

On behalf of the Claimant
Niall Toru
First Witness Statement
Exhibits: NT1
Date: 20 November 2023

Claim No: CO/2224/2023

IN THE HIGH COURT OF JUSTICE
KING'S BENCH DIVISION
ADMINISTRATIVE COURT
IN AN APPLICATION FOR JUDICIAL REVIEW

BETWEEN:

FRIENDS OF THE EARTH LIMITED

Claimant

-and-

SECRETARY OF STATE FOR ENERGY SECURITY AND NET ZERO

Defendant

FIRST WITNESS STATEMENT OF NIALL TORU

I, Niall Toru, of 139 Clapham Road, London, SW9 0HP, WILL SAY AS FOLLOWS:

1. Since March 2021 I have been employed by the Claimant as a Senior Lawyer. In this role I have worked on both the current claim for judicial review, concerning the Carbon Budget Delivery Plan ("**the Plan**"), and on the claim issued in 2022, concerning the Net Zero Strategy¹.
2. I make this statement having reviewed the Defendant's detailed grounds of defence and supporting evidence. That evidence includes the first witness

¹ *R. (on the application of Friends of the Earth Ltd and others) v Secretary of State for Business, Energy and Industrial Strategy* [2022] EWHC 1841 (Admin).

statement of Chris Thompson, dated 27 October 2023, together with a bundle marked 'Exhibit CT1'. In my statement references to Mr Thompson's statement are in the form CTWS/page number/paragraph number, and references to Mr Thompson's exhibit bundle are in the form Exhibit CT1/exhibit number/page number. In this statement I also exhibit certain documents using the reference: "[Exhibit NT1/x]"; where "x" is the page number.

3. The purpose of this statement is to produce a comparison between:
 - a. the information provided by the Department for the Environment, Food and Rural Affairs ("DEFRA") to the Department for Energy Security and Net Zero ("DESNZ") on the delivery risk of DEFRA's quantified policies and proposals, to the extent that information has been disclosed, and
 - b. the information later provided by DESNZ officials to the Defendant, when deciding on whether to adopt the Plan, on the delivery risk of those quantified DEFRA policies and proposals.
4. Section L of Mr Thompson's statement is entitled "The process by which DEFRA risk summaries were agreed" [CTWS/38/121]. Within that section Mr Thompson refers to "The December commission", being an exercise "to gather information for the purpose of preparing the documents that were scheduled to be published in March 2023" [CTWS/39/123]. DESNZ issued guidance to departments on their responses to the December commission [Exhibit CT1/6/34]. That included guidance on the 'RAG' ratings to be used, being 'Red', 'Red/Amber', 'Amber', 'Amber/Green' and 'Green'. These denoted policies with "very low degree of confidence", "low degree of confidence", "medium degree of confidence", "high degree of confidence" and "very high degree of confidence" respectively [Exhibit CT1/6/45-46].
5. On 27 February 2023 DESNZ received the "final approved version" of DEFRA's return to the December commission [CTWS/42/135]. The return itself is at [Exhibit CT1/26/189]. It includes a table entitled "Defra's Quantified List of Net Zero Measures & Savings". That table includes a column entitled "Additional commentary on delivery risk & next steps". In that column DEFRA set out, for

each of the measures listed, information on delivery confidence, including DEFRA's policy-level 'RAG' ratings.

6. Section O of Mr Thompson's statement is entitled "The advice provided to the Secretary of State and the Secretary of State's decision" [CTWS/56/185]. That includes a sub-section entitled "The s 13 advice" in which Mr Thompson refers to the three risk tables that were put before the Defendant when deciding whether to adopt the Plan [CTWS/66/214]. The second table, 'Table 2', listed all of the 190 cross-government quantified proposals and policies [Exhibit CT1/60/2259]. Table 2 included narrative text under the headings "delivery risks: explanation" and "delivery risks: mitigation". The Table did not include the RAG ratings and nor were those ratings elsewhere provided to the Defendant. Instead the RAG ratings had been converted into narrative text, pursuant to a DESNZ commission email of 21 February 2023 [CTWS/36/112]. Guidance for that commission suggested the following "prompts" for departments "to use when describing the individual delivery risks..." [Exhibit CT1/23/151]:

"For policies that are labelled **green** or **green-amber** in the commission returns, the new descriptions could start: **'We have high certainty in the delivery of this policy and its associated carbon savings'**. A single bespoke line should then be added to explain why.

"For policies that are labelled **amber** in the commission returns, please begin by describing the actual risks faced, with a couple of short lines. This could then be finished with a summary line such as **'These risks require attention, however appear resolvable based on the actions already underway.'**

For policies that are labelled **amber-red** or **red** in the commission returns, whose rating is not due to uncertainty, but real and present risks, please begin by describing the actual risks faced (with a couple of short lines) and then finishing with a summary sentence, such as: **If not mitigated, these risks could materially effect the successful delivery of the savings in full associated with the policy.**

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EXHIBIT NT1

I exhibit the following documents referred to in this statement:

	Document	Date	Page
1	Table comparing: (i) Defra's policy-level RAG ratings from its December commission return [CT1/26/189] with (ii) the equivalent 'prompts' on delivery risk provided to the Defendant [taken from CT1/60/2259].	20 November 2023	2
2	Table comparing: (i) the entire DEFRA return to the December commission for each of its policies and proposals, including the RAG ratings [Exhibit CT1/26/189], with (ii) for each such policy-level return, the equivalent information provided to the Defendant [Exhibit CT1/60/2259].	20 November 2023	3-49

Signed: *Niall Toru*

Niall Toru
Dated: 20 November 2023

Tab 26 code/ Tab 60 Table 2 code	Tab 26 RAG rating	Tab 60 'prompts' used
A1.1/149	Amber/Red	"Uncertain delivery risk. [...]"
A1.6/150	Amber/Red	"Uncertain delivery risk. [...]"
A4.1.1/159	Red	"Uncertain delivery risk. [...]"
A4.1.2/164	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A4.1.3/157	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A4.1.4/158	Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A4.2.1/165	Amber/Red	"Uncertain delivery risk. [...]"
A4.2.2/151	Red	"Uncertain delivery risk. [...]"
A4.2.4/152	Amber/Red	"Uncertain delivery risk. [...]"
A4.2.5/153	Amber/Red	"Uncertain delivery risk. [...]"
A4.3.1/172	Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies."
A4.3.2/173	Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A4.3.3/171	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A4.3.4/170	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A4.3.5/169	Red	"Uncertain delivery risk. [...]"
A.4.3.6/168	Amber	"[...] These risks require attention, however they appear resolvable based on the actions already underway."
A6.1/154	Amber	"[...] These risks require attention, however they appear resolvable based on the actions already underway."
A6.2/155	Amber	"[...] These risks require attention, however they appear resolvable based on the actions already underway."
A7.1/166	Amber	"[...] These risks require attention, however they appear resolvable based on the actions already underway."
A7.2/167	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A8.1/156	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A10.1/160	Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
A10.2/161	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies."
A11/162	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies."
A12/[none]	Amber/Green	n/a
A15/163	Amber/Red	"Uncertain delivery risk. [...]"
Af1-E/176	Amber/Red	No stock wording used
A2/175	Red	"Uncertain delivery risk. [...]"
A2.2/174	Amber/Red	"Uncertain delivery risk. [...]"
Nrg3/177	Red	"Uncertain delivery risk. [...]"
Peat 1/[none]	Amber/Red	n/a
Peat 2/178	Amber/Red	"Uncertain delivery risk. [...]"
Peat 3/179	Red	"Uncertain delivery risk. [...]"
Peat 4/180	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
[none]/181	n/a	No stock wording used
Peat 5/[none]	Green	n/a
W1A/182	Amber/Red	"Uncertain delivery risk. [...]"
W1B/183	Red	"Uncertain delivery risk. [...]"
W2A/[none]	Green	n/a
W4A/184	Amber/Red	"Uncertain delivery risk. [...]"
W5A/186	Amber/Red	No stock wording used
W6A/187	Red	No stock wording used
W2B/185	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
Fg1/189	Amber/Green	"We have high certainty in the delivery of this policy and its enabling impacts on other policies. [...]"
Fg2/188	Amber/Green	No stock wording used
Fg3/[none]	Amber/Green	n/a
[none]/190	n/a	No stock wording used

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A1.1	Increase feed analysis and use of precision feeding to not exceed animal requirements.	<p>This measure involves the assessment of animal feed to ensure the composition and volume of feed meets, but does not exceed animal requirements. This can reduce methane emissions and nitrous oxide emissions associated with animal waste.</p> <p>Increasing industry adoption is expected as part of a market-led take up of precision feeding that is already occurring. The AIC (Agricultural Industries Confederation) maintains a register of accredited feed nutritionists to facilitate this. In addition, precision mixing machinery is available for the preparation of mixed rations. The role of Government is in supporting and accelerating this. This measure is being developed under the Farming Innovation Programme and the funding will enable the development of technology to enable precision feeding, including nutritional advice, to ensure feed is provided effectively to livestock.</p>	0.00	0.01	0.03	<p>Delivery confidence RAG: Amber/Red</p> <ul style="list-style-type: none"> All measures would need sufficient R&D investment through FIP or other means. Savings will remain uncertain until innovation / R&D is complete. Innovation will need to provide evidence that increases confidence in technical feasibility. Delivery levers will need to be identified to ensure necessary levels of uptake. Requires more research, specifically on impact on other environmental targets. We need to confirm if these measures are covered at all by ELM. 	Yes – industry are aware and generally adopting.

#	NZS 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			
149	Agriculture and LULUCF	Increase feed analysis and use of precision feeding to not exceed animal requirements.	Precision feeding involves the assessment of animal feed to ensure the composition and volume of feed meets, but does not exceed, animal requirements. This can reduce emissions and emissions intensity by maximising feed utilisation, stabilising fermentation in the stomach, improving animal health, and minimising nutrient excretion in manure. It is expected that industry adoption of precision feeding will increase as a market-led take up of precision feeding is already occurring. The AIC (Agricultural Industries Confederation) maintains a register of accredited feed nutritionists to facilitate this by providing technical advice on best feeding practice. In addition, precision mixing machinery is available for the preparation of mixed rations. The role of Government is in supporting and accelerating the take up of precision feeding. The Government will provide funding under the Farming Innovation Programme, which could support the development of technology related to precision feeding,	0.00186	0.01020	0.02815	2022	Uncertain delivery risk. The policy requires further appraisal of options and uses a technology that is nascent, creating inherent uncertainties and risk. Savings will remain uncertain until innovation / R&D is complete. Innovation will need to provide evidence that increases confidence in technical feasibility.	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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A1.6	Use of methane suppressing feed products (e.g. 3NOP, nitrate additives) to reduce methane emissions from livestock.	<p>This measure involves utilising 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).</p> <p>Food Standard Agency (FSA) and Food Standards Scotland (FSS) are responsible for the authorisation process of feed additives in Great Britain. We will continue to work with the FSA and FSS, industry and the sector to explore suitable policy options to encourage rapid and extensive uptake of methane suppressing feed products with proven safety and efficacy, including exploring mandating methane suppressing feed products in compound feed for cattle in England.</p> <p>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.</p>	0.94	1.57	1.57	<p>Delivery confidence RAG: Amber/red</p> <ul style="list-style-type: none"> Call for evidence closed in November 2022. Defra officials are currently analysing responses and reviewing options to deliver this policy, including through voluntary industry led schemes, incentives, and regulatory intervention. Next steps will include improving knowledge on existing take up and being clear on the role of industry and Government. <p>Barriers to overcome:</p> <ul style="list-style-type: none"> Product availability: FSA approval of 3NOP (Bovaer) anticipated by the end of 2023. Defra officials engaging with manufacturer to better understand cost and availability. Exploring opportunities to encourage further market maturity. Integration on farm: Concerns remain over applicability across some farm systems (e.g. pasture-based or organic) and outstanding issues of farmer perceptions. To be further explored through analysis of CfE responses and wider policy development throughout 2023. <p>Legislation: Mandatory introduction will require legislation. Defra officials are developing policy options to deliver these following recommendations of CfE, research projects and industry engagement.</p> <ul style="list-style-type: none"> Costs: Initial estimates for 3NOP indicate a cost for effective dosing of around £80 per head pa. 	Yes, but not mandating element (EIP).

#	NZS 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			
150	Agriculture and LULUCF	Use of methane suppressing feed products (e.g. 3NOP, nitrate additives) to reduce methane emissions from livestock.	Methane-suppressing feed products (for example 3NOP, nitrate additives) within feed rations to reduce the amount of methane produced by ruminant livestock (e.g. cattle). Food Standard Agency (FSA) and Food Standards Scotland (FSS) are responsible for the authorisation process of feed additives in Great Britain. We will continue to work with the FSA and FSS, industry and the sector to explore suitable policy options to encourage rapid and extensive uptake of methane suppressing feed products with proven safety and efficacy, including exploring mandating methane suppressing feed products in compound feed for cattle in England. We have already published research on these products and recently ran a call for evidence on methane suppressing feed products to better understand the opportunities and challenges associated with their use. This will inform our next steps to encourage the extensive update of methane suppressing feed products.	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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.1.1	Analyse manure prior to application to match crop requirements.	<p>This measure is about improving nutrient management. Analysing the nitrogen content of slurry, prior to application on crops and grassland, can ensure the nitrogen applied matches crop requirements and minimises emissions of nitrous oxide (N2O).</p> <p>Increasing industry adoption is expected as part of a market-led take up of precision farming that is already occurring. Government will support this through the design and delivery of wider farming reforms. We expect the Sustainable Farming Incentive (nutrient management standard) to contribute indirectly to this outcome.</p>	0.000	0.000	0.001	<p>Delivery confidence RAG: Red</p> <ul style="list-style-type: none"> To identify whether the actions we are encouraging under the SFI (particularly advisor visits) will partly contribute to this outcome. 	Yes - Sector generally aware and adopting and in ELM SFI

#	NZS 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			
159	Agriculture and LULUCF	Analyse manure prior to application to match crop requirements.	Analysing the nitrogen content of slurry, prior to application on crops and grassland, can improve nutrient management, ensuring nitrogen applications do not exceed crop requirements to minimise emissions of nitrous oxide (N2O). Increasing industry adoption is expected as part of a market-led take up of precision farming that is already occurring. Government will work with industry to identify the most appropriate mechanisms for change. We expect the Sustainable Farming Incentive (nutrient management standard) to contribute indirectly to this outcome.	0.00008	0.00032	0.00096	2022	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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.1.2	Biological fixation of nitrogen on grassland using grass-legume mixtures.	<p>This measure relates to the inclusion of clover into pasture areas and also increasing the proportion of clover in the mixed grassland to at least 20%. This allows nitrogen gas from the atmosphere to be incorporated into the tissues of plants. Doing so reduces the rate of fertiliser application and associated nitrous oxide (N2O) emissions.</p> <p>We are already seeing farmer led movement to more biological and on farm solutions to nutrients. Government will accelerate wider adoption through the design and delivery of wider farming reforms. For instance, we will fund 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).</p>	0.02	0.12	0.30	<p>Delivery confidence RAG: Amber/Green</p> <ul style="list-style-type: none"> 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. 	Yes - Sector generally aware and adopting and in ELM SFI

#	NZS 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			
164	Agriculture and LULUCF	Biological fixation of nitrogen on grassland using grass-legume mixtures.	Increasing the inclusion of clover into pasture areas and ensuring the proportion of clover in the mixed grassland to at least 20%. Clover captures atmospheric nitrogen which is made available to pasture, reducing mineral fertiliser requirements and associated nitrous oxide (N2O) emissions. We are already seeing farmer led movement to more biological and on farm solutions to nutrients. Government will accelerate wider adoption 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 several stakeholder organisations since 2019. We plan to continue this in 2023. We've also created a single landing page on GOV.UK on funding for farmers.	0.02198	0.1	0.3	2022	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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.1.3	Covering slurry tanks with a retrofitted, permeable cover.	<p>Retrofitting slurry tanks with a permeable cover will reduce both methane and ammonia emissions.</p> <p>We plan to introduce new regulatory requirements to cover slurry stores, as committed to in the 2019 Clean Air Strategy. Defra plans to consult on this later this year.</p> <p>In the short term, focus is on improving compliance and supporting take up through e.g., Countryside Stewardship slurry grants.</p>	0.0000	0.0002	0.0004	<p>Delivery confidence RAG: Amber/Green</p> <ul style="list-style-type: none"> A small retrofitting offer is currently available under the Countryside Stewardship Capital Grants. Next steps are to confirm whether this will be included in FIF. Expected to be fully covered in future years when rollout is expanded. Uptake is not required to start until 2027. 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. 	Yes - CS grants cover this

#	NZS 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			
157	Agriculture and LULUCF	Covering slurry tanks with a retrofitted, permeable cover.	<p>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.</p> <p>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>	0.00003	0.00015	0.00043	2027	<p>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.</p>	<p>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.</p>

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.1.4	Covering slurry tanks with a retrofitted, impermeable cover.	<p>Retrofitting slurry tanks with an impermeable cover to reduce both methane and ammonia emissions.</p> <p>We plan to introduce new regulatory requirements to cover slurry stores, as committed to in the 2019 Clean Air Strategy. Defra plans to consult on this later this year.</p> <p>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 slurry grants. We will keep those regulations under review and track uptake to project the savings.</p>	0.01	0.06	0.15	<p>Delivery confidence RAG: Green</p> <ul style="list-style-type: none"> 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. 	Yes - CS and FIF slurry infrastructure grants cover this

#	NZS 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			
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 in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g., due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.	0.0099 1	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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.2.1	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.	0.00	0.02	0.05	<p>Delivery confidence RAG: Amber/Red</p> <ul style="list-style-type: none"> 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. 	No

#	NZS 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			
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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.2.2	Use of conventional breeding practices (not genomics or gene editing) to breed cattle that have reduced emissions.	Reducing emissions intensity in cattle, without compromising welfare or fertility, by using conventional production focused breeding metrics such as Estimated Breeding Value (EBV) (not genomics, gene editing or genetic modification). This process allows the identification of desirable genetic effects in individuals and enables cattle to be bred with lower rates of intestinal methane production. Continuing market-led uptake from farmers is expected. Measures such as funded annual animal health and welfare visits are expected to support that uptake.	0.01	0.04	0.14	Delivery confidence RAG: Red <ul style="list-style-type: none"> Competitions in FIP 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. 	Yes - Some market-led uptake already

#	NZS 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			
151	Agriculture and LULUCF	Use of conventional breeding practices (not genomics or gene editing) to breed cattle that have reduced emissions.	Using conventional production focussed breeding metrics such as Estimated Breeding Value (EBV – which do not require gene editing or genetic modification) reduces emissions intensity in cattle, without compromising welfare or fertility. This process allows the identification of desirable genetic effects in individuals and enables cattle to be bred with lower rates of methane production. Continuing market-led uptake from farmers is expected. Ongoing research and development to improve breeding metric and measures such as funded annual animal health and welfare visits (to support improved fertility and reproduction rates) are expected to support that uptake.	0.01117	0.04487	0.1	2022	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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.2.4	Increased milking frequency (using robotic milking systems not hormones).	<p>Increasing the rate of milk production, without the use of hormones, by moving from milking twice a day to three times a day. This may require robotic milking parlours and changes to stock management (e.g., keeping cattle closer to the milking parlour).</p> <p>We are currently seeing market-led changes to support this. The role of Government's role is to support adoption and remove any barriers. Currently grants for relevant technology and equipment to facilitate this are being offered under Farming Investment Fund (e.g a grant for improving farm productivity using robotic or autonomous equipment), and future rounds of funding are being considered.</p>	0.01	0.03	0.07	<p>Delivery confidence RAG: Amber/Red</p> <ul style="list-style-type: none"> Further evidence required (could be explored in FIF). 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). 	Yes - Grants available under FIF

#	NZS 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			
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).

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.2.5	Multi-purpose breeds or multi-use of cows - (milk, calves and meat).	<p>This could be accomplished either by switching from specialised dairy and beef to multipurpose breeds, or by increasing the proportion of beef derived from the dairy supply chain. Research suggests that a more integrated approach can reduce the emissions from milk and meat production. The reason is that specialised, pure beef production systems show higher Greenhouse Gas emission intensities when compared to beef produced in dairy systems.</p> <p>We are seeing market-led response to support this, and we will monitor this and work with industry and the sector to consider the role that may be required of Government if emissions savings are not realised.</p>	0.06	0.24	0.64	<p>Delivery confidence RAG: Amber/Red</p> <ul style="list-style-type: none"> R&D needs to be completed. Following this, 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). Farming Science team in AFC 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 conclusions of the research. 	Yes - Some awareness in sector

#	NZS 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			
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 conclusions of the research.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.3.1	Cultivating common crop varieties that have better nutrient uptake.	Supporting and accelerating the adoption of the cultivation of varieties of already common crops in the UK which use nitrogen more efficiently, reducing Nitrous oxide (N2O) emissions. Competitions in Farming Innovation Programme (FIP) are developing this technology and equipment. In addition, Defra's Genetic Improvement Networks (GINs) aim to improve the main UK crops by identifying genetic traits to improve their productivity, sustainability and resilience. Ongoing work in the Wheat GIN, including annual nitrogen diversity trials, is exploring nitrogen use efficiencies in different wheat varieties.	0.0000	0.0001	0.0004	<p>Delivery confidence RAG: Green</p> <ul style="list-style-type: none"> 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 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. 	Yes - FIF

#	NZS 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			
172	Agriculture and LULUCF	Cultivating common crop varieties that have better nutrient uptake.	Support and accelerate the adoption of the cultivation of varieties of already common crops in the UK which use nitrogen more efficiently, reducing Nitrous oxide (N2O) emissions. Competitions in Farming Innovation Programme (FIP) are developing this technology and equipment. In addition, Defra's Genetic Improvement Networks (GINs) aim to improve the main UK crops by identifying genetic traits to improve their productivity, sustainability and resilience. Ongoing work in the Wheat GIN, including annual nitrogen diversity trials, is exploring nitrogen use efficiencies in different wheat varieties. NB. This measure shows carbon savings starting before the start date. While Government action or support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions. Additionally due to the significant lead in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g., due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.	0.00001	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 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.

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Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps	Is this measure already in the public domain already?
A4.3.2	Growing cover crops within a rotation to maintain soil cover during fallow periods.	<p>Crops, grown within a rotation to maintain soil cover during fallow periods (where soil is ploughed and left bare), captures carbon below ground through increased productivity and maintaining input of organic matter (which allow the soil to retain nutrients and not release them as emissions) throughout the rotation.</p> <p>We are seeing market-led uptake of this from farmers. The role of Government is to support and accelerate adoption and ensure co-benefits (e.g. for nature and water quality) are realised. This is included in Sustainable Farming Incentive arable and horticultural soils standard for SFI 2022 and through Countryside Stewardship (SW6 Winter cover crops).</p>	0.01	0.06	0.15	<p>Delivery confidence RAG: Green</p> <ul style="list-style-type: none"> This measure is already being taken up (based on SFI pilot data). Track uptake to confirm whether we have sufficient numbers to achieve savings. 	Yes - EIP

#	NZS 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			
173	Agriculture and LULUCF	Growing cover crops within a rotation to maintain soil cover during fallow periods.	Support and accelerate adoption of such cover crops to ensure co- benefits (e.g. for nature and water quality, from the capture of carbon and the retention of nutrients) are realised. This is included in Sustainable Farming Incentive arable and horticultural soils standard for SFI 2022 and through Countryside Stewardship (SW6 Winter cover crops).	0.01021	0.05504	0.1	2022	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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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.3.3	Maintain a soil pH that is optimum for crop or grass growth (e.g., liming).	<p>This measure involves carrying out soil analysis for pH and carrying out soil liming (application of magnesium or calcium rich materials to soils) on arable grassland. The application of lime improves the soil pH on land which is below the optimal pH for crop or grass growth. This allows more carbon to be captured below ground through improved productivity and efficient use of nutrients from the soil.</p> <p>We are seeing market-led uptake of this from farmers. The role of Government is to support and accelerate adoption. This is included in SFI soils standards for 2022, moorland standard for 2022, and nutrients standard for 2023.</p>	0.02	0.12	0.32	<p>Delivery confidence RAG: Amber/ Green</p> <ul style="list-style-type: none"> 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, 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. 	Yes - Sector generally aware and adopting and in ELM SFI

#	NZS 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			
171	Agriculture and LULUCF	Maintain a soil pH that is optimum for crop or grass growth (e.g., liming).	Support and accelerate adoption of soil analysis for pH and carrying out soil liming (application of magnesium or calcium rich materials to soils) on arable grassland. The application of lime improves the soil pH on land which is below the optimal pH for crop or grass growth. This allows more carbon to be captured below ground through improved productivity and efficient use of nutrients from the soil. This is included in SFI soils standards for 2022, moorland standard for 2022, and nutrients standard for 2023.	0.02316	0.1	0.3	2022	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, 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.

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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A4.3.4	Precision Farming (arable/grassland) using machine guidance and other technologies to control and adjust fertiliser application.	<p>The use of machine guidance (MG) and variable rate nitrogen application technologies (VRNT) in arable and temporary grassland field operations can help farmers reduce overlaps/avoids gaps and adjust the application rate of fertiliser to match need better in that precise location within the field. This can reduce Nitrous oxide (N2O) emissions.</p> <p>Increasing industry adoption is expected as part of the market-led take up of precision farming that is already occurring. The role of Government is to support adoption, demonstrate potential and promote further innovation, 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.</p>	0.01	0.02	0.06	<p>Delivery confidence RAG: Amber/ Green</p> <ul style="list-style-type: none"> Under consideration for inclusion in ELM as a revenue offer to 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). 	Yes - Sector generally aware and adopting and in ELM SFI

#	NZS 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			
170	Agriculture and LULUCF	Precision Farming (arable/grassland) using machine guidance and other technologies to control and adjust fertiliser application.	Support and accelerate the use of machine guidance (MG) and variable rate nitrogen application technologies (VRNT) in arable and temporary grassland field operations to help farmers reduce overlaps/avoids gaps and adjust the application rate of fertiliser to match need better in that precise location within the field in order to reduce Nitrous oxide (N2O) emissions. Funding is available for technology and equipment to facilitate this measure through the Farming Investment Fund and new innovations are being supported through the Farming Innovation Programme.	0.00559	0.02102	0.06084	2022	We have high certainty in the delivery of this policy and its enabling impacts on other policies. Delivery vehicle not yet confirmed.	Under consideration for inclusion in ELM as a revenue offer to 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).

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Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps	Is this measure already in the public domain already?
A4.3.5	Improving/renovating land drainage on mineral soils (where drainage is poor).	<p>Improving and renovating current land drainage (where drainage is poor) to improve crop yield and reduce Nitrous oxide (N2O) emissions.</p> <p>The role of Government includes working with industry to ensure clear guidance for the best way to drain soils (balancing flood, water quality, agricultural and net-zero).</p>	0.00	0.00	0.01	<p>Delivery confidence RAG: Red</p> <ul style="list-style-type: none"> Need to confirm the extent to which we expect small savings total of this measure to be covered by other ELM actions helping with soil drainage. Explore how industry/market may encourage this. 	No - But likely to be awareness of this practice

#	NZS 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			
169	Agriculture and LULUCF	Improving/renovating land drainage on mineral soils (where drainage is poor).	Produce guidance on improving and renovating current land drainage (where drainage is poor) to improve crop yield and reduce Nitrous oxide (N2O) emissions.	0.00108	0.00447	0.01473	2022	Uncertain delivery risk. The policy relies on further appraisal of options.	We need to confirm the extent to which we 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.

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Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps	Is this measure already in the public domain already?
A.4.3.6	Reversing, reducing and preventing surface and subsoil soil compaction.	<p>Compaction of soil acts as a barrier and restricts the movement of air, water and nutrients within the soil which can reduce crop yields and increase emissions e.g Nitrous oxide and carbon dioxide (CO2). Improved root penetration may increase organic inputs. This measure focuses on reducing and remediating surface and subsoil compaction. The policy also considers prevention of compaction of vulnerable soils, such as through controlled traffic farming.</p> <p>Actions under the Sustainable Farming Initiative SFI and soil health measures in the Environmental Improvement Plan could make a contribution to this measure, alongside impacts from regulations such Farming Rules for Water.</p>	0.02	0.10	0.19	<p>Delivery confidence RAG: Amber</p> <ul style="list-style-type: none"> No incentives could mean cost may become limiting, and farmers may not see as necessary or feasible. 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. 	Yes - Sector generally aware of this practice and some elements covered by SFI

#	NZS 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			
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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A6.1	Reducing emissions from cattle by improving animal health, delivered through tackling endemic disease.	<p>This measure is part of Defra's Animal Health and Welfare Pathway and will be delivered through the in- development disease eradication programme focusing on Bovine Viral Diarrhoea (BVD) in England.</p> <p>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.</p>	0.03	0.12	0.28	<p>Delivery confidence RAG: Amber</p> <ul style="list-style-type: none"> The AHW 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 can track who is doing the action and where, which we can combine with our environmental impact modelling to track live trajectories. 	Yes - Herd Health is mentioned in the EIP

#	NZS 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			
154	Agriculture and LULUCF	Reducing emissions from cattle by improving animal health, delivered through tackling endemic disease.	<p>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.</p>	0.02945	0.1	0.3	2022	Unclear how much further could go in different policy scenarios. 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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A6.2	Reducing emissions from sheep by improving animal health, delivered through tackling endemic diseases.	<p>This measure is part of Defra's Animal Health and Welfare Pathway and will be delivered through the in- development disease reduction programme focusing on a range of diseases and conditions in sheep in England.</p> <p>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.</p>	0.01	0.02	0.06	<p>Delivery confidence RAG: Amber</p> <ul style="list-style-type: none"> The AHW 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 can track who is doing the action and where which we can combine with our environmental impact modelling to track live trajectories. 	Yes - Herd Health is mentioned in the EIP

#	NZS 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			
155	Agriculture and LULUCF	Reducing emissions from sheep by improving animal health, delivered through tackling endemic diseases.	<p>This measure is part of Defra's Animal Health and Welfare Pathway (launched in 2022 to support the gradual and continual improvement in farm animal health and welfare) and will be delivered through the in-development disease reduction programme focusing on a range of diseases and conditions in sheep in England. Improving health of sheep can reduce emissions intensity by improving the efficiency of livestock production, through improved fertility, reducing mortality and morbidity. The recently launched Sustainable Farming Incentive Annual Health and Welfare Review will also improve sheep health by providing funding to test the effectiveness of worming treatments.</p>	0.00591	0.02260	0.06066	2022	Unclear how much further could go in different policy scenarios. 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 can track who is doing the action and where, which we can combine with our environmental impact modelling to track live trajectories.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5/ NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A7.1	Use of plant biostimulants to promote growth and reduce emissions.	<p>Use of plant biostimulants to promote growth and reduce emissions. Plant biostimulants contain substances (microbial and non-microbial) that stimulate natural plant processes. Biostimulants may offer 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.</p> <p>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.</p>	0.000	0.000	0.002	<p>Delivery confidence RAG: Amber</p> <ul style="list-style-type: none"> We need to understand more on the impact on soil biology. There is a Call for Evidence this year. FFCP to follow up later. It would require farm specific advice. Fertiliser regulatory reform from 2023 will also include scope to include more novel products such as biostimulants - but from later in 2020s. Due to the need for further research and development of biostimulants it is 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. Team have commissioned evidence to look at inhibitors/biostimulants as we currently lack evidence on impacts to soil. Call for evidence being launched this year. 	Yes - Sector aware of practice and FIF is developing the measure

#	NZS 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			
166	Agriculture and LULUCF	Use of plant biostimulants to promote growth and reduce emissions.	<p>Use of plant biostimulants to promote growth and reduce emissions. Plant biostimulants are plant or soil additives that contain substances (microbial and non-microbial) that stimulate natural plant processes and can reduce greenhouse gas emissions intensity by increasing yield. Biostimulants may offer these productivity and resilience gains by enhancing nutrient uptake, nutrient efficiency, tolerance to environmental stress and crop quality. Regulation is in development to set consistent products standards.</p> <p>The evidence on the efficacy of Biostimulants is mixed, and so further research is required to allow for it to be integrated into the Sustainable Farming Incentive. Defra's Farming Innovation Programme (FIP) and agri-food evidence programme are developing evidence on novel fertilising products. NB. This measure shows carbon savings starting before the start date. While Government action or support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions. Additionally due to the significant lead in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g. due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.</p>	0.00008	0.00037	0.00152	2030	<p>We need to understand more on the impact on soil biology. Due to the need for further research and development of biostimulants it is 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>Call for Evidence being launched this year. At a later stage, the Future Farming and Countryside Programme (FFCP) would look at potential 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>

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A7.2	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. Defra's Farming Innovation Programme (FIP) and agri-food evidence programme are developing evidence on novel fertilising products.	0.01	0.03	0.08	Delivery confidence RAG: Amber/ Green <ul style="list-style-type: none"> We are planning to commission a research project to develop the evidence base. 	Yes - FIF is developing the measure

#	NZS 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			
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.

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	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A8.1	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.	0.000	0.001	0.003	<p>Delivery confidence RAG: Amber/ Green</p> <ul style="list-style-type: none"> Further evidence and policy development required but being explored in FIP - Gene editing/modern breeding techniques are in scope of all competitions in the FIP. Not projected to make a significant contribution by CB6. Potentially sensitive - will require a shift away from economic breeding indices. 	Yes - FIP developing this

#	NZS 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			
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 savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g. due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.	0.00019	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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	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A10.1	Integrating grass/herbal leys in rotation in arable systems.	Leys are temporary grasslands made up of legume, grass and herb species that have the benefits of increasing soil organic matter and adding nitrogen to the soil and improving the soil structure. This measure promotes diversification of vegetation in arable cropping systems with the introduction of grass leys to reduce use of artificial nitrogen fertiliser. 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).	0.00	0.01	0.05	Delivery confidence RAG: Green <ul style="list-style-type: none"> Track uptake to confirm whether we have sufficient numbers to achieve savings. 	Yes - In ELM SFI

#	NZS 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			
160	Agriculture and LULUCF	Integrating grass/herbal leys in rotation in arable systems.	Leys are temporary grasslands made up of legume, grass and herb species. Diversification of arable cropping systems with grass/herbal leys can increase the positive effects of rotation practices. This measure reduces greenhouse gas emissions and emissions intensity by improving soil organic matter leading to positive impacts on crop yield, soil structure, resistance to erosion losses and could reduce nitrogen fertilizer application. Grass leys are also likely to reduce nitrogen leaching from the soil. This is included in the Sustainable Farming Incentive SFI (soils standards for SFI 2022). Once land is entered into the standard, the Government will pay for the integration of multi-species cover crops including a mix of legume, grass and herb species. NB. This measure shows carbon savings starting before the start date. While Government action or support to deliver implementation at pace may not yet be in place, there is existing, market led, uptake across sectors to deliver emission reductions. Additionally due to the significant lead in time for the projected savings to start, and the modelling system used, there may be minor emissions savings before the anticipated start year, e.g. due to proactive and engaged farmers and land managers taking steps themselves, ahead of policy.	0.00306	0.01310	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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	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A10.2	Avoiding use of Nitrogen in excess through the development of an agronomist led nutrient management plan.	<p>We are already seeing the use of nutrient management plans and manure management plans across the farming sector. Government's role is to support that adoption (and where appropriate ensure such plans support decarbonisation) and more consistent use of Nutrient Management Plans at farm level to optimise the use of nitrogen and avoid excess application. Positive impacts include reduced Greenhouse Gas emissions from synthetic fertilisers and reduced energy use and leaching of nitrogen from the soil. This action may be covered or partially covered by ELM, or by the Farming Rules for Water and Nitrate Vulnerable Zones regulation.</p> <p>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.</p>	0.00	0.01	0.02	<p>Delivery confidence RAG: Amber/ Green</p> <ul style="list-style-type: none"> SFI 23 could partially help minimise the risk of excess nitrogen application through greater awareness and education via the 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. 	Yes - nutrient management plans referred to as a measure in EIP

#	NZS 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			
161	Agriculture and LULUCF	Avoiding use of Nitrogen in excess through the development of an agronomist led nutrient management plan.	Support the use of nutrient management plans and manure management plans across the farming sector. To optimise the use of nitrogen and avoid excess application. Positive impacts include reduced Greenhouse Gas emissions from synthetic fertilisers and reduced energy use and leaching of nitrogen from the soil. This is included in the Sustainable Farming Incentive SFI (soils standards for SFI 2022, nutrients standard for 2023, and low/no input grassland standard for 2023) and is also partially covered by the Farming Rules for Water and Nitrate Vulnerable Zones regulations.	0.00144	0.00779	0.02102	2022	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 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.

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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A11	Improved crop health through improved pest and disease control practices.	<p>Improving crop health should increase yields and the efficiency of nutrient use. The measure assumes improved pest and disease control practices, which can be a combination of management actions targeting the relevant problems on the farm.</p> <p>We expect continuing market-led uptake from farmers, so the role of government is in improving these practices. The Sustainable Farming Incentive SFI Integrated Pest Management actions are expected to contribute to this. New pest management techniques are also being supported through the Farming Innovation Programme.</p>	0.000	0.001	0.004	<p>Delivery confidence RAG: Amber/ Green</p> <p>We need to confirm the extent to which we expect the savings total to be covered by SFI Integrated Pest Management actions.</p>	

#	NZS 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			
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 through a reduced need for control agents, such as pesticides, and activities such as fuel used during pesticide application.	0.00035	0.00140	0.00433	2022	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.

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Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps	Is this measure already in the public domain already?
A12	<p>[NB: This measure will not be included in the public facing compliant report, as it has moved to the baseline. Is included here as it will be included in the advice to DESNZ SoS].</p> <p>Economic projection for the agriculture sector (based on changes to farming incentives).</p>	n/a	0.00	0.00	0.00	Delivery confidence RAG: Amber/ Green	No

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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A15	Improved farm fuel and energy efficiency.	This measure refers to reductions in farm non-traded carbon dioxide (CO2) emissions from motive power, pumps and drives. This may include options like the electrification of tractors and utility vehicles, use of small robots in place of heavy human operated machines, low energy motors etc. There is a strong market-led response due to current high energy prices. We anticipate this continuing but will support adoption where needed. Currently competitions in the Farming Innovation Programme (FIP) are developing this technology and equipment and the Farming Investment Fund (FIF) is providing grants towards the purchase of relevant equipment.	0.10	0.30	0.57	<p>Delivery confidence RAG: Amber/ Red</p> <ul style="list-style-type: none"> Future work to consider existing roll out of technologies and the steps required to deliver additional savings in this area. 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 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 BEIS 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. 	Yes - Sector aware and adopting

#	NZS 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			
163	Agriculture and LULUCF	Improved farm fuel and energy efficiency.	Support reductions in farm non- traded carbon dioxide (CO2) emissions from motive power, pumps and drives. Actions include, amongst others, the use of minimum till, which can cultivate the land using mechanical measures other than ploughing to reduce soil disturbance, and the use of no till, which uses direct drilling methods 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.	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 additional savings in this area.	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 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.

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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
Af1-E	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 where these deliver a wide range of environmental outcomes.	-0.01	0.05	0.26	Delivery confidence RAG: Amber/Red <ul style="list-style-type: none"> We have recently adjusted our tree target to increase delivery confidence. There are delivery risks with tree planting because our measures are ambitious and demand-led, but 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 31st January 2028, requiring an increase in tree and woodland cover of 34,000 ha. Initial delivery pathway set out in 2023 Environmental Improvement Plan. 	Yes

#	NZS 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			
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 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.	-0.00780	0.05240	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 invest in facilities and equipment to increase the quantity, quality, diversity and biosecurity of tree, seed, and sapling supply.

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	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A2	Agroforestry. A combination of levers aiming to increase silvo-arable agroforestry to 10% of all arable land by 2050.	Agroforestry will be delivered through environmental land management schemes. Indicative launch date for agroforestry standard in Sustainable Farming Incentive is 2024, although this will not be confirmed until nearer the date.	0.00	0.02	0.09	Delivery confidence RAG: Red <ul style="list-style-type: none"> Review regulatory status of agroforestry to classify as agriculture, rather than forestry, to remove regulatory barriers. Provide financial support to farmers to assist in covering costs for investment in technology and equipment; and grants to support costs of transforming land from agriculture to agroforestry (tree planting, tree covers, etc). Fund a national advice and guidance service to support uptake of agroforestry with network of regional advisers. Fund reverse auctions to scale uptake of agroforestry. Review farm tenancy arrangements to enable appropriate diversification into agroforestry and forestry and provide industry led guidance (best practice and case studies of how landlords and tenants can work together). Review the tax treatment of woodlands (and if necessary, amend to ensure there is no disadvantage to farmers from changing their use of land to forestry). 	Yes

#	NZS 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			
175	Agriculture and LULUCF	Agroforestry. A combination of levers aiming to increase silvo-arable agroforestry to 10% of all arable land by 2050.	Agroforestry will be delivered through environmental land management schemes. Indicative launch date for agroforestry standard in Sustainable Farming Incentive is 2024, although this will not be confirmed until nearer the date. These measures will increase carbon storage and sequestration.	0.00000	0.01400	0.08800	2029	Uncertain delivery risk. The policy requires additional research to provide greater clarity on savings potential and to inform further policy development. Agroforestry will mainly be delivered through ELM and is dependent on voluntary uptake of schemes. Data will be limited until the rollout of the agroforestry standard.	Develop strong comms and guidance services on agroforestry systems. Closely monitor uptake of ELM schemes.

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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
A2.2	Hedgerows.	Support farmers to create 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. We will also support them to additionally restore degraded hedges across the country. We have announced the inclusion of a hedgerow standard in the Sustainable Farming Incentive, expected to roll out in 2023.	0.02	0.05	0.09	<p>Delivery confidence RAG: Amber/ Red</p> <ul style="list-style-type: none"> Defra will encourage and support increased hedgerows through our environmental land management 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), but there are risks around certainly in delivery until those offers, and their timings are confirmed.. 	Yes

#	NZS 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			
174	Agriculture and LULUCF	Hedgerows.	Support farmers to create or restore at least 30,000 miles of managed hedgerows by 2037, increasing to a total of at least 45,000 miles of additional managed hedgerows by 2050 returning hedgerow lengths in England to 10% above the 1984 peak (360,000 miles).. We will also support them to additionally restore degraded hedges across the country. These measures will increase carbon storage and sequestration. We have announced the inclusion of a hedgerow standard in the Sustainable Farming Incentive, expected to roll out in 2023.	0.01800	0.05000	0.09200	2022	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).

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
Nrg3	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. Further consideration will be provided in the Biomass Strategy. We will also be further exploring how this will be driven by market demand and whether other support might be needed from government to enable this planting.	0.01	0.35	1.00	<p>Delivery confidence RAG: Red</p> <ul style="list-style-type: none"> Underpinning this measure is confidence in the end market for these products and need to maximise proportion of feedstock destined for technologies with CCUS. <p>To increase delivery confidence, we need to:</p> <ol style="list-style-type: none"> Get ministerial agreement to the specific elements within the scaled back pathway, including integration with wider land use requirements, species mix, cultivation standards Continue working closely with BEIS and key stakeholders to understand the viable and sustainable end market for biomass crops, modelling and maximising the proportion destined for technologies with CCUS. Alongside this end market economic modelling, rapid work to understand what further delivery mechanisms may be needed to incentivise growers. 	Yes

#	NZS 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			
177	Agriculture and LULUCF	Domestic planting of Perennial Energy crops (PECs) and Short Rotations Forestry. Increase planting of PECs (miscanthus and Short Rotation Coppice) and Short Rotation Forestry (SRF).	Increase land planted with perennial energy crops and short rotation forestry, ensuring above- and below-ground carbon sequestered by fast-growing species through the Biomass Strategy. We will also be further exploring how this will be driven by market demand, what the appropriate sustainable business models might be and whether other support might be needed from government to enable this planting.	0.00812	0.3	1.0	2026	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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps	Is this measure already in the public domain already?
Peat 1	<p>[NB: This measure will not be included in the public facing compliant report, as it has moved to the baseline. Is included here as it will be included in the advice to DESNZ SoS].</p> <p>Peat Restoration (Nature for Climate Fund - 2020-2025).</p>	Restoring 35,000 ha of peatland by 2025.	0.00	0.00	0.00	<p>Delivery confidence RAG: Amber/ Red</p> <ul style="list-style-type: none"> We are working with the LR team and wider ELM teams to ensure join up in delivery rounds to provide longer term confidence in the future delivery of peatland restoration. This should help landowners have more confidence to put their land into restoration but reaching the 35,000 ha target may still be challenging. We have funded discovery projects and have a pipeline of approximately 50,000 ha, however reaching the 35,000 ha may go beyond 2024/25 due to the sector capacity constraints. Increased, long term demand for restoration projects should build restoration sector confidence to expand to meet our challenging delivery targets to CB6 and 2050. We are also exploring other options to encourage sector capacity growth such as skills and training, and new entrants' schemes. We are in the process of commissioning an R&D project to understand the sector size and the growth required, as well as what skills gap currently exists. This will be funded by a mixture of public and private finance. 	Yes

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
Peat 2	Peat Restoration (Blended Finance - 2022-2050).	<p>Overarching target to 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.</p> <p>Informed by data from the England Peat Map and findings of the Lowland Agricultural Peat Task Force, a Peatland Restoration Roadmap will be developed to set out a detailed trajectory for restoration to 2050.</p>	0.16	0.82	1.37	<p>Delivery confidence RAG: Amber/ Red</p> <ul style="list-style-type: none"> We are exploring different options for private finance, including the peatland carbon code and inclusion of peat in the Emissions Trading Scheme. 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 also be important for long term delivery, as well as the development and publication of our Peatland Restoration Roadmap (2024). 	Yes

#	NZS 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			
178	Agriculture and LULUCF	Peat Restoration (Blended Finance - 2022-2050).	<p>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 to set out a detailed trajectory for restoration to 2050.</p>	0.2	0.8	1.4	2025	<p>Uncertain delivery risk. 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>	<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).</p>

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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
Peat 3	Increasing responsible management of lowland agricultural peatlands .	More responsible agricultural management of peatlands, through raising water tables and wetter modes of farming (e.g. Paludiculture).	0.04	0.18	0.24	<p>Delivery confidence RAG: Red</p> <ul style="list-style-type: none"> The updated Peat Map (2024) and other R&D projects will develop a clearer picture of the technical feasibility of restoration and sustainable management activities. 	No

#	NZS 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			
179	Agriculture and LULUCF	Increasing responsible management of lowland agricultural peatlands .	Promote more responsible agricultural management of peatlands, through raising water tables and wetter modes of farming (e.g. Paludiculture).	0.03600	0.2	0.2	2025	Uncertain delivery risk. 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. .

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
Peat 4	Ending the sale of peat in horticulture.	Ending the sale of peat in horticultural growing media, in the amateur sector by 2024 and in the professional sector by 2030.	0.00	0.01	0.04	<p>Delivery confidence RAG: Amber/Green</p> <ul style="list-style-type: none"> Positive progress with the outcome of the public consultation being published announcing the ban in amateur sector. Need to identify appropriate legislative Bill. Need to continue to progress with pursuing a ban in the profession sector. 	Yes

#	NZS 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			
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.	0.00000	0.01000	0.04000	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.

#	NZS 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			
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 delivery risks are uncertain.	<p>In preparing this report, the DAs have provided information on the policies and proposals they expect to implement to reduce emissions in these sectors.</p> <p>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 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 the need to manage competing demands on land, dependencies on stakeholders, the appropriate infrastructure being in place, evidence gaps and dependencies on early stage technologies. In DESNZ's experience the approach for typically mitigating these risks may be for the relevant administration to set a vision for managing competing priorities, engagement 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.</p>

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Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps	Is this measure already in the public domain already?
Peat 5	Update the greenhouse gas inventory, including applying new wasted peat cropland emissionsC.	Determination of new emissions factors for various peatland categories, including particularly cropland on wasted peat (peat formerly mapped as having a depth of at least 40cm), and their inclusion in the 1990-2021 LULUCF inventory published in 2023.	1.92	1.92	1.92	Delivery confidence RAG: Green <ul style="list-style-type: none"> This is a GHG inventory adjustment to account for updates to emissions factors across the inventory, including for those of cropland on wasted peat. These changes have been made in the inventory published on 7 February resulting in emissions from peat being reduced but are not yet included in the EEP baseline. 	No

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	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
W1A	Near elimination of biodegradable municipal waste to landfill - Confirmed collection and packaging reforms policies.	Collection and packaging reforms to reduce biodegradable waste municipal waste to landfill. Primarily consistency in collection of household recycling (food waste, garden waste and paper and cardboard).	0.43	1.96	2.95	<ul style="list-style-type: none"> Delivery confidence RAG: Amber/Red Maintain £295m capital funding and £60mil of resource transition funding for weekly household separate food waste collections, and wider waste budgets for collection, packaging, and recycling reforms. <i>(To note we need to secure funding for ongoing costs at the next spending review).</i> <p>Work with local authorities and the non-household municipal sector to ensure that we achieve compliance by the implementation dates as agreed with Defra Secretary of State. These dates will be included within legislation.</p>	Yes

#	NZS 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			
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 space for more biodegradable waste to be processed in waste processing facilities which are not landfill.	0.4	2.0	3.0	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.

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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
W1B	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.	0.42	0.49	0.71	<ul style="list-style-type: none"> Delivery confidence RAG: Red 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 to explore options to achieve the near elimination of biodegradable municipal waste to landfill. Ministers will also soon be deciding next steps for textiles. 	Yes

#	NZS 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			
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.

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Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps	Is this measure already in the public domain already?
W2A	<p>[NB: This measure will not be included in the public facing compliant report, as it has moved to the baseline. Is included here as it will be included in the advice to DESNZ SoS].Data improvement for industrial wastewater treatment.</p>	Emissions savings associated with respect to data improvement have been factored into the new EEP baseline.	0.00	0.00	0.00	<ul style="list-style-type: none"> • Delivery confidence RAG: Green • The emissions savings associated with W2A have now been factored into the new Energy and Emissions Projections (EEP) baseline (EEP 2021-40). Therefore, we need to remove them from our emissions savings projections. 	No

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	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
W4A	Monitoring emissions from wastewater treatment and subsequent optimisation of existing operations to minimise process and other emissions.	Detection of emissions from a full range of sites, treatment stages and environmental conditions using new sensors will give a better understanding of processes. This will allow optimisation of current processes to reduce greenhouse gas leakage and minimise production.	0.02	0.13	0.25	<ul style="list-style-type: none"> Delivery confidence RAG: Amber/Red We need to be in a position where water companies are able to understand the emissions from different treatment processes and how they vary with environmental conditions/load/location. This will allow modification of the treatment process to minimise emissions of GHG. To do this we need further research and the development of techniques to monitor GHG emissions. The Water Industry holds responsibility to drive this through existing industry tools and processes such the WINEP, UKWIR and opportunities from regulator driven funding mechanisms such as the Ofwat Innovation Fund. 	Yes

#	NZS 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			
184	Waste and F-gases	Monitoring emissions from wastewater treatment and subsequent optimisation of existing operations to minimise process and other emissions.	Work with water compaies to encourage the widespread deployment of new sensors for the detection of emissions from a full range of sites, treatment stages and environmental conditions to enable optimisation of current processes to reduce greenhouse gas leakage and minimise production.	0.01680	0.1	0.3	2026	Uncertain delivery risks. Delivery is dependent on water company action. Water companies will need to invest in new wastewater treatment processes, which would require pilots and investment by water companies to upgrade treatment facilities and processes. investment would be contingent on price review outcomes.	To do this we need further research and the development of techniques to monitor GHG emissions. The Water Industry holds responsibility to drive this through existing industry tools and processes such 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.

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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
W5A	High proportion of conventionally digested sludge from wastewater treatment is upgraded to Advanced Anaerobic Digestion (AAD).	By treating a higher proportion of sewage sludge via advanced anaerobic digestion, process emissions could be reduced.	0.01	0.05	0.08	<ul style="list-style-type: none"> Delivery confidence RAG: Amber/Red 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. 	Yes

#	NZS 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			
186	Waste and F-gases	High proportion of conventionally digested sludge from wastewater treatment is upgraded to Advanced Anaerobic Digestion (AAD).	Work with water companies to upgrade existing treatments which use anaerobic digesters to Advanced Anaerobic Digestion, which emit less greenhouse gas and capture waste energy as heat and natural gas.	0.01344	0.05376	0.08400	2025	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.

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	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
W6A	Alternative treatment processes for wastewater - e.g., anaerobic treatment/Membrane Aerated Biofilm Reactor (MABR)/alternative ammonia removal processes.	Development and adoption of new wastewater treatment processes will improve the efficiency of wastewater treatment and reduce greenhouse gas production.	0.00	0.03	0.08	<ul style="list-style-type: none"> Delivery confidence RAG: Red 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. 	Yes

#	NZS 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			
187	Waste and F-gases	Alternative treatment processes for wastewater - e.g., anaerobic treatment/Membrane Aerated Biofilm Reactor (MABR)/alternative ammonia removal processes.	Work with the water industry to expand into more sustainable wastewater treatment techniques and encourage the development and adoption of new wastewater treatment processes which will improve the efficiency of wastewater treatment and reduce greenhouse gas production and contribute to the circular economy by allowing resources to be reused.	0.0000 0	0.02520	0.08400	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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	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
W2B	Data improvement for industrial wastewater treatment.	Further improvements in modelling and data collection should improve reporting and reduce uncertainty.	0.07	0.07	0.07	Delivery confidence RAG: Amber/Green	Yes

#	NZS 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			
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.	0.06720	0.06720	0.06720	2037	We have high certainty in the delivery of this policy. This work is currently underway but the level of reduction that will be delivered is less certain.	We have high delivery confidence in this policy and the programme of work is currently underway.

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	Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
Fg1	Metered-dose inhalers (MDIs) F-gas Phasedown.	Measures implemented by the NHS to reduce MDI F-gas emissions.	0.02	0.19	0.45	<ul style="list-style-type: none"> Delivery confidence RAG: Amber/ Green 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 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. 	Yes

#	NZS 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			
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	<p>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 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.</p>	We are continuing to engage with the NHS and health boards.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
	Measure: Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps
Fg2	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	0.00	0.00	0.05	<ul style="list-style-type: none"> Delivery confidence RAG: Amber/ Green 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. 	Yes

#	NZS 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			
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.	0.00000	0.00000	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.

FOR REFERENCE ONLY	PUBLIC FACING – SECTION 14 COMPLIANT REPORT					NOT PUBLIC FACING – SECTION 13 ADVICE TO DESNZ SOS	
Measure Code	Measure: Public Facing Name	Measure: Public Facing Description	CB4 savings p.a. (England only)	CB5 / NDC savings p.a. (England only)	CB6 savings p.a. (England only)	Additional commentary on delivery risk & next steps	Is this measure already in the public domain already?
Fg3	Raise ambition through a review of F-gas policy in 2023.	Conduct a review of F-gas policy in 2023 to identify further policy measures.	0.17	0.50	0.63	<ul style="list-style-type: none"> • Delivery confidence RAG: Amber/ Green • 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. 	Yes

#	NZS 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			
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 delivery risks are uncertain.	<p>In preparing this report, the DAs have provided information on the policies and proposals they expect to implement to reduce emissions in these sectors.</p> <p>These include various waste measures, including decreasing waste and increasing recycling. 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 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.</p>