

Filed on behalf of the Claimant

Witness: Michael Andrew Childs

First Witness Statement

Exhibit: MC1

Dated: 14 June 2023

IN THE HIGH COURT OF JUSTICE

Case No.:

KING'S BENCH DIVISION

ADMINISTRATIVE COURT

IN THE MATTER OF AN APPLICATION FOR JUDICIAL REVIEW

BETWEEN:

THE KING

- on the application of -

FRIENDS OF THE EARTH LIMITED

Claimant

-and-

SECRETARY OF STATE FOR ENERGY SECURITY AND NET ZERO

Defendant

WITNESS STATEMENT OF MICHAEL ANDREW CHILDS

I, MICHAEL ANDREW CHILDS, of 139 Clapham Road, London, SW9 0HP, **WILL SAY:-**

1. I am employed by the Claimant as Head of Science, Policy and Research. I have worked at Friends of the Earth for 30 years. For the last 20 years, my work has largely focussed

on climate change policy. I hold a degree in Biology (BSc) from the University of York. Prior to that, I was employed as a laboratory technician at Essex University.

2. I make this Witness Statement on behalf of the Claimant in these proceedings and am duly authorised to do so. References to documents in the claim bundle are expressed as **[CB/x,§]** where: **CB** stands for Claim Bundle; **x** is the page number; and **§** is the paragraph number, if relevant.
3. The purpose of this witness statement is simply to explain the basic analysis carried out by the Claimant's in-house team on the information disclosed by the Secretary of State as part of his pre-action response. The purpose of that analysis is to compare the information which was included in the Carbon Budget Delivery Plan (CBDP) published on 30 March 2023, with the information which the Secretary of State was provided in the document entitled *S.13 Appendix B for Disclosure* (hereafter the "Disclosure Document").

Friends of the Earth's interest in the Climate Change Act 2008

4. In 2005, Friends of the Earth initiated a campaign calling for the introduction of a Climate Change Act ("CCA") in the UK (called the Big Ask Campaign). I led the team of people in Friends of the Earth that identified the need for a CCA, drafted an outline of what the Act would need to cover, secured support for the idea from leading figures across the main political parties, devised the strategy to secure Government and parliamentary-backing and ran the successful 4-year campaign.
5. One of the reasons that Friends of the Earth campaigned for the CCA was that Government pledges for shorter term emissions reductions made in policies and manifestos were not being met. Friends of the Earth were of the view that making these reduction targets legally-binding and requiring an annual report to Parliament would significantly increase the likelihood of these being met. Another key reason was that a legal requirement was clearly needed, in order for Government to provide detailed plans on how it would reduce emissions against a publicly declared timeline,

and so that these plans could be closely scrutinised by Parliament, and by the public. We were delighted that Parliament agreed and that the CCA was passed in 2008 with cross-party support.

6. The Government published the CBDP on the 30th March 2023, following successful legal challenges brought by Friends of the Earth, ClientEarth and Good Law Project. The CBDP is the section 14 Report under the CCA.
7. In this statement, I set out the analysis carried out by the Claimant's in-house team [enclosed at **MC1/1-5; CB/80-216**], as to the lack of detail on the risk to the delivery of the policies in the CBDP. That exercise did not involve any expert input and my witness statement is simply to explain the basic exercise undertaken, not in any way to give any kind of expert input.

Friends of the Earth's review of the Disclosure Document

8. I am aware from advice received by the Claimant's lawyers that the CBDP is required, under sections 13 and 14 of the CCA, to set out the proposals and policies which the Secretary of State considers will enable the UK to meet its carbon budgets. I note that that the CBDP states that the quantified policies will secure overachievement of carbon budgets 4 and 5 [CBDP p15 **[CB/262]**]. However, there is a 3% shortfall in term of carbon budget 6; the CBDP states that the Government is "*confident that Carbon Budget 6 can be met through a combination of the quantified and unquantified policies identified*" [para 31, p15 **[CB/262]**]. The CBDP also states that there is a 8% shortfall in meeting the UK's Nationally Determined Contribution, which sets a 68% reduction in carbon emissions as compared to 1990 levels by 2030 [CBDP p29 **[CB/276]**]. This 8% shortfall is notable given the proximity of the deadline. All of these predictions on emissions savings are based on a key and central assumption: "*The calculated savings assume the package of proposals and policies are delivered in full*" (CBDP p14, para 26 **[CB/261]**; my emphasis added).

9. On the face of it, this is a big assumption to make, because some policy slippage does tend to happen. For example:

- a) the Government's 2021 Net Zero Strategy promised a Biomass Strategy for 2022 but this is still not published;
- b) expected rules on the insulation levels required in the private-rented sector have been delayed; and
- c) guidance to local authorities on the development of Local Transport Plans have been delayed.

10. Furthermore, I note that the policy paper entitled "*Powering Up Britain: Net Zero Growth Plan and Carbon Budgets Delivery Plan – analysis methodology (Technical annex)*" which was published with the CBDP on 30 March 2023, states that: "The final emissions trajectories for each agriculture measure are based on the most ambitious assessment of what the feasible deployment rates are for these measures as identified from these consultations. For methane suppressing feed additives and mobile machinery, additional analysis by Defra has adjusted implementation rates to generate an even more ambitious trajectory. The policies and proposals set out in the Carbon Budget Delivery Plan are designed to deliver these trajectories." (emphasis added) [CB/618]. So an assumption of overachievement of carbon budgets four and five, and achievement of 97% of the sixth carbon budget, is being made on the basis of the CBDP policies being delivered in full, and where the predictions, for agricultural policies at least, are based on "the most ambitious assessment" of what they can feasibly achieve.

11. The assumption is all the more notable, given the information provided on risk to delivery which was disclosed by the Secretary of State as part of his PAP Reply. I set out some key observations on this point below.

Assessment of delivery risk in Table 2

12. The Secretary of State has given a summary account of the process leading to the Carbon Budget Delivery Plan (PAP Reply, paras 13-18 [CB/242-243]; Statement of

Facts and Grounds ('SFG'), paras 34-40). In addition, he has disclosed two "risk tables", which he took into account as part of this process. These purportedly assessed the risks to delivery of each policy and proposal. "Table 2" lists quantified proposals and policies [CB/457-538]. "Table 3" lists unquantified proposals and policies [CB/538-582]. The risk tables are said to replicate Tables 5 and 6 in Appendix B to the CDBP (pp. 46-105 and pp106-168) [CB/293-352; 353-415] but with the addition of two further columns setting out narrative text under the headings "Delivery Risks: Explanation" and "Delivery Risks: Mitigation".

Analysis of Table 2

13. I have reviewed Table 2, which lists the 191 quantified proposals and policies. So too has the Claimant's in-house team, which has produced the following analysis, which I agree with.
14. The delivery risks for 60 of the 191 quantified proposals and policies are expressed to be uncertain. A list of these proposals and policies is **exhibited** to this statement at **Appendix 1 [CB/80-126]**. That appendix reproduces relevant extracts from Table 2, namely the rows for the 60 proposals and policies where delivery risk is said to be uncertain. No changes to the text have been made, but the Claimant's in-house team has made formatting changes, in that expressions of uncertainty in the final two columns have been underlined and bolded. The Claimant's team has calculated that the total expected emissions savings from these policies, for the period covered by carbon budgets 4 to 6 (i.e. 2023 to 2037) ("**CB4-6 savings**"), is at least 766 MtCO₂e, or approximately 47% of the total Table 2 CB4-6 savings (the approach to these calculations is explained below).
15. For 65 of the 191 policies, whilst information is included on delivery risks, contingencies, dependencies, barriers or similar (in that those risks, contingencies etc are described) no information is included on either the degree of delivery risk (high/low etc.) or on the confidence in the assessment (certain/uncertain etc.). A list of these is **exhibited** to this statement at **Appendix 2 [CB/127-173]**, which reproduces relevant extracts from Table 2, namely the rows of text for the 65 proposals and

policies where there is no information on degree of delivery risk or confidence in the assessment. Total CB4-6 savings from these policies are calculated to be at least 683 MtCO₂e (approximately 42% of the total).

16. For 25 of the 191 policies, no information is included on either what delivery risks there may be, or on the degree of risk to delivery. A list of these proposals and policies is **exhibited** to this statement at **Appendix 3 [CB/174-186]**, which reproduces relevant extracts from Table 2, namely the rows for the 25 policies in question. Total CB4-6 savings from these policies are calculated to be at least 27 MtCO₂e (approximately 2% of the total).
17. The delivery risks for 6 of the 191 policies are expressed as being significant, high or challenging. A list of these proposals and policies is **exhibited** to this statement at **Appendix 4 [CB/187-191]**. That appendix reproduces relevant extracts from Table 2, namely the rows of text for the 6 policies in question. No changes to the text have been made, but the Claimant's in-house team has made formatting changes, in that expressions of significant etc. risk in the final two columns have been underlined and emboldened. Total CB4-6 savings from these policies are calculated at to be least 18 MtCO₂e (approximately 1% of the total).
18. For the remaining 35 of the 191 policies, the delivery risks are expressed in terms of having high confidence or certainty. These are **exhibited** to this statement at **Appendix 5 [CB/192-216]**. That appendix reproduces relevant extracts from Table 2, namely the rows of text for the 35 policies in question. No changes to the text have been made, but the Claimant's in-house team has made formatting changes, in that expressions of high confidence or certainty in the final two columns have been underlined and emboldened. Total CB4-6 savings from these policies are calculated to be at least 135 MtCO₂e (approx. 8% of the total).
19. I will now explain the approach that the team followed in calculating, for each of the above categories, both the total expected emissions savings and their respective percentages of the total emissions reductions predicted from Table 2 for the period CB4-6. Table 2 sets out average annualised savings for each of the three carbon budget

periods broken down by policy/proposal. Those averages were added up and that total sum was multiplied by five (given each budget lasts for 5 years). That produced, for each proposal or policy, a total expected emissions saving for the CB4-6 period¹. All power sector proposals and policies were excluded from this exercise, given individual savings were not provided (see CDBP, Appendix B, §§ 7-11 [CB/268-269]). That is why total savings above are expressed as “at least” x MtCO₂e and being “approx.” y% of the total. The team considered this a reasonable approach given, when you factor in power sector savings², they amount to 6% of the total, so even were it possible to include these in the above analysis, they would not significantly change the figures arrived at.

20. Taking the above approach, I also note:

- a) Row 181 groups together future carbon savings for the Devolved Administrations’ proposals and policies for the agriculture and LULUCF (i.e. Land Use, Land-use Change and Forestry) sectors. These are projected to deliver 66 MtCO₂e across carbon budgets 4 to 6.
- b) Row 190 groups together future carbon savings for the Devolved Administrations’ proposals and policies relating to waste, wastewater and F-gases. These are projected to deliver 7 MtCO₂e across carbon budgets 4 to 6.
- c) Table 2 lists 33 proposals/policies falling with NZS sector ‘Agriculture and LULUCF’ and 9 in the ‘Waste and F-gases’ sector. Of these 42 proposals and policies:
 - i. The delivery risks for 22 are expressed to be uncertain. The savings from these policies over CB4-6 total 168 MtCO₂e, being 91% of those sectors’ total savings;
 - ii. For 6 of the policies/proposals, whilst information is included on delivery risks, contingencies, dependencies, barriers or similar, no

¹ For rows 71 to 73 that total was divided by 3 to avoid triple-counting. See p.67 of the CDBP [CB/314-316]: “The savings represented in rows 71/72/73 are the and should collective result of the policies on those rows, so should be treated as a single figure from three sets of individual fuel switching policies, not be summed together”.

² CDBP, Table 2, row 1 [CB/457].

information is included on either the degree of delivery risk (high/low etc.) or on the confidence in the assessment (certain/uncertain etc.). The savings from these policies over CB4-6 total 5 MtCO₂e, being 3% of those sectors' total savings; and

- iii. For 14 of the policies/proposals, the delivery risks are expressed in terms of having high confidence or certainty³. The savings from these policies over CB4-6 total 12 MtCO₂e, being 6% of those sectors' total savings.

21. It is important to note the apparent disparity between the information contained in Table 2 in relation to the 42 proposals and policies falling with Agriculture and LULUCF' 'Waste and F-gases', and the information contained in a risk analysis produced by the Department for Environment Food and Rural Affairs ("DEFRA") in relation to the net zero measures within that department's responsibility. This risk analysis was referred to in an article by *The Times* on 4 April 2023, exhibited at [MC1/6; CB/217-220]. According to *The Times*, the risk analysis carried out by DEFRA used a traffic-light scale of green, amber and red. 21 out of 44 policies were marked red/amber indicating they will be hard to achieve. These policies encompass 85% of DEFRA's proposed emissions savings. A further 18 were marked amber/green and only five were marked green. It further states that two of the five policies marked as green disappeared from the CBDP – when there are only 42 proposals and policies in the CBDP within DEFRA's responsibility. The fact that only five policies were marked as green appears at odds with Table 2 which shows that the delivery risks for 14 of the policies/proposals in these sectors are expressed in terms of having high confidence or certainty.

22. It is worth noting that uncertainty over risk is not confined to proposals and policies that will deliver a small fraction of the necessary emissions savings, but also across

³ This is based on the explanation of delivery risk for each of these stating: "We have high certainty in the delivery of this policy and its enabling impacts on other policies" (see Table 2, rows 156, 157, 158, 160, 161, 162, 164, 167, 170, 171, 172, 173, 180 and 189). It is unclear, however, what level of delivery risk is attached to the policy achieving the savings expected. This distinction is made elsewhere in Table 2. For example, the explanation in row 43 [CB/472] states: "We have high certainty in the delivery of this policy, but cannot guarantee that it will lead to associated carbon savings" (emphasis added). Similarly, the explanation in row 53 states: "We have high certainty in the delivery of this policy and its associated carbon savings" (emphasis added) [CB/476].

those policies that are assumed to deliver comparatively large portions. For example, there are 22 policies or proposals that are projected to each achieve savings in excess of 20 MtCO_{2e} over carbon budgets 4, 5 and 6⁴. Total CB4-6 savings for those 22 policies amount to 1,167 MtCO_{2e}, or 67% of the total Table 2 savings (including the Power sector). Of those 22 policies:

- a) The delivery risks for 11 proposals and policies are expressed to be uncertain. The savings from these policies over CB4-6 total 549 MtCO_{2e}, being 32% of the total Table 2 savings;
- b) For 10 of the proposals and policies, whilst information is included on delivery risks, contingencies, dependencies, barriers or similar, no information is included on either the degree of delivery risk (high/low etc.) or on the confidence in the assessment (certain/uncertain etc.). The savings from these policies over CB4-6 total 527 MtCO_{2e}, being 30% of the total Table 2 savings; and
- c) For 1 of the proposals and policies, the delivery risks are expressed in terms of having high confidence or certainty. The savings from this proposal/policy over CB4-6 total 91 MtCO_{2e}, being 5% of the total Table 2 savings.

23. From considering this analysis and reviewing Table 2, the following is clear:

- a) Table 2 provides more information on delivery risk than is presented in the CBDP;
- b) Table 2 does not provide the same degree/specificity of information on delivery risk for each policy; there is in fact considerable variation in this across the Table;
- c) The delivery risk is stated to be uncertain for 60 out of the 191 proposals and policies in Table 2, equating to nearly half of the overall Table 2 emissions savings required by carbon budgets 4 to 6 (paragraph 14 above), and for 11 out of the 22 high impact policies, equating to 32% of the emissions savings in Table 2 (para 22a above).

⁴ Table 2, rows 66, 69, 70, 74, 75, 96, 112, 122, 123, 124, 125, 126, 127, 128, 129, 130, 133, 145, 150, 181, 182 and 191 [CB/486-537].

24. Taken together, this leads me to question the soundness of the statements in the CBDP that the carbon budgets 4 and 5 will be overachieved by the quantified policies, and that 97% of carbon budget 6 will be achieved, when this is all based on an assumption that all of the proposals and policies are delivered in full.

Comparison of Table 2 with the sectoral summaries in the CBDP

25. The Secretary of State has confirmed that his officials provided him with a sector-by-sector summary of risk to delivery of proposals and policies in each specific sector, and that this summary was similar to that set out in Appendix D to the CBDP (PAP Reply, §§14-15 [CB/243]; and CBDP pp.173-182 [420-429]).

26. Having reviewed Table 2 and Appendix D to the CBDP I note the following:

- a) The sectoral summaries merely identify key delivery risks. They do not go on to explain how those risks might impact the likelihood that the emissions savings for each sector will be achieved.
- b) The sectoral summaries do not convey the degree of uncertainty as to delivery risk that is apparent from Table 2 (see above para 14). They do not identify, for example, the number of policies that have an uncertain delivery risk, or the predicted emissions savings that those policies are nonetheless predicted to achieve. The Transport sectoral summary makes an overarching and non-specific comment on the *“intrinsic uncertainties of long-term sectoral emissions projections”* (CBDP p180 para. 37 [CB/427]); the Greenhouse Gas Removal sectoral summary refers to the *“inherent associated uncertainty”* given that *“new technologies and markets for engineered removals are in their infancy”* (CBDP p181 para.42 [CB/428])
- c) The CBDP fails to identify all proposals and policies which do not themselves contribute to emissions savings. The CBDP identifies some policies and proposals as not contributing themselves to emissions savings. However, after comparing the information in Tables 2 and 3 with the CBDP, the team has identified 7 policies which are listed in Tables 2 and 3 as not directly leading to carbon savings which

are not identified as such in CDBP. The fact that they have failed present information consistently between Table 2 and 3 and the CDBP could mislead Parliament and the public. The discrepancies are listed below:

- i. Policy 3 on Power in Table 2 states: “This policy will not lead to carbon savings directly.”
 - ii. Policy 4 on Power in Table 2 states: “This policy will not lead to carbon savings directly.”
 - iii. Policy 63 in Table 3 (Energy Technology List- Annual Review) states: “Policy is in delivery and does not deliver direct savings.”
 - iv. Policy 64 in Table 3 (EPC Action Plan) states: “Policy is in delivery and does not deliver direct savings.”
 - v. Policy 65 in Table 3 (Consumer Information & Advice (former Simple Energy Advice) – Enhancement) states: “Policy is in delivery and does not deliver direct savings.”
 - vi. Policy 66 on Buildings in Table 3 (Trustmark & PAS 2035) states: “This policy does not deliver carbon savings.”
 - vii. Policy 67 in Table 3 (Home Retrofit Skills and Capacity Building) states: “This policy will not lead to carbon savings directly.”
- d) The in-house team has also identified a further 25 policies in Tables 2 and 3 where the CDBP does not indicate that risks would “materially affect” savings; or that savings are “dependent upon” another factor (for example, research, funding, or regulation); or that savings are uncertain due to the “early stage” of policy development. Examples of these policies include the following:
- i. Policy 22 on Power (Biomass Strategy) in Table 2 states: “If not mitigated, the risk of delay could materially [a]ffect the successful delivery of the savings enabled and supported by policies within.”

- ii. Policy 129 on Domestic Transport (Accelerated Transition to Zero Emission Vans)_in Table 2 states: “Policy is progressing in line with expectations, but delivery of full projected savings is dependent on timely roll-out of regulation, sufficient uptake of zero emission vans, and the rollout of enabling infrastructure across the UK. Under delivery in any area may lead to a slower than anticipated fleet turnover and extended on-the-road usage of the existing internal combustion engine fleet, reducing anticipated emissions savings.” (emphasis added)
- iii. Policy 152 on Agriculture and LULUCF (Increased milking frequency (using robotic milking systems not hormones) in Table 2 states: “Uncertain delivery risk. The policy requires additional research to provide greater clarity on savings potential and to inform further policy development.” This policy is supposed to take effect in 2022.
- iv. Policy 153 on Agriculture and LULUCF (Multi-purpose breeds or multi-use of cows - (milk, calves and meat)) in Table 2 states: “Uncertain delivery risk. The policy requires additional research to provide greater clarity on savings potential and to inform further policy development. The policy requires further appraisal of options - an approach to incentivising the measure will need to be identified, unless market forces are sufficient to drive action at the scale required.” This policy is also supposed to take effect in 2022.
- v. Policies 82, 83, 85, 86 and 100 (all Agriculture and LULUCF) in Table 3 state: “Uncertain delivery risk. The policy requires additional research to provide greater clarity on savings potential”

Statement of Truth

27. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth. This statement has been produced following

telephone calls and email exchanges with the Claimant's in-house lawyers and its legal representatives at Leigh Day.

Signed

A handwritten signature in black ink, appearing to read 'M Childs', written over a horizontal line.

Michael Andrew Childs

Date 14 June 2023

Filed on behalf of the Claimant
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Exhibit: MC1
(amended)
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4 August 2023

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EXHIBIT MC1 (AMENDED)

I exhibit the following document referred to in this statement:

	Document	Date	Page
1	Table 2 Policies and Proposals : Uncertainty expressed	14 June 2023	3-49
2	Table 2 Policies and Proposals : Risk expressed but not risk level	14 June 2023	50-96
3	Table 2 Policies and Proposals : No Information on Risks or Risk Level (as amended)	14 June 2023 4 August 2023	97-109 97-110
4	Table 2 Policies and Proposals : High Risk Expressed	14 June 2023	110-114 111-115

5	Table 2 Policies and Proposals : High Confidence or Certainty (as amended)	14 June 2023 4 August 2023	115-139 116-139
6	Time Article: Ministers were warned net zero schemes wouldn't work	4 April 2023	140-143

Signed



Michael Andrew Childs

Dated: ~~14 June 2023~~ 4 August 2023

Proposals and Policies in Table 2: Uncertainty Expressed

#	Sector	Policy Name	Policy description	Average Annualised Savings (MtCo2e pa)			Timescale From Which the Policy Takes Effect	Delivery risks: Explanation	Delivery risks: mitigation
				CB4	CB5	CB6			
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. 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.				Mid CB5	Uncertain delivery risk. Risk that power BECCS is not included in the final network design list due to storage constraints.	We are exploring opportunities for Power BECCS to be deployed under Track 1 expansion or Track 2 to ensure we're still on track to meet the 2030 5mt ambition. Taking forward work on powerBECCS BMs aligns with the Net Zero Review recommendations.
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	Uncertain delivery risk, as funding is subject to future spending reviews.	Mitigations include: a) Work with HMT and the IPA to clear the Track 1 Negotiations Mandate b) Deliver a detailed programme schedule covering all deliverables to support realistic delivery timeline assessment. c) Deliver Project BOOST: a project

Proposals and Policies in Table 2: Uncertainty Expressed

						commissioned by DESNZ to develop the geospatial data needed to make data driven decisions on CO2 storage and marine spatial planning. d) Ensure that funding is available to deliver the programme of work.
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	Uncertain delivery risk , as funding is subject to future spending reviews.	Mitigations include: a) Work with HMT and the IPA to clear the Track 1 Negotiations Mandate b) Deliver a detailed programme schedule covering all deliverables to support realistic delivery timeline assessment. c) Deliver Project BOOST: a project commissioned by DESNZ to develop the geospatial data needed to make data driven decisions on CO2 storage and marine spatial planning. d) Ensure that funding is available to deliver the programme of work.
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	We have reviewed responses to our call for evidence and are on track to publishing our government response this year. However, as we are at the early stages of developing proposals, it is difficult to assess the delivery	Despite potential minor resourcing constraints, we are identifying potential supplementary resourcing if needed, and are still fairly confident that we can publish the response to

Proposals and Policies in Table 2: Uncertainty Expressed

					<u>risk to enabling carbon savings from specific proposals.</u>	our call for evidence this year.
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.	FromMid CB4 subject to call for evidence and consultation responses,	Retail market - announced in Energy Security Plan. REMA workstreams are making progress but there is a lot of complexity to manage as well as <u>uncertainty</u> in how quickly decisions can be made given the level of policy development still required. The team are clarifying what the business case and assurance pathway requirements will be for the programme and will begin the business case process in earnest over the quarter.	We have confidence that these risks can be mitigated by a fortnightly senior programme board with XWH representation. The team have also brought in new resource on the delivery side to progress the business case and assurance workstreams.
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	The Smart Systems and Flexibility Plan contains 35 actions across government, Ofgem and industry. Within these, there are delivery risks including policies dependent on technologies that are nascent, requirements for industry coordination, and policies that require further appraisal of options. The Energy Bill is continuing its passage through parliament and will be progressing on to Report Stage in the House	We have robust governance processes in place to monitor and challenge progress across the plan actions. We remain committed to the important measures in the Energy Security Bill to deliver change in the energy system over the long term. We have contingencies in place for any potential knock-on effects on delivery timelines for energy smart appliances, load control, and electricity storage workstreams.

Proposals and Policies in Table 2: Uncertainty Expressed

								of Lords. There is some remaining uncertainty around timings for royal assent, but this isn't anticipated to have a significant impact on delivering measures. Overall, these risks require attention, however, appear resolvable based on the actions already underway.	
HSM Note 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 policies and proposals 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 Production Business Models (baseline assumption)	a) 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. These include: £240m Net Zero Hydrogen Fund (capital funding) Hydrogen Production Business Model (funded via the Industrial Decarbonisation and Hydrogen Revenue Support Scheme) Industrial Decarbonisation and Hydrogen Revenue Support	-0.051	-0.282	-0.299	Mid CB4	Uncertain delivery risk - Funding is subject to a future spending decisions so therefore cannot be confirmed now, creating inevitable uncertainty ; aspects of the policy have yet to be consulted on; the policy relies on passing the Energy Security Bill and additional research to inform further policy development. The hydrogen production group of policies (NZHF, IDHRS and future levy, T&S, LCHS and	Delivering the projected savings is dependent on exchequer and levy funding for IDRHS and delivering legislation for the hydrogen production business models, and transport and storage business models. HPBM payments for projects awarded contracts through HAR1 will be funded by government until the hydrogen levy comes into effect, and securing this and the HPBM and T&S legislation

Proposals and Policies in Table 2: Uncertainty Expressed

			<p>scheme (IDHRS), which will support both electrolytic ('green') and CCUS enabled methane reformation ('blue') low carbon hydrogen production. New business models for hydrogen transport and storage infrastructure by 2025, which will grow the hydrogen economy and provide security for producers of hydrogen. 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. Please refer to the note on the first Hydrogen scenario (Hybase – line 58) for an explanation of our modelling in this sector.</p>					<p>certification) and reaction to date from industry to them, along with the known pipeline of UK hydrogen production projects, provides confidence that HMG is moving in the right direction to meet our 10GW ambition. However, the UK is still at a near zero base of low carbon hydrogen production. To deliver our ambition, we will require considerable support via IDHRS (i.e. initial exchequer and then future levy spend). The dependency of the HPBM levy and T&S BMs on HMG funding and legislation is a significant risk. We are developing policies to support multiple off-takers of hydrogen, including the potential for blending as a demand sink, but there remains significant uncertainty from investors and industry to these policy signals. There are various significant dependencies (including funding and legislation) and external factors (including current levels of inflation) overlaying our ambitious</p>	<p>will keep us on track to deliver carbon savings, as recommended by the Review of Net Zero. Barriers to hydrogen fuel switching are being identified and addressed across sectors. Regulation and carbon pricing will prompt sectors to explore hydrogen use and funding for innovation and trials are helping develop nascent technologies necessary to unlock this demand. The HPBM also requires production facilities seeking support to locate and agree offtake with demand partners, incentivising the market for hydrogen to form without heavy government intervention. Decisions intended to be announced in the Net Zero Growth Plan and Energy Security Plan will help mitigate this risk by giving industry greater certainty over timing and extent of funding. These actions include publishing the shortlist of projects applying to the first electrolytic hydrogen allocation round which we will take forward to due diligence and the hydrogen projects being</p>
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Proposals and Policies in Table 2: Uncertainty Expressed

								policy programme which create further delivery risks. This means that hydrogen production is at risk of delay, which could reduce emissions savings from hydrogen use in end use sectors. Rapid developments and substantial public funding on offer/being developed in the US and EU mean the UK is now directly competing with other countries for the investment needed to support its hydrogen deployment ambitions. There is risk that mobile private investment will be drawn away from the UK while projects wait for certainty over the funding and timing for contract award, with associated implications for jobs and supply chain development. Anecdotal evidence from industry suggests increased risk in the next 12-18 months.	taken forward to negotiations under Track 1 of the CCUS Cluster Sequencing Process. We intend to launch the second electrolytic hydrogen allocation round later in 2023, and are working with industry to ensure UK supply chain opportunities and barriers are understood. Taking forward this work aligns with the Net Zero Review recommendations.
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 10 GW ambition, so it is additive to	0	0	-0.069	CB6	Uncertain delivery risk - Funding is subject to a future spending decisions so therefore cannot be confirmed now, creating inevitable uncertainty ; aspects of the policy have yet to be consulted on; the policy relies on	Delivering the projected savings is dependent on exchequer and levy funding for IDRHS and delivering legislation for the hydrogen production business models, and transport and storage business models. HPBM

Proposals and Policies in Table 2: Uncertainty Expressed

			<p>the '10 GW low carbon hydrogen production by 2030 and beyond' line. This scenario assumes hydrogen production capacity reaches a total of 18 GW 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. £240m Net Zero Hydrogen Fund (capital funding) Hydrogen Production Business Model (funded via the Industrial Decarbonisation and Hydrogen Revenue Support Scheme) Industrial Decarbonisation and</p>					<p>passing the Energy Security Bill and additional research to inform further policy development. The hydrogen production group of policies (NZHF, IDHRS and future levy, T&S, LCHS and certification) and reaction to date from industry to them, along with the known pipeline of UK hydrogen production projects, provides confidence that HMG is moving in the right direction to meet our 10GW ambition. However, the UK is still at a near zero base of low carbon hydrogen production. To deliver our ambition, we will require considerable support via IDHRS (i.e. initial exchequer and then future levy spend). The dependency of the HPBM levy and T&S BMs on HMG funding and legislation is a significant risk. We are developing policies to support multiple off-takers of hydrogen, including the potential for blending as a demand sink, but there remains significant uncertainty from investors and industry to</p>	<p>payments for projects awarded contracts through HAR1 will be funded by government until the hydrogen levy comes into effect, and securing this and the HPBM and T&S legislation will keep us on track to deliver carbon savings. Barriers to hydrogen fuel switching are being identified and addressed across sectors. Regulation and carbon pricing will prompt sectors to explore hydrogen use and funding for innovation and trials are helping develop nascent technologies necessary to unlock this demand. The HPBM also requires production facilities seeking support to locate and agree offtake with demand partners, incentivising the market for hydrogen to form without heavy government intervention. Decisions intended to be announced in the Net Zero Growth Plan and Energy Security Plan will help mitigate this risk by giving industry greater certainty over timing and extent of funding. These actions include publishing the shortlist of projects</p>
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Proposals and Policies in Table 2: Uncertainty Expressed

			<p>Hydrogen Revenue Support scheme (IDHRS), which will support both electrolytic ('green') and CCUS enabled methane reformation ('blue') low carbon hydrogen production. New business models for hydrogen transport and storage infrastructure by 2025, which will grow the hydrogen economy and provide security for producers of hydrogen. 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. 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</p>					<p>these policy signals. There are various significant dependencies (including funding and legislation) and external factors (including current levels of inflation) overlaying our ambitious policy programme which create further delivery risks. This means that hydrogen production is at risk of delay, which could reduce emissions savings from hydrogen use in end use sectors.</p>	<p>applying to the first electrolytic hydrogen allocation round which we will take forward to due diligence and the hydrogen projects being taken forward to negotiations under Track 1 of the CCUS Cluster Sequencing Process. We intend to launch the second electrolytic hydrogen allocation round later in 2023, and are working with industry to ensure UK supply chain opportunities and barriers are understood.</p>
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Proposals and Policies in Table 2: Uncertainty Expressed

			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 the first Hydrogen scenario line 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 10 GW 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 34 GW 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	0	-0.011	-0.361	CB5	Uncertain delivery risk - Funding is subject to a future spending decisions so therefore cannot be confirmed now, creating inevitable uncertainty ; aspects of the policy have yet to be consulted on; the policy relies on passing the Energy Security Bill and additional research to inform further policy development.. The hydrogen production group of policies (NZHF, IDHRS and future levy, T&S, LCHS and certification) and reaction to date from industry to them, along with the known pipeline of UK hydrogen production projects, provides confidence that HMG is moving in the right direction to meet our 10GW ambition. However, the UK is still at a near zero base of low carbon hydrogen	Delivering the projected savings is dependent on exchequer and levy funding for IDRHS and delivering legislation for the hydrogen production business models, and transport and storage business models. HPBM payments for projects awarded contracts through HAR1 will be funded by government until the hydrogen levy comes into effect, and securing this and the HPBM and T&S legislation will keep us on track to deliver carbon savings. Barriers to hydrogen fuel switching are being identified and addressed across sectors. Regulation and carbon pricing will prompt sectors to explore hydrogen use and funding for innovation and trials are helping develop nascent technologies necessary to unlock this

Proposals and Policies in Table 2: Uncertainty Expressed

			<p>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, as a replacement to high-carbon fuels. £240m Net Zero Hydrogen Fund (capital funding) Hydrogen Production Business Model (funded via the Industrial Decarbonisation and Hydrogen Revenue Support Scheme) Industrial Decarbonisation and Hydrogen Revenue Support scheme (IDHRS), which will support both electrolytic ('green') and CCUS enabled methane reformation ('blue') low carbon hydrogen production. 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</p>					<p>production. To deliver our ambition, we will require considerable support via IDHRS (i.e. initial exchequer and then future levy spend). The dependency of the HPBM levy and T&S BMs on HMG funding and legislation is a significant risk. We are developing policies to support multiple off-takers of hydrogen, including the potential for blending as a demand sink, but there remains significant uncertainty from investors and industry to these policy signals. There are various significant dependencies (including funding and legislation) and external factors (including current levels of inflation) overlaying our ambitious policy programme which create further delivery risks. This means that hydrogen production is at risk of delay, which could reduce emissions savings from hydrogen use in end use sectors.</p>	<p>demand. The HPBM also requires production facilities seeking support to locate and agree offtake with demand partners, incentivising the market for hydrogen to form without heavy government intervention. Decisions intended to be announced in the Net Zero Growth Plan and Energy Security Plan will help mitigate this risk by giving industry greater certainty over timing and extent of funding. These actions include publishing the shortlist of projects applying to the first electrolytic hydrogen allocation round which we will take forward to due diligence and the hydrogen projects being taken forward to negotiations under Track 1 of the CCUS Cluster Sequencing Process. We intend to launch the second electrolytic hydrogen allocation round later in 2023, and are working with industry to ensure UK supply chain opportunities and barriers are understood.</p>
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Proposals and Policies in Table 2: Uncertainty Expressed

			<p>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. Please refer to the note on the first Hydrogen scenario line for an explanation of our modelling in this sector.</p>						
66	Industry	Industrial Carbon Capture Business Models for the additional carbon capture of industrial emissions needed to achieve 6 MtCO ₂ 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 MtCO ₂ p.a. in	0	3	5.1	Mid CB5	This policy includes CCS deployment through Track-2 and Track-1 expansion. Uncertain delivery risk due to the early stage of policy development. Funding mechanism is in place but quantum unconfirmed as	We will be launching Track-2 of the CCUS Programme to identify at least two additional stores.

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			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.					subject to future spending reviews.	
67	Industry	Industrial Carbon Capture Business Models for the additional carbon capture of industrial emissions needed to achieve 10 MtCO ₂ p.a. in total by 2035	Business model for Industrial Carbon Capture (ICC) support needed to achieve 10 MtCO ₂ p.a. in total by 2035. This includes the ambition to capture and store 9MtCO ₂ pa of industrial emissions by 2035, as set out in the Net Zero Strategy. It is anticipated that an additional 1MtCO ₂ pa 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	0	0.3	3.6	Mid CB5	Uncertain delivery risk due to the early stage of policy development. This policy includes current CCUS ambition (Track 1, Track-1 expansion and Track 2). These savings go beyond existing policy. Key risks include lack of route for deployment and lack of appraised storage capacity.	Emissions saving partially deliverable via existing Track 1, Track 1 expansion and Track 2 programmes, and there is sufficient time to develop the policy framework to enable CCUS delivery to these estimates. Emissions savings deliverable provided a clear signal to the sector of the need for strategic investment in the CCUS project pipeline, including a clear vision for longer term delivery past Track 2. Mitigations include: Deliver Project BOOST, a project commissioned by DESNZ

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			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.						to develop the geospatial data needed to make data driven decisions on CO2 storage and marine spatial planning; and, ensure that funding is available to deliver the programme of work.
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 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	1	2.5	4.5	End CB4	We are <u>uncertain about the delivery of this policy and associated carbon dioxide savings</u> due to the early stage of policy development. The policy requires additional evidence on emissions saving potential and consultation with stakeholders on emissions savings options.	We have announced that we are accepting the Skidmore recommendation to develop a strategy to decarbonise NRMM, with work starting in 2023. Risks are mitigated by this, as we will ensure that research is underway on possible decarbonisation options for different types of NRMM and we plan to publish a Call for Evidence in Autumn 2023.

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			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.	0.1 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	2.3 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	7.6 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	2025-2027	<u>Uncertain delivery risk</u> , this policy includes both electrification and hydrogen fuel switching options that are at exploratory stage. Action is required now, and mitigations are in place, however there is a <u>large amount of uncertainty</u> due to: a. Funding is subject to a future spending review round and therefore cannot be confirmed now, creating <u>inevitable uncertainty</u> . The policy has yet to be consulted on. The policy uses a technology that is nascent, creating <u>inherent uncertainties</u> and risk The policy relies on another part of the NZ system/another NZ policy that is also not completed (Grid improvements to meet electrification and Hydrogen demand is inherently linked to availability of hydrogen supply) The policy requires additional research to provide greater clarity on savings potential and to inform	There are mitigating actions in place, such as: gas and electricity price rebalancing workstreams; the implementation of the hydrogen production business model and awarding of the Net Zero Hydrogen Fund; the design of H2 transport and storage business models; and the continued capital funding for fuel switching projects through the Industrial Energy Transformation Fund. These agreed actions, being taken forward during 2023 and beyond, are expected to derisk both the electrification and hydrogen fuel switching options.

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								further policy development.	
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	0.1 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	2.3 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	7.6 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	2025-2027	Uncertain delivery risk , this policy includes both electrification and hydrogen fuel switching options that are at exploratory stage. Action is required now, and mitigations are in place, however there is a large amount of uncertainty due to: Funding is subject to a future spending review round and therefore cannot be confirmed now, creating inevitable uncertainty . The policy has yet to be consulted on. The policy uses a technology that is nascent, creating inherent uncertainties and risk The policy relies on another part of the NZ system/another NZ policy that is also not completed (Grid improvements to meet electrification and Hydrogen demand is inherently linked to availability of hydrogen supply) The policy requires additional research to provide greater clarity on savings potential and to inform further policy development.	There are mitigating actions in place, such as: gas and electricity price rebalancing workstreams; the implementation of the hydrogen production business model and awarding of the Net Zero Hydrogen Fund; the design of H2 transport and storage business models; and the continued capital funding for fuel switching projects through the Industrial Energy Transformation Fund. These agreed actions, being taken forward during 2023 and beyond, are expected to derisk both the electrification and hydrogen fuel switching options.

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			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.						
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 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.	1.2	5.6	7	2025-2027	Uncertain delivery risk. The emissions savings attributed to Resource Efficiency have been modelled using a top down approach that uses a high ambition scenario, in line with the figures used in the Climate Change Committee's sixth carbon budget report. Further work is required to test and validate the feasibility of this emissions saving pathway with industry, and to develop a bottom up assessment of the policy measures that could deliver the full scale of savings. Barriers to delivery are largely understood, and remaining uncertainty is linked to: Evidence gaps on the total and sector level emissions saving potential from RE measures and how this might be impacted by	Partial mitigating actions have been agreed, such as undertaking a research project to improve the robustness of modelled emissions savings. The research will improve our understanding of private sector action to deliver RE measures, barriers and areas for potential government intervention. Subject to securing resource and funding, we will devise an action plan to improve our delivery confidence and support the development of a bottom-up assessment of emissions saving potential from planned/implemented RE policies.

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								other decarbonisation and energy efficiency plans. Dependency on securing resources and investment to support RE measures through future spending reviews. Our delivery confidence is therefore weakest for the RE emissions savings that are due to be delivered in the mid-2020s.	
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	Uncertain delivery risk. This policy is in an early stage of development however action is required as soon as possible to ensure that future policy savings can be achieved. Barriers to delivery are understood to some extent and appropriate actions are being developed but funding yet to be agreed.	Work underway to develop and agree mitigating actions.
78	Industry	Phasing-e Out Fossil Fuels in Off Gas Grid Industrial Buildings	The Government consulted on proposals in late 2021 and will publish the	0.006	0.08	0.2	Late CB4 subject to	There are uncertainties that need managing around timescales, further	Policy is deliverable but will require political support and may also

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			Government response in due course.				consultation response	developing of options for properties currently not suitable for heat pumps and number of buildings impacted.	require additional financial support to support certain tranche of the non-domestic consumers affected by the regs (e.g SMEs). Further work to define properties currently not suitable for heat pumps will help define the scope more tightly making them easier to deliver. This is expected ahead of the second consultation in 2024. The Non- Domestic Building Survey will help build the evidence base to enable better design of the policy.
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 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	0	0.2	0.2	2029	This policy is at very early concept stage. Currently no resourcing allocated for this policy development due to reprioritisation. Savings coming from a variety of different scenarios based on the possible pathways for on-gas heat decarbonisation, so increased uncertainty due to different possible future pathways.	Policy not due until later in the decade so can still be delivered when resourced at a later date. Strategic decision on hydrogen heat pathway in 2026 will enable clarity on most likely scenario.

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			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	0	0.2	0.8	2030	The policy is at very early concept stage and requires further appraisal of options. There is uncertainty reflecting that the hydrogen scenario is subject to strategic heat policy decisions using the evidence acquired by the Programme in 2026.	Uncertainty is inevitable pending strategic policy decisions in 2026, further appraisal of options will follow in due course. The high/mid hydrogen scenario provides alternative decarbonisation scenario should we conclude

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			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.						high/mid hydrogen heat deployment.
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	0	0.1	0.7	2030	The policy is at very early concept stage and requires further appraisal of options. There is uncertainty reflecting that the hydrogen scenario is subject to strategic heat policy decisions using the evidence acquired by the Programme in 2026.	Uncertainty is inevitable pending strategic policy decisions in 2026. The high electrification scenario provides alternative decarbonisation scenario should we conclude lower/no hydrogen heat deployment.

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			mechanisms to deliver a more extensive rollout of hydrogen for heat than in a medium hydrogen scenario.						
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 B8 (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	0.1	0.7	2030	The policy is at very early concept stage and requires further appraisal of options. There is uncertainty reflecting that the hydrogen scenario is subject to strategic heat policy decisions using the evidence acquired by the Programme in 2026.	Uncertainty is inevitable pending strategic policy decisions in 2026. The high electrification scenario provides alternative decarbonisation scenario should we conclude lower/no hydrogen heat deployment.
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	0.012	0.081	0.1	Late CB4 subject to consultation response	There are uncertainties that need managing around timescales, further developing of options for	Policy is deliverable but will require political support and may also require additional

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			Government response in due course.					properties currently not suitable for heat pumps and number of buildings impacted.	financial support to support certain tranche of the non-domestic consumers affected by the regs (e.g SMEs). Further work to define properties currently not suitable for heat pumps will help define the scope more tightly making them easier to deliver. This is expected ahead of the second consultation in 2024. The Non- Domestic Building Survey will help build the evidence base to enable better design of the policy.
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	0	0.4	0.4	2028	This policy is at very early concept stage. Currently no resourcing allocated for this policy development due to reprioritisation. Savings coming from a variety of different scenarios based on the possible pathways for on-gas heat decarbonisation, so increased uncertainty due to different possible future pathways.	Policy not due until later in the decade so can still be delivered should resourcing be allocated to it at a later date. Strategic decision on hydrogen heat pathway in 2026 will enable clarity on most likely scenario. Further appraisal of options is underway as part of the Hy4Heat programme.

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			<p>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.</p>						
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-	0	0.4	2	2030	The policy is at very early concept stage and requires further appraisal of options. There is uncertainty reflecting that the hydrogen scenario is subject to strategic heat policy decisions using the evidence acquired by the Programme in 2026.	Uncertainty is inevitable pending strategic policy decisions in 2026. The high/mid hydrogen scenario provides alternative decarbonisation scenario should we conclude high/mid hydrogen heat deployment. Further appraisal of options is

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			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.						underway as part of the Hy4Heat programme.
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	0	0.4	1.8	2030	The policy is at very early concept stage and requires further appraisal of options. There is uncertainty reflecting that the hydrogen scenario is subject to strategic heat policy decisions using the evidence acquired by the Programme in 2026.	Uncertainty is inevitable pending strategic policy decisions in 2026. The high electrification scenario provides alternative decarbonisation scenario should we conclude lower/no hydrogen heat deployment. Further appraisal of options is underway as part of the Hy4Heat programme.

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			hydrogen for heat than in a medium hydrogen scenario.						
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 high electrification scenario (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	0.4	1.8	2030	The policy is at very early concept stage and requires further appraisal of options. There is uncertainty reflecting that the hydrogen scenario is subject to strategic heat policy decisions using the evidence acquired by the Programme in 2026.	Uncertainty is inevitable pending strategic policy decisions in 2026. The high electrification scenario provides alternative decarbonisation scenario should we conclude lower/no hydrogen heat deployment. Further appraisal of options is underway as part of the Hy4Heat programme.
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	0.07	0.3	0.3	2025	Planning for Wave 3 has begun and will take place over the course of 2023, however planning is at an early stage so there are	Intention is for Wave 3 to launch before the end of Wave 2 to ensure that delivery overlaps over projects. Intention will be

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			warmer and more energy-efficient homes, reducing carbon emissions and bills, and tackling fuel poverty as well as supporting green jobs.					inevitable uncertainties about the specifications. These risks require attention, however appear resolvable based on the actions already underway.	to ensure that there is a clear policy and delivery design to inform future spending reviews.
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	0.3	0.8	Early CB5	Policy is at an early stage of development. Policy delivery is subject to developing our evidence base, detailed design work and consultation. Delivery and level of carbon savings are therefore subject to uncertainty .	We are currently working to develop our evidence base to inform policy design. We expect to set out more details later this year.
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.	0.01	0.5	0.8	2026	Policy is at an early stage of development. Policy delivery is subject to developing our evidence base, detailed design work and consultation. Delivery and level of carbon savings are therefore subject to uncertainty .	We are currently working to develop our evidence base to inform policy design. We expect to set out more details later this year.
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. Convert 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	0	0.7	9	2030	The use of hydrogen for heat is not yet a fully established technology. There is uncertainty on the carbon savings associated with hydrogen heating policy until evidence has been assessed and strategic policy decisions made in 2026. Uncertainty reflects that any deployment of hydrogen for heating is	The government is working with industry and regulators to support a range of research, development and testing projects, including pioneering hydrogen heating consumer trials. This work will determine the feasibility, costs and convenience of using hydrogen as an alternative to natural gas

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			incumbent technology of natural gas for heating to deliver carbon savings.					subject to the strategic decisions in 2026.	for heating, to allow strategic decisions in 2026 on the role of hydrogen heating. The high electrification scenario provides alternative decarbonisation scenario should we conclude no hydrogen heat deployment.
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	0.5	5	2030	The use of hydrogen for heat is not yet a fully established technology. There is uncertainty on the carbon savings associated with hydrogen heating policy until evidence has been assessed and strategic policy decisions made in 2026. Uncertainty reflects that any deployment of hydrogen for heating is subject to the strategic decisions in 2026.	The government is working with industry and regulators to support a range of research, development and testing projects, including pioneering hydrogen heating consumer trials. This work will determine the feasibility, costs and convenience of using hydrogen as an alternative to natural gas for heating, to allow strategic decisions in 2026 on the role of hydrogen heating. The high electrification scenario provides alternative decarbonisation scenario should we conclude no hydrogen heat deployment.
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	0	2.6	3.6	CB5	The proposal is at the earliest stage of conception and requires further appraisal of options. As a result there	Uncertainty is inevitable pending further policy development to explore policy options. Mitigation measures to address

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			vehicle owners to move towards cleaner vehicles faster than currently anticipated should this be required to stay on track to meet carbon budget obligations.					is uncertainty as further development of potential mechanisms to deliver the proposal is needed.	delivery risks will be explored at the same time as policy development and Ministers will ensure that reviews are carried out so that any future policy achieves its aims
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	0.5	1	CB5	The proposal is at the earliest stage of conception and requires further appraisal of options. As a result there is uncertainty as further development of potential mechanisms to deliver the proposal is needed.	Uncertainty is inevitable pending further policy development to explore policy options. Mitigation measures to address delivery risks will be explored at the same time as policy development and Ministers will ensure that reviews are carried out so that any future policy achieves its aims
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	0	0.5	0.7	CB5	The proposal is at the earliest stage of conception and requires further appraisal of options. As a result there is uncertainty as further development of potential mechanisms to deliver the proposal is needed.	Uncertainty is inevitable pending further policy development to explore policy options. Mitigation measures to address delivery risks will be explored at the same time as policy development and Ministers will ensure

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			miles travelled, should this be required to stay on track to meet carbon budget obligations						that reviews are carried out so that any future policy achieves its aims
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	1.1	1.5	CB5	The proposal is at the earliest stage of conception and requires further appraisal of options. As a result there is uncertainty as further development of potential mechanisms to deliver the proposal is needed.	Uncertainty is inevitable pending further policy development to explore policy options. Mitigation measures to address delivery risks will be explored at the same time as policy development and Ministers will ensure that reviews are carried out so that any future policy achieves its aims
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	The proposal is at the earliest stage of conception and requires further appraisal of options. As a result there is uncertainty as further development of potential mechanisms to deliver the proposal is needed.	Uncertainty is inevitable pending further policy development to explore policy options. Mitigation measures to address delivery risks will be explored at the same time as policy development and Ministers will ensure that reviews are carried out so that any future policy achieves its aims
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	0.02	0.3	3	2022	Delivery is dependent on successful implementation of regulation and demonstration of technologies. There is still uncertainty around which technologies should be pursued. Evidence gaps in relation to maritime	Funding schemes under UK SHORE will support essential R&D, including competitions such as the Clean Maritime Demonstration Competition and the Zero Emission Vessels and Infrastructure competition. DfT will

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			<p>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 (ZEVl) competition.</p>					<p>emissions and decarbonisation solutions will need to be closed.</p>	<p>publish the refreshed Clean Maritime Plan in 2023, supporting policy development and mitigating potential risks. DfT is working with analytical experts, industry, academic stakeholders, and the wider science and technology community to identify and fill evidence gaps. This is alongside the commissioning of high-quality research.</p>
149	Agriculture and LULUCF	Increase feed analysis and use of precision feeding to not exceed animal requirements.	<p>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 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</p>	0.00186	0.0102	0.02815	2022	<p><u>Uncertain delivery risk.</u> The policy requires further appraisal of options and uses a technology that is nascent, creating inherent <u>uncertainties</u> and risk. Savings will remain <u>uncertain</u> until innovation / R&D is complete. Innovation will need to provide evidence that increases confidence in technical feasibility.</p>	<p>All measures would need sufficient R&D investment through the Farming Innovation. Programme or other means. Delivery levers will need to be identified to ensure necessary levels of uptake.</p>

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			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	0.9	1.6	1.6	2022	Uncertain delivery risk. The policy uses a technology that is nascent, creating inherent uncertainties and risk and policy requires further appraisal of options.	Next steps are to maximise outputs from the Call for evidence which closed in November 2022. Analysis of call for evidence responses will help identify options to mitigate risks and overcome barriers, and inform next steps through wider policy development throughout 2023. Defra officials are reviewing options to deliver this policy, including through regulatory intervention, voluntary industry led schemes, and incentives.

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			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 suppressing feed products.						
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	0.01117	0.04487	0.1	2022	Uncertain delivery risk. The policy requires further appraisal of options. Delivery vehicle needed.	Competitions in the Farming Innovation Programme are developing this technology and equipment. The measure is ready for further rollout. A subsequent delivery vehicle is to be identified in discussion with industry.

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			expected to support that uptake.						
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	Uncertain delivery risk. The policy requires additional research to provide greater clarity on savings potential and to inform further policy development.	Further evidence required could be explored in the Farming Innovation Fund. Farmers are currently able to apply for grants through the Improving Farm productivity theme of the farming transformation fund (e.g., Improve farm productivity using robotic or autonomous equipment & systems to aid crop and livestock production).
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 dairy/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	Uncertain delivery risk. The policy requires additional research to provide greater clarity on savings potential and to inform further policy development. The policy requires further appraisal of options - an approach to incentivising the measure will need to be identified, unless market forces are sufficient to drive action at the scale required.	A proportion of the sector is willing to make these changes. There are two main streams of work: (1) engage with the dairy and beef sectors and breeding societies to gauge appetite and technical suitability of breeds and (2) assess the role of markets (Industry has started to trial this). Defra are looking to commission a research project to better define this action. We will consider policy solutions, working with sector policy teams to understand the role of the market and supply chain commitments in influencing uptake of this measure, and to be better informed by the

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									conclusions of the research.
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 (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.	0.02945	0.1	0.3	2022	<u>Unclear how much further could go in different policy scenarios.</u> These risks require attention, however they appear resolvable based on the actions already underway.	The Animal Health and Welfare team are undertaking a further evidence review of improving animal health to understand if and how much further we could potentially go in terms of carbon savings under different policy scenarios. Through our monitoring and evaluation programme we can track who is doing the action and where. We can then combine this with our environmental impact modelling to track live trajectories.
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,	0.00591	0.0226	0.06066	2022	<u>Unclear how much further could go in different policy scenarios.</u> These risks require attention, however appear resolvable based on the actions already underway.	The Animal Health and Welfare team are undertaking further evidence review of improving animal health to understand if and how much further we could potentially go in terms of carbon savings under different policy scenarios. Same for all ELM actions - we have uptake forecasting and environmental impact modelling prior to release, and through our monitoring and evaluation programme

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			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.						can track who is doing the action and where, which we can combine with our environmental impact modelling to track live trajectories.
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 (N ₂ O). 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	Delivery risk uncertain. Requires further analysis of actions under SFI to help deliver this.	Identify whether the actions encouraged under the SFI (particularly advisor visits) will partly mitigate delivery risks.
163	Agriculture and LULUCF	Improved farm fuel and energy efficiency.	Support reductions in farm non- traded carbon dioxide (CO ₂) emissions from motive power, pumps and drives. Actions include, amongst others, the use of minimum till, which can cultivate the	0.1	0.3	0.6	2022	Uncertain delivery risk. The policy requires further appraisal of options. Future work needed to consider existing roll out of technologies and the steps required to deliver	Competitions in FIP are developing this technology and equipment. Next steps will involve monitoring what is coming out of FIP, and what is being paid for

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			land using mechanical measures other than ploughing to reduce soil disturbance, and the use of no till, which uses direct drilling methods 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.					additional savings in this area.	under FIF, and also to build a more detailed picture with a view to developing a list of specific measures (e.g., efficiency in fuel use and farm buildings energy efficiency, energy saving technologies), and consider future delivery vehicles. A DESNZ led call for evidence on Non-Road Mobile Machinery (NRMM) is currently planned for 2023. This would aim to identify possible savings opportunities for agricultural machinery for through fuel switching and technological improvement.
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 through livestock urine and subsequent emissions to the environment. Government is considering the role in, and options for encouraging the reseeded of temporary pasture/ forage crops with high sugar grass varieties.	0.00337	0.01856	0.05139	2022	Uncertain delivery risk. The policy requires further appraisal of options. While it is not possible to monitor/verify whether these are being used (they do not look different from other varieties), it is possible that we could pay towards the cost of seed and that advice provided under SFI may encourage farmers to take up this measure.	Next steps are to explore options for paying for higher sugar grasses and establish what we would/could pay for.
169	Agriculture and LULUCF	Improving/renovating land drainage on	Produce guidance on improving and renovating	0.00108	0.00447	0.01473	2022	Uncertain delivery risk. The policy relies on	We need to confirm the extent to which we

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		mineral soils (where drainage is poor).	current land drainage (where drainage is poor) to improve crop yield and reduce Nitrous oxide (N2O) emissions.					further appraisal of options.	expect the small total savings of this measure to be covered by other ELM actions helping with soil drainage. We need to explore how industry/market may encourage this.
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.	0.018	0.05	0.092	2022	Uncertain delivery risk. The policy requires additional research to provide greater clarity on savings potential and to inform further policy development. We will closely monitor the uptake of ELM schemes to ensure there is enough uptake for delivery..	Defra will encourage and support increased hedgerows through our ELM schemes. We are working with Sustainable Farming Incentive pilot participants to gather learning from the pilots and are incorporating this feedback into the development of the live version of the Hedgerow Standard and its supporting capital items, which are due to be rolled out into the scheme in 2023.SFI is unlikely to deliver the savings alone but together with CS options it is likely to (for example BN11: planting new hedge, BN5: Hedgerow laying, BN7: hedgerow gapping up).
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	0	0.014	0.088	2029	Uncertain delivery risk. The policy requires additional research to provide greater clarity on savings potential and to inform further policy development. Agroforestry will mainly	Develop strong comms and guidance services on agroforestry systems. Closely monitor uptake of ELM schemes.

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			this will not be confirmed until nearer the date. These measures will increase carbon storage and sequestration.					be delivered through ELM and is dependent on voluntary uptake of schemes. Data will be limited until the rollout of the agroforestry standard.	
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	2026	Uncertain delivery risk. The policy requires further appraisal of options. Other: Underpinning this measure is confidence in the end market for these products and need to maximise proportion of feedstock destined for technologies with CCUS. Decision needed on vehicle for incentivising uptake.	To increase delivery confidence, we need to: Facilitate ministerial decisions on the specific elements within this pathway, including integration with wider land use requirements, species mix, cultivation standards. Continue working closely across government and with key stakeholders to understand the viable and sustainable business models and end market for biomass crops, maximising the proportion destined for technologies with CCUS. Alongside this end market economic modelling, rapid work to understand barriers to land use and behaviour change, what further delivery mechanisms may be needed to support or incentivise growers. The Skidmore review called for the publication of a Biomass Strategy, and government has committed to do this.

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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 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	0.2	0.8	1.4	2025	<p><u>Uncertain delivery risk.</u> The policy requires additional research to provide greater clarity on savings potential and to inform further policy development. Restoration delivered via ELM schemes post 2025 will require landowners to voluntarily put land forward for restoration.</p>	We are exploring different options for private finance, including the peatland carbon code. We will develop understanding of the feasibility of changes to landscape- scale water level management, which will enable more expansive lowland restoration, through a large-scale R&D programme rolling out of water landscape infrastructure (water storage and water level management) awaiting procurement. The sector capacity and skills work mentioned in the cell above will be important for long term delivery, as well as the development and publication of our Peatland Restoration Roadmap (2024).
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Proposals and Policies in Table 2: Uncertainty Expressed

			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).	0.036	0.2	0.2	2025	<u>Uncertain delivery risk.</u> The policy requires additional research to provide greater clarity on savings potential and to inform further policy development. Technical feasibility of restoration and sustainable management activities is unclear.	The updated Peatland Restoration Roadmap (2024) and other R&D projects will develop a foundation for next steps in policy development. .
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	These sectors are devolved and therefore <u>delivery risks are uncertain.</u>	In preparing this report, the DAs have provided information on the policies and proposals they expect to implement to reduce emissions in these sectors. These include tree planting, peatland restoration and various agriculture measures. Information is published in Net Zero Wales, the Green Growth Strategy for Northern Ireland and Scotland's Climate Change Plan update. These sectors are largely devolved and also given the UK's land use profile, a significant proportion of UK-wide emissions reductions savings will be delivered by Devolved Administrations (DAs). Whilst DAs have been

Proposals and Policies in Table 2: Uncertainty Expressed

									addressing common challenges and sharing best practice to mitigate delivery risks, recognising devolved competence.
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 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	0.4	2	3	2023-2028	Uncertain delivery risk. Many actions are dependent on external stakeholders. For example, waste policies such as the consistent collections of recycling are dependent upon successful, timely implementation of the reforms by businesses and local authorities and response from households.	Distribute the £295m capital funding in 23/24 and £60mil of resource transition funding in 23/24 for weekly household separate food waste collections, and maintain wider waste budgets for collection, packaging, and recycling reforms. Work with local authorities and the non-household municipal sector to ensure that they can achieve compliance by the implementation dates as agreed with Defra Secretary of State. These dates will be included within legislation. NB some local authorities may need transitional arrangements past the legislative implementation date due to being tied into long-term contracts. Defra are exploring potential transitional arrangements and the latest analysis suggests the impact on carbon savings would be within the uncertainty bounds of the modelling regardless.

Proposals and Policies in Table 2: Uncertainty Expressed

			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	Uncertain delivery risk. We know that the near elimination of biodegradable waste to landfill is a desirable environmental outcome and will develop policy in this vein. At this time however we do not have confidence in the data and numbers to quantify the proportion of material in mixed wastes that is biodegradable. As a result we do not yet have detailed policies to take forwards that will achieve the near elimination of biodegradable waste, although are exploring options and intend to implement policies in advance of 2028 so as to meet the commitment for near elimination from 2028 – and sooner if possible. We are delivering research which supports this aim.	Enhanced waste composition data will allow us to both model potential savings and take a targeted approach to deliver on the near elimination of biodegradable waste to landfill. We aim to begin addressing this through launching a call for evidence (intended to launch March 2023 subject to Ministerial approval). We have policy ideas that can work on, but these will be enhanced and we will have greater confidence in their likely success following the call for evidence. Ministers will also soon be deciding next steps for textiles.
184	Waste and F- gases	Monitoring emissions from wastewater treatment and subsequent optimisation of existing operations to	Work with water compaies to encourage the widespread deployment of new sensors for the detection of emissions from a full range of sites,	0.0168	0.1	0.3	2026	Uncertain delivery risks. Delivery is dependent on water company action. Water companies will need to invest in new wastewater treatment	To do this we need further research and the development of techniques to monitor GHG emissions. The Water Industry holds

Proposals and Policies in Table 2: Uncertainty Expressed

		minimise process and other emissions.	treatment stages and environmental conditions to enable optimisation of current processes to reduce greenhouse gas leakage and minimise production.					processes, which would require pilots and investment by water companies to upgrade treatment facilities and processes. investment would be contingent on price review outcomes.	responsibility to drive this through existing industry tools and processes such as the WINEP, UKWIR and opportunities from regulator driven funding mechanisms such as the Ofwat Innovation Fund and progress is being made in this area. In addition, the PR24 guidance contains Water Companies Performance Commitments and a Net Zero Challenge fund to support and incentivise delivery.
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 assessments setting out options to improve estimates of greenhouse gas emissions from industrial wastewater treatment.	0.0672	0.0672	0.0672	2037	We have high certainty in the delivery of this policy. This work is currently underway <u>but the level of reduction that will be delivered is less certain.</u>	We have high delivery confidence in this policy and the programme of work is currently underway.
190	Waste and F- gases	UK-level estimates of future carbon savings – waste, wastewater, and F- gases	Modelling for UK-wide consistency for the waste, wastewater and F-gas sectors	0.1	0.5	0.8	CB4	These sectors are devolved and therefore <u>delivery risks are uncertain.</u>	In preparing this report, the DAs have provided information on the policies and proposals they expect to implement to reduce emissions in these sectors. These include various waste measures, including decreasing waste and increasing recycling.

Proposals and Policies in Table 2: Uncertainty Expressed

									<p>Information is published in Net Zero Wales, the Green Growth Strategy for Northern Ireland and Scotland's Climate Change Plan update. These sectors are largely devolved and a significant proportion of UK-wide emissions reductions savings will be delivered by Devolved Administrations (DAs). Whilst DAs have been consulted on this Carbon Budget Delivery Plan, as required by section 14(5) of the Climate Change Act 2008, DESNZ's understanding of DA-specific risks is limited. However, we understand that many of the risks to delivery of emissions savings will be common across all four Nations and, in DESNZ's experience, policies for these sectors may be subject to risks such as dependencies on stakeholders, the appropriate infrastructure being in place, evidence gaps and dependencies on early stage technologies. In DESNZ's experience the approach for typically mitigating these risks may be for the</p>
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Proposals and Policies in Table 2: Uncertainty Expressed

									relevant administration to engage with stakeholders, investment in infrastructure, and research and development. UK Government will continue to work 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.
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 MtCO ₂ /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 MtCO ₂ /year by 2035 and 75-81Mt CO ₂ /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	0.054	6.4	23.4	2027	Uncertain delivery risk- Funding for the power BECCS and the GGR business model is subject to a future spending review round and therefore cannot be confirmed now, creating inevitable uncertainty . Greenhouse removals technologies have never been deployed at scale , creating inherent uncertainties and risk The policy relies on CCS policy for Track 1 expansion and Track 2 that is also not completed The policy requires additional research and innovation in GGR technologies to provide greater clarity on savings potential and to inform further policy development.	There are outstanding decisions around GGRs business model and CCUS cluster funding which when made will substantially reduce delivery risk. March 2023: Public announcement on access CCUS Track 1 expansion and Track-2 DESNZ Engagement with HMT on power BECCS and GGR business model design and opportunities, and managing the interdependencies between CCUS programme timings and funding Legislation to enable both the power BECCS and GGR business models is required in the Energy Bill DESNZ to reduce uncertainty on

Proposals and Policies in Table 2: Uncertainty Expressed

			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.						GGR technologies through innovation funding pilot programme. Further research underway to explore potential around non-CCUS related technologies for 2030 and beyond
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Table 2 Proposals and Policies: Risk Levels Not Included

#	Sector	Policy Name	Policy description	Average Annualised Savings (MtCo2e pa)			Timescale From Which the Policy Takes Effect	Delivery risks: Explanation	Delivery risks: mitigation
				CB4	CB5	CB6			
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	Scheme is nearing conclusion. A total of three manufacturing projects have been awarded grants under this scheme as well as providing support outside of the scheme for one major port hub. Scheme is now moving into a monitoring phase as the projects begin to build out. This scheme will indirectly support emission reductions by de-risking the delivery of offshore wind capacity, including government's ambition to deliver up to 50GW of offshore wind capacity by 2030 and achieving net zero by 2050.	Continuing to look at further ways to grow the infrastructure and manufacturing base to support offshore wind deployment.
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,				Mid CB5	The OWAT concludes at the end of March 2023, alongside Tim Pick's role as Offshore Wind Industry Champion. The functions of OWAT and associated work priorities will be	Officials are working closely with the Offshore Wind Industry Council to design and reform this government/industry forum, ensuring it takes forward the priorities

Table 2 Proposals and Policies: Risk Levels Not Included

			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.					transitioned into the Offshore Wind Industry Council. However there is a risk that momentum will be lost.	and recommendations emerging from OWAT and operates effectively to drive improvements to the sector.
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				Early CB5	Delivery timescales are tight and partly dependent on Energy Bill progress through Parliament. Policy issues also remain to be resolved with Devolved Administrations. Timescales on National Policy Statement consultation also challenging . The risks require attention but they appear soluble on the basis of the actions underway.	Working closely with Defra and DLUHC on design and implementation of OWEIP measures, including on parliamentary processes. Also significant engagement on devolution issues. Working closely with colleagues in Devolved administrations on detail of Bill clauses. Working with Defra, to ensure delivery of key non-legislative elements of the OWEIP to allow projects to benefit from these

Table 2 Proposals and Policies: Risk Levels Not Included

			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.						elements in advance of full implementation.
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	The Floating Offshore Wind demo programme has been slightly affected by supply chain constraints and higher inflation. However, there is no major risk to achieve the objectives.	Regular contact with the projects to understand their needs and avoid any delays. Make sure to deliver before the end of SR.
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				Mid CB4	Policy development for consultation developed, Write Round issued and concluded with no conditions.. The policies included in the consultation will only	Reforms to improve network access are underway and officials are also continuing to work with DLUHC to explore further changes to planning

Table 2 Proposals and Policies: Risk Levels Not Included

			<p>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.</p>				<p>be efficacious if other critical blockers to the deployment of onshore wind in England are addressed, specifically in relation to planning and networks. The policies are intrinsically linked to DLUHC's open consultation on the National Planning Policy Framework, so further details on the nature of the reforms are dependent on the outcome, due to report until May/June.</p>	<p>frameworks. Taking forward this work aligns with the Net Zero Review recommendations.</p>	
13	Power	Marine Spatial Prioritisation Programme	<p>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</p>				<p>Late CB5 (assuming outputs impact offshore wind projects)</p>	<p>Risk of Departments pressing ahead with new commitments that increase pressure on the marine space and undermine future strategic management of marine-based energy deployment. Lack of strategic planning for</p>	<p>Risks and mitigations are being managed through a DEFRA-led Board with cross-Whitehall and ALB membership</p>

Table 2 Proposals and Policies: Risk Levels Not Included

			balancing this with restoring and protecting the marine environment					sea use could affect ability to meet energy security and net zero targets.	
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	This will require significant resource to deliver in the recommended timeframe. There is also a broader risk to solar deployment from possible supply chain disruption should proposed restrictions on imports linked to forced labour be implemented. If not mitigated, these risks could materially affect the successful delivery of the savings in full associated with the policy	Escalate resourcing risk, in order to deliver in the recommended timeframe. Taking forward this work aligns with the Net Zero Review recommendations.
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				Late CB4	The Power and Networks working group has met several times over the last few months and has agreed a set of 'problem statements' that the renewables sector is facing in relation to skills and workforce and	Encourage solar industry to actively participate in Power and Networks skills working group. Team will also continue to work with DBT, HMT, No 10 Office of Investment, UKIB etc to help identify any

Table 2 Proposals and Policies: Risk Levels Not Included

			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.					potential solutions. The group is developing a joint government-industry action plan, to be published by summer 2023. Some good progress by solar industry in setting up and facilitating local skills training but funding/ resources is a risk to roll out more widely across the country.	funding opportunities / other support for individual potential investors in UK supply chain on case by case basis. Once established, the new solar taskforce should prioritise work on delivering skills and supply chain capability.
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	Consultation has concluded with amendments to the National Planning Policy Framework on track for publication in the Spring. However, feedback from industry is that they see no advantage in the proposals so further work is necessary to relieve planning constraints.	Continuing to work with DLUHC on the response to the consultation. Taking forward this work aligns with the Net Zero Review recommendations.

Table 2 Proposals and Policies: Risk Levels Not Included

22	Power	Biomass Strategy	<p>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.</p>				Mid CB5	<p>Timely delivery depends on resource across government to support the development of the Strategy, the completion of the key analytical work, and rapid agreement on policy-relevant decisions on the priority uses of biomass. If not mitigated, the risk of delay could materially effect the successful delivery of the savings enabled and supported by policies within. Analysis to date for the Biomass Strategy shows that expected biomass supply (from domestic sources and imports) is lower than previously assumed during the Net Zero Strategy, potentially impacting on technologies relying on biomass from CB6 onwards to 2050. Crucial to our ability to secure enough biomass for CB6 and beyond is ensuring the UK has access to sufficient</p>	<p>Working closely with OGDs and with analysts to resolve any remaining issues and actively supporting analytical work wherever possible. Taking forward this work aligns with the Net Zero Review recommendations. The Skidmore review called for the publication of a Biomass Strategy, and government has committed to do this in 2023</p>
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Table 2 Proposals and Policies: Risk Levels Not Included

								biomass imports. We intend to present potential future biomass availability estimates in the Biomass Strategy and their impact on the net zero pathways.	
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				Around end of CB4 (see description)	CCUS: Progress is being made with a Waste Industrial Carbon Capture Contract to enable revenue support for CCUS projects in the EfW sector. However, any carbon savings from EfW CCUS projects will ultimately depend on project selection as it is not guaranteed any of the applicants will be awarded support contracts to enable CCUS build phase. These risks require attention, however appear resolvable based on the actions already underway.	CCUS: Mitigations include: Progressing the primary legislation via the Energy Bill as well as continuing to hit key milestones for capital support via CCS Infrastructure Fund and ongoing revenue support via IDHRS and business models, as well as progressing negotiations with shortlisted projects, will progress policy development and improve certainty in emissions savings; Work with HMT and the IPA to clear the Track 1 Negotiations Mandate; and, Deliver a detailed programme schedule covering all deliverables to support realistic delivery timeline assessment.

Table 2 Proposals and Policies: Risk Levels Not Included

			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						Taking forward EfW with CCUS would align with the Net Zero Review recommendations. See line 2 of Table 3 for the overall assessment of the ETS programme consultation response for risks and mitigations
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				Live	Following the successful HMG investment in the project in Nov 22, we are now seeking to secure additional development funding to mature the Project pre-construction, and	We are working closely with HMT, EDF and advisors to develop an achievable and value for money capital structure. We are escalating across Whitehall as

Table 2 Proposals and Policies: Risk Levels Not Included

			<p>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.</p>					<p>sufficient financing to take FID. This will be done through a capital raise, intended to begin in Q2 of 2023. The size of the capital raise, the balance sheet treatment of the Project, and the VfM of risk transfer to the private sector means that HMG are seeking steers from the Chx on the Project’s capital structure – getting a clear decision made is key to maintaining the critical path to FID. In parallel, the Project continues to mature its leadership, resource and capabilities, and approach to commercials, to be able to engage credibly with private investors. Aside from decisions on capital structure, the majority of the HMG policy enablers are in place, with the finalisation of the project’s generation licence, Funded Decommissioning</p>	<p>appropriate to drive decision-making, and scenario- planning for the Project’s capital raise to move forward quickly once we have clarity.</p>
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Table 2 Proposals and Policies: Risk Levels Not Included

								Programme and subsidy control obligations still outstanding. These risks require attention, however appear resolvable once there is clarity on capital structure and capital raise strategy.	
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				RAB projects are targeted to begin contributing to the energy systemMid-Late CB6, subject to all project-specific approvals	Sizewell C is at a critical point. Following the successful HMG investment in the project in Nov 22, we are now seeking to secure additional development funding to mature the Project pre-construction, and sufficient financing to take FID. This will be done through a capital raise, intended to begin in Q2 of 2023. The size of the capital raise, the balance sheet treatment of the Project, and the VfM of risk transfer to the private sector means that HMG are seeking steers from the Chx on the Project's capital structure – getting a clear decision made is	We are working closely with HMT, EDF and advisors to develop an achievable and value for money capital structure. We are escalating across WH as appropriate to drive decision-making, and scenario- planning for the Project's capital raise to move forward quickly once we have clarity.

Table 2 Proposals and Policies: Risk Levels Not Included

			<p>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.</p>					<p>key to maintaining the critical path to FID. In parallel, the Project continues to mature its leadership, resource and capabilities, and approach to commercials, to be able to engage credibly with private investors. Aside from decisions on capital structure, the majority of the HMG policy enablers are in place, with the finalisation of the project's generation licence, Funded Decommissioning Programme and subsidy control obligations still outstanding. These risks require attention, however appear resolvable once there is clarity on capital structure and capital raise strategy.</p>	
32	Power	Advanced Nuclear Fund	<p>The Government has committed to spend up to £385 million to invest in the next generation of nuclear technologies. This includes up to £215 million for Small Modular</p>				<p>Mid-CB5 depending on policy development and commercial outcomes</p>	<p>Rolls Royce SMR have publicly stated that they will need to slow down work whilst they evaluate their confidence in a trajectory to FOAK. This</p>	<p>Continuing to work with RR SMR and our delivery partner UKRI to understand impacts and mitigate risks. Developing contingency plans in case of AMR</p>

Table 2 Proposals and Policies: Risk Levels Not Included

			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 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					could impact upon the timeline and scope of their work. AMR competition is ongoing, with assessment of bids planned for April. If there insufficient high quality bids, the programme may not award all of the funding.	programme not having sufficient successful bids.
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,				Mid-CB6 assuming value for money, and all relevant approvals	The department are currently evaluating applications and will publish information on the shortlist of applications progressing to stage 3 of the fund in due course. Grant awards will be subject to internal government assurance and approval processes and due	FNEF project on final stretch to release funding by spring target, Resources aligned to maximise the opportunity to achieve this outcome.

Table 2 Proposals and Policies: Risk Levels Not Included

			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.					diligence. Commencement of work packages is expected in Spring 2023 (indicative). There is a risk of delay of the launch of FNEF funded projects beyond spring. A delay could reduce the time available for FNEF funded projects to utilise the funding to optimum effect - with potential impact to delivery of the FNEF Project objectives/benefits.	
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				2024	The policy has yet to be consulted on to ensure the grid isn't a limiting factor. However, these risks appear resolvable based on strategic planning exercises (e.g. Holistic Network Design) but delivery is dependent on ability to implement reforms necessary to accelerate grid development.	We have confidence that these risks will be mitigated via the National Policy Statement consultation, aligned with DLUHC announcements on National Significant Infrastructure Project reform. This will underpin further planning reforms being delivered under the Energy Bill and Levelling Up and Regeneration Bill and assist with acceleration of offshore wind and

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			will enable the deployment of these low carbon technologies, which would be expected to lead to carbon emissions savings.						networks deployment. Taking forward this work aligns with the Net Zero Review recommendations.
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	There have been some delays in the applications process and there is risk of further delay. While it is likely we will meet the ambition of at least 18 GW interconnection capacity by 2030, there is not yet full confidence in the pipeline of projects as Ofgem is still considering applications to its third window and several projects are still seeking regulatory approval in neighbouring countries. This risk requires attention however appears resolvable based on the actions already underway	We have confidence that these risks will be mitigated via working closely with Ofgem to ensure that DESNZ can provide support and communicate with developers as appropriate to maintain confidence in the pipeline of projects.
38	Power	Offshore Transmission Network Review	The review looks into the way that the offshore transmission network is designed and delivered,				Mid CB5	Challenges include Developer coordination in East Anglia which is voluntary; consenting is	We have confidence that these risks will be mitigated including through strong

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			<p>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.</p>					<p>complex; and challenging timescales on key publications. These risks require attention however appear resolvable based on the actions already underway.</p>	<p>engagement in East Anglia. The Future Frameworks and a supporting Governance structure is being devised to address barriers to deployment and facilitate early planning of network infrastructure and streamline processes to ensure infrastructure is brought forward in a coordinated way. The Energy Bill is continuing its passage through parliament including progression through Report Stage in the House of Lords in February. And the OTNR operates a robust governance process with a clear Board structure, regular workstream planning and milestone re-baselining as well as regular workstream risk and mitigation reviews.</p>
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			It will also reduce the local and environmental impacts of transmission through an increase in coordinated infrastructure.						
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	This is part of the Energy Bill, which is continuing its stages through Parliament.	Working with Bill team and external stakeholders to understand potential challenges to Bill's progress and develop mitigations e.g. responses to potential amendments.
46	Power	Fast-track System for Nationally Significant Infrastructure	DLUHC are designing a fast-track system for Nationally Significant Infrastructure Projects				StartLate 2023, having full effect	The Levelling Up and Regeneration Bill (LURB) has completed Commons stage and is	We have confidence that the risks can be mitigated by the actions underway.

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		Projects (NSIPs) 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.				from 2024 onwards	entering the Lords. Royal Assent is anticipated in early summer. It is intended that the full fast track regime will come into force by the end of the year. DLUHC plan to trial elements of the Fast Track process through "early adopter" pilots through the second half of this year, in advance of full implementation. There is a risk that the criteria developed for the Fast Track will not align with the OWEIP measures and will exclude OFW projects in practice. DLUHC will be seeking NSIP projects approaching planning application in that period to participate. Remaining risks appear to be soluble on the basis of the actions underway.	DESNZ officials are feeding into the Parliamentary process. Detailed design work on the Fast Track (which covers all NSIP projects, not only energy) is ongoing with Task and Finish groups active on various elements of the design and operation. This includes participation from both Renewable Electricity and Energy Infrastructure and Planning officials in Task and Finish groups.
49	Power	Future System Operator	The Government will be taking powers to establish the Future System Operator (FSO) through the Energy Bill. The FSO				Depending on a number of factors, including timings of	Risks to delivery of this joint DESNZ-Ofgem policy include: resource constraints in Ofgem; agreeing timelines with	We have confidence that these risks can be mitigated by conversations between DESNZ, Ofgem and

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			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.				the Energy Bill and discussing timelines with key parties, our aim is for the FSO to be operational by, or in, 2024	key parties, including National Grid; timings of the current energy Bill. These risks require attention however appear resolvable based on the actions already underway.	National Grid which are ongoing. Recruitment is ongoing across team vacancies. New rebaselined plan has been agreed for the project between DESNZ and Ofgem to ensure milestones remain on track. We have provided information into Bill process with regards to risk associated with Bill timings.
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	-0.005	-0.236	-0.383	2027	This is not applicable as this line represents emissions created as a by-product of biomethane production and is not a proposal or policy.	This is not applicable as this line represents emissions created as a by-product of biomethane production and is not a proposal or policy.

Table 2 Proposals and Policies: Risk Levels Not Included

			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						
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 North Sea Transition Deal and will be delivered by Government, key regulators including the North Sea Transition Authority and industry.	0	1	0.7	2028	Electrification has four key barriers to its deployment: high capital costs (including expensive infrastructure such as subsea cables), high operating cost (high cost of power), misaligned timelines for grid connection (Industry needs by or before 2027 but unlikely pre 2030) and unclear regulatory landscape (legislation was not designed with electrification in mind). If not mitigated, these risks could materially affect the successful delivery of the savings in full associated with the policy.	Electrification projects are deliverable from a technical standpoint. We have reasonable confidence industry can technically deliver this however, more work needed with Industry to succeed within regulatory constraints. BEIS/DESNZ is supporting industry to address regulatory and administrative barriers. Industry motivation for the expenditure is in retaining their social licence to operate in the UK.
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	1.1	1	0.9	2018	As of March 2022, Ofgem informed BEIS that GDNs (according to their 2021 annual report), are on track to	No mitigating actions are currently required for this policy

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			<p>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.</p>					<p>completing the replacements of iron mains with plastic pipes up to the end of the current price control - 2026. HSE is to undertake a review of the Iron Main Replacement Programme this year. We were informed that this would provide more information on the safety case and determine whether the scope of the programme would remain. The findings of this review may be a barrier to continuing with the replacement of iron mains but other factors, including the progression of low carbon alternatives would also be considered.</p>	
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	0.084	0.9	0.9	Late CB4 - Early CB5	This policy includes current CCS Infrastructure Fund, IDHRS and business models for ICC and waste CCS for Track-1. Emissions savings are dependent on	Mitigations include: Progressing the primary legislation via the Energy Bill as well as continuing to hit key milestones for capital support via CCS Infrastructure Fund and

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			<p>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.</p>					<p>successful negotiations with projects and delivery of projects (which are first of a kind).</p>	<p>ongoing revenue support via IDHRS and business models, as well as progressing negotiations with shortlisted projects, will progress policy development and improve certainty in emissions savings; Work with HMT and the IPA to clear the Track 1 Negotiations Mandate; and, Deliver a detailed programme schedule covering all deliverables to support realistic delivery timeline assessment.</p>
68	Industry	Industrial Energy Transformation Fund	<p>The Industrial Energy Transformation Fund (IETF) supports industrial sites with high energy use to transition to a low carbon future. The fund</p>	0.1	0.2	0.2	2022	<p>The IETF is a demand led scheme, meaning its potential to deliver emissions savings is dependent on the nature and scale of the</p>	<p>The IETF has now closed and all applications are currently being assessed or are moving to delivery stage. Later</p>

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			<p>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</p>					<p>projects that apply to the fund, and are successful in the competitive process. External economic pressures and supply chain disruption are a further risk to the delivery of IETF funded projects.</p>	<p>in 2023, modelled carbon savings for the IETF will be updated with an estimate based on emissions saving projections from the final portfolio of successful IETF projects. The IETF team is providing support and flexibility for applicants where possible to help them to manage external pressures that affect project delivery.</p>
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Table 2 Proposals and Policies: Risk Levels Not Included

			with newly committed funding to extend the IETF for a Phase 3 round of applications are not included.						
76	Industry	Non Domestic Energy Performance Certificate (EPC) Regulations - Private Rented Sector	Raising the Minimum Energy Efficiency Standards for industrial buildings.	0.044	0.1	0.1	Late CB4 subject to consultation response	The policy requires further appraisal of options and a legislative vehicle to allow implementation.	Policy is deliverable, but requires further action including finalising Government response and legislation developed and implemented.
84	Buildings	Non Domestic Energy Performance Certificate (EPC) Regulations - Private Rented Sector	[Raising the Minimum Energy Efficiency Standards for privately rented non-domestic buildings.	0.2	0.4	0.4	Late CB4 subject to consultation response	The policy requires further appraisal of options and a legislative vehicle to allow implementation.	Policy is deliverable, but requires further action including finalising Government response and legislation developed and implemented.
85	Buildings	Non Domestic Energy Performance Certificate (EPC) Regulations - Point of Purchase	Minimum Energy Efficiency Standard of EPC Band B for owner-occupied commercial buildings at point of purchase.	0.083	0.3	0.5	Late CB4 subject to consultation response	Requires further appraisal of options and advice to Ministers.	Policy is deliverable, but requires further policy development and advice to Ministers.
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	0.046	0.031	0.031	2023	The policy requires further appraisal of options and savings are dependent on assumption that disclosure will drive further savings from business buildings.	Further work to finalise the policy and prepare for implementation is in train.

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			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.						
95	Buildings	Improving Home Energy Performance through Lenders	Take action following a Government consultation on proposals for mortgage lenders to support	0.6	1.5	1.6	2023	Further policy development needed on the back of the	Policy is deliverable to achieve carbon savings, if decisions are made in 2023/4.

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			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.					Government's consultation.	
96	Buildings	Phasing Out Fossil Fuels in Off Gas Grid Homes	The Government consulted on proposals in late 2021 and will issue the Government response in due course.	0.052	1.4	3.4	Late CB4 subject to consultation response	Further work required on the scope and approach for homes currently not suitable for heat pumps which will impact the size of carbon savings. This includes the number of homes that could fall within scope.	Policy is deliverable but will require political support and may also require additional financial support for certain consumers affected by the regs. Further work needed including defining properties currently not suitable for heat pumps.
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	0.3	1	1.3	2025	Policy development on track to deliver consultation on time but pressure remains from some developer stakeholders for delay and the timeline is tight.	Policy still deliverable with ambitious action from HMG.

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			detail is subject to consultation.						
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	Launched application window in September 2022 with 2 rounds of assessment/allocation over 4 month period. Round 1 successfully allocated £472m. Risk around under allocation in round 2 to issue remaining £228m and meet 60% rural ringfence, and successful LA delivery.	New challenge fund model (including batch delivery) is designed to improve delivery confidence. Issues around supply chain, LA capacity and timeframes for procurement/delivery remain, so project may need to utilise flexibility of timeframes to realise scheme benefits.
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	There are risks to delivery including product inflation and material availability.	Being effectively managed through a change control process and funding flexibilities across years to allow projects longer to deliver.
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	0.041	0.045	0.045	2023	The highest risk aspect of Wave 2 delivery is the concurrent procurement of a Joint Delivery Partner with HUG2 and the associated governance, commercial and	The Delivery Partner procurement assessment has now been completed and the project is moving forward. These risks require attention, however appear

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			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.					financial risks surrounding this.	resolvable based on aforementioned actions
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	Scheme design, legislation, and delivery preparation are proceeding well against target scheme launch of April 2024. Potential Scheme Administrators are questioning the feasibility of April 2024 launch (vs eg late 2024), and are projecting potentially higher programme costs. This could lead to a delay to scheme launch but with likely only a very small effect on overall carbon savings.	Work continuing to identify whether April 2024 launch can be maintained. However, impact of any delay extremely limited on carbon savings.
109	Buildings	Heat Network Market Framework previously 'Future 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	0.064	0.2	0.4	2025	DLUHC led FBS consultation on track but timescales are tight. The risks require attention, however appear resolvable based on the actions already underway.	Renewed focus on developing and finalising the policy through the consultation phase.

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			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 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.						
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	0.3	1.4	2.7	2025	Dependent on the passage of the Energy Bill.	Carbon savings for zoning likely to be achieved. The heat networks team is reassessing staffing allocations to prioritise development of zoning within portfolio and reduce risks to delivery.

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			existing fossil fuel heating systems with heat networks supplied by low carbon sources.						
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	Further development and funding needed as this is about a future scheme	Carbon savings deliverable subject to further policy development and funding allocation
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	Evidence gaps and industry and consumer acceptance are potential risks to delivery.	Further policy development in train, including relating to the evidence base. Policies, when developed, would be subject to stakeholder engagement and consultation.
116	Buildings	Energy-related Product Standards - Improved Information	Improved information about energy consumption of energy	0.4	0.4	0.4	2025	Evidence gaps and industry and consumer acceptance are	Further policy development in train, including relating to the

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		on Energy Labels including Lifetime Costs etc. (non-traded sector impact)	using products provided on energy labels in order to allow consumers to make informed purchases and buy the most energy efficient products.					potential risks to delivery.	evidence base. Policies, when developed, would be subject to stakeholder engagement and consultation.
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	Evidence gaps and industry acceptance are potential risks to delivery.	Further policy development in train, including relating to the evidence base. Policies, when developed, would be subject to stakeholder engagement and consultation.
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	0.2	0.8	1.1	2025	Currently consulting on proposals, stakeholder reaction and assessment of feasibility presents potential delivery risk.	Mitigating actions are not currently required for this policy.

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			Boiler Plus Standards, that were introduced in England in 2018.						
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	2025	Currently consulting on proposals, stakeholder reaction and assessment of feasibility presents potential delivery risk	Proposals are currently being consulted on and potential risks may not materialise. Carbon savings therefore remain possible to achieve.
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 through 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	3.3	15.4	2029	Policy in early stages of development. There are a high number of dependencies including heat pump affordability, consumer engagement, and networks / connections.	There remains significant lead time ahead of required introduction of policy. Actions to address dependencies are in progress. Policy for 2029 - 37 is in early stages of development. Further appraisal of options is underway as part of the Hy4Heat programme.
125	Buildings	Additional On Gas Grid Heat Pumps	Part of the "high hydrogen" scenario in	0	2.6	6.2	2029	The deployment of heat pumps beyond 2028	Work has started on expansion to other

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		(2029 to 2037) - "High Hydrogen" Scenario Only	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.					will depend on wider commercial factors such as the cost of heat pumps and the successful commercialisation of hydrogen to heat buildings developing at sufficient pace to meet this deployment pathway.	sectors and a consultation will be required, with data collection and small pilots for each sector. Further appraisal of options is underway as part of the Hy4Heat programme.
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	2.7	10.3	2029	The deployment of heat pumps beyond 2028 will depend on wider commercial factors such as the cost of heat pumps and the successful commercialisation of hydrogen to heat	Work has started on expansion to other sectors and a consultation will be required, with data collection and small pilots for each sector. Further appraisal of options is underway as

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								buildings developing at sufficient pace to meet this deployment pathway.	part of the Hy4Heat programme.
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	2024	Policy is progressing in line with expectations, but delivery of full projected savings is dependent on timely roll-out of regulation, sufficient uptake of zero emission cars and the rollout of enabling infrastructure across the UK. Under delivery in any area, including slower uptake of zero emission vehicles by consumers, may lead to a slower than anticipated fleet turnover and extended on-the-road usage of the existing internal combustion engine fleet, reducing anticipated emissions savings.	The ZEV mandate has been developed in close consultation with industry and designed to deliver ambitious emissions savings. Alongside this, the Department has committed significant funding to support the transition to zero emission vehicles. Over £2bn has already been spent on reducing the purchase price of zero emission vehicles and deployment of charging infrastructure. Future funding for charging infrastructure will primarily be available through the Local Electric Vehicle Infrastructure (LEVI) Fund and the Rapid Charging Fund. DfT is also progressing policies to improve consumer experience of public charging.

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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	Policy is progressing in line with expectations, but delivery of full projected savings is dependent on timely roll-out of regulation, sufficient uptake of zero emission vans, and the rollout of enabling infrastructure across the UK. Under delivery in any area may lead to a slower than anticipated fleet turnover and extended on- the-road usage of the existing internal combustion engine fleet, reducing anticipated emissions savings.	The ZEV mandate has been developed in close consultation with industry and designed to deliver ambitious emissions savings. Alongside this, the Department has committed significant funding to support the transition to zero emission vehicles. Over £2bn has already been spent on reducing the purchase price of zero emission vehicles and deployment of charging infrastructure. Future funding for infrastructure will primarily be available through the Local Electric Vehicle Infrastructure (LEVI) Fund and the Rapid Charging Fund. DfT has also confirmed the Plug in Van Grant until at least 2024/25.
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	0.1	1.6	5.4	2026	Progressing in line with expectations, but delivery of full projected savings is dependent on successful	HGV phase out dates will be supported by a regulatory framework, currently under consideration. DfT will build on the success of

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			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.					implementation of regulation and demonstration of zero emission technologies. Also dependent on the rollout of sufficient enabling recharging and refuelling infrastructure, and will be further enabled by incentives to reduce up-front purchase price of zero emission alternatives. Under delivery in any area may lead to a slower than anticipated fleet turnover and extended on- the-road usage of the existing internal combustion engine fleet, reducing anticipated emissions savings	the Zero Emission Road Freight Trials Feasibility Studies and demonstrate new HGV technologies through the Zero Emission Road Freight Demonstrator Programme. £582m has been announced to continue all plug-in vehicle grants until 2024/25, some of which will act as an incentive to encourage the uptake of zero emission commercial vehicles.
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-	-0.001	0.3	0.9	2027	Ongoing funding support is necessary to enable the continued roll out of ZEBs and infrastructure. In time, this will need to be supported by the introduction of an end sale date for sale of new non ZEBs. We consulted on dates	In January 2023 DfT Ministers approved £25m in scope increases for 4 existing Zero Emission Bus Regional Area (ZEBRA) projects. This takes funding committed this parliament to £348m. To support this, we will soon announce the

Table 2 Proposals and Policies: Risk Levels Not Included

			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.					between 2025-32, the projected savings could be impacted by a later end sales date being implemented.	legal end date for sale of new non-zero emission buses. This has been developed following close consultation with industry.
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	Delivery of full projected savings is dependent on timely roll-out of regulation, sufficient uptake of zero emission L-category vehicles, and the rollout of enabling infrastructure across the UK. Under delivery in any area, including slower uptake of zero emission L-category vehicles by consumers, may lead to a slower than anticipated fleet turnover and extended on-the-road usage of the existing internal combustion engine fleet, reducing anticipated emissions savings.	A Government consultation on when to end the sale of new non-zero emission L-category vehicles ran from 14 July to 21 September 2022. This will help inform the end of sale date for new non-zero emission L-category vehicles.

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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	Dependent on technology development in line with ambitious Jet Zero Strategy trajectory, particularly for zero emission flight. Feedstock availability is a key dependency to supply necessary quantities of SAF. Increased global demand for biomass could impact the deliverability of these projected savings. Upscaling of SAF use also dependent on industry willingness to invest in innovative technology.	DfT is working with DBT, HMT and industry (including through the Jet Zero Council) to ensure investment in aviation and aerospace is strongly focused on decarbonisation, with measurable outcomes. Funding schemes have supported aviation decarbonisation, including the Zero Emission Flight Infrastructure Project. Following publication of the Government response to the Developing UK ETS consultation, DfT will continue to consider how UK ETS can incentivise use of SAF. DfT continues to work with industry on options to further support the UK SAF industry and is working closely across Government to coordinate the approach to feedstocks. DfT has commissioned research to explore viable pathways
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									towards achieving the Jet Zero Strategy's net zero 2040 target for domestic aviation. The research will also identify barriers to consider. DfT will continue its work by publishing a Call for Evidence later this year.
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	Local Authority Capability and Capacity may impact their ability to deliver investment in cycling and walking. Delivering the projected savings is therefore dependent on LAs being able to address this.	Active Travel England has been established. It will help local authorities develop and deliver feasible and high-quality projects with existing funding. The Government remains committed to investing in active travel, with around £3bn committed up to 2025.
143	IAS	International Maritime Decarbonisation	Pursue the ambitious emission reduction strategy and targets agreed at the International Maritime Organization (IMO) in 2018. The UK Government is playing a	0.047	0.4	3.2	2022	There is the risk that lack of global appetite hampers progress to secure an ambitious IMO GHG strategy.	We are working collaboratively with other high ambition States to secure support and we are applying the UK's international influence through all available

Table 2 Proposals and Policies: Risk Levels Not Included

			leading role in calling for even greater ambition during negotiations at the IMO.						channels to secure the most ambitious possible agreements through the International Maritime Organization (IMO).
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	Time and cost requirements to implement technology change may prevent zero carbon airport operations by 2040.	Research commissioned by DfT shows that our target of zero emission airport operations by 2040 is feasible with the correct commercial model and incentives. We are working with stakeholders to create an achievable strategy and a call for evidence on our zero emission airport operations target was published in February.
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	0.9	2.7	3.8	2025	Continued policy and funding support is necessary to support investment in increased production and uptake of SAF and to contribute to delivery against high ambition scenarios. Feedstock availability is a key dependency to supply necessary quantities of SAF. Increased global	The SAF mandate itself will provide a level of price support to industry, although it cannot stipulate UK production. Funding support has been provided through the £165m Advanced Fuels Fund, supplying capital funding to help projects progress towards commercialisation in

Table 2 Proposals and Policies: Risk Levels Not Included

			discussions with industry on action to tackle barriers to the production and use of SAF.					demand for biomass could impact the deliverability of these projected savings.	the UK and access further private investment. There is ongoing policy development to address remaining barriers to investment in the UK, which will help large scale SAF production reach a commercial level and overcome market failures. Following further stakeholder engagement through the Jet Zero Council, if required, we plan to launch a consultation on potential revenue certainty mechanisms for SAF that could support a UK industry in summer in 2023. There is also ongoing dialogue across Government and with industry on a coordinated approach to feedstocks. The UK is fully engaged in the work of the International Civil Aviation Organization to increase use of SAF globally, in line with the
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Table 2 Proposals and Policies: Risk Levels Not Included

									new global net zero 2050 target and in preparation for a major ICAO alternative fuels conference in Autumn 2023.
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	0	0.3	2036	The recent success of the 2022 ICAO assembly has maintained the integrity of CORSIA, ensuring that offsetting will begin from 2024. However, continued international cooperation will be required to achieve appropriate carbon prices beyond 2035 when the current CORSIA scheme will end.	DfT is continuing to work with ICAO to influence ambition and further drive the consensus to continue progress. DfT is also working with the UK ETS Authority to respond to the developing UK ETS consultation which will be published in 2023. A second consultation on CORSIA implementation and interaction with the UK ETS will also be launched in 2023. This work will enable legislation for CORSIA to come into force by January 2024.
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	0.00008	0.00037	0.00152	2030	We need to understand more on the impact on soil biology. Due to the need for further research and development of biostimulants it is	Call for Evidence being launched this year. At a later stage, the Future Farming and Countryside Programme (FFCP) would look at potential

Table 2 Proposals and Policies: Risk Levels Not Included

			<p>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</p>					<p>assumed they would not see uptake until 2030 (10 year lead in time from 2020). This further development is needed as there is limited evidence on their effects, and this drives the lack of uptake. These risks require attention, however appear resolvable based on the actions already underway.</p>	<p>use and any farm specific advice required. Fertiliser regulatory reform from 2023 will also include scope to include more novel products such as biostimulants from later in 2020s. Defra has commissioned evidence to look at inhibitors/biostimulants as we currently lack evidence on impacts to soil.</p>
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			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.						
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	No incentives could mean cost may become limiting, and farmers may not see as necessary or feasible. These risks require attention, however appear resolvable based on the actions already underway.	SFI actions and soil health measures in the EIP may make some contribution, we need to explore the possible savings impacts from these measures and from Farming Rules for Water.

Table 2 Proposals and Policies: Risk Levels Not Included

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 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	-0.0078	0.0524	0.3	2028	There are delivery risks with tree planting because our trajectory is ambitious; these include sector capacity, supply keeping up with planting rates and landowners buy-in to make permanent change.	We have recently legislated a statutory tree target. We are making good progress. For example, in 2021/22 2,300 ha of woodland creation took place in England, representing a 10% increase in woodland creation compared to the previous year and an additional 400 ha of tree planting outside of woodland. Interim (non-binding) target to increase tree and canopy cover by 0.26% of land area in England by 31 January 2028, (equivalent to tree and woodland cover of 34,000 ha). Initial delivery pathway was set out in the Environmental Improvement Plan. To increase operational capacity government launched the Tree Production Capital Grant, which will provide funding support to nurseries and seed suppliers to
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Table 2 Proposals and Policies: Risk Levels Not Included

			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.						invest in facilities and equipment to increase the quantity, quality, diversity and biosecurity of tree, seed, and sapling supply.
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	0.084	2025	This is dependent the water industry investing in the processes. It is market driven as there are no legislative requirements driving this.	This could be achieved through the Ofwat Open Access Fund in development for spring 2023.
187	Waste and F- gases	Alternative treatment processes for wastewater - e.g., anaerobic treatment/Membrane Aerated Biofilm Reactor (MABR)/alternative	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	0	0.0252	0.084	2030	This is dependent on the water industry investing in the processes. It is market driven as there are no legislative requirements driving this.	BEIS have set up a Regulators Pioneer Fund (closed September 2022) for projects starting and finishing between January 2023- March 2025.

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		ammonia removal processes.	improve the efficiency of wastewater treatment and reduce greenhouse gas production and contribute to the circular economy by allowing resources to be reused.						
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. (Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006 (Text with EEA relevance) (legislation.gov.uk). Timescales for this measure assume that legislation is secured.	0	0	0.05627	2035	A primary legislative vehicle would need to be secured. Additionally, in order to undertake their review, the F-Gas team will need to prioritise net zero action in addition to their ongoing work on the REUL Bill and NIP Bill.	We are continuing to explore legislative options.

Table 2 Policies and Proposals: No Information on Risks or Risk Levels **Amended to correct copying errors**

#	Sector	Policy Name	Policy description	Average Annualised Savings (MtCo2e pa)			Timescale From Which the Policy Takes Effect	Delivery risks: Explanation	Delivery risks: mitigation
				CB4	CB5	CB6			
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 No mitigating actions are currently required for this policy	No mitigating actions are currently required for this policy	No mitigating actions are currently required for this policy
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) Allocation Round 5—the first of a series of annual allocation rounds—is on track to open in March 2023. Design and planning for CfD AR6 (2024) is underway with an initial consultation with	Allocation Round 5 - the first of a series of annual allocation rounds - is on track to open in March 2023. Design and planning for CfD AR6 (2024) is underway with an initial consultation with industry now completed. No mitigating actions are currently required for this policy	No mitigating actions are currently required for this policy Allocation Round 5—the first of a series of annual allocation rounds—is on track to open in March 2023. Design and planning for CfD AR6 (2024) is underway with an initial consultation with industry now completed.

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				industry new completed.		
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, ESP 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.	<p>Early CB5 (assumes consultation implements reform)</p> <p>We are examining future reform options of the CfD to support accelerated deployment and supply chain growth ambitions. This policy will not lead to carbon savings directly, however, through ensuring an effective functioning of the CfD allocation rounds it will enable our policy to deliver low carbon capacity through the CfD mechanism.</p>	<p>We are examining future reform options of the CfD to support accelerated deployment and supply chain growth ambitions. This policy will not lead to carbon savings directly, however, through ensuring an effective functioning of the CfD allocation rounds it will enable our policy to deliver low carbon capacity through the CfD mechanism.</p> <p>No mitigating actions are currently required for this policy</p>	<p>No mitigating actions are currently required for this policy</p> <p>We are examining future reform options of the CfD to support accelerated deployment and supply chain growth ambitions. This policy will not lead to carbon savings directly, however, through ensuring an effective functioning of the CfD allocation rounds it will enable our policy to deliver low carbon capacity through the CfD mechanism.</p>
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	<p>Late CB5 (assumes consultation implements reform)</p>	<p>Policy thinking is at an early stage with a call for evidence planned in spring. While this policy will</p>	<p>No mitigating actions are currently required for this policy</p>

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			<p>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.</p>	<p>Policy thinking is at an early stage with a call for evidence planned in spring. While this policy will not lead directly to carbon savings, any changes to the CfD scheme as a result of this consultation would be expected to enable our policy to deliver low-carbon, low-cost generation capacity.</p>	<p>not lead directly to carbon savings, any changes to the CfD scheme as a result of this consultation would be expected to enable our policy to deliver low-carbon, low-cost generation capacity.</p> <p>No mitigating actions are currently required for this policy</p>	<p>Policy thinking is at an early stage with a call for evidence planned in spring. While this policy will not lead directly to carbon savings, any changes to the CfD scheme as a result of this consultation would be expected to enable our policy to deliver low-carbon, low-cost generation capacity.</p>
9	Power	Floating Offshore Wind Taskforce	<p>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.</p>	<p>Mid CB5</p> <p>Taskforce phase 1 report identifying infrastructure investment requirements to support Floating Offshore Wind deployment ambitions is complete. Now moving on to scoping phase 2 (pathway to 2050/long term</p>	<p>Taskforce phase 1 report identifying infrastructure investment requirements to support Floating Offshore Wind deployment ambitions is complete. Now moving on to scoping phase 2 (pathway to 2050/long term vision) work to examine the possible role of floating</p>	<p>No mitigating actions required.</p> <p>Taskforce phase 1 report identifying infrastructure investment requirements to support Floating Offshore Wind deployment ambitions is complete. Now moving on to scoping phase 2 (pathway to 2050/long term</p>

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				vision)-work to examine the possible role of floating offshore wind in the net zero energy system and its steady state industrial footprint	offshore wind in the net zero energy system and its steady state industrial footprint No mitigating actions required.	vision)-work to examine the possible role of floating offshore wind in the net zero energy system and its steady state industrial footprint
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) As part of the Spring Statement 2022, the Chancellor announced that VAT rates on solar and solar & storage packages will be reduced. This means that solar installations and battery storage supplied as part of installation of a qualifying energy saving material (including solar panels) will benefit from a VAT zero rate for the next 5 years	As part of the Spring Statement 2022, the Chancellor announced that VAT rates on solar and solar & storage packages will be reduced. This means that solar installations and battery storage supplied as part of installation of a qualifying energy saving material (including solar panels) will benefit from a VAT zero rate for the next 5 years when these are installed in any residential accommodation in Great Britain. No further action needed at this time.	No mitigating actions are currently required for this policy As part of the Spring Statement 2022, the Chancellor announced that VAT rates on solar and solar & storage packages will be reduced. This means that solar installations and battery storage supplied as part of installation of a qualifying energy saving material (including solar panels) will benefit from a VAT zero rate for the next 5 years when these are installed in any

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				when these are installed in any residential accommodation in Great Britain. No further action needed at this time.	No mitigating actions are currently required for this policy	residential accommodation in Great Britain. No further action needed at this time.
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) The consultation is open for eight weeks, closing on 25 April. We expect responses to be positive on the whole, though there remains the small chance of pushback against some proposals.	The consultation is open for eight weeks, closing on 25 April. We expect responses to be positive on the whole, though there remains the small chance of pushback against some proposals. DLUHC have worked closely with DESNZ on proposals within the consultation and we expect this to continue once responses are received, allowing us to influence finalised changes with the continued aim of further enabling the deployment of solar.	DLUHC have worked closely with DESNZ on proposals within the consultation and we expect this to continue once responses are received, allowing us to influence finalised changes with the continued aim of further enabling the deployment of solar. The consultation is open for eight weeks, closing on 25 April. We expect responses to be positive on the whole, though there remains the small chance of pushback against some proposals.

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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.	<p>Mid CB4 (assuming full implementation)</p> <p>Research is being conducted and policy options developed. Government is engaging an appropriate consultancy and finalising contract details. Initial work is underway</p>	<p>Research is being conducted and policy options developed. Government is engaging an appropriate consultancy and finalising contract details. Initial work is underway</p> <p>No mitigating actions are currently required for this policy. Taking forward this work aligns with the Net Zero Review recommendations.</p>	<p>No mitigating actions are currently required for this policy. Taking forward this work aligns with the Net Zero Review recommendations.</p> <p>Research is being conducted and policy options developed. Government is engaging an appropriate consultancy and finalising contract details. Initial work is underway</p>
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.	<p>Late CB4</p> <p>Development of consultation on the Future Homes and Building Standards continues at pace. The consultation was planned for publication in spring, but has been delayed.</p>	<p>Development of consultation on the Future Homes and Building Standards continues at pace. The consultation was planned for publication in spring, but has been delayed.</p> <p>Team to maintain frequent contact with DLUHC officials so that the opportunity to input into consultation planning</p>	<p>Team to maintain frequent contact with DLUHC officials so that the opportunity to input into consultation planning and text is fully utilised.</p> <p>Development of consultation on the Future Homes and Building Standards continues at pace. The consultation was planned for publication in spring,</p>

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					and text is fully utilised.	but has been delayed.
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.	Draft guidance in train and Cabinet Office are now leading the delivery element of publication.	Recruitment in train to support work.	Draft guidance in train and Cabinet Office are now leading the delivery element of publication.
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 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	Ambitious timeline for the delivery of the Tech Selection by the end of this year and the full set up of GBN. Once set up at the end of March, GBN capacities will need to be rapidly built. To down select technologies by the end of this year, we will need to have finalised the process and the policy work so that the second phase (down selection process) can start this summer.	We will launch a Market Engagement asap (April) to inform the tech selection design and policy. We will build on the work done so far and used DESNZ capacity to support GBN. We will put in place a XWH process to ensure XWH alignment and enable a rapid and transparent decision making process. Taking forward this work aligns with the Net Zero Review recommendations.
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	Early CB4 - framework is live	The strategic framework has already been published. It sets out a strategic framework to inform policy making and was not	No mitigating actions are currently required for this policy

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			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.		intended to be a programme management plan but Government is monitoring policy developments and delivery closely.	
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	Nick Winser is on track to put forward his recommendations to Government in June 2023. We will then need to assess his recommendations and take a further view on confidence in delivery for recommendations put forward and the extent to which they can enable carbon savings.	No mitigating actions are currently required for this policy
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	Early CB4	The SPS is yet to be publicly consulted on but we plan to do this in spring 2023. We anticipate high stakeholder interest and a large number of consultation responses. The SPS needs to be laid in Parliament and	We are currently finalising the consultation. We plan to hold stakeholder roundtables while the consultation is live. We have kept references to the FSO's roles and responsibilities at a higher level in this

Table 2 Policies and Proposals: No Information on Risks or Risk Levels **Amended to correct copying errors**

			calculated to further the delivery of the specified policy outcomes.		debated in both Houses before it can be formally designated. The Future System Operator (FSO) is currently planned to be created by, or in, 2024, at which point it will also be required to have regard to the SPS in carrying out its functions (subject to passage of the 2022 Energy Bill), alongside Ofgem. Whilst the 2022 Energy Bill gives the option of reviewing the SPS at the point the FSO is created, in practice it is unlikely to be desirable to update the SPS so soon after designation.	current version of the statement and instead plan to reflect how best to cover the FSO in its substantive role once it is established.
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	Timelines need development although as the emission limits would only take effect on 1 October 2034, there is still significant time to implement these measures.	To further manage timescales, we are likely to take a phased approach to implementation, prioritising those measures that are crucial to security of supply.

Table 2 Policies and Proposals: No Information on Risks or Risk Levels **Amended to correct copying errors**

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	We are on track to consult on the policy framework in 2023.	We are preparing to consult on policy options by Summer 2023 and are supporting innovative technologies to commercialise through the up to £68m Longer Duration Energy Storage competition.
77	Industry	Non Domestic Energy Performance Certificate (EPC) Regulations - Point of Purchase	Minimum Energy Efficiency Standard of EPC Band B for owner-occupied industrial buildings at point of purchase.	0.068	0.2	0.4	Late CB4 subject to consultation response	The policy requires further appraisal of options and advice to Ministers	Policy is deliverable, but requires further policy development and advice to Ministers.
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	0.004	0	0	2023	The policy requires further appraisal of options and savings are dependant on assumption that disclosure will drive further savings from business buildings.	Further work to finalise the policy and prepare for implementation is in train.

Table 2 Policies and Proposals: No Information on Risks or Risk Levels **Amended to correct copying errors**

			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.						
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	0.4	1.4	1.3	2026	Finalisation of policy approach is required following Government consultation.	Further advice to Ministers in train, following discussions with No10 on best approach to take for this tenure. This will include regulatory options for primary legislation and

Table 2 Policies and Proposals: No Information on Risks or Risk Levels **Amended to correct copying errors**

			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.						approach to implementation, including the supporting option of funding further enforcement pilots to increase compliance with existing regulations.
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	Local Authority Delivery Scheme - Phase 3 has been delivering since April 2022. Has delivered 5,177 homes by end of Jan 2023 and Managed Closure change to delivery initiated in October 2022.	Ministerial Approval has been given for a Managed Closure until 30 September 2023. Recovery Plans being assessed, with 20-22,000 homes being targeted by the Local Authorities.
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	0.003	0.005	0.005	2025	Delays to programme encountered.	We are exploring minimum viable product options. Resourcing and skills gaps are being addressed and recruitment for vacancies is underway to ensure a

Table 2 Policies and Proposals: No Information on Risks or Risk Levels **Amended to correct copying errors**

			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. .						full project team is in place.
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. Great British Insulation 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	Currently on track for scheme start in Spring.	Suppliers are legally required to meet their bill saving target or be subject to enforcement action from Ofgem.
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	0.014	0.2	0.3	2025	Funding secured at 2023 spring budget.	Policy deliverable and will utilise existing delivery mechanism.

Table 2 Policies and Proposals: No Information on Risks or Risk Levels **Amended to correct copying errors**

			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. .						
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	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.	
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	Maintaining funding is essential to delivery of these schemes.	The electrification of the Transpennine Route, the Midland Mainline to Sheffield and Derby, and the Wigan-Bolton line are all existing commitments with allocated funding.

Table 2 Policies and Proposals: High Risk Expressed

#	Sector	Policy Name	Policy description	Average Annualised Savings (MtCo2e pa)			Timescale From Which the Policy Takes Effect	Delivery risks: Explanation	Delivery risks: mitigation
				CB4	CB5	CB6			
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				Mid CB5	MoD have informed us that they are on track to submit their business case and launch their tender competition in Q3 this year, but there is a significant risk of slippage owing to negotiations on funding arrangements between MoD and developers of which there is a hard deadline of 4 April to resolve.	Officials are participating in various governance meetings looking to maintain progress and ministers are briefed and ready to engage as necessary. Taking forward this work aligns with the Net Zero Review recommendations.

Table 2 Policies and Proposals: High Risk Expressed

			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.'						
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				Mid CB5	Delivery of the necessary grid reinforcements identified through these strategic planning exercises will be dependent on successful implementation of several reforms to planning necessary to accelerate grid development, the right regulatory environment being delivered on time, and successful engagement with a stretched global supply chain for key components. <u>Implementation of these mitigations is</u>	Some risks around planning will be mitigated via National Policy Statements. This will underpin further planning reforms being delivered under the Energy Bill and Levelling Up and Regeneration Bill and assist with acceleration of offshore wind deployment. We are also supporting OWAT and the Offshore Wind Industry Champion, Tim Pick, to develop a report outlining progress by Taskforce and key remaining barriers to deployment. However,

Table 2 Policies and Proposals: High Risk Expressed

			permit the most efficient electricity system.					challenging , and progress has been slower than expected in some areas. If not mitigated, these risks could mean some Offshore Wind is delayed or projects are cancelled.	recommendations made may be difficult to implement and work is ongoing to mitigate some risks, particularly around supply chains and regulatory changes, where we are exploring further action required.
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	HUG 1 has encountered significant deliver challenges across its KPIs. Risks have included concurrent delivery with other funding opportunities, supply chain capacity issues and a challenging delivery window. If not mitigated, these risks could materially effect the successful delivery of the savings in full associated with the policy.	Lessons have already been incorporated into later phases. Proposals are currently being consulted on for additional time for delivery through a managed closure process which will secure additional delivery whilst securing delivery of HUG Phase 2.
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, which	0.091	0.6	1.1	2025	Higher delivery risk as funding has not been allocated. Carbon savings are deliverable with resolution here	Carbon savings are retrievable if policy is funded.

Table 2 Policies and Proposals: High Risk Expressed

			identified a range of products with high potential for additional energy efficiency gains as well as other mitigation of other environmental impacts.						
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	0	0.1	2035	Zero emission flight technology is at an early stage of development and <u>delivery of this ambition will be challenging</u> . The availability of low carbon hydrogen at scale from 2030 onwards is likely to be critical.	A Zero Emission Flight Delivery Group of the Jet Zero Council has been established to help develop and deploy zero emission technologies. The Government is also providing funding to the Aerospace Technology Institute Programme between 2022-2025 for the development of ultra-low and zero emission technologies.
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	-0.003	0.3	1.3	2027	<u>Achieving a step up in fuel efficiency improvement may be challenging</u> if the sector cannot provide sufficient investment. For example, if airlines cannot afford to invest in modernising their fleets, if airports cannot invest in modernisation of their airspace, or if the aerospace sector	Government is supporting airspace modernisation through £9.2m of funding between 2020-2023 and the development of ultraefficient aircraft technologies through £685m funding to the Aerospace Technology Institute Programme between 2022- 2025.

Table 2 Policies and Proposals: High Risk Expressed

			Technology Institute Programme.					cannot afford to invest in creating the necessary aircraft advancements.	
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Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

#	Sector	Policy Name	Policy description	Average Annualised Savings (MtCo2e pa)			Timescale From Which the Policy Takes Effect	Delivery risks: Explanation	Delivery risks: mitigation
				CB4	CB5	CB6			
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	Scheme will launch shortly, high degree of delivery confidence , based on experience / track record.	Continuing to engage with industry
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.				ByMid CB5 or earlier depending on future policy decisions, market conditions, and linked policy delivery	We have good certainty of delivering the consultation in 2023, however, emission reductions cannot be quantified at this stage because a decision has yet to be taken on a form or scale of market intervention. Emission savings would be dependent on the volumes of hydrogen to power generation intervention brings forward and whether any plant brought forward replaces through conversion unabated gas generation.	Hydrogen to power expected to be a key flexible technology to support the decarbonisation of the power sector. Policy work ongoing and required for enabling clear decarbonisation pathways for unabated gas generation. Further work ongoing for identifying and removing barriers to hydrogen to power deployment. If consultation feedback is opposed to market intervention, policy teams will develop a strategy to support hydrogen to power within existing policies and market frameworks.
28	Power	Decarbonisation Readiness	HMG published our Decarbonisation Readiness consultation in March 2023 on proposed updates to the 2009 Carbon				July 2024 as proposed in the	We have high certainty in the delivery	Previous industry engagement and call

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			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	March 2023 Decarbonisation Readiness Consultation	of this policy and its enabling of carbon savings.	for evidence indicates general support for policy proposals. SI development in late stage with agreement on approach. Team are resourced for delivery of Government Response.
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.	The revised draft NPS suite is in train and will underpin further planning reforms announced in the Action Plan and being delivered under the Energy Bill and Levelling Up and Regeneration Bill. Further reforms to the planning system under active consideration but there will inevitably be challenging trade offs in the existing checks and balances to ensure decisions are made fairly.	<u>We have confidence that these risks will be mitigated</u> via National Policy Statements. Taking forward this work aligns with the Net Zero Review recommendations.
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	Mid CB5	We have <u>high certainty</u> in the delivery of this policy as far as DESNZ is able to influence. The main dependency is around the policy changes, as requested by the developers of	Detailed mitigation plans are being actioned. Where other stakeholders e.g. Ofgem have control, we work closely with them and there are clear milestones and interim

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			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.		the specific projects the Scheme is targeting (being in part delivered by DESNZ, but also by Ofgem and ESO and other partners). I	milestones to keep on track.
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	We have high certainty in the delivery of this policy, but cannot guarantee that it will lead to associated carbon savings. This is because community support for projects will be driven by a myriad of factors such as engagement and context specific issues.	We have confidence that risks to delivery will be mitigated. Delivery of wider reforms will improve community support such as strategic network planning and planning reform. Consultants have been procured to help support in developing the guidance at pace to be published this year. Taking forward this work aligns with the Net Zero Review recommendations.
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	Early CB5	This document was published by Ofgem in December 2022. We have had positive	No mitigating actions are currently required for this policy

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			transmission networks, enabling decarbonisation by allowing timely connection of low carbon generation and demand to the grid.		<u>responses from stakeholders and are confident that it will enable carbon savings delivery</u> by reducing delivery risks to building infrastructure that will connect to low carbon generation.	
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	Ofgem published their final determinations in Nov 2022 for distribution network providing over £22bn in funding from 1 April 2023. <u>We are confident that this will lead to carbon savings</u> as to meet the demands from a system with more electrified heat and transport, £3.1bn of funding has been made available for network upgrades.	No mitigating actions are currently required for this policy
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	Late CB4 depending on when Ofgem receives powers from the Energy Bill and is then able to issue the first Strategic Direction	We have <u>high certainty</u> in the delivery of this joint DESNZ- Ofgem policy and in its significance as an enabler for Net Zero. The project is dependent on the timely passage of the Energy Bill, to empower Ofgem to make the	We have built a good relationship with Ofgem to ensure work continues throughout passage of the Bill.

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			the codes governance process is better equipped to facilitate the widespread changes required to deliver Net Zero.		necessary changes and continue with implementation work. There is a joint DESNZ/Ofgem consultation on secondary legislation planned late 2023 to continue project delivery.	
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	We have high certainty in the delivery of this policy and its associated carbon savings . The actions and commitments set out in the Energy Digitalisation Strategy, and the response to the Energy Digitalisation Taskforce are all implemented or on track. The Department should now consider the next set of commitments necessary to progress the policy.	No mitigating actions are currently required for this policy
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	Mid-CB4	Individual projects will be subject to specific delivery risks, however overall we have high confidence in the successful delivery of this competition's objectives and that it	No mitigating actions are currently required for this policy

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			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.					will result in the building and commissioning of multiple innovative storage demonstrators.	
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				Mid-CB4	We have high certainty in the delivery of this policy. Despite the complexity of the FIP, the majority of the FIP projects are underway and delivering policy evidence or positive innovation programmes as expected. The remainder of the FIP programmes and projects are in development and this gives us confidence that the programme can be delivered as planned.	No mitigating actions are currently required for this policy

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			have not been determined for this policy.						
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	0.2	0.2	2031	We have high certainty in the delivery of this policy and its associated carbon savings. This target is well understood and owned by Industry with reasonable run in time for delivery.	No mitigating actions are currently required for this policy
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	0.3	7.6	10.3	2023	We have high certainty in the delivery of this policy and its associated carbon savings due to the deliverability and confidence in steel making decarbonisation technologies being considered which impact majority of the	Progress on delivery depending on company decisions regarding support put forward by HMG. Timings of delivery are highly uncertain owing to significant commercial and physical infrastructure

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			be developed further to replace ore- based iron imports with domestic near-zero hydrogen iron-making as the next step process.					emission reductions (such as using electric arc furnaces) which have been in use for decades and proven emissions savings. Remaining emission reductions can be considered part of next step in replacing ore-based imports.	considerations we will explore mitigations in due course including via consultation with industry.
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	0.1 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	2.3 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	7.6 (Total estimated savings from the industrial fuel switching policies in rows 71/72/73 and should not be summed together)	Late CB4	Limited risk for the policy. The upcoming strategy will provide input into the amount of sustainable biomass available, and priority uses for the sectors. The risks for industry are mainly focused around dependencies with the delivery of emerging technologies such as CCUS and outlining the best pathway for transitioning sectors from bioenergy.	Mitigating actions include continuing policy development and sector engagement.

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			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).						
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	-0.06	-0.076	2022	We have high certainty in the delivery of this policy and its associated carbon savings. Policy is in delivery, with regulation in force	No mitigating actions are currently required for this policy
94	Buildings	Regulations to Introduce Social Rented Sector	Early stage proposal to develop regulations to introduce Social Rented	0	0.022	0.07	CB5	We are confident that the policy development can proceed and deliver	DLUHC have committed to consult within 6 months of the

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

		Minimum Energy Efficiency Standards	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 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.					ahead of the dates used for the projected carbon savings.	Social Housing Regulations Bill receiving Royal Assent.
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	1	2022	We have high certainty in the delivery of this policy and its associated carbon savings. Policy is in delivery, with regulation in force	No mitigating actions are currently required for this policy
99	Buildings	Building Regulations - Part L Interim Uplift 2021	Uplift to the energy efficiency standards for existing domestic buildings, delivered	0.054	0.1	0.2	2023	We have high certainty in the delivery of this policy and its associated carbon savings. Policy is	No mitigating actions are currently required for this policy

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		for Existing Domestic	through changes to the Building Regulations and publication of new statutory guidance.					in delivery, with regulation in force	
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	We have high certainty in the delivery of this policy and its associated carbon savings. Policy is in delivery and does not deliver direct savings.	No mitigating actions are currently required for this policy
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 budget is £32m, with eight funding windows planned across 23/24 and 24/25. This scheme follows on from the HNES Demo ran between Oct 21 and March 22 which delivered £3.8m of capital grants to improve performance of existing heat networks	0.008	0.009	0.009	2023	We have high certainty in the delivery of this policy and its associated carbon savings. Policy is in delivery and meeting expected savings	No mitigating actions are currently required for this policy

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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. Additionally due to the significant lead in time for the projected	0.00019	0.00082	0.00339	2035	We have high certainty in the delivery of this policy and its enabling impacts on other policies. Further evidence and policy development required. Not projected to make a significant contribution by CB6. Potentially sensitive - will require a shift away from economic breeding indices.	Evidence and policy development needs being explored in Farming Innovation Programme - Gene editing/modern breeding techniques are in scope of all competitions in the FIP.
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Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			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 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,	0.00003	0.00015	0.00043	2027	We have high certainty in the delivery of this policy and its enabling impacts on other policies. A small retrofitting offer is currently available under the Countryside Stewardship Capital Grants. Projected uptake for the scheme (heavily caveated that this requires quality assurance and as such is subject to change) suggests in excess of 50% of specialised pig and dairy holdings in England (based off 2021 farming stats data) having upgraded slurry storage and covers by 2029.	Next steps are to confirm whether this will be included in the Farming Innovation Fund. Expected to be fully covered in future years when rollout is expanded. Uptake is not required to start until 2027. Will track uptake.

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			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.						
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 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	0.00991	0.05521	0.2	2023	We have high certainty in the delivery of this policy and its enabling impacts on other policies. Projected uptake for the scheme (heavily caveated that this requires quality assurance and as such is subject to change) suggests in excess of 50% of specialised pig and dairy holdings in England (based off 2021 farming stats data) having upgraded slurry storage and covers by 2029.	Next steps are to track uptake.

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			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.						
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).	0.00306	0.0131	0.04779	2024	We have high certainty in the delivery of this policy and its enabling impacts on other policies. Already incorporated into ELM.	Track uptake to confirm whether we have sufficient numbers to achieve savings.

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			<p>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 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.</p>						
161	Agriculture and LULUCF	Avoiding use of Nitrogen in excess through the development of an agronomist led	Support the use of nutrient management plans and manure management plans across the farming sector. To optimise the use of	0.00144	0.00779	0.02102	2022	We have high certainty in the delivery of this policy and its enabling impacts on other policies.	SFI 23 could partially help minimise the risk of excess nitrogen application through greater awareness and education via the

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

		nutrient management plan.	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.						annual FACTS qualified adviser visit. We are also looking at rewarding grassland farmers to use more natural nitrogen fixing crops to reduce the demand for nitrogen fertiliser inputs. We have commissioned a project to develop a new online, free to user, nutrient management planning tool (to be launched 2025) which also aims to improve uptake of nutrient management planning. Market forces (i.e. current price of nitrogen fertiliser) will impact applications of N fertilizers and potentially drive increased efficient use of nitrogen.
162	Agriculture and LULUCF	Improved crop health through improved pest and disease control practices.	Support improve crop health to increase yield quality and reduce yield losses, through the Sustainable Farming Incentive SFI Integrated Pest Management actions and the Farming Innovation Programme. This reduces emissions	0.00035	0.0014	0.00433	2022	We have high certainty in the delivery of this policy and its enabling impacts on other policies.	We need to confirm the extent to which we expect the savings total to be covered by SFI Integrated Pest Management actions.

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			through a reduced need for control agents, such as pesticides, and activities such as fuel used during pesticide application.						
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 (N ₂ O) emissions. We are already seeing farmer led movement to more biological and on farm solutions to nutrients. Government will accelerate wider adoption t 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	0.02198	0.1	0.3	2022	We have high certainty in the delivery of this policy and its enabling impacts on other policies. This will be delivered by Countryside Stewardship and ELM: CS GS4 – Legume and herb- rich swards; SFI23 nutrients standard.	Next steps are to review the role of ELM and wider levers necessary to achieve desired levels of uptake (e.g. regulation). We will continue to develop options to consider how to maximise uptake/ carbon savings. This will involve reviewing Defra land use surveys, census and farm practice surveys to establish the baseline and working with British Grassland Society to understand what is realistic.

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			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.						
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	We have high certainty in the delivery of this policy and its enabling impacts on other policies. Further research needed.	Defra are planning to commission a research project to develop the evidence base.
170	Agriculture and LULUCF	Precision Farming (arable/grassland) using machine	Support and accelerate the use of machine guidance (MG) and	0.00559	0.02102	0.06084	2022	We have high certainty in the delivery of this policy and its enabling	Under consideration for inclusion in ELM as a revenue offer to

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

		guidance and other technologies to control and adjust fertiliser application.	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 innovations are being supported through the Farming Innovation Programme.					impacts on other policies. Delivery vehicle not yet confirmed.	complement capital offers for related technologies that already exist. We need to confirm whether we intend to offer precision farming revenue payments through ELM. (We expect to make a provisional decision on this in the next month).
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	0.02316	0.1	0.3	2022	We have high certainty in the delivery of this policy and its enabling impacts on other policies. Several relevant actions in ELM but not direct.	There are several relevant actions in ELM (e.g., nutrients advice and soil assessments) although we are not directly paying people to keep soil at optimum pH level as this would be hard to track. Under the Farming Rules for Water, farmers are required to plan their nutrient applications according to crop need,

Table 2 Policies and Proposals: High Confidence or Certainty **Amended to correct copying errors**

			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.						and one step in this process is checking the soil pH. We also expect discussion around checking soil pH levels and checks on soil analysis to take place as part of the SFI funded FACTS annual adviser visit. We are investigating the impact of this on this measure's emission saving.
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,	0.00001	0.00007	0.00039	2034	We have high certainty in the delivery of this policy and its enabling impacts on other policies.	A longer lead in time (10-15 years) is assumed for this measure to allow for R&D of improved crop varieties through a crop breeding programme. We are exploring it in FIP, which is industry led, so we don't have control over what technologies are explored explicitly. We have worked with the FIP team to ensure that we have opportunities to feed in, for example in the 'Sustainable Proteins' theme. In particular, the focus is on improving the efficiency of crops to

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			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 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.						utilise the N fertiliser. This would mitigate emissions as well as reduce the economic loss of unrecovered nitrogen. We will look to utilise FIF or ELM to support the wider roll out of these improved crop varieties, and the associated procedures, once they have been successfully developed and safely demonstrated.
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	0.01021	0.05504	0.1	2022	We have high certainty in the delivery of this policy and its enabling impacts on other policies. This measure is already being taken up (based on SFI pilot data).	Track uptake to confirm whether we have sufficient numbers to achieve savings.

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			included in Sustainable Farming Incentive arable and horticultural soils standard for SFI 2022 and through Countryside Stewardship (SW6 Winter cover crops).						
180	Agriculture and LULUCF	End the sale of peat in horticulture.	End the sale of peat in horticultural growing media, in the amateur sector and in the professional sector by 2026, with limited exemptions.	0	0.01	0.04	2031	We have high certainty in the delivery of this policy and its enabling impacts on other policies. There has been positive progress with the outcome of the public consultation being published announcing the ban in amateur sector. There is a risk as we need to identify appropriate legislative Bill and to progress with pursuing a ban in the profession sector.	The sector team are currently looking to identify a legislative vehicle for this bill.
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	We have high certainty in the delivery of this policy and its enabling impacts on other policies. The NHS would need to prioritise training for clinicians on how to use and prescribe alternatives, and patients would need to be supported to switch. Need MHRA	We are continuing to engage with the NHS and health boards.

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									to approve MDIs using alternative propellants. Slight risk relating to MHRA backlog as there is no unmet clinical need to prioritise it over other approvals work.	
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ENVIRONMENT

Ministers were warned net zero schemes won't work



The document was produced for Grant Shapps, the energy security and net zero secretary
CHRIS J RATCLIFFE/GETTY IMAGES

Key climate schemes trumpeted as part of the government's net zero strategy are likely to fail, ministers were told before last week's "green day" announcements.

A leaked document by the Department for Environment, Food and Rural Affairs (Defra) reveals that officials told ministers they were not confident that [key policies announced on Thursday](#) — including tree planting, peat restoration and recycling targets — were realistic.

The ten-page advisory document — marked "not public facing" — was produced on February 20 for [Grant Shapps](#), the energy security and net zero secretary. It assessed the "delivery risk" and "delivery confidence" of each of the net zero measures proposed by Defra, which is run by Thérèse Coffey, the environment secretary. Each was assessed with a traffic-light scale of green, amber and red.



England needs to plant as many as three times the number of trees each year as it presently does, which the Defra document said was unlikely to happen
GETTY IMAGES

Of 44 policies, 21 were marked red or red/amber, indicating they will be hard to achieve. These policies encompass about 85 per cent of Defra's proposed emissions savings, indicating officials expect to fall well short of what they claim.

A further 18 policies were marked as amber or amber/green, and only five were marked green, two of which disappeared from the final "carbon budget delivery plan" document published on Thursday.

Defra has long been warned it has not pulled its weight when it comes to cutting carbon. Land use and agriculture, for which the department is responsible, accounts for 12 per cent of UK carbon emissions. If the UK is to hit its net zero targets, this sector must reduce its emissions by two thirds.

Chris Stark, chief executive of the Climate Change Committee, the government's independent climate advisory body, said his team was assessing the plans but that the agricultural policies looked weak.



“Defra is on the naughty step,” he said. “I don’t think there’s any question about that. I’ve been in this job since 2018 and every year when we report on progress, we’ve said that Defra needs to come forward with a plan for decarbonising farming and for changing land use and we haven’t got that.”

The final public document published on Thursday contained 42 of the policies in the confidential document along with the projected emissions savings but without officials’ confidence ratings. It was published alongside emissions reductions policies from other parts of government, such as the transport and energy departments.

Dustin Benton, policy director at the Green Alliance, said: “The big picture is that Defra is responsible for a big proportion of total emissions. The power and transport sectors are doing quite a lot but Defra is not. The fact that they are not that confident about actually delivering the little that they have promised is really worrying.

“Most of the things on this list are not new ideas — they’re not that hard. The fact that they think that they can’t do them is a reflection that they just haven’t tried.”

Even if all the policies were delivered, the government would still be short of hitting its carbon reduction targets for 2037. Officials calculate a shortfall of 32 million tonnes greenhouse gas emissions against the target savings set into law by the Climate Change Act, which Boris Johnson signed off two years ago when he was prime minister.

The proposed policies include seemingly outlandish plans such as feeding cows supplements containing seaweed, which reduces the methane they emit.

But they also include well-established goals such as increasing tree planting — a Conservative election manifesto commitment — hedgerow planting, the responsible management of peatlands and the elimination of biodegradable waste from landfill. Each of these are judged unlikely to be attained, according to the leaked document.

Matt Williams, of the Natural Resources Defence Council, said: “In England, tree planting needs to be somewhere in the order of 4,000 to 6,000 hectares a year. But planting is actually at about 2,000 hectares per year at the moment for England and effectively flatlining.”

Tom Lancaster, head of land, food and farming at the Energy and Climate Intelligence Unit, added: “A lot of the stuff where they could get big emissions savings is kicked into the ‘unquantified’ table in the carbon budget delivery plan, in some instances because it’s too

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