

Carbon Dioxide

GHG Inventory summary Factsheet

Territorial coverage: UK including Crown Dependencies and Overseas Territories

Total emissions: Quoted with respect to emissions including net LULUCF

Sector Definition: National Communication

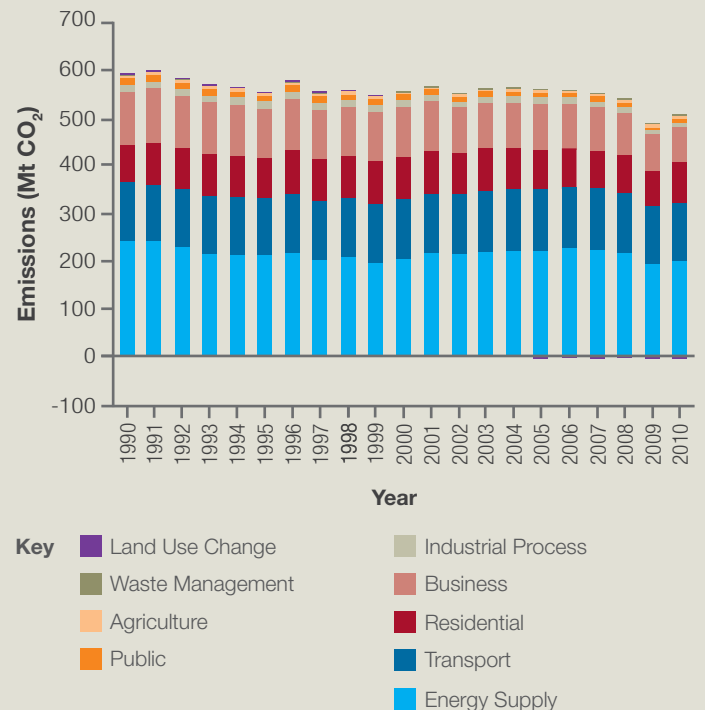
GHG summary - historic emissions

- Carbon dioxide emissions have decreased by 15.9% from 1990 to 2010 and are currently 497.9 MtCO₂ (84.4% of UK total GHGs).
- The main sources of carbon dioxide emissions in 2010 are fuel combustion for electricity and heat production (31.6%), road transport (22.4%) and to a lesser extent residential fuel combustion (17.0%) and manufacturing and construction (13.3%).
- Carbon dioxide emissions from electricity production reduced by 22.9% over the period and contributed to nearly half (49.8%) of the total net change in carbon dioxide.
- Road transport and residential fuel combustion emissions have increased over the period by 2.7% and 9.2% respectively.
- Manufacturing and construction industry carbon dioxide emissions decreased by 34.5% from 1990 to 2010, which equated to 37.2% of the total net reduction in carbon dioxide.

Sources of emissions and data sets

- The predominant source of emissions is fuel combustion with the main uses being to generate electricity and use in the transport sector, manufacturing industries and residential sector.
- The Digest of UK Energy Statistics (DUKES) and EU Emissions Trading System (EU ETS) are key datasets for stationary combustion sources, together with information from trade associations such as Tata Steel and the Mineral Products Association.
- For transport key data sources include DUKES, UK Department for Transport publication Transport Statistics Great Britain, Association of Train Operating Companies (ATOC), fuel consumption data from the Ministry of Defence and Civil Aviation Authority movement data.
- Most emission factors for carbon dioxide are UK specific, based on data supplied by organisations such as the UK Petroleum Industries Association.

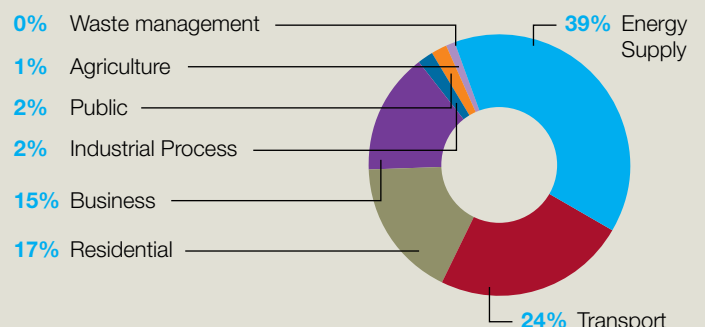
Total Net Carbon Dioxide Emissions, 1990 - 2010



Source: UK GHG Inventory (UNFCCC coverage) (AEA, 2012)

Note: Categories used are based on source emissions not end-user. Excludes the impact of traded allowances.

Total Emissions by Sector (2010, Excluding LULUCF)



Methodology

- For large combustion sources, emissions are estimated by combining activity data (from DUKES) with emission factors that are taken from a variety of sources including the EU-ETS, data provided by industry groups and literature based sources. For some plant site specific data are available.
- Carbon dioxide emissions from transport are estimated from fuel consumed and the carbon content of fuels, with movement and journey characteristics taken into account where applicable.
- Residential fuel combustion emissions are estimated by multiplying the fuel use estimates in DUKES by an emission factor. Emission factors are either UK specific or are taken from published inventory guidelines (IPCC and UNECE).
- Emissions from Land Use, Land Use Change and Forestry are modelled according to IPCC Good Practice Guidance for LULUCF.

Uncertainties

- The GHG Inventory quantifies uncertainties on emission factors and activity data, which in turn allow for the production of uncertainty estimates on the: emissions; overall uncertainty by gas; and indicative-only estimates of sector level uncertainties.

- Uncertainty in UK carbon dioxide emissions in 2010 is 2%. Total emissions of carbon dioxide are dominated by fuel combustion. Carbon dioxide emissions from fuel combustion are relatively certain, since the ca-ba content of fuel is well known, and the energy statistics are of good quality.
- The central estimate of total carbon dioxide emissions in 2010 was estimated as 497.9 MtCO₂ with Monte Carlo uncertainty analysis suggested that 95% of the values were between 490.2-505.5 MtCO₂.
- Uncertainty in the trend: 95% probability that carbon dioxide emissions in 2010 were between 14% and 18% below the level in 1990.

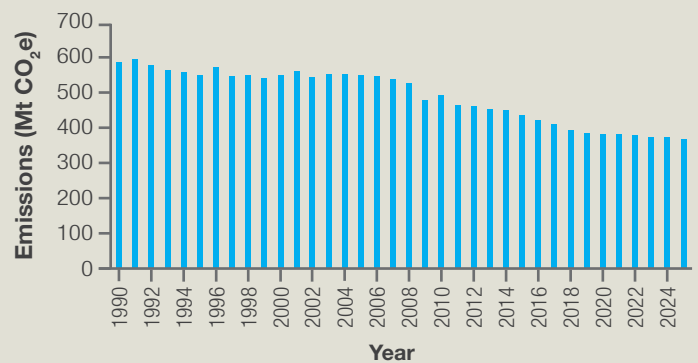
Improvements

- Work is ongoing to better understand the differences between DUKES and EU ETS data, and to reconcile any discrepancies.
- The 2012 inventory included improvements to road transport to take account of information about the fleet mix from Automatic Number Plate Recognition (ANPR) data.

Projections

- Projected emissions of carbon dioxide are expected to decrease by 25% from 2010 levels by 2025.
- Emissions continue to be dominated by fuel combustion for electricity and heat production and road transport.
- The overall decrease in carbon dioxide emissions between 1990 and 2025 is estimated to be 37%.
- The projections presented here exclude the impact of emissions trading.
- The projections are taken from Updated Energy and Emissions Projections: October 2011 (DECC); historic data taken from the 2012 inventory.

Historic and Projected Emissions of Carbon Dioxide



Source: Updated Energy and Emissions Projections: October 2011 (DECC).

Links

- NAEI website: <http://naei.defra.gov.uk/>
- DECC GHG statistics: http://www.decc.gov.uk/en/content/cms/statistics/climate_stats/gg_emissions/gg_emissions.aspx
- DECC projections: http://www.decc.gov.uk/en/content/cms/about/ec_social_res/analytic_projs/en_emis_projs/en_emis_projs.aspx