



HM Government

Government response to the Committee on Climate Change

Progress on meeting carbon budgets

October 2016



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Foreword



Climate change is one of the most serious risks to our long-term economic and national security.

The UK has continued to perform a key role in the global effort to tackle climate change. Firstly, we played a leading role in securing last year's historic Paris Agreement. This was the first time that 195 countries committed to reducing emissions. Secondly, one of the first actions of this Government was to legislate the fifth carbon budget (2028 – 2032), at the level recommended by our independent advisors. This will require the UK to reduce its emissions by an average of 57% on 1990 levels over the 5-year period.

As we approach the next Conference of Parties in Marrakesh, countries are shifting from commitments to action. This is mirrored in the UK, where we are now developing our emissions reduction plan, which will outline how we will meet our carbon targets, as well as our progress and our next priorities. The plan will provide an important signal to the markets, businesses and investors, and help the private sector plan for the transition to a low carbon future.

There are exciting opportunities offered by transitioning to a low carbon economy. The growing global political commitment has been accompanied by a shift in private capital. Businesses are acknowledging both the risks our changing climate poses and the new market opportunities to tackle it. There will also be new opportunities from the UK's exit from the EU and in the new Department's responsibilities of business, energy and Industrial Strategy, allowing partnerships to be made across sectors.

But we know that meeting our carbon targets represents a significant challenge. As the Committee on Climate Change make clear in their 2016 progress report, it will require transitions across all sectors of our economy, not least how we decarbonise power, transport and heat. For this very reason, we are taking time to prepare our plan, so that we pursue emissions reductions fairly and cost-effectively. We all use energy - in our homes, businesses and industry – so this will be a shared challenge and we will want to engage on our proposed solutions.

The emissions reduction plan will elaborate on our policies, proposals and these opportunities. This Government response is a helpful starting point in mapping out the progress made over the past 12 months, which in turn will provide the base upon which we will build our plan.

A handwritten signature in black ink that reads "Nick Hurd". The signature is written in a cursive, slightly stylized font.

Nick Hurd MP, Minister of State for Climate Change and Industry
Department of Business, Energy and Industrial Strategy

Background

The Climate Change Act 2008 (the Act) established a legally binding target to reduce the UK's greenhouse gas emissions by at least 80% below 1990 levels by 2050. In million tonnes of carbon dioxide-equivalent (MtCO₂e), we currently estimate this target to be equivalent to around 160 MtCO₂e in 2050 compared to 800 MtCO₂e in 1990.

To drive progress across the economy and set the UK on a pathway towards this target, the Act also introduced a system of carbon budgets which provide legally binding limits on the amount of emissions that may be produced in successive five-year periods, beginning in 2008.

The Committee on Climate Change (CCC) was set up under the Act as an independent body to advise the Government on climate change. The CCC are required to produce annual reports on the UK's progress towards meeting its carbon budgets and the 2050 target.

The first three carbon budgets (covering 2008 to 2022) were set in law in May 2009 requiring total emissions of 3,018 MtCO₂e over 2008 – 2012 (equivalent to an average 25% reduction against 1990 levels), 2,782 MtCO₂e (30%) for the period 2013 – 2017 and 2,544 MtCO₂e (36%) for the period 2018 – 2022. The fourth carbon budget (2023 – 2027) was set in June 2011 requiring a reduction in emissions to 1,950 MtCO₂e (51%).

The CCC provided advice on the level of the fifth carbon budget (2028 – 2032) in November 2015 and the Government set the fifth carbon budget, in line with this advice, at 1,725 MtCO₂e (equivalent to an average 57% reduction against 1990 levels), in July 2016.

In June 2016, the CCC published their eighth annual progress report on the Government's progress in reducing greenhouse gas emissions. The CCC's progress report focused on their priorities for the UK Government's forthcoming emissions reduction plan. The UK Government is required to respond to the CCC's 2016 progress report by the 15 October 2016.

Throughout this publication the term Government is used to denote the UK Government and its views. The Devolved Administrations have provided their respective views and responses set out from page 29.

Introduction

The Government is committed to tackling climate change as one of the most serious long-term risks we face.

The 2015 Paris Agreement (the Agreement) shows that our international partners share our commitment. For the first time, 195 countries agreed to take action to reduce emissions.

The UK played a key role in securing this first truly global agreement to tackle climate change. The Agreement commits countries to take action to keep temperature rises to well below two degrees, pursue efforts to limit temperature increases to 1.5 degrees and work towards the collective long term goal of net zero emissions in the second half of the century. It also set a framework for raising global ambition in the future with stocktakes of progress towards our goals on mitigation, adaptation and finance flows, and updated commitments from all countries every five years.

The UK, alongside 177 other countries, signed the Agreement in April 2016. We have now initiated, with a view to completing before the end of the year, the domestic process to enable ratification of the Agreement. Equally, we remain committed to honouring our obligations under the Agreement.

The UK is playing its part in delivering the Paris goals through our Climate Change Act 2008 and our legal obligation to reduce emissions by at least 80% by 2050 on 1990 levels. The CCC have published their views on the implications of the Paris Agreement for the UK's future climate ambition. We will carefully consider their recommendations.

Our leadership on this agenda has also been demonstrated at home. One of the first pieces of legislation made by this new Government was the fifth carbon budget (covering 2028 – 2032). It was set in line with the recommendations of the CCC - 1,725 MtCO_{2e}, equivalent to an average 57% reduction on 1990 levels. This was widely welcomed by the business community and green groups for the certainty it provides on the Government's commitment to a low carbon economy. It clearly confirmed our commitment to a steady path of decarbonisation.

Following the outcome of the Referendum on 23 June 2016, the UK Government is preparing for the negotiations on the exit of the UK from the EU. These negotiations will be complex and will need to be carefully managed to ensure that the UK is able to realise the opportunities the departure from the EU presents. Until those negotiations are complete, and the UK exits the EU, our commitment to and our obligations under EU legislation on climate change remain unchanged. We remain fully committed to the UK's Climate Change Act and the targets under it.

We also see opportunity arising from the creation of the new department for Business, Energy and Industrial Strategy (BEIS). One of the main challenges in

tackling climate change is to reduce carbon emissions without jeopardising economic growth. The creation of the new Department will enable a whole economy approach, which will focus on ensuring UK business is best placed to take advantage of the opportunities a low carbon economy (at home and abroad) presents. Our forthcoming Industrial Strategy is also an opportunity to make such links.

Our response to the CCC's 2016 Progress Report

Whilst our commitment to tackling climate change remains undiminished, our approach this year in responding to the CCC's 2016 progress report will be different. This is because the Government is working towards its emissions reduction plan. This plan is a once in a Parliament opportunity for the Government to set out how the UK intends to decarbonise over the 2020s and meet our carbon budgets. We have, therefore, used our response to acknowledge the CCC's recommendations (many concerning the content of the emissions reduction plan) and provide background on our current policy approach. This will be the base upon which we develop new policies and proposals for the emissions reduction plan.

We recognise the emissions reduction plan will form an important signal to the markets, businesses and investors. We want to invest the time now to undertake critical preparatory work to ensure we get this right. This includes engaging across businesses, industry and other stakeholders on the shared challenge of moving to a low carbon economy.

Overall Progress

The UK was the first country in the world to set a legally binding target 2050 for greenhouse gas emissions, which remains one of the most ambitious globally. The 2008 Climate Change Act is seen as a model for climate legislation, with it being replicated in other countries, such as France.

We have already made good progress towards our long term climate change goals. Provisional statistics indicate that UK emissions in 2015 were 38% lower than in 1990, and more than 3% below those in 2014. These statistics also indicate that between 2010 and 2015, the UK reduced its domestic greenhouse gas emissions by 17%: the largest reduction in a single Parliament.

In 2014, UK greenhouse gas emissions were at their lowest levels since 1990, while Gross Domestic Product (GDP) reached its highest rate since 1990. From 1990 to 2014, UK greenhouse gas emissions have steadily decreased by 35% and GDP has increased by around 60%. Between 1990 and 2014, there are 15 years with a decrease in greenhouse gas emissions and an increase in GDP compared to the previous year, suggesting that UK territorial emissions are decoupling from economic growth. In 2014, greenhouse gas emissions decreased by 8% compared to 2013, while there was a 2% increase in GDP. This was the second largest decrease in greenhouse gas emissions in a year of economic growth since 1990.

We met the first carbon budget (2008 – 2012) and our projections show that we are on track to meet the second and third (2013 – 2017 and 2018 – 2022). However, we recognise that our emissions over the fourth carbon budget (2023 – 2027) are currently projected to be 10% greater than the budget level. In short, we have a 'gap' to meet the 51% reduction (on 1990 levels) needed over this period.

We have set a fifth carbon budget to challenge us even further than this. It requires reducing the UK's net carbon account over 2028 – 2032 to 1,725MtCO₂e, equivalent to an average 57% reduction on 1990 levels. As expected given we have just set a new stretching target, we also have a 'gap' to meet this budget - our emissions are currently projected to be 18% greater than the fifth carbon budget level.

We know we need to do more to meet our targets from the early 2020s. We have always been clear that options would be developed in this Parliament. This work is underway and will be set out in the emissions reduction plan.

Power

CCC Recommendations

In its 2016 Progress Report, the CCC recommend further actions to continue reducing power sector emissions through the 2020s.

On Carbon Capture and Storage, the CCC call for a strategic approach to deployment in the UK, while on offshore wind they recommend continued support as costs are driven down.

The CCC also recommend that the Government bring forward an approach to deploying the cheapest low carbon generation, such as onshore wind and solar, with no additional subsidy.

Finally, the CCC recommend that plans are set out for flexibility options (such as storage, interconnection and demand response) reflecting their full value to the electricity system, and that contingency plans are made for delay or cancellation of planned projects.

Emissions

We have continued to make reductions in the power sector; with emissions down by 39% (or 81 MtCO_{2e}) since 1990. In 2014, power emissions were 124 MtCO_{2e}, making up 24% of total UK emissions.

Current approach

The Government remains committed to continuing to reduce power sector emissions whilst delivering secure and affordable electricity supplies.

The Capacity Market is the UK's principal tool to ensure we have secure supplies of electricity. The Government announced three key reforms in May 2016 which will ensure the Capacity Market continues to deliver energy security and give both bill-payers and the energy industry more certainty for the coming winters:

- Holding an 'early' auction to bring forward the first Capacity Market delivery year to 2017/18,
- Buying more capacity and buying it earlier, and

- Tightening delivery incentives on those who have agreements to deliver against them and penalise those who renege more severely.

The Government continues to view new nuclear power as a key part of our work to build a secure, affordable and clean energy system to keep the lights on in the decades ahead. Following a comprehensive review of the Hinkley Point C project, and a revised agreement with EDF, the Government has decided to proceed with the first new nuclear power station for a generation. However, Ministers will impose a new legal framework for future foreign investment in Britain's critical infrastructure, which will include nuclear energy and apply after Hinkley. Developers have proposed five further new nuclear power plants. We remain in close contact with them as they develop their plans.

On current plans, we expect to see 10 gigawatts of offshore wind installed by 2020 alongside 11-13 gigawatts of onshore wind and approximately 13 gigawatts of solar. Costs of offshore wind are falling and thanks to the Contracts for Difference (CFD) auction driving competition, consumers are benefitting from those savings. The first CFD auction in 2015 achieved strike prices approximately 20% below the reserve prices saving consumers in excess of £100 million per annum. The Government will auction 15-year CFDs during this Parliament, with an initial auction offering annual support of up to £290 million for offshore wind and other less established renewables (pot 2). We will set out our plans for mature technologies (pot 1) in due course.

As part of the Government's efforts to reduce the deficit, we have taken decisions to prioritise Government spending and in November 2015, the Government chose to no longer make available capital funding to support the two CCS Competition projects and took the decision to close the CCS Competition in early 2016. The Government then commissioned Lord Oxburgh to establish a CCS Parliamentary Advisory Group which reported to Government on 12 September 2016. We will consider carefully the findings and recommendations made in Lord Oxburgh's report and will set out a future approach to CCS in due course. We will continue to work with industry going forward, but the costs of CCS must come down if it is to play a part in the long-term decarbonisation of the UK's economy.

The Department of Business, Energy and Industrial Strategy (BEIS) and Ofgem are undertaking work to support the move to a smart energy system, which could lower bills for consumers and help manage the low carbon transition. The benefits of smart energy have been estimated at £3-8 billion a year in 2030 by the National Infrastructure Commission in their 2016 Smart Power Report. Ofgem has given regulatory approval for 7.7 gigawatts of additional interconnection capacity, which is expected to deliver at least £11.8 billion of consumer benefits over 25 years. In the 2016 Budget, Government committed at least £50 million of funding to support innovation in Demand Side Response (DSR), storage and smart technologies.

Looking forward

The Government will continue to deliver reliable supplies through the Capacity Market, control the costs of renewables subsidies and bring down technology costs, whilst also building on the progress made in reducing power sector emissions to date.

The Government will remain in close contact as developer's progress plans for further new nuclear power plants. We will also set out the details of future Contract for Difference auctions for less mature technologies, and outline our plans for mature technologies.

On CCS, the Government will consider closely the findings and recommendations of Lord Oxburgh's Advisory Group and will set out a future approach in due course. Finally, we will be launching a consultation on coal power stations, which will inform our policy development in this area.

The Government's approach to decarbonisation of the power sector will be set out in our emissions reduction plan.

Buildings

CCC recommendations

The CCC recommend that more action is needed on both heat decarbonisation and energy efficiency.

The CCC highlight the need for a credible set of policies to drive heat pump deployment and district heating. Action should address key barriers to deployment under the Renewable Heat Incentive (RHI), a policy package to roll-out low carbon heat technologies at higher rates and new policies to support Small to Medium Enterprises (SMEs) in England to install cost-effective low carbon heating.

In parallel the CCC recommend a stronger policy framework to drive residential energy efficiency improvements by addressing gaps and strengthening existing policies: addressing behavioural factors for the able-to-pay, increased funding for fuel poor households and developing an effective approach for the private rented sector.

For new buildings, the CCC recommend standards to ensure these properties are highly energy efficient and use low-carbon heating systems by default.

Finally the CCC highlight that more progress is needed on improving the energy efficiency of non-residential buildings including a consolidated reporting mechanism for commercial and public buildings, new emissions reduction targets for the public estate and new policies to support SMEs.

The CCC have published a detailed assessment of options for accelerating progress in the buildings sector on 13th October.

Emissions

Over 2014 emissions for this sector have been broadly flat, though emissions reduced by 22% (23 MtCO₂e) since the 1990 base year. Emissions in buildings (excluding fluorinated gases) were 82 MtCO₂e in 2014, making up 16% of total UK emissions.

Current approach

Homes

The UK's 28 million homes account for around 12% of overall carbon emissions. Some 65% of energy used in homes is for space heating. Improving and decarbonising our homes will require changes to both energy efficiency measures and heating systems in properties, and we are committed to considering both together, from a consumer perspective.

The Government is therefore taking forward a number of energy efficiency policies including:

- Smart meters will bring an end to estimated bills and make switching energy suppliers easier and faster. As of end-March 2016 3.6 million smart meters had been installed in homes and small business sites across Britain. Domestic customers will be offered an In-Home Display enabling them to see what energy they are using and how much it is costing, in near-real time. Smart metering will also transform the prepay experience, topping up a smart meter in prepay mode should become as easy as topping up a mobile phone. The rollout of smart meters underpins the move to a broader smart energy system, creating new opportunities for demand side response and storage.
- Plans for the implementation of regulation in the private rented sector from April 2018, after which landlords in England and Wales of both domestic and non-domestic private rented properties will not be able to re-let premises unless they meet at least an Energy Performance Certificate (EPC) band E (subject to certain exemptions). The Government is working closely with industry to ensure landlords, tenants and enforcement authorities can make the necessary arrangements for the introduction of the regulations.
- To boost consumer and industry confidence, and improve on the current framework for consumer standards for energy efficiency and renewable energy installations, the Government asked Dr Peter Bonfield in the Summer 2015, to chair an Independent Review of Consumer Advice, Protection, Standards and Enforcement. The review has drawn on views across industry and will report soon.
- Local Authorities and Local Enterprise Partnerships (LEPs) share many of our priorities on low carbon, energy efficient properties and tackling fuel poverty. Government is working closely with local authorities and other partners to help develop their strategic plans for local energy and on devolution deals.

The Government assesses that 2.38 million households in England (under 11%) are in fuel poverty, finding it difficult to meet energy costs because of a combination of low incomes and high heating costs. In order to tackle fuel poverty, in November 2015 the Government announced its intention to focus the Energy Company Obligation (ECO) on fuel poor households and confirmed it would be extended to 2022. The Government's recent consultation on ECO set out detailed proposals for 2017 – 18 and the strategic direction for the scheme from 2018 – 22. The proposals were to refocus the scheme on insulation in low-

income and vulnerable households, maximising its impact on fuel poverty and helping keep down the energy bills of those most in need.

Business and public buildings

Keeping energy bills down for businesses is a priority. One of the best ways to do this is by using less energy, which helps improve productivity and meet our carbon budgets.

Following the Business Energy Tax Review, at the Budget 2016 we announced changes to business energy taxation and reporting. These will reduce the complexity of the policy landscape and encourage cost-effective investment in energy efficiency. The roll out of non-domestic smart meters will put small businesses in control of their energy use, bring an end to estimated bills, make switching faster and easier, and help businesses to save energy and money.

The changes will include consulting on a new carbon and energy reporting framework for business. We also announced that the CRC energy efficiency scheme will be abolished after 2018/2019 compliance year and the price signal replaced by increasing the Climate Change Levy (CCL). CCL rates will also be rebalanced to better reflect the carbon content of fuels and encourage firms to reduce their gas use.

The Government has also been working with stakeholders across the non-domestic private rented property sector to develop comprehensive guidance on the non-domestic private rented property minimum energy efficiency standards. As set out above, these regulatory standards will take effect from April 2018 and the guidance will help support landlords in England and Wales in meeting their duties.

In relation to public buildings, we published the 2014 – 15 annual report on the Greening Government Commitments in November 2015. This showed a reduction in greenhouse gas emissions from the Government's own estate and business transport of 22% against a 2009 to 2010 baseline.

That same November, the 2015 Spending Review announced £295 million will be provided over five years to improve the energy efficiency of schools, hospitals and other public sector buildings.

New Buildings

The energy performance requirements for new buildings were strengthened by more than 30% during the last Parliament, reducing energy bills and saving carbon. These energy requirements are couched in performance terms and do not prescribe the technologies, materials or fuels to be used. All new buildings will need to have high levels of insulation and builders will increasingly have to consider renewable and low carbon technologies such as solar panels and heat pumps in their designs. The Housing & Planning Act 2016 places a duty on Government to review energy performance requirements for new homes. The European Energy Performance of Buildings Directive requires an assessment on

whether requirements in the Building Regulations are 'cost optimal' by June 2017. The outcome of this review/assessment will help to inform decisions on any further uplifts of energy requirements.

Heat in buildings

Improving and decarbonising our homes, business and public buildings will require changes to both energy efficiency measures and heating systems in properties.

There are several technologies with the potential to contribute to the decarbonisation of heat – including heat networks, heat pumps, hydrogen and biogas. We are currently reviewing which ones will work at scale and keep costs down. There are different approaches that will need to be considered as the Government develops a long-term plan that delivers the best solution for consumers.

The Government continues to support deployment of low carbon heat technologies, with a particular focus on properties off the gas grid. The 2015 Spending Review confirmed the Renewable Heat Incentive (RHI) budget to March 2021, rising each year from £430 million in 2015/16 to a total of £1.15 billion in 2020/21 (the budget is £640 million for 2016/17).

As part of the November 2015 Spending Review settlement, the Government committed £320 million of funding over five years to support investment in heat network projects, which is expected to support construction of up to 200 heat networks. We are expecting to draw in up to £2 billion of additional investment and help create a sustainable market for heat networks.

Looking forward

We want the longer term framework to set signals for the market which give businesses the confidence to invest and innovate, improve product performance and bring costs down for consumers. We also need to ensure that those people who most need support in keeping their homes warm do receive it. To do so, we also need to find new approaches to delivering energy efficiency improvements and low carbon heating systems. We are considering these issues in the run up to the emissions reduction plan.

We are currently considering what more we can do in the business energy area – particularly in the context of our work on industrial strategy and the emissions reduction plan. To inform this work we are building a stronger evidence base on emissions from business and public buildings.

Targets for the energy efficiency of the Government's own estate are being considered as part of the next stage of the Greening Government Commitments and will be reported on further in due course.

Industry

CCC Recommendations

The CCC recommend that the Government adopt an overall approach to long term industrial decarbonisation through developing and extending the existing roadmaps project (covering the eight most energy intensive sectors) to other industrial sectors.

Additionally the CCC call for a strategic, funded approach to Industrial Carbon Capture and Storage and associated infrastructure as a key technology needed to meet the 2050 target.

The CCC also recommend an effective approach to drive sustained uptake of low carbon heat in industrial processes and buildings through sustainable biomass and the low carbon electrification of space and process heat.

Finally, the CCC recommend the implementation of a stronger policy framework for industrial energy efficiency in order to meet the fifth carbon budget. The CCC suggest that this policy could encourage private investment in the best equipment currently available and develop breakthrough technologies needed to implement the roadmaps.

Emissions

Emissions in industry (excluding Fluorinated gases) were 115 MtCO₂e in 2014, making up 22% of total UK emissions. Emissions in this sector have reduced by 48% (or 105 MtCO₂e) since the 1990 base year.

Current approach

The Government is continuing to work collaboratively with industry and academia to promote and support emissions reductions in the industrial sector, whilst ensuring that UK industry remains competitive. The 2050 Roadmaps project has seen industry, Government and others work collaboratively to gain a better shared understanding of the opportunities for decarbonisation and energy efficiency in eight energy intensive sectors. The roadmaps were published in March 2015 and since then the collaborative process has continued with the development of sector-by-sector action plans.

The EU Emissions Trading System (EU ETS) is a European wide carbon pricing system which sets a cap on the amount of certain greenhouse gases that can be emitted by factories, power plants and other installations in the system. Each ETS allowance gives the holder the right to emit one tonne of CO₂. Each year installations within the scheme must surrender allowances for every tonne of CO₂ emitted in the previous year. The Government has continued to press for reforms to strengthen the EU ETS so it provides a stronger, more stable investment signal. A system of free allocation of allowances is used to mitigate the risk of carbon leakage.

Following the outcome of the referendum, there will be no immediate changes to UK participation in the EU ETS. The Government will therefore continue to engage in the negotiation and decision-making process for the next phase of the system (phase IV, covering the period of 2021 – 2030). Looking further ahead, we will consider the UK's future participation in the EU ETS as part of delivering a wider settlement that is in the best interests of the UK.

Energy efficiency is key for industrial decarbonisation. Policies to incentivise investment in industrial energy efficiency more widely include incentives to improve the financial case for investing in combined heat and power (CHP), which can reduce primary fuel use by up to 30%. These incentives include exemptions from the Carbon Price Support and Climate Change Levy taxes, Capacity Market payments, and renewables subsidies for biomass-fuelled CHPs.

Further support for industry is provided through Climate Change Agreements. These allow eligible energy intensive industries a discount of 90% off the Climate Change Levy (CCL) for electricity use and 65% off CCL on gas and other fuels. At the 2016 Budget, a reform of business energy taxation was announced with CCA eligibility maintained until the end of the current phase (2023). A review of the CCA targets and the buy-out price, a fee which sites pay on energy use that exceeds their CCA target, is currently underway.

We are also looking to design a £12 million support programme to incentivise the recovery and reuse of up to 3.5 terawatt hours of waste heat from industry. We intend that this support will be provided as match funding, with contributions from industry and with the aim of improving knowledge and reducing investment risk. A consultation on our proposed approach is expected in early 2017.

The Renewable Heat Incentive (RHI) is the main policy designed to drive the sustained uptake of low carbon heat in industrial buildings. It supports the deployment of renewable and low-carbon heating technologies, including biomass, heat pumps, deep geothermal and CHP.

Looking forward

We are currently considering policy approaches to industrial decarbonisation and competitiveness, in the context both of our work on industrial strategy and the emissions reduction plan. As part of this, the Government and industry are working jointly to prepare Action Plans on key energy intensive sectors drawing on the 2050 Industrial Decarbonisation and Energy Efficiency Roadmaps. These

will set out how progress could be made to help enable the transition towards a low carbon economy with a competitive industrial sector.

Industrial Carbon Capture Usage and Storage has been identified as a potentially important contributor to long term decarbonisation. As with CCS more generally, the Government will set out a future approach in due course.

We are also seeking views on the Climate Change Agreements through our discussion paper published on 5 August 2016.

Transport

CCC Recommendations

The CCC recommend stretching standards for new car and van CO₂ emissions beyond 2020, and policies to ensure a high uptake of ultralow emission vehicles by 2030, of around 60% of new sales. To deliver this the CCC recommend policies including: support for upfront costs that drives innovation and declines over time until costs align with conventional vehicles; a national network of charge points; and roll out of local incentives such as preferential road access and free parking.

The CCC also call for policy to deliver an increase in uptake of sustainable biofuels to around 8% by energy by 2020, maintained during the 2020s and increasingly derived from sustainable waste and advanced feedstocks.

On Heavy Goods Vehicles (HGVs), the CCC recommend vehicle efficiency improvements based on “real-world” testing, driver training, more efficient logistics and modal shift to rail. The CCC also states that ultra-low emission HGV technologies, such as electric and hydrogen options, should be developed for deployment by around 2030.

The CCC recommend national and local policies to reduce demand, sufficient to deliver car kilometre reductions of around 5% below the baseline trajectory.

Finally, the CCC recommend that the UK should plan for UK aviation emissions at around 2005 levels by 2050 (implying around a 60% potential increase in demand), supported by strong international policies.

Emissions

Emissions from transport sector were 118 MtCO₂e in 2014, making up 23% of total UK emissions. Emissions in this sector have reduced by 3% (or 4 MtCO₂e) since the 1990 base year.

Current approach

The Government has committed that nearly all cars and vans in the UK will be zero emissions vehicles by 2050, meaning all car and van sales need to be zero emission vehicles by 2040. In November 2015, the Government committed to delivering this and is providing over £600 million of support this Parliament, aimed at achieving growth in the early market for ultra low emission cars and vans and

preparing for mass market uptake in the 2020s. Reducing carbon emissions from Transport will be increasingly important for the Government to meet its carbon budget commitments, including the recently set fifth carbon budget (2028-2032).

It has been announced that there will be a continuation of the plug-in car grant to at least March 2018, with £400 million of funding. There are 29 models now eligible for the plug-in car grant, with more models in the pipeline, and nine for the plug-in van grant. The continuation of the Electric Vehicle Homecharge Scheme has also been confirmed, with £500 grants available. £35 million has been awarded through the Go Ultra Low city scheme to four towns and cities (Bristol, London, Milton Keynes and Nottingham) for innovative measures like preferential parking and lane access, rapid charging hubs and electric car clubs, with a further £5 million for four other cities for their own projects.

Overall the UK's approach (in terms of incentives, taxes and regulation) on cars and vans is already proving successful: in 2015, average new car CO₂ emissions in the UK fell to 121.4 grams per kilometre, a 26.4% drop on 2007 and a 2.6% reduction on 2014. This is demonstrably delivering real reductions in the average emissions of new vehicles.

We have demonstrated our commitment to the biofuel industry and advanced biofuels by providing £25 million of privately matched capital investment in advanced biofuels, through the Department for Transport's Advanced Biofuels Demonstration Competition. We aim to consult later this year on proposals to increase the supply of sustainable biofuels to meet our climate change commitments. We want to set long term supply targets to give certainty to industry, incentivise the production of advanced biofuels, support their use in aviation and freight and set a sustainable level for crop derived biofuels.

The Government is working to address the environmental impacts associated with the road freight sector through encouraging the uptake of alternative fuels and supporting developments in vehicle technologies and refuelling infrastructure. For example, we launched a joint Government and Industry Low Carbon HGV Technology Accreditation Scheme in June 2016 and have recently launched a £24 million Low Emission Freight and Logistics funding competition to enable industry led trials of innovative vehicles or vehicle systems that can deliver real world emission savings for the freight industry.

The Government has a manifesto commitment to double the number of journeys made by bicycle and reduce the number of cyclists and other road users killed or injured on our roads every year. To support this, the Department for Transport (DfT) will provide over £300 million for cycling over the life of this Parliament. The Infrastructure Act 2015 placed a duty on the Secretary of State for Transport to publish a Cycling and Walking Investment Strategy (CWIS) for England. The draft CWIS was published on 27 March 2016 for consultation. Once all considerations from the consultation have been taken into account, we will publish the final CWIS, alongside guidance to local bodies on developing local cycling and walking infrastructure plans. In February and July 2016, DfT launched an £80 million Sustainable Transport Transition Year / Access Fund respectively to boost the local economy and cut carbon by supporting cycling and walking.

In February and July 2016 DfT launched an £80 million Sustainable Transport Transition Year/Access Fund respectively to boost the local economy and cut carbon by supporting cycling and walking.

In October 2016, at the International Civil Aviation Organisation's (ICAO) 39th Assembly, the UK and 190 other States agreed on a Global Market-based Measure (GMBM) to tackle CO₂ emissions from international aviation. This will be the first worldwide scheme to address CO₂ emissions in any single sector. Under the deal, aircraft operators would be required to purchase offset credits to cover any sectoral growth in CO₂ emissions above 2020 levels, with the aim of delivering carbon-neutral growth of international aviation from 2020. The GMBM complements ICAO's 'basket of measures' to tackle aviation emissions, such as operational improvements, sustainable alternative fuels and technological measures, including a recent agreement in ICAO earlier this year on a CO₂ standard for international aviation. The standard means that all new aeroplane designs will have to be compliant with this minimum standard from 2020.

Looking forward

The Government will need effective and ambitious regulation for the period beyond 2020 that supports the introduction of zero emission vehicles to the mass-market, and are currently undertaking analysis of a potential approach as we look ahead to the emissions reduction plan. Our freight carbon review is also exploring a range of options to significantly reduce HGV carbon emissions.

In due course the Government will announce next steps for plug-in vehicle grants, and for further support for electric vehicle charging infrastructure.

We also expect the European Commission to publish its proposals for new car and vans targets post 2021 in early 2017. Work will continue to determine the UK's priorities and our approach to delivering them, including consideration of the implications of Britain's exit from the EU. We aim to consult later in the year on proposals to increase the levels of biofuels to meet our climate change targets.

In ICAO, the UK will continue to be closely involved in the negotiations to finalise the detailed design of the GMBM for international aviation over the next two years, to ensure that the GMBM is implemented robustly around the world and uses high-quality offsets. Data collection is due to begin from 2019, prior to full implementation of the measure from 2021.

Agriculture, LULUCF and Forestry

CCC Recommendations

The CCC recommend a stronger policy framework to deliver greenhouse gas emissions reduction in agriculture, and firm measures to increase afforestation rates in line with ambition.

The CCC advise that new policies and measures are required to deliver emissions reductions in agriculture to 2030 be introduced that moves beyond the current voluntary approach of providing information and advice. Additionally, the CCC also calls for the new Smart Inventory for agriculture to be introduced in 2017.

In relation to Land Use, Land Use Change and Forestry (LULUCF), the CCC recommends that the Government address the financial and non-financial barriers to increase afforestation and agro-forestry.

Emissions

Emissions in agriculture and LULUCF were 40 MtCO₂e in 2014, making up 8% of total UK emissions. Emissions in this sector have reduced by 32% (or 19 MtCO₂e) since the 1990 base year.

Current approach

The Government remains committed to delivering carbon reductions within the agriculture, land use and land use change and forestry sectors. Decarbonising these sectors is particularly difficult and they are particularly exposed to the risks of a changing climate.

We want to work towards achieving carbon reductions in partnership with business, industry and communities to improve efficiency in production and resource use to deliver reductions in emissions and sustainable growth in the sector.

Agriculture

Government and industry are working together in a number of areas so that we can reduce emissions while maintaining a strong and growing food and farming sector. Industry has developed a Greenhouse Gas Action Plan, which aims to reduce emissions from farming by the equivalent of 3 million tonnes of CO₂ by

2022. The action plan has so far delivered just under a third of its target reduction. We will continue to work with industry to support them in the delivery of the Greenhouse Gas Action Plan (GHGAP) in England and on opportunities to reduce emissions in this sector with the Devolved Administrations. We are also reviewing the GHGAP, and aim to publish the review conclusions by Spring 2017.

Decisions on further emission reduction can only happen once we have a strong evidence base in place. Not all farm management options to increase efficiency and reduce emissions are currently reported. The Government and the Devolved Administrations have worked to address this by developing a new approach to collecting inventory data through the 'SMART' inventory. We will look implement the new 'SMART' inventory fully in 2017.

Forestry

The Government is on track to meet the Manifesto commitment to plant 11 million trees this Parliament; 1.3 million trees have been planted to date. The Government remains committed to increasing the rate of woodland creation.

The Government incentivises woodland planting through making funding available to landowners and farmers through voluntary, demand-led agri-environment schemes. These funds seek to maximise public benefit and achieve best value for money. We are working to review and improve the administration of the Countryside Stewardship Woodland Creation Grant and we have re-opened the Woodland Creation Planning Grant, amending the requirements to facilitate the preparation of high quality plans. We have confirmed that woodland creation capital agreements in place by the time of the Autumn Statement will be funded.

The 'Durham Environmental Impact Assessment (EIA) pilot' was completed in Summer 2016, including the development of a methodology for mapping 'low sensitivity areas for large-scale woodland creation with a significant productive element'.

Projections of future planting rates and associated greenhouse gas removals that arise from these policies, strategies and programmes are co-ordinated through the Scientific Steering Group for the UK's LULUCF Greenhouse Gas Inventory and more broadly through the National Inventory Steering Committee. This involves a continual process of improvement to the models underpinning the inventory, the assumptions used within the models and to the policy scenarios to ensure that emissions reductions are achievable and cost-effective.

Working with the National Inventory Steering Committee, we have reviewed the evidence-base on agroforestry, in partnership with industry, for future consideration. Through the Scientific Steering Group for the UK's LULUCF Greenhouse Gas inventory, we have included 'small woods' (those between 0.1 hectare and 0.5 hectare) in the UK's LULUCF greenhouse gas inventory for the first time.

Looking forward

Tackling climate change presents significant challenges but also offers genuine opportunities for food production businesses and for improving the environment.

Given the decision to exit the EU, we now have the opportunity to tailor an environmental and farming policy to the needs of this country and create new possibilities for the UK to continue to reduce emissions through land management, food production and woodland creation. We want businesses, volunteers and local communities to have their say on how we can achieve these aims together.

In order to set out the options for reducing emissions the Government will, therefore, be publishing three key documents – engagement frameworks for the 25 year plan on food and farming and the 25 year environment plan, and the emissions reduction plan.

Fluorinated gases and Waste

CCC Recommendations

The CCC recommend the Government monitor, implement and enforce existing Fluorinated gases (F gases) regulations and that the Government should seek cost-effective opportunities to reduce F gas emissions further than existing legislation requires. The CCC also advise that the Government strengthens its approach throughout the waste chain, including waste prevention, separate collections (e.g. of food waste), diverting biodegradable waste from landfill and increased methane capture at landfill.

Emissions

Progress has been made on reducing the emissions from the waste sector (including F gases). In 2014, emissions were 36 MtCO₂e, making up 7% of total UK emissions. Emissions in this sector have reduced by 60% (or 54 MtCO₂e) since the 1990 base year.

Current approach

The Government is committed to delivering a sustainable and more circular economy.

Fluorinated gases

F gases are a family of gases used in a range of industrial applications such as refrigeration and air conditioning. While they are less harmful to the atmospheric ozone layer than other types of gas and so are used as substitutes for ozone-depleting substances, they are powerful greenhouse gases, with a global warming effect up to 23,000 times greater than CO₂.

The Government continues to take regulatory action to ensure that we remain on track to reduce F gas emissions in the UK by 81% by 2035. Enforcing authorities regularly monitor regulatory compliance and undertake any necessary enforcement actions. We also work closely with EU partners on product standards and to ban the use of F gases with high global warming impacts in certain products, including fridges, air conditioning units and aerosols, as less harmful alternatives become widely available.

Hydrofluorocarbons are the most important member of the F gas family from a climate perspective and international negotiations are underway for a global phase down which could avoid 0.5c of warming by 2100.

Waste

The Government supports increased recycling of household waste across England. WRAP (Waste and Resources Action Programme) have published a framework and business case for greater consistency in household recycling in September 2016. The framework recommends separate collection of food waste. WRAP will now work with local authorities to demonstrate the benefits this approach can achieve.

In March 2016, the Courtauld Commitment 2025 was launched, led by stakeholders across the UK food & drink system that supported a 20% reduction in food and drink waste arising in the UK. This commitment goes further than ever before with three ambitious industry targets to be reached by 2025.

At the same time, WRAP published a refreshed Household Food Waste Guide providing local authorities with the latest information on the collection of household food waste as a means of diverting material from landfill or other residual waste treatment. This updates the previous 2009 guide which includes the different options and systems for collecting food waste. It highlights issues to consider when planning and implementing a new food waste collection scheme. The guide also provides advice to local authorities on how to increase participation in such schemes through effective promotion and communication activities.

Looking forward

The Government will shortly publish an engagement framework as the first step in developing a new 25 year environment plan, which will include waste and F gases. This presents an important opportunity to engage with stakeholders and to help inform the content of the new 25 year environment plan and the emissions reduction plan.

Innovation

CCC Recommendations

The CCC highlight the good work that has been undertaken for the low carbon strategy, but seeks a clear overarching strategy for government low-carbon innovation spending. The CCC specifically ask that an effective low-carbon innovation strategy sets out a coherent overall approach to government spending, ensuring that this is targeted at strategically important technologies.

The CCC suggest that in order to meet the fourth and fifth carbon budgets, the Government consider different ways to promote new innovation within the UK.

Current approach

The Government has made significant progress towards our commitments on innovation. Public sector support over the last spending review period (2011 to 2016) for energy technology innovation amounted to in excess of £1.4 billion. This was spent on Research, Development and Demonstration projects. Following the 2015 Spending Review and Autumn Statement, the Government has significantly increased its energy innovation support, such that annual spend by 2021 will have doubled to over £400 million per annum. This funding will leverage additional investment from the private sector and supports researchers in universities, entrepreneurs in SMEs and innovative companies working on a range of innovative technologies. As a result, this funding will help accelerate the commercialisation of the technologies and systems we need to ensure secure, affordable low carbon energy in the future.

The increased energy innovation budget forms part of the UK's international commitment to the Mission Innovation initiative, launched by heads of state at the UN COP21 climate change conference last year. This high-profile initiative seeks to strengthen international clean energy research, development and demonstration. So far it involves 21 members, including the EU, with others likely to join. There are two parts to Mission Innovation; the first is doubling Governmental investment in Clean Energy Innovation, and the second is fostering increased transparency, together with strengthened collaboration.

Looking ahead

We recognise the important role of innovation in decarbonising the energy sector and the Government will be setting out in due course further details of its support for energy innovation through to 2020.

In addition, EU funding for energy innovation remains available to UK researchers. Following the EU referendum result, the Government has provided

reassurance to UK participants in the European Union's Horizon 2020 Programme, with a commitment to safeguard funding for research and innovation projects. The Treasury has confirmed that it will underwrite Horizon 2020 projects where funding has been agreed by the European Commission before the UK leaves the EU. As a result, British organisations have certainty over future funding and should continue to bid for Horizon 2020 while the UK remains a member of the EU. The Treasury will underwrite the payment of such awards, even when specific projects continue beyond the UK's departure from the EU.

Devolved Administrations

Scotland

Scottish emissions in 2014 were down by 45.8% from baseline levels, exceeding the level of the statutory 2020 target to reduce emissions by 42% six years early. While there were emissions reductions in all sectors, falls in emissions associated with energy supply and waste management made a significant contribution. In this regard, since the start of 2007, renewable electricity output has trebled – meeting the equivalent over 56% of gross electricity consumption in 2015 and provisionally exceeding the Scottish Government’s 2015 50% interim target; and the number of households receiving a food waste collection service in Scotland has increased from 300,000 in 2010 to 1.8 million (75% of total households) and, since 2008, food waste processing capacity (anaerobic digestion and composting) has increased from 20,000 tonnes per year to around 297,000 tonnes per year.

While good progress has been made, it is recognised that some policy strengthening will be required to meet future targets and a new Climate Change Plan, setting out policies and proposals to deliver existing statutory emissions reduction targets for the period to 2032, will be published in winter 2016/17. In response to the historic Paris Agreement proposals for a new Scottish Climate Change Bill will be outlined in early 2017, including a more testing target for 2020.

The Scottish Government will respond separately to the Committee’s stand-alone progress report for Scotland, published in September 2016, which is based on more detailed and extensive analysis of the progress against Scotland’s climate targets. The Scottish Government will contribute to the UK Government’s emissions reduction plan.

Wales

Wales will continue to take action on climate change through the new legal framework set by the Well-being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016.

The Well-being of Future Generations (Wales) Act is about improving the social, economic, environmental and cultural well-being of Wales consistent with their sustainable development principle and our seven well-being goals. The Act sets the context for the Welsh Government’s decision making, which will frame the development of actions to tackle climate change. The Environment (Wales) Act complements the climate change provisions in the Wellbeing of Future Generations Act and goes further by establishing a clear statutory basis for decision making, emission reduction targets, a carbon budgeting approach and clear accountability framework. The implementation of the new legislation provides Wales with a platform to ensure that action to tackle climate change

across all areas is accelerated. The Welsh Government is developing the associated regulations under the Environment (Wales) Act to ensure their implementation by the end of 2018.

Alongside the introduction of new legislation, the Welsh Government has made considerable progress in actions to tackle climate change across different sectors. For example, they have invested over £200 million since 2012 to improve the energy efficiency of over 36,000 homes of households on low incomes or situated in the most deprived areas of Wales. To help address the short term challenges in meeting their tree-planting targets, the Woodlands for Wales Action Plan sets short term actions to March 2020 to focus collaborative Welsh Government and stakeholder effort on achieving the long-term goals set out in the Woodlands for Wales Strategy.

The Welsh Government is committed to support the aspirations for active travel in Wales and since the Active Travel (Wales) Act came into force, more than £31 million has been made available to Local Authorities, resulting in infrastructure, training and promotion and active travel study initiatives. To address non-financial barriers for electric vehicles the Welsh Government is considering a number of recommendations made by the Expert Steering Group on Low Carbon Vehicles for increasing the take-up of low carbon vehicles in Wales. Furthermore the Expert Steering Group report on Low Carbon Vehicles recognises the relationship between our Active Travel aspirations and the role low carbon vehicles can play. Following its Review of Land Use Climate Change (October 2014), the Welsh Government and the agriculture industry are currently developing a detailed action plan which puts Climate Change at the core of mainstream agriculture production and food policy development. In addition, municipal waste reduction and recycling targets are being exceeded with significant progress made to reduce the amount of all biodegradable waste going to landfill. The Welsh Government will contribute to the emissions reduction plan.

Northern Ireland

The Northern Ireland Cross Departmental Working Group on Climate Change submitted its fifth annual progress report in March 2016 to the Executive on the performance of all departments in implementing the agreed Northern Ireland Greenhouse Gas Emissions Reduction – Action Plan. The Action Plan supports the achievement of the programme for Government outcomes and work to reduce greenhouse gas emissions.

The greenhouse gas inventory 1990-2014 reports that there has been a reduction in Northern Ireland greenhouse gas emissions of 17.4%. The latest available projection data indicate that Northern Ireland is estimated to achieve a reduction in emissions of 34.1% by 2025.

For the first time in 2016, Northern Ireland saw over 25% of its total electricity consumption generated from local renewable sources. In addition to the ongoing extension of the gas network to the west, further expansion of the natural gas network to the south east was announced and the first phase of a new 100 megawatt energy battery storage facility became operational. The pilot rollout will

be assessed in terms of its contribution to reducing costs to consumers and greenhouse gas emissions will inform the case for a full rollout.

Across the Government Estate, notably health and education, investment in energy efficiency schemes including renewable technologies has produced annual recurring revenue savings and reductions in emissions. Work also continues to address fuel poverty, with the Affordable Warmth Scheme and Boiler Replacement Scheme targeting energy efficiency schemes for those most in need.

Change has been encouraged across the transport, waste, agricultural and educational sectors. The expansion of cycling routes and dedicated bus lanes helps promote a modal shift to public transport. The amount of waste going to landfill continues to fall and is supported by new legislation banning separately collected food waste going to landfill. The agriculture sector will see the launch of its 2016 – 2020 phase of the Efficient Farming Cuts Greenhouse Gas Strategy helping those in the sector to adapt to and gain economically from carbon efficient food production. In education, Northern Ireland achieved a world first, achieving 100% eco-schools status, helping future generations understand the impacts of climate change and the need for sustainability in everyday lives.

The Northern Ireland Programme for Government 2016 – 2021 is currently being developed. The draft framework for the programme contains a commitment to increase environmental sustainability by reducing greenhouse gas emissions. This will contribute to the policies and strategies required out to 2030 in the emissions reduction plan.

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