HM Government

Carbon Budget Delivery Plan

March 2023

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Contents

Introduction

1. This Carbon Budget Delivery Plan - which also serves as our “section 14” report under the Climate Change Act 2008 - is being published to inform Parliament and the public on the government's proposals and policies to enable carbon budgets to be met.

2. The approach set out in our October 2021 plan to deliver net zero, the Net Zero Strategy, remains the right one. The independent Net Zero Review led by Chris Skidmore MP supported this position. The Net Zero Growth Plan and the Energy Security Plan, published alongside this report, provide an update to the 2021 Net Zero Strategy and sets out the government’s strategy to achieve net zero and to deliver energy security, while at the same time increasing the UK’s international economic competitiveness.

3. This Carbon Budget Delivery Plan provides the detail, setting out the current package of proposals and policies prepared by the Secretary of State (as of March 2023) to enable the delivery of Carbon Budgets 4, 5 and 6. The proposals and policies reach far into the future, setting out our plans to the end of Carbon Budget 6 in 2037. This means that, whilst maintaining focus on delivering the proposals and policies, we must acknowledge that the package represents one of many routes to full decarbonisation of the UK economy by 2050. We expect the world to change between now and the end of Carbon Budget 6, so we expect that the package of proposals and policies will evolve to adapt to changing circumstances, new evidence, to utilise technological developments and address emerging challenges. This will enable us to maximise opportunities to drive growth, jobs and investment across the UK whilst reducing emissions.

4. In light of this, and consistent with the duties imposed by the Climate Change Act 2008, we will continue to keep the proposals and policies under review and update and amend the package as appropriate. It is an extremely difficult process to precisely forecast those proposals and policies that will be in effect so far in the future, for example those intended to take effect in Carbon Budget 6, and there is considerable fluidity in the final delivery. We expect to provide periodic updates over time.

5. The carbon budgets apply to the whole of the UK economy and society. In preparing this package of proposals and policies, we have consulted with Devolved Administrations who we continue to work with to deliver our UK-wide carbon budgets.

Background

Climate Change Act and carbon budgets

6. Parliament passed the Climate Change Act 2008 ('the Act'), legislating the UK's framework for setting carbon budgets. Under the Act, the UK is legally required to reduce greenhouse gas emissions by at least 100 per cent by 2050 on 1990 levels. In 2019, on advice of the Climate Change Committee ('CCC'), the UK committed to reaching net zero emissions by 2050 and consequently the target reduction in the Act was amended (prior to this the target was at least 80 per cent reduction on 1990 levels). To keep the UK on a pathway to achieving the 2050 target, the government is required to set legally binding, five-year caps on emissions – carbon budgets – twelve years in advance and then to publish a report setting out proposals and policies for meeting that budget and those budgets previously set.

7. The Act also established the Committee on Climate Change, now the Climate Change Committee (CCC), an independent statutory body, to advise the government and the Devolved Administrations on setting and meeting carbon goals. The CCC advises the government on the level of each budget, the respective contributions that different sectors could make and the extent to which carbon budgets could be met through the use of permitted "flexibilities" (such as surpluses from previous carbon budgets or the purchase of good quality international carbon credits).

8. Six carbon budgets have been set to date, covering 2008 to 2037. Carbon Budget 6, the first to be set under the UK's new net zero target, was legislated for in June 2021. The UK has already met, and overachieved, its first (2008-2012) and second (2013-2017) carbon budgets and is on track to meet the third (2018-2022). Between 1990 and 2021, UK emissions fell by 48% while our economy grew by 65%, decarbonising faster than any other G7 country.

9. This Carbon Budget Delivery Plan is the means by which we satisfy section 14 of the Act to publish a package of proposals and policies for enabling Carbon Budgets 4, 5 and 6 to be met.

10. To demonstrate how we will enable our legislated carbon budgets up to and including Carbon Budget 6 to be met, this report sets out the package of proposals and policies and their anticipated emissions reductions (where quantified) to 2037. As required by the Act, it also sets out the timescales over which we expect those proposals and policies to take effect.

Meeting carbon budgets

Baseline and savings required

11. To determine the total additional emissions reductions required to enable carbon budgets to be met we take an adjusted version of the government Energy and Emissions Projections (EEP 2021-2040) as a "baseline" for future emissions and compare this to the legislated carbon budget levels.[1]

12. EEP 2021-2040 is based on assumptions of future economic growth, fossil fuel prices, electricity generation costs, UK population and other key variables. They also incorporate EEP policies that have already been implemented, adopted or planned as of January 2022 (July 2022 for power sectors).[2] The Technical Annex includes further detail on the latest 2021-40 Energy and Emissions Projections.

13. The current package of proposals and policies to enable Carbon Budgets to be met comprises the policies already incorporated in EEP 2021-2040, as well as the yet to be implemented, adopted or planned proposals and policies that will be needed to deliver emissions savings up to CB6. Table 4 in Appendix B sets out the full list of policies currently included in EEP 2021-2040 and Tables 5 and 6 in the same appendix set out the list of additional proposals and policies.

14. The policies set out in EEP 2021-2040 show the excellent progress that the UK has already made towards meeting our carbon targets. From the Projected baseline, EEP policies alone are expected to deliver over 100% of the emissions savings needed for Carbon Budget 4, and over 40% of the savings required for Carbon Budget 6, compared to projections with no government policy included (see Chart 1).

15. The latest EEP 2021-2040 was published in 2022, with the next update expected in the autumn 2023. However, recent changes in the greenhouse gas inventory and underlying trends in some areas have affected baseline emissions. For the purposes of this report, we have made adjustments to the EEP 2021-2040 baseline to reflect these. When making the adjustments we have taken a conservative approach, resulting in a higher baseline than the EEP 2021-2040 baseline by 4Mt amount in CB6. More detail on baseline adjustments is set out in the Technical Annex to this report.

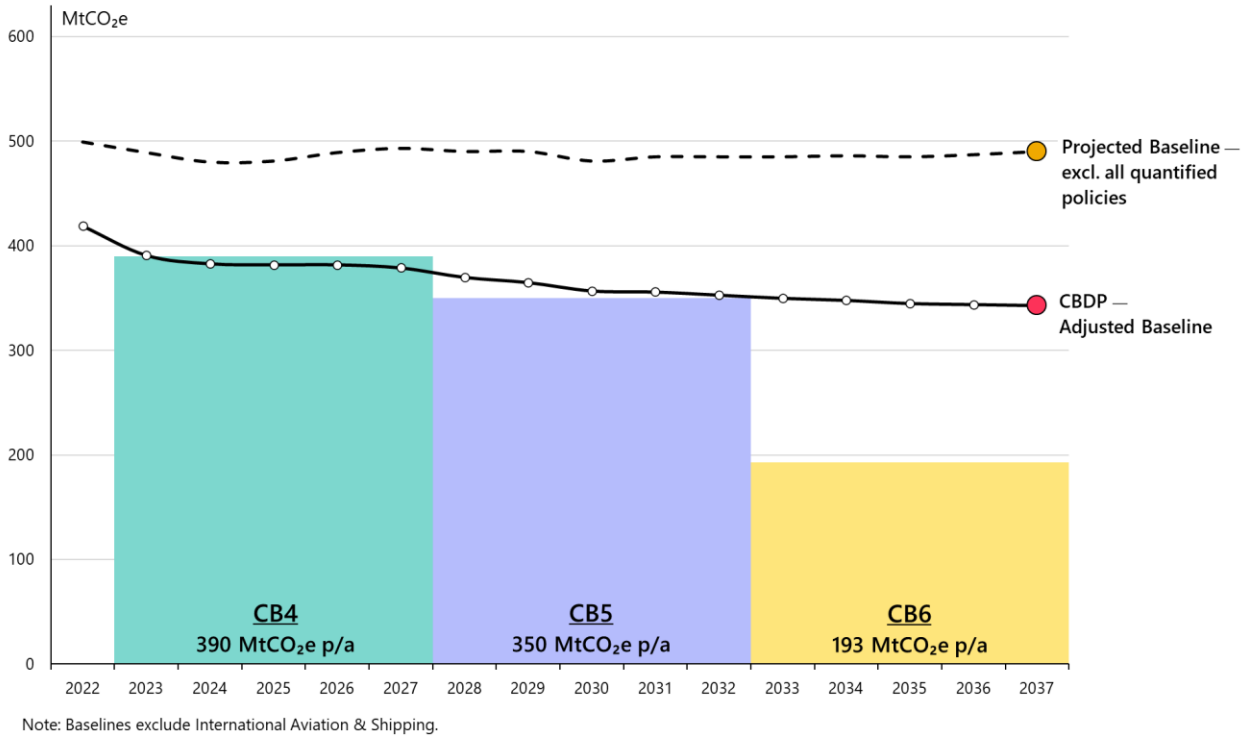
1 UK Government, Energy and emissions projections: 2021 to 2040. Available at https://www.gov.uk/government/publications/energy-and-emissions-projections-2021-to-2040

2 Note this equates to the UNFCCC international reporting scenario "With Additional Measures" (WAM), which includes Existing and Planned policies.

16. The difference between the adjusted baseline and the carbon budget for that period represents the level of emissions savings required to meet the target - this is the reduction in emissions we are trying to achieve through the proposals and policies laid out later in this document (Appendix B). When the total quantified savings for a given carbon budget are discussed as a percentage, this percentage relates to the gap between the baseline and the carbon budget.

17. After the baseline adjustments have been made, we project that CB4 could already be met with 7Mt p.a of headroom. The amount of savings required from further proposals and policies to meet CB5 and CB6 are 9Mt p.a and 199Mt p.a, respectively.

Chart 1 – emission savings baseline with no EEP policies, CBDP adjusted baseline including EEP policies and Carbon Budget targets.



Note: Baselines exclude International Aviation & Shipping.

Energy & Emissions Projections, 2022 • Dept. DESNZ internal analysis, 2023.

Projected emissions against current and future carbon budgets

18. Table 1 shows the expected performance against Carbon Budgets 4, 5 and 6 targets. For each carbon budget, the savings from new and early-stage proposals and policies are subtracted from the baseline to produce a figure for residual emissions. This is then compared to the 'budget limit' to establish expected total quantified performance. Where there is a positive figure in this last row of the table, it indicates that we expect to have reduced emissions beyond the level required by the budget; and where this is negative, it indicates

that further emissions savings will be required to meet the budget. Unquantified proposals and policies that will contribute to achieving carbon budgets are set out separately.

Table 1 – total projected emissions against CB4 – CB6 ($MtCO_2e$)

	CB4 5-yr (average pa)	CB5 5-yr (average pa)	CB6 5-yr (average pa)
Years covered	2023 - 2027	2028 - 2032	2033 - 2037
Budget limit	1950 (390)	1752 (350)	965 (193)
Baseline (includes EEP policies and baseline adjustments)	1917 (383)	1799 (360)	1958 (392)
Savings from new and early-stage proposals and policies	88 (18)	446 (89)	961 (192)
Residual emissions (after policy savings)	1829 (366)	1353 (271)	997 (199)
Performance against carbon budgets	121 (24)	399 (80)	-32 (-6)

Sectoral overview

19. Table 2 below sets out the projected sectoral emissions across the carbon budgets. These figures represent the projected residual emissions, after proposals and policies set out in this report have taken effect. The figures shown for each carbon budget are total emissions over the five-year period. Alongside this, we have shown the actual emissions over the single year of 2021 to show current performance. These are only projections and should not be interpreted as hard sectoral policy targets. Within our overall carbon budgets it is vital to retain a degree of flexibility to adjust our plans as circumstances change given the complexity of the net zero system and the inherent uncertainty in any projections. Modelling cannot always take into account systemic feedback effects, which are hard to quantify. Other factors such as consumer behaviour, technological innovation and the speed and structure of future economic growth further contribute to intrinsic uncertainties of long-term sectoral emissions projections.

Table 2 - Summary of sectoral residual emissions across carbon budgets ($MtCO_2e$)

Sector	Current (2021, pa)	CB4 5-yr (average pa)	CB5 5-yr (average pa)	CB6 5-yr (average pa)
Agriculture and LULUCF	49	231 (46)	207 (41)	183 (37)
Buildings	88	350 (70)	320 (64)	217 (43)
Domestic transport	109	546 (109)	422 (84)	254 (51)
Fuel supply	20	93 (19)	69 (14)	48 (10)
Industry	76	340 (68)	207 (41)	111 (22)
Power	54	143 (29)	63 (13)	42 (8)
Waste and F-gases	30	125 (25)	96 (19)	75 (15)
Greenhouse Gas Removals	N/A	0 (0)	-32 (-6)	-117 (-23)
Intl aviation and shipping (IAS)	20	217 (43)	210 (42)	184 (37)
Total excluding including IAS	**426**	**1829 (366)**	**1353 (271)**	**813 (163)**
Total including IAS	**446**	**2046 (409)**	**1563 (313)**	**997 (199)**

Background to our package of proposals and policies to meet the Carbon Budgets

20. Our Carbon Budget Delivery Plan is a dynamic long-term plan for a transition that will take place over the next 15 years, setting us on course to reach net zero by 2050. Many of the proposals and policies in the package will be phased in over the next decade or longer. Given our success in decarbonisation to date we are confident in our approach, but this plan does not intend to predict the exact shape of the British economy in 2037 or later, and nor should it.

21. We are taking a market-led approach to developing and deploying the technological shifts required to meet net zero. This means that it is very likely that some proposals or policies will out-perform expectations, with costs falling faster than we expect - for example, as scale increased, the per unit price of UK offshore wind fell by almost 70% between the first Contracts for Difference allocation round in 2015 and the fourth in 2022. Meanwhile, some other proposals or policies will under deliver compared to expectations. The complexity of the net zero system means there is inherent uncertainty in any forecasts. Modelling cannot always take into account systemic feedback effects, which are hard to quantify, such as co-benefits from technology roll-out. These have the potential to improve our position to enable the carbon budgets to be met.

22. Similarly, consumer behaviour, future trends and the future economic context, all of which will play a huge role in meeting carbon budgets and the exact mix of proposals and policies we need to get there is variable. For example, in recent years the uptake of electric vehicles has consistently exceeded expectations.

23. It is important to emphasise two points. Firstly, the list of proposals and policies that we set out is, necessarily, a snapshot of our current plan for meeting carbon budgets. As future circumstances change, we will review and adapt the proposals and policies in this report. Secondly, some of the measures relied upon are proposals at an early stage of development that may not be required at all if we are overachieving in meeting carbon budgets or that could be subject to significant change as part of the full policy development process. The mechanisms for implementing these proposals will depend upon technological developments, societal changes, stakeholder views, future spending arrangements and broader policy developments. The inclusion of proposals and policies at an early stage of development that require further design and development ensures we do not risk curtailing scientific and technological development through over-prescription, whilst still setting out a carefully-planned, long-term package that will enable carbon budgets to be met.

The methodology adopted in this report

24. In order to assess the package of proposals and policies against carbon budgets, we first calculated the expected emissions savings for all proposals and policies where this could be quantified at this stage (see Table 5). A range of analytical models, designed to represent the sectors described in this report, and analytical techniques were used to derive the estimates, using consistent assumptions on shared inputs (such as GDP and fuel prices), and set against an appropriate baseline for each sector.

25. Further detail on the methodological approach underpinning these estimates can be found in the Technical Annex.

26. The calculated savings assume the package of proposals and policies are delivered in full. We consider it is reasonable to expect this level of ambition -

having regard to delivery risks and the wider context, which give rise to both downside and upside risks (see further information on delivery risks below).

27. We then combined these savings with the baseline as described above, to calculate the position compared to the carbon budgets. We then considered the potential of unquantified policies, where we cannot currently quantify associated emissions savings, for example in relation to some early-stage proposals, where we are still assessing the available evidence.

Consideration of the 2030 Nationally Determined Contribution

28. The government is committed to delivering its international commitments, including the 2030 Nationally Determined Contribution (NDC) under the Paris Agreement. The UK will report to the United National Framework Convention on Climate Change on progress towards meeting the 2030 NDC from 2024 and will report on progress every 2 years.

29. We have quantified emissions savings to deliver 88 Mt or 92% of the NDC. We are confident the delivery of emissions savings by unquantified policies detailed in this package will largely close this gap and the government will bring forward further measures to ensure that the UK will meet its international commitments if required.

Conclusion on enabling carbon budgets to be met

30. As outlined, our quantified proposals and policies give us over 100% of savings required to meet Carbon Budget 4 and 5 and 97% of the savings required to meet Carbon Budget 6.

31. Whilst the savings deliverable from the proposals and policies are likely to exceed Carbon Budgets 4 and will substantially overdeliver against Carbon Budget 5, there is a judgement to be made whether the policies identified at this stage are sufficient to enable Carbon Budget 6 to be met. We are confident that Carbon Budget 6 can be met through a combination of the quantified and unquantified policies identified. Proposals and policies we expect to deliver additional carbon savings, beyond those currently quantified, is identified in the first column of Table 6 of Appendix B.

32. Examples of areas where we expect some further savings are areas of future research in the Agriculture and Land Use, Land-use Change and Forestry (LULUCF) sectors, as well as policies to further improve the energy efficiency of buildings and place-based transport interventions that will reduce emissions locally.

33. In addition, the package is further strengthened through the inclusion of a range of cross-cutting proposals and policies which will enable and support our other proposals and policies – whether through leveraging the investment needed for technological growth or delivering the green jobs needed for the transition. This

supports with de-risking delivery across the package. We also expect that some of these areas could lead to additional emissions savings beyond those we have currently quantified: for example our package of policies to drive innovation is likely to lead to new low-carbon technologies which will lower costs and accelerate the transition to net zero.

34. We have also considered wider factors, which will affect our ability meet carbon budgets. These include additional emissions reductions not related to central government policy, such as the action we know is being taken by local authorities and devolved administrations, and areas of wider uncertainty in our projections of emissions. Taken together, they could positively impact our ability to meet carbon budgets.

35. The full list of proposals and policies to enable carbon budgets to be met are presented in Appendix B. Figures are included at a UK level except in relation to land use policies which are England only. In setting out the total emission reductions, above, an assumption of overall emissions savings at UK level are assumed for land use.

Delivery risks to our package of proposals and policies

Background

36. The context within which we are delivering this transition is inherently uncertain. There are a wide range of fluctuating external factors which drive changes in greenhouse gas emissions and therefore the amount of savings we subsequently need to deliver to achieve carbon budgets. Our EEP baseline is sensitive to macro-economic changes, changes to fossil fuel prices, behavioural shifts and much more. This creates uncertainty and both upside and downside risks, which we manage through regular monitoring and updating of our baseline and, if necessary, taking action to address.

37. Policies included in the EEP baseline have high delivery confidence as they are at an advanced stage of development and have either been implemented already or are planned policies where the funding has been agreed and the design of the policy is near final.

38. Non-EEP proposals and policies vary in their degree of delivery confidence. This is because a significant proportion of these proposals and policies have uncertainties inherent in long-term policy making and linked to our spending review cycles (as explained in the background to our package of proposals and policies above). Again, there are both upside and downside risks. Naturally, as we move towards Carbon Budget 6, a greater number of proposals and policies that are currently at an earlier stage of development will move into implementation and form part of the EEP baseline, giving higher delivery confidence. Currently, 40% of all savings needed to achieve our Carbon Budget

6 are projected to come from government policies that are part of the EEP baseline, providing further confidence in the plan.

39. Furthermore, taking a market-led approach to the transition means that technological changes and behavioural shifts will significantly shape the delivery of government policies providing opportunities to out-perform expectations and deliver greater savings.

40. Appendix D includes summaries at a sectoral level of the delivery risk picture, which includes commentary on the significance of the risks faced and the mitigating action being taken.

Conclusion on delivery risk

41. We have robust mechanisms in place to monitor, manage and mitigate our delivery risks. The Secretary of State for the Department for Energy Security and Net Zero is deputy chair of the Domestic Economic Affairs (Energy, Climate and Net Zero (DEA (ECNZ)) Cabinet Committee, which oversees overall progress across the UK's climate portfolio, considering matters related to the delivery of net zero. This forum sits at the apex of our climate governance. Like its predecessor (The Climate Action Implementation Committee), DEA (ECNZ) will receive regular updates on the UK's progress against carbon budgets and the UK 2030 NDC, which are informed by regular reporting and to ensure timely action is taken to keep programmes and policies on track. This is supported by well-established official-level governance structures supporting DEA (ECNZ), which regularly scrutinises and approves analysis and reports on the proposals and policies being developed to keep us on track for our carbon budgets.

42. Taking account of the level of policies already in delivery and in the EEP projections; the progress already made for Carbon Budget 4; the timelines for further policy development and implementation for Carbon Budgets 5 and 6; and the risks and mitigations around those policies, we have assessed the risks as being manageable and consider that the package of proposals and policies will enable carbon budgets to be met.

Timescales

43. The timescales over which the proposals and policies take effect represent modelled estimates of when emissions savings are expected to begin and end. This is informed by an evidence-based understanding of how soon after policy implementation we would expect emissions savings to materialise; and for how long we anticipate the policy to continue to deliver emissions reductions. Whilst the government has committed to implementation dates for some proposals and policies, for others the implementation date remains subject to change as the policy develops. Further, some proposals and policies depend on funding decisions at future Spending Reviews. When emissions savings start to take effect is therefore dependent on the evidence underpinning the modelling as well

as when the policy is implemented – this means that the timescales presented in Appendix B will change over time. All proposals and policies are expected to deliver emissions savings until at least 2037, the end of Carbon Budget 6.

Appendix A: sector definitions

Table 3: Sector definitions

Net Zero Strategy Sector	Sector definition
Power	Emissions from power stations (Major Power Producers only), including those generating energy from waste.
Fuel Supply	Emissions from the extraction, processing, and production of fuels (chiefly oil, coal, gas and hydrogen).
Industry	Emissions from industrial processes, manufacturing, and production, including fuel combustion and product use in industrial buildings, as well as emissions from refineries and construction machinery. Includes emissions from non-Major Power Producers auto-generation and Combined Heat and Power.
Heat and Buildings	Emissions from public, commercial, and residential buildings, including domestic product use such as garden machinery and composting.
Domestic Transport	Emissions from all forms of road and rail transport, domestic aviation and domestic shipping (including fishing vessels).
International Aviation and Shipping	Emissions from fuel used in international aviation and international shipping, as measured by UK bunker fuel.
Agriculture	Covers emissions from livestock, crop soils and agricultural machinery.
Forestry and Other Land Use	Emissions and removals from land use change, forestry, peatlands and agro-forestry
Resources and Waste	Emissions from the treatment and disposal of solid and liquid waste and landfill, including emissions from incineration not used to generate energy (e.g. incineration of chemical waste).
Fluorinated Gases (F-gases)	Fluorinated gas emissions, primarily from refrigeration, air-conditioning, heat pumps, aerosols, and high voltage switchgear.
Greenhouse Gas Removals[3]	Negative emissions from engineered removal technologies, including direct air and bio-energy carbon capture and storage.

3 Nature-based solutions, such as afforestation, are included in the Agriculture and LULUCF sub-sector.

Appendix B: Tables of proposals and policies and projected emissions savings

Within this appendix, we list the individual proposals and policies which will enable the Carbon Budgets to be met. These are set out over three tables:

- Table 4 - Policies captured in the Energy and Emissions Projections (EEP)
- Table 5 - Quantified proposals and policies
- Table 6 - Unquantified proposals and policies

Notes to accompany Table 5 - Quantified proposals and policies

Explanation of UK-wide approach to emissions.

1. The carbon budgets apply to the whole of the UK economy and society. In preparing this package of proposals and policies, we have consulted with Devolved Administrations who we continue to work with to deliver our UK-wide carbon budgets. Emission reduction figures are included at a UK- wide level, with the exception of the agriculture, forestry and other land use (AFOLU) and waste sectors, where we have provided savings at an England-only level, as the vast majority of these policy areas are devolved. F-gases are presented at a GB-wide level. We have provided separate, assumed UK figures, representing estimated projections for ongoing carbon savings for CB4, CB5 and CB6, for these sectors. Simple assumptions have been used to generate an initial estimate for emissions savings in these sectors, in Scotland, Wales and Northern Ireland. Further detail on the methodology is included in the Technical Annex.

Explanation of approach to presenting timescales of policy effects

2. To fulfil the statutory requirement to set out the period over which the proposals and policies are expected to take effect, table 5 (quantified policies) indicates the year in which our modelling anticipates emissions reductions would start. For some proposals and policies, it is highly uncertain when the policy may be implemented – in these cases we have indicated the carbon budget period rather than a specific year. Table 6 (unquantified policies) also indicates the year or period from which we expect proposals and policies to take effect.

3. In all cases, the timescales over which we expect policies to take effect are not commitments – these may change according to developments in the evidence underpinning the modelling, the timing of policy implementation (unless the implementation date is an existing public commitment) and decisions on future spending (where applicable). All proposals and policies are expected to deliver emissions reductions until at least 2037, the end of Carbon Budget 6.

Explanation of “scenarios" in modelled emission savings.

4. In some areas the technology pathway is more uncertain than others. For example, the government continues to support the potential deployment of hydrogen in heat (through commercialising hydrogen deployment through funding via the Net Zero Innovation Fund, for instance) and also the electrification of heat (for instance through increased deployment of heat pumps).

5. For most of the proposals and policies in the package, we show savings under a high electrification scenario because their savings do not vary across the different scenarios. However, we have modelled different decarbonisation options for some proposals in the buildings and fuel supply sectors. The emissions savings attached to these policies varies depending on the level of deployment of hydrogen across the economy. This applies to three policy areas covering heat pump deployment, buildings “on the gas grid”, and the emissions associated with hydrogen production unquantified policies 58, 59 and 60. The modelled scenarios show how differing uptake rates of hydrogen may displace some technologies that rely on electrification (and the policies that support them) across the economy.

6. These scenarios are mutually exclusive. This means that emissions savings from policies in the high electrification scenario cannot be summed together with those from a "medium" or "high" hydrogen scenarios, as only one or the other policy would be implemented. Likewise, savings from "high" and "medium" hydrogen scenarios cannot be summed together. Although our list includes proposals and policies in different scenarios, we do not double count these emission savings in analysis presented elsewhere in this report. Across all sectors, the three scenarios achieve the same emissions reductions as each other – we do not expect emission reductions across the whole economy to vary materially depending on which of the three scenarios is taken forward through to 2050.

Explanation of power policies represented by a single emissions figure.

7. DESNZ simulates the power sector using the Dynamic Dispatch Model[4], with emissions savings determined by comparing indicative net zero consistent scenarios against a scenario where no further government action is taken to decarbonise the power sector (which does not need to be net zero compliant). For all scenarios, the model builds sufficient capacity to ensure security of supply, with the capacity mix balanced to keep system costs low. Although specific capacity mixes are required by these scenarios, DDM modelling has shown that there are a range of capacity mixes that can achieve net zero and the government has adopted a market driven approach to delivering net zero.[5]

4 UK Government, Dynamic Dispatch Model (DDM) – May 2012. Available at: www.gov.uk/government/publications/dynamic-dispatch-model-ddm

5 UK Government, Modelling 2050 – electricity system analysis. Available at: www.gov.uk/government/publications/modelling-2050-electricity-system-analysis

8. We provide a single emissions savings figure for the whole sector because power sector proposals and policies all contribute to a single interlinked dynamic system. Calculating individual emissions savings (where capacity for a single technology does or does not materialise because of the policy) will yield significantly different values depending on whether that policy is evaluated in isolation or in conjunction with one or more other policies. This non-additive nature also means that single policy emissions savings are sensitive to the exact configuration of the chosen scenario, so two net zero consistent scenarios may yield different emissions savings for the same policy.

9. In this context, generating emissions savings for individual policies is likely to be both misleading and inaccurate. Risks to power sector decarbonisation are therefore not defined by the level of emissions savings for a given policy but rather in how each policy facilitates and accelerates the delivery of low carbon capacity and whether the policy retains optionality; that is, provide avenues for a large number of technologies to participate in the power sector, diversifying the technology mix and, in doing so, de-risking the system as a whole.

10. Emissions savings attributed to greenhouse gas removal technologies such as power-BECCS are accounted for in the Greenhouse Gas Removal section; whereas the contribution of that technology to low-carbon power generation as part of the power system are represented as part of the single Power carbon accounting line.

11. More information on how policies in the power sector are modelled can be found in the Technical Annex.

Table 4 – Policies captured in the Energy and Emissions Projections

We have taken the EEP policy table directly from Annex D, that is published as part of the EEP 2021-2040.[6]

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
1	Active travel spending	Committed active travel spending from 2011/12 onwards including from ring-fenced and non-ringfenced funds including the Local Growth Fund, Other Government Infrastructure Funds (e.g. the Housing Infrastructure Fund), Highways Maintenance Fund, Transforming Cities Fund, Integrated Transport Block, Local Sustainable Transport Fund and Cycling Ambition Cities Fund	Implemented	2011	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Agricultural Policies	Agricultural Policies are a group of English, Scottish and Welch policies and programs: the Agricultural Action Plan (England), the Climate Change Plan (Scotland), and the Climate Smart Agriculture (Wales). These policies aim to reduce emissions through a range of resource-efficiency and land management measures. Relevant policies are quantified in the aggregate 'Agricultural policies'.	Implemented	Various	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	1.9	1.9	1.9	1.9	1.9
3	Boiler Plus (technical standards for domestic boiler installations)	The policy objectives are to deliver additional energy and carbon savings from the domestic heating sector in England by lowering overall gas demand from domestic properties. It aims to do this by increasing the deployment of devices which increase the efficiency of domestic heating systems, through controls and measures to make gas boilers heat homes more efficiently. The policy instrument is a technical standard set through statutory guidance under the Building Regulations framework. This requires existing households in England to install an additional energy saving measure from a choice list at	Implemented	2018	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.5	0.5

[6] UK Government, Energy and emissions projections: 2021 to 2040. Available at: www.gov.uk/government/publications/energy-and-emissions-projections-2021-to-2040

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
		the point of installing a new or replacement combi gas boiler in an existing dwelling																	
4	Boiler Upgrade Scheme (BUS)	The Boiler Upgrade Scheme (BUS) is a £450m, 3year scheme offering upfront capital grants (£5000 for ASHP & Biomass, £6000 for GSHP) to property owners to install heat pumps and in some limited circumstances, biomass boilers, to replace fossil fuel heating systems. The scheme will open in spring 2022 until 31 March 2025.	Implemented	2022	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	Building Regulations Part L (2002+2005/6)	Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.	Implemented	2002	8.7	8.2	7.6	7.1	6.6	6.0	5.5	5.1	4.6	4.1	3.7	3.2	2.7	2.3	1.8
6	Building Regulations 2010 Part L	Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.	Implemented	2010	6.0	6.1	6.4	6.5	6.1	5.6	5.2	4.8	4.6	4.5	4.3	4.1	3.9	3.8	3.6
7	Building Regulations 2013 Part L	Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.	Implemented	2013	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
8	Car policies	EC Regulation 443/2009 sets fuel efficiency targets for new cars to be achieved by 2015 and 2020. The regulation translates a fleet average CO2 tailpipe emissions target for new vehicles sold into the EU market into specific targets for individual manufacturers according to the mass of their fleet. Heavy fines are imposed for non-compliance. The 2021 target is for a fleet average of 95g CO2/km across the single market, with a transition period where 95% of a manufacturer's fleet must meet the 95g target by 2020. New stretching CO2 reduction targets (EU Regulation 2019/631) have been introduced for 2025 and 2030 based on the 2021 Worldwide Harmonised Light Vehicle Test Procedure (WLTP) measurements. As a result, the new passenger cars and light duty vehicles CO2 regulation came into force in January 2020. The Road Vehicle Emission Performance Standards (Cars and Vans) (EU Exit) (Amendment) Regulations 2019 in March 2019 ensure the UK's existing ambition and targets out to 2024 still apply even in the event of the UK leaving the EU without a deal in January 2020. Complementary measures are a collection of technologies that could improve 'real world' fuel efficiency of cars which would not be fully captured in new car CO2 target and could improve fuel efficiency within the existing fleet. These include gear shift indicators, tyre pressure monitoring systems more efficient mobile air-conditioning and low rolling resistance tyres. EC Regulation 661/2009 sets minimum requirements and introduce labelling for the rolling resistance, wet grip and external rolling noise of tyres. Measures to support the uptake of	Implemented	2012	6.2	8.5	10.8	13.3	16.0	19.1	22.0	25.1	27.6	30.0	32.3	34.5	36.8	38.7	40.3

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
		ultra-low emission vehicles include the Plug-in Grant funding for ultra-low emission vehicle (ULEV) cars, vans, motorcycles and taxis as well as various tax incentives including lower rates for Vehicle Excise Duty and Company Car Tax. Electric vehicle (EV) infrastructure is directly supported through the Workplace Charging Scheme grants for EV chargepoints for employees and fleets, the Electric Vehicle Homecharge Scheme grants towards home EV chargepoints, the On-street Residential Chargepoint Scheme and the public-private £400 million Charging Infrastructure Investment Fund, launched in September 2019. Highways England have committed £15 million to ensure that 95% of the Strategic Road Network will be within 20 miles (32.2km) of a charging point.																		
9	Carbon Trust measures	The Carbon Trust provides a range of measures from general advice to in-depth consultancy and accreditation, to reduce emissions and save energy and money to businesses and public sector organisations of all sizes.	Expired	2002	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Carbon Emissions Reduction Target (CERT) Uplift and Extension (2010-12)	CERT extension - increased the targets originally set under CERT by 20% and required domestic energy suppliers with a customer base in excess of 50,000 (later increased to 250,000) to make savings in the amount of CO2 emitted by householders. The extension also refocused subsidy towards insulation measures and away from electricity saving measures such as low energy lighting - and introduced a super priority group (households in receipt of certain means-tested benefits) to make energy reductions in low income and vulnerable households.	Expired	2010	1.5	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
11	Community Energy Saving Programme (CESP)	Community Energy Saving Programme (CESP) - area based regulation that targeted households across Great Britain, in areas of low income, to improve energy efficiency standards, and reduce fuel bills. CESP was funded by an obligation on larger energy suppliers and also the larger, electricity generators.	Expired	2009	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
12	CRC Energy Efficiency Scheme	The CRC (formerly the Carbon Reduction Commitment) is a mandatory UK-wide emissions trading scheme (launched in 2010). It encourages the uptake of energy efficiency measures in large non-energy intensive private and public sector organisations that use energy not covered by the EU ETS or Climate Change Agreements. It covers around 5000 medium and large users of energy across the business and public sector. The scheme is split into phases. Phase 1 ran from 1 April 2010 until 31 March 2014. Phase 2 runs from 1 April 2014 until 31 March 2019. In the 2016 Spring Budget, the Chancellor announced there would be no further sales of CRC allowances after Phase 2 (i.e. following the 2018/19 compliance year) and legislation was laid in July 2018 to close the scheme after Phase 2. From April 2019, the CCL will be increased to recover the revenue forgone from CRC allowances and a new streamlined energy and carbon reporting framework for quoted companies of all sizes and large unquoted companies and large Limited Liability Partnerships will come into force UJ-wide.	Implemented	2010	0.9	0.9	0.9	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
13	Energy Company Obligation (ECO) 3	The reformed scheme (ECO 3) will run from autumn 2018 to March 2022. The scheme focuses completely on low income and vulnerable households. Supplier thresholds were lowered to 200,000 domestic customers from 2019, and 150,000 domestic customers from 2020. A new 'Innovation' element was introduced to incentivise new better performing measures and cost-effective delivery techniques (up to 10% of scheme), and up to a further 10% of scheme for a monitoring regime to better understand measure performance. The LA Flexible Eligibility mechanism was increased to up to 25% of the scheme.	Implemented	2018	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
14	Energy Company Obligation (ECO) 4	n/a	Implemented	n/a	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	Energy company obligation (ECO) Extension	The 2015 Spending Review announced that ECO will be replaced with a new, lower cost scheme that will run for 5 years (to March 2022) and will tackle the root causes of fuel poverty. The 5-year extension will take place in the two phases, with the ECO Extension (April 2017 - Sept 2018) acting as a bridge between the expired ECO scheme and the new fuel poverty focused scheme, ECO 3, which will run from December 2018 to March 2022. The Local Authority Flexible Eligible mechanism was introduced under ECO2 Extension, enabling LAs to determine eligibility and refer households to obligated suppliers. Up to 10% of Affordable Warmth could be delivered through this route.	Implemented	2017	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
16	Energy company obligation (ECO)	The Energy Company Obligation (ECO) is a statutory obligation on energy suppliers with over 250,000 domestic customers and delivering over a certain amount of electricity or gas to make reductions in carbon emissions or achieve heating cost savings in domestic households. ECO focuses on insulation measures, and also heating improvements to low	Expired	2013	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
		income and vulnerable households. It ran until March 2017. ECO initially ran to March 2015 (also known as 'ECO1') and was extended in April 2014 to March 2017 ('ECO2').																	
17	EEC1 (energy efficiency commitment), EEC2 (2002-2008) & Baseline Carbon Emissions Reduction Target (CERT) (2008-2010)	EEC I: GB wide regulation that required all electricity and gas suppliers with 15,000 or more domestic customers to achieve a combined energy saving of 62 TWh by 2005 by incentivising their customers to install energy-efficiency measures in homes. EEC II - energy suppliers with more than 50,000 domestic customers required to deliver a total of 130 TWh lifetime energy use reductions in GB households, primarily through the promotion of energy efficiency measures. Carbon Emission Reduction Target (CERT) – GB regulation that required all domestic energy suppliers with a customer base in excess of 50,000 domestic customers to make savings in the amount of CO2 emitted by householders.	Expired	2002	2.6	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
18	Energy Performance of Buildings Directive (EPBD; UK transposition)	Energy Performance Certificates (EPCs) are required when any building is sold, rented out or constructed, and sometimes after refurbishment work. EPCs give information on a building's energy efficiency in a sliding scale from 'A' (very efficient) to 'G' (least efficient).	Implemented	2007	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
19	Energy Savings Opportunity Scheme (ESOS)	A mandatory energy assessment scheme for all large undertakings (non-SMEs) in response to requirements contained Article 8 of the EU Energy Efficiency Directive (2012/27/EU). Organisations which employ 250 or more people, or employ fewer than 250 people but have both an annual turnover exceeding £38.9m and an annual balance sheet total exceeding £33.4m, must measure their total energy consumption and carry out audits of the energy used by their buildings, industrial processes and transport to identify cost-effective energy saving measures, by 5 December 2015 and every four years thereafter. It is estimated that around 10,000 organisations will participate in the scheme.	Implemented	2014	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
20	F-gas regulations	The F-gas regulations introduced a 79% phase down in the quantities of hydrofluorocarbons that can be placed on the EU market and was delivered via a gradually reducing quota system; a number of bans on the use of certain F gases in some new equipment; a ban on the use of very high GWP HFCs for the servicing of certain types of refrigeration equipment; and some strengthening of obligations in the 2007 regulation relating to leak checking, repairs, F gas recovery and technician training. These regulations were introduced by the EU in 2014 and passed into UK law in 2015.	Implemented	2014	3.8	4.3	4.6	4.9	5.2	5.5	5.7	6.0	6.2	6.5	6.8	7.1	7.4	7.6	7.9
21	Forestry policies	Forestry policies are a range of post-2009 policies aimed at driving afforestation and reforestation. Relevant policies are quantified in the aggregate 'Forestry policies'.	Implemented	Various	-0.3	-0.3	-0.3	-0.2	-0.1	0.0	0.0	0.1	0.2	0.3	0.5	0.6	0.7	0.9	1.0
22	Green Gas Support Scheme	The Green Gas Support Scheme (GGSS) is a tariff subsidy to support the generation of biomethane by anaerobic digestion, for injection into the gas grid. It launched in November 2021 and will be open for applications until 2025, operating in England, Scotland and Wales. It is funded through the Green Gas Levy.	Implemented	2021	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
23	Green Heat Network Fund (GHNF)	GHNF is £328m fund that provides capital support to develop low carbon heat network infrastructure. Its objective is to accelerate the low carbon transition of new and existing heat networks and increase waste heat recovery from heat sources not currently exploited. GHNF supports greater deployment of large heat pumps (air-source, ground-source and water-source), waste-heat recovery (including heat exchangers and heat pumps boosting heat from industrial/commercial processes and energy-from-waste plants), solar thermal with storage, and biomass (where this is sustainably sourced and complies with air-quality legislation).	Implemented	2021	0.1	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
24	Green Homes Grant Local Authority Delivery Scheme	The GHG Local Authority Delivery Scheme (LAD) is a scheme of up to £500m for energy efficiency low-carbon heating improvements for low-income households.	Implemented	2020	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	Green Homes Grant Voucher Scheme	The Green Homes Grant voucher scheme was announced in 2020 as an economic stimulus scheme. It opened on 30th September 2020, but early closure was announced resulting in applications ending on 31st March 2021. Up to £320m budget is allocated for FY21/22, but current applications will come out of this budget. Policy savings represent an estimate of savings as a result of estimated installations later on in the year as a result of applications to the scheme, which have now closed, and so estimated energy savings could change significantly.	Expired	2020	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
26	Heat Networks Investment Project	The Heat Networks Investment Project (HNIP) is a capital funding scheme across England and Wales to encourage the development of heat networks. The HNIP is expected to support up to 200 projects by 2021 through grants and loans and other mechanisms and to lever in up to wider investment, reducing bills, cutting carbon and forming a key part of wider urban regeneration in many locations. The scheme will be open for applications from heat networks for up to three years and allocate commercialisation and construction funding through a competitive process. The key objective of the project is to build a sustainable market for heat networks to support the decarbonisation of heat in buildings, helping the UK reach the carbon budget targets.	Implemented	2017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
27	Heat Networks Metering and Billings Regulations	The Heat Network (Metering and Billing) Regulations 2014 aim to introduce fairer billing and incentivise energy savings, by requiring heat suppliers to install heat metering devices where cost-effective and to bill based on consumption. The approach to assessing cost-effectiveness was suspended in 2015 due to methodological issues. Since then, this aspect of the Regulation has not been enforced. Amendments to the Regulation are required to support the installation of customer-level metering devices, reduce administrative burden, support wider UK climate goals, and enable consistency across heat network customers and compliance with the requirements of the Energy Efficiency Directive (EED).	Implemented	2020	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
28	Heavy Goods Vehicles (HGV) Policies	EC Regulation 661/2009 sets minimum requirements and introduces labelling for the rolling resistance, wet grip and external rolling noise of tyres. Industry and government are taking a range of actions to reduce freight emissions, including the Freight Transport Association's Logistics Carbon Reduction Scheme, which encourages members to record, report and reduce emissions from freight. The Mode Shift Revenue Support scheme encourages modal shift from road to rail or inland waterway where the costs are higher than road, and where there are environmental benefits to be gained. It currently helps to remove around 800,000 lorry journeys a year from Britain's roads. A similar scheme, Waterborne Freight Grant, can provide assistance with the operating costs associated with coastal or short sea shipping. A voluntary, industry-supported commitment to reduce HGV greenhouse gas emissions by 15% by 2025, from 2015 levels, was introduced in 2018. The Regulation (EU) 2019/1242 setting CO2 emission standards for heavy-duty vehicles entered into force on 14 August 2019.The Regulation also includes a mechanism to incentivise the uptake of zero- and low-emission vehicles, in a technology-neutral way. From 2025 on, manufacturers will have to meet the targets set for the fleet-wide average CO2 emissions of their new lorries registered in a given calendar year. Stricter targets will start applying from 2030 on. The targets are expressed as a percentage reduction of emissions compared to EU average in the reference period (1 July 2019-30 June 2020): from 2025 onwards a 15% reduction, from 2030 onwards a 30% reduction. The 2025 target can be achieved using technologies that are already available on the market. The 2030 target will be	Implemented	2012	0.9	1.1	1.4	1.7	2.0	2.2	2.5	3.0	3.5	3.9	4.3	4.6	4.9	5.2	5.4

#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
		assessed in 2022 as part of the review of the Regulation.																	
29	Industrial Energy Transformation Fund (IETF)	The Industrial Energy Transformation Fund (IETF) was announced in the autumn Budget in 2018. The Fund will support businesses with high energy use, such as energy intensive industries, to transition to a low carbon future. It will help companies cut their energy bills and carbon emissions through investing in energy efficiency and low-carbon technologies. The IETF has a UK-wide budget of £315m over five years to 2024.	Implemented	2019	0.2	0.5	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
30	Industrial Heat Recovery Support (IHRS)	The policy aims to increase industry confidence to invest in the technology potential to recover heat from industrial processes, and increase the deployment of such technologies across manufacturing and data centres in England and Wales. It establishes a fund for feasibility studies that examine the potential for industrial businesses to adopt heat recovery technologies and a fund to subsidise the deployment of heat recovery technologies.	Implemented	2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
31	Van Policies	EC Regulation 510/2011 sets fuel efficiency targets for new Light Commercial Vehicles (LCV) to be achieved by 2017 and 2020. EC Regulation 661/2009 sets minimum requirements and introduces labelling for the rolling resistance, wet grip and external rolling noise of tyres. The regulation translates a fleet average CO2 tailpipe emissions target for new vehicles sold in the EU market into specific targets for individual manufacturers according to the mass of their fleet. Heavy fines are imposed for non-compliance. The 2020 target is for a fleet average of 147g CO2 /km and represents a reduction of 19% from the 2012 average. EC Regulation 510/2011 sets fuel efficiency targets for new Light Commercial Vehicles (LCV) to be achieved by 2017 and 2020. EC Regulation 661/2009 sets minimum requirements and introduces labelling for the rolling resistance, wet grip and external rolling noise of tyres. The regulation translates a fleet average CO2 tailpipe emissions target for new vehicles sold into the EU market into specific targets for individual manufacturers according to the mass of their fleet. Heavy fines are imposed for non-compliance. The 2020 target is for a fleet average of 147g CO2 /km and represents a reduction of 19% from the 2012 average. New stretching CO2 reduction targets (EU Regulation 2019/631) have been introduced for 2025 and 2030 based on the 2021 Worldwide Harmonised Light Vehicle Test Procedure (WLTP) measurements. As a result, the new passenger cars and light duty vehicles CO2 regulation came into force in January 2020. The Road Vehicle Emission Performance Standards (Cars and Vans) (EU Exit) (Amendment) Regulations 2019 in March 2019 ensure the UK's existing ambition and targets out to 2024 still apply even in the event of the UK leaving the EU without a deal in	Implemented	2012	1.2	1.3	1.6	1.9	2.1	2.4	2.6	3.1	3.6	4.1	4.7	5.2	5.7	6.3	6.8

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
		January 2020. To help address payload penalty issues and encourage uptake of cleaner vans, a derogation from the European Union third Driving Licence Directive (2006/126/EC) has been introduced to allow Category B (car) licence holders to operate alternatively fuelled vehicles up to a maximum authorised mass of 4.25 (rather than 3.5) tonnes. Complementary measures to support the uptake of ultra-low emission vans include the Plug-in Van Grant and various tax incentives; for instance zero emission vans only pay a small proportion of the van benefit charge and are not subject to the van fuel benefit charge. Electric vehicle (EV) infrastructure is directly supported through the Workplace Charging Scheme grants for EV chargepoints for employees and fleets, the Electric Vehicle Homecharge Scheme grants towards home EV chargepoints, the On-street Residential Chargepoint Scheme and the public-private £400 million Charging Infrastructure Investment Fund, launched in September 2019. Highways England have committed £15 million to ensure that 95% of the Strategic Road Network will be within 20 miles (32.2km) of a charging point.																	

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
32	Products Policy (Implemented 2009 - 2016)	The EU Ecodesign Directive and the Energy Labelling Framework Regulation operate by setting minimum performance and information requirements (respectively) for energy-using products. They aim to take the least efficient products off the market and to give consumers clear energy use-related information to guide their purchasing decisions. This is implemented through product-specific EU regulations, replicated in UK law.	Implemented	2009	2.8	2.7	2.9	2.8	2.7	2.3	2.3	2.0	2.2	2.2	2.3	2.2	2.0	2.0	2.0
33	Products Policy (Implemented 2008)	The EU Ecodesign Directive and the Energy Labelling Framework Regulation operate by setting minimum performance and information requirements (respectively) for energy-using products. They aim to take the least efficient products off the market and to give consumers clear energy use-related information to guide their purchasing decisions. This is implemented through product-specific EU regulations, replicated in UK law.	Implemented	2008	2.8	2.4	2.4	2.0	1.8	1.3	1.2	0.9	1.1	1.1	1.1	1.0	0.8	0.8	0.7
34	Private Rented Sector (PRS) Energy Efficiency Regulations	'There are two distinct parts to the Private Rented Sector Energy Efficiency Regulations. The first part represents the 'Tenants' energy efficiency improvements' provisions, which came into force in 2016. The second part represents the 'Minimum level of energy efficiency' provisions which were implemented in 2018. This implies a requirement for any properties rented out in the private rented sector to have a minimum energy performance rating of E on an Energy Performance Certificate (EPC), unless the property meets the conditions for an exemption, and that exemption has been registered on the PRS Exemptions Register. The regulations came into force for new lets and renewals of tenancies in England and Wales with effect from 1 April 2018 and for all longer-term tenancies on 1 April 2020 (1 April 2023 for non-domestic properties). In April 2019 these regulations were further strengthened with respect to the domestic sector only, to require a	Implemented	2016, 2018	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
		contribution of up to £3,500 from landlords towards the cost of improving their property towards EPC Band E (previously landlords of domestic properties were only required to take action where third party funding was available to meet the improvement costs). It will be unlawful to rent a property which breaches the requirement for a minimum E rating, unless one of the limited number of exemptions applies. There is no minimum requirement for private rented sector properties in Northern Ireland currently.																	
35	Public service vehicles (PSV) Policies	The Green Bus Fund (GBF) allowed bus companies and local authorities in England to compete for funds to help them buy new low carbon emission buses. The four rounds of the fund, which ran from 2009- 2014, added around 1250 Low Carbon Emission Buses onto England's roads. The GBF has now been replaced by the Low Emission Bus Fund (LEBS) which offered £30m for bus operators and local authorities across England and Wales to bid for low emission buses and supporting infrastructure. This scheme funding is open from 2016-2019 and the successful bidders were announced in July 2016, adding more than 300 extra low emission buses to fleets. In Autumn 2016, a further £100m was announced to increase the amount of low emission buses on the road. £11.1m was used to fund those who narrowly missed out on LEBS funding, and £48m formed the Ultra-Low Emission Bus Scheme which was launched in March 2018. Winners of	Implemented	2006	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
		this scheme were announced in February 2019. The remaining funding formed the Clean Bus Technology Fund, which was used to fund retrofitting solutions for existing bus fleets to a minimum Euro VI standard, and the winners of this fund was announced in February 2018. This was in addition to the previous £27m of Clean Bus Technology Fund rounds in 2013 and 2015. There was also a £5m Clean Vehicle Technology Fund in 2014. These funding schemes have contributed to an extra 5000 low emission buses on the road.																	
36	Public Sector Decarbonisation Scheme	The Public Sector Decarbonisation Scheme provides grants for public sector bodies to fund heat decarbonisation and energy efficiency measures. This return includes the £1bn of funding allocated in phase 1 of the scheme, £0.075bn of funding made available in phase 2, and £1.425bn of funding made available in phase 3.	Implemented	2020	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
37	Public Sector Energy Efficiency Loans Scheme - Pre-LCTP & Post-LCTP	The Public Sector Energy Efficiency Loans Scheme, managed by Salix Finance Ltd, provides interest-free loans in England, Scotland and Wales to public sector organisations for energy efficiency schemes. These loans are intended to provide the capital cost of energy efficiency retrofit work and other measures to be installed. These loans have a payback period of five years (eight for schools) during which the repayments are met with the energy bill savings from the energy efficiency measures. Thus, once the loan has been paid off, the organisations continue to benefit from energy savings for the lifetime of these measures. This funding is then	Implemented	2004	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
		Policy Characteristics			**Savings ($MtCO_2e$)**														
		recycled once it has been returned to the Scheme and once again loaned out. BEIS provides the most amount of funding to the Scheme but there is also some funding from the Scottish Government, the Welsh Government and the Department for Education.																	
38	Public Sector Energy Efficiency Loans Scheme - Pre-LCTP & Post-LCTP	The Public Sector Energy Efficiency Loans Scheme, managed by Salix Finance Ltd, provides interest-free loans in England, Scotland and Wales to public sector organisations for energy efficiency schemes. These loans are intended to provide the capital cost of energy efficiency retrofit work and other measures to be installed. These loans have a payback period of five years (eight for schools) during which the repayments are met with the energy bill savings from the energy efficiency measures. Thus, once the loan has been paid off, the organisations continue to benefit from energy savings for the lifetime of these measures. This funding is then recycled once it has been returned to the Scheme and once again loaned out. BEIS provides the most amount of funding to the Scheme but there is also some funding from the Scottish Government, the Welsh Government and the Department for Education.	Implemented	n/a	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
39	Renewable heat incentive (RHI)	The Non-Domestic Renewable Heat Incentive (RHI) is a Great Britain (GB) wide scheme which provides financial incentives to increase the uptake of renewable heat by businesses, the public sector and non-profit organisations. Eligible installations receive quarterly payments for 20 years based on the amount of heat generated. The Domestic RHI is a GB wide scheme which provides financial incentives to promote the use of renewable heat in domestic properties. Eligible installations receive quarterly payments for seven years based on either the estimated amount of renewable heat generated, or their metered heat use. In Northern Ireland, separate Renewable Heat Incentive schemes operated before being suspended on 29 February 2016.	Implemented	2011 non-domestic GB, 2014 domestic GB	5.1	5.2	5.2	5.2	5.2	5.2	5.2	5.1	5.1	5.1	4.9	4.5	3.7	2.9	2.2
40	Smart metering	The smart metering programme will replace 53 million meters with smart electricity and gas meters in all domestic properties, and smart or advanced meters in smaller non-domestic sites in Great Britain by the end of 2025. Smart meters will deliver consumers with near-real time information on their energy consumption to help them control energy use, so avoiding wasting energy and money. It will deliver energy networks with better information upon which to manage and plan current activities. Smart meters will also assist the move towards smart grids which support sustainable energy supply and will help reduce the total energy needed by the system. There are now 28.8 million smart and advanced meters operating across Great Britain. In January 2022, the Smart Metering Implementation Programme began a new 4-yar targets-based framework to maintain roll out momentum.	Implemented	2012	1.8	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
41	Small and Medium Enterprises (SME) Loans	The Carbon Trust provided interest free loans of £3,000 - £400,000 for small and medium sized businesses to invest in energy efficiency equipment and renewable technologies. These loans were designed so that in most cases the forecast reduction in energy costs would be similar to the total repayment amount.	Expired	2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	Social Housing Decarbonisation Fund	The Social Housing Decarbonisation Fund (SHDF) Demonstrator is a £60mn innovation project that looks at applying whole house retrofit to social housing over 2021.	Implemented	2021	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	Streamlined Energy and Carbon Reporting for business (SECR)	SECR is a reporting framework which obligates all large (as defined by the Companies Act 2006) UK registered companies to report their energy use and associated emissions relating to electricity, gas and transport in their annual reports. Companies will also be required to provide an intensity metric and disclose any energy efficiency actions undertaken during the reporting period. Quoted companies will in addition be required to report their global energy use and GHG emissions.	Adopted	2019	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
44	Renewable Transport Fuel Obligation, (RTFO) - 5% by volume	The RTFO set a 4.75% target for biofuel use by diesel and petrol suppliers to be achieved by 2014. Targets are by volume rather than by energy. Implemented the EU Renewables Directive (2009/28/EC).	Implemented	2007	3.1	3.1	3.1	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
45	Renewable Transport Fuel Obligation, (RTFO) - Increase target to meet RED	This policy sets enhanced overall targets of 9.75% (by volume) for biofuel use by diesel and petrol suppliers by 2020 and at least 12.4% in 2032. It implements the EU Renewables Directive (2009/28/EC) as amended by the ILUC Directive (2015/1513).	Implemented	2018	4.7	4.9	5.0	5.1	5.2	5.3	5.4	5.4	5.4	5.5	5.2	5.0	4.8	4.6	4.5

Policy Characteristics					Savings ($MtCO_2e$)														
#	Policy name	Policy Description	Implementation status	Implementation date	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
46	Warm front	Warm Front installed heating and insulation measures to make homes warmer and more energy efficient for private sector households in England vulnerable to fuel poverty. The scheme offered a package of heating and insulation measures of up to £3,500 (or £6,000 where oil central heating or other alternative technologies are recommended).	Expired	2000	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
47	Warm Home Discount (WHD)	The Warm Home Discount (WHD) scheme provides an energy bill rebate to low income and vulnerable households. We assume that recipients will spend a portion of the rebate on increased energy consumption for heating. Upper and lower scenarios are derived from the uncertainty range in the labelling effect (the proportion of the WHD rebate that recipients spend on energy). The central estimate is 41%, with an uncertainty range of 15%-66%. The larger labelling effect (66%) is used for the "lower" EEP scenario, as this leads to a larger increase in energy consumption. The smaller labelling effect (15%) is used for the "upper" scenario, as this leads to a smaller increase in energy consumption. The source of the range in labelling effect is: "Cash by any other name? Evidence on labelling from the UK Winter Fuel Payment (2011)" https://www.ifs.org.uk/publications/5603	Implemented	2021	-0.4	-0.4	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	Electricity supply policies: recent decarbonisation policies in the electricity supply industry	Electricity supply policies' are a bundle of decarbonisation policies in the electricity supply industries. Recent policies (post-LCTP) are quantified in the aggregate 'Decarbonisation policies in the electricity supply industries'. Older policies are included in the baseline and mitigation impacts are not quantified.	All	Various	32.4	32.2	31.1	37.3	42.5	47.1	49.2	45.4	47.6	48.3	48.5	49.8	52.2	54.3	57.0

Table 5 – Quantified proposals and policies

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
1	Power	Emissions savings associated with power sector decarbonisation. By nature of the power sector, HMG cannot allocate savings to the power policies so the aggregate savings will be captured here.	Emissions savings associated with power sector decarbonisation. By nature of the power sector HMG cannot allocate savings to the power policies so the aggregate savings will be captured here. An explanation for our accounting approach this interrelated set of policies can be found in the main report, Appendix B, para 6 and Technical Annex.	2.7	6.7	11.2	CB4
2	Power	Contracts for Difference (CfD) Allocation Rounds	A CfD is a long term contractual agreement between a low carbon electricity generator and Low Carbon Contracts Company (LCCC), designed to provide the generator with price certainty over the lifetime of the contract. Contracts for Difference Allocation Rounds will run annually. The first annual auction will be the fifth CfD Allocation Round (AR5) scheduled to open in March 2023. This is the government's main mechanism for supporting low-carbon electricity generating projects in Great Britain, including the goal to deliver up to 50GW offshore wind (including 5GW floating wind) by 2030 and up to 70GW solar by 2035.				Live policy (AR1 projects live 2016/17)
3	Power	Review of Contracts for Difference (CfD) Mechanism	The government will keep the Contracts for Difference (CfD) mechanism under review to ensure it remains investable and capable of addressing emerging barriers to renewable energy deployment. The government will respond to the consultation published in December 2022, which sought views and supporting evidence on specific changes proposed for the sixth Allocation Round of the CfD scheme (AR6), as well as early views on longer-term policy considerations for future rounds. Through ensuring an effective functioning of the CfD allocation rounds, this policy will support the delivery of low carbon electricity generating projects. On supporting repowered projects, Energy Security Plan states that government will consider how to ensure investment in repowered assets is appropriately valued in the market, to ensure locations with good energy resource continue to contribute to electricity security. This will include considering the potential of the CfD to support repowered projects, as part of a CfD consultation response by Spring.				Early CB5 (assumes consultation implements reform)

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
4	Power	Non Price Factors in the Contracts for Difference (CfD) Scheme	The government is launching a Call for Evidence in April 2023 on the potential introduction of non-price factors into the CfD. If implemented, this would mean that, when considering CfD applications, HMG could take into account additional factors of value to the system and not only the statutory considerations of value for money and maximising deployment. Any changes made to the CfD scheme under these proposed changes would support the delivery of low-carbon, low-cost electricity generation capacity.				Late CB5 (assumes consultation implements reform)
5	Power	Offshore Wind Manufacturing Investment Support Scheme (OWMIS)	This scheme supported investment in port infrastructure and manufacturing in the offshore wind supply chain. It was implemented to support development of offshore wind supply chain capacity. The scheme therefore indirectly supports emission reductions by de-risking the delivery of offshore wind capacity.				Late CB4
6	Power	Offshore Wind Acceleration Taskforce (OWAT)	OWAT's work has helped put in place measures to accelerate the deployment of offshore wind and supported industry actions. The government has worked with the OWAT, Ofgem, the National Grid, the Crown Estates and the Devolved Administrations to speed up planning and consenting for offshore wind farms. The Supply Chain and Infrastructure Working Group, established under OWAT, has also identified and addressed barriers to the development of the offshore wind supply chain.				Mid CB5
7	Power	Offshore Wind Environmental Improvement Package (OWEIP)	The Offshore Wind Environmental Improvement Package (OWEIP) will support the accelerated deployment of offshore wind, whilst maintaining environmental protections. The OWIEP will be implemented through regulations to adapt environmental assessments for offshore wind, enable strategic compensation and introduce industry funded Marine Recovery Funds. The government is seeking to introduce legislation through the Energy Bill to deliver the OWEIP, alongside non-legislative measures. This package will de-risk the delivery of offshore wind capacity including government's ambition to deploy up to 50GW offshore wind by 2030.				Early CB5
8	Power	Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS)	This scheme, which will launch in March 2023, will provide up to £160m to kick start investment in port infrastructure projects needed to deploy and service the scale of the floating offshore wind pipeline. This will indirectly support carbon emission reductions by de-risking the delivery of offshore wind capacity.				Mid CB5
9	Power	Floating Offshore Wind Taskforce	The government is working with the industry-led Floating Offshore Wind Taskforce to identify what investment in infrastructure is needed to support deployment of up to 5GW of floating offshore wind by 2030, and to support its further expansion into the 2030s and beyond. The taskforce will bring together companies from across the sector to coordinate their efforts, and speed up the further development.				Mid CB5

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
10	Power	Floating Offshore Wind Demonstration Programme	The Floating Offshore Wind Demonstration Programme, using £31m government funding matched by £30m from industry, supports research and development to advance floating offshore wind technology. This work has the potential to enable the development and deployment of floating offshore wind capacity, and in doing so help the government achieve its ambition of up to 5GW floating offshore wind (part of the up to 50GW offshore wind ambition).				2022
11	Power	Radar and Offshore/Onshore Wind	DESNZ is working with industry, the Ministry of Defence, and The Crown Estate to find both interim and enduring solutions to mitigate air defence radar interference from offshore wind turbines. Similarly, government is working jointly with industry and the aviation sector to formulate a long-term strategy to address current and future civil radar interference issues. This policy is focussed on safety and security; and is not expected to lead to emissions savings. This package will de-risk the delivery of approximately 20GW of offshore wind capacity, and support ongoing deployment of onshore wind. The document 'Competition document: windfarm mitigation for UK Air Defence' on www.gov.uk notes, 'The continued development of wind turbine sites has the potential to cause a number of negative effects on civil and military air traffic control and defence. Offshore windfarms, when in the line of sight of radar, have a detrimental effect on Ministry of Defence's (MOD) primary surveillance radar capability used to deliver a recognised air picture for Air Defence.'				Mid CB5
12	Power	Local Partnerships for Onshore Wind (England)	The government will consult on developing local partnerships for onshore wind in England so that those who wish to host new onshore wind infrastructure can benefit from doing so – a commitment made in the British Energy Security Strategy. The government is due to launch a new consultation to seek views on how to improve the system of engagement and benefits in England. The proposals in the consultation may help to indirectly reduce delays and improve the consenting of onshore wind planning applications by introducing policies to improve community support for onshore wind projects in England. However, the consultation does not include any policies that will directly drive the deployment of onshore wind.				Mid CB4
13	Power	Marine Spatial Prioritisation Programme	The cross-government, Defra-led Marine Spatial Prioritisation programme aims to support strategic planning of renewables and other sea uses by optimising use of the marine space, maximising coexistence between different sea users and balancing this with restoring and protecting the marine environment.				Late CB5 (assuming outputs impact offshore wind projects)
14	Power	Solar Taskforce and Roadmap	In line with the Skidmore Review recommendation, and to provide certainty to investors in the solar industry, the government will publish a solar roadmap setting out a clear step by step deployment trajectory to achieve a fivefold increase (up to 70GW) of solar by 2035. Government will also establish a government/industry taskforce, covering both ground mounted and rooftop solar to drive forward the actions needed by government and industry to make this ambition a reality.				Late CB4

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
15	Power	VAT Amendments for Solar in Spring Statement 2022	The government has supported the rollout of rooftop projects by removing VAT on solar panels installed on residential accommodations, and introducing capital allowances for rooftop solar panels until March 2027. This policy will incentivise residential solar deployment and therefore help to de-risk the delivery of solar capacity and support the government's ambition to deliver up to 70GW solar by 2035.				Live policy (announced in 2022)
16	Power	Permitted Development Rights (solar)	The government is currently consulting on changes to permitted development rights. The proposed changes seek to simplify planning processes for larger commercial rooftop installations and introduce a new permitted development right for non domestic solar canopies. The consultation was published on 28 February.				Mid CB4 (assumes consultation implements reform)
17	Power	Low-cost Finance for Solar for Homes and Small Businesses	To meet the demand for rooftop solar, the government is looking at facilitating low-cost finance from retail lenders for homes and small business premises, aligning with recommendation in the Skidmore Net Zero Review.				Mid CB4 (assuming full implementation)
18	Power	Emerging Workforce Challenges (renewables, with a focus on solar)	The joint government/industry Green Jobs Delivery Group is developing an action plan which will address key emerging workforce challenges for solar and other renewables. The solar sector is also working with training partners, certification scheme providers and local bodies such as Mayor of London to provide grants, learning tools, and training and placement programmes. DESNZ expect that the new solar taskforce will consider further actions to build supply chain resilience and strengthen skills capability. This policy is key to ensuring the relevant skills and supply chain needed to build solar capacity are available, enabling the delivery of solar capacity.				Late CB4
19	Power	Consultation on Future Homes and Building Standards	The government will explore how it can continue to drive onsite renewable electricity generation, such as solar panels, where appropriate in new homes and buildings. Bringing forward new renewables generation is a key component of decarbonising the power system.				Late CB4
20	Power	National Planning Policy Framework (Local, England)	Recognising that onshore wind is an efficient, cheap and widely supported technology, government has consulted on changes to planning policy in England for onshore wind to deliver a localist approach that provides local authorities more flexibility to respond to the views of their local communities. We will respond to the NPPF consultation in due course.				Early CB5

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
21	Power	Advice and Guidance to Public Sector Procurement	The government will publish guidance to support the installation of solar technology on the Central government and wider public sector estate. This will incentivise and enable the deployment of solar technology.				Mid CB4 (assuming full implementation)
22	Power	Biomass Strategy	The government has committed to publishing a Biomass Strategy, which is due in 2023. The Strategy will set out how sustainable biomass could be best utilised across the economy to help achieve the government's net zero and wider environmental commitments while also supporting energy security. The Strategy will also establish the role which BECCS can play in reducing carbon emissions across the economy and set out how the technology could be deployed.				Mid CB5
23	Power	Energy from Waste (EfW) and the UK Emissions Trading Scheme (UK ETS)	The government is exploring expanding the UK ETS to waste incineration and EfW by the mid-late 2020s. This would incentivise the development and uptake of decarbonisation technologies and practices to reduce emissions from waste incineration and EfW, principally by strengthening long-term investment incentives. For example, the scheme could enhance the pre-treatment of waste before it is incinerated to reduce fossil plastic in the waste stream. This is otherwise a costly and intensive process. The expansion of the UK ETS would also incentivise investment into Carbon Capture and Storage (CCS) to reduce CO2 emissions from EfW, depending on wider availability of the technology and infrastructure, and cost-benefit to the plant. Due to biogenic content present in waste streams, in future operators may be able to generate 'negative emissions' by applying CCS equipment to EfW plants, depending on the level of biogenic CO2 captured. As per the consultation in March 2022 in Developing the UK ETS, we propose to explore expanding the UK ETS to waste incineration and EfW by the mid-late 2020s i.e. around the end of CB4. Government will respond to this consultation shortly and will set out more detail on the intended timing				Around end of CB4 (see description)
24	Power	Power Bioenergy with Carbon Capture and Storage (BECCS) Business Model	The government is developing a first of a kind (FOAK) business model for power Bioenergy with Carbon Capture and Storage (BECCS) to incentivise negative emissions and low carbon electricity generation. Power BECCS is expected to play an important role in helping the UK to achieve net zero and to contribute significantly to the ambition to deliver five million tonnes of GGRs by 2030, whilst also delivering low-carbon electricity to contribute toward security of supply within Great Britain. The government consulted on the proposed business model framework last summer; consultation considered actions the government can take to enable the deployment of power BECCS at scale, through addressing prevailing market failures, deployment barriers and risks to investment. The consultation also proposed a number of high level business model design options, included a question on the most appropriate negative emissions market and posed questions on the proposal to include supply chain emission thresholds. The work on the business model will help to support our ambition to deploy power BECCS. A consultation response will be published imminently.				Mid CB5

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
			Power BECCS provides two types of carbon savings. Within the Power sector, Power BECCS delivers carbon savings by displacing non-zero CO2 emissions electricity generation with low carbon electricity generation. Within the GGR sector, Power BECCS contributes carbon savings from generating negative emissions by capturing the CO2 emissions from biomass-to-power plants and storing those safely and permanently.				
25	Power	Power Carbon Capture, Usage and Storage (CCUS)	The government has announced the project negotiating list for Track 1 carbon capture, usage and storage (CCUS) clusters. The negotiating list contains one power CCUS project. The government will provide up to £20 billion funding for early deployment of CCUS across all sectors. Further projects will be able to enter a selection process for Track 1 expansion launching this year, and 2 additional clusters will be selected through a Track 2 process.				Late CB4/Early CB5 subject to project negotiations, cluster negotiations, linked project delivery
26	Power	Dispatchable Power Agreement (DPA)	The government has developed a Dispatchable Power Agreement (DPA) business model to bring forward a first of kind carbon capture, usage and storage (CCUS) power plant. The model will potentially supporting additional CCUS power plants in the future. When deployed, this first of a kind CCUS plant will provide low carbon electricity generation and reduce power sector emissions.				From late CB4/early CB5 subject to project negotiations, cluster negotiations, linked project delivery
27	Power	Hydrogen to Power	In the Energy Security Plan, government announced our intention to consult in 2023 on the need and potential design options for hydrogen to power market intervention. To support the consultation development, government has commissioned external research on the need and case for market intervention to support hydrogen to power plants. This policy could enable the accelerated deployment of hydrogen to power capacity and the support the decarbonisation of the power sector. Emission reductions would be dependent on the pace and scale of deployment and so reductions are unquantified at this stage.				By mid CB5 or earlier depending on future policy decisions, market conditions, and linked policy delivery
28	Power	Decarbonisation Readiness	HMG published our Decarbonisation Readiness consultation in March 2023 on proposed updates to the 2009 Carbon Capture Readiness requirements. The proposals would require new build and substantially refurbishing combustion power plants to be built in such a way that they could easily decarbonise by converting to either 100% hydrogen generation or carbon capture technology. This policy does not have direct emission savings associated with it, but will enable emission savings				July 2024 as proposed in the March 2023 Decarbonisation Readiness Consultation

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
29	Power	Great British Nuclear	The government is committing to a programme of new nuclear projects beyond Sizewell C, giving industry and investors the confidence, they need to deliver projects at speed, reducing costs through learning and replication. To deliver this, we have launched Great British Nuclear (GBN) which will be an arms-length body with the responsibility to drive delivery of new nuclear projects, backed with funding it needs. The first priority for GBN is to launch a competitive process to select the best SMR technologies. This will commence in April with market engagement as the first phase. The second phase will follow in the summer, with an ambition to assess and decide on the leading technologies by autumn. We are working towards bringing forward legislation setting out Great British Nuclear's statutory role when parliamentary time allows. In the meantime, work will continue at pace to achieve our ambition within the existing legal framework to support delivery of HMG's ambitions.				Mid to end CB6
30	Power	Sizewell C Government Investment Decision	Following the government's investment decision to take a £700m stake in Sizewell C, the government will work with EDF as a co-shareholder in the project to continue its development. This includes plans to prepare for a capital raise later this year, using the newly established RAB model for nuclear. The government's investment was an historic step, as our first direct investment in a nuclear project for 35 years. New nuclear projects like Sizewell C will work alongside renewables to help to ensure secure and stable, low-cost and low-carbon electricity system for the long-term.				Live
31	Power	Regulated Asset Base Model	Following consultation and the passing of the Nuclear Energy (Financing) Act 2022, the government is implementing a Regulated Asset Base (RAB) model as an option for funding new nuclear projects. In November 2022, the Sizewell C project became the first to be designated to benefit from the RAB model, following a statutory consultation. In sharing risk between projects and consumers (overseen by an economic regulator) RAB has the potential to reduce the cost of project capital, the biggest driver of nuclear project costs. The appropriate funding model for each new nuclear project will be determined through negotiations between government and the project's developer. Providing this option to developers will support the development of new projects, helping the government achieve its ambition to have up to 24 GW of nuclear capacity by 2050.				RAB projects are targeted to begin contributing to the energy system mid-late CB6, subject to all project-specific approvals
32	Power	Advanced Nuclear Fund	The government has committed to spend up to £385 million to invest in the next generation of nuclear technologies. This includes up to £210 million for Small Modular Reactors (SMRs) to develop a domestic smaller-scale power plant technology design, and funding for a research and development programme to deliver an Advanced Modular Reactor (AMR) demonstration by the early 2030s. While this policy will not deliver emissions savings itself, it will play an important role in enabling the				Mid-CB5, depending on policy development and commercial outcomes

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
			nuclear sector to evolve, potentially delivering additional low-carbon, low-cost power and heat, and helping the government achieve its ambition of up to 24 GW of nuclear capacity by 2050				
33	Power	Future Nuclear Enabling Fund (FNEF)	The Future Nuclear Enabling Fund (FNEF) is a £120m fund announced in the government's Net Zero Strategy: Build Back Greener in 2021. The fund is the first in a series of government interventions designed to achieve the government's ambition of deploying up to 24GW of nuclear capacity by 2050, as announced in the British Energy Security Strategy (BESS). The FNEF will help industry reduce project risks, so they are better positioned for anticipated future investment decisions. The FNEF is be targeted at applicants that could be in a position to take a Final Investment Decision (FID) within the next parliament, subject to Value for Money and all relevant approvals.				Mid-CB6 assuming value for money, and all relevant approvals
34	Power	Levelling-Up and Regeneration Bill (Energy Infrastructure)	The government is making amendments to the Levelling-up and Regeneration Bill to give powers to the Secretary of State to improve the National Significant Infrastructure Projects (NSIP) system. Our aim is to bring forward and, where necessary, incentivise firm, flexible and variable low carbon technologies to meet anticipated demand and reduce reliance on unabated fossil fuel generation. This policy will enable the deployment of these low carbon technologies, which would be expected lead to carbon emissions savings.				2024
35	Power	Interconnectors	Ofgem's decision on Third Cap and Floor Window for Electricity Interconnectors and Ofgem's Multi-Purpose Interconnector Pilot Scheme (publicly available, confirms Ofgem decisions on project eligibility) will incentivise and encourage investment in electricity and multi-purpose interconnectors. The cap and floor regime will deliver a new generation of interconnectors and the multi-purpose interconnector pilot will enable investment in low carbon infrastructure and more effective coordination in the delivery of low-cost offshore networks.				Early/mid CB5
36	Power	Holistic Network Design and follow up exercise	The government will support the National Grid ESO on The Pathway to 2030 Holistic Network Design and Follow Up Exercise. This is a network design, delivered by the ESO, to connect the offshore wind projects covered by the Pathway to 2030 workstream of the Offshore Transmission Network Review in a coordinated manner. The Holistic Network Design will incentivise investment in network infrastructure which is needed to connect new generation offshore wind assets and demand to the grid, and to avoid congestion and permit the most efficient electricity system.				Mid CB5
37	Power	Consultation on National Policy Statements	The government will update the National Policy Statements for energy to ensure they provide a suitable framework to support decision making for nationally significant energy infrastructure. This is the first time they have been updated since 2011. The policy need for energy has been strengthened and the language of the NPSs has been simplified and made more accessible. An initial consultation was issued in early 2022, and documents have been further updated to reflect the increased ambition set out in the NZS and BESS. Stronger National Policy Statements will ensure that HMG has a planning policy framework which can support the infrastructure required to transition to net zero.				Late CB4 subject to further decision making and commercial activity'

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38	Power	Offshore Transmission Network Review	The review looks into the way that the offshore transmission network is designed and delivered, consistent with the ambition to deliver net zero emissions by 2050. It brings 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. The review is determining whether changes need to be made to offshore transmission networks to enable new generation to operate effectively, connect both new generation assets and demand to the grid, and accelerate transmission and distribution infrastructure build to avoid congestion and permit the most efficient system. The outcomes of the OTNR will support the delivery of offshore wind generation assets by accelerating the delivery of the transmission required to move power to the centres of demand. It will also reduce the local and environmental impacts of transmission through an increase in coordinated infrastructure.				Mid CB5
39	Power	Offshore Coordination Support Scheme	The Offshore Coordination Support Scheme provides grants to offshore energy projects to develop coordinated options for offshore transmission infrastructure. The secondary objective of the scheme is to learn lessons from funding activities to support coordination in late-stage projects that can be applied to later workstreams of the Offshore Transmission Network Review (OTNR). The Scheme will complement those other arrangements to facilitate coordination being made as part of the OTNR. The Scheme is a competitive process under which one or more Applications may receive Grant funding. The scheme will enable the development of offshore low carbon infrastructure. This will support and enable the delivery of offshore wind capacity and help in delivering the ambition of up to 50GW offshore wind by 2030.				Mid CB5
40	Power	Onshore Networks: Competitive Tendering and Special Merger Regime	Through primary legislation in the Energy Bill and forthcoming secondary legislation, the government will introduce competitive tendering in onshore electricity networks and an Energy Networks Special Merger Regime. Introducing competition will provide new opportunities to invest in networks where it is efficient to do so. The creation of a new competitive market should improve efficiency in investment, foster innovative solutions to network needs, including increasing the opportunities for smart and flexible solutions, and reduce costs to consumers.				Early CB4
41	Power	Electricity Networks Strategic Framework	Early stage policy development - this joint DESNZ and Ofgem publication sets out a strategic framework, and actions the government and Ofgem are taking, to ensure the electricity network can act as an enabler of a secure, resilient, net zero energy system - for example (per the publication) 'speeding up the connections process by reviewing minimum standards for connections (in particular, the time it takes a customer to connect to the distribution grid); introducing a penalty-only incentive for distribution network operators to deliver on major network connections)'. The focus of this work is to enable the necessary transformation of the network at the scale and pace required to accommodate decarbonisation and demand growth. It is therefore a key enabler of decarbonisation and of other decarbonisation targets such as the government's ambitions on offshore wind and solar generation and the 2035 phase out of new petrol and diesel cars and vans.				Early CB4 - framework is live

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42	Power	Electricity Networks Commissioner's Recommendations	The government appointed Nick Winser as Electricity Networks Commissioner to advise the government, Ofgem and industry on actions to accelerate the delivery of electricity transmission network infrastructure. The Electricity Networks Commissioner is expected to make recommendations to government in June. This will enable decarbonisation through the potential to accelerate network infrastructure build, therefore allowing new generation and demand to connect to the grid more quickly.				Mid CB4 subject to Commissioner recommendations being agreed and actioned
43	Power	Response to Consultation on Options for Community Benefits for Transmission Infrastructure	The government has published a consultation on community benefit options for network infrastructure ('Community Benefits for Electricity Transmission Network Infrastructure' March 2023) and, pending responses, intends to produce guidance on community benefits. The consultation considers different types of community benefits and how this can be implemented (e.g. voluntary or mandatory). The consultation proposes to introduce voluntary guidance on the appropriate levels and forms of benefits to give communities the knowledge, power and flexibility to decide what benefits they want in consultation with the project developer, with the option to move to a mandatory approach if necessary. The consultation proposes introducing a recommended level of funding for community benefits, which we believe will increase the level of funding from that seen in existing examples of community benefits for electricity transmission network infrastructure. The proposed guidance will focus on providing direct benefit payments to eligible individuals and wider community-focused benefits. Following consultation feedback, we intend to work with community and industry representatives to develop the guidance, which we intend to publish in 2023. The proposals enable decarbonisation by supporting the timely deployment of network infrastructure to connect low carbon generation and technologies, by improving community support and avoiding delays.				Early CB4 subject to taking forward consultation responses and publishing guidance
44	Power	Land Rights and Consenting for Electricity Networks	To understand whether the current land rights and consenting processes for electricity network infrastructure are fit for purpose, government sought views on what improvements could be made in a call for evidence and will respond this year. This policy is likely to enable or incentivise timely deployment of electricity network infrastructure that will be necessary for connecting low carbon generation and demand to the grid.				Early CB4
45	Power	Ofgem Decision on Accelerated Strategic Investment	Ofgem's Accelerating Strategic Transmission Investment work seeks to accelerate regulatory approval for delivery of key strategic transmission network projects to 2030. This work will act as an enabler for investment into electricity transmission networks, enabling decarbonisation by allowing timely connection of low carbon generation and demand to the grid.				Early CB5
46	Power	Fast-track System for Nationally Significant Infrastructure Projects (NSIPs) Projects	DLUHC are designing a fast-track system for Nationally Significant Infrastructure Projects (NSIPs) that meet certain quality standards. The clauses are in the Levelling Up Regeneration Bill, which is going through Parliament, and pilots are expected to include offshore wind developments, de-risking the delivery of offshore wind capacity.				Start late 2023, having full effect from 2024 onwards

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47	Power	RIIO-ED2 Final Determinations	Ofgem Final Determinations for Distribution Network Operators (DNOs) on expenditure for the next electricity distribution price control (RIIO-ED2) from 2023-2028. This policy will enable carbon savings as it will directly determine investment into electricity distribution networks that will be necessary for enabling the timely connection of low carbon electricity generation and demand.				2023
48	Power	Strategy and Policy Statement for Energy Policy	The Strategy and Policy Statement (SPS) set out the government's strategic priorities and other main considerations of its energy policy, the policy outcomes to be achieved as a result of the implementation of that policy, and the roles and responsibilities of those who are involved in implementation of that policy. The SPS will enable emissions savings because the Energy Act 2013 and imposed new duties on Ofgem to have regard to the strategic priorities when carrying out its regulatory functions and to carry out those functions in the way it considers is best calculated to further the delivery of the specified policy outcomes.				Early CB4
49	Power	Future System Operator	The government will be taking powers to establish the Future System Operator (FSO) through the Energy Bill. The FSO will build on the existing capabilities and functions of the Electricity System Operator, managing the electricity system in real time, as well as supporting its future development. It will also be responsible for gas strategic network planning, long-term forecasting and market strategy functions. No emissions savings have been quantified; it has no direct emission impacts but the body it enables (FSO) could be a significant driver of emission reductions.				Depending on a number of factors, including timings of the Energy Bill and discussing timelines with key parties, our aim is for the FSO to be operational by, or in, 2024
50	Power	Energy Code Governance Reform	Through the legislation in the Energy Bill the government will be creating a new governance framework for the energy codes. This will empower Ofgem to set a strategic direction for how the detailed rules of the energy system should evolve each year and create licensed code managers to ensure that direction is delivered. The reforms will allow Ofgem to drive strategic change across the codes, for example for the coordinated delivery of Net Zero priorities, alongside benefits for consumers and competition. The new code governance framework will also aim to remove potential barriers to innovation arising from the current arrangement, ensuring the codes governance process is better equipped to facilitate the widespread changes required to deliver Net Zero.				Late CB4 depending on when Ofgem receives powers from the Energy Bill and is then able to issue the

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							first Strategic Direction
51	Power	Capacity Market 2023 Consultation	The government has launched a consultation on "Capacity Market 2023: strengthening security of supply and alignment with net zero", which closed on 3rd March 2023. This policy aims to ensure that the capacity market remains fit for purpose while also looking at options for aligning the capacity market with the government's Net Zero ambitions.				2034 - subject to further analysis/policy development, and security of supply
52	Power	Energy Markets Reform - Consultations and Call for Evidence	On Retail Markets, government are considering retail market reforms aimed at making sure the market supports the wider transformation of our energy system, whilst also working better for consumers and being more resilient and investable. We aim to publish a Call for Evidence in summer 2023 on how the retail regulatory framework needs to evolve to support new ways of offering energy supply. On the Review of Electricity Market Arrangements, the programme ('REMA') is exploring the reforms needed to (non-retail) electricity market arrangements to support delivery of a decarbonised power system by 2035, helping to deliver a cost-effective transition to a future net zero power sector, whilst maintaining a secure electricity supply. The government first consulted on REMA in 2022, and published the summary of responses in March 2023. We aim to publish a second REMA consultation in Autumn 2023.				From mid CB4 subject to call for evidence and consultation responses
53	Power	Energy Digitalisation Strategy	Delivering the actions set out in the Energy Digitalisation Strategy. Continuing to work with Ofgem and Innovate UK, building on the joint response to the recommendations of the Energy Digitalisation Taskforce. The actions in the strategy will deliver greater digitalisation of the energy system and implementation of smart technologies needed to integrate low carbon technologies.				Mid-CB4
54	Power	Smart Systems and Flexibility Plan	The government will deliver the actions set out in the Smart Systems and Flexibility Plan. This will remove barriers to flexibility on the electricity grid and reform markets to reward flexibility. This includes legislating for enabling powers in the Energy Security Bill and consulting on proposals for a Secure and Smart Electricity System, alongside learning from innovative approaches such as the National Grid Electricity System Operator's Demand Flexibility Service. These measures form part of our approach to bring forward and incentivise firm, flexible and low carbon technologies that are needed to meet demand and ensure security of supply and de-risking the delivery of emission reductions in the power sector.				Mid-CB4

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55	Power	Large Scale Long Duration Storage (LLES)	Large scale, long duration storage (LLES) is a key enabler to a secure, cost-effective and low carbon energy system. It has an important role to play in achieving net zero, helping to integrate renewables, maximising their use, contributing to security of supply, and helping manage constraints in certain areas. LLES technologies provide low carbon flexibility, replacing some unabated gas generation. DESNZ will ensure the deployment of sufficient LLES to balance the overall system by developing appropriate policy to enable investment by 2024				Mid CB5 subject to policy design
56	Power	Longer Duration Energy Storage (LODES) Competition	Energy storage has the ability to significantly reduce carbon emissions by shifting low-carbon energy supply to meet demand. To support development of new energy storage technologies the government has been running the Longer Duration Energy Storage (LODES) innovation competition. The first phase of the £68m LODES program, the feasibility phase, has successfully concluded. In November 2022 we announced £32.9 million of LODES funding awarded to successful Phase 2 projects (build and demonstration phase). DESNZ expect to announce further recipients of Phase 2 funding in early 2023 as part of the £1 billion Net Zero Innovation Portfolio. While it is expected that these projects will deliver demonstration schemes. They are intended to be proofs of concept and so carbon emissions savings have not been determined for this competition.				Mid-CB4
57	Power	Flexibility Innovation Programme (FIP)	To support widespread electricity system flexibility, the government has been running the Flexibility Innovation Programme (FIP), part of the £1 billion Net Zero Innovation Portfolio. This Programme, worth up to £65 million, is supporting over 40 innovation projects, and includes innovation action on Interoperable Demand Side Response, Alternative Energy Markets, Vehicle-to-Everything and Automatic Asset Registration. These projects are intended to support innovation, deliver proof of concepts, and deliver insights to policy development which will enable decarbonisation of the energy system; and so carbon emissions savings have not been determined for this policy.				Mid-CB4
	Fuel Supply	Note on Hydrogen Scenario Modelling	HMG continues to support the potential deployment of hydrogen in heat (through commercialising hydrogen deployment through funding via the Net Zero Innovation Fund, for instance) and also support for electrification of heat, for instance through increased use of heat pumps. Because of this, we have modelled different decarbonisation pathways for parts of the buildings and fuel supply sectors that vary depending on the level of deployment of hydrogen across the economy. This applies to three policy areas covering heat pump deployment, buildings “on the gas grid”, and the emissions associated with hydrogen production. Modelled scenarios show how differing uptake rates of hydrogen may displace some electrification across the economy. These scenarios are mutually exclusive of one another. Emissions savings from the high electrification scenario cannot be summed together with those from a "medium" or "high" hydrogen scenarios. Likewise, savings from "high" and "medium" hydrogen scenarios cannot be summed together. Although our list therefore includes proposals and policies in different scenarios, we do not double count these emission savings in analysis presented elsewhere in this report.				
58	Fuel Supply	10GW Low Carbon Hydrogen Production by 2030 and beyond - Net Zero Hydrogen Fund & Hydrogen	Delivery of the 2030 ambition for 10GW low carbon hydrogen production capacity, with at least half from electrolytic hydrogen, will be supported through a range of measures.	-0.051	-0.3	-0.3	Mid CB4

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		Production Business Models (baseline assumption)	These include: a) £240m Net Zero Hydrogen Fund (capital funding) b) Hydrogen Production Business Model (funded via the Industrial Decarbonisation and Hydrogen Revenue Support Scheme) c) Industrial Decarbonisation and Hydrogen Revenue Support scheme (IDHRS), which will support both electrolytic ('green') and CCUS enabled methane reformation ('blue') low carbon hydrogen production. d) New business models for hydrogen transport and storage infrastructure by 2025, which will grow the hydrogen economy and provide security for producers of hydrogen. e) Working with industry and other stakeholders to develop a hydrogen production roadmap on the scaling up of hydrogen production and supply chain growth across the decade We have announced today the shortlist of projects to take through to due diligence for the first electrolytic allocation round, which will offer support from our Net Zero Hydrogen Fund and from the Hydrogen Production Business Model. Please refer to the note on hydrogen modelling above and the Technical Annex for an explanation of our modelling in this sector.				
59	Fuel Supply	10GW Low Carbon Hydrogen Production Capacity by 2030 and 18GW by 2037 and beyond - in an electrification pathway	This is a modelled scenario covering hydrogen production capacity deployment to 2037 in a scenario where heating is electrified. It only includes production capacity which is additional to our 10GW ambition, so it is additive to the '10GW low carbon hydrogen production by 2030 and beyond' ((HYbase – line 58) line. This scenario assumes hydrogen production capacity reaches a	0.000	0.000	-0.069	CB6

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			total of 18GW by 2037, which is sufficient to meet demand for hydrogen in a scenario where heat is electrified. This scenario would require further policy development beyond 2030. Our production policies are grouped together to model our planned hydrogen production deployment. It is not possible to quantitatively split out the impact of the separate policies, as they each contribute to hydrogen production and are interlinked. Hydrogen production alone will not generate carbon savings, but we expect it to enable potential carbon savings in several sectors including industry, power, transport and potentially buildings by replacing high-carbon fuels. a) £240m Net Zero Hydrogen Fund (capital funding) b) Hydrogen Production Business Model (funded via the Industrial Decarbonisation and Hydrogen Revenue Support Scheme) c) Industrial Decarbonisation and Hydrogen Revenue Support scheme (IDHRS), which will support both electrolytic ('green') and CCUS enabled methane reformation ('blue') low carbon hydrogen production. d) New business models for hydrogen transport and storage infrastructure by 2025, which will grow the hydrogen economy and provide security for producers of hydrogen. e) Working with industry and other stakeholders to develop a hydrogen production roadmap on the scaling up of hydrogen production and supply chain growth across the decade We have announced on 30 March the shortlist of projects to take through to due diligence for the				

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			first electrolytic allocation round, which will offer support from our Net Zero Hydrogen Fund and from the Hydrogen Production Business Model. We are aiming to run annual allocation rounds for electrolytic hydrogen, moving to price competitive allocation by 2025 as soon as legislation and market conditions allow. This means that we aim to have up to 1GW of electrolytic hydrogen in construction or operational by 2025, with up to 2GW of production capacity overall (including CCUS-enabled hydrogen) in operation or construction by 2025. Please refer to the note on hydrogen modelling above and the Technical Annex for an explanation of our modelling in this sector.				
60	Fuel Supply	10GW Low Carbon Hydrogen Production Capacity by 2030 and 34GW by 2037 and beyond - in a hydrogen pathway	This is a modelled scenario covering hydrogen production capacity deployment to 2037 in a scenario where hydrogen is used for heating. It only includes production capacity which is additional to our 10GW ambition, so it is additive to the '10 GW low carbon hydrogen production by 2030 and beyond' line. This scenario assumes hydrogen production capacity reaches a total of 34GW by 2037, sufficient to meet demand for hydrogen in a scenario where hydrogen is used for heat. This scenario would require further policy development beyond 2030. Our production policies are grouped together to model our planned hydrogen production deployment. It is not possible to quantitatively split out the impact of the separate policies, as they each contribute to hydrogen production and are interlinked. Hydrogen production alone will not generate carbon savings, but we expect it to enable potential carbon savings in several sectors	0.000	-0.011	-0.4	CB5

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			including industry, power, transport and potentially buildings, as a replacement to high-carbon fuels. a) £240m Net Zero Hydrogen Fund (capital funding) b) Hydrogen Production Business Model (funded via the Industrial Decarbonisation and Hydrogen Revenue Support Scheme) c) Industrial Decarbonisation and Hydrogen Revenue Support scheme (IDHRS), which will support both electrolytic ('green') and CCUS enabled methane reformation ('blue') low carbon hydrogen production. d) New business models for hydrogen transport and storage infrastructure by 2025, which will grow the hydrogen economy and provide security for producers of hydrogen. e) Working with industry and other stakeholders to develop a hydrogen production roadmap on the scaling up of hydrogen production and supply chain growth across the decade We have announced on 30 March the shortlist of projects to take through to due diligence for the first electrolytic allocation round, which will offer support from our Net Zero Hydrogen Fund and from the Hydrogen Production Business Model. We are aiming to run annual allocation rounds for electrolytic hydrogen, moving to price competitive allocation by 2025 as soon as legislation and market conditions allow. This means that we aim to have up to 1GW of electrolytic hydrogen in construction or operational by 2025, with up to 2GW of production capacity overall (including CCUS-enabled hydrogen) in operation or construction by 2025.				

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			Please refer to the note on hydrogen modelling above and the Technical Annex for an explanation of our modelling in this sector.				
61	Fuel Supply	Bio-Generation Emissions Associated with Future Framework/Scheme for Biomethane Support	This line represents emissions created as a by-product of our policy framework to deliver increased production of biomethane and associated carbon savings. Biomethane will play an important role in decarbonising the gas grid and supporting various pathways to Net Zero. This framework, which would be subject to public consultation, would build on the Green Gas Support Scheme (GGSS), which will increase the amount of biomethane injected into the gas grid and closes to new applicants in 2025/6	-0.005	-0.2	-0.4	2027
62	Fuel Supply	Flaring and Venting Abatement	Reduce emissions from the practice of gas flaring and venting in the oil and gas industry. This policy is in line with government's commitment to the World Bank's 'Zero Routine Flaring by 2030' initiative, the North Sea Transition Deal and the sector's target for 50% reduction of emissions by 2030, and 100% by 2050. The North Sea Transition Authority's Strategy includes the expectation that flaring, venting, and associated emissions will be at the lowest possible levels and requires new developments to be planned based on zero routine flaring and venting.	0.000	0.2	0.2	2031
63	Fuel Supply	Electrification of Upstream Oil and Gas Production	This is a policy to promote electrification of existing and new offshore oil and gas production assets in the North Sea via integration with the onshore grid and offshore renewables infrastructure, with the aim of reducing emissions by 50% by 2030, and 100% by 2050. The policy is in line with the	0.000	1.0	0.7	2028

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			North Sea Transition Deal and will be delivered by government, key regulators including the North Sea Transition Authority and industry.				
64	Fuel Supply	Reducing Methane Leakage through the Distribution Network (Ofgem and HSE	This is an Ofgem and Health and Safety Executive (HSE) policy to reduce methane leakage from the Gas Distribution Networks through the replacement of old iron mains pipes with new plastic pipes, through the Ofgem/HSE Iron Mains Risk Reduction Programme (IMRRP). Ofgem funds this work through the RIIO-2 price control (as set out in the price control framework). Leakage rates for plastic pipes are around 99% lower than for metallic pipes.	1.1	1.0	0.9	2018
65	Industry	Industrial Carbon Capture Business Models as part of the Track 1 CCUS Cluster Sequencing Process	Business model for Industrial Carbon Capture (ICC), comprising upfront capital support (via the CCS Infrastructure Fund) and ongoing revenue support (via the Industrial Decarbonisation and Hydrogen Revenue Support (IDHRS) scheme) as part of the Track 1 CCUS Cluster Sequencing process programme. DESNZ will work to evolve the business model and allocation process to enable us to contribute and deliver these long-term ambitions. Updated business model contracts with further technical contractual drafting are planned to be published in 2023. Preparations to lay relevant secondary legislation in 2023 (following the Energy Security Bill) are also being made. Note: The start date for this row contains a degree of uncertainty. The actual start dates are subject to successful project negotiations with multiple projects and clusters, and project delivery.	0.084	0.9	0.9	Late CB4 - Early CB5

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66	Industry	Industrial Carbon Capture Business Models for the additional carbon capture of industrial emissions needed to achieve 6 MtCO2 p.a. in total by 2030	Building on the Industrial Carbon Capture (ICC) business models as part of the Track 1 CCUS Cluster Sequencing process develop further support for Industrial Carbon Capture (ICC) for the additional carbon capture of industrial emissions to achieve 6 MtCO2 p.a. in total by 2030. Note that this scenario is the additional capture needed (after the Track-1 Cluster Sequencing scenario) and will not achieve the NZS ambitions without the scenario above. As such, it relies upon the delivery mechanisms set out under the Track 1 ICC sequencing process row. This is planned to be delivered via Track 2 of CCUS Cluster Sequencing process and expansion of Track-1 clusters. We plan to set out a vision for the UK CCUS sectors in 2023 to raise confidence and improve visibility for investors.	0.000	3.0	5.1	Mid CB5
67	Industry	Industrial Carbon Capture Business Models for the additional carbon capture of industrial emissions needed to achieve 10 MtCO2 p.a. in total by 2035	Business model for Industrial Carbon Capture (ICC) support needed to achieve 10 MtCO2 p.a. in total by 2035. This includes the ambition to capture and store 9MtCO2pa of industrial emissions by 2035, as set out in the Net Zero Strategy. It is anticipated that an additional 1MtCO2pa could, if required, be delivered by industrial carbon capture, but the best mechanism for doing so remains under review. We will work to evolve the business model and allocation process to enable us to contribute and deliver these long-term ambitions. Note that this scenario is the additional capture needed (after the 6 Mt ambition) and will not achieve the NZS ambitions without the scenario above. As such, it relies upon the delivery mechanisms set out under the Track 1 ICC sequencing process and Track 2/Track 1 expansion rows. Updated business model contracts with further technical contractual drafting are planned to be published in 2023.	0.000	0.3	3.6	Mid CB5

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68	Industry	Industrial Energy Transformation Fund	The Industrial Energy Transformation Fund (IETF) supports industrial sites with high energy use to transition to a low carbon future. The fund targets existing industrial processes, helping industry to cut energy bills by investing in more efficient technologies and reduce emissions by bringing down the costs and risks associated with investing in deep decarbonisation technologies. Grant funding is allocated through a competitive process aimed at supporting the highest quality and most transformational bids. The fund is open to a broad range of industrial sectors of all sizes and will support applicants based in England, Wales, and Northern Ireland, both within and outside of industrial clusters. Phase 2 of the Fund closed to new applications in February 2023. Note: The average annualised carbon savings presented in this table are not included in the EEP and are therefore in addition to those stated in table 4. Carbon savings associated with newly committed funding to extend the IETF for a Phase 3 round of applications are not included.	0.1	0.2	0.2	2022
69	Industry	Steel Sector Decarbonisation	Proposal for steelmaking to be carried out through electrification by 2035 with recycled steelmaking supplemented with ore-based iron imports. Limited near-term savings are achieved through existing policies. The proposal could potentially be developed further to replace ore-based iron imports with domestic near-zero hydrogen iron-making as the next step process.	0.3	7.6	10.3	2023
70	Industry	Industrial Non-Road Mobile Machinery Decarbonisation	Publish an industrial non-road mobile machinery (NRMM) strategy to ensure that emissions savings are delivered. The strategy will set out how the sector can decarbonise while maintaining competitiveness, attracting investment and supporting growth. To deliver the strategy, government is developing its evidence base on NRMM decarbonisation options through ongoing	1.0	2.5	4.5	End CB4

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			external research and a call for evidence planned for late 2023. Government has made support available for NRMM decarbonisation through schemes such as the £40m Red Diesel Replacement competition, the Industrial Energy Transformation Fund (IETF), and the Renewable Transport Fuel Obligation (RTFO).				
71	Industry	Industrial Fuel Switching - Electricity	We expect our ambition to achieve 50TWh of industrial fuel switching to low carbon fuels by 2035 primarily to be reached via switching from fossil fuels to electricity and hydrogen. Bioenergy is an additional fuel source that could enable carbon savings where other low carbon alternatives aren't available or through BECCS to generate negative emissions. The split will depend on the availability, cost and technical feasibility of the various fuel switching options We will explore measures to address barriers inhibiting the switch away from fossil fuels to electricity, including capital and operational costs such as the fuel cost barrier, through publishing a call for evidence in 2023. The call for evidence will seek industry's, and other stakeholders', views on overcoming barriers to electrification. This is part of a broader policy package to reach industrial fuel switching target of 50TWh low carbon fuels by 2035. The savings represented in rows 71/72/73 are the collective result of the policies on those rows, so should be treated as a single figure from three sets of individual fuel switching policies, and should not be summed together.	0.1	2.3	7.6	2025-2027

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
72	Industry	Industrial Fuel Switching - Hydrogen	We expect our ambition to achieve 50TWh of industrial fuel switching to low carbon fuels by 2035 primarily to be reached via switching from fossil fuels to electricity and hydrogen. Bioenergy is an additional fuel source that could enable carbon savings where other low carbon alternatives aren't available or through BECCS to generate negative emissions. The split will depend on the availability, cost and technical feasibility of the various fuel switching options. Having published our response to the call for evidence on 'Enabling or requiring hydrogen-ready industrial boiler equipment', we will sponsor the BSI to ensure that hydrogen-ready industrial-sized boiler equipment is covered by a Publicly Available Specification (PAS). This will help establish best practice for the production and installation of hydrogen ready equipment, designed to facilitate a switch to low carbon hydrogen. We will explore further measures to incentivise fuel switching through regulating out the use of unabated fossil fuels in industry. Measures under consideration include product regulation, environmental permitting, or a combination of the two. Any potential measures taken forward will be designed through consultation with relevant industries and stakeholders. The savings represented in rows 71/72/73 are the collective result of the policies on those rows, so should be treated as a single figure from three sets of individual fuel switching policies, and should not be summed together.	0.1	2.3	7.6	2025-2027

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
73	Industry	Industrial Fuel Switching - Biomass	We expect our ambition to achieve 50TWh of industrial fuel switching to low carbon fuels by 2035 primarily to be reached via switching from fossil fuels to electricity and hydrogen. However, bioenergy is an additional fuel source that could enable carbon savings where other low carbon alternatives are not available or through BECCS to generate negative emissions. The split will depend on the availability, cost and technical feasibility of the various fuel switching options. We will explore measures to direct the use of biomass, a limited resource, within the industrial sector to achieve industrial decarbonisation. The upcoming Biomass Strategy, due for publication in 2023 Q2, will review the amount of sustainable biomass available to the UK and how this resource could be best utilised across the economy. The outcomes of the strategy will guide the next stage where we will develop a policy package that strives to make best use of biomass as a transitional fuel, and generate negative emissions in combination with bioenergy with carbon capture and storage (BECCS). The savings represented in rows 71/72/73 are the collective result of the policies on those rows, so should be treated as a single figure from three sets of individual fuel switching policies, and should not be summed together.	0.1	2.3	7.6	End CB4
74	Industry	Industrial Resource Efficiency	This is a proposal in an early stage of development, but government has recognised the importance of Industrial Resource Efficiency (RE) as a decarbonisation lever in HMG's Industrial Decarbonisation and Net Zero Strategies (2021). Research is underway to identify the full range of Industrial Resource Efficiency measures that, if	1.2	5.6	7.0	2025-2027

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
			implemented, could deliver against the modelled RE emissions savings in the Net Zero Pathway. We are supporting greater collaboration across government departments to accelerate and co-ordinate actions to encourage reuse, recycling, repair, remanufacture, and material substitution, supporting the development of new resource efficient business models.				
75	Industry	Industrial Energy Efficiency	This is a proposal in an early development stage that will look to tackle multiple barriers that businesses face to investing in energy efficiency measures with limited near term savings achieved through existing policies. This is in order to deliver wider HMG ambitions on Net Zero and energy security and the recently announced target to reduce total UK energy demand by 15% from 2021 levels by 2030. As part of this, we intend to launch a pilot which will offer advice, energy audits and grants to 4000 SMEs. The pilot will allow us to learn lessons and gather evidence to inform future policy making, and reduce energy use delivering bill savings.	0.7	2.5	2.8	2025-2026
76	Industry	Non Domestic Energy Performance Certificate (EPC) - Private Rented Sector	The government has consulted on proposals for the private rented sector and will publish the government response in due course.	0.044	0.1	0.1	Late CB4 subject to consultation response
77	Industry	Non Domestic Energy Performance Certificate (EPC) - Point of Purchase	We will consider how we can further support greater energy efficiency in owner occupied commercial buildings.	0.068	0.2	0.4	Late CB4 subject to consultation

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
78	Industry	Phasing Out Fossil Fuels in Off Gas Grid Industrial Buildings	The government consulted on proposals in late 2021 and will publish the government response in due course.	0.006	0.080	0.2	Late CB4, subject to consultation response
79	Industry	Energy Saving Opportunity Scheme Improvements (Industrial Buildings)	A mandatory energy assessment scheme for large UK industrial businesses' energy use opportunities at least every four years, intended to identify practicable and cost-effective energy saving opportunities. ESOS is to be strengthened through the Energy Security Bill. The key changes are to strengthen requirements for audits and make them more standardised, to improve the quality of ESOS audits e.g. through better oversight of assessors and to require additional public disclosures from the audits. We have also announced the introduction for the next ESOS phase a requirement for the audits to include a net zero element and are sponsoring new PAS standard. Through the consultation we also sought views on the potential expansion to a wider range of businesses and requiring mandatory implementation of recommendations, which we are considering as options for future phases of ESOS.	0.004	0.000	0.000	2023
80	Industry	Phasing Out Fossil Fuel Systems in Non-Domestic Buildings on the Gas Grid (base high electrification scenario) The "base high electrification scenario" should be taken in addition to one of the	There will be a need to phase out fossil fuel systems in non-domestic building on the gas grid. The policy is split across four lines to represent various options to electrify heat or deploy hydrogen. High electrification scenario: This is a modelled scenario for emission savings for policies to phase out fossil fuel heated systems in non-domestic buildings on the gas grid. There are a range of measures which would be subject to future consultation. For 2030 onwards, there are	0.000	0.2	0.2	2029

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
		following three scenarios: - High electrification scenario - High hydrogen scenario - Medium hydrogen scenario	three different scenarios with involving a different balance of deploying hydrogen and electrification. This is because if more hydrogen heating is rolled out, then less electrification (i.e. fewer heat pumps) are required to achieve the same carbon savings. To capture the full picture, this policy should be captured with one of the scenario policies listed below. - Assumes the deployment of little to no hydrogen, alongside heat pumps post 2030. - Assumes the deployment of a "High" level of hydrogen alongside heat pumps post 2030. - Assumes the deployment of a "Medium" level of hydrogen alongside heat pumps post 2030. The non-traded emissions are the same in each scenario but the traded emissions and hydrogen demand will change. Hydrogen scenario is dependent on the domestic hydrogen scenario.				
81	Industry	Phasing Out Fossil Fuel Systems in Industrial Buildings on the Gas Grid (high electrification scenario) - in addition to the "base electrification scenario"	There will be a need to phase out fossil fuel systems in industrial buildings on the gas grid. The policy is split across four lines to represent various options to electrify heat or deploy hydrogen. High electrification scenario: This represents early stage policies that to grow the heat pump market in industrial buildings on the gas grid to the extent that would be required in a high-electrification scenario (where hydrogen plays a limited or no role in heating). We will seek to grow the market and transition consumers, while continuing to follow natural replacement cycles to work with the grain of consumer behaviour. For industrial buildings, we could focus initially on key segments of the building stock, for example based on tenure or building use.	0.000	0.2	0.8	2030

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
82	Industry	Phasing Out Fossil Fuel Systems in Non-Domestic Buildings on the Gas Grid - "high hydrogen scenario" (in addition to the "base electrification scenario")	There will be a need to phase out fossil fuel systems in non-domestic industrial buildings on the gas grid. The policy is split across four lines to represent various options to electrify heat or deploy hydrogen. High hydrogen scenario: This represents early stage policies in a high hydrogen scenario would be taken in addition to base high electrification scenario measures to grow the heat pump market) in order to roll out hydrogen for heat to the extent required in a high hydrogen scenario. To note, a high hydrogen scenario would require chosen policy mechanisms to deliver a more extensive rollout of hydrogen for heat than in a medium hydrogen scenario.	0.000	0.1	0.7	2030
83	Industry	Phasing Out Fossil Fuel Systems in Non-Domestic Buildings on the Gas Grid - "medium hydrogen scenario" (in addition to the "base electrification scenario")	There will be a need to phase out fossil fuel systems in non-domestic industrial buildings on the gas grid. The policy is split across four lines to represent various options to electrify heat or deploy hydrogen. Medium hydrogen scenario: This represents early stage policies which in a medium hydrogen scenario would be taken in addition to the base electrification scenario above (measures to grow the heat pump market) in order to roll out hydrogen for heat to the extent required in a medium hydrogen scenario. To note, a medium hydrogen scenario would require chosen policy mechanisms to deliver a less extensive rollout of hydrogen for heat than in a high hydrogen scenario. The non-traded emissions are the same in each scenario but the traded emissions and hydrogen demand will change. Hydrogen scenario is dependent on the domestic hydrogen scenario.	0.000	0.1	0.7	2030

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
84	Buildings	Non Domestic Energy Performance Certificate (EPC) - Private Rented Sector	The government has consulted on proposals for the private rented sector and will publish the government response in due course.	0.2	0.4	0.4	Late CB4 subject to consultation response
85	Buildings	Non Domestic Energy Performance Certificate (EPC) - Point of Purchase	We will consider how we can further support greater energy efficiency in owner occupied commercial buildings.	0.083	0.3	0.5	Late CB4 subject to consultation
86	Buildings	Building Regulations - Part L Interim Uplift 2021 for Existing and New Non-Domestic buildings	An uplift to the energy efficiency standards for non-domestic buildings was implemented in December 2021 and came into force in June 2022, delivered through changes to the Building Regulations and publication of statutory guidance.	-0.034	-0.060	-0.076	2022
87	Buildings	Phasing Out Fossil Fuels in Off Gas Grid Non-Domestic Buildings	The government consulted on proposals in late 2021 and will publish the government response in due course.	0.012	0.081	0.1	Late CB4, subject to consultation response
88	Buildings	Energy Saving Opportunity Scheme Improvements (Buildings)	A mandatory energy assessment scheme for large UK commercial businesses' energy use opportunities at least every four years, intended to identify practicable and cost-effective energy saving opportunities. ESOS is to be strengthened through the Energy Security Bill. The key changes are to strengthen requirements for audits and make them more standardised, to improve the quality of ESOS audits e.g. through better oversight of assessors and to require additional public disclosures from the audits. We have also announced the introduction for the next ESOS phase a requirement for the audits to include a net zero element and are sponsoring new PAS standard. Through the consultation we also	0.046	0.031	0.031	2023

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
			sought views on the potential expansion to a wider range of businesses and requiring mandatory implementation of recommendations, which we are considering as options for future phases of ESOS.				
89	Buildings	Phasing Out Fossil Fuel Systems in Non-Domestic Buildings on the Gas Grid (base high electrification scenario) The "base high electrification scenario" should be taken in addition to one of the following three scenarios: - High electrification scenario - High hydrogen scenario - Medium hydrogen scenario	There will be a need to phase out fossil fuel systems in non-domestic building on the gas grid. The policy is split across four lines to represent various options to electrify heat or deploy hydrogen. High electrification scenario: This is a modelled scenario for emission savings for policies to phase out fossil fuel heated systems in non-domestic buildings on the gas grid. There are a range of measures which would be subject to future consultation. For 2030 onwards, there are three different scenarios with involving a different balance of deploying hydrogen and electrification. This is because if more hydrogen heating is rolled out, then less electrification (i.e. fewer heat pumps) are required to achieve the same carbon savings. To capture the full picture, this policy should be captured with one of the scenario policies listed below. - Assumes the deployment of little to no hydrogen, alongside heat pumps post 2030. - Assumes the deployment of a "High" level of hydrogen alongside heat pumps post 2030. - Assumes the deployment of a "Medium" level of hydrogen alongside heat pumps post 2030. The non-traded emissions are the same in each scenario but the traded emissions and hydrogen demand will change. Hydrogen scenario is dependent on the domestic hydrogen scenario.	0.000	0.4	0.4	2028

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
90	Buildings	Phasing Out Fossil Fuel Systems in Non-Domestic Buildings on the Gas Grid (high electrification scenario) - in addition to the "base electrification scenario"	There will be a need to phase out fossil fuel systems in non-domestic building on the gas grid. The policy is split across four lines to represent various options to electrify heat or deploy hydrogen. High electrification scenario: This represents early stage policies that to grow the heat pump market in non-domestic buildings on the gas grid to the extent that would be required in a high-electrification scenario (where hydrogen plays a limited or no role in heating). We will seek to grow the market and transition consumers, while continuing to follow natural replacement cycles to work with the grain of consumer behaviour. For non-domestic buildings, we could focus initially on key segments of the building stock, for example based on tenure or building use.	0.000	0.4	2.0	2030
91	Buildings	Phasing Out Fossil Fuel Systems in Non-Domestic Buildings on the Gas Grid - "high hydrogen scenario" (in addition to the "base electrification scenario")	There will be a need to phase out fossil fuel systems in non-domestic building on the gas grid. The policy is split across four lines to represent various options to electrify heat or deploy hydrogen. High hydrogen scenario: This represents early stage policies in a high hydrogen scenario would be taken in addition to base high electrification scenario measures to grow the heat pump market) in order to roll out hydrogen for heat to the extent required in a high hydrogen scenario. To note, a high hydrogen scenario would require chosen policy mechanisms to deliver a more extensive rollout of hydrogen for heat than in a medium hydrogen scenario.	0.000	0.4	1.8	2030

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
92	Buildings	Phasing Out Fossil Fuel Systems in Non-Domestic Buildings on the Gas Grid - "medium hydrogen scenario" (in addition to the "base electrification scenario")	There will be a need to phase out fossil fuel systems in non-domestic building on the gas grid. The policy is split across four lines to represent various options to electrify heat or deploy hydrogen. Medium hydrogen scenario: This represents early stage policies which in a medium hydrogen scenario would be taken in addition to the base electrification scenario above (measures to grow the heat pump market) in order to roll out hydrogen for heat to the extent required in a medium hydrogen scenario. To note, a medium hydrogen scenario would require chosen policy mechanisms to deliver a less extensive rollout of hydrogen for heat than in a high hydrogen scenario. The non-traded emissions are the same in each scenario but the traded emissions and hydrogen demand will change. Hydrogen scenario is dependent on the domestic hydrogen scenario.	0.000	0.4	1.8	2030
93	Buildings	Private Rented Sector Minimum Energy Efficiency Regulations	Proposals to strengthen the Minimum Energy Efficiency Standard Regulations for the domestic Private Rented Sector in England and Wales to EPC Band C by 2025 for new tenancies and 2028 for all tenancies. We will publish a summary of responses to the consultation on improving the energy performance of privately rented homes. Note: these savings reflect the consultation stage IA published in September 2020; the estimated carbon savings will be updated once final policy decisions have been made.	0.4	1.4	1.3	2026
94	Buildings	Regulations to Introduce Social Rented Sector Minimum Energy Efficiency Standards	Early stage proposal to develop regulations to introduce Social Rented Sector (SRS) Minimum Energy Efficiency Standards (MEES), subject to consultation. Following the 2020 Social Housing White Paper, the 2021 Heat and Buildings Strategy committed government to consider	0.000	0.022	0.070	CB5

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			setting a new regulatory standard of EPC Band C for the social rented sector. We have committed to begin the consultation process on a minimum energy efficiency standard for the social rental sector, within six months of the Social Housing Regulation Bill receiving Royal Assent.				
95	Buildings	Improving Home Energy Performance through Lenders	Take action following a government consultation on proposals for mortgage lenders to support homeowners to improve the energy performance of their properties. A government response will be published by the end of 2023. Note: these savings reflect the consultation stage IA published in November 2020; the estimated carbon savings will be updated once final policy decisions have been made.	0.6	1.5	1.6	2023
96	Buildings	Phasing Out Fossil Fuels in Off Gas Grid Homes	The government consulted on proposals in late 2021 and will publish the government response in due course.	0.052	1.4	3.4	Late CB4, subject to consultation response
97	Buildings	Future Homes Standard	Regulations from 2025 through the Future Homes Standard to ensure all new homes are ready for net zero by having a high standard of energy efficiency and low carbon heating installed as standard. The technical detail is subject to consultation.	0.3	1.0	1.3	2025
98	Buildings	Building Regulations - Part L new Domestic Interim Uplift	Uplift to the energy efficiency standards for new domestic buildings, delivered through changes to the Building Regulations and publication of new statutory guidance. The standard applies when certain building works take place.	0.4	1.0	1.0	2022
99	Buildings	Building Regulations - Part L Interim Uplift 2021 for Existing Domestic	Uplift to the energy efficiency standards for existing domestic buildings, delivered through changes to the Building Regulations and publication of new statutory guidance.	0.054	0.1	0.2	2023

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
100	Buildings	Local Authority Delivery Scheme - Phase 3	LAD 3 to raise the energy efficiency of low income and low energy performance homes with a focus on energy performance certificate (EPC) ratings of E, F or G. LAD 3 allocated £286.8m to Local Authorities (2022-2023).	0.017	0.016	0.016	2022
101	Buildings	Home Upgrade Grant - Phase 1	Up to £218m of grant funding for local authorities to improve the energy performance and heating systems of low income households living off the gas grid in England (2022-2023). Will achieve carbon saving through energy demand reduction in homes and transition from fossil fuel to low carbon heating. Scheme in delivery.	0.014	0.014	0.014	2022
102	Buildings	Home Upgrade Grant - Phase 2	Up to £630m in grant funding for local authorities to improve the energy performance and heating systems of low income households living off the gas grid in England (2023-2025). Will achieve carbon saving through energy demand reduction in homes and transition from fossil fuel to low carbon heating.	0.042	0.046	0.045	2023
103	Buildings	Home Upgrade Grant - Consumer Led Route (pilot)	Up to £100m of funding for eligible consumers to improve the energy performance and heating systems of off gas grid homes in England. Importantly, it would use an assessment of household income in order to approve eligibility. Scheme is at the policy development stage and is anticipated to be launched in financial year 24/25. .	0.003	0.005	0.005	2025
104	Buildings	Great British Insulation	The £1 billion Great British Insulation scheme (formerly ECO+) will see hundreds of thousands of homes across the country receive new home insulation, saving consumers around £310 a year. The Great British Insulation scheme will extend support to those in the least energy efficient homes in the lower Council Tax bands, as well as targeting the most vulnerable	0.1	0.2	0.1	2023

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105	Buildings	Social Housing Decarbonisation Fund - Wave 1	The government launched Wave 1 of the SHDF in August 2021. It has awarded around £179m of grant funding for delivery from 2022 into 2023, and will see energy performance improvements to up to 20,000 social housing properties.	0.013	0.013	0.013	2022
106	Buildings	Social Housing Decarbonisation Fund - Wave 2	£800m has been committed for the SHDF as part of the 2021 Spending Review settlement. The Wave 2.1 competition, which closed on 18 November 2022, will look to allocate up to £800m of grant funding to support the installation of energy performance measures in social homes in England. Successful projects are likely to be notified in March 2023. Delivery will continue until 2025.	0.041	0.045	0.045	2023
107	Buildings	Social Housing Decarbonisation Fund - Future Phases (Wave 3 & 4)	The funding will upgrade a significant amount of the social housing stock currently below EPC C up to that standard, delivering warmer and more energy-efficient homes, reducing carbon emissions and bills, and tackling fuel poverty as well as supporting green jobs.	0.070	0.3	0.3	2025
108	Buildings	Clean Heat Market Mechanism	A new market-based incentive for heating appliance manufacturers, similar to obligations in sectors such as low-emissions vehicles and renewable electricity generation, to support investment in increasing the proportion of low-carbon heating appliances installed relative to fossil fuel boilers over the years 2024 to 2028.	0.3	1.2	1.2	2024
109	Buildings	Heat Network Market Framework	The Heat Networks Regulation will use new primary legislation to appoint Ofgem as the heat network regulator in GB and the CCNI in NI. Under this system of regulation consumers will be given equivalent levels of protection to those on electricity and gas with new regulatory powers to ensure all consumers are treated fairly and networks are run to high standards. We will also help operators run their heat networks as cost-efficiently as possible, delivering further savings	0.064	0.2	0.4	2024

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			for consumers and government will have powers to regulate the carbon emissions of heat networks so that they meet their 2050 net-zero target. Finally, it will make it easier for investors to enter the sector and level the playing field with other utilities.				
110	Buildings	Green Heat Networks Fund - Extension	The Green Heat Network Fund (GHNF) is an existing capital grant support programme available for the development of new and existing low and zero-carbon heat networks within the current SR. This is a proposal to extend capital support to continue to grow the heat networks market. Carbon savings are achieved by displacing existing fossil fuel heating systems with heat networks supplied by low carbon sources which is achieved through competitive funding rounds and scheme design.	0.014	0.2	0.3	2025
111	Buildings	Consumer information & advice (former Simple Energy Advice)- Enhancement	A “minimum viable product” one-stop shop where you can connect your EPC to your home and get bespoke advice on energy efficiency. The next stage will be to connect that advice to the government-funded schemes such as the Home Upgrade Grant and ECO.	0.007	0.007	0.005	2023
112	Buildings	Heat Network Zoning	Through new powers in the Energy Bill, Heat Network Zoning will be introduced by no later than 2025. Zoning will involve the identification and designation of areas where heat networks are expected to be the lowest cost solution for decarbonising heat. Carbon savings are achieved by displacing existing fossil fuel heating systems with heat networks supplied by low carbon sources.	0.3	1.4	2.7	2025
113	Buildings	Heat Network Efficiency Scheme - Main	The Heat Network Efficiency Scheme (HNES) will provide grant funding to existing heat network projects in England and Wales, in order to address customer detriment and deliver network efficiency improvements. The scheme grant	0.008	0.009	0.009	2023

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			budget is £32m, with eight funding windows planned across 23/24 and 24/25.				
114	Buildings	Heat Network Efficiency Scheme - Extension	The Heat Network Efficiency Scheme (HNES) is an existing capital support programme that supports performance improvements to existing heat networks or communal heating projects within the current Spending Review period. This is a proposal to extend capital support to continue to support performance improvements in future years, subject to future Spending Reviews.	0.002	0.007	0.007	2025
115	Buildings	Energy-related Product Standards - Minimum Energy Efficiency Standards for Domestic Cooking Appliances	Ecodesign regulation to raise minimum energy performance standards for domestic cooking appliances (ovens and hobs) in order to phase out the worst performing appliances as the market towards more efficient and low carbon products, subject to consultation.	0.077	0.4	0.7	2025
116	Buildings	Energy-related Product Standards - Improved Information on Energy Labels including Lifetime Costs etc. (non-traded sector impact)	Improved information about energy consumption of energy using products provided on energy labels in order to allow consumers to make informed purchases and buy the most energy efficient products.	0.4	0.4	0.4	2025
117	Buildings	Energy-Related Product Standards - Minimum Energy Efficiency Standards for Non-Domestic Cooking Appliances	Ecodesign regulation to introduce minimum energy performance standards for non domestic cooking appliances, subject to consultation.	0.038	0.2	0.3	Second half of CB4
118	Buildings	Energy-Related Product Standards	Update to energy efficiency requirements and introduction of resource efficiency requirements for a range of products (starting with lighting and space heating appliances) following the work of the Energy-related Product Policy Framework,	0.091	0.6	1.1	2025

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			which identified a range of products with high potential for additional energy efficiency gains as well as other mitigation of other environmental impacts.				
119	Buildings	Boiler Efficiency Standards	A package of measures to improve domestic gas boiler heating system efficiency. The policy is aimed at ensuring gas boilers are operating at their best after they have been fitted into homes, through a combination of energy saving technologies, better boiler product standards and supporting improved design and maintenance of heating distribution systems, following consultation in December 2022. This builds on the previous standards for domestic gas boilers, the Boiler Plus Standards, that were introduced in England in 2018.	0.2	0.8	1.1	2025
120	Buildings	Gasification Biomethane to the Grid	Drive forward commercial-scale gasification given its potential for biomethane production. The proposal is at an early stage of policy development and would be subject to consultation.	0.000	0.3	0.8	Early CB5
121	Buildings	Biomethane - Future Support	Create a policy framework to deliver increased production of biomethane and associated carbon savings, subject to consultation. This will follow the current Green Gas Support Scheme (GGSS) and increase the amount of biomethane injected into the gas grid.	0.010	0.5	0.8	2026
122	Buildings	Public Sector Decarbonisation Scheme - Future Phases	Future phases of the PSDS scheme, with the aim of reducing direct emissions from public sector buildings by 75% by 2037. Mechanism for delivery is a 2021-2032 grant scheme for Public Sector Organisations to decarbonise their heat and install energy efficiency measures.	0.5	2.7	5.0	2025

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123	Buildings	Additional Retrofit Heat Pump Installations (2029 to 2037)- "High Electrification" Scenario Only	Part of the 'high electrification' pathway, requiring an increase in heat pump installations. Drive forward mechanisms to increase the retrofitting of existing properties. Delivery mechanisms under consideration include capital schemes to support consumers, regulation to better incentivise industry and other methods of building the supply chain for heat pump manufacturing and installation.	0.000	3.3	15.4	2029
124	Buildings	Hydrogen Heating Deployment - "High Hydrogen" Scenario Only	Part of the "high hydrogen" scenario in which hydrogen makes up a large proportion of the mix of clean heat technology. The gas grid could be converted to handle hydrogen for heat (domestic & non-domestic) required in high hydrogen scenario, in order for hydrogen heating to contribute to the replacement of the incumbent technology of natural gas for heating to deliver carbon savings.	0.000	0.7	9.0	2030
125	Buildings	Additional On Gas Grid Heat Pumps (2029 to 2037) - "High Hydrogen" Scenario Only	Part of the "high hydrogen" scenario in which hydrogen makes up a large proportion of the mix of clean heat technology. For all hydrogen scenario policies: The deployment of heat pumps beyond 2028 will depend on wider commercial factors such as the cost of heat pumps (both their upfront costs and running costs) and the successful commercialisation of hydrogen to heat buildings - as well as continued government action through a range of measures. Heat pump deployment is lower in a scenario of greater hydrogen uptake. Government is planning to take a strategic decision on the role of hydrogen heating in 2026.	0.000	2.6	6.2	2029

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126	Buildings	Hydrogen heating deployment - "Medium Hydrogen" Scenario Only	Part of the "medium hydrogen" scenario in which hydrogen makes up a medium proportion of the mix of clean heat technology. Convert the gas grid to handle hydrogen for heat (domestic & non-domestic) required in medium hydrogen scenario, in order for hydrogen heating to contribute to the replacement of the incumbent technology of natural gas for heating to deliver carbon savings.	0.000	0.5	5.0	2030
127	Buildings	Additional On Gas Grid Heat Pumps (2029 to 2037) - "Medium Hydrogen" Scenario Only	Part of the "medium hydrogen" scenario in which hydrogen makes up a medium proportion of the mix of clean heat technology.	0.000	2.7	10.3	2029
128	Domestic Transport	Accelerated Transition to Zero Emission Cars	The zero emissions vehicle (ZEV) mandate will set targets for a percentage of manufacturers' new car sales to be zero emission each year from 2024; alongside regulations that will require non-ZEV emissions to not worsen.	0.3	5.1	16.0	2024
129	Domestic Transport	Accelerated Transition to Zero Emission Vans	The ZEV mandate will set targets for a percentage of manufacturers' new van sales to be zero emission each year from 2024; alongside regulations that will require non-ZEV emissions to not worsen.	0.6	3.5	7.4	2024
130	Domestic Transport	Accelerated Transition to Zero Emission Medium- and Heavy-Goods Vehicles (MHGVs)	The policy comprises a range of measures to support UK road freight's transition to net zero, including removing barriers to the uptake of zero emission medium and heavy goods vehicles, the Zero Emission Road Freight Demonstrator programme, financial incentives, and updating and introducing MHGV regulation aimed at delivering the 2035 phase out date for the sale of new, non-zero emission MHGVs 26 tonnes and under, and increased support for uptake in the interim.	0.1	1.6	5.4	2026

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131	Domestic Transport	Accelerated Transition to Zero Emission Buses (ZEBs), Coaches and Minibuses	The policy comprises a range of funding measures to support the ZEB markets, and policy/regulation to ensure in-scope zero emission vehicles are deployed at pace. Funding includes that delivered through the ZEB Regional Area Scheme and the All-Electric Bus City initiative. Following a consultation in Spring 2022, government will announce an end date for the sale of new non ZEBs in due course. Take further action following recent calls for evidence on the decarbonisation of coaches and minibuses.	-0.001	0.3	0.9	2027
132	Domestic Transport	Accelerated Transition to Zero Emission L-Category Vehicles	End the sale of new non-zero emission light-powered two, three and four wheeled (L-category) vehicles following government consultation held in 2022.	0.002	0.039	0.1	2026
133	Domestic Transport	Accelerating fleet turnover	This proposal requires further development. There are a number of potential national and local policy levers that could encourage vehicle owners to move towards cleaner vehicles faster than currently anticipated should this be required to stay on track to meet carbon budget obligations.	0.000	2.6	3.6	CB5
134	Domestic Transport	Efficiency improvements to ICEV new sales and plug-in hybrid electric vehicle (PHEV) fleet	This proposal requires further development. PHEV performance could be improved through targeted technological improvements and changes in real-world use. We will consider different levers that could bring about such improvements, should this be required to stay on track to meet carbon budget obligations. Current projections assume limited improvements in the CO2 performance of internal combustion engine vehicles in the period of the ZEV mandate. Policy measures could be developed to incentivise consumers to opt for more fuel efficient (and lower CO2) petrol and diesel vehicles during this period.	0.000	0.5	1.0	CB5

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135	Domestic Transport	Increasing average road vehicle occupancy	This proposal requires further development. We will consider measures that could reverse recent trends in declining average road vehicle occupancy, bringing the UK more in line with comparable countries and reducing overall vehicle miles travelled, should this be required to stay on track to meet carbon budget obligations.	0.000	0.5	0.7	CB5
136	Domestic Transport	HGV and van logistics	This proposal requires further development. We will consider ensuring more support is available for HGV and van drivers to reduce total fuel used by HGV fleets, should this be required to stay on track to meet carbon budget obligations.	0.000	1.1	1.5	CB5
137	Domestic Transport	Greater decarbonisation of the rail network	This proposal requires further development. We will consider decarbonisation of the rail network beyond currently funded electrification schemes through additional electrification and deployment of alternative traction trains, should this be required to stay on track to meet carbon budget obligations and subject to future Spending Reviews.	0.008	0.058	0.2	CB5
138	Domestic Transport	Reduced Use of Urea and Liquid Petroleum Gas	This policy is not additional - these emissions savings result from other measures indirectly reducing the use of urea and liquid petroleum gas in road vehicles.	0.036	0.1	0.3	2024
139	Domestic Transport	Domestic Aviation Decarbonisation	Domestic aviation policy aligned with policy for international aviation, including rapid scale up of the use of Sustainable Aviation Fuels, introduction of zero emission aircraft from 2035, continued improvements in efficiencies of our airspace, aircraft and airports and carbon pricing. (See International Aviation section for more detail.)	0.029	0.093	0.2	2030

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140	Domestic Transport	High Annual Investment in Cycling and Walking Infrastructure and Policy	The second statutory Cycling and Walking Investment Strategy (CWIS2) and the government's Gear Change Plan include delivery of a range of capital and revenue funded projects to enable more cycling and walking in line with the July 2021 Transport Decarbonisation Plan commitment to 'deliver a world-class cycling and walking network in England by 2040'.	0.045	0.1	0.2	2020
141	Domestic Transport	Maritime Decarbonisation Across Vessels and Ports	The 'Course to Zero' consultation will inform development of indicative decarbonisation targets and policy interventions. We have consulted on expanding the UK ETS to domestic shipping and will publish a government response in due course. R&D funding is being delivered through the £206m UK Shipping Office for Reducing Emissions (UK SHORE) programme, including the Clean Maritime Demonstration Competition and the Zero Emission Vessels and Infrastructure (ZEVI) competition.	0.020	0.3	3.0	2022
142	Domestic Transport	Rail Electrification Schemes	This policy includes electrification of the Transpennine Route Upgrade (due for completion 2036-41), the Midland Mainline to Sheffield and Derby (completion date TBC), and the Wigan-Bolton line (due for completion 2024).	0.003	0.071	0.1	2024
143	IAS	International Maritime Decarbonisation	Pursue the ambitious emission reduction strategy and targets agreed at the International Maritime Organization (IMO) in 2018. The government is playing a leading role in calling for even greater ambition during negotiations at the IMO.	0.047	0.4	3.2	2022
144	Domestic Transport	Aircraft Support Vehicle Decarbonisation	This policy is not additional but is linked to delivery of the government's target for airport operations in England to be zero emission by 2040.	0.017	0.2	0.4	2026

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145	IAS	Increasing the Take Up of Sustainable Aviation Fuels	Promote the rapid scaling up of Sustainable Aviation Fuels (SAFs) in the aviation sector, in line with the high ambition scenario detailed in the Jet Zero Strategy, through the introduction of a SAF mandate. This policy will be supported by measures such as the £165m Advanced Fuels Fund and ongoing discussions with industry on action to tackle barriers to the production and use of SAF..	0.9	2.7	3.8	2025
146	IAS	Zero Emission Flight (ZEF) from 2035	Introduction of zero emission aircraft from 2035 in line with the high ambition scenario detailed in the Jet Zero Strategy. Government is promoting development of ultra-low and zero emission technologies through its funding to the Aerospace Technology Institute Programme.	0.000	0.000	0.1	2035
147	IAS	High Fuel Efficiency Savings in Operational Aircraft	Promote continued improvements in efficiencies of airspace, aircraft and airports as set out in the Jet Zero Strategy. Government is providing funding to support airspace modernisation and is promoting development of ultra-efficient aircraft technologies through its funding to the Aerospace Technology Institute Programme.	-0.003	0.3	1.3	2027
148	IAS	Carbon Pricing in Aviation	Introduce carbon pricing through the UK Emissions Trading Scheme and Carbon Offsetting Reduction Scheme for International Aviation (CORSIA) to incentivise in-sector reduction of emissions (e.g. through fuel efficiency, uptake of sustainable aviation fuels and zero emission flight). Carbon pricing assumptions in line with the high ambition scenario in the Jet Zero Strategy.	0.000	0.000	0.3	2036
149	Agriculture and LULUCF	Increase feed analysis and use of precision feeding to not exceed animal requirements.	Precision feeding involves the assessment of animal feed to ensure the composition and volume of feed meets, but does not exceed, animal requirements. This can reduce emissions and emissions intensity by maximising feed utilisation, stabilising fermentation in the stomach, improving animal health, and minimising nutrient	0.00186	0.01020	0.02815	2022

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			excretion in manure. It is expected that industry adoption of precision feeding will increase as a market-led take up of precision feeding is already occurring. The AIC (Agricultural Industries Confederation) maintains a register of accredited feed nutritionists to facilitate this by providing technical advice on best feeding practice. In addition, precision mixing machinery is available for the preparation of mixed rations. The role of government is in supporting and accelerating the take up of precision feeding. The government will provide funding under the Farming Innovation Programme, which could support the development of technology related to precision feeding,				
150	Agriculture and LULUCF	Use of methane suppressing feed products (e.g. 3NOP, nitrate additives) to reduce methane emissions from livestock.	Methane-suppressing feed products (for example 3NOP, nitrate additives) within feed rations to reduce the amount of methane produced by ruminant livestock (e.g. cattle). Food Standard Agency (FSA) and Food Standards Scotland (FSS) are responsible for the authorisation process of feed additives in Great Britain. We will continue to work with the FSA and FSS, industry and the sector to explore suitable policy options to encourage rapid and extensive uptake of methane suppressing feed products with proven safety and efficacy, including exploring mandating methane suppressing feed products in compound feed for cattle in England. We have already published research on these products and recently ran a call for evidence on methane suppressing feed products to better understand the opportunities and challenges associated with their use. This will inform our next steps to encourage the extensive update of methane supressing feed products.	0.9	1.6	1.6	2022

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151	Agriculture and LULUCF	Use of conventional breeding practices (not genomics or gene editing) to breed cattle that have reduced emissions.	Using conventional production focussed breeding metrics such as Estimated Breeding Value (EBV – which do not require gene editing or genetic modification) reduces emissions intensity in cattle, without compromising welfare or fertility. This process allows the identification of desirable genetic effects in individuals and enables cattle to be bred with lower rates of methane production. Continuing market-led uptake from farmers is expected. Ongoing research and development to improve breeding metric and measures such as funded annual animal health and welfare visits (to support improved fertility and reproduction rates) are expected to support that uptake.	0.01117	0.04487	0.1	2022
152	Agriculture and LULUCF	Increased milking frequency (using robotic milking systems not hormones).	Funding provided through Farming Investment Fund can help facilitate an increase in the rate of milk production, without the use of hormones, by moving from milking twice a day to three times a day, such as by supporting farmers to install robotic milking parlours and make changes to stock management (e.g., keeping cattle closer to the milking parlour).	0.00726	0.02707	0.07093	2022
153	Agriculture and LULUCF	Multi-purpose breeds or multi-use of cows - (milk, calves and meat).	Monitor current market-led initiatives to increase integration of beef and dairy production chains (via dual purpose breeds or increasing use of diary/beef cross calves) explore government's potential role and policy options to support delivery of this measure should the market-led response not meet the required uptake levels or emissions savings.	0.06434	0.2	0.6	2022
154	Agriculture and LULUCF	Reducing emissions from cattle by improving animal health, delivered through tackling endemic disease.	This measure is part of Defra's Animal Health and Welfare Pathway (launched in 2022 to support the gradual and continual improvement in farm animal health and welfare) and will be delivered through the in-development disease eradication programme focusing on Bovine Viral Diarrhoea	0.02945	0.1	0.3	2022

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			(BVD) in England. Testing for BVD is also part of the recently launched Sustainable Farming Incentive Annual Health and Welfare Review which is the first step on the Pathway to improving the health of cattle herds across England.				
155	Agriculture and LULUCF	Reducing emissions from sheep by improving animal health, delivered through tackling endemic diseases.	This measure is part of Defra's Animal Health and Welfare Pathway (launched in 2022 to support the gradual and continual improvement in farm animal health and welfare) and will be delivered through the in-development disease reduction programme focusing on a range of diseases and conditions in sheep in England. Improving health of sheep can reduce emissions intensity by improving the efficiency of livestock production, through improved fertility, reducing mortality and morbidity. The recently launched Sustainable Farming Incentive Annual Health and Welfare Review will also improve sheep health by providing funding to test the effectiveness of worming treatments.	0.00591	0.02260	0.06066	2022
156	Agriculture and LULUCF	Using genetic testing (genomic tools) to develop improved livestock breeding goals and deliver permanent low emissions traits.	The measure involves improving breeding, using genetic testing (genomic tools), to ensure that breeding goals involve some low carbon traits. The measure involves farmers collecting performance information on the individual animals and genetic testing and feeding back this information to help with breeding goal development (the goals include lower methane emissions). Competitions in Defra's Farming Innovation Programme (FIP) are developing this measure ahead of further refinement of policy measures. NB. This measure shows carbon savings starting before the start date. While government action or support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions.	0.00019	0.00082	0.00339	2035

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			Additionally due to the significant lead in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g. due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.				
157	Agriculture and LULUCF	Covering slurry tanks with a retrofitted, permeable cover.	Regulations to mandate retrofitting slurry tanks with a permeable cover will reduce both methane and ammonia emissions, subject to consultation. In the short term, focus is on improving compliance and supporting take up through e.g., Countryside Stewardship slurry grants. NB. This measure provides carbon savings starting before the start date. While government action or support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions. Additionally due to the significant lead in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g., due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.	0.00003	0.00015	0.00043	2027
158	Agriculture and LULUCF	Covering slurry tanks with a retrofitted, impermeable cover.	Regulations to mandate retrofitting slurry tanks with an impermeable cover to reduce both methane and ammonia emissions. In the short term, focus is on improving compliance and supporting take up through e.g. grants provided through Farming Investment Fund Slurry Infrastructure Grant and Countryside Stewardship capital grants for slurry stores. NB. This measure provides carbon savings starting before the start date. While government action or support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions.	0.00991	0.05521	0.2	2023

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			Additionally due to the significant lead in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g. due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.				
159	Agriculture and LULUCF	Analyse manure prior to application to match crop requirements.	Analysing the nitrogen content of slurry, prior to application on crops and grassland, can improve nutrient management, ensuring nitrogen applications do not exceed crop requirements to minimise emissions of nitrous oxide (N2O). Increasing industry adoption is expected as part of a market-led take up of precision farming that is already occurring. Government will work with industry to identify the most appropriate mechanisms for change. We expect the Sustainable Farming Incentive (nutrient management standard) to contribute indirectly to this outcome.	0.00008	0.00032	0.00096	2022
160	Agriculture and LULUCF	Integrating grass/herbal leys in rotation in arable systems.	Leys are temporary grasslands made up of legume, grass and herb species. Diversification of arable cropping systems with grass/herbal leys can increase the positive effects of rotation practices. This measure reduces greenhouse gas emissions and emissions intensity by improving soil organic matter leading to positive impacts on crop yield, soil structure, resistance to erosion losses and could reduce nitrogen fertilizer application. Grass leys are also likely to reduce nitrogen leaching from the soil. This is included in the Sustainable Farming Incentive SFI (soils standards for SFI 2022). Once land is entered into the standard, the government will pay for the integration of multi-species cover crops including a mix of legume, grass and herb species. NB. This measure provides carbon savings starting before the start date. While government action or	0.00306	0.01310	0.04779	2024

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			support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions. Additionally due to the significant lead in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g. due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.				
161	Agriculture and LULUCF	Avoiding use of Nitrogen in excess through the development of an agronomist led nutrient management plan.	Support the use of nutrient management plans and manure management plans across the farming sector. To optimise the use of nitrogen and avoid excess application. Positive impacts include reduced Greenhouse Gas emissions from synthetic fertilisers and reduced energy use and leaching of nitrogen from the soil. This is included in the Sustainable Farming Incentive SFI (soils standards for SFI 2022, nutrients standard for 2023, and low/no input grassland standard for 2023) and is also partially covered by the Farming Rules for Water and Nitrate Vulnerable Zones regulations.	0.00144	0.00779	0.02102	2022
162	Agriculture and LULUCF	Improved crop health through improved pest and disease control practices.	Support improved crop health to increase yield quality and reduce yield losses, through the Sustainable Farming Incentive Integrated Pest Management actions and the Farming Innovation Programme. This reduces emissions through a reduced need for control agents, such as pesticides, and activities such as fuel used during pesticide application.	0.00035	0.00140	0.00433	2022
163	Agriculture and LULUCF	Improved farm fuel and energy efficiency.	Support reductions in farm non-traded carbon dioxide (CO2) emissions from motive power, pumps and drives. Actions include, amongst others, the use of minimum till, which can cultivate the land using mechanical measures other than ploughing to reduce soil disturbance, and the use of no till, which uses direct drilling methods	0.1	0.3	0.6	2022

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			instead of cultivation machinery, thereby reducing fuel emissions. Currently competitions in the Farming Innovation Programme (FIP) are developing this technology and equipment (for example electrified tractors and utility vehicles, the use of robots and low energy motors) and the Farming Investment Fund (FIF) is providing grants towards the purchase of relevant equipment.				
164	Agriculture and LULUCF	Biological fixation of nitrogen on grassland using grass-legume mixtures.	Increasing the inclusion of clover into pasture areas and ensuring the proportion of clover in the mixed grassland to at least 20%. Clover captures atmospheric nitrogen which is made available to pasture, reducing mineral fertiliser requirements and associated nitrous oxide (N2O) emissions. We are already seeing farmer led movement to more biological and on farm solutions to nutrients. Government will accelerate wider adoption by funding these actions through the Sustainable Farming Incentive (soils standards for SFI 2022 nutrients standard for SFI 2023) and Countryside Stewardship (GS4 Legume and herb-rich swards). We have conducted done co-design pilots, tests and trials with more than 5,000 farmers and other people, plus several stakeholder organisations since 2019. We plan to continue this in 2023. We've also created a single landing page on GOV.UK on funding for farmers.	0.02198	0.1	0.3	2022
165	Agriculture and LULUCF	Reseeding temporary pasture/forage crops with high sugar grass varieties.	Reseeding temporary pasture/forage crops with high sugar grass varieties. High sugar grasses have the potential to increase livestock's nitrogen usage efficiency. This reduces nitrogen lost though livestock urine and subsequent emissions to the environment. Government is considering the role in, and options for encouraging the	0.00337	0.01856	0.05139	2022

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			reseeding of temporary pasture/ forage crops with high sugar grass varieties.				
166	Agriculture and LULUCF	Use of plant biostimulants to promote growth and reduce emissions.	Use of plant biostimulants to promote growth and reduce emissions. Plant biostimulants are plant or soil additives that contain substances (microbial and non-microbial) that stimulate natural plant processes and can reduce greenhouse gas emissions intensity by increasing yield. Biostimulants may offer these productivity and resilience gains by enhancing nutrient uptake, nutrient efficiency, tolerance to environmental stress and crop quality. Regulation is in development to set consistent products standards. The evidence on the efficacy of Biostimulants is mixed, and so further research is required to allow for it to be integrated into the Sustainable Farming Incentive. Defra's Farming Innovation Programme (FIP) and agri-food evidence programme are developing evidence on novel fertilising products. NB. This measure shows carbon savings starting before the start date. While government action or support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions. Additionally due to the significant lead in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year e.g. due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.	0.00008	0.00037	0.00152	2030

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167	Agriculture and LULUCF	Use of nitrification Inhibitors (chemical additives to fertilisers) to reduce nitrous oxide emissions.	Nitrification inhibitors are chemical additives that inhibit or delay biochemical processes that give rise to Greenhouse Gas emissions from fertiliser breakdown. Evidence is not yet robust enough on the case for direct government intervention. While nitrification inhibitors are currently available on the market, further research and evidence is needed for example on impacts and application rates. Defra's Farming Innovation Programme (FIP) and agri-food evidence programme are developing evidence on novel fertilising products to inform future policy and regulation development.	0.00646	0.02564	0.07833	2022
168	Agriculture and LULUCF	Reversing, reducing and preventing surface and subsoil soil compaction.	Promote reducing and remediating surface and subsoil compaction through the Sustainable Farming Initiative SFI and soil health measures in the Environmental Improvement Plan, alongside regulatory impacts from initiatives such as Farming Rules for Water. Compaction compromises the movement of the movement of air, water and nutrients within soil which can reduce crop yields and increase emissions.	0.02238	0.09603	0.2	2022
169	Agriculture and LULUCF	Improving/renovating land drainage on mineral soils (where drainage is poor).	Produce guidance on improving and renovating current land drainage (where drainage is poor) to improve crop yield and reduce Nitrous oxide (N2O) emissions.	0.00108	0.00447	0.01473	2022
170	Agriculture and LULUCF	Precision Farming (arable/grassland) using machine guidance and other technologies to control and adjust fertiliser application.	Support and accelerate the use of machine guidance (MG) and variable rate nitrogen application technologies (VRNT) in arable and temporary grassland field operations to help farmers reduce overlaps/avoids gaps and adjust the application rate of fertiliser to match need better in that precise location within the field in order to reduce Nitrous oxide (N2O) emissions. Funding is available for technology and equipment to facilitate this measure through the Farming Investment Fund and new	0.00559	0.02102	0.06084	2022

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			innovations are being supported through the Farming Innovation Programme.				
171	Agriculture and LULUCF	Maintain a soil pH that is optimum for crop or grass growth (e.g., liming).	Support and accelerate adoption of soil analysis for pH and carrying out soil liming (application of magnesium or calcium rich materials to soils) on arable grassland. The application of lime improves the soil pH on land which is below the optimal pH for crop or grass growth. This allows more carbon to be captured below ground through improved productivity and efficient use of nutrients from the soil. This is included in SFI soils standards for 2022, moorland standard for 2022, and nutrients standard for 2023.	0.02316	0.1	0.3	2022
172	Agriculture and LULUCF	Cultivating common crop varieties that have better nutrient uptake.	Support and accelerate the adoption of the cultivation of varieties of already common crops in the UK which use nitrogen more efficiently, reducing Nitrous oxide (N2O) emissions. Competitions in Farming Innovation Programme (FIP) are developing this technology and equipment. In addition, Defra's Genetic Improvement Networks (GINs) aim to improve the main UK crops by identifying genetic traits to improve their productivity, sustainability and resilience. Ongoing work in the Wheat GIN, including annual nitrogen diversity trials, is exploring nitrogen use efficiencies in different wheat varieties. NB. This measure shows carbon savings starting before the start date. While government action or support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions. Additionally due to the significant lead in time for the projected savings to start, and the modelling	0.00001	0.00007	0.00039	2034

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			system used, there may be minor emissions savings before the anticipated start year, e.g. due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.				
173	Agriculture and LULUCF	Growing cover crops within a rotation to maintain soil cover during fallow periods.	Support and accelerate adoption of such cover crops to ensure co-benefits (e.g. for nature and water quality, from the capture of carbon and the retention of nutrients) are realised. This is included in Sustainable Farming Incentive arable and horticultural soils standard for SFI 2022 and through Countryside Stewardship (SW6 Winter cover crops).	0.01021	0.05504	0.1	2022
174	Agriculture and LULUCF	Hedgerows.	Support farmers to create or restore at least 30,000 miles of managed hedgerows by 2037, increasing to a total of at least 45,000 miles of additional managed hedgerows by 2050 returning hedgerow lengths in England to 10% above the 1984 peak (360,000 miles). We will also support them to additionally restore degraded hedges across the country. These measures will increase carbon storage and sequestration. We have announced the inclusion of a hedgerow standard in the Sustainable Farming Incentive, expected to roll out in 2023.	0.01800	0.05000	0.09200	2022
175	Agriculture and LULUCF	Agroforestry. A combination of levers aiming to increase silvo-arable agroforestry to 10% of all arable land by 2050.	Agroforestry will be delivered through environmental land management schemes. Indicative launch date for agroforestry standard in Sustainable Farming Incentive is 2024, although this will not be confirmed until nearer the date. These measures will increase carbon storage and sequestration.	0.00000	0.01400	0.08800	2029
176	Agriculture and LULUCF	Increase tree canopy and woodland cover to 16.5% of total land area in England by 2050.	Through the England Trees Action Plan, supported by the Nature for Climate Fund (NCF), we have launched new grants and initiatives to support increased tree planting in England. These include the England Woodland Creation Offer, the	-0.00780	0.05240	0.3	2028

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
			Community Forests Trees for Climate Programme and the establishment of Woodland Creation Partnerships in Cornwall and Northumberland. Tree planting and woodland creation was increased in England to c.2,700 hectares in 2021/22. The new environmental land management (ELM) schemes will deliver a large proportion of tree planting funding from 2025, when the NCF is due to end. Future woodland creation grants in ELM will mirror the EWCO. Landscape Recovery will support major landscape-scale afforestation projects where these deliver a wide range of environmental outcomes. NB. This measure has small negative carbon savings over CB4. This is due to operational emissions created during the creation of woodlands, for example from the machinery used and soil disturbance. Our tree-planting goals have a large impact on the longer term goals, as they will sequester more carbon the more they grow.				
177	Agriculture and LULUCF	Domestic planting of Perennial Energy crops (PECs) and Short Rotations Forestry. Increase planting of PECs (miscanthus and Short Rotation Coppice) and Short Rotation Forestry (SRF).	Increase land planted with perennial energy crops and short rotation forestry, ensuring above- and below-ground carbon sequestered by fast-growing species through the Biomass Strategy. We will also be further exploring how this will be driven by market demand, what the appropriate sustainable business models might be and whether other support might be needed from government to enable this planting.	0.00812	0.3	1.0	2026
178	Agriculture and LULUCF	Peat Restoration (Blended Finance - 2022-2050).	Restore approximately 280,000 ha of peatland by 2050 (inclusive of the Nature for Climate Fund (NCF) funded restoration). The NCF is providing over £33 million to restore 20,000 hectares of peatlands, with a further bidding round in 2023. Beyond 2025, the main delivery vehicles will be incentives through the new environmental land	0.2	0.8	1.4	2025

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
			management (ELM) schemes: Countryside Stewardship will provide a key funding stream for wetter modes of farming; Landscape Recovery will provide long-term funding to support large-scale peatland restoration projects; and the Farming Innovation Programme supports applications for research and development in paludiculture. Private investment will be mobilised by developing the Peatland Code further, including by expanding the Code to cover lowland peat and exploring further carbon pricing opportunities for the sector. Informed by data from the England Peat Map and findings of the Lowland Agricultural Peat Task Force, a Peatland Restoration Roadmap will be developed to set out a detailed trajectory for restoration to 2050.				
179	Agriculture and LULUCF	Increasing responsible management of lowland agricultural peatlands	Promote more responsible agricultural management of peatlands, through raising water tables and wetter modes of farming (e.g. Paludiculture).	0.03600	0.2	0.2	2025
180	Agriculture and LULUCF	End the sale of peat in horticulture.	End the sale of peat in horticultural growing media, in the amateur sector by 2024 and in the professional sector by 2026, with limited exemptions.	0.00000	0.01000	0.04000	2031
181	Agriculture and LULUCF	UK-level estimates of future carbon savings - Agriculture and LULUCF	Modelling for UK-wide consistency for the agriculture and LULUCF sectors	2.1	4.2	6.9	CB4
182	Waste and F-gases	Near elimination of biodegradable municipal waste to landfill - Collection and packaging reforms.	The majority of emissions from the waste sector are attributable to methane produced by biodegradable waste breaking down in landfill. Collection and packaging reforms will support the reduction of biodegradable municipal waste going	0.4	2.0	3.0	2023-2028

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
			to landfill. Collection and Packaging reforms are made up of the consistent collection of household and business recycling, the introduction of packaging Extended Producer Responsibility (pEPR) and a Deposit Return Scheme (DRS) for plastic and metal drinks containers. We have brought forward £295 million of capital funding which will allow local authorities in England to prepare to implement free separate food waste collections for all households from 2025. Consistent collection of recycling is the primary driver reducing biodegradable waste going to landfill. DRS and pEPR will reduce the total amount of waste and therefore create space for more biodegradable waste to be processed in waste processing facilities which are not landfill.				
183	Waste and F-gases	Near elimination of biodegradable municipal waste from landfill - additional policies towards near elimination of this waste to landfill from 2028.	This is an early-stage proposal which will consist of further measures to divert biodegradable municipal waste from landfill from 2028. We will launch a call for evidence to support development of a plan to achieve this shortly.	0.4	0.5	0.7	2023-2028
184	Waste and F-gases	Monitoring emissions from wastewater treatment and subsequent optimisation of existing operations to minimise process and other emissions.	Work with water companies to encourage the widespread deployment of new sensors for the detection of emissions from a full range of sites, treatment stages and environmental conditions to enable optimisation of current processes to reduce greenhouse gas leakage and minimise production.	0.01680	0.1	0.3	2026

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
185	Waste and F-gases	Data improvement for industrial wastewater treatment.	Promote further improvements in modelling and data collection to improve reporting and reduce uncertainty. Government will publish a rapid evidence assessment setting out options to improve estimates of greenhouse gas emissions from industrial wastewater treatment.	0.06720	0.06720	0.06720	2037
186	Waste and F-gases	High proportion of conventionally digested sludge from wastewater treatment is upgraded to Advanced Anaerobic Digestion (AAD).	Work with water companies to upgrade existing treatments which use anaerobic digesters to Advanced Anaerobic Digestion, which emit less greenhouse gas and capture waste energy as heat and natural gas.	0.01344	0.05376	0.08400	2025
187	Waste and F-gases	Alternative treatment processes for wastewater - e.g., anaerobic treatment/Membrane Aerated Biofilm Reactor (MABR)/alternative ammonia removal processes.	Work with the water industry to expand into more sustainable wastewater treatment techniques and encourage the development and adoption of new wastewater treatment processes which will improve the efficiency of wastewater treatment and reduce greenhouse gas production and contribute to the circular economy by allowing resources to be reused.	0.00000	0.02520	0.08400	2030
188	Waste and F-gases	Additional HFC phasedown step(s) to secure 85% cut.	Implementation of additional phasedown step(s) to meet the Kigali Amendment requirement to reduce HFC consumption by 85% by 2036. This will follow the same process laid out for the existing phasedown step(s) in the F-gas regulation. Timescales for this measure assume that legislation is secured.	0.00000	0.00000	0.05627	2035
189	Waste and F-gases	Metered-dose inhalers (MDIs) F-gas Phasedown.	Prescribing incentives introduced by the NHS to reduce the use of HFCs in inhalers and industry commitments to introduce lower GWP propellants in MDIs.	0.02738	0.2	0.5	2025

#	Sector	Policy Name	Policy Description	Avg. Annual CB4 Savings (MtCO2e) pa	Avg. Annual CB5 Savings (MtCO2e) pa	Avg. Annual CB6 Savings (MtCO2e) pa	Timescale from which the policy takes effect
190	Waste and F-gases	UK-level estimates of future carbon savings - waste and F-gases	Modelling for UK-wide consistency for the waste, wastewater and F-gas sectors	0.1	0.5	0.8	CB4
191	Engineered Removals	Business Models to support Greenhouse Gas Removal Technologies	Develop and implement business models to support the overarching policy ambition to deploy at least 5 MtCO2/year of engineered Greenhouse Gas Removals (GGRs) by 2030 and further future development. After 2030 we expect the volume of engineered removals to increase to 23 MtCO2/year by 2035 and 75-81Mt CO2/year by 2050. Our aim is to enable a diverse portfolio of engineered GGRs. The main business models are the GGR Business Model and the Power BECCS (Bio-energy Carbon Capture and Storage) Business Model. The Industrial Carbon Capture (ICC) and Hydrogen Business Models are additional policy instruments that could enable some GGR deployment. The actual split of GGR technology will depend on the scope for business models and commercial negotiations, but likely include Power BECCS, H2 BECCS, Industry BECCS and Direct Air Capture and Storage (DACCS) technologies.	0.054	6.4	23.4	2027

Table 6 – Unquantified proposals and policies

Note - Proposals and policies that we expect will or could deliver further emissions savings, in addition to the savings identified in Table 5, are marked with an asterisk (*). These are proposals and policies for which we cannot currently quantify associated emissions savings, for example in relation to some early-stage proposals, where we are still assessing the available evidence.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
1	Cross cutting	**Emissions trading- UK ETS Cap**: To incentivise cost effective abatement across traded sectors at the pace and scale required to deliver net zero, we have consulted (in partnership with the Devolved Administrations) on a net zero consistent UK ETS cap for 2024-2030. The range of options put forward in the consultation remains compatible with achieving carbon budgets. In due course, the Authority will communicate its decision on the UK ETS cap in its response to the consultation along with an assessment of any impacts on carbon budget delivery.	CB4	The UK Emissions Trading Scheme (ETS) puts a price on the 'carbon externality' that greenhouse gas emissions represent. This is the most cost-efficient way to support the transition to net zero. It is a necessary condition for enabling the market to deliver that transition, and provides a long-term price signal that, when supported by complementary mechanisms and policies, can deliver a stable investment case for decarbonisation. The ETS emissions cap also provides a strong guarantee that the traded sector's emissions will not exceed its decarbonisation pathway.
2*	Cross cutting	**Setting out a long-term pathway for emissions trading:** We will work within the ETS Authority to publish a long term pathway for the ETS this year. Subject to agreement within the Authority, this pathway will set out our intention to legislate to continue the ETS beyond 2030 until at least 2050. It will remain aligned with our net zero target, so giving businesses the certainty they need to invest in decarbonisation. We will explore	CB4	We will explore expanding the scheme to more sectors of the economy, including high emitting sectors. We consulted last year on expanding the scheme to cover energy from waste/waste incineration and domestic maritime emissions and on incorporating greenhouse gas removals. We will explore the potential role of emissions trading markets in gas/electricity price rebalancing as we consider options for rebalancing policy costs away from electricity and onto fossil energy use when the current high gas prices fall. We will work to develop a harmonised approach for measuring carbon emissions from farms.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		expanding the scheme to more sectors of the economy, including high emitting sectors.		The ETS emissions cap provides a strong guarantee that the traded sector's emissions will not exceed its decarbonisation pathway. Depending on future decisions regarding the ETS, including future levels of the cap and expansion to other sectors, this could therefore provide additional savings beyond those which are currently quantified.
3*	Innovation	**Government portfolio of net zero research and innovation programmes for the Spending Review period 2022-2025**, amounts to approximately £4.2 billion of public investment. This includes £1.5 billion specifically allocated to net zero innovation announced in the Net Zero Strategy (including the £1 billion Net Zero Innovation Portfolio), as well as further research and innovation delivered through other departmental programmes and through UKRI.	Ongoing - policy in effect. Start of emissions savings will depend on the specific innovations, technologies, and sub-technologies being considered, as well as the speed at which they can be scaled up.	This policy provides R&I funding to support the development of new technologies to decarbonise sectors such as power, buildings, industry, transport and agriculture. Continued investment in cutting-edge research, development and demonstration will be integral to achieving the transition. This cross-government portfolio of net zero research and innovation support will help develop technologies critical for decarbonising all relevant sectors of the economy. There is potential for this policy to generate carbon savings beyond those already quantified by increasing the effectiveness of new technologies, reducing costs so that technologies can be deployed at greater scale sooner or from technologies currently at early technology readiness levels which are not yet mature enough to have quantified deployment plans. Additional policies to deploy new technologies at scale will be needed to realise any additional savings from innovation.
4	Innovation	**Implementing measures to make it easier for pension schemes to unlock investment in illiquid assets**, including innovative companies, green projects, and infrastructure. The government's response to the October 2022 consultation, published on 30 January 2023, outlined the final regulatory changes.	Subject to Parliamentary approval, regulations to come into force by Spring 2023. Start of emissions savings will depend on the specific innovations, technologies, and sub-technologies	This policy aims to open up more financing options for innovative companies, including those focused on net zero.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
			being considered, as well as the speed at which they can be scaled up.	
5	Innovation	**Driving innovation in key low-carbon sectors by taking leadership role in Mission Innovation 2.0.** Through our leadership of Mission Innovation (MI) and the Secretariat, we have cemented Mission Innovation as the leading forum for international clean energy innovation and global collaboration. The UK co-leads the Green Powered Future Mission and the Clean Hydrogen Mission, as well as the Heating and Cooling Innovation Community. The UK also participates in four other Missions: Net-Zero Industries, Integrated Biorefineries, Carbon Dioxide Removal and Zero-Emission Shipping.	Ongoing - policy in effect. Start of emissions savings will depend on the specific innovations, technologies, and sub-technologies being considered, as well as the speed at which they can be scaled up.	This policy aims to drive enhanced international action and investment in research and innovation for clean energy solutions.
6	Innovation	**Missions**: As one of the first major investments following the creation of the Department of Science, Innovation and Technology (DSIT), it dedicates £250m over three years to exploiting the UK's global leadership in three of the five technologies that will be the focus of the Department's work: Artificial Intelligence, Quantum Technologies and Engineering Biology. Developed with delivery partners, the new programme delivers against the Innovation Strategy commitments for new "innovation	The programme dedicates £250m over the next three years, but the impacts of the interventions will take place over a longer timeframe.	This policy aims to build on UK strengths and opportunities to catalyse industry, research and public sector actors in developing key transformational technologies which could support the net zero transition.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		missions" and to support the 7 technology families. The development of these technologies will help tackle major challenges faced by the UK and the world such as climate change and energy security. The missions may include interventions directly supportive of Net Zero activity, or through spill over benefits in the realisation of technology outcomes.		
7	Innovation	The **Net Zero Research and Innovation Framework,** which set out the key research and innovation challenges for the next 5-10 years and a roadmap to 2050. Alongside the Net Zero Growth Plan, we've published a follow-up Delivery Plan which outlines the government's investment of £4.2 billion towards net zero research and innovation programmes for the current Spending Review 2022-25, aligned to the priorities in the Framework.	Ongoing - policy in effect. Start of emissions savings will depend on the specific innovations, technologies, and sub-technologies being considered, as well as the speed at which they can be scaled up.	This policy aims to set out the government's key priorities for net zero R&DI and clearly articulate government support against those priorities.
8	Innovation	**Provision of advice, networking opportunities, skills development and testing facilities, including an online innovation hub from Innovate UK**	Ongoing - policy in effect. Start of emissions savings will depend on specific innovations, technologies, and sub-technologies being considered, as well as the speed at which they can be scaled up.	Innovate UK, together with the British Business Bank, is developing an online Innovation Hub for businesses to easily access all funding and support opportunities that are relevant for them with three clicks. This is in response to an action in the Innovation Strategy to provide a dedicated platform for opportunities, making it easier and simpler for innovative businesses to access government backed funding and support. This also includes options specifically for net zero businesses to grow and scale as fast as possible.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
9	Innovation	**UK participation in Horizon Europe** either as an associated country or a third country, the world's largest collaborative research programme worth around €95 billion over the next decade, will help us reach our net zero goals. With a minimum of 35% of funding earmarked for climate change projects, this collaboration with other world leaders in net zero research will drive further progress. DSIT continues to develop its alternative to Horizon Europe in case it is needed which is designed to significantly increase the scale, pace and impact of our international leadership on Net Zero. This funding will support international research collaboration with the EU and others to drive progress on net zero.	Start of emissions savings will depend on the specific innovations, technologies, and sub-technologies being considered, as well as the speed at which they can be scaled up.	In all circumstances, there will be funding that will support collaboration with EU partners in order to progress net zero research.
10	Innovation	We will continue to invest in R&D through the **Advanced Propulsion Centre (APC) competition.**	CB4	Support the transition to zero emission vehicles by accelerating technology development. Since 2013, government and industry have jointly committed more than £1.3 billion in the design and development of new vehicle technologies, with 188 zero emission and low carbon projects supported across a range of R&D competitions. These projects are estimated to support over 56,000 jobs and save over 370MtCO2e.
11	Innovation	**We will coordinate transport's investment in R&D, collaborating with key stakeholders through our Transport Research and Innovation Board (TRIB).**	2025	TRIB could accelerate R&D to reduce transport emissions, including transport infrastructure.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
12	Investment	**Introduce mandatory climate-related financial disclosure requirements across the economy:** These requirements were aligned to the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD). To achieve economy-wide reporting, requirements were introduced by the Financial Conduct Authority via listings rules and the Department for Work and Pensions and the Department for Business, Energy and Industrial Strategy via regulation. Regulations came into force through 2021 and 2022, with the final BEIS (now DESNZ) policy coming into effect 6th April 2022.	Requirements in place from 6th April 2022	Significant flows of private finance will be needed to meet our carbon budgets. The right mix and quantum of public and private capital will be a pre-requisite for delivery of most deployment targets, and thus most associated carbon savings. For financial institutions to effectively allocate their capital, they must have access to the right information and data to price and manage risks, identify opportunities and get comfortable with building exposure to new sectors and technologies. The UK's climate-related financial disclosure requirements will help ensure the right capital is available at the right time, reducing the delivery risk of other carbon savings.
13	Investment	**Transition planning** Currently the Financial Conduct Authority (FCA) requires listed companies, as well as large asset owners and managers to disclose transition plans on a 'comply or explain' basis. The government commits to consulting on the introduction of requirements for the UK's largest companies to disclose their transition plans if they have them. To ensure parity between listed and private companies, as well as to ensure requirements are consistent and comparable across the economy, we expect to consult on the basis that these requirements could align closely with those of the FCA, including the 'comply or explain' basis. The government will also work with the FCA	Forthcoming - subject to consultation	Transition planning is a useful tool for companies to communicate to investors how they will be managing risks and securing opportunities associated with our transition to net zero. They allow investors to more effectively allocate capital.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		to ensure transition plan requirements are delivered across the financial services sector alongside requirements for listed and private companies.		
14	Investment	**UK Green Taxonomy** We will deliver a UK Green Taxonomy – a tool to provide investors with definitions of which economic activities should be labelled as green. This will support the quality of standards, labels and disclosures used in the industry for green finance activity. We expect to consult in Autumn 2023. The government proposes that nuclear - as a key technology within our pathways to reach net zero - will be included within the UK's Green Taxonomy, subject to consultation. After the Taxonomy has been finalised, we will initially expect companies to report voluntarily against it for a period of at least two reporting years after which we will explore mandating disclosures. Government does not wish to place undue burdens onto companies whose size or scale makes the disclosure of	Forthcoming - subject to consultation	Significant flows of private finance will be needed to meet our carbon budgets. The right mix and quantum of public and private capital will be a pre-requisite for delivery of most deployment targets, and thus most associated carbon savings. For financial institutions to effectively allocate their capital, they must have access to the right information and data to price and manage risks, identify opportunities and get comfortable with building exposure to new sectors and technologies. As such, the UK's Green Taxonomy will help ensure the right capital is available at the right time, reducing the delivery risk of other carbon savings.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		taxonomy-related information unreasonable. Therefore, we will develop proposals with proportionality in mind. We are considering whether it is appropriate to pursue a 'Transition Taxonomy', which was a recommendation of the Net Zero Review, or include certain transitional activities within one Taxonomy.		
15*	Investment	**Use the new UK Infrastructure Bank to co-invest alongside private sector investors for infrastructure projects.** The Bank will support projects in England, Scotland, Wales and Northern Ireland and is available to local and mayoral authorities for key infrastructure projects and will provide advice on developing and financing infrastructure. The Bank will 'crowd-in' in private investment to support economic growth, accelerate our progress to net zero, and help level up the UK. The Bank will invest in public and private projects, as well as providing world-class advisory services. Initially, the government will provide the Bank with £5bn of equity and allow it to borrow a further £7bn on top, with a review point in three years to assess whether that is sufficient funding. In addition to this £12bn of capital it will be able to deploy £10bn of government guarantees. We expect it to use this to crowd in private investment to support more than £40bn of infrastructure	Ongoing - policy in effect	For many of the sectors and technologies we are reliant upon for meeting our carbon budgets, access to the right forms of public funding and co-investment will be critical. This is due to the sectors and technologies in question being too nascent to attract the deepest pools of private capital. Although the capital deployed by the UK Infrastructure Bank cannot be quantified into specific carbon savings, as the capital will be deployed across sectors and across time horizons, the scale and the reach of the capital available means the UKIB's interventions should provide additional carbon savings.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		investment overall. £4bn of capital is set aside for local authority lending. On the £8bn for private projects, based on evidence from the UK and internationally, we would expect it to crowd in private investment at a ratio of 2.5:1, supporting £20bn of private investment.		
16*	Investment	**Adopt a new Net Zero objective and integrate Net Zero into the operations of the British Business Bank (BBB).** BBB is a government-owned economic development bank established by the UK government. BBB supports access to finance for smaller businesses to drive sustainable growth and prosperity across the UK, and also to enable the transition to a net zero economy. Between 2014 and end of August 2022, BBB supported £505 million of equity investment in clean technology companies.	Ongoing - policy in effect	For many of the sectors and technologies we are reliant upon for meeting our carbon budgets, access to the right forms of public funding and co-investment will be critical. This is due to the sectors and technologies in question being too nascent to attract the deepest pools of private capital. Although the capital deployed by the British Business Bank cannot be quantified into specific carbon savings, as the capital will be deployed across sectors and across time horizons, the scale and the reach of the capital available means we expect the BBB's interventions to provide additional carbon savings.
17*	Investment	**The Clean Growth Fund (CGF):** launched in 2020, with an ambition to use its £101 million in venture-stage funding to accelerate the deployment of innovative clean technologies that reduce greenhouse gas emissions, while catalysing the UK clean growth venture capital market and leveraging private sector funding into early stage clean tech start-ups.	Ongoing - policy in effect	For many of the sectors and technologies we are reliant upon for meeting our carbon budgets, access to the right forms of public funding and co-investment will be critical. This is due to the sectors and technologies in question being too nascent to attract the deepest pools of private capital. Although the capital deployed by the Clean Growth Fund cannot be quantified into specific carbon savings, as the capital will be deployed across sectors and across time horizons, the scale and the reach of the capital available means we would expect the CGF's interventions could provide additional carbon savings.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
18	Investment	**Green Financing Framework**: published in June 2021, sets out six categories of green expenditure that are eligible to be financed under the programme (www.gov.uk/government/publications/uk-government-green-financing). A total of £16.3 billion has been raised by the sale of green gilts and retail green savings bonds for the financial year 2020-21. The Green Financing Programme will continue into the next financial year, with further issuances totalling £10 billion. These proceeds are held in HM Treasury's general account, and the equivalent amount will be allocated to fund environmental and climate-related expenditures as classified in the Framework.	Ongoing - policy in effect	The capital raised through the green gilt helps to fund multiple net zero programmes. As such, the associated carbon savings are already accounted for. The policy does however reduce the delivery risk of the programmes it helps to fund.
19	Investment	**Green finance education charter:** In 2019, we partnered with the Green Finance Institute and leading UK-based finance professional bodies to launch the first-ever Green Finance Education Charter which commits signatories to integrating green finance and sustainability into their core curricula, new qualifications and the continued professional development of members.	Ongoing - policy in effect	For our green finance policy framework to be effective, and as such for it to reduce overall delivery risk for our carbon budgets, we need the right skills and expertise to be available within our financial and professional services sector. This policy helps deliver that and therefore de-risks the delivery of carbon budgets.
20*	Domestic transport	**Promote use of higher biocontent low carbon fuels in compatible heavy-duty vehicles (HDVs)** as an interim measure to reduce emissions from internal combustion engine vehicles as the fleets transition to Zero Emission Vehicles	CB4	In 2021 the Zemo Partnership published a report which modelled potential emission savings from deploying higher biocontent transport fuels blends. The modelling suggested the potential to contribute up to 44-47 MtCO2e cumulative emission savings from 2020 to 2030. Higher biocontent fuels would help achieve further GHG savings from existing

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		(ZEV). Fuels could include B20, B30 and B100, where figures represent the fraction of biodiesel blended (i.e., B20 = up to 20% biodiesel blended).		internal combustion engine (ICE) HDVs, as the fleet transitions to zero emission vehicles.
21*	Domestic transport	Identify specific opportunities for transport decarbonisation in rural areas through **transport innovation in the upcoming Future of Transport: Rural Strategy.**	CB4	The strategy will enable local areas to identify potential solutions for decarbonising rural areas, as well as the risks of not planning for these changes. Alongside decarbonisation, a key aim for the strategy is improving transport for the user.
22*	Domestic Transport	Drive decarbonisation and transport improvements at a local level by **making quantifiable carbon reductions a fundamental part of local transport planning and funding.**	CB4	Updated Local Transport Plan (LTP) and Quantifiable Carbon Reductions (QCR) guidance will support local transport authorities to drive transport decarbonisation at the local level. This will enable a better understanding of the potential carbon impact of local transport interventions, which will support local authorities to deliver quantifiable carbon reductions and contribute to national decarbonisation.
23	Domestic transport	Allocating further funding to support the electrification of UK vehicles and their supply chains through the **Automotive Transformation Fund.**	CB4	Support the transition to zero emission vehicles and roll-out of supporting infrastructure.
24	Domestic transport	**Build a globally competitive zero emission vehicle supply chain** and ensure our automotive sector is at the forefront of the transition to net zero.	CB4	Support the transition to zero emission vehicles and roll-out of supporting infrastructure.
25	Domestic transport	**Ensure the UK's charging infrastructure network is reliable, accessible, and meets the demands of all motorists.**	CB4	Support the transition to zero emission vehicles and roll-out of supporting infrastructure. The UK now has over 37,000 electric vehicle charging points.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
26	Domestic transport	**Launch Local Electric Vehicle Infrastructure (LEVI) Fund** to support Local Authorities to deliver charging infrastructure for drivers without off street parking.	CB4	Support the transition to zero emission vehicles and roll-out of supporting infrastructure.
27	Domestic transport	**The Rapid Charging Fund** will support the upgrade of electricity capacity on the strategic road network, enabling the roll-out of ultra-rapid electric vehicle chargepoints.	CB4	Support the transition to zero emission vehicles and roll-out of supporting infrastructure.
28	Domestic transport	**Deliver the first All-Electric Bus Town or City.**	CB4	Supports bus, coach, and minibus decarbonisation.
29	Domestic transport	**UK Shipping Office for Reducing Emissions (UK SHORE)**	CB4	Supports the decarbonisation of domestic maritime across vessels and ports. UK SHORE will deliver £206m of R&D funding to accelerate the development of zero emission technologies. Demonstration projects will directly reduce emissions in both the short and long term.
30	Domestic transport	**Publish the Low Carbon Fuels Strategy** and further develop policy on potential SAF support for scaling up a UK SAF industry	Ongoing - policy in effect	These policy mechanisms support the effective use and deployment of low carbon fuels. This will deliver emissions savings, particularly in the transition period to zero emission vehicles.
31*	Domestic Transport	**Embed transport decarbonisation principles in spatial planning and across transport policy making.**	Ongoing - policy in effect	Increased spatial consideration of transport schemes will lead to more potential for walking, wheeling, cycling and public transport uptake, leading to additional carbon savings.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
32*	Domestic Transport	**Tees Valley Hydrogen Hub intervention**. Investment of up to £20m until March 2025 to establish the UK's first multi-modal hydrogen transport hub in Tees Valley.	CB4	The Tees Valley Hydrogen Transport Hub is delivering hydrogen vehicles and refuelling infrastructure which will lead to a direct reduction in carbon emissions in the Tees Valley in Carbon Budget 4 although the full quantification can only be completed once bids have been properly assessed. DfT will sign grant offer letters with winning projects from the competition, which will ensure continuing activity after March 2025.
33	Domestic Transport	**Support the development of commercial-scale Sustainable Aviation Fuels (SAF) plants** in the UK through the £165m Advanced Fuels Fund.	CB4 (funding runs to 2025)	Supports delivery of our commitment to SAF deployment, delivering significant emissions savings from aviation.
34*	Green Choices	**Launch the Commute Zero Programme.** Commute Zero will be a programme that works with leading companies and large employers to research, support and encourage long-term changes to employee travel habits and support the take-up of lower carbon commuting.	CB4	Carbon reductions could be achieved through a combination of encouraging sustainable transport modes, increases in vehicle occupancy, and uptake of zero emission vehicles.
35*	Green Choices	**Work with the Civil Aviation Authority to provide consumers with environmental information at the time of searching for and booking flights.**	CB4	This policy is aimed at individual consumer choices and therefore it is not possible to quantify its impact on emissions reductions. However, once implemented, additional emissions savings are expected from individuals and businesses making greener choices.
36	Green choices	**We are supporting motorists through Plug-In Vehicle Grants**, which provide support towards the upfront purchase of new zero emission vans, motorcycles, wheelchair accessible vehicles and trucks, which are eligible.	CB4	Support the transition to zero emission vehicles.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
37	Fuel Supply	**Downstream oil & gas:** Downstream, UK refineries already underpin major CCUS and hydrogen projects in key industrial clusters. We have also published the draft Downstream Oil Resilience Bill which will give the government the powers it needs to ensure secure fuel supplies are maintained during the transition to net zero.	Energy Bill expected to receive Royal Assent 2023	This policy is not designed to reduce carbon emissions itself, however it will support progress to reduce emissions by enabling CCUS and hydrogen projects which themselves will lead to carbon savings.
38	Fuel Supply	**Low Carbon Hydrogen Standard and Certification Scheme**: Set up a hydrogen certification scheme by 2025. We envisage the certification scheme will use the methodology set out in the Low Carbon Hydrogen Standard, which sets a maximum threshold for the amount of greenhouse gas emissions allowed in the production process for hydrogen to be considered 'low carbon hydrogen'. Certification scheme - this is a proposal to set up a hydrogen certification scheme by 2025, as committed to in the British Energy Security Strategy. We envisage the certification scheme will use the methodology set out in the Low Carbon Hydrogen Standard, which sets a maximum threshold for the amount of greenhouse gas emissions allowed in the production process for hydrogen to be considered 'low carbon hydrogen'.	CB4 Low Carbon Hydrogen Standard published in April 2022. Hydrogen Certification Scheme to be set up from 2025.	Creating a trusted, transparent certification scheme will help producers and consumers to demonstrate the environmental credentials of the hydrogen they create and use. It will also help to deliver carbon savings in end use sectors by boosting the growth of the low carbon hydrogen market and helping consumers choose low carbon hydrogen. Hydrogen production and certification alone will not generate carbon savings, but we expect it to enable carbon savings in several sectors including industry, power, transport and potentially buildings, by replacing high-carbon fuels used today.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
39	Fuel Supply	**Net Zero Hydrogen Fund:** The £240m Net Zero Hydrogen Fund (NZHF) aims to support the commercial deployment of new low carbon hydrogen production projects during the 2020s. The NZHF will provide capital grant co-funding to give projects a financial boost for construction to begin. It will also provide development support to stimulate a diverse pipeline of projects.	CB4 Net Zero Hydrogen Fund opened for applications in April 2022. Successful projects from the first funding window announced alongside Net Zero Growth Plan.	This funding will kickstart the production of low carbon hydrogen during the 2020s, which is crucial in displacing fossil fuels and meeting our ambitions for hydrogen production. It will also help to deliver carbon savings in end use sectors by boosting the growth of the low carbon hydrogen market. Hydrogen production alone will not generate carbon savings, but we expect it to enable carbon savings in several sectors including industry, power, transport and potentially buildings, by replacing high-carbon fuels used today.
40	Fuel Supply	**Hydrogen Production Business Model:** A government subsidy which provides revenue support to hydrogen producers to overcome the operating cost gap between low carbon hydrogen and high carbon counterfactual fuels.	CB4 We aim to award contracts for HAR1 (joint NZHF and HPBM support) in Q4 2023, with first projects operational in 2025 (subject to affordability and value for money).	The intervention will support the deployment of low carbon hydrogen projects that will support government's ambition of reaching up to 10GW of hydrogen production capacity by 2030, with at least half of this from electrolytic hydrogen. It will also help to deliver carbon savings in end use sectors by boosting the growth of the low carbon hydrogen market. Hydrogen production alone will not generate carbon savings, but we expect it to enable carbon savings in several sectors including industry, power, transport and potentially buildings, by replacing high-carbon fuels used today.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
41	Fuel Supply	**Industrial Decarbonisation and Hydrogen Revenue Support (IDHRS) scheme and Hydrogen Production Levy**: The Hydrogen Production Business Model (HPBM) will initially be taxpayer funded via the Industrial Decarbonisation and Revenue Support (IDHRS) scheme. Through the Energy Bill, we have introduced hydrogen spending powers and provisions for a hydrogen levy which is intended to fund revenue support payments made through the HPBM. Government will provide funding for successful projects from the first electrolytic hydrogen allocation round until the hydrogen levy is in place.	CB4 We aim to award contracts for HAR1 (joint NZHF and HPBM support) in Q4 2023, with first projects operational in 2025 (subject to affordability and value for money).	It is intended to give long term certainty to investors and projects and enable the first commercial scale deployment of low carbon hydrogen production. It will also help to deliver carbon savings in end use sectors by boosting the growth of the low carbon hydrogen market. Hydrogen production alone will not generate carbon savings, but we expect it to enable carbon savings in several sectors including industry, power, transport and potentially buildings, by replacing high-carbon fuels used today.
42	Fuel Supply	**Hydrogen Transport and Storage Business Models**: This is a proposal to design new business models for hydrogen transport and storage infrastructure by 2025. A consultation closed in November 2022 and a government response is expected in Q2 2023. Legislative measures will be crucial to delivering these new business models.	CB4 We aim to design new business models for hydrogen transport and storage infrastructure by 2025.	The business models will support hydrogen transport and storage infrastructure which is needed to enable our 10GW production capacity ambition and lead to potential carbon savings. It will also help to deliver carbon savings in end use sectors by boosting the growth of the low carbon hydrogen market. Hydrogen production alone will not generate carbon savings, but we expect it to enable carbon savings in several sectors including industry, power, transport and potentially buildings, by replacing high-carbon fuels used today.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
43	Fuel Supply	**Reducing Methane Leakage through the Distribution Network (Ofgem)** The Gas Distribution Networks have been given a financial incentive in the RIIO-2 price control to reduce leakage levels by means of lowering system pressures and improved gas conditioning levels. Reducing methane leakage means lower greenhouse gas emissions	Ongoing - policy is in effect	The Gas Distribution Networks have been given a financial incentive in the RIIO-2 price control to reduce leakage levels by means of lowering system pressures and improved gas conditioning levels. Reducing methane leakage means lower greenhouse gas emissions
44	Industry	**Climate Change Agreements (existing scheme):** The Climate Change Agreements scheme exists to ensure that the businesses, for whom energy makes up a larger proportion of their operating costs, are supported to make changes to their processes to increase their energy efficiency. Support through Climate Change Agreements is available to 2,600 eligible businesses in over 50 industrial sectors who meet negotiated energy efficiency or carbon reduction targets. The current scheme began in 2013 and will run until the 31 March 2025.	CB 4	Climate Change agreements support energy efficiency improvements and associated carbon savings for eligible industrial operators

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
45	Industry	**Climate Change Agreements (from 2025):** The government is extending the Climate Change Agreements (CCA) scheme by two years to cover 2025-26 and 2026-27 as announced in the March 2023 Budget. This will allow continued support to energy-intensive businesses across the UK in return for them meeting energy efficiency targets. The terms of the extended scheme are set out in a consultation document published by the Department for Energy Security and Net Zero, published alongside the Budget. The government is considering proposals for a potential future CCA scheme with potential targets from 2025 and the role it could play in supporting energy efficiency aims.	CB 4	Climate Change agreements support energy efficiency improvements and associated carbon savings for eligible industrial operators
46	Industry	**IETF Phase 3 Extension:** Phase 3 of the Industrial Energy Transformation Fund will launch in 2024, subject to business case approval. The additional £185m budget will support energy intensive industries across the UK to save energy and decarbonise whilst maintaining competitiveness.	CB 4	The Industrial Energy Transformation Fund (IETF) supports industrial sites with high energy use to transition to a low carbon future. The fund targets existing industrial processes, helping industry to cut energy bills by investing in more efficient technologies; and reduce emissions by bringing down the costs and risks associated with investing in deep decarbonisation technologies.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
47*	Industry	**International efforts to increase the transparency of embodied emissions and boost demand for low carbon products:** The UK championed a number of key initiatives in this area at COP26 and beyond. This includes the Clean Energy Ministerial's Industrial Deep Decarbonisation Initiative, which the UK co-leads with India. This focuses on aligning approaches to data measurement, standards and procurement, to ensure there is a coordinated approach to market creation across borders. We are also supporting the Net Zero Industry Mission, under Mission Innovation, which aims to foster deeper collaboration on industry decarbonisation.	CB 4	Work to support demand for low carbon products and carbon leakage mitigation starts with an internationally agreed methodology to monitor and report on the embodied emissions of products. This information allows us to enact policies based on data, including private and public procurement, product labelling, product standards and CBAMs. More broadly, mitigating carbon leakage risk is essential to enable domestic businesses to make investments required for decarbonisation and to reach net zero.
48	Industry	**Resource efficiency:** The approach in driving the transition to a more resource efficient economy is set out for England in the government's 2018 Resources and Waste Strategy, to be supplemented by a new Waste Prevention Programme, which outlines how we will maximise the value of our resources and minimise waste to increase the circularity of our economy. We will formalise joint working arrangements across government departments to promote collaboration on resource efficiency approaches, ensuring we are using all the policy tools available in working towards shared emissions and environmental targets.	CB 5	Delivering carbon savings through resource efficiency requires collaboration across multiple sectors and departments. This policy will help to unlock the savings attributed to quantified Industrial Resource Efficiency policies by enabling joint working across government.

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49	Industry	**Resource efficiency**: Government has supported the Green Construction Board to produce a Routemap to Zero Avoidable Waste, published in July 2021. We will continue to promote the adoption of resource efficient practices across the sector through close collaboration with the Green Construction Board, and wider industry engagement.	CB 5	This policy will help to unlock savings under the quantified Industrial Resource Efficiency package of policies, which includes carbon savings from resource efficiency in construction.
50*	Industry	**Demand-side measures/ Carbon Leakage mitigation measures**: Published a call for evidence on demand-side policy in Spring 2022, to investigate how we can define low carbon products and the emissions reporting that will be required to support those definitions. It also explored the design of demand-side policy levers, with a view to the potential introduction of voluntary standards and labelling as early as 2025, and regulatory standards being introduced in the late 2020s. In March 2023 the government published a consultation exploring a range of potential policy measures to mitigate carbon leakage risk in the future and ensure UK industry has the optimal policy environment to decarbonise. The eventual policy package could include a Carbon Border Adjustment Mechanism (CBAM), mandatory product standards and other demand-side policies to grow the market for low carbon industrial	CB 5	The aim of demand-side policies is to increase demand for low carbon products, supporting the business case for companies to decarbonise and helping to mitigate carbon leakage. This will enable industry to make the large investments required to decarbonise highly emitting industrial processes. The group of policies described would support significant carbon savings both domestically and internationally.

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		products, as well as emissions reporting that could support the implementation of these policies.		
51	Industry	**Resource efficiency**: We are supporting inter-disciplinary approaches and strengthening the evidence base on resource efficiency initiatives by collaborating with the UKRI funded National Interdisciplinary Circular Economy Research (NICER) programme. The Department for Energy Security and Net Zero and Defra are also conducting a research project to investigate resource efficiency opportunities across 11 sectors.	CB4	This policy will help to build the evidence base and enable effective decision making to unlock savings associated with the quantified Industrial Resource Efficiency package of policies.

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52	CCUS Programme	**Track 1 of the Cluster Sequencing Programme** The cluster sequencing process was established to identify and sequence carbon capture, usage and storage (CCUS) clusters, with Track-1 identifying clusters suitable for deployment in the mid-2020s. Following the announcement of HyNet and East Coast Cluster as Track-1 clusters, we invited applications for capture projects to connect to the clusters. We have announced the Track-1 Project Negotiations List alongside the Net Zero Growth Plan and Energy Security Plan and negotiations with those projects will now commence. We will also set out a process this year for the expanded deployment of projects in the T-1 clusters and their associated stores.	late CB4	The projects included on the Track-1 negotiating list could deliver emissions savings by capturing CO2 emissions and transporting that CO2 to permanent geological storage. The final realised emissions savings enabled by Track 1 of the Cluster Sequencing Programme will be subject to negotiations successfully concluding and projects demonstrating deliverability, affordability and value for money. We have also confirmed we will launch a process to expand the Track-1 clusters.
53	CCUS Programme	**Track 2 of the Cluster Sequencing Programme -** The cluster sequencing process was established to identify and sequence carbon capture, usage and storage (CCUS) clusters, with Track-2 seeking clusters suitable for deployment by 2030. We have launched further details alongside the Net Zero Growth Plan and Energy Security Plan.	late CB4	We will be launching Track-2 of the CCUS Programme to select two new transport and storage systems, and associated capture projects to deliver government's ambition of deploying CCUS in four clusters by 2030, with Track-2 clusters to be operational by 2030. Any projects delivered throughTrack-2 will enable emissions savings by capturing CO2 emissions and transporting that CO2 to permanent geological storage.
54	CCUS Programme	**CCUS Deployment Post-2030:** In response to the Independent Review of Net Zero, we have confirmed we will set out a vision on how the CCUS sector will support our net zero ambitions.	late CB4	Policies to support the delivery of CO2 capture projects and the delivery of further CO2 transport and storage infrastructure are essential for enabling the sectoral capture policies, across power, industry, low-C hydrogen production, waste, and GGRs.

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55	CCUS Programme	**Business Model for Transport and Storage (T&S) of CO2, including associated economic regulatory framework and legislation** to support the development of T&S networks for the deployment of CCUS clusters using a regulated asset base model. The economic licence and supporting network code will be overseen by an economic regulator, (OFGEM).	late CB4	The delivery of the CO2 transport and storage infrastructure is essential for enabling the sectoral capture policies, across power, industry, low-C hydrogen production, waste, and GGRs.
56	Engineered Removals	**Delivery of £100 million innovation funding** (a subset of the £1bn innovation funding set out in the innovation policy section)	CB4	The Innovation funding supports the development of GGR technologies to help them achieve commercialisation. This includes the Direct Air Capture and GGR Innovation Competition. Phase 2 of the competition was announced in July 2022, with over £54m of government funding awarded across 15 of the most promising demonstration projects. This will support our ambition of at least 5MtCO2/yr of engineered removals by 2030 (see quantified list).
57	Engineered Removals	**Respond to, and take action following, the call for evidence exploring the role of the UK ETS as a potential long-term market for GGRs.**	CB5	The call for evidence explored whether GGRs could be incentivised further if they were integrated into the UK Emissions Trading Scheme. Inclusion of engineered GGRs in the ETS could further support the growth and deployment of GGRs, which will be important in achieving our ambition to deploy at least 5MtCO2/yr of engineered removals by 2030.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
58	Engineered Removals	**Explore options for regulatory oversight to provide robust monitoring, reporting and verification (MRV) of GGRs**, following the recommendations of the BEIS-led MRV Task & Finish Group involving experts from industry and academia.	CB4	This policy supports carbon budget delivery by designing policy to address critical barriers to the deployment of engineered GGRs through the establishment of reliable MRV standards to underpin business model support and a future negative emissions markets. It plays a critical role in balancing residual emissions from the hardest to decarbonise sectors by setting out accounting and sustainability frameworks to ensure that GGR projects deliver verifiable, permanent and sustainable removals of CO2 from the atmosphere.
59	Buildings	**Phasing out of new and replacement gas boilers.** The government stated an ambition in the Heat & Buildings Strategy to phase out new and replacement gas boilers by 2035 at the latest.	CB6	The emission savings for the 2035 ambition are embedded within the quantified pathways.
60	Buildings	**Additional measures to support the Heat Networks Programme**: Heat Network enabling measures aim to ensure that future heat network policies are delivered at the pace and scale needed to meet our net zero targets. The programme ensures that policies are delivered in a programmatic and systematic way and encompasses a range of supporting activity which de-	CB4	Supports savings associated with the Heat Networks Transformation Programme

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		risks delivery. This includes the development of procurement models to leverage private sector investment, technical standards, developing skills and supply chain capacity.		
61	Buildings	**Boiler Upgrade Scheme - Extension**: The current Boiler Upgrade Scheme can be extended. This would be a part of a number of measures to reach the ambition for 600,000 heat pump installations p.a. by 2028.	CB4	Heat Pump uptake could be accelerated to deliver up to ~15Mt/year of emission savings2 (on average over CB6 period). This depends on wider commercial factors such as the cost of heat pumps (both their upfront costs and running costs). Any future government support would be dependent on future Spending Review outcomes.
62	Buildings	**Green Gas Levy:** The Green Gas Levy will raise the capital required to fund the Green Gas Support Scheme by placing a levy on all licensed fossil fuel gas suppliers.	CB4	The Green Gas Levy (GGL) applies to licensed fossil fuel gas suppliers in Great Britain from 30 November 2021, and funds the Green Gas Support Scheme (GGSS) (supporting associated savings).
63	Buildings	**Energy Technology List - Annual Review**: A government list of energy efficient products that meet the robust energy saving criteria. HMG annually reviews the technologies and products that qualify for inclusion. This can be found at https://www.gov.uk/guidance/energy-technology-list	CB4	The list functions as an easy-to-use procurement tool for energy managers, procurement professionals, facilities managers and a wide variety of other professions and organisations. The ETL gives the added reassurance to purchasers of measured and verified energy performance

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64	Buildings	**EPC Action Plan:** The EPC Action Plan, published in Summer 2020, is intended to improve the accuracy and reliability of EPCs, their usefulness to users, and to improve access to EPC data. The EPC Register was launched in September 2020 and has been redesigned to provide a more user-friendly experience to help people improve the energy performance of their homes.	CB4	Better reflecting the benefits of heat pump installation in buildings assessments could incentivise greater deployment of low carbon technologies. Making EPCs more robust could strengthen retrofitting of homes and the incentives for consumers to value low-carbon homes
65	Buildings	**Consumer Information & Advice (former Simple Energy Advice) - Enhancement:** A one-stop shop where you can connect your EPC to your home and get bespoke advice on energy efficiency. The next stage will be to connect that advice to the govermment-funded schemes such as the Home Upgrade Grant and ECO.	CB4	This service is an enabler and will support homeowners make information green choices. Actions to improve their home efficiency will lead to reductions in energy waste.
66	Buildings	**Trustmark & PAS 2035**: The Each Home Counts review, published in 2016 recommended the development of an overarching standards framework for end to end delivery of retrofit and the establishment of a government endorsed quality mark to ensure consumer protection and redress. HMG sponsors the PAS standards and they, with TrustMark registration, are key requirement for installers working in government funded decarbonisation schemes. We are working with TrustMark to encourage more installers to sign up to	CB4	TrustMark delivers consumer confidence through its expert network of Scheme Providers and their Registered Businesses when untertaking building retrofit work

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		the standards and/or TrustMark as appropriate.		
67	Buildings	**Home Retrofit Skills and Capacity Building**: Proposal supporting upskilling through the £9.2m Home Decarbonisation Skills Fund, which builds on £6m spent in 2020 and 2021, and will continue to work with the industry to remove barriers to growth, including the uptake of training. We are currently developing plans for a further £15m package of skills support that will launch in 2023	CB4	This proposal supports skills training and capacity building in the home retrofit supply chain, which needs to grow and upskill to meet our fuel poverty and net zero commitments
68*	Buildings	**Future Buildings Standard**: The Future Buildings Standard will produce extremely efficient non-domestic buildings which use low-carbon heat complemented by high fabric standards. Buildings built to the Future Buildings Standard will be zero carbon ready, meaning that no retrofit work will be necessary to ensure they have zero carbon emissions as the electricity grid continues to decarbonise. These changes will be delivered through amendments to the Building Regulations and publication of a new Approved	CB4	The Future Buildings Standard will produce extremely efficient non-domestic buildings which use low-carbon heat complemented by high fabric standards. Buildings built to the Future Buildings Standard will be zero carbon ready, meaning that no retrofit work will be necessary to ensure they have zero carbon emissions as the electricity grid continues to decarbonise.

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		Document (statutory guidance) subject to consultation.		
69	Buildings	**New Buildings:** We will consult on whether to end all new gas grid connections, or whether to remove the duty to connect from the Gas Distribution Networks.	CB4	Regulating on new connections to the Gas Grid would act as a backstop to the Future Homes Standards and the Future Buildings Standard to ensure our expected timetable for new builds to be built using low carbon heat from 2025 is met.
70	Buildings	**Public Sector:** We have initiated the Public Sector Low Carbon Skills Fund which provides complementary funding alongside the Public Sector Decarbonisation Scheme to enable public sector organisations to acquire expert skills in order to unlock decarbonisation projects.	CB4	As an enabler, the Low Carbon Skills Fund provides public sector organisations with the resources to draw together their heat decarbonisation plans. To realise the carbon savings identified in the heat decarbonisation plans, grant recipients are then required to identify funding for and sources of investment in the recommended carbon reduction measures .
71	Buildings	**Enablers:** We will enhance our gov.uk service to provide homeowners with personal, tailored advice for retrofitting their homes and links to local, accredited, trusted installers. We will launch regionally-led in-person pilots in 2023 and are expanding the telephone helpline will also support users.	Delivery over the next 3 years	This service is an enabler and will support homeowners make information green choices. Actions to improve their home efficiency will lead to reductions in energy waste.

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72*	Buildings	**Products standards:** Progress consultations on additional proposals to raise products standards between 2022 and 2023 ahead of implementing measures from 2025.	CB4	Current savings are based on proposals to raise minimum energy efficiency standards for a limited group of high priority products. Additional savings would be possible if we set stronger efficiency product standards than is currently planned and/or raised/introduced energy efficiency standards for additional products. Barriers to this would include cost and consumer/business impact of going beyond our current proposals.
73*	Buildings	**Additional owner occupier energy efficiency improvement.** This is an early-stage proposal to explore how to upgrade homes in the owner-occupied sector to ensure as many homes as possible meet EPC Band C by 2035 where cost-effective, practical and affordable. We are planning to consult by the end of this year on how to improve the energy efficiency of owner-occupied homes.	The consultation will explore implementation trajectories. Policy start and end date to be determined.	Further improvements to the energy performance of owner occupied homes would deliver additional carbon savings towards the carbon budgets.
74	Buildings	**The Heat Pump Investment Accelerator Competition (HPIAC**). The Accelerator will provide non-refundable grant funding of up to £30m towards building and fitting out new, or re-purposing existing, factories to manufacture heat pumps and/or components. The accelerator expects to support up to £270m in private sector investment, supporting the UK supply chain for heat pumps and components by supporting up to 270,000 heat pumps and components being manufactured in the UK (which is half the 2028 installation target). The accelerator could support up	Delivery over 2023 to 2026.	The competition is intended to support the delivery of CB5 and 6 through improving supply chain security of heat pumps, by increasing domestic manufacturing rather than relying upon importing heat pumps, which as global demand continues to increase, demand is outstripping supply.

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		to 3,000 low carbon jobs, either new or safeguarding those currently working in the UK fossil fuel boiler manufacturing sector.		
75	Buildings	**Incentivising low-carbon technologies:** The government has committed to setting out a clear approach to gas vs electricity price 'rebalancing' by the end of 2023/24. Rebalancing will generate the clear short-term price signal necessary to shift households and businesses to lower-carbon, more energy efficient technologies such as heat pumps.	CB 4	This policy is intended to support delivery from CB4 onwards by ensuring consumers are not penalised for making green choices through reducing running costs of low carbon heating, relative to fossil fuel alternatives.
76*	Agriculture and LULUCF	**Better health through disease reduction in pigs.** Endemic production-limiting disease is a major at on efficient livestock production and will have an impact on the carbon footprint of livestock farming. Improving health status would be expected to lead to reductions in emissions intensity. The Animal Health and Welfare Pathway aims to improve farm animal health and welfare across our national herds and flocks, including an in-development Porcine Reproductive	Subject to the results of further development, this proposal could produce carbon savings within the next 3 years.	Improving the health status of pigs would be expected to lead to reductions in the emissions intensity of pork production. This is emerging work and the potential emissions reductions are contingent on research. Defra is currently undertaking research to quantify the emissions savings associated with improved pig health but this has not been completed.

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		and Respiratory Syndrome virus control programme for pigs.		
77*	Agriculture and LULUCF	**Development of more sustainable protein sources for human diets.** Alternative proteins could offer environmental benefits. However, the sector is diverse and at different stages of readiness and investment, and so further research is needed to overcome technological barriers, increase understand consumer acceptance preferences and accomplish an optimal regulatory alignment that meets the needs of the sector and consumer safety.	Subject to future market development, and the results of further research and policy development, some technologies could produce carbon savings within the next 10 years. Other technologies face technical barriers that mean they will take longer than a decade to deliver savings.	Within a broad and varied market, some alternative proteins may offer environmental benefits through low emissions intensity associated with production. Emissions savings towards the carbon budgets could be delivered via a shift in the agricultural sector in response to market drivers. This is emerging work and the potential emissions reductions are contingent on research and market drivers.
78*	Agriculture and LULUCF	**Developing the evidence base on controlled environment agriculture (CEA) systems/vertical agriculture.** These systems make it possible to consistently and reliably control and/or manipulate the growing environment. This effectively controls crop nutrition and growth along with potential pathogens (pests and diseases) on the crop, and	This proposal could produce carbon savings within the next 10 - 20 years. In particular, the significant energy requirements of CEA systems will require an integrated	CEA/vertical farming could improve the energy efficiency of production (including reducing transport emissions). This could lead to reductions in the emissions intensity of the arable/horticulture sector. This is emerging work and the potential emissions reductions are contingent on research. These systems are likely to increase GHG emissions until renewable energy sources become more widely available. We continue to undertake research and monitor the evidence base in this area.

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		increases the potential to reduce transport/import emissions and improve yields.	approach to developing renewable energy supply for such projects.	
79*	Agriculture and LULUCF	**Methanisation, methane capture and combustion.** Additional mitigation intervention whereby the methane generated during storage of liquid manure is collected and burnt, converting it to carbon dioxide, a less potent GHG. There may also be potential to utilise heat or energy produced on combustion within the farm business.	Subject to the results of further research and policy development, this proposal could produce carbon savings within the next 10 – 20 years.	Methane, generated during storage of liquid manure, is collected and burnt. This converts the methane to carbon dioxide, a less potent greenhouse gas, which may deliver carbon savings. There may also be potential to utilise the heat and energy produced. This is emerging work and the potential emissions reductions are contingent on research. Although initial quantification has been attempted, significant uncertainty remains and further work is needed, and further work is needed.
80*	Agriculture and LULUCF	**Biorefinery as nutrient recovery**. We continue to support research and development in this area such as through the Farming Innovation Programme. The Programme funds industry-led research and development to drive innovation that will enhance the productivity and profitability of England's farming sectors, whilst enhancing the environment and reducing greenhouse gas emissions. It has already supported a range of projects, including ones which focus on biorefinery as nutrient recovery. For instance, the 'Bringing H2OPE to Agriculture' project looks at on-site	Subject to the results of further research and policy development, this proposal could produce carbon savings within the next 5 years.	Producing high-value products, such as livestock feed or fertilisers from waste could support a more circular economy in which emissions are avoided or reduced from feed or fertiliser production. This is emerging work and the potential emissions reductions are contingent on research. Although initial quantification has been attempted, significant uncertainty remains, and further work is needed.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		transformation of dairy cow slurry into valuable byproducts including fertiliser and growth substrate.		
81*	Agriculture and LULUCF	**Using insect protein as animal feed**. Feeding insect protein to animals has the potential to reduce overall global emissions from feed production (in comparison to conventional protein production e.g. soya grown overseas) and support a circular economy (e.g. if insects are raised on waste). There is ongoing research to determine the potential of these measures and the sector is at an early stage of development. This measure is unlikely to have significant UK GHG or land use impacts. It could, however, reduce supply chain emissions from feed supply occurring outside the scope of UK carbon budgets.	Subject to the results of further research and policy development, this proposal could produce carbon savings within the next 5 - 10 years. Whilst this may be an important technology to reduce emissions across the livestock supply chain, it may have limited impact on UK emissions. Further work is required to understand the impacts on UK territorial emissions within scope of the Climate Change Act versus wider international	Feeding insect protein to animals may reduce overall global emissions from feed production by displacing soya grown in deforested areas and support a more circular economy. Whilst this may be an important technology to reduce emissions across the livestock supply chain, it may have limited impacts on UK emissions. Further work is required to understand the impacts on UK territorial emissions within scope of the Climate Change Act versus wider international emissions reductions This is emerging work and the potential emissions reductions are contingent on research (including an assessment of any potential impacts on animal and public health).’

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
			emissions reductions.	
82*	Agriculture and LULUCF	**Policy roadmap for the safe use of timber in construction**. Increasing the safe use of timber in construction was a commitment in the England Trees Action Plan and the Net Zero Strategy, as it can support storing carbon safely, for example through using timber to build houses. This work will be taken forward in particular through the cross-government and industry timber in construction working group, which will design a policy roadmap identifying key actions for government and industry to safely increase timber use in construction.	Government is planning to publish a Timber in Construction Road Map by the end of 2023 which will lay out the next steps in more detail.	Harvesting timber to be stored in buildings and replanting the woodland creates a 'conveyor belt of carbon' from woodlands into storage in buildings. Increased demand for timber means higher timber prices and therefore more investment in woodland creation, which means we're more likely to meet our tree planting target. Higher timber prices drive increased management of existing woodlands. This makes woodlands more resilient to risks such as wildfire and disease and reduces the risk of reversals which cause emissions. More wood products going into structural use means that the carbon is stored over a longer time horizon than when used for e.g. MDF or pallets. Substitution of carbon-intensive materials such as cement, steel and brick for wood reduces emissions
83*	Agriculture and LULUCF	**Increase ambition for planting perennial energy crops and short rotation forestry.** This may be achieved either through: increasing land planted, or relaxing expected standards about stocking density or use of exotic species.	Subject to the results of further policy development, this proposal could produce carbon savings in Carbon Budget 6.	Increasing land planted with perennial energy crops and short rotation forestry, would ensure above- and below-ground carbon sequestered by fast-growing species.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
84*	Agriculture and LULUCF	**Paradigm shift in water management on lowland peatlands.** Major investment in water storage and water level management infrastructure is required to transform the management of water to rewet lowland peatlands. This would enable us to raise water levels safely in a controlled way to an appropriate depth that would lead to lower GHG emissions.	Long term (10+ years)	Rewetting by raising and maintaining higher water levels in peat soil reduces emissions and offers opportunities for continued productive agriculture and growing new crops suited to wetter soils, as well as supporting lowland peat restoration activities. This is because peat restoration is sensitive to water table depth, so managing this is integral to meeting our peatland targets. Further R&D needs to be completed before we can accurately quantify the carbon savings.
85*	Agriculture and LULUCF	**Regulatory approaches to activities on lowland peat soils**.Following the provision of necessary water management infrastructure, explore how we can go beyond our farming scheme incentives to achieve rewetting of lowland peat soils.	Long term (10+ years)	Peatland is privately owned and incentive schemes are demand led, therefore, rewetting peat soils will be the prerogative of landowners once the water infrastructure is in place. This measure would achieve greater rates of rewetting, reducing the GHG emissions.
86*	Agriculture and LULUCF	**Paludiculture.** Implementation of a roadmap towards commercially viable paludiculture. This includes building on the work of the Lowland Agricultural Task Force and delivery of the Paludiculture Exploration Fund (2022-2025), which comprises a community engagement project and a competitive grant scheme.	Long term (10+ years)	Raising and maintaining water levels just below the surface of peat soil, as required for paludiculture, reduces emissions and offers opportunities for continued productive agriculture and growing new crops suited to wetter soils.
87*	Agriculture and LULUCF	**R&D**: Improving peat emissions data. Ongoing Research & Development will improve the quantification of peat emissions data and removals.	Mid term (2-5 years) and ongoing	Improving the available evidence base on our peatlands will enable the baseline estimate of emissions from peat to be revised. Areas of improvement have been identified. It would also support government and industry to implement more effective policy and guidance, supporting reducing our emissions.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
88*	Agriculture and LULUCF	**Saltmarsh restoration and creation.** Explore the potential for carbon sequestration through the restoration and creation of saltmarsh habitats around the UK.	Subject to the Roadmap recommendations on inclusion in the UKGHGI this proposal could produce carbon savings in Carbon Budget 6.	Saltmarshes may contribute to climate change mitigation. While we are already working to protect and restore these habitats, we are not yet in a position to accurately quantify the extent of that contribution. There are significant data gaps surrounding emissions from coastal wetlands, activity data regarding extraction activities, and habitat extent. This information must be collected before a decision on inclusion in the GHGI can be made.
89*	Agriculture and LULUCF	**Seagrass restoration and creation.** Explore the potential for carbon sequestration through the restoration and creation of seagrass habitats around the UK.	Subject to the Roadmap recommendations on inclusion in the UKGHGI this proposal could produce carbon savings in the next 12-20 years.	Seagrass may contribute to climate change mitigation. While we are already working to protect and restore these habitats, there are significant uncertainties over the extent of that contribution. Work continues to improve the evidence base.
90*	Agriculture and LULUCF	**Explore the potential for carbon dioxide removal through the application of ground silicate rocks to land.**	Unknown Provided R&D results are positive and subject to further policy development this proposal could produce carbon savings in the next 10 to 20 years.	This is emerging work and contingent on research, but could provide additional support to meeting carbon budgets through providing a further mechanism for carbon dioxide removal from the atmosphere.
91*	Agriculture and LULUCF	**Explore the potential to deploy biochar for carbon sequestration through application to land.**	Provided R&D results are positive and subject to further policy development this proposal could produce carbon	This is emerging work and contingent on research, but could support carbon budgets through providing an additional mechanism for carbon dioxide removals from the atmosphere.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
			savings in the next 10-20 years.	
92*	Agriculture and LULUCF	**Explore the potential to cultivate microalgae to fix carbon dioxide into biomass.**	Provided R&D results are positive and subject to further policy development and inclusion in the UKGHGI this proposal could produce carbon savings in the next 15-20 years.	This is emerging work and is contingent on research, but could support carbon budgets through providing an additional mechanism for carbon dioxide removal.
93*	Agriculture and LULUCF	**Explore the potential to cultivate macroalgae (such as seaweed or kelp) to fix carbon dioxide into biomass.**	Provided R&D results are positive and subject to further policy development and inclusion in the UKGHGI this proposal could produce carbon savings the next 15-20 years.	This is emerging work and contingent on research, but could support carbon budgets through providing an additional mechanism for carbon dioxide removals from the atmosphere.
94	Agriculture and LULUCF	**Agriculture, Forestry and Other Land Use (AFOLU): Nature for Climate Fund.** We will boost the existing £640 million Nature for Climate Fund with a further £124 million of new money, ensuring total spend of more than £750 million by 2025	By the end of 2025	NCF supports delivery for both forestry and peat restoration.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		on peat restoration, woodland creation and management.		
95	Agriculture and LULUCF	**Rewetting lowland peat.** Rewetting lowland peat necessitates investment in (I) water storage capacity (e.g., reservoirs), and (ii) water level management capabilities (e.g., telemetry, mechanised pumps, Archimedes screws). This infrastructure would facilitate rewetting and address drought and flood risks. Design and cost of interventions will be context-specific, and will require close working with the EA, NE and water management authorities, e.g. around regulatory challenges. We are developing projects to facilitate a better understanding of the costs, barriers, and emissions impact of this work.	Long-term (10+ years)	Rewetting by raising and maintaining higher water levels in peat soil reduces emissions and offers opportunities for continued productive agriculture and growing new crops suited to wetter soil, as well as supporting lowland peat restoration activities. This is because peat restoration is sensitive to water table depth, so managing this is integral to meeting our peatland targets.
96	Waste and F-gases	**Product Labelling and company reporting**. Explore the use of product labelling to show the durability, repairability and recyclability of products, as well as their environmental footprint, with a view to stimulating demand for better quality items. We have committed to developing a mandatory methodology for the voluntary eco-labelling of food and drink products. This will be for participating companies to consistently follow, providing a common standard where eco-information is voluntarily used	Exploration has started and will be ongoing. We expect activity to increase.	Environmental labelling and eco-labelling can be used to indicate products and services with lower embodied carbon emissions, enabling more informed choices. Company reporting will incentivise companies to improve the environmental performance of their products and drive increased traceability in supply chains.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		should they choose to include such information on their products. Through the Food Data Transparency Partnership, Defra will also develop defined and consistent methodologies for the food and drink sector to consistently measure and report scope 3 GHG emissions.		
97	Agriculture and LULUCF	**Green Jobs and Skills**: New professional body for the farming industry. Between 2021 and 2027, Defra will gradually reduce and then stop untargeted Direct Payments. Farmers will instead receive public money for improving the environment, improving animal health and welfare and reducing carbon emissions. To achieve this, farmers will need new skillsets. The government is contributing towards the establishment of a new professional body for the farming industry; The Institute for Agriculture and Horticulture (TIAH). TIAH is aimed at removing the fragmentation that exists within current learning and skills landscape for farming businesses. TIAH will drive improvements in industry capability – which will cover the skillsets required to deliver future Environmental Land Management objectives; including water and air quality, soil husbandry,	TIAH is expected to formally launch in 2023 and its existence will then be ongoing.	This is in an industry initiative that won't directly deliver any additional carbon savings but will enable the delivery of agricultural transition policies that aim to deliver net zero.

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		woodland restoration and management, agroforestry and biodiversity. Alongside TIAH's work, we are also looking at the new skills and knowledge advisers may need to support farmers and land managers towards these goals. Action is already being taken by the sector. For example, the Chartered Institute for Ecology and Environmental Management (CIEEM) has developed a competency framework and BASIS has recently launched an environmental adviser training module and register.		
98	Agriculture and LULUCF	**Green Jobs and Skills: Forestry Training Fund.** To meet afforestation targets, the Forestry Training Fund launched in. February 2023 to provide practical training courses for new entrants and upskilling the existing workforce. With Forestry England, we are increasing the number of available apprenticeships including the launch of the Level 6 Professional Forester.	Started and ongoing.	The initiatives won't directly deliver any additional carbon savings but will enable the delivery of forestry policies that aim to deliver net zero, such as the afforestation targets

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
99	Agriculture and LULUCF	**Agriculture**: Consider the role of emissions targets to drive decarbonisation. Assess the role and efficacy of introducing agriculture specific emissions targets, such as targets split between individual greenhouse gases to drive decarbonisation across the agriculture and land use sectors.	We will consider whether an emissions target for agriculture would help to drive down emissions and will keep this under review.	Emissions targets, or targets split between individual greenhouse gases, could help us reduce emissions in the agricultural sector. This is an early-stage proposal and next steps have not yet been determined. The potential emissions reductions are contingent on further research.
100	Agriculture and LULUCF	**Develop the evidence on agroecological farming systems and the potential of regenerative systems.** We are seeing farmers undertake such practices and are monitoring efficacy across farming. Defra's evidence programme encompasses R&D on the productivity, sustainability and wider trade-offs of agroecological farming systems including extensive livestock systems, which will inform future development. Many of the pathway measures delivered through the Environmental Land Management schemes align with agroecological practices, for example introducing cover crop.	R&D is ongoing as part of a long-term programme of work developing evidence to feed into policy on an ongoing basis.	This is an early-stage proposal, with next steps yet to be determined. Agroecological farming systems may promote farming practices that reduce Greenhouse Gas (GHG) emissions, such as reducing Nitrogen application and introducing clover into pasture, supporting delivery of the pathway. Although regenerative measures are considered within the pathway and delivered through the Environmental Land Management Schemes, there is scope for additional emissions reductions from farming practices promoted under agroecological farming systems once they are better understood.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
101	Agriculture and LULUCF	**Increase the use of robust Monitoring, Reporting and Verification of GHG emissions (MRV).** We will explore policies to increase the use of MRV across farm businesses as a mechanism to support improved understanding and behaviour change for decarbonisation. This will build on the recent UK ETS consultation call for evidence chapter which explored the use and application of MRV for the agriculture sector and ongoing research projects to examine opportunities to better harmonise and improve the robustness of emission reporting across farm, food, and drink businesses. We will develop a harmonised approach for measuring carbon emissions from farms and by 2024 will set out how farmers will be supported to understand their emission sources through carbon audits and take further actions to decarbonise their businesses.	We will develop a harmonised approach for measuring carbon emissions from farms by 2024.	This is an enabling policy that could support the delivery of carbon savings within existing net zero agriculture measures by improving sector level understanding of the source and scale of emissions on farms, and empowering farmers to deliver existing measures in order to decarbonise. This is an early-stage proposal and next steps have not yet been determined. The potential emissions reductions are contingent on further research.
102	Agriculture and LULUCF	**Further incentives to encourage nutrient use efficiency.** Continue to monitor the effectiveness of current nutrient efficiency measures and market forces and consider development of policy levers to further enhance or strengthen delivery if needed e.g., through regulation.	We will continue to keep this enabler under review and implement if required.	This is an enabling policy which could support emissions reductions by encouraging a more efficient use of nutrients. This is an early-stage proposal and next steps have not yet been determined. The potential emissions reductions are contingent on further research.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
103	Agriculture and LULUCF; Waste and F-gases	**Explore the role of carbon pricing strategies and trading markets as a mechanism to drive decarbonisation.** We will continue to review potential carbon pricing strategies for the agriculture and land use and waste sectors, including the potential role for voluntary or compliance carbon markets to support cost effective decarbonisation in these sectors.	We will continue to review whether carbon pricing will support cost effective decarbonisation. In 2022, we consulted on proposals to expand and improve the UK ETS. Details of next steps will be published in the government Response.	This is an enabling policy that could support emissions reductions by encouraging uptake of net zero measures and practices. This is an early-stage proposal and next steps have not yet been determined. The potential emissions reductions are contingent on further research.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
104*	Waste and F-gases	**R&D to refine emissions estimates and explore further methane gas capture from landfill.** Landfill gas is collected and is used to generate electricity, oxidised through flaring or natural processes. Whilst current practices capture some landfill gas, there is room for improvement. Previous research has indicated that most methane is lost at operational sites through uncapped waste and around infrastructure, such as gas wells. Industry practise could reduce this leakage. There are also other smaller opportunities for improvements at closed but permitted sites.	This is ongoing early stage research at present, but with appropriate resource and progress we could expect activity in this area to increase and therefore, provided R&D results support the further development of this trajectory of travel, timeframes for carbon savings could be possible in the range 5-15 years.	This is emerging work and contingent on research but could support the more accurate measurement of landfill gas and enable exploration of opportunities to improve methane gas capture from landfill.
105	Waste and F-gases	**Waste water: Research and Investment**. Water company research and investment into reducing process emissions from wastewater treatment plants, e.g. anaerobic treatment, membrane activated biofilm reactors, alternative ammonia removal processes and nature-based solutions.	This is ongoing but we expect activity to increase.	Improving the available evidence base on process emissions will enable government and industry to implement more effective policy and guidance, supporting reducing our emissions.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
106*	Waste and F-gases	**Raising ambition through additional actions identified by the review of F-gas legislation.** We are undertaking a review of F-gas policy in 2023 and will identify action to deliver additional emissions savings which we will then take forward as appropriate.	Providing legislation is secured, savings could begin in 5-10 years	Subject to passing suitable primary legislation, measures identified through the review of F-gas policy are likely to allow us to deliver greater emissions savings, although the extent of these savings cannot at present be determined.
107	Green Jobs and Skills	**We have established an Expert Committee on Critical Minerals to advise government and have published an updated list of these minerals to guide investment decisions**. A Critical Minerals Intelligence Centre has also been launched that will provide robust, dynamic analysis on stocks and flows to guide our decision-making. The government has published a Critical Minerals Strategy on 22nd July 2022 setting out our approach to securing the technology-critical minerals and metals.	Ongoing - policy in effect	Increasing the resilience of global critical mineral supply chains supports the manufacturing of clean technologies globally. Securing the supplies of critical minerals can support the UK to play its part in manufacturing the technologies required for the NZ transition.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
108	Green Jobs and Skills	**The Green Jobs Delivery Group (GJDG) -** A cross-cutting delivery group to include representatives from industry, the skills sector and other key stakeholders to oversee the development and delivery of the government's plans for green jobs and skills. This group will drive action across the green skills agenda. We will set out further details on the membership and mandate of the cross-cutting delivery group later this year. We will continue to encourage industry to ensure there is equal opportunity for all to work in the green economy, building on our existing support for industry initiatives. Through the cross-cutting delivery group we will explore what actions can be taken across industry to improve diversity in the green economy, including improving data collection and transparency.	Policy in effect	The Green Jobs Delivery Group is supporting the delivery of policies which help to deliver net zero and reduces risks to delivering our Carbon Budgets. For example, it can accelerate or extend the savings achieved across its work plan.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
109	Green Jobs and Skills	**The Skills for Life campaigns** - raises awareness of education, training and skills options, including those that can lead to green careers, inspiring young people (14-19) and adults (primary audience is adults aged 25 to 44 years old, C2DE, secondary audience is working age population, C2DE, in England) to work in the green economy. This campaign supports Net Zero by promoting green careers in its images, content and case studies - along with other shortage and priority sectors.	2023	The user journey for people exploring, applying for and taking up skills offers is not linear and delivered across multiple partners. Government cannot track a customer journey from initial interaction with the campaign to take up of skills offers, completion and employment. We are exploring whether it is possible to track awareness and consideration of qualifications and jobs that would contribute to net zero although this is challenging due to the complexity of the 'green' sector and the numbers of jobs that could contribute to net zero. We are exploring how to gather demand-led data which could be fed into an assessment of campaign effectiveness. While this data will shed light on what is happening on the ground, we would not be able to directly link the campaign to any of this data due to the incomplete customer journey and the fact it is impossible to demonstrate the additionality of comms vs other interventions.
110	Green Jobs and Skills	**Delivery of Sustainability Strategy by Department of Education (published April 2022)**	2021 (to 2030)	The strategy will support meeting of carbon budgets in the following ways: 1. Enabling cross government net zero policy by providing a pipeline of learners prepared for the net zero economy. 2. Stimulating behaviour change in learners and thus the local communities via initiatives such as the Climate Action Award, Climate Action Plans and the National Education Nature Park. 3. Reducing the carbon emissions from the operations of the education system (36% of total public sector emissions).

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
111	Green Jobs and Skills	**Introduce a national education nature park and award scheme**	Moving into national rollout from September 2023	Enables children and young people to develop skills needed for their future studies and careers and to ensure that they factor in climate change and sustainability in their work going forward. By studying for the Climate Action Award, children and young people will be developing new skills needed in Net Zero industries.
112	Green Jobs and Skills	**Employer-led Local Skills Improvement Plans (LSIPs)** are bringing together employers and providers (e.g., further education colleges) to identify skills priorities. The Skills and Post-16 Education Act 2022 places LSIPs on a statutory footing and the Secretary of State for Education may only approve a LSIP if satisfied that the skills, capabilities, or expertise required in relation to jobs that contribute to or support Net Zero targets, adaptation to climate change and other environmental goals, have been considered in the development of the plans. We have now designated employer representative bodies (ERBs) to lead on the development of LSIPs in all 38 areas of England. The Strategic Development Fund (SDF) provides capital and programme funding to enable FE providers in an area to support changes in local facilities and provision so as to better meet the needs of employers, as set out in LSIPs.	LSIP Trailblazers took place during 2021-22 FY. National rollout of LSIP programme began September 2022 with LSIPs to be signed off by SoS by summer 2023. Once rolled out, policies are ongoing, with plans drawn up over 3 year cycles.	This will support more people to retrain, develop skills, grow an interest in and gain qualifications in jobs that are directly or indirectly linked to the NZ transition (e.g. Wind Turbine Maintenance, Electrical Install, bio science). This will help limit supply chain constraints thereby de-risking delivery of existing policies.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
113	Green Jobs and Skills	**Careers** - we will continue to build an integrated careers information, advice and guidance offer to raise awareness of different career pathways in low-carbon sectors	Ongoing - policy in effect	Awareness raising of opportunities in green jobs and skills through the provision of careers information, advice and guidance, supports uptake of new and growing opportunities within the green skills economy. By creating a more informed workforce in this area, it will help limit supply chain constraints thereby de-risking delivery of existing policies.
114	Green Jobs and Skills	**Further education teaching -** we have worked with employers to **develop a refreshed occupational standard for Further Education teaching** (included in the Level 5 Learning and Skills Teacher Apprenticeship), which came into effect in September 2021. This occupational standard will form the basis of future FE teaching qualifications, confirming that from 2024 all FE trainee teachers, not just apprentices, will embed and promote these issues across their teaching, in all subject areas. This means that future learners in FE will receive training relevant to new developing growth sectors. This will support future skills supply by ensuring that all new FE teachers have a good level of skill and understanding in relation to teaching on sustainability.	The revised Learning and Skills Teacher Apprenticeship Standard was made available for delivery in September 2021.	Future skills supply will be supported as all new FE teachers will have a good level of understanding of sustainability in relation to their technical and vocational subject. Future FE teachers will be able to ensure that sustainable knowledge and practices underpin their teaching and they will be well positioned to support emerging skills.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
115	Green Jobs and Skills	**Green Apprenticeships and Technical Education Advisory Panel** - The Institute for Apprenticeships and Technical Education (IfATE) has convened a Green Apprenticeships and Technical Education Advisory Panel (GATE-AP) to work with employers to align occupational standards to net zero and wider sustainability objectives.	CB4 Target to have greened all in scope occupational standards by March 2024. Processes are being updated to ensure environment and climate change Knowledge, Skills and Behaviouss are considered as business as usual.	By updating occupational standards to include environment and climate change , people undertaking apprenticeships and other technical education qualifications will be able to apply their learning to work in sectors which contribute to delivery of the carbon budget and help to make sectors which are les directly linked to carbon budgets function more sustainably.
116	Green Jobs and Skills	**Continue to roll out T levels which support green careers -** there are three Construction, and three Engineering, Manufacturing T Levels now in live delivery and Agriculture is in development for September 2023.	There are three Construction, and three Engineering and Manufacturing T Levels now in live delivery and Agriculture is in development for September 2023.	This policy will contribute to meeting the latest environmental and climate change skills needs. Increasing quantity and quality of green careers will help limit supply chain constraints thereby de-risking delivery of existing policies.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
117	Green Jobs and Skills	**Higher Technical Qualifications (HTQs) -** started rollout from September 2022. These are existing and new level 4/5 qualifications approved and quality marked by IfATE as aligning to the skills demanded in the workplace by employers, including for green occupations. Digital HTQs are available for teaching this academic year with additional occupational routes coming on stream up to 2025.	Cycle 2 of rollout which also covers Construction and Health & Science (in addition to Digital) will begin teaching in September 2023. Qualifications approved in cycle 3 will be available for teaching from September 2024, covering an additional 4 occupational routes (7 in total). Qualifications approved in cycle 4, will be available for teaching from September 2025, covering an additional 6 occupational routes (13 in total).	HTQs are important to meeting carbon budgets as roll-out up to 2025/26 will continue to broadly align with government priorities, supporting the development of level 4/5 skills aligned with the transition to net zero.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
118	Green Jobs and Skills	**Institutes of Technology -** the Network of 21 Institutes of Technology (IoTs) across England are working alongside industry leading employers to deliver higher level technical provision in key STEM subjects such as manufacturing and engineering, construction and digital. The extent to which each IoT delivers green skills provision as part of their curriculum is determined by the IoT itself and is dependent on the skills needs of employers in the area they serve.	Wave 1 IoTs are already in delivery, 7/9 wave 2 lots are expected to commence delivery from September 2023.	The provision delivered by IoTs links to employment in green jobs across a wide range of sectors, supporting the transition to net zero and the wider net zero system.
119	Green Jobs and Skills	**Skills Bootcamps** - providing free, flexible courses of up to 16 weeks for people to retrain and upskill at Levels 2-5 in skills supporting the green economy, including building retrofit, solar and wind, heat pump installation, forestry and arboriculture, electric vehicle maintenance and repair, and charge point installation.	The policy is ongoing, however its next iteration is under review.	Skills Bootcamps support Carbon Budget delivery through the provision of training, and employment, in green sectors and roles that support the reduction of emissions and the transition to net zero. Examples include upskilling workers into job roles that support greater energy efficiency in domestic and commercial buildings, and to work with green technologies that contribute to the lowering of carbon emissions.
120	Green Jobs and Skills	Through the NSF we are **funding an Emerging Skills Project in electrification and battery technology,** which commenced in June 2021. We are exploring options to develop the Emerging Skills Programme further, to stimulate the provision and demand for cutting-edge skills in key technologies and sectors such as green construction.	The policy is in current delivery (started April 2021) and has funding cover within the current SR period .	The policy supports green jobs across a wide range of sectors, supporting the transition to net zero and the wider net zero system.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
121	Green Jobs and Skills	**Free Courses for Jobs -** provides adults without an existing full level 3 the opportunity to gain one by studying one of over 400 high value qualifications. In addition, adults who meet the definition of being unemployed or the low wage criteria can also access these qualifications for free, regardless of their prior qualification level. Some qualifications are available to study online or part-time and those eligible may be able to get support to pay for childcare, travel, and other costs. Free Courses for Jobs includes various qualifications supportive of the green economy; a list was published in 2021 alongside the Green Jobs Taskforce report.	The policy is in current delivery (started 2021) and has funding cover within the current SR period.	Whilst FCFJs is not primarily a net zero focused delivery policy, it will support more people to retrain, develop skills and gain qualifications in jobs that are directly or indirectly linked to the NZ transition (e.g. Wind Turbine Maintenance, Electrical Installation).
122	Green Jobs and Skills	**STEM subjects** - we are encouraging more students into STEM subjects throughout primary and secondary education. To do this, we are funding several initiatives to support STEM teaching and uptake, such as support for teaching about climate change as part of the curriculum. We are encouraging a diverse range of students to take up STEM subjects through programmes such as Tomorrow's Engineers Code which showcase the diversity of roles and people that make up the STEM sector.	This policy covers a range of short, medium, and long-term interventions which feed into the National Science and Technology Council's aim of making the UK a 'science superpower' by 2030.	Increasing the uptake of STEM skills throughout primary and secondary education will impact the supply of skills relevant to green jobs in STEM sectors, indirectly supporting the transition to net zero and the wider net zero system.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
123	Green Jobs and Skills	The Department for Work & Pensions are considering **how government can work more closely with sectors in the future to support them in the green transition**, and we are identifying where we can adapt and enhance our support for people at risk of redundancy to support a transition to green jobs.	2018-2022	Improvements in DWP's ability to support people into green jobs will help to ensure recruitment demand in green industries is met as these sectors grow to help deliver the net zero transition. Providing support for workers in at-risk jobs to move into new roles will also mitigate against the risks of Carbon Budget delivery, as high emission sectors decline.
124	Green Jobs and Skills	**Defra are in the process of commissioning an R&D project to assess the size of the wider restoration sector** and the level of growth it needs to undergo in order to meet our restoration targets. This will include looking at green skills routes into the sector.	CB4	The jobs and skills initiatives will enable the delivery of peat restoration targets as part of the delivery of net zero.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
125*	Local NZ	**Local Net Zero Hubs Programme**: supports all areas of England to reach net zero by promoting best practice and supporting local authorities to develop net zero projects and attract commercial investment.	Ongoing - policy in effect	Local authorities play an essential role in driving and accelerating action to tackle climate change with significant influence in energy, housing, and transport. Local authorities are directly responsible for only 2-5% of local emissions through their own estates and operations, but they have potential to influence up to around 80% of all UK emissions. Local authorities can also attract private sector net zero investment that wouldn't otherwise be obtained, supporting local supply chains with new and upskilled local jobs. Local authorities can therefore play a key role in supporting the delivery of our national net zero targets across a number of sectors. The Local Net Zero Hubs Programme supports all areas of England with their capacity and capability to reach net zero by supporting local authorities to develop net zero projects and attract commercial investment to accelerate net zero delivery.
126	International	The UK has responded to the Glasgow Climate Pact by **revisiting its 2030 Nationally Determined Contribution (NDC) and strengthening it with information on delivery** of our target to reduce all greenhouse gas emissions by at least 68% by 2030 on 1990 levels.	Present - 2030	The 2030 NDC is more ambitious than Carbon Budget 5 and in response to the Glasgow Climate Pact, was strengthened by making the following updates: • clarified how the target aligns with the Paris Agreement temperature goal; • explained more fully how the UK will deliver the NDC by 2030; • updated on the progress made in expanding the territorial scope of the NDC to include the UK's Crown Dependencies and Overseas Territories; and • included more detail on the UK's approach to levelling up, gender, green skills, public engagement, Just Transition and how the UK is supporting other countries with delivery of their NDCs.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
127	International	Build on our G7 and COP26 Presidencies and COP campaigns to **strengthen collaboration in key sectors**. Utilise bilateral relationships (and extensive climate attaché network) and multilateral fora to **develop strategic partnerships on climate action**, including through G20.	This is an ongoing commitment with much of the work driven by regular multilateral and bilateral governance (eg annual COPs underpinned by intercessionals throughout the year). The effects of this work will last indefinitely but we are focusing particularly on driving action this decade to keep 1.5 degrees within reach	Promoting greater international ambition and coordination across climate and energy policy supports our Net Zero Strategy by addressing multiple issues and making decarbonisation faster and cheaper for all, offering opportunities for growth and trade. As the impacts of UK action on international decarbonisation are not possible to quantify, it is not possible to quantify the potential impact o UK emissions.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
128	International	**Published a refreshed Export Strategy** to outline how we are advocating for extended export support to green energy initiatives and more green innovation in the export market for the period 2021-2024. In the first year of the strategic period, UK Export Finance (UKEF) has: introduced variants of its existing products which offer low carbon exporters access to increased lending capacity, with extended repayment terms; estimated its financed emissions across its full portfolio and set ambitious 2030 decarbonisation targets for the oil and gas, and power sectors, which will guide UKEF on it pathway to net zero by 2050; and continued to demonstrate international leadership on climate change, such as by supporting peers in their implementation of the COP26 statement to end public support for the fossil fuel energy sector overseas (the government's fossil fuel policy), and by becoming the first export credit agency in the world to offer Climate Resilient Debt Clauses (CRDCs) in its direct sovereign lending.	2021 - 2024	UKEF support can unlock finance for green exports and investment. This supports HMG's net zero by 2050 ambitions, by growing industrial capacity in new technologies, and the Export Strategy ambition to increase exports to £1 trillion by 2030.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
129	International	**Champion UK priorities for integrated international climate and nature action** over the coming decade in a cross-governmental strategic framework (anticipated Q1 2023).	Present - 2030	The Strategic Framework for International Climate and Nature Action sets out how government will continue to drive forward ambitious international climate and nature action to 2030. It brings together existing government international policy on climate and nature for the first time. As this is an internationally focused framework the main impacts are expected to be on emissions in other countries. However, supporting faster international action - for instance in innovation, research and deployment - could potentially have positive spill overs globally and in the UK e.g. helping to reduce costs and speed up low carbon deployment.
130	International	The UK will seek to **increase and facilitate trade in green goods and services through our trade policy**, **our pipeline of free trade agreements (FTAs) and our seat at the World Trade Organization (WTO).** We will seek to reaffirm our commitment to the Paris Agreement in all UK trade agreements, and will ensure that they preserve our regulatory autonomy to pursue our climate targets. We will use our multilateral fora to galvanise international partners to adopt climate-ambitious trade policy, and to promote global trade rules that are aligned to net zero and the Paris Agreement.	Ongoing - policy in effect	Trade can help support the growth of the global market for priority sectors identified in the Net Zero Strategy - zero emission vehicles and renewables are particularly trade-exposed sectors with global supply chains. While the UK enjoys regulatory sovereignty, agreeing clarificatory text under FTAs offers some additional protections for measures required to meet net zero targets, in the event of a trade dispute. Trade is an important enabler across priority net zero sectors. Changing trade patterns will also play an important role in reducing deforestation and preventing carbon leakage.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
131	International	**Publication of the UK International Climate Finance Strategy** brings together the collective ambitions for ICF of DESNZ, FCDO and DEFRA, and reaffirms our international commitment to double ICF spend on 2019 levels, to £11.6bn in the period from 2021/22 to 2025/26. The strategy also shows how we are delivering on the ICF sub-targets which we have announced publicly, on nature adaptation, and innovation.	FY21/22-25/26 - Strategy speaks to how it contributes to 2030 UK objectives and 2030 UN Sustainable Development Goals	This investment will support low and lower-middle income countries to increase their level of ambition in their NDCs, including by investing more in the protection and restoration of critical ecosystems, such as forests, peatland and marine habitats which are major carbon sinks. A more ambitious global effort could reduce the cost of certain low carbon technologies more quickly, catalysing and de-risking our own transition.
132	International	Following the adoption of the Just Transition Declaration at COP26, the UK will focus on the **implementation of this framework** to support developing countries and emerging economies to accelerate climate ambition and enable a global green recovery	International declaration that has taken effect indefinitely. We intend to include information on Just Transition efforts, where relevant, in our national Biennial Transparency Reports in the context of reporting on our policies and measures to achieve our Nationally Determined Contributions	Just Energy transitions supports the greening of the economy in a way that is fair and inclusive.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
133	International	**Commitment to monitoring the impacts of our climate and clean energy policies** to assess the need for targeted support for disproportionately impacted groups. This will include working to advance gender equality and diversity in the clean energy sector, for example through our commitments under the 'Equal by 30' Campaign to work towards equal pay, equal leadership and equal opportunities for women in the clean energy sector by 2030.	By 2030	A gender diverse energy sector is vital for driving energy transition
134	International	We will **support increased climate finance flows to developing and emerging markets to finance the transition to net zero**, this includes delivering on our commitment to provide £11.6 billion International Climate Finance. As part of this HMG is increasing investment to £3 billion in nature-based climate solutions which offer co-benefits for biodiversity and so support delivery of the Global Biodiversity Framework.	Total ICF spend of 11.6Bn is committed to the period 2021/22-2025/26. DESNZ has approx 20% share of this budget.	This investment will support low and lower-middle income countries to increase their level of ambition in their NDCs, including by investing more in the protection and restoration of critical ecosystems, such as forests, peatland and marine habitats which are major carbon sinks. A more ambitious global effort could reduce the cost of certain low carbon technologies more quickly, catalysing and de-risking our own transition.
135*	International	Following ICAO's adoption of Net Zero by 2050 as its long-term aspirational goal, continue to **use UK influence through the forum to push for the strengthening of existing measures** such as CORSIA and agree further measures, such as a global target for sustainable aviation fuels.	2022	This policy would support reductions to UK aviation emissions (both domestic and international), e.g., through increased use of SAF. It cannot be quantified at present as it is not known what can be achieved through international agreements, but further developments are likely.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
136	Embedding	**Lay legislation on 'Improving Consumer Experience of Public Charging'**	CB4	Support the transition to zero emission vehicles and roll-out of supporting infrastructure.
137	Embedding	We have **established the Domestic Economic Affairs (Energy, Climate and Net Zero) Cabinet Committee** - DEA(ECNZ) which places net zero and climate more broadly at the heart of government decision-making.	CB4	The Cabinet Committee sits at the apex of internal government governance structures. As such it indirectly supports all quantified policies - it does this through progress monitoring, direction setting and decision-making.
138	Embedding	**Revision to HMT Green Book Guidance**, including on transformational change and upcoming changes to carbon valuation in policy appraisal.	CB4	This policy supports the delivery of Carbon Budgets by giving policy officials the tools to fully consider and appraise climate change and emissions when creating policy. Proper appraisal and evaluation of emissions will ensure ministers have high quality advice on costs and benefits when deciding between policy options, increasing the quality of decision making and - ultimately - policy outcomes for the UK.
139	Embedding	HMT **set requirements at Spending Review 2021 for major bids to be assessed according to their climate and environmental impact**, and has published data on the environmental impacts of SR21**.** HMT continues to improve this methodology and to work with departments to build capacity and capability. HMT also now requires all measures at budgets to have climate impact assessments.	CB4	This policy supports the delivery of Carbon Budgets by ensuring that the climate impacts of spending bids are considered as part of the Spending Review process led by HMT. This ensures that net zero is embedded into fiscal decision-making processes.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
140	Embedding	**Greening Government Commitments** to reduce emissions from the estates and operations of central government and their partner organisations	The current set of GGC targets cover the period 2021-25, and so fall into CB3 (2018-2022) and CB4 (2023-2027)	This policy provides government departments and their partner organisations with targets to reduce their emissions. This will help these organisations to decarbonise and ultimately helping to meet Carbon Budgets.
141	Embedding	**National Procurement Policy Statement** sets out clear principles that contracting authorities should be following organisationally, with net zero being one of the key considerations.	CB4	This policy encourages the consideration of net zero in public procurement, aiming to ensure that contracting authorities factor in net zero as they undertake procurement activities. This policy ensures net zero is embedded into the wider public procurement ecosystem, working in tandem with other policies to leverage public procurement spending in support of net zero.
142	Embedding	**Carbon Exclusion Measure Procurement Policy Note** requires suppliers bidding for major government contracts (>£5m) to commit to net zero and publish a 'Carbon Reduction Plan'.	CB4	This policy ensures that suppliers bidding for major government contracts commit to net zero and publish a carbon reduction strategy. This helps to ensure that the government is procuring with suppliers committed to net zero.
143	Embedding	**Environmental principles policy statement**: impact on net zero. The Environment Act 2021 makes sure that environmental considerations are at the heart of government policy making, by creating a legal duty on Ministers of the Crown to have due regard to the environmental principles policy statement when making policy. The five internationally recognised principles are: integration, prevention, rectification at source, polluter pays, and the precautionary principle. The policy statement is designed to set out how the principles should be interpreted and proportionately applied. The final	The final Environmental Principles Policy Statement was laid before Parliament on 31 January 2023. The duty to give due regard to the statement will commence on 01 Nov 2023.	The Environment Act 2021 places a legal duty on Ministers of the Crown to have 'due regard' to the environmental principles policy statement (EPPS) when making policy. We published the final EPPS in Jan 2023. The EPPS explains how Ministers of the Crown should interpret and proportionately apply the five environmental principles when making new or revised policy. Its publication will help to further embed net zero (as it is a core component of the overall EPPS framework) into government policymaking. It will come into force on 1 November 2023. This will help support the transition to net zero and delivery of Carbon Budgets.

No.	Sector	Policy name and description	Timescale from which the policy takes effect	How the policy supports delivery/ meeting of carbon budgets
		environmental principles policy statement was published on 31 Jan 2023. Following an implementation period, the duty will come into force on 01 Nov 2023.		

Appendix C: Deployment assumptions underpinning quantified savings

The table below shows real-world deployment assumptions for each sector, based on the emissions profile of proposals and policies in this report. Ranges indicate where values differ between the electrification and hydrogen pathways set out for the heat and buildings sector. In some cases, these assumptions represent early-stage assessments based on maximum technical potential. Given ongoing uncertainties, the policy mix that will meet carbon budgets, and related deployment assumptions, are subject to change; these are illustrative and should not be interpreted as government targets.

Table 7

Sector	Deployment assumption	Unit	2021	2025	2030	2035
Power	Electricity generation	TWh	307	315	370	460* - 495
	Low carbon GB generation as a percentage of total projected generation required in 2035	%	34% - 38%*	37% - 41%*	67% - 71%*	99%
Industry	Low carbon fuels [a] consumption as a percentage of final energy consumption in industry**	%	40%	40%	50%	60%
	Resource and energy efficiency savings	$MtCO_2e$	See policy savings tables for resource and energy efficiency policy savings			
	Industry demand for Industrial CCUS (including BECCS)	$MtCO_2e$	0	0	6	10

Fuel Supply	Low carbon hydrogen production	TWh	0	10***	55 - 65	80 - 140*
	Electrical power demand from offshore oil and gas installations as a percentage of their total power demand	%	0%	0%	25%	29%
Heat & Buildings	Cumulative heat pumps installed domestically	Million installations	0.3	0.9	3.6* - 3.8	7.1* - 11.5
	Cumulative homes converted to 100% hydrogen for heat	Million homes	0	0	0 - 0.2*	0 - 4.0*
	Yearly homes treated by new domestic energy efficiency measures	Million homes	0.2	1.5	0.4	0
	Low carbon fuels [a] consumption as a percentage of total fuel consumption in commercial buildings (excluding heat networks)	%	59%	61%	65%	73%
	Yearly heat supplied via heat networks	TWh	15	17	27	35
	Yearly biomethane injected into the grid	TWh	4	7	12	13
Agriculture & LULUCF	Yearly area of peatland under restoration in England	Ha	1,600	14,000	14,000	7,000
	Yearly area of afforestation in the UK	Ha	13,300	7,500	8,900	10,300
	Yearly additional area of perennial energy crop and short rotation forestry planted	Ha	0	0	9,600****	15,000****

	Farmers engaging with low carbon farming practices as a percentage of total farmers	%	56%	70%	75%	85%
Waste & F-gases	Level of HFC consumption relative to a 2015 baseline level (percentage of bulk gas use only in 2015 use)	%	45%	31%	21%	21%
Removals	BECCS and DACCS	$MtCO_2e$	0	0	5.6	22.9
Domestic transport	ZEVs as a percentage of total car fleet	%	0.9%	7%	25%	52%
	ZEVs as a percentage of total van fleet	%	0.5%	3%	16%	43%
	ZEVs as a percentage of total HGV fleet	%	0.1%	0.4%	9%	37%
	ZEVs as a percentage of total bus and coach fleet	%	0.8%	14%	35%	61%
	Low carbon fuels [a] used in road transport as a percentage of total fuel use (in litres)	%	6%	9%	10%	11%
	Proportion of short journeys (less than 5 miles) in towns and cities that are walked or cycled	%	45%	46%	50%	55%
	SAF use in domestic aviation as a percentage of total fuel use (in tonnes)	%	0%	4%	10%	15%
	Low carbon fuels [a] use in domestic shipping as a percentage of total fuel use (in TWh)	%	0%	0%	1%	42%
IAS	SAF use in international aviation as a percentage of total fuel use (in tonnes)	%	0%	4%	10%	15%

	Low carbon fuels use [a] in international shipping as a percentage of total fuel use (in TWh)	%	0%	0%	1%	28%
Overall	GDP carbon intensity	tCO_2e/ GDP£m2021	184	140	93	64
	GDP energy intensity	MWh/ GDP£m2021	670	630	540 - 550*	450 - 470*

*Reflects demand in the high hydrogen pathway.

**This metric has been changed from "Low carbon fuel switching" published in the Net Zero Strategy due to methodological issues. Figures for low carbon fuel switching, including BECCS, are 122TWh for 2021, 115TWh for 2025, 120TWh for 2030, and 160TWh for 2035.

***Figure reflects hydrogen production in the mid-2020s (rather than 2025 specifically).

****Energy crop and short rotation forestry area figures are indicative and may vary, for example, based on precise mix of crop varieties.

[a] The table includes several deployment assumptions covering relevant low carbon fuels in different sectors. The low-carbon fuels included are the following: electricity, biofuels, solid biomass, hydrogen, ammonia and methanol. All of these deployment assumptions include electricity and hydrogen both in the numerator and denominator, with the exception of low-carbon fuels used in road transport (from which electricity and hydrogen are completely excluded).

The metric ‘Single track kilometres electrified per year’ has been removed while we develop an appropriate metric to reflect the policy on rail electrification.

Appendix D: Sectoral summaries of delivery confidence

1. Delivery confidence for all proposals and policies- but particularly those delivering in later carbon budget periods- will be impacted by technological developments, societal changes and future spending arrangements. Below we set out further detail for each sector.

Power

Introduction

2. Delivering deep decarbonisation of power is key both to delivering sector carbon savings and unlocking the path to net zero across transport, industry, and heating buildings. Meeting growing demand while achieving the goal of decarbonising the power system by 2035 subject to security of supply needs substantial expansion of renewable low carbon generation. This will require appropriate planning arrangements, expansion of electricity networks and grid connections, strong supply chains, deploying sufficient flexible capacity capable of replicating the role of unabated gas on the electricity system and the delivery of new nuclear capacity. We must catalyse private investment in low carbon infrastructure to deliver the level, pace and scale of ambitions. Given the scale and pace at which the power sector will need to deliver generating infrastructure, to meet demand, and the risks to delivery and deployment, power must retain optionality on which generating technologies deploy to deliver lower cost solutions.

3. The Energy White Paper, Net Zero Strategy, British Energy Security Strategy, and the Energy Security Plan set out our strategy for decarbonising the power sector, including how we are developing and delivering a portfolio approach to mitigate the delivery risk of any individual project or technology.

Risks and mitigation

4. An efficient planning system for nationally significant infrastructure is essential for the deployment of large scale low carbon electricity generation technologies like offshore wind, nuclear power and power-CCUS at the pace and scale we need to meet Carbon Budget 6. The government is undertaking several actions to review planning and consents, such as the Action Plan for reform published in February, making the system faster, fairer and more effective, as well as changes to Permitted Development Rights to simplify obtaining planning consent

for solar installations. The government has also issued a Call for Evidence on Land Rights and Consenting for electricity networks. The government is also updating the National Policy Statements to ensure that we have a planning policy framework to support infrastructure required for net zero and has set up taskforces to support the development and deployment of infrastructure.

5. The electricity network will need to be expanded so that the new generating capacity can connect to the grid. The electricity network will need to be able to manage an additional capacity required on the electricity system for Carbon Budget 6. We are developing proposals and policies to meet this onshore and offshore, including delivering the Electricity Networks Strategic Framework, focused on how government and Ofgem would enable the transformation of the network at the scale and pace required; and delivering the Centralised Strategic Network Plan with Ofgem and National Grid ESO; and Holistic Network Design with National Grid ESO.

6. Nuclear capacity is a key technology in the decarbonisation of the power sector, and faces legislative, planning, policy and financing challenges. We manage this by planning on taking one project to FID this Parliament and two projects in the next Parliament, legislating in 2022 for the Regulated Asset Base, setting up Great British Nuclear and taking forward Sizewell C. Further action to mitigate risk includes work on a nuclear siting consultation as a first step towards a new National Policy Statement for nuclear; implementing the Action Plan published last month for reforming the planning process for all nationally significant infrastructure; and exploring the potential for streamlining the planning process further. In addition, the government has launched Great British Nuclear (GBN) which will be funded to lead delivery of our programme of new nuclear projects. The first priority for GBN is to launch a competitive process to select the best small modular reactors (SMR) technologies. We will also be exploring the research and development of advanced modular reactors (AMRs) and fusion.

7. Currently the UK relies heavily on unabated gas to provide flexibility in the electricity system. Reducing emissions in the power sector will also depend on bringing forward flexible technologies that are capable of replicating the role of unabated gas in the electricity system. These include technologies such as power CCUS, hydrogen to power, and energy storage. To boost confidence and funding clarity for CCUS we are taking forward Track 1 negotiations including one power CCUS project; setting out plans for Track 2 and expansion of Track 1 clusters; and setting out a longer-term vision to give investors, industry and regulators clarity on our 2030s approach. For hydrogen to power we intend to consult on the need and potential design options for market intervention and we will develop appropriate policy to enable investment in large scale long duration storage by 2024. We are also taking forward actions set out in the Smart Systems and Flexibility Plan. This includes legislating for enabling powers in the Energy Security Bill and consulting on proposals for a Secure and Smart Electricity System.

8. Power BECCS is a technology that can deliver both low carbon generation to support the decarbonisation of the power sector, as well as negative emissions. To support the deployment of power BECCS the government is developing

Power BECCS business models to incentivise negative emissions and power generation.

Industry

Introduction

9. Industry is a major source of CO2 emissions. Industrial sectors in 2021 produced 18% (76 Mt CO2e) of UK emissions, with just over half of these emissions concentrated in specific ‘clusters’ – geographical areas with large concentrations of industry. We set out a plan to decarbonise industry in the Industrial Decarbonisation Strategy (2021) and in the Net Zero Strategy.

Risks and mitigation

10. Our ambitions are stretching to achieve. To de-risk delivery we are looking at what could be delivered with further government action on resource and energy efficiency, fuel switching and CCUS. We increased our ambition in the Net Zero Strategy to capture and store industrial emissions (from 3 MtCO2 per year to 6 MtCO2 by 2030, and to 9 MtCO2 per year by 2035); are now committed to delivering more fuel switching to low carbon alternatives, with our initial ambition to replace around 20 TWh of fossil fuels per year by 2030 – potentially increasing to 50 TWh per year by 2035; and decarbonising the iron and steel sector in the 2020s and early 2030s. We are also developing proposals for industry through the Energy Efficiency Taskforce, as part of the 15% reduction in energy use target, which will increase delivery confidence for industrial energy efficiency and resource efficiency.

11. A lot of our efforts are focused on major industrial clusters, which account for just over half of total industry emissions, and less on support for remaining emissions in more ‘dispersed’ industrial sites. To address this, we have launched the Local Industrial Decarbonisation Plan (LIDP) to allow industries outside industrial clusters to develop strategic plans to decarbonise. Plans will be reviewed to ensure they continue to present value for money and are delivering on the carbon savings expected.

12. Many industries continue to highlight carbon leakage as a risk preventing investment. We are addressing this by ensuring there is a clear plan for carbon leakage mitigation that gives industry confidence to invest ahead of upcoming changes to the ETS cap.

13. The delivery of the industrial decarbonisation pathway is heavily reliant on new and emerging technologies, alongside significant investment. This is a long-term package that will be adapted as our understanding of the technical and economic potential for industrial decarbonisation continues to develop.

Fuel supply

Hydrogen production

14. We have an ambition to have up to 10GW low carbon hydrogen production capacity by 2030, subject to affordability and value for money, with at least half of that coming from electrolysis. Growing the sector from an extremely low starting point naturally entails challenges in either high hydrogen or high electrification scenarios.

15. Hydrogen production alone will not generate emissions savings, but we expect it to enable emissions savings in several sectors including industry, power, transport and potentially buildings by replacing high-carbon fuels used today.

16. Policies intended to meet this stretching 2030 ambition and contribute towards CB6 carry delivery risks, some of which are inevitable given pace and scale of deployment. We have higher certainty in the delivery and funding of some policies in the near term, having launched the Net Zero Hydrogen Fund, Hydrogen Production Business Model, and the Low Carbon Hydrogen Standard. Confidence should grow as government and industry action provides clarity on long term funding, production, and legislating for Transport and Storage business models by 2025.

17. Up to 50% of the 2030 hydrogen production ambition depends on Carbon Capture Use and Storage (CCUS), which carries delivery risks which could materially affect the successful delivery of the associated carbon savings for 2030. Progress on Track 1, Track 1 Expansion and Track 2 plans provide significant mitigation for these risks.

Oil & Gas

18. The oil and gas sector continues to make good progress in decarbonising in line with North Sea Transition Deal (NSTD) for upstream; and steady progress on the midstream gas approach. NSTD projects are primarily focused on offshore infrastructure electrification, and cessation of routine flaring and venting, which require industry action and new approaches so entail delivery risks.

19. Factors driving the delivery risks include the high cost of infrastructure change, regulatory complexity, bottlenecks in network capacity and scheduling and a challenging investment climate. These could affect the speed at which we electrify and decarbonise. We do not assume that all platforms will electrify.

20. Government continues to work with the industry and regulators to help mitigate these risks, including by responding to questions regarding the regulatory environment and encouraging investment in infrastructure.

21. The oil and gas sector’s expertise and supply chain is key to supporting technologies that will help us enable carbon budgets to be met, including

offshore wind, CO2 storage, and hydrogen; while ensuring UK energy security as we transition to net zero by 2050.

Heat and Buildings

Introduction

22. The Buildings sector accounted for around 17% of UK GHG emissions in 2019 and therefore has a significant contribution to make to enable carbon budgets to be met. Action is needed on finance, regulation and driving consumer behaviour change.

Risks and Mitigation

Future Government decisions

23. Delivery is dependent on government taking decisions in relation to future Carbon Budget periods to provide additional funding and to regulate for changes. This will be subject to technological developments, societal changes, stakeholder views, future spending arrangements and broader policy developments.

Consumer choices

24. Over a third of the policies require consumers to make choices to achieve the carbon savings. There are risks that these choices may not occur due to several factors including concerns around costs and lack of clear information for the consumer to make informed choices, which could mean there would be no widespread adoption of policy measures. In July 2022 government launched a home retrofit tool on GOV.UK, 'Find ways to save energy in your home', and a phoneline service that will help provide consumers in England with tailored and impartial information about how to improve the energy performance of their homes. Consumer awareness of the benefits of heat pumps and the Boiler Upgrade Scheme is also being raised through a targeted marketing campaign.

Supply chains

25. There is also a risk that retrofit and low carbon heat supply chains do not grow or upskill sufficiently to enable meeting our energy efficiency and clean heat deployment targets. This sector can face capacity issues as the majority of businesses are small to medium enterprises that may require support to upskill or retrain staff. Also, within the labour market there are challenges for attracting workers with the right skillset for insulation measures, which we are addressing with skills funding across heat decarbonisation and buildings retrofit. The £15m Home Decarbonisation Skills Fund commits to future support for training for people who want to work in the energy efficiency sector and has already funded 18 projects. We have also recently announced the £5m Heat Training Grant for heat pump and heat network skills.

Capital costs

26. Product supply may not meet demand at an affordable price which makes the achievement of targets more expensive. This is driven by current costs of technologies or measures and the potential to reduce these, as well as by inflation, transport costs and competing demand from other markets. Product supplies are not directly within government control but are influenced by demand generated by government schemes or policies. For clean heat measures, we are growing the heat pump market and supply chain through the Boiler Upgrade Scheme, Clean Heat Market Mechanism, Heat Pump Investment Accelerator and through off-gas grid regulations. An insulation products strategy is in development with key industry partners to enable management of peaks in demand and overall costs.

Running costs

27. Distortions between electricity and gas prices may continue to disincentivise technologies such as heat pumps. We are committed to support low carbon technology development and deployment.

28. The external risks outlined above present delivery challenges to the buildings sectors carbon savings targets, however we are confident that the agreed and funded schemes will deliver on their targets with appropriate mitigation. Schemes without allocated funding or in an early stage of development carry inherently higher risk and are subject to future decision-making.

Natural Resources, Waste and F-Gases

Introduction

29. The Natural Resources, Waste and F-Gases (NRWF) sectors accounted for 18% of UK GHG emissions in 2021, meaning that delivery of emissions savings in this sector are important to enabling cross-economy carbon budgets to be met. Action on these areas can also support economic growth, a circular economy, and co-benefits for nature.

30. Many of the delivery risks faced in these sectors are due to a need for further research and innovation, dependencies on other stakeholders to deliver, supply chain and sector capacity issues and the need to manage potential trade-offs with other priorities, such as food production. There is increased risk to delivery as many of our proposals and policies are in early stages of development. It is crucial we maintain flexibility to adapt our pathway to ensure we maximise co-benefits with priority outcomes. Some of the most significant delivery risks are detailed below. There are links and interdependencies between the different thematic risks.

Risks and Mitigations

31. Given the UK's land use profile and that these sectors are largely devolved, a significant proportion of UK-wide emissions reductions savings will be delivered

by Devolved Administrations (DAs). Many of the risks to delivery of emissions savings will likely be common across all four nations. Proposals and policies for these sectors may be subject to risks such as the need to manage competing demands on land, dependencies on stakeholders, the appropriate infrastructure being in place, evidence gaps and dependencies on early stage technologies. Close working will continue with DAs on net zero policy and analysis to support UK-wide delivery, addressing common challenges and sharing best practice to mitigate delivery risks, recognising devolved competence.

Data, Evidence and Research and Development

32. Various measures that form part of the package of proposals and policies are dependent on R&D and improved data. We are addressing this risk through Defra's commitment to spend £75 million on net zero R&D for the NRWF sectors during the current spending review period and through a £270 million Farming Innovation Programme.

The role of external stakeholders

33. Many actions are dependent on external stakeholders. For example, waste policies are dependent upon successful implementation of the reforms by businesses and local authorities and response from households. We are working closely with businesses and local authorities to support detailed waste policy development. Also, in order to restore and manage lowland peatlands, government and industry need to work together to ensure the correct water infrastructure exists to facilitate water management.

34. Many of the agriculture and wider land use measures will be delivered through our environmental land management schemes, which are voluntary schemes and depend on sufficient uptake. For agriculture and land use measures, information on the schemes' funding was published in January 2023, including the announcement of six new Sustainable Farming Incentive standards. The second round of Landscape Recovery focuses on net zero, protected sites and habitat creation, including creating and enhancing woodland and peatland. government will monitor uptake and implementation and will consider adjustments.

Land Use

35. There is a risk that competing priorities for land affects delivery of emissions savings. We have a finite amount of land and this needs to support the delivery of net zero as well as other objectives, like improving biodiversity and water quality, as well as maintaining food production. To address this, government will publish a Land Use Framework later this year, setting out how our land can play an important role in delivering multifunctional landscapes.

Early-stage proposals and policies

36. Many proposals and policies, such as policy relating to domestic biomass planting and some aspects of waste decarbonisation, are at early stages of development. Key risks to delivery of the biomass pathway include establishment of the business model for sustainable biomass cultivation, linked with demand from end use sectors including bioenergy with carbon capture and

storage, and confidence in uptake of new models for land use. R&D and policy work is ongoing to increase delivery confidence. For delivery of waste emissions savings, we committed in the Environmental Improvement Plan to launch a call for evidence to support detailed policy development to achieve the near elimination of biodegradable municipal waste to landfill from 2028.

Transport

Introduction

37. In 2020 transport remained the biggest emitting sector of the UK economy, responsible for 24% of UK greenhouse gas emissions. Reducing transport emissions is therefore a clear priority to successfully enable carbon budgets to be met. To tackle transport emissions, in July 2021 DfT published the Transport Decarbonisation Plan. This included 78 ambitious commitments – covering all types of transport – to decarbonise the sector and set it on the path to net zero. We have made good progress on delivering these commitments and must continue on this trajectory. Despite the intrinsic uncertainties of long-term sectoral emissions projections, we still have a reasonable to high level of confidence that the proposed policy package will deliver in line with what is needed to enable carbon budgets to be met.

Risks and Mitigations

38. Road transport accounts for around 90% of domestic transport emissions, with nearly three quarters coming from cars and vans. A principal risk is that the regulation and incentives we are putting in place are insufficient to drive the transition to zero emission vehicles at the speed required to enable carbon budgets to be met. However, we have confidence in the established mechanisms for transitioning the car and van fleet to zero emission alternatives, and there are already signs for optimism. Evidence shows that deployment of electric cars and vans in the time since publication of the 2021 Net Zero Strategy has outstripped expectations – both domestically and in international comparators – indicating that these technologies are attractive to consumers. The adoption of battery electric cars has also increased dramatically with nearly 17% of new cars sold in 2022 battery electric. Regulation will come into force, most notably the ZEV mandate from 2024 and phase out dates for the sale of all types of new non-zero emission vehicle by 2040 at the latest. There will also be continued investment in enabling measures – such as the Local EV Infrastructure Fund and Project Rapid – to support the rollout of essential charging infrastructure. We will continue to monitor progress in this space, and should our confidence change, we will consider additional measures to support the transition to ZEVs.

39. Another risk is that we see considerable, unanticipated growth in transport demand, going beyond our high-end projections. DfT analysis is based on the latest available demand projections for road transport and aviation. However, the

impacts of recent lower GDP projections on road traffic projections and the impact of COVID on aviation demand are not yet fully factored in, and these factors may mean growth in demand is lower than current projections. This helps to mitigate this risk, and critically, should future demand be lower than current projections, emissions will be lower than previously forecast.

40. Risks to delivery are highest where there is a reliance on nascent or immature technologies and associated markets, such as zero emission vehicle or flight technologies or utilisation of lower carbon fuels. To mitigate this risk, stakeholder groups and R&D funding are being used to explore how technologies can be expedited and supported through development. For example, zero emission maritime technologies are supported through the UK SHORE R&D programme whilst the Zero Emission Road Freight Demonstrator is supporting development of zero emission freight technologies. The Zero Emission Flight Delivery Group (part of the Jet Zero Council) has been established to explore the UK's capabilities to deliver zero emission technologies.

41. As committed to in the Transport Decarbonisation Plan, DfT will review progress against our pathway at least every five years and consider as necessary additional options to support delivery of UK carbon budget targets.

Greenhouse Gas Removals

Introduction

42. Engineered greenhouse gas removals (GGRs) are essential for meeting net zero and enabling our carbon budgets to be met.[7] We have an ambition to deploy at least 5MtCO2/yr of engineered removals by 2030, with analysis suggesting 30 Mtpa removals are required by 2037 at the end of carbon budget 6. However, this is a nascent sector, with inherent associated uncertainty as new technologies and markets for engineered removals are in their infancy. We are addressing this uncertainty and enabling the sector through progress on policy and through innovation funding. This includes developments on GGR and power BECCS business models, monitoring, reporting and verification (MRV), access to carbon capture and storage (CCS) infrastructure and exploring integration with the UK ETS.

Risks and mitigation

43. Key to managing the uncertainty and risk in this emerging sector is supporting development across a range of GGR technologies and projects. Through this portfolio approach and our ongoing policy development, we are confident that we are developing a world-leading approach to GGRs and enabling the delivery of engineered removals for carbon budgets.

[7] Nature-based solutions, such as afforestation, are included in the Agriculture and LULUCF subsector

44. New technology scale-up carries inherent delivery risk and government's innovation funding is crucial for de-risking this. The GGR sector needs to pull through a portfolio of First of a Kind (FOAK) technologies to commercialisation. We are addressing this through the DAC and Greenhouse Gas Removals Innovation Programme; last year we announced over £54m of government funding across 15 GGR pilot projects.

45. Business models are essential to address the risk of financial barriers to deployment and provide investors with certainty in early GGR projects. In 2022, we consulted on both a GGR and FOAK power BECCS business model. For the GGR consultation we intend to respond later this year and we will publish the power BECCS consultation response imminently. In December 2022, the Industrial Carbon Capture (ICC) Business Model and Waste ICC Business Model also updated policy positions on how potential GGR credits will be incorporated into the business models.

46. A well-functioning negative emissions market will be essential to reduce investment risk for the private sector. We are exploring options for different market options to support deployment. We will work within the UK ETS Authority to consider options for integrating GGRs in the UK ETS subject to the outcomes of last year's UK ETS consultation, a robust monitoring, reporting and verification (MRV) regime being in place, and the management of wider impacts - including market stability and the permanence of the emissions stored by the GGRs. Further detail will be provided in the Government Response to the UK ETS consultation. We recognise the integrity offered by the UK ETS could unlock investment at scale in the UK's greenhouse gas removal sector by providing an integrated market where businesses can make economically efficient choices on how to decarbonise or remove their emissions.

47. Robust MRV will be critical to reduce market risks and increase public certainty through ensuring the credibility of GGRs. We are developing our MRV policy through consultation and we intend to review the existing landscape, to determine which of these standards, if any, might form the basis of 'MRV eligibility criteria' for business model support in the near-term. For biomass GGRs, the Biomass Strategy is due to be published in 2023 and will outline recommendations for enhancing the UK's existing biomass sustainability criteria.

48. Access to CCS clusters is critical to achieve the volumes of removal needed. For technologies that rely on long-term geological storage, such as direct air capture with carbon capture and storage (DACCS) and bioenergy with carbon capture and storage (BECCS) access to CCS is important for large scale removals. Subject to criteria under development, the government is minded to enable engineered GGRs to apply to Track-1 expansion and Track-2 of the CCUS cluster sequencing process. We have also published a project submission process for power BECCS projects to enable project selection and announced the outcome of this assessment.

Appendix E: Wider Factors

Table 8 Summary of wider factors

Factor	Consideration in Net Zero Growth Plan chapters and accompanying publications	Conclusion
Scientific Knowledge	Analysis is based on the latest science available. We have adjusted emissions to account for the latest climate science.	The scientific case for strong action on climate change remains definitive.
Technology	See Innovation chapter and Technical Annex	The latest evidence on relevant climate technologies has been used for all emissions analysis.
Economic	See Net Zero Workforce and Green Finance and Investment chapters. Sectoral impacts considered in each, relevant chapter.	There are many economic and competitiveness impacts of the transition, with some potential significant economic benefits, particularly when compared against inaction on climate change. However, the economic impacts and interactions of reaching net zero are complex. We make no overall conclusion.
Fiscal	See Embedding Net Zero in Government chapter.	The full fiscal impact of these proposals and policies is not yet known and will depend on varied policy decisions and economic outcomes. DESNZ and other departmental spending was set at the 2021 Spending Review. We will continue to consider the impacts on the public finances of future climate policy.
Sustainable Development	See Sector chapters	There are both positive and negative natural capital impacts associated with these proposals and policies but the overall contribution to sustainable development is likely positive.
Energy Policy	See Power chapter and separate Energy Security Plan. Analysis in this report has accounted for latest policy developments, including the response to recent	Delivering our carbon budgets has the potential to reduce demand for gas, coal, oil and transport fuels which could improve security of supply by diversifying away from primarily imported fossil fuels. Other measures will mean increases in electrification and the simultaneous deep decarbonisation of electricity supply, which carries security of supply risks.

	energy price spike and recent announcements to ensure long-term security of supply.	
Social	See “Empowering the Public and Business to Make Green Choices” and Buildings chapters. See also Energy Security Plan.	Price and bill impacts will depend on electricity market developments and consumption patterns. Government has mitigated some of the worst impacts of recent energy price increases, saving typical households £1,500 factoring in the extension of the Energy Price Guarantee to June. Policies that improve energy efficiency of homes will reduce bills and benefit fuel poor households.
International Aviation and Shipping	See Technical Annex and Transport chapters. IAS emissions are factored into analysis and into presentation of the sixth carbon budget.	IAS emissions will be included in the sixth carbon budget and will use the bunker fuel sales method to calculate emissions.
International and European	See International Leadership chapter and Technical Annex. The UK revisited its world leading 2030 Nationally Determined Contributions and strengthened it with plans to expand the territorial scope to include the UK’s Crown Dependencies and Overseas Territories.	The UK has world leading ambition on climate change and is committed to advancing global climate action - in the run up to and at COP26 we narrowed the ambition gap, with net zero commitments covering 90% of the world’s economy, up from 30% two years ago, when the UK took on the COP26 Presidency. The UK has left the EU and is no longer bound by EU climate policies, allowing the UK to tailor policies in the national interest and deliver better outcomes. For example, we are undertaking the most significant reform of agricultural policy and spending in England in decades as we move from the EU’s Common Agricultural Policy (CAP) to our Environmental Land Management schemes, designed for our countryside and environment.
Devolved Circumstances	In addition to UK-level policy which would affect all nations, for some sectors, the analysis has used scaling factors to account for savings from Devolved Administrations where appropriate. Further analytical assumptions are outlined in the Sector Modelling discussion of the Technical Annex.	The proposals and policies in this report will directly reduce emissions across the nations of the UK, depending on their differing circumstances. There is potential for further reductions where the Devolved Administrations are taking action beyond what is reflected in our assumptions.

Appendix F: Summary of impact of proposals and policies across sectors of the economy

1. The Net Zero Growth Plan sets out the impact on jobs and investment at a sector level. See the table below for a summary of impacts of proposals and policies on sectors.

Summary of the impacts of the Carbon Budget Delivery Plan proposals and policies on sectors

2. Proposals and policies (P&Ps) in this section refer to the list of P&Ps in Appendix B of the s14 report (tables 4-6). The descriptions of the P&Ps identify their proposed effects and anticipated impacts. This section seeks to summarise the anticipated impacts of these P&Ps on different sectors of the economy. For additional detail, please see the sector chapters in the Net Zero Growth Plan (NZGP).

3. There are risks inherent in the delivery of the defined suite of P&Ps. Please see Appendix D for sectoral summaries of delivery confidence, alongside risks and mitigations.

Power

4. P&Ps, as defined above, will have a significant impact on the power sector. The package creates markets for investment and sector growth, offers targeted funding support to reduce technology and infrastructure costs, and provides long-term clarity and certainty in terms of future revenue streams.

5. The package will result in the expansion of electricity networks, deployment of sufficient flexible capacity capable of replicating the role of unabated gas on the electricity system, expand renewables and remove planning barriers to support deployment of renewable and low carbon infrastructure to facilitate delivery of a more secure, cleaner and cheaper energy system. As a package the P&Ps will meet growing demand while achieving the goal of decarbonising the power system by 2035, subject to security of supply.

Impacts:

a) Decarbonising the power sector whilst meeting a potential 60% increase in electricity demand has the potential to bring forward £275 – £375 billion of investment from both the private and public sectors. Investment in the electricity network will support the expected increase in peak demand, bringing forward £50-£150 billion of investment by 2037.

b) Reinforcing the onshore electricity network could support 20,000-80,000 jobs by 2037, in addition to providing further employment in the supply chain. In addition, measures to increase storage and demand side flexibility could support up to 7,000 jobs across the supply chain by 2030. We are also working to build UK training and certification capability for onshore wind and solar.

c) Our proposals and policies for growing the offshore wind sector in line with our 50GW ambition could support up to 90,000 direct and indirect jobs.

d) For nuclear, we aim to take one nuclear project to Final Investment Decision this parliament and two in the next parliament, including Small Modular Reactors (SMRs). Each large-scale nuclear power plant could support up to around 10,000 jobs at peak construction, in addition to providing further employment in the supply chain.

e) In 2021, power emissions were around 54 MtCO2e making up around 12% of total UK net GHG emissions (including international aviation and shipping). Natural gas combustion currently makes up the largest share of emissions.

f) Power emissions have decreased by 6% since 2019 and 73% since 1990. This decrease has resulted mainly from changes in the mix of fuels being used for electricity generation, including the decline of coal and growth of renewables; together with greater efficiency resulting from improvements in technology.

g) In line with the sectoral breakdown of the indicative pathway set out in the Net Zero Strategy, compared to 2021 emissions levels, GHG emissions could need to fall by 42% to 48% on average over 2023-27, by 69% to 74% by 2030 and 79% to 84% on average over 2033-37.

h) Support a range of technologies, including offshore wind, onshore wind, solar, tidal, geothermal and floating offshore wind through annual Contracts for Difference (CfD) Allocation Rounds.

i) Streamline the planning system to support offshore wind, solar, nuclear power and carbon capture, and enable local technology like EV charge points and heat pumps.

Fuel Supply & Hydrogen

6. P&Ps are aimed at growing the emerging sector and putting it in a position to act as a key enabler to carbon savings across other sectors - including industry, power, transport and potentially buildings by replacing high-carbon fuels used today. The package provides clarity on long-term funding, the legal framework and production. Taken together P&Ps will support deployment of new low

carbon hydrogen production, reduce upfront infrastructure costs, and provide greater clarity and certainty around future demand and revenue streams.

7. P&Ps will also support decarbonisation in the oil and gas sector between 2027 and 2040, primarily through electrification. Working alongside regulators the package will result in the elimination of the practice of ‘flaring’ as soon as possible.

Impacts:

a) Decarbonising our fuel supply and driving the new green industry of hydrogen has the potential to unlock £11 billion of private investment across production, transport, and storage, supporting 12,000 jobs by 2030. The UK has already built world leading capabilities - for example in electrolyser and fuel cell manufacture. There are over 200 companies working on hydrogen and fuel cell technologies in the UK, and we consistently feature in the top ten countries globally for hydrogen technology patent rates.

b) Carbon Capture Usage and Storage (CCUS) forms part of the most cost-effective route to net zero, and represents a significant economic opportunity, with the potential to support up to 50,000 jobs by 2030 and deliver £4.3 billion in GVA by 2050 through exports.

c) In 2021, fuel supply emissions were around 20 MtCO2e making up around 4% of total UK net GHG emissions (including international aviation and shipping). Upstream oil and gas currently make up the largest share of these emissions. Fuel supply emissions have decreased by 18% since 2019 and 66% since 1990. Since 1990, the largest reductions have been from coal mining and gas leakage.

d) In line with the sectoral breakdown of the indicative pathway set out in the NZS, compared to 2021 emissions levels, GHG emissions could rise by 8% or fall by 2% on average over 2023-27, fall by 22% to 33% by 2030 and 43% to 52% on average over 2033-37.

e) Government and industry remain committed to the North Sea Transition Deal target to reduce GHG emissions from oil and gas production by 50% by 2030 from 2018.

Industry

8. P&Ps will result in an increased rate of adoption of low carbon technologies and processes in industrial sectors, particularly when these technologies are not yet fully cost- or price-competitive with established practices. In the process the package will support jobs and investment in areas with a rich heritage of manufacturing and engineering.

9. The package will support the delivery of a reduction of total UK energy demand by 15% from 2021 levels by 2030, across domestic and commercial buildings and industrial processes, with a particular focus on the role of the private sector and the stimulation of investment.

Impacts:

a) Decarbonising our industrial sector has the potential to unlock £19 billion in public and private investment across the UK in line with our 2037 delivery pathway.

b) This could support up to 4000 jobs directly in industry for the manufacture and installation of on-site energy efficiency measures and up to 50,000 jobs across industry, power and the transport and storage network for the deployment of CCS. This is supporting growth and levelling up across the country both in our industrial clusters and in dispersed industrial sites.

c) In 2021, industry's GHG emissions were 76MtCO2e, equivalent to 17% of whole economy GHG emissions. This represents a 3% decrease from 2019 levels, and a 52% drop from 1990 levels. The majority of these GHG emissions are from industrial combustion (57%).

d) In line with the sectoral breakdown of the indicative pathway set out in the NZS, compared to 2021 emissions levels, GHG emissions could fall by 15% to 25% on average over 2023-27, 41% to 52% by 2030 and 62% to 75% on average over 2033-37.

Heat & Buildings

10. The package will result in more efficient, low-carbon buildings, reduced energy bills and healthier, more comfortable environments. At the same time, it will reduce our reliance on volatile fossil fuel prices, improving energy security and resilience.

11. Targeted regulation and new market-based mechanisms will result in reduced costs for consumers and businesses, attract greater private investment and strengthen supply chain resilience. New government funding will provide long-term funding certainty, supporting the growth of supply chains and skills.

12. The package will stimulate private investment and increase green finance options, galvanising supply chains, and increase public and business engagement with energy efficiency, including how to build public understanding of clean heat technologies and deliver greater take-up of support.

Impacts:

a) Potential to unlock up to £10 billion in Gross Value Add (GVA) per year in the UK and supporting ~240,000 jobs in 2035. For example, research shows that heat networks could provide for c.20% of total UK heat demand by 2050, up from providing c.3% currently. This represents an investment opportunity of £60 – £80 billion, incentivised through policies such as heat network zoning and capital support schemes.

b) Grow the UK heat pump market to 600,000 installations a year by 2028.

c) In 2021, buildings emissions were around 88 MtCO2e making up around 20% of total UK net GHG emissions (including international aviation and shipping). Residential

combustion currently makes up the largest share of emissions (78%), the vast majority of which is from heating. Buildings emissions have increased by 5% since 2019 and decreased by 19% since 1990. Annual buildings emissions are particularly volatile as impacted by external temperatures.

d) In line with the sectoral breakdown of the indicative pathway set out in the NZS, compared to 2021 emissions levels, GHG emissions could fall by 7% to 17% on average over 2023-27, 25% to 37% by 2030 and 47% to 61% on average over 2033-37.

e) Support generation of biomethane for injection into the gas grid

f) Raise consumer standards and improve the performance of heat networks through a new market framework, and identify areas where heat networks are the lowest cost solution for decarbonising heat.

g) Support industry to deliver trials ahead of taking decisions on the role of hydrogen in decarbonising heating.

Transport

13. P&Ps will result in the widespread decarbonisation of road, maritime and aviation transport as well as the supporting infrastructure. The package will also provide benefits across the UK, bolstering energy security, unleashing economic growth, and supporting a healthier population and environment. The P&Ps will bring about an accelerated shift to public transport and active travel following investment in the development and building of new walking, wheeling, and cycling routes.

Impacts:

a) We have provided strong market signals and incentives to drive supply chain development, and this is already unlocking significant private investment. For example, our commitment to zero emission vehicles has led to hundreds of millions of pounds of private investment in charging infrastructure.

b) We are a world leader in the production and use of low carbon fuels, with independent analysis conducted for Sustainable Aviation forecasting the potential for 65,000 jobs to be created by a UK SAF industry by 2050, and £1.9bn of direct GVA benefit per annum.

c) The sector will see accelerated growth in the number of zero-emission vehicles on the road following implementation of the ZEV mandate and investment in charging infrastructure across the country.

d) In 2021, domestic transport emissions were around 109 MtCO2e making up around 25% of total UK net GHG emissions (including international aviation and shipping). Road transport makes up the vast majority of emissions. Domestic transport emissions have decreased by 11% since 2019 and 15% since 1990, though 2021 emissions were impacted by COVID-19 and resultant restrictions on movement.

e) In line with the sectoral breakdown of the indicative pathway set out in the NZS, compared to 2021 emissions levels, GHG emissions for domestic transport could fall by 2% to 8% on average over 2023-27, 27% to 39% by 2030 and 61% to 73% on average over 2033-37.

f) International aviation and shipping were significantly impacted by COVID-19 and resultant restrictions on movement. In 2021, international aviation and shipping emissions were around 20 MtCO2e making up around 4% of total UK net GHG emissions (including international aviation and shipping). In 2019, international aviation and shipping emissions were around 44 MtCO2e making up around 9% of total UK net GHG emissions (including international aviation and shipping).

g) For IAS, in line with the sectoral breakdown of the indicative pathway set out in the NZS, compared to 2019 emissions levels due to severely depressed demand in 2021, GHG emissions could fall by 11% or rise by 5% on average over 2033-37.

Natural Resource, Waste & F-Gases

14. P&Ps will maximise co-benefits for climate and nature alongside other priority outcomes, including biodiversity, water quality, climate adaptation and economic growth. The package will ensure that from 2024, we will be paying farmers to provide a range of public goods, including actions to reduce emissions. The package will also lead to improved capture of data and evidence, with increased funding for R&D, increased engagement with external stakeholders to support waste policy and water management plans. P&Ps will also result in greater clarity on how we can deliver multifunctional landscapes that are resilient to our changing climate whilst meeting our needs for net zero, food production, environmental recovery, housing and infrastructure.

Impacts:

a) Decarbonising agriculture and land use sectors and increasing carbon sequestration from land will provide opportunities for economic growth across rural communities.

b) Unlocking private investment into nature-based solutions such as afforestation and peatland restoration will contribute to our goal to attract at least £1 billion of private finance into nature's recovery per year by 2030.

c) In 2021, agriculture and other land use emissions were around 49 MtCO2e making up around 11% of total UK net GHG emissions (including international aviation and shipping). Livestock (particularly cattle) currently make up the largest share of these emissions. Agriculture and other land use emissions have decreased by 2% since 2019 and 25% since 1990. The largest factor in this long-term fall has been an increase in the sink provided by forest land, with an increasing CO2 uptake by trees as they reach maturity, in line with the historical planting pattern. In line with the sectoral breakdown of the indicative pathway set out in the NZS, compared to 2021 emissions levels, GHG emissions could fall by 1% to 12% on average over 2023-27, 11% to 24% by 2030 and 19% to 37% on average over 2033-37.

d) In 2021, waste and F-gas emissions were around 30 MtCO2e making up around 7% of total UK net GHG emissions (including international aviation and shipping). The largest emissions sources include landfill and air conditioning and refrigeration. Waste and F-gas emissions have decreased by 11% since 2019 and 66% since 1990. The reduction since 1990 is primarily due to reductions in emissions from landfill and halocarbon production. In line with the sectoral breakdown of the indicative pathway set out in the NZS, compared to 2021 emissions levels, GHG emissions could fall by 23% to 31% on average over 2023-27 43% to 51% by 2030 and 56% to 65% on average over 2033-37.

e) The near elimination of biodegradable municipal waste being sent to landfill.

f) Optimisation of current wastewater processes to reduce greenhouse gas emissions.

Greenhous Gas Removals (GGR)

15. P&Ps will capitalise on the economic benefits from this emerging sector by scaling-up First of a Kind technologies to deliver new export opportunities and high-quality green jobs across the UK, supporting energy security and levelling-up.

16. The package will provide clarity on innovation funding, business models, monitoring, reporting and verification. Successful delivery will see the sector mature and grow significantly through the mid-to-late 2020s. This will be both in terms of a growth in the evidence base of the emerging technologies, and in terms of industry and public confidence in the long-term prospects of the deployment of GGRs at-scale in the UK.

Impacts:

a) Funding a variety of innovative GGR technologies, including several first-generation Direct Air Capture (DAC) technologies through the DAC and Greenhouse Gas Innovation Programme. This programme will produce several operational pilot plants by 2025, and will also realise investment, jobs, skills and technology in this nascent sector.

b) £100m innovation investment in key technologies, will help to move nascent technologies from prototype stage through to demonstration and deployment.

c) One example of a project being funded is a consortium led by Sizewell C, who are developing an innovative heat-powered Direct Air Capture (DAC) demonstrator plant designed to capture low carbon waste heat from a nuclear power plant. This technology could offer increased efficiency and less reliance on electricity, therefore reducing the cost of removing carbon dioxide from the atmosphere. A scaled-up DAC plant linked to Sizewell C could utilise around 400 MW of heat from the nuclear power plant to capture 1.5 million tonnes of CO2 per year.

d) As set out in the Net Zero Strategy, to meet our CB4, NDC and CB6 targets, we set an ambition to deploy at least 5 MtCO2e p.a. of engineered removals by 2030, potentially rising to 23 MtCO2e p.a.by 2035.

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