Cynulliad Cenedlaethol Cymru | National Assembly for Wales

Carbon dioxide emissions in Welsh local authorities

November 2013

Introduction

This research note includes statistical information on carbon dioxide emissions within local authorities. It includes data on all emissions within local authorities, and also on emissions within the scope of local authorities' influence. It is the second in a series of three statistical research notes produced by the Research Service relating to greenhouse gas emissions. The first covers all greenhouse gas emissions in Wales,[1] while the third will look at greenhouse gas emissions within devolved competence of the Welsh Government.

The UK Government's Department of Energy and Climate Change (DECC) currently publish data for carbon dioxide emissions rather than all greenhouse gas emissions, although they may do this in future if reliable estimates can be made.[2]

[1] Research Service, **Greenhouse Gas Emissions**, July 2013 [accessed 8 November 2013)

[2] Department for Energy and Climate Change, **Sub-national emissions statistics: Frequently asked questions**, page 9, July 2013 [accessed 8 November 2013]

Total carbon dioxide emissions within Welsh local authorities.

Carbon dioxide emissions for local authorities are calculated using the end-user approach. This distributes emissions according to the point of energy consumption, and **is useful for comparing emissions from energy use in local authority areas**. Emissions from aviation, shipping and military transport are excluded from these figures as there is no basis for allocating them to local areas.

Table 1 shows levels of carbon dioxide emissions in 2011 by sector and local authority, and also includes the ranking of the Welsh local authorities in terms of total emissions. Figure 1 shows the percentage change in total carbon dioxide emissions of Welsh local authorities between 2005 and 2011. Figure 2 shows the ranking of Welsh local authorities compared to all UK local authorities. Figures are published in kilo tonnes (Kt). It can be seen that:

- Of the Welsh local authorities, **Neath Port Talbot** had the highest level of carbon dioxide emissions in 2011 (the main contributor to this is the Tata Steelworks in Port Talbot). Of the 406 local authorities across the UK, **Neath Port Talbot** had the second highest level of carbon dioxide emissions, behind North Lincolnshire.
- **Merthyr Tydfil** had the lowest level of carbon dioxide emissions of all Welsh local authorities in 2011. Of the 406 UK local authorities, it had the 390th highest (17th lowest) level of carbon dioxide emissions in 2011.
- **Industrial and commercial emissions accounted for over half (54%) of carbon dioxide emissions in Wales in 2011**. Domestic and transport emissions accounted for 22% and 21% of emissions respectively.

It can be seen that between 2005 and 2011:

- Of the 22 Welsh local authorities, 19 saw a decrease in carbon dioxide emissions between 2005 and 2011. The **Isle of Anglesey** saw the greatest decrease, 34.8%. The three authorities that saw an increase in emissions were **Powys**, **Ceredigion** and **Gwynedd**.
- It is also interesting to note that **eight of the nine rural Welsh local authorities saw increases or lower than average decreases in carbon dioxide emissions between 2005 and 2011**. This is mainly due to increases in land use, land use change and forestry emissions over this period

Table 1: Carbon dioxide emissions by sector and local authority, 2011 (Kt CO_2)

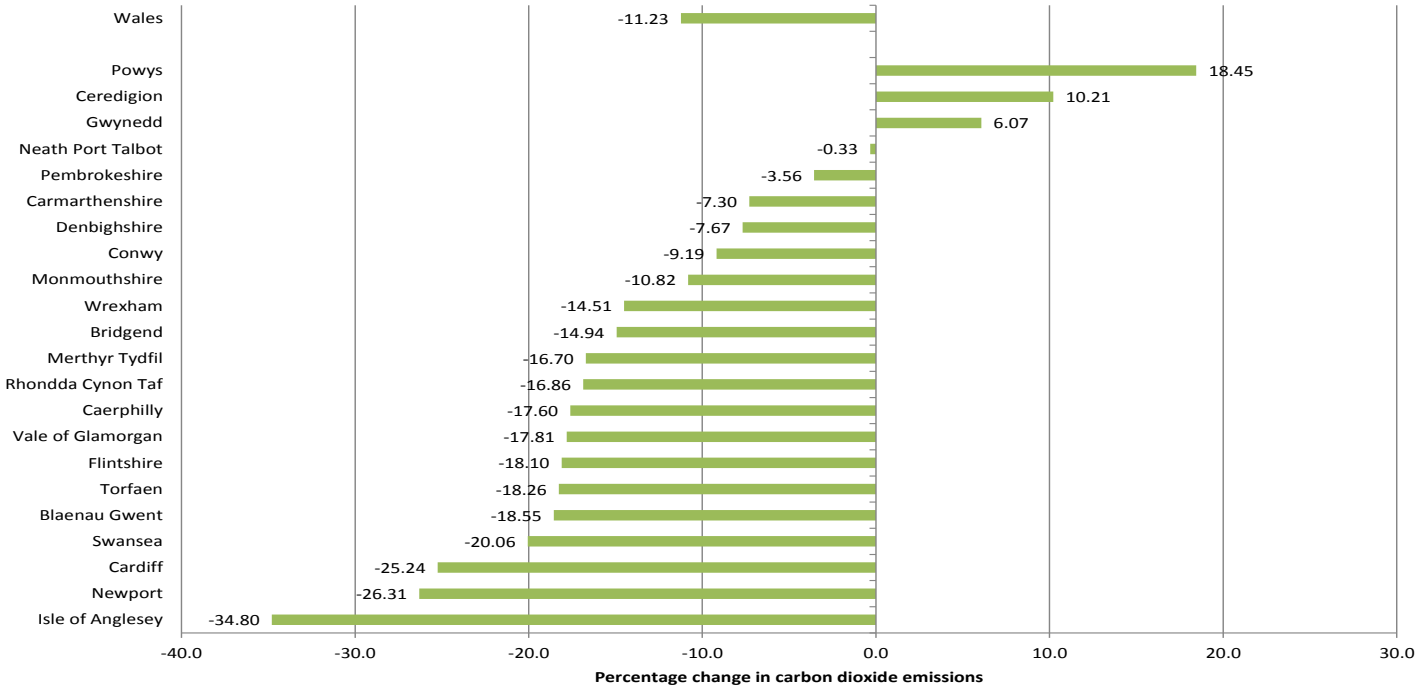
Local Authority	Industry and Commercial	Domestic	Transport	LULUCF (a)	Total	Welsh rank of total emissions (out of 22)
Isle of Anglesey	166	193	127	38	524	20
Gwynedd	261	302	263	87	913	13
Conwy	161	252	251	46	710	16
Denbighshire	187	212	190	40	629	18
Flintshire	919	388	364	16	1,688	3
Wrexham	715	291	218	22	1,246	9
Powys	354	360	338	169	1,221	10
Ceredigion	225	200	154	88	666	17
Pembrokeshire	567	303	219	76	1,166	11
Carmarthenshire	527	449	411	123	1,511	4
Swansea	476	481	361	18	1,336	6
Neath Port Talbot	6,918	281	280	21	7,500	1
Bridgend	409	268	283	19	980	12
Vale of Glamorgan	765	251	218	22	1,256	8
Cardiff	753	603	622	9	1,986	2
Rhondda Cynon Taf	400	466	437	19	1,321	7
Merthyr Tydfil	106	120	89	6	321	22
Caerphilly	309	345	240	13	908	14
Blaenau Gwent	136	144	77	5	362	21
Torfaen	235	168	135	5	543	19
Monmouthshire	241	201	345	32	820	15
Newport	782	264	436	8	1,490	5
Wales	**15,613**	**6,542**	**6,059**	**882**	**29,096**	..

Source: Research Service calculations from Department for Energy and Climate Change, **Local and regional CO2 emissions for 2005 to 2011: Full dataset** (full dataset tab)

Note:

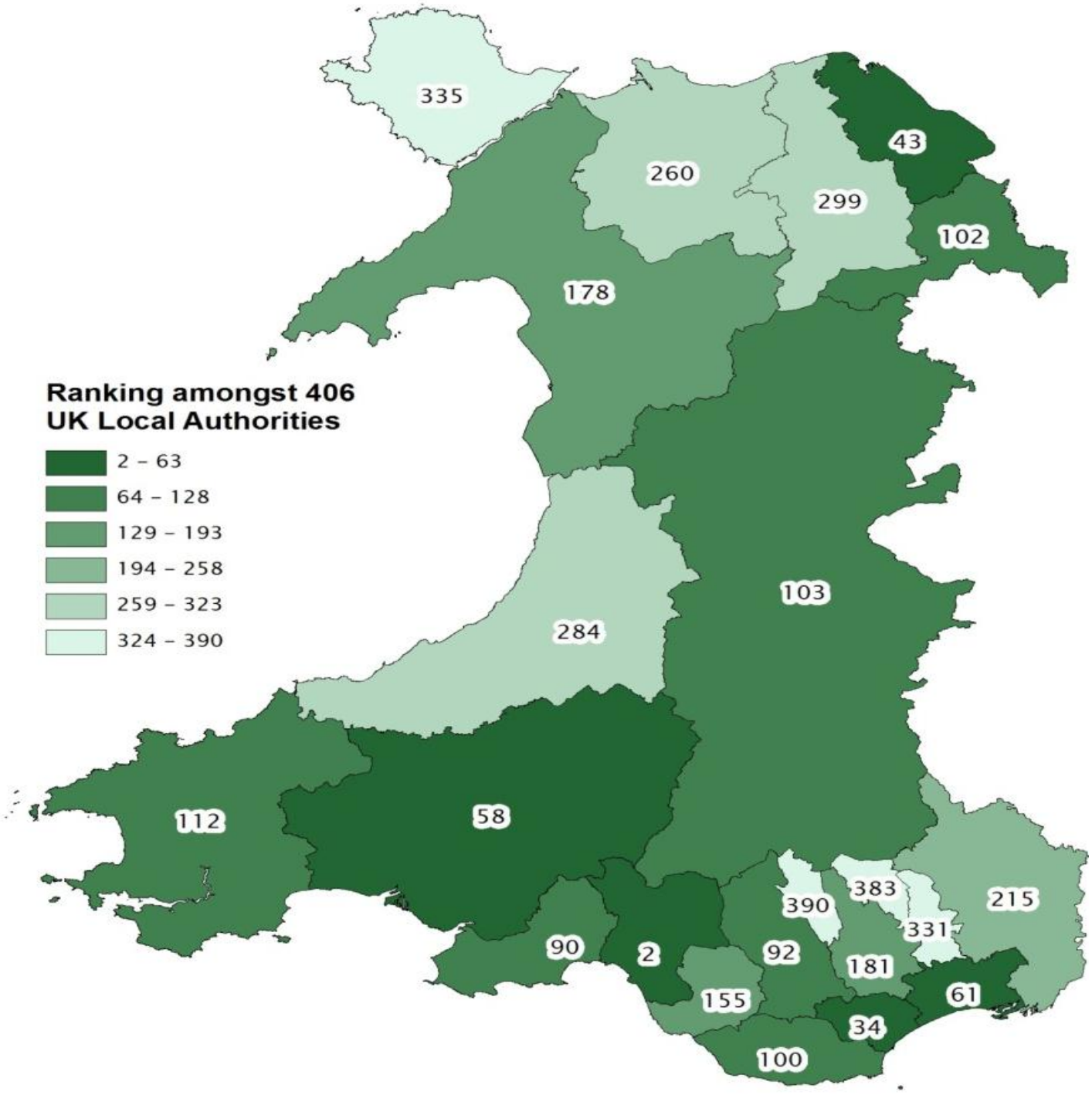
(a) LULUCF means Land use, land use change and forestry.

Figure 1: Percentage change in carbon dioxide emissions between 2005 and 2011, by Welsh local authority



Source: Research Service calculations from Department for Energy and Climate Change, **Local and regional CO2 emissions for 2005 to 2011: Full dataset** (full dataset tab).

Figure 2: Ranking of carbon dioxide emissions in comparison to UK local authorities, by Welsh local authority, 2011



Source: DECC and Research Service

Per capita emissions provide an indication of the level of emissions in comparison with the population of each local authority. Table 2 provides carbon dioxide emissions per capita in each Welsh local authority, broken down by sector.

The following observations can be made from table 2:

- **Neath Port Talbot** has the highest per capita emissions (53.6 tonnes per capita), largely influenced by also having the highest industry and commercial per capita emissions. The lowest emissions per capita are from **Caerphilly** (5.1 tonnes).
- The greatest variation was seen in the industry and commercial sector, where **Neath Port Talbot** had the highest emissions (49.5 tonnes) and **Conwy** had the lowest (1.4 tonnes).
- There is little variation in domestic emissions ranging from 1.7 tonnes per capita in **Cardiff** to 2.8 tonnes per capita in the **Isle of Anglesey**.
- **Monmouthshire** had the highest road transport emissions per capita at 3.8 tonnes per capita, while **Blaenau Gwent** had the lowest, at 1.1 tonnes per capita

Table 2: Carbon dioxide emissions per capita, by sector in Wales, 2011 (tonnes per capita)

Local Authority	Industry and Commercial	Domestic	Transport	LULUCF (a)	Total
Isle of Anglesey	2.4	2.8	1.8	0.5	7.5
Gwynedd	2.1	2.5	2.2	0.7	7.5
Conwy	1.4	2.2	2.2	0.4	6.2
Denbighshire	2.0	2.3	2.0	0.4	6.7
Flintshire	6.0	2.5	2.4	0.1	11.1
Wrexham	5.3	2.2	1.6	0.2	9.2
Powys	2.7	2.7	2.5	1.3	9.2
Ceredigion	3.0	2.7	2.0	1.2	8.8
Pembrokeshire	4.6	2.5	1.8	0.6	9.5
Carmarthenshire	2.9	2.4	2.2	0.7	8.2
Swansea	2.0	2.0	1.5	0.1	5.6
Neath Port Talbot	49.5	2.0	2.0	0.1	53.6
Bridgend	2.9	1.9	2.0	0.1	7.0
Vale of Glamorgan	6.0	2.0	1.7	0.2	9.9
Cardiff	2.2	1.7	1.8	0.0	5.8
Rhondda Cynon Taf	1.7	2.0	1.9	0.1	5.6
Merthyr Tydfil	1.8	2.0	1.5	0.1	5.4
Caerphilly	1.7	1.9	1.3	0.1	5.1
Blaenau Gwent	1.9	2.1	1.1	0.1	5.2
Torfaen	2.6	1.8	1.5	0.1	5.9
Monmouthshire	2.6	2.2	3.8	0.4	9.0
Newport	5.4	1.8	3.0	0.1	10.2
Wales	5.1	2.1	2.0	0.3	9.5

Source: Research Service calculations from Department for Energy and Climate Change, **Local and regional CO2 emissions for 2005 to 2011: Full dataset** (full dataset tab)

Note:

(a) LULUCF means Land use, land use change and forestry.

Carbon dioxide emissions within local authorities' influence

In addition to the total carbon dioxide emissions from local authorities, DECC also produces a subset of data which represents carbon dioxide emissions that are within the scope of influence of local authorities. This excludes several emission types deemed to be outside local authorities' influence. These are motorways, EU Emissions Trading System (EU ETS) sites,[3] diesel railways and Land use, land use change and forestry.[4]

Table 3 shows the carbon dioxide emissions within local influence for 2011 by sector and local authority, and also includes the ranking of the Welsh local authorities in terms of emissions within their scope of influence. Figure 3 shows the percentage decrease in these figures since 2005. Figure 4 shows the ranking of Welsh local authorities compared to all UK local authorities.

It can be seen that:

- **Cardiff** emitted the most carbon dioxide from sources within its influence in 2011 though it has also reduced its emissions by 25.8% between 2005 and 2011, the third largest decrease of all Welsh local authorities.
- The industrial and commercial emissions under local authority influence **of Neath Port Talbot**, the **Vale of Glamorgan**, **Newport** and **Flintshire** are much lower that the total emissions. This is mainly due to the exclusions of sites within the EUETS trading scheme.
- All local authorities in Wales reduced the carbon dioxide emission within the scope of their influence between 2005 and 2011. The reduction in emissions under local authorities influence across Wales as a whole was 18.8%.
- Across all 406 UK local authorities **Cardiff** had the 29th highest emissions and **Merthyr Tydfil** (with the lowest emissions in Wales) had the 391st highest in 2011

[3] The **EU Emissions Trading Scheme** (EU ETS) is a cap set on the total amount of certain greenhouse gases that can be emitted by the factories, power plants and other installations in the system. The cap is reduced over time so that total emissions fall. In 2020, emissions from sectors covered by the EU ETS will be 21% lower than in 2005. Within the cap, companies receive or buy emission allowances which they can trade with one another as needed. They can also buy limited amounts of international credits from emission-saving projects around the world.

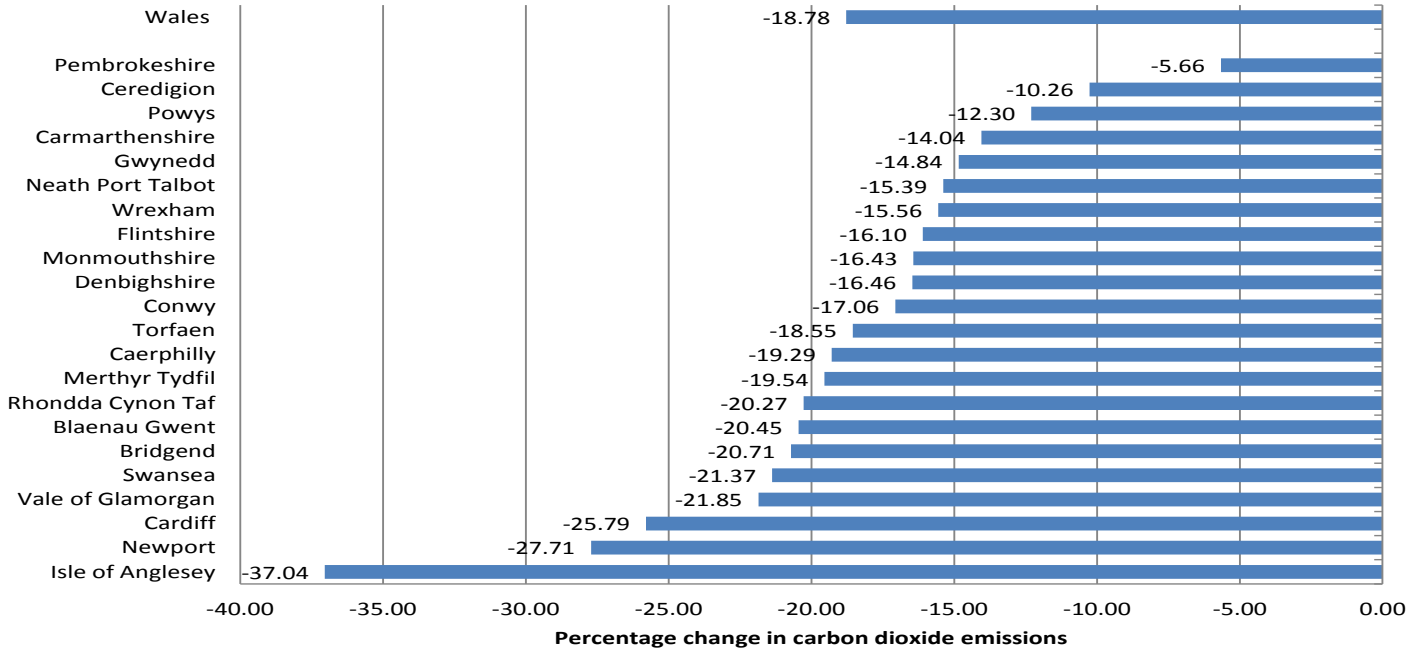
[4] Department for Energy and Climate Change, **2011 Local Authority CO2 emissions estimates: Statistical Summary**, page 20, July 2013 [accessed 5 November 2013]

Table 3: Carbon dioxide emissions within the scope of local authorities by sector and local authority, 2011 (kt CO_2)

Local Authority	Industry and Commercial	Domestic	Road Transport	Total	Welsh rank of total emissions (out of 22)	UK rank /406 (of total emissions)
Isle of Anglesey	166	193	125	484	20	335
Gwynedd	261	302	258	821	12	173
Conwy	161	252	247	660	16	249
Denbighshire	187	212	187	586	17	277
Flintshire	609	388	360	1,357	2	59
Wrexham	715	291	215	1,221	6	78
Powys	354	360	335	1,050	10	109
Ceredigion	193	200	151	544	18	302
Pembrokeshire	556	303	216	1,075	9	104
Carmarthenshire	487	449	385	1,321	3	63
Swansea	476	481	274	1,231	4	75
Neath Port Talbot	712	281	166	1,158	7	89
Bridgend	353	268	171	793	13	190
Vale of Glamorgan	278	251	181	709	14	220
Cardiff	742	603	506	1,852	1	29
Rhondda Cynon Taff	400	466	360	1,225	5	76
Merthyr Tydfil	106	120	86	312	22	391
Caerphilly	309	345	236	890	11	142
Blaenau Gwent	136	144	77	357	21	383
Torfaen	232	168	133	533	19	307
Monmouthshire	241	201	250	692	15	233
Newport	620	264	214	1,099	8	100
Wales	8,295	6,542	5,134	19,970	..	..

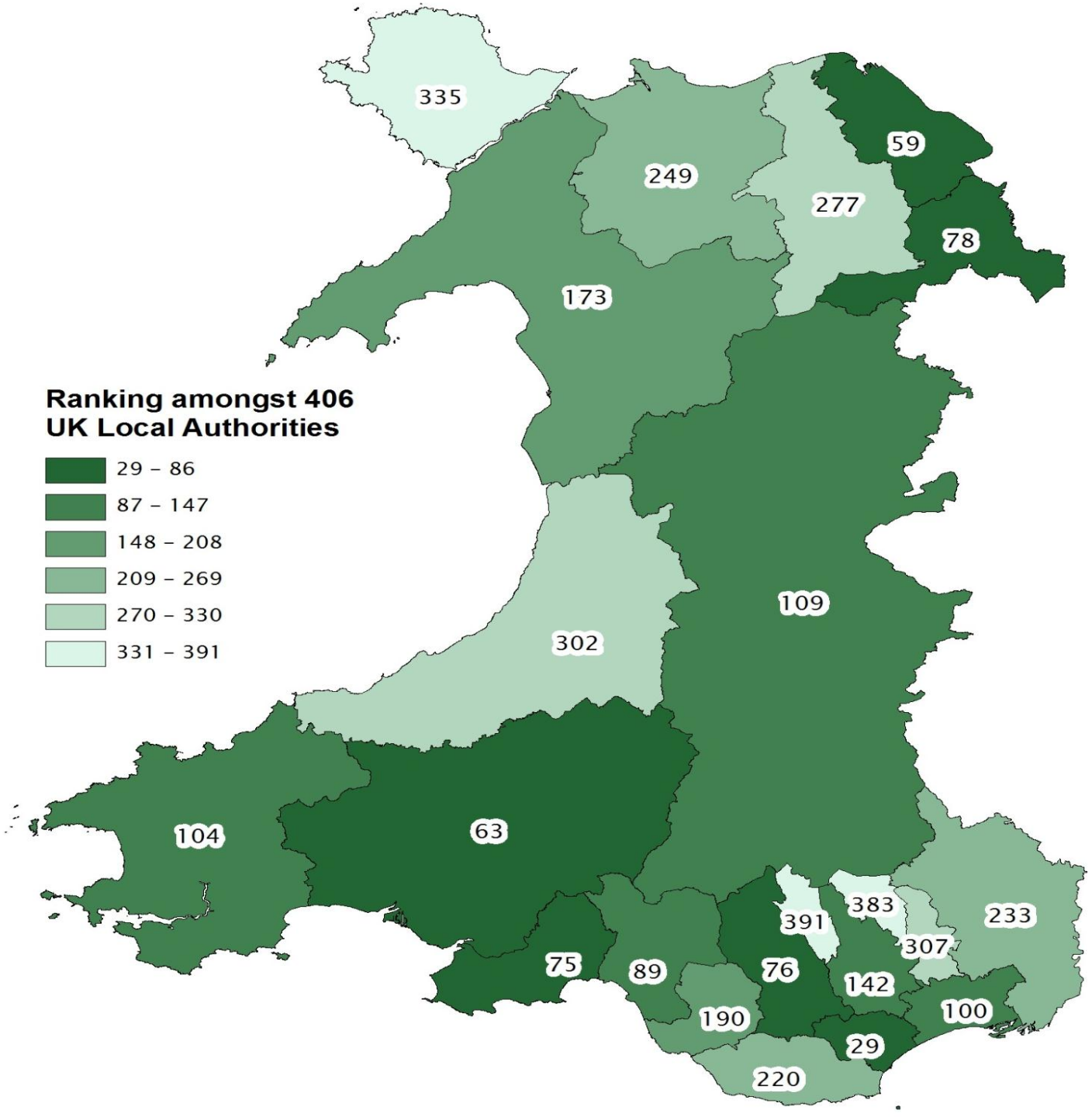
Source: Department for Energy and Climate Change, **Emissions within the scope of influence of local authorities for 2005-2011** (indicator dataset tab)

Figure 3: Percentage change in carbon dioxide emissions within the scope of local authorities' influence between 2005 and 2011, by Welsh local authority



Source: Research Service calculations from Department for Energy and Climate Change, **Emissions within the scope of influence of local authorities for 2005-2011** (indicator dataset tab)

Figure 4: Ranking of carbon dioxide emissions within the scope of local authorities' influence in comparison to UK local authorities, by Welsh local authority, 2011



Source: DECC and Research Service

Per capita emissions within the influence of local authorities in 2011 are shown in table 4. The following observations can be made from table 4:

- **Wrexham** has the highest per capita emissions (9.0 tonnes per capita), largely influenced by also having the highest industry and commercial per capita emissions. The lowest emissions per capita are from **Caerphilly** (5.0 tonnes).
- The greatest variation was seen in the industry and commercial sector, where **Wrexham** had the highest emissions (5.3 tonnes) and **Conwy** had the lowest (1.4 tonnes).
- There is little variation in domestic emissions ranging from 1.7 tonnes per capita in **Cardiff** to 2.8 tonnes per capita in the **Isle of Anglesey**.
- **Monmouthshire** had the highest road transport emissions per capita at 2.7 tonnes per capita, while **Swansea** and **Blaenau Gwent** had the lowest, at 1.1 tonnes per capita.

Table 4: Carbon dioxide emissions within the scope of local authorities per capita, by sector in Wales, 2011 (tonnes per capita)

Local Authority	Industry and Commercial	Domestic	Road Transport	Total
Isle of Anglesey	2.4	2.8	1.8	6.9
Gwynedd	2.1	2.5	2.1	6.8
Conwy	1.4	2.2	2.1	5.7
Denbighshire	2.0	2.3	2.0	6.2
Flintshire	4.0	2.5	2.4	8.9
Wrexham	5.3	2.2	1.6	9.0
Powys	2.7	2.7	2.5	7.9
Ceredigion	2.6	2.7	2.0	7.2
Pembrokeshire	4.5	2.5	1.8	8.8
Carmarthenshire	2.6	2.4	2.1	7.2
Swansea	2.0	2.0	1.1	5.2
Neath Port Talbot	5.1	2.0	1.2	8.3
Bridgend	2.5	1.9	1.2	5.7
Vale of Glamorgan	2.2	2.0	1.4	5.6
Cardiff	2.1	1.7	1.5	5.4
Rhondda Cynon Taff	1.7	2.0	1.5	5.2
Merthyr Tydfil	1.8	2.0	1.5	5.3
Caerphilly	1.7	1.9	1.3	5.0
Blaenau Gwent	1.9	2.1	1.1	5.1
Torfaen	2.5	1.8	1.5	5.8
Monmouthshire	2.6	2.2	2.7	7.6
Newport	4.3	1.8	1.5	7.5
Wales	2.7	2.1	1.7	6.5

Source: Research Service calculations from Department for Energy and Climate Change, **Emissions within the scope of influence of local authorities for 2005-2011** (per capita tab)

Further information

For further information about carbon dioxide emissions in Welsh local authorities, please contact **Gareth Thomas** (GarethDavid.Thomas@Wales.gov.uk), Research Service.

See also:

- Department for Energy and Climate Change, **Local Authority Carbon Dioxide Emissions 2011**
- Research Service, **Greenhouse Gas Emissions**

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