

# CLIMATE CHANGE PLAN

Third Report on Proposals and Policies 2018-2032  
Summary Document



Scottish Government  
Riaghaltas na h-Alba  
gov.scot

This Summary Document provides an overview of the Scottish Government's Climate Change Plan 2018-2032<sup>1</sup>.

All data is consistent with the Climate Change Plan published in February 2018, with the exception of the renewable electricity generation figures in this document which update those in the Plan, based on new data now available from UK BEIS. These are referenced in footnotes. In addition, the section on the Scottish Energy Efficiency Scotland Programme has been updated to reflect the publication of the Energy Efficient Scotland Route Map in May 2018. Finally the Climate Change adaptation section has been updated to reflect the publication of the fourth annual review of the Scottish Climate Change Adaptation Programme, which was laid in Parliament on 31 May 2018.



<sup>1</sup>The Scottish Government's Climate Change Plan, Third Report on Proposals and Policies 2018-2032 (RPP3), available at <http://www.gov.scot/Publications/2018/02/8867>



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# VISION

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**By 2032, Scotland will have reduced its emissions by 66%, relative to the baseline, while growing the economy, increasing the wellbeing of the people of Scotland and protecting and enhancing our natural environment.**

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## OUTCOMES

- A healthier society
- An enhanced and protected natural environment
- A diversified, resilient and sustainable economy

By



# 2032

- Scotland's electricity system, already largely decarbonised, will be increasingly important as a power source for heat and transport.
- Scotland's buildings will be insulated to an appropriate level, and will increasingly be heated and cooled by low carbon technologies.
- Scotland will have phased out the need to buy petrol and diesel engine cars and vans, implemented low emission zones in Scotland's largest cities and made significant progress in reducing emissions from buses, HGVs and ferries.



- Our industrial sector will be more energy efficient, more productive, and increasingly use more innovative technologies, presenting significant economic and competitive opportunities.
- Landfilling of biodegradable municipal waste will have ended, we will have reduced food waste, more of Scotland's waste will be recycled and a more circular economy will present significant economic opportunities.
- Scotland's woodland cover will have increased, and more of our peatlands will be restored to good condition, benefiting people, biodiversity and ecosystems.
- The Scottish agriculture sector will be among the lowest carbon and most efficient food production systems in the world.





# MESSAGE FROM ROSEANNA CUNNINGHAM

Cabinet Secretary for Environment, Climate Change and Land Reform

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In 2009, the Scottish Parliament passed the most ambitious climate change legislation anywhere in the world at the time, and in May 2018 the Scottish Government introduced a new Bill that increases that ambition even further. The Scottish Government's new Climate Change Bill proposes a 90% reduction target for all greenhouse gases which means net zero emissions of carbon dioxide by 2050, in other words Scotland will be carbon neutral. In February 2018 we published our statutory Climate Change Plan, which sets out the actions we will take to reduce emissions by 66% by 2032. This document provides a summary of the full Climate Change Plan.

Tackling climate change is a moral responsibility but it is also an economic opportunity. Low carbon technologies will revolutionise the global economy and, in order to grasp these economic opportunities, we must act quickly and with purpose or be left behind. As the First Minister of Scotland said at the annual United Nations climate change conference in Bonn in November 2017, 'our ambitions must live up to the scale of the challenge, and our actions must live up to our ambitions'. Our Climate Change Plan sets out our domestic plans to ensure we continue to be leaders and collaborators in global action to tackle climate change.



**“In finalising our Climate Change Plan, my Cabinet colleagues and I selected an emissions reduction path that we believe is the most beneficial to the people of Scotland”**



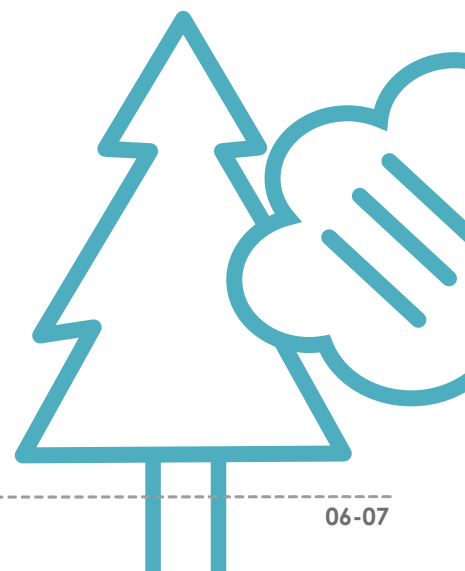
In finalising our Climate Change Plan, my Cabinet colleagues and I selected an emissions reduction path that we believe is the most beneficial to the people of Scotland, maximising opportunities and minimising disruption for households, communities, business and industry. We used the Scottish TIMES model to help us decide how best to reduce emissions across the economy by using a pathway broken down into emissions envelopes by sector. A summary of our approach, and the effort we expect each sector to undertake, is laid out in this document.

Clearly, our ambitious plans cannot and should not be delivered by Government alone. Every household and every organisation has a role to play. Our aim is to enable and support the changes required now, as well as stimulating the innovation and creativity required for the future. Of course we cannot predict with certainty exactly how we will achieve all of our ambitions through to 2032. We do not know how global and regional market forces will evolve or how some technologies will develop. Our role is to chart a path through this uncertainty – putting the welfare of our people, the health of our economy, and the protection and enhancement of our natural environment at the heart of our transformation. The Climate Change Plan is a step along this path.



This is an exciting time for Scotland, and we look forward to working with our partners both here and abroad on what is one of the defining challenges of our time.

*R. Cunningham*



# Where will we be in 2032?

By 2032, our energy sector will be flourishing and competitive, delivering secure affordable energy for Scotland's households, communities and businesses. Our industrial sector will continue to lead the way in decarbonisation, with reduced carbon intensity from adopting new technologies and increasing energy productivity. Homes and buildings will be more efficient, with less energy required to heat and cool them – critical to both reduce levels of fuel poverty and costs for businesses. In transport, people and businesses will have access to cleaner forms of travel and transport, and our urban air quality will improve. People will have significantly more opportunities to walk and cycle, important for both their physical and mental health as well as improving our urban environment. The landfilling of biodegradable municipal waste will be phased out and our circular economy will mean more productive businesses, new markets and reduced reliance on scarce resources. Our agriculture sector will be among the most efficient global food producers with one of the lowest carbon intensities in the world, and our ambitious peatland restoration and tree planting programmes will enhance Scotland's biodiversity and ecosystems, as well as provide wonderful natural places for local people and visitors to enjoy and relax.





# 1. OUR PROGRESS SO FAR

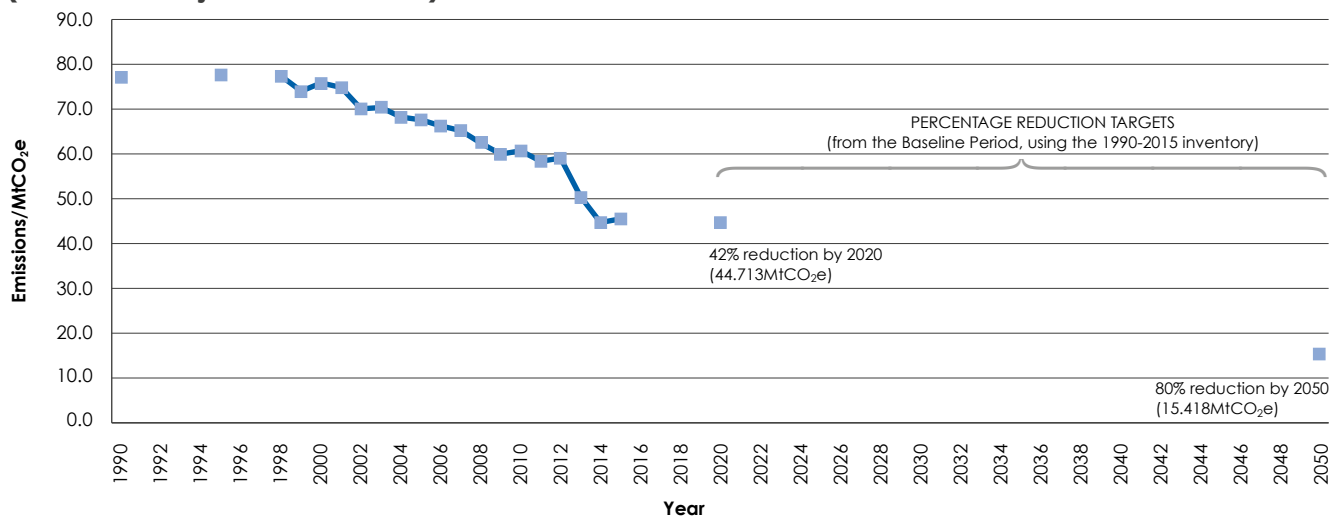


**Scotland is a world leader in tackling climate change and Scotland's transition to a more prosperous, low carbon society is already well underway.**

In 2015, Scotland had reduced its emissions by 41% from the 1990 baseline<sup>2</sup>, and in 2017 Scotland generated 68.1% of its electricity

requirements from renewables<sup>3</sup>. Scotland's success in decarbonising electricity paves the way for transformational change across all sectors of the economy and society, particularly as electricity will be increasingly important as a power source for heat and transport.

**Figure 1: Scotland's greenhouse gas emissions reduction over time (based on adjusted emissions)**



<sup>2</sup> Scottish Greenhouse Gas Emissions Statistics 2015 <https://www.gov.scot/Publications/2017/06/9986>

<sup>3</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/669722/regional-generation-2004-2016.xls](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/669722/regional-generation-2004-2016.xls)

# 2. OUR ROLE ON THE INTERNATIONAL STAGE



Promoting Scotland as a world leader on climate change and engaging with the international community on climate related issues are key aspects of our external outreach activity. The Scottish Government has established a strong presence within the global climate action debate. This has been built over many years through Ministerial attendance at annual Conferences of the Parties to the United Nations Framework Convention on Climate Change and through active participation in international climate programmes. This includes the Under 2 Coalition, which is made up of more than 200 governments who represent over 1.3 billion people and nearly 40% of the global economy.

The Scottish Government supports the Paris Agreement, which mandates the international response to global climate change. As stated earlier, in May 2018, we introduced a new Climate Change Bill which will raise our ambitions in direct response to the Paris Agreement and ensure we achieve net zero emissions of carbon dioxide, otherwise known as carbon neutrality, by 2050. This will mean that Scotland continues to meet its responsibilities and shows leadership as one of the first countries to bring forward new statutory climate targets in response to the Paris Agreement.

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# 3. CLIMATE JUSTICE



**The Scottish Government has been championing climate justice since 2012, when we launched the Climate Justice Fund. Climate justice is based on the core principle that the poor and vulnerable at home and overseas are the first to be affected by climate change, and will suffer the worst, yet have done little or nothing to cause the problem. A total of £21 million has been committed through to 2021 to support some of the world's most vulnerable people and communities in becoming more resilient to the changing climate. The Scottish Government is also collaborating with the Glasgow Caledonian University Centre for Climate Justice.**

The concept of climate justice is also relevant to the people of Scotland. The Scottish Government has collaborated with the University of Edinburgh to research climate justice within Scotland, reviewing the potential climate justice implications

of selected policies in the Climate Change Plan. The research report has been published<sup>4</sup> and the project will help to inform future climate-just policy design and implementation within Scotland.

The Scottish Government will establish a Just Transition Commission to advise Scottish Ministers on how to make the transition to a low carbon economy in a way that also tackles inequality and poverty, and promotes a fair and inclusive jobs market. We will continue to work towards resolving fuel poverty with a clear aspiration to improve the energy performance of our building stock. We have designated energy efficiency as a national infrastructure priority, and we published the Energy Efficient Scotland: Route Map<sup>5</sup> in May 2018, to support delivery of our ambitions in this area.

4 Climate Justice Begins At Home: Implications for domestic climate change mitigation policy [https://www.researchgate.net/publication/323019280\\_CLIMATE\\_JUSTICE\\_BEGINS\\_AT\\_HOME\\_Implications\\_for\\_domestic\\_climate\\_change\\_mitigation\\_policy](https://www.researchgate.net/publication/323019280_CLIMATE_JUSTICE_BEGINS_AT_HOME_Implications_for_domestic_climate_change_mitigation_policy)

5 Energy Efficient Scotland: Route Map <http://www.gov.scot/Publications/2018/05/1462>

# 4. NATURAL CAPITAL

**Scotland's natural environment is, first and foremost, important because of its intrinsic value. Biodiversity and beauty are precious in and of themselves. Our natural environment is also of great economic significance. It is believed to account directly for more than 60,000 jobs in Scotland. It is vital to our tourist industry, which employs more than 200,000 people across the country and it is essential to Scotland's food and drink sector, including whisky.**

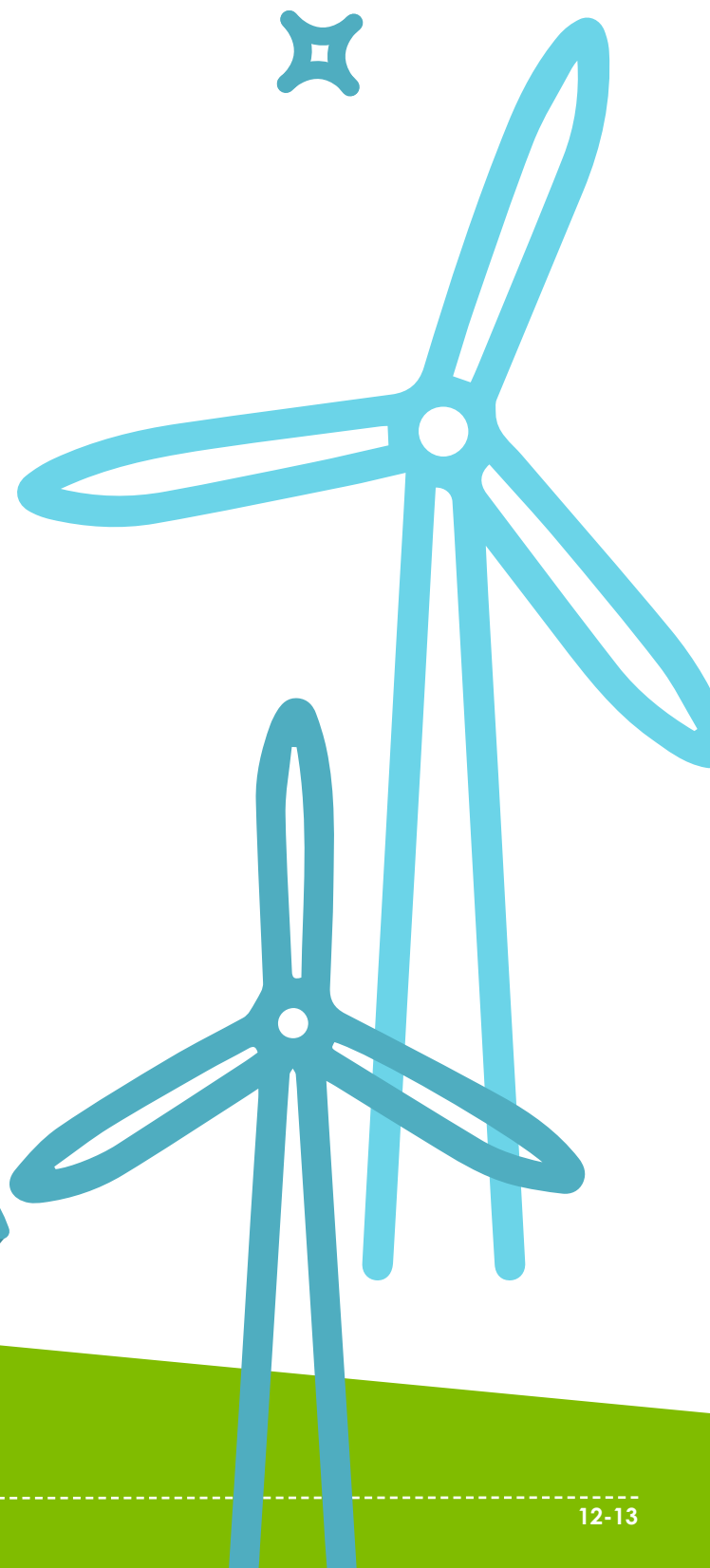
Natural capital is defined as a country's stock of natural resources and environmental assets including plants, animals, water, air, soils and minerals. People derive a wide range of benefits from natural capital. These benefits are often referred to as "ecosystem services". Ecosystem services are vital to society and the economy, providing benefits such as the food we eat, the water we drink, climate regulation, carbon storage, natural flood defences, and timber and crop pollination. Protecting the environment and safeguarding Scotland's natural capital is a crucial part of the transition to a low carbon society. Scotland is leading the way in demonstrating that there needn't be a tension between protecting our environment and our natural capital, and growing our economy.



# 5. ADAPTING TO CLIMATE CHANGE

The Climate Change Plan lays out our plans for meeting Scotland's emissions reductions targets; it is not a plan for adapting to the changing climate. However, climate change is already affecting Scotland. Many of Scotland's iconic industries, such as forestry, fisheries and whisky, rely on climate-sensitive natural resources. Sea level rise and changes in weather patterns will test our transport, communications, fuel, and energy networks and challenge the delivery of health and social care services. Biodiversity and ecosystems are also at risk.

All countries must plan for and take action on adaptation. Our progress in Scotland is set out in the fourth annual review of the Scottish Climate Change Adaptation Programme, which was laid in Parliament on 31 May 2018. We will continue to strengthen our adaptation to climate change in the years and decades ahead, working with partners across sectors on the priorities for the Second Scottish Climate Change Adaptation Programme, which is currently under development and will be published in 2019.



# 6. LOW CARBON SOCIETY

**The Scottish Government cannot and should not deliver the Climate Change Plan alone. Local government, other public bodies, the private sector, the third sector, communities, households and individuals all have important roles to play.**

Scotland's **private sector** will drive much of the decarbonisation effort as well as benefitting from it, from savings made through energy efficiency measures, through to innovative new industries, clean technologies and access to global markets.

The **public sector** is increasingly demonstrating how its own operations are driving down emissions, both through its statutory duties and its wider leadership role.

**Third sector** organisations in Scotland continue to be successful in promoting climate change awareness and action in Scotland.

The role of **communities** across Scotland is also crucial. Through the Climate Challenge Fund<sup>6</sup>, the Scottish Government enables communities to develop their own local solutions to reduce emissions.

**All of us** can make a difference at some level, whether it is in the home, the work place, or in schools, colleges and universities. Understanding how and why we behave the way we do is crucial. The Scottish Government provides resources such as Climate Conversations and Greener Scotland – Let's Go Greener Together – to help us understand why climate change is an issue and what we can collectively do to reduce our own impacts.<sup>7</sup>

The transition to a low carbon Scotland requires all of us to take action together: changing how we get around; how we heat and cool our homes and buildings; and how we deal with waste. Understanding how and why people behave the way they do is crucial to designing suitable policy interventions. To support the development and the implementation of proposals and policies in the Plan, we have used the Individual, Social, Material (ISM) approach<sup>8</sup> to changing behaviours, and where suitable, we have used behaviour change as an enabler in delivery of policy outcomes in this Plan.

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<sup>6</sup> <https://www.keepsotlandbeautiful.org/sustainability-climate-change/climate-challenge-fund/>

<sup>7</sup> Climate Conversations <http://www.gov.scot/Topics/Environment/climatechange/lowcarbonbehaviours/publicengagement> and Let's go greener together <http://www.greenerScotland.org/>

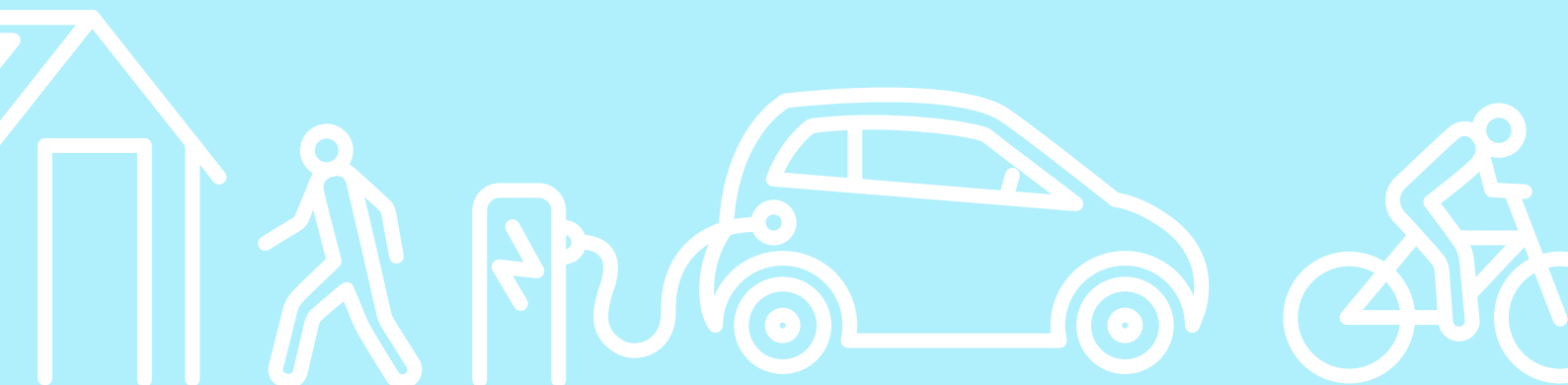
<sup>8</sup> Influencing Behaviours - Moving Beyond the Individual - A User Guide to the ISM Tool <http://www.gov.scot/Publications/2013/06/8511>





## THE PLANNING SYSTEM

Buildings, streets and spaces are the ingredients of place, and placemaking is a useful way of thinking about how the planning system can help Scotland decarbonise. The planning system is a means by which the missing infrastructure which would assist low carbon choices to be made, can be identified and developed in the future. Our buildings are already becoming more energy efficient and our streets are changing to accommodate electric vehicle charging and active travel infrastructure. Using the placemaking approach and design-led principles can help to create places where sustainable and active lifestyles become the default, easy option.



# 7. OUR TRANSITION TO A LOW CARBON ECONOMY



Scotland's transition to a more prosperous, low carbon economy is already well underway. We have created jobs and backed innovative industries while winning international respect for our ambition and leadership on climate change. Analysis by the International Finance Corporation indicates that the Paris Agreement will help to open up \$23 trillion worth of opportunities for climate-smart investments in emerging markets between 2016 and 2030. Scotland is well placed to take advantage of these opportunities.

We will continue the work that we have been doing with businesses and industry in Scotland to support the low carbon economy – helping businesses use their experience, adaptability and willingness to diversify and innovate in order to become more competitive. Our practical leadership includes: specific financial support, such as the Low Carbon Infrastructure Transition Programme<sup>9</sup>; the work of our enterprise agencies, for example in opening up opportunities in the circular economy and in water treatment in overseas markets; and through the provision of advisory services such as Zero Waste Scotland and the Scottish Manufacturing Advisory Service.



<sup>9</sup> <http://www.gov.scot/Topics/Business-Industry/Energy/Action/lowcarbon/LCITP>

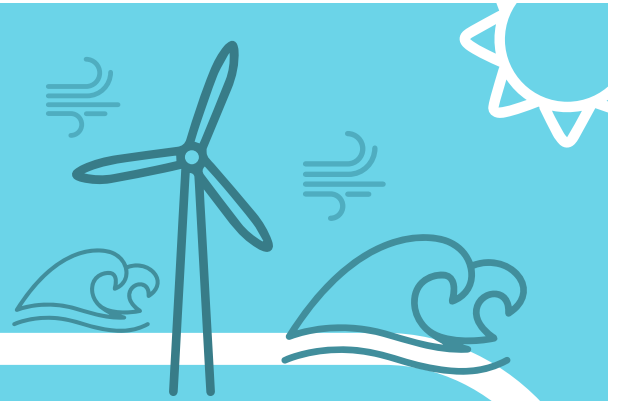


# OUR TRANSITION TO A LOW CARBON ECONOMY

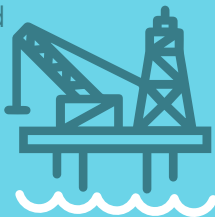
## RENEWABLE ENERGY DEPLOYMENT

Scotland's natural resources create investment opportunities for deployment of renewable energy technologies

Opportunities for innovation and leadership for Scottish businesses in wave and tidal technologies



Opportunities for oil and gas infrastructure to be repurposed for carbon storage as CCS is demonstrated and deployed



By investing in low carbon products and services, business strengthen their competitive advantage by anticipating the increase in demand from environmentally conscious consumers

## DEVELOPMENT OF NEW PRODUCTS

Climate action creates opportunities for businesses to develop new products that are geared towards sustainability

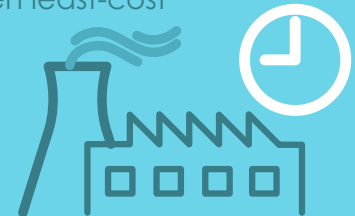


## POTENTIAL TO REDUCE ENERGY COSTS

Move to domestic renewables reduces exposure of energy costs to volatile global commodity prices

UK and Scottish energy market interventions create range of incentives for investment in energy efficiency measures

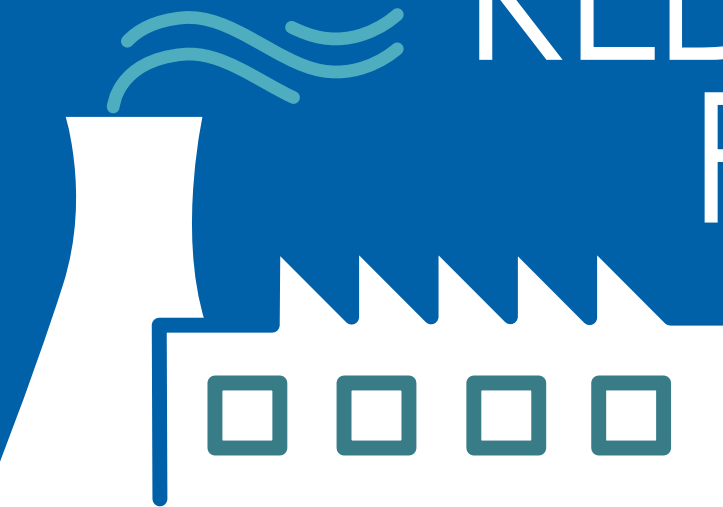
Opportunities for businesses that can reorganise production timings to make use of energy when least-cost



Over the timescale covered by this Plan, Scotland will continue to be a vibrant, diverse country that is a confident, outward-looking and responsible global citizen. By adopting an outward-looking and participative approach to engaging with our global partners, we will expand our diplomatic reach and strengthen our global ties.

There is clear scope to use Scotland's expertise and international reputation as a vehicle for furthering coordinated, global interaction on climate change. Consistent with our international agenda we will continue to implement progressive social policies and environmental measures, playing our part in making the world a safer, fairer and more sustainable place.

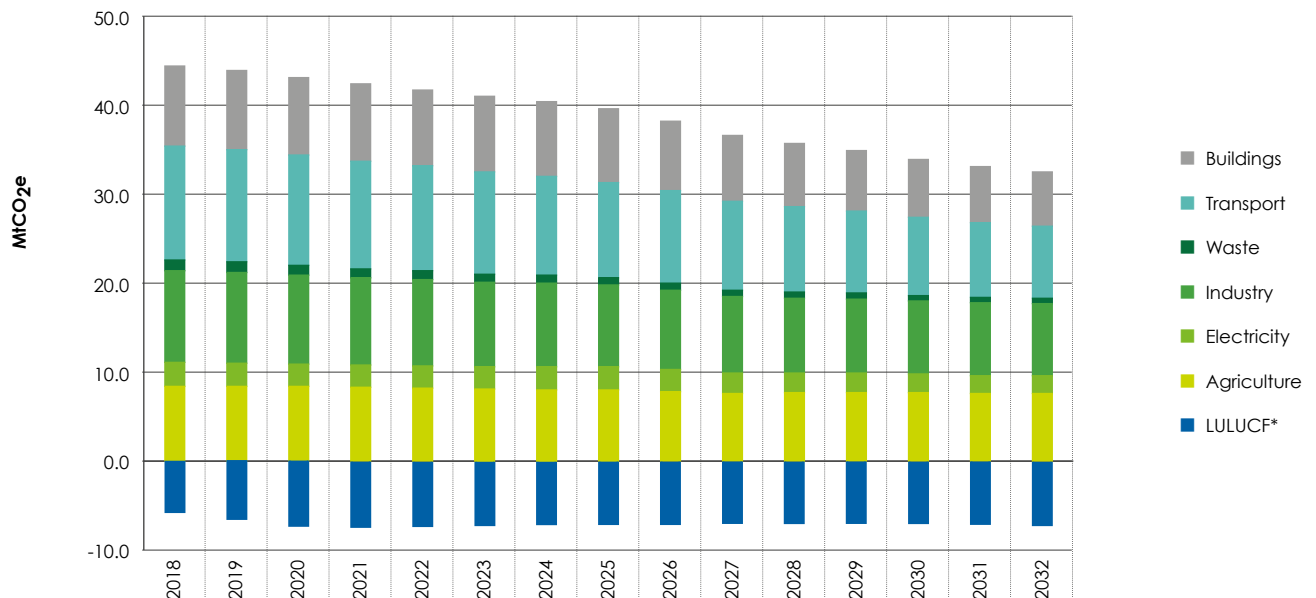
# 8. OUR EMISSIONS REDUCTIONS PATHWAY TO 2032



The Climate Change Plan presents proposals and policies to meet Scotland's annual emissions reduction targets to 2032. This is done through a sectoral approach, and each sector has an 'emissions envelope'. The seven sectors are: electricity; buildings; transport; industry; waste; land use, land use

change and forestry (LULUCF); and agriculture. Figure 2 below illustrates the decarbonisation pathway, based on the Scottish Greenhouse Gas Inventory (2015) representing an emission reduction of 66% by 2032 compared to baseline levels.

Figure 2: Pathway to 2032



\*Land Use, Land Use Change and Forestry

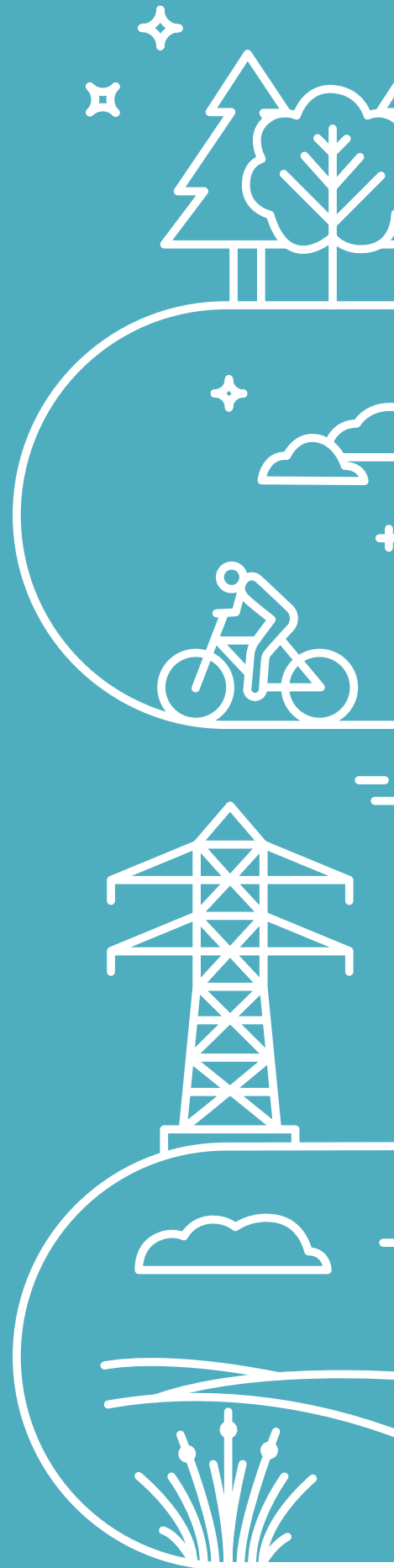
Source: Scottish TIMES model results



# 10. WIDER IMPACTS

Policies designed to reduce greenhouse gas emissions not only mitigate the risks of climate change but can also have other positive societal impacts such as improved air quality and health outcomes. Identifying these potential wider impacts has been an important part of the development of the Plan.

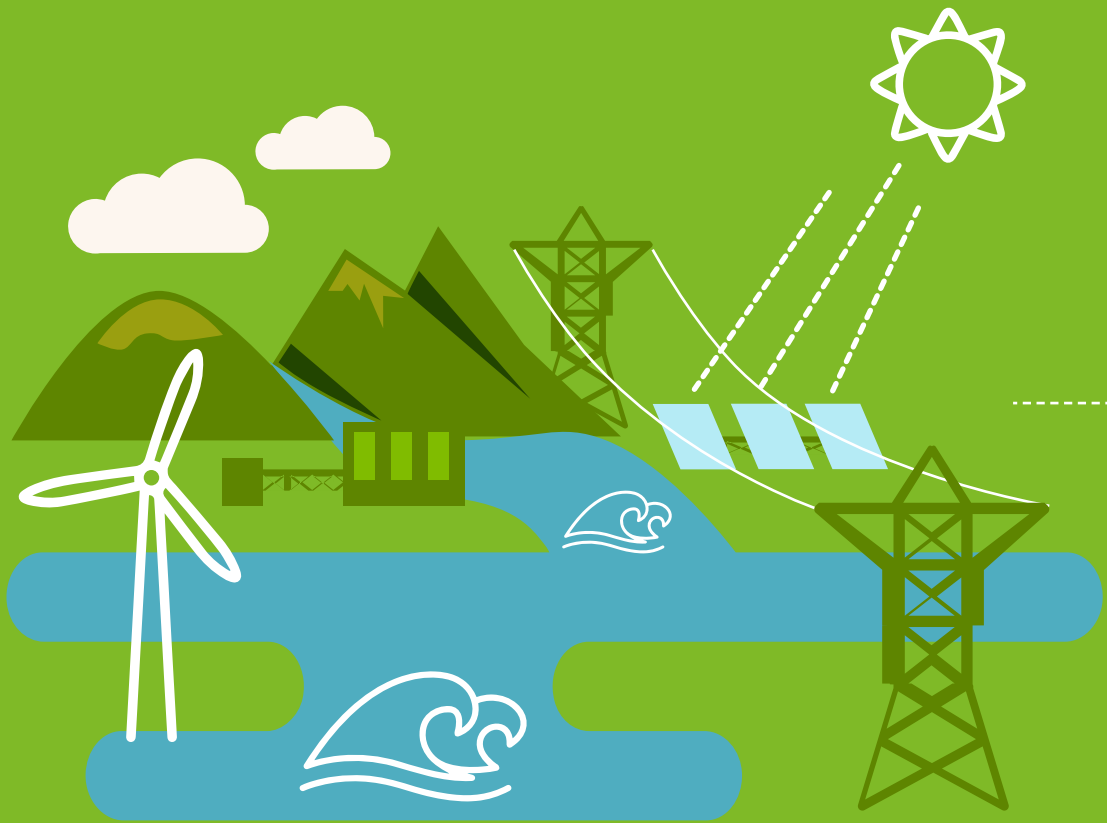
The Scottish Government commissioned three evidence reviews<sup>11</sup> of the potential wider impacts of climate change mitigation options, focusing on: agriculture, forestry, waste and related land use; the built environment; and transport. The reviews highlighted the potential for positive social, economic and environmental impacts from the Plan. We have used these evidence reviews to assess the potential wider impacts of the policies within the Plan.



<sup>11</sup> Evidence Reviews <http://www.gov.scot/Publications/2017/01/2768>



# ELECTRICITY



28%

total drop  
in emissions  
between 2018  
and 2032

# 1 Our ambition

Emissions from the electricity sector are expected to fall by 28% (0.8MtCO<sub>2</sub>e) over the lifetime of the Plan. By 2032, Scotland's electricity system will supply a growing share of Scotland's energy needs and by 2030, 50% of all Scotland's energy needs will come from renewables. Electricity will be increasingly important as a power source for heat and in transport to charge Scotland's growing fleet of ultra-low emission vehicles (ULEVs). Innovative energy systems will improve efficiencies and deliver secure, clean and affordable electricity. Smart domestic energy applications and systems will allow consumers to increase control over their energy use and avoid excessive costs.

This builds upon progress already made since 1990. Scotland's electricity generation mix has changed significantly. Emissions fell by 48% between 1990 and 2015, largely due to an increase in electricity production from renewable sources such as wind. Renewables generated the equivalent of 68.1% of Scotland's electricity demand in 2017<sup>12</sup>, from just over 12% in 2000 – which means we have met our interim target to deliver the equivalent of 50% of Scotland's electricity needs from renewables by 2015.

Scottish communities will benefit from innovative and integrated local energy systems. The transformation of our electricity system will attract investment and stimulate growth of highly skilled employment, benefiting people in both rural and urban areas of Scotland. Harnessing electricity from land, seas, lochs, rivers and the sun will increase Scotland's resilience against future changes in global energy markets.

<sup>12</sup> The Climate Change Plan refers to a figure of 54.0% which is the official statistic for 2016.

## Policy Outcomes

- A. From 2020 onwards, Scotland's electricity grid intensity will be below 50g CO<sub>2</sub> per kilowatt hour. The system will be powered by a high penetration of renewables, aided by a range of flexible and responsive technologies.
- B. Scotland's energy supply is secure and flexible, with a system robust against fluctuations and interruptions to supply.

# 2 Achieving our ambition

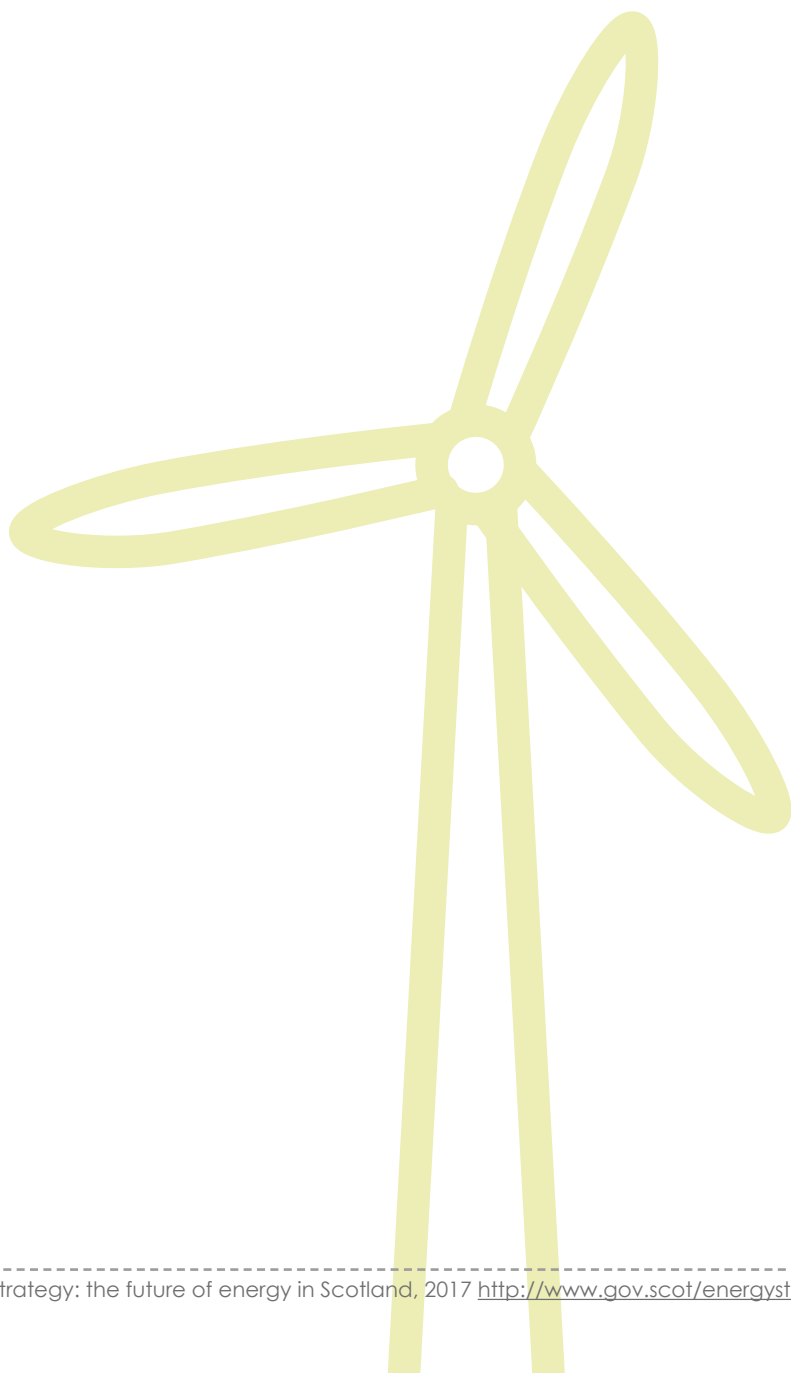
## Delivery

To achieve our ambition in the electricity sector, we are supporting the development of a wide range of renewable technologies by addressing current and future challenges, including market and policy barriers. We will support improvement to electricity generation

and network asset management, including network charging and access arrangements that encourage the deployment and availability of renewable projects in Scotland; and encourage development of a range of technologies that aid system security, flexibility and resilience.

## ENERGY STRATEGY

The Energy Strategy<sup>13</sup> published in 2017, sets out the Scottish Government's long-term vision for the future energy system in Scotland. The Strategy's proposed 2030 'all-energy' target to supply the equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption from renewable sources captures our ambition to adopt a system-wide approach. We have also committed to increasing the productivity of energy use across the Scottish economy by 30% by 2030.





# BUILDINGS



33%

total drop  
in emissions  
between 2018  
and 2032

# 1 Our ambition



Emissions from Scotland's buildings are expected to fall by 33% (2.9 MtCO<sub>2</sub>e) over the lifetime of the Plan. Residential and non-domestic buildings are expected to fall by 23% and 53% respectively. In the short term (to 2020) emissions from Scotland's buildings are expected to fall to 8.7 MtCO<sub>2</sub>e, primarily driven by energy efficiency improvements, and after 2025, the pace of emissions reduction will increase as we begin to supply an increasing proportion of heat to on-gas grid buildings using lower carbon fuels, where they are a low or no regrets option.

This builds upon progress already made since 1990. Between 1990 and 2015 emissions from Scotland's buildings fell by 14%. Emissions from Scotland's residential buildings have fallen by 24% during this period. In addition, the energy efficiency of Scotland's homes has improved in recent years. In 2016, around two fifths (39%) of homes achieved an Energy Performance Certificate (EPC) rating of Band C or above. Scotland now has, proportionately, 32% more homes with the top three EPC ratings (A-C) than England<sup>14</sup>.

Improving the energy efficiency of Scotland's residential and non-residential buildings will ensure that we keep our homes, schools and businesses warm while conserving energy. The cornerstone of this is the Energy Efficient Scotland<sup>15</sup> programme. To the mid-2020s, Energy Efficient Scotland will focus primarily on energy demand reduction in all buildings in Scotland, tackling fuel poverty and making our businesses more competitive. It will establish solutions for switching heating supplies from high to lower carbon or renewable sources for properties off the mains gas grid, as well as encouraging appropriately-sited district heating. Beyond that Energy Efficient Scotland will be reviewed and developed in the context of wider changes to heat policy.



<sup>14</sup> Scottish House Condition Survey, 2016 and English Housing Survey, 2016-17, based on SAP 2012.

<sup>15</sup> Energy Efficient Scotland: Route Map <http://www.gov.scot/Publications/2018/05/1462>

Where technically feasible by 2020, 60% of walls will be insulated and 70% of lofts in homes will have at least 200mm of insulation.

By 2032:

- 35% of heat for domestic buildings will be supplied using low carbon technologies<sup>16</sup>, where technically feasible, and all buildings (residential and non-domestic) will be insulated to the maximum appropriate level
- 70% of heat and cooling for non-domestic buildings will be supplied using low carbon heat technologies<sup>17</sup>
- improvements to the building fabric of Scotland's buildings will result in a 15% reduction in residential and 20% in non-residential heat demand

Increases in measures such as cavity wall, floor and loft insulation, secondary glazing, smart meters and programmable thermostats, amongst others, will provide consumers with opportunities for cost savings from reducing heat demand, help to alleviate fuel poverty and make businesses more competitive by releasing savings from fuel bills that can be invested in frontline services.

Raising the energy efficiency of Scotland's building stock will help to minimise the impact of any fuel price rises in future. A growing market and supply chain for energy efficiency services and technologies will stimulate innovation and entrepreneurship, and ensure the people of Scotland live and work in warm buildings in both urban and rural areas.

## 2 Achieving our ambition

### Policy Outcomes

- 1) By 2032, the energy intensity of 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.

### Delivery

The Scottish Government will support the delivery of energy efficiency solutions, such as insulation and boiler replacement, reducing domestic and public and private sector energy use. The Scottish Government allocated £116 million in the 2018-2019 budget to support delivery of energy efficiency measures through our Home Energy Efficiency Programme. Energy efficiency in the social rented sector will be improved through our Energy Efficiency Standard for Social Housing, which requires social landlords to improve the EPC rating of their properties before 2020. The Scottish Government will support delivery of the Low Carbon Infrastructure Transition Programme and encourage investment in decarbonisation of business and the public sector through £76 million funding to 2018, with an additional £60 million allocated from 2018-2020. We will also support public and third sector organisations to retrofit their building stock through the Non Domestic Public Sector Energy Efficiency framework.

<sup>16</sup> This includes the electrification of heat. Currently, around 12% of domestic buildings' heat is supplied using electricity which, over time, will see an increase in the low carbon feedstock.

<sup>17</sup> This includes the electrification of heat. Currently, around 50% of non-domestic buildings' heat is supplied using electricity which, over time, will see an increase in the low carbon feedstock

## ENERGY EFFICIENT SCOTLAND

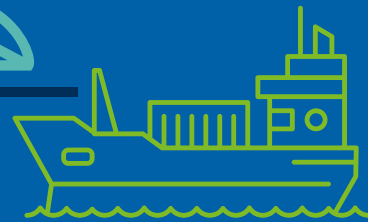
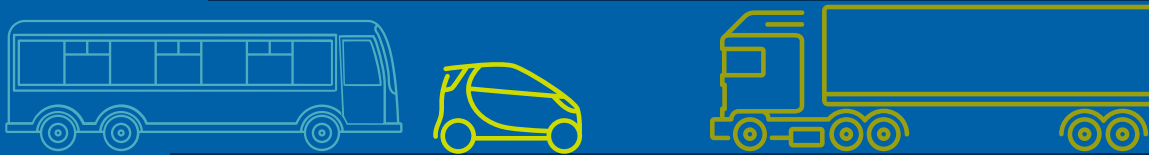
Energy Efficient Scotland will radically improve the energy efficiency of Scotland's homes, and buildings in the commercial, public and industrial sectors. It will build upon a transition programme, which offers local authorities incrementally greater opportunities to deliver integrated energy efficiency projects. The Scottish Government awarded £4.6 million funding in 2017-2018 for pilots to test integrated solutions to improve the energy performance of residential, commercial and public buildings, and investments to decarbonise the heat supply. Within the pilots, 12 local authorities are also considering approaches to Local Heat and Energy Efficiency Strategies. In May 2018<sup>18</sup> we launched a full Route Map for Energy Efficient Scotland and introduced the Energy Efficient Scotland Transition Programme. By 2050, Energy Efficient Scotland will have transformed the energy efficiency and heating of Scotland's buildings. This will make our homes, shops, offices, schools and hospitals warmer and easier to heat. Reducing energy demand will help tackle fuel poverty, help businesses become more competitive, and release savings in the public sector for front line services.

All homes and businesses will be offered a smart meter by 2020 under a UK Government initiative, providing the opportunity for a greater understanding of final energy consumption and to maximise benefits to consumers – particularly those who are vulnerable or in fuel poverty. We will continue to support decarbonisation of our buildings through the Renewable Heat Incentive, which provides financial support to the owner of the renewable heating system and is targeted but not limited to off-gas grid solutions. We will support transition to low carbon heating by supporting the District Heating Loan Fund, which helps address the financial and technical barriers to district heating projects

by offering low interest loans. During the development of Energy Efficient Scotland, we will consider what sort of funding mechanisms are needed to support low carbon heat technologies over longer time frames. The Heat Network Partnership, a collaboration of agencies focused on the promotion and support of district heating schemes, will encourage capacity building and project development to support heat planning and programme delivery work that will be developed by local authorities.



# TRANSPORT



37%

drop in  
emissions  
between 2018  
and 2032

# 1 Our ambition



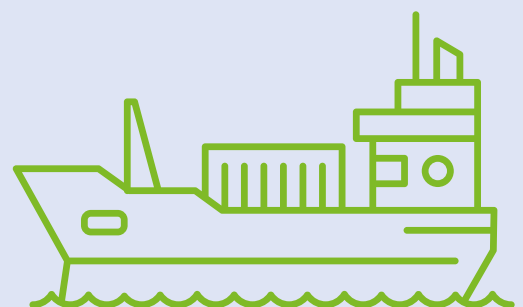
**Emissions from transport are expected to fall by 37% (4.7 MtCO<sub>2</sub>e) over the lifetime of the Plan. Our ambition is to reduce emissions from transport in ways that promote sustainable environmental and socio-economic wellbeing.**

In 2015, transport emissions (including those from international aviation and shipping) amounted to 13.1 MtCO<sub>2</sub>e, marginally below the 1990 baseline figure of 13.3 MtCO<sub>2</sub>e. Within that long-term profile, we have seen significant reductions more recently: since transport emissions peaked at 14.9 MtCO<sub>2</sub>e in 2007, they have fallen by a total of 1.8 MtCO<sub>2</sub>e, although in the last two years emissions from transport have risen marginally, driven by increases from cars, goods vehicles and international aviation.

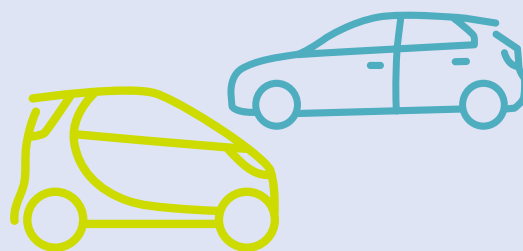
To help achieve our ambitions over the lifetime of the Plan, we will phase out the need to buy petrol and diesel engine cars and vans by 2032, a full eight years ahead of the UK Government. This will be driven by a significant increase in the uptake of ultra-low emission battery electric and hydrogen electric vehicles, which may also play a role in management of the wider energy system.

We will also work to clean up heavier vehicles such as buses, HGVs and ferries and support operators and owners by implementing low emission solutions at Scottish airports and ports. Low emission zones in Scotland's largest cities will improve air quality in our urban areas by limiting the access of vehicles that exceed emissions benchmarks while providing unrestricted access to low emission cars, vans and buses. Increased active travel investment will see our towns and cities become safer and friendlier spaces for cyclists and pedestrians.

Our vision is that by 2050, Scotland will be free from harmful tailpipe emissions from land transport with other modes decarbonising at a slower rate. This will result in a significant reduction in overall transport emissions and we will be enjoying the social, health and economic benefits of noticeably improved air quality.



# 2 Achieving our ambition



## Policy Outcomes

- 1) Average emissions per kilometre of new cars and vans registered in Scotland to reduce in line with current and future EU/UK vehicle emission 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 total 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.

## Delivery

### We will:

- negotiate stretching emission standards for new cars and vans beyond 2021; and vehicle excise duty differentials between ultra-low emission vehicles (ULEVs) and diesel and petrol vehicles to support and encourage uptake of ULEVs
- investigate the potential for biofuels to be used sustainably in the decarbonisation of the whole transport sector
- enhance the capacity of the electric vehicle charging network by supporting development of charge points for consumers and providing funding for town and cities to meet transition needs
- encourage uptake of ULEVs by providing interest free loans to consumers, businesses, taxi and the private hire sector
- support the public sector in leading the way in transitioning to ULEVs, in particular local authorities in delivering low carbon public transport
- support an increase in active travel by doubling funding from £40 million to £80 million from 2018-2019 and supporting programmes to encourage travel behaviour change

# INDUSTRY



21%

drop in  
emissions  
between 2018  
and 2032





# 1 Our ambition

**Emissions from the industrial sector are expected to fall by 21% (2.2 MtCO<sub>2</sub>e) over the lifetime of the Plan through a combination of fuel diversification, cost saving energy efficiency, heat recovery and participation in the EU Emissions Trading System.**

The industry sector saw a 10.3 MtCO<sub>2</sub>e (49%) fall in emissions between 1990 and 2015. Emissions figures from this sector have been more constant in recent years, albeit with small fluctuations since 2009. There was a 4% (0.5 MtCO<sub>2</sub>e) decrease in emissions between 2013 and 2015.

The introduction of innovative technologies will present significant economic opportunities for Scottish businesses by stimulating investment and increasing productivity to better

compete on a global scale. Industrial energy efficiency will enable heat recovery, which could provide an additional income stream, enhance productivity, increase resilience and reduce risk arising from volatile energy prices.

Industrial clustering will help to decrease costs by sharing infrastructure, such as district heating networks, and creating more efficient supply chains. Continuing participation in the EU and UK regulatory frameworks will stimulate decarbonisation and provide certainty for business investment in low carbon technologies. Outcomes are now monitored by measures that embed our support of economic activity within our ambition to decarbonise industrial processes.

# 2 Achieving our ambition

## Policy Outcomes

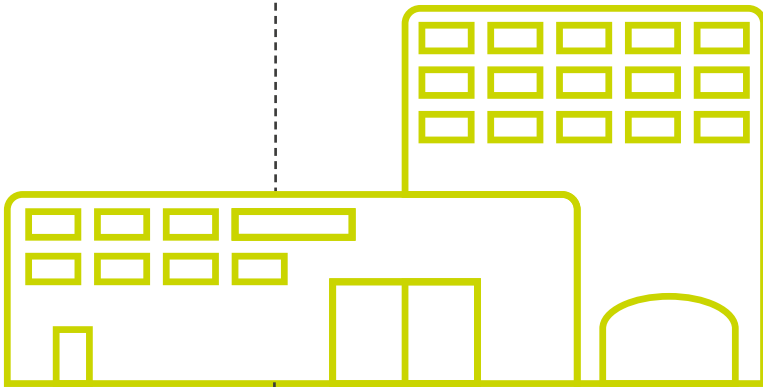
- 1) By 2032, industrial and commercial energy productivity to improve by at least 30%, from 2015 levels, through a combination of fuel diversification, energy efficiency improvements and heat recovery.
- 2) By 2032, industrial and commercial emissions intensity will fall by at least 30%, from 2015 levels,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



## Delivery

The Scottish Government will negotiate for a level playing field in the EU ETS cap share in line with meeting Scotland's domestic ambitions. We will incentivise the industry sector to shift from gas to alternative fuels and encourage uptake of renewable heat technologies through the non-domestic Renewable Heat Incentive. We will provide a coordinated approach to incentives and investment opportunities in energy efficiency measures. This reflects our commitment to manage the transition toward decarbonising industry and builds on existing means of support such as those provided by the Manufacturing Action Plan. We will continue exploring the scope for accessing finance for cross-sector technology demonstrator projects such as Carbon Capture and Storage, and hydrogen used for local energy and transport.

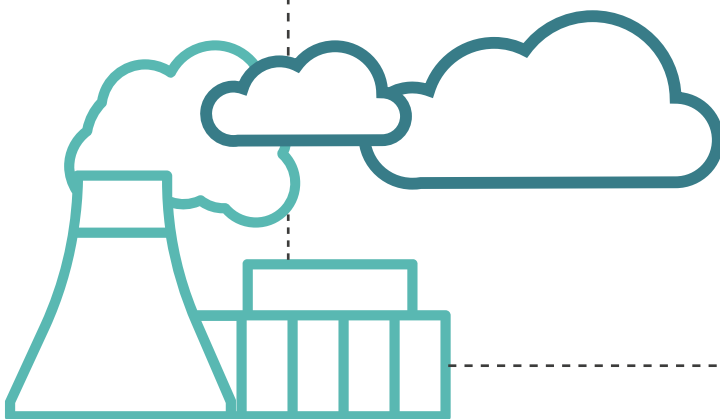




## HEADING STILL TO COME?

The future of Carbon Capture, Storage and Utilisation in Scotland beyond 2032

- Carbon Capture, Storage and Utilisation is an essential technology for further industrial emissions reduction.
- Existing infrastructure makes Scotland one of the best-placed countries in Europe to realise Carbon Capture and Storage on a commercial scale.
- Carbon Capture and Storage may be critical to unlocking the potential for large scale low-carbon hydrogen production.
- Carbon Capture and Utilisation could help Scotland to shift to a more circular economy through better use and management of carbon for processes.





# 1 Our ambition

**Emissions are expected to fall by 52% (0.6 MtCO<sub>2</sub>e) over the lifetime of the Plan as we reduce, re-use and recycle more waste, capture gas from landfill sites and transition to a more circular economy.**

Waste has already seen a 4.2 MtCO<sub>2</sub>e (75%) fall in emissions between 1990 and 2015. This is a result of the progressive introduction of landfill gas being captured and used for energy and the ongoing reduction in biodegradable municipal waste going to landfill. Other factors may contribute to this reduction, including improvements in the standards of landfill and changes to the types of waste going to landfill.

Emissions will continue to fall as we make progress towards our ambitious waste targets. By January 2021, the landfilling of biodegradable municipal waste will be phased out. By 2025, we expect to reduce food waste by 33%, and to recycle 70% of all waste.

By 2050, we aim to be delivering emissions reductions through a circular economy approach in our business and industry sectors. Products will be designed for longer lifetimes, second hand goods will be seen as a good value, mainstream option, and major industrial sectors to be optimising the value of used equipment, such as the reuse of elements of energy infrastructure.

Emissions from closed landfill sites in Scotland will be captured, where possible, with long-term plans for wider methane utilisation.

Through a more circular economy, businesses will increase their productivity, new markets will stimulate the jobs market and Scotland will reduce its reliance on scarce resources. The people of Scotland will benefit from the greater availability of lower cost options, access to second hand or refurbished goods; and will make savings through repairing items rather than replacing them, bringing opportunities for social enterprise.

## 2 Achieving our ambition

### Policy Outcomes

- 1) Reduction in waste sent to landfill.
- 2) Reduction in emissions from closed landfill sites.

### Delivery

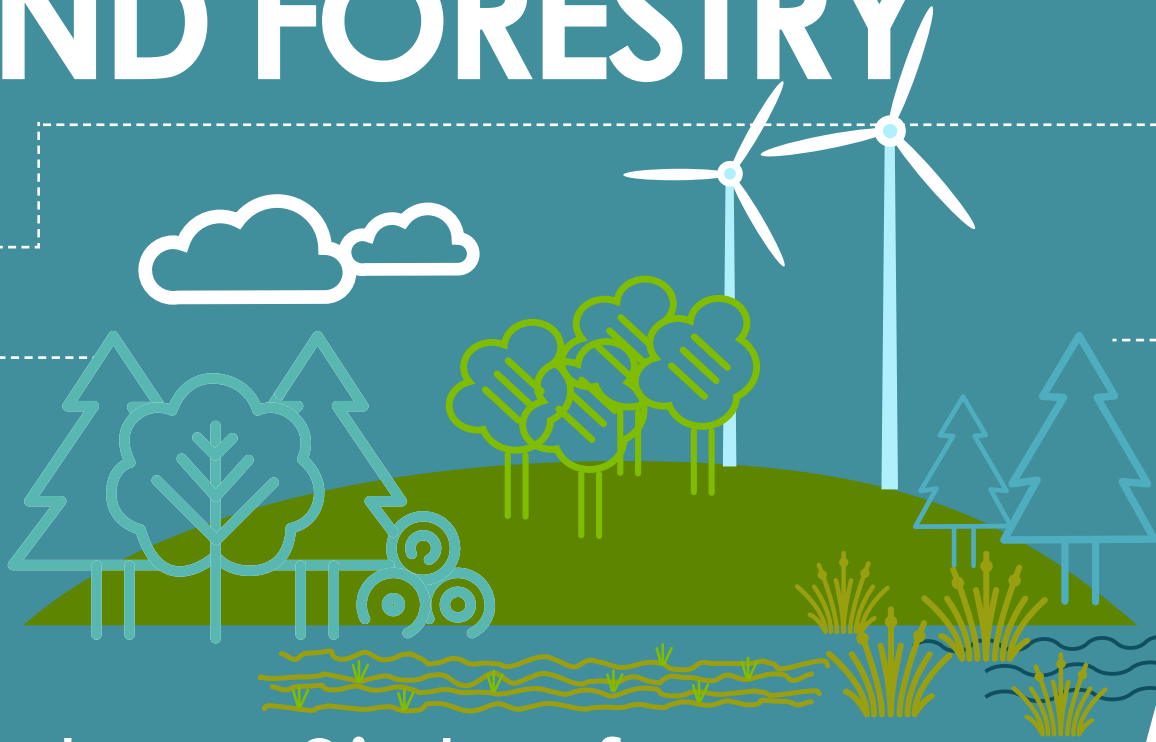
We aim to recycle 70% of all waste by 2025 and reduce food waste by 33% (from 2013 baseline) by 2025. The Scottish Government will end landfilling of biodegradable municipal waste by January 2021 and reduce the percentage of all waste sent to landfill to 5% by 2025. Over the course of the Plan, we will establish a more circular economy, where goods and materials are kept in use for longer. We will take action to capture gas from closed landfill sites to tackle emissions of methane – so far 12 potentially suitable sites have been identified by the Scottish Environment Protection Agency.

## MAKING THINGS LAST

'Making Things Last – a Circular Economy Strategy for Scotland' sets out our priorities for moving towards a more circular economy – where products and materials are kept in high value use for as long as possible. It builds on Scotland's progress in the zero waste and resource efficiency agencies. A more circular economy will benefit:

- **the environment** by cutting waste and carbon emissions and reducing reliance on scarce resources;
- **the economy** by improving productivity, opening up new markets and improving resilience; and
- **communities** by providing more, lower cost options to access the goods we need with opportunities for social enterprise.

# LAND USE, LAND USE CHANGE AND FORESTRY



Carbon Sink of

**-6.7MTCO<sub>2</sub>e**  
in 2032

# 1 Our ambition

The sector is expected to be a sink of around -6.9MtCO<sub>2</sub>e by 2020, dipping slightly after 2021, and then fairly constant until 2032.

## Forestry

By 2032, Scotland's woodland cover will increase from 18% to 21% of Scottish land area. The ambition is that the rate of woodland creation will increase to 15,000 hectares per year by 2025 and the quantity of Scottish timber in UK construction will increase from 2.2 million cubic metres (current) to around 3 million cubic metres by 2031-2032. By 2050, Scotland's woodlands will be an intrinsic part of ecosystem services, such as natural flood management and biodiversity enhancement.

## Peatlands

By 2020, 50,000 hectares of degraded peatland will have been restored, with another 200,000 hectares restored over the following ten years – an improvement of valuable soils across 20% of Scotland. By 2050, Scotland's expanded peatlands will sustain a diverse ecosystem and sequester more carbon than ever before.

## LULUCF

Based on the 2015 GHG Inventory, in 1990, LULUCF as a whole was **emitting** a net 1.5 MtCO<sub>2</sub>e. However by 2015 there had been a significant increase in net **sequestration** of up to -2.8 MtCO<sub>2</sub>e.

The emissions projections data, provided by the UK Government Department for Business, Energy and Industrial Strategy (BEIS) and produced by the Centre for Ecology and Hydrology (CEH), which we have used for 2016 onwards, incorporate a number of changes to the approach taken to estimating LULUCF emissions. These changes are reflected in the 2016 GHG Inventory, (published in June 2018), which increases the scale of the LULUCF sector as a sink.

# 2 Achieving our ambition

## Policy Outcomes

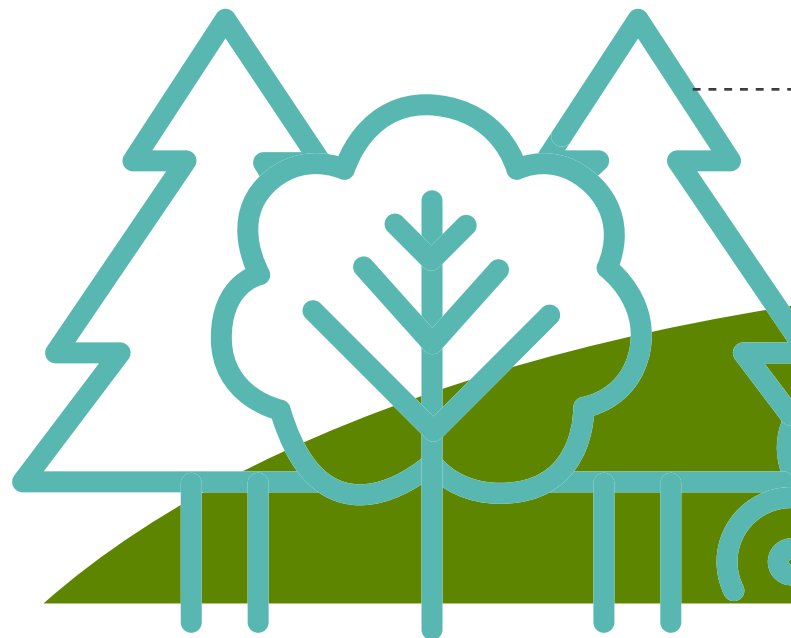
- 1) A stepped increase in annual woodland creation rates from 2020-2021 will mean more trees capturing more carbon and helping to reduce emissions.
- 2) Encouraging the construction industry to increase its use of sustainably sourced wood where appropriate to store carbon and reduce emissions.
- 3) An increase in the annual rate of peatland restoration, from 10,000 hectares in 2017-2018 to 20,000 hectares per year thereafter will result in more carbon storage in peatland.

## Delivery

To achieve our forestry ambition, the Scottish Government will:

- provide support funding for eligible landowners who are creating woodlands or restoring peatland
- create new sustainable woodland on the National Forest Estate to help meet woodland creation targets
- run more farm-based events to illustrate the productivity benefits of integrating farming and forestry

The Scottish Government will work with other UK administrations to maintain a UK Forestry Standard for sustainable forestry and, in partnership with the forestry sector, increase the promotion of the Woodland Carbon Code. Together with private forest sector and other public sector bodies, the Timber Development Programme will support the promotion and development of wood products for use in construction. Land managers, contractors and others looking to deliver peatland restoration projects will be given tools and information to develop their knowledge, capacity and skills.



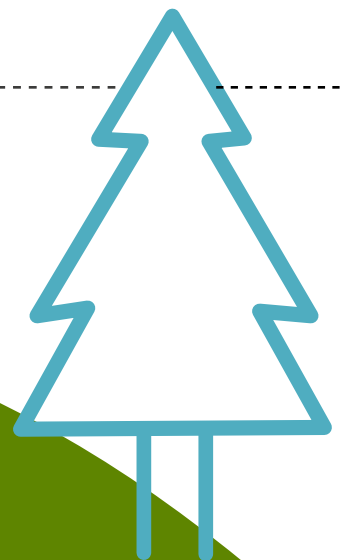


## BLUE CARBON

Still a relatively new concept, 'blue carbon' refers to the carbon sequestered and stored in marine ecosystems. Some marine ecosystems may be as important as forests and peatland for carbon capture and storage. Degradation or damage of these ecosystems may release carbon, and compromise their ability to sequester carbon in the future.

Many habitats and species important for blue carbon – Priority Marine Features – are given general protection under the National Marine Plan and many are also safeguarded within Scotland's Marine Protected Area Network, providing potential to enhance these important ecosystems.

Further research into blue carbon is needed so Marine Scotland, in partnership with Scottish Natural Heritage and Scottish academic institutions, has developed a new research programme for one post-doctoral study and eight doctorates.



# AGRICULTURE



9%

drop in  
emissions  
between 2018  
and 2032

# 1 Our ambition

**Agriculture emissions are expected to fall by 9% (0.8 MtCO<sub>2</sub>e) over the lifetime of the Plan. We want Scotland to be a world-class producer of high quality food: sustainably, profitably and efficiently in environmental and economic terms.**

On agriculture our ambition is for Scotland to be among the lowest carbon and most efficient food producers in the world. Growing numbers of farmers and crofters will adopt low carbon farming practices that will not only achieve greenhouse gas emissions reductions but will generate improvements in animal health and welfare, provide cleaner water and air, increase the volume of our national carbon sink and give farmers more financial security through cost savings.

The Agriculture and Related Land Use sector (as defined in the GHG inventory) has seen a fall of 3.8 MtCO<sub>2</sub>e (25.8%) in emissions between 1990 and 2015. The definition used by the TIMES model shows the decline to be 14% (the difference between the Inventory and TIMES is down to the Related Land Use component of Agriculture, which is captured in the Agriculture and Related Land Use category

in the Inventory and in the LULUCF sector envelope in TIMES. This fall is mostly attributable to four factors: efficiency improvements in farming, such as higher milk yields per cow; fewer cattle and sheep; reduction in the amount of nitrogen fertiliser being applied; reduction in grassland being ploughed for arable production.

By 2020, we will work with farmers so that they know the pH of the soil on a third of their improved land to encourage the efficient use of nitrogen fertiliser. We will encourage farmers producing a substantial proportion of Scotland's agricultural output to complete a carbon audit, and by 2030 most farmers will know the nutrient value of their improved soil and will be implementing best practice in nutrient management and application.

By 2050, Scottish farmers will be making full use of technology to apply precision farming techniques across the board, and Scotland's land will be producing sustainable, healthy, nutritious and high quality food while providing a substantial contribution to Scotland's national carbon sink that offsets emissions elsewhere in our economy.

# 2 Achieving our ambition

## Policy Outcomes

- 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.



## Delivery

We will take a holistic approach to protecting and enhancing our soil, optimising land use, tackling livestock disease, utilising the latest technology, maximising input efficiency and turning wastes into resources. To encourage greater adoption of low carbon farming approaches, we will form an agri-tech group to help disseminate information and advice on climate change mitigation measures, as well as the latest advances in science, through a range of communication methods and technologies. We will recruit volunteer Young Farming Climate Change Champions who will be trained to explain, promote and encourage low carbon farming among their peers.

To increase the efficient use of fertilisers, we will encourage greater uptake of precision farming; and provide information, advice, and practical demonstrations on the benefits of soil testing. The Scottish Government will support improvements in fertility, reducing mortality and management practices in the livestock sector to generate products that have lower emissions intensity. We will reduce emissions from the use and storage of manure and slurry by looking into the feasibility of large-scale anaerobic digestion, and we will engage with farmers to establish how they can improve manure and slurry management. We will explore how best to increase planting of trees and hedgerows which optimise carbon sequestration, including the role of agroforestry.

# 11. KEEPING ON TRACK

## MONITORING AND GOVERNANCE

The Climate Change Plan contains a new monitoring framework, building on previous work by the Committee on Climate Change and the Scottish Government, as well as advice from the Scottish Parliament. Details of indicators can be found in Annex A. We will continue to develop the approach as we learn from the implementation process.

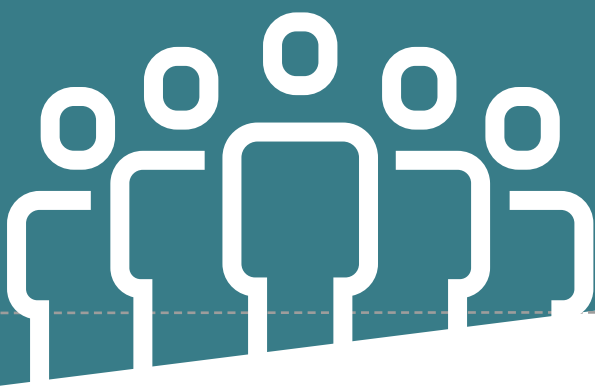
**Policy output indicators:** The policy output indicators measure progress against achieving policy outcomes, for example, whether the commercial and industrial emissions intensity has fallen by 30% by 2032 relative to 2015. These indicators help us determine whether implementation is on track. In some cases the indicator can be measured annually, for others qualitative data will describe progress. Instead of focusing on long-term trajectories with high levels of uncertainty, where possible we have included short-term trajectories to drive the action required now.

**Policy implementation indicators:** These interim indicators check the progress in policy

implementation, checking progress towards delivering the ultimate policy outcome, for example, the amount of electricity generated by renewable sources in Scotland. In some cases these will be measurable quantitative indicators, in others qualitative indicators will describe progress made so far.

**Annual greenhouse gas emissions statistics:** The statistics state whether Scotland has met its annual emissions reduction target and are the ultimate measure of our progress towards our aim to reduce emissions. They are published 18 months after the end of the year to which they relate. Some data used in the monitoring framework will relate to the same time period but other data will relate to the 12 months directly before publication, meaning it is not currently possible to directly link the monitoring data and the statistics.

**External drivers:** Policy outcomes will be achieved as a result of policies working in combination with external drivers including political, economic, technological and societal factors. External drivers will be included where relevant to provide an explanation for progress, such as relevant technological advances.



### Monitoring reserved climate policies:

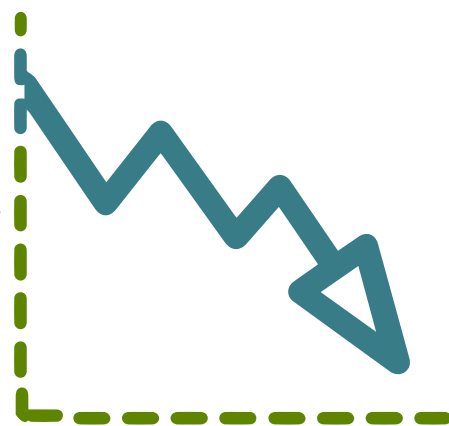
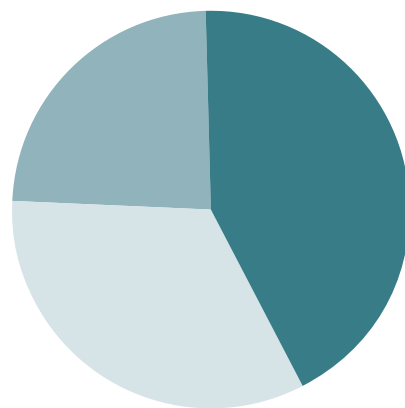
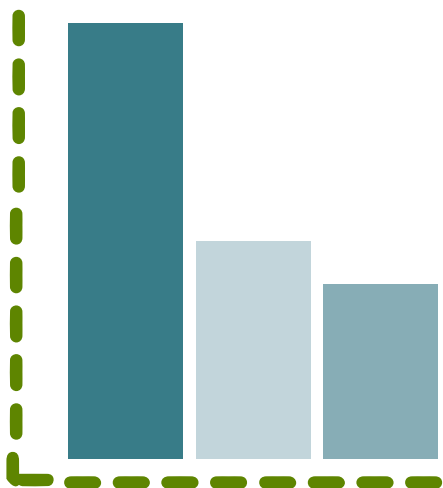
Implementation of the Plan is reliant on a mix of international, EU, UK and Scottish policy. The monitoring framework has been designed to understand and improve the delivery of Scottish Government policy. However, where relevant it will capture the progress made under UK, EU and international policy direction.

### Governance of the Monitoring Framework

The Climate Change Plan provides for the establishment of a Governance Body. The key functions of the Governance Body will be to:

- review monitoring information and other relevant data to assess progress against policy outcomes in the Climate Change Plan
- provide advice to Scottish Ministers on the monitoring information, including where significant adjustments to policy might be required and how these might be made
- contribute to an annual monitoring report for publication on the Scottish Government website

The Body will be made up of senior Scottish Government officials representing the sectors in the Plan, and non-Scottish Government representation to provide independent overview and external scrutiny.



# Annex A – MONITORING FRAMEWORK INDICATORS

## ELECTRICITY

### Output indicators

1. Electricity Grid Intensity (g CO<sub>2</sub> per kilowatt hour).
2. Over the period of the Climate Change Plan, Scotland's energy system will continuously evolve and the Scottish Government will use all available levers, while collaborating with and influencing all key stakeholders and partners, to ensure that the regulatory and technological changes support a robust and flexible system that meets the needs of people in Scotland. These changes will be regularly monitored and reported on as part of the overall monitoring framework.

### Implementation indicators

1. Increase amount of electricity generated from renewable sources in Scotland.
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 12GW and 17GW.
3. Increase total community and locally owned renewable energy capacity operational, and in development, in Scotland.

4. Increase total renewable capacity in Scotland by planning stage.
5. Increase the share of electricity generated from renewable sources, as a proportion of total electricity generated in Scotland.

## BUILDINGS

### Output Indicators

1. Change in energy intensity from 2015.
2. Change in emissions intensity from 2015.
3. Change in energy productivity from 2015.

### Implementation indicators

1. Average energy efficiency levels of domestic buildings increases.
2. Grouped domestic energy efficiency ratings improve.
3. Percentage of domestic properties with loft and wall insulation increases.
4. Total renewable heat generation in Scotland increases.
5. Installed capacity of non-domestic RHI increases.
6. Amount of renewable heat paid for under the domestic RHI scheme in Scotland increases.
7. Further analysis to establish a baseline for non-domestic buildings' energy efficiency and emissions data.



# TRANSPORT

## Output indicators

1. Total change in average gCO<sub>2</sub>e/ km (cars).
2. Total change in average gCO<sub>2</sub>e/ km (vans).
3. Biofuels as % of total petrol and diesel sales.
4. Percentage of grant funding for charge points utilised each year.
5. Percentage of charge point installs completed each year.
6. Annual utilisation of the CPS network.
7. Total % share of car sales that are classified as low emissions.
8. Total % share of van sales that are classified as low emissions.
9. Average emissions of HGVs per tonne kilometre.
10. Report on the number of ECO Stars member organisations and impact on emissions and fuel savings.
11. Report qualitatively against the actions outlined in the Rail Freight Strategy.
12. Total emissions (gCO<sub>2</sub>e) per tonne kilometre of Road Freight Index 2017 = 100.
13. Proportion of bus fleet made up of low emission vehicles (%).
14. Qualitative report on Transport Scotland input into port and airport strategies.
15. Number of low emission ferries in Scottish Government ownership.
16. Percentage of rail track electrified (kilometres).
17. Active travel budget for the year.
18. Progress towards active travel vision.

## Implementation indicators

1. Average emissions per kilometre of cars and vans registered in Scotland.
  2. The outcome of changes in VED at each budget.
  3. Negotiations regarding biofuels are ongoing within the context of an EU framework. Scotland has engaged in the development of the approach.
  4. Number of individuals and organisations who have completed fuel efficient driver training.
  5. Percentage of grant funding for publically available charge point installations that is utilised each financial year.
  6. Percentage of grant funding for domestic/ workplace charge point installations that is utilised each financial year.
  7. Percentage of publically available charge point installs that are completed each financial year.
  8. Percentage of domestic/workplace charge point installs that are completed each financial year.
  9. Uptake of the ECO-Stars programme.
  10. Progress in delivering the Rail Freight Strategy.
  11. Number of low carbon buses purchased including those through the Scottish Green Bus Fund.
  12. Annual low carbon bus expenditure through Scottish Green Bus Fund and Bus Service Operators Grant incentive.
  13. Numbers of kilometres run by low emission buses as a percentage of total bus kilometres.
  14. Update on programme of procurement through the Vessel Replacement Plan.
  15. Qualitative annual report on Transport Scotland's engagement with Scottish port authorities and airports.
  16. Annual information on electrification is contained within the Scottish Transport Statistics.
  17. Qualitative update on what has been achieved through active travel expenditure.
  18. Qualitative report on the implementation and achievements of Smarter Choices, Smarter Places.
-



# INDUSTRY

## Output indicators

1. Change in Energy productivity from 2015.
2. Change in emissions intensity from 2015.
3. Tonnes of waste landfilled (household and non-household).
4. Number of additional landfill sites with gas capture being developed each year.

## Implementation Indicators

1. The installed capacity of renewable heat receiving payment under the non-domestic RHI increases.
2. Improve the evidence base of the industrial sector in Scotland through initiatives under the Manufacturing Action Plan and SEEP.
3. Continued annual monitoring of energy productivity and emissions intensity.
4. The Scottish Government funded elements of the ACORN CCS Project feasibility study are completed by November 2018
5. 60% of total household waste recycled by 2020.
6. 70% of all waste recycled by 2025.
7. Household and non-household food waste reduced by 33% by 2025 from 2013 baseline.
8. Up to 12 landfill gas capture sites supported by 2020/21.

# LAND USE, LAND USE CHANGE AND FORESTRY

## FORESTRY

### Output indicators

1. Number of hectares of woodland created.
2. Annual volume (in millions of cubic metres) of Scottish produced sawn wood and panel boards used in construction (extrapolated from UK figures).

### Implementation indicators

1. Area of new woodland created with grant scheme support.
2. Percentage of applications that are processed within processing time agreements.
3. Area of new woodland created on the national forest estate.
4. Number of promotional events held.
5. Number of woodland creation projects that have been issued with a UK Forestry Standard non-compliance notice within the first ten years following creation.
6. Number of Planning Authorities with current Forest and Woodland Strategies.
7. Number of knowledge exchange events held each year involving members of the construction industry e.g. designers, specifiers and engineers.
8. Annual Timber Association figures for the adoption of timber framed for new build houses across the UK.

# PEAT

## Output Indicators

1. Number of hectares of restored peatland per year.

## Implementation indicators

1. Number of hectares on the road to recovery through Peatland Action at the conclusion of the preceding financial year.
2. Total number of applications received for Peatland Action restoration project funding.
3. Number of projects approved for funding from the Peatland Action restoration project funding.
4. Number and area of restoration feasibility plans supported by Peatland Action.
5. Number of contractors upskilled to carry out the restoration.
6. Number of land managers/consultants trained through the Peatland Action programme.
7. Number of dedicated Project officers.

# AGRICULTURE

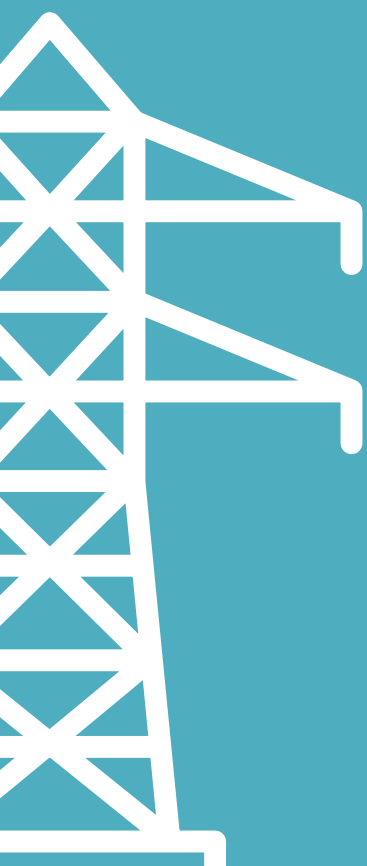
## Output indicators

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:

1. a reduction in agricultural greenhouse gas emissions in the national inventory;
2. an increase in the share of farmers carrying out soil tests;
3. an increase in the share of farm completing nutrient management plans.

## Implementation Indicators

1. The number of attendees at climate change-themed Farming for a Better Climate and Farm Advisory Service events, who rated them useful and have said they will put what they have learned into practice.
2. The uptake of free carbon audits provided through the Farm Advisory Service – increase the uptake of free carbon audits provided through the Farm Advisory Service to 200 audits delivered per year by 2019.
3. The uptake of Integrated Land Management Plans (ILMPs) provided through the Farm Advisory Service – increase uptake of Integrated Land Management Plans provided through the Farm Advisory Service to 300 ILMPs delivered per year by 2019.





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