Department for Energy Security & Net Zero

UK local authority greenhouse gas emissions estimates 2022

27 June 2024 **Accredited Official Statistics**

This publication presents the latest estimates of greenhouse gas emissions for local authority and National Park areas in the UK for 2005-2022, and for the first time this year also includes emissions estimates for National Landscapes and Areas of Outstanding Natural Beauty (AONBs). Emissions are reported against the areas where they occurred except for energy supply emissions that are distributed to sectors and locations based on where the "end-use" of the energy occurred and emissions from waste that have been distributed based on the waste arising in each area.

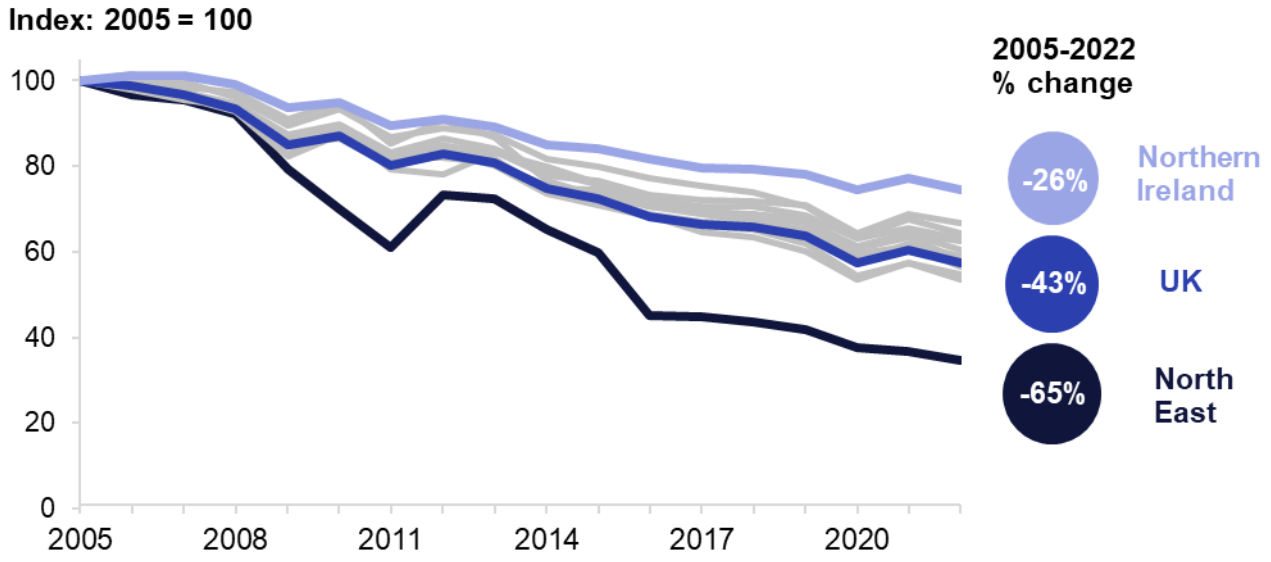
The main findings from the statistics are:

- Between 2021 and 2022, greenhouse gas emissions decreased in 346 out of the 361 local authorities in the UK (96%). This is consistent with the decrease in overall UK emissions in 2022, which decreased by 5% largely due to a reduction in fuel use to heat buildings.

- Overall in 2022, 31% of greenhouse gas emissions assigned to local authority areas were attributed to transport, 22% to the domestic sector, 16% to industry, 13% to agriculture and 9% to the commercial sector. There are wide local variations, mainly because of the economy and geography of different local areas. The transport sector had the highest share of greenhouse gas emissions in 55% of authorities, the domestic sector had the highest share in 21%, the agriculture sector in 14% and the industrial sector in 7% of authorities.

- Between 2005 and 2022 greenhouse gas emissions fell by 26% in Northern Ireland, 40% in Wales, 43% in England and by 38% in Scotland. The North East of England was the region with the largest fall in emissions over this period at 65%, in part due to industrial closures.

Figure 1: Greenhouse gas emissions by region



Responsible statistician: Christopher Waite **Email: GreenhouseGas.Statistics@energysecurity.gov.uk**
Media enquiries: 020 7215 1000 **Public enquiries: 020 7215 8285** **Next publication: June 2025**

Contents

Introduction

This Accredited Official Statistics publication provides the latest estimates of territorial greenhouse gas emissions for local authority, National Park, National Landscape and AONB areas for 2005-2022. This is the first time we have published estimates of emissions in National Landscapes and AONBs. This report explains the background to the estimates, summarises the key results, and discusses some of the issues which need to be considered when using the data. Full details of the results and methodology are available in the accompanying tables and the Technical Report, which can be found at the link below: https://www.gov.uk/government/collections/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics

These statistics cover emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) within the UK's borders. Emissions of fluorinated gases are not available at a local authority level so are excluded from these statistics. In our latest UK territorial greenhouse gas emission statistics they accounted for around 2% of greenhouse gas emissions in the UK in 2022. Note that a significant proportion of landfill methane emissions in England in 2005-2009 could not be allocated to local authorities so the landfill emissions estimates shown will be underestimates for some areas in the early part of the time series.

In accordance with international reporting and carbon trading protocols, emissions from each of the gases is weighted by its global warming potential (GWP)[1], so that total greenhouse gas emissions can be reported on a consistent basis. The GWP for each gas is defined as its warming influence relation to that of carbon dioxide over a 100-year period. Greenhouse gas emissions are then presented in carbon dioxide equivalent units (CO_2e).

Emissions have been assigned to all 361 local authorities in the UK: 296 of these are in England, 32 in Scotland, 22 in Wales and 11 in Northern Ireland[2]. Estimates are also shown for the 15 National Park areas within Great Britain, the 38 National Landscapes in England and Wales (which were known as AONBs until 2023) and the 8 AONBs in Northern Ireland.

In the statistics most emissions are allocated to sectors and locations based on the point where the emission occurred, other than for emissions related to energy supply and waste. Energy supply emissions, e.g. from power stations and refineries, are allocated on an "end-user" basis where emissions are distributed to sectors and locations based on where the "end-use" of the energy occurred. Emissions from waste have been spatially distributed using an approach analogous to the fuel end-user basis, distributing UK total emissions from waste proportionally to the waste arising in each local authority, rather than to the location of waste management facilities. For example, emissions from landfills are distributed based on estimates of biogenic waste arising in each local authority.

Except for the energy industry, emissions from the production of goods are assigned to where the production takes place. Therefore, emissions from the production of goods which are exported will be included, and emissions from the production of goods which are imported are excluded.

[1] The global warming potentials (GWPs) used are from Working Group 1 of the IPCC Fifth Assessment Report: Climate Change 2013 and shown in table 6.4 in our Final UK greenhouse gas emissions statistics, 1990 to 2022: https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2022

[2] The local authorities shown in this publication are based on administrative boundaries as of 1 April 2023.

The UK compiles an annual inventory of its greenhouse gas emissions to monitor progress against its domestic and international targets. Disaggregated versions of the UK inventory are also produced for England, Scotland, Wales and Northern Ireland, along with maps estimating the geographical distribution of the sources of emissions. This publication combines data from the UK's greenhouse gas inventory with data from a number of other sources, including local energy consumption statistics, to produce a nationally consistent set of greenhouse gas emissions estimates at local authority level.

The statistics are largely consistent with the UK national greenhouse gas inventory and with the Devolved Administration (DA) greenhouse gas inventories, but there are some minor methodological differences which are explained later in this publication. If you are looking for emissions figures at UK or DA level, you should use the UK[3] or DA[4] inventories rather than this publication.

These statistics cover the period from 2005 to 2022. A consistent time series has been produced by re-calculating the 2005 to 2021 estimates to reflect the methodological changes used in calculating the 2022 estimates. This is important as it allows changes to be monitored over time.

Full details of the results and methodology are available in the supplementary reports and files published alongside this statistical release.

Use of the estimates

The purpose of these estimates is to assist those wishing to understand the sources and assess changes in emissions from local areas. Local authorities are not mandated to have greenhouse gas emissions reductions targets, but some local authorities do have such targets. These statistics allow local authorities to track their greenhouse gas emissions trends over time, and measure progress against any targets they have. While local authorities are the main users of the statistics, other users include non-profit organisations, the Devolved Administrations, government departments, and academia.

It is important to be aware that circumstances vary greatly between authorities, and that local authorities have relatively little influence over some types of emissions. For all these reasons, these statistics should be interpreted with caution. However, used with care they can provide help in setting priorities. In particular, the dataset is sufficiently robust to set a baseline against which action on climate change can be monitored at a local level.

It should be noted that the results for regional level, which are also available from the dataset, are much more robust. Most of the difficulties in allocating data to local authorities have little impact at regional level. Problems of interpretation, such as economic activity or transport taking place across boundaries, still exist but are less acute at the regional level than at the local level.

There are some important limitations that users of these estimates should be aware of. These include:

[3] Final UK greenhouse gas emissions statistics, 1990-2022: https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2022
[4] Devolved Administration Greenhouse Gas Inventories: https://naei.beis.gov.uk/reports/reports?section_id=4

- Unallocated electricity and landfill emissions, where electricity sales and waste sent to landfill within the sub-national dataset cannot be successfully allocated to specific local authorities due to lack of information.
- A significant proportion of landfill methane emissions in England in 2005-2009 could not be allocated to local authorities so the landfill emissions estimates shown will be underestimates for some areas in the early part of the time series.
- Road transport emission estimates rely on national road traffic estimates, and distribution of traffic on minor roads has had to be imputed at local level from regional level data.
- The local distribution of emissions from smaller emission sources largely has to be estimated from proxy information such as population or employment data.
- Some of the key sources used for mapping emissions do not cover the whole of the UK, and therefore alternative methods have had to be used for authorities in Northern Ireland.

Further details on data quality and the methods used are available in the supplementary reports published alongside this statistical release.

2022 emissions

Estimates of greenhouse gas emissions have been produced for each local authority, National Park, National Landscape and AONB in the UK from the following broad source categories:

- Industry (including electricity-related emissions)
- Commercial (including electricity-related emissions)
- Public sector (including electricity-related emissions)
- Domestic (including electricity-related emissions)
- Transport
- Land use, land use change and forestry (LULUCF) (including removals of carbon dioxide from the atmosphere, so that net emissions from this sector can sometimes be negative)
- Agriculture (including electricity-related emissions)
- Waste (distributed based on the waste arising in each local authority)

The level of sectoral detail available is constrained by the data available for local electricity and gas use. To estimate a more detailed breakdown would involve further general assumptions about energy use for different sectors, since local data is not available. However, further details - mostly in terms of fuel types - are shown in the Technical Report in order to provide additional insight into how the estimates are constructed.

We have this year made some adjustments to the source categories presented in these statistics to align them where possible with the new Territorial Emissions Statistics (TES) sectors introduced in the UK territorial greenhouse gas emissions statistics. This has led to a small change in the coverage of the sectors presented in these statistics, as the *Waste* sector in this year's statistics includes all of the emissions that were in the *Waste management* sector last year, in addition to emissions from accidental fires and household composting than were previously in the *Industry* and *Domestic* sectors. And while the *LULUCF* and *Agriculture* sectors have not changed in their overall coverage, a different breakdown is shown within the LULUCF sector in line with the new subsectors shown in the UK statistics, and the coverage of the *Agriculture* subsectors has been revised.

See the Final UK Greenhouse Gas Emissions Statistics 1990 to 2022 statistical release for more details about the sector changes.

2022 emissions by region

The overall decrease since 2022 in greenhouse gas emissions allocated to local authorities in the UK was 5.1%, largely as a result of warmer temperatures in 2022 resulting in less energy being used to heat buildings, and it may have also been affected by higher energy prices, particularly towards the end of the year. This was despite an increase in emissions from transport as the UK continued to recover from the coronavirus (COVID-19) pandemic.

Figure 2 shows a comparison of greenhouse gas emissions by region for 2021 and 2022. All regions saw a decrease in emissions between 2021 and 2022. The largest overall decrease was in Yorkshire and the Humber (down 8.4%), largely due to reductions in industrial and domestic emissions.

Figure 2: Greenhouse gas emissions by region, 2021 and 2022

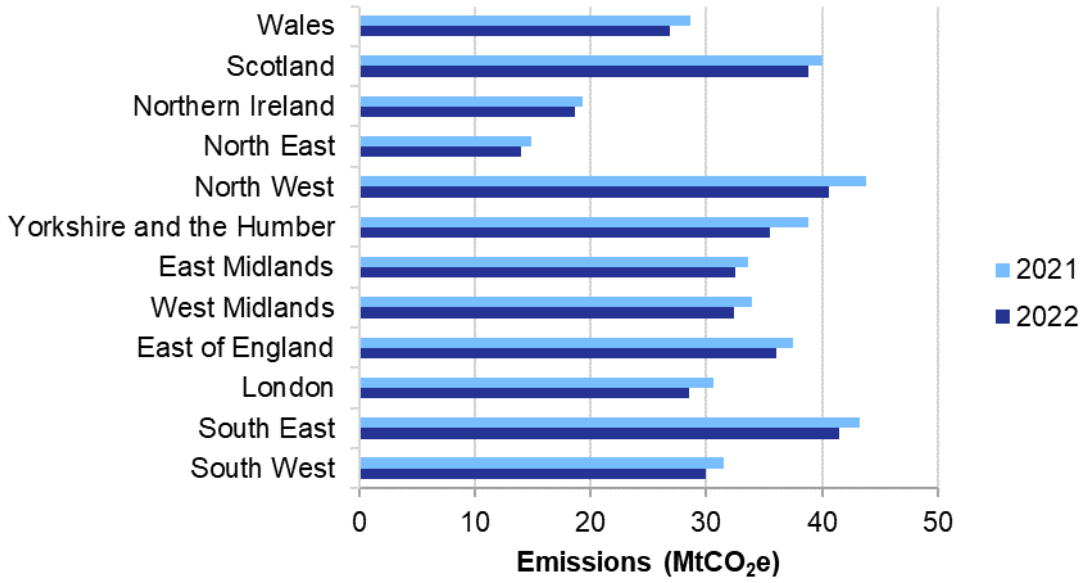


Figure 3 shows a summary of the greenhouse gas emissions allocated to local authorities by region and sector. Results for individual local authorities can be found in the spreadsheet published alongside this statistics release. There is a great deal of variation between local authorities. In particular a significant amount of industrial emissions are concentrated in a few areas, so the contribution of industrial and commercial emissions for specific local authorities may be different from the regional averages.

Figure 3: Greenhouse gas emissions by region and sector, 2022

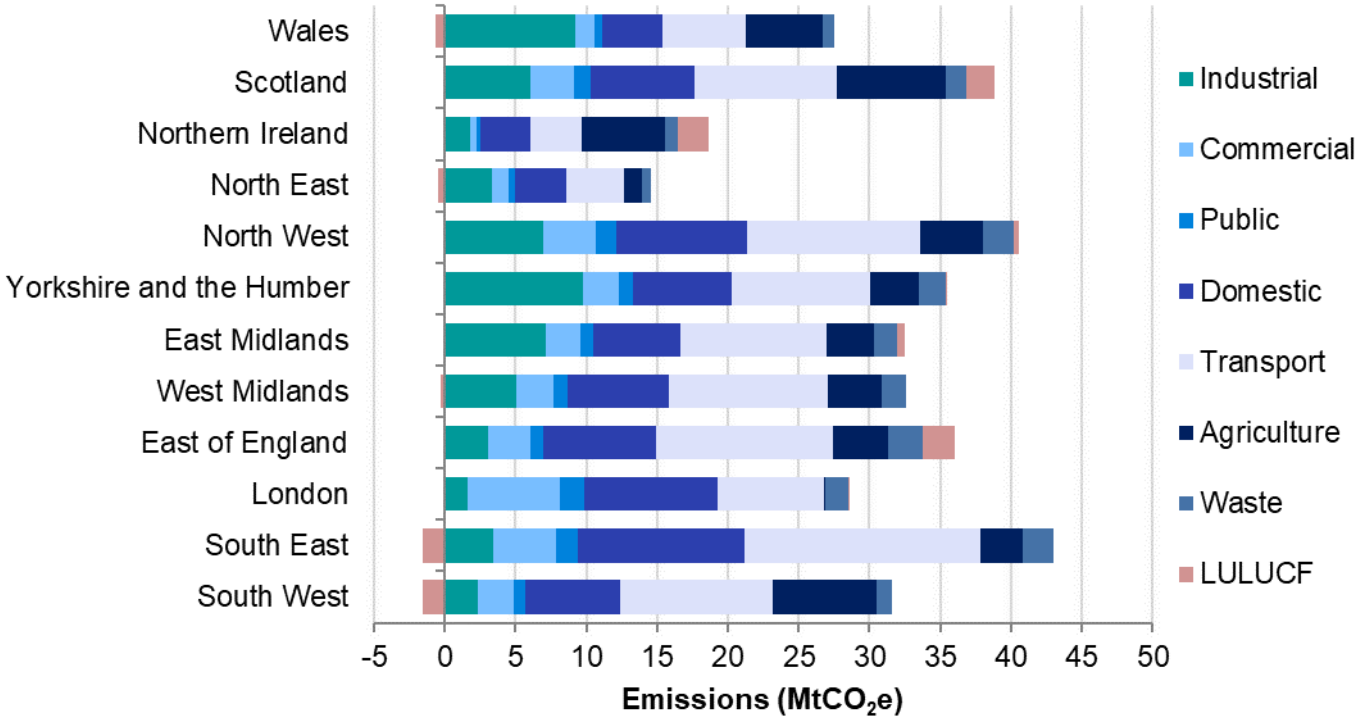


Figure 4 shows annual greenhouse gas emissions per capita to make some allowance for the different sizes of regions. However, it should be noted that while greenhouse gas emissions per capita may be a useful measure for domestic emissions, emissions from other sources are driven by many factors other than resident population. Therefore, industrial, commercial, public and transport emissions per capita should be interpreted with caution.

Emissions per capita allow comparison between areas of different population size. There was an overall decrease in greenhouse gas emissions per capita in the UK of 5.9% in 2022. Northern Ireland, Wales, and Scotland have the highest annual emissions per capita. Northern Ireland in particular has notably higher emissions per capita from the agriculture and LULUCF sectors than the UK average, while Wales has considerably higher industrial emissions per capita than any other region of the UK.

London has the lowest per capita emissions, as the urban nature of the transport system and the high population density results in lower emissions than the UK average when total emissions, including non-domestic emissions, are spread across residents. Additionally, in London there are a greater proportion of residential areas which means that large industrial facilities are unlikely to be located there, which contributes to the low per capita emissions.

Figure 4: Annual per capita greenhouse gas emissions by region and sector, 2022

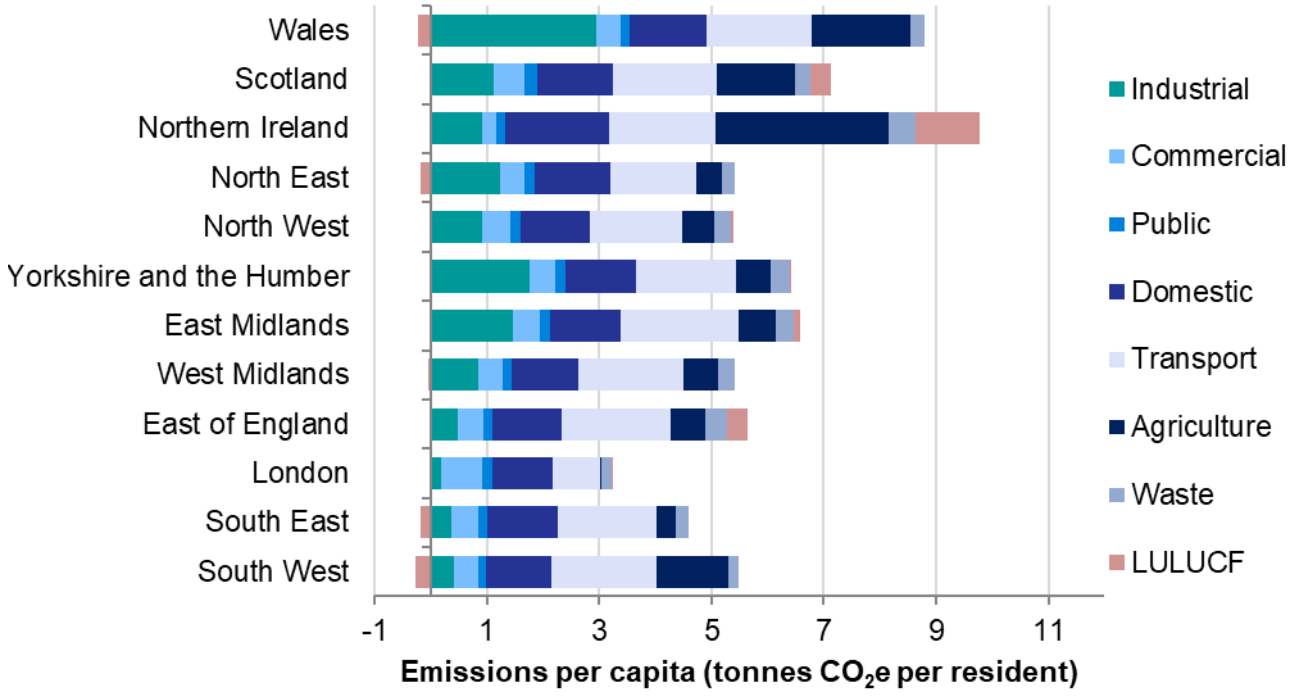
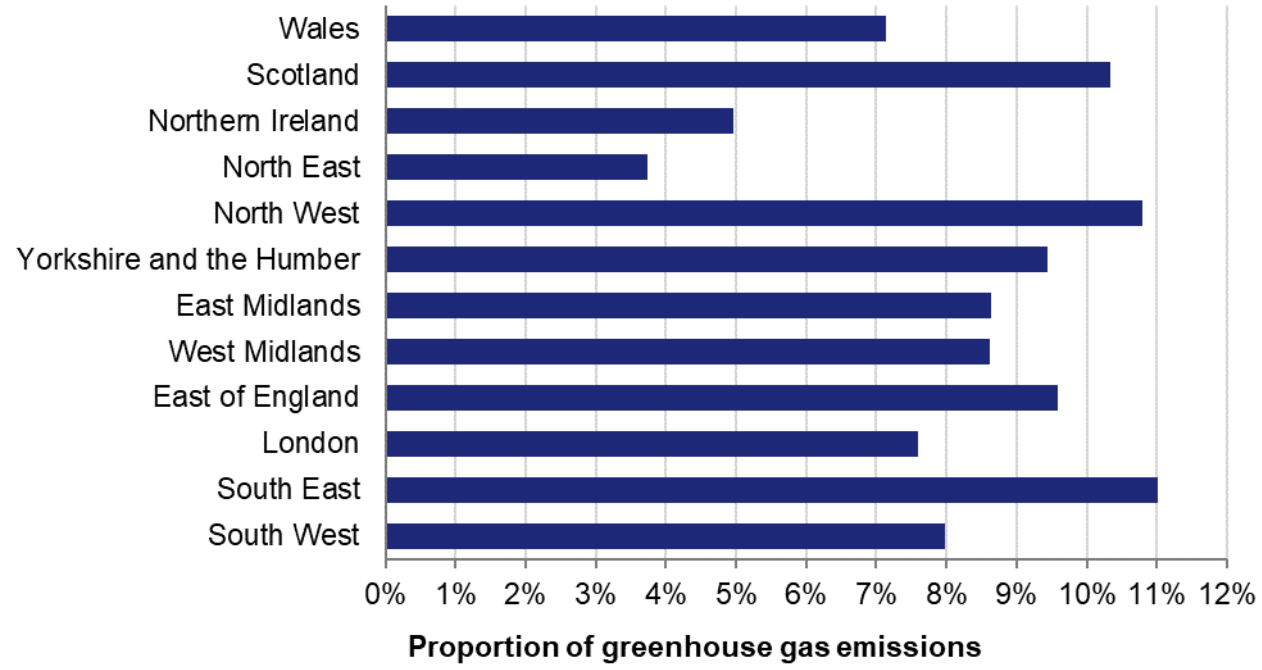


Figure 5 shows how total emissions are split across the various regions. The highest emission totals are in the South East and North West of England, each accounting for around 11% of emissions in the UK, while the smallest emission totals are in the North East (4% of the UK total) and in Northern Ireland (5%).

Figure 5: Proportion of UK greenhouse gas emissions in each region: 2022



Note: Unallocated emissions are not shown in this figure.

2022 emissions by local authority

As the map in Figure 7 on the next page shows, annual emissions per capita can vary noticeably between regions in the UK. When looked at on this basis, the local authority areas with the highest emissions per capita are a mixture of those with large industrial sites and those with relatively low populations compared to the size of the area or the activities that take place there that produce emissions. The latter group are often in more rural areas, although the local authority with the highest greenhouse gas emissions per capita in 2022 was the City of London, with 55.2 tCO_2e per person, which has a very high level of commercial activity compared to its resident population. The second highest greenhouse gas emissions per capita in 2022 was Neath Port Talbot (44.1 tCO_2e), mainly due to its high level of emissions from industrial installations. Conversely, the areas with the lowest emissions per capita are typically built-up areas with high resident populations, with the lowest level of emissions in 2022 being in Hackney, which had emissions of 2.2 tCO_2e per person.

Emissions can also be looked at relative to the area of each local authority, as shown in Figure 8. On this basis the local authorities with the highest emissions per km^2 of area are a mixture of built-up city areas and those with large industrial sites, while the authorities with the lowest emissions per km^2 are in more rural areas. The City of London is also the local authority with the highest emissions on this basis, with greenhouse gas emissions of 190.1 tCO_2e per km^2, followed by Westminster with emissions of 75.4 tCO_2e per km^2. Whilst the authority with the lowest figure was Argyll and Bute with emissions of less than 0.1 tCO_2e per km^2.

Figure 6 shows for each sector the number of local authorities with different proportions of greenhouse gas emissions coming from that sector (once LULUCF emissions and sinks have been excluded, since these can give a negative net total). The proportion of emissions attributable to each sector differs considerably across the local authorities. In 2022 there were 15 local authorities (4%) where transport accounted for over 50% of emissions, 10 (3%) where industry did, and 10 (3%) where agriculture did.

Figure 6: Sectoral breakdown of emissions: Number of UK local authorities by proportion of greenhouse gas emissions in each sector (excluding LULUCF), 2022

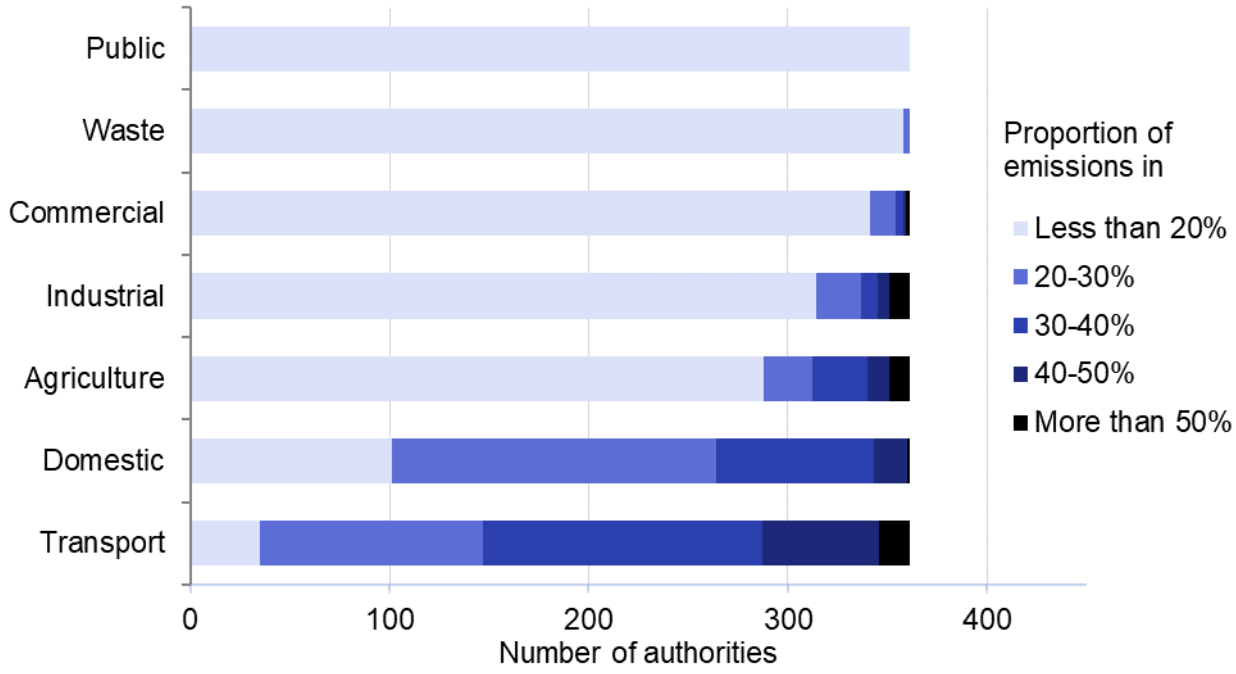


Figure 7: Net emissions of greenhouse gases per capita by local authority (tonnes CO_2e per capita) in 2022

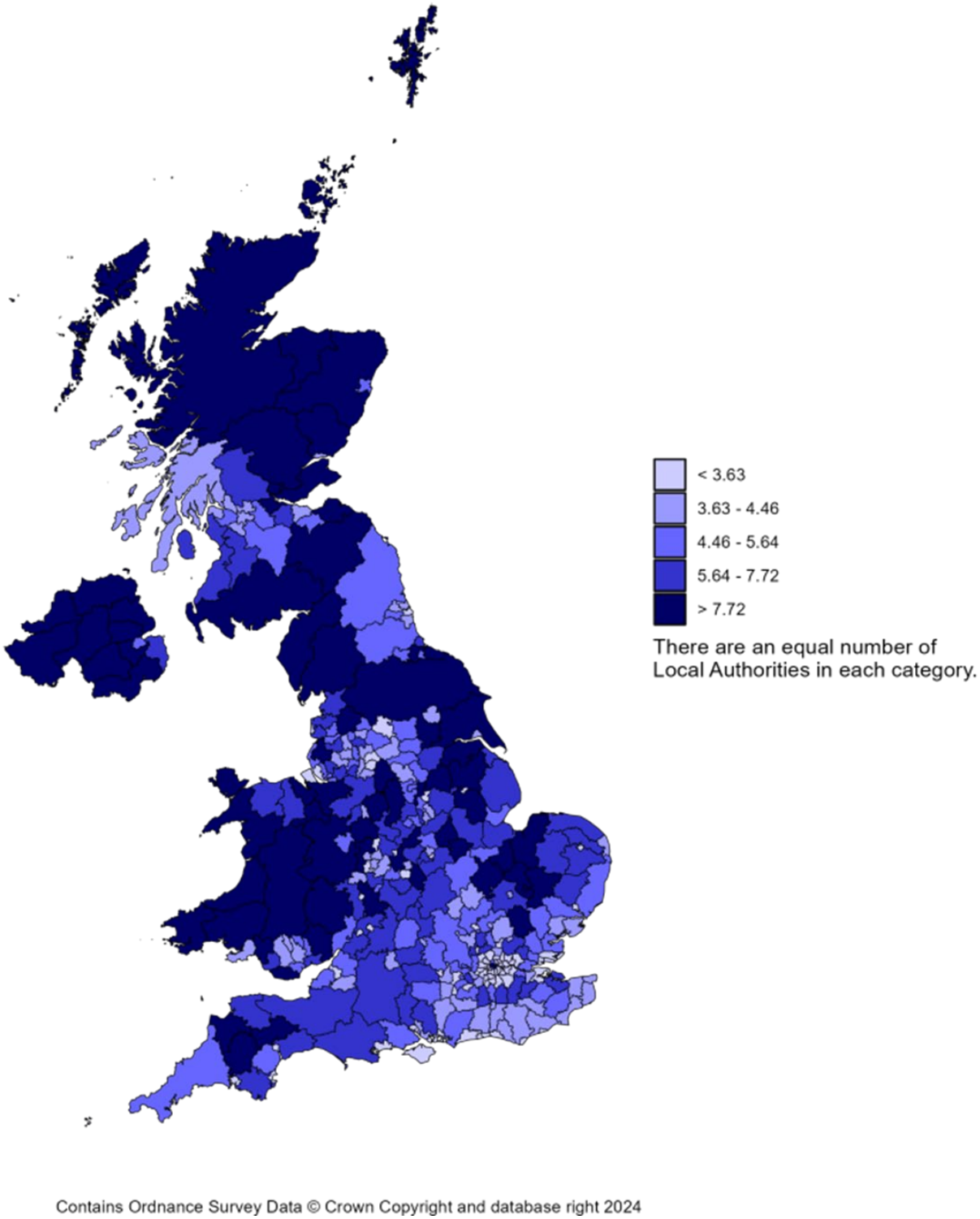
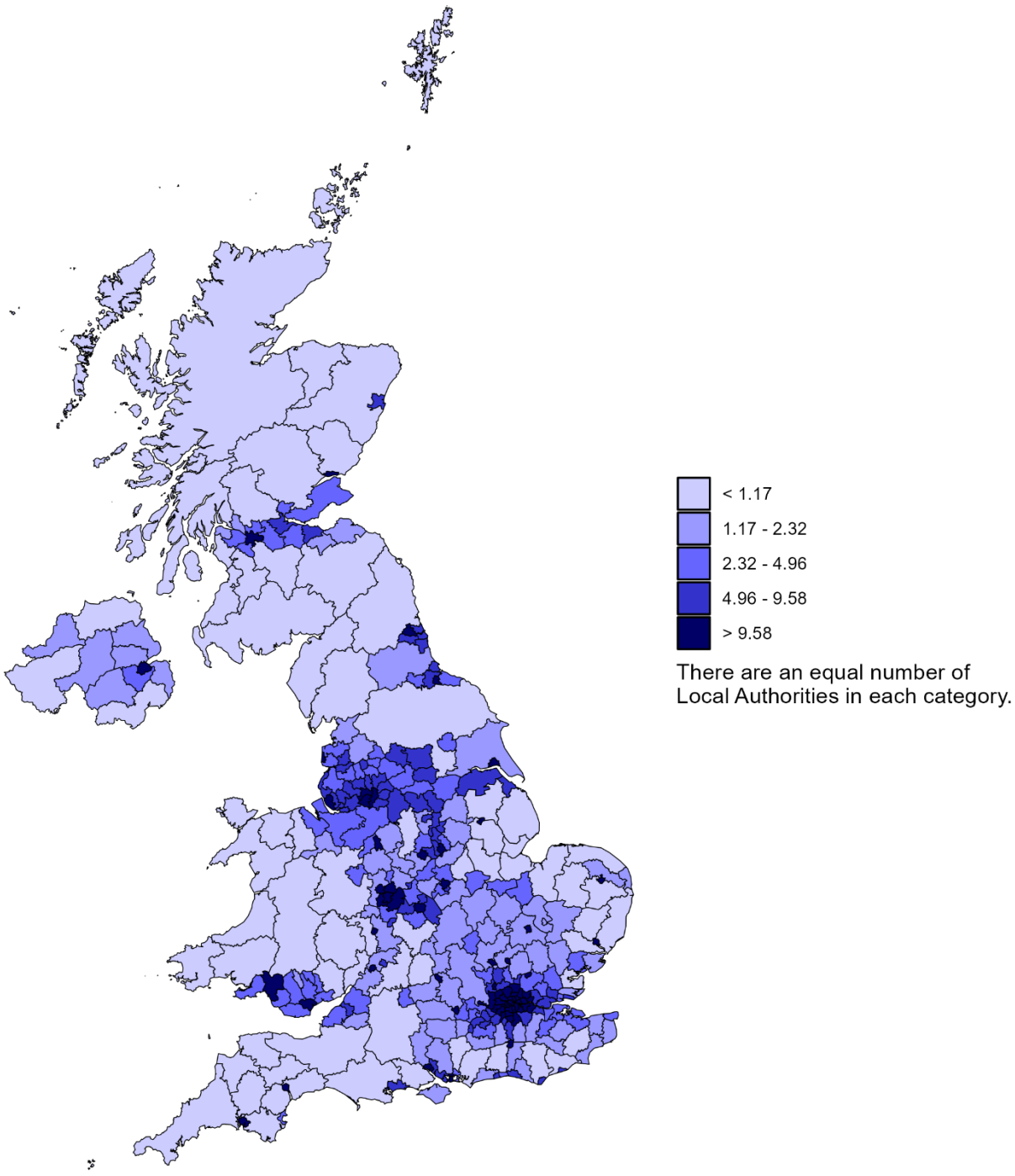


Figure 8: Net emissions of greenhouse gases per km^2 by local authority (tonnes CO_2e per km^2) in 2022



Domestic sector

In 2022, domestic sector greenhouse gas emissions decreased in all 361 local authorities in the UK. The main driver of this decrease is likely to be the warmer temperatures in 2022 compared to 2021[5] resulting in less energy being used to heat homes. Higher energy prices may have also been a factor in reducing demand for fuels, particularly towards the end of the year. In 2022, about 63% of domestic emissions arose from gas use, 24% from electricity and 12% from consumption of other fuels.

Looking at longer term trends, national greenhouse gas emissions from the domestic sector have decreased since 2005 in all local authorities. The local authorities with the largest decreases in domestic sector emissions since 2005 are Isles of Scilly (63%), Shetland Islands (57%) and Argyll and Bute (56%), having each reduced their emissions from domestic electricity by more than two thirds. The larger falls in these areas are also partly because other local authorities have higher levels of domestic gas consumption, from which emissions have generally fallen more slowly than for electricity. Whereas the Isles of Scilly, Shetland Islands, and a high proportion of households in Argyll and Bute are not connected to the gas network.

Emissions per capita for the domestic sector have the least variation between local authorities and are dominated by gas and electricity consumption. DESNZ publishes sub-national metered domestic energy consumption data[6,7] which have been used to estimate emissions for the domestic sector for all local authorities related to gas and electricity consumption. Domestic emissions here represent emissions from energy consumption in and around the home, but not activities by private individuals elsewhere, such as personal travel. Table 1 shows the range of greenhouse gas emissions per capita in this sector across local authorities. There are more local authorities in the lower categories than in 2021, reflecting the overall fall in domestic emissions.

Table 1: Breakdown of UK local authorities by annual greenhouse gas emissions per capita in the domestic sector, 2021-2022

Number of local authorities, percentages

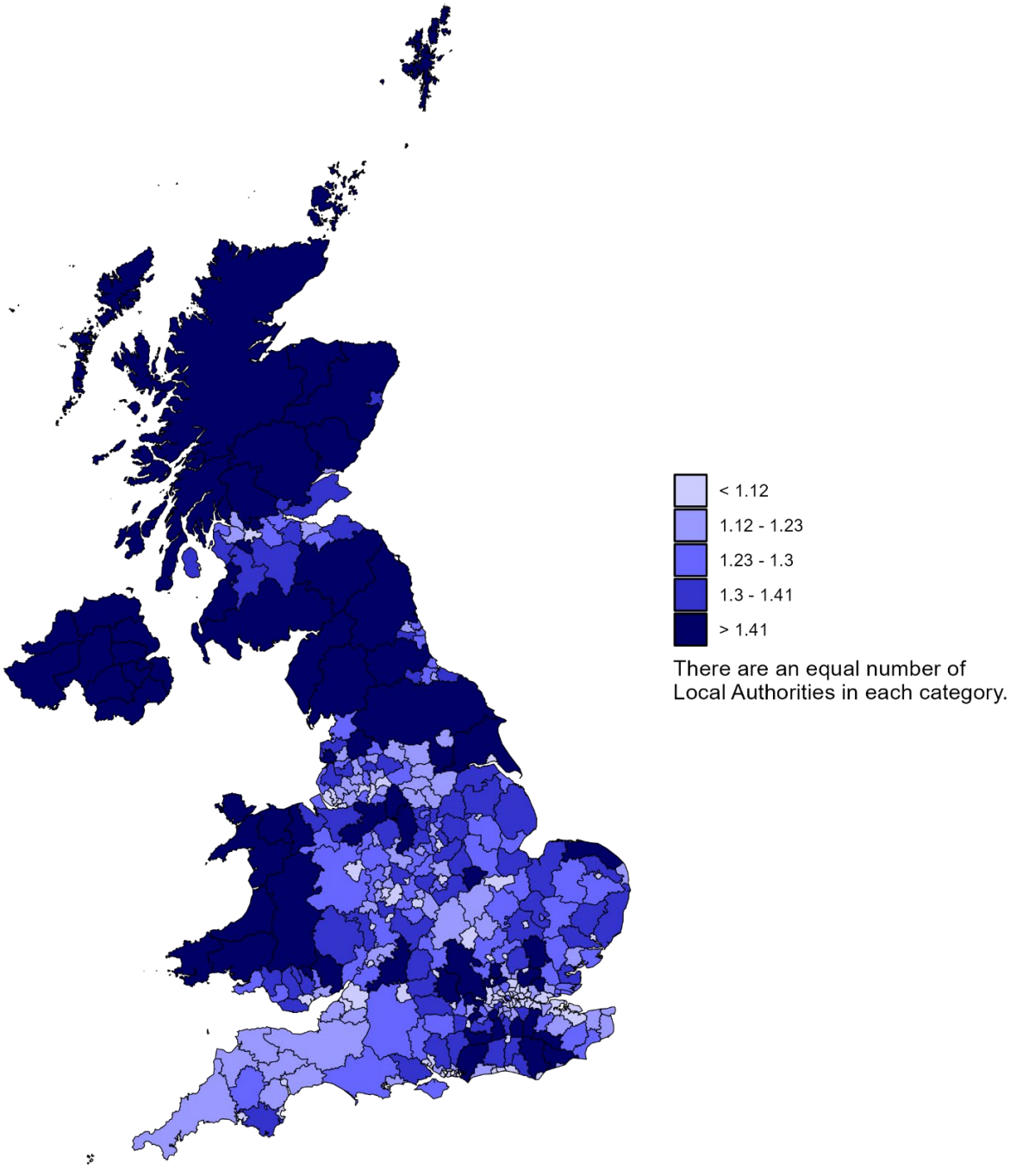
Tonnes of CO_2e per person	No. of LAs 2021	% of LAs 2021	No. of LAs 2022	% of LAs 2022
<1.0	4	1%	19	5%
1.0 to 1.5	195	54%	301	83%
1.5 to 2.0	157	43%	38	11%
2.0 to 2.5	5	1%	3	1%
Total	361	100%	361	100%

For 21% of local authorities (76 of 361) the domestic sector was the greatest contributor to end-use emissions in 2022. This sector can be influenced by the fuel types used, the type and condition of the housing (including its insulation), the average temperature (urban areas can be much warmer and therefore easier to heat than rural areas), average household size, type of household and the income and preferences of the occupiers.

[5] https://www.gov.uk/government/statistics/energy-trends-section-7-weather
[6] https://www.gov.uk/government/collections/total-final-energy-consumption-at-sub-national-level
[7] For gas and electricity consumption estimates are available for local authorities, regions, Lower and Middle Super Output Areas, and at a postcode level.
Gas: https://www.gov.uk/government/collections/sub-national-gas-consumption-data
Electricity: https://www.gov.uk/government/collections/sub-national-electricity-consumption-data

As Figure 9 shows, in 2022, for the domestic sector, emissions per capita were higher in Scotland, Northern Ireland, and Wales than in England. Per capita emissions are high in Northern Ireland predominantly because there is limited availability of natural gas in this area; this results in the combustion of more carbon intensive fuels instead, such as coal, burning oil and gas oil, which are assigned to the domestic 'other fuels' sector. Wales also has a higher proportion of emissions from 'other fuels' than the rest of the UK, though to a lesser extent than Northern Ireland.

Figure 9: Domestic greenhouse gas emissions per capita by local authority (tonnes CO_2e per capita) in 2022



Transport sector

Transport emissions include freight and passenger transport, both for private and business purposes, with the large majority of greenhouse gas emissions in the UK coming from road transport. The estimates are based on the distribution of traffic, therefore some of the emissions within an authority represent through traffic, or part of trips into or out of the area, whether by residents or non-residents. In some authorities this can be particularly significant, and this should be considered when looking at either totals or per capita estimates. The Technical Report shows how the road traffic estimates break down between major and minor roads, to help with consideration of this point. As the estimates are on an end-user basis, the transport emissions include a share of emissions from oil refineries.

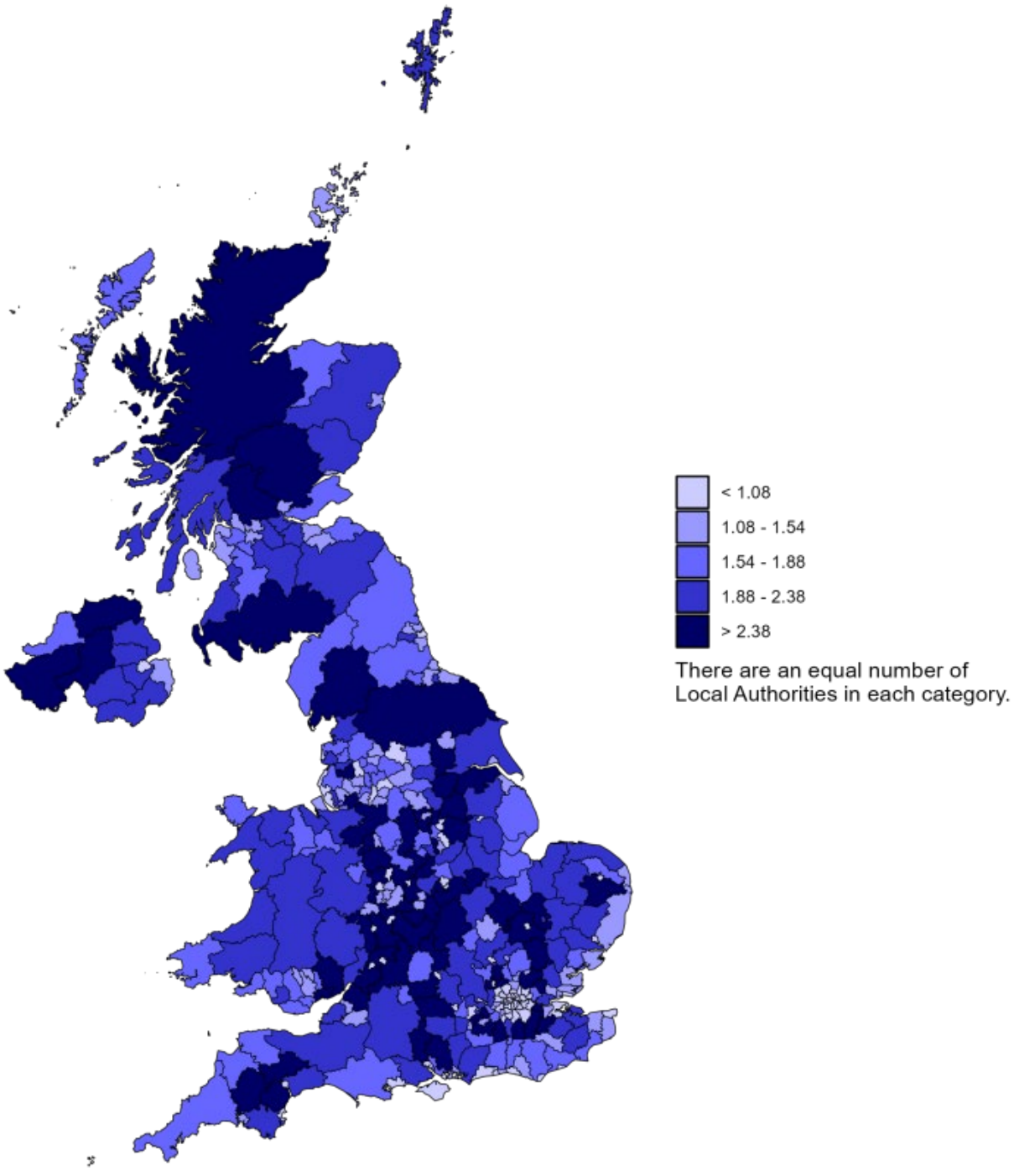
At a national level, transport greenhouse gas emissions saw an increase of 0.6% in 2022 compared to 2021, following the removal of the last COVID-19 restrictions. During 2022, 59% of local authorities (212) saw an increase in transport emissions compared to 2021, although emissions remain lower in 95% (342) of local authorities when compared to 2019, the last year before the pandemic. Transport was the sector with the highest greenhouse gas emissions in 200 local authorities, 55% of the total.

Prior to the large fall in 2020 that resulted from COVID-19 restrictions, national transport emissions had decreased slightly since 2005, even though there had been an increase in both the number of passenger vehicles[8] and the vehicle kilometres travelled[9]. This is due to lower petrol consumption by passenger cars outweighing an increase in diesel consumption, and improvements in fuel efficiency of both petrol and diesel cars[10]. In 2022, 353 out of 361 local authorities had lower greenhouse gas emissions from transport than in 2005, with City of London having the greatest decrease (57%) and the Isles of Scilly having the greatest increase (16%).

Figure 10 shows how greenhouse gas emissions per capita from transport vary around the UK. There are a variety of factors that will affect the level of transport emissions in different areas such as the composition of the vehicle fleet and the level of road traffic for different vehicle types. Areas with higher emissions are more likely to be those with motorways and major roads carrying a lot of through traffic, while the areas with the lowest levels of emissions per capita are typically built-up highly populated areas with a high use of public transport.

[8] https://www.gov.uk/government/statistical-data-sets/tsgb09-vehicles
[9] https://www.gov.uk/government/statistical-data-sets/tsgb01-modal-comparisons
[10] https://www.gov.uk/government/statistical-data-sets/tsgb03

Figure 10: Transport greenhouse gas emissions per capita by local authority (tonnes CO_2e per capita) in 2022



Industrial sector

Industry accounted for 16% of greenhouse gas emissions in the UK in 2022 and in authorities with large industrial sites is a very significant source of emissions. In 2022, 75% of local authorities in the UK (272 out of 361) experienced a decrease in greenhouse gas emissions from the industrial sector. Overall, there was a 7.1% fall in greenhouse gas emissions from industry between 2021 and 2022, largely due to a decrease in emissions from large industrial installations. Looking at longer term trends, 99% of local authorities (359 out of 361) have seen decreases in greenhouse gas emissions from this sector since 2005.

Emissions from fuel use in large industrial installations have been mapped using the National Atmospheric Emissions Inventory database of point sources, which combines data from the UK Emissions Trading Scheme and EU Emissions Trading System with data reported by operators that are held in regulators' pollution inventories. In the data tables accompanying this publication these data are included in the Large Industrial Installations category to ensure that no sensitive fuel consumption data for specific sites is disclosed. This means that in particular the industrial gas category does not include all industrial gas consumption, as some is included in the Large Industrial Installations category.

Emissions per capita in the industrial sector are higher in Wales than in the other countries of the UK. Emissions from this sector are heavily dependent on whether there are large industrial sites situated in an area, and some of the lowest industrial emissions per capita are in authorities in London which has a higher population density and a greater proportion of residential areas meaning that industrial sites are less likely to be located there.

Commercial sector

Commercial emissions predominantly arise from the use of electricity and gas by businesses. They accounted for 9% of greenhouse gas emissions in the UK in 2022. They fell by 4.8% from 2021, likely due to the warmer temperatures in 2022 compared to 2021, and higher energy prices may have also been a factor in reducing demand for fuels. This fall from 2021 is reflected in the local authority figures, as 84% of local authorities (304 of 361) saw a decrease in greenhouse gas emissions.

Over the longer term, almost all local authorities (360 of 361) saw a decrease in commercial greenhouse gas emissions since 2005. This long-term fall is largely driven by the reduction in emissions resulting from electricity use in this sector, largely due to a decrease in the use of coal for electricity generation and increased use of renewables. The one authority that saw an increase is Slough, where commercial emissions were 62% higher than in 2005 due to increases in commercial electricity emissions, possibly due to the large number of data centres that have been built there.

Public sector

Most local authorities saw a fall in public sector greenhouse gas emissions between 2021 and 2022, with 84% (302 out of 361) seeing a decrease. This is in line with the overall 6.5% decrease in public sector emissions in the UK which was predominantly due to a fall in emissions from public sector gas consumption, likely due to the warmer temperatures in 2022 compared to 2021. Almost all local authorities (99%, 357 of 361) saw a decrease in

greenhouse gas emissions from the public sector since 2005, predominantly as a result of a reduction in emissions resulting from electricity use in this sector, due to the national decrease in the use of coal for electricity generation and increased use of renewables.

Figures 11, 12 and 13 show greenhouse gas emissions per capita for the industrial, commercial and public sectors respectively.

Figure 11: Industrial greenhouse gas emissions per capita by local authority (tonnes CO_2e per capita) in 2022

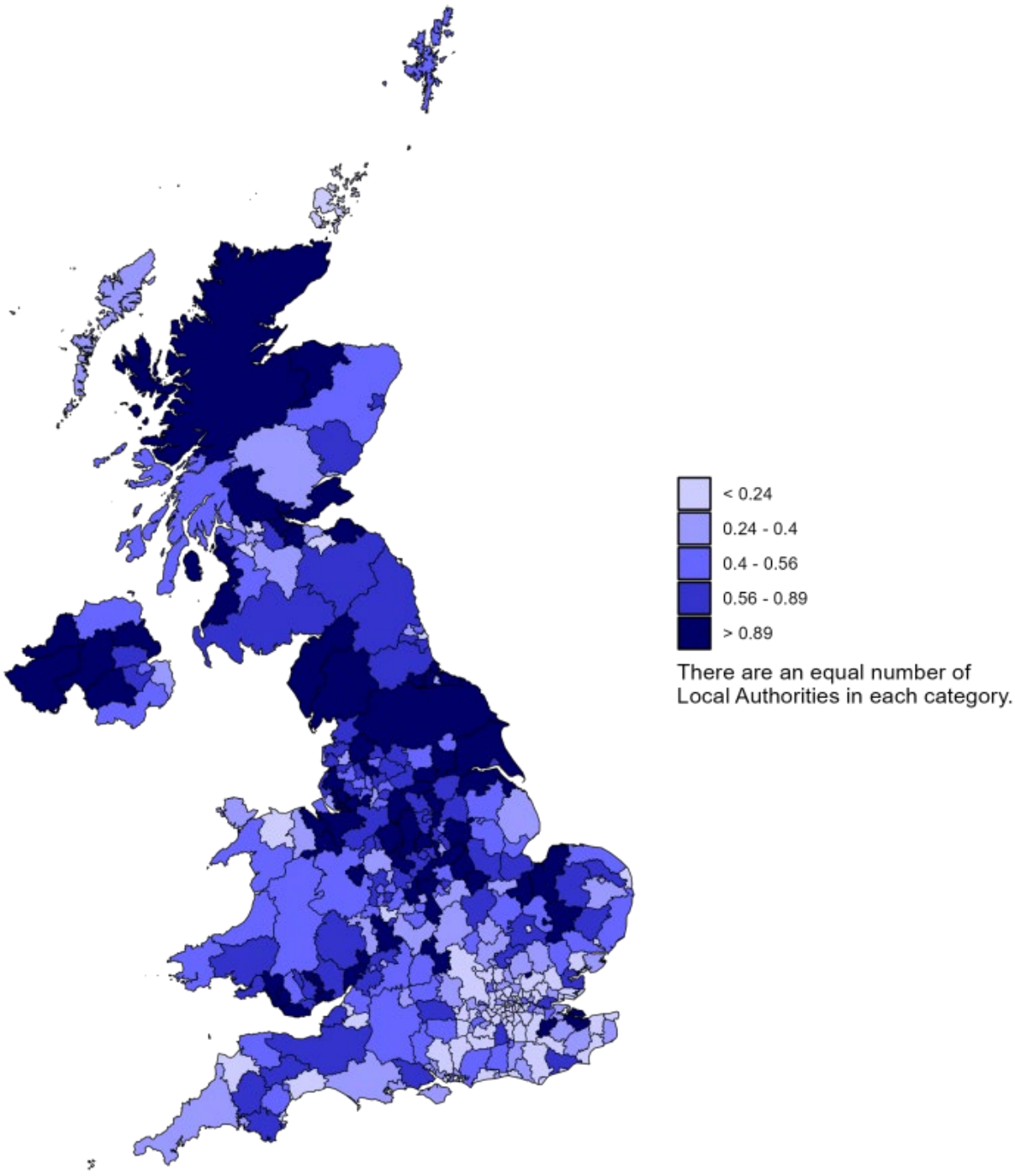


Figure 12: Commercial greenhouse gas emissions per capita by local authority (tonnes CO_2e per capita) in 2022

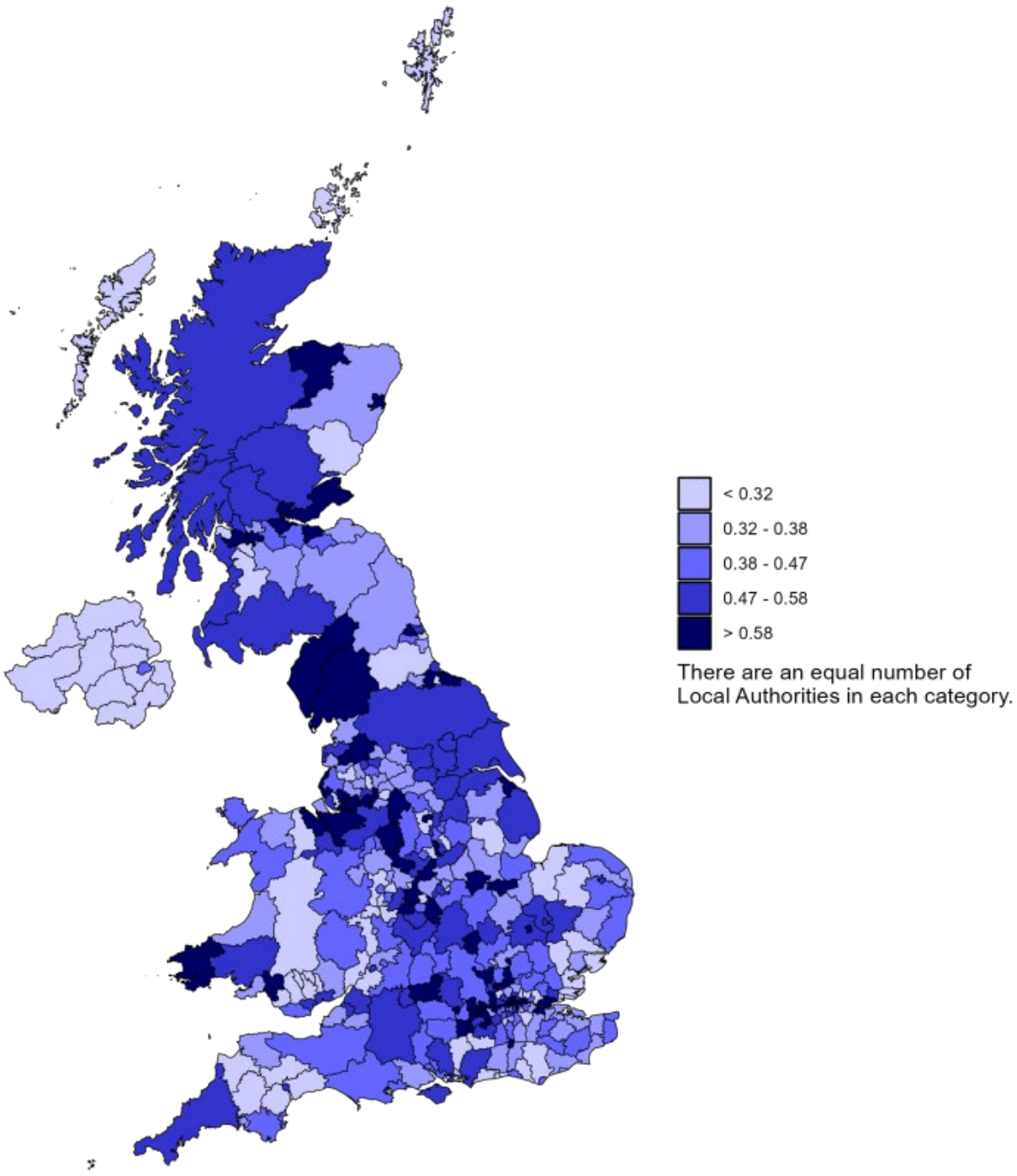
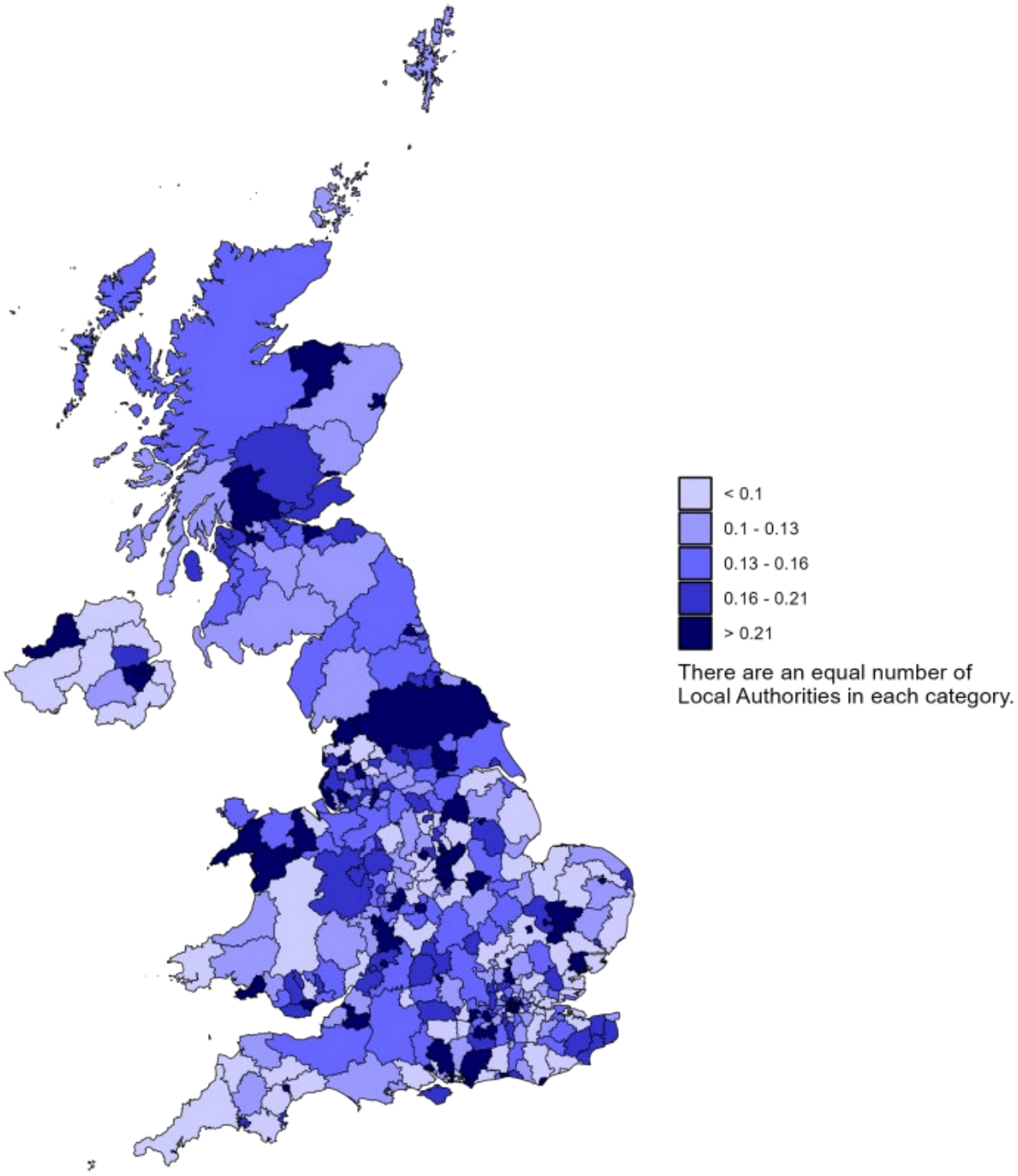


Figure 13: Public sector greenhouse gas emissions per capita by local authority (tonnes CO_2e per capita) in 2022



Agriculture

Most emissions in the agriculture sector come from non-CO_2 gases, with 56% of the 2022 emissions total being methane and 25% nitrous oxide. The remaining 18% of emissions were carbon dioxide. Greenhouse gas emissions from agriculture made up 13% of emissions in the UK in 2022.

Agriculture is a significant source of emissions in a number of authorities and was the sector with the highest emissions in 51 local authorities in 2022, 14% of the total. Nationally, greenhouse gas emissions from agriculture fell by 2.7% between 2021 and 2022, with 80% of local authorities (289 out of 361) seeing a decrease. These falls were largely due to a decrease in emissions from agricultural machinery and a decrease in emissions of nitrous oxide from agricultural soils. Over the longer term, since 2005 agriculture emissions have fallen in 87% of local authorities (315 out of 361).

Waste

Non-CO_2 gases make up the majority of waste emissions, with methane emissions from landfill sites in particular making up 72% of waste emissions across the UK in 2022. Greenhouse gas emissions from waste made up 5% of emissions in the UK in 2022. Nationally, they fell by 0.4% between 2021 and 2022, with 45% of local authorities (161 out of 361) showing a decrease in emissions.

Rather than recording waste emissions against the locations where the emissions occurred, in these statistics we have allocated emissions to local authorities based on the locations where the waste occurs. This is to enable local authorities to understand the emissions resulting from waste produced in their area, in a similar way to how emissions from energy supply are shown on an end-user basis in these statistics, so that emissions resulting from the production and supply of electricity and other energy are shown against the locations where the energy was used.

Note that a significant proportion of landfill methane emissions in England in 2005-2009 could not be allocated to local authorities so the landfill emissions estimates shown will be underestimates for some local authorities in the early part of the time series.

Figure 14: Agriculture net greenhouse gas emissions per capita by local authority (tonnes CO_2e per capita) in 2022

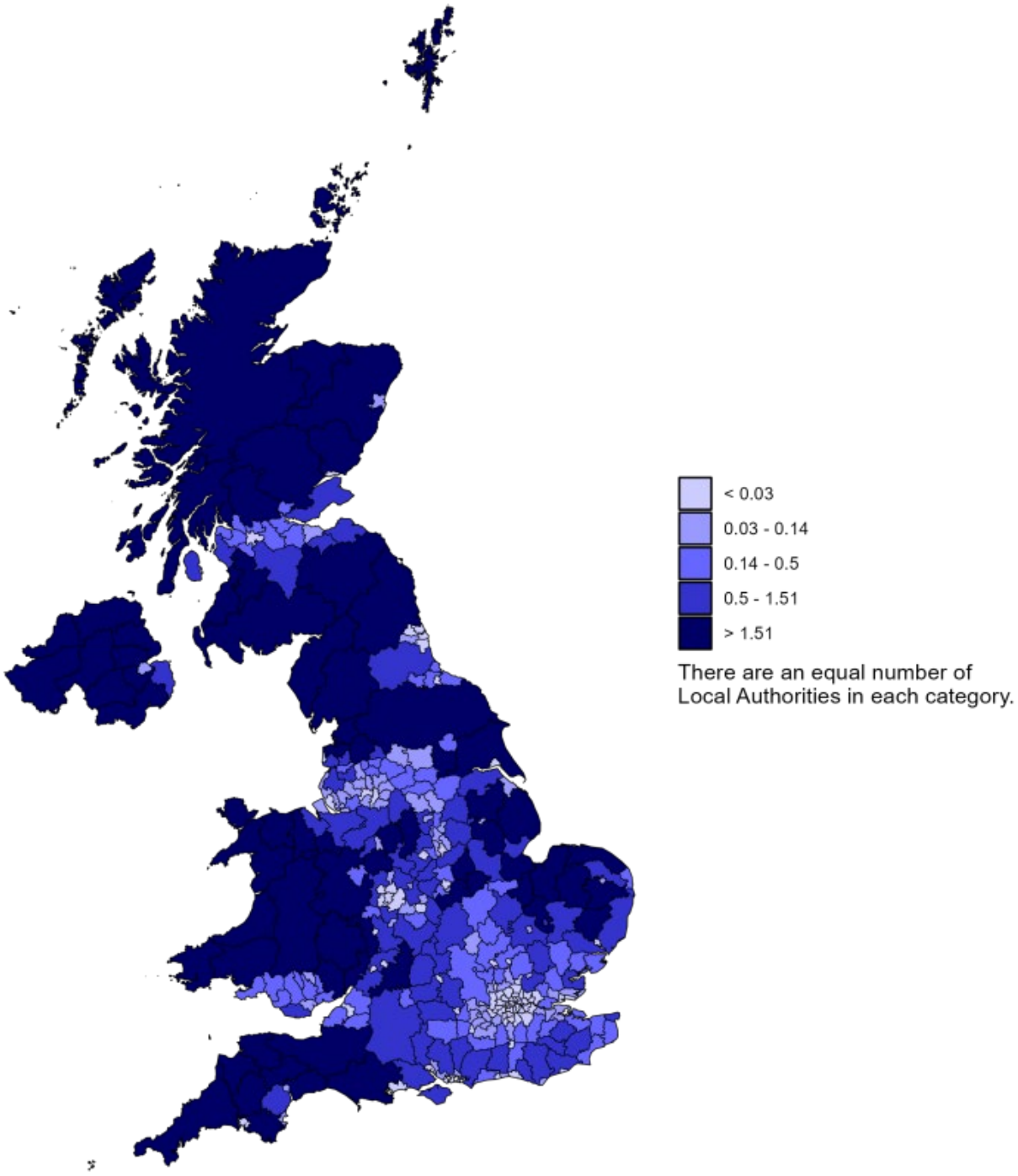
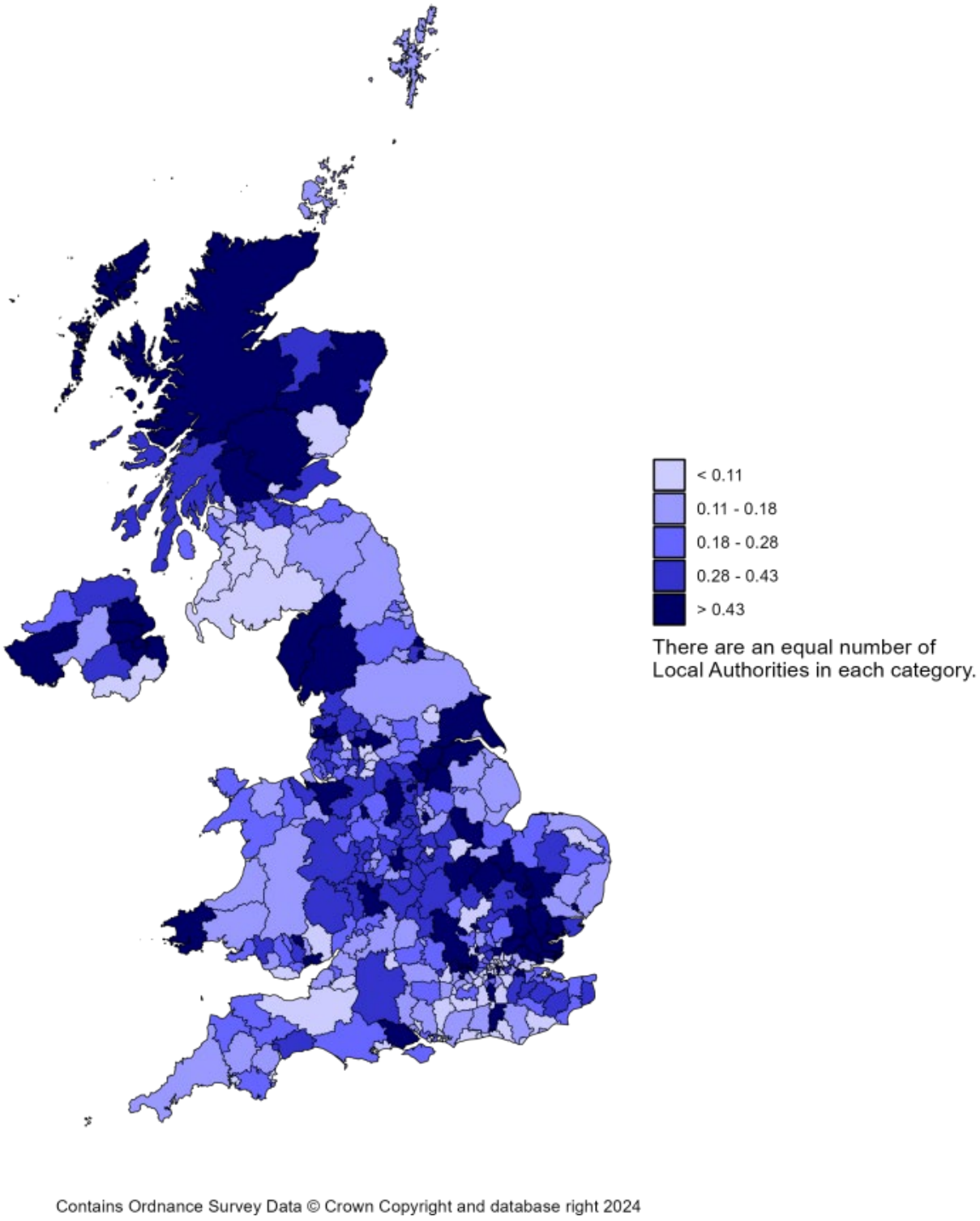


Figure 15: Waste net greenhouse gas emissions per capita by local authority (tonnes CO_2e per capita) in 2022



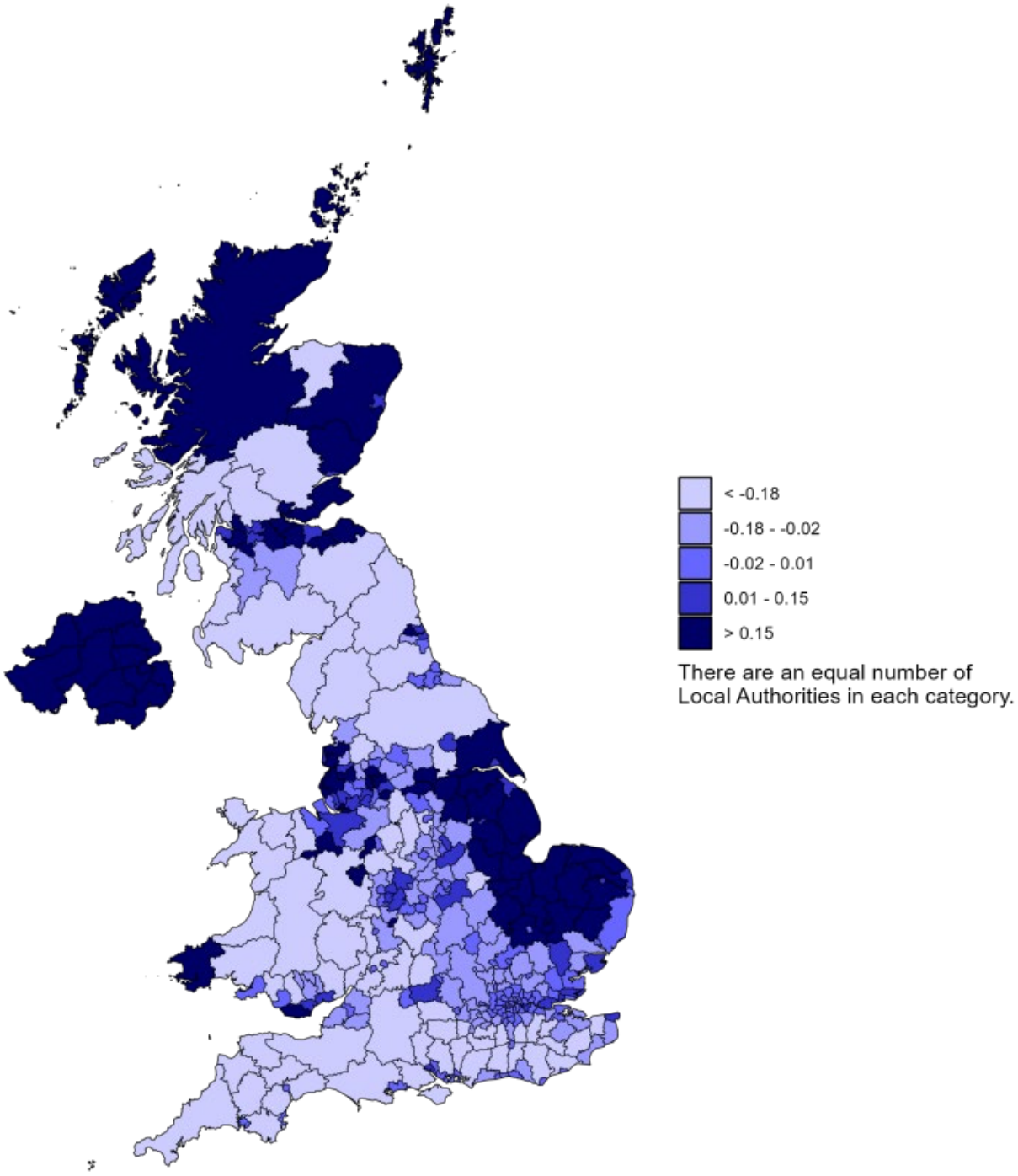
Land use, land use change and forestry (LULUCF)

The LULUCF sector consists of emissions and removals from forests, cropland, grassland, peatland, and settlements. It is the only sector that includes emission removals, although we estimate the sector as a whole to be a net source of greenhouse gas emissions in each year from the start of the data series. In general, peatland is the largest source of greenhouse gas emissions, while forestry is the dominant sink. Settlements and cropland mineral soils changes are estimated to have been net sources of emissions throughout the data series, while grassland mineral soils changes are estimated to have been a net sink.

While the LULUCF sector was a net source of emissions across the UK as a whole in 2022, we estimate that it was a net sink in 49% of local authorities (176 of 361). There was an overall increase in net emissions from the LULUCF sector in 2022 compared to 2021, the largest factor being a reduction in the net sink from forestry, with 76% of local authorities (273 of 361) showing an increase in net emissions from the LULUCF sector. The majority of local authorities (87%, 315 of 361) saw a decrease in net greenhouse gas emissions from the LULUCF sector between 2005 and 2022. The largest factor in this long-term fall has been a reduction in emissions from peatlands associated with ongoing management practices such as re-wetting.

In the LULUCF sector, there are clear regional trends in per capita emissions (Figure 16). In particular, in large parts of Wales, the North East, and the South East and South West there are large sinks of greenhouse gases. In other parts of the UK, such as in Northern Ireland, Scotland, and parts of the East of England, LULUCF is a large source of greenhouse gas emissions. Northern Ireland has the highest LULUCF emissions per capita, due to the clearing of land for the maintenance and creation of settlements and croplands.

Figure 16: Land Use, Land Use Change and Forestry net greenhouse gas emissions per capita by local authority (tonnes CO_2e per capita) in 2022



Local authorities with large changes in emissions since 2021

Overall, greenhouse gas emissions decreased in 346 out of 361 local authorities between 2021 and 2022, reflecting the 5.1% decrease between 2021 and 2022 in the national emissions total allocated to local authorities. For most local authorities this was largely due to a reduction in emissions from heating buildings due to warmer temperatures than in 2021, while most authorities also saw reductions in industrial and agriculture emissions. On the other hand many authorities saw an increase in transport emissions as road traffic increased following the removal of COVID-19 pandemic restrictions. Some authorities will have had specific local factors affecting them such as changes in industrial emissions following closures or expansions of large industrial sites in those areas. The 15 authorities that saw a rise in emissions in 2022 did so because of a range of factors across different sectors. There are also authorities where the LULUCF sector provides a large emissions sink, giving them a small net emissions total that can be subject to large percentage changes when other sources of emissions change.

Table 2 shows some examples of local authorities that had particularly big increases or decreases in emissions and the sub-sector that made the largest contribution to this change in each case. The largest falls between 2021 and 2022 were seen in Cheshire West and Chester (20%), North Lincolnshire (17%) and Barking and Dagenham (16%). The largest factors in the falls in Cheshire West and Chester and in North Lincolnshire were reductions in large industrial installations. The largest factor in the reduction in Barking and Dagenham was a fall in landfill methane emissions.

Isles of Scilly (8%), Argyll and Bute (6%) and Luton (5%) saw the largest increases in emissions from 2021 to 2022. For Isles of Scilly this related to transport emissions increasing following two years where they were lower due to the pandemic. In Argyll and Bute this was due to a reduction in the net emissions sink provided by forestry. Luton's increase is mainly due to landfill emissions increasing.

Table 2: Local authorities that had the largest changes in greenhouse gas emissions between 2021 and 2022

Percentages

Local authority	Percentage change	Sub-sector most responsible for changes in that area
Cheshire West and Chester	-20%	Large Industrial Installations
North Lincolnshire	-17%	Large Industrial Installations
Barking and Dagenham	-16%	Landfill
Luton	5%	Landfill
Argyll and Bute	6%	Net Emissions: Forestry
Isles of Scilly	8%	Transport 'Other'

Greenhouse gas emissions trends since 2005

When the local authority emissions are aggregated, estimated total greenhouse gas emissions decreased by around 43% since 2005 (the earliest year for which data are available at local authority level) – falling from 656 million tCO_2e to 376 million tCO_2e. Whilst emissions have decreased over time there have been periods of fluctuation, with emissions increasing between 2009 and 2010 (largely due to exceptionally cold weather in 2010 and relatively low emissions in 2009 as a consequence of economic factors), between 2011 and 2012 (largely due to variations in temperature) and between 2020 and 2021 (largely due to the easing of COVID-19 restrictions and variations in temperature). For information on the drivers of trends at national level, see the latest UK territorial greenhouse gas emission statistics.

Regional trends since 2005

Figures 17 and 18 show how total greenhouse gas emissions and annual greenhouse gas emissions per capita compare between 2005 and 2022 in each region and country in the UK. Emissions have decreased in all regions since 2005. The largest percentage decrease in emissions (65%) and the largest decrease in per capita terms of 10.7 tonnes per person were seen in the North East. The smallest decrease in percentage terms (26%) was seen in Northern Ireland and in per capita terms (3.9 tonnes per person) was seen in London.

Figure 17: Greenhouse emissions by region, 2005 and 2022

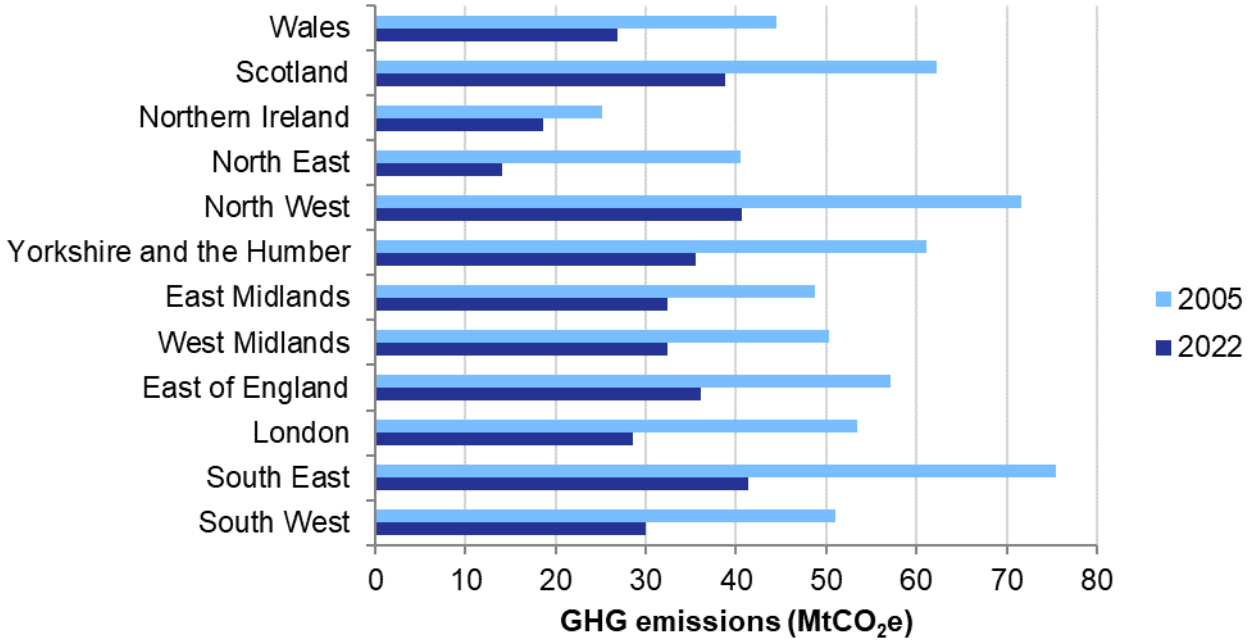


Figure 18: Annual greenhouse emissions per capita by region, 2005 and 2022

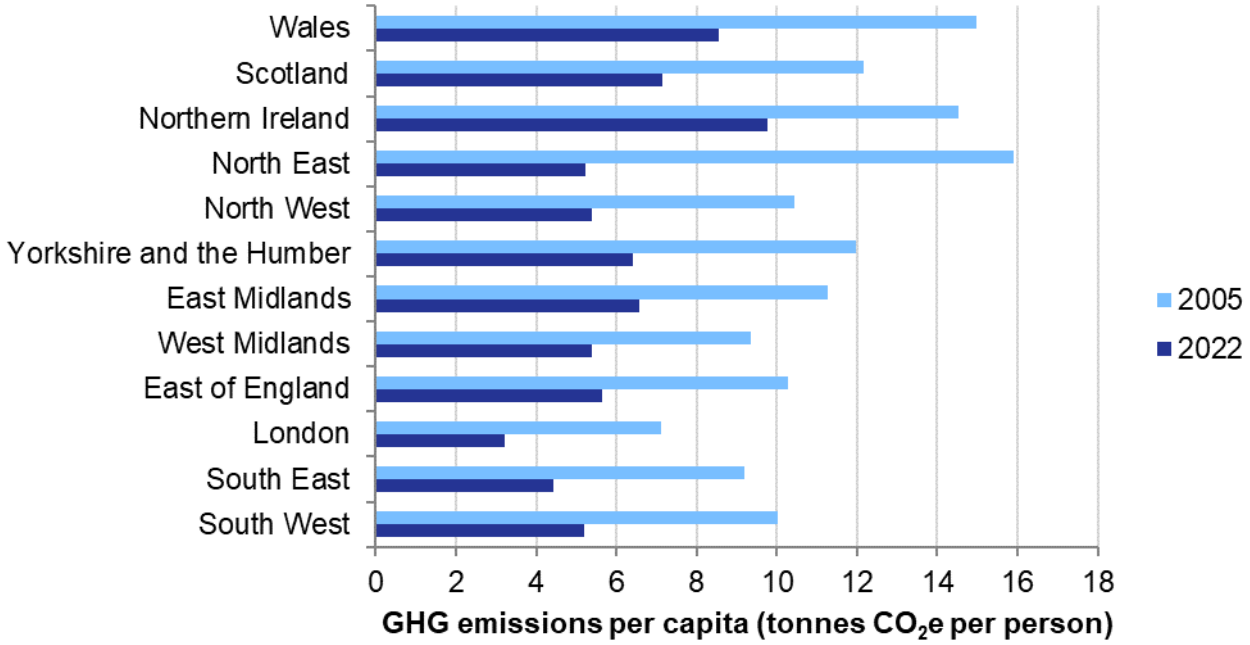


Table 3 shows how total greenhouse gas emissions and greenhouse gas emissions per km^2 compare between 2005 and 2022 in each region and country in the UK. The highest emissions per km^2 are generally in urban areas and areas with large industrial sites. At a regional level the largest emissions per km^2 are in London, at 17.9 tCO_2 per km^2 in 2022, due to London's high population density.

Table 3: Greenhouse gas emissions and greenhouse gas emissions per km^2 by region, 2005 and 2022

$MtCO_2e$, tCO_2e

Region / country	2005		2022		Difference between 2005 and 2022 per km^2 (tCO_2e)
	Total emissions ($MtCO_2e$)	Per km^2 (tCO_2e)	Total emissions ($MtCO_2e$)	Per km^2 (tCO_2e)	
UK	656	2.6	376	1.5	-1.1
Wales	45	2.1	27	1.3	-0.8
Scotland	62	0.8	39	0.5	-0.3
Northern Ireland	25	1.8	19	1.3	-0.4
England	509	3.8	291	2.2	-1.6
North East	41	4.7	14	1.6	-3.1
North West	72	4.8	41	2.7	-2.1
Yorkshire and the Humber	61	3.9	36	2.3	-1.6
East Midlands	49	3.1	32	2.1	-1.0
West Midlands	50	3.9	32	2.5	-1.4
East of England	57	2.9	36	1.8	-1.1
London	53	33.5	29	17.9	-15.6
South East	76	3.9	41	2.1	-1.8
South West	51	2.1	30	1.2	-0.9

Local authority trends since 2005

There is more variation in trends at local authority level than at regional level, as seen in Table 4. Emissions for many local authorities are heavily influenced by activities at industrial sites, and changes at a single site can have a big impact on emissions trends.

All 361 local authorities have shown a decrease in total emissions between 2005 and 2022. This reflects the decrease in overall emissions for the UK during this period driven mainly by reductions in emissions from power stations and industrial combustion. The reduction from power stations is driven by change in the fuel mix used for electricity generation with a large reduction in the amount of coal, which is a carbon intensive fuel, and increasing use of renewables. The reduction in industrial combustion is largely driven by the closure or reduced activity of industrial plants, a notable portion of which occurred during 2009, likely due to economic factors.

From 2005 to 2022, the largest percentage decrease:

- in total emissions was in Redcar and Cleveland (down 91% since 2005), driven by the closure of a number of large industrial installations over this period.
- in emissions from the industrial sector was in Gravesham (down 96%) due to the closure of some large industrial installations over this period.
- in emissions from the commercial sector was North Ayrshire (down 78%) due to reductions in emissions from electricity use and from gas consumption.
- in emissions from the public sector was Newport (84%) due to reductions in emissions from electricity use.
- in emissions from the domestic sector was in Isles of Scilly (down 63%) due to reductions in emissions from electricity consumption, although in absolute terms this reflects only a small decrease in emissions (3.5 kilotonnes (kt) of CO_2e).
- in emissions from transport was in City of London (down 57%), due to a decrease in emissions from road transport.
- in emissions from agriculture was in Redcar and Cleveland (down 75%), due to a decrease in emissions from agricultural electricity use.

From 2005 to 2022, the largest percentage increase:

- in emissions from the industrial sector was in Gedling (up 3%), driven by a rise in emissions from industrial gas use.
- in commercial emissions was in Slough (up 62%), due to increases in commercial electricity emissions.
- in emissions from the public sector was Armagh City, Banbridge and Craigavon (up 16%), driven by an increase in public sector gas consumption over this period.
- in the transport sector was Isles of Scilly (up 16%) due to an increase in non-road transport emissions.
- in emissions from agriculture was in Hounslow (up 192%), due to an increase in emissions from livestock, although in absolute terms this equates to a small increase in emissions (2.9 $ktCO_2e$).

No local authorities showed an increase in total emissions in the domestic sector, and the largest changes in the waste sector are not shown since a significant proportion of landfill emissions in 2005 could not be allocated to local authorities.

Table 4: Breakdown of size of decrease in greenhouse gas emissions between 2005 and 2022

Change in emissions since 2005	Number of local authorities
Decrease of more than 50%	51
Decrease of 45%-50%	62
Decrease of 40%-45%	78
Decrease of 35%-40%	70
Decrease of 30% to 35%	44
Decrease of 0-30%	56

Tables 5 below provides some information on the local authorities that have experienced the largest percentage decreases in emissions since 2005, and the sub-sector that made the largest contribution in each case.

All of the local authorities with the largest decreases in greenhouse gas emissions since 2005 were driven by closures in large industrial installations, except for City of London, where emissions reductions were mainly due to a decrease in emissions from commercial electricity use.

For some authorities a LULUCF sink is a factor in the trend in its emissions. A large sink can lead to the net emissions total in a local authority being much lower than its non-LULUCF emissions total, meaning that changes in emissions from other sectors lead to a larger percentage change in total emissions. This is the case for New Forest and Northumberland in this list, that both have notable LULUCF sinks meaning that their total emissions have fallen by a larger percentage than when only their non-LULUCF emissions are considered.

Table 5: Local authorities that had the largest decreases in greenhouse gas emissions between 2005 and 2022

Percentage

Local authority	Percentage decrease	Sub-sector most responsible for decrease
Redcar and Cleveland	91%	Large Industrial Installations
Gravesham	77%	Large Industrial Installations
New Forest	70%	Large Industrial Installations
Northumberland	69%	Large Industrial Installations
City of London	66%	Commercial Electricity

Carbon dioxide emissions within the scope of influence of local authorities

Alongside the full dataset, we have also published a “subset dataset” which represents carbon dioxide emissions within the scope of influence of local authorities. This can be found in the tables accompanying this publication, available on the department’s statistics website. This

dataset was originally used to report progress against National Indicator 186 under the Department for Communities and Local Government's Local Area Agreements, and while the National Indicator Set was discontinued in 2011 we continue to publish this subset of the data since some local authorities use these statistics to monitor their progress in reducing emissions in their local area.

Unlike the full dataset, the dataset of emissions within the scope of local authorities excludes emissions that local authorities do not have direct influence over. The emissions that are removed from the full dataset are:

- Motorways – all emissions from the "Transport (motorways)" sector have been removed.
- EU Emissions Trading System (EU ETS) and UK Emissions Trading Scheme (UK ETS) sites – these emissions have been removed from the "Large industrial installations" sector, with the exception of energy suppliers (e.g. power stations), whose emissions are indirectly included via the end-user estimates for electricity use. Note that not all the emissions from the "Large industrial installations" sector are produced by EU and UK ETS installations, hence the fact that there are emissions remaining in this sector in the subset.
- Diesel railways – all emissions from the "Diesel Railways" sector have been excluded.
- Land Use, Land Use Change, and Forestry – all emissions belonging to the "LULUCF Net emissions" sector have been excluded.

Removing these emissions has a significant impact on some local authorities compared to others, as some local authorities have a much bigger proportion of emissions from the above sources than others. Table 6 shows the local authorities with the largest decreases in emissions within the scope of influence of the local authority between 2005 and 2022. No authorities saw an increase over this period.

Only one of these, City of London, is amongst the top five local authorities for decreases in overall emissions (which are shown in Table 5 in the previous section). This is because the largest decreases in overall emissions were mostly driven by the large industrial installations sub-sector, large aspects of which are considered to be outside the scope of influence of local authorities, or occurred in areas with large LULUCF sinks, which are considered to be entirely outside the scope of influence of local authorities.

Table 6: Local authorities that had the largest increases or decreases in CO_2 emissions within the scope of influence of the local authority between 2005 and 2022

Percentage

Local authority	Percentage change	Sub-sector most responsible for change
City of London	-68%	Commercial Electricity
Exeter	-58%	Public Sector Gas
North East Lincolnshire	-56%	Industry Gas
Thurrock	-55%	Industry Gas
Westminster	-55%	Commercial Electricity

Looking at changes in emissions within the scope of influence of local authorities between 2021 and 2022, 355 out of 361 local authorities had decreases in their emissions over this period. Table 7 shows the local authorities with the biggest percentage changes to the emissions within their scope of influence between 2021 and 2022. Several of these local authorities do not appear in Table 2, as the drivers of some of the largest emissions changes (such as the opening or closing of large industrial installations) may be outside the scope of influence of local authorities.

Table 7: Local authorities that had the largest increases or decreases in CO_2 emissions within the scope of influence of the local authority, 2021-2022

Percentage

Local authority	Percentage change	Sub-sector most responsible for change
Stockton-on-Tees	-14%	Industry Gas
Rother	-13%	Commercial Gas
Bury	-13%	Domestic Gas
Uttlesford	1%	Transport 'Other'
Redditch	2%	Industry Gas
Isles of Scilly	8%	Transport 'Other'

Emissions within Protected Landscapes

Protected Landscapes consist of the UK's National Parks, National Landscapes and Areas of Outstanding Natural Beauty (AONBs). Estimates of emissions within National Landscapes and AONBs have been included in these statistics for the first time this year. These estimates have been produced following the same methodologies as the local authority estimates as far as possible, and where there are differences these are given in the Technical Report that accompanies this publication.

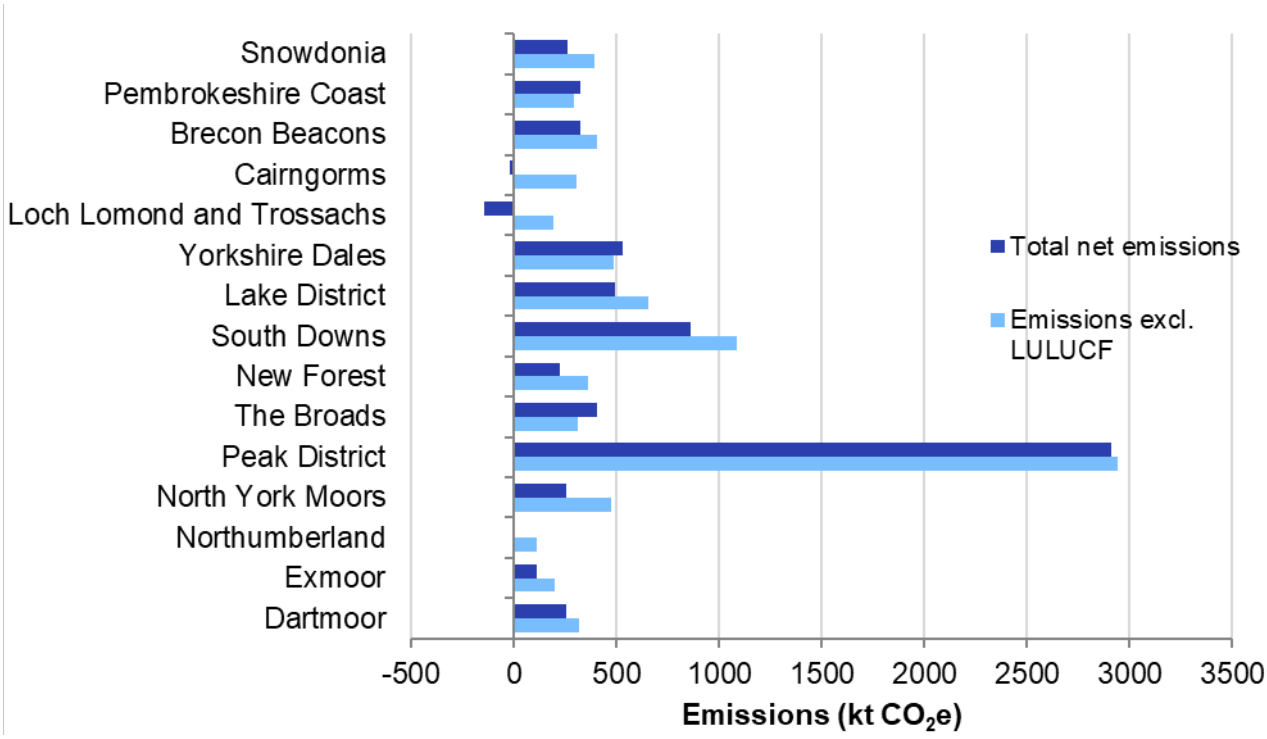
There are 15 National Parks in the UK, of which 10 are in England, 3 in Wales and 2 in Scotland. There are 38 National Landscapes in England and Wales (which were known as AONBs until 2023) and 8 AONBs in Northern Ireland.

Protected Landscapes are more rural than many other areas of the country so have quite different characteristics. Compared to their size they have lower levels of greenhouse gas emissions than more built up areas, averaging emissions of 0.3 $ktCO_2e$ per km^2 of area in 2022 in National Parks and 0.3 $ktCO_2e$ per km^2 in National Landscapes & AONBs, compared to the UK average of 1.5 $ktCO_2e$ per km^2. However, they have higher emissions than average compared to the size of their populations, averaging 15.5 $ktCO_2e$ per capita in 2022 in National Parks and 10.0 $ktCO_2e$ per capita in National Landscapes & AONBs, compared to the UK average of 5.6 $ktCO_2e$ per capita. The LULUCF sector is also more prominent in the emissions in Protected Landscapes, both as a source and as an emission sink in different areas.

Figure 19 shows how the net greenhouse gas emission totals in 2022 in the 15 National Parks compared including and excluding LULUCF. The Peak District has the largest total, 79% of

which was industrial emissions. LULUCF acts as a net emission sink in 12 of the 15 parks, and in Northumberland, the Cairngorms, and Loch Lomond and Trossachs results in the total net emissions being negative.

Figure 19: Net greenhouse gas emissions in National Park areas including and excluding LULUCF, 2022



Reconciliation with the UK inventory

Local authority estimates are designed to be as consistent as possible with the national inventory for the UK. However, some differences are unavoidable.

A number of emission sources included in the UK inventory are not included in the local authority estimates. Excluded sources are principally linked to aviation and shipping.

A small proportion of the gas and electricity consumption allocated to the domestic sector in these estimates is attributed to business in the UK inventory. This is because it is not possible to distinguish between domestic customers and smaller businesses in the meter point consumption data used in these local estimates.

Table 8 shows a summary of the reconciliation between the UK inventory and the local inventory. The different elements of this reconciliation should be interpreted as follows:

- **"Excluded"** are the sectors that have been deliberately excluded from the local level allocation, as it would not have been appropriate to include them, or in the case of fluorinated gases because data are not available to be able to estimate emissions at a local authority level.

- **"Unallocated methodological differences"** are differences which have become apparent due to the different methodological approaches used in deriving the UK Inventory and local level estimates. These include gas and electricity consumption which cannot be allocated to local authorities due to confidentiality concerns at high emitting sites or incomplete address information for individual meters, some landfill emissions for which data are not available showing which local authorities the waste originated in, and harvested wood products.

- **"Methodological differences"** are the methodological differences that have caused discrepancies between the national inventories and the local authority greenhouse gas emissions dataset. These are explained after the UK reconciliation table.

Table 8: Reconciliation of 2022 local emission estimates with UK inventory

$MtCO_2e$

	Details	Totals
Emissions allocated to local areas		**375.3**
Unallocated methodological differences:		
Large electricity users with unknown location	0.7	
Unallocated consumption	-0.1	
Total unallocated		0.6
Total UK emissions (local method)		**375.9**
Excluded from local allocation:		
Domestic shipping	5.2	
Domestic aviation	1.2	
Military transport	1.6	
Exports	10.0	
International aviation and shipping	3.2	
Fluorinated gases	7.6	
Total excluded		28.8
Methodological differences:		
Industrial sector	12.9	
Commercial sector	-7.6	
Public sector	0.7	
Agriculture sector	-0.5	
Domestic sector	-3.5	
Transport sector	-0.6	
Waste sector	0.0	
LULUCF sector	0.0	
Total methodological differences		1.4
UK total greenhouse gas emissions		**406.2**

Main differences between the local authority and Devolved Administrations (DA) datasets

This section of the report describes where there are unavoidable differences between the methodologies used in the estimation of emissions for this local authority greenhouse gas emissions dataset, and for the Devolved Administration emissions datasets.

The following section sets out where and why these differences occur.

Gas and Electricity Consumption data

The definitions used for domestic and industrial and commercial consumers differ between the two datasets. In the local authority greenhouse gas dataset, the split is as defined by the DESNZ sub-national energy consumption dataset which are not fully consistent with the national energy data presented in Digest of UK Energy Statistics (DUKES)[11]. The Devolved Administration greenhouse gas inventory, however, is based on DA-wide electricity consumption statistics which are available in the electricity generation and supply section of DESNZ's Energy Trends[12] publication and are fully consistent with DUKES data for major power producers. These two underlying datasets are not fully consistent, and therefore result in differences between the local authority dataset and the DA inventories for gas and electricity use, as described below.

Unallocated Gas and Electricity Consumption data

In the sub-national energy datasets, some gas data cannot be allocated to local authorities, due to reasons of confidentiality. In part, these gaps in the emissions estimates are filled through the point source database (mentioned above). However, in doing so, this introduces some uncertainty. In the DA inventory though, there is no unallocated consumption; point source data is supplemented by employment and other surrogate data to allocate all the national fuel use between the four countries.

In the local authority dataset, some electricity consumption data cannot be allocated to local authorities. This is due to both commercial confidentiality concerns for high-consuming sites, and where address information is incomplete. In these instances, these data are therefore assigned to the 'unallocated' category. The DA inventory, on the other hand, reports emissions against a wider geographical coverage, effectively negating the data disclosure concerns, and hence there is no need to exclude specific emissions from the DA inventories.

Unallocated LULUCF data

Harvested wood products can be allocated to particular DAs but not to particular local authorities. Within the local authority greenhouse gas dataset, these emissions/removals are therefore assigned to the 'unallocated' category. These are the differences which can be seen in each of the DA reconciliation tables. All other LULUCF estimates are fully consistent across UK, DA and local authority data.

Use of additional gas data for Northern Ireland

Both datasets include consideration of gas consumption data supplied by Northern Ireland energy suppliers, which shows a large growth in gas use within Northern Ireland from 2006 onwards. The DA inventory approach includes estimates for the fuel-switching from oil and solid fuels that this growth in gas use has displaced. In the local authority greenhouse gas data these estimates of fuel switching have not been possible, given the greater level of detail required by the data, and the UK emissions distribution grids have been used solely.

Distribution of 'Other Fuels' across DAs

[11] For the definitions used in DUKES see DUKES 2023**:**
https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2023
[12] https://www.gov.uk/government/collections/energy-trends

There are some areas where emissions allocation methods differ between the two datasets due to the availability of data.

In the iron and steel sector, the methodology used for the local authority greenhouse gas emissions assumes that all emissions from the iron and steel sector from industrial processes, process gases and solid fuels occur at large point sources. Emissions from the consumption of oil in the iron and steel sector are mapped using a combination of point sources and area sources (as described in the Technical Report). In the DA inventory, fuel use data supplied by the Iron and Steel Statistics Bureau (ISSB) is used, since it is available on a DA basis.

For domestic solid fuel combustion, the DA inventory estimates use the energy modelling work based on the 2011 census and the 2019 Defra Solid Fuel Survey, which also underpins the local authority estimates. This results in more consistent reporting between local authority greenhouse gas emissions and the DA inventory emissions. However, some differences remain for solid and liquid fuels due to different compilation methods and fuel aggregations; the local authority greenhouse gas dataset takes a more bottom-up approach to disaggregating smokeless solid fuels according to the location of smokeless zones, for example.

Point Sources

There are also some differences between the estimates of emissions at large point sources and those in the national totals. An explanation for these differences is provided in the Technical Report.

Methodological improvements since last year and revisions to the data for 2005 to 2021

In the production of the 2022 estimates, new data were introduced, together with some improvements to the underlying methodology. To ensure that the data for 2005 to 2021 are consistent with the data now available for 2022, the estimates for these years have been revised to incorporate both the new data and the improvements in the underlying methodology. For some local authorities, these revisions have resulted in noticeable changes to the emissions estimates in the earlier years for some sectors. More information and specific examples are given in the Technical Report.

Alignment with Territorial Emissions Statistics (TES) sectors

We have this year made some adjustments to the source categories presented in these statistics to align them where possible with the new Territorial Emissions Statistics (TES) sectors introduced in the UK territorial greenhouse gas emissions statistics. This has led to the following changes in the coverage of some of the sectors presented in these statistics compared to last year's statistics:

- The *Waste* sector in this year's statistics includes all of the emissions that were in the *Waste management* sector last year, in addition to emissions from accidental fires and household composting that were previously in the *Industry* and *Domestic* sectors.

- The *LULUCF* sector has not changed in its overall coverage, but a different breakdown is shown within the LULUCF sector to match the new subsectors shown in the UK statistics.

- The *Agriculture* sector has not changed in its overall coverage, but emissions from grazing and manure spreading have been moved from the livestock to the soils subsector to align the subsectors used in these statistics with the TES subsectors.

- Emissions from refrigerated transport and seaport machinery which would have previously been reported in the *Industry* sector are now included in the *Transport* sector, in the *Transport 'Other'* subsector. This follows an improvement to the UK non-road mobile machinery (NRMM) emissions model this year that means that NRMM emissions are now better disaggregated by machinery type, enabling these emissions to be identified separately.

See the Final UK Greenhouse Gas Emissions Statistics 1990 to 2022 statistical release for more details about the sector changes.

Energy Performance Certificate (EPC) and Display Energy Certificate (DEC) data

EPC and DEC data provide building level information on non-domestic sites that consume solid and liquid fuels. They have been incorporated into the non-domestic emissions estimates to improve the accuracy of the distribution of emissions from solid, liquid and other fuel use between different areas. For the sites where fuel consumption is not available, their emissions are distributed based on employee numbers in different industries by location and an estimate of fuel consumption per employee for different fuels by industry. This has led to revisions in the *Industry 'Other'*, *Commercial 'Other'*, *Public Sector 'Other'* and *Agriculture 'Other'* subsectors.

Previously data were not available that showed which fuels were used in different locations around the country so more simplistic assumptions were used, with geographical constraints applied to ensure that consumption per employee was artificially lowered in areas covered by gas supply and the distribution of solid fuel limited to areas outside smoke control areas.

The methodology in which these data are now used is described in the *Employment Based Energy Consumption Mapping in the UK* report published as part of this publication.

Road transport

In line with the UK emission estimates, the fuel consumption factors for all road vehicle types are derived from fuel consumption-speed relationships and have been updated to be based on COPERT 5.6. COPERT 5 "*Computer Programme to Calculate Emissions from Road Transport*"[13] is a model and database of vehicle emission factors developed on behalf of the European Environment Agency (EEA) and is used to calculate emissions from road transport.

This update has led to two new aspects of fuel use being calculated. Before an engine reaches peak operating temperate, fuel is consumed at a different rate; this is known as a 'cold start'. COPERT 5.6 has provided a methodology for estimating the excess fuel consumed during a cold start for cars and light goods vehicles (LGVs) that was not included in previous versions. This means there is an increase in the total fuel used by these vehicles, which is all assumed to be associated with minor roads. Secondly, the update to COPERT 5.6 also means that LPG used in LGVs are now also included in the fuel use statistics.

[13] http://www.eea.europa.eu/themes/air/emep-eea-air-pollutant-emission-inventory-guidebook/emep

Land Use, Land Use Change and Forestry

There have been several methodological updates to the LULUCF sector this year. In particular the forestry estimates have been revised to incorporate:

- A fix to the soil model component of the CARBINE model, the carbon accounting model used to estimate carbon uptake by forests planted in the UK.
- Inclusion of urban trees and inclusion of wood production from private forests in Northern Ireland for the first time.
- Minor updates to planting estimates and wood production statistics.

The peatland estimates have been revised due to the inclusion of new peat extraction volume data for Northern Ireland, changes to the baseline peatland (organic soil) areas and changes to forest planting on organic soil data.

Details of the methodologies used to estimate the land use, land use change and forestry emissions are outlined in the *Mapping Greenhouse Gas Emissions & Removals For The Land Use, Land-use Change & Forestry Sector* report that accompanies this publication.

Large Industrial Installations

There is a programme of continuous improvement and revisions have been made to the point source data for 2005-2021 in a few instances where additional data have become available, or where other changes (such as changes to the methodology of the UK greenhouse gas inventory) have an impact on the point source data. Most point source data, however, will be unchanged from the values used in the previous version of these statistics.

Accompanying tables

The following tables are available in Excel and ODS format on the department's statistics website:

Local authority greenhouse gas emissions

Table 1.1	Local Authority territorial greenhouse gas emissions estimates 2005-2022
Table 1.2	Local Authority territorial carbon dioxide (CO_2) emissions estimates 2005-2022
Table 1.3	Local Authority territorial methane (CH_4) emissions estimates 2005-2022
Table 1.4	Local Authority territorial nitrous oxide (N_2O) emissions estimates 2005-2022

Emissions within the scope of influence of Local Authorities

Table 2.1	Local Authority territorial carbon dioxide (CO_2) emissions estimates within the scope of influence of Local Authorities 2005-2022 - Subset dataset (Excludes large industrial sites, railways, motorways and land-use)

Sector scope

Table 3.1	Scope of the local authority emission sectors used in these statistics
Table 3.2	Intergovernmental Panel on Climate Change (IPCC) sectors from the UK Greenhouse Gas Inventory which are covered by the local authority greenhouse gas emission statistics

Reconciliation of national totals in local authority greenhouse gas emissions statistics with those in national end user inventories

Table 4.1	Reconciliation of 2022 Local Authority territorial greenhouse gas emissions estimates with full end user UK Greenhouse Gas Inventory, by fuel and sector
Table 4.1 Notes	Notes on the methodological differences and differences in categorisation between Local Authority estimates and UK estimates in table 4.1
Table 4.2	Reconciliation of 2022 Local Authority territorial greenhouse gas emissions estimates with end user inventory for England, by fuel and sector
Table 4.3	Reconciliation of 2022 Local Authority territorial greenhouse gas emissions estimates with end user inventory for Scotland, by fuel and sector
Table 4.4	Reconciliation of 2022 Local Authority territorial greenhouse gas emissions estimates with end user inventory for Wales, by fuel and sector
Table 4.5	Reconciliation of 2022 Local Authority territorial greenhouse gas emissions estimates with end user inventory for Northern Ireland, by fuel and sector

Pollution inventory

Table 5.1	Pollution Inventory 'by source' emissions, not consistent with local authority emissions by end-user

National Park greenhouse gas emissions

Table 6.1	National Park territorial greenhouse gas emissions estimates 2005-2022
Table 6.2	National Park territorial carbon dioxide (CO_2) emissions estimates 2005-2022
Table 6.3	National Park territorial methane (CH_4) emissions estimates 2005-2022
Table 6.4	National Park territorial nitrous oxide (N_2O) emissions estimates 2005-2022

National Landscape and Area of Outstanding Natural Beauty greenhouse gas emissions

Table 7.1	National Landscape and Area of Outstanding Natural Beauty territorial greenhouse gas emissions estimates 2005-2022
Table 7.2	National Landscape and Area of Outstanding Natural Beauty territorial carbon dioxide (CO_2) emissions estimates 2005-2022
Table 7.3	National Landscape and Area of Outstanding Natural Beauty territorial methane (CH_4) emissions estimates 2005-2022
Table 7.4	National Landscape and Area of Outstanding Natural Beauty territorial nitrous oxide (N_2O) emissions estimates 2005-2022

Technical information

The full set of data tables and methodology documents that accompany this statistics release can be found at: https://www.gov.uk/government/collections/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics

A number of supplementary reports are also available for local authority emissions. These are for users to refer to if they want more information on the methodology for producing the estimates:

- **Local and regional greenhouse gas emissions estimates for 2005-2022 for the UK: technical report**
  - Report on the methodology used to produce the emissions estimates.

- **Employment based energy consumption mapping in the UK**
  - A report which outlines the methodology used to map emissions from smaller industrial and commercial sources.

- **Mapping carbon emissions & removals for the Land Use, Land Use Change & Forestry (LULUCF) sector**
  - A report looking at LULUCF emissions and removals at the local authority level.

The following user guidance is available for sub-national emissions: Sub-national emissions statistics: Frequently asked questions

Further information on UK greenhouse gas emissions statistics can be found at: https://www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics

This statistical release and the related data tables are part of the National Atmospheric Emissions Inventory (NAEI) for 1970-2022, produced for the Department for Energy Security & Net Zero and the Devolved Administrations by Ricardo. For further information on the UK Greenhouse Gas Inventory, see the NAEI website: https://naei.beis.gov.uk/

Given the number of local authorities, this statistical release does not provide a detailed explanation of all revisions to the historical data series or the year-on-year changes for each local authority. However, explanations of the reasons for any changes are available on request; any such requests should be sent to the following email address: GreenhouseGas.Statistics@energysecurity.gov.uk

Further information

Future updates to these statistics

The next UK local authority greenhouse gas emissions estimates, covering the period 2005-2023, will be published in June 2025.

Final estimates of UK greenhouse gas emissions in 2023 will be published in February 2025.

In March 2025, the 1990-2023 UK greenhouse gas emissions estimates will be updated to include uncertainty estimates and estimates by end user, and provisional 2024 UK emissions estimates will be published.

In June 2025, the 1990-2023 UK greenhouse gas emissions estimates will be updated to include estimates by Standard Industrial Classification.

Related statistics

Devolved Administration Greenhouse Gas Inventories

Greenhouse gas emissions inventories are available for England, Scotland, Wales and Northern Ireland on the NAEI website: https://naei.beis.gov.uk/reports/reports?section_id=4

Final UK greenhouse gas emissions statistics

This publication provides the latest estimates of UK greenhouse gas emissions by source sector (published in February each year) and by end user (published in March): https://www.gov.uk/government/collections/uk-territorial-greenhouse-gas-emissions-national-statistics

Provisional UK greenhouse gas emissions statistics

Published in March each year, this publication provides initial estimates of the previous year's greenhouse gas emissions: https://www.gov.uk/government/collections/uk-territorial-greenhouse-gas-emissions-national-statistics

Sub-national energy consumption statistics

Several publications are produced by DESNZ estimating energy consumption by local authority, which are used in the production of the UK local authority greenhouse gas emissions estimates:

- Electricity consumption statistics for Great Britain and for Northern Ireland: https://www.gov.uk/government/collections/sub-national-electricity-consumption-data
- Gas consumption statistics for Great Britain and for Northern Ireland: https://www.gov.uk/government/collections/sub-national-gas-consumption-data
- Road transport fuel consumption statistics for the United Kingdom: https://www.gov.uk/government/collections/road-transport-consumption-at-regional-and-local-level

- Residual fuel (non-electricity, non-gas, non-road transport fuels) consumption for the United Kingdom: https://www.gov.uk/government/collections/sub-national-consumption-of-other-fuels
- Total final energy consumption statistics for the United Kingdom: https://www.gov.uk/government/collections/total-final-energy-consumption-at-sub-national-level

Revisions policy

The DESNZ statistical revisions policy sets out the revisions policy for these statistics, which has been developed in accordance with the UK Statistics Authority Code of Practice for Statistics.

User engagement

Users are encouraged to provide comments and feedback on how these statistics are used and how well they meet user needs. Comments on any issues relating to this statistical release are welcomed and should be sent to: GreenhouseGas.Statistics@energysecurity.gov.uk

The DESNZ statement on statistical public engagement and data standards sets out the department's commitments on public engagement and data standards as outlined by the Code of Practice for Statistics.

Accredited Official Statistics designation

Accredited official statistics are called National Statistics in the Statistics and Registration Service Act 2007.

These accredited official statistics were independently reviewed by the Office for Statistics Regulation (OSR) in June 2014 and had their accreditation reviewed in September 2018. They comply with the standards of trustworthiness, quality and value in the Code of Practice for Statistics and should be labelled 'accredited official statistics'.

Our statistical practice is regulated by the OSR.

OSR sets the standards of trustworthiness, quality and value in the Code of Practice for Statistics that all producers of official statistics should adhere to.

You are welcome to contact us by emailing GreenhouseGas.Statistics@energysecurity.gov.uk with any comments about how we meet these standards.

Alternatively, you can contact OSR by emailing regulation@statistics.gov.uk or via the OSR website.

Pre-release access to statistics

Some ministers and officials receive access to these statistics up to 24 hours before release. Details of the arrangements for doing this and a list of the ministers and officials that receive pre-release access to these statistics can be found in the DESNZ statement of compliance with the Pre-Release Access to Official Statistics Order 2008.

Contact

- Responsible statistician: Christopher Waite
- Email: GreenhouseGas.Statistics@energysecurity.gov.uk
- Media enquiries: 020 7215 1000
- Enquiries: 020 7215 8285

This publication is available from: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-statistics-2005-to-2022

If you need a version of this document in a more accessible format, please email GreenhouseGas.Statistics@energysecurity.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.