

16 December 2020

Unpacking the Sixth Carbon Budget

The transition for agriculture, land use and waste

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Agenda

1. **Our approach**

Outline of methodological approach to the Sixth Carbon Budget

2. **Our recommended path**

Recommendations for Sixth Carbon Budget, 2030
NDC – and associated requirements

3. **Agriculture and Land use - path to Net Zero**

Key elements of emissions reduction in agriculture and land

4. **Waste – path to Net Zero**

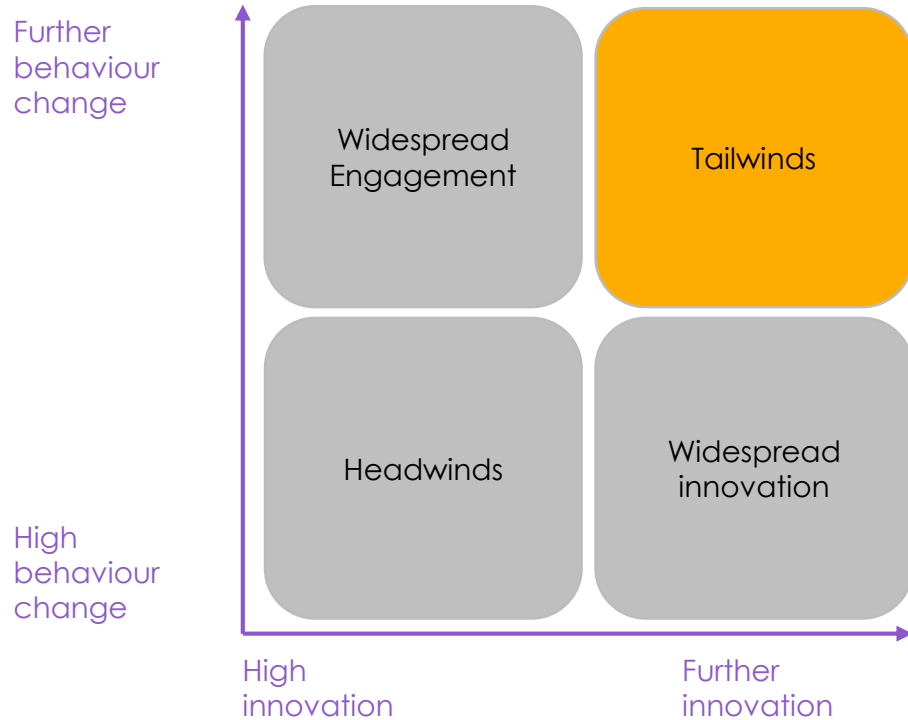
Key elements of emissions reduction in the waste sector

5. **Q&A**

Our approach

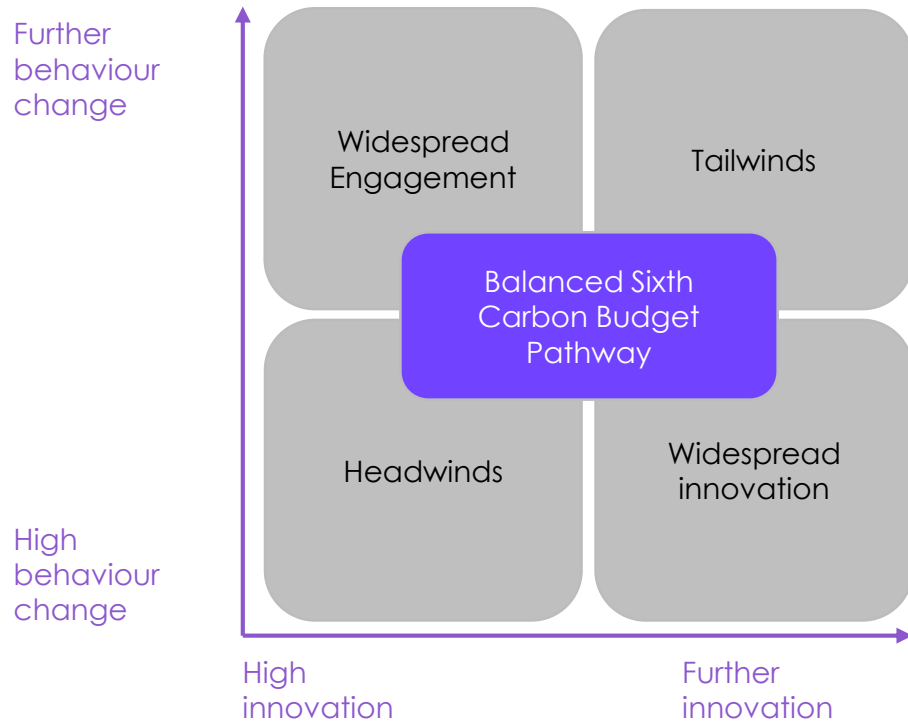
Our approach

One highly optimistic scenario with success on infrastructure, innovation, societal and behavioural change



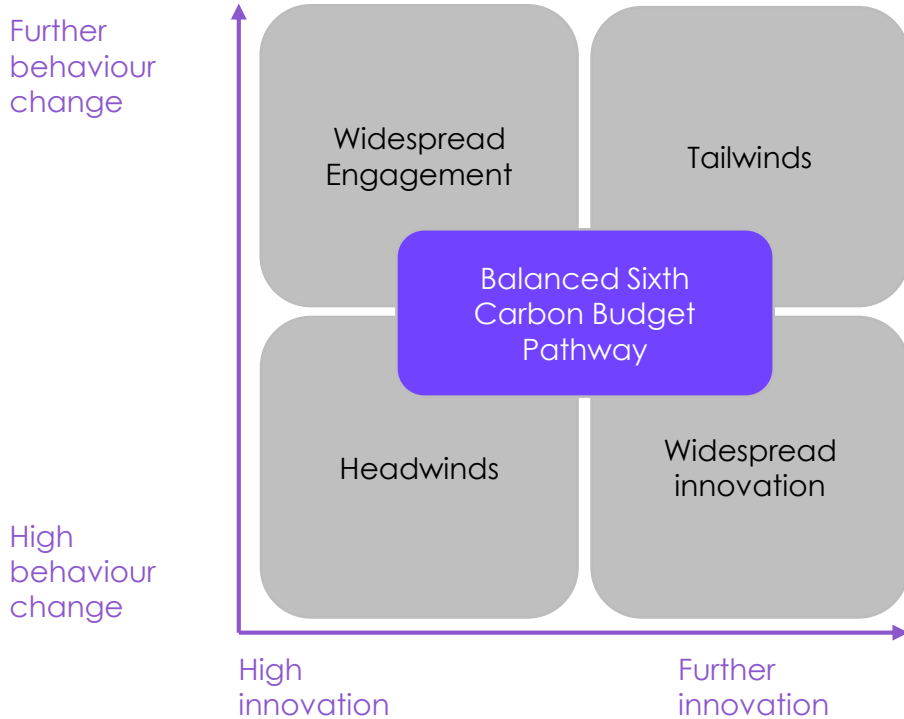
Our approach

A balanced pathway to keep options open



Our approach

Consistent with the Paris Agreement



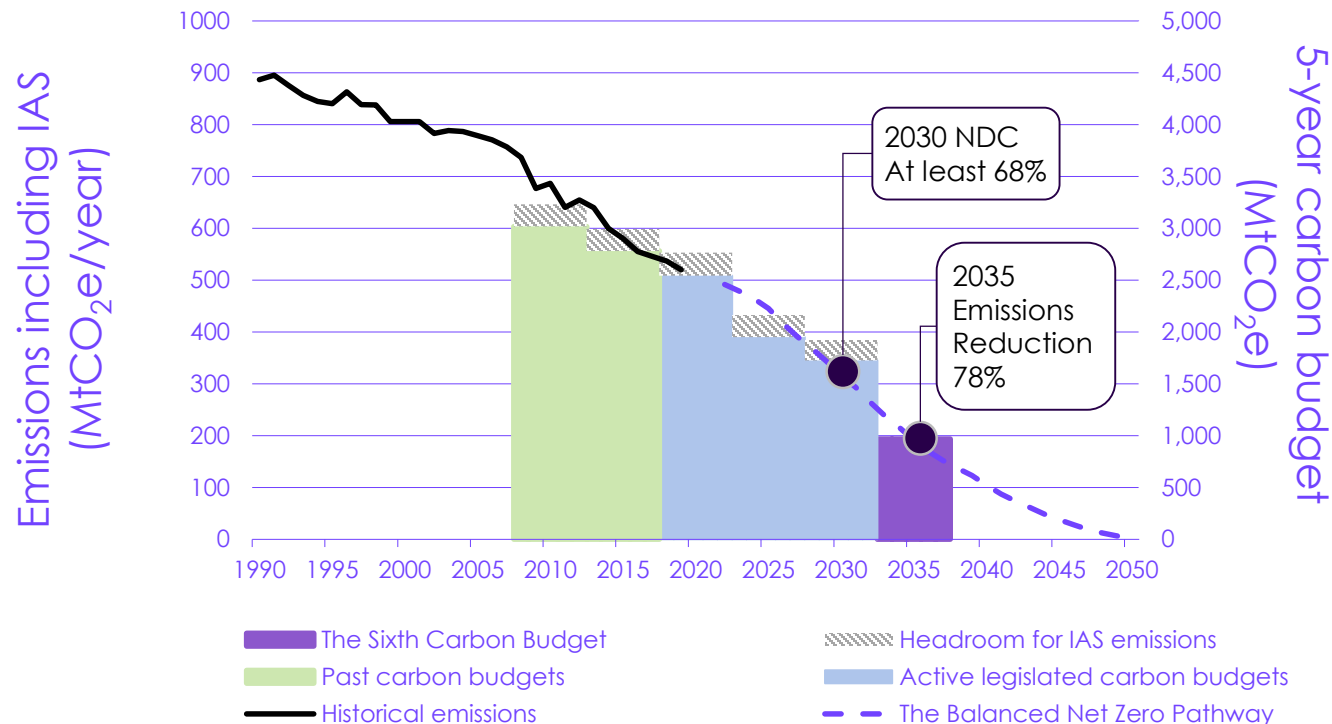
Climate science and international circumstances

- Need deep reductions globally to 2030 to keep 1.5°C in play
- Paris demands 'highest possible ambition'
- UK leadership matters as President of COP26
- Equity arguments reinforce need for strong UK action

Our recommended path

Our recommended path

The recommended sixth carbon budget and 2030 NDC



Notes:
Emissions shown including emissions from international aviation and shipping (IAS) and on an AR5 basis, including peatlands. Adjustments for IAS emissions to carbon budgets 1-3 based on historical IAS emissions data; adjustments to carbon budgets 4 and 5 based on IAS emissions under the Balanced Net Zero Pathway.

Source:
BEIS (2020) Provisional UK greenhouse gas emissions national statistics 2019; CCC analysis.

Key recommendations

The Sixth Carbon Budget and 2030 NDC

The Committee's key recommendations

- **Budget level.** The Sixth Carbon Budget should be set at 965 MtCO₂e, implying a 78% reduction from 1990 to 2035.
- **2030 NDC.** The UK should submit an NDC requiring *at least* a 68% reduction in territorial emissions from 1990 to 2030 (excluding emissions from international aviation and shipping, IAS, in line with UN convention), to be delivered through domestic action, with additional actions to reduce the UK's contribution to IAS emissions.
- **Budget scope.** The budget should cover all greenhouse gas emissions, including those from international aviation and shipping, and removals of CO₂ from the atmosphere.
- **Domestic action.** Performance against the budget should

be judged based on actual UK emissions (net of removals), without recourse to international carbon units (often referred to as 'credits'). The Government could choose to use credits to go *beyond* the budget as a greater international contribution.

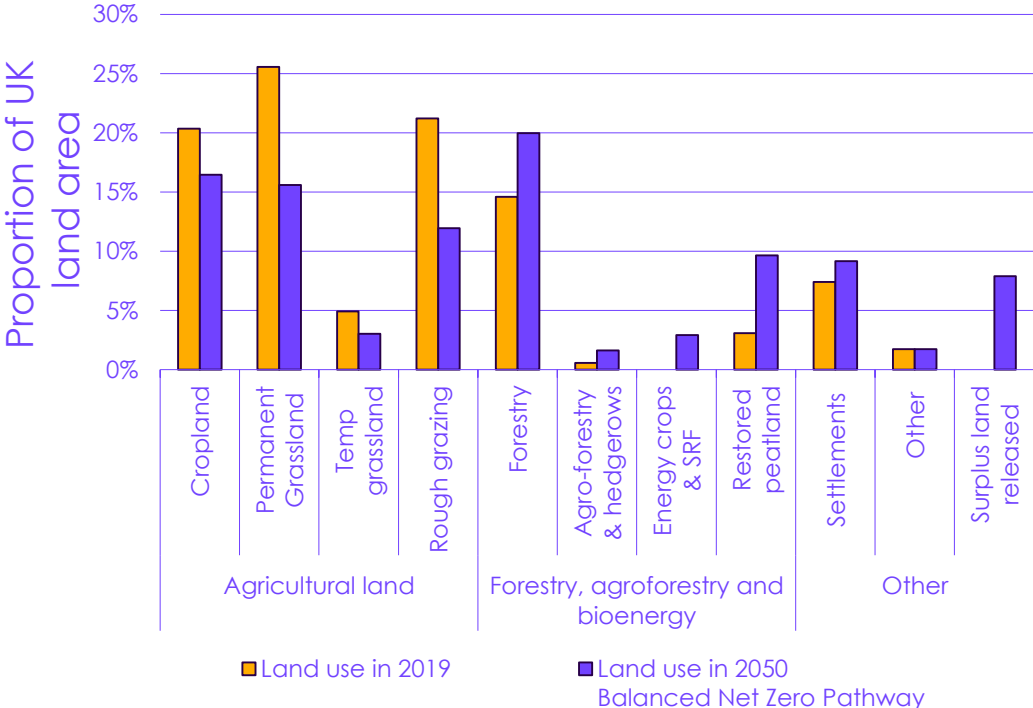
- **Net Zero Strategy.** The Government should legislate our recommended Sixth Carbon Budget as soon as possible and sets out its Net Zero plans and policies in the first half of 2021
- **Existing carbon budgets.** It is for the Government to decide whether the existing budgets should be amended to bring them in line with the Net Zero 2050 target, however, the Committee does not consider it necessary to reset these in law.

Agriculture and land use

Changes in land use

Transformation in land use now to 2050

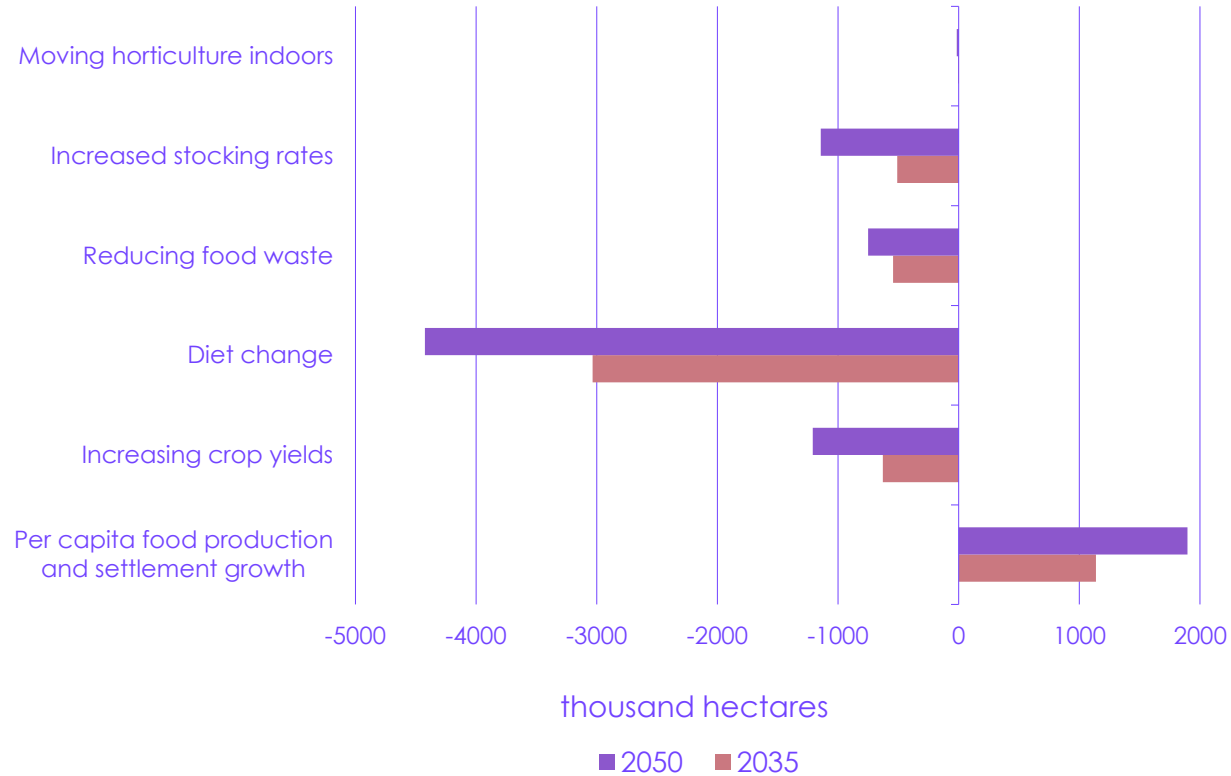
- Around one-third of agricultural land is freed up through changes in output and more efficient farming practices.
- We need 21% of this land for actions to sequester and reduce CO₂.
- In total, 25% of the UK land area is forested or used for agro-forestry and energy crop production by 2050 - compared to around 15% today.
- Harmful peat extraction is ended, and nearly 80% of the UK's peatlands are restored.



Source: CCC Analysis

Agricultural land released in the Balanced Pathway

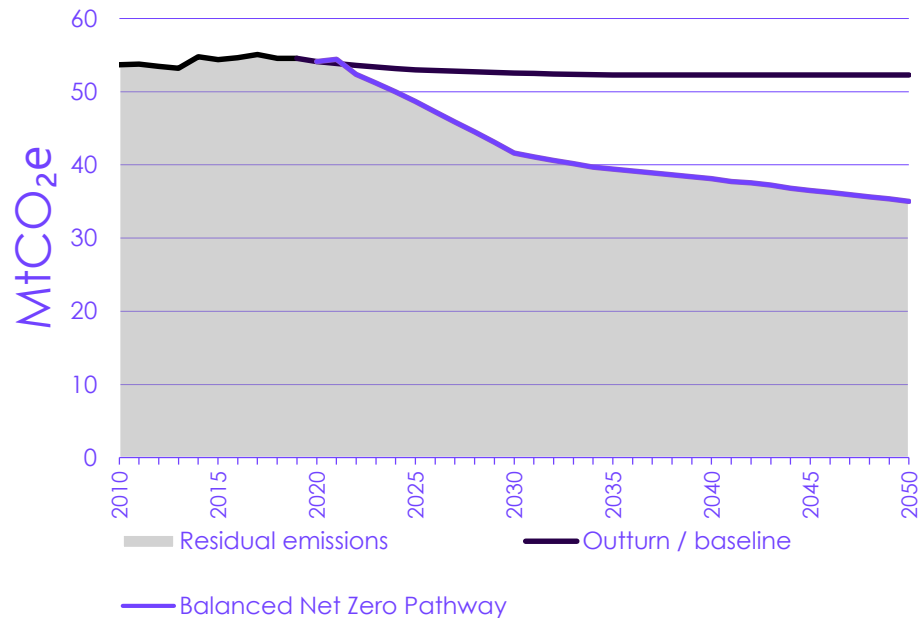
3.8 million hectares (21%) by 2035 and 6 million hectares (35%) by 2050.



The Balanced Pathway in Agriculture

Agriculture emissions reduce by 28% to 39 MtCO₂e by 2035 and by 36% to around 35 MtCO₂e by 2050 compared to 2018

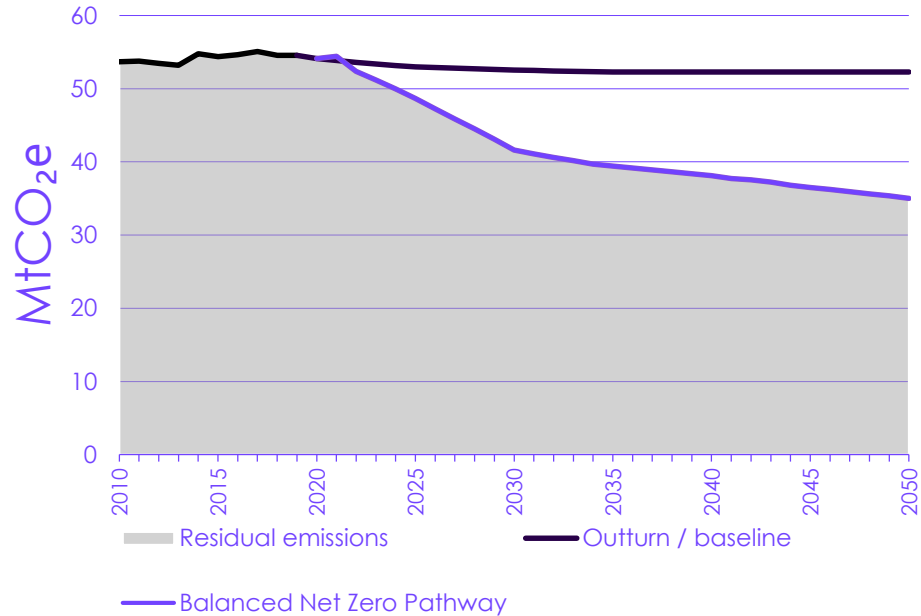
Agriculture emissions in our Balanced Pathway



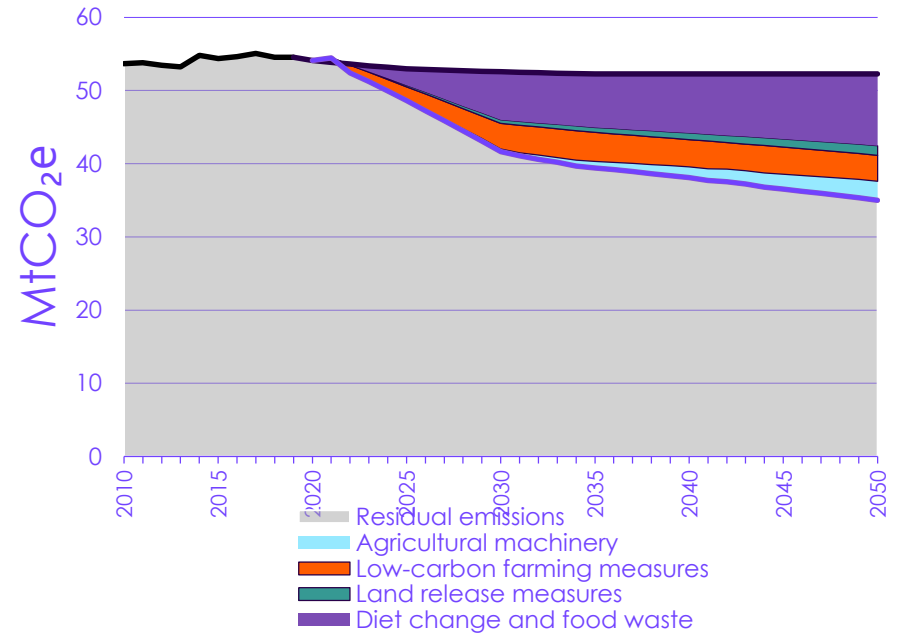
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Agriculture emissions in our Balanced Pathway

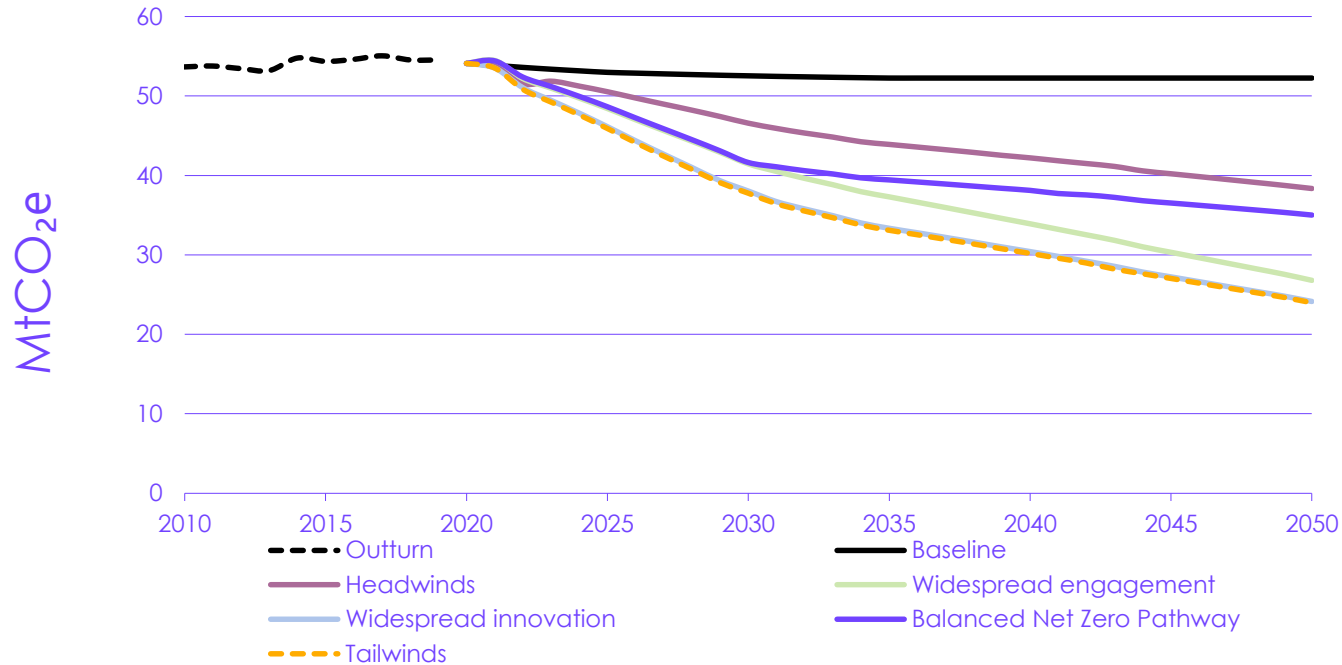


Sources of abatement in our Balanced Pathway



Emissions pathways for Agriculture

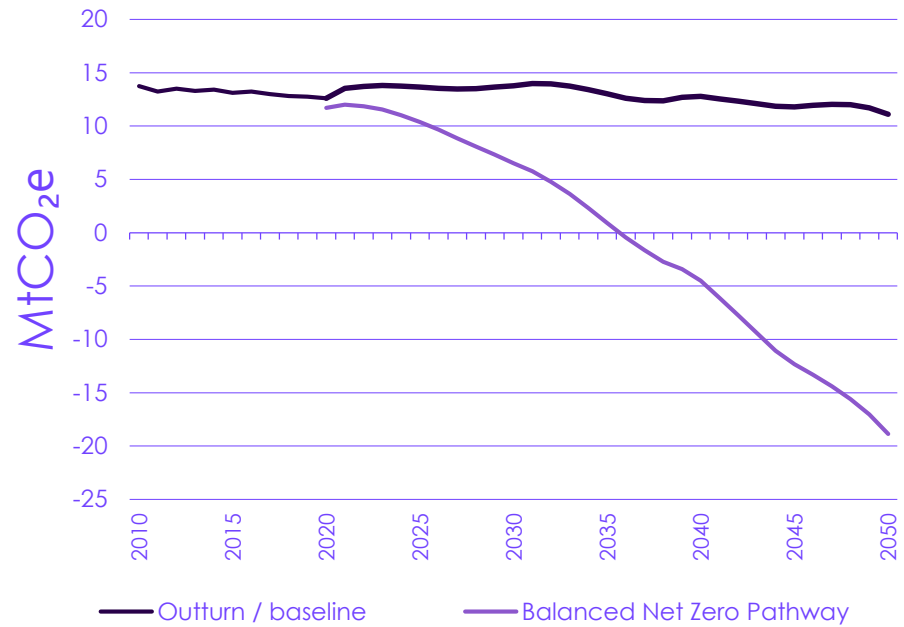
- Annual emissions savings ranging 9–19 MtCO₂e by 2035 relative to the baseline.
- Residual emissions fall by between 30-56% by 2050 compared to 2018



The Balanced Pathway in Land use

Net emissions reduce by 93% to around 1 MtCO₂e by 2035 and is a net sink (19 MtCO₂e) by 2050

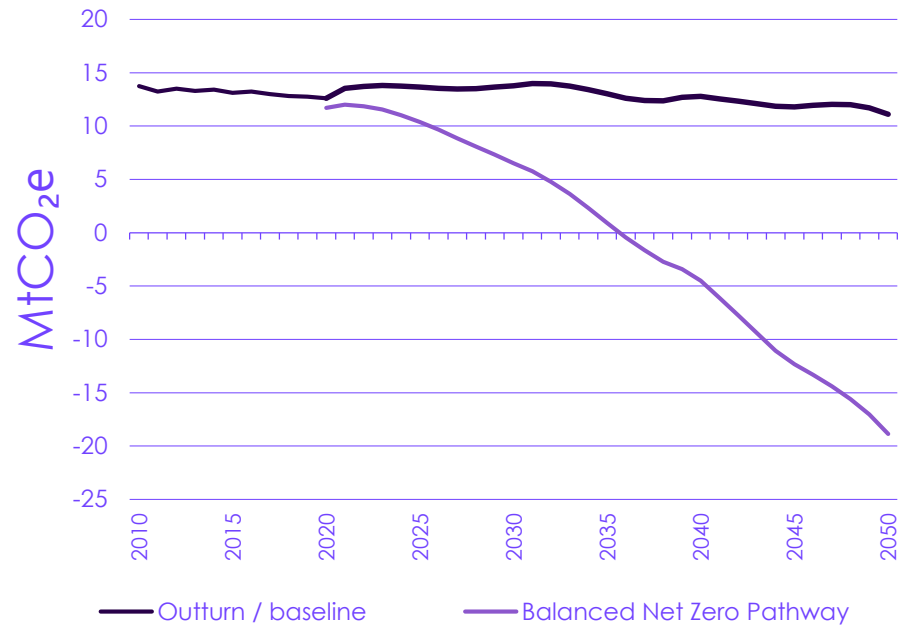
Net emissions from land use in our Balanced Pathway



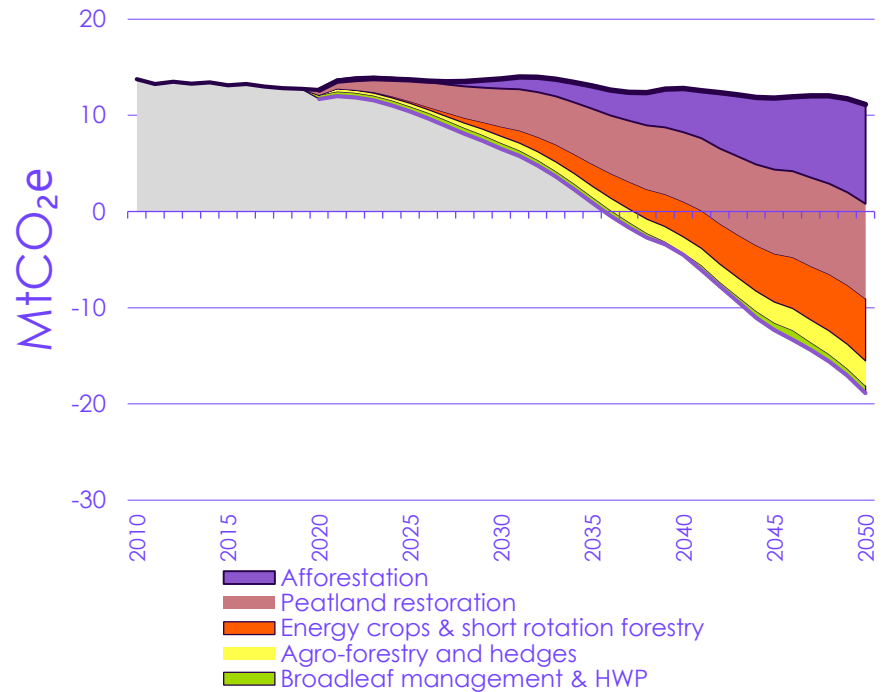
The Balanced Pathway in Land use

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Net emissions from land use in our Balanced Pathway

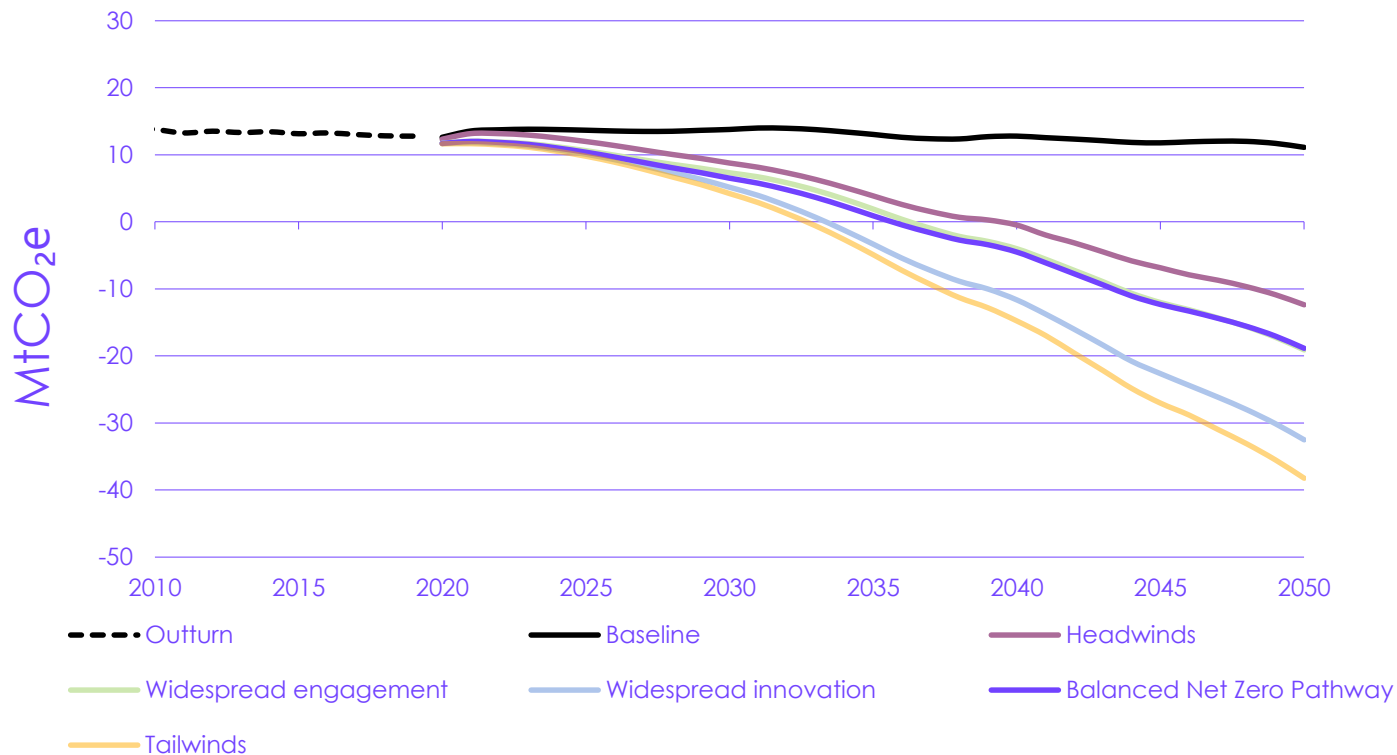


Sources of abatement in our Balanced Pathway



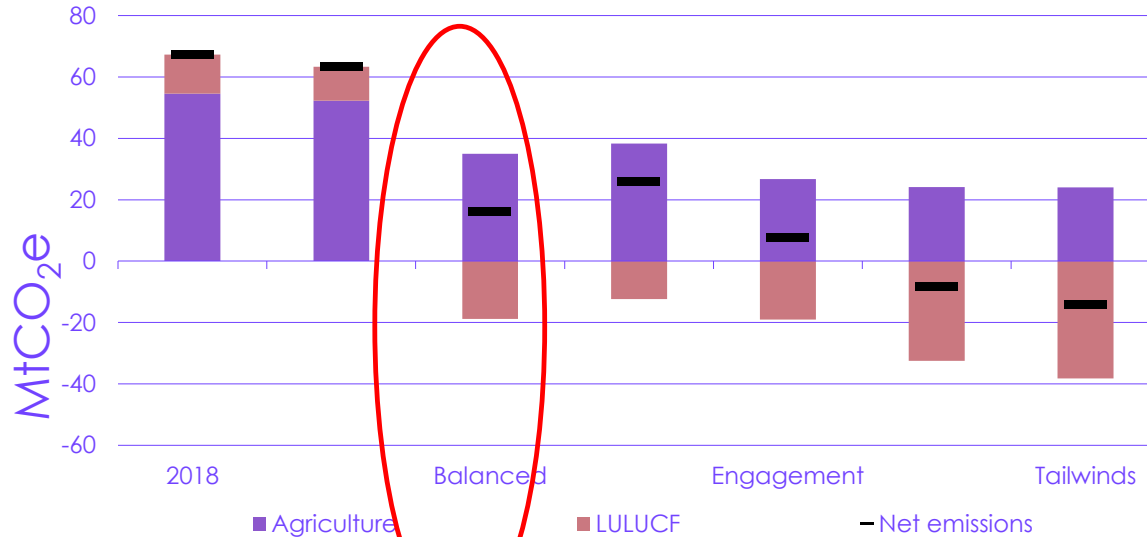
Emissions pathways for Land use

- Widespread Innovation and Tailwinds are net sinks by 2035.
- By 2050, all scenarios are net sinks ranging 12-38 MtCO₂e.



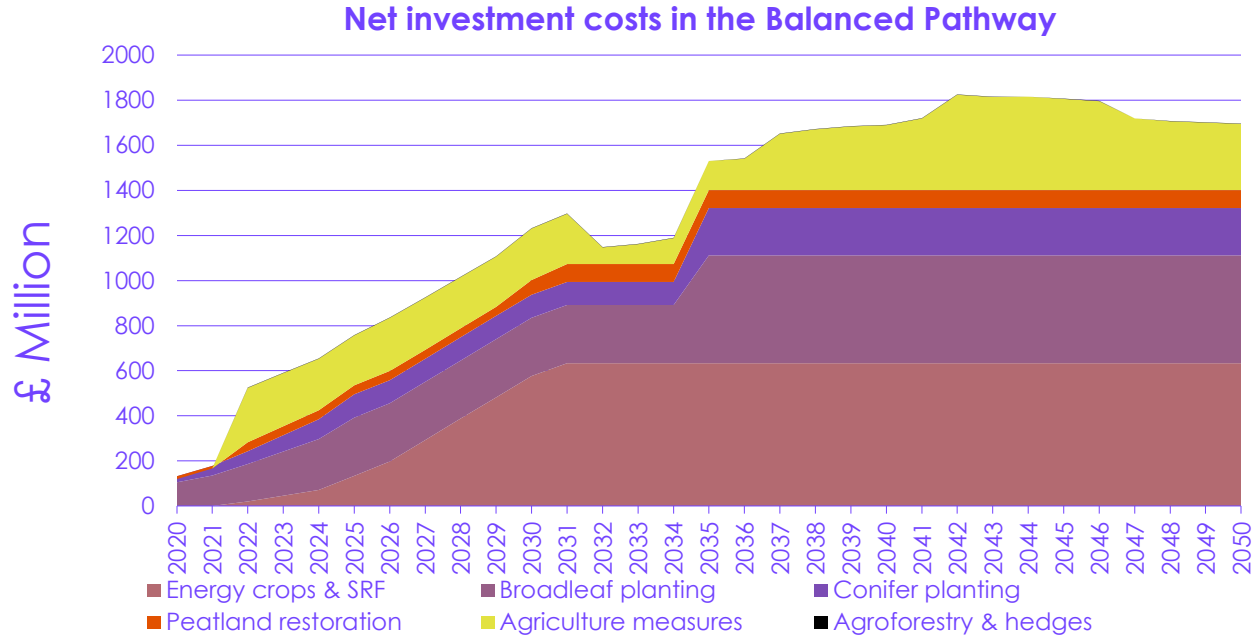
Residual GHG emissions in agriculture and land use in 2050

Combined emissions fall to 16 MtCO₂e in the Balanced Pathway by 2050, and range between 26 and -14 MtCO₂e under the other scenarios



The Balanced Pathway requires net investment of £1.5 billion in 2035

- £1.4 billion in the land sector and £0.1 billion for agricultural measures
- Woodland creation and energy crops are the most significant



But will deliver wider social and environmental benefits of £0.1 billion in 2035 and 0.6 billion by 2050: largest is recreational benefits from woodlands (74%)

Key recommendations

In agriculture and land use

The Committee's key recommendations

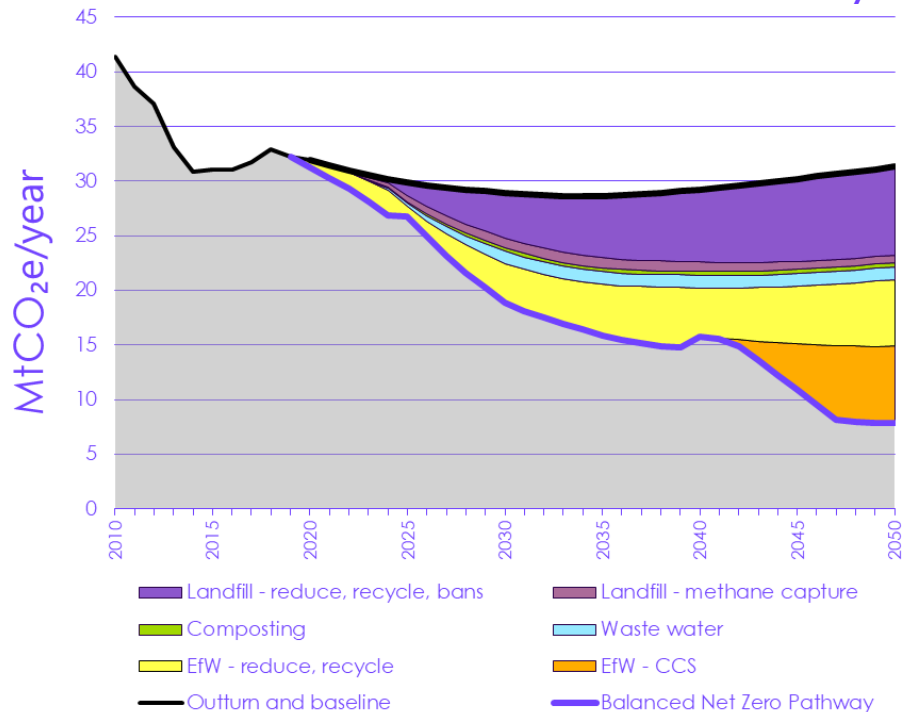
- **Strengthen the regulatory baseline to ensure low-regret measures are taken up.** Retain and extend existing legislation (e.g. cross compliance); new legislation (Clean Air Strategy); ban rotational peat burning and peat sale for horticultural use.
- **Provide funding for actions above the baseline to support more costly measures.** Private mechanism (e.g. trading scheme, auctioned contracts) for afforestation; public (e.g. ELMS) for non-carbon benefits of afforestation, low-carbon practices, peat restoration, and agroforestry.
- **Address non-financial barriers.** For example: Addressing skills and knowledge exchange on farms; forestry supply-chain and tenancy issues.
- **Introduce interim policies to avoid a hiatus in action.** Continued funding (e.g. Treasury funding of Countryside Stewardship from 2021).
- **Introduce measures to encourage consumers to shift diets and reduce food waste. This includes an** evidence-based strategy encompassing information provision, skills support, and encouraging greater accountability of business through clear and robust metrics and mandatory reporting. 'Nudge' measures for consumers and mandatory separate food waste collection,
- **Provide a strong monitoring, reporting and verification system (MRV)** to monitor and pay for actions across the UK; and ensure bodies responsible for enforcement (e.g. EA and FC) are sufficiently resourced.

Waste

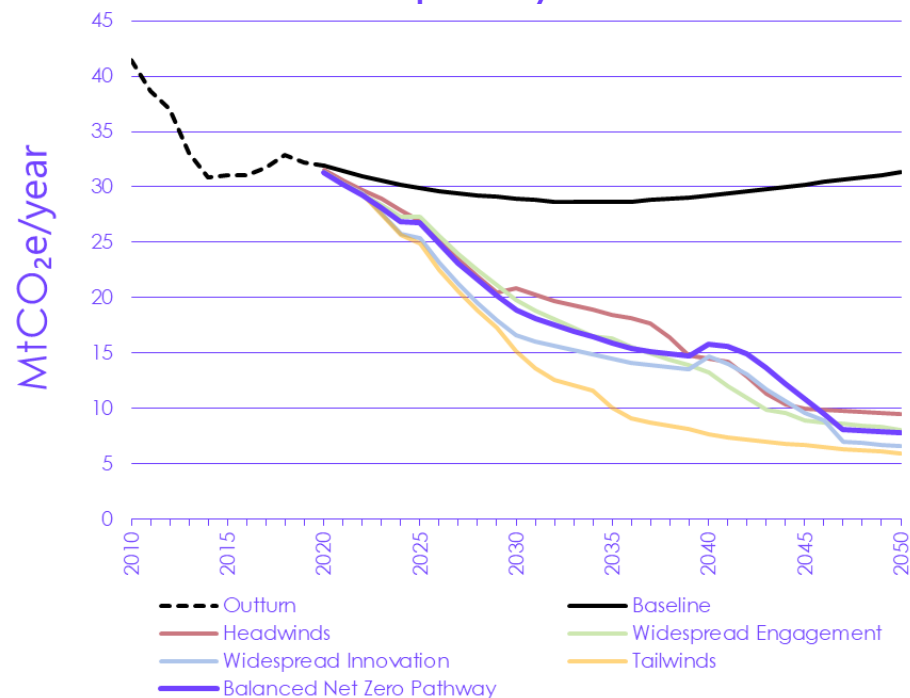
Waste sector abatement is dominated by prevention and recycling

- Enables biodegradable waste landfill ban in 2025 and constrains energy-from-waste emissions (before CCS installed at all plants during 2040s). Emissions fall 71-82% by 2050 compared to 2018

Emissions abatement in the Balanced Pathway

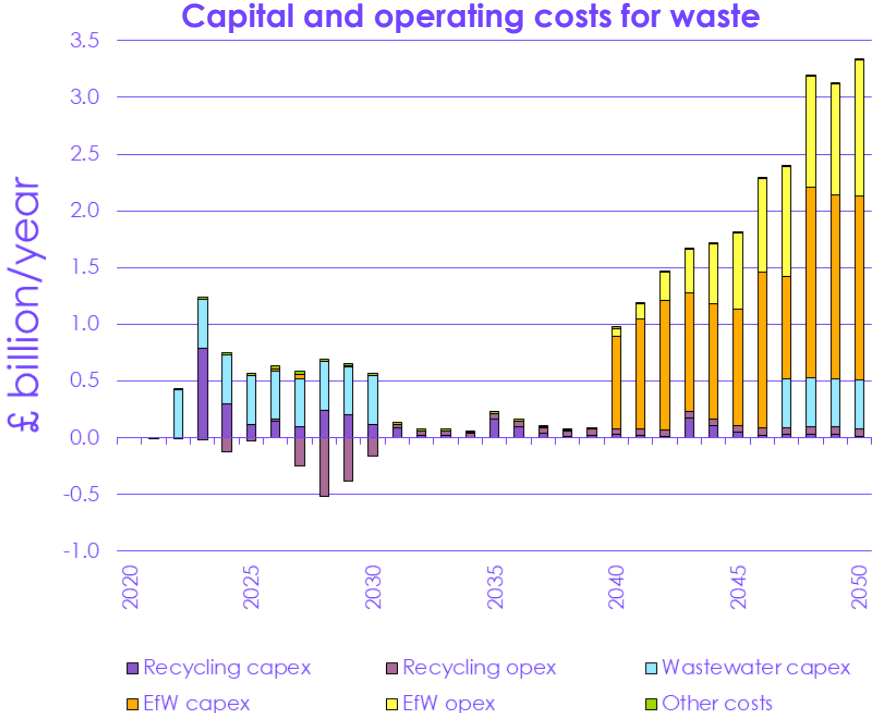


Emissions pathways for waste



The Balanced Pathway investment in the 2020s and 2040s, with up to £2 billion by 2050.

- A step-change towards a circular economy will require strong action in the early 2020s.
- Investment of £100-800 million a year is needed for recycling (including anaerobic digestion and composting), and £430 million a year for wastewater in the 2020s. Recycling will have operational cost savings in some years.
- Adding CCS to energy-from-waste plants requires capital investment of £1-1.6 billion a year in the 2040s, and is relatively expensive abatement.



Key recommendations

In the Waste sector

The Committee's key recommendations

- **Enhanced action on waste prevention, re-use and recycling**

- Focus on manufacturing, addressing product demand, lifetimes and material substitution.
- Mandatory business food waste reporting, 'nudge' approaches to tackling household food waste.
- Universal collections of separated recycling by mid-2020s, more ambitious 2030 recycling targets.

- **Reductions in landfill emissions**

- Ban on landfill of biodegradable municipal & non-municipal waste from 2025 – requires sufficient investment in recycling/AD/composting capacity to avoid energy-from-waste surge.
- Funding for increased methane capture at landfill, demonstration of methane oxidation options.

- Total landfill ban only after prevention efforts and CCS installed on energy-from-waste plants.

- **Wastewater investment in decarbonisation**

- Ofwat Net Zero mandate, capital roll-out of advanced AD, further R&D for novel processes.

- **Energy-from-waste requirements**

- Guidance notes issued to Local Authorities on minimising need for further energy-from-waste in light of new prevention and recycling ambitions impacting regional residual waste arisings.
- All new plants to be built with CCS or CCS-ready, dates set for retrofitting existing plants with CCS (latest by 2050). Could be via GHG thresholds, CCUS incentives and/or carbon taxation.

Contact us

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