

CO2 emissions in Wirral, 2005-2016

Wirral Intelligence Service

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Background to Wirral Intelligence Service Website

The Website

Wirral Intelligence Service (WIS) website was established to bring together in one place high quality research, information and intelligence about Wirral; the place and the people that live here. It includes the Joint Strategic Needs Assessment (JSNA), a systematic review of the health and wellbeing needs of the local population, informing local priorities, policies and strategies that in turn informs local commissioning priorities to improve health and wellbeing outcomes and reduce inequalities throughout the Borough.

Who is involved?

Information from Council, NHS and other partners is collected and collated to inform the website content including the JSNA and this reflects the important role that all organisations and sectors have (statutory, voluntary, community and faith) in improving the health and wellbeing of Wirral's residents.

About this document

This document contains the most relevant information on the chosen topic and provides an overview of related key aspects

How can you help?

If you have ideas or any suggestions about this topic then please email us at <u>wirralintelligenceservice@wirral.gov.uk</u> or go to <u>https://www.wirralintelligenceservice.org/</u>

Version Number	Date	Authors
1.0	December 2018	Paula Vickers – Performance Management Officer
1.1	January 2019	Review and final version - John Highton, Bryan Lipscombe, Paula Vickers

Content overview

Abstract	Summary of CO ₂ emissions locally and nationally
Intended or potential audience	 External General public and local industry Internal Cool Wirral
Links with other topic areas	 <u>Climate & Health</u> <u>Wirral Climate Change Strategy 2014-19</u> <u>Air Quality</u>

Key findings

The report discusses changes in Carbon Dioxide (CO_2) emissions arising in the local authority area of Wirral between 2005 and 2016¹

- Wirral is continually reducing its CO₂ output across all sectors and sources since 2005
- This reduction in CO₂ output has also been seen in 343 of 353 English local authorities
- Since 2005 Wirral reduced its CO₂ output from 1,841 kilo tonnes to 1,192 kilo tonnes, a reduction of 649 kilo tonnes, or 35.3%
- The reduction of CO₂ nationally has been 30.7% and across the North West Local Authorities is 33.3%
- Local authorities seen as similar demographically have also reduced output by an average of 35.3%
- In 2016, the highest levels of emissions in Wirral were attributed to the domestic sector (42.5%)
- This is in contrast to England and the North West, where the highest emissions were attributed to the industry and commercial sector. There are wide local variations on this mainly due to economy and geography of local areas.
- Of domestic emissions in Wirral in 2016, 68.2% emissions came from gas and 29.2% from electricity consumption.

¹This report discusses CO₂ emissions on an end-user basis (where emissions are distributed according to the point of energy consumption) assigned to Wirral Local Authority area excluding emissions that the authority does not have any direct influence over, these include: Motorways; EU Emissions Trading System sites; Diesel railways; Land use, Land Use Change, and Forestry.

Emissions from the production of goods (Industry and Commercial) are assigned to where the production takes place.

Wirral CO₂ emissions

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The climate is changing driven by a rise in temperatures due to increasing concentrations of greenhouse gases in the atmosphere (Intergovernmental Panel on Climate Change or IPCC 2014¹).

The rise in greenhouse gases is associated with human activities including the burning of fossil fuels for heat, power and transportation; changes in land uses such as the clearance of forests; the production of concrete; the rearing of cattle for food; and the production and use of fertilisers in agriculture (Green Alliance, 2011²).

Carbon dioxide (CO₂) is the main greenhouse gas, accounting for about 81% of the UK greenhouse gas emissions in 2016.³

Why is this important?

Climate fundamentally shapes the environment and influences patterns of life. Changes in climate thus have far reaching consequences. Much of human development has occurred under relatively stable global climate system. The recent rise in global temperatures associated with extra greenhouse gases in the atmosphere is therefore a great cause for concern

The United Nations (UN) Paris Agreement seek to stabilise the global temperature rise to no more than 2°C above the pre-industrial level, with an aim to limit the rise to 1.5°C to avoid more damaging and dangerous climate change. The latest scientific evidence suggests we need to cut greenhouse gas pollution to net-zero soon to avoid 1.5°C of warming. It is already around 1°C warmer than in the pre-industrial period (IPCC, 2018⁴). The world is currently on course for higher and more dangerous warming.

The UK Government's current target is to reduce carbon emissions by 80% by 2050 compared to 1990 levels. The government has recently sought advice from its independent Climate Change Committee on the implications of the UN's 1.5°C target limit so it is probable recommendations to tighten the target will be made.

Changes in the climate have profound implications for health and future health inequalities globally and locally. In Wirral certain population groups could be more susceptible to weather events associated with climate change and at greater risk of the subsequent impacts and negative health outcomes. Groups most susceptible to climate impacts are: young children, older people, residents experiencing multiple deprivation and people suffering from cardiovascular disease or respiratory illnesses.²

There are many ways we can reduce CO_2 pollution. The present climate change strategy for Wirral indicates: ways to reduce demand for energy; generate and source more energy from renewable sources; and promote use of more sustainable modes of transport and less polluting vehicles. It also addresses the ways we can cut 'indirect' emissions related to the decisions we take (e.g. eating less meat, re-using resources and recycling of waste).

You can read more on this subject through the Government Clean Growth Strategy <u>here</u>. Wirral Climate Change Strategy <u>here</u> and Wirral Intelligence Service JSNA: Climate & Health <u>here</u>

¹ <u>https://www.ipcc.ch/report/ar5/syr/</u>

²https://www.green-alliance.org.uk/page_86.php

⁴<u>https://www.ipcc.ch/sr15/chapter/summary-for-policy-makers/</u>

⁵https://www.wirralintelligenceservice.org/jsna/climate-health/

³https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/695930/2017_Provisional_Emi ssions_statistics_2.pdf

National CO₂ emissions within the scope of influence of local authorities

Not all carbon emissions are within the scope of influence of local authorities^{**}. Emissions that authorities do not influence include: Motorways; EU Emissions Trading System sites; Diesel railways; Land use, Land Use Change, and Forestry (all emissions belonging to the LULUCF Net Emissions). This report discusses Carbon Dioxide (CO₂) emissions on an end-user basis (where emissions are distributed according to the point of energy consumption) assigned to Local Authority areas.

Across England emissions that authorities can influence reduced by 30.7% between 2005 and 2016. North West improvement was higher at 33.3% and Wirral improved output reduction further, by 35.3% (Figure 1).

Carbon dioxide emissions within the scope of influence of Local Author (kilo tonnes)											
	2005	2016	Difference	% Difference							
England	363,336	251,898	-111,438	-30.7%							
North West	49,117	32,748	-16,369	-33.3%							
Wirral	1,841	1,192	-649	-35.3%							

Figure 1: CO₂ emissions (kilo tonnes) within the influence of Local Authorities 2005-2016*

Source: Department for Business, Energy & Industry Strategy: UK local authority and regional carbon dioxide emissions national statistics produced as Local Authority Carbon Dioxide Emissions Estimates (2018)

Notes:

*Data published in 2018 refers to collection period ending 31st December 2016 – data is delayed 2 years before publication **This data represents carbon dioxide emissions within the scope of influence of Local Authorities. The full dataset includes all emissions that occur within the boundaries of each local authority; the subset however excludes emissions that authorities do not have any direct influence over, these include: Motorways; EU Emissions Trading System sites; Diesel railways; Land use, Land Use Change, and Forestry (all emissions belonging to the LULUCF Net Emissions). Removing these emissions has a much bigger impact on some Local Authorities than others, as some Local Authorities have a much bigger proportion of emissions from the above sources than others.

CO₂ emissions within the scope of influence of Local Authorities come from 6 sectors; domestic, transport, industry & commercial, agriculture and large industrial installation. Agriculture and large industrial installation emissions make up just 0.3% of Wirral's emissions, therefore this report will focus on the 3 main sources; domestic, transport and industry & commercial.

Industry and Commercial sector emits the highest proportion of CO_2 throughout England (34.8%) and the North West (38.3%) as a whole, this is lower in Wirral (31.2%). The highest proportion of emissions in Wirral is from domestic sources (42.5%) this compares to North West at 34.6% and England at 33.5% (Figure 2).

Area	Domestic	Transport	Industry & Commercial	Agriculture	Large Industrial Installations	Total CO2 emissions (kilo tonnes)
England	33.5%	31.7%	34.8%	1.0%	0.7%	251,898
North West	34.6%	27.1%	38.3%	1.1%	0.3%	32,748
Wirral	42.5%	26.3%	31.2%	0.3%	0.0%	1,192

Figure 2: CO₂ emissions source sector distribution 2016

Source and Notes: See Figure 1 above

National and Local Domestic CO₂ Emissions

CO₂ emissions from domestic sources have reduced nationally and regionally. Wirral's output percentage reduction at 38.4% is better than national (33.2%) and regional (35.7%) reductions. Emissions are reducing from each source; gas, electricity, and other fuel (Figure 3). The main source of emissions in this sector is the use of natural gas for heating and cooking.

Area	Area Domestic Total				Electricity			Gas		Other Fuels		
Area	2005	2016	% Diff	2005	2016	% Diff	2005	2016	% Diff	2005	2016	% Diff
England	126,264	84,286	-33.2%	52,844	26,176	-50.5%	65,429	51,707	-21.0%	7,991	6,403	-19.9%
North West	17,600	11,323	-35.7%	6,876	3,331	-51.6%	9,830	7,261	-26.1%	894	731	-18.2%
Wirral	823	507	-38.4%	323	148	-54.2%	484	346	-28.5%	16	13	-18.8%

Figure 3: Domestic emissions by source; national, regional and local comparisons (kilo tonnes) 2005-2016

Source: Department for Business, Energy & Industry Strategy: UK local authority and regional carbon dioxide emissions national statistics produced as Local Authority Carbon Dioxide **Emissions Estimates (2018)**

Notes: Domestic emissions represent emissions from energy consumption in and around the home, including emissions attributable to the use of electricity, but not activities by private individuals elsewhere. This sector can be influenced by the fuel types used, the type and condition of the housing, the average temperature, and household size, type of household and the income and preferences of the occupiers. Other Fuels: Bottled gas, liquid petroleum gas, coal, oil for central heating, paraffin and wood

Figure 4 demonstrates CO₂ kilo tonnes of emissions each year since 2005 in Wirral. Emissions from domestic electricity have reduced furthest, by 175 kilo tonnes (54.2%). In 2016 just 29.2% of domestic emissions were from electricity, this is compared to 39.2% in 2005. *The decrease in the use of coal for electricity generation, has led to a decrease in emissions for domestic electricity. Since coal has a higher carbon content than gas, more dioxide emissions result from burning 1 tonne of coal to generate a unit of power than from 1 tonne of gas. *Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/719182/Local_Authority_CO2_Emissions_Statistical_Release_2016.pdf

Туре	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Diff 2005-2016	% Diff 2005-2016
Domestic Total	823	814	780	779	704	744	643	693	669	551	533	507	-316	-38.4%
Gas	484	465	434	449	406	439	353	391	394	322	335	346	-138	-28.5%
Electricity	323	334	333	315	285	291	276	289	261	216	184	148	-175	-54.2%
Other Fuel	16	15	14	15	13	14	13	13	14	14	14	13	-3	-18.8%
Percentage share of Do	omestic ei	missions	each year											
Gas	58.8%	57.1%	55.6%	57.6%	57.7%	59.0%	54.9%	56.4%	58.9%	58.4%	62.9%	68.2%		
Electricity	39.2%	41.0%	42.7%	40.4%	40.5%	39.1%	42.9%	41.7%	39.0%	39.2%	34.5%	29.2%		
Other Fuel	1.9%	1.8%	1.8%	1.9%	1.8%	1.9%	2.0%	1.9%	2.1%	2.5%	2.6%	2.6%	1	

Figure 4: Yearly breakdown of domestic emissions in Wirral, reduction in 2016 compared to 2005 (kilo tonnes)

Source and Notes: See Figure 3 above. Not all percentages will add to 100% due to rounding

National and Local Transport CO₂ Emissions

Road transport* is the highest source of emissions in this sector, in particular passenger cars. Emissions from passenger cars have decreased since the early 2000s due to lower petrol consumption outweighing an increase in diesel consumption (less consumption in total) and more recently, improvements in fuel efficiency of both petrol and diesel cars. *Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/719182/Local_Authority_CO2_Emissions_Statistical_Release_2016.pdf

CO₂ output from transport sources has decreased nationally. Wirral's percentage decrease at 14.7% is better than national (8.3%) and regional (11.4%) decreases for each source (Figure 5).

Area	Tra	Transport Total			A Roads			Minor Roads			Transport Other		
Area	2005	2016	% Diff	2005	2016	% Diff	2005	2016	% Diff	2005	2016	% Diff	
England	87,123	79,865	-8.3%	49,601	44,130	-11.0%	35,979	33,984	-5.5%	1,544	1,751	13.4%	
North West	10,028	8,885	-11.4%	5,277	4,518	-14.4%	4,523	4,100	-9.4%	229	266	16.2%	
Wirral	367	313	-14.7%	172	142	-17.4%	192	169	-12.0%	2	2	0.0%	

Figure 5: Transport emissions by source; national, regional and local comparisons (kilo tonnes) 2005-2016

Source: Department for Business. Energy & Industry Strategy: UK local authority and regional carbon dioxide emissions national statistics produced as Local Authority Carbon Dioxide **Emissions Estimates (2018)**

Notes: Sum of CO₂ emission estimates for: Road Transport (A roads); Road Transport (Minor roads); Transport Other. The 'Other Transport' sector includes emissions from inland waterways, coal combustion in the rail sector and aircraft support vehicles. Transport emissions include freight and passenger transport, both private and for business purposed. The estimates are made on the basis of 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.

Figure 6 presents CO₂ kilo tonne emissions by year from 2005 to 2016. This suggests that output from vehicles using 'A' roads has reduced further than vehicles using minor roads. Most recently there have been slight increases for emissions in 2016 compared to 2015.

		-												
Туре	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Diff 2005-2016	% Diff 2005-2016
Transport Total	367	354	355	339	325	320	316	310	303	307	308	313	-54	-14.7%
A roads	172	165	161	151	144	142	143	141	137	138	141	142	-30	-17.4%
Minor roads	192	187	191	185	180	175	171	167	164	168	165	169	-23	-12.0%
Transport Other	2	2	2	2	2	2	2	2	2	2	2	2	0	0.0%
Percentage share of Tr	ansport e	missions	each year											
A roads	46.9%	46.6%	45.4%	44.5%	44.3%	44.4%	45.3%	45.5%	45.2%	45.0%	45.8%	45.4%		
Minor roads	52.3%	52.8%	53.8%	54.6%	55.4%	54.7%	54.1%	53.9%	54.1%	54.7%	53.6%	54.0%		
Transport Other	0.5%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.7%	0.7%	0.6%	0.6%		
ource and Notes: See Figure 5 above. Not all percentages will add to 100% due to rounding														

Figure 6: Yearly breakdown of transport emissions in Wirral, comparing reduction in 2016 compared to 2005 (kilo tonnes)

National and Local Industry and Commercial CO₂ Emissions

The information in Figure 7 suggests that total emissions from industry and commercial sources have decreased; the reduction being mostly from lower emissions from electricity production as a consequence to the decrease in the use of coal for electricity generation. Wirral's percentage decrease at 42.8% is better than national and regional decreases for each source with Wirral achieving an electricity emissions reduction of 62.1% between 2005 and 2016. However reduction in gas emissions was lower at 2.7% reduction over that same period and less than both North West LA areas (-19.2%) and England (-23.9%) respectively.

Area	Industry	& Commerc	ial Total		Electricity	,	Gas			
Alea	2005	2016	% Diff	2005	2016	% Diff	2005	2016	% Diff	
England	149,949	87,748	-41.5%	86,979	40,778	-53.1%	38,680	29,450	-23.9%	
North West	21,489	12,540	-41.6%	12,062	5,418	-55.1%	6,260	5,059	-19.2%	
Wirral	651	373	-42.8%	406	154	-62.1%	183	178	-2.7%	

Figure 7: Industry and commercial emissions by source, national, regional and local comparisons (kilo tonnes) 2005/2016

Source: Department for Business, Energy & Industry Strategy: UK local authority and regional carbon dioxide emissions national statistics produced as Local Authority Carbon Dioxide Emissions Estimates (2018)

Notes: 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.

In Wirral, with gas emissions remaining largely unchanged over this period, it has resulted in gas emissions now exceeding electricity for the first time. In 2005 28.0% of industrial and commercial emissions were from gas compared to 47.7% in 2016 (Figure 8). The main drivers of the decrease were a change in the fuel mix for electricity generation, with a decrease in the use of coal and more use of gas and renewables^{**}. ^{**}https://assets.publishing.service.gov.uk/government/uploads/attachment_data/file/719182/Local_Authority_CO2_Emissions_Statistical_Release_2016.pdf

-									•				,	,
Туре	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Diff 2005-2016	% Diff 2005-2016
Industry Total	651	650	646	606	508	541	442	502	492	388	390	373	-278	-42.8%
Electricity	406	430	418	399	323	335	273	292	282	216	195	154	-252	-62.1%
Gas	183	160	169	161	143	163	130	170	175	135	153	178	-5	-2.7%
Industry Other	63	60	59	46	42	43	39	40	35	38	42	41	-22	-34.9%
Percentage share of li	ndustry er	nissions	each yeai	•									·	
Electricity	62.3%	66.2%	64.7%	65.9%	63.5%	61.9%	61.7%	58.3%	57.4%	55.6%	50.0%	41.3%		
Gas	28.0%	24.6%	26.2%	26.5%	28.1%	30.2%	29.4%	33.8%	35.6%	34.7%	39.2%	47.7%		
Industry Other	9.7%	9.2%	9.1%	7.6%	8.3%	7.9%	8.9%	7.9%	7.0%	9.7%	10.8%	10.9%		
Source: Department for Bu	isiness, Ene	ergy & Indus	stry Strateg	y: UK loca	l authority	and region	al carbon d	lioxide emi	ssions nati	onal statist	ics produce	ed as Loca	I Authority Carbon	<u>Dioxide</u>
Emissions Estimatos (2018	b and													

Figure 8: Yearly breakdown of industry and commercial emissions in Wirral, comparing reduction in 2016 compared to 2005 (kilo tonnes)

Emissions Estimates (2018) and

Notes: Figure 8 Industry Total also includes 'other fuels' which includes oil, agriculture and large industrial installations. Not all percentages will add to 100% due to rounding

The Chartered Institute of Public Finance and Accountancy (CIPFA) <u>Nearest Neighbours model</u> seeks to measure similarity between Local Authorities. As such Wirral can be compared against 15 authorities that are most similar based on a wide range of key demographic indicators. These are endorsed by the government as a way to compare and benchmark ourselves statistically.

These authorities are: Sefton, North Tyneside, Redcar and Cleveland, Southend-on-Sea, Northumberland, Dudley, Torbay, Durham, St. Helens, Wigan, Rotherham, Bury, Calderdale, Darlington, Kirklees

- Wirral's Carbon Dioxide (CO₂) output reduction at 35.3% is identical to the average of our most similar group of local authorities
- Domestic output reduced by 38.4%. The average reduction across our similar authority group is 35%. Wirral's reduction in both electricity and gas output was greater than the average and as such ranked Wirral second amongst its statistical neighbours
- Transport output reduced by 14.7%. The average reduction across our similar authority group is 10.8%. Wirral's reduction in both 'A' Roads and Minor Roads output was greater than the average and as such ranked Wirral first amongst its statistical neighbours
- Industry and commercial output reduced by 42.8%. The average reduction across our similar authority group is 46.8%. Wirral ranks twelfth amongst its statistical neighbours

Local Authority	Total (LA Influence)	Domestic	Transport	Industry & Commercial							
Rotherham	43.3%	34.2%	10.9%	60.6%							
Redcar and Cleveland	41.2%	35.9%	12.1%	50.9%							
Northumberland	39.8%	32.9%	5.8%	58.0%							
St. Helens	38.0%	35.8%	11.5%	47.4%							
North Tyneside	37.0%	34.5%	11.1%	54.6%							
Torbay	36.2%	37.3%	6.1%	56.5%							
Bury	35.8%	36.1%	10.5%	50.9%							
Wirral	35.3%	38.4%	14.7%	42.8%							
Southend-on-Sea	35.0%	36.3%	10.4%	47.6%							
Dudley	34.8%	34.1%	13.3%	50.6%							
Wigan	34.0%	35.3%	13.3%	44.4%							
Kirklees	32.3%	32.7%	9.4%	42.4%							
Darlington	32.0%	32.7%	13.8%	40.1%							
Calderdale	31.9%	33.5%	12.0%	41.1%							
Durham	31.4%	31.8%	6.9%	45.3%							
Sefton	26.4%	38.7%	10.7%	16.5%							
Averages of statistical neight	oour group										
The average of those similar local authorities	35.3%	35.0%	10.8%	46.8%							
Rank across statistical neighbour group											
Wirral Rank (1st would be best) Source: <u>Department for Business, Ene</u>	8th	2nd	1st	12th							

Figure 9: CO₂ output reductions 2005-2016 (within influence of local authority)

Source: Department for Business, Energy & Industry Strategy: UK local authority and regional carbon dioxide emissions national statistics produced as Local Authority Carbon Dioxide Emissions Estimates (2018)

Cool Wirral

https://www.wirral.gov.uk/about-council/climate-change-and-sustainability/cool-wirral

Environment Agency

https://www.gov.uk/government/organisations/environment-agency

Department for Business, Energy & Industry Strategy Local Authority Carbon Dioxide Emissions Estimates 2016

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/fil e/719182/Local_Authority_CO2_Emissions_Statistical_Release_2016.pdf

Wirral Climate Change Strategy

https://www.wirral.gov.uk/sites/default/files/all/About%20the%20council/climate%20change/Wirral %20Climate%20Change%20Strategy%202014-2019.pdf

Relevant and related national and local strategies

Reducing UK emissions: 2018 Progress Report to Parliament

https://www.theccc.org.uk/wp-content/uploads/2018/06/CCC-2018-Progress-Report-to-Parliament.pdf

Gov.uk: Clean Growth Strategy

https://www.gov.uk/government/publications/clean-growth-strategy

Liverpool City Region Sustainable Energy Action Plan

https://www.liverpoollep.org/wp-content/uploads/2015/06/wpid-lcr-sustainable-energy-actionplan-07-2012.pdf

Intergovernmental Panel on Climate Change: Global Warming of 1.5°C

https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_High_Res.pdf

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