

Title: Regulatory Impact Assessment for The Climate Change (Carbon Budget 2038-2042) Regulations (Northern Ireland) 2026	Regulatory Impact Assessment (RIA)
	Date: 12 February 2026
Lead department or agency: Department of Agriculture, Environment and Rural Affairs (DAERA)	Type of measure: Subordinate Legislation
	Stage:
Other departments or agencies:	Source of intervention:
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Summary Intervention and Options

What is the problem under consideration? Why is government intervention necessary? (7 lines maximum) The Climate Change Act (Northern Ireland) 2022 (the Act) ¹ sets a legally binding target for net-zero greenhouse gas (GHG) emissions by 2050, as well as emissions reduction targets for 2030 and 2040. DAERA is required by the Act to make regulations that set the maximum total amount of carbon emissions for each five-year period, these are known as carbon budgets. The Department must now set the Fourth Carbon Budget for 2038–2042, and this budget must align with the 2040 target and maintain a trajectory consistent with achieving net zero by 2050.	
What are the policy objectives and the intended effects? (7 lines maximum) The objective is to set the Fourth Carbon Budget at a level consistent with the requirements of the Act, ensuring Northern Ireland remains on track to achieve the 2040 (77%) and 2050 (100%) reduction targets. DAERA proposes to set the Fourth Carbon Budget in line with the recommendation of the UK Climate Change Committee (CCC). The Climate Change (Carbon Budget 2038–2042) Regulations (Northern Ireland) 2026 will therefore set the Fourth Carbon Budget at an annual average emissions reduction of 77% below the 1990 baseline ² .	
What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base) (10 lines maximum) The following two options have been considered- Option 1: Do nothing/ Business as Usual – Do not set the Fourth Carbon Budget Option 2: Set the Fourth Carbon Budget at an annual average emissions reduction of 77% lower than the 1990 baseline. Option 2 is the preferred option. Under the Act, DAERA must set carbon budgets for the fourth and subsequent budgetary periods at least twelve years before they begin. For the 2038–2042 period, the deadline for doing so was 31 December 2025. The CCC recommended that emissions during this period should be reduced by an annual average of 77% below 1990 levels. DAERA considers this level necessary to ensure consistency with the Act's 2040 and 2050 targets and to comply with section 25 of the Act. Failure to set the Fourth Carbon Budget at this level would risk breaching those statutory duties.	
Will the policy be reviewed? Yes, it will be reviewed. Evidence will be reviewed when considering the level of Northern Ireland's fifth carbon budget.	If applicable, set review date: 31/12/2030

Cost of Preferred (or more likely) Option

¹ [Climate Change Act \(Northern Ireland\) 2022 \(legislation.gov.uk\)](https://legislation.gov.uk/ukni/2022/0001)

² [Northern Ireland greenhouse gas inventory](#)

Total outlay cost for business £m The costs/benefits reflect the total across the whole NI economy is estimated to be approximately £1.39bn benefit.	Total net cost to business per year £m £53.46m (Benefit) NI economy wide.	Annual cost for implementation by Regulator £m Costs identified are the net costs to the NI economy which will be made up of private and public investment. Regulator-specific costs cannot yet be identified. These will be determined when policies across all departments are developed and implemented to meet the Fourth CAP. Each policy will have its own separate RIA
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The exact cost of the Fourth Carbon Budget will not be known until emission reduction policies and proposals which are developed for inclusion in the Fourth Climate Action Plan (CAP) have been costed and approved. Estimated costs for the NI Net Zero Pathway (2025-2050) have been produced using the CCC's financial datasets which accompanied their letter "Northern Ireland's Fourth Carbon Budget - Advice to the Northern Ireland Executive"³, including the CCC's NI Net Zero Pathway and then applying the DESNZ Green Book Carbon Values⁴ to calculate the net cost/benefit to NI economy.

Using CCC NI Net Zero Pathway cost estimates (2023 prices) and central HM Treasury Green Book Carbon Values, the cost estimates for the period 2025-2050 are:

- Figures are rounded to the nearest £10m.

Costs Calculated using CCC Datasets	Carbon Value Series Projection	Benefits (£bn)	Net Cost/Benefits
£3.56Bn	Low	2.47	£1.09
	Central	4.95	£1.39 (Benefit)
	High	7.42	£3.86 (Benefit)

The cost estimates reflect NI economy wide investment and should not be interpreted as the cost to the public sector alone. The CCC report estimates that a substantial proportion of the investment required to deliver decarbonisation is expected to come from the private sector, with public expenditure likely to play a more significant role in the early stages of transition before declining as markets develop. The CCC costs projections don't account for wider co-benefits or avoided climate damage.

Does Implementation go beyond minimum EU requirements?	YES ☐	NO ☒
Is this measure likely to impact on trade and investment?	YES ☒	NO ☐
Are any of these organisations in scope?	Micro Yes ☒ No ☐	Small Yes ☒ No ☐
	Medium Yes ☒ No ☐	Large Yes ☒ No ☐

The final RIA supporting legislation must be attached to the Explanatory Memorandum and published with it.

Approved by: Date:

³ [Northern Ireland's Fourth Carbon Budget - Climate Change Committee](#)

⁴ [Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK](#)

Summary: Analysis and Evidence

Policy Option 1

Description: Do nothing/Business as usual – Do not set the Fourth Carbon Budget

ECONOMIC ASSESSMENT (Option 1)

Costs (£m)	Total Transitional (Policy)		Average Annual (recurring)	Total Cost
	(constant price)	Years	(excl. transitional) (constant price)	(Present Value)
Low	Optional		Optional	Optional
High	Optional		Optional	Optional
Best Estimate				

Description and scale of key monetised costs by 'main affected groups' Maximum 5 lines

No direct transitional or recurring monetised costs under BAU. However, by not setting the Fourth Carbon Budget, government would still be legally required to deliver the 2040 and 2050 targets. This would likely increase long-term costs, as early, planned investment would be replaced by later, more disruptive and more expensive measures to remain compliant with the Act.

The CCC supplementary analysis⁵ for the UK Seventh Carbon Budget using Green Book carbon values indicates that avoiding climate damage through emissions reduction could deliver estimated UK savings of £40bn to £130bn in 2050.

Other key non-monetised costs by 'main affected groups' Maximum 5 lines

If the proposal is not progressed, it would breach statutory obligations under the Climate Change Act (NI) 2022 and create significant compliance risks. In addition, reduced investor confidence and weakened strategic planning would hinder investment and slow the transition. Overall, these factors would increase the risk of Northern Ireland failing to meet its 2040 and 2050 emissions-reduction targets.

Benefits (£m)	Total Transitional (Policy)		Average Annual (recurring)	Total Benefit
	(constant price)	Years	(excl. transitional) (constant price)	(Present Value)
Low	Optional		Optional	Optional
High	Optional		Optional	Optional
Best Estimate				

Description and scale of key monetised benefits by 'main affected groups' Maximum 5 lines

There are no monetised benefits associated with Option 1. Delaying action does not remove the legal obligation to meet the 2040 and 2050 targets; therefore, no cost savings accrue.

Other key non-monetised benefits by 'main affected groups' Maximum 5 lines

Without setting the Fourth Carbon Budget, Northern Ireland would not have the necessary trajectory to meet the legislative 2040 and 2050 emissions reduction targets. Setting the Fourth Carbon Budget helps provide focus and limit emissions over the 2038-2042 period. If it is not legislated for, there may be insufficient incentive and clarity for Northern Ireland to make the required transition and attract the required investment in a timely manner to achieve a low GHG emission economy and society.

Key Assumptions, Sensitivities, Risks Maximum 5 lines

There is uncertainty around the economic impacts of climate inaction and continuing with a business-as-usual approach, but evidence shows that delaying mitigation increases long-term costs.

Doing nothing and not setting the Fourth Carbon Budget will leave DAERA in breach of its legislative requirements in the Act and is therefore it is deemed not to be a viable option.

BUSINESS ASSESSMENT (Option 1)

Direct Impact on business (Equivalent Annual) £m				
Costs:	Benefits:	Net:		

Cross Border Issues (Option 1)

⁵ [Supplementary analysis of the Seventh Carbon Budget - Climate Change Committee](#)

How does this option compare to other UK regions and to other EU Member States (particularly Republic of Ireland) Maximum 3 lines

This option would leave Northern Ireland out of step with other regions. All other UK Devolved Administrations (DAs) and ROI set carbon budgets.

ECONOMIC ASSESSMENT (Option 2)

Costs (£m)	Total Transitional (Policy)		Average Annual (recurring)	Total Cost
	(constant price)	Years	(excl. transitional) (constant price)	(Present Value)
Low	Optional	2025	Optional	Optional
High	Optional	-	Optional	Optional
Best Estimate		2050	£137m	£3.56bn

Description and scale of key monetised costs by ‘main affected groups’

The costs used are the capital and operating expenditure incurred from 2025 to 2050 using CCC Datasets. The specific costs associated with meeting the Fourth Carbon Budget cannot be fully determined at this stage. All NI departments will need to develop and implement proposals and policies to help meet emission limits set with the carbon budget. At this stage it is not known what proposals and policies will be developed and implemented, therefore the associated costs are unknown.

However, there will need to be investment to mitigate climate change to ensure the Fourth Carbon Budget is not exceeded and that emission reduction targets in the Act are met. The precise amount and profile of costs will depend on the policies chosen by Ministers across all NICS departments to meet the carbon budgets.

The costs provided by the CCC are the total, economy-wide capital and operating expenditure needed to meet the Net Zero Pathway, relative to the baseline scenario of no further decarbonisation. These costs are not specific to the Fourth Carbon Budget period (2038-2042), some of the capital costs incurred, and some of the operating savings will be from investments made to meet previous carbon budgets.

Other key non-monetised costs by ‘main affected groups’ Maximum 5 lines

Meeting the Fourth Carbon Budget will involve a range of impacts that cannot currently be quantified. Some transition-related costs will arise from measures already underway before 2038, while the further policies required for the 2038–2042 period have not yet been developed. As Northern Ireland’s economy shifts towards low-carbon technologies, sectors such as agriculture, transport, buildings and industry are expected to experience operational and structural adjustments. Households and organisations may also face temporary disruption from retrofits, infrastructure upgrades, and changes in practices associated with decarbonisation. These costs cannot be monetised at this stage, as the specific policy and implementation pathway will be determined through the Fourth CAP.

Benefits (£m)	Total Transitional (Policy)		Average Annual (recurring)	Total Benefit
	(constant price)	Years	(excl. transitional) (constant price)	(Present Value)
Low	Optional		Optional	£2.47bnOptional
High	Optional		Optional	£7.42bnOptional
Best Estimate			£190m	£4.95bn

Description and scale of key monetised benefits by 'main affected groups'

Carbon savings, monetised using government carbon values, are the main benefit.

Greenhouse gas emissions carbon values are used across government for valuing impacts on GHG emissions resulting from policy interventions. They represent a monetary value that society places on one tonne of carbon dioxide equivalent (£/tCO₂e). The government uses these values to estimate a monetary value of the greenhouse gas impact of policy proposals during policy design, and also after delivery. HM Treasury Green Book central carbon values were applied to calculate the best estimate total monetised benefits from emissions reductions over 2025–2050.

Sensitivity analysis using the low and high carbon value series produces a range of £2.47bn to £7.42bn.

As the costs calculated by the CCC are in 2023 prices, the Green Book carbon values are adjusted using a UK GDP deflator at market prices.

Both costs and benefits are discounted at a rate of 3.5% per year from 2025, in line with Green Book guidance. This is the Social Time Preference rate, which reflects society's preference for present consumption over future consumption. This places greater weight on benefits and costs that occur sooner rather than later.

Costs have been rounded to the nearest million.

Other key non-monetised benefits by 'main affected groups' Maximum 5 lines

Implementation of the Fourth Carbon Budget is expected to generate a range of significant benefits that cannot currently be monetised. These include improved air quality, enhanced public health, increased resilience to climate impacts, and wider environmental gains from measures such as peatland restoration, afforestation and nature-based solutions. Households and businesses are also likely to experience non-monetised operational benefits over time, such as reduced exposure to fossil-fuel price volatility and improved energy security. Additional advantages include strengthened investor confidence, greater policy certainty and long-term economic competitiveness as supply chains shift toward low-carbon standards. These wider societal and environmental benefits are expected to be substantial but cannot be quantified until specific policies under the Fourth CAP are developed.

Key Assumptions, Sensitivities, Risks Maximum 5 lines

Delivery of the Fourth Carbon Budget depends on assumptions about technology costs, behavioural change, macroeconomic conditions. Actual impacts will vary once specific policies are set through the Fourth CAP. Key sensitivities include the availability and cost of low-carbon technologies, supply-chain capacity, and future fossil-fuel and carbon-value trajectories. Risks arise from slower-than-expected innovation, global economic pressures, and uncertainties in long-term modelling of emissions, costs and discounting. These factors affect the scale and timing of both costs and benefits and will be refined as detailed policies are developed.

BUSINESS ASSESSMENT (Option 2)

Direct Impact on business (Equivalent Annual) £m				
Costs:	Benefits:	Net:		
While the CCC have estimated the costs of taking action, they do not identify how these will be paid. Direct annual costs and benefits to business cannot yet be monetised, as the specific policies required to meet the Fourth Carbon Budget have not been developed. The CCC's cost estimates reflect economy-wide net investment requirements rather than direct business-specific impacts. Many of the actions to reduce emissions at a UK level via National policies will likely be paid for at UK level/socialised across the whole of the UK. The extent to which costs and savings are shared across the UK including the amount of expenditure through devolved administrations' budgets will be determined by policy at UK and at devolved level. The carbon value benefits also can't be expressed as a direct business impact at this stage. When the policies and proposals are developed for inclusion in the Fourth CAP, impacts assessments should be assessed on a policy-by-policy basis.				

Cross Border Issues (Option)

How does this option compare to other UK regions and to other EU Member States (particularly Republic of Ireland) Maximum 3 lines

Setting the Fourth Carbon Budget keeps Northern Ireland aligned with the wider UK and the Republic of Ireland, all of which operate legally binding climate frameworks and carbon-budgeting systems. All UK Devolved Administrations have statutory emissions-reduction pathways—Scotland and Wales through multi-year carbon budgets, and the UK as a whole through legally binding five-year budgets. Likewise, the Republic of Ireland has legislated three five-year carbon budgets (2021–2025, 2026–2030, 2031–2035), under its Climate Action and Low Carbon Development (Amendment) Act 2021.

Northern Ireland's proposed level is broadly comparable to these jurisdictions and maintains consistency with regional and EU climate trajectories.

Evidence Base

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1. INTRODUCTION

Climate change is a complex but critically important issue, recognised as one of the greatest global challenges of our time and a priority for governments worldwide. The United Nations (UN) defines climate change as long-term shifts in temperature and average weather patterns across the planet. While these shifts can occur naturally, since the 1800s human activities, particularly the burning of fossil fuels such as coal, oil, and gas, have been the main driver of climate change, releasing greenhouse gases that trap heat in the atmosphere.

Across the globe, including in Northern Ireland, efforts are focused on limiting temperature rise to 1.5°C to help avoid increasingly frequent and severe extreme weather events such as heatwaves, droughts, flooding, and storms. In February 2020, the Northern Ireland Assembly declared a climate emergency.

Recognising that many climate solutions require strong legislation and fair implementation, the Northern Ireland Assembly passed the Climate Change Act (Northern Ireland) 2022 in March 2022. The Act, which came into operation on 7 June 2022, sets a legally binding target of net zero greenhouse gas emissions by 2050, alongside interim targets for 2030 and 2040. A key responsibility under the Act is the setting of carbon budgets, which limit the total emissions permitted over five-year periods. In December 2024, the Northern Ireland Assembly approved 'The Climate Change (Carbon Budgets 2023-2037) Regulations (Northern Ireland)' 2024⁶ which set the first three carbon budgets for Northern Ireland. They are:

- Carbon Budget 1: The carbon budget for the 2023-2027 budgetary period is an annual average of 33% lower than the baseline.
- Carbon Budget 2: The carbon budget for the 2028-2032 budgetary period is an annual average of 48% lower than the baseline.
- Carbon Budget 3: The carbon budget for the 2033-2037 budgetary period is an annual average of 62% lower than the baseline.

The Fourth Carbon Budget for Northern Ireland ensures continued progress toward meeting the 2050 net zero target. Responsibility for tackling climate change and adapting to its impacts is shared across all sectors of society.

The Northern Ireland Executive plays a central role in leading effective mitigation and adaptation measures. Tackling climate change and addressing its impacts is cross-cutting, with all departments bearing a collective responsibility for taking forward climate change action.

2. PROBLEM UNDER CONSIDERATION

Section 23 of the Act requires DAERA to set, by regulations, 5-yearly net GHG emission limits, known as carbon budgets. Section 27 of the Act requires DAERA to set the carbon budget for the fourth and subsequent budgetary periods at least twelve years before the start of the period in question. The Fourth Carbon Budget covering the period 2038-2042 was required to be set by the end of December 2025.

The Fourth Carbon Budget must be set at a level that DAERA is satisfied is consistent with meeting the emissions reduction target for 2040 and 2050 net zero target.

The Act has the following targets –

The Northern Ireland departments must ensure that the net Northern Ireland emissions account for –

- the year 2050 is at least 100% lower than the baseline; and
- the year 2040 is at least 77% lower than the baseline level.

When making regulations that set carbon budgets, DAERA is required to seek the advice of the CCC and take this advice into account before making the associated regulations. The CCC is an independent statutory body that advises the UK and devolved administration governments on setting and meeting carbon budgets and preparing for climate change.

⁶ [The Climate Change \(Carbon Budgets 2023-2037\) Regulations \(Northern Ireland\) 2024](#)

Section 5 of this document provides details on the advice received from the CCC. As required by section 23 of the Act, DAERA consulted with the other Northern Ireland departments on the proposed carbon budgets and complied with the requirements set out in section 26 of the Act.

3. POLICY OBJECTIVE

The objective of The Climate Change (Carbon Budget 2038–2042) Regulations (Northern Ireland) 2026 is to set the Fourth Carbon Budget at a level required under the Climate Change Act (Northern Ireland) 2022 to remain consistent with achieving the statutory emissions reduction targets for 2040 and 2050. Carbon budgets provide a legally binding limit on total greenhouse gas emissions over each five-year period and ensure Northern Ireland remains on a clear and evidence-based trajectory towards its longer-term commitments.

The Regulations will:

- establish a statutory emissions-reduction pathway for the period 2038–2042, helping to deliver the Act's long-term targets;
- underpin future climate change policies and strategies across all Northern Ireland departments;
- complement existing statutory requirements within the Act and provide a coherent framework for cross-government planning;
- give greater certainty to investors, businesses and the public sector by setting a clear decarbonisation trajectory for the medium term.

The Regulations set the emissions limit only; they do not prescribe the specific policies or measures required to meet the budget. These will be developed separately through future CAPs, supported by the necessary assessments and just transition considerations.

4. NORTHERN IRELAND – CURRENT PERFORMANCE

Northern Ireland is already experiencing the effects of a changing climate, with observable increases in average temperature, shifting rainfall patterns, and rising sea levels. These changes are increasing the risks of flooding, heat stress, and disruption to agriculture and infrastructure, consistent with findings in CCRA3, the Climate Change Risk Assessment for Northern Ireland⁷. Projections for the 2050s indicate continued warming and more variable seasonal rainfall, further heightening climate-related risks.

Variable	Change experienced in Northern Ireland	Projected 2050s
Average annual temperature	Increase of 0.7°C from mid-1970s to mid-2010s	+1.2°C
Annual mean rainfall	Increase of 6.4% from mid-1970s to mid-2010s	+3% winter -11% summer
Weather extremes	UK-wide increase in extreme heat events Little evidence yet of changes in extreme rainfall	
Sea level rise	UK-wide increase of ~1.4mm per year since 1901 (16cm to date)	14-19cm

Northern Ireland's greenhouse gas emissions

The [Northern Ireland Greenhouse Gas Emissions 2023](#) details the greenhouse gas emissions per sector in NI.

Greenhouse gas emissions share by Territorial Emissions Statistics (TES) sector (2023 figures rounded to the nearest whole number)

⁷ [CCRA-Evidence-Report-Northern-Ireland-Summary-Final.pdf](#)

Agriculture	31%
Domestic Transport	21%
Buildings and Product Use	14%
Land use, Land use change and Forestry	12%
Electricity Supply	12%
Industry	6%
Waste	4%

The biggest source of emissions was agriculture, making up 30.8%, followed by transport at 21.5%. Other contributors included buildings and product use (13.8%), land use and forestry (11.8%), and electricity supply (11.7%). These sectors will all require a marked reduction in emissions in order to meet the long-term targets of the Act.

Most sectors reduced their emissions between 2022 and 2023, except fuel supply and land use. The biggest drops were in electricity supply, buildings, and agriculture.

Sector	Base Year	2022	2023	Change Base year - 2023
Agriculture	5.2	5.7	5.6	0.4
Buildings and product use	4.4	2.9	2.5	-1.9
Domestic transport	3.7	3.9	3.9	0.2
Electricity supply	5.3	3.0	2.1	-3.2
Fuel supply	0.0	0.0	0.0	0.0
Industry	3.3	1.2	1.1	-2.2
LULUCF	2.6	2.1	2.1	-0.5
Waste	2.0	0.8	0.8	-1.2
Grand Total	26.6	19.6	18.2	-8.4

In 2023, Northern Ireland's net greenhouse gas emissions were estimated at 18.2 million tonnes of carbon dioxide equivalent (MtCO₂e). This is a decrease of 7.1% from 2022 and 31.5% lower than in the early 1990s.

Northern Ireland made up 4.7% of the UK's total emissions in 2023. Across the UK, emissions have fallen by 52.7% since the early 1990s, while Northern Ireland's reduction was 31.5%. For comparison, England cut emissions by 55.1%, Scotland by 52.7%, and Wales by 38.5%.

5. INDEPENDENT EXPERT ADVICE AND EVIDENCE

As required by section 23 of the Climate Change Act (Northern Ireland) 2022, the Department sought the independent statutory advice of the CCC on the appropriate level for Northern Ireland's Fourth Carbon Budget (2038–2042). The CCC published its advice on 19 March 2025⁸, recommending that the Fourth Carbon Budget should be set at an average annual emissions reduction of 77% below the 1990 baseline. This level reflects the CCC's assessment of the trajectory required to remain consistent with the legislated 2040 (77%) and 2050 (100%) emissions reduction targets.

The CCC advice also produced a dedicated "Northern Ireland Net Zero Pathway" that sets out one possible scenario for how Northern Ireland could deliver the recommended 77% reduction during the Fourth Carbon Budget period. It is important to emphasise that this pathway is illustrative only. The CCC uses modelled scenarios to demonstrate how a given carbon budget *could* be achieved, but these scenarios do not mandate how Northern Ireland must deliver emissions reductions. The CCC itself is clear that other choices are available to the Northern Ireland Executive and that the precise policies and proposals, technologies and sectoral actions is a matter for Northern Ireland Executive Ministers to decide.

Accordingly, setting the Fourth Carbon Budget does not determine a delivery pathway, the role of the carbon budget is to establish the legally binding emissions limit for the five-year period. The policies, proposals and sectoral measures required to meet that limit will be developed separately.

The Act requires Climate Action Plans (CAP) to set out the policies and proposals to meet corresponding carbon budgets. It is the CAP process not the carbon budget that determines how emissions reductions will be achieved. All Northern Ireland departments must contribute policies and proposals to the CAP, each supported by the required impact assessments, including just transition and financial, social and economic impact assessments. The CAP will then be subject to consultation and Assembly scrutiny before being finalised.

The CCC's modelling therefore serves as evidence to inform decision-making, helping to illustrate potential trajectories and highlight sectoral opportunities or challenges. It does not constrain ministerial choice, nor does it pre-empt the decisions of the Executive or the Assembly.

The Northern Ireland Executive will determine its own approach through future CAPs, ensuring that the transition to net zero is shaped in a way that reflects local circumstances, strategic priorities and the just transition principles set out in the Act.

Other Evidence and Advice

DAERA has also taken account of the expertise and advice provided by the Republic of Ireland's Climate Change Advisory Council (CCAC) and the Intergovernmental Panel on Climate Change (IPCC), the United Nations body responsible for assessing climate science.

DAERA has reviewed key publications issued by both bodies as part of its analysis and development work in relation to the proposed carbon budget and has also engaged with the CCAC. There are consistent themes in terms of the key advice provided by the CCC, the CCAC and IPCC. According to the IPCC's [Sixth Assessment Report \(AR6\)](#)⁹, limiting warming to 1.5°C requires global CO₂ emissions to fall by about 43% by 2030 and reach net zero around 2050. The recommendations of the CCC and the CCAC are consistent with IPCC projected emission levels globally if warming is to be limited to 1.5°C.

The CCAC has issued a broad range of advice on climate change, including recommendations for Ireland's first three carbon budgets. The initial carbon budget programme proposed by the CCAC was approved by the Government and adopted by both Houses of the Oireachtas in April 2022. This programme sets out three consecutive five-year carbon budgets for the periods 2021–2025, 2026–

⁸ [Northern Ireland's Fourth Carbon Budget - Climate Change Committee](#)

⁹ [Sixth Assessment Report — IPCC](#)

2030, and 2031–2035. In addition, Ireland has committed to reducing its greenhouse gas emissions by 51% by 2030 compared to 2018 levels.

The Climate Change Advisory Council's latest Annual Review (2025)¹⁰ warns that Ireland is off track to meet its climate targets, having exceeded the first carbon budget by around 10 MtCO₂e. The report highlights 2024 as the fourth-warmest year on record and calls for urgent action across sectors, including accelerating electric vehicle uptake, expanding public transport, phasing out fossil fuel subsidies, and retrofitting buildings. It also stresses the need for increased investment in climate adaptation and biodiversity measures, while noting that upfront costs for low-carbon technologies will lead to long-term savings and improved resilience.

Economic impact of climate change

Recent evidence demonstrates that the economic impacts of climate change on Northern Ireland and the wider UK are increasingly significant, with clear financial risks from inaction and identifiable benefits from early, sustained mitigation. The UK Climate Change Committee's Fourth Carbon Budget Advice for Northern Ireland (2025) sets out the most robust and up-to-date assessment, showing that NI faces substantial economic exposure to climate-related impacts on agriculture, infrastructure, energy systems and public services. The CCC highlights that delaying emissions reductions increases overall transition costs, reduces investor confidence, and risks higher future expenditure on emergency response, infrastructure repair, and adaptation.

Northern Ireland specific analysis prepared for DAERA by Cambridge Econometrics (2025) further shows that climate inaction would impose rising financial pressures across the NI economy, with impacts concentrated in agriculture, transport, and the built environment. Their modelling finds that setting the Fourth Carbon Budget at 77% requires upfront investment but delivers long-term savings through lower operating costs, reduced exposure to fossil fuel price volatility, and productivity gains from cleaner technologies. Economic risks are projected to intensify without mitigation, with climate impacts reducing output, damaging assets, and increasing long-term public spending commitments.

Additional NI-relevant evidence from the *Northern Ireland Environmental Improvement Plan Annual Progress Report (2024–25)*¹¹ highlights that climate-driven changes in rainfall, extreme weather, and land conditions are already affecting local infrastructure, farming operations, and environmental services. Academic research published in 2025 by the University of Bristol¹² shows that Northern Ireland is experiencing tangible impacts on health, agriculture, and rural productivity, and that these costs are expected to escalate as warming accelerates. These studies underline that climate impacts in NI are no longer hypothetical future risks but are already materialising across communities.

At UK level, the Office for National Statistics' *Beyond GDP Insights* (2025)¹³ confirms that climate change is affecting productivity, natural capital, and economic stability, while low carbon sectors are becoming key drivers of national growth. This complements NI specific findings by demonstrating how climate impacts propagate through supply chains, labour markets, and public finances across the UK.

Taken together, the latest NI specific and UK evidence shows that the economic case for early emissions reduction is strong. Mitigation reduces long-term damage costs, strengthens resilience, stabilises public finances and supports new economic opportunities. Inaction would lead to increasing economic losses, higher adaptation expenditures, and growing risks to key NI sectors such as agriculture, transport, energy and health. This evidence therefore supports setting the Fourth Carbon Budget at a level consistent with NI's pathway to net zero.

¹⁰ [CCAC-AR-2025-SfA-final.pdf](#)

¹¹ [Environmental Improvement Plan Annual Progress Report 2024-2025](#)

¹² [Cabot Institute for the Environment | University of Bristol](#)

¹³ [Beyond GDP insights – environment, climate and nature, UK: 2025 - Office for National Statistics](#)

6. APPROACHES IN OTHER JURISDICTIONS

National Political and Legal Context – UK, Scotland, Wales, Republic of Ireland (ROI) and EU

United Kingdom: The UK remains committed to the 2015 Paris Agreement¹⁴, aiming to cap global warming well below 2 °C and strive towards 1.5 °C. Following the 2019 amendment to the Climate Change Act 2008, the UK legally pledged to reach net zero greenhouse gas emissions by 2050, a commitment that aligns with the expert advice from the Climate Change Committee (CCC). The UK Climate Change Act 2008 also mandates a process for setting five-yearly carbon budgets which should not be exceeded by the UK, in order to meet the UK's emission reduction commitments.

Carbon Budget	Period	Emissions Limit	% Reduction vs 1990
CB4	2023–2027	1,950 MtCO₂e	52%
CB5	2028–2032	1,725 MtCO₂e	58%
CB6	2033–2037	965 MtCO₂e	77%

The UK's Seventh Carbon Budget is not yet set in legislation. The CCC's advice recommends limiting emissions to 535 MtCO₂e for 2038–2042, this equates to an 87% reduction compared to baseline. This is advisory only until government sets the official figure in legislation.

Scotland:

The Scottish Government's 2025 Programme for Government set out Scotland's climate ambitions for the next 20 years, through to achieving net zero by 2045. This will be progressed through a series of carbon budgets. The carbon budgets propose five-year, statutory limits on emissions from 2026 to 2045. The proposed budgets are in line with the advice from the CCC.

The average level of emissions for Scotland over each five-year period are:

Carbon Budget	Period	% Reduction vs 1990
CB1	2026 - 2030	57%
CB2	2031- 2035	69%
CB3	2036 - 2040	80%
CB4	2041 - 2045	94%

By implementing these budgets, Scotland aims to ensure steady progress toward its reaffirmed net zero target by 2045.

Wales.

Wales has a legally binding Net Zero by 2050 target under the *Environment (Wales) Act 2016*, supported by statutory interim targets and a series of five-year carbon budgets. The Welsh Government has committed to achieving the transition without reliance on international offsets, with 0% carbon credit limits already set for Carbon Budgets 2 and 3.

Carbon Budget	Period	% Reduction vs 1990
CB3	2026–2030	58%
CB4	2031–2035	73%

¹⁴ [The Paris Agreement | UNFCCC](#)

ROI

Ireland's first carbon budget programme, comprising three 5-year economy-wide carbon budgets (2021–2035), was approved by the Government in April 2022.

These budgets are designed to guide Ireland towards climate neutrality by no later than 2050 and to support the legally binding target of a 51% reduction in greenhouse gas emissions (from 2018 levels) by 2030, as outlined in the Climate Action and Low Carbon Development (Amendment) Act 2021.

Carbon Budget	Period	Emissions Limit (MtCO ₂ eq)	Notes
Carbon Budget 1	2021–2025	295 MtCO ₂ eq	Legally approved by the Oireachtas
Carbon Budget 2	2026–2030	245 MtCO ₂ eq	Designed to support the 51% emissions reduction target by 2030
Carbon Budget 3	2031–2035	151 MtCO ₂ eq	Reflects continued pathway to climate neutrality “no later than 2050”

These values represent the maximum cumulative permitted greenhouse gas emissions for each budget period and are set to align Ireland's emissions trajectory with its climate neutrality objective and the 51% reduction target by 2030.

EU

The European Union currently has laws in place to require the bloc to reduce emissions by at least 55% by 2030, compared with baseline levels, with a commitment to achieving ‘EU climate neutrality’ by 2050. These targets will be partly implemented by annual emissions targets set for each Member State¹⁵, which apply to specific sectors only, and each Member State's target is calculated to reflect its relative level of wealth¹⁶. Less wealthy countries have less ambitious targets because their relatively higher economic growth is likely to be a stronger emission driver and they have relatively lower investment capacities.

Table of overview of targets and carbon budgets across UK, Ireland and EU

¹⁵ [Climate action – binding annual greenhouse gas emission reductions \(2021–2030\) | EUR-Lex](#)

¹⁶ [Effort sharing 2021-2030: targets and flexibilities - Climate Action](#)

7. DESCRIPTION OF OPTIONS CONSIDERED

Option 1: Do nothing/Business as usual – Do not set the Fourth Carbon Budget

	Net Zero	2020	2030 target	2040 target	CB1 2023 - 2027	CB2 2028- 2032	CB3 2033-2037	CB4 2038-2042
NI	Net Zero by 2050	N/A	48%	77%	33% (2023–2027)	48% (2028–2032)	62% (2033–2037)	77% proposed
UK	Net Zero by 2050	34%	68%	N/A	1,950 MtCOe (UK CB4)	1,725 MtCOe (UK CB5)	965 MtCOe (UK CB6)	535 MtCOe (proposed UK CB7)
Wales	Net zero by 2050		63%	89%	37% (2021-2025)	58% (2026-2030)	73% (2031–2035)	
Scotland	Net zero by 2045	48.5%				57% (2026-2030)	69% (2031-2035)	80% (2036-2040)
Ireland	Net Zero by 2050	N/A	51%	N/A	295 MtCOe (2021-2025)	200 MtCOe (2030) (2026-2030)	151 MtCOe (2035) (2031-2035)	120 MtCOe (2036-2040)
EU	Net Zero by 2050		55%	90%	The EU does not operate carbon budgets. Commitments are set through EU-wide reduction targets for 2040-2050.			

Regulations for Northern Ireland.

Under this option, the Fourth Carbon Budget would not be set. This would leave DAERA in breach of its statutory obligations under the Act. While all Northern Ireland departments would still be required to develop and implement policies to meet the Act's emissions reduction targets, the absence of carbon budgets would mean there is no defined trajectory to guide progress toward those targets.

Option 2: Set the Fourth Carbon Budget Regulations for Northern Ireland

This option would make Regulations which would set the Northern Ireland's Fourth Carbon Budget in line with the CCC recommendations and the Statutory Rule being assessed reflects that. The Climate Change (Carbon Budget 2038-2042) Regulations (Northern Ireland) 2026 will set the Fourth Carbon Budget for Northern Ireland at an annual average of 77% lower than the baseline.

The draft Regulations to set the Fourth Carbon Budget do not propose specific policies or plans to achieve the targets. They set a legal limit on Northern Ireland's net greenhouse gas (GHG) emissions over the 2038-2042 period. It will be the responsibility of all Northern Ireland departments to develop and implement policies to meet the Fourth Carbon Budget, and the emission reduction targets within the Act. Each policy will be subject to its own impact assessments, including Regulatory Impact Assessments (RIAs), completed by the relevant departments within their policy remit area.

8. MONITISED AND NON-MONITISED COSTS AND BENEFITS

Monetised costs and benefits

The monetised and non-monetised costs and benefits are associated with setting the Fourth Carbon Budget at an annual average reduction of **77% below 1990 levels**, in line with the independent advice of the CCC. The analysis draws on CCC datasets, HM Treasury Green Book carbon values.

In their advice to Northern Ireland the CCC produced detailed datasets to estimate the economy-wide capital and operating expenditure needed to meet the Net Zero Pathway. These costs are not specific to the Fourth Carbon Budget, (2038-42). The CCC modelling for Northern Ireland assesses costs over the entire 2025–2050 NI Net Zero Pathway rather than the specific, isolated costs of meeting the Fourth Carbon Budget. Within the Fourth Carbon Budget period 2038–2042, some capital expenditure relates to measures that will deliver emissions reductions in later carbon budget periods, while some savings will arise from investments made in the earlier carbon budget periods. As such, the available data cannot be used to quantify the standalone cost of achieving the Fourth Carbon Budget in isolation from the wider transition to the NI Net Zero Pathway.

The emission reductions are then monetised using the Green Book carbon values¹⁷. Across government, greenhouse gas emissions values (carbon values) are applied to quantify the impact of policy measures on GHG emissions. They represent the monetary value society places on avoiding one tonne of carbon dioxide equivalent (£/tCO₂e). These differ from carbon prices, which reflect the market price of carbon, such as those observed in the UK Emissions Trading Scheme.

The Green Book sets out how carbon values should be applied and recommends using the central projection series for policy appraisal, with low and high projection series used for sensitivity testing. It is important to note that the benefits presented here only reflect monetised reductions in greenhouse gas emissions. Other potential co-benefits, such as improved air quality and associated health outcomes, or positive impacts on biodiversity and wider environmental factors are not included in this assessment.

The cost estimates comprise the capital and operating expenditures required from 2025 to 2050. Because CCC cost estimates are presented in 2023 prices, the Green Book carbon values, originally in 2022 prices, are adjusted for inflation using the UK GDP deflator¹⁸ at market prices to ensure comparability between costs and benefits. Both costs and benefits are discounted at 3.5% per year from 2025, in line with Green Book guidance. This reflects the Social Time Preference Rate, which captures society's preference for present consumption over future consumption. This gives greater emphasis to benefits and costs that arise sooner rather than later.

Costs Calculated using CCC Datasets	Carbon Value Series Projection	Benefits (£bn)	Net Cost/Benefits
£3.56Bn	Low	2.47	£1.09
	Central	4.95	£1.39 (Benefit)
	High	7.42	£3.86 (Benefit)

These results indicate a net benefit using the central and high carbon value series projections of between £1.39 and £3.86 billion, but a net cost using the low carbon value series projection of £1.09 billion.

It is essential to assess the costs and benefits of achieving Net Zero within a broader context, particularly when considering the significant economic risks associated with climate inaction. Recent economic evidence demonstrates that the cost of climate inaction has increased significantly compared with earlier assessments. Analysis by the World Economic Forum and Boston Consulting Group (WEF & BCG, 2024)¹⁹ indicates that climate-related damages have already exceeded \$1 trillion between 2020 and 2024, with the overall economic costs of climate impacts having more than doubled over the past two decades. Their findings warn that, without decisive global action, global GDP could

¹⁷ [Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK](#)

¹⁸ [GDP deflators at market prices, and money GDP September 2025 \(Quarterly National Accounts\) - GOV.UK](#)

¹⁹ https://reports.weforum.org/docs/WEF_The_Cost_of_Inaction_2024.pdf

be up to 22% lower by 2100 compared with a scenario featuring effective mitigation. In contrast, early and sustained climate action offers substantial net economic benefits, with adaptation investments estimated to generate returns of between \$2 and \$19 for every \$1 invested, and long-term mitigation efforts capable of preventing 10–15% of projected GDP losses.

For the UK specifically, the CCC's 2019 *Net Zero* report estimated that meeting Net Zero would cost around 1–2% of GDP each year. More recent analysis has shown that these costs have continued to fall due to rapid improvements in low-carbon technologies, reduced capital costs, and greater market maturity. Building on this, the CCC's 2025 advice on the Seventh Carbon Budget (2038–2042) reinforces that meeting Net Zero remains economically achievable. The CCC recommends a 535 MtCO₂e limit for CB7 and projects that delivering this pathway would involve average annual costs of around 0.2% of UK GDP, with early investment leading to long-term savings as low-carbon technologies mature. Independent modelling and analytical evidence considered by the CCC in preparing the Seventh Carbon Budget—including macroeconomic assessments from bodies such as Cambridge Econometrics, Energy Systems Catapult and the Bank of England—also shows that sustained early action reduces long-term climate-related economic risks and avoids deeper future GDP losses.

The CCC's NI Fourth Carbon Budget report estimated that meeting the Fourth Carbon Budget will cost around 0.2% of Northern Ireland's GDP each year between 2025 and 2050. Taken together, the most recent research on both UK-wide and Northern Ireland-specific Net Zero pathways indicates that the long-term economic benefits of reducing greenhouse gas emissions and mitigating climate change are expected to outweigh the associated costs, which for Northern Ireland.

Non-monetised costs and benefits

In addition to the monetised impacts set out above, the transition required to meet the Fourth Carbon Budget will generate a range of significant non-monetised costs and benefits. These impacts and benefits cannot be fully quantified at this stage because the specific policies for delivering the carbon budget will not be determined until the Fourth CAP is developed. Nonetheless, the available evidence provides a clear indication of the likely types and scale of effects.

It is also important to note that the CCC's cost estimates do not include the avoided economic damages associated with failing to reduce emissions. While some climate impacts are unavoidable and will require increased resilience, early and sustained emissions reduction is expected to mitigate future economic risks and lessen the scale of adaptation required.

Improved Air Quality and Public Health

Electrification of transport, buildings and industry reduces fossil-fuel use, leading to improved air quality and associated health benefits. Cleaner air lowers the prevalence of respiratory and cardiovascular conditions and contributes to a healthier population.

Ammonia is released during manure and slurry storage and spreading, as well as through the use of inorganic fertilisers, and can contribute to particulate pollution in urban areas, increasing respiratory and cardiovascular illness. A study by the Centre for Ecology and Hydrology for the ONS called "*The UK environment – fighting pollution, improving our health and saving us money*"²⁰ estimated reductions in hospital admissions resulting from natural vegetation removing air pollutants; this model was adapted for this analysis. However, because the forests assessed here are mainly in peri-urban and rural areas with lower population density, the health benefits are smaller than in studies focused on urban tree planting.

The DAERA 'Air Pollution in Northern Ireland 2024' report²¹ (published 13 November 2025) provides an annual overview of air quality monitoring across Northern Ireland. It highlights that pollutants such as nitrogen oxides and sulphur dioxide from fuel combustion in transport, energy generation, industry and household heating can worsen symptoms for people with existing lung conditions or asthma and compares monitored pollution levels against the 2021 WHO air-quality guidelines.

²⁰ [The UK environment – fighting pollution, improving our health and saving us money](https://ons.gov.uk) - Office for National Statistics (ons.gov.uk)

²¹ [Air Pollution in Northern Ireland 2024 Report](#) | Department of Agriculture, Environment and Rural Affairs

The report confirms that most statutory UK limit and target values were met for the majority of pollutants in 2024. However, while PAH levels remain compliant with EU regulatory targets, three of the four PAH monitoring sites exceeded the stricter UK Air Quality Strategy objective, highlighting persistent challenges linked largely to domestic solid-fuel burning.

Air quality continues to be compared against the World Health Organization (WHO) 2021 guidelines, which are significantly tighter than current UK limits. This benchmark shows that some pollutants remain at levels associated with adverse health impacts, despite legal compliance.

Overall, the 2024 report indicates continued improvement in many pollutants but highlights ongoing concerns particularly for PAHs and NO₂ in specific locations underscoring the need for targeted local and regional actions to further protect public health.

Operational Savings for Households and Businesses

Electric vehicles and heat pumps provide lower running and maintenance costs compared with fossil-fuel technologies, helping to reduce household energy bills over time and improve affordability. The used EV market continues to expand. In 2023, just over one in five electric vehicles (21.9%) were purchased second-hand. This share rose to 32.41% in 2024 and climbed further in 2025, with nearly four in ten EVs (36.9%) now bought on the used market.

Energy Security and Economic Resilience

Reduced reliance on global fossil fuel markets strengthens resilience to price volatility and supply shocks, enhancing long-term energy security for Northern Ireland's economy.

Economic Opportunities and Job Creation

The transition creates new economic opportunities across installation, manufacturing, retrofitting and renewable energy sectors. Job creation is expected in heat pump installation, EV infrastructure, renewable energy development and related supply chains.

Environmental and Natural Capital Gains

Peatland restoration, woodland creation and nature-based carbon sequestration improve biodiversity, protect ecosystems, enhance soil and water quality and contribute to long-term natural capital enhancement.

Reduced Long-Term Climate Risk

Lower emissions reduce Northern Ireland's exposure to climate-related risks such as flooding, agricultural disruption and environmental degradation benefits not captured monetarily but critical to long-term resilience.

Woodland in the upper parts of river catchments can help reduce flood risk by slowing water flow, although the scale of the benefit depends on factors such as location and planting density. Targeting planting on sensitive soils or key landscape positions can also intercept and absorb surface run-off from surrounding land. The value of this service is based on Forest Research's report *"Revised valuation of flood regulation services of existing forest cover to inform natural capital accounts"*²² which estimates the cost of storing the equivalent amount of water in UK reservoirs (a replacement expenditure method). This UK estimate is then converted to a per-hectare value for use in this study.

Behavioural and Lifestyle Adjustments

Achieving reductions relies partly on behavioural change, including lower consumption of high-carbon goods and dietary shifts. Natural environments are frequently used for activities such as walking, running, and sports, which provide visitors with physical health benefits. These benefits can contribute to better long-term health outcomes, often assessed through the relative reduction in the risk of premature death.

²² Revised valuation of flood regulation services of existing forest cover to inform natural capital accounts

Impacts on Agriculture and Rural Communities

Changes to farming practices including lower livestock intensity, land-use diversification and increased peatland and woodland activity may create operational and cultural transition pressures for the agricultural sector.

Household and Business Disruption

Retrofit activity, such as insulation upgrades and preparation for heat pump installation, imposes temporary disruption and inconvenience on households and businesses beyond the direct financial cost.

Infrastructure Deployment Impacts

Construction and installation of electricity network upgrades, EV charging infrastructure and engineered removals capacity can lead to short-term community and environmental disruption not reflected in monetised assessments.

Industry Transition and Workforce Adjustments

Key sectors including agriculture, transport, construction and industry will require operational changes and workforce reskilling, representing non-monetised transition challenges.

Emission Reduction Policies Required to meet Carbon Budgets

The CCC advice only provides 'suggested' recommendations of the action that will be required to meet net zero. It does not set out how each carbon budget will be delivered. The full policies to deliver on the Fourth Carbon Budget has not been decided at this stage. This impact assessment does not assess or determine the policy actions or behavioural changes required to meet this carbon budget.

Emissions-reduction policies and proposals will need to be developed to ensure Northern Ireland remains within the limits set by each budget and follows a pathway toward net zero by 2050.

Under the Act, DAERA must develop five-year CAPs that will outline the policies and proposals for Northern Ireland departments to deliver on the Fourth Carbon Budget and achieve the associated emissions-reduction targets. The required impact assessments will be carried out on the fourth CAP and on the key policies and proposals it contains.

A more detailed breakdown of costs between public and private sectors, and of costs associated with specific interventions, will only be possible once detailed policy proposals are developed as part of future CAPs.

9. RISKS AND ASSUMPTIONS

There are general assumptions and limitations in assessing the costs and benefits of the options. The Green Book guidance provides recommendations that the central series costs are used when completing policy proposals. It also provides a balanced and resilient estimate of climate-related costs and benefits which help to ensure that decisions reflect realistic assumptions rather than relying on extreme scenarios like the 'high' or 'low' costings. There is a risk that these values are not as accurate as estimated.

The eventual outcomes will depend on the specific policies, measures and delivery choices made by departments to achieve the required emissions reductions under Option 2 (setting the Fourth Carbon Budget). As the detailed policies will only be developed through the Fourth CAP, it is not yet possible to quantify certain effects with precision.

There are also risks and uncertainties associated with Option 2, including the possibility that the expected advances in technology, innovation, behavioural change or productivity do not materialise at the pace assumed in UK-wide and Northern Ireland evidence. These uncertainties could influence both the scale and timing of transition costs. Social acceptance is another factor: while behavioural change is required to support emissions reduction, its extent, timing and distributional impacts remain uncertain. However, trends across the UK and internationally show a growing public awareness of climate impacts, increasing willingness to adopt lower-emission behaviours and stronger expectations for government guidance and support.

Significant uncertainties remain across all potential pathways. These include:

- the global nature of climate change, meaning the scale of benefits experienced in Northern Ireland is influenced by international action or inaction;

- the specific policies selected for delivery, and the pace, timing and effectiveness of their implementation;
- the extent and speed of behavioural change that reduces demand for greenhouse-gas-emitting activities;
- the future availability, cost and deployment rates of low-carbon and energy-efficient technologies;
- the future trajectory of fossil-fuel prices; and
- the inherent uncertainty in all modelling exercises due to evolving economic conditions, technological progress and global market dynamics.

Option 1: Do nothing/Business as usual – Do not set the Fourth Carbon Budget Regulations for Northern Ireland.

Under Option 1, it is assumed that the current position would remain unchanged and a Fourth Carbon Budget would not be set. However, it is important to note that it is highly unlikely that the Northern Ireland government would take no further action on climate change, given the obligation within the Act for Northern Ireland to achieve net-zero by 2050. Carbon budgets and emission reduction targets are intended to provide the pathway for Northern Ireland to reach net zero by 2050.

Without establishing a Fourth Carbon Budget, there would be significant uncertainty and risk regarding whether climate action would progress at the speed and scale required to reduce GHG emissions in line with statutory targets. This creates a risk that Northern Ireland may not achieve the emission reductions needed to stay on track for its long-term commitments.

Option 2: Set the Fourth Carbon Budget Regulations for Northern Ireland

Under option 2 the Regulations to set the Fourth Carbon Budget for Northern Ireland would provide greater certainty and clarity across all sectors in planning for climate action. This clarity is expected to support and incentivise the scale of changes necessary to deliver substantial reductions in GHG emissions across the Northern Ireland economy.

Option 2 aligns with the independent advice and evidence provided by the CCC and meets the statutory requirement within the Act to set carbon budgets in line with emission reduction targets set out in the Act.

The CCC's recommended Speculative Option (DACC) Pathway (100%) is their suggested pathway which sees net zero emissions in Northern Ireland by 2050, detailed within the CCC's ["Advice Report: The Path to a Net Zero Northern Ireland"](#).

The CCC has advised that its Balanced Pathway is ambitious but bounded by realistic expectations about the rate at which low-carbon technologies can be developed and deployed. The pathway allows time for supply chains, markets and infrastructure to scale up, and incorporates moderate assumptions about behavioural change and innovation. It also includes actions in the coming decade aimed at developing multiple options for wider deployment in later years, such as hydrogen and electrification for heavy goods vehicles and buildings.

The CCC has also emphasised that its recommended pathways to UK-wide and Northern Ireland net zero are designed to be ambitious while remaining achievable within real-world constraints. These constraints include uncertainty around the pace of technological development, market readiness, and the extent to which households, businesses and wider society will adopt low-carbon behaviours. There are significant uncertainties and risks in estimating the costs and benefits associated with Northern Ireland's transition to net zero and the setting of the Fourth Carbon Budget. Key uncertainties include:

- **Future policies and proposals:** The specific measures to deliver the Fourth Carbon Budget will be determined by the Northern Ireland Executive through future Fourth CAP. Under the Climate Change Act (Northern Ireland) 2022, DAERA prepares the CAP and each NI department must bring forward its own policies and proposals, with Ministers collectively responsible for agreeing the overall package and its delivery. As CAPs are developed, uncertainty will reduce as actual policies, timings and delivery responsibilities are set out. Each policy and proposal will be owned by the relevant department and will be subject to the

appropriate impact assessments (including just transition, financial, social, economic, rural and regulatory) before implementation.

- specific measures that will be introduced to meet emission reductions are not yet known. These will be set out in forthcoming Fourth CAP. As future CAPs are developed uncertainties should reduce as actual policies become clearer. Each policy and proposal will have its own impact assessment completed where appropriate.
- **Technology availability and performance:** The pace and scale of low-carbon technology development remain uncertain. The scenarios are based on different assumptions about new technologies, but it isn't possible to fully measure or predict the technological and resource uncertainties involved in the transition to net zero.
- **Economic conditions:** Due to the uncertainty of future GDP growth, it is difficult to predict future emissions, which affects how much abatement technology will be needed to meet net-zero targets.
- **Behavioural and structural change:** The uncertainty of future behaviour changes, consumption habits, and structural economic changes, it is difficult to predict how these factors will influence emission reductions and the overall cost of achieving the Fourth Carbon Budget.
- **Global factors:** There is uncertainty around the level of emissions reductions required to meet global temperature targets, as well as risks associated with delivering the policies that will likely be needed to meet the Fourth Carbon Budget. As this impact assessment does not assess specific policies, the analysis focuses only on what is technically possible, while still noting the likely delivery challenges for each sector.
- **Climate and environmental uncertainties:** Future climate impacts and the precise emissions reductions required to align with global temperature goals remain uncertain. There is uncertainty over the future structure of the economy. This may include changes in behaviour, consumption and trade patterns as well as other long-term shifts. Global developments in technology, the macroeconomy, and international climate ambition are also uncertain, and these factors will influence Northern Ireland's transition to net zero. The long-term impacts of climate change remain uncertain.

Given these uncertainties, actual costs and benefits may differ from illustrative analysis in this assessment of the options for setting the Fourth Carbon Budget.

While the CCC's advice outlines the types of high-level actions Northern Ireland may need to take to reach net zero, it does not specify how each carbon budget, including the Fourth Carbon Budget will be delivered. The full set of policies required to meet the Fourth Carbon Budget has not yet been determined.

There is broad scientific consensus that we are already experiencing the impacts of significant global climate change, driven primarily by human-generated GHG emissions. Without intervention, rising temperatures, sea-level rise, more extreme weather events, ecosystem degradation, and reduced agricultural productivity will continue to intensify. Coordinated global action is needed to rapidly reduce emissions and achieve net zero, helping to avert severe environmental and economic consequences, while also supporting wider environmental sustainability, such as water quality and resource availability. Setting the Fourth Carbon Budget, provides a clear pathway for acting on climate change and helps secure long-term economic stability and resilience for the UK and globally. Although there is uncertainty around the precise long-term economic impacts of climate change, the evidence is clear that the cost of inaction far exceeds the cost of taking early and sustained action.

Rationale and evidence

Meeting the emissions reduction level required for the Fourth Carbon Budget will deliver substantial environmental and long-term economic benefits for Northern Ireland, but it will also involve costs and uncertainties. These uncertainties arise from factors such as technology development, market readiness, behavioural change, and wider economic conditions. Some emerging technologies—such as engineered removals—may play a role in the longer-term transition, but their deployment pathways, costs and applicability in Northern Ireland remain uncertain.

In particular, the CCC notes that technologies such as Direct Air Capture with Carbon Capture and Storage (DACCS) may become part of longer-term decarbonisation options, but stresses that their future role is not guaranteed. Deployment in Northern Ireland would depend on the availability of supporting carbon-transport and storage infrastructure, which is not yet in place, and costs may be

higher locally due to the need to transport captured CO₂ out of the region. As a result, while these technologies feature in some illustrative pathways, they are not requirements, and the Northern Ireland Executive retains full discretion over whether, when and how such technologies might be used. Given these uncertainties, this Regulatory Impact Assessment draws on a wide-ranging and up-to-date evidence base. Reliance on the CCC's advice is considered appropriate because it represents the statutory, independent assessment of what is required to meet the emissions-reduction targets set in the Climate Change Act (Northern Ireland) 2022. The CCC's modelling for Northern Ireland's Fourth Carbon provides a consistent and transparent framework for understanding the total system-wide costs and benefits of the transition over the 2025–2050 period.

Importantly, the CCC's pathways are illustrative scenarios, not prescribed policy routes. They show one way in which the emissions limit could be achieved, but the specific measures required to deliver the Fourth Carbon Budget will be determined by the Northern Ireland Executive through future CAPs. Each department will be responsible for bringing forward policies within its remit, and each policy will be subject to the required impact assessments, including assessments of financial, social, economic and just-transition implications.

This combination of independent expert advice, statutory obligations and Executive decision-making responsibility provides a clear, evidence-based rationale for setting the Fourth Carbon Budget at the recommended level while recognising that the precise policy and delivery pathway will be defined in future Executive approved plans.

10. EVALUATION OF OPTIONS AND OPTION CHOSEN

Option 1 – Do nothing/Business as usual – Do not set the Fourth Carbon Budget Regulations for Northern Ireland

Choosing to take no action would leave Northern Ireland out of step with other regions. All other UK Devolved Administrations have their own climate legislation requiring carbon budgets to track progress toward national and UK wide goals. The Republic of Ireland also has national climate legislation that commits to a climate-neutral economy by 2050, supported by three legislative carbon budgets (2021–2025, 2026–2030, and 2031–2035), which came into effect on 6 April 2022.

The purpose of carbon budgets is to provide Northern Ireland with a clear, legally defined trajectory for meeting the emissions reduction targets set out in the Climate Change Act. Without them, progress toward these statutory targets could slow, creating greater long-term costs and delivery challenges. As carbon budgets are a legal requirement and all departments must contribute to meeting the emission reduction targets there are no meaningful advantages to not setting the Fourth Carbon Budget.

Even if the fourth budget were not set, Northern Ireland would still be legally required to deliver the 2040 and 2050 targets. However, without a defined carbon budget limit the risk of failing to meet those statutory obligations would increase. While carbon budgets do not set out the policies and proposals departments must develop and implement, they establish the framework within which departments plan, assess options and evaluate costs. Individual policies will each undergo their own impact assessments as they are developed.

The CCC's 2023 Advice Report, *The Path to a Net Zero Northern Ireland*, highlights that achieving net zero by 2050 will require a major acceleration in emissions reduction action, with progress needing to increase more than threefold across every sector. The CCC also warns that delaying action including delaying carbon-budget setting creates significant risks, including higher long-term costs, greater capital scrappages, and increased household and business energy burdens as a result of slower deployment of low-carbon technologies.

The 2023 Advice further notes that delay would reduce competitiveness, as other UK regions and international markets accelerate investment in low-carbon technologies and supply chains. This aligns with the evidence presented in the Fourth Carbon Budget Section 26 Assessment, which emphasises the growing economic opportunity associated with early action and the risk that slow progress could leave Northern Ireland less able to participate in emerging green economy sectors.

Although region specific figures for Northern Ireland are not available, the wider economic literature consistently shows that inaction significantly increases long-term costs. Recent global analysis,

including the World Economic Forum and Boston Consulting Group (2024), shows that climate related economic damages exceeded \$1 trillion between 2020 and 2024 and are rising sharply, with delayed action leading to significantly higher future costs and more disruptive interventions over shorter timescales.

Overall, the most recent evidence indicates that not setting the Fourth Carbon Budget would increase strategic, economic and environmental risks, delay progress, and raise the long-term cost of meeting Northern Ireland's statutory climate commitments.

Benefits: Option 1 could delay immediate action to reduce emissions and may reduce short-term costs and administrative burdens. However, the purpose of carbon budgets is to set Northern Ireland on a clear pathway to achieving the 2030, 2040 and 2050 emissions reduction targets. If the Fourth Carbon Budget is not set, progress towards these statutory targets is likely to slip, resulting in higher long-term costs and challenges.

As setting carbon budgets is a legal requirement under the Act there are no real benefits to not setting the Fourth Carbon Budget. Instead, inaction would increase uncertainty, weaken planning, and risk Northern Ireland falling behind its required trajectory.

Evaluation: This option would not deliver on the legislative requirements of the Act and therefore this option is not considered viable.

Recommendation: Option 1 is not recommended.

Outcome: Option 1 was not chosen due to reasons set out above.

Option 2 : Set the Fourth Carbon Budget Regulations for Northern Ireland

The Fourth Carbon Budget, covering years 2038–2042, will set a legislative emissions reduction limit, however the specific costs of achieving this target cannot yet be determined. All Northern Ireland departments will be required to develop and implement policies to deliver the emissions reductions set within this 5-year budget. As these measures have not yet been designed, the associated costs remain unknown.

Investment will be required to ensure the emissions limits are not exceeded in the Fourth Carbon Budget. The scale and timing of these costs will depend on the policy choices made by Ministers across all NICS departments. Indicative benefits are informed by CCC estimates, which show that emission reductions over a 25-year period are largely driven by improved technologies and reduced energy use, many of which will build on progress made under earlier carbon budgets and extend into the 2038–2042 period.

These estimates do not include broader benefits such as avoided climate damage, environmental improvements, enhanced biodiversity, cleaner air, better public health, and economic opportunities linked to green investment. All of these co-benefits are expected to be substantial and will support Northern Ireland in achieving both UK-wide and Northern Ireland 2050 net-zero targets while enabling a just transition.

Additional advantages include greater investment certainty, improved long-term planning, enhanced climate resilience, a more competitive green economy, and significant gains for the natural environment and public wellbeing.

Benefits: This option would deliver on the requirements of the Act.

Setting the Fourth Carbon Budget will help place Northern Ireland on a clear trajectory towards achieving net zero GHG emissions reduction by 2050. This aligns Northern Ireland with the UK's global approach to meeting the goals of the Paris Agreement. By adopting an emissions reduction pathway consistent with the Paris Agreement, the UK aims to influence global emissions reductions more effectively.

This option is supported as the most viable option for a number of reasons:

- Economic opportunity: UK-wide analysis from HM Treasury's *Net Zero Review* (2021)²³, the UK Green Jobs Taskforce (2021)²⁴, and Cambridge Econometrics modelling (as referenced by the CCC) indicates that the interventions required to reach net zero will cost around 0.5–1% of UK GDP, but could increase UK GDP by around 3% and support up to 300,000 additional UK jobs by 2035."
- Green recovery potential: Early investment in low-carbon measures is expected to generate savings over time, for example through reduced fuel use, lower energy bills, and improved efficiency.
- Investor certainty: Setting the Fourth Carbon Budget provides clarity and a predictable long-term trajectory, giving businesses confidence to invest in low-carbon technologies and future-proofed operations, supporting job creation.
- Significant co-benefits: Actions to decarbonise Northern Ireland will also deliver major benefits for public health, the natural environment, and climate adaptation. The CCC's expert review highlights near-term health gains from cleaner air, active travel, improved housing, and healthier diets when policies are well-designed and accessible to all.

Implementation of the Fourth Carbon Budget will also generate economic, social and environmental benefits through the expansion of:

- Low-carbon and climate-resilient infrastructure.
- Skills development, retraining and research for a net-zero, climate-resilient economy.
- Upgrades to homes and buildings to ensure they are energy-efficient and fit for the future.
- Measures that make walking, cycling and remote working easier and more accessible.
- Tree planting, peatland restoration and wider investment in nature-based solutions and green spaces.

Evidence indicates that meeting the Fourth Carbon Budget will generate substantial non-monetised co-benefits alongside emissions reductions, including improved air quality and public health, enhanced recreational and green spaces, and reduced flood risk. These benefits are highlighted in recent assessments and, while not yet quantified for Northern Ireland, are expected to be material and to offset a portion of transition costs over time (for example through fewer hospital admissions, increased productivity, and avoided damage costs). The precise scale will depend on the delivery pathway set through future CAPs.

Setting the Fourth Carbon Budget therefore provides environmental protection, economic opportunity, and long-term resilience, while helping ensure Northern Ireland remains aligned with the UK's net zero trajectory and the wider global transition.

Evaluation: Under the Act, DAERA must set the carbon budget for 2038–2042 at a level aligned with meeting the 2040 and 2050 targets already in the Act.

Recommendation: This option was considered the only option viable, for the reasons set out above. This option is therefore recommended.

Outcome: Option 1 was not chosen. Option 2 fulfils the legislative requirements of the Act, and its Fourth Carbon Budget emissions limit is based on the best available scientific evidence and the independent advice of Northern Ireland's statutory climate advisory body, the CCC.

Future Reviews/Monitoring

Under section 27(2) of the Climate Change Act (Northern Ireland) 2022, a carbon budget may only be amended before the start of the relevant budgetary period, and only in limited circumstances such as where the CCC recommends a change, or where there has been a significant development in climate-related law or policy or in scientific knowledge or technology. Section 27(2) also provides that the Department may amend the statutory deadline by which a future carbon budget must be set.

DAERA will continue to review any new CCC advice and monitor developments in legislation, science and technology to ensure the Fourth Carbon Budget, and all subsequent carbon budgets, remain appropriate and evidence-based. Any consideration of amendment would be taken forward in line with

²³ [Net Zero Review Final Report - GOV.UK](#)

²⁴ [Green Jobs Taskforce report](#)

section 27(2) and through the established Executive and Assembly processes, recognising that the Northern Ireland Executive is responsible for determining the future policy pathway through forthcoming CAPs.

11. SMALL AND MICRO BUSINESS ASSESSMENT (SAMBIT)

Action required to meet the Fourth Carbon Budget will have impacts and benefits across all sectors of the economy and society, including small and micro-businesses (Small to Medium Sized Enterprises (SMEs)). At this stage, it is not possible to quantify the exact impacts and benefits on SMEs, as the specific policies to deliver the emissions-reduction limit for 2038–2042 have not yet been developed. While some impacts may be minimal initially, others remain uncertain in the longer term. Any policies introduced by departments through future CAP to deliver the Fourth Carbon Budget will carry associated costs that may affect SMEs.

SMEs, which employ around two-thirds of Northern Ireland's workforce, may benefit over time from reduced operating costs through improved energy efficiency and lower reliance on fossil fuels. However, many face financial and operational barriers to adopting low-carbon technologies. Targeted financial support, guidance and advisory services will be essential to help SMEs overcome these challenges and fully engage in the transition. Supporting SME participation will also help them remain competitive in international supply chains where sustainability and low-carbon standards are increasingly required.

Under section 35 of the Act, each CAP must explain how its proposals and policies will affect and support the workforce, employers and communities, with specific reference to small businesses. This includes describing how policies will help SMEs adapt to change and access opportunities arising from decarbonisation.

Policies brought forward meet the Fourth Carbon Budget will, where appropriate, undergo their own small and medium business impact test (SAMBIT) assessments, public consultations, and regulatory impact assessments. These processes will evaluate the potential effects on SMEs. The Act also requires departments to give particular consideration to small businesses when explaining how CAP measures impact the workforce, employers and communities. Additionally, when setting carbon budgets, departments must consider the economic impact on SMEs.

SMEs may be affected in various ways, including:

- **Policy and regulatory changes** designed to encourage low-carbon investment.
- **Opportunities for growth** through adopting green technologies and improving resource efficiency.
- **Challenges relating to information gaps**, limited awareness of climate risks, and preparedness for rising energy costs—issues that can be mitigated through targeted departmental support.
- **External factors** such as consumer behavioural change, international market shifts, and climate-related impacts on supply chains (e.g., crop failures affecting raw material availability).
- **Energy-cost pressures**, which may pose risks to productivity, although savings can be realised through greater efficiency and reduced emissions.

The Act also requires all departments to apply the just transition principle when developing policies to reduce greenhouse gas emissions. This ensures that measures taken to meet the Fourth Carbon Budget consider fairness, protect vulnerable sectors including SMEs and support inclusive economic opportunities. CAPs must also explain how their proposals take account of just transition considerations.

