent country brand marketing proposition which found that using collective marketing would be beneficial. Scotland Food and Drink are leading a programme of work on the development of a “Naturally Scottish” brand which will capitalise on the high sustainability and quality assurance standards that we have within Scotland. This is expected to be launched in summer 2023 and will initially focus on business-to-business market.</p>		<p>The “Naturally Scottish” brand campaign is expected to be launched summer 2023.</p>
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Outcome 3: Nitrogen emissions, including from nitrogen fertiliser, will have fallen through a combination of improved understanding, efficiencies and improved soil condition

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>Communicate and demonstrate the benefits of precision farming and nitrogen use efficiency in order to achieve a reduction in GHG emissions.</p>	<p>CCPu 2020</p>	<p>Since 2016, the FAS programme delivered produced 1,374 publications, 664 videos, 277 podcasts and 40 online tools, as well as 1,374 events and across the board we would conservatively estimate that more than 50% of this activity will be around climate change adaptation and mitigation support. Event attendees highlighted an improved knowledge of climate change, improved soil/nutrient management, and improved knowledge of environmental issues and opportunities.</p> <p>FFBC continues to provide a key source of information and support for Scottish farmers and crofters to encourage the uptake of climate mitigation and adaptation measures. The FFBC website includes a range of additional materials that supports farmers and crofters to take action in this area including a page on <a href="#">Soils, Fertilisers And Manures</a> and a</p>		<p>Scottish Government have procured another year of the FAS to run April 2023 to March 2024. It will be reframed to focus further on climate change and support farmers to contribute further to both mitigation and adaptation. It is envisaged that new FAS contracts will be procured in 2023/2024 for delivery up to and including 2026/27.</p> <p>We have also extended FFBC for a further two years until end of March 2023.</p>

		<p>podcast episode on 'The benefits of reduced tillage.'</p> <p>The FFBC Soil Regenerative Agriculture Group continue to work together to establish how best to support, enhance and protect their farm soils. Their actions cover several measures which support nitrogen use efficiency for example, use grass leys, cover crops and reduced tillage or no tillage to reduce loss of soil organic matter, and improving soil structure which reduces run off and loss of nitrogen.</p> <p>Regulations came into force from 1 January 2022 to consolidate the Silage Slurry and Agricultural Fuel Oil (Scotland) Regulations 2003 into The Water Environment (Controlled Activities) (Scotland) Regulations 2011. Guidance and advice are provided to farmers through the Scottish Environment Protection Agency and <a href="#">Farming and Water Scotland</a>, an initiative funded by Scottish Government.</p> <p>The Scottish Nitrogen Balance Sheet (SNBS) will be reviewed and updated on an annual basis from 2023 onwards. After each such round of review, an updated version of the Balance Sheet dataset will be published, with an accompanying report setting out assessments of progress towards relevant on-the-ground actions to improve the use of</p>		<p>The next update to the SNBS is currently planned for May 2023.</p>
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		<p>nitrogen and identification of opportunities for further improvements in future.</p> <p>Under PSF, we have been offering farmers and crofters the ability to claim funding towards carbon audits and soil analysis. Overall claim levels have been lower this year than initially anticipated, but there was a late surge of claims in the final days before the closing date. Anecdotal feedback is that more farmers and crofters are engaging for the 2023 scheme year, and we will build on this foundation year to increase awareness and uptake.</p>		
<p>Work with the agriculture and science sectors regarding the feasibility and development of a SMART (specific, measurable, achievable, relevant and time bound) target for reducing Scotland's emissions from nitrogen fertiliser.</p>	CCPu 2020	<p>Through the ClimateXChange, we are funding research to explore the potential for a nitrogen use efficiency target for agriculture in Scotland. The project is expected to report in Autumn 2023.</p> <p>The SNBS will be reviewed and updated on an annual basis from 2023 onwards. After each such round of review, an updated version of the Balance Sheet dataset will be published.</p> <p>Under PSF we have been offering farmers and crofters the ability to claim funding towards carbon audits and soil analysis. Overall claim levels have been lower this year than initially anticipated, but there was a late surge of claims in the final days before the closing date. Anecdotal feedback is that more farmers and</p>		<p>The next update to the SNBS is currently planned for May 2023.</p>

		crofters are engaging for the 2023 scheme year, and we will build on this foundation year to increase awareness and uptake.		
From 2018 we expect farmers to test the soil on all improved land every five or six years, and we will work with them to establish how best to achieve this.	CCPu 2020	Under PSF we have been offering farmers and crofters the ability to claim funding towards oil analysis. Overall claim levels have been lower this year than initially anticipated, but there was a late surge of claims in the final days before the closing date. Anecdotal feedback is that more farmers and crofters are engaging for the 2023 scheme year, and we will build on this foundation year to increase awareness and uptake.		PSF continues to be open for claims during 2023
Investigate the benefits and barriers of leguminous crops in rotation.	CCP 2018	<p>Research on <a href="#">The potential for leguminous crops in Scotland</a> was published in January 2021.</p> <p><a href="#">The environment, food and rural affairs Strategic Research Programme 2022-2027</a> has two projects which will consider legumes:</p> <ul style="list-style-type: none"> <li>• The Impact of Novel Crops and Farming Technologies on the Scottish Agricultural Landscape</li> <li>• Crop Improvement for Sustainable production in a Changing Environment</li> </ul> <p>A survey was conducted under the NTP on the topic of rotate crops to build nutrients and soil</p>		<p>The research projects will run until March 2027.</p> <p>The new framework for agricultural support is expected to be phased in from 2025.</p>

		<p>structure. Initial results have identified the majority of farms say that they either regularly or occasionally rotate crops to build nutrients and soil structure.</p> <p>Several measures related to the use of legumes in the rotation are being considered as part of the <a href="#">Agricultural Reform Programme (ARP)</a>, including 'Efficient/reduced use of inorganic fertilisers and lime' and 'Use of N fixing crops.'</p>		
Crop varieties with improved nitrogen-use efficiency.	CCP 2018	<p>The environment, food and rural affairs Strategic Research Programme 2022-2027 has two projects which will consider nitrogen:</p> <ul style="list-style-type: none"> <li>• Exploring Barley Diversity for resilience and sustainability</li> <li>• The Impact of Novel Crops and Farming Technologies on the Scottish Agricultural Landscape</li> </ul>		The research projects will run until March 2027.

Outcome 4: Reduced emissions from red meat and dairy through improved emissions intensity

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Commission and publish a report into the establishment of emissions intensity figures for beef, lamb and milk.	CCP 2018	<p><b>COMPLETE</b></p> <p>ClimateXChange published “<a href="#">Emission intensity of Scottish agricultural commodities</a>” in August 2018</p>		
Work with Quality Meat Scotland, ScotEID and livestock producers to encourage improved emissions intensity through genotyping, improving fertility, reducing animal mortality and improving on farm management practices.	CCPu 2020	<p>In December 2022 SAOS, supported by the Scottish Government, launched the <a href="#">MyHerdStats</a> tool. MyHerdStats provides cattle keepers in Scotland with access to cattle performance indicators including:</p> <ul style="list-style-type: none"> <li>• Calving intervals</li> <li>• Age at first calving</li> <li>• Replacement rates</li> <li>• Youngstock sales</li> </ul> <p>MyHerdStats offers an opportunity to provide insight to those performance indicators whilst helping to quantify positive change over time. Informed and data led</p>		Next stage of project with SAOS to take place over 2023. Scottish Government working with SAOS to explore establishment of MyHerdStats stakeholder group to discuss exposing aspirational benchmarking targets through MyHerdStats tool.

		<p>management decisions will improve technical performance and could play a role in continued support payments. Since the launch of MyHerdStats in December 2022 to mid-February 2023 there were 1,258 unique visits to the website.</p> <p>As part of the Agricultural Reform route map announced on 10 February 2023, we published details on broad areas of interest for future enhanced support measures of future agricultural support as part of the Agricultural Reform Program (ARP). This has included the addition of measures which support livestock farmers and crofters to undertake best practice in areas of livestock health, breeding, and nutrition.</p> <p>The Animal health and Welfare Livestock strategy 2016 – 2021 review is currently delayed. This is now due to be published in 2023 with a new five-year strategy published in collaboration with industry.</p>		
Determine the practicality of establishing a SMART target for reduction in the intensity of emissions for beef, sheep and dairy sectors.	CCP 2018	<p>Under the NTP we are working with a cohort of beef farms to understand the impact on productivity of improved data capture technology combined with specialist advice.</p> <p>This will be complimented with activity under the NTP to work with farmers in all sectors to test how farmers will respond to actions aimed at delivering positive outcomes with</p>		The NTP will run till 2025 and we will increase awareness of timescales for agricultural reform via promotions throughout 2023.

		regard to emissions reduction.		
Consult in 2018 to determine the nature of livestock health measures that the sector will adopt from 2019.	CCP 2018	This policy has been maintained from the 2018 Climate Change Plan and is ongoing.		The detailed proposals and ideas within the farmer led groups reports continue to be considered as we work to create a new rural support scheme.
Determine the practicalities and feasibility of using livestock feed additives as a means of reducing emissions.	CCP 2018	<p>At present within Great Britain (GB) there are no authorised feed additives approved for use under the functional group 'substances which favourably affect the environment.'</p> <p>Feed additives are regulated products which means that feed additives can only be placed on the market and used in GB if they have been authorised by the GB regulated products process which is jointly managed by Food Standards Scotland (FSS) and Food Standards Agency (FSA). Regulated product applications for the GB market, including feed additives, are now subject to the UK's own risk analysis process. FSA and FSS received the GB application for the new feed additive 3-NOP in April 2021 (19 months after the EU application) for its use in ruminants for milk production and ruminants for reproduction. The regulated products process consists of the following phases: validation, risk assessment, risk management, public consultation,</p>		Feed additives awaiting approval for use.



		<p>recommendation, and Ministerial decisions, laying and scrutiny of the instrument on 4 nation basis and can take up to 24 months. FSA and FSS are working to address the numerous factors that affect the progress of applications to ensure the earliest possible authorisation of applications such as 3 NOP’.</p> <p>Working with DEFRA, NI DAERA and Welsh Government we have undertaken a Call for Evidence (CfE) <a href="#">on the potential of increasing uptake of methane supressing feed additives</a>. A summary response will be published by DEFRA in early to mid-2023.</p> <p>The draft list of measures (published on 10 February 2023) refers to a broad intention to recognise uptake of methane supressing feed products by livestock farmers as part of future support.</p>		
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Outcome 5: Reduced emissions from the use and storage of manure and slurry

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>Engaging with farmers to explore their support requirements, establish how they can improve the use and storage of manure and slurry, including the potential for cooperatively owned and managed anaerobic digesters.</p>	<p>Dec 2020, before CCPu 2020</p>	<p>Guidance and advice (including for the new regulations under Silage Slurry and Agricultural Fuel Oil (Scotland) Regulations 2003 which came into force 1 January 2022) are provided to farmers through the Scottish Environment Protection Agency and Farming and Water Scotland, an initiative funded by Scottish Government.</p> <p>554 offers worth £4.60m, were accepted by the SACGS 2022 deadline of 26 July 2022. Following reports of difficulties in some places in securing equipment the deadline for claims was extended to 31 March 2023.</p> <p>Funding available through AECS in 2023 will provide continued support to improve water quality and help mitigate climate change by ensuring sufficient slurry storage capacity is available on a farm for the equivalent livestock units.</p>		<p>Under the new regulations:</p> <ul style="list-style-type: none"> <li>From 1 January 2023: Liquid digestate must now be applied using precision equipment; slurry must not be applied using a raised splash plate or rain gun; slurry must be applied using precision equipment if</li> </ul>

		<p>Farmers and crofters can also access advice on improving the use and storage of slurry and silage through FAS and FFBC.</p>		<p>applied by a contractor and/or on farms with more than 100 milking cows, 200 beef or more than 800 fattening pigs or sows.</p> <ul style="list-style-type: none"> <li>• From 1 January 2024: Silage and slurry stores built after 1991 (or that were substantially reconstructed or enlarged on or after 1st Sept 1991) and those with planning permission but not yet constructed must be structurally</li> </ul>
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				<p>compliant and all liquid digestate stores constructed before 1st January, or where planning permission was granted prior to 1st Jan 2022, must meet requirements within the regulations.</p> <ul style="list-style-type: none"><li>• From 1 January 2026: Silage and slurry stores built before 1991 (and not substantially enlarged or reconstructed since 1991) must be fully compliant and slurry</li></ul>
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				<p>stores located outside an NVZ must have capacity to store the total slurry likely to be produced in 26 weeks by housed pigs or 22 weeks by housed cattle by 2026.</p> <ul style="list-style-type: none"> <li>• From 1 January 2027 all slurry application must be applied using precision equipment.</li> </ul> <p>Initial evaluation of successful SACGS applicants from the pilot project is intended to be undertaken in 2023.</p> <p>There will be no SACGS round offered</p>
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				in 2023. The ATF budget which underpins SACGS is being used to provide an extension of support for slurry storage across Scotland ( <u>except</u> in Nitrate Vulnerable Zones (NVZ) which have previously been supported to meet regulatory requirements). This will be administered through AECS.
Investigate the practicalities of livestock grazing in rotation on current arable land.	CCP 2018	<p><b>Completed</b></p> <p>The East/West Beed Grazing Collaboration Pilot run by SAOS was supported under the Knowledge Transfer and Innovation Fund to work toward establishing evidence on the financial and environmental value of moving cattle to lower cost natural resources.</p> <p>The operational group produced case studies showing there are environmental and carbon sequestration benefits, especially where fodder crops are grown and grazed gradually over the winter period. The findings included significant potential fuel savings, that adopting</p>		

		rotational grazing negates the necessity for artificial fertilisers and intensely farming the fields and that it was on the whole a low cost, low carbon system with less reliance on cereals-based diets and greater utilisation of grazing ground both in the summer and winter.		
Conduct a feasibility study for the establishment of manure/slurry exchange.	CCP 2018	COMPLETED <a href="http://climatexchange.org.uk">Slurry Storage on Scottish Farms – A Feasibility Study (climatexchange.org.uk)</a>		

<p>Determine how to consistently minimise emissions from slurry storage.</p>	<p>CCP 2018</p>	<p>Applicants for SACGS 2022 focused on providing support for low emission slurry spreading equipment and slurry store covers that are proven to reduce harmful ammonia emissions and reduce adverse impacts on water quality resulting from the storage and spreading of livestock slurry and digestate.</p> <p>Following reports of difficulties in some places in securing equipment the deadline for claims was extended to 31 March 2023.</p> <p>Support for slurry storage continues to be made available for farmers through AECS.</p>	<p>No new indicators</p>	<p>The ATF budget which underpins SACGS is being used to provide an extension of support for slurry storage across Scotland (<u>except</u> in Nitrate Vulnerable Zones (NVZ) which have previously been supported to meet regulatory requirements).</p> <p>In 2023, the £5 million Agriculture Transformation Fund (ATF) will extend support for slurry storage. This support, which surpasses the previous targeted support that has been available under AECS, will help the sector meet the regulatory requirements introduced to improve the storage of slurry and digestate on farms.</p>
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<p>Review management of storage and application of organic materials such as silage, slurry and liquid digestate, including what support may be required to ensure best practice.</p>	<p>CCPu 2020</p>	<p>Guidance and advice (including for the new regulations under Silage Slurry and Agricultural Fuel Oil (Scotland) Regulations 2003 which came into force 1 January 2022) are provided to farmers through the Scottish Environment Protection Agency and Farming and Water Scotland, an initiative funded by Scottish Government.</p> <p>Applicants for SACGS 2022 focused on providing support for low emission slurry spreading equipment and slurry store covers that are proven to reduce harmful ammonia emissions and reduce adverse impacts on water quality resulting from the storage and spreading of livestock slurry and digestate.</p> <p>Following reports of difficulties in some places in securing equipment the deadline for claims was extended to 31 March 2023.</p> <p>Support for slurry storage continues to be made available for farmers through AECS.</p>	<p>See above for the timescales for new requirement under these new regulations.</p> <p>The ATF budget which underpins SACGS is being used to provide an extension of support for slurry storage across Scotland (<u>except</u> in Nitrate Vulnerable Zones (NVZ) which have previously been supported to meet regulatory requirements).</p> <p>In 2023, the £5 million ATF will extend support for slurry storage. This support, which surpasses the previous targeted support that has been available under AECS, will help the sector meet the regulatory requirements introduced to improve the storage of slurry and digestate on farms.</p>
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				Scottish Ministers have committed to extending AECS to 2024.
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Outcome 6: Carbon sequestration and existing carbon stores on agricultural land have helped to increase and maintain our carbon sink

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
<p>Explore with the farming and forestry sectors how best to increase planting of trees and hedgerows which optimise carbon sequestration, including the role of agroforestry.</p>	<p>2020</p>	<p>The ITN is a farmer-led initiative which aims to encourage more farmers and crofters to plant trees. This joint Scottish Government and Scottish Forestry initiative has hosted 24 events since March 2021, sharing first hand experiences and providing advice on everything from the practicalities of accessing funding and planting the trees to the multiple business and environmental benefits.</p> <p>We are currently working with Scottish Forestry's Trees on Farm group to develop trial specifications for the Forestry Grant Scheme's (FGS) agroforestry option. These updates are intended to provide more flexibility with a range of approaches available which are expected to focus on:</p> <ul style="list-style-type: none"> <li>• Productive broadleaves, which includes cattle-proof guards (e.g., cactus guards) allowing cattle to</li> </ul>	<p>No new indicators</p>	<p>The ITN will continue to host events for farmers and crofters throughout 2023.</p> <p>The new agroforestry specifications will be available in 2023.</p> <p>A new Agriculture Bill is to be introduced to Parliament in 2023 and The Scottish Government aims to publish a report on the findings of the Agriculture Bill consultation in Spring 2023.</p>

		<p>continue to use the land</p> <ul style="list-style-type: none"> <li>• Biodiversity, integrating native broadleaves into the farming system; and,</li> <li>• Fruit and nut trees</li> </ul> <p>The uptake of agroforestry schemes under this trial will be monitored closely and the lessons learnt will be used to inform the development of future support mechanisms and encourage further uptake of agroforestry.</p> <p>To inform the introduction of a new Scottish Agriculture Bill in 2023 which will provide a replacement for CAP, a public consultation on our proposals, “Delivering our Vision for Scottish Agriculture” ran from 29 August 2022 till 5 December 2022.</p> <p>A public consultation on the Scottish Forestry Grant Scheme is currently open until 17<sup>th</sup> May and asks for views on how to help reduce barriers for farmers and crofters wanting to integrate trees into their business.</p> <p>To deliver our Vision for Agriculture, we announced an agricultural reform route map on 10 February 2023 which also included information on woodland creation support.</p>		<p>An analysis of the consultation on the Scottish Forestry Grant Scheme consultation will follow in the summer 2023 and will inform priorities for post-2025 enhancements to the grant scheme</p>
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<p>Investigate the feasibility of payment for carbon sequestration taking into account any existing schemes such as the woodland carbon code as a means of encouraging the uptake of carbon sequestration on farms.</p>	<p>CCP 2018</p>	<p>We know that both public and responsible private investment in Scotland’s natural capital will be essential to meet the pace and scale of the challenge of delivering on our climate change targets and wider land use and environmental objectives.</p> <p><a href="#">The 2022 National Strategy for Economic Transformation</a> includes a commitment for a public sector partnership to develop a values-led, high-integrity market for responsible investment in natural capital in Scotland. This commitment was followed by the publication of the <a href="#">2022 Interim Principles for Responsible Investment in Natural Capital</a> which set out in more detail to market stakeholders the vision for the natural capital market in Scotland.</p> <p>Across the UK, around half of the current projects registered to the <a href="#">Woodland Carbon Code</a> (WCC) are located in Scotland. Scottish projects make up the significant majority (around 82%) of the total area of projects. A large majority of registrations under the WCC are from farmers or intermediaries where farmers are doing the planting.</p>	<p>The programme is acting to increase investment in the existing Peatland Code and WCC, and also to support the development of new investment mechanisms through an investment readiness fund for Scottish projects. There are also wider UK initiatives such as the Soil Carbon Code which is being developed and piloted with funding support provided by DEFRA’s Natural Environment Investment Readiness Fund (NEIRF).</p> <p>An analysis of the consultation on the Scottish Forestry Grant Scheme consultation will follow in the summer 2023 and will inform</p>
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				priorities for post-2025 enhancements to the grant scheme
Increase woodland cover on suitable agricultural land.	CCP 2018	<p>The integration of woodlands into existing businesses is very much part of the woodland creation picture in Scotland. Over half of the applications to the FGS are for smaller scale woodlands under 20 ha which are typically part of existing agricultural business.</p> <p>To deliver our Vision for Agriculture, we announced an agricultural reform route map on 10 February 2023 which also included information on woodland creation support.</p> <p>A public consultation on the Scottish Forestry Grant Scheme is currently open until 17<sup>th</sup> May.</p> <p>The established sub-group of Scottish Forestry's Customer Representative's Group continues to meet quarterly and continues to assist in the development by advising on ways of encouraging more farm businesses to plant trees through facilitating cross-sectoral working and engagement with practitioners.</p>		

<p>Building on the successful work integrating woodland with farming businesses, help remove barriers for those on agriculture holdings, particularly in the tenanted sector who want to engage in woodland creation, including exploring the potential to reform legislation where appropriate.</p>	<p>CCPu 2020</p>	<p>Scottish Forestry, in partnership with the STFA and a CES tenant, has produced a woodland creation financial analysis, including the woodland carbon code, based on full rotations of different forestry types. The “Helping tenant farmers grow trees for their business” output was part of the Tenant and Trees group and was highlighted in an edition of STFA magazine.</p> <p>Scottish Forestry have taken on the work of the Tenants and Trees group from CES and continue to co-ordination discussions involving stakeholders in this topic via the Tenant Farming Commissioner and TFAF.</p>	<p>No new indicators</p>	<p>The partnership with Scottish Forestry, STFA and CES tenant and the Tenants and Trees group will continue in 2023.</p>
<p>Work with stakeholders on options to increase peatland restoration on suitable agricultural and crofting land, to support delivery of policies in the LULUCF chapter. We will map peatland against this land which will allow modelling options for land-use change and inform opportunities for targeted support of peatland restoration and management.</p>	<p>CCPu 2020</p>	<p>Work is progressing to establish a pilot for peatland restoration on crofting land. 13 Scottish Government Estates, covering a total area of 38,804 ha, have been assessed through a combination of desk-based assessments and site visits. Three potential sites have been selected and grazing committees are starting initial discussions with Peatland ACTION officers.</p> <p>Work is progressing to ensure peatland restoration principles are imbedded into the agriculture reform support system as this is developed.</p> <p>Outputs from our CivTech challenge on</p>	<p>No new indicators</p>	<p>We will continue to progress restoration pilots on crofting land, linking to development of the policies in the LULUCF chapter of the CCPu and future CCP. We will also continue to feed in peatland principles into the ongoing agriculture reform process.</p>

		peatland restoration is providing us with data on the extent and condition of deep peat (>50cm) across Scotland, which can enable greater targeting to maximise benefits from restoration.		
Explore options for landuse change to optimise uses beyond traditional farming and food production to multifaceted land use including forestry, peatland restoration and management and biomass production.	CCPu 2020	Regional Land Use Partnerships are being piloted across five areas of Scotland. They aim to facilitate collaboration between stakeholders and engagement with communities at a regional level to maximise the contribution that our land can make to addressing the climate and environmental crises. The Scottish Government is supporting the current pilots in developing their Regional Land Use Frameworks by the end of 2023. We are working with the pilot groups to test approaches to engagement and partnership governance that best suit the local situation and priorities. This will help inform future decisions on any wider establishment of Partnerships.	No new indicators	The Regional Land Use Frameworks are due to be produced by the end of 2023. With Scotland's fourth Land Use Strategy due for publication in 2026.



# Climate Change Plan Monitoring Report 2023: Negative Emissions Technologies (NETs)

## Part A - Overview of sector

Negative Emissions Technologies (NETs) are yet to be deployed in Scotland as they rely on carbon capture and storage (CCS) to deliver negative emissions. Whilst some technologies that could deliver negative emissions are currently deployed, such as energy from waste, these facilities would require retrofitting with carbon capture technology and a route to storage to be considered a negative emissions technology.

The CCPu includes policies and proposals for supporting and enabling early deployment from 2029 onwards. We currently do not track progress against the NETs envelope in the CCPu. However, once we have clarity on the UK Government's support to deliver CCS in Scotland and the outcomes of our NETs Feasibility Study, we will provide a comparison of progress towards delivering NETs against the envelope as laid out in the CCPu.

The CCPu sets out the following policy outcomes for the sector. Given that this sector chapter appeared first in the CCPu (2020), there are no indicators for these outcomes. In the next CCP we will update the policy outcomes and include indicators to track progress against these updated outcomes.

Detailed feasibility study on NETs will assess the opportunities for negative emissions in Scotland, and identify applications with the greatest potential, including specific sites where possible

CCUS: the continued development of CCUS technologies and systems is prioritised to ensure these can be rolled out commercially and at scale by the late 2020s.

Bioenergy: a cross-sectoral approach for the appropriate and sustainable use of biomass in energy applications is agreed and implemented (taking into account competing land and feedstock uses).

## Just transition and cross economy impacts

We wish to understand and report on the broader just transition and cross-economy impacts of our emissions-reduction activities in addition to these sector specific policy outcomes and indicators. To do this, in this report we use data from the Office of National Statistics (ONS): Low Carbon Renewable Energy Economy (LCREE)

publication. The LCREE data presented in this report is based on survey data of businesses which perform economic activities that deliver goods and services that are likely to help generate lower emissions of greenhouse gases, for example low carbon electricity, low emission vehicles and low carbon services.

The LCREE indicator is narrowly defined and, while useful within its limited scope, does not give us the full picture of the impacts on workforce, employers and communities and progress towards a just transition.

Over the next few years we will work to develop a more meaningful set of success outcomes and indicators aimed at tracking the impacts of our policies on a just transition to net zero.

## Sector commentary on progress

The CCPu included Negative Emissions Technologies (NETs) as a sector chapter for the first time, recognising the important role that emissions removals will need to play in reaching net zero, as highlighted by the IPCC Working Group 3 report. The 'learning by doing' approach set out in the CCPu more widely was also identified as being particularly important in the case of this sector, given the considerable uncertainties around technological development and dependencies on UK Government action, particularly with regard to carbon capture and storage.

Policies included in the NETs chapter recognised these challenges and uncertainties and sought to develop an evidence base to allow for further policy development. We have now undertaken an initial review of evidence.

The review indicates that NETs in Scotland can deliver at scale in due course but not at the pace assumed in the CCPu. This is due to various shifts in evidence since the time of the CCPu, including:

- The UK Government's decision not to allocate the Scottish Cluster as a Track-1 cluster for delivery in the mid-2020s, impacting on when carbon storage underpinning NETs will be available, and industries' appetite to invest in NETs technologies. We have urged the UK Government to accelerate the Scottish Cluster to full Track-1 status without delay and provide urgent clarity on the next stages of the cluster sequencing process, setting out a clear and accelerated timeframe for Track 2. While the UK Government's Powering Up Britain announcements on 30 March reconfirming their commitment to four CCUS clusters by 2030, highlighting Acorn as one of two projects "best placed to deliver on Government objectives for Track-2" and starting the Track 2 process are positive developments, only eight out of 20 shortlisted and 41 initially eligible Phase 2 projects were taken forward to the negotiation stage (and this did not include any projects from the Humber region of the East Coast Cluster), suggesting a weakening of progress. No NETs projects

are included in this list. They also did not provide a clear timeline for Track 2, merely confirming that they “intend to provide an update in the summer, following the closure of the expression of interest process”. We continue to call for further clarity on Scottish Cluster deployment timelines.

- The availability of home grown sustainable biomass to supply large scale power bioenergy with CCS (BECCS); and
- No public commitment to date by a commercial operator to employ a NETs model for a single large power station in Scotland. Given lead in times for development of such a facility and proposals for CCS deployment for the Peterhead CCGT power project, it is unlikely that a new NETs power facility will be developed in the 2020s.

We are now gaining further knowledge and evidence of what scale of NETs can be delivered in Scotland and to what timescale, through undertaking a NETs feasibility study. This further evidence will be worked up over 2023 and will be considered as we develop ESJTP and next full CCP.

#### Developments in monitoring arrangements since last report:

No changes.

## Part B - Progress to Policy Outcome Indicators

**Policy Outcome:** Cross-sectoral social and economic

**Indicator:** FTE employment in Low Carbon Renewable Energy Economy Indicator

**On-Track Assessment (Milestones/Targets):** Year-to-year change

**Most Recent Data:** 2021

**Data Source(s):** Office of National Statistics: Low Carbon Renewable Energy Economy (LCREE), Time spent of Green Tasks

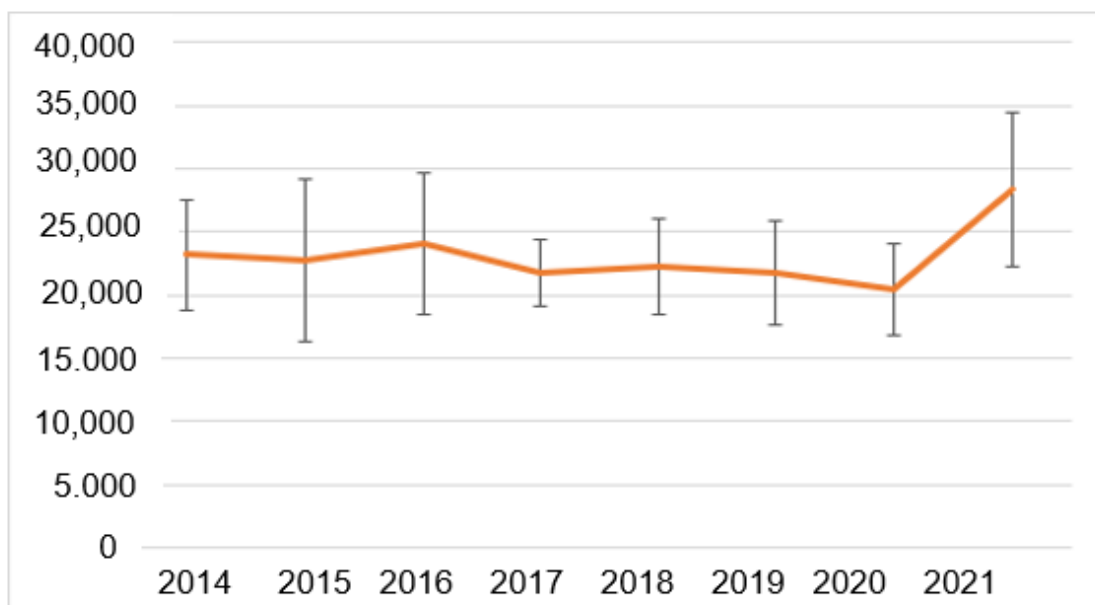
**Assessment:** Too Early to Say

### Commentary:

In 2021, the Scottish low carbon renewable energy (LCREE) sectors were estimated to provide 28,300 jobs<sup>38</sup>.

- The estimates of LCREE are based on a relative small sample of businesses and hence are subject to a wide confidence interval. Scottish LCREE employment in 2021 is substantially higher than previous years but the difference is not statistically higher than 2020.

Employment in Low Carbon Renewable Energy Economy, FTE<sup>39</sup>



<sup>38</sup> The Scottish Government also commissioned an independent analysis projecting future employment in the Energy Production Sector to inform the draft ESJTP. This can be found in Chapter 3 of the report and is available [here](#).

<sup>39</sup> This is low carbon renewable employment, and this chart (LCREE) does not include Scottish employment in CCUS or NETs sectors, as neither have been deployed in Scotland to date.

- LCREE only shows employment in roles in industries directly involved in the transition to Net Zero. This means that possible CCUS-related activity carried out by firms in sectors not targeted by the survey might be missed and statistics on jobs may undercount the economy's actual labour allocation to these activities.
- The ONS also released experimental statistics on a wider perspective of green activity in the economy with their time spent on green tasks release.
- These statistics reflect green activities in both LCREE and non-LCREE sectors. The 2023 publication has not yet been published.

## Part C- Information on implementation of individual policies

Outcome 1: Detailed feasibility studies on NETs will assess the opportunities for negative emissions in Scotland, and identify applications with the greatest potential, including specific sites where possible.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
In 2021/22 carry out a detailed feasibility study of opportunities for developing NETs in Scotland ready for the early 2030s. This will identify specific sites and applications of NETs, including developing work to support policy on Direct Air Capture and its role within NETs in our future energy system	CCPu 2020	Studies to build our evidence on NETs and inform the scope of a detailed feasibility study have been commissioned and published within 2021/22. These outputs include research on bioenergy feedstock availability ( <a href="#">Available here</a> ) and a horizon scan of international deployment of NETs ( <a href="#">Available here</a> ).  A detailed feasibility study has been scoped and is currently underway.	N/A	The feasibility study research is underway.  The final report containing recommendations to government and proposed NETs implementation pathways is expected in Summer 2023.

<p>From 2022, based on the outcomes of the feasibility work, we will provide support for commercial partners to develop NETs proposals.</p>	<p>CCPu 2020</p>	<p>We have continued to build our evidence of NETs feasibility through studies on bioenergy feedstock availability and international NETs deployment. This work will be bolstered by a detailed feasibility study that is now underway.</p> <p>We are simultaneously identifying and engaging with those key stakeholders which have the ability to implement NETs in Scotland to better understand the support that the Scottish Government may be able to offer.</p>	<p>Initiated in 2022 supported by the EETF.</p>	<p>Work on a feasibility study is underway. This work is expected to report by May 2023.</p> <p>As evidence on NETs accrues via the feasibility study and further stakeholder engagement throughout 2023, we will begin to formulate support measures for commercial partners and these will be outlined in the next CCP.</p>
<p>Put in place a continual process to review the development of NETs and progress against its envelope.</p>	<p>CCPu 2020</p>	<p>This is assured by internal governance boards.</p>	<p>N/A</p>	<p>Timing and arrangements to be confirmed in the next CCP.</p>

<p>We will work with UK Government to ensure that they bring forward suitable mechanisms to support the development of NETs business cases in relevant sectors.</p>	<p>CCPu 2020</p>	<p>Recognising that many NETs support mechanisms are reserved to the UK Government, we are working with relevant departments, including DESNZ, to ensure support for prospective NETs developers in Scotland.</p> <p>In particular, and following the outcome of the UK government's cluster sequencing process in which it failed to award the Scottish CCS cluster track 1 status, we have championed the timely deployment of Scottish CCS infrastructure as being essential to enabling development of NETs.</p> <p>Work with the UK has further involved engaging with relevant consultations. In March 2021 we responded to the Call for Evidence on greenhouse gas removals (GGRs), Scottish Government response to UK Government Engineered Greenhouse Gas Removals Business Models consultation</p>		<p>We will continue working with UK Government to foster the necessary support for NETs in Scotland.</p> <p>The UK Government recently opened the expression of interest process for Track 2 CCUS clusters but we continue to urge them to provide a timetabled solution for Track-2 clusters will be awarded and will continue to promote the rapid deployment of the Scottish cluster as being essential to both Scottish and UK NETs ambitions.</p> <p>We will continue to take forward work with the rest of the ETS Authority on the potential inclusion of GGRs in the UK ETS.</p>
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		<p>submitted in October 2022.</p> <p>Through our role as part of the ETS Authority (which comprises of the UK Government and the three Devolved Administrations) we ran a consultation in 2022 on changes to the Emissions Trading Scheme. This included a Call for Evidence on the inclusion of greenhouse gas removals (GGRs) in the ETS.</p>		
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Outcome 2: CCUS: the continued development of CCUS technologies and systems is prioritised to ensure these can be rolled out commercially and at scale by the late 2020s.

Policy	Date announced	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
Support the development of NETs technologies within Scotland.	CCPu 2020	This has been significantly impacted by the UK Government decision on the CCUS cluster, as discussed in Part A. £80m funding has been made available via the Emerging Energy Technologies Fund to enable the Scottish CCUS cluster to continue and accelerate the deployment of carbon capture technology	N/A	£80m funding has been made available via the Emerging Energy Technologies Fund to enable the Scottish CCUS cluster to continue and accelerate the deployment of carbon capture technology.
Support the inclusion of NETs in the development of strategic, industry lead pathways for CCUS infrastructure in Scotland.	CCPu 2020	This has been significantly impacted by the UK Government decision on the CCUS cluster, as discussed in Part A.	N/A	N/A

Funding through the Scottish Industrial Energy Transformation Fund to consider the development of NETs demonstrators.	CCPu 2020	NETs demonstrators to be considered for inclusion in subsequent calls of SIETF.	As for SIETF	As for SIETF
Provide a focus on integrating NETs projects with CCS infrastructure through the Emerging Technologies Fund.	CCPu 2020	This has been significantly impacted by the UK Government decision on the CCUS cluster, as discussed in Part A. £80m funding has been made available via the Emerging Energy Technologies Fund to enable the Scottish CCUS cluster to continue and accelerate the deployment of carbon capture technology.	N/A	£80m funding has been made available via the Emerging Energy Technologies Fund to enable the Scottish CCUS cluster to continue and accelerate the deployment of carbon capture technology.

Outcome 3: Bioenergy: a cross-sectoral approach for the appropriate and sustainable use of biomass in energy applications is agreed and implemented (taking into account competing land and feedstock uses).

Policy	Date	Progress on implementation since time of last report / CCPu	Have any implementation indicators / milestones been set for this policy? If so, most recent data for progress against these.	Timeframe and expected next steps
We will publish a Bioenergy Update in early 2021, laying out our current position and understanding of the role of bioenergy in the energy system and setting out in more detail how we will move forward.	CCPu 2020	We published the <a href="#">Bioenergy Update</a> on 24 March 2021	N/A	We published the Bioenergy Update on 24 March 2021.
In 2021, building on the Bioenergy Update, we will establish a cross sectoral Bioenergy Expert Working Group to consider and identify the most appropriate and sustainable use for bioenergy resources across Scotland. It will also assess the	CCPu 2020	<p>We have published research which forecast the availability of domestic bioresources out until 2045.</p> <p>We will consider the impacts and interactions of increasing biomass production on existing agricultural land.</p> <p>Following publication of the draft Bioenergy Action Plan,</p>		<p>Ongoing meetings of the working group over the next 24 months. Gathering evidence and sharing knowledge across multiple sectors.</p> <p>Engagement with UK Government in the lead up to their Biomass Strategy due to be published in 2023.</p>

<p>volume of bioenergy resources that we can grow or produce within Scotland, and confirm the level of import that we believe is compatible with a sustainable global trade in bioenergy.</p>		<p>we will establish an expert panel to review policy and suggest routes for developing the bioenergy sector.</p>		
<p>By 2023, in time to inform the next CCP, we will publish a draft Bioenergy Action Plan, incorporating the learning developed by the expert working group and our understanding of the options to use Bioenergy in both NETs and other applications.</p>	<p>CCPu 2020</p>	<p>See above – we will publish a draft Bioenergy Action Plan in advance of the next draft CCP.</p> <p>Following publication of the draft Bioenergy Action Plan, we will establish an expert panel to review policy and suggest routes for developing the bioenergy sector.</p>	<p>See above</p>	<p>To be developed from the findings and recommendations from the Working Group.</p> <p>Following publication of the draft Bioenergy Action Plan, we will establish an expert panel to review policy and suggest routes for developing the bioenergy sector.</p>



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