The United Kingdom (UK) was responsible for 0.9% of global greenhouse gas emissions in 2019. UK per capita emissions of 6.6 tonnes CO₂ equivalent were below EU levels and just above the global average.
Trends in UK emissions

The UK emitted 440 million tonnes (Mt) carbon dioxide equivalent (CO₂e) in 2019, a 0.9 % share of global greenhouse gas (GHG) emissions. The UK’s GHG emissions stood at 755 Mt CO₂e in 1991, and have fallen steadily as the country shifted to cleaner energy sources and a service economy. Between 2005 and 2019, when the UK was still an EU Member State, the country’s GHG emissions fell by 35 %, much faster than the EU average. Land use, land-use change and forestry (LULUCF) has been a modest but constant carbon sink, absorbing around 11 Mt CO₂ per year since 2016 (2.5 % of the UK’s 2019 GHG emissions), bringing the UK’s net emissions to 429 Mt CO₂e in 2019.

Figure 1 – Total, LULUCF and net greenhouse gas (GHG) emissions (MtCO₂e)

Data source: Climate Watch (CAIT): Country Greenhouse Gas Emissions Data, FAOSTAT. Note: emissions data from the Climatewatch/CAIT dataset may differ from countries’ official greenhouse gas inventories.

The UK is party to the United Nations Framework Convention on Climate Change (UNFCCC). It belongs to the Annex I group of developed countries and has signed the Paris Agreement. Annex I countries have stricter requirements and are expected to support developing countries. Nationally determined contributions (NDC) set out parties’ targets and commitments to climate action (see page 4). NDCs must be updated every 5 years according to the Paris Agreement rulebook.

Carbon intensity

With 138 grams CO₂e per US$, the carbon intensity of the UK economy in 2019, relative to gross domestic product (GDP), was among the lowest of EU Member States and far below the world average. It dropped by 47 % between 2005 and 2019, driven by changes in the country’s economic structure, improved energy efficiency and the phase-out of coal.

Service industries, which include finance, retail, hospitality, professional services and business administration, grew faster than the overall UK economy and accounted for 80 % of the UK’s total economic output in 2021. By contrast, manufacturing industries contributed only 10 % and the construction sector 6 %.

Figure 2 – Carbon intensity of the economy: GHG emissions (gCO₂e) per unit of gross domestic product (GDP) (US$ in 2015 prices)

Emissions across the economy

Transport was the sector with the highest GHG emissions in 2019. Like in the EU, transport emissions have remained stable over the years, while other sectors achieved substantial emission reductions. Electricity and heat, the top-emitting sector in 2005, reduced its GHG emissions by 59% between 2005 and 2019, and accounted for 23% of the UK’s emissions in 2019. Manufacturing, construction and industrial processes accounted for a combined share of 11% of the UK’s GHG emission, roughly the same as the agriculture sector. The UK participated in the EU emissions trading system (EU ETS), which applied to electricity generation and industrial installations until 2020, and established its own UK Emissions Trading Scheme (UK ETS) on 1 January 2021. The UK heat and buildings strategy addresses a sector that accounted for 20% of the UK’s GHG emissions in 2019. The strategy takes a systemic approach to minimising the cost of decarbonising the sector by improving buildings’ energy efficiency, reducing the cost of heat pumps, and promoting innovation.

Figure 3 – Total GHG emissions by sector (MtCO₂e) (rounded data)


Energy transition

The UK’s primary energy consumption fell by more than a quarter between 2005 and 2021. Coal experienced the largest reduction, due to coal-to-gas switching, driven by a carbon price floor for electricity generation and a commitment to phase out coal-fired power plants by 2025. The UK’s biggest coal power plant was largely converted to biomass, and aims to deliver negative emissions through bioenergy with carbon capture and storage (BECCS) technology.

The UK was a major oil and gas exporting country, thanks to the North Sea fields, but production peaked around the turn of the century, and since 2004, the country has been a net energy importer.

In 2021, the UK reached a 17% share of renewable energy sources (RES) in primary consumption. The largest growth rates were achieved in wind, solar and biomass. The UK aims to achieve a fully decarbonised electricity system by 2035. Offshore wind power plays a key role, with 10 gigawatts (GW) installed capacity 2021 and an additional 16 GW in planning. The April 2022 British energy security strategy aims for 50 GW of offshore wind capacity by 2030, including 5 GW of wind farms that use floating technology.

Figure 4 – Primary energy consumption by energy source (exajoules, 2005 and 2021)

UK climate policies

The 2008 Climate Change Act, which was the first law of its kind in the world, formed the policy base for cutting emissions and preparing for the impact of climate change. It set a long-term goal to reach net zero emissions by 2050, and obliged government to achieve interim 5-year carbon budgets. The UK's 6th carbon budget requires a 78% reduction by 2035. In 2021, the UK hosted the COP26 climate change conference in Glasgow, the outcome of which keeps a global warming limit of 1.5°C still feasible. It also vouched to give its full support to Egypt in delivering ambitious outcomes at COP27.

In its NDC, updated in September 2022, the UK commits to reducing economy-wide GHG emissions by at least 68% by 2030, using a mix of sectoral as well as cross-cutting actions. It will implement a range of targeted strategies, such as reforming the energy system and decarbonising industry, transport, and housing and heating. In April 2018, the UK submitted to the UNFCCC its first long-term strategy, the clean growth strategy, followed in October 2021 by the UK net zero strategy with decarbonisation pathways to net zero emissions by 2050. In July 2022, the English High Court ruled that the net zero strategy fails to comply with the obligations of the Climate Change Act because it lacks detail on emissions savings for individual measures.

The Climate Action Tracker rates UK climate policy as 'almost sufficient', praising some elements, such as the domestic emissions reduction targets, to be world-leading, while deeming its contributions to global climate finance inadequate. The Climate Change Performance Index ranked the UK seventh in the world, with high ratings in GHG emissions, energy use, and climate policy. At the same time, it underlined the country's lack of energy efficiency policy and high environmental footprint in the heating sector. The UK government launched a review of net zero policies to ensure the delivery of 'pro-growth and pro-business' goals; this may cause delays and has alarmed environmentalists, given its support for fracking and increasing North Sea oil and gas production.

MAIN REFERENCES


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