UK Government

Energy and emissions projections 2024 to 2050

Department for Energy Security and Net Zero (February, 2026)

Any enquiries regarding this publication should be sent to us at:
emissionsprojections@energysecurity.gov.uk

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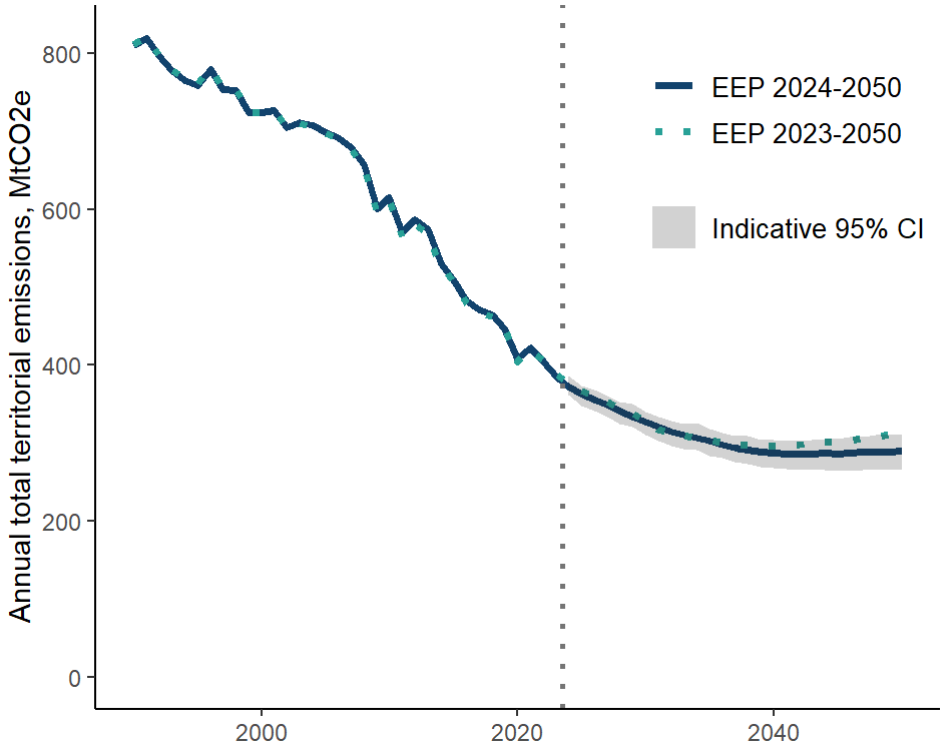
Executive summary

The Department for Energy Security & Net Zero (DESNZ) publishes annual projections of UK energy demand and greenhouse gas emissions (EEP)[1]. This report contains outputs from the latest projections, Energy and Emissions Projections 2024-2050 (EEP 2024-2050), along with comparisons to EEP 2023-2050.

The DESNZ Energy and Emissions Projections (EEP) take account of any policies that, as of June 2025, have either been implemented or those that are planned where the level of funding has been agreed and the policy design is near final. These are referred to as EEP-ready policies. Policies at an earlier stage of development are not included.

The Energy and Emissions Projections show what the UK would expect to happen if no further policies were planned or implemented (as of June 2025). As such, they provide the baseline assumptions for assessing future climate and energy policy proposals before they become EEP-ready. The projections are also used to meet the UK's international reporting obligations under the United Nations Framework Convention on Climate Change[2]. Figure i shows how EEP 2024-2050 projects lower or similar emissions than EEP 2023-2050[3] for all future years.

Figure i: UK projected territorial emissions (excluding IAS), $MtCO_2e$



[1] Energy and emissions projections: https://www.gov.uk/government/collections/energy-and-emissions-projections
[2] Note this equates to the UNFCCC international reporting scenario "With Additional Measures" (WAM), which includes Existing and Planned policies. Further information on UNFCCC reporting requirements is available at: https://unfccc.int/reporting-and-review
[3] EEP 2023-2050, published December 2024: https://www.gov.uk/government/publications/energy-and-emissions-projections-2023-to-2050

This publication's projected emissions are lower than EEP 2023-2050 for each of the five-year periods for which the UK has set carbon budget targets under the Climate Change Act 2008. Under EEP-ready policies, we project that the UK will meet its next two legislated domestic targets (Carbon Budget 4 2023-2027 and Carbon Budget 5 2028-2032). In addition, compared to EEP 2023-2050, the latest projections show a smaller gap between projected performance and emissions target for Carbon Budget 6 (2033-2037).

Overall changes in this year's projections are primarily due to three main factors:

- Revisions to historic data in the July 2024 update of the Digest of UK Energy Statistics (particularly for industry, domestic and transport sectors), and the Feb 2025 update of the Greenhouse Gas Inventory (GHGI). These led to lower projected emissions.

- New EEP-ready policies included in EEP 2024-2050, including the Warm Homes Local Grant, Social Housing Decarbonisation Fund (Wave 3), Defra's Collection and Packaging Reform Policies, and new low-carbon power sector capacity (procured primarily through Allocation Round 6). These new policies have reduced projected emissions.

- Improvements to projection methodology, particularly Defra modelling of landfill methane, DfT's modelling of International Aviation and Shipping and DESNZ's modelling of the domestic and power sectors. These changes had varying impacts on emissions projections.

1 Introduction

- This report contains projections of energy consumption, electricity generation, and greenhouse gas emissions under EEP-ready policies out to 2050.
- The projections take account of policies that, as of June 2025, have been implemented and those that are planned where the level of funding has been agreed and the design of the policy is near final i.e. where there are no outstanding decisions on intervention design or funding that might materially affect their impact. These policies together are referred to as “EEP-ready” policies.
- Policies that have been announced but have not reached the required EEP-ready state of development are not included.
- The Energy and Emissions Projections show what the UK would expect to happen if no further policies were planned or implemented (as of June 2025). As such, they provide the baseline assumptions for assessing future climate and energy policy proposals before they become EEP-ready. The projections are also used to meet the UK’s international reporting obligations under the United Nations Framework Convention on Climate Change[4].
- Chapter 2 looks at our projections for overall UK territorial emissions (emissions that occur within the UK’s borders) and performance against Carbon Budget targets, overall and for different Net Zero Strategy sectors.
- Chapter 3 explores the impact of policies that are new to this edition of EEP as well as changes to the estimated impacts of policies that were already included in EEP 2023-2050.
- Chapter 4 looks at the drivers and changes to projected electricity supply.
- Chapter 5 sets out more information about the major changes to the projections between EEP 2023-2050 and EEP 2024-2050.

1.1 About this document

This report sets out the 2024-2050 Energy and Emissions Projections: referred to as EEP 2024-2050.

EEP provides projections of energy, emissions, and electricity generation under policies that have been implemented and those that are planned where the level of funding has been agreed and the design of the policy is near final. Policies at an earlier stage of development

[4] Note this equates to the UNFCCC international reporting scenario “With Additional Measures” (WAM), which includes Existing and Planned policies. Further information on UNFCCC reporting requirements is available at: https://unfccc.int/reporting-and-review

are not included. This is because the estimated impact of a planned policy will be sensitive to decisions on its design and/or level of funding. In this report, policies that have reached the required stage of development are referred to as "EEP-ready" policies. Policies are included if they had reached the EEP-ready stage of development by June 2025.

The Energy and Emissions Projections are produced to meet the UK's international reporting obligations under the United Nations Framework Convention on Climate Change[5] and to provide essential assumptions for government modelling of energy and climate change policies. The Energy and Emissions Projections show what the UK would expect to happen if no further policies were planned or implemented (as of June 2025). As such, they provide the baseline against which future climate and energy policy proposals are assessed before they become EEP-ready. Other uses include the provision of short-term electricity demand assumptions for power sector policy modelling and future industrial output assumptions for industrial decarbonisation modelling.

This report provides an overview of the updated projections and includes comparisons against EEP 2023-2050. Detailed annual breakdowns for energy, emissions and electricity generation under EEP-ready policies are contained in the accompanying annexes.

For sector definitions and further information on the change, see the final UK greenhouse gas emissions national statistics, known as the 1990-2023 UK Greenhouse Gas Inventory (GHGI)[6].

The Climate Change Act 2008 (CCA) introduced carbon budgets[7]. These are legally binding limits on the total amount of greenhouse gas (GHG) emissions the UK can emit over five-year periods. Carbon budgets have been set out to 2037, with Carbon Budget 6 (2033-2037) being the latest target set. The Carbon Budget 7 time period (2038-2042) is also in scope for our analysis and has been included in this report. The Government will set Carbon Budget 7 by June 2026, in line with its statutory duties. We present projected performance against carbon budgets under EEP-ready policies in Chapter 2.

The metric used to assess performance against carbon budgets is called the Net UK Carbon Account (NCA). The Government has committed to including International Aviation and Shipping (IAS) in CB6, whilst earlier targets do not. Therefore, we include IAS when reporting against CB6. For international aviation projections in EEP 2024-2050, consistent with the approach in the UK 1990-2023 GHG Inventory, the UK's share is based on the amount of refuelling from bunkers at UK airports, whether by UK or non-UK operators, for onward international journeys. For international shipping projections in EEP 2024-2050, an activity-based approach is adopted to estimate emissions from the UK's share. Annex tables contain projections with and without IAS.

[5] Note this equates to the UNFCCC international reporting scenario "With Additional Measures" (WAM), which includes Existing and Planned policies. Further information on UNFCCC reporting requirements is available at: https://unfccc.int/reporting-and-review
[6] Available at: https://www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics
[7] Available at: https://www.gov.uk/guidance/carbon-budgets

These projections bring together statistical and modelled information from many different sources:

- At the time of modelling, the main source of energy consumption data was the annual Digest of UK Energy Statistics (DUKES)[8], published July 2024. The projections have not been updated to incorporate the latest estimates of energy consumption published in DUKES July 2025. The first projection year for energy consumption is therefore 2024 and we report energy consumption trends against a comparison year of 2023.

- The main source of emissions statistics is the final UK greenhouse gas emissions national statistics, the 1990-2023 UK Greenhouse Gas Inventory (GHGI)[9], published in February 2025. The first projection year for emissions is therefore 2024, and we report emission trends against 2023 unless we state otherwise.

- The latest Office for Budget Responsibility (OBR) short and long run economic growth projections available at the time of modelling were from March 2025[10].

- The Department for Energy Security & Net Zero (DESNZ) updated fossil fuel price projections in September 2024. See Fossil Fuel Price Assumptions for further details of the latest update[11].

- Non-energy and non-CO_2 projections have been updated and are consistent with the 1990-2023 Greenhouse Gas Inventory (GHGI). See Annex N for details of this. These are produced by the Department for Energy Security & Net Zero (DESNZ), the Department for Environment, Food & Rural Affairs (Defra), Ricardo[12] and the UK Centre for Ecology and Hydrology (CEH)[13].

- Land Use, Land Use Change and Forestry (LULUCF) projections are aligned with the 1990-2023 Greenhouse Gas Inventory (GHGI) and are consistent with the inventory. These are produced by the UK Centre for Ecology and Hydrology (CEH).

- Iron and Steel projections assume Port Talbot converts to Electric Arc Furnace as planned. Projections for all other iron and steel output are purely statistical extrapolations of past trends and do not take account of nor reflect any assumptions about the forthcoming Steel Strategy or HMG interventions under the Steel Industry Special Measures Act 2025.

We produce projections of energy demand and emissions outside the power sector by applying standard statistical techniques. These project forward energy demand and emissions based on trends and relationships in past data with additional inputs from other models for some sectors. We adjust these projections to take account of estimated reductions in energy consumption

[8] There is more detail here: https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes
[9] Available at: https://www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics
[10] Available at: https://obr.uk/efo/economic-and-fiscal-outlook-march-2025/
[11] Available at: https://www.gov.uk/government/collections/fossil-fuel-price-projections
[12] Ricardo Energy & Environment
[13] Available at: https://ceh.ac.uk

from EEP-ready policies. We then project energy-related emissions by multiplying energy demand by the relevant emissions factors[14].

We produce projections of power sector generation and associated emissions by feeding our projections of electricity demand into a model of electricity supplier behaviour.

We obtain separate projections for non-energy related emissions from the Department for Environment, Farming & Rural Affairs (Defra), Ricardo, the UK Centre for Ecology & Hydrology (CEH) and the North Sea Transition Authority[15]. The accompanying methodology summary[16] provides further details of the projection methodology.

1.2 The "reference scenario" and other scenarios

We refer to our main projection as the "reference scenario". This is our core analysis of how the UK energy and emissions system could evolve under EEP-ready policies and our central assumptions about how the system drivers will change. Results in this report are from the reference scenario unless stated otherwise. They are the baseline or counterfactual projection showing what the UK would expect to happen if no policies at an earlier stage of development were implemented. Results from other EEP scenarios are provided in the accompanying annexes. These include the "With Existing Measures (WEM)"[17] policy scenario which only includes policies that have already been implemented.

Finally, since the projections are sensitive to macro-economic assumptions, the annexes also include projections under alternative fossil fuel price and economic growth assumptions.

We publish our projections for the reference scenario and other scenarios in annexes alongside this report. Each chapter of this report notes the relevant annexes. The data underlying the report's tables and figures are in the web tables and web figures supplementary files. Chapter 6 lists these resources in full.

1.3 Domestic energy consumption methodology changes

We have improved our methodology for domestic gas consumption by using baseline projections from the National Buildings Model (NBM).

The NBM simulates building energy use, costs and emissions under policy incentives. The core model is a generic simulation engine which applies user-defined policy assumptions to a representation of the domestic buildings stock. Building physics calculations are performed using the Standard Assessment Procedure 2012 energy model. The domestic building stock is

[14] Emissions factors are available from: https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting
[15] Available at: https://nstauthority.co.uk
[16] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794741/energy-emissions-projections-methodology-overview.pdf
[17] "WEM" stands for the "With Existing Measures" scenario used for international reporting to UNFCCC.

represented using a sample of dwellings from the English Housing Survey[18]. For EEP we have used simulations of the domestic buildings stock in England and scaled outputs to estimate UK-wide gas consumption. This scaling aligns consumption simulated using the NBM with actual past energy consumption published in DUKES.

Using the NBM has enabled us to more accurately model how future domestic gas consumption will change as a result of how the buildings stock evolves over time. For example, the NBM simulates the reduction in gas consumption that occurs when boilers reaching the end of their lifespan are replaced by more efficient models. Using the NBM also means the EEP baseline is now created using the same model used for most domestic policy savings.

We then use historic energy data to estimate the impact of factors that are not modelled in the NBM, such as the impact on consumption from domestic gas retail prices.

Under the previous EEP methodology, policy savings to energy demand and emissions were deducted individually from "without policy" projections. Under the new methodology for domestic gas consumption, the effects of policies are added at earlier stages of the modelling process. This means that the total policy savings we have modelled are not a simple sum of all savings for the relevant individual policies published in Annex D of EEP. While we have not yet produced estimates of individual policy savings that fully align with the new domestic gas methodology, our domestic gas projection includes savings from all policies in Annex D.

In future editions of EEP we will seek to make further improvements to domestic energy modelling using the NBM, both to our overall projections and to policy savings estimated against the EEP baseline.

Separately from the changes to domestic gas modelling described above, we have made a change to the modelling of domestic electricity consumption to better account for improvements to domestic appliance efficiencies which are not all attributable to government policies.

Overall, these changes to the methodology for domestic energy consumption result in emissions that are lower by 10 $MtCO_2e$ in the fifth Carbon Budget Period, and lower by 17 $MtCO_2e$ in the sixth Carbon Budget Period.

[18] Further information available at: https://www.gov.uk/government/collections/english-housing-survey

2 UK emissions projections

- Under EEP-ready policies only, emissions are projected to fall by 25% between 2023 and 2050.
- Under EEP-ready policies only, the projections show headroom of 126 $MtCO_2e$ against the fourth Carbon Budget and headroom of 86 $MtCO_2e$ for the fifth carbon budget period.
- The scope of emissions included in Carbon Budget 6 (CB6) projections widens to include International Aviation and Shipping. For CB6 the projected shortfall is 737 $MtCO_2e$ (reduced from 779 $MtCO_2e$ in EEP 2023-2050).

2.1 Introduction

This chapter looks at our projections for overall UK territorial emissions and performance against carbon budget targets.

Emissions estimates in this publication include seven greenhouse gases as defined by the Climate Change Act 2008[19]: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). HFCs, PFCs, SF_6, and NF_3 are collectively referred to as fluorinated- or F-gases.

Emissions from each greenhouse gas are weighted by its Global Warming Potential (GWP), so that total greenhouse gas emissions can be reported on a consistent basis in terms of carbon dioxide equivalent (CO_2e). In November 2021, it was agreed by the international community at the 2021 United Nations Climate Change Conference (COP26) that greenhouse gases shall be reported under the Paris Agreement transparency framework using 100-year GWPs listed in table 8.A.1 of the Fifth IPCC Assessment Report (AR5 without climate-feedback)[20]. Therefore, all projections and comparisons in this report and in the accompanying EEP 2024-2050 annex tables are reported on this basis.

2.2 UK emissions projections and uncertainty

In this section, we compare emissions with EEP 2023-2050[21]. For convenience, we use the carbon budget periods to summarise projection results. These are not the same as the Net

[19] Climate Change Act 2008: https://www.legislation.gov.uk/ukpga/2008/27/part/1/crossheading/targeted-greenhouse-gases
[20] Fifth IPCC Assessment Report: https://unfccc.int/documents/311138
[21] EEP 2023-2050, published December 2024: https://www.gov.uk/government/publications/energy-and-emissions-projections-2023-to-2050

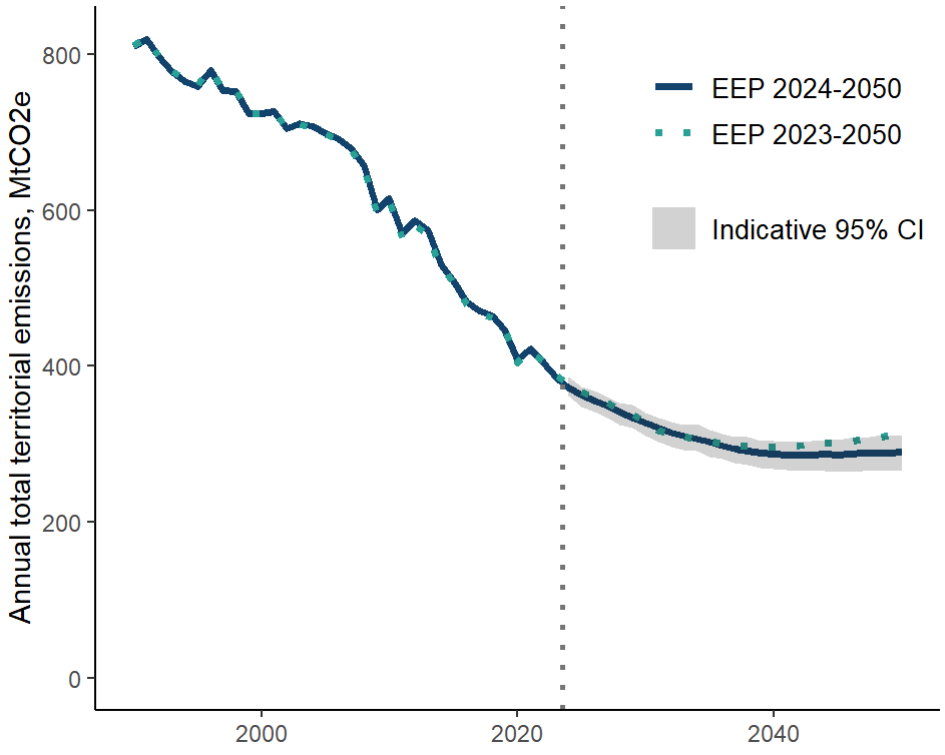
Carbon Account (NCA) metric used to assess performance against carbon budget targets: see section 2.3 and Box 1 for details.

Figure 2.1 compares the main territorial emissions trends from EEP 2024-2050 with those from EEP 2023-2050.

When we compare total UK territorial emissions (excluding IAS) for carbon budget periods four to six, EEP 2024-2050 has lower projected emissions than EEP 2023-2050 for all carbon budget periods:

- For the fourth carbon budget period they are 22 $MtCO_2e$ (1%) lower.
- In the fifth carbon budget period, territorial emissions are lower than in EEP 2023-2050 by 3 $MtCO_2e$.
- In the sixth carbon budget period they are 8 $MtCO_2e$ (1%) lower.

Figure 2.1: UK projected territorial emissions (excluding IAS), $MtCO_2e$



To produce uncertainty bounds around our emissions projections, we performed Monte Carlo analysis on the Energy Demand Model. Key model input variables were assigned historical distributions, and the model was run 10,000 times to explore the impact of input uncertainty on emissions. The 97.5th and 2.5th percentiles of emissions were taken from these 10,000 runs to produce a 95% confidence interval around the projected emissions.

More detail around this analysis was published in the report accompanying EEP 2018[22]. Since EEP 2018 some input assumptions have changed but the underlying methodologies remain similar.

2.3 Progress towards the carbon budgets

The UK has domestic targets for reducing greenhouse gas emissions under the Climate Change Act 2008 (CCA). In June 2019, the CCA was amended to commit the UK to achieving a 100% reduction in net emissions by 2050 from the base year (Net Zero).

The UK met the first (2008-12), second (2013-17) and third (2018-2022) carbon budgets. The latest carbon budget to be set was the sixth Carbon Budget covering the period 2033 to 2037. We will set the Seventh Carbon Budget (2038-2042) by June 2026, in line with statutory duties.

Performance against carbon budget targets is assessed by comparing the budget level against a metric called the UK "Net Carbon Account" (NCA). Box 1 outlines details of how the NCA is calculated.

Box 1: The UK net carbon account (NCA)

2023 onwards:

In this publication, the net carbon account is defined as the sum of two components:

1. **All UK territorial emissions:** In the sixth Carbon Budget (2033-37), emissions from UK international aviation and shipping (IAS) are also in scope[23].
2. **Credits/debits from international trading systems:** This is currently assumed to be zero[24].

Figure 2.2 shows projected performance against the carbon budgets under EEP-ready policies. Table 2.1 also details projected performance against carbon budgets.

[22] EEP 2018 report: https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2018

[23] For international aviation projections in EEP 2024-2050, consistent with the approach in the UK 1990-2023 GHG Inventory, the UK's share is based on the amount of refuelling from bunkers at UK airports, whether by UK or non-UK operators, for onward international journeys. For international shipping projections in EEP 2024-2050, an activity-based approach is adopted to estimate emissions from the UK's share.

[24] The UK reserves the right to credit and debit carbon units to the NCA under the Climate Change Act 2008. This could occur through linking the UK ETS to another emissions trading system, or through the use of international emissions reductions or removals units. As the Carbon Budget and Growth Delivery Plan (CBGDP) shows, the UK intends to meet its climate targets through domestic action, with the following limited exception: for carbon budgets which include IAS, we intend to account for credits purchased by UK airlines for UK departing flights under the International Civil Aviation Organization's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), where we are satisfied that they meet high integrity principles. This is not reflected in this publication. For further information, see the CBGDP.

We project headroom of 126 $MtCO_2e$ in the fourth Carbon Budget and 86 $MtCO_2e$ in the fifth Carbon Budget, under EEP-ready policies. In the sixth Carbon Budget we project a shortfall of 737 $MtCO_2e$. Projections of performance under EEP-ready policies have improved slightly in all carbon budget periods. The projected NCA metric used to assess performance against targets includes IAS in the sixth Carbon Budget but not in earlier carbon budgets. Therefore, projected NCA emissions are higher in CB6 than in CB5.

Figure 2.2: Projected performance against carbon budgets under EEP-ready policies, $MtCO_2e$

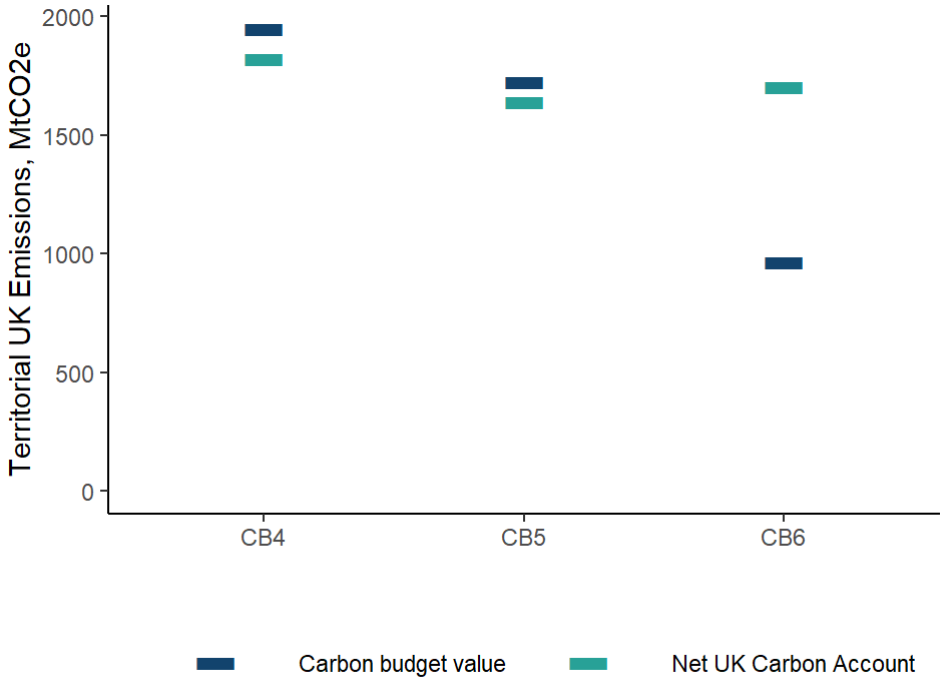


Table 2.1: Territorial and Net Carbon Account emissions projections across carbon budget periods, $MtCO_2e$

	CB4 (2023-27)	CB5 (2028-32)	CB6 (2033-37)
Carbon budget target	1,950	1,725	965
Projected territorial and Net Carbon Account (NCA) emissions			
Territorial emissions exc. IAS	1,824	1,639	1,512
Territorial emissions inc. IAS	2,033	1,841	1,702
Projected performance vs target (projected NCA minus CB target)	-126	-86	737
Average annual percentage reduction on base year [2] emissions			
Implied carbon budget/NCA target	-52%	-58%	-77%
Projected Net Carbon Account (exc. IAS)	-55%	-60%	
Projected Net Carbon Account (inc. IAS)			-59%

Notes:

- [1] All data based on reference scenario.

- [2] The base year is 1990 for CO_2, CH_4 and N_2O, and 1995 for fluorinated gases. For CB4-5, base year emissions are currently estimated to be 813 $MtCO_2e$. CB6 base year emissions include an additional 24 $MtCO_2e$ for international aviation and shipping. Base year emissions estimates on which CB percentage reductions are based are revised annually and are therefore subject to change.

3 Effect of policies on emissions

- Policies are included in these projections if they had either been implemented or were planned and at a near final stage of development by the policy cut-off point (June 2025 for all policies). These are together referred to as “EEP-ready” policies.
- This chapter includes the total of territorial and international aviation and shipping (IAS) policy savings. Relative to no policy intervention, we project that EEP-ready quantified government policies (excluding power section interventions) will reduce total emissions (including IAS) by around 290 $MtCO_2e$ in the fourth carbon budget period, 424 $MtCO_2e$ in the fifth carbon budget period and 561 $MtCO_2e$ in the sixth carbon budget period.
- The new individually quantified policies that are included for the first time in EEP 2024-2050 are the Warm Homes Local Grant, Social Housing Decarbonisation Fund (Wave 3) and Defra’s Collection and Packaging Reform Policies within waste projections. In total, these new policies are projected to contribute 0.7 $MtCO_2e$ of savings in the fourth carbon budget period, 9 $MtCO_2e$ in the fifth carbon budget period, and 14 $MtCO_2e$ in the sixth carbon budget period.

3.1 Introduction

This chapter explores the impact of policies that are new to this edition of EEP as well as changes to the estimated impacts of policies that were already included in EEP 2023-2050.

A full list of policies included in EEP 2024-2050 is available in Annex D. We also provide quantified impacts for individual policies in Annex D where these are available.

Most policies included in EEP have individually quantified impacts. However, we cannot currently provide separate quantified impacts for some types of policy due to limitations with our modelling approach:

- Power sector, forestry and agriculture policies are modelled as three separate policy groupings, and the impact of individual policies cannot be separated out due to interactions between them.
- Policies which operate fully or partly through a price impact such as the Climate Change Levy (an environmental tax on the energy that businesses use) cannot be quantified due to limitations with our modelling approach. These are taken into account in the modelling (through their impact on energy demand), but we do not have estimates of the individual impacts.
- Some policies and initiatives are not taken into account in our modelling. These will only be picked up in the projections if their combined past impact is sufficiently large to affect long term trends. These include:

- Enabling policies, such as innovation funding or investment in infrastructure.
- Policies implemented by Devolved Administrations (DAs).
- Initiatives by local authorities or other public, voluntary, or private sector organisations unless these are directly driven by a central government initiative.

3.2 Policies for emissions reductions

Table 3.1 shows that we estimate that quantified government policies (excluding power sector interventions) will reduce total emissions (including IAS) by 1,924 $MtCO_2e$ over carbon budgets four to seven. We report policy savings in Annex D: this gives brief information about the policies we include.

Table 3.1: Projected GHG emissions savings from EEP-ready policies excluding power sector interventions, $MtCO_2e$

	CB4 (2023-27)	CB5 (2028-32)	CB6 (2033-37)	CB7 (2038-42)	Total (2023-42)
Savings from policies excluding power sector	290	424	561	650	1,924

3.3 Changes to individually quantified policy savings since EEP 2023-2050

From the fourth carbon budget period onwards, we project higher total GHG savings from EEP-ready government policies excluding power sector interventions compared with EEP 2023-2050 projections.

These policy savings for the fourth carbon budget period were slightly lower than EEP 2023-2050 at 290 $MtCO_2e$. For the fifth carbon budget period these savings are slightly higher in EEP 2024-2050, at 424 $MtCO_2e$. For the sixth carbon budget period, they are 561 $MtCO_2e$, an increase of 22 $MtCO_2e$ from EEP 2023-2050.

Policies with the largest change in savings from previous projections include:

- New EEP-ready policies: There are three new EEP-ready policies included in EEP 2024-2050. These are the Warm Homes Local Grant, Social Housing Decarbonisation Fund (Wave 3) and Defra's Collection and Packaging Reform Policies. In total, they are projected to contribute 0.7 $MtCO_2e$ of savings in the fourth carbon budget period, 9

$MtCO_2e$ in the fifth carbon budget period and 14 $MtCO_2e$ in the sixth carbon budget period.

- Defra's Collection and Packaging Reform Policies are now included in the Waste projections. This has resulted in 0.5 $MtCO_2e$ of savings in carbon budget 4, 8.2 $MtCO_2e$ in carbon budget 5 and 13.5 $MtCO_2e$ in carbon budget 6.
- International Aviation and Shipping (maritime assumptions): The international shipping projections have been produced by DfT's new Maritime Emissions Model for EEP 2024-2050. This results in an international maritime emissions decrease, due to the implementation of new international policies since EEP 2023-2050. The EEP scenario now includes the impact of International Maritime Organization (IMO) efficiency measures, the expansion of the EU ETS and FuelEU Maritime regulation (setting limits on the greenhouse gas intensity of energy used by ships calling at EEA ports).

3.4 Emissions savings from policies in electricity supply

Supply-side policies comprise:

- Large Combustion Plant Directive
- Industrial Emissions Directive
- UK Carbon Price Support
- Feed-in-Tariffs (for small scale generation)
- Renewables Obligation and Contracts for Difference (for large-scale generation)
- Phase out of coal-fired generation
- Capacity Market

Power supply markets are highly interconnected, meaning it is not possible to robustly disaggregate the impacts of individual policies. We are reviewing the method for calculating savings from overall power interventions. For this edition of EEP, we have excluded the aggregated emissions savings from power supply policies in the "All by sector" section of Annex D.

3.5 The EEP and policies from the Carbon Budget and Growth Delivery Plan

In 2019, the Government passed legislation which requires the UK to reduce net emissions by 100% compared to 1990 levels.

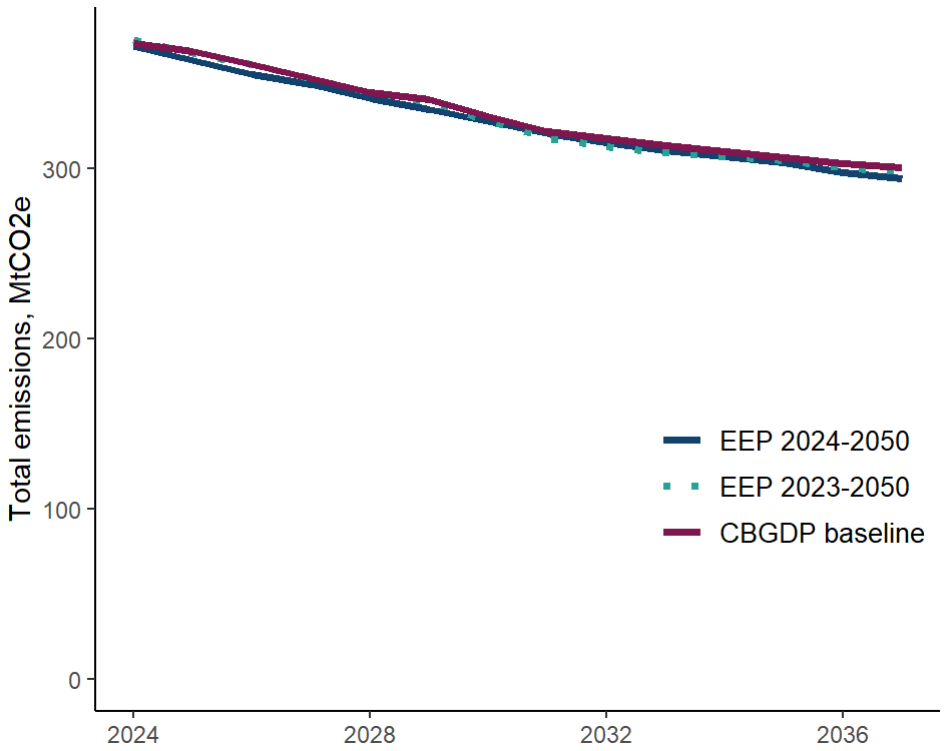
EEP only contains implemented policies and those that are planned where the policy design was near final at the policy cut-off date (June 2025). Policies at an earlier stage of development are not included because the impact of these policies will be sensitive to decisions that have not yet been taken on the design of the intervention.

The Carbon Budget and Growth Delivery Plan (CBGDP)[25] published on 29th October 2025 set out a package of quantified and unquantified proposals and policies, to enable carbon budget periods 4-6 to be met – many of these are not yet EEP-ready.

The impact of these additional (non EEP-ready) policies and proposals was assessed against a baseline derived from the previous edition of EEP (EEP 2023-2050) – referred to here as the Carbon Budget and Growth Delivery Plan (CBGDP) baseline. Adjustments were made to the EEP 2023-2050 projections for some sectors to better align with sectoral modelling. More information on these adjustments can be found in the technical annex of the CBGDP[26].

Following these adjustments, the CBGDP baseline was c. 2.5 $MtCO_2e$ per year higher over Carbon Budget 6 than the EEP 2023-2050 emissions projections (excluding international aviation and shipping). Figure 3.1 below shows the CBGDP baseline compared to this year and last year's projections.

Figure 3.1: Carbon Budget and Growth Delivery Plan Baseline (October 2025) compared to EEP 2024-2050 and EEP 2023-2050. Territorial emissions projections, excluding International Aviation and Shipping, $MtCO_2e$



[25] Available at: https://www.gov.uk/government/publications/carbon-budget-and-growth-delivery-plan-2025
[26] Available at: https://assets.publishing.service.gov.uk/media/6901dfae71b575684c3cf78a/carbon-budget-and-growth-delivery-plan-technical-annex.pdf

4 Electricity supply

- In this year's EEP, we have strengthened our approach to modelling the power sector to provide a more robust baseline for assessing the impact of new policies and proposals and for monitoring future progress. In the revised approach, a plant is only considered "EEP-ready" if it has an existing CfD contract (up to and including Allocation Round 6 – AR6) or a firm, funded arrangement for deployment. Previously, the definition also covered low-carbon capacity we intended to secure by 2030 to meet decarbonisation goals, even where funding was not confirmed. While that reflected policy intent, it created ambiguity in tracking progress, which is why we have tightened the criteria this year.
- As such, this year's power sector projections are not directly comparable with EEP 2023-2050. However, based on the latest evidence and definition, and only looking at the impact of policy changes, new EEP-ready low-carbon capacity procured since June 2024 (mainly AR6) is projected to cut power sector emissions by 15 $MtCO_2e$ during Carbon Budget 5.

4.1 Introduction

This chapter explores the drivers and changes to projected electricity supply and associated emissions.

We produce projections of power sector generation and associated emissions by feeding our projections of electricity demand[27] into a model of electricity supplier behaviour. We undertook this electricity supply sector modelling in autumn 2025 using DESNZ's "Dynamic Dispatch Model" (DDM)[28]. The DDM simulates the dispatch of electricity in half-hourly periods out to 2050 taking into account numerous factors such as fuel costs and balancing requirements. The model also projects what new generation capacity will be required to ensure security of supply in future years.

Electricity supply policies are only included if they had reached the "EEP-ready" stage by June 2025. In previous years, 'EEP-ready' had included low-carbon capacity we were planning to secure up to 2030 to meet decarbonisation goals, even where firm and funded arrangements were still pending. Although an accurate reflection of policy intent, this created some ambiguity in measuring progress, which is why we have tightened the definition this year. From this year, plants will only be considered 'EEP-ready' if they have an existing CfD contract (i.e., up to and including Allocation Round 6 – AR6) or a firm and funded arrangement is in place for its deployment. This means, all plants with an existing CfD contract up to AR6 are included, in addition to one pilot Carbon Capture and Storage (CCS) plant called Net Zero Teesside

[27] Electricity demand projections are based on the rest of EEP and therefore consistent with 'EEP-ready' policy only.
[28] For background information on the DDM please see: https://www.gov.uk/government/publications/dynamic-dispatch-model-ddm

(NZT)[29] and the nuclear plants Sizewell C (SZC) and Hinkley Point C. We also assume the continuation of rooftop solar.

Beyond these 'EEP-ready' plants, the model also builds technologies assessed as economically viable without CfDs or other dedicated renewable support, subject to build limits, in order to maintain security of supply. These technologies include unabated gas (CCGTs, OCGTs and reciprocating engines), ground-mounted solar, onshore wind and batteries.

In this scenario, the absence of further renewable support mechanisms increases financing costs for new renewable projects because investors face greater revenue uncertainty. Although renewables retain a lower underlying levelised cost than gas, these higher financing costs mean that fewer merchant renewable plants proceed. At the same time, to ensure system adequacy, the scenario assumes the continued operation of the Capacity Market, which provides stable and predictable availability payments to all eligible technologies — including gas — thereby reducing financing risk and supporting investment in firm capacity. When the increased financing risk for renewables is combined with the relatively secure revenue stream available to gas from the Capacity Market, the model builds additional unabated gas to fill the resulting capacity gap - although this is without a full consideration of how easy or costly it would be to procure new unabated gas.

This outcome reflects the policy environment assumed in the scenario, not a reversal of the cost advantage of renewables or an indication of a cost-optimal future system. It illustrates what could occur in the absence of further government policy to support investment in low-carbon technologies. The results highlight the importance of regular renewable allocation rounds — such as the UK's CfD auctions — in bringing forward clean power at scale. These mechanisms play a critical role in lowering financing costs, managing investor risk during capital-intensive construction phases, and enabling low-carbon technologies to compete effectively with capacity supported through security-of-supply mechanisms.

Substantial research has been undertaken for power sector modelling since the last publication, and this has led to the following revisions in assumptions which have also affected projections for the power sector:

- For wind power, the maximum technical load factors have been revised downwards[30].
- Additional energy from waste plants is now in the pipeline.
- Updates to carbon price assumptions and fossil fuel prices (which tend to have a higher impact on the power sector - see Table 5.2 in Chapter 5). See Annex M to the EEP publication for details of the prices underlying these projections.

[29] See: https://www.gov.uk/government/news/contracts-signed-for-uks-first-carbon-capture-projects-in-teesside
[30] For information about the change in wind load modelling please see: https://www.gov.uk/government/publications/onshore-wind-and-solar-cost-and-technical-assumptions

- Higher renewable costs based on updated research have led to fewer renewable projects being deployed beyond plants secured through previous CfD allocation rounds[31].

4.2 Summary of projections

As described earlier, this year's power sector projections are not directly comparable with EEP 2023-2050 primarily due to the refinement of how we apply the EEP-ready definition in the power sector. Section 4.1 also describes several other updates in evidence and assumptions.

However, based on the latest evidence and definition, and only looking at the impact of policy changes, new EEP-ready low-carbon capacity procured since June 2024 (mainly AR6) is projected to cut power sector emissions across all projected years, including by 15 $MtCO_2e$ during Carbon Budget 5.

[31] For information on the renewable costs please see: https://www.gov.uk/government/publications/hurdle-rate-estimates-for-electricity-sector-technologies

5 Detailed comparisons with EEP 2023-2050

5.1 Introduction

This chapter provides more information about the major changes to the projections since last year's publication.

In the same way as last year's publication, all breakdowns here are based on total emissions including International Aviation and Shipping (IAS). For convenience, we use the carbon budget periods to summarise projection results, however as mentioned earlier in this report, emissions from IAS are excluded from carbon budget reporting totals until the sixth carbon budget period.

As last year's publication was extended to 2050, we are now able to include comparisons for the 7th carbon budget period in all tables.

5.2 Changes in emissions (including international aviation and shipping) since EEP 2023-2050

We update the projections each year to incorporate a range of updated scientific evidence, statistics, and projections of economic and demographic drivers, as well as updated estimates of policy impacts and DESNZ improvements to projections methodology and modelling. Table 5.1 summarises the contribution of each of these changes to overall emissions estimates.

Table 5.1: Changes which affect total emissions projections including aviation and shipping (in comparison with EEP 2023-2050), $MtCO_2e$

	CB4 (2023-27)	CB5 (2028-32)	CB6 (2033-37)	CB7 (2038-42)
Transport assumption updates (inc. DfT policy savings)	1	-10	-27	-33
Modelling and assumption changes	0	-10	-17	-24
Policy savings updates (DESNZ and MHCLG)	-2	-3	-3	-2
Macro-economic, power sector and other model input updates (inc. Defra policy savings)	-28	1	5	-27
Total	-29	-21	-42	-86

In more detail these changes are:

- **Transport assumption updates (inc. DfT policy savings):** This is the combined effect of updates to transport assumptions and both national and international DfT policies. This category of updates led to downward adjustments to projected emissions (including international aviation and shipping[32]) of 10 and 27 $MtCO_2e$ for the fifth and sixth carbon budget periods respectively, in comparison to EEP 2023-2050. For international aviation and shipping (IAS), the main change was due to revisions in international shipping projections, where for the first time DfT provided data produced by the Maritime Emissions Model. More information is in the Modelling Framework published alongside the Maritime Decarbonisation Strategy[33]. This change results in an international maritime emissions decrease, as the EEP scenario now includes the impact of International Maritime Organization (IMO) efficiency measures, the expansion of the EU ETS and FuelEU Maritime regulation (however these policies aren't yet possible to individually quantify in Annex D).

- **Modelling and assumption changes** decreased projected emissions, due to improvements to the modelling of domestic gas consumption, about which further details can be found in Section 1.3. The new methodology uses baseline projections from the National Buildings Model (NBM)[34], which is a simulation model of buildings fabrics used within DESNZ to estimate changes to buildings energy use, costs and emissions under policy changes. Modelling and assumption changes did not change emissions in the fourth carbon budget period but lowered them by 10 $MtCO_2e$ in the fifth

[32] All figures in this chapter include international aviation and shipping. However please note that carbon accounting only includes international aviation and shipping from the sixth carbon budget period onwards.
[33] See: https://www.gov.uk/government/publications/maritime-emissions-modelling-framework
[34] For information on the National Buildings Model see: https://www.gov.uk/government/publications/beis-business-critical-analytical-models-2022/beis-business-critical-models-2022

carbon budget period and 17 $MtCO_2e$ in the sixth carbon budget period. The 'modelling and assumption changes' relate to modelling within the immediate Energy and Emissions Projections team; improvements to external methodologies (e.g. modelling by other government departments) are included within the 'Macro-economic, power sector and other model input updates' category.

- **Policy savings updates for DESNZ and MHCLG climate change policies:** The new policies (described in more detail in Chapter 3) helped to reduce emissions slightly across all carbon budget periods. For this row, we just include DESNZ and MHCLG policies. There have also been small revisions to existing policies, in some cases increasing emissions savings and in others decreasing emissions savings. Overall, these changes in isolation contributed 2, 3 and 3 $MtCO_2e$ more emissions savings than EEP 2023-2050 for the fourth, fifth and sixth carbon budget periods respectively.

- **Macro-economic, power sector and other model input updates (inc. Defra policy savings):** This category combines revisions to power sector modelling and other model inputs (for example fossil fuel price updates and economic growth). See section 4 for more details of power sector updates and section 5.3 for more details of input updates. The update to this group of assumptions reduced emissions projections (relative to EEP 2023-2050) by 28 $MtCO_2e$ in the fourth carbon budget period and increased by 1 $MtCO_2e$ in the fifth carbon budget period and by 5 $MtCO_2e$ in the sixth carbon budget period.

5.3 Changes to projections of emissions (including international aviation and shipping) due to input updates

Table 5.2 further breaks down the changes in 'Macro-economic, power sector and other model input updates' (as featured in aggregate in Table 5.1) and their effect on emissions. The overall impact of changes to inputs varies over time and led to a decrease in projected emissions of 28 $MtCO_2e$ in Carbon Budget period 4, an increase of 1 $MtCO_2e$ in Carbon Budget period 5 and an increase of 5 $MtCO_2e$ in Carbon Budget period 6.

Table 5.2: Input updates which affect emissions projections including international aviation and shipping (in comparison with EEP 2023-2050), $MtCO_2e$

	CB4 (2023-27)	CB5 (2028-32)	CB6 (2033-37)	CB7 (2038-42)
Fossil fuel, retail and carbon prices	10	16	26	19
Waste methodology update (inc. policy)	4	-5	-18	-24
Inventory, Non-CO_2 (excluding waste and agriculture) and LULUCF updates	4	-2	-2	-1
Economic and demographic assumptions	-1	-2	0	1
Winter Degree Days	-3	0	0	0
Agricultural methodology update	-5	-4	-8	-17
Power sector and network assumption updates	-8	21	34	27
DUKES update	-30	-26	-31	-36
Other	1	4	5	5
Total	-28	1	5	-27

The main input updates causing an increase in the projections (compared with EEP 2023-2050) were:

- **Fossil fuel, retail and carbon price assumptions:** The projected prices for carbon, oil, gas and coal are all lower than assumed for EEP 2023-2050 over the whole of CB5 and CB6, but some prices are slightly higher for some years in CB4. As lower projected prices are likely to lead to increased demand, this change leads to higher projected emissions for the fourth carbon budget period of 10 $MtCO_2e$, 16 $MtCO_2e$ in the fifth carbon budget period, and 26 $MtCO_2e$ in the sixth carbon budget period.

The main revisions to emissions leading to a decrease in the projections come from updates to:

- **Waste methodology update (inc. policy):** updates to landfill emissions due to a revised assumption about the timing of these emissions in the GHG Inventory model for landfill methane generation and revised estimates of landfill gas capture have led to higher emissions for recent historic years and earlier years in the projections, with emissions in the fourth carbon budget period higher by 4 $MtCO_2e$ compared to EEP 2023-2050. However, the inclusion of Collection and Packaging Reform policies and updated modelling of waste tonnages result in lower emissions in the longer-term. This year's projected emissions are lower by 5 $MtCO_2e$ in the fifth carbon budget period and

18 $MtCO_2e$ in the sixth carbon budget period, in comparison to EEP 2023-2050. There have also been minor revisions to some other waste sector emission sources.

- **Inventory, LULUCF and non-CO_2 (excluding waste and agriculture) emission data:** updated historic data from the GHG Inventory and new projections of non-CO_2 emissions means that emissions have been revised upwards from EEP 2023-2050 by 4 $MtCO_2e$ in the fourth carbon budget period and revised downwards by 2 $MtCO_2e$ in the fifth carbon budget period and 2 $MtCO_2e$ in the sixth carbon budget period.

- **Agricultural methodology update:** This section covers the impact of methodological changes on the agriculture projections, with changes based on revisions to historic data covered in other categories. There have been updates to projections up to 2050 (in EEP 2023-2050 these were held constant after 2032), and changes driven by a gradual reduction in livestock population. In comparison to EEP 2023-2050, this has led to a decrease in emissions of 5, 4 and 8 $MtCO_2e$ for the fourth, fifth and sixth carbon budget periods respectively.

- **Power sector and network assumption updates:** Since the EEP 2023-2050 projections, the primary change is that we have refined how we apply the EEP-ready definition in the power sector. We have also incorporated numerous updates to assumptions underlying our power sector modelling. (See chapter 4 for a full explanation of these changes). Finally, we have updated network cost assumptions, and assumptions on supplier costs and margins and other policy costs. This category captures the impact of these assumption updates as well as how demand for electricity, generation and price all influence each other (this modelling process is outlined in the Energy and Emissions Projections Methodology Overview[35]). These factors led to a reduction (relative to EEP 2023-2050 projections) of 8 $MtCO_2e$ in the fourth carbon budget, an increase by 21 $MtCO_2e$ in the fifth carbon budget and 34 $MtCO_2e$ in the sixth carbon budget.

- **DUKES update, including revisions to historic data:** The main source of energy consumption data used in the projections is the annual Digest of UK Energy Statistics (DUKES), published in July 2024. In this DUKES edition, revisions were made to oil, gas and electricity balances based on methodology changes, including a new survey of oil wholesalers, more detailed analysis of existing administrative datasets, a review of gas consumption to reflect improved data quality following an update to surveys, and increased work with data suppliers (further information on the impact of methodology changes can be seen on page 61 of the DUKES 2024 report[36]). The revisions, as well as the latest year of data, feed through the time series and regression analysis, and particularly impacted the domestic, industry and transport sectors. A change in the demand mix from different fuels, with a higher percentage of demand coming from

[35] For more information see: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794741/energy-emissions-projections-methodology-overview.pdf

[36] For information on the DUKES revisions see: https://assets.publishing.service.gov.uk/media/66a7e14da3c2a28abb50d922/DUKES_2024_Chapters_1-7.pdf

renewable sources, also led to a decrease in emissions. Overall, the July 2024 DUKES data resulted in lower emissions for the fourth carbon budget period of 30 $MtCO_2e$, 26 $MtCO_2e$ in the fifth carbon budget period, and 31 $MtCO_2e$ in the sixth carbon budget period.

6 Lists of supporting material

6.1 Annexes

As in the previous edition we have published the demand annexes (Annex E and F) with versions in both ktoe/Mtoe and TWh. For the next publication, we plan to move to publishing only one version (probably the TWh version), but please let us know at the following email address if you have a strong preference for the older versions: emissionsprojections@energysecurity.gov.uk.

Annex A: NZS Categories: Greenhouse gas emissions by source

Annex A: TES Categories: Greenhouse gas emissions by source

Annex B: Carbon dioxide emissions by source

Annex C: CO_2: Carbon dioxide emissions by IPCC category

Annex C: Non-CO_2: Non-CO_2 greenhouse gas emissions by IPCC category

NEW: Annex C: Carbon dioxide emissions by CRT category (Common Reporting Tables)

NEW: Annex C: Non carbon dioxide emissions by CRT category (Common Reporting Tables)

Annex D: Policy savings in the projections

Annex E: Primary energy demand (versions in both Mtoe and TWh)

Annex F: Final energy demand (versions in both ktoe and TWh)

Annex G: Major power producers' generation by source

Annex H: Major power producers' cumulative new electricity generating capacity

Annex I: Major power producers' total electricity generating capacity

Annex J: Total electricity generation by source

Annex K: Total cumulative new electricity generating capacity

Annex L: Total electricity generating capacity

Annex M: Growth assumptions and prices

Annex N: Non-CO_2 GHG emissions projections report

Our annexes contain projections for the following scenarios, most of which we publish each year:

Scenario	Description
Reference Scenario	Based on central estimates of economic growth and fossil fuel prices. Contains policies that have already been implemented and those planned policies ("EEP-ready" policies). See annex D on policy savings for definitions of each policy implementation status.
Low Prices	Similar assumptions to reference scenario but with lower projected fossil fuel prices.
High Prices	Similar assumptions to reference scenario but with higher projected fossil fuel prices.
Low Growth	Similar assumptions to reference scenario but with lower projected economic growth.
High Growth	Similar assumptions to reference scenario but with higher projected economic growth.
Existing Policies	UNFCCC With Existing Measures scenario. Contains central price and growth assumptions but without any planned policies included.

Until EEP 2021-2040 we included a scenario called 'Pre-LCTP baseline'. Due to challenges in modelling the power sector under this scenario and feedback from users that a no policy scenario would better meet their needs we have discontinued this scenario. Instead, we aim in the next couple of years to produce a scenario called 'without policies' which will exclude all demand-side policies, and which would ideally be included in future as part of the UK's international reporting requirements.

6.2 Web tables and figures

We publish web tables and figures alongside this report. These mainly replicate tables and figures in the report text.