



HM Government

# The Government Response to the Committee on Climate Change's 2020 Progress Report to Parliament

Reducing UK emissions

Presented to Parliament pursuant to section  
37 of the Climate Change Act 2008



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Any enquiries regarding this publication should be sent to us at:  
[carbonbudgets@beis.gov.uk](mailto:carbonbudgets@beis.gov.uk)

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# Ministerial Foreword



**The Rt Hon Alok Sharma**  
Secretary of State for Business,  
Energy and Industrial Strategy



**The Rt Hon Kwasi Kwarteng**  
Minister of State for Business,  
Energy and Clean Growth

It is clear that the coronavirus pandemic has caused significant harm – both human and economic – and has led to an unprecedented shutdown of large parts of the global economy with severe consequences for all sectors and countries.

As the Committee on Climate Change (CCC) acknowledged, Covid-19 has presented immense challenges for businesses and governments. Chief among these is how we recover from the pandemic, stimulate economic growth and create employment while ensuring we also address the linked challenges of safeguarding public health, tackling climate change, and preserving biodiversity.

As the Prime Minister said in May, we owe it to future generations to build back better and base our recovery on solid foundations including a fairer, greener, and more resilient global economy. The recovery is a chance for us to build back better, build back greener and to do that at the pace that this moment requires. This means placing clean growth and our target to achieve net zero greenhouse gas emissions by 2050 at the heart of our economic recovery. We have taken huge strides in bringing forward ambitious net zero policies across all sectors of the economy. That is what we are doing here in the UK.

Since March, the Government has announced billions in support of the green economic recovery, including: over £3 billion to reduce emissions from the UK's buildings which includes our £2 billion Green Homes Grant, launched in September<sup>1</sup>, which will allow homeowners to obtain funding for up to two-thirds of the cost of energy saving home improvements, as well as to save up to £600 a year on their energy bills; £250 million for an emergency active travel fund as part of a £2 billion package for cycling and walking within plans to boost greener, active transport; £191 million into a Sustainable Innovation Fund; and £100 million into research, development and demonstration of direct air capture technologies, alongside £350 million into cutting emissions in heavy industry.

On 6 October, the Prime Minister announced that £160 million will be made available to increase our offshore wind capacity in order to meet the Government's updated ambition of generating 40GW through offshore wind by 2030, an increase from the previous 30GW target, which means that offshore wind could produce enough electricity to power every home in the country by 2030<sup>2</sup>.

This funding builds on earlier green commitments made at the Spring Budget including: a record £5.2 billion investment in flood defences between 2021 and 2027 which will better protect 336,000 properties; over £1 billion of support for ultra-low emission vehicles; £640 million in a Nature for Climate Fund to deliver England's contribution towards planting 30,000 hectares of trees a year across the UK by 2025 and to restore 35,000 hectares of peatland in

England; and £270 million for the Green Heat Networks Scheme<sup>3</sup>. In addition, £100 million was announced in August 2019 to scale up low carbon hydrogen production<sup>4</sup>.

In supporting families and businesses to recover from the pandemic, we cannot lose sight of our wider climate ambition and our legal obligation to achieve net zero greenhouse gas emissions by 2050. As the CCC notes, the urgent need for action on climate change has not diminished and the significant changes required to our economy to achieve net zero have not been altered by the pandemic.

Against this backdrop, we welcome the CCC's annual Progress Report for 2020, published in June<sup>5</sup>. We are pleased that the Committee has recognised the progress we have made over the last year in establishing an appropriate policy framework to deliver our net zero ambitions across the whole UK economy. This includes:

- In October 2019 it was announced that the Prime Minister would chair a Cabinet committee on climate change. The Climate Action Strategy Committee (CAS) determines the UK's overarching climate strategy, both domestically and internationally. It is supported by the Climate Action Implementation Committee (CAI), chaired by the Secretary of State for Business, Energy and Industrial Strategy, which seeks to operationalise the Government's climate strategy and drive implementation.
- The Government has announced that the Net Zero Review report will be published in spring 2021. In the meantime, HM Treasury will publish an interim report this autumn. This will present some of our initial findings and analysis for the Review.
- In the government Response to the Future of UK Carbon Pricing consultation published in June 2020<sup>6</sup>, we committed to consulting on the most appropriate trajectory for the UK Emissions Trading System (ETS) cap for the remainder of its first phase within nine months of the CCC's sixth carbon budget advice being published, should that be the method of carbon pricing we choose to adopt on leaving the EU ETS.
- In the lead-up to COP26 in Glasgow in November 2021, we continue to drive climate ambition on the global stage. We have established a dedicated COP26 Unit to deliver our ambitious presidency plans and announced last year that we will double our International Climate Finance to £11.6 billion<sup>7</sup>.
- Building on our success to date, we continue to support and drive decarbonisation across the power sector, creating thousands of jobs in new industries in the process. The price of offshore wind energy has fallen by two-thirds between 2015<sup>8</sup> and 2019<sup>9</sup> and UK offshore wind capacity is now the largest in the world<sup>10</sup>. From April to June this year we went 67 days without using coal for our power generation and we can say with confidence that the UK will meet its ambition to phase out coal power by 2024.
- On 26 March 2020, we took the important step of publishing "Decarbonising Transport: Setting the Challenge", taking a holistic view of emissions across the entire transport sector and launching our work on preparing a Transport Decarbonisation Plan. To be published in 2020, the Transport Decarbonisation Plan will set out a credible and ambitious pathway to cut greenhouse gas emissions across the entire transport system.

However, just as importantly, we have heard the strong message from the CCC that progress has been greater in some areas than others. While we have decarbonised our economy faster than any other major economy over the past two decades<sup>11</sup>, we recognise that more needs to be done if we are to meet the size of our net zero and carbon budgets ambitions.

We are pleased to announce today that, in addition to ambitious plans across key sectors of the economy, including an Energy White Paper, Transport Decarbonisation Plan and Heat and Buildings Strategy, we will publish a comprehensive Net Zero Strategy in the lead up to COP26. The strategy will set out the Government's vision for transitioning to a net zero economy, making the most of new growth and employment opportunities across the UK. These will raise ambition as we outline our path to hit our 2050 target.

As we continue to deal with the Covid-19 pandemic, we agree wholeheartedly with the CCC on the need to ensure that our recovery plans support our climate change response. By building back greener and better, we can achieve our climate goals, protect our biodiversity and natural capital, and sustain climate-resilient economic development, all in a fair and inclusive way.

We also agree with the CCC that as we do this it is important that we involve the public and bring them with us, so that the decisions we make align with society's concerns and values. As the Committee has pointed out, 62% of emissions reductions involve some form of behaviour change. In June 2019 six Select Committees of the House of Commons convened the Climate Assembly UK. The Assembly produced its final report<sup>12</sup> this September. We welcome the report and will be considering its findings closely as we shape our approach to net zero. We have already committed to many policies in line with the report and wholeheartedly agree with the spirit of its recommendation on greater citizenship involvement around climate change. The green recovery and move to a net zero economy affect every one of us, and getting there will require politicians, policy makers, businesses, and the public to work together.

As the CCC rightly notes, 2021 will be a critical year for climate ambition, both domestically and internationally. Through our COP26 and G7 presidencies, the UK is well-placed to drive international cooperation in the year ahead and we will continue to press for more ambition to reduce emissions, build resilience, and support each other.

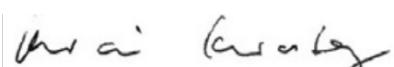
We recognise and agree with the CCC that UK international climate leadership must be underpinned by robust domestic policy and continued progress at home. In the report that follows, we set out in detail the progress we have made so far in pursuit of the decarbonisation of the UK economy as well as further actions that we will undertake to deliver net zero and meet our carbon budgets.

We would like to reiterate our thanks to the CCC for its 2020 Progress Report and the detailed analysis and recommendations that it contains. It is clear that the immense challenges of addressing climate change can only be met by working together across government, business and civil society. The Government will continue to work closely with the CCC as we continue to drive our transition to net zero by 2050 and we look forward to receiving further advice from the Committee on Carbon Budget 6 in December.



The Rt Hon Alok Sharma

Secretary of State for Business,  
Energy and Industrial Strategy



The Rt Hon Kwasi Kwarteng

Minister of State for Business,  
Energy and Clean Growth

# Executive Summary

The truly global challenge presented by climate change cannot be underestimated. The science is clear. To limit the Earth's warming to 1.5 degrees Celsius, we need to halve global greenhouse gas emissions over the next decade<sup>13</sup>.

The UK has taken considerable steps to meet this challenge. We have reduced emissions faster than any other G7 nation since 1990<sup>14</sup>, and in 2019, we became the first major economy to legislate to achieve net zero greenhouse gas emissions.

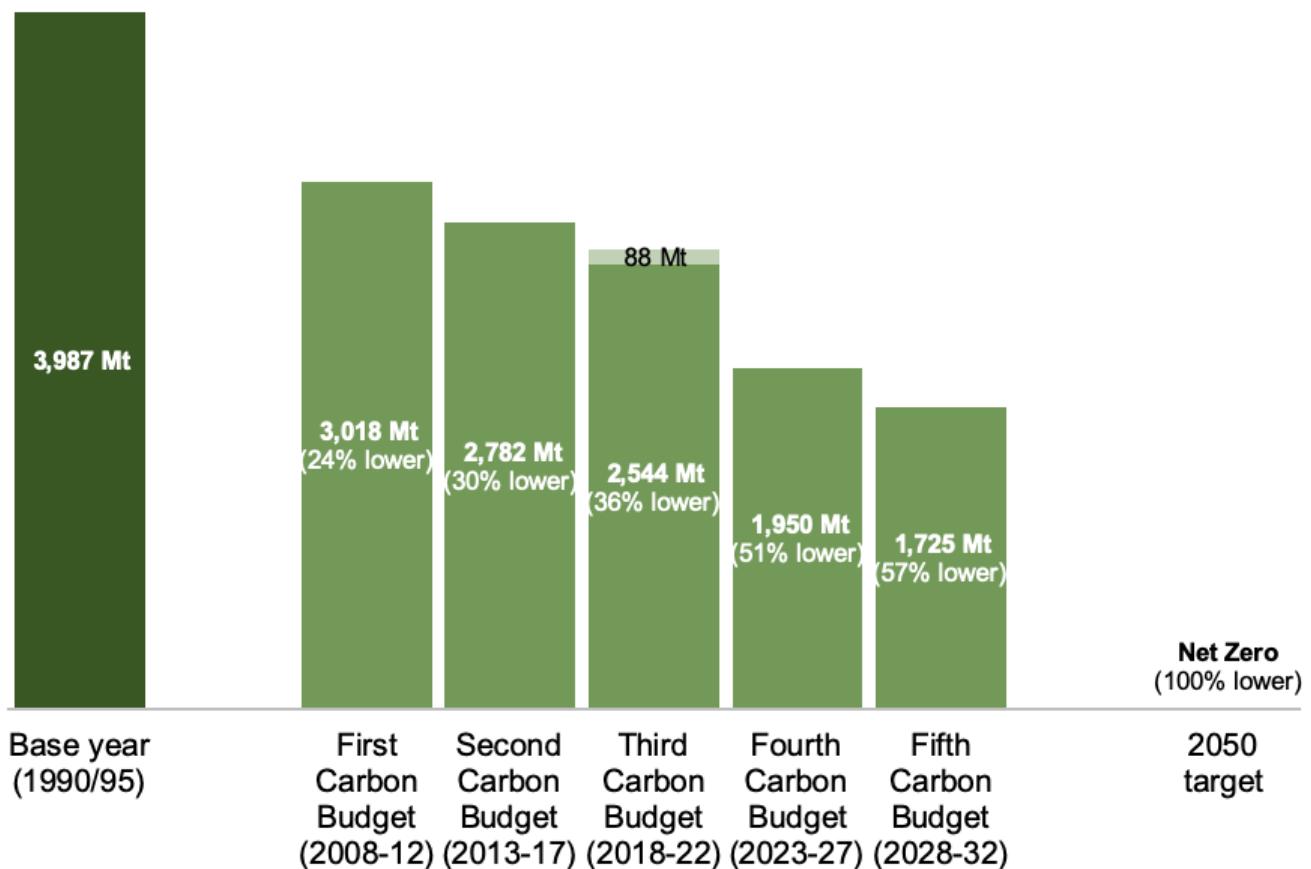
Reaching net zero will involve fundamental changes across the UK economy. Under any feasible scenario, meeting net zero will require reductions in emissions across the economy on a scale not previously seen; ambitious and early deployment of existing technologies and approaches; and innovation in new technologies, including greenhouse gas removal technologies which will enable us to sequester or offset emissions from sectors which cannot fully decarbonise and could offset the highest cost measures in other sectors.

In delivering net zero, we want to ensure we deliver emissions reductions at a rate which:

- reflects our scientific knowledge on climate change;
- ensures a cost-effective transition; and
- maximises the economic opportunities for the UK, both from domestic deployment of clean technologies as well as through realising export opportunities in what promise to be large and growing international markets in low carbon technologies and services such as renewables, carbon capture usage and storage (CCUS), hydrogen, smart energy systems and storage, and road transport.

Delivering net zero will have a profound effect on our economy. It presents a major opportunity for growth in some areas. The UK's low-carbon economy already supports over 460,000 jobs<sup>15</sup> and, by one estimate, the low carbon economy in the UK could grow 11% per year between 2015 and 2030 - supporting up to two million jobs<sup>16</sup>. Research published last year estimated that with high levels of innovation and ambitious policy, the UK's 12 low carbon sectors with the largest potential for innovation could contribute £27 billion to the economy through domestic economic activity and £26 billion through exports by 2050<sup>17</sup>.

But there are also risks as we transition to net zero which require careful management – in particular for 'higher-carbon' sectors and the workers and places that depend on them. Currently around 10% of UK GVA<sup>18</sup> comes from a group of sectors that are potentially exposed to the transition, and our financial markets are particularly exposed to fossil fuels. For some sectors like coal electricity generation the impacts are being felt now and will lead to the closure of the industry over the next five years, whilst for others like automotive or oil and gas the transition will play out over a longer time horizon and there are routes to low carbon futures for these sectors and workers, if managed effectively. HM Treasury's Net Zero Review will consider how the transition to net zero will be funded, helping ensure an equitable balance of contributions between households, businesses and taxpayers.

**Figure 1: UK carbon budgets and 2050 target**

**Source:** BEIS, UK Legislation.

As the Prime Minister said in May, our significant national efforts will count for little, unless they are fortified with international cooperation. In the run up to COP26 in November 2021, the UK as COP Presidency will continue to work with all involved to increase climate ambition and focus on the actions that can support our goals, build resilience and lower emissions.

We welcome the CCC's 2020 Progress Report, and in particular the structural changes from previous years' reports.

These include dedicated recommendations for individual departments for the first time. The Government has always been clear on our commitment to ensure that climate mitigation and adaptation are embedded as priorities across Whitehall departments. We have sought to mirror the CCC's progress report in our response, where possible, including by providing specific departmental responses to each of the recommendations. In doing so we have detailed the actions that are being taken across different policy areas and departments to facilitate our transition to net zero by 2050 as well as outlining next steps in specific areas. They give a clearer picture of the broad spectrum of efforts that will be required across the UK economy to decarbonise by 2050.

Further detail about the structure of the report is set out below.

### Structure of the Report

This report sets out the Government's response to the Committee on Climate Change's 2020

annual Progress Report to Parliament, assessing progress in reducing UK emissions over the past year and the impact of government policies. The structure of the report is as follows:

- **Building Back Greener** sets out the UK's approach to ensuring a green and resilient recovery from the Covid-19 pandemic and the links to achieving net zero emissions by 2050. It outlines steps that we have already taken to ensure that our response to the pandemic is built on sustainable foundations as well as future activities we are undertaking to build back better.
- **Sector-specific action** assesses our progress in reducing emissions across the key sectors identified in the Clean Growth Strategy: Power, Buildings (domestic and non-domestic), Industry (including Carbon Capture Usage and Storage (CCUS) and hydrogen), Transport, and Natural Resources (including agriculture, forestry, land use, waste and fluorinated gases (F-gases)).
- We have heard the CCC's clear message that further action is required to embed adaptation to climate change across government policy, including long-term planning to help the country prepare for scenarios such as global temperature rise of 2°C (and consideration of 4°C) at the end of the century. **Adaptation and Resilience** looks at the actions the Government is taking on climate adaptation. Annex 1 also outlines additional developments taking place to address priority risks outlined in the second Climate Change Risk Assessment ahead of the CCC's next report on progress in adapting to climate change impacts in England in 2021.
- **Action in Devolved Administrations** provides an update on action to reduce emissions undertaken by the Devolved Administrations. Recognising that many of the actions required to decarbonise our economy and meet our net zero target fall under devolved competence, we outline current progress to reduce emissions in Scotland, Wales and Northern Ireland.
- **International leadership and countdown to COP26** provides an overview of the actions that the UK is undertaking internationally to drive climate ambition ahead of the pivotal COP26 summit that will take place in Glasgow in 2021.
- **Annex 1** provides specific responses to the CCC's recommendations for individual departments as well the priorities identified for all departments.
- **Annex 2** provides an update on progress against the milestones for 2018/19 we committed to in the Government's response to the CCC's 2019 Progress Report in October 2019.
- **Annex 3** assesses our performance against the economy-wide and sector-level metrics set in the Clean Growth Strategy to benchmark progress.

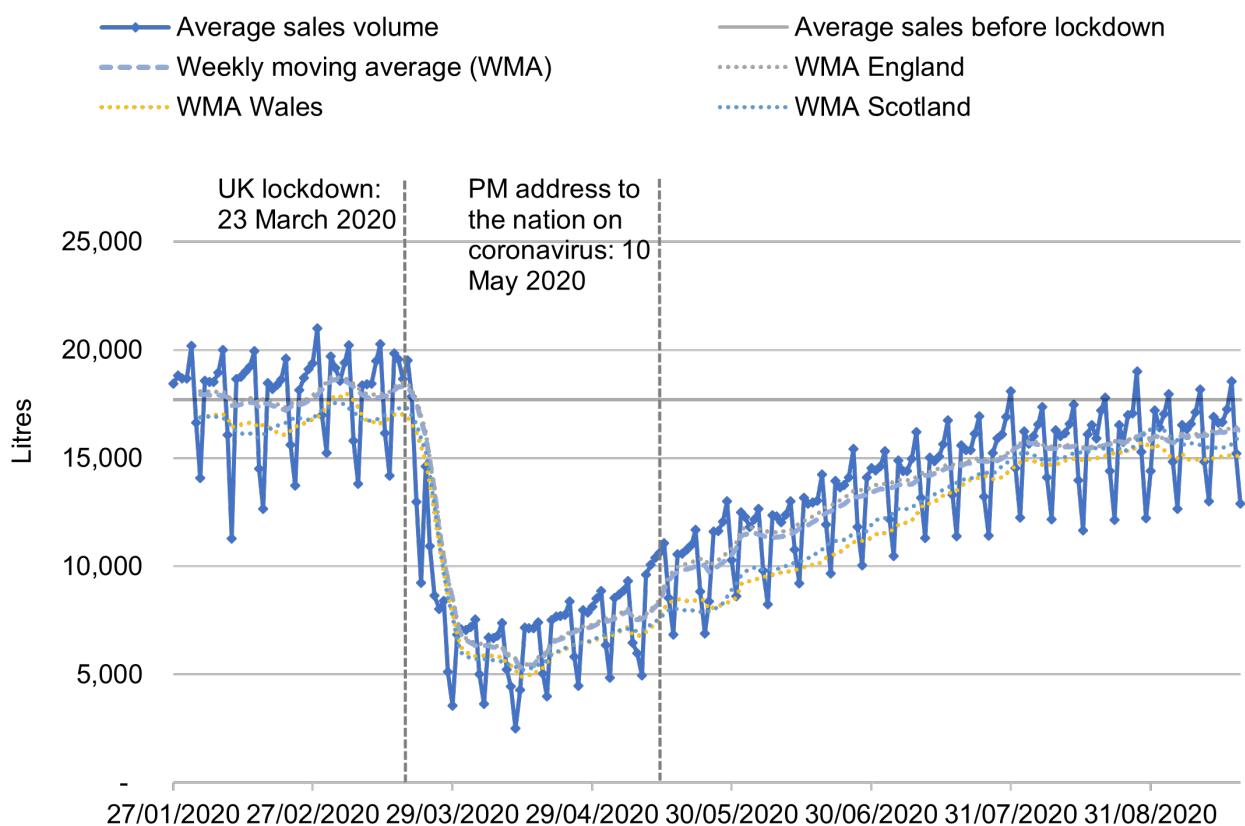
# Building Back Greener

In his speech on 30 June<sup>19</sup>, the Prime Minister made clear that in recovering from Covid-19, we must build back better and greener, and to do that at the pace that this moment requires by investing in and accelerating infrastructure across the UK to promote a clean, green recovery.

2020 has been a year of unprecedented global challenge. Covid-19 has been a powerful reminder of the impact of systemic risks – such systemic risks as climate change and habitat and biodiversity loss pose a major threat to UK prosperity and security. It follows that we must use the recovery from Covid-19 to make our economy fit for tomorrow's challenges by reducing risk and increasing our resilience to the threat climate change poses to the UK's prosperity and security, while addressing the linked challenges of biodiversity loss and public health protection.

Covid-19 has clearly had an environmental impact. In the first seven weeks of lockdown, average daily road fuel sales were 39% of their typical level in the eight weeks prior to lockdown, leading to lower greenhouse gas emissions and improved air quality<sup>20</sup>. However, as pointed out by the CCC, the changes that drove this are likely to be short lived, and we are already seeing road fuel sales moving back toward their pre-lockdown levels.

**Figure 2: Average road fuel sales at sampled filling stations, Great Britain**



Source: BEIS Energy Trends (2020).

The long-term impacts of Covid-19 on UK emissions will be linked to economic growth and behavioural change, both of which are harder to predict. We can be clear that the need for

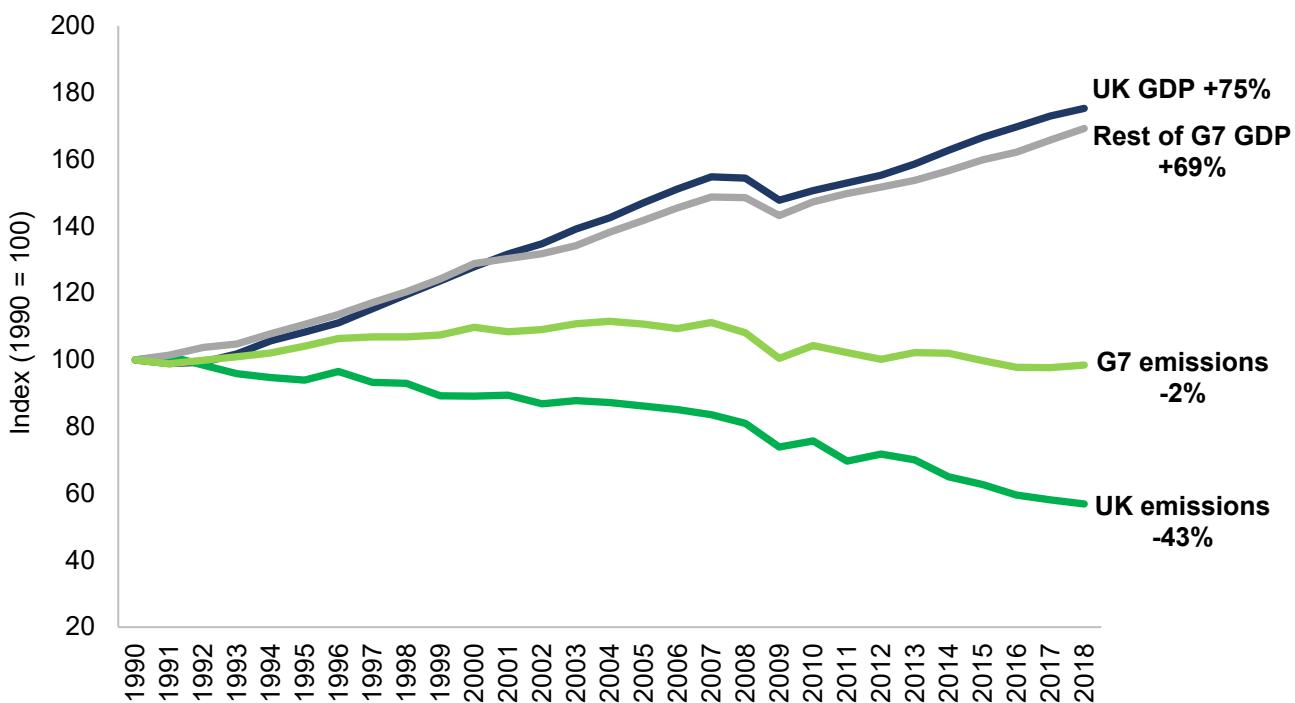
action to achieve net zero remains unchanged.

The UK Government is committed to building back better and greener from Covid-19, investing in and accelerating infrastructure to both deliver on net zero and in the process deliver jobs and economic opportunities across the UK, levelling up to unleash the whole country's potential.

With our expert scientists, business leaders and innovators, the UK has already excelled at cutting emissions while creating wealth. Between 1990 and 2018, we have reduced emissions by 43% while growing our economy by 75% – decarbonising our economy faster than any other G20 country since 2000<sup>21</sup>.

The International Energy Agency (IEA) previously estimated that in 2020 the impact of Covid-19 means that global emissions are expected to fall by around 8%<sup>22</sup>. The UK's emissions are likely to fall by a similar amount but this effect is largely temporary and sustained falls require the UK to continue to pursue ambitious policies.

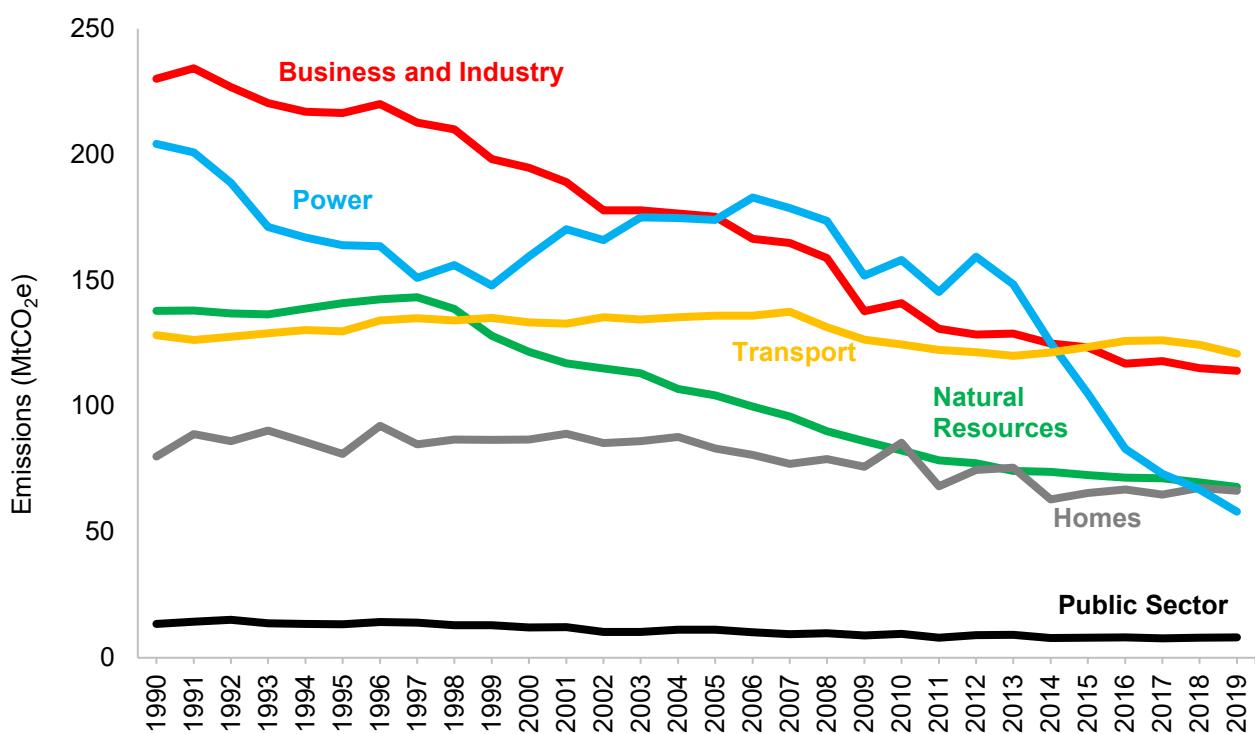
**Figure 3: UK vs Rest of G7 GDP and Emissions**



**Source:** World Bank, UNFCCC National Inventory Submissions, ONS, BEIS Greenhouse Gas Inventory 1990-2018.

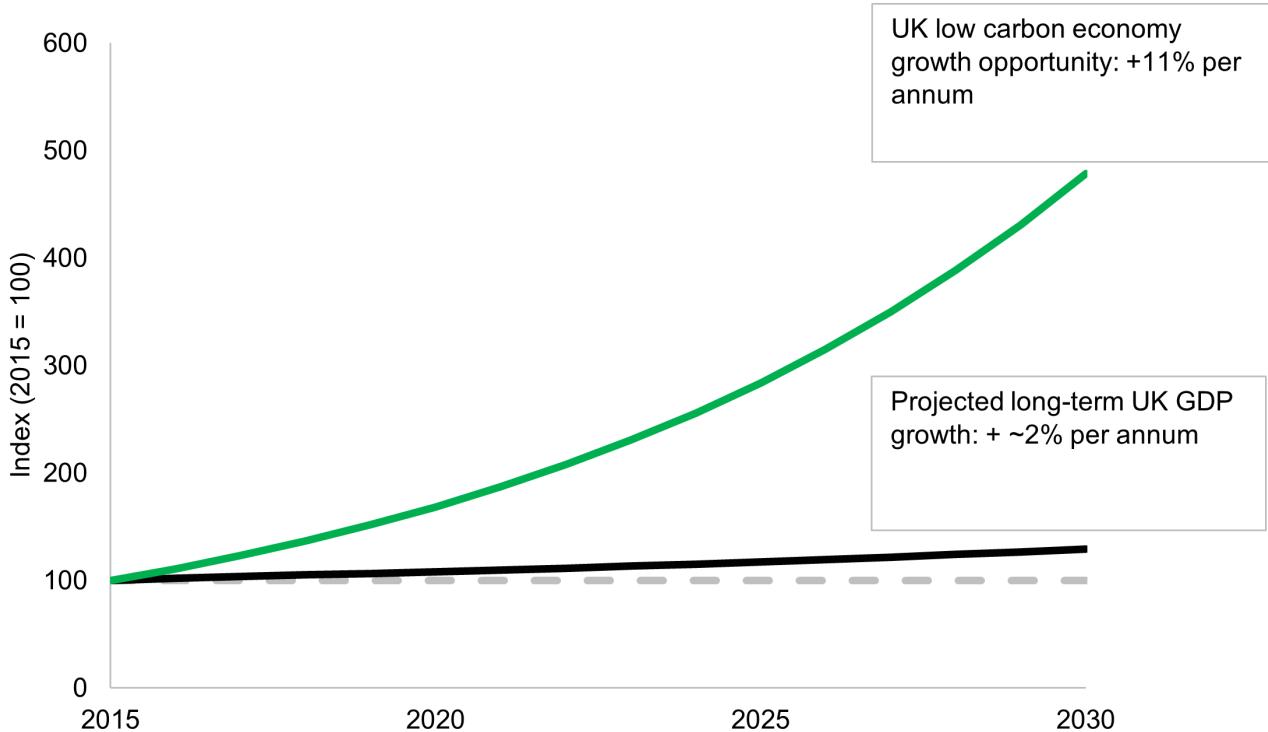
Across the UK almost half a million people are employed in the low carbon economy and its supply chains<sup>23</sup>. We already boast electric vehicle manufacturing in the Midlands and North East, and reconditioning and recycling in the North East and West Midlands. The offshore wind sector supports an estimated 11,000 direct jobs<sup>24</sup>, with a burgeoning industry on the north east coast of England, centred around the Humber and the Tees.

**Figure 4: Emissions per sector**



Source: BEIS Provisional Greenhouse Gas Inventory 1990-2019.

**Figure 5: Potential growth in the UK low carbon economy**



Source: Ricardo AEA for the CCC, OECD.

In the short term, evidence from the global financial crisis in 2008 and modelling have demonstrated that green investments, such as renewables and energy efficiency, are effective means of delivering jobs. They offer higher employment compared to traditional stimulus measures, thanks to higher jobs multipliers (as in the case of renewables), which boost spending and increasing short-run GDP<sup>25</sup>.

In the long-term, we are determined to seize the once-in-a-generation economic opportunities of the net zero transition – creating new business opportunities and up to 2 million green jobs by 2030 across all regions of the UK. Globally, 83% of the \$13.3 trillion investment in electricity systems worldwide between now and 2050 could be into zero-carbon technologies<sup>26</sup>. With high levels of innovation and ambitious policy, the UK's 12 low carbon sectors with the largest potential for innovation could contribute £27 billion to the economy through domestic economic activity and £26 billion through exports by 2050. The UK is already a world leader in offshore wind with the largest installed capacity in the world<sup>27</sup>. Growth in UK exports could add £2.4 billion GVA and support 21,000 jobs by 2050<sup>28</sup>.

In delivering on our net zero target we are looking to position the UK as a world leader in those low carbon technologies, services and systems that will be needed globally to deliver on the Paris Agreement, building on existing strengths including in offshore wind, smart energy, electric vehicle technologies and green finance.

To drive a green economic recovery, we have announced that we will invest over £3 billion to reduce emissions from the UK's buildings, this includes over £2 billion for the Green Homes Grant which will upgrade more than 600,000 homes across the country, and could save households hundreds of pounds a year on their energy bills and support more than 100,000 green jobs. It also includes £1 billion for the Public Sector Decarbonisation Scheme which will fund shovel-ready projects and could support up to 33,000 green jobs in sectors that will be key to delivering our net zero ambitions.

We also announced the £191 million Sustainable Innovation Fund to help companies recovering from the impact of Covid-19 keep their cutting-edge projects and ideas alive, for example in developing new energy efficiency technologies, ground-breaking medical technologies, or reducing the carbon footprint of public transport in our towns and cities.

In transport, on top of £250 million for an emergency active travel fund, the Government confirmed £10 million of funding for the first wave of innovative R&D projects to scale up manufacturing of the latest technology in batteries, motors, electronics and fuel cells and £73.5 million to support the development of cutting-edge technology for the next generation of electric taxis, cars and vans. This is in addition to a share of funding for the UK's first 'gigafactory' and supporting supply chains to mass manufacture cutting-edge batteries for the next generation of electric vehicles, as well as for other strategic electric vehicle technologies.

This builds on earlier green commitments at the Spring Budget including a record £5.2 billion investment in flood and coastal defences between 2021 and 2027 which will better protect 336,000 properties, over £1 billion support for ultra-low emission vehicles, £640 million in a Nature Climate Fund to deliver England's contribution towards planting 30,000 hectares of trees a year across the UK by 2025 and to restore 35,000 hectares of peatland in England, and £270 million on a Green Heat Networks Scheme<sup>29</sup>. In addition, £100 million was announced in August 2019 to scale up low carbon hydrogen production<sup>30</sup>.

There is public support for this approach<sup>31 32</sup>. The Covid-19 pandemic and the measures to control the pandemic have impacted behaviours that contribute to emissions such as how we travel, work and shop. As we look to build back greener, we will also explore ways to support

people to maintain new low carbon behaviours which will be vital because as the Committee has identified, 62% of emissions reductions involve some form of behaviour change.

As the CCC highlights, the year ahead is critical for global progress on climate change, and a major test of global cooperation after Covid-19. We agree that it will be crucial for the UK to demonstrate strong climate leadership, and we are pleased that the CCC acknowledges the progress in UK emissions reductions in this context. The UK will take on the G7 Presidency next year and will make climate ambition a core priority, in line with our broader international efforts ahead of COP26. Next year provides a unique opportunity to promote climate ambition internationally by aligning our G7 Presidency with our COP26 Presidency in partnership with Italy, and Italy's own G20 Presidency.

The Government is committed to working with international partners on a roadmap for global climate action between now and COP26 in November 2021. As COP26 Presidency, we will take the lead in supporting a green, inclusive and resilient recovery building on the principles of the Paris Agreement and the Sustainable Development Goals. We continue to press for much greater ambition around the world - more ambition to reduce emissions, more ambition to build resilience, and more ambition to cooperate and support each other.

# Sector-specific action

## Power

### **Key achievements over the past year: Power**

The Offshore Wind Sector Deal had an ambition of delivering up to 30GW by 2030<sup>33</sup>. We have increased this to delivering 40GW by 2030. We have also set out a new ambition to have 1GW of floating offshore wind by 2030 as part of that overall 40GW offshore wind ambition<sup>34</sup>.

We are bringing an end to coal generation in the UK – in February the Prime Minister announced on the Government's intention to bring forward the date of coal closure in the UK from 2025 to 2024<sup>35</sup>.

We are also ending our support for coal abroad. In January, the Prime Minister announced that the Government will no longer provide any new direct official development assistance, investment, export credit or trade promotion support for thermal coal mining and coal power plants overseas<sup>36</sup>.

To deliver more renewables, in March, we announced that the next Contracts for Difference (CfD) allocation round will be open to both established and less-established technologies<sup>37</sup>. This will accelerate the deployment of onshore wind and solar, both of which will be key to delivering net zero at low cost. The Government has since confirmed that the next CfD allocation round will open in late 2021, and has set a target to support up to double the capacity of renewable electricity in the next round than was secured in the 2019 allocation round<sup>38</sup>.

To deliver more renewables we announced that pot 1 technologies will be eligible to bid into allocation round 4 of the CfD scheme planned to open in 2021. This will accelerate the deployment of onshore wind and solar, both of which will be key to delivering net zero<sup>39</sup>.

We launched the Offshore Transmission Network Review<sup>40</sup>, to support the growth in offshore wind needed to meet our world-leading ambitions. The review will ensure the infrastructure for interconnection and offshore wind is delivered in the most appropriate way, minimising impacts on communities and the environment.

To provide security of supply in a decarbonised manner, we have passed legislation to introduce carbon emissions limits into the Capacity Market, which will prevent the most carbon-intensive capacity from competing in future auctions, and expanded the list of renewable technologies that can compete in the Capacity Market to include onshore and offshore wind and solar photovoltaic<sup>41</sup>.

We sought views, through a call for evidence published in June 2020<sup>42</sup>, on the future role of efficient co-generation of heat and power to support achievement of our net zero emissions target by 2050.

In August this year we published our response to the CCUS business models consultation<sup>43</sup>, publishing our minded-to position on the Power CCUS business model to

demonstrate how this key low-carbon technology can provide both firm and flexible generation.

In November 2019 we announced the outcome of the Industrial Strategy Challenge Fund Low Cost Nuclear Challenge and awarded £18 million to a UK consortium led by Rolls-Royce, which aims to develop a Small Modular Reactor (SMR), designed and manufactured in the UK, capable of producing cost effective low-carbon electricity<sup>44</sup>.

We are also making the electricity system smarter. In June 2020 we confirmed that a new smart metering policy framework will apply from July 2021, under which energy suppliers will be set binding annual targets to deliver market-wide rollout as soon as practicable<sup>45</sup>.

We have taken multiple steps to drive flexibility across the system<sup>46</sup>: legislating to make it easier to get planning permission for large scale storage<sup>47</sup>; ensuring storage assets are not double charged for network and policy costs; developing standards for smart appliances<sup>4849</sup>; and, opening up access to the balancing and capacity markets to smaller flexibility assets.

We have awarded £70 million for a number of flexibility innovation programmes, including for flexibility market platforms, large scale storage, smart tariff comparison, using smart metering for smart charging of electric vehicles and an energy data catalogue<sup>50</sup>.

Ofgem has published its draft determinations for RIIO-2<sup>51</sup> and consultation on RIIO-ED2<sup>52</sup>, showing Ofgem's focus on achieving net zero and supporting innovation and strategic investment.

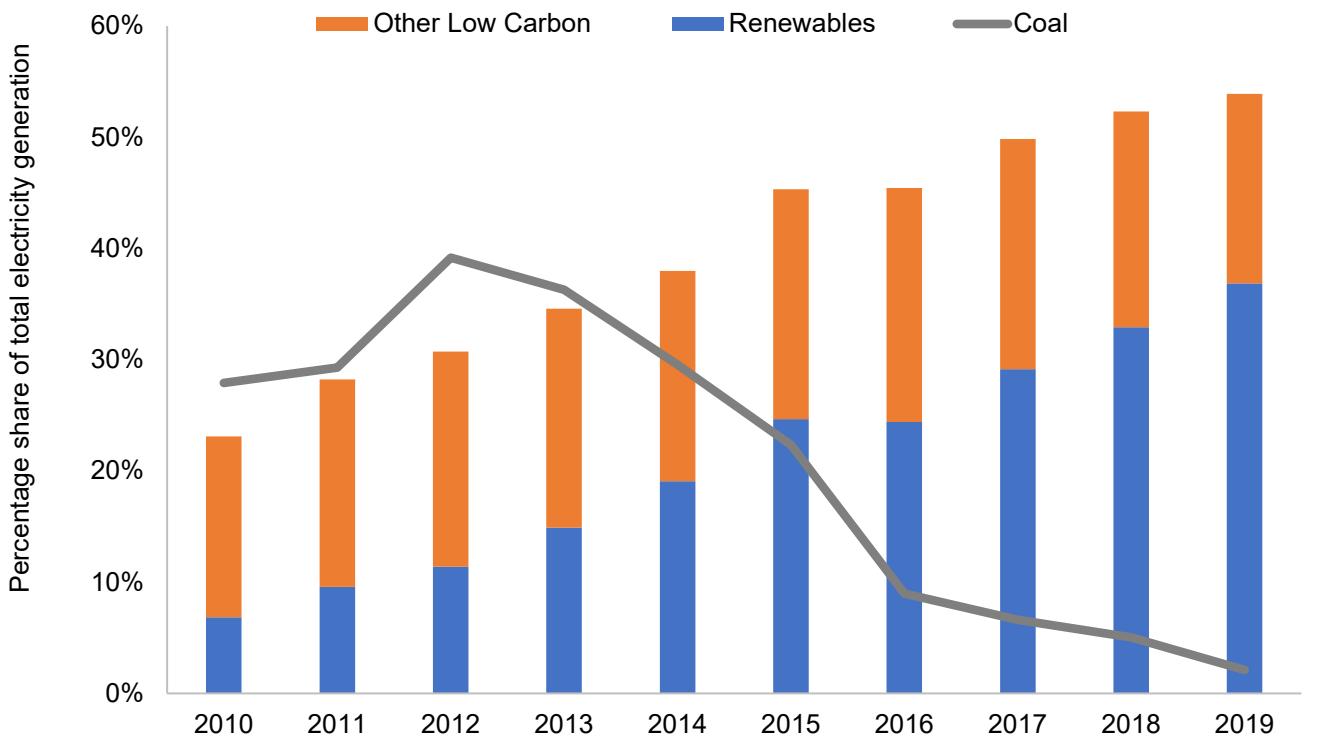
Ensuring a reliable, cost-effective, low-carbon power supply is key to achieving our net zero ambitions. The UK is well placed to benefit from the transition to a cleaner, smarter power sector and we have already made significant strides in reducing our emissions.

In 2019, carbon dioxide emissions (MtCO<sub>2</sub>e) from power stations were down 13%<sup>53</sup> on 2018 levels and were 72% lower than 1990 levels<sup>54</sup>, as we have switched from coal to gas and more renewable power with the continued contribution of nuclear.

As a result of our existing policies, including carbon pricing and our support for renewables, the UK has already made great headway in reducing our reliance on coal in the electricity mix, from 34% in 2007 to just 2% in 2019 – a 94% decrease<sup>55</sup>. In April 2017, the UK experienced its first coal-free day since the industrial revolution and went on to go eighteen days without generating electricity from coal in May to June 2019<sup>56</sup>. In 2020, from April to June the total coal-free period lasted 67 days. This is a huge achievement for the energy sector and is testament to how our electricity system is changing to reduce emissions in the UK.

The amount of renewable capacity connected to the grid has increased almost six-fold from 8GW in 2009 to 47.4GW at the end of April this year<sup>57</sup>. We have also seen an increase in the share of low carbon electricity from 52.6% in 2018 to 54.4% in 2019<sup>58</sup>. The renewables share of electricity was at a record 37.1% in 2019<sup>59</sup> with 47% of electricity coming from renewable sources in the first quarter of 2020 (partly as a result of lower demand during the Covid 19 lockdown)<sup>60</sup>.

**Figure 6: Share of total electricity generation, coal vs low carbon sources**



Source: BEIS Digest of UK Energy Statistics (DUKES) 2020.

However, there is more that can and needs to be done.

By 2050, electricity demand could double as it is used to decarbonise heat and transport. We will need a substantial increase in low carbon generation and a mix of technologies to deliver a low carbon, low cost and reliable electricity system that can adapt to our needs.

The UK is already taking steps in all these areas to ensure that the power sector is equipped to meet the challenge of the UK's net zero ambitions.

Energy efficiency has an important role to play in reducing the cost of energy transformation. We will build on lessons learnt from the Electricity Demand Reduction pilot and last year's call for evidence<sup>61</sup>, to develop policies to better incentivise the deployment of energy efficiency measures.

Regardless of the precise level of demand, we agree with the CCC's net zero report<sup>62</sup> that the falling cost of wind and solar means that they are likely to provide the majority of our generating capacity in 2050. Our sustained support for clean energy, through early policy action, innovation, and growth in deployment, has led to dramatic falls in the costs of these technologies and more efficient low carbon technologies, and there are early signs of wind and solar deploying without consumer support<sup>63</sup>.

The Contracts for Difference (CfD) scheme is the Government's main mechanism for supporting new low carbon electricity generation projects in Great Britain. The scheme has so far awarded contracts to around 16GW of new renewable electricity capacity, including 13GW of offshore wind, across many technologies in 58 projects<sup>64</sup>. Last year's CfD Allocation Round 3 awarded contracts to 5.8GW of new renewable electricity capacity to be added to the grid by

2025, with offshore wind clearing prices around 30% lower than prices in 2017.

In the next CfD allocation round<sup>65</sup> - planned to open in late-2021 - we have set an ambition to support up to double the capacity of renewable electricity secured in the previous round in 2019, securing investment in additional renewable capacity including less-established technologies such as onshore wind and solar. In March, the Government consulted on a number of proposed policy changes to the CfD scheme, so that it continues to support low carbon electricity generation at the lowest possible cost to consumers, whilst supporting the 2050 net zero target. This consultation – to which the Government will publish a response shortly – included proposals to introduce a new classification for floating offshore wind, and to update the current CfD ‘pot’ structure.

On 6 October the Prime Minister announced<sup>66</sup> that we are increasing our offshore wind ambition from delivering up to 30GW by 2030, as set out in the Offshore Wind Sector Deal, published last year, to 40GW. We have also set a new ambition for floating offshore wind of delivering 1GW of capacity by 2030, over 15 times the current worldwide capacity.

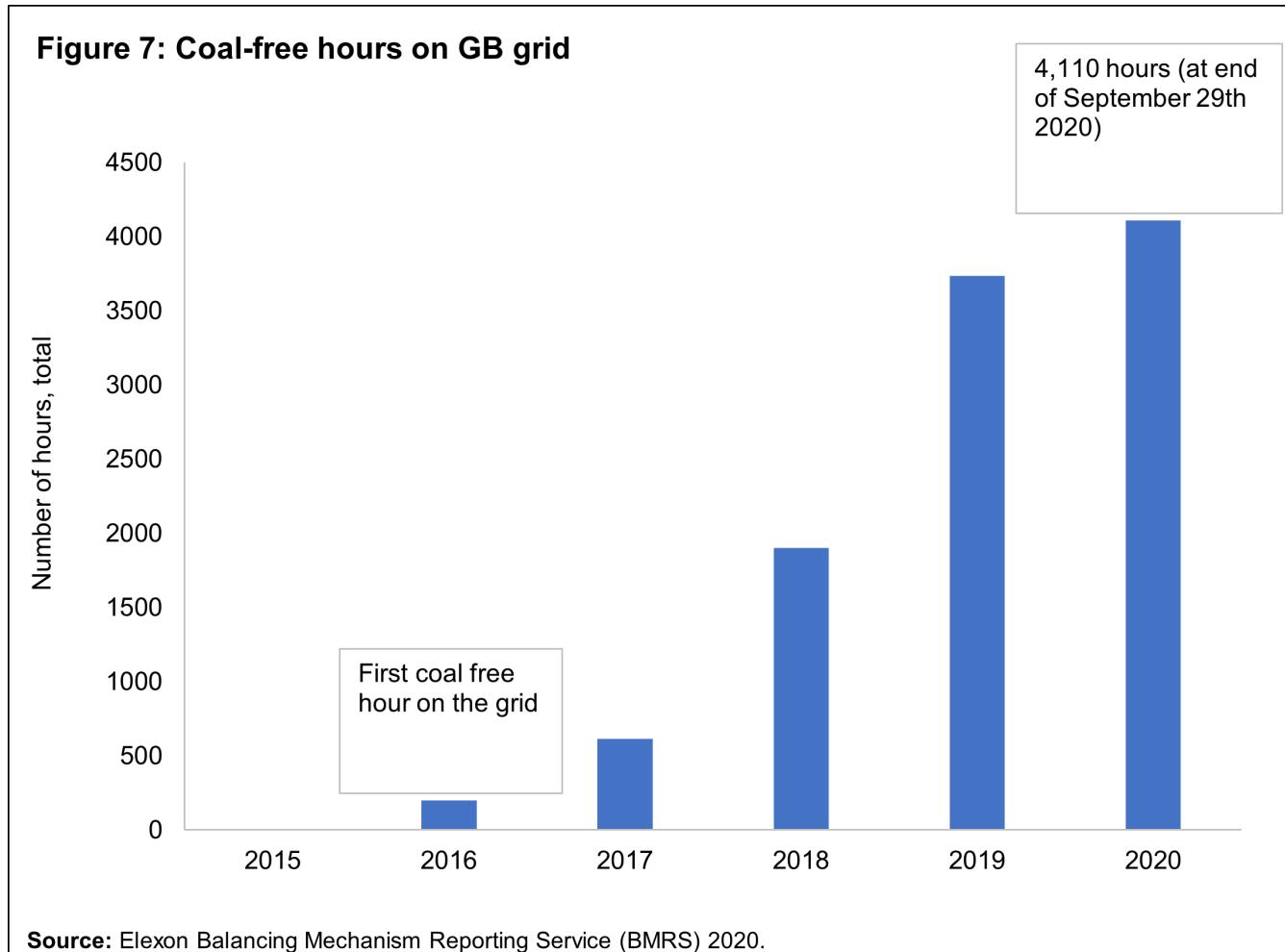
We are also working to remove barriers to deployment. As part of the Offshore Wind Sector Deal, we have committed to work collaboratively with industry to address a range of potential barriers. We have recently launched the Offshore Transmission Network Review to ensure that the transmission connections for offshore wind generation are delivered in the most appropriate way. We are also working with a wide range of partners to ensure that offshore deployment can continue apace whilst protecting the marine environment and taking account of the effects on other users of the sea, as well as considering how to address concerns over the effects which wind turbines have on radar systems.

In order to identify and define solutions to radar mitigation, which will allow the planned pipeline of offshore wind to be deployed, we are working with the sector through a joint task force. In parallel, BEIS and MOD are collaborating on an innovation competition to identify the next generation of potential solutions which will operate from 2030 and beyond.

We are also working with The Crown Estate, and Crown Estate Scotland on an Offshore Wind Evidence and Change programme. This will bring together a range of stakeholders and interested parties to identify the cumulative effects of offshore wind deployment and to consider how these can be mitigated.

In order to deliver a reliable system, wind and solar will need to be complemented by sources of power which are available when the wind does not blow and the sun does not shine. This will increasingly have to come from low carbon sources including nuclear, and biomass or gas with carbon capture and storage, and through flexibility, such as batteries, interconnectors, or demand side response, which can also improve the use of intermittent or inflexible resources.

As part of this transition to a low carbon system we have confirmed our commitment to put an end to unabated coal power generation from 2025, with an intention to bring this forward to 2024. As coal comes offline and old nuclear plants are decommissioned, the Capacity Market<sup>67</sup> provides a cost-effective mechanism for bringing forward new capacity to ensure security of electricity supply during the transition to a low carbon economy. The Capacity Market is open to all types of technologies, including low carbon technologies, but we have recently passed legislation to introduce carbon emissions limits, which will prevent the most carbon-intensive capacity from competing in future auctions. The list of renewable technologies that can compete in the Capacity Market has also been expanded to include onshore and offshore wind and solar photovoltaic.



Nuclear power will continue to play a role in the UK's future energy mix as we transition to a low-carbon economy, including through our investments in small and advanced modular reactors. In 2019, nuclear power stations provided approximately 17% of the electricity generated in the UK. Over the next decade, many UK nuclear plants will be coming to the end of their lives at a time when the demand for low-carbon electricity is likely to increase. BEIS will continue to deliver the Nuclear Sector Deal<sup>68</sup> and the nuclear generation policy and legal framework in order to maximise the value and benefit of nuclear power to the UK and we will also be running an Advanced Modular Reactors R&D programme to support advanced nuclear innovation. In July 2020, we awarded up to £30 million to successful participants to further their advanced reactor designs.

The Government has also committed to supporting the construction of the UK's first CCS power plant using consumer subsidies. In August this year we published our response to the CCUS business models consultation<sup>69</sup>. We are working in collaboration with industry, through the BEIS led Power CCUS Expert Group to develop this work and will aim to provide an update this quarter. CCUS can be an engine to drive cleaner, sustainable growth, transforming our industrial heartlands. It can also unlock new jobs and innovative businesses, raising productivity and competitiveness across the UK.

There is widespread acceptance that biomass, including bioenergy with CSS and energy from waste, has a key role to play in achieving net zero. The question is where and how biomass is best used to deliver on our targets – whether that is for generating electricity or other purposes. The UK is already a leader in many respects for bioenergy deployment and sustainability, but we recognise that we need to continue to lead the way in improving how we deploy this

resource sustainably to meet our ambitious emissions targets. Biomass has great potential, so we are developing a new cross-government Biomass Strategy that will look at how biomass should be sourced and used across the economy to best contribute to our net zero target. We will set out more details about this in the forthcoming Energy White Paper and issue a call for evidence.

Coal-to-biomass conversions have been a successful technology providing the means of delivering large volumes of renewable generation relatively quickly, and by displacing coal fired generation have contributed to significantly reduced emissions. However, since the Government's 2012 Bioenergy Strategy, we have been clear that coal-to-biomass conversions were supported as a transitional, rather than a long-term, technology in the decarbonisation of UK electricity generation<sup>70</sup>. All support for biomass conversions will end in 2027 and in March 2020, we consulted<sup>71</sup> on making coal-to-biomass conversions ineligible for future allocation rounds of the CfD scheme. We will publish a response to this consultation shortly.

The electricity system will be key to achieving our goals, developing enhanced capability to manage increased demand and penetration of intermittent sources of power whilst connecting new low carbon technologies quickly and easily in the future.

Realising our net zero ambitions will require energy system governance arrangements able to drive decarbonisation while minimising costs for consumers and maintaining security of supply. We are considering the current split of responsibilities across Ofgem, system operators and government. BEIS also continues to work closely with Ofgem as it develops a network price control which enables strategic investment for networks to ensure net zero 2050 is achievable.

Smart meters are a key enabler of a more flexible energy system and are currently being rolled out across Great Britain as part of a national infrastructure upgrade to make the energy system cleaner and more efficient, helping to deliver net zero and modernise energy services for consumers. Without a more flexible energy system, modelling for the Committee on Climate Change estimated the cost of meeting net zero by 2050 could be up to £16 billion higher each year<sup>72</sup>. There are around 21.5 million smart and advanced meters in homes and small businesses<sup>73</sup>, and in June 2020 the Government confirmed a new four-year policy framework from July 2021 with binding annual milestones for energy suppliers that will drive momentum towards market-wide rollout<sup>74</sup>.

We are delivering the existing Smart Systems and Flexibility plan<sup>75</sup> by 2022, including Ofgem's decision on market-wide half hourly settlement expected in spring 2021, developing technical standards to ensure cyber security for smart appliances and electric vehicle chargepoints, and developing local flexibility markets. We are working closely with Ofgem and industry to develop the next phase of smart systems and flexibility policy, including policies to facilitate digitalisation – essential for optimising low carbon assets across the system – and improved flexibility monitoring.

In addition to these actions, the Energy White Paper, which is due to be published this autumn, will further address the transformation of our energy system, promoting high-skilled jobs and clean, resilient economic growth as we deliver net zero emissions by 2050.

## Buildings

### Key achievements over the past year: Buildings

The Government has made significant investment towards our net zero buildings by 2050 target. In the March budget the Chancellor announced a number of new schemes supporting the deployment of low carbon heat in homes and businesses. This was followed by a further announcement in August of the 'net zero building package' worth in excess of £3 billion, representing a significant down payment on manifesto commitments.

This package included a £2 billion 'Green Homes Grant', under which homeowners and landlords can apply for a voucher to fund up to two thirds of the cost of hiring tradespeople to upgrade the energy performance of their homes, to support the installation of energy efficiency measures. It also included £1 billion for a new Public Sector Decarbonisation Scheme, to upgrade public sector buildings, including schools and hospitals, making them fit to help meet net zero with energy efficiency and low carbon heat measures and a £50 million Social Housing Decarbonisation Fund demonstrator to start the decarbonisation of social housing over 2020-21.

We have continued to insulate existing homes by delivering energy efficiency measures for those who are vulnerable and fuel poor through the Energy Company Obligation (ECO) scheme. As of August 2020, ECO has delivered over 2.8 million energy efficiency measures installed in around 2.1 million households, meeting the Government's target to upgrade 1 million homes between May 2015 and April 2020. Additionally, as of April 2020, all privately rented homes in England and Wales must have an energy performance rating of EPC E prior to being let out, unless a valid exemption applies.

To begin to develop our best in class Energy Saving Products Policy, we also published a call for evidence to explore how minimum energy performance standards and energy labels for energy-using products can be improved following the end of the transition period as well as other policy measures that can increase the uptake of more energy and resource efficient products.

To support the growth of the heat pump market we announced the extension of the Domestic Renewable Heat Incentive (RHI) until March 2021, introduced a new Clean Heat Grants Scheme backed by £100 million of funding over the next two years and a further round of Tariff Guarantees under the Non-domestic RHI to provide investment certainty to larger non-domestic projects, such as biomethane plants. We have also awarded £16.5 million through the Electrification of Heat Demonstration Project which aims to demonstrate the feasibility of a large-scale transition to electrification of heat in Great Britain by installing heat pumps in a representative range of homes, to be completed by 2022.

We have awarded funding for the first ten projects of the £320 million Heat Networks Investment Project<sup>76</sup> running up to April 2022. We will continue to grow heat networks during the 2020s by following up with the £270 million Green Heat Network Fund opening in 2022, which we recently consulted on<sup>77</sup>. In February, the Government also consulted on the Heat Networks Market Framework<sup>78</sup> looking at regulations to protect consumers, support market growth and develop low carbon networks.

We continued to grow UK Biomethane production capacity by launching a new Green Gas Support Scheme<sup>79</sup> running from 2021-22 to 2025-26, to support biomethane

injection into the gas grid to accelerate the decarbonisation of our gas supplies. This will be funded by a new Green Gas Levy which we are currently consulting on<sup>80</sup>.

The Government also took the following steps to improve building standards:

- In February we published the evaluation and Post Implementation Review of the Energy Savings Opportunity Scheme<sup>81</sup>, to target emissions in commercial and industrial buildings.
- We consulted in late 2019 on a meaningful uplift of energy efficiency requirements for new homes<sup>82</sup> as a stepping stone towards the Future Homes Standard, creating homes with low carbon heating and very high fabric standards. This year, we committed to review the roadmap to the new standard to ensure that the full Future Homes Standard is implemented in the shortest possible timeline.
- We launched a new government endorsed quality scheme under TrustMark for home energy improvements<sup>83</sup> to help provide greater consumer confidence in the quality of installations.
- And we launched a new Building Safety Regulator<sup>84</sup> which will provide stronger oversight of performance of all building and increasing the competence of those working on buildings.

The Government has also launched a range of innovation projects which are key to bringing down the costs of deployment of energy efficiency measures and low carbon heating technologies. This includes:

- £7.7 million awarded through the Whole House Retrofit cost reduction trajectory competition to projects which will retrofit over 300 homes in Cornwall, Nottingham, and Sutton.
- £6 million of funding through the BASEE innovation competition which aims to improve access for SMEs to energy efficiency.
- £4.7 million of funding to six local supply chain demonstration pilots which will focus on reducing the cost for retrofit and building supply chain capacity.
- £1.8 million awarded through the Green Home Finance Innovation Fund to three projects that will develop innovative green mortgage and additional borrowing products, as well as tools to evaluate the impact of energy efficiency on property valuation.

In addition, the Government has issued a public consultation on new and updated Ecodesign requirements for a number of domestic and industrial energy-using products. The draft regulations proposed in this consultation are expected to save 15.8 TWh of electricity by 2050 in the domestic sector, which is the equivalent of up to a £3 billion reduction on household energy bills. This will also result in around 1.3 MtCO<sub>2</sub> of Carbon Savings for the same period<sup>85</sup>.

Meeting our net zero target will require virtually all heat in buildings to be decarbonised.

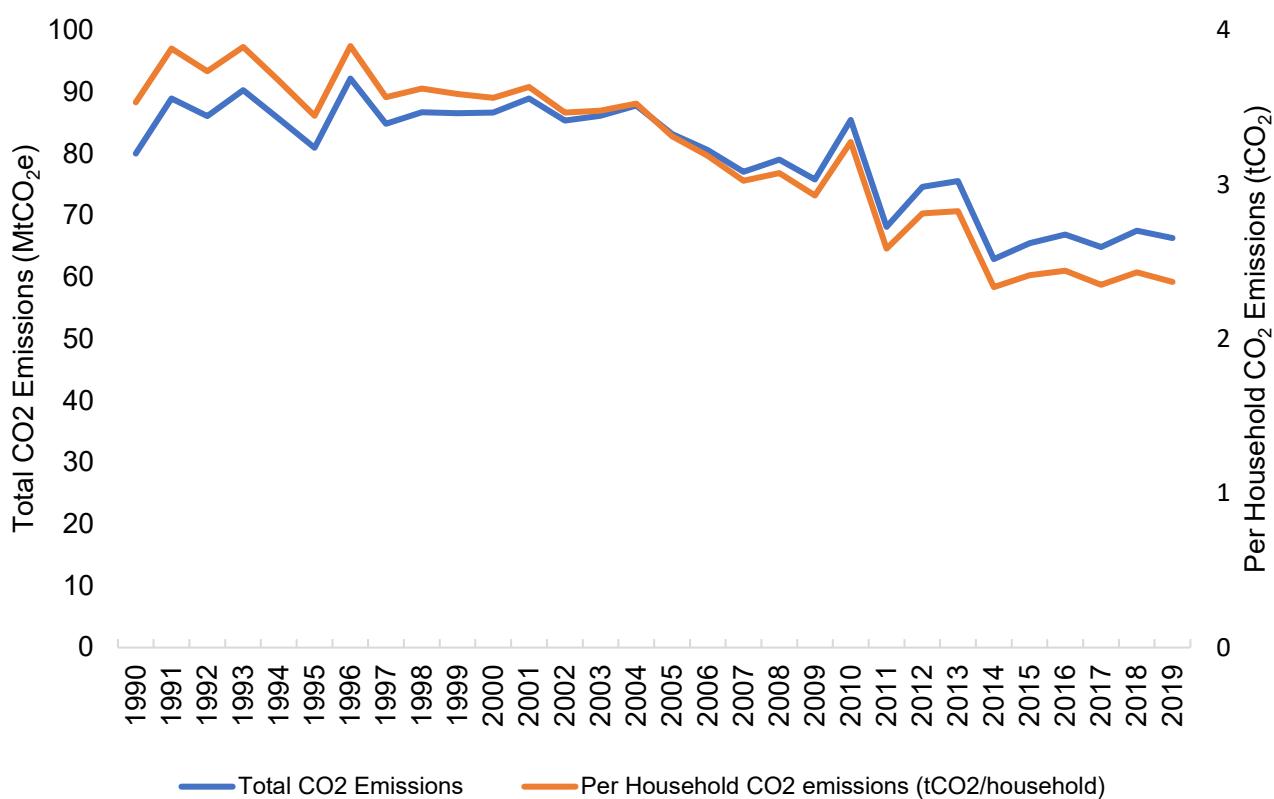
Our forthcoming Heat and Buildings Strategy will set out the immediate actions we will take for reducing emissions from our current building stock. These actions include the deployment of energy efficiency measures and low carbon heating as part of an ambitious programme of

work required to enable key strategic decisions on how we achieve the mass transition to low-carbon heat and set us on a path to decarbonising all homes and buildings.

We need to deliver this decarbonisation alongside other important goals, such as driving green growth and jobs, levelling-up across the country, tackling fuel poverty, creating safer, healthier buildings, and ensuring a secure and resilient energy system. Buildings decarbonisation could deliver up to 200,000 jobs and Gross Value Added of £5 billion to £10 billion per annum by 2030, as part of a green recovery that delivers better, greener, healthier homes. Buildings decarbonisation also offers huge levelling-up potential given the geographic spread of the action needed and a focus on fuel poverty.

Reflecting the Government's commitment to build back greener, deliver a green recovery and reach our net zero ambition, the Chancellor announced a 'net zero building package' in August 2020 worth in excess of £3 billion. This new funding represented a significant and accelerated down payment on manifesto commitments, to help stimulate the economic recovery and create green jobs. The funding supports a new Public Sector Decarbonisation Scheme to upgrade public sector buildings, a new Green Homes Grant allowing homeowners and landlords to apply for a voucher to fund some of the costs of upgrading the energy performance of their homes and a Social Housing Decarbonisation Fund demonstrator to accelerate the decarbonisation of social housing.

**Figure 8: Total emissions from homes and emissions per household**



Source: BEIS Provisional Greenhouse Gas Inventory 1990-2019. ONS Household Projections 2016 & 2018.

## Transition to net zero

We are establishing the foundations now for the transition to low carbon heating and improved energy efficiency measures to put us on a path to net zero. The 2020s will be critical to build

the supply chains and technology options that will put us on a cost-effective pathway to 2050. Ultimately, delivering net zero buildings will mean moving away from burning fossil fuels for heating. There are two main options for doing this – electrification of heat using heat pumps and replacing the natural gas in the grid with hydrogen.

Low carbon hydrogen could potentially provide a means of decarbonising a large proportion of the approximately 85% of buildings currently connected to the gas grid, and work is ongoing to ensure that the technical, safety and economic case for deploying hydrogen in different sectors and buildings is fully understood. Further R&D and field trials at scale will be important to testing the case, together with the emergence of low carbon hydrogen production at scale.

Electrification is not just a solution for off-grid buildings. Deploying heat pumps for some on-gas grid households in the 2020s will be beneficial, regardless of the outcome of the decisions regarding the majority of on-gas grid households.

Heat networks will also have an important role to play, especially in areas of high-density demand and where there are large low-carbon heat sources, as will other options that can play a smaller but significant role. Heat networks have the potential to reduce bills, support local regeneration and be a cost-effective way of reducing carbon emissions from heating. Heat networks can also be decarbonised after installation, in line with their natural replacement cycle and in most cases with minimal disruption to the end-user consumer. This flexibility around fuel source could prove to be crucial in meeting our carbon targets.

Low carbon gas such as biogas also has the potential to make substantial contributions to emissions reductions from heating. These reductions could occur through a variety of applications, including the production of biomethane for use in the gas grid. Biomethane is currently the only green gas commercially produced in the UK and offers a cost-effective way of contributing to near term legally binding carbon budgets. We will look to support biomethane injection into the gas grid, through a new Green Gas Support Scheme running from 2021-22 to 2025-26. The scheme will look to accelerate the decarbonisation of our gas supplies and will be funded by a new Green Gas Levy.

In any future low carbon buildings scenario, regardless of the heating decarbonisation pathway, the low carbon heating market will need to grow, from one that is delivering around 30,000 systems a year, to one which is able to replace fossil fuel boilers. This currently comprises around 1.7 million installations per year of which 80-100k are Oil/LPG boilers.

Driving the transition to low carbon buildings at pace, while ensuring consumers are getting a good deal, means addressing the market barriers to the deployment of new technologies and working with the market to reduce cost and disruption to consumers. We will continue to ensure that consumers have access to the protections, information and trusted advice that they need in order to take action and make change with confidence. Our strategy will be to use market-based approaches, alongside other policy levers, to decarbonise buildings using natural market trigger points to minimise disruption and housing market impacts.

Successfully delivering a transition to low carbon buildings will require economic and social costs to be shared fairly across society, therefore we will prioritise tax payer support for areas where it is most needed, such as the fuel poor and social housing.

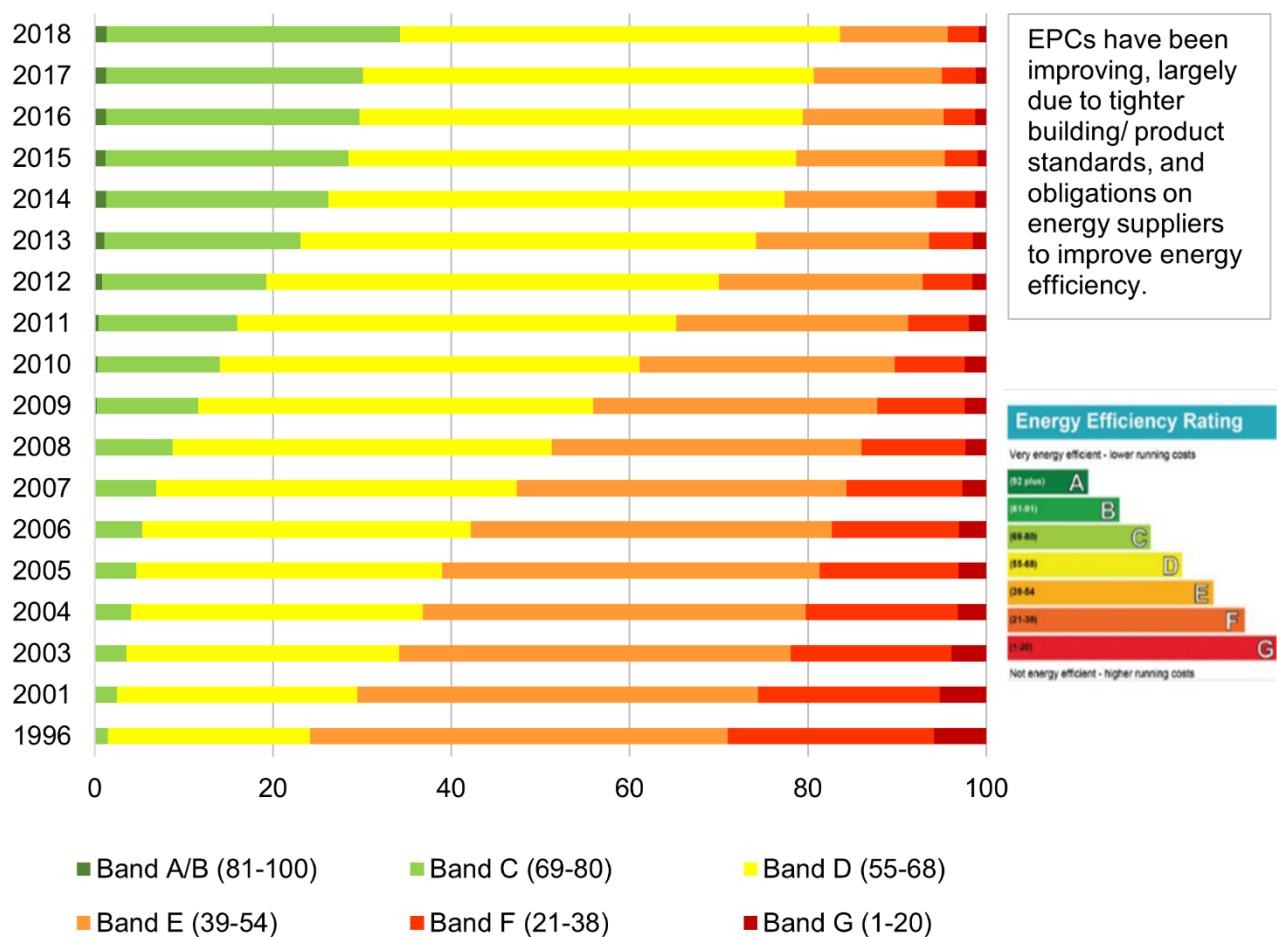
For fuel poor and vulnerable homes, the Government is considering the appropriate mix of subsidy, incentives and regulations required as part of the planned update to the Fuel Poverty Strategy for England, due later this year. In the consultation for this Strategy, government proposed to introduce a ‘sustainability principle’ which aims to better align work on fuel poverty

and the decarbonisation of heat.

## Action in the 2020s

A key focus of the 2020s will be to deliver a package of policies and enablers that allow markets to scale up, with a step change in energy efficiency and low carbon heat deployment to deliver carbon savings through the 2020s and build supply chains and skills to prepare for the following decades. This will provide investment signals to give certainty to markets and to mobilise around £100 billion of capital across homes, businesses and the public sector over the 2020s alone. We will use the public sector to set an example for the private non-domestic sector and help build up supply chains for larger buildings to act as a springboard for the wider low carbon market in the UK and internationally.

**Figure 9: Energy efficiency rating bands for domestic homes (England), 1996-2018**

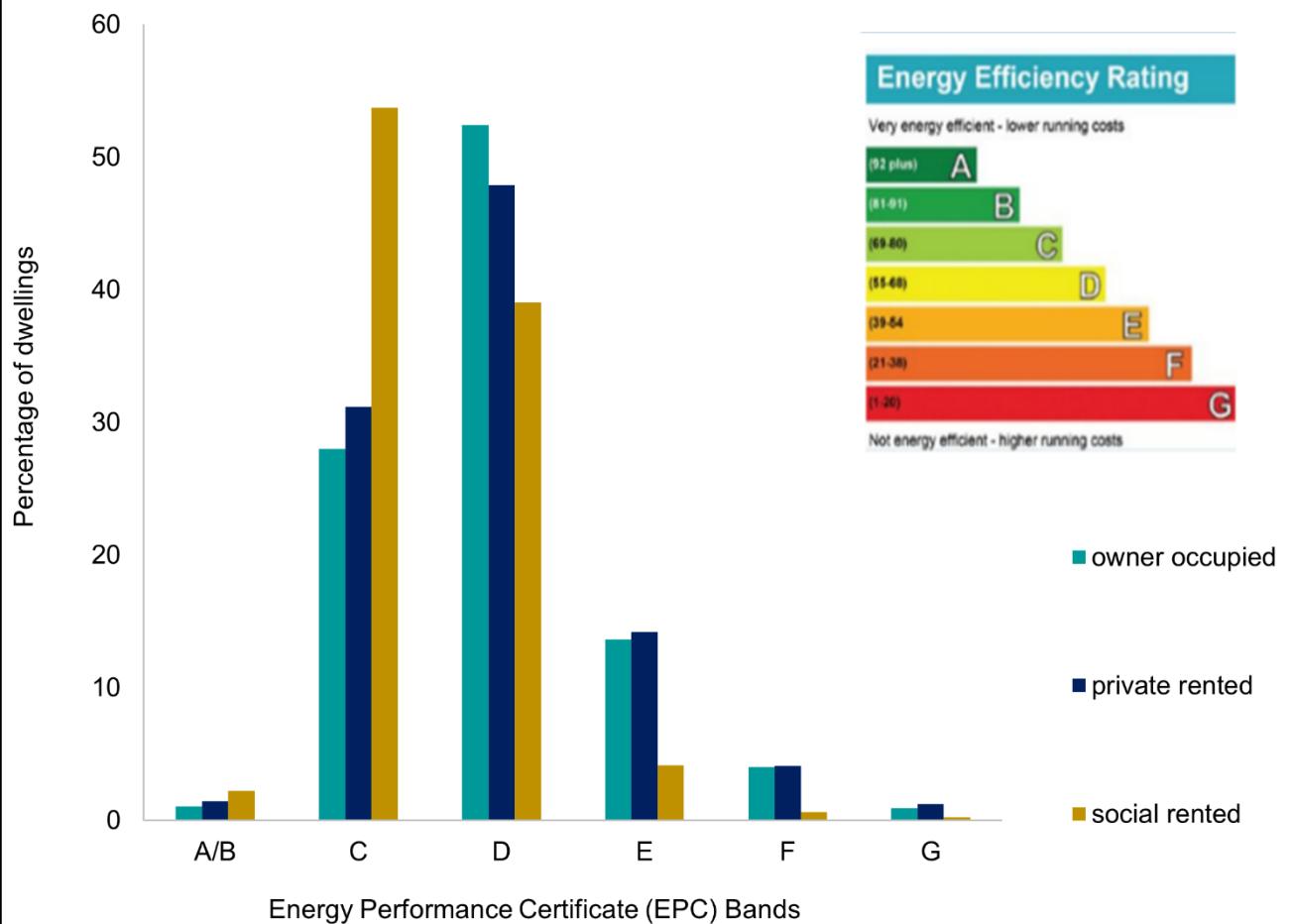


Source: English Housing Survey.

Regardless of heat technology scenario, there are actions which are 'no regrets'. Reducing building emissions will rely on the development of low carbon heat and energy efficiency policy in tandem. The reduction of energy use will be vital to keeping costs low as alternatives to fossil fuels are increasingly deployed. Increasing the energy efficiency of our buildings through insulation will reduce bills, improve comfort and health, as well as being the main route to delivery of our statutory goals on fuel poverty. By targeting interventions at upgrading homes towards our EPC C aspiration, we are preparing the housing stock for future heat decarbonisation in a cost-efficient way and tackling fuel poverty.

Last year we published a consultation on tightening energy efficiency standards for rented commercial and industrial buildings to Energy Performance Band B by 2030<sup>86</sup>, which if implemented, could save businesses £1 billion per year. We will respond to that consultation this calendar year, setting out the target trajectory for 2030 giving landlords time to plan and deliver the necessary improvements. The sooner we invest in energy efficiency, the more we save, and the more buildings are prepared for installation of low carbon heat.

**Figure 10: Energy efficiency rating bands, by tenure (England), 2018**



Source: English Housing Survey.

We need to build a market for heat pumps by strengthening business and public confidence in heat pump technology. Equipment manufacturers, suppliers and installers need to ramp up supply chain capacity to reduce technology and installation costs and deliver credible low carbon pathways. We propose to launch the new Clean Heat Grants scheme, providing targeted support to consumers and small businesses for heat pumps and some limited biomass, in April 2022, following the end of the domestic Renewable Heat Incentive, which has been extended for a year. This scheme is backed by £100 million of funding as announced in the 2020 budget and will be open for two years. As energy efficiency measures and low carbon heating will be deployed as part of an increasingly integrated energy system, the electrification of heat has implications for the electricity system, given the increased demand and the prospect of different demand patterns which arise from using power for heat.

Smart meters can help mitigate these impacts, for example by enabling time of use tariffs which allow consumers to save money by shifting when they use energy. We will consider

measures which help maximise the flexible potential of heat pumps and the role smart meters can play. Heat networks are a crucial step in the path towards decarbonising heat and can play important roles in either electricity or hydrogen scenarios. As low-carbon infrastructure, they are the most cost-effective way to reduce carbon emissions from heat in high-density areas. We will look to continue to grow heat networks during the 2020s through the Heat Network Investment Project investing £320 million up to April 2022, followed by the £270 million Green Heat Network Fund opening 2022 which we will look to consult on later this year.

We will also need to make sure new homes are fit for the future. Last year we consulted on an ambitious uplift in the energy efficiency of new homes as a stepping stone towards a Future Homes Standard. A further consultation will follow, proposing changes to the energy efficiency standards for new non-domestic buildings; for building work to existing homes and non-domestic buildings; and on mitigating overheating in new dwellings.

We expect the new standard to require new homes to produce 75-80% lower CO<sub>2</sub> emissions compared to those built to current Building Regulations standards. These homes will be ‘zero carbon ready’, with the ability to become zero carbon over time as the electricity grid decarbonises, without the need for further costly retrofitting. We want to support industry to begin delivering low carbon, energy efficient homes as soon as possible, and in the Planning for the Future consultation we announced that we intend to review the roadmap to the Future Homes Standard to ensure that implementation takes place in the shortest possible timeline.

The planning system is also a crucial tool to mitigate and adapt to climate change. The National Planning Policy Framework (NPPF) sets out government’s planning policies on how new development can respond to the impacts of climate change through supporting sustainable development, including minimising greenhouse gas emissions and designing and shaping places that are resilient to, and appropriate for, current and future climate change impacts.

The Planning for the Future White Paper (August 2020) includes proposals to ensure that new homes meet our climate change and environmental objectives. It proposes to strengthen environmental outcomes: the National Planning Policy Framework will be revised to ensure policies support climate change mitigation and adaptation.

Complementing this, the National Design Guide sets out appropriate mitigation and adaptation measures at the development/building scale, including opportunities to improve air quality and incorporate green infrastructure using measures such as street trees.

These new, high standards for the design, environmental performance and safety of new and refurbished buildings must be monitored and enforced. Freeing local authorities up from many planning obligations through our reforms will enable them to reassign resources and focus more fully on enforcement. Ensuring that planning standards and building regulations are met, whether for new homes or for retrofitting old homes, will help to ensure that we deliver homes that are fit for the future and cheaper to run.

We are conscious that we must do this alongside ensuring the safety of new and existing buildings and continuing to deliver more, affordable homes. As we recover from Covid-19, we are working hard to get the housing market back on its feet while supporting growth and jobs in sectors that will be crucial to our climate objectives.

## Industry

### Key achievements over the past year: Industry

In August 2019, we announced the £100 million Low Carbon Hydrogen Production Fund to create more production capacity and increase its use across the energy system.

In the Spring Budget, the Chancellor announced the £800 million Carbon Capture and Storage Infrastructure Fund.

In May and June, we launched our Industrial Decarbonisation Challenge Phase 2 roadmap studies and deployment phase, which will be able to award up to £8 million and £131 million respectively.

In June, we launched the first phase of the £289 million Industrial Energy Transformation Fund, which will help businesses cut their energy bills and reduce emissions. The first application window opened in July and over 600 stakeholders attended launch events.

In June 2020, the Government and the Devolved Administrations published the Response to the Future of UK Carbon Pricing consultation<sup>87</sup>, outlining the design of a UK Emissions Trading Scheme (ETS), which could operate as either a linked or standalone system. As an alternative to a standalone UK ETS, to ensure a carbon price remains in place in all scenarios, the Government has published a consultation on the design of a Carbon Emission Tax<sup>88</sup>.

The draft affirmative statutory instrument establishing a UK ETS was laid, for approval, in the UK Parliament and devolved legislatures in July 2020<sup>89</sup>. This is the first in a package of statutes to deliver and ensure the functionality of the UK ETS. Progress with delivery of this package is on track in all four legislatures to enable the UK ETS to launch as expected in January 2021.

In July, we published the Government Response to the consultation on the Climate Change Agreements scheme extension and views on reforms for any future scheme<sup>90</sup>. The statutory instrument to implement the two-year scheme extension UK-wide was laid in September<sup>91</sup>.

We also announced publication of the Industrial Decarbonisation Strategy in the spring.

And we opened the final application window for the £18 million Industrial Heat Recovery Support programme which has offered funding to 54 feasibility studies and capital deployment projects in a wide range of industrial sectors, including food manufacturing, metal and non-metallic minerals, chemical industries and data centres, since 2017.

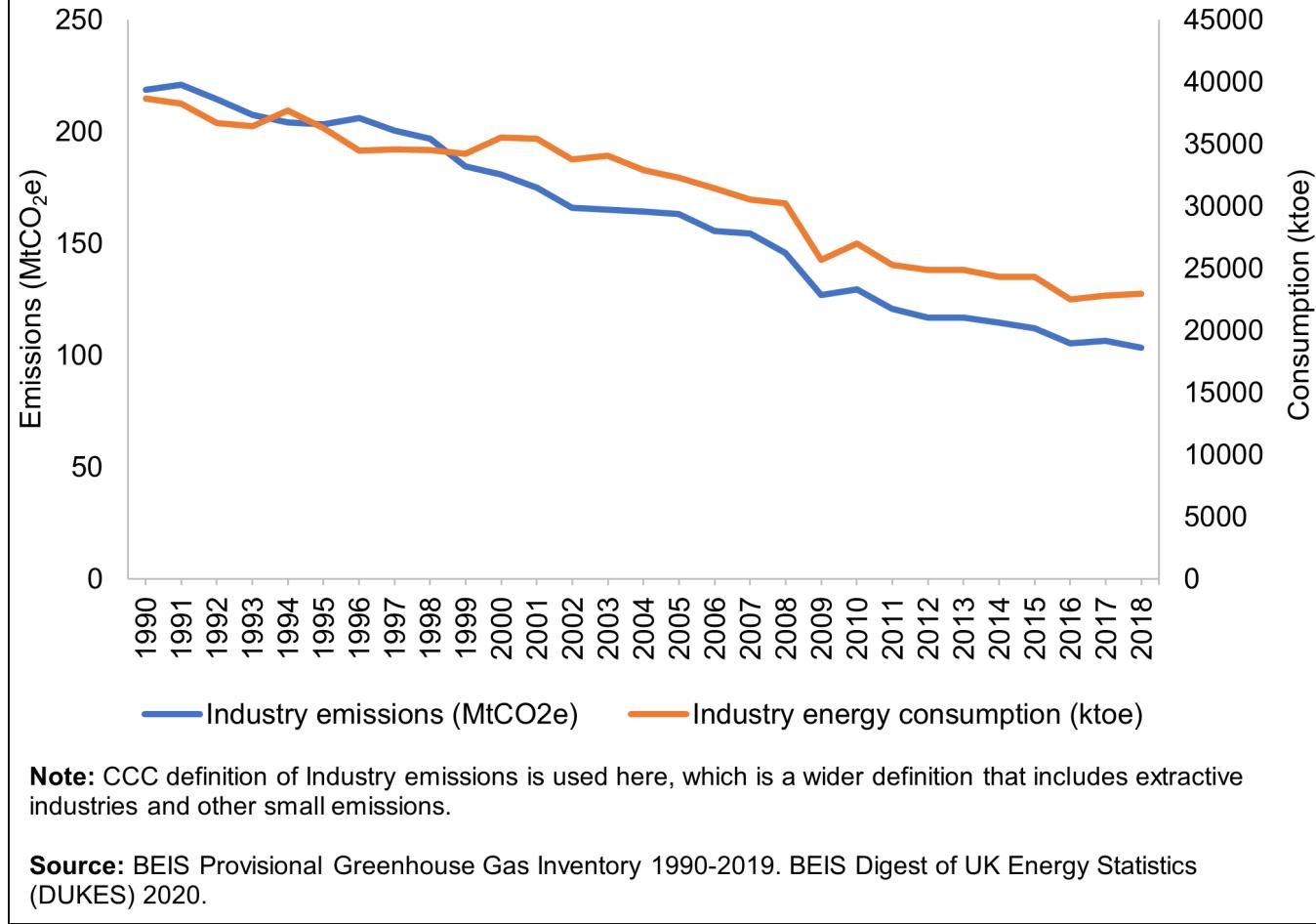
We created the Hydrogen Advisory Council to inform the development of hydrogen as a strategic decarbonised energy carrier for the UK and its first meeting took place in July.

In August, we published the Government Response to the consultation on Industrial CCUS and Hydrogen Business Models.

Reducing emissions while supporting a thriving UK industrial and manufacturing sector is central to our mission to deliver our net zero target.

In response to the Covid-19 pandemic, we not only want to support businesses to bounce back as quickly as possible but also to do so in a way that meets the UK's big, structural challenges. We want to deliver a green recovery in partnership with business and finance and we are working closely with industry leaders to discuss how to capture economic growth opportunities from the shift to net zero GHG emissions.

**Figure 11: Emissions from Industry, energy consumption in Industry**



Promoting the green economy makes sense: since 1990 we have cut emissions by 43% while growing our economy by 75%. Green investments create more jobs than standard economic stimulus spending, and twice as much as investment in fossil fuel infrastructure. In 2018 the industrial sector contributed £170 billion to the measure of the UK economy's Gross Value Added. At the same time, by investing in vital manufacturing industries such as steel, cement and glass, we are increasing productivity, maintaining our industrial base and safeguarding 2.5 million jobs<sup>92</sup>, many of which are located in areas outside of London<sup>93</sup>.

We are therefore incentivising and supporting industry to reduce their emissions and invest in innovative, clean technology. The Government has schemes worth nearly £2 billion operating, or in development, supporting our vital energy intensive industries to decarbonise:

- £800 million Carbon Capture and Storage Infrastructure Fund
- £200 million to £300 million annually through the Climate Change Agreements Scheme

- £289 million Industrial Energy Transformation Fund
- £170 million Industrial Decarbonisation Challenge Fund

The UK will replace the EU ETS with a carbon pricing system that is intended to be at least as ambitious and will deliver a smooth transition for business. In June 2020, we published design of a UK ETS which could operate as either a linked or standalone system, to incentivise industry (and some other areas of the economy) to decarbonise. As an alternative to a standalone UK ETS, to ensure a carbon price remains in place in all scenarios, HMG has also published a consultation on the design of a Carbon Emission Tax. All options for carbon pricing will deliver on the Clean Growth Strategy commitments and will lay the foundation for effective carbon pricing in the UK. The overall cap for the UK ETS, if chosen, will determine the limit on total emissions allowances, and following review, put the sector on a path to net zero by January 2023, and certainly no later than 2024. It will also signal our long-term climate commitments and ensure our economy remains competitive.

We recognise the need for further action, however. Emissions from manufacturing and refineries, which form the bulk of industrial emissions, accounted for 16% of the UK's GHG emissions in 2018<sup>94</sup>. Over half of these emissions come from the UK's major industrial clusters<sup>95</sup> and action in these clusters will be essential to drive the deep decarbonisation of industry. Our vision is to lead the world in the green industrial revolution, working together to transform the high-emission industries of today into the clean businesses of tomorrow.

Deep decarbonisation of industry requires energy efficient buildings and processes, along with the use of CCUS, and fuel switching away from fossil fuels to hydrogen, sustainable biomass or clean electricity. Every part of industry needs to address its emissions. Over the long run, we believe markets will be best placed to determine the most cost-effective pathways to decarbonise industry, using a robust carbon price to drive technology choices and investment. But for now, we cannot rely on market forces alone to see industry through the transition. Our industrial sectors will need support, particularly through the initial phase of decarbonisation where the risks and costs are at their highest.

To that end, we will publish the Industrial Decarbonisation Strategy in spring 2021. This will set out the Government's vision for a prosperous, low carbon UK industrial sector in 2050. Working closely with Devolved Administration partners, we will set out how the low carbon transition can support industrial competitiveness and the green recovery across the UK, including identifying opportunities for new markets and sectors to develop.

## Transport

### Key achievements over the past year: Transport

On 26 March 2020, we published “Decarbonising Transport: Setting the Challenge”, taking a holistic view of emissions across the entire transport sector and launching our work on preparing a Transport Decarbonisation Plan<sup>96</sup>.

The Net Zero Transport Board met for the first time on 8 July 2020<sup>97</sup>. The Net Zero Transport Board is an external advisory board providing independent, objective and impartial advice on transport decarbonisation to the Department for Transport.

We have consulted on ending the sale of new petrol, diesel and hybrid cars and vans by 2035 or earlier<sup>98</sup>.

The March Budget included over £1 billion additional funding to support the transition to ultra-low emission vehicles, including:

- Over £530 million extra funding to keep plug-in vehicle grants for another three years to 2023<sup>99</sup>; and
- £500 million over the next five years to support the rollout of charging infrastructure for electric vehicles<sup>100</sup>.

We have announced a vision for the rapid chargepoint network in England<sup>101</sup>. The vision will be supported by a Rapid Charging Fund, which was announced in the March 2020 Budget as part of the £500 million commitment for electric vehicle (EV) charging infrastructure described above<sup>102</sup>.

We continue to look at the ongoing delivery of electrification across the rail network, including on the Midland Mainline and Great Western Mainline. Completion of electrification through the Severn Tunnel means that an electrified railway now runs continuously from London to South Wales<sup>103</sup>. Development of the Network Rail-led Traction Decarbonisation Network Strategy, when complete, will inform decisions about deployment of low carbon technologies to replace diesel trains.

We announced further funding of around £2 million to support deployment of decarbonisation technologies on the railway for winners of our First of a Kind 2020 competition<sup>104</sup>.

We launched “Gear Change: a bold vision for cycling and walking”, which sets ambitious plans to boost cycling and walking, where half of all journeys in towns and cities are cycled or walked by 2030<sup>105</sup>. This will be supported by a £2 billion funding package for active travel over the next 5 years<sup>106</sup>.

The multi-billion pound package to transform buses and cycling announced by the Prime Minister in February 2020<sup>107</sup> will deliver at least 4,000 new Zero Emission buses, higher frequency services (including evenings and weekends), more affordable, simpler fares, and new priority schemes to make routes more efficient. The £5 billion in new funding will also help build first hundreds, then thousands of miles of protected cycle routes, and dozens of ‘Mini-Holland’ schemes to make town centres safer for cyclists and pedestrians.

The Jet Zero Council met for the first time on 22 July, creating a partnership between

industry and government to drive high ambition in the delivery of new technologies and innovative ways to cut aviation emissions<sup>108</sup>.

The International Civil Aviation Organization (ICAO) Assembly in October 2019 agreed to press ahead with implementing the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and to begin to develop options on a long-term aspirational goal for reducing international aviation's CO<sub>2</sub> emissions for consideration by the next Assembly in 2022. We worked with other states in ICAO to secure a decision in March 2020 on which emissions units will be eligible for use by airlines under CORSIA to offset their emissions from 2021-23<sup>109</sup>, the pilot phase of the scheme.

In June 2020 the Government and the Devolved Administrations published their response to the Future of UK Carbon Pricing consultation<sup>110</sup>, outlining the design of a UK ETS that will include aviation, ensure a smooth transition for businesses at the end of the transition period, and be more environmentally ambitious than the current EU ETS. The new UK ETS could operate as either a linked or standalone system. As an alternative to a standalone UK ETS, to ensure a carbon price remains in place in all scenarios, the Government has published a consultation on the design of a Carbon Emission Tax<sup>111</sup>.

We have built upon the Clean Maritime Plan<sup>112</sup>, undertaking research considering the role of maritime clusters in delivering clean innovation and growth, exploring whether and how to include maritime elements in the Renewable Transport Fuel Obligation for public consultation later this year, in the current consultation HM Treasury are considering inclusion of the treatment of marine fuel in a Carbon Emissions Tax from 2022<sup>113</sup>.

Whilst transport helps to connect people and places, boosting economic growth and opportunity, it is now the largest emitting sector in the UK, contributing 28% of domestic GHG emissions in 2018<sup>114</sup>. It is clear that transport modes must decarbonise in order to meet our economy wide net zero commitment.

Following the introduction of net zero by 2050 into legislation in June 2019, the Secretary of State for Transport announced that the Department would develop a Transport Decarbonisation Plan (expected to be published later in 2020)<sup>115</sup>. The plan will take a holistic and cross-modal approach to transport decarbonisation. This considers where and how people and goods travel and sets out in detail what will be needed to deliver significant emissions reduction in the sector, including through place-based solutions and the use of technology.

In March 2020, we published Decarbonising Transport: Setting the Challenge<sup>116</sup>. This document is the first step to developing the policy proposals of the Transport Decarbonisation Plan. The document presents transport modes and their current GHG emissions, the existing strategies and policies already in place to deliver against our current targets as well as future plans and actions already committed to. The document sets a vision for a net zero transport system and six cross-cutting strategic priorities<sup>117</sup>:

- Accelerating modal shift to public and active transport;
- Decarbonisation of road vehicles;
- Decarbonising how we get our goods;
- Place-based solutions for emissions reduction;
- UK as a hub for green transport technology and innovation; and

□ Reducing carbon in a global economy.

This publication also marked the start of a comprehensive stakeholder engagement process to assist the development of the Transport Decarbonisation Plan, and its vision for a net zero transport system in the UK. It also announced the launch of Net Zero Transport Board, which convened for the first time in July 2020, to offer external advice on the Department's approach to transport decarbonisation.

The CCC has previously stated that whilst it is technically possible to deliver net zero based on "current consumer behaviours and known technologies"<sup>118</sup>, the target will only be credible if policy measures ramp up significantly and urgently. We agree and do not underestimate the challenge of delivering what will be fundamental changes to the way people and goods move around. This will require changes to people's behaviours, including encouraging more active travel and the use of public transport, alongside increasing the uptake of zero emission vehicles and new technologies.

The plan will not just consider existing and new modes of transport. The role for people and places will be crucial as we consider where and how transport contributes to GHG emissions and how to maximise the benefits of decarbonisation for all of society.

We will work with local authorities and other regional bodies to identify and support place-based solutions for the greatest polluting areas, to help enable lower carbon communities. For consumers, we will need to provide different travel options, which meet their needs and improve mobility, whilst also reducing emissions. Using approaches informed by behavioural science to encourage people to make more environmentally-friendly choices will be key.

Changes in transport technologies and business models are creating an opportunity to support the UK's ambitions for decarbonisation and net zero. New types of travel and new business models, enabled by data and connectivity, automation and electrification are starting to transform how people and goods move.

The opportunities are significant, but unlocking them will require difficult decisions to be made, with large inputs from government and industry, supported and driven by shifting public attitudes and behavioural changes. The challenge presents vast and exciting opportunities for the UK, opening new markets in which the UK is poised to become a world leader and the opportunity to deliver co-benefits that lead to a better society.

## **Green recovery**

So that our economy is more sustainable and resilient, we are committed to delivering cleaner air and lower carbon emissions. We will put a green recovery for transport at the heart of our decisions, whilst levelling up the economy for the benefit of the people and communities that need it most.

## **Environmental improvements seen during lockdown**

While the restrictions associated with Covid-19 have had a huge impact on our communities, many people across the country noted the lower emissions and cleaner air seen as a result<sup>119</sup>. We now have a unique opportunity to lock in and build on these benefits by making lasting changes to the way we travel, to help make our country greener and healthier, and to deliver clean economic growth.

## **Changing the way we travel for good**

This means building on the new habits people have developed during the restrictions, as well as the leveraging and championing the power of new, cleaner technologies as we build our recovery – helping to ensure that, as we kick start our economy, we deliver on our duty to move quickly and decisively to reduce transport emissions.

We have already helped ensure that our roads are fit to cater for the huge numbers of people who have discovered, or rediscovered, cycling and walking as their main way of getting around, announcing a £2 billion fund – the largest investment ever made in this area<sup>120</sup>. As part of this we are giving local authorities £225 million to redesign towns and cities, so they are safer for cyclists and pedestrians.

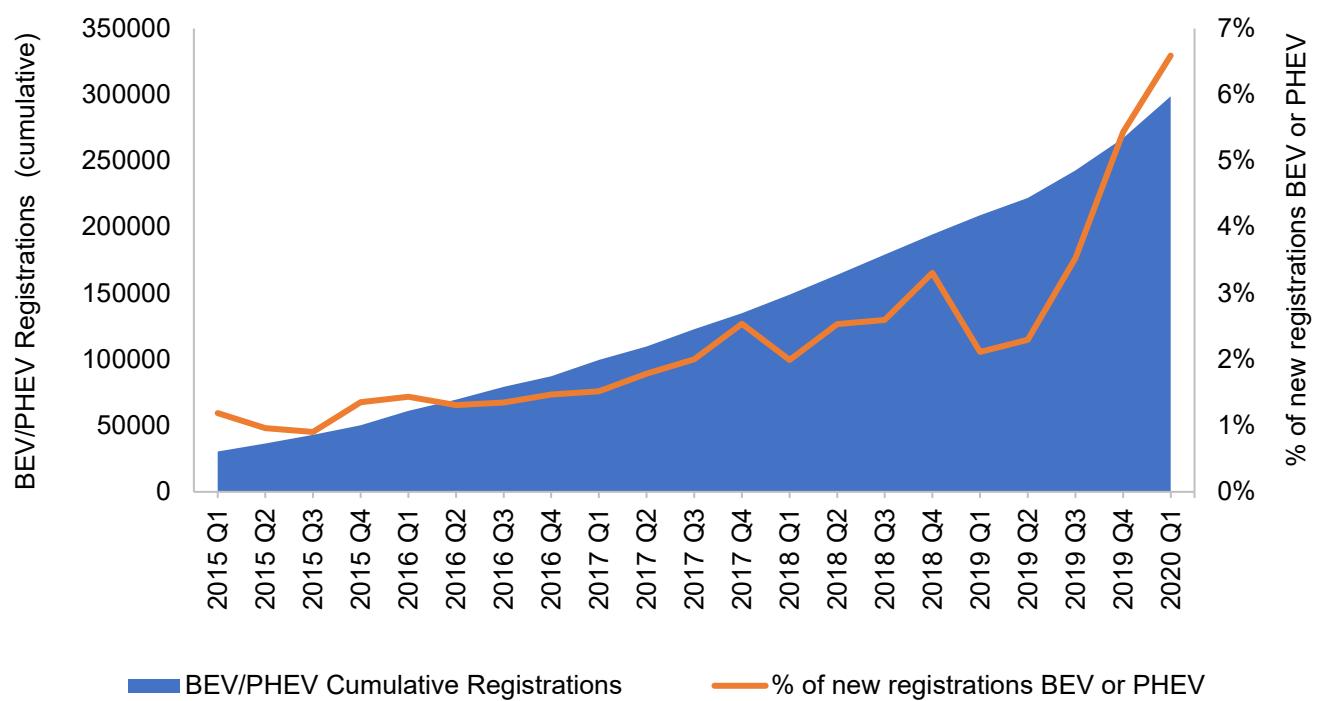
The money will help create pop up and permanent cycle lanes with protected space for cycling, wider pavements, safer junctions, and bike and bus-only corridors.

But we know that as people return to work and, in time, start to travel across the country and beyond, the number of trips will increase, and so will emissions, making our efforts all the more crucial. That is why, in line with our clean air and net zero targets, we are working to ensure that emissions continue to fall over time right across the country.

### **Championing new technology**

This work has already begun – and in large part is thanks to the opportunities offered by new technologies. We have announced an extra £10 million to incentivise local authorities to install up to 7,200 additional on-street electric vehicle chargepoints, doubling the current funding amount for the second time this year. This comes on top of a new vision for the rapid chargepoint network in England, with every motorway service area to have a minimum of six ultra-rapid chargepoints by 2023 and by 2035 we expect the number to increase to around 6,000 high powered chargers across the network. This vision will be supported by a Rapid Charging Fund, which is part of £500 million announced at the Budget in March 2020 to support the rollout of infrastructure for electric vehicles. We have also brought forward e-scooter trials to help provide another green alternative to get from A to B. This will allow government to assess their benefits, with the potential to see rental vehicles on UK roads very soon. And we have committed to supporting 4,000 zero emission buses to make greener travel a convenient option.

**Figure 12: Registrations of battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) and new car market share**



**Source:** Department for Transport.

## Natural Resources

### Key achievements in the past year: Natural Resources

We published the Environmental Land Management (ELM) Policy Discussion Document<sup>121</sup> in February 2020, which sets out our current thinking on the ELM scheme, including our proposed three tier design.

In July 2020, Part 1 of the National Food Strategy: independent review<sup>122</sup> was published, with Part 2 set to be published in spring 2021.

We launched the £50 million Woodland Carbon Guarantee in November 2019 to provide long-term income support to new woodland creation projects.

In March 2020, we announced measures to enable the planting of 30,000 hectares of woodland annually in the UK and the restoration of 35,000 hectares of peatland by 2025, through a new £640 million Nature for Climate Fund. This fund, along with the £25 million Nature Recovery Fund, will bring together businesses, landowners and local communities to support woodland creation and peatland restoration and nature recovery.

We published the Circular Economy Package<sup>123</sup> which introduces a revised legislative framework, identifying steps for waste reduction, and establishing a long-term path for waste management and recycling. It will optimise our use of economic resources by increasing the duration of a product's useful life.

We consulted on proposals for a new England Tree Strategy<sup>124</sup> to inform delivery of the Nature for Climate Fund.

We introduced legislation to phase out the sales of wet wood in volumes under 2m<sup>3</sup> and coal for domestic burning between May 2021 and May 2023 and introduce sulphur and smoke emissions for manufactured solid fuels from May 2021.

We created a plan for a new Northern Forest, to which the Government will be contributing more than £5 million, accompanied by a new review of National Parks and Areas of Outstanding Natural Beauty.

In August 2019 we set up a £15 million pilot scheme to reduce food waste through food redistribution and initiatives.

We commissioned a £5 million pilot on establishing a new Natural Capital and Ecosystem Assessment (improving baseline understanding of habitats and species abundance across the country in every planning authority).

We launched a consultation<sup>125</sup> on the proposal to introduce a due diligence requirement on companies using forest risk commodities in their supply chains, helping to reduce the UK's global environmental footprint.

The natural resources sector consists of emissions reductions from waste management, agriculture, land-use, and fluorinated gases (F-gases). It also includes carbon sequestration through forestry. From 1990 to 2018, GHG emissions from the natural resources sector have fallen by 51% in England, largely due to a reduction in waste going to landfill.

Our ambitious environment, fisheries and agricultural bills<sup>126</sup> will work hand in hand to protect and recover our precious natural environment, and diverse ecosystems, in line with our 25 Year Environment Plan<sup>127</sup> commitment to leave the environment in a better place than we inherited it.

Nature recovery needs to be a cornerstone of our climate change response. Wildlife-rich places capture and store carbon, and bigger, better-quality and well-connected habitats are also more resilient and can support their species in adapting to a changing climate. As such, we also announced, in the Spring 2020 Budget<sup>128</sup>, significant funding through the Nature for Climate and Nature Recovery funds for tree planting, peatland and wider ecosystem restoration. In response to the challenges facing the environmental sector as a result of Covid-19, the Green Recovery Challenge Fund has brought forward £40 million of these funds to kick start a programme of nature-based projects to address the twin challenges of halting biodiversity loss and tackling climate change, while creating and retaining jobs in the conservation sector, as part of a green recovery<sup>129</sup>.

## Agriculture

Emissions from the agriculture sector, stemming from livestock, agricultural soils and farm machinery, are estimated to have been responsible for 10% of UK GHG emissions in 2018<sup>130</sup>. Emissions of methane (56%) and nitrous oxide (31%) are the main GHGs emitted. While farming processes inevitably create GHG emissions, there remains potential for reducing emissions and increasing sequestration of carbon in land and plants.

As the cornerstone of future agricultural policy, the Environmental Land Management (ELM) scheme is intended to provide a powerful vehicle for achieving the goals of the 25 Year Environment Plan and the commitment to net zero emissions by 2050, while supporting our rural economy. Through ELM, farmers and other land managers will be paid for delivering environmental public goods, including mitigation of, and adaptation to, climate change.

In order to continue reducing emissions further in this sector, the Clean Growth Strategy<sup>131</sup>, and the 25 Year Environment Plan set out specific commitments on matters such as land management, the use of low emissions fertilisers and the control of endemic diseases in livestock. As part of the 25 Year Environment Plan, the Government is developing a soil health indicator to inform the ambition for sustainably managed soils by 2030.

Henry Dimbleby, Defra's lead Non-Executive Director, is leading an independent review to develop recommendations to shape a National Food Strategy<sup>132</sup>. The Government has committed to responding to the Review's recommendations with a White Paper within six months of the release of Part Two of the report.

## Waste and Resources

Waste management sector emissions consist of waste disposed to landfill sites, waste incineration (without energy recovery) and the treatment of wastewater. In 2018, waste was responsible for ~5% of UK GHG emissions, with methane accounting for 92% of those emissions. Resources and waste also encompasses material resource efficiency policy, where emissions are reflected in industrial and energy sectors. There is potential for significant emissions savings from material resource efficiency policies<sup>133</sup>.

The Government published the Resources and Waste Strategy<sup>134</sup> (RWS) in 2018, an ambitious document that lays out how our stock of material resources will be preserved through minimising waste, promoting resource efficiency, and moving towards a more circular

economy. The RWS announced three proposed major reforms to the waste system in England. These are the introduction of a deposit return scheme for drinks containers, extended producer responsibility for packaging, and consistency in household and business recycling collections. As well as waste system reform, the Government is also taking steps to work towards waste prevention. Action taken includes developing a new tax on plastic packaging that has less than 30% recycled content, from April 2022 whose revenue will fund waste reduction investments; and a ban on the supply of plastic straws, stirrers, and plastic-stemmed cotton buds to end-users, effective in October 2020.

## **Forestry**

Forests are an essential part of the UK's plans to meet our long-term emissions target, as they act as a natural carbon sink. When correctly managed, trees help protect from flood risk, provide shade during extreme heat events, recover biodiversity and are a sustainable raw material for the future bio-economy. The Government is committed to increasing tree-planting across the UK to 30,000 hectares per year by 2025. This reflects CCC advice that the UK should increase planting rates to between 30,000 and 50,000 hectares per year and maintain these to 2050 to reach net zero emissions<sup>135</sup>. We are aiming to increase planting in England with support from a new £640 million Nature for Climate Fund.

In November 2019 we launched the £50 million Woodland Carbon Guarantee scheme<sup>136</sup> to encourage farmers and landowners to plant more trees and tackle climate change. Tree planting is incentivised through long-term income that can be invested in carbon sequestration, delivered through the sale of Woodland Carbon Units to the Government over 35 years at a guaranteed price set by auction.

Our action involves making significant changes to the structure and management of woodlands now; to give them the best chance of survival and to thrive in 50 years' time. We have consulted on proposals for a new England Tree Strategy<sup>137</sup> which will set out policy priorities to deliver our ambitious tree planting programme through a focus on the expansion, protection and improvement of our woodlands.

## **Land Use**

Peat is our largest terrestrial carbon store, and better management of peatlands has a range of co-benefits alongside climate mitigation, from habitats for rare wildlife to flood management. We will set out an ambitious framework for recovering English peatlands through the England Peat Strategy and the establishment of a Lowland Agricultural Peat Taskforce. The Taskforce will work with stakeholders to deliver recommendations for more sustainable agriculture on lowland peatlands. The Government's Nature for Climate Fund also focuses on peat, contributing to the restoration of 35,000 hectares of peatland over the next five years.

## **Fluorinated gases (F-gases)**

The UK has been committed to an 85% cut in hydrofluorocarbons (HFCs) by 2036 since ratifying the Kigali Amendment to the UN Montreal Protocol<sup>138</sup>. We have continued to cut F-gas consumption in the UK at a faster pace than that required under the Kigali Amendment through the world leading EU HFC phasedown, reducing levels by over 37% since 2015 through quota limits. Other developed countries will not be required to reach this point under Kigali until 2024. Under the EU F-gas Regulation, importers and producers are subject to a specific limit on F-gases that are cut every three years until a 79% phasedown is achieved by 2030<sup>139</sup>. The EU regulation also extends this phasedown to HFCs inside pre-charged equipment and bans certain products containing F-gases, such as insulating foams, refrigeration units and aerosols.

All the requirements of the EU F-gas Regulation will be retained after the Transition Period, maintaining at least the same level of environmental ambition and regulatory certainty from day one. A UK review of the EU Regulation will be complete by 2022 at the latest, to assess what more can be done, including what can be implemented to meet the net zero goal in 2050.

As a champion member of the UN Cool Coalition, the UK is calling for countries to make ambitious commitments on cooling. In July, the Government, the Carbon Trust and the Kigali Cooling Efficiency Programme launched a sustainable cooling guide<sup>140</sup>, showcasing UK leadership on sustainable cooling through case studies under each of the priority COP26 sector themes. The guide lists specific actions countries, industry and cities could take in the run up to COP26.

Furthermore, the Government continues to contribute around £8.9 million annually<sup>141</sup> to help developing countries cut their use of F-gases and ozone depleting substances, through the Montreal Protocol's Multilateral Fund. In parallel Defra funds projects to accelerate the climate benefits of the HFC phasedown and elevate the importance of sustainable cooling in developing countries through the UN Implementing Agencies to the Montreal Protocol.

# Adaptation and Resilience

## Key achievements in the past year: Adaptation

We announced plans to invest £5.2 billion over six years from April 2021 in a major upgrade to flood and coastal protection infrastructure across the country to better prepare communities for flooding and coastal erosion risks for the long-term. We will also invest a further £200 million over those six years to pilot innovative actions that improve the long-term flood and coastal resilience of 25 local areas. We have recently announced £170 million as a green recovery measure which will accelerate work on 22 shovel-ready flood defence schemes providing an immediate boost to jobs and supporting local economies.

In July 2020, we published a Policy Statement on flood and coastal erosion risk management<sup>142</sup>, which sets out our policies to create a nation more resilient to future flood and coastal erosion risks, both of which are set to intensify with a changing climate.

The National Flood and Coastal Erosion Risk Management Strategy for England<sup>143</sup>, which was published alongside the Statement, provides a framework to guide the activities of those involved in flood and coastal erosion risk management. Taken together, the Policy Statement and the National Strategy will ensure that our country is more resilient to flooding and coastal erosion in the long term.

In March 2020 we published our National Framework for Water Resources<sup>144</sup>, which sets out England's future water resource needs and potential deficits, at a national and regional level. This will further support future water company planning for droughts, a key risk identified in the second Climate Change Risk Assessment (CCRA2)<sup>145</sup>.

In August 2020 we published the Environment Bill: Environmental Targets<sup>146</sup> paper setting out the objectives that we consider could be addressed by our first suite of Environment Bill targets, many of which could drive adaptation benefits. For example, we are exploring possible targets to reduce demand for public water supply.

We continued work with our practitioner partners to enhance the resilience of our natural environment to climate change risks. In May 2020 Natural England published a new edition of the Climate Change Adaptation Manual<sup>147</sup> with RSPB to support nature conservation in a changing climate and have been holding workshops with stakeholders. In 2019 the Forestry Commission published guidance on Managing England's woodlands in a climate emergency<sup>148</sup>. In May Defra published new sensitivity assessments<sup>149</sup> focussed on potential climate change impacts on protected features of Marine Protected Areas (MPAs) and their role in enhancing climate change resilience.

We launched a £3.9 million first-of-its-kind project in the Solent to trial an online 'nitrate trading' auction platform, under which housing developers buy credits to create new habitats such as meadows, woodlands and wetlands<sup>150</sup>. These nature based solutions will ensure nitrate pollution from new housing does not harm internationally important protected sites in the Solent, as well as delivering wider environmental benefits, such as flood risk reduction, carbon offsetting, biodiversity net gain and better access to nature.

In December 2019 the Environment Agency began introducing changes to some of the regimes in the Environmental Permitting Regulations to require organisations to consider potential climate risks as part of their permit, alongside other types of environmental risk.

We continued work with delivery partners, statutory advisors and other government departments on adaptation and climate change evidence. In July 2020 the CCC launched the new UK Climate Risk website and published six research reports, to help inform the third Climate Change Risk Assessment (CCRA3) evidence report next year. These will be instrumental for government, businesses, organisations and civil society to make climate resilient decisions in their own operations.

We also continued to work closely with the £18.7 million UK Research & Innovation and Met Office Strategic Priority Fund on Climate Resilience<sup>151</sup>, to ensure it achieves its aims to be multidisciplinary and addresses research gaps identified in CCRA2.

We continued to deliver the first ever HMG Green Finance Strategy (GFS), which sets out our plans to transform the financial sector and generate the investment required to deliver our ambitious environmental goals. The GFS includes steps to improve take-up of the Taskforce on Climate-related Financial Disclosures (TCFD) framework, which includes disclosure of physical climate risks.

The CCC's progress report on reducing emissions contains important recommendations on strengthening the country's resilience to climate change risks. The CCC has also highlighted that Covid-19 has made starkly clear how crucial resilience is to the management of risks and hazards.

The Government agrees with the CCC that integrating our climate mitigation and adaptation actions and other environmental policies is crucial to maximise their co-benefits and minimise trade-offs; promoting a holistic approach.

Since our response to the CCC's Progress Report to Parliament on Preparing for Climate Change in 2019<sup>152</sup>, we have continued to deliver the second National Adaptation Programme (2018-2023)<sup>153</sup> to support and drive further action on resilience to the priority risks identified in CCRA2<sup>154</sup>. We broadly accepted the recommendations made last year by the CCC, and we continue to address them. This includes working with the CCC to consider the expansion of the indicators used to monitor adaptation.

As referenced in the Natural Resources section of this response, nature needs to be at the core of our climate change response. The interconnected challenges of climate change and biodiversity loss remain. Restoring, expanding and maintaining ecosystems is integral for their resilience and capacity to adapt to a changing climate. For example, we will consult on a strategy for the management of beavers in the wild and the national approach for any further releases; recognising the potential role they may have in creating wetland habitat and reducing flood risk downstream. We are also preparing to launch a new consultation to change our approach to environmental assessment and mitigation in the planning system. We want to make the system more efficient, but also create better outcomes for the environment, including on climate change, through more data-driven, strategic approaches. Our ambitious environment, fisheries and agriculture bills<sup>155</sup> will work hand in hand to protect and recover our precious natural environment, and diverse ecosystems, in line with 25 Year Environment Plan<sup>156</sup> commitment to leave the environment in a better place than we inherited it.

Looking forward, 2021 marks a hugely significant year for global climate action, culminating in COP26. Increasing international action on adaptation and resilience is one of the core priorities for the UK's Presidency of COP26, reflecting the ambition of the Paris Agreement. It is one of our five international COP26 campaigns (alongside finance, clean transport, energy transitions and nature). Building on the foundations laid through our leadership on adaptation and resilience, we will put our own approach in the spotlight as we have a unique opportunity to

showcase, and share best practice, whilst driving further progress at home to ensure our international ambitions are underpinned by strong domestic action.

In Annex 1 we have provided further information on our actions in response to the CCC's recommendations on demonstrating long-term planning for climate change this century (preparing for 2°C global temperature rise, with consideration of 4°C), addressing key risks laid out in CCRA2, as well as responses to specific departmental recommendations. Further information on adaptation developments will be included in a NAP action update to the CCC to inform their next Progress Report on Preparing for Climate Change.

# Action in Devolved Administrations

## Northern Ireland

### Summary of Progress

In Northern Ireland, greenhouse gas emissions have reduced by 20% against the 1990 baseline to 19.4 MtCO<sub>2</sub>e in 2018 – a decrease of 2% compared to 2017. The largest sectors in terms of emissions in 2018 were agriculture (27%), transport (23%) and energy supply (15%)<sup>157</sup>. Most sectors showed a decreasing trend since the base year. The largest decreases, in terms of tonnes of carbon dioxide equivalent, were in the energy supply, waste management and residential sectors. These were driven by improvements in energy efficiency, fuel switching from coal to natural gas, which became available in the late 1990s, and the introduction of methane capture and oxidation systems in landfill management.

### Waste

The Department of Agriculture, Environment and Rural Affairs (DAERA) has consulted on the reform of the producer responsibility system for packaging and the introduction of a deposit and return scheme for drinks containers. These policy proposals, alongside HM Treasury's proposed introduction of a tax on virgin plastic used for packaging, should reduce the amount of packaging waste produced, improve recycling and recyclability, and tackle street and marine litter. A second round of consultations is planned alongside the rest of the UK next year.

To ensure environmental governance is maintained following EU exit, DAERA is working closely with Defra to include appropriate enabling powers for forthcoming policy proposals in the Environment Bill.

The 2019 Waste Prevention Programme "Stopping Waste in its Tracks" was consulted on earlier in 2020. A summary of responses is now available on the DAERA website. It contains a series of actions centred on household and commercial activity and tackling food waste along with a range of initiatives aimed at supporting both the public and third sectors, with the overall aim of maintaining the downward trend in waste arisings. This in turn will have a significant impact on meeting landfill diversion targets. One such initiative recently launched and funded by the Department is a reuse and repair network, Northern Ireland Resource Network (NIRN). This network aims to promote and increase reuse and repair in the province.

In addition to considering the CCC's advice, DAERA has launched a £23 million programme to provide financial assistance to local government to improve recycling services and facilities in order to improve recyclate quality and increase recycling rates to support the circular economy. To date seven projects have been supported with a total value of £3.5 million.

### Energy

The Department for the Economy is currently undertaking work on the development of a new Energy Strategy for Northern Ireland, regularly engaging with key stakeholders and industry. A cross departmental Northern Ireland Energy Strategy Government Stakeholder Group has been established, along with five thematic working groups and an Expert Panel for the Future of Energy.

A new Northern Ireland energy strategy will provide joined-up, cross-departmental leadership

and support for the wider energy related decarbonisation efforts across all departments. In the interim, ongoing extension of the natural gas network to eight towns in the West and thirteen towns and villages in East Down aims to connect some 68,000 consumers to gas, and in doing so, reduce greenhouse gas emissions through conversion from more polluting fuels. Also, since 2010, the Utility Regulator's Northern Ireland Sustainability Energy Programme (NISEP) has made a significant contribution to energy efficiency in homes and premises across Northern Ireland, with 890,321 tonnes of Lifetime Carbon Savings achieved during the period 2010-11 to 2016-17.

In 2010, the Northern Ireland Executive set a target that 40% of electricity consumed in Northern Ireland would come from renewable sources by 2020. Statistics recently published by the Department for the Economy show that the proportion of electricity consumed from renewables for the 12 month period ending 31 March 2020 was 46.8%<sup>158</sup> demonstrating that the Executive target has been exceeded.

## Transport

The Department for Infrastructure (DfI) has placed considerable emphasis on developing better quality walking and cycling infrastructure through the development of greenways, walkways and cycle ways and schemes. The Minister recently created the position of Walking and Cycling Champion within the Department to provide a focus on delivering active travel projects and to increase the number of journeys made by walking and cycling. The work that the Champion is leading is key to reimagining and reshaping northern Ireland's spaces to accommodate cycling, walking and active travel as part of an ambitious Northern Ireland Executive Covid-19 recovery plan and to building a better future that delivers more for Northern Ireland's citizens, socially and economically and that delivers cleaner, greener and healthier communities.

The Department has allocated £20 million of funding for blue/green infrastructure to support transformation of Northern Ireland's communities, promoting active travel and shaping places to live in the new normal.

DfI is currently engaged with Councils in preparing new Local Transport Plans integrated with Local Development Plans covering the period to 2032. The intention is that councils will designate zones for new development where people can walk, cycle or use public transport making use of existing or new transport facilities planned by DfI. In addition, multi-modal urban transport schemes, demonstrated by the "Belfast on the Move" project and the development of modern digitally connected conurbations providing opportunities for decentralisation will both help to reduce congestion and emissions.

Where use of vehicles cannot be substituted by active travel or digital solutions, major projects such as the introduction of the "Glider" Rapid Transport system in Belfast have succeeded in getting people out of their cars and onto cleaner hybrid public transport. Public transport has a key role to play in decarbonising transport in Northern Ireland and Translink, supported by DfI, is therefore progressing a programme to: replace the older buses in its fleet with new buses which comply with European legislative requirements on carbon monoxide, hydrocarbons, nitrous oxides and particulate matter emissions; introduce low, ultra-low and zero emission buses; and migrate to renewable fuels and more fuel efficient vehicles. Translink has successfully obtained funding for infrastructure to allow the introduction of hydrogen zero emission vehicles in the Belfast Metro Fleet.

DfI has been working with the Department for the Economy which is leading work to inform a new draft Energy Strategy for Northern Ireland. This is intended to address strategic energy

issues, including the requirement to respond to climate change and the UK Government's net zero carbon target by 2050. As transport is a key energy user, DfI is leading on transport aspects to support this decarbonisation agenda.

### **Land use, land-use change, and forestry (LULUCF)**

DAERA has commissioned a suite of Conservation Management Plans for Northern Ireland's Special Areas of Conservation to improve the condition and resilience of these priority habitats and species to a range of pressures including those associated with climate change. These sites include the best of Northern Ireland's peatland resource and will have specific recommendations and costings for appropriate peatland management and restoration.

INTERREG Va funding is being used to develop a number of the Conservation Management Plans which will define and implement peatland restoration for key peatland sites to improve their biodiversity, water purification and carbon storage value. The projects also implement some of these conservation actions delivering vital improvements in the conservation value of the sites.

Work has commenced on developing a Peatland Strategy for Northern Ireland which will highlight the importance of peatlands in relation to the climate change agenda. The strategy will focus on the need to put in place long-term plans involving a wide range of public and private landowners to protect and restore peatland habitat. The strategy will have implications across several sectors including agriculture and will focus on the importance of future agri-environment policies to maintain and increase the resilience of our peatlands. The Northern Ireland Executive intends to consult on the strategy in late 2020.

In March 2020 the DAERA Minister announced a new programme of afforestation, 'Forests for Our Future' which is aimed at creating 9,000 hectares of new woodland in the next ten years to help contribute to the UK's net zero carbon target by 2050. This was based on the CCC's report (February 2019) which recommended 900 hectares of woodland creation per year in Northern Ireland compared with the previous annual figure of around 200 hectares per year. Between March and August 2020 the Minister has taken a personal lead in promoting the Programme through public events; opening a revised forest expansion grant scheme, announcing development of a new small woodland grant scheme and forming an afforestation forum to make plans for planting suitable public and council land.

### **Next Steps**

The Department of Agriculture, Environment and Rural Affairs (DAERA) Minister leads on climate change in Northern Ireland following restoration of the Northern Ireland Executive in early 2020.

Northern Ireland contributes towards the UK climate change targets and carbon budgets set out in the Climate Change Act 2008. In addition, the Northern Ireland Programme for Government (PfG) includes the objective to 'live and work sustainably, protecting our environment' with greenhouse gas emissions reductions being used as one of the indicators to help monitor progress. The PfG sets out the priorities to be pursued by the Northern Ireland Executive setting real-world objectives on how policies make a difference.

DAERA requested an independent overview from the CCC on what Northern Ireland needs to do to reduce emissions going into the 2020s. In February 2019, the CCC published its report 'Reducing Emissions in Northern Ireland'<sup>159</sup>. This provided comprehensive recommendations on policy options and actions across all sectors that could deliver economy wide emission

reductions. The report was issued to all Northern Ireland departments for their consideration.

In response to the CCC report, DAERA has established the Future Generations Working Group on Climate Change. This cross departmental group will look at all Northern Ireland sectors with a view to further reducing the province's emissions. Northern Ireland departments will consider all recommendations set out in recent CCC reports to identify what policies, strategies, measures and schemes may be possible to progress emissions reduction in Northern Ireland through the 2020s.

The DAERA Minister has written to the CCC requesting its advice on what would be Northern Ireland's equitable contribution to the UK zero target. The CCC's response is due to issue in December 2020 following publication of advice to the UK Government on Carbon Budget 6.

## Scotland

### Summary of Progress

The Scottish Government's response to the global climate emergency continues, and it remains committed to ending Scotland's contribution to emissions by 2045 in line with the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. The Act sets targets to reduce Scotland's emissions of all greenhouse gases to net zero by 2045 at the latest, with interim targets for reductions of at least 56% by 2020, 75% by 2030, and 90% by 2040.

The most recent statistics on Scotland's greenhouse gas emissions (for 2018) show that Scotland is already half of the way to net zero (50% reduction from 1990 baseline to 2018, on basis used for reporting progress to Scotland's statutory targets)<sup>160</sup>. That strong long-term progress means that Scotland continues to lead the UK as a whole in reducing long-term emissions, and in western Europe is second only to Sweden<sup>161</sup>.

These figures also predate a huge amount of further work to tackle climate change, including through the Scottish Government's 2018 Climate Change Plan<sup>162</sup>, and measures announced following the declaration of a global climate emergency by Scotland's First Minister in 2019.

The nature of the climate change challenge faced by Scotland, as well as other countries, has been fundamentally altered by the lasting impacts of Covid-19. The recent Programme for Government (PfG) 2020-21<sup>163</sup> is based on the Scottish Government's strong belief that in recovering from this virus it must not be business as usual, and significant advances must be made to deliver a fairer, greener, more prosperous Scotland. That is why the programme, as well as tackling Covid-19, renews the Scottish Government's commitment to end Scotland's contribution to climate change.

The PfG sets out how Scotland will make further progress to becoming a net zero emitter. This includes the next phase of the Scottish Government's Green New Deal announced in 2019 to rethink the investments it makes, and how it makes them. The Scottish Government has now expanded this commitment with a package of measures to form the basis of Scotland's green recovery from the impact of Covid-19. Key elements of a green recovery as part of Scotland's Green New Deal are investing in a green recovery and mobilising private finance; skills and training for green jobs; supporting local economies and community wealth building; investing in future resilience; transforming how Scotland's homes and buildings are heated; transitioning industry and energy towards net zero; and protecting and restoring Scotland's land and natural economy.

To support this, specific measures in this year's PfG include £1.6 billion low carbon funding including a £100 million Green Jobs Fund, investment in heat and energy efficiency and industrial decarbonisation; a 20 year vision for energy efficient, zero carbon housing, with access to outdoor space, transport links, digital connectivity and community services; £500 million for infrastructure to support active travel; continuing to develop the Agricultural Transformation Programme utilising the Agricultural Transformation Fund, including a capital grant scheme; and an additional £100 million to Scottish Forestry to increase new planting alongside £30 million to Forestry and Land Scotland to expand Scotland's national forests and land by an additional 18,000 hectares per year by 2024. An ambitious, ten-year, £250 million peatland restoration plan will also be delivered by 2025. The Scottish Government is mobilising private finance towards the net zero transition, including by setting net zero as the primary mission of the Scottish National Investment Bank; identifying projects worth over £3 billion for the Green Investment Portfolio and developing a Green Growth Accelerator model with local

government.

Through the range of low carbon funding set out throughout the PfG, the Scottish Government will invest significantly to secure a just transition to a net zero economy. This will help provide new, green jobs and skills development, and ensure that as Scotland accelerates the transition to net zero the Scottish supply chain, workforce and expertise that are needed to maximise the opportunities from that transition in Scotland and globally are in place.

The Scottish Government aims to lead by example and will ask the same of other public bodies. As part of its plans, the Scottish Government will further strengthen Scotland's legislative framework through regulations requiring public bodies to set a date for when they will become net zero emitters and introduce science-based targets for their emissions.

The Scottish Government is also preparing for the impacts of global climate change which are already locked in. In September 2019, the Scottish Government published its second five-yearly statutory Climate Change Adaptation Programme responding to the main climate risks for Scotland - as identified by the CCC and covering a range of global warming scenarios. Measures in the current PfG, including an extra £150 million for flood risk management and £12 million for coastal change adaptation, will further increase Scotland's resilience to the impacts of climate change as part of a green recovery from Covid-19.

## **Next Steps**

An update to Scotland's 2018 Climate Change Plan to reflect the more ambitious targets in the Climate Change (Emissions Reduction Targets) Act 2019 was due to be laid in the Scottish Parliament in April, but was necessarily postponed as a result of the global coronavirus pandemic. The Climate Change Plan update will now be published in December 2020 and will be reframed around a green recovery from the coronavirus. The Scottish Government's recast Climate Change Plan update will further set out its green recovery plans, alongside its policies and proposals to meet Scotland's future emissions reduction targets. The recast Plan will draw upon the best available evidence, including advice from the Committee on Climate Change, the Advisory Group on Economic Recovery<sup>164</sup>, the Just Transition Commission<sup>165</sup>, the Sustainable Renewal Advisory Group<sup>166</sup> and the Climate Emergency Response Group<sup>167</sup>.

To support the plan the Scottish Government will undertake a significant programme of stakeholder engagement which alongside expert advice, including from the CCC, will inform its approach and promote public understanding of the role they can play. Subject to Covid-19 restrictions the first meeting of an independent, representative citizens' assembly on climate change will be held in late autumn.

The Scottish Government will also respond separately to the CCC's stand-alone 2020 Scottish progress report on emissions reduction in Scotland<sup>168</sup>.

## Wales

### Summary of Progress

The Welsh Government remains committed to limiting global temperature rises and has maintained momentum in its response to the climate emergency throughout the coronavirus pandemic. This includes new, multi-million investments in flood and coastal erosion risk management, emergency response capability, active travel schemes, low-emission vehicles, superfast broadband in rural areas, tree planting and a further round of the circular economy fund.

The Welsh Government intends to go further and faster in pursuit of a zero-carbon Wales to deliver prosperity and equality, as well as clean air, water and land. It will achieve this by strengthening the resilience of its natural and built environments to the impact of a changing climate and by enabling an economic transformation that will displace reliance on fossil fuels, creating the industries and the jobs of the future.

Work has begun to create a national forest for Wales, including launching a community woodlands fund, a fourfold increase in the woodland creation budget. The Welsh Government will continue to engage with the Welsh farming sector to understand how it can work with them to expand the role they play in maintaining and growing Wales' carbon stores.

The Welsh Government remains on track to meet its goal of investing £350 million in flood and coastal erosion risk management. It announced a £60 million investment programme for 2020-1, in addition to £14 million in funding to repair flood defences and transport infrastructure damaged during the intense storms that affected thousands of people across Wales earlier this year. During the pandemic, it has also established a new programme to address the risk to communities from coal tips.

The Welsh Government is also investing directly through the innovative housing programme, designed to test new approaches to building social and affordable housing that meets the highest environmental standards. It hopes that the 1,400 homes being delivered in the first three years of the programme will be the first in the UK to deliver whole-life net zero homes that are being built using Welsh timber.

The latest emissions data (for 2018) show Wales is making good progress towards its 2020 target. Data published in June show a 31% reduction compared to base year emissions and an 8.3% decrease compared with 2017. Most of this reduction is driven by the energy supply sector for which emissions declined by 19.2% between 2017 and 2018.

The Welsh Government will look to reinforce the climate-positive behaviours that have emerged during the lockdown such as the significant increase in both walking and cycling, and the dramatic increase in home working. It will support communities to lock in positive travel habits and has provided £15 million of new funding for local authorities across Wales to reallocate road space, building on record levels of investments in active travel last year.

Decarbonisation is one of the Government's priority areas, which cuts across multiple well-being objectives and requires a whole-government approach. Recognising the need for a whole-government approach, the Welsh Government is now holding a climate change-focussed Cabinet discussion each Senedd term.

The Welsh Government is encouraging all public bodies, businesses and communities in Wales to be part of creating a truly All—Wales plan to overcome the climate emergency,

supporting our economy to recover from the impact of Covid-19, creating new industries and jobs, to deliver a prosperous, healthier and more equal Wales. The recently published Engagement Plan sets out how the Welsh Government will engage with Welsh communities and industries to strengthen our collective efforts<sup>169</sup>.

## Next Steps

The Welsh Government continues to focus its efforts on delivering the policies and proposals in Prosperity for All: A Low Carbon Wales; whilst also working with all Welsh sectors to begin developing and shaping the second All Wales Plan for the second carbon budget (CB2), (2021-2025) for publication in 2021. The Welsh Government will receive its first Wales-specific Progress Report at the end of this year and will use the recommendations to inform development of the CB2 Plan.

The Welsh Government plans to update the targets in its climate legislation in spring 2021. It has requested further advice from the CCC regarding how the new 95% target for 2050 affects Wales' interim targets for 2030 and 2040, as well as the first two carbon budgets, already set in legislation. It will also work with the CCC and others to identify how Wales might go beyond 95% in 2050.

Wales' Climate Week in November 2020 will be a stepping stone towards COP26 and the CB2 Plan. It will consist of free, digital, live broadcasts and interactive events from national and global policy makers, pioneers and innovators, discussing and interrogating the actions for tackling the climate emergency in the context of a global pandemic.

In pursuit of a green recovery from the Covid-19 pandemic, Jeremy Miles MS, Counsel General and Minister for European Transition, is working with an external advisory group comprised of experts including Paul Johnson, director of the Institute for Fiscal Studies, and Dr Rebecca Heaton, both members of the UK Committee on Climate Change. Their findings and recommendations are expected this autumn.

# International leadership and countdown to COP26

The science is clear. To limit global warming to 1.5 degrees Celsius, we need to halve global emissions over the next decade. However, current commitments made under the Paris Agreement fall far short of what is required. We must scale up action to respond to the climate emergency, and the world must act together to achieve this.

In May, the Bureau of the UNFCCC, with the UK and our Italian partners, agreed that COP26 will take place from 1-12 November 2021. However, postponement of COP26 does not mean postponement of climate action or lowering of climate ambition. We agree with the CCC that the delay to COP26 provides opportunities to ensure that the international response to the Covid-19 pandemic delivers a truly green, inclusive and resilient global recovery aligned to the Sustainable Development Goals (SDGs) and Paris Agreement objectives. Covid-19 has demonstrated the importance of international cooperation, and of being well prepared to respond to major shared challenges. COP26 can be a moment where the world unites behind a fair, green recovery from the effects of Covid-19, and we will put this at the heart of our international engagement.

As incoming UNFCCC COP Presidency, we are committed to working with our partners Italy, the Chilean COP25 Presidency, the UNFCCC, the UN Secretary General, and all parties and stakeholders to ensure that climate ambition is accelerated in 2020, 2021 and beyond. The new date will also allow the UK and our Italian partners to harness our incoming G7 and G20 presidencies in driving climate ambition.

We will focus on the concrete actions that can support our goals, build resilience and lower emissions. We are asking every country to submit enhanced Nationally Determined Contributions (NDCs), adaptation plans, and ambitious Long-Term Strategies – to commit to further cuts in carbon emissions by 2030, to plan for a resilient future, and to reach net zero as soon as possible.

The PM announced in September 2019, that the UK would double its contribution to international climate finance from £5.8 billion to £11.6 billion over 2021-2026 to help reduce and mitigate the impacts of climate change in developing countries. Through programmes such as the NDC Partnership and the UK Green Recovery Challenge Fund, we continue to support other nations as they develop their plans and we remain committed to fulfilling the \$100 billion climate finance goal alongside other donors. For example, the UK PACT Green Recovery Challenge Fund announced in June is a £12 million capacity-building fund to support low-carbon transitions and a green, resilient economic recovery across ODA-eligible countries.

We agree with the CCC that UK international climate leadership must be underpinned by robust domestic policy and we recognise our responsibilities as the incoming COP and G7 presidency in this regard. The UK will play its part and come forward with an enhanced NDC well ahead of COP26, at a point which contributes to the greatest possible momentum and ambition. The Government's priority for the UK NDC is a clear statement of the UK's overall contribution out to 2030 to meeting the Paris Agreement's temperature goals. Likewise, building on our foundational work on adaptation and resilience, in the lead-up to COP26 we will put our own adaptation approach in the spotlight as we have a unique opportunity to showcase, and share best practice, whilst driving further progress at home to ensure our

international ambitions are underpinned by strong domestic adaptation as well as mitigation action.

The UK is committed to fulfilling the full potential of the Paris Agreement. As incoming COP Presidency we will work with all parties through a series of high-level events in the key areas of NDCs, long-term strategies, adaptation and resilience, loss and damage, finance, and capacity building; as well as focusing on specific economic sectors including energy, nature, and transport, bringing countries and other stakeholders together to accelerate progress towards resilient and low carbon growth; and accelerating action on the nature-based solutions that are key to climate outcomes, biodiversity, and public health. In Glasgow we will facilitate agreement on outstanding elements of the Paris rulebook as part of a balanced negotiated outcome that accelerates climate action, enables greater ambition and powers the process forward.

If countries act together, progress can be made faster, and the benefits will be realised sooner. The UK's COP Presidency will focus efforts to develop concrete actions in five areas which need particular, global attention to achieve the Paris goals:

- **Clean Energy:** We can make the most of the low costs of renewables to boost growth and create jobs, including accelerating investment in clean energy in the power sector, and supporting communities in making a just transition away from coal, building on the work of the UK-Canada led Powering Past Coal Alliance<sup>170</sup>.
- **Clean Transport:** By accelerating the transition to zero carbon road transport and phasing out petrol and diesel engines, we can accelerate the transition to cleaner air, lower costs and open up new opportunities for industry.
- **Nature-based Solutions:** By protecting and restoring nature, we can improve the potential of nature-based solutions to deliver adaptation, tackle loss and damage and reduce emissions.
- **Adaptation and Resilience:** By encouraging greater ambition and commitments to support practical, best practice adaptation action we can better prepare for the next crisis while supporting communities, landscapes and global economies.
- **Finance:** In all sectors, we must align our public and private finance with the Paris Agreement, accelerating the flow of finance from high to low-carbon and resilient investments, improving access to finance especially for developing countries, accelerating the development and transfer of technologies, enhancing long-term capacity building and ensuring the \$100 billion climate finance goal is met.

For COP26 to be successful, it ultimately has to be a joint endeavour between nations, civil society and businesses. That is why the UK, in partnership with Chile and the UN, is leading the Climate Ambition Alliance (CAA), bringing together over 120 countries, more than 1,000 businesses, 36 investors, nearly 500 cities and regions, and more than 500 universities with the common ambition of achieving net zero emissions by 2050. It already represents over half of global GDP and covers nearly a quarter of global CO<sub>2</sub> emissions.

In June, the High-Level Champions for COP25 and COP26 launched the 'Race to Zero' Coalition under the CAA. This is a global campaign to rally leadership and support from businesses, cities, regions, investors for a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.

As the CCC rightly notes, 2021 will be a crucial year for determining global progress on climate

change and broader multilateral cooperation after the pandemic. In line with and in addition to our broader international efforts ahead of COP26, 2021 will see the UK taking on the G7 Presidency where we will make climate ambition a core priority.

We will continue to work bilaterally and multilaterally to engage countries on their recovery and climate plans. For example, we are working with the US and China on low carbon energy innovation, through the G20 to make progress on areas such as energy, environment and agriculture, and with the NDC Partnership to support a green recovery in developing countries.

We are at a turning point for our planet and our health. We must unite the world on a path to a zero carbon economy as we build back greener from Covid-19. In Glasgow at COP26 we must show that green jobs and the green economy are our common future. This journey must be fair, inclusive and create the global resilience we need to fight climate change.

# Annex 1: Responses to departmental recommendations

## Priorities for all departments

*Integrate Net Zero into all policymaking and ensure procurement strategies are consistent with the UK's climate objectives.*

The Government agrees with the Committee's recommendation that net zero should be embedded as a core government goal and integrated into all policymaking where appropriate, reflecting its status of a legal commitment underpinned by an act of Parliament. It is incumbent upon all departments and contracting authorities to make immediate progress towards this goal.

Procurement can serve as significant market signalling mechanism thereby increasing the effectiveness of other government initiatives. Leaving the EU means we can reform our public procurement rules to make public procurement simpler and better able to meet the needs of this country, whilst still complying with our domestic and international obligations. While environmental considerations including net zero can already be taken into account under the existing regulations, our aim is to introduce bold reforms in procurement policy and process to ensure public procurement at all levels actively helps achieve national strategic priorities such as tackling climate change and meeting our net zero by 2050 target.

Recent steps on procurement methodologies taken by the Cabinet Office include proposals to strengthen the Public Services (Social Value) Act 2012 by requiring central government departments to expressly evaluate environmental, social and economic benefits as part of the procurement process.

The Government plans to publish a Green Paper, with a view to introducing primary legislation, which would allow us to initiate a procurement reform programme. An expert panel is currently supporting the development of the Green Paper and advising on the necessary innovations required for a future UK procurement regime that is net zero compliant.

As policies and best practice on adapting procurement to help deliver net zero and resilience to climate risks are further developed, the Crown Commercial Service will ensure all agreements will as a minimum meet these policies.

The Greening Government Commitments (GGCs) seek to establish public sector leadership by setting out the actions UK government departments and their agencies will take to reduce their impacts on the environment. The GGCs set targets for reducing the Government's GHG emissions, domestic flights, waste, paper and water. They commit the Government to consider sustainability in procurement as well as to reporting publicly on our actions on climate change adaptation, biodiversity, sustainable food and catering, and sustainable construction, as well as any other significant aspects of our work.

The current GGCs were due to expire in April 2020, but to reduce pressure on resources in all government departments as a result of Covid-19, a decision has been taken that the current Greening Government Commitments will be rolled over for one year, and new commitments

will be released in April 2021. The next set of targets will be in line with our net zero by 2050 target and 25 Year Environment Plan goals. Individual departments are also required to publish their own sustainability reports either as part of their annual report, or as separate reports.

The Government has taken other broader enabling steps, including the announcement in October 2019 that the Prime Minister would chair a Cabinet committee on climate change<sup>171</sup>. The PM-chaired Climate Action Strategy Committee (CAS) determines the UK's overarching climate strategy, both domestically and internationally. In May 2020, the Prime Minister also established a Climate Action Implementation Committee (CAI), chaired by BEIS Secretary of State<sup>172</sup>. The CAI supports the CAS to operationalise the Government's climate strategy by driving the implementation of decisions made there. It considers matters relating to the delivery of COP26, net zero and building the UK's resilience to climate impacts, ensuring consistent policy-making across government, and driving forward delivery plans in these areas. It will also consider how these plans can support the Government's Covid-19 recovery strategy, working closely with other relevant committees.

The Government has announced that the Net Zero Review report will be published in spring 2021. In the meantime, HM Treasury will publish an interim report this autumn. This will set out our approach to the Review and analysis which will inform the final report. In line with recommendations from the Public Accounts Committee and the National Audit Office, we remain committed to incentivising joined-up working and are considering how cross-government planning and performance processes could be further improved to drive delivery of priorities, such as net zero, which cut across departmental boundaries.

*Ahead of the CCC's next adaptation progress report in 2021, demonstrate adaptation planning for a minimum 2°C and consideration of a 4°C global temperature rise (by 2100 from pre-industrial levels).*

Whilst we accelerate efforts to end our contribution to climate change, we must continue to take robust action to ensure the country is well prepared to face the challenges a changing climate brings.

2021 marks a hugely significant year for global climate action, culminating in COP26 which will be hosted in Glasgow in November. Increasing international action on adaptation and resilience is one of the core priorities for the UK's Presidency of COP26, reflecting the ambition of the Paris Agreement. It is one of our five international campaigns. Building on the foundations laid through our leadership on adaptation and resilience at the UN Climate Action Summit in September 2019, we will put our own approach in the spotlight as we have a unique opportunity to showcase, and share best practice, whilst driving further progress at home to ensure our international ambitions are underpinned by strong domestic action.

In the 25 Year Environment Plan, we committed to ensure that "all policies, programmes and investment decisions consider the possible extent of climate change this century"<sup>173</sup>. Following on from the 25 Year Environment Plan, the second National Adaptation Programme (NAP2) established our strategy for adapting to the climate change that we are already seeing, and that which we might see in the future.

We know that achieving our long-term goals on adaptation will require many steps along an evolving pathway. Our approach involves planning for the long term, whilst remaining responsive to the latest evidence and tools. We will continue along that pathway, as we continue to develop, invest, and build further capacity for adaptation. This includes building on

the publication, with the Met Office, of the UK Climate Projections 2018 (UKCP18)<sup>174</sup>, including new high-resolution local projections released in September 2019 (UKCP Local)<sup>175</sup>, which provide a key tool to inform government planning and decision-making, as well as helping businesses and individuals to act to improve and build resilience.

As part of ensuring this approach is embedded in policy and programme decisions, we are revising the Green Book Supplementary Guidance on Accounting for the Effects of Climate Change<sup>176</sup> to include updated information on climate evidence and assessments. This guidance, which will be published soon, will be an important tool in supporting departments to meet the Green Book requirement to consider climate risks in policy, programme and investment decisions where appropriate. When making these decisions, the Government will need to consider the impacts of a global temperature rise of 2°C, and decisions with longer-term horizons (beyond 2035) will also need to consider impacts at 4°C. The guidance will set out this approach as prudent to upholding the ‘managing public money principles’, given our current understanding of risks.

Government departments, agencies and arm’s length bodies continue to work closely to increase the nation’s resilience to climate change, and to ensure plans take account of long-term climate impacts, for example:

- In 2018 the Environment Agency launched a climate impacts tool<sup>177</sup>, which aims to help staff understand, and address, climate risks and impacts in strategies and plans at 2°C and 4°C.
- In July, alongside the Government’s Policy Statement<sup>178</sup>, the Environment Agency published the National Flood and Coastal Erosion Risk Management Strategy<sup>179</sup> which will enable us to better prepare for a 2°C warming in global temperatures as well as support risk management authorities to plan for higher scenarios, such as a 4°C rise. It sets out a vision for a nation ready for, and resilient to, flooding and coastal change up to the year 2100.
- This year the Ministry of Justice published an Adaptation Strategy<sup>180</sup> setting out a range of actions to address the risk and resilience of estates and wider activity, informed by UKCP18 climate projections.
- This year Natural England and the RSPB also published the 2<sup>nd</sup> edition of the Adaptation Manual<sup>181</sup>, which provides evidence to support nature conservation in a changing climate. The Manual represents a key resource and will help advisors and practitioners understand and manage risks posed by a 2°C average global increase in temperature, whilst taking account of potential worse case scenarios.
- Through the Adaptation Reporting Power, Defra is supporting discussions with infrastructure networks and stakeholders on what long-term planning scenarios mean for the resilience of key sectors.

We continue to work with the CCC in preparing an Evidence Review to support delivery of the next Climate Change Risk Assessment (CCRA3), due in 2022. Building on previous reports, the latest review will offer an invaluable update of the present, and future, risks and opportunities for the UK from climate change, aligned with a global temperature rise of 2°C and 4°C<sup>182</sup>.

The launch in July this year by the CCC of the new UK Climate Risk Website<sup>183</sup> and CCRA research reports will also be instrumental for government, businesses, organisations and civil society to make climate resilient decisions in their own operations.

*Follow best practice shown by leading businesses to monitor and verify their paths to a net-zero and climate resilient future.*

Building a financial system fit for net zero will mean fundamental changes to the way investment decisions are made. Businesses and financial institutions need to move beyond seeing climate change solely as a corporate social responsibility issue – to recognising it as a financial and strategic imperative.

Consideration of the financial risks and opportunities arising from climate change should be embedded across businesses' core governance and risk management processes, and this should be normalised as good business. The Government's 2019 Green Finance strategy<sup>184</sup> sets out how we will accelerate this 'greening' of finance.

Key to this will be driving the implementation of the Taskforce on Climate-related Financial Disclosure's (TCFD) recommendations<sup>185</sup> in the UK and globally. The UK Government has set out a clear expectation that all UK listed companies and large asset owners will disclose in line with the TCFD recommendations by 2022 – and has established a new taskforce with the regulators to ensure a coordinated approach and to explore the appropriateness of mandatory reporting.

We are also engaging with key national stakeholders on climate resilience and pathways to net zero through multiple channels. The 'Adaptation Reporting Power' introduced under the Climate Change Act 2008<sup>186</sup>, enables government to invite or direct infrastructure providers and public bodies to report on their climate change preparedness. The third round of reporting opened in 2019, and as of now, over 90 organisations and businesses have committed to provide an adaptation report before the end of 2021 on actions they are taking to strengthen preparedness to climate change risks. This includes organisations and businesses responsible for water, energy, transport, environment, heritage, health and finance. For the first time, all four financial regulators will be reporting on climate adaptation. The Government continues to use the vital engagement on ARP to learn from and share best practice developed by leading organisations and businesses on climate resilience, including managing interdependencies between and within sectors.

Initiatives such as the Council for Sustainable Business (CSB) act as a bridge between government and stakeholders and build positive momentum towards achieving our shared ambitions. The CSB provides a sounding board for how businesses can help achieve the 25 Year Environment Plan goals, including on tackling and managing climate change and how government can help businesses in meeting these goals. In particular, the CSB has been an important driving force in encouraging UK business to move towards net zero and improve biodiversity.

The UK has been supporting the Coalition for Climate Resilient Investment (CCRI) to mobilise private finance for adaptation and transform infrastructure investment, by integrating climate risks into decision-making, driving a shift toward a more climate resilient economy to become fit for purpose in a climate changed world.

Next November, the UK will host COP26, where the world will meet to agree on more ambitious action. We need countries, cities, states and businesses to move onto a credible path to net zero. That is why the UK, in partnership with Chile and the UN, is leading the Climate Ambition Alliance (CAA), bringing together over 120 countries, more than 1,000 businesses, 36 investors, nearly 500 cities and regions, and more than 500 universities. The Alliance is the largest ever coalition of leaders committed to reaching net zero by 2050. It

already represents over half of global GDP and covers nearly a quarter of global CO<sub>2</sub> emissions.

In June, the High-Level Champions for COP25 and COP26 launched the ‘Race to Zero’ Coalition under the CAA. This is a global campaign to rally leadership and support from businesses, cities, regions, investors for a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.

*Demonstrate actions that address all of the more urgent risks set out in the second UK climate change risk assessment relevant to the Department.*

The second National Adaptation Programme (NAP), running from 2018-2023, is a cross-departmental collaboration that brings together the Government’s policies on managing climate change risks, as identified in the second Climate Change Risk Assessment (CCRA2). To improve the focus of the CCRA, Defra asked the Adaptation Sub-Committee of the CCC to prioritise risks in its evidence report for CCRA2, with the NAP focusing on these top risks<sup>187</sup>.

Government provided an update on progress in delivering NAP actions to the CCC in 2019<sup>188</sup>. Defra, as lead department for adaptation, is working across government to take stock of progress. Defra is engaging with a wide set of teams to demonstrate both existing NAP activity and additional developments taking place in addressing priority risks in the second CCRA.

A few key examples of ways in which we are working to address key CCRA risks are highlighted below:

- **Risks to freshwater species from high water temperatures (CCRA risk: NE7).** The rivers and streams section of the recently published 2<sup>nd</sup> edition of the Natural England and RSPB Adaptation Manual<sup>189</sup> highlights risks posed by warming temperatures to freshwater species; the role of riparian trees in addressing them; and the wider role of the restoration of natural function and processes in providing resilience. It also signposts the Woodland Trust’s Keeping Rivers Cool: A Guidance Manual<sup>190</sup> for detailed guidance. Tree planting is supported by Countryside Stewardship, targeting of which is informed by spatial data layers, including the Keeping Rivers Cool layer that Natural England and Forestry Commission advisors can access internally, and applicants can access via the Forestry Commission’s web-browser. Forest Research will also publish a Riparian Woodland Practice Guide over the coming months to support implementation of the UK Forestry Standard.
- **Changes in suitability of land for agriculture and forests (CCRA Risk: NE3).** Work by the Forestry Commission and Forest Research to incorporate the UKCP18 climate projections into a climate matching tool, aims to help foresters visualise the extent of changes to the climate that future woodlands will have to accommodate<sup>191</sup>. In 2019, the Forestry Commission published guidance on Managing England’s Woodlands in a Climate Emergency<sup>192</sup>. Forest Research has embedded climate projections in its decision support tool for species selection<sup>193</sup>, to support integration of future climate and site suitability. Consideration of current and projected future species suitability is a requirement of some grant schemes administered by the Forestry Commission. Forest Research is also working with the Forestry Commission to develop a Climate Change Knowledge Hub to support adaptation in the forestry sector.
- **Action to address international risks from climate change (CCRA risks: IT4-6),** As outlined in the response to recommendations to the Foreign, Commonwealth and

Development Office in this document, the Government acknowledges the role of climate change as a stress multiplier both domestically and internationally. We will continue to align expertise on climate-related risk with our core security and defence policy.

- **Action to support resilience to risks to global food production and trade (CCRA risks: IT1 & IT3).** In July 2019 the UK convened the Global Resource Initiative taskforce to investigate how the Government can create sustainable, resilient supply chains. The findings are currently under consideration and will be responded to this year. Government has commissioned an independent review to develop recommendations to shape a National Food Strategy to look across issues of food security, climate change, and health<sup>194</sup>.
- **Research to address imported food safety risk (CCRA risk: IT2).** The Food Standards Agency has published its Areas of Research Interest<sup>195</sup> detailing 11 research questions to address in collaboration with partners, including academia and the wider research community. This includes considering climate change's influence on patterns of foodborne disease prevalence, the availability or need for new or novel foods, and its impact on international trade. The Food Standards Agency is supportive of the National Food Strategy<sup>196</sup> and has been providing input in its development.
- **Risks to energy, transport & ICT from high winds & lightning (CCRA risk: In11).** Through its Climate Change Adaptation Reporting Group, the Energy Networks Association has commissioned a research report to understand the risks of UKCP18 projections on energy assets. Current research suggests that storm strength (wind speed and frequency of lightning strikes) will not increase significantly. The risks associated with strong winds are being assessed within the analysis, where storms in the UK exceed thresholds. Electricity network resilience is also being managed through monitoring and reporting of events, and vegetation clearance, to minimise the risk of faults through contact with overhanging trees. This will be reviewed in light of the Met Office report.

The Energy Emergencies Executive and its Committee are the principal fora for industry engagement for resilience. This meets regularly and monitors key risks to the sector, and measures in place, to ensure resilience of the system. Downstream oil and gas are not generally affected by storms and gales of worst-case scenario levels of severity. However, storms and gales can disrupt electricity supplies, strong winds can impair recovery and lightning strikes can cause circuits to trip. Annually, electricity and gas industry partners confirm their winter preparedness, reviewing lessons learnt the following spring, to ensure necessary improvements. The electricity industry has a mutual aid resource sharing protocol named 'NEWSAC', which supplements the coordination of resources to effectively restore electricity supplies to customers, regardless of the network operator provider. To enhance resilience to lightning strikes, the energy sector uses protection systems, which ensure electrical assets disconnect and clear disturbances to voltage, and subsequently automatically energise and reconnect to the system. Engineering Standard ETR 132 Improving Network Performance Under Abnormal Weather Conditions by Use of a Risk Based Approach to Vegetation Management Near Electric Overhead Lines<sup>197</sup> requires Network Operators to fell a proportion of trees within falling distance of overhead lines.

The likelihood of major telecoms disruption from extreme weather is relatively low. The most serious issue is related to interacting risks, access to affected sites for repairs if transport routes are impacted, or high winds bringing down power lines impacting telecoms. The telecoms sector has frequent dialogue with the power sector, with

government input to improve cooperation. In the long-term, improving existing infrastructure such as increased rollout of fibre optic cabling, which is less susceptible to weather-related damage will strengthen resilience to these risks. Industry links with DCMS are effective and managed through the industry-run Electronic Communications Resilience and Response Group (EC-RRG) which represents all major operators. The EC-RRG has committed to regular updates of its report which considers the impacts of climate change on the telecoms sector as well as to voluntary reporting on climate change adaptation. EC-RRG and DCMS work closely with the regulator Ofcom on issues relating to adaptation planning.

The UK's data infrastructure of around 500 data centres is provided by multiple private operators. Individual operators compete based on their resilience through international, peer reviewed standards like ISO27001 and the EN5600 series, and commercial industry ratings like 'Uptime Tiers', which include provisions for severe weather risks. Lightning poses both direct risks (strikes and surges) and indirect risks (damage to communications, energy and transport infrastructure), and high winds can also compromise communications, energy and transport connections. Risk of lightning is addressed by advanced earthing systems and surge protection, plus compliance with the BS EN 62305. On-site emergency generating capacity accommodates interruptions in grid electricity and fluctuations in frequency, with data centres being resilient to transport interruptions due to effective risk planning. However, if combined with grid power outage, severe transport disruption could delay oil supplies for emergency generators. Significant damage to communications infrastructure continues to represent risks that operators address through approaches like mirroring and disaster recovery sites.

- **Risks to passengers from high temperatures on public transport (CCRA risk: PB2).** In managing the London Underground network, Transport for London (TfL) continues to follow its cooling hierarchy wherever possible. This includes minimising energy use through optimised train performance, and recycling the energy recovered through regenerative braking and from tunnel and station cooling. TfL is also running 'Beat the Heat' campaigns which encourage customers to prepare for high temperatures. TfL has introduced air-conditioning to trains covering 40% of the Underground network; over two-thirds of the Overground fleet; and all trains running between Heathrow and Paddington. For buses, TfL is focusing on energy efficient cooling methods, functional windows and painting the roofs of all London buses white to reflect heat. TfL is also planning a research project to explore the impact of heat on bus passengers, focusing on thermal comfort.
- **Risks to offshore infrastructure from storms and high waves (CCRA risk: In12).** Developers of offshore windfarms will factor in offshore conditions when designing, constructing, and maintaining their projects. This applies to both windfarms and transmission assets. Any generation asset that is connected to the National Grid Transmission system will go through rigorous checks and balances through the National Grid connection process and will be subject to robust regulatory requirements for connection by Ofgem. This ensures all assets that form part of energy infrastructure are resilient to a number of risks, including severe disruptive weather.
- **Risks to health from changes in air quality (CCRA risk: PB10).** Cleaner Air is one of Public Health England (PHE)'s top ten strategic priorities, as set out in PHE's Strategy 2020-2025<sup>198</sup>. PHE is developing a five-year programme of work which aims to reduce the sources of air pollution and people's exposure to it, particularly for the most vulnerable groups. In doing so, PHE are considering physical and mental health co-

benefits. One priority is to understand opportunities and threats associated with air pollution and health, including climate change. PHE also co-led the implementation of the National Institute for Health Research Health Protection Research Unit (HPRU) in Environmental Change and Health (2014-2020) to address climate risks and health outcomes across climate resilience, healthy sustainable cities, and public health and the natural environment<sup>199</sup>. PHE has secured further funding for phase two of the HPRU. PHE is simultaneously undertaking consultations with lead academics, devolved administrations, and cross-government partners to update the guidance on Health Effects of Climate Change in the UK report (due 2023). Work from HPRU on Environmental Change (2016-20) has led to the development of three policy briefs, including housing energy and indoor air quality, and how to adapt UK housing stock to higher summer temperatures. These are currently being finalised.

The Government has put in place a £3.8 billion plan to clean up vehicle emissions and we are implementing measures in our Clean Air Strategy (CAS)<sup>200</sup> which the World Health Organization praised as “an example for the rest of the world to follow”<sup>201</sup>. The Environment Bill delivers key parts of the CAS and introduces a duty to set a legally-binding target for fine particulate matter concentrations, and a duty to set a long-term air quality target. In collaboration with the CCC, the Air Quality Expert Group ran a workshop in January 2020 looking at the impacts of net zero pathways on future air quality in the UK, a report<sup>202</sup> for which was published in June 2020. It found that for virtually all the changes proposed on the CCC net zero pathway, better air quality outcomes can be envisaged. It also, however, highlighted several areas where the options adopted need to be carefully assessed to ensure the pathway to that end goal is as beneficial as possible.

A fuller update on these developments will be included in a NAP actions update to the CCC to inform its next Progress Report. Defra continues to work closely with the £18.7 million UK Research & Innovation and Met Office Strategic Priority Fund on Climate Resilience, to ensure it achieves its aims to be multidisciplinary and addresses research gaps identified in CCRA2.

## Recommendations for the Cabinet Office and N°10

*Continue to embed Net Zero as a core Government goal and strengthen focus on climate adaptation:*

- *Led through the Cabinet Committee on Climate Change, which should meet monthly and report transparently on progress, including adaptation.*
- *Ensure departments and delivery bodies are sufficiently resourced and are taking action as set out in this report.*

We welcome the CCC's recommendation that net zero should be embedded as a core government goal and that the focus on climate adaptation should be strengthened. In October 2019 it was announced that the Prime Minister would chair a Cabinet committee on climate change<sup>203</sup>. The PM-chaired Climate Action Strategy Committee (CAS) determines the UK's overarching climate strategy, both domestically and internationally. This strategy covers both net zero and adaptation.

In May 2020, the Prime Minister also established a Climate Action Implementation Committee (CAI), chaired by BEIS Secretary of State<sup>204</sup>. CAI supports the CAS to operationalise the Government's climate strategy by driving the implementation of decisions made there. It considers matters relating to the delivery of COP26, net zero and building the UK's resilience to climate impacts and ensures the credibility and drives forward delivery of plans for addressing these areas. It will also consider how their plans can support the Government's Covid-19 recovery strategy, working closely with other relevant committees.

CAS and CAI meet as needed and the Government will continue to announce collectively on agreed climate change policy decisions as appropriate. It is a long-established convention that information about the specific discussions that have taken place at Cabinet Committees is not shared publicly.

We are committed to ensuring that departments have sufficient resources to achieve our ambitious climate objectives and ensure that we achieve net zero. This will be considered as part of the upcoming Spending Review. HM Treasury is working with teams across government to ensure that climate change is central to this process and the Green Book already mandates the consideration of climate and environmental impacts in spending bids. HM Treasury will work with all departments to ensure their bids are ambitious on decarbonisation while delivering value for money and helping to meet other government objectives.

*Ensure the COVID-19 recovery plans accelerate the transition to Net Zero and strengthens the UK's resilience to climate risks.*

This Government has made clear that in recovering from Covid-19, we must build back better and greener, and to do that at the pace that this moment requires. Many of the actions needed for our net zero and environmental goals can create employment and economic opportunities.

Since the outset of Covid-19, we have announced that we will invest over £3 billion to reduce emissions from the UK's buildings, £250 million for an emergency active travel fund as part of a £2 billion package for cycling and walking as part of plans to boost greener, active transport, £191 million into a Sustainable Innovation Fund to help companies recovering from the impact

of Covid-19 keep their cutting-edge projects and ideas alive and £100 million into research and development of direct air capture technologies.

The Spring Budget also confirmed over £1 billion support for ultra-low emission vehicles, £640 million in a Nature Climate Fund to increase tree planting in England and restore 35,000 hectares of peatland in England and £270 million on a Green Heat Networks Scheme<sup>205</sup>. In addition, £100 million was announced in August 2019 to scale up low carbon hydrogen production<sup>206</sup>.

*Set the Sixth Carbon Budget (covering 2033- 2037) in line with the Committee's advice, due in December 2020.*

We are committed to setting the sixth carbon budget (covering 2033-2037) by 30 June 2021, taking into account the independent advice of the Committee on Climate Change (CCC), in accordance with the Climate Change Act 2008. We look forward to carefully considering the CCC's advice.

*Develop and implement plans towards making all public buildings and vehicle fleets zero-carbon in the long term.*

*Government must set the standard on buildings decarbonisation by accelerating plans to halve direct emissions in the public estate by 2032 at the latest.*

Net Zero Buildings announced £1 billion over the next year in a new Public Sector Decarbonisation Scheme to upgrade public sector buildings, including schools and hospitals, making them fit to help meet net zero with energy efficiency and low carbon heat measures.

As pledged in the Clean Growth Strategy, BEIS has worked with departments to agree a 43% greenhouse gas emission reduction target by 2020 (based on 2009/10 levels). Central government reduced its greenhouse gas emissions by 39% in 2017/18, exceeding the target of 32%. We are investigating options for both central and wider public sector emissions reduction targets post-2020.

BEIS will continue to enable greenhouse gas emission reductions through the Public Sector Energy Efficiency Loan Scheme. The capital pot for England stands £385 million by 2020/21. This funding, managed by Salix Finance, has delivered over 17,000 projects, significantly improving energy performance in the public sector.

Cabinet Office is working across government to combine work to improve the condition of the government estate and its sustainability, under a theme of a well-maintained zero carbon estate.

Robust strategic asset management planning is a key part of the decision-making framework for property. Progress this year has included embedding the transition towards a well-maintained zero carbon estate into the annual strategic asset management planning process.

The forthcoming Spending Review will be looking at how government property bids support progress towards a well-maintained zero carbon estate. In order to support government departments to develop strong investment cases, the Office of Government Property has developed a suite of tools and guidance.

*Cabinet Office should lead a strong cross government response to the most urgent national risks set out in the third Climate Change Risk Assessment.*

The Climate Action Implementation Committee and Climate Action Strategy Committee consider matters relating to the delivery of COP26, net-zero and building the UK's resilience to climate change, providing the credibility and momentum to deliver plans to address future impacts. Additionally, the Climate Change National Strategy Implementation Group (NSIG) - of which the Cabinet Office is a member - aims to enhance the UK's prosperity, security and international standing through leadership on climate and an acceleration of the global shift to clean sustainable growth and overall climate resilience. The NSIG will continue to cover both domestic and international aspects of climate change impact mitigation and resilience building.

The evidence reports for the Climate Change Risk Assessment (CCRA) review the latest available evidence (including cutting-edge climate science, such as the new UK Climate Projections UKCP18) to identify the UK's priority climate risks<sup>207</sup>. Following the research gaps highlighted in the CCRA2 evidence report, Defra, Devolved Administrations and research councils (NERC, ESRC and EPSRC) commissioned six research reports as part of the CCRA3 evidence report, which have now been published on a new UK Climate Risk website<sup>208</sup>. These reports, along with wider evidence, will inform the CCRA3 Evidence Report which is developed with contributions from over 450 people from more than 130 organisations. This will be used to inform the Government's third CCRA report (due in 2022) and subsequently the third National Adaptation Programme.

The third National Adaptation Programme (NAP) (a five-yearly requirement under the UK Climate Change Act 2008) will be published in 2023 setting out how we will address climate risks in England in the following five years. It will follow from and respond to the priority risks in CCRA3. Cabinet Office will work closely with Defra and other government departments to develop a third NAP that delivers a strong cross-government response to the priority risks set out in CCRA3.

Where possible, in the future, the Cabinet Office and Defra will look to align the CCRA process and its findings with other relevant government strategies and assessments including, for example, with the National Security Risk Assessment, ensuring that risk scenarios fully account for long-term influences such as climate change.

*Review guidance documents used in policy and business case development (e.g. the Green Book) and ensure these are consistent with the requirements of Net Zero and account for the impacts of climate change.*

Our world-leading Green Book guidance on appraisal and evaluation provides detailed advice for valuing the costs and benefits of interventions with regards to climate change mitigation, adaptation and other environmental impacts.

The Green Book is clear in its requirement to consider all benefits and costs – stating, for example, that ‘social cost-benefit analysis requires all impacts – including social, economic, environmental and financial – to be assessed relative to continuing with what would have taken place in the absence of intervention’.

We are revising the Green Book Supplementary Guidance on Accounting for the Effects of Climate Change<sup>209</sup> to include updated information on climate evidence and assessments. This guidance, which will be published soon, will be an important tool in supporting departments to

meet the Green Book requirement to consider climate risks in policy, programme and investment decisions where appropriate.

## Recommendations for the Foreign Commonwealth and Development Office, the Department for Business, Energy & Industrial Strategy, and the COP26 Unit

### ***Demonstrate UK climate leadership at COP26 and the G7, including:***

*Submit a UK Nationally Determined Contribution (NDC) on the basis of the pathway to reach Net Zero by 2050 that the Committee will advise on in December 2020. Deliver an exemplar NDC, reflecting the expectations of the Paris Agreement, including commitments on adaptation and climate finance (on which the Government recently committed to double spend). Choose timing to maximise diplomatic impact.*

As incoming COP26 President, the Government is urging all countries to come forward with ambitious updated Nationally Determined Contributions (NDCs). The UK will play its part and come forward with an enhanced NDC well ahead of COP26 at a point which contributes to the greatest possible momentum and ambition. The Government's priority for the UK NDC is a clear statement of the UK's overall contribution to the Paris Agreement's temperature goals out to 2030. The Paris Rulebook provides technical guidance on what Parties must include in an NDC. The UK will follow this guidance and, as set out in the Paris Rulebook, the information that supports the NDC will be mindful of the need for clarity, transparency, and understanding.

### ***Update the UK's long-term low greenhouse gas emission development strategy with the UNFCCC to reflect a formulated economy-wide plan needed to achieve Net Zero by 2050.***

The UK is committed to demonstrating international climate leadership through role modelling best practice reporting and transparency. As set out in the adoption of the Paris Agreement, Parties to the UNFCCC are invited to communicate long-term low greenhouse gas emission development strategies by 2020. In 2018, the UK submitted its Clean Growth Strategy as its long-term low emission develop strategy to the UNFCCC.

Leading up to COP26, we will bring forward ambitious plans across key sectors of the economy to meet our world-leading net zero 2050 target, which we will use to update our long-term low emission development strategy to the UNFCCC.

### ***Support and champion increases in domestic UK action on mitigation and adaptation consistent with reaching net-zero emissions and demonstrating that all departments are planning for a minimum 2°C rise in global temperature with consideration of 4°C.***

Whilst we accelerate efforts to end our contribution to climate change, we must continue to take robust action to ensure the country is well prepared to face the challenges a changing climate brings.

We know that achieving our long-term goals on adaptation will require many steps along an evolving pathway. Our approach involves planning for the long term, whilst remaining responsive to the latest evidence and tools.

We are revising the Green Book Supplementary Guidance on Accounting for the Effects of Climate Change<sup>210</sup> to include updated information on climate evidence and assessments. This

guidance, which will be published soon, will be an important tool in supporting departments to meet the Green Book requirement to consider climate risks in policy, programme and investment decisions where appropriate. The updated guidance introduces a new appraisal approach for potentially climate-affected projects whereby a minimum baseline consistent with a global temperature rise of 2°C must be considered. For projects with longer-term horizons (beyond 2035), an additional appraisal, consistent with a global temperature rise of 4°C, must also be undertaken. Government departments, agencies and arm's length bodies continue to work closely to increase the nation's resilience to climate change.

2021 marks a hugely significant year for global climate action, culminating in COP26 which will be hosted in Glasgow in November. Increasing international action on adaptation and resilience is one of the core priorities for the UK's Presidency of COP26, (alongside Clean Energy, Clean Transport, Nature-based solutions and Finance). Building on our foundational work on adaptation and resilience, we will put our own approach in the spotlight as we face a unique opportunity to showcase, and share best practice, whilst driving further progress at home to ensure our international ambitions are underpinned by strong domestic adaptation and mitigation action.

*Work through UNFCCC and other international fora (e.g. ICAO) to support the development of high integrity international carbon markets and strengthened governance for bioenergy and removals, through rulesetting, capacity-building and early market development.*

The UK continues to play a leading role in international negotiations on carbon markets. In the past year, we have worked with others to reach agreement by the International Civil Aviation Organization (ICAO) Council on the crediting programmes eligible for the pilot phase of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), as well as to develop options for the implementation of the International Maritime Organization's 2050 emissions reduction commitment. Although countries were not able to agree to rules under the UNFCCC on international carbon markets (part of 'Article 6') at COP25, as the incoming COP Presidency the UK is fully committed to helping parties reach agreement at COP26.

While the last year saw growth in market activity, there remains a need for further capacity building. In recognition of this, and in addition to our existing market-related support, the UK will provide funding to the World Bank's Partnership for Market Implementation, a programme focused on the implementation of carbon pricing mechanisms in the 2020s. Given the evolving nature of carbon markets, the UK is regularly assessing how we can best support capacity in developing countries and further market development, on a bilateral or multilateral basis.

*Help support the adoption of raised ambition and Net Zero targets internationally in the year before COP26 to maximise the international impact of the UK Net Zero target. This will help countries onto sustainable development paths, focusing on areas of comparative UK strengths.*

As hosts of COP26, the Government is encouraging the highest possible ambition on mitigation, adaptation and support to tackle climate change. We have a strong bilateral engagement programme through ministers and ambassadors. We are working with international partners to push for the highest possible mitigation ambition through new or updated Nationally Determined Contributions, and long-term strategies from countries, regions, cities and businesses that set a course for net zero, in advance of COP26.

*Actively utilise the opportunities of the UK's international leadership platforms ahead of COP26 to convene efforts to align global COVID-19 recovery plans with the goals of the Paris Agreement.*

As countries recover from the Covid-19 pandemic, they face choices that will have profound long-term consequences – for people and the planet. The pandemic has heightened awareness of the human and financial costs of major global challenges including air pollution, zoonotic diseases, and climate change, all of which can have a negative effect on economies, health and human development. The climate crisis and global biodiversity loss continue to worsen – despite a temporary reprieve in greenhouse emissions when industrialised countries locked down – and their effects are already felt in many of our partner countries, as they are in the UK, through more intense and more frequent shocks.

The Prime Minister laid out the UK's commitment to a cleaner, greener recovery in his speech to the UN Financing for Development event in May, stating that 'we owe it to future generations to build back better and base our recovery on solid foundations, including a fairer, greener and more resilient global economy'<sup>211</sup>.

Our COP26 and G7 Presidencies next year provide the UK with a strong platform for global green and resilient recovery. We will work multilaterally to recover better, support the most vulnerable and anchor enhanced and credible climate action at the heart of recovery, pressing for a fair and inclusive increase in global ambition.

The UK has a leading role on green recovery through our co-leadership of the UN Financing for Development work stream on recovering better for sustainability. With our co-leads (the EU, Fiji and Rwanda) we have worked to identify and produce a range of policy options, setting out the transformative actions needed to deliver a truly clean, inclusive and resilient global recovery from Covid-19 aligned to the SDGs and Paris goals. The UNSG is hosting an event during the UNGA high-level segment to mobilise action, and we are urging others to use this moment to commit a green recovery, and to draw on our 'menu' of options to help guide their recovery.

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We are working closely with the international finance institutions to ensure that stimulus packages amounting to billions of dollars provided in response to Covid-19 reflect international climate and environment objectives through the provision of targeted financing. The UK is also working with Multilateral Development Banks to ensure an inclusive and resilient recovery from Covid-19 supports delivery of the Paris Agreement.

The UK is working closely with the GEF Secretariat on its response to Covid-19 as they have developed immediate, medium term and long-term responses to the pandemic. The latter including exploring the transformational changes for people and the planet in the context of the next GEF replenishment.

We are continuing to support a global green and resilient economic recovery through our International Climate Finance programmes. Since June 2020, we have committed a package of over £100 million to date in support of the global green recovery efforts across Latin America, Africa and Asia which includes:

- The £64 million Territorios Forestales Sostenibles programme which will create local jobs in areas affected by Covid-19 and conflict, improving livelihoods of communities who rely on forests.
- £17 million of additional funding for the NDC partnership, including support for a new initiative to fund economic advisers in partner countries to work on a green, resilient recovery.
- The expansion of NAMA Facility Special Initiative to help countries rebuild sustainable and resilient economies and scale up climate ambition.
- The £12 million UK PACT Green Recovery Challenge Fund announced by the Secretary of State on June 2020 to support low-carbon transitions and a green, resilient and inclusive economic recovery across ODA-eligible countries.
- These initiatives will support green recovery efforts, which in turn supports growth and job creation and builds resilience to future shocks. Through our UK International Climate Finance, we can support a green, fair and inclusive recovery in more than 100 countries and our results to date demonstrate the transformative impact that international climate action can have.

The Government will continue to place a green and resilient recovery at the centre of our climate diplomacy abroad whilst utilising our influence in the international institutions to ensure that this remains a key focus of recovery efforts.

*FCDO: Develop a plan to address the scale of climate risk that the UK faces from climate change overseas, with support from Defra, DIT and the Home Office.*

The UK Government acknowledges the role of climate change as a stress multiplier both domestically and internationally and will continue to align our expertise on climate-related risk with our core security and defence policy.

Government addresses the physical risks of climate change overseas through our chairmanship of the Risk Informed Early Action Partnership<sup>212</sup>, a £2 million commitment this year to the UN Climate security mechanism, and the pledge of a significant proportion of our international climate finance over the next five years towards building resilience.

Government proactively manages climate-associated socio-economic risks. The UK convened the Global Resource Initiative taskforce in July 2019 to investigate how the Government can create sustainable, resilient supply chains<sup>213</sup>. The findings are currently under consideration and will be responded to this year. Government commissioned an independent review to develop recommendations to shape a National Food Strategy, to look across issues of food security, climate change and health<sup>214</sup>. Part one was launched on 29 July 2020<sup>215</sup>, and part 2 will be published in 2021. More broadly, the Integrated Review of security, defence, development and foreign policy, announced in February 2020, will consider how the UK's international and national strategy must evolve as the world changes<sup>216</sup>. The increasingly tangible effects of climate change are recognised as a key driver of this change, both in the UK and globally.

Government will continue to analyse the evidence for the impact of climate driven forced migration, instability and potential knock-on effects for the UK. The MOD has commissioned a review on the role of climate change in national defence, with a view to publication in December 2020<sup>217</sup>.

## Recommendations for HM Treasury

*Ensure the COVID-19 recovery plans accelerate the transition to Net Zero and strengthen the UK's resilience to climate risks.*

Since the outbreak of Covid-19, we have put climate at the heart of our recovery. In recognition of the need to support workers into low carbon industries, we have created Skills Advisory Panels that can advise local areas how to transfer to low-carbon industries. We also ensured that any company receiving financial support as a Last Resort Business Intervention will be expected to commit to ambitious climate conditions. In addition to this, to encourage a shift to walking and cycling, we announced £2 billion to improve cycle lanes and the pedestrian experience<sup>218</sup>.

At the Summer Economic Update we went further still. We announced £3 billion for green buildings to cut bills, cut carbon, and create jobs, as well as strengthening R&D funding for revolutionary decarbonisation technology by dedicating £100 million towards Direct Air Capture technologies to support our net zero target<sup>219</sup>. We will continue to build on this over the autumn with the Spending Review and Budget.

The UK's recent history shows there is a mutually reinforcing relationship between sustainable economic growth and emission reduction. Renewable sectors have the potential to create new jobs and drive investment across the UK. We need a strong, resilient economy to help deliver net zero and prepare for future risks, which the Government is providing through our economic support and wider pro-growth policies.

*Complete the Net Zero Review, which should:*

- Develop a plan for funding decarbonisation fairly and review the distribution of costs for businesses, households and the Exchequer.*
- Consider near-term as well as long-term decarbonisation funding needs and policy implications for a just transition.*

The Government has announced that the Net Zero Review report will be published in spring 2021. In the meantime, HM Treasury will publish an interim report this autumn. This will present some of our initial findings and analysis for the Review. The Review looks at the overall costs of reaching net zero by 2050, the impact on the economy, and how the transition could be funded.

*The spending review(s) should ensure departments are fully equipped to deliver the necessary actions across climate change mitigation and adaptation, during the rest of this Parliament and beyond.*

HM Treasury is working with teams across government to ensure that climate change is central to the Spending Review.

Our world-leading Green Book already mandates the consideration of climate and environmental impacts in spending bids. It is clear in its requirement to consider all benefits and costs – stating, for example, that 'social cost-benefit analysis requires all impacts – including social, economic, environmental and financial – to be assessed relative to continuing

with what would have taken place in the absence of intervention'.

We are revising the Green Book Supplementary Guidance on Accounting for the Effects of Climate Change<sup>220</sup> to include updated information on climate evidence and assessments. This guidance, which will be published soon, will be an important tool in supporting departments to meet the Green Book requirement to consider climate risks in policy, programme and investment decisions where appropriate. We are continuing to think about how to further embed assessment of climate impacts in fiscal events. We will work with all departments to ensure their bids are ambitious on decarbonisation while delivering value for money and helping meet other government objectives.

*Ensure the forthcoming National Infrastructure Strategy is fully consistent with the UK's Net Zero and climate adaptation objectives, in particular on buildings energy efficiency, where funding is likely to be needed beyond manifesto commitments.*

Infrastructure is central to our economic strategy, and the Government will publish the National Infrastructure Strategy setting out further details on its long-term ambitions, including on decarbonisation and levelling up, in the autumn.

Energy efficiency will have a key role to play in meeting our net zero target. As part of the Plan for Jobs, the Chancellor recently announced £3 billion of new funding to make our homes and public sector buildings greener by improving their energy efficiency. This could support 140,000 green jobs, upgrade 650,000 homes and public sector buildings, and save households hundreds of pounds on their energy bills<sup>221</sup>. This is a significant and accelerated down payment on decarbonising buildings to stimulate the economy.

The Government uses a range of policy levers to achieve its environmental objectives, including spending. Any decisions on future spending are for the upcoming Spending Review.

*Work with BEIS on the Buildings and Heat Strategy, and a strategy for net-zero manufacturing to ensure that relative prices favour a shift to low-carbon technologies that sufficient funding is available and to consider the role of tax incentives (e.g. Stamp Duty differentials).*

HM Treasury, BEIS and other government departments work closely together in the policy development process and will continue to do so. We keep all taxes under review.

The Budget announced a package of measures to support low carbon heat technologies, including a £270 million Green Heat Networks Fund, a Green Gas Levy to increase the proportion of green gas in the grid and a new £100 million Clean Heat Grants scheme, to provide grants for heat pumps and biomass boilers<sup>222</sup>.

*Work with MHCLG and the new buildings safety regulator to ensure that local authorities are properly funded to enforce buildings standards.*

Last year MHCLG consulted<sup>223</sup> on proposals to move towards a Future Homes Standard. We expect the new standard to require new homes to produce 75-80% lower CO<sub>2</sub> emissions compared to current levels. These homes will be 'zero carbon ready', with the ability to become fully zero carbon homes over time as the electricity grid decarbonises, without the need for further costly retrofitting work. We will respond to the Future Homes Standard consultation in

the autumn where will set out a meaningful and achievable increase to the energy efficiency standard for new homes, as a first step towards the full standard. We also intend to review the roadmap to the Future Homes Standard to ensure that implementation takes place to the shortest possible timeline.

Our ambition is that homes built under our new planning system will not need expensive retrofitting in the future. To work towards ensuring that all new homes are fit for a zero-carbon future we will also explore options for the longer-term future of energy efficiency standards.

We will also want to ensure that high standards for the design, environmental performance and safety of new and refurbished buildings are monitored and enforced. We have published the Planning for the Future consultation document that proposes reforms of the planning system. These proposals could free local authorities from many planning obligations and allow local authorities to be able to reassess resources and focus more on enforcement. Ensuring that planning standards and building regulations are met, whether for new homes or for retrofitting old homes, will help to ensure that we deliver homes that are fit for the future and cheaper to run.

*Reform Vehicle Excise Duty to provide stronger incentives to purchase zero emission vehicles and halt the shift towards larger, higher emitting cars.*

The Government uses the tax system to encourage the uptake of cars with low carbon dioxide emissions to help meet our legally binding climate change targets.

At Spring Budget 2020, the Chancellor announced that zero emission cars would be exempt from the Vehicle Excise Duty (VED) supplement for vehicles with a list price exceeding £40,000 from 1 April 2020. This reduced the VED liabilities of around a third<sup>224</sup> of new zero emission cars by around £1,600<sup>225</sup>. As a result, zero emission cars pay no VED, either at first registration, or subsequently.

Also at Spring Budget 2020, the Government published a call for evidence examining how to make VED a more effective lever for incentivising the uptake of electric vehicles and reducing emissions from road transport<sup>226</sup>. Specifically, the call for evidence seeks to build understanding of how the VED regime influences individuals and fleet car purchasers when deciding which vehicle to purchase, and what bearing it has on manufacturers when deciding which models to produce.

The Chancellor also announced an additional two years of company car tax rates that benefit ULEVs, ending in April 2025, and that zero emission vans will be nil-rated within the van benefit charge from April 2021.

*Review guidance documents used in policy development (e.g. the Green Book) and ensure these are consistent with the requirements of Net Zero and account for the impacts of climate change.*

Our world-leading Green Book guidance on appraisal and evaluation<sup>227</sup> provides detailed advice for valuing the costs and benefits of interventions with regards to climate change mitigation, adaptation and other environmental impacts.

The Green Book is clear in its requirement to consider all benefits and costs – stating, for example, that ‘social cost-benefit analysis requires all impacts – including social, economic,

environmental and financial – to be assessed relative to continuing with what would have taken place in the absence of intervention’.

We are revising the Green Book Supplementary Guidance on Accounting for the Effects of Climate Change<sup>228</sup> to include updated information on climate evidence and assessments. This guidance, which will be published soon, will be an important tool in supporting departments to meet the Green Book requirement to consider climate risks in policy, programme and investment decisions where appropriate.

***Climate Adaptation:***

*Reinstate funding for an adaptation support service for businesses and public sector bodies including local authorities.*

*Develop a plan for funding climate resilience across infrastructure, society and the economy, equivalent to the work currently being undertaken on Net Zero.*

Adaptation is rightly integrated throughout the policies and programmes of government. Where relevant, project proposals from government departments should consider and apply the Green Book supplementary guidance on Accounting for the Effects of Climate Change to ensure climate impacts are incorporated into cost benefit analysis. It will be particularly important to consider the risks and effects of climate change if a potential policy, programme or project has assets or elements affected by the weather, has long-term lifetimes, involves significant investment, has high value at stake (including human wellbeing and biodiversity), provides or supports (critical) national infrastructure, involves decisions which will result in ‘lock-in’ to a particular future, or where climate change may lead to irreversible damage or has significant interdependencies with other government activities or the wider economy.

We are revising the Green Book Supplementary Guidance on Accounting for the Effects of Climate Change<sup>229</sup> to include updated information on climate evidence and assessments. This guidance, which will be published soon, will be an important tool in supporting departments to meet the Green Book requirement to consider climate risks in policy, programme and investment decisions where appropriate.

From 2012, the Government ran a Climate Ready Support Service (CRSS), designed to deliver the objectives in the first National Adaptation Programme (NAP), published in 2013. It was envisaged as a time limited three-year programme but was extended for a further year until March 2016. Many of the extensive range of tools that the CRSS produced with stakeholders over its existence continue to be applied by businesses and organisations to support adaptation activities. The second NAP was published in 2018 and builds on the progress made under the first NAP. The Government continues to engage with key national stakeholders on climate resilience, supporting organisations reporting under the Climate Change Act’s Adaptation Reporting Power (ARP), and by hosting the Local Adaptation Advisory Panel (LAAP), a forum for dialogue on climate change adaptation between local authorities, central government and delivery bodies.

The Government will continue to promote planning and investment in adaptation, including as part of the Comprehensive Spending Review and other policy reviews, such as Covid-19 recovery measures.

## Recommendations for the Department for Business, Energy & Industrial Strategy

*Ensure the COVID-19 recovery plans accelerate the transition to Net Zero and strengthen the UK's resilience to climate risks.*

This Government has made clear that in recovering from Covid-19, we must build back better and greener, and to do that at the pace that this moment requires. Many of the actions needed for our net zero and environmental goals can create employment and economic opportunities. They can also play a role in addressing longer-term economic challenges facing the UK which the pandemic may accentuate - including poor productivity and inequality between regions.

As set out above, this year alone, the Government has set out billions in support for our low-carbon economy. We are taking action in every sector including: over £3 billion to transform energy efficiency in homes and public buildings; £2 billion to kickstart a cycling and walking revolution; £1 billion support for ultra-low emission vehicles; £800 million to capture carbon from power stations and industry; a £640 million Nature Climate Fund; £350 million to cut emissions in heavy industry; and £100 million to research and develop Direct Air Capture technologies.

Investing in green measures offers wide-ranging societal and wellbeing benefits. Our £640 million Nature for Climate Fund will protect, restore, and expand habitats like woodlands and peat bogs. Over the next five years, we will increase tree planting in England as part of a UK-wide effort to increase planting to levels recommended by the CCC, and restore 35,000 hectares of peatland.

In responding to Covid-19, the Government will assess the impacts of potential Last Resort Business Interventions against their contribution to our environmental goals, including our climate change and air quality targets. Companies that have exhausted all other options and meet the exceptionally high bar for Last Resort Business Interventions, will need to agree to appropriate conditions, including those on climate.

*Deliver a renewed Clean Growth Strategy that is consistent with Net Zero and the Committee's December 2020 recommendations on the Sixth Carbon Budget. Where policies remain under development, there should be clear statements on their plans and ambition.*

The Government welcomes the Committee's recommendation. Leading up to COP26 - in addition to ambitious plans across key sectors of the economy, including an Energy White Paper, Transport Decarbonisation Plan and Heat and Buildings Strategy - we will publish a comprehensive Net Zero Strategy, setting out the Government's vision for transitioning to a net zero economy, making the most of new growth and employment opportunities across the UK. These will raise ambition as we outline our path to hit our 2050 target.

We will build on the strong foundations we have established through our leading progress in decarbonising our economy; our ambitious manifesto commitments; and recent announcements from the Prime Minister and Chancellor of measures to cut emissions as we build back better in our economic recovery from Covid-19.

The Government looks forward to the Committee's advice on the sixth carbon budget in December this year, ahead of setting this next ambitious target on the path to net zero by June 2021 as required by the Climate Change Act.

*Review the planned UK Emissions Trading System following the Committee's December advice on the Sixth Carbon Budget and adjust it to align to the Net Zero pathway.*

In the government Response to the Future of UK Carbon Pricing consultation published in June 2020<sup>230</sup>, we committed to consulting on the most appropriate trajectory for the UK ETS cap for the remainder of its first phase within nine months of the CCC's sixth carbon budget advice being published, should that be the method of carbon pricing we choose to adopt on leaving the EU ETS. The Government's aim is that any changes to the policy to appropriately align the cap with a net zero trajectory will be implemented by 2023 if possible and no later than January 2024, although we would also aim to give the industry at least one year's notice to provide the market with appropriate forewarning.

As stated in The Future Relationship with the EU: The UK's Approach to Negotiations<sup>231</sup>, the UK would be open to considering a link between any future UK Emissions Trading System (ETS) and the EU ETS (as Switzerland has done with its ETS), if it suited both sides' interests. As an alternative to a standalone UK ETS, to ensure a carbon price remains in place in all scenarios, the UK Government has also published a consultation on the design of a Carbon Emission Tax.

#### ***Buildings decarbonisation:***

*Produce an ambitious Buildings and Heat Strategy to eliminate emissions from buildings through a clear direction for the next 30 years backed by standards, funding to make low-carbon heat pay, enabling measures (i.e. skills and green passports) and actions to drive immediate progress. The CCC will advise further on heat policy later this summer. (In partnership with HMT, MHCLG and DfE).*

The Government is developing options for how a long-term framework of policy approaches, including regulation, can combine to provide a clear direction-of-travel for industry and accelerate the uptake of low-carbon heat, initiate a transformation of our building stock, and set us on a path to decarbonising all homes and buildings. Our Heat and Buildings Strategy, which we aim to publish later this year, will establish the strategic direction within which we will consult on further strands of this policy framework.

The Department is developing policies to deliver low carbon heating in the 2020s and meet our climate targets. BEIS is will continue to work closely across Whitehall including with MHCLG to develop the Heat and Buildings Strategy.

#### ***Buildings targets and standards:***

*Publish long-awaited policies to deliver Clean Growth Strategy ambitions on retrofit (minimum EPC band C by 2035), the 20% business efficiency target and the public sector targets. This must include a package for able-to-pay homeowners, a delivery mechanism for the social housing minimum standards and support for SMEs.*

The Department has taken forward several policies forward to hit the target we set out in the

## Clean Growth Strategy:

- We launched a new Streamlined Energy and Carbon Reporting framework from April 2019. Requiring large UK businesses by law to disclose their emissions in their annual reporting.
- We launched the Boosting Access for SMEs to Energy Efficiency competition (BASEE) (£6 million) to develop new business models or solutions that reduce costs, simplify processes and encourage the take-up of energy efficiency by SMEs at scale. This aims to overcome access to finance barriers around scale.
- To support the able to pay we launched the £2 billion Green Homes Grant, under which homeowners and landlords can apply for a voucher to fund up to two thirds of the cost of hiring tradespeople to upgrade the energy performance of their homes (up to a maximum contribution of around £5,000).
- The Whole House Retrofit competition was launched in June 2019 to demonstrate cost reduction in the deep retrofitting of buildings through economies of scale and scope. This summer we announced awards totalling £7.7 million to three winning projects, which will retrofit over 300 homes<sup>232</sup>. The projects are being led by Cornwall Council, Nottingham City Council, and the London Borough of Sutton, and will complete by March 2022.
- We also awarded awards totalling £1.8 million to three projects that applied to the Green Home Finance Innovation Fund<sup>233</sup> competition. The projects will develop innovative green mortgage and additional borrowing products, as well as tools to evaluate the impact of energy efficiency on property valuation, and a digital platform connecting homeowners with installers of energy efficiency measures. The three winning projects, which have until March 2022 to complete, are being led by Lloyds Bank, Monmouthshire Building Society, and Home Infrastructure Technology Limited, and they are targeting any consumers that would not get support under Government schemes.

The Government also remains committed to consult on the merits of setting requirements for lenders to help households to which they lend to improve the energy performance of their homes, as set out in the Green Finance Strategy, in due course. The consultation will build on feedback from the Government's call for evidence on Building a Market for Energy Efficiency<sup>234</sup>, the Government response to which was published in July 2019.

As of April 2020, certain privately rented homes in England and Wales which are required to have an Energy Performance Certificate (EPC) must have a minimum energy performance rating of EPC Band E, unless a valid exemption has been registered under the Private Rented Sector Minimum Energy Efficiency Standards Regulations<sup>235</sup>.

We are consulting on improving the energy performance standards of privately rented homes, in line with our Clean Growth Strategy commitment to improve as many privately rented homes as possible to EPC Band C by 2030<sup>236</sup>, and are also conducting the second round of the PRS Enforcement Pilot Study to support local authorities in the enforcement of the Private Rented Sector Minimum Energy Efficiency Standards Regulations. We are planning to disseminate a best-practice toolkit to all local authorities in England and Wales in 2021 to help promote and enforce these regulations.

Later this year we will publish a consultation on our approach to decarbonising the largest commercial and industrial buildings responsible for over half the emissions from non-domestic buildings. The consultation will set out proposals to introduce a new mandatory rating scheme

for the largest buildings with ratings obtained and publicly disclosed annually, enabling comparison between similar buildings, and showing progress towards net zero.

We will also respond to last year's consultation on the Private Rented Sector Regulations for commercial and industrial buildings where we set out the Government's preferred trajectory of all buildings in scope achieving an EPC B where the package of measures is cost effective.

Following the call for evidence on extending EPCs, we have set out a summary of responses to call for evidence on Energy Performance Certificates in Buildings, alongside an action plan to enhance and strengthen the current EPC framework<sup>237</sup>.

BEIS's Social Housing Decarbonisation Fund, specifically, will include a technical assistance element for social landlords, so they are able to assess the condition of their stock, and develop business cases that take account of wider plans around building remediation, scheduled repair & maintenance, and estate regeneration. To ensure effective join up, MHCLG are represented on the Social Housing Decarbonisation Fund project board and will be involved in the development and delivery of the scheme at a working level.

Next year we will publish a consultation on the Small Business Energy Efficiency Scheme<sup>238</sup>. While no decision on the final delivery model for the scheme has yet been taken, we have commissioned research into auction design in order to further inform the policy-making process. The purpose of the scheme remains unchanged, to reduce business energy bills and lower carbon footprints by overcoming the significant and well documented barriers SMEs face. We intend that the scheme would be underpinned by a new quality mark for retrofit currently being developed by the British Standard Institute with industry experts. This quality mark will be available in spring next year.

The Government is planning to publish a Heat and Buildings Strategy later this year, which will set out the immediate actions we will take for reducing emissions from buildings. These actions include the deployment of energy efficiency measures and low carbon heating as part of an ambitious programme of work required to enable key strategic decisions on how we achieve the mass transition to low-carbon heat and set us on a path to decarbonising all homes and buildings.

#### ***Carbon Capture Usage and Storage:***

*Choose the preferred funding model and mechanism for delivering CO<sub>2</sub> infrastructure by the end of this year, planning for plants to be operational at multiple industrial clusters by the mid-2020s.*

*Support business models for CCUS designed for use in industry, electricity and hydrogen production and GHG removals.*

In August, we published the Government Response on potential CCUS business models, for use in industry, electricity, low carbon hydrogen and CO<sub>2</sub> T&S networks<sup>239</sup>.

These business models are integral to the efficient and cost-effective decarbonisation of our economy. Combined they will enable the deployment of firm and flexible low carbon power in a low cost, flexible electricity system; support at-scale low carbon hydrogen for use across the economy; and support the low carbon economic transformation of the UK's industrial heartlands. The learnings from deployment of CCUS and the development of its transport and

storage network will be essential in the deployment of negative emissions technologies through bio-energy CCUS (BECCS) and direct air capture with carbon sequestration (DACCs).

We will provide an update on our preferred funding model and mechanism for delivering CO<sub>2</sub> infrastructure, Industry and Power CCUS by the end of the year. In developing this option, we will consider the application of the CCUS Infrastructure Fund for the early projects to support improved value for money. Further information on business models for industrial CO<sub>2</sub> capture is set out in the specific recommendation below.

We will publish a consultation on hydrogen business models in 2021 before finalising the preferred approach in 2022.

#### ***Manufacturing and construction:***

##### *Publish manufacturing and construction decarbonisation strategy.*

In July, the Government announced plans to publish an Industrial Decarbonisation Strategy in spring 2021. The Strategy will set out the Government's vision for a prosperous, low carbon UK industrial sector in 2050. Working closely with Devolved Administration partners, the Strategy will set out how the low carbon transition can support industrial competitiveness and the green recovery across the UK, including identifying opportunities for new markets and sectors to develop.

The Strategy's aims are to:

- Show how the UK can have a thriving, competitive industrial sector aligned with the net zero target.
- Set out how and when government will act to support this, while sharing the costs fairly between industry, its customers and the taxpayer.
- Start a conversation with industry, shareholders, customers, employees and wider society about the shape of industry in a net zero world.

##### *Decide on preferred mechanism for supporting industrial CO<sub>2</sub> capture and set out plans for awarding support.*

The government response on potential business models to enable the deployment of CCUS was published in August<sup>240</sup>. This underlines the Government's ambition to deliver CCUS and low carbon hydrogen in the 2020s, supported by new commercial frameworks. The response document sets out the progress we have made on business models to incentivise CCUS and low carbon hydrogen, as well as an update on the £800 million CCS Infrastructure Fund, announced at Spring Budget. The response sets out the Government's position to progress an Industrial CCUS Contract for Difference model (with an element of capital grant funding for initial projects). We will provide a further detailed update on the model design and potential plans by the end of the year. On low carbon hydrogen, it includes a commitment to continue to progress the development of a low carbon hydrogen business model with the intention to consult on a preferred business model in 2021.

##### *Consult on mechanisms to enable early deployment of industrial fuel switching.*

The consultation on the final design of the Industrial Energy Transformation Fund (IETF) was published in October 2019. The IETF is a grant funding scheme aiming to support businesses to reduce bills and cut carbon emissions. The first application window opened in July and over 600 stakeholders attended launch events. The scheme will support companies to undertake a variety of energy efficiency and decarbonisation projects. Phase 1 of the scheme, which is worth at least £30 million, was launched in June 2020 alongside the government response to the consultation and the scheme is open for bids until the 28 October 2020.

Through support for engineering studies in Phase 1, the scheme aims to enable earlier deployment of industrial fuel switching projects than would have otherwise been possible. The next phase of the scheme will then support the deployment of these projects in industry, as well as further studies if necessary. The Industrial Energy Transformation Fund is worth £289 million, being delivered by BEIS in England, Wales and Northern Ireland. The Scottish Government will separately administer £26 million allocated for this purpose in Budget 2018.

*Agree an ambitious and tight set of Climate Change Agreements with industry to help deliver industrial energy efficiency improvements and set out which policies will deliver the additional 12 TWh of industrial energy efficiency potential identified by the Government.*

The Industrial Decarbonisation Strategy due to be published in spring 2021 will set out the role of energy efficiency in getting industry to net zero, as well as the role of current and future policies.

We consulted earlier this year on extending the current Climate Change Agreements (CCA) scheme by two years<sup>241</sup>, through:

- The addition of a new Target Period, from 1 January 2021 to 31 December 2022.
- Extending certification for reduced rates of Climate Change Levy (CCL) for participants meeting obligations under the scheme to 31 March 2025.
- Re-opening the scheme, allowing eligible facilities not currently participating to apply to join.

In addition, we have sought initial views on potential reforms were there to be a future CCA scheme beyond the extension.

The government response<sup>242</sup> was published in July and the regulations to implement the extension were laid in September. We are now in the process of agreeing individual targets with the 50 or so sectors in the Scheme, who have until 30 October to provide evidence-based counter-proposals<sup>243</sup>.

*Set out a clear plan to develop near-zero emission non-road mobile machinery (NRMM) for applications where these are not yet available and increase deployment for NRMM applications where options are already available.*

We agree that emissions from non-road mobile machinery need to be addressed. Examples of NRMM technologies are diggers, forklifts, cranes and rollers. Decarbonisation is largely associated with finding alternatives to diesel combustion engines. Given the similarities with decarbonisation of transport fuels, we are considering where best in the policy landscape this sits.

### **Fossil fuel supply:**

*Set out policies to significantly reduce the emissions intensity of fossil fuel production.*

The Government recognises that the North Sea is a declining basin, but which still has a role to play in meeting our energy needs now, while also being an asset which can assist in decarbonising the UK economy. We have committed to deliver a transformational North Sea Transition Deal within this Parliament to support that objective and preserve high quality jobs in new sectors<sup>244</sup>. The Deal, which is at an early stage, is expected to include a focus on how the oil and gas sector can support delivery of new low carbon energy technologies such as hydrogen and carbon capture and storage, while also driving to reduce emissions from our domestic offshore oil and gas production.

In the meantime, while we continue to produce oil and gas domestically, we are keen to ensure we do so in a way that meets our climate change objectives, including on emissions. We have therefore announced that we will conduct a review of policy on the future UK offshore oil and gas licensing regime. Initial findings will be included in the Energy White Paper.

The independent regulator of the offshore oil and gas sector, the Oil and Gas Authority (OGA), has also considered its role in working with industry to support the Government's net zero obligation. At the start of this year, the OGA announced it would revise its strategy to take this new policy into account. The OGA has carried out a 12-week consultation and expects to publish a revised strategy by the end of the year.

In advance of this, the OGA is already using its influencing and regulating role to bear down on emissions from oil and gas production. In September 2020, they published baseline benchmarking research on flaring and venting, providing important data which will help to drive good practice<sup>245</sup>. And in May 2020, the OGA published analysis, comparing the carbon intensity of UK Continental Shelf (UKCS) gas with imported liquified natural gas (LNG) and pipelined gas. This showed imported LNG has a significantly higher average emission intensity than gas extracted from the UKCS. However, the OGA's analysis showed that importing gas via by pipeline, particularly from Norway, produces even lower average emissions, suggesting there is still potential for the UKCS to continue to improve its operations and lower emissions further.

*Ofgem to set ambitious requirements for reductions in leakage of methane from the gas grid.*

The primary means of reducing gas leakage is through replacing leaky iron pipes with plastic (known as repex). For RIIO-GD2 Ofgem are proposing to set the gas distribution network companies a target of replacing 15.5k km of iron mains and their associated services, which by the end of the five year period (starting 1 April 2021) will reduce annual emissions from the grid by 485 kilotonnes CO<sub>2</sub>e. This equates to a reduction of 17% of their current levels of leakage. On top of this Ofgem are setting a financial incentive for the GDNs to reduce leakage further by means of pressure management and gas conditioning. Ofgem consulted on these proposals earlier this year<sup>246</sup> with the aim of making the decision at the end of this year.

### **Electricity generation, transmission and distribution:**

*Deliver plans to decarbonise the power system to reach an emissions intensity of 50*

*gCO<sub>2</sub>/kWh by 2030, with at least 40 GW of offshore wind and a role for onshore wind and large-scale solar power, with a clear timetable of regular auctions.*

The Government recognises that our legally binding net zero target will require deep decarbonisation in the power sector. 2030 will be an important point at which we will assess progress on the path to net zero. We set an ambition through the offshore wind sector deal<sup>247</sup> to deliver up to 30GW by 2030 and, on 6 October, we announced our commitment to increase that ambition to 40GW. In addition, we have also set a new ambition of 1GW of floating offshore wind by 2030 within that target of 40GW by 2030. This will provide the sector with forward visibility – which is important given the long-term nature of offshore wind projects – to stimulate investment and begin the cost reduction journey.

To meet net zero cost effectively, we will also need to ensure the deployment of other low-cost renewable technologies. To support growth across a diverse range of technologies we have announced all established renewable generation technologies, including solar and onshore wind projects, will be able to bid for contracts in the next Contracts for Difference (CfD) allocation round planned to open in late 2021<sup>248</sup>.

We will continue to support investment in renewables and have set out our intention to hold a CfD auction around every two years. The next allocation round, for which we have set a target to support up to double the capacity of renewable electricity secured in the 2019 round, is planned to open in late 2021.

We agree with the CCC that the majority of low carbon generating capacity in 2050 is likely to be provided by renewable technologies but that there will still be a key role for low-carbon ‘firm’ (i.e. not weather dependent) power, such as nuclear and gas CCUS, to decarbonise while maintaining security of supply and keeping costs low.

*Continue to improve system flexibility through the implementation of all actions in the Smart Systems and Flexibility Plan, including working with DCMS on cyber security. Develop mechanisms that encourage users of electric heat and electric vehicles to be flexible and ensure that costs of network upgrades are shared among those who benefit from them and negative impacts on existing consumers are avoided.*

Flexibility is essential for net zero and we are making good progress rolling out smart meters to homes and small businesses across Great Britain<sup>249</sup> and in delivering the Smart Systems and Flexibility Plan, with 25 of 38 actions implemented. We are now looking beyond the plan to develop the next phase of smart systems policy, in close collaboration with Ofgem and industry. In particular, we are looking at further market reforms, system digitalisation and improved flexibility monitoring.

Realising our net zero ambitions will also require energy system governance arrangements able to drive decarbonisation while minimising costs for consumers and maintaining security of supply. We are currently considering the current split of responsibilities across Ofgem, system operators and government. BEIS also continues to work closely with Ofgem as it develops a network price control which enables strategic investment for networks to ensure net zero 2050 is achievable. BEIS works closely with DCMS on improving cyber security in the energy sector. For example, energy is included in the scope of the Network and Information Systems Regulations (NIS) 2018, which are designed to ensure that operators of essential services (OES), such as energy providers, have adequate cyber security systems in place. BEIS, working closely with Ofgem and the Health & Safety Executive, have regulatory powers to

oversee and enforce cyber security in the energy sector. Under the NIS Regulations, OES have to provide assessments of their cyber security measures, set against a common framework, and what steps they are taking to ensure that their services are secure.

BEIS and Ofgem are conscious that widespread network upgrades will be needed in order to meet net zero. Ofgem, through the RIIO price control, is developing a framework to enable this at best cost to consumers. Ofgem's recent Sector Specific Methodology Consultation<sup>250</sup> for the electricity distribution price control outlines options to enable strategic investment ahead of net zero. Ofgem's Access and Forward-Looking Charges Significant Code Review<sup>251</sup> considers price signals placed on network users, and net zero and fairness to consumers is at the heart of this work. Ofgem will consult on its minded-to position on this towards the end of the year.

*Develop a strategy to coordinate interconnectors and offshore networks for wind farms and their connections to the onshore network and bring forward any legislation necessary to enable coordination.*

In July, Minister Kwasi Kwarteng launched the Offshore Transmission Network Review<sup>252</sup> to bring together the key stakeholders involved in the timing, siting, design and delivery of offshore wind to consider all aspects of the existing regime and how this influences the design and delivery of transmission infrastructure for interconnectors and offshore wind.

Its terms of reference, as agreed with delivery partners and stakeholders in the sector, focus on identifying tactical near-term actions that can be taken and early opportunities for coordination for projects in the short- to medium-term, plus a longer-term strategic review to develop a new regime that can ensure a more coordinated approach for the future.

BEIS will publish an update by the end of the year, with a view to providing clarity for an enduring approach in 2021. Policy recommendations and proposed changes to the existing regime will be delivered through the usual consultation process.

*Consult on the future of the electricity market design as renewables make up an increasing share of generation, including consideration of technology neutrality, subsidy-free renewables, mechanisms for repowering, the need to ensure sufficient energy supply resilience at both national and regional levels, and the role of GHG removal technologies (see GGR below).*

The Government recognises the need for an effective policy framework in order to deliver the levels of renewables necessary to reach net zero. In March this year, the CfD allocation round 4 consultation<sup>253</sup> announced our intention to publish a call for evidence on the future of government support for renewables deployment. This will allow government to engage with industry on a range of topics including, the future of renewable financing, efficient system integration, and how to support innovation and new business models, thus allowing current policies to evolve in-line with the needs of the system.

We have announced that we will launch a call for evidence on greenhouse gas removal (GGR) support mechanisms later this year. This will explore both long- and short-term support options for GGRs, including bio-energy with carbon capture and storage (BECCS).

*Move Advanced Conversion Technologies (ACT), Dedicated Biomass with CHP and large-scale Anaerobic Digestion to CfD Pot 1 for established technologies, and restrict*

***ACT to CHP applications only.***

We do not think there is sufficient evidence to show that Advanced Conversion Technologies (ACT), Anaerobic Digestion (AD), and Dedicated Biomass with Combined Heat & Power (CHP) could compete with the technologies currently in Pot 1. We removed the requirement to state whether an ACT developer is deploying with or without CHP because we want to avoid provisions which would in practice disincentivise those developers from deploying CHP where demand for both heat and electricity exists. We considered that the contract terms that came into play when requiring ACT developers to declare they were deploying with CHP added complexities and costs to the project which led to developers choosing not to deploy with CHP. Decisions on which pots the various biomass technologies should sit in for future rounds will follow from the findings of the Biomass Strategy.

***Hydrogen:***

*Develop a strategy for low-carbon hydrogen use (across power, industry, transport and buildings), production and infrastructure, aiming for largescale hydrogen trials to begin in the early 2020s.*

We recognise the importance of setting out a strategic approach to hydrogen and will publish the UK Hydrogen Strategy in spring 2021. The strategy will outline government's ambitions for a UK hydrogen economy, and set out the near-term actions that need to be taken to ensure low carbon hydrogen can play a vital role in decarbonising industry, heat and heavy transport, whilst also providing system value through grid balancing and integration of increasing levels of intermittent renewable electricity.

Hydrogen is one potential option for decarbonising heating, alongside other solutions, including heat pumps and heat networks.

The Government is therefore supporting a range of research, development and testing projects designed to help determine the feasibility of using low carbon hydrogen as an alternative to the use of natural gas for heating in homes, businesses and industry.

BEIS is investing up to £121 million in a range of innovation programmes to explore and develop the potential of low carbon hydrogen across the value chain, including for heat.

BEIS is also working closely with industry and other stakeholders to ensure that the overall programme of work is comprehensive and provides the necessary evidence to assess key issues including safety, feasibility, costs and benefits and the overall consumer experience. The Hydrogen Advisory Council has been established to inform the development of hydrogen as a strategic decarbonised energy carrier for the UK. The Council is co-chaired by Minister Kwarteng and Sinead Lynch, UK Country Chair for Shell and held its first meeting in July 2020.

A £100 million Low Carbon Hydrogen Production Fund was announced in August 2019, which aims to enable greater use of hydrogen as a decarbonisation option across the energy system and encourage future private sector investment.

Through our response to the July 2019 consultation on CCUS and Hydrogen Business Models, we have committed to consulting on our preferred business model for low carbon hydrogen in 2021.

### **Bioenergy:**

*Refresh the UK's Bioenergy Strategy in line with recommendations on governance, monitoring and best-use from the Committee's 2018 biomass report and 2020 Land Use report. To include: consideration of the best-uses of biomass and waste resources to 2050 including wood in construction and the wider bio-economy; the role of CCS and requirements for CCS-readiness, with clear dates for when CCS will need to be integrated across biomass & waste facilities; UK and international governance over biomass feedstocks; support schemes, including for CO<sub>2</sub> removal and sequestration; aviation biofuels and UK production of biomass feedstocks.*

We intend to publish a new Biomass Strategy in 2022, building on the 2012 UK Bioenergy Strategy<sup>254</sup>. This will be 'cross-Whitehall', bringing together the many departments whose policies for delivering net zero involve the use of sustainable biomass. We will take into account the CCC's recommendations as we are developing the Strategy and we will set out more details for developing the Strategy in the Energy White Paper. We will provide a progress update on the Strategy development during 2021.

We have announced that we will launch a call for evidence on GGR support mechanisms later this year. This will explore both long- and short-term support options for GGRs, including BECCS.

### **Greenhouse gas removals:**

*Launch a consultation on the Government's preferred strategy and long-term requirement for GHG removals, including a proposed market design & set of governance principles.*

GHG removals have an important role to play in delivering the net zero target and are likely to be required principally to offset emissions from sectors which are difficult to abate through other means, such as some parts of agriculture and aviation. At the Summer Economic Update we announced that we will be strengthening R&D funding for revolutionary decarbonisation technology by dedicating £100 million towards direct air capture technologies to support our net zero target<sup>255</sup>.

In order to inform future policy and strategy on GHG removals, a call for evidence on negative emissions technologies will be launched later this year. The call for evidence will focus on carbon pricing, market design and governance principles for GHG removals. This will build on evidence gathered through the HM Treasury consultation on Carbon Emissions Tax<sup>256</sup>.

### **Finance:**

*Continue to use the Task force on Climate-related Financial Disclosure (TCFD) framework to better report transition and physical climate risks and shift investments away from high-carbon infrastructure. This should include clear deadlines for ensuring listed companies and large asset owners report on climate-related risks and opportunities, as recommended by the Green Finance Taskforce and Environmental Audit Committee.*

*Ensure the duties of economic regulators take into account the Net Zero transition, as well as the physical risks of climate change.*

We have set out in the Green Finance Strategy that the Government expects listed companies and large asset owners to disclose in line with the TCFD recommendations by 2022. We want to ensure that we take an effective and measured approach that does not disproportionately burden financial actors. That is why we have established a joint taskforce with the regulators to explore the most effective way to approach disclosure in the UK – and the taskforce's work will include consideration of whether it would be appropriate to make reporting mandatory. The Government's joint TCFD taskforce with the regulators will issue a report by the end of 2020 setting out our next steps on TCFD.

DWP is seeking powers in the Pension Schemes Bill to make adoption of and reporting against the recommendations of the Taskforce on Climate-related Financial Disclosures mandatory for occupational pension schemes. These measures, the first of their kind in UK pensions law, will ensure pension scheme members and others have sight of their pension scheme's governance of climate change risks on a granular and consistent basis. Action by trustees of such schemes will ensure members' savings are protected against the risks that climate change poses and are taking advantage of the investment opportunities the transition to net zero presents. The Department has launched a consultation on the timing, scope and details of these proposals<sup>257</sup>. The FCA also ran a consultation from March – October 2020 on putting in place a 'comply or explain' rule requiring premium listed companies to disclose in line with the TCFD recommendations.

We welcome the actions regulators are taking to embed climate considerations into their supervisory practices and approach. The Prudential Regulation Authority, the Financial Conduct Authority, the financial reporting Council and the Pensions Regulators published a joint statement on climate change alongside the Green Finance Strategy which set out how climate-related financial risks require a coordinated approach and collective action to address.

In February 2020, DWP issued its letter to the Pensions Regulator (TPR), setting out the Department's views on integrating climate change risks and opportunities into TPR's activities. In the Chancellor's remit letter to the Financial Policy Committee in March 2020, he welcomed the Committee's consideration of climate risks, including its decision to test the UK financial system's resilience to physical and transition risks and recommended that the Committee should continue to take into account both physical and transition risks from climate change in the delivery of its objectives.

#### **Research and Innovation:**

*Drawing on the Energy Innovation Needs Assessments ensure innovation funding (e.g. through UKRI, Catapults, the Industrial Strategy Challenge Funding and BEIS Innovation Programme) drives forward an extensive research and innovation package for delivering a net-zero, climate resilient future.*

On 1 July, the Government published its ambitious research and development roadmap to ensure the UK is the best place in the world for scientists, researchers and entrepreneurs to live and work, while helping to power up the UK's economic and social recovery and level up the UK<sup>258</sup>.

The Roadmap builds on the ambitious commitment set out at Budget to increase public spending in research and development (R&D) by £22 billion by 2024-25, putting the UK on track to reach 2.4% of GDP being spent on R&D across the UK economy by 2027.

Through the 2020 Comprehensive Spending Review, the Government will make the strategic

choices to secure a settlement that will enable us to meet our objectives for R&D, including those set out in the Roadmap.

The Chancellor announced at Budget 2020 to at least double the current £505 million Energy Innovation Programme. Priorities under this new programme will be informed by analysis including the Energy Innovation Needs Assessments published in December 2019<sup>259</sup>. One priority includes the June 2020 announcement by the Prime Minister of £100 million to support Direct Air Capture innovation.

The Energy Innovation Board is chaired by Sir Patrick Vallance, the government Chief Scientific Adviser and provides strategic oversight of government funding of energy and net zero innovation programmes.

#### **Skills:**

*Working with DWP, DfE and the Home Office, develop a strategy for a Net-Zero workforce that ensures a ‘just transition’ for workers transitioning from high-carbon to low-carbon and climate resilient jobs, integrates relevant skills into the UK’s education framework and actively monitors the risks and opportunities arising from the transition. This strategy should include the development and roll-out of plans for training and skills, with buildings and manufacturing being priority areas.*

Cross-departmental roundtables led by ministers including the Parliamentary Under Secretary of State for Apprenticeships and Skills, have taken place with various industry bodies to discuss skills for a green recovery and net zero. DfE continue to engage with cross-Whitehall departments including BEIS, DWP and the Home Office to help progress the net zero agenda and understand the potential skills shortages within clean growth. This includes ensuring there is support for industries that are changing, such as construction, and for workers to transition from high carbon activity, such as in oil & gas.

A first step towards this will be the Green Homes Grant Skills Training Competition in autumn 2020<sup>260</sup> which is making available £6.9 million of grant funding to support training in the installation of energy efficiency and low carbon heating measures supported by the Government’s Green Homes Grant voucher scheme. These include retrofit assessor and coordinator, insulation, heat pumps, solar thermal, and heating and hot water controls. Training developed via the competition is expected to support at least 5,000 training opportunities, and lessons learnt from the project will help inform future skills development work.

The Construction Leadership Council recently published its construction Industry Recovery Plan<sup>261</sup> to not only support the construction sector as it recovers from the impacts of Covid-19 but to take account of wider government priorities including reducing carbon emissions, improving the sustainability and resource efficiency of the construction and built environment sectors, and making measurable progress towards delivering net zero carbon. Skills are highlighted as a key element across the three phases of the plan with a focus on:

- Maintaining investment in training and retraining workers to support recovery and the adoption of new technologies.
- Ensuring investments contribute to net zero, resource efficiency and shared prosperity.
- Modernising training and qualifications system for construction to ensure that this is fit for purpose, and will support the delivery of the skills that the industry will need in future such as those related to the delivery of net zero carbon, and the multi skilling of the

construction workforce to increase flexibility and adaptability.

BEIS is also working with the Institute for Apprenticeships and Technical Education which is convening a Sustainability Advisory Group to guide the Institute in encouraging trailblazers to align apprenticeships to net zero and wider sustainability objectives. The group will work with the Institute to identify which apprenticeships directly support the green agenda and which may need refocussing and identify potential gaps where there is an opportunity to create new green apprenticeships. It will also develop guidance to encourage employers to include sustainable knowledge, skills and behaviours to be included across multiple apprenticeships.

In terms of transition for high carbon workers, government has made a commitment to deliver a transformational Sector Deal for the oil and gas sector that will help transition the sector and support workers within the industry. Ministers and officials are actively discussing the contents and timeframe for the North Sea Transition Deal that will be focused on the energy transition and net zero.

DWP continue to constantly review policies, strategies and services to help claimants to address skills gaps needed for the labour market and to enable jobseekers to pivot to high demand, growth sectors, including low-carbon and climate resilient jobs. The sector-based work academy programme (SWAP) has proved to be effective when filling entry-level vacancies (e.g. jobs involving the installation of smart meters, building insulation products etc.). SWAP placements can also be used as a route into apprenticeships for those who need to demonstrate core employability skills to secure an apprenticeship. DWP sees apprenticeships as the best route into high-skilled careers.

MOJ is also proactively engaging with employers in low carbon sectors to directly increase the number of prison leavers in their work forces through our New Futures Network. The New Futures Network is the specialist part of HMPPS that brokers partnerships between employers and prisons across multiple industry sectors.

#### ***Climate Adaptation:***

*Ensure the implementation of the Industrial Strategy, and the National Infrastructure Strategy, account for the risks of extreme weather now and in the future.*

The 2017 Industrial Strategy set out to harness the economic opportunities of the clean growth transition – building on existing strengths and growing new pillars for the economy of the future, while addressing specific decarbonisation priorities. It provided a framework for ensuring that clean growth is supported by our broader economic policy across skills, innovation, infrastructure, business support, exports and regional growth. The implementation of the Industrial Strategy will be aligned to meeting our legally binding net zero target and the Government's plans to build the UK's resilience to climate change impacts, including more extreme weather now and in the future.

Initiatives in the 2017 Industrial Strategy take account of building resilience to the impacts of climate change. For example, the £90 million Transforming Food Production Industrial Strategy Challenge Fund<sup>262</sup> to improve resilience in food supply chains and the Home of 2030 innovation competition<sup>263</sup>, created to drive innovation in the provision of affordable, efficient and healthy green homes for all, including designing homes to meet potential impacts of changing weather patterns due to global warming, accounting for changing temperature and flood risks.

Infrastructure is central to our economic strategy, and the Government will publish the National Infrastructure Strategy setting out further details on its long-term ambitions, including on decarbonisation and adaption, later in the autumn.

## Recommendations for the Department for Environment, Food and Rural Affairs

*Defra is the lead on Climate Change Mitigation for the Natural Resources Sector and the overall lead on Climate Change Adaptation strategy.*

***Introduce an ambitious new policy framework to drive transformational change in agriculture and land-use, including:***

*A strong regulatory baseline that includes low-cost, low-regret options, including standards for emission reduction through the use of existing (e.g. Nitrates Directive) and new legislation (Clean Air Strategy) and banning extraction of peat and rotational burning.*

Agriculture plays a key role in protecting the environment; and in achieving the targets set out in the 25 Year Environment Plan and meeting net zero. Our farmers are already required to meet important environment standards, including rules on resource use and soil management which will positively impact GHG balance<sup>264265</sup>. As part of the Clean Air Strategy, the Government will require and support farmers to take more action to reduce air emissions. The Strategy also commits to extending the Environmental Permitting regime to dairy and intensive beef in England by 2025. Defra and the Environment Agency will work with stakeholders to agree Best Available Technique documents for limiting pollution, including GHG emissions, water and air pollutants, from these sectors. The Government will also increase its engagement with interested parties on agricultural regulation in the autumn to ensure we have the best possible system for the agricultural sector in the future.

We are looking at how legislation could achieve the phase out of rotational burning of protected blanket bog to conserve these vulnerable habitats and are considering next steps. Real progress is being made in promoting sustainable alternatives to landowners and we continue to work with them constructively. In March, the Chancellor of the Exchequer announced the Government's intention to restore 35,000 hectares of our peatlands by 2025, which will more than double the current estimated amount of peat restoration. The England Peat Strategy will be published later this year, which will detail further how we intend to protect, restore, and reduce damage to our peatlands. The biggest user of extracted horticultural peat is the amateur gardening sector, and this is an important part of our policy focus. The Government is committed to phasing out the use of peat in horticulture in England by 2030.

***Establish a comprehensive delivery mechanism to deliver land-scape scale changes, including an increase in afforestation rates (to at least 30,000 ha per year across UK) and peatland restoration that addresses carbon, adaptation and other co-benefits (e.g. flooding, biodiversity, air and water quality). This should include mechanisms for private and public financing, which should also deliver agricultural measures above the baseline and other land-based solutions (e.g. innovative farming options, agro-forestry, production of biomass feedstocks, and hedgerow creation).***

We welcome the CCC's recommendation to introduce a delivery mechanism to deliver land-scape scale changes that address carbon, adaptation and other co-benefits. The Government has established a £640 million Nature for Climate Fund (£30 million of which has been brought forward alongside other funding as part of a £40 million Green Recovery Challenge Fund) to increase tree-planting and peatland restoration rates in England, helping reach our climate goals and manifesto commitments. The Government is committed to introducing the

Environmental Land Management (ELM) scheme from 2024.

We have consulted on proposals for a new England Tree Strategy<sup>266</sup> to inform delivery of the Nature for Climate Fund. The consultation has explored proposals to expand woodlands, increase tree-planting, increase uptake of agro-forestry and production of woody biomass. A wide range of 25 Year Environment Plan goals are outlined which the Strategy seeks to deliver on, and a commitment is made to ensure smooth transition between existing, new and future (ELM) mechanisms.

To address biodiversity loss at scale, we are establishing the national Nature Recovery Network: an increasingly interconnected network of places that are richer in wildlife, more resilient to climate change, and provide wider environmental benefits, including carbon capture. The Environment Bill sets the framework for at least one legally binding biodiversity target, establishes mandatory spatial mapping and planning tools to inform nature recovery (Local Nature Recovery Strategies); and establishes duties and incentives, such as biodiversity net gain, to drive change on the ground.

ELM will pay farmers and land managers to deliver environmental public goods, including: mitigation of, and adaptation to climate change; clean air; clean and plentiful water; thriving plants and wildlife; management of and resilience to environmental hazards, such as flooding and drought; and beauty, heritage and engagement with the environment. The scheme will be piloted in 2021, before launching across England in 2024. As set out in the ELM Policy Discussion Document<sup>267</sup>, we propose that Tier 3 of the scheme should focus on delivering landscape-scale projects that can make significant contributions to national priorities, such as net zero. This could include funding for afforestation, peatland restoration and wetland creation. We also propose that the scheme should also incentivise environmentally sustainable farming (through Tier 1), and the delivery of locally targeted environmental outcomes (through Tier 2) which could contribute to net zero. We are also investigating mechanisms for blending public and private sector finance through ELM and are exploring options for innovative finance mechanisms through our tests and trials.

*Addressing non-financial barriers such as knowledge exchange of low-carbon farming practices, issues for tenant farmers, support upskilling and scale-up of supply chains.*

Defra is looking at ways to reduce agricultural emissions controlled directly within the farm boundary and is considering a broad range of measures including improvements in on-farm efficiency. Defra has commissioned research into GHG mitigation options in agriculture to address existing knowledge gaps. The Clean Growth through Sustainable Intensification project will deliver its final report in November 2020. This will identify the most promising technologies and practices for adoption on farms and assess their feasibility and acceptability within the farming and food industry, as well as their suitability for application across England's diverse farming sector. A key part of this work will be advice and guidance to ensure farmers and landowners are fully equipped to adopt the outputs of the project.

ELM will support land managers' delivery of environmental goods and services, we are engaging with a wide range of stakeholders to inform ELM development, including tenant farmers, to ensure that ELM is designed equitably and to maximise environmental benefits. ELM participants are likely to undertake low carbon activities, such as careful use of inorganic inputs, and tending to natural assets that can store and sequester carbon. Examples of these assets are extensively managed grasslands, moorlands, heathlands, wetlands and woodlands. ELM also recognises that access to reliable guidance and adviser support will be central to the scheme's effectiveness. ELM plans to use a mixture of market and public sector advisers to

augment published scheme guidance.

In order to meet net zero, as well as other key government commitments in the 25 Year Environment Plan and the Clean Growth Strategy, there is a need for more nutrient recycling. While fertilisers are key, they also have consequences for air, water, habitat and soil quality. The Clean Air Strategy, published in 2019, sets out the Government's intention to minimise air pollution from fertilisers. An Expert Group is being established to provide recommendations on the optimal policy approach to minimise pollution from organic and inorganic fertilisers. There will also be two 'sector sounding boards' that allow engagement between practitioners, farmers and technical specialists with the discussions of the Expert Group. Outputs will contribute to a final, published report which will be fed back to the sector boards to inform guidance to farmers as appropriate.

*Policies to encourage consumers to shift to healthier diets and reduce food waste, including public sector leadership and development of an evidence-based strategy on diets; and target setting in the public and private sector to reduce food waste.*

The National Food Strategy: independent review led by Henry Dimbleby was commissioned to inform the Government's strategy to deliver safe, healthy, affordable food, regardless of personal circumstances, and to restore and enhance the natural environment for the next generation. It will build on the Government's obesity strategy to address the challenge of supporting people to eat healthy diets. Part One of the review was published on 29 July 2020<sup>268</sup>. It contains urgent recommendations in the wake of the Covid-19 pandemic and preceding the end of the transition period with the European Union. Part Two will be published in 2021 and will include a root and branch examination of the food system and the economics that shape it. Part Two will also investigate how the food system can contribute to the UK reaching net zero GHG emissions by 2050. The Government has committed to responding to the Review's recommendations in the form of a White Paper within six months of the final report's release and will carefully consider any recommendations in the report.

The Government is committed to using public sector food procurement policy to improve food quality, for example by improving nutrition and sustainability standards. Defra and DHSC are already working together to strengthen the nutrition standards in the Government Buying Standards for Food and Catering Services<sup>269</sup> to bring them in line with the latest scientific dietary recommendations. Part Two of the review will include a comprehensive recommendation on what the Government can do to ensure that publicly procured food and drink is healthier and more sustainable.

We welcome support from the CCC on policies which encourage consumers to reduce food waste. The Courtauld Commitment 2025 (C2025), funded by government and delivered by the Waste and Resources Action Programme (WRAP), was launched in 2016 to increase the resource efficiency of the food supply chain and includes a target to reduce UK food waste post farm-gate by 20% between 2015 and 2018. This has been successful to date, with household food waste totalling 6.6 million tonnes in 2018, down from 7.1 million tonnes in 2015<sup>270</sup>. WRAP evidence suggests this was delivered through a combination of C2025 actions, principally by a new citizen food waste prevention strategy, including the Love Food Hate Waste campaign, and an enhanced programme aimed to drive changes in food packaging design and labelling to encourage environmentally conscious consumer behaviour.

Our priorities for the coming year include further action through: a Food Waste Action Week in March 2021 which aims to raise awareness of food waste, clearly acknowledging links to climate change; and supporting WRAP in developing and piloting Behaviour Change

Interventions to gain a better understanding of what approaches will have the most impact in changing consumer behaviours.

Measures in the Environment Bill will permit us to take action to reduce food waste through enabling producer responsibility obligations to be applied at all levels of the waste hierarchy including the prevention of food waste through, for example, the redistribution of surplus food. Should progress from the proposed introduction of regulations on mandatory annual reporting of food surplus and waste and current food waste reduction policy be insufficient to maintain progress, we will consult on options to take regulatory action through producer responsibility obligations. These obligations may, or may not, take the form of a target.

#### **Resources and Waste:**

*Legislate (in England via the Environment Bill) for and implement a ban on landfilling of municipal & non-municipal biodegradable wastes from 2025.*

The Resources and Waste Strategy committed to working towards eliminating all biodegradable waste to landfill by 2030, and we are currently considering the feasibility of bringing this target forwards to 2025. It remains highly challenging to ban all biodegradable waste streams to landfill by 2025, due to the time required for the sector (both commercial and public) to establish alternative treatment infrastructure and to undertake key steps for example, allowing for local authorities to change contracts and role services. The Government is already committed to implementing measures that will remove a large proportion of biodegradable waste from the residual waste stream, such as through implementing separate food waste collections and consistency in the recycling system through the Environment Bill. This will deliver a reduction in volumes of biodegradable waste to landfill or other residual treatments. Remaining waste will increasingly be treated by alternatives to landfill, such as energy from waste plants and waste-to-transport fuels. We remain committed to conducting composition analysis, when relevant Environment Bill policies have been implemented, to determine whether the biodegradable content of residual waste to landfill remains an issue and taking action accordingly. In addition, we continue to review the scope for additional policy measures to prevent biodegradable waste going to landfill. We have also legislated (to come into effect on 1<sup>st</sup> October) to ban separately collected plastic, metal, glass and paper from being landfilled unless it has gone through some form of treatment and is the best environmental outcome<sup>271</sup>. This will further reduce the amount of biodegradable material sent to landfill.

Through our commitment to consult on mandatory annual reporting of food surplus and waste by food businesses in England, we will be taking legislative action to reduce food waste and associated emissions. We plan to publish this consultation before the end of the financial year. The need to report data is shown to spur companies into taking the necessary targeted action.

*Set a target for a 70% recycling rate by 2030 in England within the Environment Bill, and announce new policies to meet this target.*

Our current evidence indicates that a 70% municipal recycling rate target by 2030 is highly challenging to meet. In the Resources and Waste Strategy, we committed to meeting a 65% municipal recycling rate target by 2035. The Government has committed to a 65% recycling rate by 2035 based on analysis of major waste reforms to achieve consistent recycling collections, a deposit return scheme for drinks containers, and packaging extended producer responsibility. This is an ambitious target based on current evidence, but other changes in the policy landscape, such as the tax of plastic packaging may make this target and more

stretching ones such as those recommended by the CCC more feasible. Further analysis is required and further commitments for recycling will be considered for the next Environmental Improvement Plan.

Our existing level of ambition for the municipal recycling rate in part reflects a large degree of uncertainty in the size of the Commercial and Industrial component of municipal waste, and in the proportion of that waste which is recyclable. Confidently making a more ambitious recycling target first requires improvements in C&I waste data; we are working to achieve such improved data in the coming years through our Waste Tracking programme.

*Accelerate investment plans for local authorities to be able to put in place universal municipal waste recycling collections, rolled out across England during 2022-24, along with the required recycling, composting and AD facilities.*

The Environment Bill sets out new requirements for separate collection of key recyclable waste streams for households, non-domestic premises and commercial and industrial premises. These streams include food waste, plastics, paper and card, metal packaging and glass. The Bill also requires garden waste to be collected from households. These measures will provide for consistent collection arrangements, and together with Extended Producer Responsibility for packaging and Deposit Return Scheme reforms will help to increase recycling rates to 65% by 2035.

*Mandatory business food waste reporting, building on WRAP's existing voluntary scheme. Develop further policies to accelerate the Resource and Waste Strategy for England, focusing on encouraging efficiency in manufacturing and construction and reducing consumer demand for products.*

Government committed in the Resources and Waste Strategy to consult on mandatory business food waste reporting and will be publishing an updated Waste Prevention Programme that will focus on effort at the top of the Waste Hierarchy.

WRAP and the Institute of Grocery Distribution recently introduced the Food Waste Reduction Roadmap, a voluntary tool which 192 businesses are now committed to. The roadmap gives businesses directions on measuring and cutting food waste in their own operations, and on how they can replicate this with suppliers. However, a lack of awareness of the scale of the opportunity presents a major barrier to engaging more businesses to commit to the voluntary agreements. The Government, therefore, agrees with the CCC's recommendation for introducing mandatory food waste reporting by food businesses. We committed to consult on the introduction of these regulations in the Resources and Waste Strategy, and publication of the consultation will take place in 2020 or early 2021.

*Examine the impact of waste targets on the utilisation of (and need for further) energy from waste plants, and issue a set of guidance notes to help align local authority waste contracts and planning policy to these targets.*

The Environment Bill requires us to set at least one legislative target in the area of resource efficiency and waste reduction. Targets are set out in a Targets Policy Paper, published in August<sup>272</sup>. Future plans to help inform waste infrastructure needs will form part of the National Infrastructure Strategy.

### **Consumption emissions:**

*Continue to monitor consumption emissions. These are important to ensure that action to decarbonise UK-based activities does not result in emissions moving offshore and to track progress in decarbonisation of imports to the UK, which in turn can inform future policy (e.g. border carbon adjustments).*

Defra publishes the UK carbon footprint statistics<sup>273</sup> annually in collaboration with the University of Leeds. We will continue to work with Leeds to publish these statistics and monitor UK imported emissions over time. Since 2020, the University of Leeds have also provided Defra with estimates of England's consumption emissions, which have been reported on in the recently released Resources and Waste Strategy: Monitoring Progress<sup>274</sup> and as part of the 25 Year Environment Plan's Outcome Indicator Framework<sup>275</sup>.

### **Climate Adaptation**

*Ensure that adaptation measures are rewarded under the ELM scheme and are integrated properly into the 25YEP, Fisheries Bill and Environment Bill.*

## **25 Year Environment Plan and Environment Bill**

Mitigating and adapting to climate change is one of the ten goals of the 25 Year Environment Plan, reflecting their importance in our aim to improve the environment within a generation. Government agrees that climate change adaptation measures should be fully integrated across the 25 Year Environment Plan. Having a clear understanding of the impact of climate risks, and how we need to adapt, is fundamental to achieving the goals in the 25 Year Environment Plan.

New provisions in the Environment Bill will put the 25 Year Environment Plan on a statutory footing and help to drive progress. For example, the 25 Year Environment Plan will be adopted as the first statutory Environment Improvement Plan (EIP). The Bill will also give the Secretary of State the power to set long-term, legally binding environmental targets across the breadth of the natural environment, including a specific duty to set at least one target each in four priority areas: air quality, biodiversity, water, and waste reduction and resource efficiency. Through a statutory cycle of monitoring, planning and reporting, the Environment Bill creates a "triple lock" to drive progress: (1) The Government must have an EIP which sets out the steps it intends to take to improve the environment, and review it at least every five years; (2) The Government must report on progress towards achieving targets every year; and (3) the Office for Environmental Protection (OEP) will hold us to account on progress towards achieving targets and every year can recommend how we can make better progress, to which government must respond.

In August we published our paper Environment Bill: Environmental Targets<sup>276</sup> which sets out the objectives that we consider could be addressed by our first suite of targets, many of which could drive adaptation benefits. For example, we are exploring possible targets to reduce water abstraction to improve the status of terrestrial and freshwater species.

## **Environmental Land Management (ELM)**

We also welcome support from the CCC for rewarding adaptation measures under the Environment Land Management (ELM) scheme. ELM is a key delivery mechanism for the environmental goals set out in the 25 Year Environment Plan. One of the six public goods that

ELM will pay farmers and other land managers to deliver mitigation of, and adaptation to, climate change.

We will determine in more detail what ELM will pay for as we further develop the scheme and engage with the relevant stakeholders. Land management activities that could be funded through ELM to support adaptation to climate change include creating and enhancing habitats for species threatened by climate change, and land management actions to reduce the risk of flooding.

## **Fisheries Bill**

The CCC have previously highlighted the importance of integrating climate adaptation into the Fisheries Bill<sup>277</sup>. The Government's ambition is to set a gold standard for fisheries management to achieve sustainable fisheries safeguarding stocks for the long-term, an ambition which includes ensuring they adapt to, and reduce their impact on, climate change.

The Government responded to previous recommendations from the CCC by introducing a climate change objective in clause 1 of the Fisheries Bill to support marine and fisheries management policy's ability to mitigate against the effects of climate change, whilst adapting it for future impacts. This is one of several objectives working together to achieve a successful and sustainable fisheries management regime that reduces the impact of fishing on the environment.

The UK administrations will publish a Joint Fisheries Statement that will set out the policies to deliver the fisheries objectives, including the climate change objective. These policy statements will be reviewed every six years with progress reported every three years, based on the best available scientific evidence, which will allow the four UK Fisheries Administrations to continually improve the health of fish stocks and protect our marine environment from the threat of climate change.

Fisheries management policy will also be bound by the core environmental principles set out in the Environment Bill. The Government will publish a policy statement setting out how these environmental principles are to be interpreted and applied to ensure the improvement of environmental protection, and delivery of sustainable development.

## **Marine environment**

The resilience of the wider marine environment to climate change risks is also imperative, both in its own right and to support healthy fisheries and ensure coastal protection. Through the Environment Bill we are setting the ambitious target of having all Marine Protected Areas (MPAs) in England in favourable condition by 2043. This will complement on-going work and existing legal obligations. The recent independent Review into Highly Protected Marine Areas (HPMAs), chaired by Richard Benyon and published on 8 June 2020, recognised their potential role in securing our vision to leave the environment in a better state than we found it. The Review's headline recommendation is that HPMAs are an essential part of the UK MPA network and the Government should introduce HPMAs within existing MPAs. Government is currently considering its response, including the role of blue carbon habitats to improve the climate resilience of the seas.

Defra generates a range of evidence on the impacts and risks from climate change on the marine environment. For example, we have recently published new sensitivity assessments<sup>278</sup> to understand and forecast potential climate change impacts on MPA protected features and their role in supporting climate resilience; we have commissioned new work investigating the

sensitivity of UK habitats and species to ocean acidification and future monitoring needs; and we continue to develop the evidence on marine carbon stores, with work underway to examine carbon stocks, fluxes, protection and methods of restoration. Defra also provides support and funding to the Marine Climate Change Impacts Partnership (MCCIP), which recently published their 2020 Report Card and Backing Papers<sup>279</sup>. This Report Card provides updates on scientific understanding of climate change impacts on UK coasts and seas, including air and sea temperatures, ocean acidification and other physical changes. This comprehensive assessment covers the range and scale of physical, ecological and societal impacts of climate change including marine species, fisheries and marine heritage. Moreover, we continue to support the Global Ocean Acidification Observing Network (North East Atlantic Hub).

*Improve 25-YEP restoration targets for terrestrial and freshwater habitats to include all priority sites*

Protected sites will be at the core of our Nature Recovery Network (NRN) and we will restore 75% of these protected sites to favourable condition. We are also committed to restoring, or creating, an additional 500,000 hectares of wildlife-rich habitat outside protected sites. We have announced new funding for nature via the Nature for Climate, Nature Recovery, and Green Recovery Challenge Funds, and will be launching a national NRN Partnership in the autumn.

These goals will be given statutory underpinning by the Environment Bill, which establishes spatial mapping and planning tools – Local Nature Recovery Strategies - and creates duties, and incentives, to inform and drive nature restoration. It also establishes a framework for targets; we are committed to developing at least one legally binding biodiversity target. The final targets will be published in October 2022. Long-term targets will drive action by successive governments to protect and enhance our natural world and provide certainty for businesses and stakeholders.

We will set out further details on action for terrestrial and freshwater habitats in our Nature Strategy for England. This will be published following adoption of a new global biodiversity framework, which we expect to be agreed in 2021 under the Convention on Biological Diversity.

*Enable water companies to implement compulsory metering beyond water stressed areas by amending regulations and requiring all companies to consider systematic roll-out of smart water meters.*

*Increase ambition through setting targets for reducing water demand in households and businesses, and reducing leakage (in addition to increasing supply).*

*Introduce compulsory water efficiency labelling of household water products.*

The Government is committed to a ‘twin track’ approach to improving water resilience; involving action to reduce leakage and water demand, alongside investing in new supply infrastructure where necessary. In the 25 Year Environment Plan, the Government committed to work with industry to set an ambitious personal consumption target, and to take cost-effective and impactful measures to achieve it. The Environment Agency’s National Framework for Water Resources recently set an expectation for water company’s regional plans to reduce demand to 110 litres per person per day by 2050, and to drive down water use across all sectors.

In July 2019 Defra launched a consultation and call for evidence on measures to reduce personal water use<sup>280</sup>. Measures consulted on included extending metering (including the use of smart meters), water efficiency labelling and amendments to building regulations. We will be publishing a position in late 2020 setting out intended next steps, which will focus on ways to support everyone to save more water without placing compulsory requirements on consumers.

On 19 August this year, Defra published a policy paper<sup>281</sup> outlining target proposals under consideration. Targets would utilise powers in the Environment Bill. This included a possible target on water demand to reduce the volume of water taken from the environment by water companies and could encompass leakage, household and non-household water use. Defra's Water Conservation Report, published in December 2018, set a government target for a 50% reduction in leakage by 2050 and endorsed the water industry's existing commitment to this reduction. We will review progress on this target every five years, in line with the regulatory process.

*Commence Schedule 3 of the Flood and Water Management Act (2010) in England.*

Sustainable Drainage Systems (SuDS) are one of a range of responses to help manage surface water flooding within the Flood and Water Management Act 2010. While Schedule 3 has not yet been enacted in England, a number of measures have been put in place to deliver its policy intent to prioritise SuDS in new development. These include updates to the National Planning Policy Framework (NPPF) to ensure SuDS are provided in all new major developments, unless demonstrated to be inappropriate. Updates to planning made in 2018 emphasised the need for planning applications to provide clear evidence to justify an application not including SuDS, to show that clear maintenance arrangements are in place, and to provide more multifunctional benefit SuDS. A 2018 review of the application and effectiveness of planning policy for SuDS concluded that planning policy had succeeded in encouraging their inclusion on new developments, with 87% of planning applications sampled featuring SuDS<sup>282</sup>.

We are acting to ensure that households, businesses and local decision makers are properly informed about all flood risks, so that they can increase resilience, including through our Surface Water Management Action Plan and our response to recommendations from the independent review of surface water management responsibilities, as published on 26 August 2020<sup>283</sup>.

*Publish an updated national, long-term, outcomes-based adaptation strategy to address the increasing flood risk identified in CCRA2.*

The Government recognises the importance of long-term strategies to address the risk of flooding. In July 2020, the Government published a new long-term Policy Statement<sup>284</sup> setting out our goals for flood and coastal erosion risk management. The Policy Statement supports the Government's announcement of a record £5.2 billion investment in the flood and coastal defence programme between 2021 and 2027. It includes five policies and over 40 supporting actions to better protect and prepare the country against future risks from flooding and coastal erosion. The Policy Statement builds on the approach taken in the 25 Year Environment Plan and in the National Adaptation Programme and includes a commitment to develop indicators to monitor the impact of our actions over time.

Alongside the Policy Statement, the Environment Agency published the National Flood and Coastal Erosion Risk Management Strategy<sup>285</sup> to guide the activities of those involved in flood

and coastal erosion risk management. The strategy will play a significant role in the delivery of our Policy Statement. It will enable us to better prepare for a 2°C warming in global temperatures as well as support risk management authorities to plan for higher scenarios, such as a 4°C rise. It sets out a vision for a nation ready for, and resilient to, flooding and coastal change up to the year 2100 and includes long-term strategic objectives and shorter practical measures to achieve better outcomes for flood and coastal erosion risk management in England.

*Set near-term milestones for the withdrawal of Flood Re.*

*Accelerate uptake of property-level flood protection needed to meet Long-term Investment Strategy/ Flood Re targets.*

Flood Re are required every five years to publish an updated transition plan setting out the actions they and others need to take to achieve a risk reflective market by 2039. Flood Re's most recent Transition Plan was published in 2018 and sets out 12 areas Flood Re believes things need to change. These include limiting the risks of flooding; reducing the costs of flooding; promoting a competitive insurance market; and understanding the limits of affordability.

The plan places significant emphasis on the importance of encouraging property flood resilience (PFR) measures. Flood Re's quinquennial review made recommendations around how the scheme could accelerate the uptake of PFR. We intend to consult later this year on these proposals as well as some which go further than Flood Re's Quinquennial Review proposals<sup>286</sup>, in order to accelerate the uptake of Property Flood Resilience and better support customers and insurers to recognise the benefits. These are:

- The ability for Flood Re to offer discounted premiums to households that have fitted property flood resilience measures, such as airbrick covers or non-return valves.
- Permitting the payment of claims to include an additional amount to build back better, in a more flood resilient way.
- Speeding up resilient homes through working with Flood Re and the insurance industry to explore whether it would be beneficial for insurers to share more information with customers about their flood risk—encouraging everyone to take responsibility to encourage greater uptake.
- Exploring whether there's more that the Flood Re scheme could do to accelerate uptake of PFR, including whether the scheme's currently available funding could contribute.
- Technical changes to enable Flood Re to amend the amount of levy raised from UK insurers and the maximum amount that Flood Re are liable to pay out each financial year to deliver better value for money.

This consultation will also be used to inform future PFR policy, which will allow us to set additional milestones both for the uptake of PFR and for Flood Re's withdrawal from the market.

The Policy Statement, referenced in our response to the recommendation above also includes actions to accelerate uptake of property flood resilience to protect homes and businesses, such as our £200 million innovative resilience programme, and provide greater clarity about the use, effectiveness and benefits of property flood resilience measures.

Once these measures are implemented we will review progress in this area. Flood Re is also required to carry out further scheme reviews every five years.

## Recommendations for the Department for Transport

### ***Active travel and public transport:***

*Invest in walking and cycling infrastructure and strengthen other schemes to support active travel modes. Invest in public transport and other measures to reduce car travel demand (e.g. car sharing and mobility as a service). Improve infrastructure connectivity to lock-in positive behaviours that reduce travel demand (e.g. home-working).*

The Prime Minister's new plan for cycling and walking, "Gear Change: a bold vision for cycling and walking" was launched in July 2020 and committed to a wide range of measures to increase cycling and walking and make them the natural choices for short journeys<sup>287</sup>. The 33-point plan sets out commitments to improve safety, infrastructure, and the quality of our streets and enable people to take up higher levels of cycling and walking.

£2 billion of dedicated funding, from the £5 billion described below, over the next five years for active travel will support this change in behaviour.

In addition, we are undertaking research with the public to understand the barriers to mode shift away from cars to public transport and active travel, and the public acceptability of different policy options to encourage this.

### **Better Deal for Bus Users**

As part of the 'Better Deal for Bus Users' package announced in September 2019<sup>288</sup>, we will be funding £50 million for Britain's first All-Electric Bus Town and a £20 million Rural Mobility Fund to support demand responsive services in rural and suburban areas.

We held a competition for this fund with the deadline for Local Authorities to apply by 4 June. We received 19 and 53 bids respectively and are currently reviewing these. We hope to announce the winner(s) of the All-Electric Bus Town soon.

### **£5 billion funding**

The Prime Minister announced on 11 February 2020 £5 billion of new funding to overhaul bus and cycle links for regions outside London<sup>289</sup>. This additional investment will include support for at least 4,000 new zero emission buses to make greener travel the convenient option.

The funding outlined for buses will also go towards measures to encourage modal shift onto the bus, such as higher frequency services, more 'turn up and go' routes, new priority schemes, and more affordable fares. The details of the programmes, including how funding will be distributed, will be announced in due course alongside the Spending Review.

### **National Bus Strategy**

We are developing a long-term National Bus Strategy to ensure that buses will continue to have a significant role in connecting people, helping the economy meet our net zero ambitions, and improving air quality.

### ***Cars and vans:***

*Confirm bringing forward the ban on new petrol/diesel and plug-in hybrid car/van sales to 2032 at the latest. Apply the same rules to motorcycles*

The Government's aim is to put the UK at the forefront of the design and manufacturing of zero emission vehicles. We are already investing around £2.5 billion with grants available for plug in cars, vans, lorries, buses, taxis and motorcycles, as well as funding to support charge point infrastructure at homes, workplaces, on residential streets and across the wider roads network. Since February we have been consulting on bringing forward the end to the sale of new petrol and diesel vehicles to 2035 (from 2040), or earlier if a faster transition appears feasible, as well as including hybrids for the first time<sup>290</sup>.

As part of this consultation, we asked stakeholders what accompanying package of support is needed to enable the transition and minimise the impacts on businesses and consumers across the UK, building on the significant demand and supply side measures already in place. The consultation ended on 31 July 2020 and we are considering the responses. We will announce the outcome of the consultation in due course.

The consultation focused on the sale of new cars and vans, rather than new motorcycles, though we did receive comments on motorcycles in consultation responses. We provide grants for the purchase of zero emission powered two wheelers and - recognising that the market for other plug-in motorcycles is still at an early stage of development - the Chancellor announced at the Budget that the Government will extend the grant for motorcycles to 2022-23.

*Back up the end date by introducing a Zero Emission Vehicle Mandate requiring increasing shares of sales to be zero-carbon, reaching 100% by 2032 at the latest. Continue to support EV infrastructure to ensure it is not a barrier to high uptake levels including for those without individual offstreet parking, and implement recommendations from the EV Energy Taskforce and the Faraday Institute.*

## **Zero Emission Vehicle Mandate**

We recognise that we need to go further than the existing regulatory regime to reduce CO<sub>2</sub> emissions from road transport to deliver our climate goals and we are considering this as part of the Transport Decarbonisation Plan.

## **Infrastructure**

Our vision is to have one of the best electric vehicle infrastructure networks in the world. This means a network for current and prospective electric vehicle drivers that is affordable, reliable, accessible and secure. Government and industry have supported the installation of over 18,000 publicly available charging devices. This includes over 3,100 rapid devices – one of the largest networks in Europe. Our grant schemes and our £400 million public-private Charging Infrastructure Investment Fund will see thousands more electric vehicle chargepoints installed across the UK. We have consulted on proposals for chargepoints to be installed with all newly built homes in England, where appropriate<sup>291</sup>. The Government is providing £500 million over the next five years to support the rollout of-charging infrastructure for electric vehicles. Today, a driver is never more than 25 miles away from a rapid chargepoint anywhere along England's motorways and major A roads. By 2023, we aim to have at least six high powered, open access chargepoints (150-350kW capable) at motorway service areas in England, with some larger sites having as many as 10-12, and by 2035 we expect the number of increase to around 6,000 high powered chargers across the network. In May, funding this financial year for

local authorities under the On-street Residential Chargepoint Scheme was doubled to £20 million. This will fund up to another 3,600 chargepoints (7,200 in total for 2020/21) across the country to make charging at home and overnight easier for those without an off-street parking space. It is also vital that consumers can charge efficiently and safely. The Government will consult on using its powers under the Automated Electric Vehicles Act<sup>292</sup> to mandate minimum standards, such as requiring contactless payment for rapid chargepoints, to improve the consumer experience.

### **Electric Vehicle Energy Taskforce and smart charging**

The taskforce reported in January with 21 proposals for government, industry and Ofgem<sup>293</sup>. The report recognises the progress already made to ready the grid for EV uptake and sets out challenges for future attention, including proposals to encourage smart charging<sup>294</sup>. In 2019 government consulted on mandating that all private chargepoints must be smart and comply with minimum device standards<sup>295</sup>. A summary of responses was published in May 2020, and it is our intention to lay the relevant legislation next year<sup>296</sup>.

Many proposals in the EV Energy Taskforce report aimed at government are already being addressed. For example, a number of the proposals on smart charging will be considered as we develop our forthcoming smart regulations to mandate that all new private chargepoints must be 'smart'. The Government has prioritised the remaining proposals and identified where new workstreams need to be created to address them. Our work with the taskforce is continuing into a second phase, to develop more detailed plans to deliver the proposals, building on the positive cross-sector collaboration achieved in the initial phase.

### **Faraday Institution**

The Faraday Institution's report called for timely and coordinated efforts to attract battery manufacturing to the UK. The Government is committed to supporting the automotive sector. We have recently announced up to a further £1 billion of additional funding to develop and embed the next generation of cutting-edge automotive technologies through the Automotive Transformation Fund. Of this funding, £10 million has been made available for the first wave of innovative R&D projects to scale up manufacturing of the latest technology in batteries, motors, electronics and fuel cells. The Government is also calling upon industry to put forward investment proposals for the UK's first 'gigafactory' and supporting supply chains to mass manufacture cutting-edge batteries for the next generation of electric vehicles, as well as for other strategic electric vehicle technologies. Further investment in the Automotive Transformation Fund will be finalised with the Treasury, as part of the Spending Review, in line with all spending programmes.

*Set more ambitious UK regulations on new car/van CO<sub>2</sub> to 2030, with more regular intervals than the EU's five years, backed by a rigorous realworld testing regime*

The Government has committed that the UK will pursue a future approach that is as least as ambitious as the current arrangements for emissions regulation. As it stands, the current regulatory regime will transfer into UK law at the end of the transition period on 31 December 2020 under the terms of the EU Withdrawal Act. The Government has just consulted on the approach it proposes to take to deliver the resulting new UK regime. But as noted above under its response to recommendation 3, the Government recognises that it needs to go further and we are considering this as part of the Transport Decarbonisation Plan.

### **Heavy Goods Vehicles**

*Set out and implement a strategy to transition to zero-carbon freight, including stronger purchase incentives, infrastructure plans and clean air zones. Evaluate schemes to reduce HGV and van use in urban areas (e.g. ecargo bikes and use of urban consolidation centres), to reduce traffic and improve the safety of active travel.*

*Trial zero emission HGVs to establish which is the most suitable and cost-effective technology for the UK. Evaluate existing and increase support for HGV logistics improvement schemes. Strengthen incentives to buy more efficient and zero-carbon HGVs. Include HGV recharging in Project Rapid plans.*

Plans for decarbonising freight will form part of the Transport Decarbonisation Plan. We are considering how to incentivise operators and industry to transition to zero emission HGVs and manage emissions from the existing fleet. This will bring together and build on the existing measures already announced.

We have consulted on the regulation of CO<sub>2</sub> emissions from new heavy-duty vehicles (HDVs), which includes trucks, buses and coaches, through emission performance standards. The regulation sets reduction targets for HDV vehicle manufacturers of 15% for 2025 and 30% for 2030 against a 2019 baseline, and includes incentives for sales of zero and low emission HDVs. As set out in the Government's Road to Zero strategy, the UK is intending to pursue "a future approach as we leave the European Union that is at least as ambitious as the current arrangements for vehicle emissions regulation". This consultation, which closed on the 21 August, was in line with that commitment.

Published in July, Gear Change: a bold vision for cycling and walking<sup>297</sup> announced plans to extend the e-cargo bike grant programme as part of government's wider programme to decarbonise deliveries. The grant, delivered by the Energy Saving Trust, contributes 20% of the purchase price of a new e-cargo bike up to the first £5,000 of any purchase price. This gives a maximum grant of £1,000 per bike, regardless of the purchase price of the bike.

Urban consolidation centres can help to alleviate congestion, while making life easier for both shippers and receivers of goods. They can also improve air quality, by reducing vehicle movements in dense urban areas. Gear Change: a bold vision for cycling and walking announced plans to pilot compulsory freight consolidation schemes in one or two historic city centres with narrow and crowded streets. This will seek to ensure that all deliveries (except perishables and items which require specialist carriers) are made to consolidation centres on the edge of the city centre, or the edge of the city, then taken to their final destinations in a far smaller number of vehicles, including cargo bikes and electric vans wherever possible. These pilots could complement work already underway by cities and towns to develop Clean Air Zones to improve air quality.

The Department is working with the Connected Places Catapult to explore and assess the zero emission technologies most suitable for HGVs on the UK road network, including hydrogen fuel cell and electric road systems. This work will feed into the Transport Decarbonisation Plan.

We continue to work with the Energy Saving Trust to develop, improve and promote their existing online Freight Portal, which provides information and support to operators seeking to reduce their vehicle emissions. In particular, we have developed a new section of the site dedicated to small and medium sized operators that focuses on the practical actions that they can take to achieve significant emission reductions and realise the commercial benefits that come through improved fuel and logistical efficiency.

### **Rail:**

*Support Network Rail in developing plans to deliver the target to remove all diesel trains by 2040.*

Work led by Network Rail on a Traction Decarbonisation Network Strategy<sup>298</sup> (TDNS) is developing costed rail decarbonisation options. TDNS will examine which parts of the network are most suited to electrification, and which will be better suited to alternative technologies such as hydrogen and battery.

DfT is working closely with Network Rail on TDNS in order that it properly informs government decisions about the scale and pace of rail decarbonisation. These decisions will support delivery of both our ambition to remove all diesel-only trains from the network by 2040 and achieve net zero by 2050.

### **Aviation and Shipping:**

- *Formally include International Aviation and Shipping emissions within UK climate targets when setting the Sixth Carbon Budget.*
- *Work with ICAO to set a long-term goal for aviation consistent with the Paris Agreement, and to strengthen the CORSIA scheme.*
- *Continue working with the IMO on global shipping policies, and updating their 2050 target.*
- *Commit to a Net Zero goal for UK aviation as part of the forthcoming aviation consultation and strategy, with UK international aviation reaching net-zero emissions by 2050 at the latest, and domestic aviation potentially earlier. Plan for residual emissions, after efficiency, low-carbon fuels and demand-side measures, to be offset by verifiable greenhouse gas removals.*
- *Build on the Clean Maritime Plan to develop incentives for zero-carbon ammonia and hydrogen supply chains for UK shipping.*
- *Monitor non-CO<sub>2</sub> impacts of aviation and shipping and consider how best to tackle them alongside UK climate targets.*
- *Review the UK's airport capacity strategy in light of COVID-19 and Net Zero, including a household & business survey of long-term travel expectations.*

Later this year a consultation on net zero aviation will be published. This consultation represents the growth in government ambition since the 2018 “Aviation 2050” green paper, reflecting the 2050 net zero target, further CCC advice on international aviation and shipping, and the latest evidence on non-CO<sub>2</sub> impacts, and will propose how the Government plans for aviation to play its part in delivering our net zero ambitions. The UK is already a global leader in decarbonising aviation. We plan to build on our existing work that is delivering clean aerospace R&D, supporting the deployment of sustainable aviation fuels, modernising our airspace, and establishing domestic and international market-based mechanisms, to reduce emissions faster and further.

Domestic aviation and shipping emissions are included in the UK's carbon budgets, with

international aviation and shipping emissions accounted for via “headroom” within our existing carbon budgets, meaning that the UK can remain on the right trajectory for net zero across the whole economy. International emissions are treated differently, largely because the inherently international nature of both sectors means that it is difficult to attribute these emissions to individual states. It is widely agreed among states that a sectoral approach (rather than state-by-state) is preferable, which is why the Kyoto Protocol gave the UN International Civil Aviation Organisation (ICAO) and the International Maritime Organization (IMO) responsibility for pursuing measures to reduce these emissions.

Internationally, we are committed to negotiating in ICAO for a long-term emissions reduction goal for international aviation that is consistent with the temperature goals of the Paris Agreement, ideally by ICAO’s 41<sup>st</sup> Assembly in 2022. At the 40<sup>th</sup> ICAO Assembly in October 2019, ICAO not only reaffirmed its commitment to CORSIA but, crucially, prioritised work towards a long-term climate goal for international aviation. Through the Aviation 2050 green paper<sup>299</sup>, the UK became the first country to publicly call for such a long-term goal. We are committed to this, as well as to ensuring that CORSIA is implemented and enforced effectively and strengthened over time.

Airport expansion is a core part of boosting our global connectivity and levelling up across the UK. The Government takes seriously its commitments on the environment and the expansion of any airport must always be within the UK’s environmental obligations.

For international shipping, through the IMO we will continue to pursue agreement of substantive short and medium term measures to peak and begin reducing emissions from international shipping, and we will work actively at the IMO to support the development of ambitious measures to fully decarbonise the sector in advance of the IMO revising its initial strategy for GHGs in 2023.

As a responsible national government, we need a contingency measure in case international progress does not go far enough or fast enough. That is why we have been clear that we would be minded to include international aviation and shipping emissions in our carbon budgets if there is insufficient progress at an international level.

We continue to build upon the Clean Maritime Plan<sup>300</sup>, undertaking research considering the role of Maritime Clusters in delivering clean innovation and growth, exploring whether and how to include maritime elements in the Renewable Transport Fuel Obligation for public consultation later this year, and working with HM Treasury to consider the potential extension of the Carbon Emissions Tax (CET) to the shipping sector in the years after 2021, as set out in the July consultation<sup>301</sup>, should that be the method of carbon pricing we choose to adopt on leaving the EU ETS.

## Recommendations for the Ministry of Housing, Communities & Local Government

***Buildings standards:** Implement a strong set of standards that ensure buildings are designed for a changing climate and deliver high levels of energy efficiency and low-carbon heat for new and existing buildings. Including:*

- Commit to a robust definition of the Future Homes Standard which is legislated well ahead of 2025 and ensures no fossil fuels are burnt in new homes.*

Last year we published the first of a two-part consultation on delivering the Future Homes Standard through an uplift to the requirements of Part L and Part F of the Building Regulations. Homes built under the Future Homes Standard will produce 75-80% lower carbon emissions compared to current standards, which means they will be fit for the future with low carbon heating and very high fabric standards. These homes will be 'zero carbon ready' with the ability to become fully zero carbon homes over time as the electricity grid decarbonises, without the need for further costly retrofitting.

As a stepping stone to the Future Homes Standard, we also consulted on a meaningful and achievable interim increase to the energy efficiency standards for new homes. The preferred option set out in consultation is a standard that should result in a 31% further reduction in emissions, compared to current standards.

The Government response to the Future Homes Standard consultation will be published in the autumn. As part of this, we are reviewing the roadmap to ensure that implementation of the full Future Homes Standard takes place in the shortest possible timeline, as well as exploring long-term options for the future of energy efficiency standard.

A further consultation will follow in due course, proposing changes to the energy efficiency standards for new non-domestic buildings; for building work to existing homes and non-domestic buildings; and on mitigating overheating in new dwellings.

- Work with BEIS on the Buildings and Heat Strategy and use standards to set a clear direction for retrofit across the buildings stock.*

BEIS and MHCLG colleagues are working closely to ensure that our policy package for buildings is complementary to broader housing priorities – particularly efforts to improve building safety. Our aim here is to minimise interventions and aligning schemes and guidance to major renovation triggers to enable improvements to be made at the same time. For buildings BEIS has sponsored the British Standards Institute to develop a new quality mark for retrofit. This quality mark will be available next spring and we will look for opportunities to promote accreditation to these new standards.

The Heat and Buildings strategy will look to provide long sighted investment signals through setting clear and timely minimum standards across sectors, as well as clear cut-off dates for changes to be made, supported by enabling policies.

For new builds, BEIS and MHCLG announced in the October 2019 consultation on Part L and Part F of the Building Regulations a proposed an ambitious uplift in the energy efficiency of new homes through the introduction of a Future Homes Standard. Homes built under the

Future Homes Standard will be 'zero carbon ready', with the ability to become fully zero carbon homes over time as the electricity grid decarbonises, without the need for further costly retrofitting work.

- *Introduce a new standard or regulation to ensure that overheating risk (in both the current and future climate) is assessed at the design stage of new-build homes or renovations. This should ensure that passive cooling measures are prioritised over active cooling.*

In response to the Committee on Climate Change's Adaption Sub-Committee's recommendation in 2015, MHCLG undertook a piece of research into the impacts of overheating in new homes. This found that all new homes exceed the overheating threshold to some extent and that this can be mitigated in most circumstances using passive measures such as shading and ventilation. We have committed to consulting on mitigating overheating risk in new homes and a range of methods will be considered to demonstrate compliance with new requirements.

The Government collects data on the English housing stock through the English Housing Survey; the 2017 report on Stock profile and condition showed that at least one part of 7% of English homes are perceived by their occupants to get uncomfortably hot. Through the Energy Follow Up Survey (EFUS) we are collecting further data on how many homes experience high indoor temperatures and the characteristics of these homes; the findings from EFUS will be published in the autumn.

- *Ensure that the remit of the new buildings safety regulator covers climate change mitigation and adaptation, and is equipped to monitor and enforce compliance with buildings standards. Work with HM Treasury to ensure that local authorities are properly funded to enforce buildings standards.*

Under the Building Safety Bill – which is currently undergoing pre-legislative scrutiny – the remit of the Building Safety Regulator will include overseeing the safety and performance of all buildings. This will involve understanding and advising on existing and emerging building safety standards and safety risks – including performance on energy efficiency - as well as overseeing the performance of building control bodies and acting if their performance is below the expected standard. This will encourage building control bodies to improve safety and performance of all buildings, and support continuous improvement and culture change.

The new regime will also place legal duties on those who build and manage buildings to manage the risks that they create and ensure that it pays to play by the rules. The draft Building Safety Bill will strengthen the ability of regulators to enforce those rules, so that anyone who breaks the rules is penalised and anyone who is considering breaking the rules is deterred from doing so.

These measures will improve the efficacy of building regulations across the board, not just in relation to safety. Climate change mitigation and adaptation are intrinsic components of the performance requirements of building regulations and will remain so.

The draft Building Safety Bill includes a power to enable local authorities to charge for, and so cover the costs of, a wider range of their Building Act functions than they can at present. Subject to parliamentary approval, we will be working with local authorities on how this wider power can be used to support their building control activities.

- *Close loopholes allowing homes to be built which do not meet the current minimum standards for new dwellings. Make accurate performance testing and reporting widespread, committing developers to the standards they advertise.*

As part of the roadmap to the Future Homes Standard, we have proposed to introduce a more stringent set of transitional requirements to make sure that developers do not continue to build to older energy efficiency standards for longer than is appropriate.

Limitations in the energy models used, different occupant behaviour of each dwelling and poor build quality can all potentially contribute to a performance gap between what is predicted at the design stage and how the building performs in practice. As well as increasing energy bills for building occupants, poorly constructed buildings can have wider implications for the Government's progress in achieving our net zero target. The Future Homes Standard consultation included proposals for improving the accuracy of as-built energy calculations and reducing the performance gap, by providing clearer information about the as-built specifications of new buildings to both Building Control Bodies and to building owners. A government response to the Future Homes Standard consultation will be published in autumn 2020.

#### ***Embodyed carbon in buildings:***

- *Develop plans to rapidly scale up the levels of wood used in construction and support the assessment and benchmarking of whole-life carbon in buildings.*

Building on commitments in our 25 Year Environment Plan and Clean Growth Strategy we want to increase the use of timber in construction where it is safe to do so, in line with fire safety regulations. We have consulted on measures to address the supply-side of this through the England Tree Strategy consultation. As part of this we are looking to amend the Timber Procurement Policy to support Grown in Britain to increase home grown timber used in England in construction. Success will require ambition from government, builders and developers to drive demand and increase the uptake of timber in construction. The importance of introducing new measures is integral to help meet the UK commitment to net zero emissions by 2050.

The regulated operational carbon emissions of new buildings are controlled for at the point of construction through the Building Regulations. The regulated operational carbon emissions of buildings are also displayed on Energy Performance Certificates.

The Government does not currently assess or benchmark the embodied carbon of buildings. To assess the embodied carbon of buildings a simple, standardised method of calculation would be required, supported by a robust evidence base. We have a range of ambitious policies in place to help industry to decarbonise including carbon pricing and a range of funding schemes such as the Industrial Energy Transformation Fund.

The Government has committed to exploring options for energy efficiency standards in the longer term to ensure that all new homes are fit for a zero carbon future.

#### ***Local Government.***

- *Support local government to play a full role in the Net Zero transition, including resourcing, guidance, involvement in local area energy plans, statutory reporting on the*

*emissions from their estate and reforming the planning framework to enable delivery of low-carbon and climate resilient measures.*

Local authorities play a central role in our efforts on climate change adaptation as they have a unique combination of democratic accountability, powers, assets, access to funding, local knowledge, and relationships with key stakeholders. This enables them to drive local progress towards our national climate change commitments in a way that maximises the benefits to the communities they serve. The unique contribution that local authorities can make is through the strategic alignment of a wide array of local functions. Central and local government can both drive the deployment of heat networks, flood defences and transport infrastructure, but only local government can produce detailed local strategies that bring together waste management, energy and transport infrastructure, fuel poverty and congestion in a cost effective way that draws in skilled workers and new jobs to fuel the local economy. MHCLG is working with local partners to support local economic recovery plans building on the strengths of local areas, and creating new opportunities for long-term growth including for sustainable green recovery. Our plans for this will be published through the Local Recovery and Devolution White Paper.

The Clean Growth Strategy acknowledges the importance of local leadership and makes a commitment for government to work closely with local authorities across the UK. Local authority involvement is referenced throughout the 25 Year Environment Plan, and the National Adaptation Programme makes it clear that adapting to climate change will require collaboration between government, civil society, local authorities, the wider public sector, the private sector and infrastructure providers. Place-based solutions will also be a key priority in the Transport Decarbonisation Plan, which will set out a vision for the role of local authorities and other local bodies.

### ***Climate Adaptation***

*Set a national target for increasing the area of urban greenspace, and integrate within Defra's 25 Year Environment Plan metrics.*

Defra publishes an annual account of progress under the Government's 25 Year Environment Plan, our plan for improving the environment within a generation. This includes dedicated sections on related 25 Year Environment Plan goals such as Thriving Plants and Wildlife, and Beauty, Heritage and Engagement with the Natural Environment. The 2019-2020 report was published in June<sup>302</sup>. Alongside the progress report is the 25 Year Environment Plan Outcome Indicator Framework, a set of indicators which describe environment change as related to the 25 Year Environment Plan. This includes an indicator which is currently being developed on the 'Enhancement of green/blue infrastructure'. This indicator will show changes in the quantity, quality, accessibility and functioning of green and blue infrastructure recognising that green and blue spaces in and around our built environment are essential to health and happiness. The Outcome Indicator Framework will be kept under regular review so that it continues to be relevant and provide the best and most cost-effective ways of assessing progress so providing opportunities to include new indicators as relevant.

*Clarify how national planning policy will manage the risks and impacts of flooding and coastal erosion.*

There are clear policies in the National Planning Policy Framework (NPPF) for how proposals for new development should respond to the challenges and risks of flooding and coastal

change. Inappropriate development in areas at risk now, or in the future from flooding should be avoided by directing development away from areas at highest risk. Where development is necessary, and where there are no suitable sites available in areas with a lower risk of flooding, the proposed development should be made safe without increasing flood risk elsewhere. Local development plans should be informed by a Strategic Flood Risk Assessment which should take account of climate change impacts on levels of flood risk by applying allowances for increases in peak river flow and sea level rise (as set out in guidance provided by the Environment Agency).

Our core planning principles and policy on coastal change are clear that inappropriate development in areas vulnerable to coastal change should be avoided. Local authorities should be clear what development will be appropriate in Coastal Change Management Areas (CCMAs) and make provision for development and infrastructure that needs to be relocated away from CCMAs.

As announced in Planning for the Future (March 2020), government will review our policy for building in areas at flood risk; this will seek to ensure that communities across the country know that future development will be safe from floods. We will assess whether current protections in the NPPF are enough and consider options for further reform. The Planning for the Future White Paper (August 2020) includes proposals to ensure that new homes meet our climate change and environmental objectives. It proposes to strengthen environmental outcomes: the National Planning Policy Framework will be revised to ensure policies support climate change mitigation and adaptation (including tackling flood risk). When determining housing need, it is proposed that this will factor in land constraints, taking into account the practical limitations, including flood zones, that some areas might face in planning for the homes they need.

*Review new build regulation standards to allow local authorities to set more ambitious standards for water consumption, especially in current and future water-stressed areas.*

Following Defra's consultation on measures to reduce personal water use, MHCLG is currently considering options to amend the Building Regulations. We will aim to ensure there is flexibility built into any amendment of building regulations so that standards could be linked to wider policy relating to water efficiency and future standards.

*Resource and support local authorities to ensure measures are being put in place to increase the area of greenspace and the area of permeable surfacing in all urban areas.*

Permitted development rights, set out in the Town and Country Planning (General Permitted Development) (England) Order 2015, allow homeowners to lay hard surfaces around their properties subject to certain limitations. The provision of over 5m<sup>2</sup> of hard surfacing in front gardens is permitted where the hard surface is made of porous materials, or the run-off is directed from the hard surface to a permeable or porous area or surface within the curtilage of the house. If this cannot be achieved the homeowner must make an application for planning permission. Government has published Guidance on the Permeable Surfacing of Front Gardens<sup>303</sup>.

The Government is implementing the 22 actions set out in the Surface Water Management Action Plan to improve understanding and strengthen action to reduce surface water flood risk. As such, since April 2019, government has invested £2 million to enable lead local flood authorities to update their surface water risk maps - covering over 1,600km<sup>2</sup>, which includes

just under 225,000 properties at risk of flooding. A total population of 2.7 million people who live in the mapped area will benefit from these grants.

The Government's Policy Statement sets out our commitment to continue to enhance local understanding of surface water flood risk and promote actions which can help prevent and better manage the potential impacts of surface water flooding.

We will continue to promote uptake of sustainable drainage systems which can reduce flood risk, improve our rivers and streams by reducing sewage spills and reduce the amount of pollutants washed directly into waterbodies following heavy rainfall.

*Put in place a statutory consultee for assessing new development in areas of surface water flood risk.*

The list of statutory consultees, including what types of application they are consulted on, is constantly under review, but government is cautious about adding extra statutory consultees or duties to the existing consultees as our objective is to make the planning process simpler and more efficient. Our Planning Practice Guidance encourages local planning authorities to engage with all relevant bodies/interested parties who might have an interest in a particular development proposal, whether statutory or not. We also encourage bodies, including statutory consultees, who wish to be engaged more in the planning process to liaise directly with local planning authorities on the types of planning application they would like to see. There may be cost/resource issues involved in creating more bodies or adding extra duties to existing consultees. Such increases in duties would require the assembling of data and reporting on performance targets and needs careful consideration.

*The current ad hoc process of issuing flood recovery grants (MHCLG) and Property-level flood resilience (Defra) schemes should, instead, be triggered by an objective measure.*

In November 2019, MHCLG agreed with HM Treasury to lead a cross-government review on the efficacy and efficiency of the use of the Flood Recovery Framework. The review commenced in March 2020 and is now continuing after a pause due to the Covid-19 emergency. Working with Defra and BEIS, MHCLG will incorporate lessons identified from the activation of the Flood Recovery Framework in November 2019 and February 2020. The focus will include clarifying eligibility for support. The review is planned for completion at the end of December 2020.

The Flood Recovery Property Flood Resilience Recovery Scheme is triggered alongside the Flood Recovery Framework, in agreement with other government departments. Defra has recently extended the eligibility period of this Scheme for a further nine months. An evaluation of the impact, administration and timescales will be undertaken as the schemes progress. As part of this evaluation, we will review the criteria to ensure that future applications of the scheme encourage the installation of the most cost-effective resilience measures new to market.

## Recommendations for the Department for Education

### **Skills**

*Working with DWP, BEIS and the Home Office, develop a strategy for a Net-Zero workforce that ensures a 'just transition' for workers transitioning from high-carbon to low-carbon and climate resilient jobs, integrates relevant skills into the UK's education framework and actively monitors the risks and opportunities arising from the transition. This strategy should include the development and roll-out of plans for training and skills, with buildings and manufacturing being priority areas.*

Cross-departmental roundtables led by ministers including the Parliamentary Under Secretary of State for Apprenticeships and Skills, have taken place with various industry bodies to discuss skills for a green recovery and net zero. DfE continue to engage with cross-Whitehall departments including BEIS, DWP and the Home Office to help progress the net zero agenda and understand the potential skills shortages within clean growth. This includes ensuring there is support for industries that are changing, such as construction, and for workers to transition from high carbon activity, such as in oil & gas.

A first step towards this will be the Green Homes Grant Skills Training Competition in autumn 2020<sup>304</sup> which is making available £6.9 million of grant funding to support training in the installation of energy efficiency and low carbon heating measures supported by the Government's Green Homes Grant voucher scheme. These include retrofit assessor and coordinator, insulation, heat pumps, solar thermal, and heating and hot water controls. Training developed via the competition is expected to support at least 5,000 training opportunities, and lessons learnt from the project will help inform future skills development work.

The Construction Leadership Council recently published its construction Industry Recovery Plan<sup>305</sup> to not only support the construction sector as it recovers from the impacts of Covid-19 but to take account of wider government priorities including reducing carbon emissions, improving the sustainability and resource efficiency of the construction and built environment sectors, and making measurable progress towards delivering net zero carbon. Skills are highlighted as a key element across the three phases of the plan with a focus on:

- Maintaining investment in training and retraining workers to support recovery and the adoption of new technologies.
- Ensuring investments contribute to net zero, resource efficiency and shared prosperity.
- Modernising training and qualifications system for construction to ensure that this is fit for purpose, and will support the delivery of the skills that the industry will need in future such as those related to the delivery of net zero carbon, and the multi skilling of the construction workforce to increase flexibility and adaptability.

BEIS is also working with the Institute for Apprenticeships and Technical Education which is convening a Sustainability Advisory Group to guide the Institute in encouraging trailblazers to align apprenticeships to net zero and wider sustainability objectives. The group will work with the Institute to identify which apprenticeships directly support the green agenda and which may need refocussing and identify potential gaps where there is an opportunity to create new green apprenticeships. It will also develop guidance to encourage employers to include sustainable knowledge, skills and behaviours to be included across multiple apprenticeships.

In terms of transition for high carbon workers, government has made a commitment to deliver a transformational Sector Deal for the oil and gas sector that will help transition the sector and support workers within the industry. Ministers and officials are actively discussing the contents and timeframe for the North Sea Transition Deal that will be focused on the energy transition and net zero.

DWP continue to constantly review policies, strategies and services to help claimants to address skills gaps needed for the labour market and to enable jobseekers to pivot to high demand, growth sectors, including low-carbon and climate resilient jobs. The sector-based work academy programme (SWAP) has proved to be effective when filling entry-level vacancies (e.g. jobs involving the installation of smart meters, building insulation products etc.). SWAP placements can also be used as a route into apprenticeships for those who need to demonstrate core employability skills to secure an apprenticeship. DWP sees apprenticeships as the best route into high-skilled careers.

MOJ is also proactively engaging with employers in low carbon sectors to directly increase the number of prison leavers in their work forces through our New Futures Network. The New Futures Network is the specialist part of HMPPS that brokers partnerships between employers and prisons across multiple industry sectors.

*Monitor and measure improvements in reducing emissions in schools and public buildings (and associated travel), aiming for zero-carbon buildings wherever possible, and ensure they are resilient to the future impacts of climate change.*

The sector is working to deliver low carbon and resilient school and college buildings and sites.

DfE is working closely with OGDs, including MHCLG on the Building Regulation updates, BEIS Public Sector Decarbonisation Team and BEIS Schools Non-Domestic Smart Energy Management Innovation Competition Team to roll out smart metering in to schools and identify ways in which data can be used by school to optimise energy consumption.

DfE's Capital Team is collaborating with industry and academia on £4.5 million of research, including Advancing School Performance: Indoor environmental quality, Resilience and Educational outcomes (ASPIRE)<sup>306</sup> and School Buildings: Adaptation, Resilience and Impacts on Decarbonisation in a changing climate (ARID)<sup>307</sup> with embedded academic researchers working with the Department<sup>308</sup>. Metered schools energy data, accessed from BEIS, will be used in UCL's school stock model. £2.4 million of funding has been secured in collaboration with the Construction Innovation Hub (CIH) to develop the next generation of secondary schools. This is a zero carbon whole-life approach using Modern Methods of Construction.

DfE has undertaken a Climate Change Adaptation study to assess the opportunities and associated risks of a 2°C and 4°C climate change scenario. Outputs from this will be presented to Defra as part of a commitment under the National Adaptation Programme. Findings from this will be used to inform the risks and required schools standards for adaptation.

A four-year strategy for Schools Flood Resilience is being developed to fund awareness, resilience and resistance work at schools. As part of this we have established a partnership with the Environment Agency and are establishing partnerships with the nine English water companies.

New build schools will have a primary focus on heat decarbonisation through a fabric first approach, while maintaining high quality indoor environmental performance, followed by,

where possible, clean supply of fuel or as a minimum sufficient flexibility in the system to switch to a low carbon heat source in the future.

Heat decarbonisation of the estate is challenging in the existing estate, and we are working across government to understand 1) the use of heat pumps in schools and 2) the opportunities around centralised energy centres on school sites.

*Consider the wider role of the education system in supporting the transition to a net-zero economy and preparing for the risks of climate change – including the need for greater public awareness and understanding, and the need for technical skills in the workforce.*

The Government is committed to making the skills systems more responsive to employer's skills needs both locally and nationally. DfE has been working with employers in all sectors including those in the green economy sector to jointly design and deliver policies and programmes to do this.

To support the need for technical skills in the workforce, the first wave of T Levels, which are new post-16 technical study programmes, will be launched from this September. T Levels in construction (from 2020 and 2021), engineering and manufacturing (2022) and agriculture (2023) will support progression into skilled occupations related to sustainability, including areas of sustainable construction and renewable energy.

The construction industry will be key in supporting the country's economic recovery and the Prime Minister recently announced a £5 billion Capital Investment Plan to accelerate infrastructure projects aimed at stimulating the sector and helping to recruit and retain staff including apprentices.

At Budget 2020, we also committed to ensuring that sufficient funding is made available in the wider apprenticeship system this year, to support small businesses wanting to take on an apprentice. Both of these commitments should support construction employers to continue to hire new apprentices in order to help meet their skills needs and support growth in the sector, both now and in the long-term.

High-quality apprenticeships give students of all ages the skills, knowledge and behaviours to make an immediate impact across all industries. Over 550 new Standards - designed by employers and for employers – cover traditional as well as new roles covering renewable and green sectors. To support businesses across all sectors, including Construction, to recover from the economic impacts of Covid-19, as part of the Chancellor's Plan for Jobs in July, it was announced that businesses will be able to claim £1,500 for every new apprentice they hire from 1 August 2020 until 31 January 2021, rising to £2,000 if they hire a new apprentice under the age of 25.

Over the course of this Parliament, we are providing £3 billion (£2.5 billion after Barnett consequentials) for a new National Skills Fund (NSF). From April, the NSF will focus on creating a step change in adult skills at levels 3-5; looking to provide the economy with the skills it needs to both recover from recession and thrive in the future. To achieve this we are recommending a package of investments aligned to DfE's Further Education reform agenda to ensure adults benefit from the skills system in a way that drives positive labour market outcomes. As part of this, the NSF will deliver on key government priorities like delivering a green recovery and transitioning to net zero.

Another crucial step we are taking to help inform our approach to skills reform in the face of big

changes in technology is to set up the Skills Productivity Board, which will bring together leading experts to offer independent analysis on skills gaps and identify new and emerging skills needs, including the green recovery.

We recognise the need for greater public awareness and understanding. We are investing over £100 million in financial year 2020-21 to help young people and adults to get high quality careers provision. Over 2,900 business volunteers have been mobilised to work with schools and colleges on their careers strategies and 3 million young people now benefit from regular employer encounters. More than 100 Cornerstone Employers, such as Anglian Water, Rolls Royce, and KPMG, have committed to engaging their networks to increase the quality and quantity of employer encounters for young people. The Careers & Enterprise Company's State of the Nation report (2019) states that young people's skills and work readiness are improving. 73% say they are more aware of different careers and 72% say they are more motivated at school.

For students aged 16 to 19, the High Value Courses Premium is additional funding to encourage and support delivery of selected level 3 courses in subjects that lead to higher wage returns and support the Industrial Strategy, including engineering, manufacturing technologies, and construction.

## Recommendations for the Department for International Trade

*Ensure UK trade policy and future trade deals protect against risks of carbon leakage leading to increases in the UK consumption emissions footprint, particularly from trade in agricultural and industrial products, and avoids undermining the required changes to reach Net Zero in the UK.*

*Ensure that future UK trade deals consider the effect of changes to trade on the UK's consumption emissions.*

DIT has launched Free Trade Agreement (FTA) negotiations with the US, Australia and New Zealand and has concluded FTA negotiations with Japan. The Department has set out that when negotiating new FTAs we will:

- Ensure parties reaffirm their commitment to international standards on the environment;
- Ensure parties do not waive or fail to enforce their domestic environmental protections in ways that create an artificial competitive advantage;
- Include measures which allow the UK to maintain the integrity, and provide meaningful protection, of the UK's world-leading environmental standards; and
- Secure provisions that support and help further the Government's ambition on climate change and target to achieve net zero carbon emissions by 2050, including promoting trade in low carbon goods and services, supporting research and development collaboration, and maintaining both parties' right to regulate in pursuit of decarbonisation.

Earlier this year, DIT launched the UK Global Tariff, which liberalised a list of 104 environmental goods, helping to promote the deployment of renewable energy generation, energy efficiency, carbon capture, and the circular economy through recycling and reducing single-use plastics.

The UK also took up its independent seat at the WTO and Secretary of State Liz Truss announced that the environment and climate change would be one of her three key priorities for UK ambition and leadership. We have committed to standing up to end environmentally wasteful practices that arise from state subsidies, such as illegal, unreported, and unregulated, fishing, and will press for successful conclusion of the fisheries subsidies negotiation to deliver on the UN's Sustainable Development Goals and Target 14.6. This will help promote biodiversity and the protection of fish stocks that are already under threat from climate change.

DIT is currently working with other government departments to consider how else to advance the UK's climate change objectives in multilateral fora including at the World Trade Organisation's (WTO) Committee for Trade and Environment and the UK's upcoming G7 presidency. These objectives will align with the Government's stated priorities for the UK at the WTO, including environmental leadership and potential WTO reform. For example, DIT sponsored an event at Geneva Trade Week to explore how trade policy can contribute to the sustainability and green recovery agenda. The Department is also considering a number of multilateral policy initiatives such as environmental goods and services and ecolabelling schemes.

Lastly, DIT is considering further internal analysis to better understand the sources of the UK's

imported emissions and the implications for UK's consumption emissions and trade. The outcome of this analysis will inform our approach to trade policy, including future free trade agreements.

*Maximise the opportunities to use trade policy to encourage increased ambition on both climate change mitigation and adaptation in other countries, including considering the role for border carbon adjustments.*

The UK has long supported the promotion of our values globally and is pushing for ambitious global action on both climate change mitigation and adaption. We are exploring all options in the design of future trade policy, including how to tackle climate change, and are utilising bilateral trade and economic dialogues to increase international ambition.

For example, in July, DIT held the 14<sup>th</sup> meeting of the India-UK Joint Economic and Trade Committee where we committed to deepening cooperation to catalyse private sector flows into green projects and strengthening our combined efforts to tackle global climate change and energy security.

DIT also hosted a UK-Colombia Trade Dialogue at which both countries committed to securing a green and sustainable recovery to Covid-19, building on the bilateral Partnership for Sustainable Growth<sup>309</sup>.

As a global leader on decarbonisation, the UK recognises the importance of addressing carbon leakage. A range of approaches could potentially help to address this, of which carbon border adjustments are one. HMG is undertaking further analysis on the issue of carbon leakage across relevant departments.

We are also considering measures to support sustainable supply chains, particularly for forest-risk commodities. For example, we are exploring whether an import credit guarantee could be used to provide financial incentives for UK firms to prioritise supply chain imports (mainly of agricultural commodities) from sustainable sources, and are considering options to secure cooperative provisions with FTA partners on maintaining and improving sustainable supply chains.

## Recommendations for the Department of Health and Social Care

*A fully funded plan is needed to address the risks of overheating in hospitals, care homes and care facilities, including consideration of homebased care.*

The Department of Health and Social Care (DHSC) is working with its arm's length bodies to develop measures to improve patient safety and increase resilience to heatwaves in health and social care buildings. For example, we have been working with the NHS since April 2017, to understand and address overheating risk in mandatory Green Plans, formerly known as Sustainable Development Management Plans. The NHS aims to embed adaptation into daily practice by 2023, by including it as a key element of Green Plans, for which there has been set a requirement of 100% coverage for NHS providers. This will be supported by guidance from the NHS Sustainable Development Unit and NHS England and NHS Improvement. The NHS Standard Contract is mandated by NHS England for use by commissioners for all contracts for healthcare services other than primary care. The Service Conditions of the full-length NHS Standard Contract 2020/21 includes conditions that require trusts to adapt the Provider's Premises and the way Services are delivered to mitigate risks associated with climate change and severe weather.

We have also worked with Public Health England to revise and ensure the heatwave plan is suitable each year to address the risks of overheating including resources for people in residential and care settings.<sup>310</sup> For example, this year the guidance was updated to include specific resources and additional actions in response to the Covid-19 pandemic.

NHS England and NHS Improvement, and Public Health England are currently preparing the Health and Social Care Adaptation Report, as part of the third round of 'Adaptation Reporting Power (ARP3) reporting (as per the Climate Change Act 2008). This will set out specific recommendations to improve data collection on overheating events and ensure resilience plans address the risks of overheating in hospitals, care homes and care facilities. Further engagement with social care providers is required to address overheating risks for home-based care. The report is expected to be published this winter.

Whilst the ARP3 report will set out the detail of the further actions required as part of the £50 million investment in LED lighting across the NHS Estate, we are clear that a proportion of the lighting installed will include thermal sensor monitoring technology which the NHS is trailing to monitor over heating in hospitals. This will allow for more specific site-based plans to be developed and implemented.

*Take actions to improve the carbon efficiency of the NHS by supporting the NHS's forthcoming Net Zero plan, including non-CO<sub>2</sub> emissions (e.g. F-gases). For example through remote consultations and other actions that can support reduced emissions from users of the health service.*

NHS England and NHS Improvement is committed to reducing the environmental impact of the NHS. In the NHS Long Term Plan, the NHS set a number of actions the NHS would take including by reducing carbon emissions, reducing business and patient travel, improving air quality, shifting to lower carbon inhalers and through transforming anaesthetic practices.

The NHS Long Term Plan set out ambitious targets for digitalisation of outpatient appointments, and Covid-19 has led to rapid adoption of virtual remote patient consultations in primary, emergency and elective care settings, reducing patient travel to and from NHS sites<sup>311</sup>.

£50 million of LED lighting is currently being rolled out across the NHS to reduce 34,000 CO<sub>2</sub>e of emissions, this is part of a wider programme as set out in the NHS Operational Planning and Contracting Guidance for 2020/21<sup>312</sup> to replace all lighting with LED alternatives during routine maintenance activities eliminating 315,000 tonnes of CO<sub>2</sub> from the NHS<sup>313</sup>.

A Net Zero Carbon Hospital Standard is being developed to ensure all new build hospitals are built to a zero carbon standard which is due to be completed in spring 2021. This will include the 40 new hospitals that are due to be built at part of the Government's Health Infrastructure Plan. To support organisations in the interim, a Net Zero Carbon Client Brief has been developed to support Trusts' design teams in scoping out their NZC hospital plans.

As part of the £1 billion public sector decarbonisation funding scheme announced by the Chancellor in July 2020, the NHS is working closely with BEIS to further accelerate the decarbonisation of the NHS Estate<sup>314</sup>.

In addition, in October this year the NHS published a new report, "Delivering a 'Net Zero' National Health Service"<sup>315</sup>, aiming to be the world's first 'net zero' national health service and setting two targets:

- For the emissions controlled directly (the NHS Carbon Footprint), the NHS will reach net zero by 2040, with an ambition to reach an 80% reduction by 2028 to 2032;
- For the emissions the NHS can influence (the NHS Carbon Footprint Plus), the NHS will reach net zero by 2045, with an ambition to reach an 80% reduction by 2036 to 2039.

The report will be used as a basis of an engagement process over the next six months. The results of this process will be used to inform further commitments and will be published throughout 2021.

*Take an active role in climate policy development that also has health benefits, such as active travel, access to green space, air quality, better buildings and healthier diets.*

DHSC has taken an active role in the development of policies that have co-benefits for health and climate.

PHE and DHSC are engaging with other government departments to ensure policies and programmes consider the role of the built and natural environment on health. Examples include, work with Defra on the implementation of the 25 Year Environment Plan, with the Department for Transport on the new Cycling and Walking plan commitments and General Practice prescriptions for cycling, as well as the Department for Business, Energy and Industrial Strategy on fuel poverty, the Ministry of Housing, Communities and Local Government on planning reforms, and Sport England on access to greenspace and active travel.

The Government is committed to helping more people connect with nature to support their health and wellbeing. In July, £4 million was committed to test a 'green social prescribing' pilot co-led by environment and health departments. The aims of this programme support peoples' health and wellbeing, while also building the communities' resilience to climate change,

contributing to net zero and helping to tackle biodiversity loss<sup>316</sup>. In August £5 million was awarded to the National Academy for Social Prescribing including money for improved green spaces<sup>317</sup>.

DHSC has also consulted on strengthening the nutrition standards to bring them in line with the latest scientific dietary recommendation in the Government Buying Standards for Food and Catering Services, a set of sustainability and nutrition-related standards. The response to the consultation will be published as soon as possible.

NHS England & NHS Improvement participates in the Office of Government Property's cross government sustainability forum which is responsible for overseeing net zero planning for 2050 across the government estate. This provides a forum through which they can join up with other departments.

PHE has published resources and updated guidance to support local authorities to reshape the environment to make the healthier choice the easiest choice, including guidance on developing healthy high streets, encouraging healthier out-of-home food provision and using the planning system and spatial planning system to promote physical and mental wellbeing. In February 2020, PHE published guidance on Healthy weight environments<sup>318</sup>, an evidence-based approach to developing local planning policy and guidance, and making planning decisions on planning applications to promote healthier and more active environments.

In July 2020, PHE updated its guidance Improving Access to Greenspace<sup>319</sup>, which highlights new evidence and actions to help local areas consider how good-quality greenspace can support the delivery of health, social, environmental and economic priorities, at a relatively low cost.

PHE which forms part of the new National Institute for Health Protection<sup>320</sup>, is engaging with local authorities and supporting knowledge into action on topics relating to green infrastructure, planning for older population and improving the use of health impact assessments. We expect to publish research findings from local engagement and a guide on Health Impact Assessment in spatial planning this winter.

## Recommendations for the Ministry of Defence

*Implement plans for a Net Zero consistent, climate resilient estate.*

*Develop and implement plans to make all MoD buildings and vehicle fleets zero-carbon in the long term. Contribute to halving direct emissions in the public estate by 2032 at the latest.*

*MoD could also share learning related to its Estates Risk Assessment process with other government departments.*

In February MOD launched the Defence Climate Change and Sustainability (CC&S) Review<sup>321</sup> to develop the MOD's response to the UK commitment to bring all greenhouse gas emissions to net zero by 2050 (NZ50). The outcome of the review will be a refreshed defence climate change and sustainability strategy and subsequent implementation plan with a clear, agreed defence ambition and defined future state in support of NZ50 and a route map for Defence's NZ50 response over one to five years, five to fifteen years and beyond.

In parallel with the CC&S Review MOD is developing an Infrastructure Energy and Emissions Sub-strategy and initiating on-site low carbon energy generation, net zero buildings, sub-metering/data management projects to inform wider adoption.

The CC&S Strategy includes the development of a natural capital asset register for the defence estate which will allow the identification of opportunities for enhancing natural capital and carbon capture and storage on the defence estate, cognisant of the Defence Estate's primary purpose.

The Department's bespoke Climate Impacts Risk Assessment Methodology<sup>322</sup> has been shared with OGDs.

*Assess the potential for alternative fuels (such as low-carbon electricity, hydrogen or bioenergy) to be used for land vehicles, ships and aircraft, and consider opportunities to support wider use of low-carbon technologies in civil applications (e.g. through research or demonstration).*

Part of the Logistics Technology Investigations Project (2019-2022) is focussed on fossil fuels, alternative energy and what actions can be taken to address net zero by 2050. It will provide a cost benefit analysis of possible opportunities to reduce fossil fuel usage and identify suitable trials to demonstrate effectiveness.

The MOD Global Bulk Fuel Framework<sup>323</sup> is being updated to enable the supply of aviation jet fuel containing alternative fuel blending components. When in place, in late 2020, this will have the potential for up to 50% alternative fuel blended with conventional jet fuel to be supplied to MOD.

*Provide assurance to the Committee that planning is taking place for domestic and overseas climate-related risks to operations (including risks to personnel and effective operation of equipment). These plans should include climate-related risks linked to global conflict, mass migration and global governance set out in the UK Climate Change Risk Assessment.*

MOD includes climate-related risk in its annual Defence Capability Assessment. The intent is to make this explicit in future annual assessments. This will ensure that Commands take into consideration the impact of climate change and ensure that the capability programmes are sustainable and resilient. The Integrated Review<sup>324</sup> will take into consideration the future risks and threats to Defence, of which climate change related risk will form an important part.

*Ensure the department's strategy addresses the potential need for an increased role in climate-related disaster avoidance and relief in the UK and overseas.*

Defence's policy and strategy for the next five years and beyond is currently subject to an Integrated Review. The Integrated Review of security, defence, development and foreign policy, announced in February 2020, will consider how the UK's international and national strategy must evolve as the world changes. The increasingly tangible effects of climate change are recognised as a key driver of this change, both in the UK and globally.

The Integrated Review will result in a series of Defence Tasks which will take into consideration the current and future risks to the Armed Forces and likely operations. Nascent policy in protecting the homeland and global positioning will form part of Defence's response to disaster avoidance and relief.

MOD is working with the Alan Turing Institute and the Met Office to consider whether the Global Urban Analytics for Resilient Defence model could be used to understand where Climate Change may induce conflict hotspots and potential for Humanitarian Assistance Disaster Response.

## Recommendations for the Home Office and Ministry of Justice

*Provide assurance to the Committee that planning and action is being taken to address overheating and poor air quality in prisons and detention facilities, and demonstrate that any actions have led to a reduction in risk.*

### Ministry of Justice

The Ministry of Justice (MoJ) is aware of the risks posed by climate change to its estate and operations, and will continue to review and put in place measures to mitigate against overheating in its existing prison estate as well as New Prisons Construction Programme.

We have published our Climate Change Adaptation Strategy<sup>325</sup> in May 2020 and have identified key climate change risks and associated actions. Through this strategy, we will ensure that climate change adaptation planning is embedded in strategic programmes and plans, estates operation and property rationalisation programmes.

The Department has also incorporated Climate Change Scenarios in its New Prisons Construction Programme to reduce summertime overheating, and minimise summertime cooling energy demand.

### Home Office

The Home Office is committed to incorporating resilient designs in relevant maintenance and new build programmes. In addition, robust business continuity plans are in place to manage occurrences of extreme weather events and to ensure our estate is resilient to climate change.

*Develop and implement plans to make all HO/MoJ buildings and vehicle fleets zero-carbon in the long term. Contribute to halving direct emissions in the public estate by 2032 at the latest.*

### Ministry of Justice

MoJ published its Carbon and Energy Reduction Strategy<sup>326</sup> in 2018 which will be updated this year to include our commitment to net zero and reducing non-traded emissions by 50% by 2032.

Our recently commissioned net zero study of the whole MoJ estate has identified various opportunities for low and zero carbon technologies to help MoJ meet its 2032 non-traded emissions target and long-term net zero target.

We have introduced specific environmental targets in certain areas, such as fleet, catering or lighting, with achievements logged through the business reporting line. Going forward, we will continue to build upon and improve on our existing successes in this area.

MoJ is developing a road map to transition its fleet vehicles away from dependence on diesel to ultra-low emissions vehicles (ULEV) including pure electric vehicles where viable options are available.

### Home Office

The Home Office's over-arching strategy is to operate a lower carbon, more resource-efficient estate thereby helping to meet its environmental obligations whilst also significantly reducing operating costs.

The Home Office is planning to commission a net zero study this year to identify various opportunities for low and zero carbon technologies to meet its 2032 non-traded emissions target and long-term net zero target.

The Home Office has commissioned a feasibility study to identify the potential for Electric Vehicle Charge Points (EVCP) across the Home Office estate to help transition its fleet to ultra-low emissions vehicles (ULEV) including pure electric vehicles where viable options are available.

### **Skills**

*Working with DWP, DfE and BEIS, develop a strategy for a Net-Zero workforce that ensures a 'just transition' for workers transitioning from high-carbon to low-carbon and climate resilient jobs, integrates relevant skills into the UK's education framework and actively monitors the risks and opportunities arising from the transition. This strategy should include the development and roll-out of plans for training and skills, with buildings and manufacturing being priority areas.*

Cross-departmental roundtables led by ministers including the Parliamentary Under Secretary of State for Apprenticeships and Skills, have taken place with various industry bodies to discuss skills for a green recovery and net zero. DfE continue to engage with cross-Whitehall departments including BEIS, DWP and the Home Office to help progress the net zero agenda and understand the potential skills shortages within clean growth. This includes ensuring there is support for industries that are changing, such as construction, and for workers to transition from high carbon activity, such as in oil & gas.

A first step towards this will be the Green Homes Grant Skills Training Competition in autumn 2020<sup>327</sup> which is making available £6.9 million of grant funding to support training in the installation of energy efficiency and low carbon heating measures supported by the Government's Green Homes Grant voucher scheme. These include retrofit assessor and coordinator, insulation, heat pumps, solar thermal, and heating and hot water controls. Training developed via the competition is expected to support at least 5,000 training opportunities, and lessons learnt from the project will help inform future skills development work.

The Construction Leadership Council recently published its construction Industry Recovery Plan<sup>328</sup> to not only support the construction sector as it recovers from the impacts of Covid-19 but to take account of wider government priorities including reducing carbon emissions, improving the sustainability and resource efficiency of the construction and built environment sectors, and making measurable progress towards delivering net zero carbon. Skills are highlighted as a key element across the three phases of the plan with a focus on:

- Maintaining investment in training and retraining workers to support recovery and the adoption of new technologies.
- Ensuring investments contribute to net zero, resource efficiency and shared prosperity.
- Modernising training and qualifications system for construction to ensure that this is fit for purpose, and will support the delivery of the skills that the industry will need in future such as those related to the delivery of net zero carbon, and the multi skilling of the

construction workforce to increase flexibility and adaptability.

BEIS is also working with the Institute for Apprenticeships and Technical Education which is convening a Sustainability Advisory Group to guide the Institute in encouraging trailblazers to align apprenticeships to net zero and wider sustainability objectives. The group will work with the Institute to identify which apprenticeships directly support the green agenda and which may need refocussing and identify potential gaps where there is an opportunity to create new green apprenticeships. It will also develop guidance to encourage employers to include sustainable knowledge, skills and behaviours to be included across multiple apprenticeships.

In terms of transition for high carbon workers, government has made a commitment to deliver a transformational Sector Deal for the oil and gas sector that will help transition the sector and support workers within the industry. Ministers and officials are actively discussing the contents and timeframe for the North Sea Transition Deal that will be focused on the energy transition and net zero.

DWP continue to constantly review policies, strategies and services to help claimants to address skills gaps needed for the labour market and to enable jobseekers to pivot to high demand, growth sectors, including low-carbon and climate resilient jobs. The sector-based work academy programme (SWAP) has proved to be effective when filling entry-level vacancies (e.g. jobs involving the installation of smart meters, building insulation products etc.). SWAP placements can also be used as a route into apprenticeships for those who need to demonstrate core employability skills to secure an apprenticeship. DWP sees apprenticeships as the best route into high-skilled careers.

MOJ is also proactively engaging with employers in low carbon sectors to directly increase the number of prison leavers in their work forces through our New Futures Network. The New Futures Network is the specialist part of HMPPS that brokers partnerships between employers and prisons across multiple industry sectors.

## Recommendations for the Department for Digital, Culture, Media & Sport

*Ensure plans for a digital transition and fibre rollout can complement changing work patterns and travel behaviours, leading to lower-carbon working. Co-ordinate with DfT to invest in digital infrastructure to lock-in positive behaviours that reduce travel demand (e.g. home-working).*

The UK already has good superfast broadband connectivity as a result of public investment of ~£1.8 billion, alongside private sector investment. Over 96% of UK premises can now access superfast speeds<sup>329</sup>. In addition, around 91% of the UK has good 4G mobile coverage from at least one operator<sup>330</sup>. However, the Government recognises that further improvements to the UK's digital infrastructure are needed to ensure that the UK remains globally competitive, to support new economic opportunities, and to enable greater connectivity where people work, live and travel, given changing work patterns and travel behaviours.

On broadband, we have committed to work with the private sector to roll out even faster and more resilient gigabit capable and full fibre broadband nationwide as soon as possible. In the most commercial 80% of the UK, the Government is working with the private sector to reduce the barriers to broadband deployment, and enable speedier rollout through the Telecommunications Infrastructure (Leasehold Property) Bill<sup>331</sup> for example. In the least commercial 20% of the UK, the Government has committed to spend £5 billion investing in gigabit capable broadband to ensure that connectivity for these areas is upgraded.

The Centre for Economics and Business Research has estimated nationwide full fibre broadband could enable:

- Over 270,000 people to move away from London and other major cities into suburban and rural areas;
- The value of the additional time saved from reduced commuting levels could equate to almost £3 billion in additional GVA by 2038; and
- This could save 300 million commuting trips, representing a carbon reduction of 360,000 tonnes.<sup>332</sup>

On mobile, the Government has reached a £1 billion deal with the Mobile Network Operators to extend 4G mobile coverage to 95% of the UK by 2025. Alongside this, the Government is committed to becoming a world leader in next generation 5G mobile technology, with deployment to the majority of the country by 2025. To support this, the Government is investing £200 million in a programme of 5G Testbeds and Trials.

*Ensure Ofcom's guidelines take into account best practice in communicating climate change.*

Ofcom, as the UK's independent regulator of television and radio, is required to draw up a broadcasting code covering standards in programmes. Ofcom has responsibility for the Code, including for any amendments. How licensed broadcasters cover climate change is an editorial matter for them consistent with their and their audience's right to freedom of expression, as long as they comply with Ofcom's Broadcasting Code.

Section 5 of the Code<sup>333</sup> deals with due impartiality and due accuracy and undue prominence of views and opinions. All news programmes must be duly accurate about climate change and broadcasters must not be materially misleading outside of news programmes, for example in current affairs programmes or documentaries, while being consistent with the right to freedom of expression.

*Work with BEIS on ensuring plans for smart, flexible energy systems are resilient to threats from cyber security.*

DCMS works closely with BEIS on improving cyber security in the energy sector. For example, energy is included in the scope of the Network and Information Systems Regulations (NIS) 2018<sup>334</sup>, which are designed to ensure that operators of essential services (OES), such as energy providers, have adequate cyber security systems in place. These OES are defined in Schedule 2 of the Regulations. BEIS, working closely with Ofgem and the Health & Safety Executive, have regulatory powers to oversee and enforce cyber security in the energy sector.

Under the NIS Regulations, OES have to provide assessments of their cyber security measures, set against a common framework, and what steps they are taking to ensure that their services are secure.

*Ensure sport and culture strategies align to other departments' plans for lower-carbon buildings, more active travel and improved public health.*

Improving the physical and mental wellbeing of the population are two of the five outcomes the Government aims to achieve by investing in sport and physical activity, as set out in the Government's sport strategy, Sporting Future<sup>335</sup>. The strategy sets out ambitions to increase cycling and walking levels, including through active travel, and to target investment towards the least physically active in the population, to generate the greatest benefits to health and wellbeing. Sport England, the arm's length body of government with responsibility for investing in community-level sport and physical activity, provides guidance to sports clubs and facility owners on how to improve the environmental sustainability of sports facilities.

The aims of Sporting Future strongly align with recent strategies published by the Government, including the Department for Transport's long-term plan for cycling and walking, Gear Change<sup>336</sup>, and the Department for Health and Social Care's Tackling Obesity strategy<sup>337</sup>. Any future iteration of "Sporting Future" will continue to champion these issues.

## Recommendations for the Department for Work and Pensions

### **Skills**

*Working with BEIS, DfE and the Home Office, develop a strategy for a Net-Zero workforce that ensures a 'just transition' for workers transitioning from high-carbon to low-carbon and climate resilient jobs, integrates relevant skills into the UK's education framework and actively monitors the risks and opportunities arising from the transition. This strategy should include the development and roll-out of plans for training and skills, with buildings and manufacturing being priority areas.*

Cross-departmental roundtables led by ministers including the Parliamentary Under Secretary of State for Apprenticeships and Skills, have taken place with various industry bodies to discuss skills for a green recovery and net zero. DfE continue to engage with cross-Whitehall departments including BEIS, DWP and the Home Office to help progress the net zero agenda and understand the potential skills shortages within clean growth. This includes ensuring there is support for industries that are changing, such as construction, and for workers to transition from high carbon activity, such as in oil & gas.

A first step towards this will be the Green Homes Grant Skills Training Competition in autumn 2020<sup>338</sup> which is making available £6.9 million of grant funding to support training in the installation of energy efficiency and low carbon heating measures supported by the Government's Green Homes Grant voucher scheme. These include retrofit assessor and coordinator, insulation, heat pumps, solar thermal, and heating and hot water controls. Training developed via the competition is expected to support at least 5,000 training opportunities, and lessons learnt from the project will help inform future skills development work.

The Construction Leadership Council recently published its construction Industry Recovery Plan<sup>339</sup> to not only support the construction sector as it recovers from the impacts of Covid-19 but to take account of wider government priorities including reducing carbon emissions, improving the sustainability and resource efficiency of the construction and built environment sectors, and making measurable progress towards delivering net zero carbon. Skills are highlighted as a key element across the three phases of the plan with a focus on:

- Maintaining investment in training and retraining workers to support recovery and the adoption of new technologies.
- Ensuring investments contribute to net zero, resource efficiency and shared prosperity.
- Modernising training and qualifications system for construction to ensure that this is fit for purpose, and will support the delivery of the skills that the industry will need in future such as those related to the delivery of net zero carbon, and the multi skilling of the construction workforce to increase flexibility and adaptability.

BEIS is also working with the Institute for Apprenticeships and Technical Education which is convening a Sustainability Advisory Group to guide the Institute in encouraging trailblazers to align apprenticeships to net zero and wider sustainability objectives. The group will work with the Institute to identify which apprenticeships directly support the green agenda and which may need refocussing and identify potential gaps where there is an opportunity to create new green apprenticeships. It will also develop guidance to encourage employers to include sustainable knowledge, skills and behaviours to be included across multiple apprenticeships.

In terms of transition for high carbon workers, government has made a commitment to deliver a transformational Sector Deal for the oil and gas sector that will help transition the sector and support workers within the industry. Ministers and officials are actively discussing the contents and timeframe for the North Sea Transition Deal that will be focused on the energy transition and net zero.

DWP continue to constantly review policies, strategies and services to help claimants to address skills gaps needed for the labour market and to enable jobseekers to pivot to high demand, growth sectors, including low-carbon and climate resilient jobs. The sector-based work academy programme (SWAP) has proved to be effective when filling entry-level vacancies (e.g. jobs involving the installation of smart meters, building insulation products etc.). SWAP placements can also be used as a route into apprenticeships for those who need to demonstrate core employability skills to secure an apprenticeship. DWP sees apprenticeships as the best route into high-skilled careers.

MOJ is also proactively engaging with employers in low carbon sectors to directly increase the number of prison leavers in their work forces through our New Futures Network. The New Futures Network is the specialist part of Her Majesty's Prison and Probation Service that brokers partnerships between employers and prisons across multiple industry sectors.

*Develop and implement plans to make all DWP buildings and vehicle fleets zero-carbon in the long term. Contribute to halving direct emissions in the public estate by 2032 at the latest.*

DWP recently submitted its annual Greening Government Commitments (GGC) return for 2019/20. Our analysis shows that we have exceeded our carbon targets for 2019/20<sup>340</sup>.

DWP Estates are developing the Estates Carbon Management Plan, which makes reference to the Government's Clean Growth Strategy, as well as the UK's commitment to net zero by 2050 and the UKGBC's Net Zero Carbon Framework. The Carbon Management Plan utilises the OGP Net Zero Carbon tool, which DWP have been beta testing, to help determine prioritised impactful activities. These plans are currently being incorporated into the Department's CSR20 bid to HM Treasury. The plan includes recommendations to:

- Improve the operational performance of our estate;
- Invest in our estate to improve energy efficiency;
- Ensure we lease highly energy efficient buildings for our long-term estate; and
- Ensure that energy efficiency standards are adhered to when we refurbish or fit out buildings.

It is by implementing this Carbon Management Plan that we propose to meet the forthcoming new Greening Government Commitments targets, and in doing so meet the 2032 target to halve direct emissions on the public estate. This will also position the Department on the correct pathway towards the net zero carbon 2050 target.

It should be noted that, as a result of Covid-19, we are looking to lease extra estate capacity for the 13,500 additional Work Coaches we will recruit as announced by the Chancellor<sup>341</sup>. This will inevitably lead to a short-term increase in overall carbon emissions across the estate during the period of these leases. However, the lease commitments for these additional properties will be short term (typically under three years) and the Department is committed to

implementing measures to reduce the carbon emissions within its longer-term property portfolio.

The Department is committed to supporting the Ultra-Low Emission Vehicle targets of 25% of its fleet to be electric vehicles by 2022 and 100% by 2030. Prior to Covid-19, plans were in place to start implementation this year. We are now reviewing the impact of Covid-19 on our plans.

The Department has reduced the print fleet by half from 8,000 to 4,400 across the estate. A targeted reduction programme has reduced print by 17% last year against a target of 10%. Covid-19 has provided an opportunity for DWP to speed the move from print to on-line and alternative options more quickly than had been planned – diverting notifications away from a vast local print regime and re-diverting these via an on-line capability or via an existing bulk print contract. These initiatives continue at pace.

## Annex 2: Progress against milestones from 2019 report

In Annex C of the Government Response to the CCC's 2019 Progress Report in October 2019, we set out an updated list of key actions and milestones that we expect to achieve over the coming year and beyond, demonstrating continued policy momentum and the Government's commitment to ambitious action to reduce emissions across the whole economy.

In this section, we provide an update on progress against the actions and milestones we expected to have achieved by the end of 2019 and beyond, demonstrating our progress towards meeting the ambitions set out.

Lead Department	Description	Original Timing	Progress
<b>Green Finance</b>			
<b>BEIS/HM Treasury</b>	Review progress on greening the UK's financial system, including implementation of the Task Force on Climate-related Financial Disclosures (TCFD) recommendations	End 2020	<b>Ongoing</b> - The Government's joint TCFD taskforce will set out our next steps on TCFD by the end of 2020
<b>BEIS/HM Treasury</b>	Conduct a formal review of progress against the ambitions and plans across all three chapters of the Green Finance Strategy	2022	<b>Ongoing</b>
<b>Clean, Smart, Flexible Power</b>			
<b>BEIS</b>	Introduction of the Smart Export Guarantee (SEG) obligation	1 January 2020	<b>Complete</b>
<b>BEIS</b>	Publish consultation on Contracts for Difference Allocation Round 4	Early 2020	<b>Complete</b>
<b>BEIS/Ofgem</b>	Government response to consultation on reforming	Autumn 2020	<b>Ongoing</b>

<b>Lead Department</b>	<b>Description</b>	<b>Original Timing</b>	<b>Progress</b>
	the energy industry codes		
<b>BEIS/Ofgem</b>	Publish report following independent review of electrical engineering standards	Spring 2020	<b>Ongoing</b>
<b>Ofgem</b>	Publish consultation on RIIO-ED2 price control strategy	Summer 2020	<b>Complete</b>
<b>Ofgem</b>	RIIO-2 price control draft determinations on network company outputs and funding	Summer 2020	<b>Complete</b>
<b>Ofgem</b>	Final decision on implementation of market-wide half-hourly settlement	Q3 2020	<b>Ongoing - Expected Spring 2021</b>
<b>BEIS</b>	First Annual Review of the Offshore Wind Sector Deal	November 2020	<b>Complete</b>
<b>BEIS</b>	Continue to work with Ofgem and industry to implement all actions in the Smart Systems and Flexibility Plan	By 2022	<b>Ongoing- We have implemented 25 of the 38 actions in the 2017 Smart Systems and Flexibility Plan and 2018 Progress Update</b>
<b>Improving Business and Industry Efficiency and Supporting Clean Growth</b>			
<b>UKRI</b>	Industrial Strategy Challenge Fund's Industrial Decarbonisation Challenge phase 1 opens	Autumn 2019	<b>Complete</b>

Lead Department	Description	Original Timing	Progress
BEIS	Publish responses to the consultations on potential business models for CCUS and on the potential re-use of existing oil and gas assets for CCUS	Late 2019	<b>Complete</b>
BEIS	Publish the UK Government's and the Devolved Administrations' response to the consultation on The Future of UK Carbon Pricing	Late 2019	<b>Complete</b>
BEIS	Publish evaluation and Post Implementation Review of the Energy Savings Opportunity Scheme	Late 2019	<b>Complete</b>
BEIS	Publish response to consultation on sustainable business models for low carbon hydrogen and use this to inform future work	Late 2019	<b>Complete</b>
BEIS	Announce the winners of the demonstration phase of both the Hydrogen Supply and Industrial Fuel Switching competitions	Late 2019	<b>Complete</b>
BEIS	Publish feasibility studies for both the Hydrogen Supply and Industrial Fuel Switching competitions	Late 2019	<b>Complete</b>
BEIS	Publish an action plan in collaboration with Mexico	Late 2019	<b>Complete</b>

Lead Department	Description	Original Timing	Progress
	and Saudi Arabia to advance the Mission Innovation CCUS Challenge		
BEIS	Award the Phase 2 contracts for the Boosting access for SMEs to energy efficiency (BASEE) competition	January 2020	<b>Complete</b>
BEIS	Publish evaluation of the current Climate Change Agreements Scheme.	Early 2020	<b>Complete</b>
BEIS	Consultation on proposals for future reform of the Energy Savings Opportunity Scheme	Early 2020	<b>Ongoing</b> – expecting to consult in 2021, in advance of next ESOS phase
BEIS	Publish the government Response to the formal consultation on the Industrial Energy Transformation Fund, alongside launch and guidance for Phase 1 of the scheme	Spring 2020	<b>Complete</b>
BEIS	Phase 1 of the Industrial Energy Transformation Fund opens to applications	Summer 2020	<b>Complete</b>
BEIS	Publish consultation on the Clean Steel Fund	2020	<b>Complete</b>
BEIS	Publish engagement on the Low Carbon Hydrogen Fund	2020	<b>Ongoing</b> - Due end of this year

Lead Department	Description	Original Timing	Progress
BEIS	Publish consultation on the proposed SME Energy Efficiency Scheme	2020	<b>Ongoing</b> - Now planned for 2021
BEIS	Publish government response to consultation on tightening the minimum energy efficiency standards for non-domestic Private Rented Sector properties	2020	<b>Ongoing</b> - Due end of this year
BEIS	Progress innovation programmes and generate learnings across the hydrogen value chain	Ongoing	<b>Ongoing</b>
BEIS	Work with partners to understand the elements required to test low carbon hydrogen production, enable the option of deployment and the role for government. This will include looking at the supply chain, skills requirements, and how best to coordinate our efforts.	Ongoing	<b>Ongoing</b>
BEIS	Beyond support through the RHI, ambition to phase out high fossil fuel heating in businesses off the gas grid during the 2020s. Businesses and industry will be involved in developing the new policy.	During the 2020s	<b>Ongoing</b> - Due later this year

<b>Lead Department</b>	<b>Description</b>	<b>Original Timing</b>	<b>Progress</b>
<b>Improving our Homes</b>			
<b>BEIS</b>	Publish consultation on the policy options for the heat networks future market framework	Late 2019	<b>Complete</b>
<b>BEIS</b>	Publish consultation on the appropriate mechanism to increase the proportion of green gas in the gas grid	Late 2019	<b>Complete</b>
<b>MHCLG</b>	Publish the second part of the consultation on Part L of the Building Regulations	Late 2019	<b>Complete</b>
<b>BEIS</b>	Publish the updated Fuel Poverty Strategy for England	Late 2019/2020	<b>Ongoing- Due later this year</b>
<b>BEIS</b>	Publish consultation on requirements for lenders to support homeowners improve the energy efficiency of the homes they lend to	Late 2019/2020	<b>Ongoing</b>
<b>BEIS</b>	Publish consultation on the trajectory for the domestic Private Rented Sector regulations	Late 2019/2020	<b>Complete</b>
<b>BEIS</b>	Publish a Heat Policy Roadmap – Heat and Buildings Strategy	2020	<b>Ongoing – Due later this year</b>
<b>BEIS</b>	Publish consultation on the successor to ECO3	2020	<b>Ongoing- Expected early 2021</b>
<b>BEIS</b>	Publish consultation on the regulatory options for	During the 2020s	<b>Ongoing- Due later this</b>

Lead Department	Description	Original Timing	Progress
	phasing out the installation of fossil fuel heating systems in properties off the gas grid. Consumers and industry will be involved in developing the new policy.		year
<b>Enhancing the Benefits and Values of our Natural Resources</b>			
Defra	Development of Farm Emissions Reduction Plan (FERP) to reduce emissions within the farm boundary	2019 onwards	FERP has been superseded and we are developing priority mitigation options for CB4-5 within and alongside the main future farming policy schemes (e.g. ELM).
Defra	Research projects on ruminant diets and microbiomes to support industry in strengthening farm biosecurity, reducing reliance on medicine and reducing emissions	2019 onwards	<b>Ongoing</b>
Defra	Launch consultation on English Tree Strategy	Summer 2020	<b>Complete</b>
Defra	Publish England Peat Strategy	Late 2019	<b>Ongoing- Expected later this year</b>
Defra	Publish research on the current understanding of the practical, social, economic and environmental constraints on the large-scale adoption of paludiculture in the lowland peats of England	Late 2020	<b>Ongoing</b>

Lead Department	Description	Original Timing	Progress
	and Wales		
Defra	Publish a Resources and Waste Strategy evaluation plan and monitoring framework	Late 2019	<b>Complete</b>
Defra	Launch consultation on food waste reporting	Late 2019	<b>Ongoing</b> - publication of the consultation will take place in 2020 or early 2021
Defra	Launch consultation for transposition of the Circular Economy Package	Late 2019	<b>Complete</b>
Defra	Publish the English Tree Strategy	2020-21	<b>Ongoing</b>
Defra	Launch of consultations on the final proposals for a deposit-return scheme, consistency in household and business recycling and an extended producer responsibility scheme	Early 2021	<b>Ongoing</b>
Defra	Ban on the supply of plastic straws, drinks stirrers and cotton buds entering into force	October 2020	<b>Complete</b>
Defra	Creation of a Fertiliser Expert Group to encourage industry to use low-emissions fertiliser	2020	<b>Ongoing</b>
Defra	Next F-gas quota reduction of 55% from baseline level	January 2021	<b>Ongoing</b>

<b>Lead Department</b>	<b>Description</b>	<b>Original Timing</b>	<b>Progress</b>
<b>Defra</b>	Launch of Environmental Land Management Scheme National Pilot	2021	<b>Ongoing</b>
<b>Defra</b>	Launch of Environmental Land Management scheme	2024	<b>Ongoing</b>
<b>Accelerating the Shift to Low Carbon Transport</b>			
<b>DfT</b>	Publish Net Zero Aviation Consultation	Autumn 2020	<b>Ongoing</b>
<b>DfT</b>	Commission research on financial and economic incentives that could possibly be adopted at a global scale to incentivise the switch to low/zero emission ships	Autumn 2019	<b>Complete</b>
<b>OLEV</b>	Work to set out a vision for a core network of rapid and high powered chargepoints along England's key road network	Late 2019	<b>Complete</b>
<b>DfT</b>	Launch public beta phases of the Bus Open Data Digital Service (timetables) to both bus operators and local authorities	Late 2019	<b>Complete</b>
<b>OLEV</b>	Analyse the report of the Electric Vehicle Energy Taskforce, commissioned by the Government to propose solutions to challenges brought to the energy system by the uptake of	Late 2019	<b>Ongoing</b>

Lead Department	Description	Original Timing	Progress
	electric vehicles		
OLEV	Launch consultation on green number plates	Late 2019/2020	<b>Complete</b>
DfT	Publish Aviation Strategy	Early 2020	This will be considered as part of the Net Zero Aviation Consultation.
OLEV	Respond to the consultation on amending Building Regulations to include the provision of an electric vehicle chargepoint in new residential buildings	2020	<b>Ongoing</b>
DfT	Decision on next steps in light of platooning and longer semi-trailer trials	2020 onwards	<b>Ongoing –</b> HGV platooning project is due to report in late 2021  Longer semi-trailer trial annual report due Autumn 2020
OLEV	Publish response to the consultation on electric vehicle smart charging and bring forward regulations	Late 2020	<b>Ongoing</b> - A summary of responses was published in May 2020, and it is our intention to lay the relevant legislation next year
OLEV	Review progress made and consider what interventions are required to speed up the adoption of ultra-low emission vehicles if not enough progress is being made	By 2025	<b>Ongoing</b> - Consultation on bringing forward the existing 2040 target closed on 31 July

## Annex 3: Progress against Clean Growth Strategy metrics

In the Clean Growth Strategy, we set out a range of key economy-wide and sector-level metrics against which we will measure our progress. This third annual update to the sector level metrics provides an indication of economy-wide progress toward meeting the ambitions set out in the Clean Growth Strategy. These have been updated to include the latest available data for 2018 and, where available, estimates for 2019. Statistical revisions to historic data have also been included.

These metrics give helpful insight into the strength of progress. However, care should be taken when interpreting the figures: year-on-year results can be volatile as they depend on external factors such as weather and may not reflect underlying trends. In addition, estimates for 2019 are based on provisional data and are likely to change.

Since 1990, the UK's emissions per capita have fallen by 51%. Emissions per capita continued to fall from 7.2tCO<sub>2</sub>e per person in 2016 to 6.8tCO<sub>2</sub>e in 2018 and are provisionally estimated at 6.5tCO<sub>2</sub>e in 2019. The Emissions Intensity Ratio of the economy has fallen over two thirds since 1990 and is provisionally estimated to have fallen again in 2019.

Sector level data demonstrates that:

- For non-industrial businesses and the public sector, provisional figures for 2019 show a continued fall in energy use per £ million output. Emissions intensity for non-industrial businesses and the public sector has fallen by 31% since 1990, however, there is a slight increase in this metric over the years 2017-19. For industrial businesses, we see a similar pattern; industrial energy use per £ output is projected to fall in 2019, however, the emissions intensity for industrial businesses is provisionally projected to increase slightly in 2019.
- Emissions from homes are highly dependent on the weather making year-on-year comparisons difficult. The trend in energy use per household and emissions intensity appears flat over the years 2016-19. Provisional figures show that the emissions intensity of home energy use will continue to fall in 2019. In 2018, 34% of homes in England were rated EPC C or above for energy efficiency. This is an increase from 30% in 2016 and 2017.
- Road transport continues to account for around a quarter of UK emissions. Road transport emissions per vehicle km have fallen by one-fifth since 1990. Provisional figures for 2019 show a continued fall in road transport energy use per vehicle km and road transport emissions per energy use.
- Power sector emissions have fallen by around two-thirds since 1990. The power sector continued to make strong progress, with emissions falling 9% in 2018 and provisional figures showing a 13% decrease in 2018. Provisional estimates for 2019 show just over half of all electricity generated was from clean sources.
- The coverage of woodland area continued to increase in both 2018 and 2019. The trend in emissions intensity of agricultural output has remained relatively flat in recent years. While emissions from waste have been largely flat since 2016, the amount of biodegradable waste sent to landfill is nearly 80% lower than in 1990.

Sector	Clean Growth Strategy Metric	1990	2010	2016	2017	2018	2019 <sup>1</sup>	1990 – 2018
Overall	Emissions per capita (tCO <sub>2</sub> e / person)	13.9	9.6	7.2	7.0	6.8	6.5*	-51%
	Emissions Intensity Ratio, EIR (tCO <sub>2</sub> e / £ million of GDP)	710	355	248	237	229	218*	-68%
	Final energy consumption intensity of GDP (MWh / £ million)	1,524	1,034	862	845	846	827	-44%
Business and public sector	Non-industrial business and public energy use per £ million output (MWh / £ million)	305	183	174	169	169	165	-44%
	Emissions intensity of non-industrial business and public energy use (gCO <sub>2</sub> e / kWh)	120	98	83	82	83	84*	-31%
	Industrial business energy use per £ million output (MWh / £ million)	1,609	1,128	875	856	856	834	-47%
	Emissions intensity of industrial business energy use (gCO <sub>2</sub> e / kWh)	486	412	403	402	387	394*	-20%
Homes	Home energy use per household (MWh / household)**	21	22	17	17	17	17*	-16%
	Emissions intensity of home energy use (gCO <sub>2</sub> e / kWh)	169	149	140	140	139	138*	-17%
	Share of Homes with EPC C or above (%)***	Not available	Not available	30%	30%	34%	Not available	Not available
Transport	Road transport energy use per 1,000 vehicle kilometres (kWh/1000km)	1,127	982	943	932	924	910	-18%
	Road transport emissions per vehicle kilometre (gCO <sub>2</sub> e/km)	261	219	214	212	209	204*	-20%
	Road transport emissions per energy use (gCO <sub>2</sub> e/kWh)	231	223	227	228	226	224*	-2%

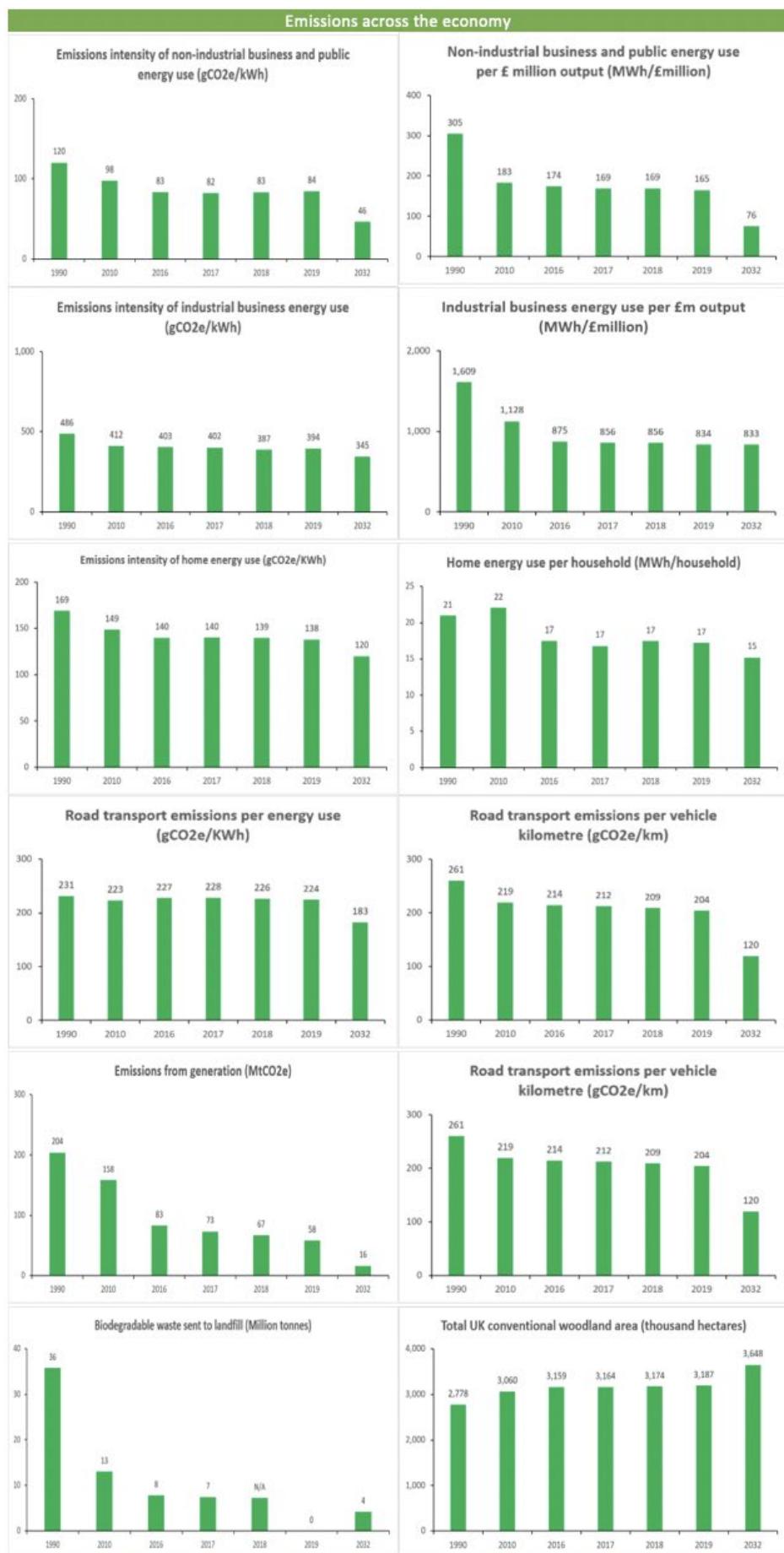
<sup>1</sup> 2019 estimates are provided where available.

Power	Emissions from generation (MtCO <sub>2</sub> e)	204	158	83	73	67	58*	-67%
	Share of generation from clean sources (%)	21%	19%	44%	49%	51%	52%	29ppts
Natural Resources	Total conventional woodland area (thousand hectares)	2,778	3,060	3,159	3,164	3,174	3,187	14%
	Emissions intensity per £ million agricultural output (tCO <sub>2</sub> e/£ million)	5,211	4,357	3,938	3,757	3,839	3,802*	-26%
	Biodegradable waste sent to landfill (MtCO <sub>2</sub> e)	36	13	8	7	7	Not available	-80%
	Emissions from landfill (MtCO <sub>2</sub> e)	60	24	14	14	14	14*	-76%

\* Emissions estimates for 2019 are provisional.

\*\* Revised metric. Based on ONS UK Household projections (2016 & 2018), with scaling factors applied in missing years. Methods differ between countries and have changed over time.

\*\*\* New metric. This is based on England only housing stock, i.e. dwellings, not households.



The graphs above include projections for 2032 from the pathway analysis presented in the Clean Growth Strategy. The Technical Annex to the Strategy provides more information on the methodology available at <https://www.gov.uk/government/publications/clean-growth-strategy>

# Endnotes

- <sup>1</sup> <https://www.gov.uk/government/news/greener-homes-jobs-and-cheaper-bills-on-the-way-as-government-launches-biggest-upgrade-of-nations-buildings-in-a-generation>
- <sup>2</sup> <https://www.gov.uk/government/news/new-plans-to-make-uk-world-leader-in-green-energy>
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