CLIMATE CHANGE PLAN

Monitoring Report

December 2019

Scottish Government
Riaghaltas na h-Alba
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Introduction

This is the second annual monitoring report on progress against the suite of 85 policy output and implementation indicators established in the Climate Change Plan: third report on proposals and policies 2018-2032[1] ("the Plan").

The first annual monitoring report[2] in 2018 was a pilot version and set out a baseline against which future assessments of progress will be made. This report updates progress using recent data[3].

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019[4] amends the Climate Change (Scotland) Act 2009 and places the monitoring framework on a statutory footing, requiring individual sector by sector monitoring reports to be laid before the Scottish Parliament annually. Future reporting will occur under the requirements of the amended Climate Change (Scotland) Act, with the first set of reports due no later than the end of May 2021.

The monitoring framework will continue to evolve to reflect legislative requirements, updates to the Plan[5], and experience in implementing the Plan.

Overview

This monitoring report on the Climate Change Plan is complementary both to the Plan itself and the most recent Official Statistics on Scotland's greenhouse gas emissions[6].

The Plan sets out the **"policies"** and **"proposals"**, leading to defined **"policy outcomes"**, by which Scotland's statutory emissions reduction targets from 2018 to 2032 will be met. The annual emissions statistics, which come with a two-year lag, provide the assessment of whether targets have been met and a breakdown of progress at a sector by sector level.

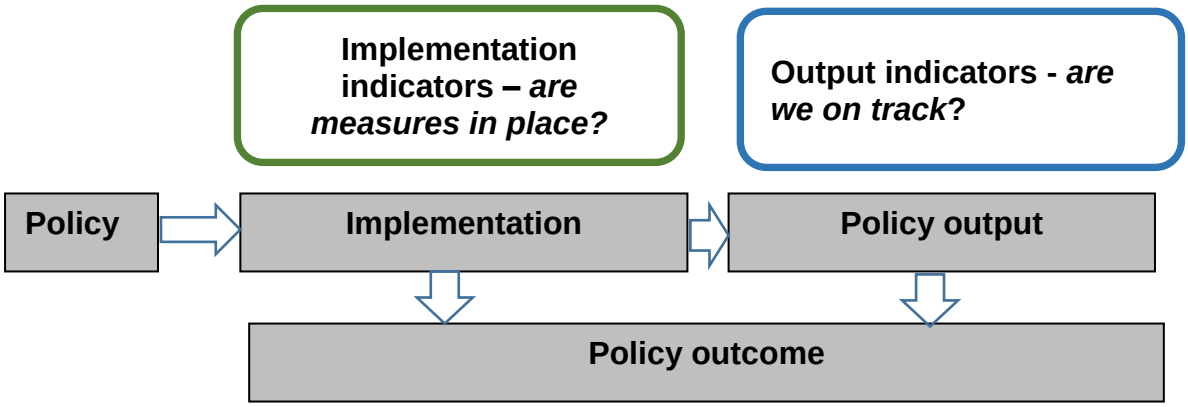
[1] https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/
[2] https://www.gov.scot/binaries/content/documents/govscot/publications/progress-report/2018/10/climate-change-plan-monitoring-report-2018/documents/00542587-pdf/00542587-pdf/govscot%3Adocument/00542587.pdf
[3] The information reported in this document covers sources published up to 30 September 2019.
[4] http://www.legislation.gov.uk/asp/2019/15/contents/enacted
[5] A draft update to the 2018-2032 Climate Change Plan will be published by the end of April 2020.
[6] https://www.gov.scot/publications/scottish-greenhouse-gas-emissions-2017/

This monitoring report provides more detailed information on progress in implementing the Plan. The report is made up of a series of sectoral chapters, containing information on the policy output and implementation indicators set out in the corresponding chapter of the Plan:

- **"Policy output indicators"** identify whether we are on track to achieve the policy outcomes for that sector. Information on these indicators is set out within blue boxes.

- **"Policy implementation indicators"** report on whether measures are in place to deliver the policy outcomes. Information on these indicators is set out within green boxes.

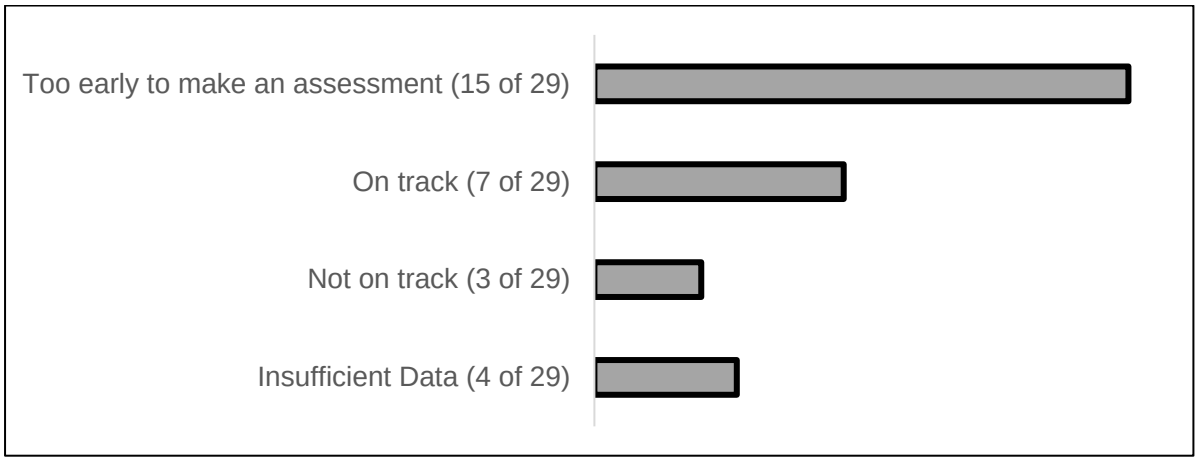
The diagram below summarises the links between the indicators upon which information is being reported here, the policies in the Plan and their outcomes.



Updates on the development of the proposals set out in the Plan are also provided in the introduction to each sectoral chapter of this report, where appropriate.

The chart below provides an overview of progress against the 29 policy output indicators across all chapters of the Plan. A list of these indicators, organised by sector, is also provided in summary table 1. Full details on each indicator may be found in the relevant chapters of this report.

Summary Figure 1: Overview of progress against policy output indicators.



When the first monitoring report was published in 2018 it was too early to make an assessment of the majority of the indicators, and a comprehensive assessment of whether the Plan was fully on track was not therefore possible. While the number of indicators in this position has reduced, it remains the case that it is too early to make an assessment for the majority of the indicators as, in many cases, data is not yet available for the period covered by the indicators.

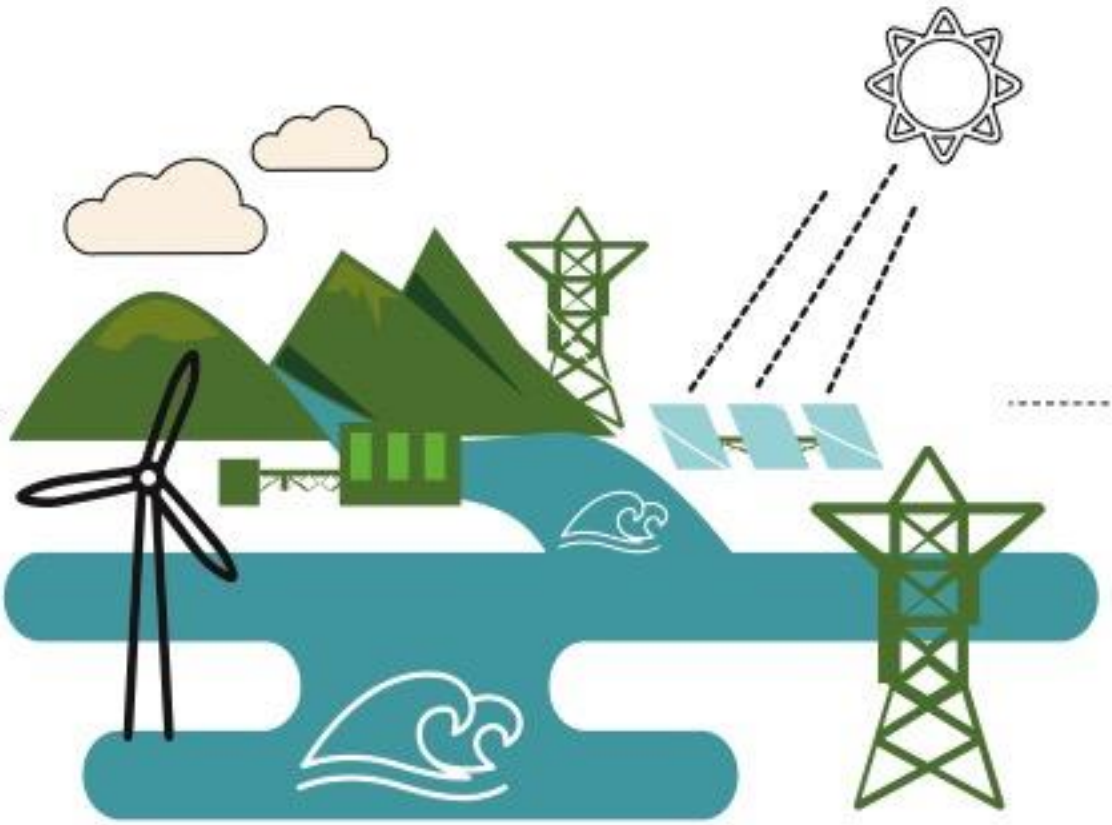
Of the indicators where “on track” assessments have been possible this year, 7 are assessed as on track (across the electricity, transport and forestry sectors) and 3 are assessed as off track (across waste and peat). Further information on these indicators, and the actions being taken where indicators are off track are set out in the body of the report.

We will continue to develop and improve this monitoring framework as we prepare for statutory reporting in future years. In particular, we will look to learn from experience over these first two years in terms of areas where data availability has proven to be a barrier to effective monitoring. We will also look to explore ways to make the assessment of whether indicators are on track as transparent as possible and to consider where the design of individual indicators can be improved.

Summary Table 1: Progress against policy output indicators.

	Too early	On track	Not on track	No data
Chapter 1: Electricity				
Electricity grid generation.		x		
Secure and flexible supply, robust against fluctuations / interruptions.		x		
Chapter 2: Buildings				
Change in energy intensity of residential buildings from 2015	x			
Change in emissions intensity of residential buildings from 2015	x			
Change in non-domestic energy productivity from 2015	x			
Change in emissions intensity of non-domestic sector from 2015	x			
Chapter 3: Transport				
Average emissions of new cars registered	x			
Average emissions of new vans registered	x			
Annual share of biofuels as percentage of petrol and diesel sales				x
Percentage of grant funding for charge points utilised each year.	x			
Percentage of charge point installs completed each year.	x			
Annual utilisation of the Charge Place Scotland network.	x			
Average emissions of HGVs per tonne kilometre.	x			
Report on ECO Stars				x
Report against the actions outlined in the Rail Freight Strategy.		x		
Proportion of bus fleet made up of low emission vehicles				x
Report on Transport Scotland's input into port and airport strategies.				x
Number of low emission ferries in Scottish Government ownership.		x		
The percentage of the rail track electrified.		x		
Active travel budget for the year.		x		
Progress towards active travel vision.	x			
Chapter 4: Industry				
Industrial and commercial energy productivity	x			
Industrial and commercial emissions intensity	x			
Chapter 5: Waste				
Volume of land filled waste			x	
Number of additional landfill sites with gas capture			x	
Chapter 6: Land Use, Land Use Change and Forestry				
Number of hectares of woodland created		x		
Scottish produced sawn wood and panel boards used in construction	x			
Number of hectares of restored peatland per year			x	
Chapter 7: Agriculture				
Level of emissions from the agriculture sector.	x			

ELECTRICITY



Electricity

Greenhouse gas emissions from the electricity sector have already been reduced by 92% (1990 to 2017).

The Plan sets out the following two policy outcomes for the sector:

1. From 2020 onwards, Scotland's electricity grid intensity will be below 50 grams of carbon dioxide per kilowatt hour. The system will be powered by a high penetration of renewables, aided by a range of flexible and responsive technologies.

2. Scotland's energy supply is secure and flexible, with a system robust against fluctuations and interruptions to supply.

Scotland's energy system continues to evolve and is making the transition from a traditional centralised model, reliant on fossil fuels, to a decentralised model, with a more diverse electricity generation mix incorporating large volumes of renewable and other low carbon sources of electricity.

Latest figures show Scotland has already reached the target of having an electricity grid intensity below 50 gCO_2 per kilowatt hour, with the 2017 figure showing a grid intensity of 24 gCO_2/kWh, a fall of 56% since 2016.

Renewable electricity generation capacity in Scotland has more than trebled in the last ten years; as of June 2019, there was 11.6 GW of installed capacity across the country. Consequently, renewables' contribution towards the total volume of electricity generated has grown from 18.5% in 2008 to 51.7% in 2017.

There is also currently an additional 13.0 GW of renewables capacity either under construction or at the planning stage, the majority of which is from wind generation. This indicates a strong pipeline, and a substantial level of capacity which could be added to the system in the future.

OUTPUT INDICATOR FOR POLICY OUTCOME 1:

For the duration of the Plan, Scotland's electricity grid intensity will be below 50 gCO_2 per kilowatt hour, powered by a high penetration of renewable technologies, including onshore wind, offshore wind, island wind, hydro, solar, marine and bioenergy.

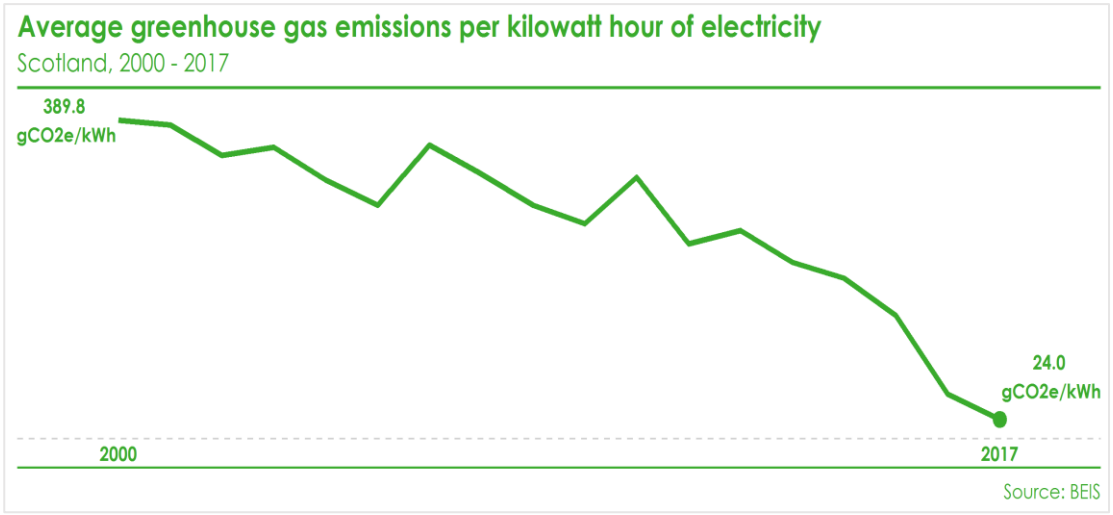
MOST RECENT DATA: Grid intensity of 24.0 gCO_2 per kilowatt hour in 2017.
DATA SOURCE(S): Scottish Government Energy Statistics Database[1].

ON TRACK: Yes.

COMMENTARY:

- Grid intensity of Scotland dropped from 54.9 gCO_2/kWh in 2016 to 24.0 gCO_2/kWh in 2017, below 50 gCO_2/kWh for the first time.
- This fall continues the downward trend from a carbon intensity of 320 gCO_2e/kWh in 2010, chiefly the result of the closure of Cockenzie and Longannet coal fired power stations in 2013 and 2016, as well as a reduced reliance on gas for power generation. This has significantly reduced the use of fossil fuels for electricity generation, resulting in a large reduction in emissions from power generation in Scotland.
- The reduction in electricity generation from coal and gas fired power stations over the last ten years has been partially offset by an increase in generation from lower carbon sources. This includes nuclear power, but most notably comes from renewable generation, which now makes up over 50% of our electricity share.

Electricity Figure 1: Grid Intensity per kWh



OUTPUT INDICATOR FOR POLICY OUTCOME 2:

Scotland's energy supply is secure and flexible, with a system robust against fluctuations and interruptions to supply.

MOST RECENT DATA: Scotland's electricity and gas supply remains secure. Peak electricity demand in Scotland for winter 2018/19 was 5.3 GW. This is within Scotland's maximum supply capacity from non-intermittent sources, which was 10.0 GW.

DATA SOURCE(S): Scottish Government Energy Statistics Database[1].

ON TRACK: Yes.

COMMENTARY:

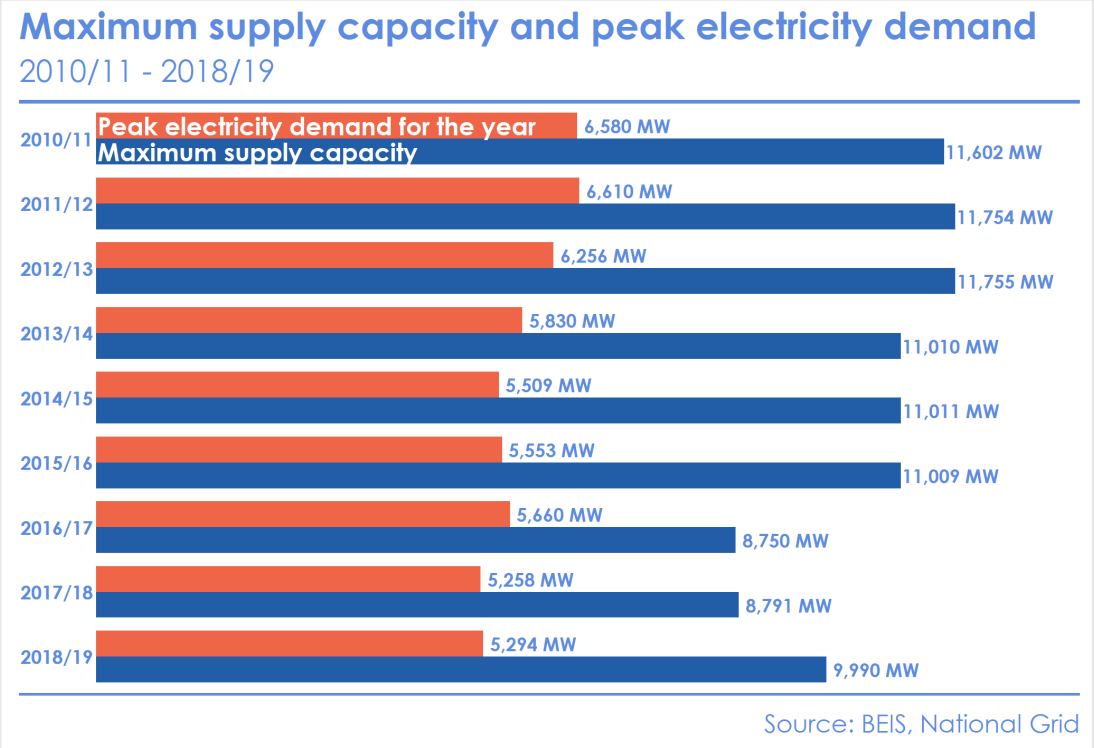
- In Electricity Figure 2, the supply capacity is defined as including dispatchable generation in Scotland (gas, nuclear, hydro and pumped storage) plus the secure import capability from Ireland over the Moyle interconnector, and over the GB transmission system from England and Wales.
- Scotland's electricity system has remained secure in each year in terms of having confidence that we can meet peak demand. Even though Scotland's maximum supply capacity is lower since the closure of Longannet in 2016 there has still been sufficient capacity to cope with peak demand.
- It should be noted that Scotland's wind and solar generation capacity is not included due to its intermittent nature.
- Scottish generation represents approximately 5.6 GW of the maximum supply capacity; the remainder consists of the Moyle Interconnector (500 MW) and other secure imports.

(continued in next box)

(continued from previous box)

- As detailed in our Electricity and Gas Networks: Vision to 2030[2], the Scottish Government will continue to engage with network operators and owners, as well as with Ofgem and the UK Government, to ensure that network investment, innovation and regulation remains sufficient to ensure a secure and resilient transmission network, with stronger interconnectors between Scotland and Europe.

Electricity Figure 2: Maximum supply capacity and peak electricity demand 2010/11-2018/19



IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1 AND 2:

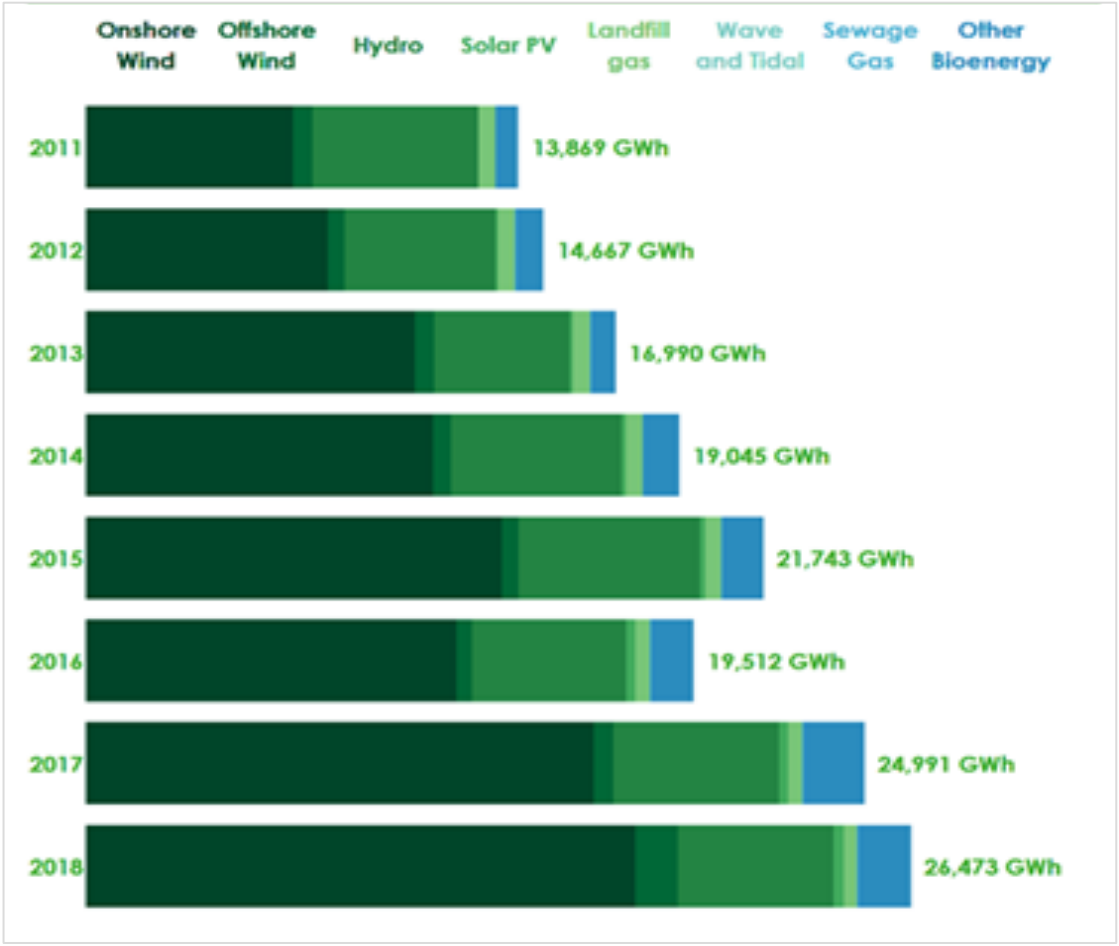
Increase amount of electricity generated from renewable sources in Scotland.

MOST RECENT DATA: 26,473 GWh of renewable electricity generated in 2018.
ANNUAL CHANGE: 1,482 GWh increase in electricity generated from renewable sources from 2017 to 2018.
DATA SOURCE(S): BEIS Energy Trends[3].

COMMENTARY:

- Electricity Figure 3 below shows the levels of electricity generation from renewable sources in Scotland from 2011-2018.
- In 2018, renewable electricity increased 6% on 2017 levels, 2017 having previously been a record breaking year for renewable generation.
- This increase is due to a continued increase in generation from onshore wind. Scotland's wind energy sector saw a record-breaking 2018. In the last year there was a 0.97 GW increase in wind capacity, from both onshore and offshore sources.

Electricity Figure 3: Electricity generated (GWh) from renewable sources, Scotland, 2011-2018



IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1 AND 2:

Increase the installed capacity of sites generating electricity from renewable sources in Scotland. By 2030, it is expected that the installed capacity of renewable electricity generation sources will be between 12GW and 17GW.

MOST RECENT DATA: 11.6 GW of installed capacity at end of June 2019.
PREVIOUS YEAR: 10.5GW of installed capacity at end June 2018.
CHANGE: 1.1 GW increase in installed capacity from June 2018 to June 2019.
DATA SOURCE(S): BEIS Energy Trends[3].

COMMENTARY:

- Installed capacity of renewable generation increased from 10.5 GW to 11.6 GW (10%) between the end of June 2018 and June 2019.
- Operational renewable electricity capacity continues to rise, and as of June 2019 there is 13.0 GW of capacity in the pipeline (albeit not all of these projects will progress to commissioning). 9.1 GW of the current installed capacity is from wind, with offshore wind growing rapidly, primarily due to the Beatrice wind farm becoming operational.
- Although there is a significant number and capacity of renewable projects in the planning pipeline, it is anticipated that recent changes to subsidy schemes for large and small scale renewables will have an impact on the rate at which additional projects will become operational, most notable the closure by the UK Government of the Feed in Tariff to new applicants on 31 March 2019.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1 AND 2:

Increase total community and locally owned renewable energy capacity operational, and in development, in Scotland.

MOST RECENT DATA: 697 MW of community and locally owned renewable energy capacity in June 2018.
PREVIOUS YEAR: 655 MW of community and locally owned renewable energy capacity in June 2017.
CHANGE: 42 MW increase in community and locally owned renewable energy capacity from June 2017 to June 2018.
DATA SOURCE(S): EST Community Energy Report (June 2018)[4].

COMMENTARY:

- An estimated 697 MW of community and locally owned renewable energy capacity was operational in Scotland.
- This is a 6% increase on the operational capacity at June 2017 of 655 MW (this is a revision to the 666 MW reported in the 2018 Climate Change Plan monitoring report).
- The Scottish Government has targets of 1 GW of community and locally owned energy by 2020 and 2 GW by 2030. The estimated operating capacity of 697 MW was 70% and 35%, respectively, towards these new targets.
- The operating capacity resulted from a total of around 18,830 individual renewable energy installations.

Electricity Figure 4: Community and locally owned renewable energy capacity in different stages of development (MW), Scotland, June 2018

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1 AND 2:

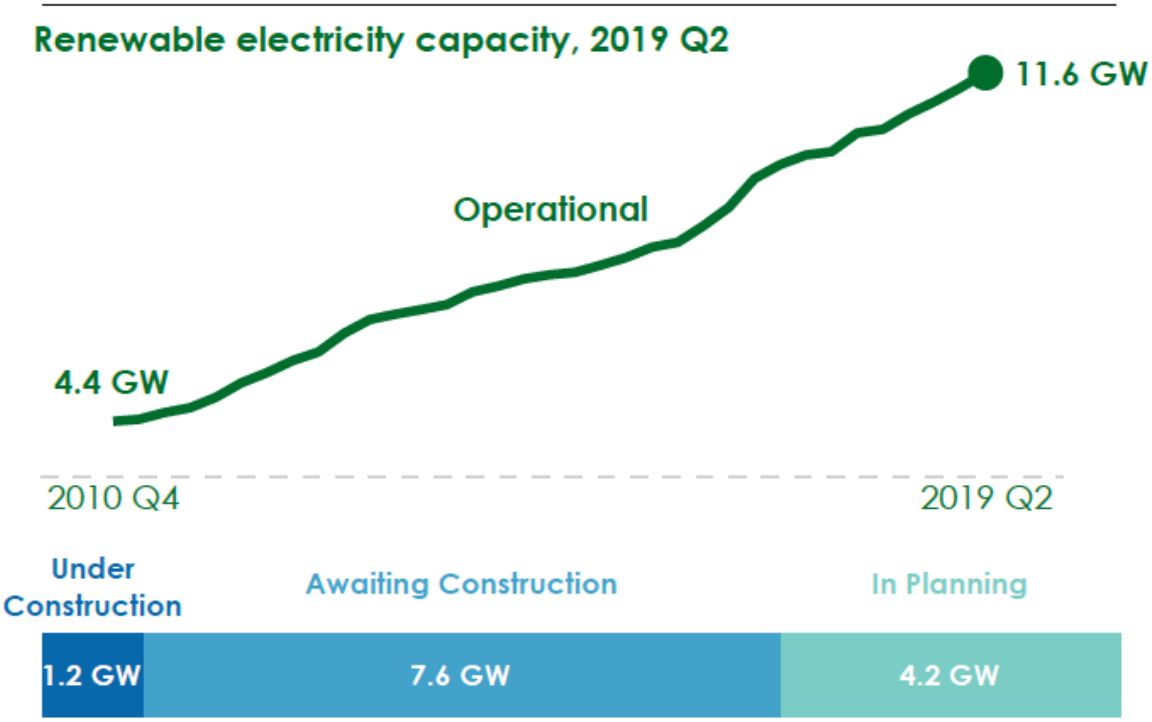
Increase total renewable capacity in Scotland by planning stage.

MOST RECENT INFORMATION: As of June 2019, renewable electricity projects with a capacity of 13.0 GW are in the pipeline, that is consented projects that are in planning, awaiting construction or under construction.
INFORMATION SOURCE(S): Scottish Government Energy Statistics Database[1].

COMMENTARY:

- As of June 2019 there is 13.0 GW of consented renewable electricity projects in the pipeline. This is greater than the 11.6 GW of renewable electricity currently deployed in Scotland.
- Onshore and offshore wind make up over 90% of the capacity in the pipeline, with 1.1 GW under construction and a further 10.9 GW awaiting construction or in planning. Shoreline wave and tidal is the next largest technology, with 0.38 GW awaiting construction or in planning. There is currently 0.02 GW of this technology operational in Scotland.
- If all consented pipeline projects become operational, it is estimated that this could generate approximately 31,500 GWh of renewable electricity annually. However, it is worth noting that it is unlikely that all projects consented in the pipeline will progress to commissioning, and that grid intensity and renewable electricity ambitions remain challenging.

Electricity Figure 5: Renewable Capacity in Scotland by Planning Stage, March 2019



IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1 AND 2:

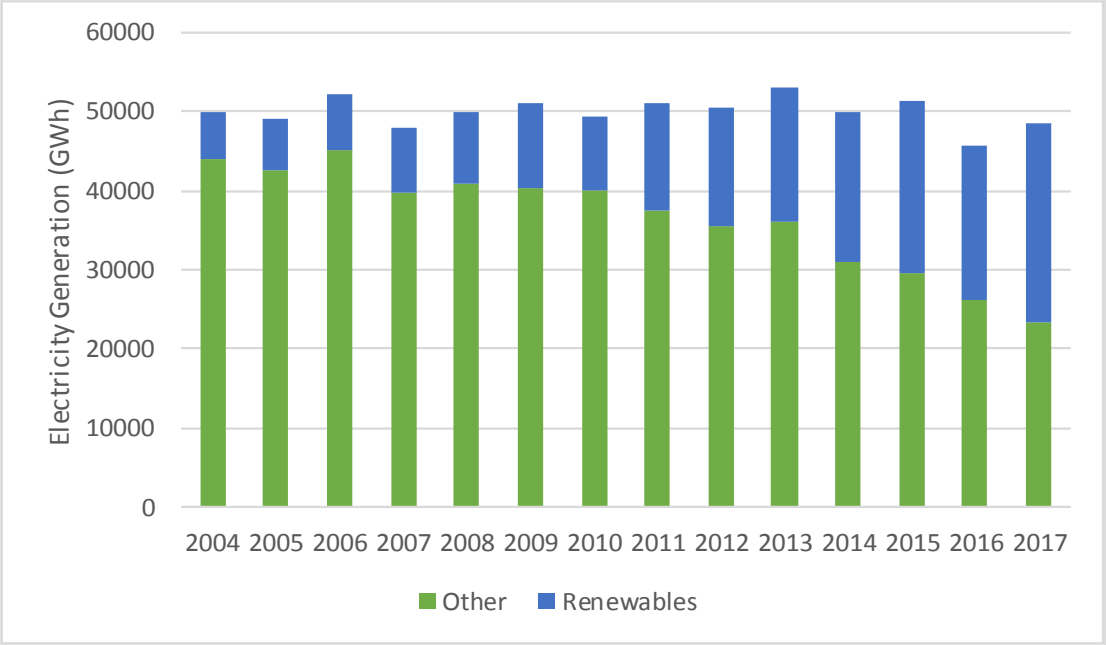
Increase the share of electricity generated from renewable sources, as a proportion of total electricity generated in Scotland.

MOST RECENT DATA: 51.7% of electricity generated from renewable sources in 2017.
PREVIOUS YEAR: 42.8% of all electricity generated in Scotland came from renewable sources in 2016.
CHANGE: 8.9 percentage point increase in proportion of electricity generated from renewable sources from 2016 to 2017.
DATA SOURCE(S): Scottish Government Energy Statistics Database[1].

COMMENTARY:

- Renewable electricity generation in 2017 was 29% higher than 2016 levels, with an overall increase of almost 5,600 GWh. As a result of this, the share of renewables as a proportion of total electricity generated in Scotland increased to 51.7%.
- The largest increase in renewable generation came from wind power, which increased by over 4,500 GWh and makes up almost 35% of total electricity generation alone.
- The total low carbon electricity generation in Scotland is 88% of total electricity generation, compared to 44% in England and Wales.

Electricity Figure 6: Share of Electricity Generated (GWh) by Renewables, 2004 - 2017



BUILDINGS

Buildings

Greenhouse gas emissions from the buildings sector have already been reduced by 16% (1990 to 2017).

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

1. By 2032, the energy intensity of Scotland's residential buildings will fall by 30% on 2015 levels.
2. By 2032, the emissions intensity of residential buildings will fall by at least 30% on 2015 levels.
3. By 2032, non-domestic energy productivity to improve by at least 30% on 2015 levels.
4. By 2032, the emissions intensity of the non-domestic sector will fall by at least 30% on 2015 levels.

The long-term trend shows that the emissions intensity of Scotland's residential buildings has fallen by 34% between 1998-2017, while energy intensity in the residential sector has fallen by 26% between 2005 and 2017. The energy productivity of the non-domestic (services) sector is falling, as energy consumption starts to increase. Emissions intensity has fallen by 34% between 1998 and 2017.

The Energy Efficient Scotland Route Map was published in May 2018. By 2040, Energy Efficient Scotland will have transformed our buildings so that they are warmer, greener and more efficient and we are putting in place a framework of standards to make it the norm to invest in energy efficiency.

We have recently consulted on whether Energy Efficient Scotland could be accelerated and how this could be achieved in line with a Just Transition and responses are being analysed. We will consider the responses with our partners in local government, and will publish an analysis report on the consultation by the end of the year.

Further details will be provided next year around the assessment of properties under Energy Efficient Scotland, the implementation of recommendations concerning quality assurance and skills and supply chain and the delivery mechanism.

Existing Home Energy Efficiency Programmes will continue under Energy Efficient Scotland and further details of our offers of support to the owner occupied sector will also be outlined next year.

OUTPUT INDICATOR FOR POLICY OUTCOME 1:

Change in energy intensity of residential buildings from 2015.

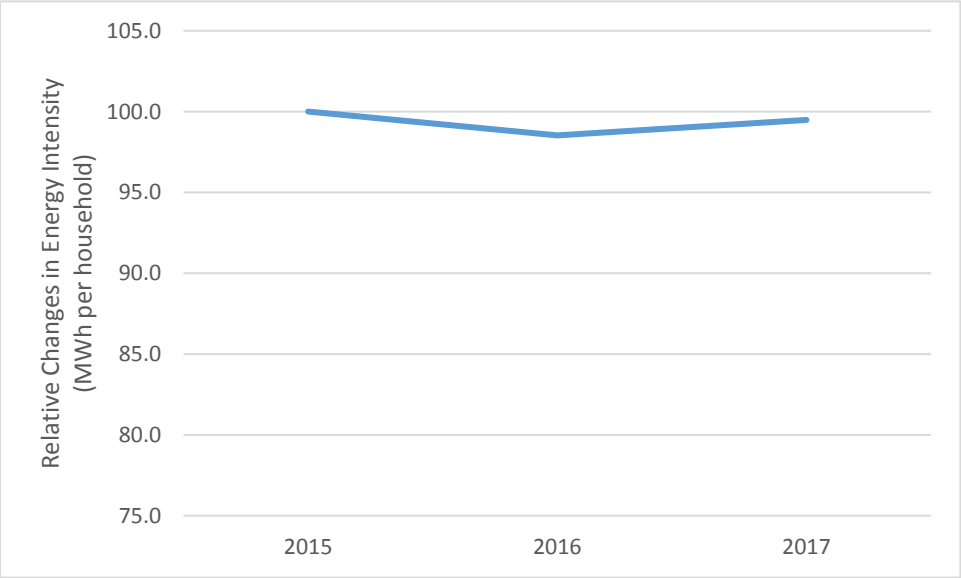
	2020	2025	2032
Change in energy intensity from 2015	-10%	-17%	-30%

MOST RECENT DATA: 18.2 MWh per household in 2017.
BASELINE DATA: 18.3 MWh per household in 2015.
CHANGE: 0.9% reduction in energy intensity between 2015 and 2017.
DATA SOURCE(S): Scottish Government Energy Statistics Database[1].

ON TRACK: Too early to make assessment as latest data available is for 2017.

COMMENTARY:

Buildings Figure 1 - Relative Changes in Energy Intensity of Residential buildings (MWh per household), 2015 to 2017 (2015=100)



Energy intensity of residential buildings has fallen 0.9% between 2015 and 2017. It has fallen by 23.7% since the first available consumption data in 2005. This decrease over time is due to both a general trend of decreasing energy consumption and increasing household numbers.

OUTPUT INDICATOR FOR POLICY OUTCOME 2:

Change in emissions intensity of residential buildings from 2015.

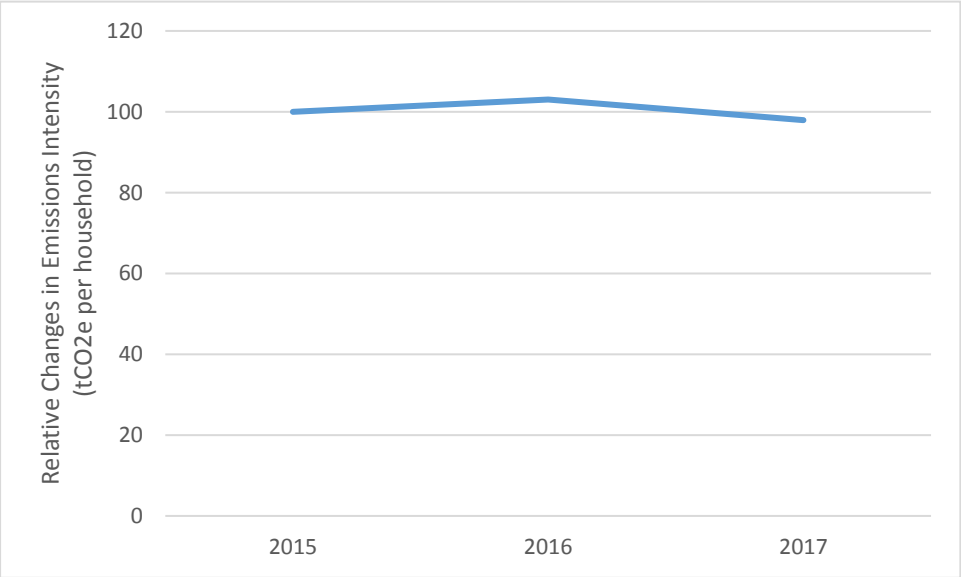
	2020	2025	2032
Change in emissions intensity from 2015	-5%	-13%	-30%

MOST RECENT DATA: 2.45 tCO_2e per household in 2017.
BASELINE DATA: 2.51 tCO_2e per household in 2015.
CHANGE: 2.1% decrease in emissions intensity between 2015 and 2017.
DATA SOURCE(S): Scottish Greenhouse Gas Emissions (Scottish Government)[2]; Estimates of households and dwellings in Scotland, 2018 (NRS)[3].

ON TRACK: Too early to make assessment as latest data available is for 2017.

COMMENTARY:

Buildings Figure 2 - Relative Changes in Emissions Intensity of Residential buildings (tCO_2e per household), 2015 to 2017 (2015=100)



Between 2015 and 2017 emissions intensity in the residential sector fell by 2.1%. Although it varies annually, mainly driven by fluctuating external temperatures, residential emissions intensity has fallen 34% between 1998 and 2017.

OUTPUT INDICATOR FOR POLICY OUTCOME 3:

Change in non-domestic (services) energy productivity from 2015.

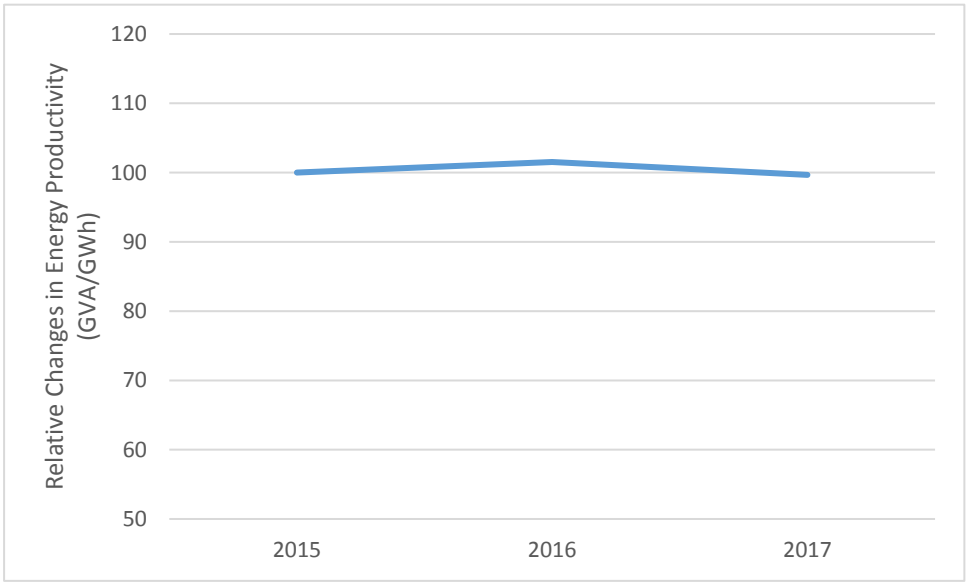
	2020	2025	2032
Change in energy productivity from 2015	10%	20%	30%

MOST RECENT DATA: £3.37 million Gross Value Added (GVA) per GWh in 2017.
BASELINE DATA: £3.38 million GVA per GWh in 2015.
CHANGE: £0.01 million GVA per GWh reduction in energy productivity from 2015 to 2017.
DATA SOURCE(S): Scottish Government Energy Statistics Database[1].

ON TRACK: Too early to make assessment as latest data available is for 2017.

COMMENTARY:

Buildings Figure 3 - Relative Changes in Energy Productivity (GVA/GWh), 2005 to 2017 (2015=100)



Energy productivity in the services sector increased by 1.5% between 2015 and 2016, and then decreased by 1.8% between 2016 and 2017. Even though GVA in the services sector increased by 0.8% between 2016 and 2017, consumption increased by 2.6%, hence the decrease in productivity.

OUTPUT INDICATOR FOR POLICY OUTCOME 4:

Change in emissions intensity of non-domestic sector from 2015.

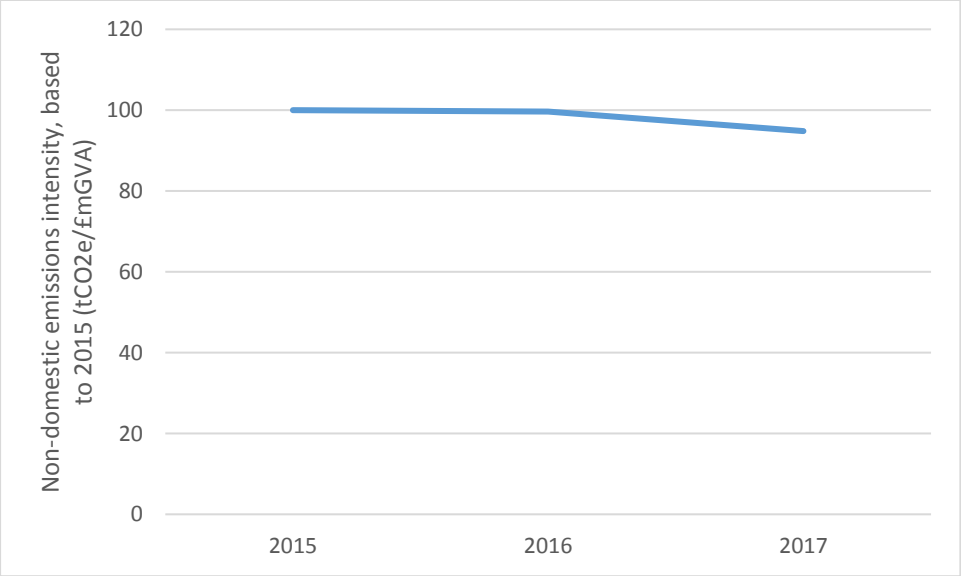
	2020	2025	2032
Change in emissions intensity from 2015	-10%	-20%	-30%

MOST RECENT DATA: 36.2 million tonnes of CO_2e per £million GVA in 2017.
BASELINE DATA: 38.2 $MtCO_2e$ per £million GVA in 2015.
CHANGE: 5.2% reduction in emissions intensity from 2015 to 2017.
DATA SOURCE(S): Scottish Government Energy Statistics Database[1].

ON TRACK: Too early to make assessment as latest available data is for 2017.

COMMENTARY:

Buildings Figure 4 - Relative Changes in Emissions Intensity (tCO_2e/£ millions), 2015-2017, (2015=100)



Emissions intensity fell by 5.2% between 2015 and 2017. Between 1998 and 2017 emissions intensity fell by 34%, as a result of an underlying 7% fall in emissions and a 41% increase in GVA (2016 prices).

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3 AND 4:

Average energy efficiency levels of domestic buildings increases.

MOST RECENT DATA: Average energy efficiency rating (SAP 2012) of 64.3 in 2017.
BASELINE DATA: Average energy efficiency rating (SAP 2012) of 62.8 in 2015.
CHANGE: +1.5 SAP points between 2015 and 2017.
DATA SOURCE(S): Scottish House Condition Survey[4].

Energy efficiency ratings are calculated under two versions of Standard Assessment Procedure (SAP), the SAP 2009 methodology and the most recent SAP 2012 methodology. Using SAP 2009 enables us to examine the trend in the energy efficiency of the housing stock since 2010. SAP 2012 was first used in reporting data from the Scottish House Condition Survey in the 2014 Key Findings Report and therefore only four years of data are available.

COMMENTARY:
An increase in the average energy efficiency of domestic buildings will contribute to reducing energy intensity and emissions intensity in the residential sector.

We are able to explore long-term improvements in the average energy efficiency of the Scottish housing stock using SAP 2009. Over the period 2010 to 2017, the average energy efficiency rating increased from 59.9 to 65.6. This highlights that Scottish housing is gradually moving up through the Energy Performance Certificate bands.

The data presented for this indicator are the mean energy efficiency rating. The median rating in 2017 was 67 (SAP 2012) indicating that half of the housing stock has an energy efficiency rating of 67 or better. Based on SAP 2009, we can also see that the median rating has improved over time, increasing from 62 in 2010 to 68 in 2017.

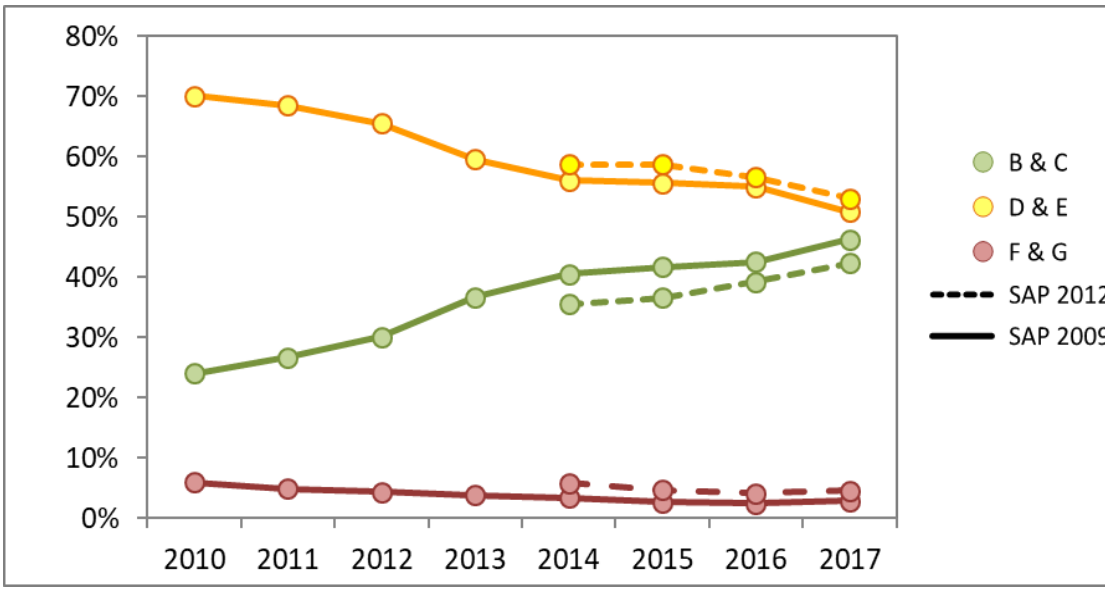
IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3 AND 4:

Grouped domestic energy efficiency ratings improve.

MOST RECENT DATA: 42% of dwellings rated as EPC band C (SAP 2012) or better in 2017.
BASELINE DATA: 37% of dwellings rated as EPC band C (SAP 2012) or better in 2015.
CHANGE: 6 percentage point increase between 2015 and 2017 in the percentage of dwellings rated as EPC band C or better.
DATA SOURCE(S): Scottish House Condition Survey[4].

COMMENTARY:

Buildings Figure 5 - Grouped EPC Bands under SAP 2009 and SAP 2012, 2010-2017



There has been a statistically significant increase in the proportion of homes whose EPC rating is at least band C from the 2015 baseline.

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 46% in 2017 (as measured under SAP 2009), and 35% in 2014 to 42% in 2017 (as measured under SAP 2012).

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.

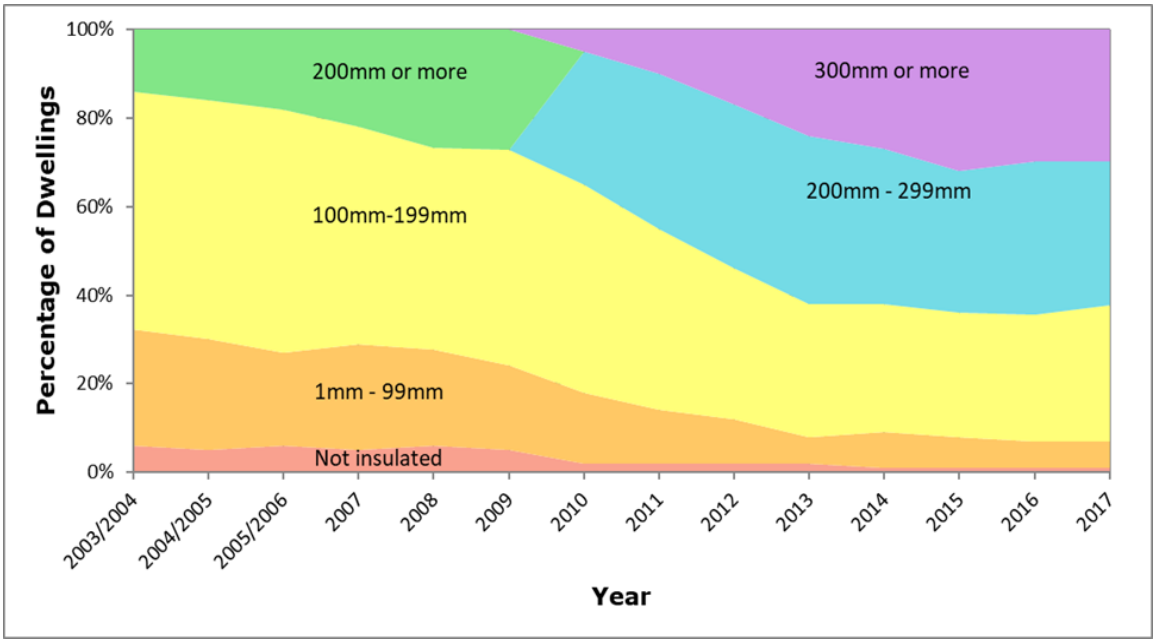
IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3 AND 4:

Percentage of domestic properties with loft and wall insulation increases.

MOST RECENT DATA: 63% of lofts had at least 200mm of loft insulation while 60% of dwellings had wall insulation (cavity or solid) in 2017.
BASELINE DATA: 64% of lofts had at least 200mm of loft insulation while 56% of dwellings had wall insulation (cavity or solid) in 2015.
CHANGE: No statistically significant difference in the proportion of lofts that had at least 200mm of loft insulation between 2015 and 2017. There is a statistically significant increase in the proportion of dwellings that have solid or cavity wall insulation from 2015 to 2017.
DATA SOURCE(S): Scottish House Condition Survey[4].

COMMENTARY:

Buildings Figure 6 - Depth of Loft Insulation (where applicable) 2003/2004 - 2017



An increase in insulation levels will contribute to reducing energy and emissions intensity in the residential sector. Existing HEEPS Area Based Schemes and Warmer Homes Scotland continue to fund and support insulation measures including solid wall insulation contributing to reduced energy demand and emissions in the domestic sector.

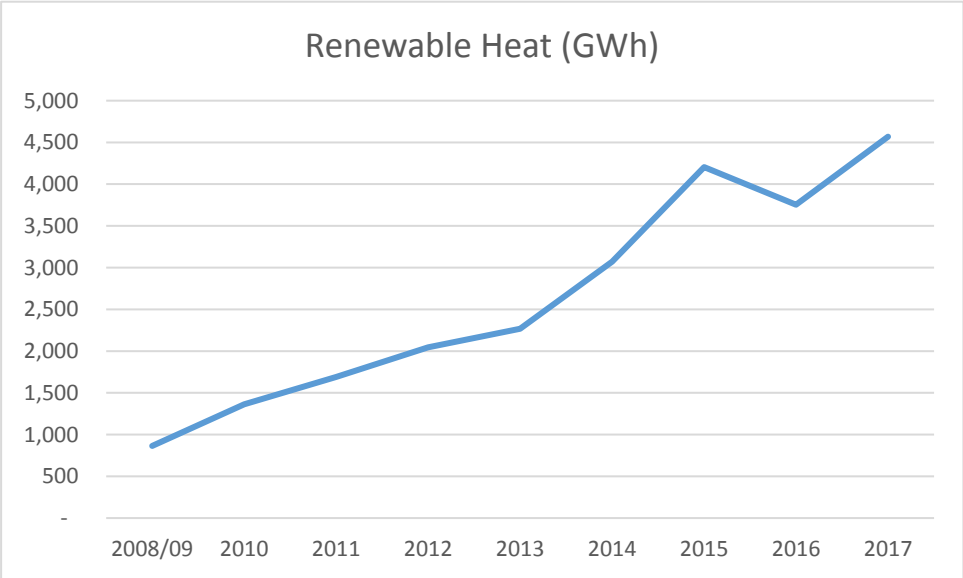
IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3 AND 4:

Total renewable heat generation in Scotland increases.

MOST RECENT DATA: 4,569 GWh renewable heat generated in 2017.
BASELINE DATA: 4,205 GWh renewable heat generated in 2015.
CHANGE: 364 GWh (8.7%) increase in renewable heat generated from 2015 to 2017.
DATA SOURCE(S): Scottish Government Energy Statistics Database[1].

COMMENTARY:

Buildings Figure 7 - Renewable Heat Generation (GWh) - 2010 to 2017



Renewable heat output decreased from 4,205 GWh in 2015 to 3,753 GWh in 2016, and this was attributed to changes at a small number of large sites. Between 2016 and 2017, renewable heat output rose to its highest level to date, 4,569 GWh. This is due to increased generation from existing large commercial sites.

Biomass continues to dominate renewable heat generation; with 74% of all renewable heat from biomass primary combustion and biomass combined heat and power. In 2016 and 2017 growth in primary combustion was higher than growth in CHP.

An increase in the level of renewable heat generation will contribute to reducing the carbon intensity of Scotland's heat generation in both the domestic and non-domestic sector.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3 AND 4:

Installed capacity of non-domestic Renewable Heat Incentive (RHI) increases.

MOST RECENT DATA: 985 MW of accredited capacity under the non-domestic RHI between November 2011 and August 2019.
BASELINE DATA: 250 MW of accredited capacity under the non-domestic RHI between November 2011 and February 2015.
CHANGE: There was an additional 735 MW of accredited capacity of renewable heat receiving payment under the non-domestic RHI between February 2015 and August 2019. It increased by 92 MW between August 2018 and August 2019.
DATA SOURCE(S): BEIS Renewable Heat Incentive statistics[5].

COMMENTARY:
Capacity of accredited non-domestic RHI installations have steadily increased from February 2015. Capacity has almost quadrupled from this period to August 2019. There are 3,753 accredited full applications by August 2019.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3 AND 4:

Amount of renewable heat paid for under the domestic RHI scheme in Scotland increases.

MOST RECENT DATA: 872 GWh of heat had been paid for between April 2014 and end June 2019 under the domestic RHI scheme in Scotland.
BASELINE DATA: Between April 2014 and end September 2016 around 276 GWh of heat had been paid for under the domestic RHI scheme in Scotland.
CHANGE: An additional 596 GWh of renewable heat was paid for between October 2016 and June 2019.
DATA SOURCE(S): Scottish Government Energy Statistics Database[1].

COMMENTARY: Two thirds of all heat generated and paid for under the domestic RHI scheme from April 2014 to June 2019 was from biomass systems, with air source heat pumps making up a quarter of heat generated.

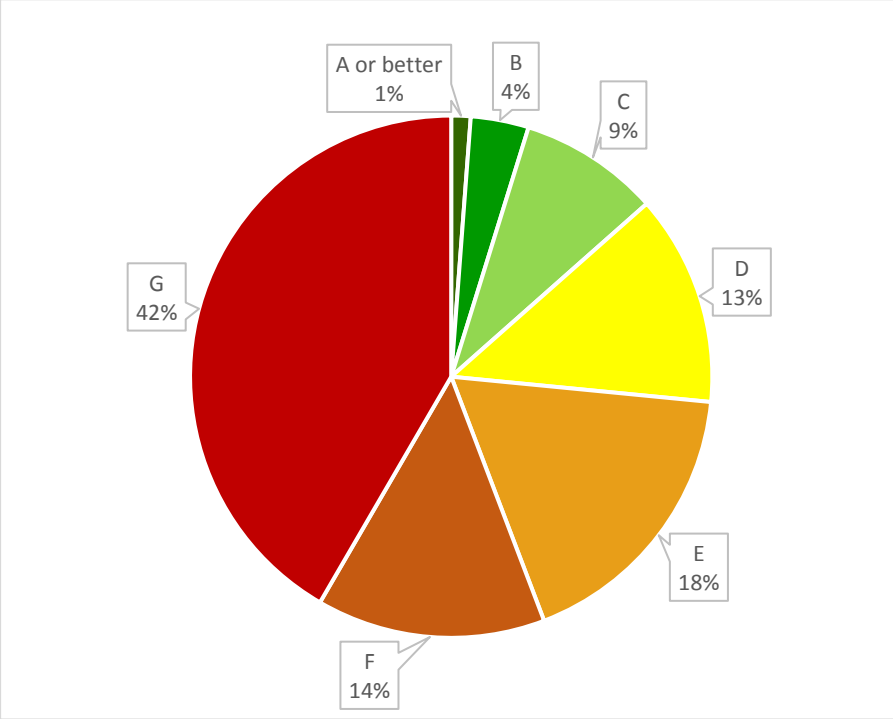
IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3 AND 4:

Further analysis to establish a baseline for non-domestic buildings' energy efficiency and emissions data.

BASELINE DATA: It is estimated that almost three in four of all non-domestic premises have a current EPC band of E or worse with 5 percent banded B or better.
SOURCE: Scotland's non-domestic energy efficiency baseline, Scottish Government[6].

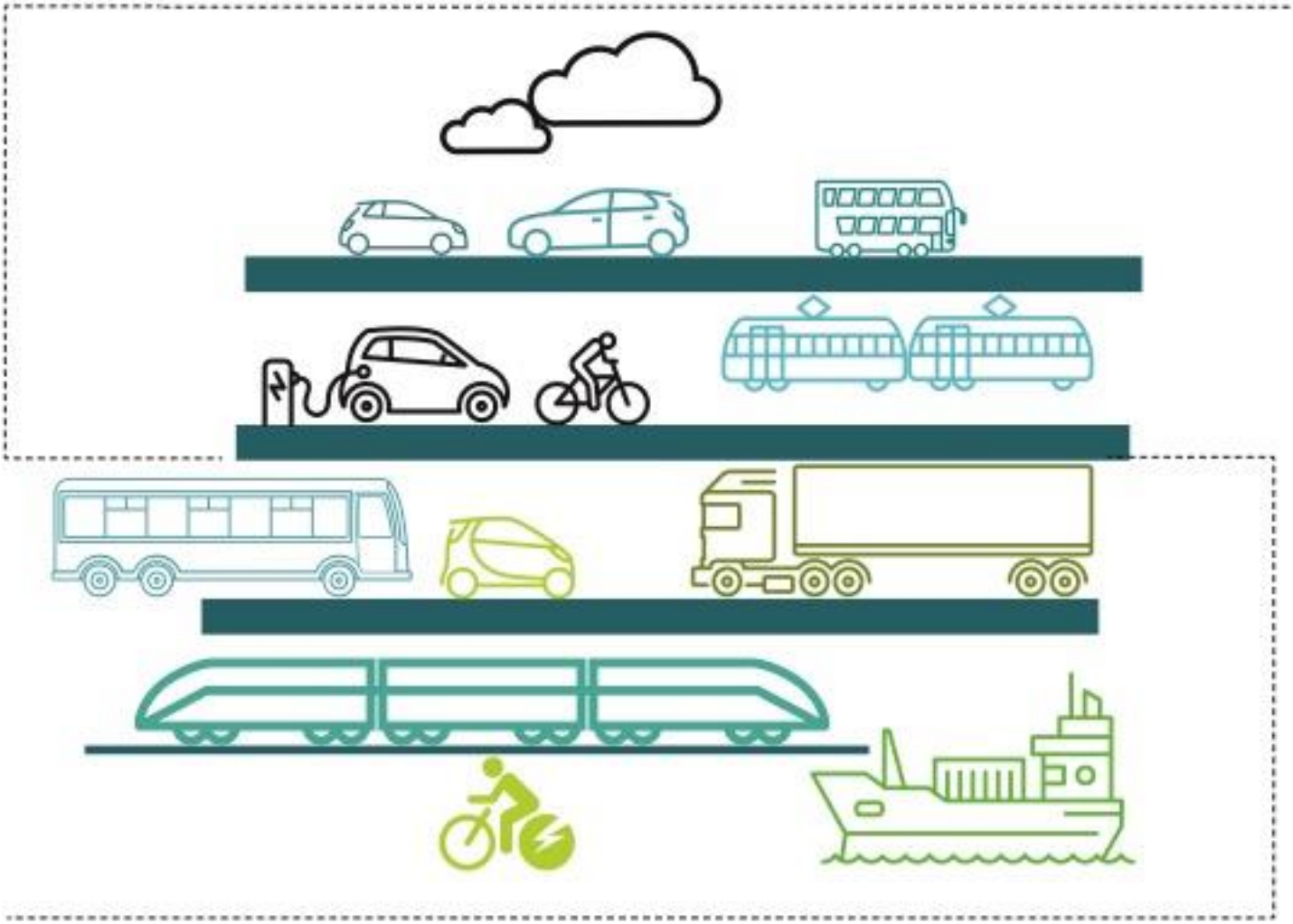
COMMENTARY:

Buildings Figure 8 - Non-domestic premises by current EPC band



EPC bands present the calculated greenhouse gas emissions for buildings on a scale from A to G. The underlying rating therefore reflects the energy efficiency of building elements (e.g. building fabric), the types of fuel used and heating, lighting and ventilation demand standardised by a combination of building type and activity.

TRANSPORT



Transport

In 2017, total Scottish transport emissions, including international aviation and shipping, were 0.4% above the 1990 Baseline year.

The Plan sets out the following eight policy outcomes for the sector:

1. Average emissions per kilometre of new cars and vans registered in Scotland to reduce in line with current and future EU/UK emissions standards.

2. Proportion of ultra-low emission new cars and vans registered in Scotland annually to reach 100% by 2032.

3. Average emissions per tonne kilometre of road freight to fall by 28% by 2032.

4. Proportion of the Scottish bus fleet which are low emission vehicles has increased to 50% by 2032.

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

6. Proportion of ferries in Scottish Government ownership which are low emission has increased to 30% by 2032.

7. We will have electrified 35% of the Scottish rail network by 2032.

8. Proportion of domestic passenger journeys travelled by active travel modes has increased by 2032, in line with our Active Travel Vision, including the Cycling Action Plan for Scotland Vision that 10% of everyday journeys will be by bike by 2020.

Our draft National Transport Strategy (NTS) - *protecting our climate and improving lives* - sets the direction for transport over the next 20 years. The draft strategy reflects the global climate emergency and the role of transport in delivering net-zero emissions by 2045 and has ‘taking climate action’ as one of four priorities. Decarbonising transport was also at the heart of this year’s Programme for Government with commitments to decarbonise all scheduled flights between airports within Scotland by 2040 and decarbonise rail services by 2035.

Chapter 3: Transport

The transition to zero emission vehicles will reduce carbon emissions from transport significantly and we have already set out a bold ambition to phase out the need for new petrol and diesel cars and vans by 2032, eight years ahead of the UK Government. It is too early to assess whether we are on track to meet this commitment but we are seeing substantial growth in the number of ultra-low emission vehicles (ULEVs) registered in Scotland each year. The increasing number of charge points will aid the pursuit of this ambition as will our support for public sector fleets and interest free loans for businesses and individuals. Since 2012, the Scottish Government has offered £30 million in grant funding to all 32 of Scotland's Local Authorities, to establish a comprehensive and fully integrated charging network, including over 1,000 publicly available charge points. Our Switched on Fleets programme has delivered more than £13 million to public bodies for zero or ultra-low emissions vehicles, and in the latest Programme for Government, we committed to create the conditions to support the decarbonisation of all public sector fleets by 2030.

To create successful places in the future we also need to manage the demand for travel to address the effects of continued single occupancy car dependency which leads to urban sprawl, inactive lifestyles and congestion. The NTS further reinforces the Sustainable Travel Hierarchy in decision making, promoting walking, wheeling[7], cycling and shared transport options in preference to single occupancy private car use. We are already investing over £1 billion per year in public and sustainable transport to encourage people onto public transport and active travel modes and in this year's Programme for Government committed to bring forward transformational long term funding for improved bus priority infrastructure of over half a billion pounds.

Progress towards achieving the majority of the transport indicators in this report will accelerate as we approach 2032. This is particularly the case as emerging technologies, underpinned by a range of behaviour change approaches, work through the system. As a result it is too early to make an assessment on the majority of indicators.

[7] Wheeling: refers to travelling by wheelchair.

OUTPUT INDICATOR FOR POLICY OUTCOME 1:

Average emissions of new cars registered in Scotland have continued to reduce in line with EU/UK standards.

	2018	2019	2020	2021
Total change in average gCO_2e/ km (cars)	**107**	**103**	**99**	**95**

MOST RECENT DATA: 120.2gCO_2e / km for new cars registered in 2017.
BASELINE DATA: 164.4 gCO_2e / km for new cars registered in 2006.
CHANGE: Change of 44.4 gCO_2e / km for new cars registered from 2006 to 2017.
DATA SOURCE(S): Scottish Transport Statistics[1].

ON TRACK: Too early to make assessment as latest data available is for 2017.

COMMENTARY:
The average CO_2 emissions from newly registered cars have been steadily falling for the past decade. However, for the first time, in 2017 there was a very small increase compared to 2016. Department for Transport's vehicle licensing statistics (UK level) suggest that one of the many contributing factors to this increase is an increase in the proportion of larger cars being registered with higher emissions.

EU legislation sets mandatory emission reduction targets for new cars. By 2021, phased in from 2020, the fleet average to be achieved by all new cars is 95gCO_2/km. More years of data are needed before we can make assessment of whether we are on track to meet this EU target. The table above outlines a simplistic linear prediction for meeting the 2021 target, however, progress might not necessarily be linear - some years might see greater reductions in average CO_2 emissions than others as manufacturers bring more efficient models to the market. It is expected that all major manufacturers will begin adding hybrid systems to their standard offers to reduce their emissions and meet the European CO_2 targets.

OUTPUT INDICATOR FOR POLICY OUTCOME 1:

Average emissions of new vans registered in Scotland have continued to reduce in line with EU/UK standards.

	2018	2019	2020	2021
Total change in average gCO_2e/ km (vans)	165	156	147	-

MOST RECENT DATA: 167.9 gCO_2e / km for new vans registered in 2017.
BASELINE DATA: 188.4 gCO_2e / km for new vans registered in 2012.
CHANGE: Change of 20.5 gCO_2e / km for new vans registered from 2012 to 2017.
DATA SOURCE(S): Department for Transport vehicle statistics[2].

ON TRACK: Too early to make assessment as latest data available is for 2017.

COMMENTARY:
CO_2 data for light goods vehicles only started being recorded in earnest in 2012, so only 5 years of data are available, compared to over ten years of CO_2 data for cars. Average CO_2 emissions in Scotland for new light goods vehicles registrations has fallen by 20.5 gCO_2e from 2012 to 2017 and 8.3 gCO_2e from 2016 to 2017.

EU legislation sets CO_2 emission targets for new vans sold on the European market. For 2020, the target is 147gCO_2/km – 19% less than the 2012 average. It is too early to make an assessment of whether we are on track to meet this EU target until more years of data are available. The table above outlines a simplistic linear prediction, however, progress might not necessarily be linear - some years might see greater reductions in average CO_2 emissions than others.

OUTPUT INDICATOR FOR POLICY OUTCOME 1:

Annual share of biofuels as a percentage of total petrol and diesel sales in the UK.

	2018	2019	2020	2021
Biofuels as % of total petrol and diesel sales	n/a	n/a	n/a	n/a

MOST RECENT DATA: 3.1% of total transport fuel (road and non-road mobile machinery) is made up of biofuels in 2017-18 (latest full UK dataset).
DATA SOURCE(S): Department for Transport's RTFO statistical release – March 2019[3].

ON TRACK: Insufficient Data.

COMMENTARY:
The Renewable Transport Fuel Obligation (RTFO) is a key UK Government policy instrument for reducing greenhouse gas emissions from vehicles by encouraging the production and use of sustainable biofuels. Under RTFO, suppliers of transport (and non-road mobile machinery) fuel in the UK (of >450,000 litres p/a - fossil or bio), must be able to show that a percentage of the fuel they supply comes from renewable and sustainable sources.

New targets were set for the RTFO in April 2018, where the percentage of fuels obligated to be derived from renewable sources increased. From January 2019, this percentage will rise to 8.50% and continue to increase up to 12.40% by 2032. Further changes include:

- setting an additional target for advanced waste-based renewable fuels, starting at 0.1% in 2019 and rising to 2.8% in 2032
- setting a sustainable level for crop biofuels, an initial maximum cap of 4% of fuel in 2018, reducing annually from 2021 to reach 3% in 2026 and 2% in 2032
- bringing renewable aviation fuels and renewable fuels of non-biological origin into the scheme.

We have indicated there is insufficient data to monitor this indicator as no separate reporting mechanism exists for biofuel sales in Scotland. We are therefore unable to monitor how Scotland compares to the UK in terms of the proportion of road transport renewable fuel.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Average emissions per kilometre of cars and vans registered in Scotland.

MOST RECENT DATA: Average emissions of 139.1 g CO_2e / km for cars in 2017. Robust data on the average emissions for all vans registered is not available.

DATA SOURCE(S): Scottish Transport Statistics[1].

COMMENTARY:
Average CO_2 emissions for all cars registered (licensed) in Scotland have been continuously falling over the past decade and fell by 2.3% from 2016 to 2017. CO_2 data for light goods vehicles (vans) only started being recorded in earnest in 2012 meaning robust data on the average emissions for all vans registered (i.e. the stock) is not available.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

The outcome of changes in Vehicle Exercise Duty at each budget.

MOST RECENT INFORMATION:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/800502/vehicle-licensing-statistics-2018.pdf.

INFORMATION SOURCE(S): Department for Transport vehicle licensing statistics[4].

COMMENTARY:
Cars with lower carbon dioxide emissions fall in cheaper Vehicle Excise Duty (VED) bands. From April 2017, the VED bands for new cars changed to require much smaller CO_2 emissions to be in the lower bands, whilst making the higher bands larger.

A range of factors, including VED, contribute to the improving average emissions of newly registered cars, however, it is not possible to isolate the impact of just VED.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Negotiations regarding biofuels are ongoing within the context of an EU framework. Scotland has engaged in the development of the approach.

MOST RECENT INFORMATION: The UK Government's Renewable Transport Fuel Obligation (RTFO)[5].
INFORMATION SOURCE(S): Transport Scotland.

COMMENTARY:
Following consultation with wider stakeholders (including the devolved administrations), the UK Government made changes to RTFO in 2018. These comprised:

- increasing the biofuels volume target from the former 4.75% to 9.75% in 2020, and 12.4% in 2032;
- setting an additional target for advanced waste-based renewable fuels, starting at 0.1% from 2019 and rising to 2.8% in 2032;
- setting a sustainable level for crop biofuels, from an initial maximum cap of 4% of fuel in 2018, reducing annually from 2021 to reach 3% in 2026 and 2% in 2032;
- bringing renewable aviation fuels and "renewable fuels of non-biological origin" into the scheme.

The changes mean a more challenging target, with higher biofuels use, and changes to address previous concerns on the sustainability of biofuels being promoted; the arrival of new fuel types; and the scheme's expansion to wider fuel sub-sectors.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Number of individuals and organisations who have completed fuel efficient driver training.

MOST RECENT DATA: 1080 individuals and 42 organisations completed training in 2017-18.
DATA SOURCE(S): Energy Saving Trust[6].

COMMENTARY:
Fuel Good driver training is a driver training scheme established to help Scottish businesses and their employees save on fuel costs and reduce carbon emissions. Since 2011 more than 17,000 individuals and 400 organisations have completed the training. The number of organisations and individuals who completed training was slightly lower in 2017-18 than 2016 -17.

OUTPUT INDICATOR FOR POLICY OUTCOME 2:

Percentage of grant funding for charge points utilised each year.

MOST RECENT DATA: 94% of grant funding for charge points was utilised in Financial Year 2018-19.

DATA SOURCE(S): Transport Scotland[7].

ON TRACK: Too early to make assessment.

COMMENTARY:
Local Authorities and the Energy Saving Trust aim to utilise 100% of the grant funding made available by Transport Scotland for installing charging points. It is too early to assess whether we are on track to meet our commitment to phase out the need for petrol and diesel cars and vans by 2032 but this increasing investment in charging infrastructure will aid the pursuit of this ambition.

OUTPUT INDICATOR FOR POLICY OUTCOME 2:

Percentage of charge point installs completed each year.

MOST RECENT DATA:
136 charge point installs completed by Local Authorities in 2018-19.
134 workplace installs completed by the Energy Saving Trust in 2018-19.
1,251 domestic installs in 2018-19.

DATA SOURCE(S): Transport Scotland / ChargePlace Scotland and Energy Saving Trust[7].

ON TRACK: Too early to make assessment.

COMMENTARY:
Drivers of EVs in Scotland benefit from a comprehensive charge point network through Charge Place Scotland. There are currently more than 1,000 publicly available charge points on the Charge Place Scotland network, including over 250 (50kWh) Rapid charge points.

It is too early to assess whether we are on track to meet our commitment to phase out the need for petrol and diesel cars and vans by 2032 but increasing number of charge points will aid the pursuit of this ambition.

OUTPUT INDICATOR FOR POLICY OUTCOME 2:

Annual utilisation of the Charge Place Scotland network.

MOST RECENT INFORMATION: In 2018 the Charge Place Scotland network was used over 590,590 times by over 10,300 users, up 39% from 424,865 in 2017.

INFORMATION SOURCE(S): Transport Scotland / ChargePlace Scotland[7].

ON TRACK: Too early to make assessment.

COMMENTARY:
There are been a year on year increase in the annual utilisation of the ChargePlace Scotland network. It is too early to assess whether we are on track to meet our commitment to phase out the need for petrol and diesel cars and vans by 2032 but the increasing utilisation of the charge point network reflects the increasing number of EV owners.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 2:

Percentage of grant funding for publically available charge point installations that is utilised each financial year.

MOST RECENT DATA: 100% of the grant funding in 2018-19 was utilised**.**

DATA SOURCE(S): Transport Scotland[7].

COMMENTARY:
£8.5 million of grant funding is available to Local Authorities for the financial year 2019-20. This funding is for the installation of publically available charge points and for the installation of workplace charge points for local authority fleet vehicles.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 2:

Percentage of grant funding for domestic/workplace charge point installations that is utilised each financial year.

MOST RECENT DATA: 96% of grant funding available for domestic/workplace charging was utilised in 2018-19.

DATA SOURCE(S): Energy Saving Trust[7].

COMMENTARY:
This year (2019-20), £2 million of grant funding is available for domestic, non-public workplace and publicly-available charge points.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 2:

Percentage of publically available charge point installs that are completed each financial year.

MOST RECENT DATA: Over 200 publicly available charge points were commissioned on the ChargePlace Scotland network in 2018-19.

DATA SOURCE(S): ChargePlace Scotland[7].

COMMENTARY:
The ChargePlace Scotland network has grown steadily since its inception in 2013 from 55 to its current level of over 1,000 publicly available charge points. Growth is steadily increasing, last financial year over 200 publicly available charge points were installed on the network and in financial year 2019-2020, we anticipate in the region of a further 300 being added.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 2:

Percentage of domestic/workplace charge point installs that are completed each financial year.

MOST RECENT DATA: 134 workplace and 1,251 domestic charge point installations completed in 2018-19.

DATA SOURCE(S): Energy Saving Trust, ChargePlace Scotland[7].

COMMENTARY:
134 workplace charge points were installed in 2018-2019, up from 123 installations in 2017-18.

1,251 domestic charge points were installed in 2018-2019, up from 1,024 installations in 2017-18.

OUTPUT INDICATOR FOR POLICY OUTCOME 3:

Average emissions of HGVs per tonne kilometre.

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total emissions (gCO_2e) per tonne kilometre of Road Freight Index 2017 = 100	98	96	94	92	91	89	87	85	83	81	79	78	76	74	72

MOST RECENT DATA: Average emissions of 725 gCO_2e per vehicle kilometre from HGVs in 2017.
DATA SOURCE(S): Scottish Transport Statistics[1] and the Carbon Account for Scotland[8].

ON TRACK: Too early to make assessment as latest data available is for 2017.

COMMENTARY:
The Climate Change Plan indicator doesn't take account of vehicle kilometres travelled with empty loads, and we have therefore reported on HGV emissions per vehicle kilometre in place of emissions per *tonne* kilometre of goods moved as this is a more stable indicator for measuring decarbonisation of HGVs.

The latest data available is for 2017 so we cannot yet establish whether average emissions have fallen by 2% from 2018 to 2017. We have therefore simply reported the average emissions per vehicle kilometre from HGVs in 2017 as the most recent data.

OUTPUT INDICATOR FOR POLICY OUTCOME 3:

Report on the number of ECO Stars member organisations and impact on emissions and fuel savings.

MOST RECENT DATA:

- 320 ECO Stars commercial vehicle members in Scotland as of August 2019.
- 12 live local authority ECO Stars schemes in Scotland as of August 2019.

MOST RECENT INFORMATION: Specific fuel savings are not recorded directly so only able to report on member numbers.

DATA / INFORMATION SOURCE(S): Transport Research Laboratory, who are responsible for ECO Stars delivery[9].

ON TRACK: Insufficient Data.

COMMENTARY:

ECO Stars is a recognition and advice scheme, making suggestions for sustainable operational practice and fleet choices. Operators are not required to submit fuel usage information as part of their application, and as such these data are not currently recorded. Specific fuel savings and emissions reductions are therefore not possible to estimate as a direct result of ECO Stars membership. Success and impact of the scheme is focussed on recruitment of new members and continued engagement with existing members. There are no defined recruitment targets for ECO Stars membership, however, there has been good uptake rates with scheme geographic coverage continuing to grow. There are now 320 members in Scotland, up from 258 last year.

OUTPUT INDICATOR FOR POLICY OUTCOME 3:

Report qualitatively against the actions outlined in the Rail Freight Strategy.

MOST RECENT INFORMATION: The Rail Freight strategy was published in 2016[10].
INFORMATION SOURCE(S): Transport Scotland.

ON TRACK: Yes.

COMMENTARY:
Delivering the Goods, Scotland's Rail Freight Strategy, published in March 2016, sets out a number of actions that have and are being taken forward by the Scottish Government, Network Rail and the Scotland Freight Joint Board. These actions are looking at new and efficient ways of transporting goods in addition to building strong and lasting partnerships to grow existing and new markets.

The strategy includes actions to inform our High Level Output Specification (HLOS) which sets Network Rail's regulatory outputs for the current rail control period (2019 to 2024). Our HLOS was published in July 2017 and includes a Scottish Gauge requirement, a specific output on the availability of cross-border routes for freight and targets to grow rail freight alongside freight performance and journey time improvements. The freight strategy and the outputs in the HLOS incentivise Network Rail to work with the wider rail industry with a clear focus on delivering our priorities.

Strong and sustainable partnership working across public and private sectors is key to achieving growth and Network Rail has undertaken a significant amount of work with the wider rail freight industry on a growth plan for rail freight to achieve or exceed the growth target. This plan was published on 15 March 2019 and sets out objectives for encouraging customer confidence, developing growth, doing things differently and looking for simpler solutions which all align with the rail freight strategy.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Uptake of the ECO-Stars programme.

MOST RECENT INFORMATION: There are 320 unique ECO Stars commercial vehicle members in Scotland as of August 2019.

INFORMATION SOURCE(S): Transport Research Laboratory, who are responsible for ECO Stars delivery[9].

COMMENTARY:
There are no defined recruitment targets for ECO Stars membership, however, there has been good uptake rates with scheme geographic coverage continuing to grow. There are currently established schemes in 12 of 14 local authorities with Air Quality Management Areas. This will widen the target recruitment area for commercial vehicle members and subsequent potential scheme impact.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Progress in delivering the Rail Freight Strategy.

MOST RECENT INFORMATION: The Rail Freight Strategy was published in 2016[10].
INFORMATION SOURCE(S): Transport Scotland.

COMMENTARY:
There are 22 actions in the rail freight strategy, most of which have been completed, are on-going or are being taken forward through other channels. One of the key actions that has been completed is the identification and formalisation of the Scottish strategic freight network.

Also, following the publication of the rail freight guide in 2017, Transport Scotland, in conjunction with industry partners, hosted a series of freight commodity workshops in 2017 and 2018 at Coatbridge, Aberdeen, Inverness and Kirkcaldy. The purpose of these workshops was to shine a light on the benefits of using rail freight, to look at the role of rail freight in the logistics chain, to hear from users of rail and industry experts, and to explain how rail could assist businesses.

In June 2019, Transport Scotland, Scottish Forestry, Network Rail and Confor hosted a timber by rail workshop to look at opportunities for sustainable transport of timber. This workshop was one of the key outputs of a Timber by Rail roundtable meeting the Cabinet Secretary for the Rural Economy hosted in March 2019. There was a willingness from both sectors to make progress and the discussion generated some potential timber by rail options to be taken forward for further development by interested partners.

In terms of investment, the Scottish Government has invested around £8 billion in rail services and infrastructure since 2007. Going forward there is a dedicated £25 million Scottish Strategic Rail Freight Fund for the period from 2019 to 2024. This fund will support the development and delivery costs of proposals for minor-medium freight interventions to improve the capacity and capability of the Scottish network for rail freight. In addition, the Scottish Government continues to administer EC state aid approved freight mode shift grant schemes which can provide capital support for infrastructure or revenue support for the additional costs of moving freight by rail or water instead of road.

Our 2018-2019 mode shift revenue support enabled seven rail freight services move just under three million tonnes of freight by rail rather than road. Since 2007, £11.3 million in mode shift capital grants has been invested in 12 freight handling facilities across Scotland removing over 110 million lorry miles from road.

OUTPUT INDICATOR FOR POLICY OUTCOME 4:

Proportion of bus fleet made up of low emission vehicles is 50% by 2032.

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Proportion of bus fleet made up of low emission vehicles (%)	13	15	18	20	23	25	27	30	33	36	39	42	45	48	50

MOST RECENT DATA: Currently unavailable – will be available for future monitoring reports (see commentary for further explanation).
DATA SOURCE(S): Bus Service Operators Grant (BSOG)[11].
ON TRACK: Insufficient data.

COMMENTARY:
We are unable to currently provide a completely accurate value for the percentage of the total fleet made up of low emission vehicles as the data provided by operators in respect of the low carbon vehicle incentive of BSOG, is collected on estimated claims, with operators changing fleets and services frequently, and on occasion not providing estimates in relation to low emission buses. We are working with operators to currently collect more accurate and informed data, with a view to this being collected online, which will speed up the process and provide more real time information**.**

Despite this, indications suggest that we are likely on track as we know there are approximately 4000 registered buses operating across approximately 200 operators and we know that around 793 of these buses claim the low carbon incentive through the BSOG. This does not include vehicles which cannot be tested as low emission and therefore do not receive the incentive. We also know the general lifespan of a bus is around 15 years and that in renewing fleets, buses must meet much stricter criteria, which will assist in the fulfilment of this target. We are collecting more detailed data through BSOG which will help inform this target in the future.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 4:

Number of low carbon buses purchased including those through the Scottish Green Bus Fund.

MOST RECENT DATA: 793 low emission buses are in operation in the Scottish fleet.
DATA SOURCE(S): Bus Service Operators Grant (BSOG) data[11].

COMMENTARY:
We can only provide accurate data on low emission buses supported through the Scottish Green Bus Fund as the data provided by operators in respect of the low carbon vehicle incentive of BSOG is collected on estimated claims.

To date £17.2 million has been spent assisting operators to purchase 475 low emission buses. Details can be found on the Transport Scotland website**.** In 2018-2019, 128 buses were purchased with the assistance of £1.1 million of the Sottish Green Bus Fund. Bus operators have also purchased low emission buses without the support of the Scottish Green Bus Fund.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 4:

Annual low carbon bus expenditure through Scottish Green Bus Fund and Bus Service Operators Grant incentive.

MOST RECENT DATA: £5.2 million low carbon bus expenditure in the financial year 2018-2019.
DATA SOURCE(S): Scottish Green Bus Fund[12], Bus Service Operators Grant low emission vehicle incentive expenditure[11].

COMMENTARY:
The Scottish Government provides funding support to bus operators for the additional costs associated with the purchase and operation of low carbon buses within the Scottish bus fleet.

The Scottish Government is committed to accelerating the uptake of such vehicles, and continue to work with bus stakeholders on the level of support required to make this commercially viable now and in the future as the technology and its associated costs matures.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 4:

Numbers of kilometres run by low emission buses as a percentage of total bus kilometres.

MOST RECENT DATA: 12.5% of kilometres run by low emission buses in the financial year 2018-2019.
DATA SOURCE(S): Bus Service Operators Grant claims[11].

COMMENTARY:
The percentage of the Scottish bus fleet that are low emission buses has increased, this is reflected in the percentage of kilometres run. Based on estimated claims the percentage of low emission kilometres in 2019-2020 will be almost 16% of the total kilometres run. In 2017-2018, 10.2% of total bus kilometres were by low emission buses.

OUTPUT INDICATOR FOR POLICY OUTCOME 5:

Qualitative report on Transport Scotland's input into port and airport strategies.

MOST RECENT INFORMATION: Transport Scotland.
INFORMATION SOURCE(S): Transport Scotland[13].

ON TRACK: Insufficient Data.

COMMENTARY:
Ports and airports in Scotland are primarily operated by independent organisations distinct from the Scottish Government and it is the responsibility of these organisations to operate their facilities in line with the relevant regulatory regimes. However, we continue to engage with ports and airports to encourage them to consider and introduce more environmentally friendly infrastructure.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 5:

Qualitative annual report on Transport Scotland's engagement with Scottish port authorities and airports.

MOST RECENT INFORMATION: Transport Scotland.
DATA SOURCE(S): Transport Scotland[13].

COMMENTARY:
Ports and airports in Scotland are primarily operated by independent organisations distinct from the Scottish Government and it is the responsibility of these organisations to operate their facilities in line with the relevant regulatory regimes.

Transport Scotland regularly engages with ports and airports in a range of forums including discussions on how they can reduce carbon emissions as part of their own operations.

OUTPUT INDICATOR FOR POLICY OUTCOME 6:

Number of low emission ferries in Scottish Government ownership.

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Number of low emission ferries in Scottish Government ownership	3	4	4	5	5	5	6	6	7	7	7	8	8	9	9

MOST RECENT DATA: 3 low emission ferries owned in 2019.
DATA SOURCE(S): Caledonian Maritime Assets Ltd (fleet owner)[14].

ON TRACK: Yes.

COMMENTARY:
Three diesel-electric hybrid ferries were delivered from 2011 to 2015. Delays to the delivery of two new vessels (LNG dual-fuel) means the current number will stay at 3 in 2019 but we are still expecting to achieve or surpass the 2032 target. The trajectory above is based on a planned investment programme through the 2020s which is required to replace vessels as they reach end of life.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 6:

Update on programme of procurement through the Vessel Replacement Plan.

MOST RECENT INFORMATION: Vessel Replacement and Deployment Plan Annual Report 2016[15].
INFORMATION SOURCE(S): Transport Scotland.

COMMENTARY:
The latest Vessel Replacement and Deployment Plan Annual Report indicated that the next vessel to be procured for the CalMac fleet would be for the services to Islay. The next version of the Vessel Replacement and Deployment Plan is due to be published in early 2020.

OUTPUT INDICATOR FOR POLICY OUTCOME 7:

The percentage of the rail track electrified.

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Percentage of rail track (route kilometres) electrified	27	29	29	29	29	30	30	31	32	32	33	33	34	34	35

MOST RECENT DATA: 29% of rail track in Scotland is electrified in 2018-2019.
DATA SOURCE(S): Transport Scotland[13].

ON TRACK: Yes.

COMMENTARY:
The percentage of rail passenger journeys using electric trains is a more useful indicator than the percentage of rail track electrified. With the addition of three new electrified rail routes operating in Scotland during 2018-2019, 75% of ScotRail journeys are expected to be on electric trains by the end of 2019 as a result of electrification projects being completed.

In September 2019, as part of its Programme for Government and its response to the global climate emergency, the Scottish Government set out a new commitment to put plans in place to decarbonise Scotland's rail services by 2035. Transport Scotland will set out details and actions in spring 2020.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 7:

Annual information on electrification is contained within the Scottish Transport Statistics.

MOST RECENT INFORMATION: Network Rail.
INFORMATION SOURCE(S): Scottish Transport Statistics: Rail Services[16].

COMMENTARY:
Please see indicator above for the most recent data on electrification.

OUTPUT INDICATOR FOR POLICY OUTCOME 8:

Active travel budget for the year.

MOST RECENT DATA: £80 million budget for 2019-20.
DATA SOURCE(S): Scottish Government budget 2019-2020[17].

ON TRACK: Yes.

COMMENTARY:
The Government doubled the active travel budget from £39 million to £80 million in 2018-19 and maintained this record funding in 2019-20 to increase the speed of change in the number of people walking and cycling and to develop an Active Nation. This equates to an average spend of £14 per capita in Scotland.

Funding has been agreed for the majority of this amount including:

- Capital funding of £66.3 million
- Resource funding of £6.3 million
- Cycling, Walking Safer Streets £7.4 million

In addition, £6.6 million funding has been provided for sustainable travel behaviour change programmes (i.e. Smarter Choices, Smarter Places, Energy Saving Trust, CoMo).

We achieved full expenditure in 2018-19 and anticipate full spend of £80 million budget by March 2020.

OUTPUT INDICATOR FOR POLICY OUTCOME 8:

Progress towards active travel vision.

MOST RECENT INFORMATION: In 2018, 1.8% of journeys under 5 miles were made by bike (the same percentage as in 2017) and 43.0% of journeys under 2 miles were made on foot (a 2.3% fall from 2017).

DATA SOURCE(S): Scottish Household Survey 2018[18].

ON TRACK: Too early to make assessment.

COMMENTARY:
The active travel vision is a long term one for 2030 and we have now developed a range of relevant indicators as part of an Active Travel outcomes framework that will allow progress to be monitored. Whilst the active travel budget has been doubled to £80 million for last year, it is too early to assess benefits as it will take time to design, plan and build new infrastructure, with some of the larger projects spanning up to 5 years.

Progress in the previous Climate Change Plan monitoring report focussed on short commutes of up to 2 miles for walking, and up to 5 miles for cycling. This was based on the proviso that this indicator would become the new National Performance Framework (NPF) measure on active travel.

However, in order to satisfy the requirement of being able to determine the performance status of NPF indicators each year, the active travel indicator has changed to include all journeys of up to 2 miles for walking and up to 5 miles for cycling as opposed to only looking at commutes. This is to increase the number of short journeys over which we can make an assessment on performance as, the smaller the number of observations the less precision the results have and the harder it is to detect genuine year on year change. In addition, there is a view that focusing overly on commuting serves to downplay other journey types undertaken by active modes which can have significance for equalities issues e.g. caring journeys made disproportionately by women.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 8:

Qualitative update on what has been achieved through active travel expenditure.

MOST RECENT INFORMATION: Transport Scotland.
INFORMATION SOURCE(S): Transport Scotland[19].

COMMENTARY:
Grant awards in 2018-2019 were for a mix of both infrastructure and behaviour change/training projects; we awarded £80 million to a range of delivery partners. Most of this funding was awarded to local authorities/other partners with a request for 50% match funding for programmes such as Community Links and Community Links PLUS.

The majority of infrastructure funding was issued to Sustrans for Community Links and National Cycle Network. Between 2011–2016, these have delivered 370 miles of newly constructed walking and cycling infrastructure, as well as 160 miles of upgrading/resurfacing. Whilst majority of increased budget is being invested on cycling infrastructure, this will take some time to design, plan and build, with some of the larger projects spanning up to 5 years.

A number of behaviour change programmes were delivered including:

- 4,500 adults supported with training in 2018-2019. This includes 2,400 bus and lorry drivers trained as part of vulnerable road user awareness courses.
- A range of Cycle Friendly programmes to promote and support cycling locally and make facilities more cycle friendly. Last year 134 grants worth £1.8 million were given to universities, workplaces and schools to build a range of cycle parking, storage facilities and showers.
- School cycle training delivered through Bikeability to give over 36,000 children from P6 to S2 the skills and confidence to cycle safely and learn how to manage traffic in 2018-2019.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 8:

Qualitative report on the implementation and achievements of Smarter Choices, Smarter Places.

MOST RECENT INFORMATION: Smarter Choices, Smarter Places 2018-2019 Programme Review.
INFORMATION SOURCE(S): Paths for All, September 2019[20].

COMMENTARY:
Smarter Choices, Smarter Places is changing people's travel behaviours. From the Scottish Borders to the Western Isles, in cities, towns and villages it promotes walking, cycling and sustainable transport as credible options for everyday journeys. It reduces the number of car miles travelled and CO_2 emissions produced. In 2018-2019 the programme was expanded to introduce a new Open Fund and delivered in partnership with 31 local authorities, 49 voluntary organisations, colleges, universities, schools, community councils and other public agencies. Partners deliver an enormous range of projects tailored to meet local needs and priorities. Activities included community and workplace active travel challenges that got more people walking and cycling. Trialling new bus services and bus ticketing promotions increased bus patronage. Maps, apps and wayfinding increased people's knowledge of routes. Social media, radio campaigns and printed media increased community awareness of walking, cycling and public transport as normal ways to travel. Initiatives are targeted at specific groups – young, old, rural, urban, BAME, women, local communities, workplaces- to meet local needs and local priorities. In 2018-2019 over 250,000 people took part in over 3,000 local events that encouraged people to reduce their car use. Projects reported 283,000 fewer car miles travelled as a consequence of the programme's intervention.

INDUSTRY

Industry

Greenhouse gas emissions from the industry sector have already been reduced by 46% (1990 to 2017).

The Plan sets out the following three policy outcomes for the sector:

1. By 2032, industrial and commercial energy productivity to improve by at least 30% from 2015 levels, through a combination of fuel diversification, energy efficiency improvements and heat recovery.

2. By 2032, industrial and commercial emissions intensity will fall by at least 30%, from 2015 levels, through a combination of fuel diversification, energy efficiency improvements and heat recovery.

3. Technologies critical to further industrial emissions reduction (such as carbon capture and storage, carbon capture and utilisation, and production and injection of hydrogen into the gas grid) are demonstrated at commercial scale by 2030.

In May 2019, the UK Committee on Climate Change recognised that government has a role to play in incentivising investment in energy efficiency and productivity whilst maintaining international competitiveness. Scottish Energy Intensive Industries (EII) face distinct challenges to decarbonise.

In order to create the conditions to secure investment that would aid emissions reductions whilst growing carbon-intensive EII - and potentially attract new, advanced manufacturing industries of the future – the Scottish Government is augmenting existing analysis.

The Scottish Government has been emphasising the focus on measures of energy productivity and emissions intensity in all programmes of advice and support for the decarbonisation of the industrial sector. This is because these measures can demonstrate the policy aims of achieving higher levels of output per unit of energy input (GVA/GWh), and/ or the release of fewer greenhouse gas emissions for each unit of output (CO_2 per unit of GVA).

OUTPUT INDICATOR FOR POLICY OUTCOME 1:

Industrial and commercial energy productivity to improve by at least 30% by 2032.

Year	2020	2025	2032
Change in Energy productivity from 2015	10%	20%	30%

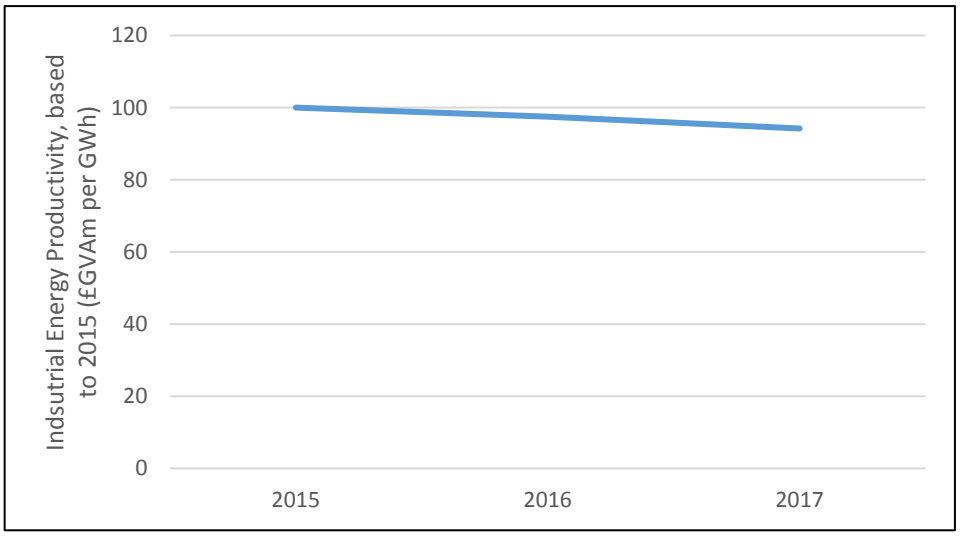
MOST RECENT DATA: £0.63 million GVA per GWh energy productivity in 2017.
BASELINE DATA: £0.67 million GVA per GWh energy productivity in 2015.
CHANGE: 6.0% decrease in industrial energy productivity from the 2015 baseline.
DATA SOURCE(S): BEIS sub-national consumption[1]; BEIS Energy Balance DUKES[2]; Scottish Government Quarterly National Accounts Scotland[3].

ON TRACK: Too early to make assessment – estimates of industrial energy productivity is only currently available from 2015, so only three years of data are available. This is inconclusive to provide a wider trend.

COMMENTARY:

- BEIS recently changed their methodology from 2016 onwards, therefore it is not possible to create a comparable time series before this point. There is, however, an estimated baseline figure for 2015 that can be used in the meantime.
- In 2017, energy productivity decreased by 6.0% from the 2015 figure. Even though industrial GVA increased by 1.3% between 2015 and 2017, this does not compensate for a 7.8% increase in consumption in the same period, hence the negative trend.

Industry Figure 1: Percentage Change in Energy Productivity from 2015 to 2017



OUTPUT INDICATOR FOR POLICY OUTCOME 2:

Industrial and commercial emissions intensity to fall by at least 30% by 2032.

Year	2020	2025	2032
Change in emissions intensity from 2015	-10%	-20%	-30%

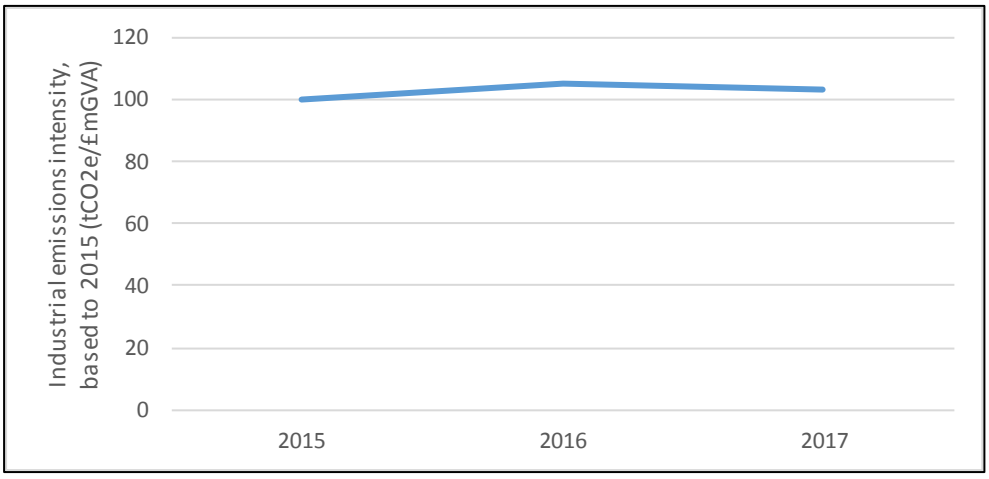
MOST RECENT DATA: 457 tCO_2e per £1 million GVA, in 2017.
BASELINE DATA: 442 tCO_2e per £1 million GVA, in 2015.
CHANGE: 3.3% increase in energy intensity from 2015 to 2017.
DATA SOURCE(S): Scottish Government Energy Statistics Database[4].

ON TRACK: Too early to make assessment – estimates of industrial emissions intensity is only currently available from 2015, so only three years of data are available. This is inconclusive to provide a wider trend.

COMMENTARY:

- Emissions intensity fell 2% in 2017 from 2016 levels, despite a small increase in total industrial emissions. GVA increased 3%, which was enough to counteract the 1% increase in emissions in 2017.
- In 2016 emissions intensity increased by 5%, due to both a decrease in GVA and an increase in emissions, and so the 2017 figure is still 3% higher than the 2015 figure. It is a move in the right direction, however, as it decreased since the previous year, but it is not back to pre-2016 levels.

Industry Figure 2: Percentage Change in Emissions Intensity from 2015 to 2017



Please note: these figures have been revised from the previous edition of the monitoring framework.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2 and 3:

The installed capacity of renewable heat receiving payment under the non-domestic RHI increases.

MOST RECENT DATA: 985 MW of installed capacity receiving payment under the non-domestic RHI between November 2011 and August 2019.
BASELINE DATA: 250 MW of installed capacity receiving payment under the non-domestic RHI in between November 2011 and February 2015.
CHANGE: There was an additional 735 MW of installed capacity of renewable heat receiving payment under the non-domestic RHI between February 2015 and August 2019.
DATA SOURCE(S): BEIS RHI stats[5].

COMMENTARY:
Capacity of accredited non-domestic RHI installations have steadily increased from February 2015. Capacity has almost quadrupled from this period to August 2019. There are 3,753 accredited full applications by August 2019.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2 AND 3:

Improve the evidence base of the industrial sector in Scotland through initiatives under the Manufacturing Action Plan and SEEP (Scotland's Energy Efficiency Programme, now Energy Efficient Scotland).

MOST RECENT INFORMATION: The Scottish Government continues to work alongside industry representatives and agencies including the Scottish Environmental Protection Agency, Resource Efficient Scotland and Zero Waste Scotland to improve the evidence base of the Scottish Industrial Sector.

INFORMATION SOURCE(S):

- SEPA Scottish Pollutant Release Inventory[6];
- European Environment Agency Database on emissions and energy use for Large Combustion Plants[7].

COMMENTARY:

The Scottish Government is supplementing existing analysis of the sector, and looking ahead to identify data or evidence gaps in order to bring more certainty to scenarios of how the sector can be expected to decarbonise, whilst remaining internationally competitive.

In response to stakeholder engagement and to enable more advantageous project positioning for funding or financing support opportunities, the Scottish Government proposes to co-ordinate knowledge of project opportunities across EII in Scotland.

We continue to lead an industrial decarbonisation agency group that informs the direction of continuing programmes of support on industrial decarbonisation. Overcoming barriers to the release or sharing of data, that could be beneficial in targeting support programmes are considered within this group.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2 AND 3:

Continued annual monitoring of energy productivity and emissions intensity.

MOST RECENT INFORMATION: As above.

INFORMATION SOURCE(S): As above.

COMMENTARY:

The annual monitoring commitment of this implementation indicator is covered in the reporting for the output indicators for policy outcomes 1 and 2.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2 and 3:

The Scottish Government funded elements of the ACORN CCS Project feasibility study are completed by November 2018.

MOST RECENT INFORMATION: The Scottish Government provided £275k for the ACORN Project as part of match funding through the Projects of Common Interest instrument called the Connecting Europe Facility.
INFORMATION SOURCE(S): Project promoters - Pale Blue Energy Ltd[8].

COMMENTARY:

- Carbon Capture Utilisation and Storage (CCUS) is an industrial scale decarbonisation system which has the potential to make a big impact on achieving Scotland's emissions targets. The Intergovernmental Panel on Climate Change and the International Energy Agency have both said that developing CCS technology will be critical to keeping global temperature increases to 2 degrees Celsius or less. The advice from the Committee on Climate Change describes CCUS as a "necessity, not an option" to achieve net zero emissions.
- Scotland's key CCUS resource is our vast potential for CO_2 storage in the North Sea. Scotland is the most cost-effective place to begin CCUS in the UK, with existing oil and gas infrastructure available to repurpose for CO_2 transport and storage.
- The Scottish Government has been consistent in our strong commitment to the development and implementation of CCUS technologies, as indicated by our providing funding to the Acorn CCS Project, and to Scottish Carbon Capture and Storage. The development of CCS could offer a range of transition opportunities for Scottish oil and gas firms and domestic supply chain companies.
- Scottish Government is working closely with the UK Government to develop the deployment pathway for CCUS. The UK Government are currently developing their policy on CCUS – interest in CCUS is growing in UK and is increasingly linked to hydrogen production. Scottish Government is closely involved in the progress of UK policy on CCUS.

WASTE

Waste

Greenhouse gas emissions from the waste sector have already been reduced by 72% (1990 to 2017).

The Plan sets out the following two policy outcomes for the sector:

1. Reduction in waste sent to landfill.

2. Reduction in emissions from closed landfill sites.

Although the total amount of waste landfilled in Scotland in 2018 was 3.74 million tonnes and is not decreasing as quickly as hoped, there was a reduction of 84,876 tonnes (2.2%) from 2017. This is despite the fact that the estimated total quantity of waste generated in Scotland had been increasing. In 2017 it was 11.82 million tonnes, an increase of 5.5% (0.62 million tonnes) from 2016. Most of this increase is due to wastes from Construction and Demolition (C&D) which increased by 10.8% (0.6 million tonnes) from 2016.

Although the recycling rate for all waste decreased slightly from 59.1% in 2016 to 58.9% in 2017, the estimated volume of waste recycled was 6.93 million tonnes, which is 142,195 tonnes (2.1%) more waste recycled than in 2016.

5 landfill sites have been retrofitted with gas capture systems since 2017, and these are now operational.

The carbon impact from household waste has reduced by 2% since 2017.

Closing off of export routes for the recycling of waste has exposed a lack of domestic infrastructure. This will take time to address, and Zero Waste Scotland are working to try to incentivise reprocessors to locate in Scotland.

OUTPUT INDICATOR FOR POLICY OUTCOME 1:

From 1 January 2025*, the landfilling of biodegradable municipal waste will be illegal. As a result of that, and the other policy action above, we expect the volume of land filled waste to fall significantly from the current [2016] level of 3.7 million tonnes.

MOST RECENT DATA: The total amount of waste landfilled in Scotland in 2018 was 3.74 million tonnes, which was a reduction of 84,876 tonnes (2.2%) from 2017.
DATA SOURCE(S): SEPA publication "Waste Landfilled in Scotland in 2018"[1].

ON TRACK: No.

COMMENTARY:
The landfilling of biodegradable municipal waste (BMW) was due to be banned in Scotland from 1 January 2021, but that deadline will now move to January 2025. Significant progress has already been made towards the ban – including further strides taken since the Waste Markets Study was published in April. Despite this further progress, it is clear that full compliance by 2021 will not be possible without significant reliance on export options, including landfill in England, with consequent environmental impact and additional financial implications for local authorities. The additional 4 years will allow for procurement, development, planning and building of waste processing infrastructure, over and above that which is already in the pipeline. There will be a centrally supported procurement intervention to enable those without solutions to secure alternative solutions for remaining BMW tonnage. Scottish Landfill Tax will be used to provide a further incentive to ensure that transitional work proceeds at the necessary pace.

The Scottish Government remains fully committed to ending the practice of sending biodegradable municipal waste to landfill in order to help achieve climate change targets.

**As explained in the commentary above, the date published in the Climate Change Plan of January 2021 has been moved. Milestones published in the Climate Change Plan will be revised accordingly.*

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

60% of total household waste recycled by 2020.

MOST RECENT DATA: For 2018, the Scottish household waste recycling rate was 44.7%.
DATA SOURCE(S): SEPA summary household data for 2018[2].

COMMENTARY:

- This is a decrease of 0.9 percentage points from the 45.5% rate achieved in 2017. The carbon impact of our household waste fell by 2% compared with 2017. We have succeeded in reducing the carbon impact of household waste by the equivalent of more than one million tonnes of CO_2 since 2011. The amount of household waste generated fell by 2% compared with 2017.
- Recent slowing of progress on recycling is partly due to loss of capacity in global recycling markets, combined with general economic challenges in the waste sector. Initiatives such as deposit return and extended producer responsibility, together with a review of the Scottish Household Recycling Charter will help to improve recycling rates.
- The figures for recycling rate demonstrate the need for the further ambitious action we have committed to through Programme for Government.
- 30 out of 32 Councils have signed the Scottish Household Recycling Charter. Zero Waste Scotland has since 2015 provided a total of £7.5 million to 8 Councils in support for transition to Charter-compliant waste and recyclate collection services.
- The Code of Practice is being reviewed to ensure that it aligns with Scotland's new deposit return system, as well as recent amendments to the EU Waste Framework Directive.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

70% of all waste recycled by 2025.

MOST RECENT DATA: The waste from all sources recycling rate in 2017 was 58.9%.
DATA SOURCE(S): Waste from all sources – Summary data 2017[3].

COMMENTARY:

- This is a decrease of 0.2 percentage points from the 59.1% of waste recycled in 2016. Despite slight decrease, we remain on track to hit the 2025 target, despite challenges in the global recycling markets. In response to these challenges, Zero Waste Scotland is working to encourage the development of more domestic recycling and reprocessing infrastructure.
- We are working with the other governments of the UK on reform of the packaging producer responsibility system to reduce waste and boost recycling.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Household and non-household food waste reduced by 33% by 2025 from 2013 baseline.

MOST RECENT DATA: 2014-2015 Waste Composition Study: Food waste went down from 420,000 tonnes in 2009 to 330,000 tonnes in 2014-2015 (21.5% reduction). This remains the most recent data; arrangements for an ongoing programme of composition work are being put in place.
BASELINE DATA: N/A.
CHANGE: N/A.

COMMENTARY:

- The work required to analyse residual waste composition is complex, labour intensive and expensive. It is therefore taking time to develop a sustainable model for this work.
- Supporting datasets are not yet available for the 2025 target, because the methodology is still being reviewed to set an agreed 2013 baseline. Data are available from the 2014-2015 Zero Waste Scotland Waste Composition Study.
- The Food Waste Reduction Action Plan (April 2019), developed in partnership with Zero Waste Scotland, outlines what more can be done to prevent and reduce food waste.

OUTPUT INDICATOR FOR POLICY OUTCOME 2:

	2017/18	2018/19	2019/20	2020/21
Number of additional landfill sites with gas capture being developed each year	3	6	9	12

MOST RECENT DATA: As of September 2019, 5 landfill sites have been retrofitted with gas capture systems.
DATA SOURCE(S): SEPA project officer[4].

ON TRACK: No.

COMMENTARY:
Fewer landfill sites have been fitted with gas capture systems than was initially planned. This is mainly because the response from local authorities to an offer of funding in 2017 was not good. No further funding is currently available, so future progress will depend on prioritisation within local authority budgets.

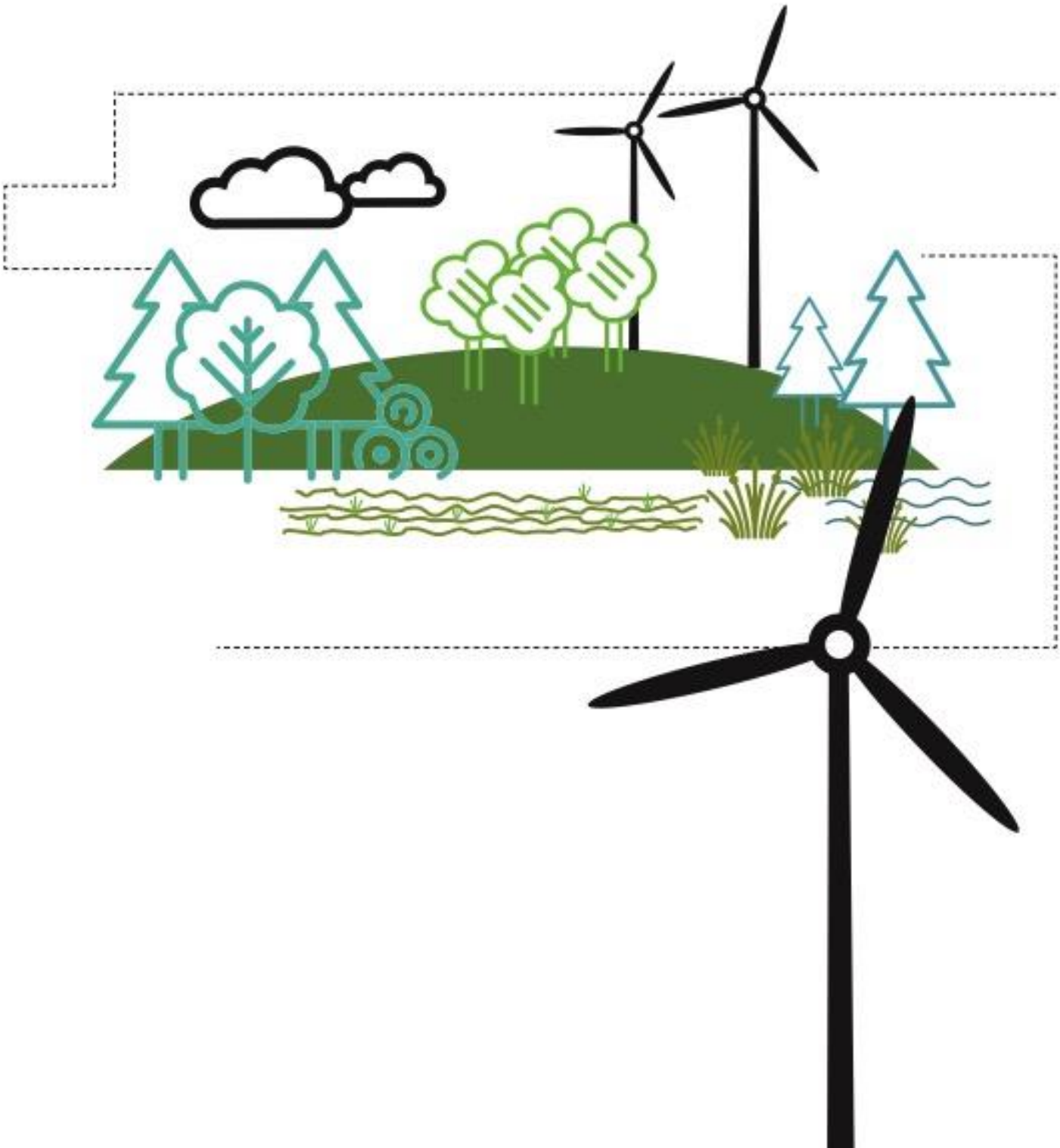
IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 2:

Up to 12 landfill gas capture sites supported by 2020-2021.

MOST RECENT DATA: See above.
DATA SOURCE(S): See above.

COMMENTARY:
See above.

LAND USE, LAND USE CHANGE AND FORESTRY



Land Use, Land Use Change and Forestry

The LULUCF sector as a whole is a net sink, rather than source, of greenhouse gases. Based on the most recent (2017) greenhouse gas inventory, the sector was sequestering a net 0.3 $MtCO_2e$ in 1990. Since then, there has been a significant increase in net sequestration, up to 5.4 $MtCO_2e$ in 2017.

The Plan sets out the following three “policy outcomes” for the LULUCF sector:

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.

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.

3. To enhance the contribution of peatland to carbon storage, we will support an increase in the annual rate of peatland restoration, from 10,000 hectares in 2017‑2018 to 20,000 hectares per year thereafter.

Forestry

- Forestry statistics for woodland creation and timber are published annually.

- For other indicators Forestry Commission Scotland, local government and industry data have been used to report against the output indicators and implementation indicators as reported in this chapter.

- Figures reported in this chapter show that the area of new woodland planting in 2018-2019 was 58% higher than the previous year and surpassing the stated target of 10,000 hectares.

- Grant funding application levels for 2019-2020 suggest that this positive trend will continue, and the Programme for Government said the Scottish Government would seek to create 12,000 hectares of new woodland in 2019-2020.

- A new approach to woodland creation grant funding proposals was introduced last year and this has helped to support an increase in woodland planting.

- Figures on use of timber products in construction also demonstrate progress towards meeting the targets as set out in the Climate Change Plan.

Peat

- In 2018-2019; 5,800 hectares of peatland were restored through Peatland ACTION, delivering the largest annual area into restoration so far in the programme. Similarly, there were 72,700 hectares covered by feasibility studies in 2018-2019 – the largest annual coverage so far in the programme. The longer term pipeline for peatland restoration is healthy and action has been taken to increase the capacity of contractors, land managers and the project team; and to extend the working window within the annualised timeframe for delivering restoration work. There is good scope to deliver the longer term climate change target for restoration. There have been improvements in data collection and analysis this year, with the formation of a project data and information group in October 2018.

OUTPUT INDICATOR FOR POLICY OUTCOME 1:

Number of hectares of woodland created.

	Until 2019-2020	From 2020-2021	From 2022-2023	From 2024-2025
Ha created	10,000	12,000	14,000	15,000

MOST RECENT DATA:
11,200 hectares for the period 1 April 2018 to 31 March 2019.

DATA SOURCE(S):
Official Statistics released in June 2019[1].

ON TRACK:
Yes.

COMMENTARY:
- Forestry statistics for woodland creation are published annually. These are the figures for the period 1 April 2018 to 31 March 2019. Figures on woodland created after March 2019 are not available.
- Scotland was responsible for 84% of new woodland creation in the UK in 2018-2019.
- Plans and approvals for 2019-2020 suggest that new planting will remain on track for this policy outcome, and the Scottish Government has said it will seek to exceed the 2019-2020 indicator by 2,000 hectares.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Area of new woodland created with grant scheme support.

MOST RECENT DATA:
10,137 hectares for the period 1 April 2018 to 31 March 2019.

DATA SOURCE(S):
Official Statistics released in June 2019[1].

COMMENTARY:
- Forestry statistics for woodland creation are published annually. These are the figures for the period 1 April 2018 to 31 March 2019. Figures on woodland created after March 2019 are not available.
- Scotland was responsible for 84% of new woodland creation in the UK in 2018-2019.
- Plans and approvals for 2019-2020 suggest that new planting will remain on track for this policy outcome and the Programme for Government said the Scottish Government would seek to create 12,000 hectares of new woodland in 2019-2020.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Percentage of applications that are processed within processing time agreements

MOST RECENT DATA: N/A

DATA SOURCE(S): N/A

COMMENTARY:

- The Forestry Grant Scheme Customer Charter was introduced in March 2018; at the same time, new Forestry Grant Scheme applicant guidance was introduced, detailing changes to the application process to deliver shorter case approval times.
- The Charter set out the Customer Service Standards for handling of applications and capital claims for grant under the Forestry Grant Scheme within the Scottish Rural Development Programme 2014–2020. This Charter committed all participants, including Forestry Commission Scotland, the Scottish Government Rural Payments and Inspection Division, consultees and applicants/claimants, to deal with applications and capital claims in a business-like manner with the objective of meeting the agreed target times.
- For Forestry Commission Scotland, the agreed target times were as follows: to send a draft contract to the applicant within 13 weeks of accepting a completed and submitted application, provided it meets the eligibility criteria and follows published guidance; and, to send a draft contract to the applicant within 15 weeks, where there is a need to request further information from applicants in order to process the application.
- In Scotland, forestry was fully devolved to Scottish Ministers on 1 April 2019 and two new agencies of the Scottish Government were created: Scottish Forestry to support the delivery of the Scottish Government's priorities for Scotland's forests through guidance, advice, incentives and regulations, and by advising ministers on forest policy; and Forestry and Land Scotland to manage national forests and land on behalf of Scottish Ministers.
- This data was intended to be available from November 2018, but due to complications with the transition of IT systems from Forestry Commission Scotland to Scottish Forestry, this data is not yet available.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Area of new woodland created on the national forest estate.

MOST RECENT DATA:
1,030 hectares from 1 April 2018 to 31 March 2019.

DATA SOURCE(S):
Official Statistics released in June 2019[1].

COMMENTARY:

- During the period of reporting, Forest Enterprise Scotland (FES) was responsible for managing Scotland's national forests and land on behalf of Scottish Ministers. This responsibility now lies with Forestry and Land Scotland (FLS).
- A Strategy for Woodland Creation on Scotland's national forests and land was published in August 2018 and sets out FES's (now FLS) aim to create 3,250 hectares of woodland in the period September 2016 to March 2021; This equates to a rate of around 650 hectares per year, with up to 250 hectares of that woodland being on newly acquired former coalfield and derelict sites as part of long-term restoration and remediation of these sites.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Number of promotional events held.

MOST RECENT DATA:
20 events held from 1 April 2018 to 31 March 2019.

DATA SOURCE(S):
Forestry Commission Scotland data[2].

COMMENTARY:

- In the period April 2018 to March 2019, Forestry Commission Scotland either hosted or initiated approximately 20 events across Scotland. This included a range of event formats, from small scale, on-farm demonstration days, to large scale National Events (e.g. the Royal Highland Show).
- While some of these events were organised and hosted by Forestry Commission Scotland, others were hosted and facilitated by partners e.g. Central Scotland Green Network, National Parks and Soil Association Scotland.
- These events aimed to promote woodland creation and discuss some of the real and perceived challenges around planting new woodland and integrating woodlands within existing businesses e.g. farming. They also provided information on the Forestry Grant Scheme and the Woodland Carbon Code. The Code is a potential vehicle for attracting additional investment into woodland creation projects.
- Events were generally well attended by a mixture of stakeholders, including farmers, land managers, and forestry students.
- In Scotland, forestry was fully devolved to Scottish Ministers on 1 April 2019 and two new agencies of the Scottish Government were created: Scottish Forestry to support the delivery of the Scottish Government's priorities for Scotland's forests through guidance, advice, incentives and regulations, and by advising ministers on forest policy; and Forestry and Land Scotland to manage national forests and land on behalf of Scottish Ministers. Therefore in future years this data will be provided by Scottish Forestry.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Number of woodland creation projects that have been issued with a UK Forestry Standard non-compliance notice within the first 10 years following creation.

MOST RECENT DATA:
1 project issued with a notice from 1 April 2018 to 31 March 2019.

DATA SOURCE(S):
Forestry Commission Scotland data[2].

COMMENTARY:

- Formal UK Forestry Standard compliance procedures were introduced in April 2018.
- In addition to helping enforce grant contract conditions, the procedures require significant breaches of the standard to be recorded and for corrective action to be taken. Where incidents of serious non-compliance are identified, they may be included in a national register and reported to professional bodies such as the Institute of Chartered Foresters, grant funding may also be reclaimed and/or regulatory approval may be suspended.
- Less serious cases of non-compliance are dealt with through the management of grant agreements.
- In Scotland, forestry was fully devolved to Scottish Ministers on 1 April 2019 and two new agencies of the Scottish Government were created: Scottish Forestry to support the delivery of the Scottish Government's priorities for Scotland's forests through guidance, advice, incentives and regulations, and by advising ministers on forest policy; and Forestry and Land Scotland to manage national forests and land on behalf of Scottish Ministers. Therefore in future years this data will be provided by Scottish Forestry.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 1:

Number of Planning Authorities with current Forest and Woodland Strategies.

MOST RECENT DATA:
31 local authorities with current Strategies in March 2019.

DATA SOURCE(S):
External data from local government[2].

COMMENTARY:

- Under the Planning (Scotland) Act 2019, planning authorities are required to prepare forestry and woodland strategies. The Act outlines the purpose of these strategies, including identifying woodlands of high nature conservation value and setting out policies and proposals as to the: development of forestry and woodlands; protection and enhancement of woodlands; resilience of woodlands to climate change; and expansion of woodland of a range of types to provide multiple benefits.
- The delivery of planning services in Scotland lies with 32 planning authorities and 2 national park authorities.
- All planning authorities (bar one) in Scotland have an existing forestry and woodland strategy in some form: some have been developed in partnership (e.g. for Stirling and Clackmannan), others have been developed by the strategic development planning authority (e.g. the Clyde Plan).
- Both national parks also have forest and woodland strategies in place.
- Forestry and woodland strategies are generally reviewed and updated every 5 years, as recommended in The Right Tree in the Right Place[3], and some are currently undergoing that process.
- All of them identify the area where new woodland would best deliver the planning authorities'/national park's objectives and the areas that are more sensitive to woodland creation. They all provide a mechanism to inform local and regional woodland expansion to deliver the Climate Change Plan.

OUTPUT INDICATOR FOR POLICY OUTCOME 2:

Annual volume (in millions of cubic metres) of Scottish produced sawn wood and panel boards used in construction (extrapolated from UK figures).

	2021-2022	2026-2027	2031-2032
Volume	2.6 million cubic metres	2.8 million cubic metres	3.0 million cubic metres

MOST RECENT DATA:
2.33 million cubic metres used in construction in 2018.

DATA SOURCE(S):
Official Statistics released in September 2019[4].

ON TRACK: Too early to make assessment.

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 2.33 million cubic metres of timber used in construction in 2018, is based on these statistics and is an update on the figure provided in the last Climate Change Plan Monitoring Report, which was based on less comprehensive data available at the time.
- It is too early to see any trend develop (although it is encouraging that the volume is increasing) and it will not be until 2022 that data will be available to estimate whether or not the target is on track.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 2:

Number of knowledge exchange events held each year involving members of the construction industry e.g. designers, specifiers and engineers.

MOST RECENT DATA:
9 knowledge exchange events held from 1 April 2018 to 31 March 2019.

DATA SOURCE(S):
Forestry Commission Scotland data[2].

COMMENTARY:
The following activities have been focussed on helping inform construction professionals and students on effectively using timber products in construction:

- Annual Royal Incorporation of Architects Scotland and 3 regional "Best use of wood" awards.
- Architecture and Design Scotland "Best use of wood" exhibition at the Lighthouse in Glasgow and other locations.
- Strategic Integrated Research in Timber programme annual update seminar.
- Continuance of funding support and digitisation of "Materials Considerations: library of sustainable building materials" at the Lighthouse in Glasgow.
- Initiation of collaborative project with Construction Scotland and Edinburgh Napier University on commercialisation of manufacturing of engineered wood products in Scotland.
- Commission research at Edinburgh Napier University on opportunities for timber products in building refurbishment and maximum use of Scottish timber in housing.

In future years this data will be provided by Scottish Forestry (as above).

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 2:

Annual Timber Association figures for the adoption of timber frames for new build houses across the UK.

MOST RECENT DATA: Almost 29% of new build houses across UK in 2018.

DATA SOURCE(S): Structural Timber Association "Timber frame construction market report (UK) 2018"[5].

COMMENTARY:

- The housing market is one of the largest markets for wood products in construction. An increase in timber frame construction can be considered to be an increase in the use of timber overall in construction.
- The Structural Timber Association publishes annual statistics on the timber frame market which allow progress to be tracked.
- Figures suggest that there has been a small increase in the timber frame share of the UK housing market from 28.4% in 2016 to almost 29% in 2018.

OUTPUT INDICATOR FOR POLICY OUTCOME 3:

Number of hectares of restored peatland per year.

	2018	2019	2020	2021	2022
Output	10,000ha	20,000ha	20,000ha	20,000ha	20,000ha

MOST RECENT DATA:
5,800 hectares on the road to recovery in 2018-2019.

DATA SOURCE(S): Peatland Action Funded Works **-** Scottish Natural Heritage Grants database[6].

ON TRACK: Using Peatland ACTION alone as the measure then this indicator is not on track at present though recoverable in the long term.

COMMENTARY:

- A high demand has been identified for peatland restoration through feasibility studies.
- The estimate for peatland restoration through Peatland Action in 2018-19 was 8,335 hectares. Actual restoration was 5,800 hectares of peatland, partly due to severe weather in the uplands during the restricted late autumn/winter window for delivering restoration, however also due to a lack of contractor availability. Action has been taken to increase the capacity of contractors, land managers and the project team – and to extend the annual window for delivering restoration work – and we are seeing a consistent increase in demand and capacity.
- There is scope to catch up with the long term target in future years through increases in capacity (budget, land manager, contractor, and project team) given that there is a high demand for peatland restoration demonstrated through feasibility studies. The most important action to secure this capacity would be to secure a longer term approach to the funding of projects.
- A full set of information for 2019-2020 will be available after the end of the financial year. There is up to 10,000 hectares of planned delivery for 2019-2020.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Number of hectares on the road to recovery through Peatland Action at the conclusion of the preceding financial year.

MOST RECENT DATA:
5,800 hectares on the road to recovery for year 2018-2019.
Since the start of the project to 31 March 2019 an estimated 19,000 ha have been restored.

DATA SOURCE(S): Grants Data base Scottish Natural Heritage[6].

COMMENTARY:

- Peatland Action is scaling up in a phased way in order to allow for a sustainable increase in the capacity of land managers, contractors and the project team, to the level required to meet the long term Climate Change Plan target.
- Progress influencing contractors to release/expand capacity for peatland restoration work is adversely affecting progress on the ground, with 1,900 hectares of offered delivery for 2018-2019 slipping into 2019-2020.
- It will be possible to provide data on actual restoration once restoration is complete, as this is a long term process. Date of restoration activity is currently the only measure.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Total number of applications received for Peatland Action restoration project funding.

	2018	2019	2020	2021	2022	2023	2024	2025
No. of grant applications	100	120	130	140	150	150	150	150

MOST RECENT DATA:
84 grant applications in 2018-2019.

133 applications in 2019-2020 – TBC at end of financial year.

DATA SOURCE(S): Grants database Scottish Natural Heritage[6].

COMMENTARY:
Demand for Peatland Action funding is still increasing year-on-year as demonstrated by the increased numbers of applications and a pipeline of viable restoration work supported by feasibility studies. The number of grant applications is increasing and is an indicator of the success of interest in the scheme. However, the number of applications does not reflect the areas restored or necessarily indicate an increase in restored peatlands as grants will vary for the areas proposed for restoration, and fewer (larger) grant applications can be a more effective way to manage the programme. To provide consistency of figures and avoid confusion it is clearer to provide data at the end of the financial year rather than at the end of the calendar year.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Number of projects approved for funding from the Peatland Action restoration project funding.

Date	2018	2019	2020	2021	2022	2023	2024	2025
No. of successful applications	90	110	115	120	125	130	130	130

MOST RECENT DATA:
2018-2019 - 66 projects were approved for funding (59 new and 7 for deferred/ subsequent phases in 2018-19).

DATA SOURCE(S): Grants database Scottish Natural Heritage[6].

COMMENTARY:

- For 2018-2019 projects, the conversion rate of applications to projects was below that anticipated in the plan. Scottish Natural Heritage now have more dedicated project officers supporting the application process and increasing the quality of applications; this should increase the conversion rate.
- The indicator is useful to assess the quality of applications received.
- To provide consistency of figures and avoid confusion it is clearer to provide data at the end of the financial year rather than at the end of the calendar year.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Number and area of restoration feasibility plans supported through the Peatland Action programme.

MOST RECENT DATA:
28 plans were supported in 2018-2019 covering 72,769 hectares.
12 plans supported in 2018, covering 50,000 hectares.

DATA SOURCE(S): Grants Database Scottish Natural Heritage, and for 2019-2020 the Peatland Action Feasibility Study contract database[6].

COMMENTARY:

- In 2018-2019, 33 projects were offered through funding agreements covering 171,825 hectares, of these a reduced amount were taken forward by applicants. The constraints of time and weather meant that for 2018-2019 some projects were not completed in the year. In 2019-2020, Scottish Natural Heritage is undertaking feasibility studies in-house, rather than via grants to landowners. This should enable a better overview of feasibility study activity to allow for improved project planning.
- Feasibility studies demonstrate that there is viable demand to deliver the longer term Climate Change Plan target for 20,000 hectares restoration per annum. This indicator strongly supports progress as it is being used to line up future projects and enables the programme to create good quality applications and also assess the potential for restoration for future years. Reporting will be more accurate at the end of the financial year.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Number of contractors trained to carry out the restoration.

MOST RECENT DATA:

23 contractors trained in 2018-19.

Since starting in October 2017 there have been 127 attendees (all categories of trainees) on training courses.

DATA SOURCE(S): Training Data base[6].

COMMENTARY:
This is a critical component of developing the longer term capacity required to meet climate change targets for peatland restoration. A training programme for contractors is now established and attendance can be reported at the end of each financial year. In the period April – June 2019 a further 9 contractors were trained. These figures do not include the informal training that takes place between contractors and project officers which is difficult to measure but enables the sharing of expertise and good practice.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Number of land managers / consultants trained through the Peatland Action Programme.

MOST RECENT DATA: 93 land managers / consultants trained in 2018-2019 encompassing private, public and third sector. Since starting in October 2017 there have been 127 attendees (all categories of trainees) on training courses.

DATA SOURCE(S): Training data base[6].

COMMENTARY
A training programme for land managers/consultants is now established and interest is high. The numbers in most recent data do not include Scottish Natural Heritage / SEPA staff. This does not include the informal training that takes place between contractors and project officers which is difficult to measure but enables the sharing of expertise and good practice.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOME 3:

Number of dedicated policy officers.

MOST RECENT DATA: 13.1 FTE Project Officers.
DATA SOURCE(S): Peatland Action Staff Records[6].

COMMENTARY:

- The dedicated project team increased to 30 by the end of 2018. The enhanced size of the dedicated team is designed to progress towards the long term 20,000 hectare per annum target in future years.
- The Dedicated Project Officers within this team are key to the delivery of Peatland Action. Project Officers work with land managers and contractors to ensure applications are appropriate and delivered to a high specification and supporting applications to the programme and delivering the training programme.
- Project officers are employed both by Scottish Natural Heritage and hosted by partner bodies, including both National Parks and a wide range of local Environmental Third Sector Organisations.

AGRICULTURE

Agriculture

Greenhouse gas emissions from the agriculture sector have already been reduced by 15% (1990 to 2017).

The Plan sets out the following five “policy outcomes” for the sector:

1. More farmers, crofters, land managers and other primary food producers are aware of the benefits and practicalities of cost-effective climate mitigation measures and uptake will have increased.

2. Emissions from nitrogen fertiliser will have fallen through a combination of improved understanding, efficient application and improved soil condition.

3. Reduced emissions from red meat and dairy through improved emissions intensity.

4. Reduced emissions from the use and storage of manure and slurry.

5. Carbon sequestration on agricultural land has helped to increase our national carbon sink.

The five overarching policy outcomes above remain the focus of the agricultural chapter of the Climate Change Plan. It is within these key areas that we continue to encourage farmers on the benefits of low carbon farming. Since the publication of the plan in February of 2018 we have and continue to take forward and strengthen our commitments. The 2018-2019 Programme for Government saw the inclusion of commitments to establish an industry led agri-tech group, commission research into nitrogen flow models within agriculture, establish our young farmer climate change champions initiative and review and renew our Farming For a Better Climate initiative, all of which we have achieved. Throughout 2018 and 2019 we have also engaged the public through the Stability and Simplicity consultation on possible roles for carbon auditing, soil testing, integrated land management plans and livestock health planning. We have continued to take forward research which has been published through ClimateXChange on areas such as livestock by breeds and greenhouse gas emissions, emissions intensity of Scottish produce, the evaluation of carbon auditing tools and the role of nitrogen fixing crops - this work is vital as we continue to ensure our evidence based approach.

Chapter 7: Agriculture

September of this year saw the launch of the 2019-2020 Programme for Government and we have again strengthened intentions. 2019-2020 signals the start of a new Agriculture Transformation Programme for our farming and food production focused on sustainability, simplicity, profitability, innovation, inclusion, productivity and reducing emissions. While funding of this package of actions will be considered as part of future rural support, work will begin this year to:

- Develop pilot schemes to reduce greenhouse gas emissions from agriculture.

- Encourage more tree planting across Scotland including woodland integration and agro-forestry on Scottish farms.

- Promote and encourage the multiple benefits of good grassland and livestock management in Scotland including the protection of our historic carbon sinks.

- Encourage more farmers to invest in renewable energy including bio-energy to meet their energy needs.

- Promote organic farming and review innovative approaches to strengthen the sustainability of future Scottish crop production and selection.

- Explore the development of models to demonstrate and promote carbon neutral farms.

Scottish farmers and crofters continue to contribute to our emissions reduction targets across a range of areas such as land use, forestry and renewable energy generation. As such our agricultural sector is also integral to our wider national commitments to:

- Develop a national nitrogen balance sheet.

- Commission independent advice on options for changing land use patterns and practices within Scotland to optimise the role that our rural land use, including agriculture and forestry, plays in achieving our national climate change targets.

OUTPUT INDICATOR FOR POLICY OUTCOMES 1, 2, 3, 4 AND 5:

Our primary output indicator will be the level of emissions from the agriculture sector in the National Greenhouse Gas Inventory. This will be underpinned with a particular focus on soil testing and nutrient planning in Scotland.

Over the next few years we would expect:

A. A reduction in agricultural greenhouse gas emissions in the national inventory.
B. An increase in the share of farmers carrying out soil tests.
C. An increase in the share of farms completing nutrient management plans.

A. **MOST RECENT DATA:** 7.56 $MtCO_2e$ in 2017.
BASELINE DATA: 7.74 $MtCO_2e$ 2015 data based on 2016 recalculations.
CHANGE: 0.18 $MtCO_2e$ from 2015 to 2017.
DATA SOURCE(S): Scottish greenhouse gas emission statistics 2017[1].

B. **MOST RECENT DATA:**
- Baseline data is still applicable as the Scottish Survey of Farm Structure and Methods is not carried out on an annual basis. The next Scottish Survey of Farm Structure and Method is due to be held 2020.

BASELINE DATA:
- 64% of farmers surveyed carried out pH testing on other (arable) land in 2016.
- 30% of farmers surveyed carried out pH testing on grassland in 2016.

CHANGE: N/A.
DATA SOURCE(S): 2016 Scottish Survey of Farm Structure and Method[2].

C. **MOST RECENT DATA:**
- Baseline data is still applicable as the Scottish Survey of Farm Structure and Methods is not carried out on an annual basis. The next Scottish Survey of Farm Structure and Method is due to be held 2020.

BASELINE DATA:
- 42% share of farms surveyed completed a nutrient management plan on other (arable) land in 2016.
- 17% of farmers surveyed completed a nutrient management plan on grassland in 2016.

CHANGE: N/A
DATA SOURCE(S): 2016 Scottish Survey of Farm Structure and Method[2].

ON TRACK: Too early to make assessment.

(continued in next box)

(continued from previous box)

COMMENTARY:

It is currently too early to make an assessment of the progress that is being made on the output indicators:

- Emissions statistics - greenhouse gas emissions are published two years in arrears and the statistics report in 2019 related to 2017 emissions. We are therefore unable to assess the impacts of the Climate Change Plan at this time.
- Soil testing and nutrient management plans, are based on data available from the 2016 Scottish Survey of Farm Structure and Method. This survey is conducted and published on a 3 to 4 year basis with the next survey due 2020. Therefore we are unable to update this at this time.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3, 4 and 5:

The level of engagement within the agricultural industry to climate change-themed topics through Farming For a Better Climate and the Farm Advisory Service.

MOST RECENT DATA: up to September 2019 -

- Combined Virtual interactions - 7100 website hits.
- Attendees at Events –1765 farmers and crofters attended 58 events across Scotland.

DATA SOURCE(S): Farming For a Better Climate[3] and the Farm Advisory Service[4].

COMMENTARY:

Since the publication of the first monitoring report our Farming For a Better Climate initiative has gone through an evolution from an event led focus farm programme to a network based approach with an online resource model focused on Regenerative Soil Agriculture. The network brings together five farmers that are working to establish how best to support, enhance and protect their farm soils. The online resource focus allows farmers to access information at a time that best suits them and removes the need for time to be spent off farm. In order to reflect this change in approach we have altered the indicator from the first report to include virtual interactions which are a combination of Farming For a Better Climate and the Farm Advisory Service to complement the ongoing events that are provided by the Farm Advisory Service. This 2019 data will be used to set a baseline for future years.

Farming for a Better Climate has also continued to interact with the wider agricultural community through the presentation and promotion of their findings at various industry events and meetings as well as through the written press through a regular column in Farming Scotland Magazine as well as having articles featured in The Scottish Farmer, The Sunday Herald, The Press and Journal and The Dundee Courier.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3, 4 AND 5:

Increase the uptake of free carbon audits provided through the Farm Advisory Service to 200 audits delivered per year by 2019.

MOST RECENT DATA: 397 free carbon audits have been taken forward between the publication of last monitoring report.
DATA SOURCE(S): The Farm Advisory Service[3].

COMMENTARY:
Whilst it is too early to judge the full implementation of the policies, proposals and milestones in the agricultural chapter of the Climate Change Plan given the short amount of time since it was published, we have seen a marked increase in the number of carbon audits that have been taken forward compared to the 2018 baseline of 150. This increase has taken us past our target of 200 and can be attributed to farmer participation in the Beef Efficiency Scheme and increased awareness in the wider agricultural community. Irrespective of the rationale for taking a carbon audit forward they provide farmers and crofters with insight into areas of their business where savings can be made both in greenhouse gas and monetary terms. As set out in the climate change plan, identifying win-win benefits is key to affecting long term change and we continue to work with our agricultural industry to achieve this.

IMPLEMENTATION INDICATOR FOR POLICY OUTCOMES 1, 2, 3, 4 AND 5:

Increase uptake of Integrated Land Management Plans (ILMPs) provided through the Farm Advisory Service to 300 ILMPs delivered per year by 2019.

MOST RECENT DATA: 144 ILMPs have been taken forward between the publication of last monitoring report.
DATA SOURCE(S): The Farm Advisory Service[3].

COMMENTARY:
Whilst it is too early to judge the full implementation of the policies, proposals and milestones in the agricultural chapter of the Climate Change Plan given the short amount of time since it was published, we have seen an increase in the number of ILMPs that have been taken forward compared to the 2018 baseline of 125. This increase can be attributed to increased awareness in the wider agricultural community. An ILMP sets out a pathway to a sustainable and profitable future for our farms and crofts. They can identify opportunities across the whole holdings, such as improving habitats for wildlife to delivering a cross compliance assessment to highlight where there may be risk areas for the business. As set out in the climate change plan, identifying win-win benefits is key to affecting long term change and we continue to work with our agricultural industry to achieve this.

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List of Acronyms

BAME Black, Asian and Minority Ethnic
BEIS Department for Business, Energy and Industrial Strategy
BMW Biodegradable Municipal Waste
BSOG Bus Service Operators Grant
CCUS Carbon Capture Utilisation & Storage
CHP Combined Heat and Power
DUKES Digest of UK Energy Statistics
EC European Commission
EII Energy Intensive Industries
EPC Energy Performance Certificate
EST Energy Saving Trust
EV Electric Vehicles
FES Forest Enterprise Scotland
FLS Forestry and Land Scotland
GVA Gross Value Added
GWH Gigawatt hours
HEEPS Home Energy Efficiency Programmes for Scotland
HGV Heavy Goods Vehicles
HLOS High Level Output Specification
ILMP Integrated Land Management Plans
NRS National Records of Scotland
NTS National Transport Strategy
RHI Renewable Heat Incentive
RTFO Renewable Transport Fuel Obligation
SAP Standard Assessment Procedure
SEEP Scotland's Energy Efficiency Programme
ULEV Ultra Low Emission Vehicles
VED Vehicle Excise Duty

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