

Appendix 3 – from Lancashire County Council

Lancashire Summary- 2017

The 2017 carbon dioxide results give a total figure of 7.2 million tonnes for the 12-authority Lancashire area. This equates to 6.0 tonnes per person (UK=5.3).

At the local authority area level, emissions range from 370.8 kilotonnes (kt) in Rossendale to 750kt or more in Lancaster, Ribble Valley and West Lancashire. Ribble Valley records an exceptionally high figure because of the presence of a major cement producer in the district.

Introduction

Carbon dioxide (CO₂) is the principal greenhouse gas believed to be contributing to global warming. In 2017, it was estimated to account for 81% of the UK greenhouse gas emissions. The vast majority of man-made CO₂ emissions come from the burning of fossil fuels in power generation and in the transport, domestic and industrial sectors. The level of emissions depends on the fuel mix and the fuel consumption data.

The [Department for Business, Energy and Industrial Strategy](#) (BEIS) {formerly DECC} publishes data on [carbon dioxide emissions](#) broken down by local authority, and the latest results are for 2017. The most recent figures for the 14 local authorities in Lancashire have been used in this article, along with a back-series of data from 2005 to 2016 for comparison purposes. Although entitled 'emissions' the totals are actually net values of CO₂ emissions and CO₂ sunk back into the land through forestry and agriculture, hence the negative values most noticeable in the Land Use Change sector figure for the United Kingdom.

Lancashire results

Expressed in terms of per capita (per resident), in order to make allowance for the different size of areas, total CO₂ emissions in the 12 authority Lancashire area, at 6.0 tonnes per annum, were above the UK average (5.3 tonnes).

In considering such per capita ratios, it should be noted that while emissions per resident may be a useful measure for domestic emissions, CO₂ levels from industry and road transport are affected by many factors other than the size of the resident population so these ratios should be interpreted with caution.

Power stations supplying domestic electricity customers via the national grid have their emissions reallocated by domestic usage, rather than from where the emissions are actually released.

The 'motorways' element of transport emissions appears to be based to some degree on road length of motorways (there are no emissions allocated to this element in authorities that have no motorways, e.g., Ribble Valley. Likewise for diesel railways, there are no emissions for this element in Rossendale which has no stations or railway lines on the national rail network.

At the district authority level, CO₂ emissions can exhibit wide variations due to differences in population numbers, geography; the extent of the local road network and the structure of local industrial and commercial sector. Across the broader Lancashire area, total CO₂ emissions range from a low of 370.8kt in Rossendale, to 750kt or more in Lancaster, Ribble Valley and West Lancashire. Viewed in terms of CO₂ rates per head, the levels range from a low of just 3.6 tonnes in Blackpool to 6.8 in West Lancashire, and an exceptional 15.6 tonnes in Ribble Valley.

Results by Emissions Type

Figure 1 (See below) presents the information from Table 1 in a format that provides additional emphasis to the variations in the mix of CO₂ emissions per authority between industry and commerce, domestic, road transport and land use.

It is important to note that the presence of certain high-energy using industries like refineries, metals production, glass and other non-metallic mineral sectors, which are concentrated in a few areas, can have a very large local impact. Within Lancashire the share of emissions attributable to industry and commerce is greatest in those districts where energy-intensive industrial activities have a disproportionate representation (see Figure 1). Blackburn with Darwen and especially Ribble Valley stand out as areas with high CO₂ emission levels from industry and commerce. Two [large cement works](#) have a fundamental impact on the outturn for Ribble Valley. Based on the 'Pollution Inventory' data, the contribution of these two works alone is around 622 kilotonnes in 2017. Cement production involves both CO₂ emissions from the fuel used to heat limestone and from the limestone itself as it is broken down into quicklime by the process. The cement industry as a whole is responsible for 5% of global CO₂ emissions.

Across Lancashire, total domestic carbon dioxide emissions vary from a highs of over 205 kt in Blackburn with Darwen, Lancaster, Blackpool and Preston to just 107.3 kt in Ribble Valley. In general, average domestic emissions can be influenced by the number of households in the area; fuel types used; the type and condition of the housing stock (including its insulation and energy efficiency); the average temperature (urban areas can be warmer and therefore easier to heat than rural areas); average household size; type of household; income and

preferences of its occupiers, though a figure of around 3.8 tonnes of domestic CO₂ emissions per household is found for five of the local authorities and also the Lancashire-14 area.

Transport emissions include freight and passenger transport, both private and for business purposes. The estimates of road transport CO₂ are made on the basis of 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 may, for example, provide part of the explanation for high figures in Chorley, Lancaster and Preston which are three authorities at the heart of the county's motorway network. Over 40% of their transport emissions of CO₂ are derived from motorway traffic.

For Burnley, Pendle, Rossendale and Blackpool domestic emissions are the largest source, whilst industry dominates in Ribble Valley, West Lancashire and Blackburn with Darwen.

Land use, land use change and forestry are the final sector considered in the CO₂ estimates. This is very much a minor or residual category. Because it can act as a sink, removing carbon from the atmosphere, as well as a source of carbon emissions, the measure takes account of both CO₂ emissions and removals. Within the 14-authority Lancashire area, the sector is responsible for just 74.2kt of emissions. West Lancashire is the only authority with a significant figure (93.3kt) in this category and is a reflection of the large amount of [top-grade agricultural land](#), the intensive nature of the farming and the use of heating and CO₂ supplementation (or enrichment) in the many glasshouses there. The value for Ribble Valley is negative, hence the county total is smaller than the West Lancashire total.

Lancashire trends in carbon dioxide emissions per capita (2005 to 2017)

Figure 2 presents the changes in CO₂ emissions levels per capita for each of the 14 Lancashire authorities between 2005 and 2017. An encouraging pattern of declining emission levels was broadly apparent across all of the 14 areas during the twelve-year period. Of particular note is the dramatic reduction that took place in Ribble Valley between 2005 and 2012, but in 2013 and 2014 there were increases. No Lancashire authority recorded a per capita rise over the most recent twelve-month period, but two, West Lancashire and Blackburn with Darwen, were largely unchanged.

BEIS additionally examines those emissions which are within the scope of the local authority, excluding some categories such as transport emissions from motorways. In terms of reductions, Blackburn with Darwen is in the best 5 authorities, having reduced emissions by -44% since 2005, largely in the Industrial and Commercial Electricity sub-sector.

At the national level, there was a 3.5% decrease in emission totals between 2016 and 2017 due mainly to a switch from fossil fuel (down -10.0%) to renewable types of electricity generation (up +27.3%). Coal-fired power generation is being phased out, with Terawatt hour (TWh) estimates for national generation falling by 26% from 2016 to just 20.6 TWh in 2017 (Source: Elexon/National Grid). In November 2016 the Department for Business, Energy and Industrial Strategy announced a consultation to close the remaining coal-fired power stations by 2025. There are [more current 2018 statistics](#) available for greenhouse gas emissions at the national level.

Table 1. Local and regional estimates of CO2 emissions, 2017, (thousands of tonnes)

First Area name	Sum of Industry and Commercial	Domestic	Transport	Land use change and forestry	Total emissions	Per Capita Emissions (tonnes)
Ribble Valley	732.3	107.3	112.9	-26.8	925.6	15.6
West Lancashire	261.4	183.6	231.4	93.3	769.8	6.8
South Ribble	272.7	179.0	274.8	0.5	727.0	6.6
Lancashire-12	2,599.0	1,946.2	2,598.6	76.8	7,220.7	6.0
Chorley	128.5	188.0	367.3	0.0	683.7	5.9
Fylde	138.2	133.9	180.9	9.2	462.2	5.9
Wyre	215.2	175.9	221.1	21.7	633.8	5.7
Lancashire-14	3,005.9	2,374.7	2,861.0	74.2	8,315.7	5.6
North West	14,878.8	10,978.0	13,741.1	-199.0	39,398.9	5.4
United Kingdom	136,057.0	98,101.3	128,666.3	-11,323.4	351,501.3	5.3
Lancaster	193.3	214.5	358.7	-12.4	754.1	5.3
Rosendale	117.0	129.6	126.6	-2.4	370.8	5.3
England	102,047.2	80,782.1	107,177.9	-5,086.2	284,921.0	5.1
Preston	194.1	207.1	321.7	0.6	723.5	5.1
Hyndburn	102.6	130.0	144.5	-2.7	374.4	4.7
Pendle	137.0	153.8	126.2	-2.1	415.0	4.6
Burnley	106.8	143.4	132.6	-2.0	380.8	4.3
Blackburn with Darwen	261.2	216.7	150.6	-4.1	624.4	4.2
Blackpool	145.6	211.7	111.7	1.5	470.6	3.4

Figure 1. Carbon dioxide emissions by type, Lancashire local authorities (2017)

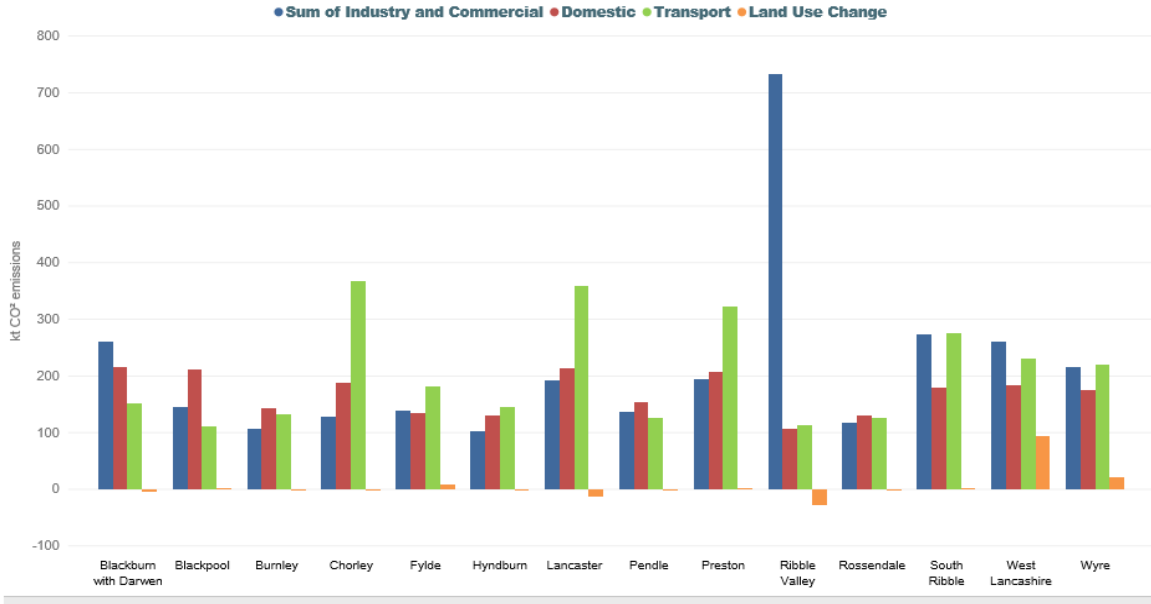
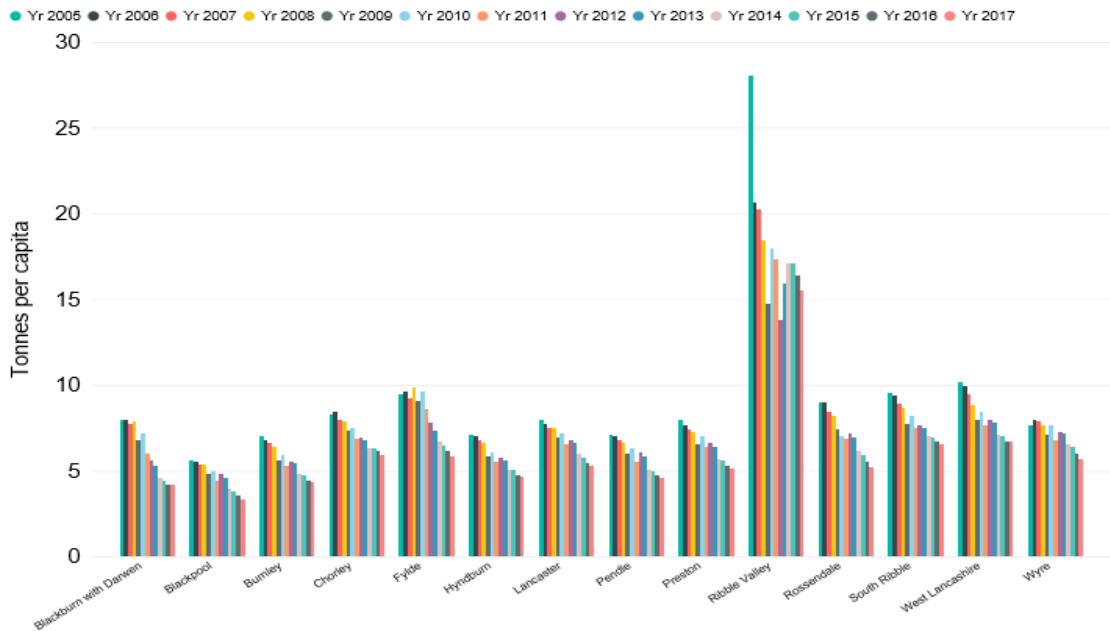


Figure 2. Changes in carbon dioxide emission levels, 2005 to 2017 (tonnes per capita)



Source: Department for Energy and Climate Change (DECC): Time series 2005 to 2017

Addendum

What is carbon dioxide?

Carbon dioxide (CO₂) is a colourless, odourless gas, denser than air and which is faintly acidic and non-flammable, that occurs naturally in the Earth's atmosphere. It is released in large quantities from natural processes, notably respiration by living organisms. Releases from respiration are balanced by a similar quantity taken up by photosynthesis by ocean-dwelling plankton and land-dwelling biomass, including forests and grasslands (so-called natural "carbon sinks") as part of the carbon cycle. Other natural sources of carbon dioxide include volcanic eruptions, forest fires, decay of dead plant and animal matter and evaporation from seawater.

Man-made releases of carbon dioxide include burning fossil fuels (coal, oil and natural gas) and other fuels containing carbon (e.g. wood) mainly for power generation and transport. Unlike natural sources, CO₂ emissions from human activities are not balanced by a corresponding carbon sink and thus accumulate in the atmosphere or are absorbed by seawater.

Carbon dioxide has many commercial uses, being valued for its reactivity, inertness and coldness. Common uses are for fire extinguishing systems; carbonisation of soft drinks; freezing and chilling of food products and their transport; in decaffeinating coffee; enhancement of oil recovery from oil wells; a raw material in the production of various chemicals and treatment of alkaline water. A minor use of the solid (frozen) form of CO₂ is to produce smoke effects in television, film and theatre. In Lancashire (particularly West Lancashire district) CO₂ is used in the glasshouse horticultural business to boost crop growth.