



WELWYN HATFIELD

Report name: 2021 Boroughwide GHG assessment

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Author: Kelly Murphy

Position: Climate Change Officer

1 METHODOLOGY

1.1 Context

A carbon footprint (often called a greenhouse gas assessment) quantifies greenhouse gases produced by an organisation's activities. A GHG assessment is an essential step in any path to net zero as it identifies emissions hotspots, allows reduction targets to be set and endorses consistent monitoring.

GHG emissions are measured in terms of kilotons carbon dioxide equivalence (ktCO₂e), where equivalence means having the same warming effect as CO₂ over a period of 100 years.

1.2 Approach

The Department of Energy Security and Net Zero annually publish Green House Gas (GHG) emissions, at sub national level.

The full methodology and dataset can be found here; [UK local authority and regional greenhouse gas emissions national statistics, 2005 to 2021 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics-2005-to-2021)

The data was updated most recently in June 2023 and reports on emissions relating to the 2021 calendar year. (There is always an 18-month time lag due to the complexity of the data collection process).

See full data set in Appendix A.

2 2021 WELWYN HATFIELD BOROUGHWIDE EMISSIONS

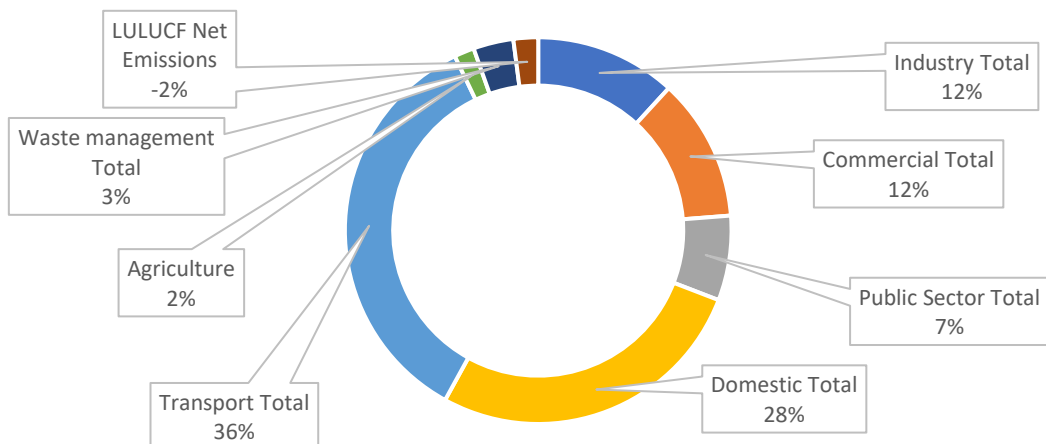
2.1 GHG emissions summary

Using this data, we can report that the borough of Welwyn Hatfield was responsible for emitting 598.9 ktCo2e in 2021.

Table 1. Total emission by source for 2021

Sector	ktCo2e	%
Industry Total	73.8	12.3
Commercial Total	74.7	12.5
Public Sector Total	44.3	7.4
Domestic Total	169.6	28.3
Transport Total	218.0	36.4
Agriculture	10.5	1.7
Waste management Total	21.0	3.5
LULUCF Net Emissions	-12.9	-2.2
Total Emissions	598.9	100

Figure 1 – Percentage of emissions by source for 2021



3 KEY FINDINGS

3.1 Overview

- The largest emissions source in 2021 was transport (36%), followed by domestic energy use (28%).
- Land use, land use change and forestry saw emissions reduction of 2% through carbon sequestration.

3.2 Transport

- Emissions from transport were predominantly associated with motorways and the council has little control or influence over these.
- The council will continue to work with Hertfordshire County Council to encourage and enable more active and sustainable travel within our Borough and the County.

3.3 Domestic energy

- The majority of emissions from domestic properties came from the use of mains gas.
- The council has a programme in place to retrofit the social housing stock. This has been supported by £2.8 million of central government funding (through the social housing decarbonisation fund).
- The council supports private homeowners on home energy efficiency improvements by promoting various funding schemes and signposting to energy use behavioural advice.

3.4 Commercial energy

- Commercial electricity is the highest emissions source in this category.
- The council does not have direct control over how businesses operate, however we have a business forum, where we offer advice and assistance to SME's on carbon accounting, carbon reduction journeys and wider sustainability goals.

3.5 Industry energy

- Electricity use is the highest emissions source in this category.
- This area is out of the Council's direct control, and we have limited influence, however, we plan to engage with more Industries based in Welwyn Hatfield around the topic of climate change and the associated environmental issues.

3.6 Public sector energy

- Emissions in this category were predominantly from the use of mains gas.
- In 2021 WHBC were awarded £2.3 of central government funding (public sector decarbonisation scheme) which saw improvements to three of our largest commercial properties. We will continue to invest in the decarbonisation of our commercial portfolio.

3.7 Waste Management

- Waste sent to landfill accounted for 12.3 ktCO₂e.
- The Council continues to improve our borough wide recycling rate and overall amount of waste being sent to landfill.

- WHBC will continue to engage with and educate residents with up-to-date best practise on the circular economy.

3.8 Agriculture

- Livestock (4.3ktCo2e) followed by soils (3.1ktCo2e) are responsible for the largest proportion of emissions within the category of agriculture.
- This area is out of the Council's direct control, and we have limited influence, however, we plan to engage with farmers more around the topic of climate change and the associated environmental issues.

3.9 Land Use and Land Use Change and Forestry

- Forest land and grassland captures and stores 18.3 ktCo2e within our borough.
- The council manages parks, woodlands and open spaces to ensure we maintain and improve our natural environment.
- We have a number of planting projects around the borough to help with climate change mitigation and adaptation.

4 METRICS AND LOCAL COMPARISON

4.1 Metrics

Intensity ratios can help to normalise emissions and assist with comparisons over periods of time.

We can express boroughwide emissions in terms of population number (per capita) and land area (per km²).

Table 2 shows the intensity ratios per capita and per km²

Metric	Co2e
Per capita (tCo2e)	5.0
km ² (ktCo2e)	4.6

4.2 Comparison to other districts and boroughs in Hertfordshire

Using these metrics we can compare emissions to the other local authorities within Hertfordshire.

Table 3 shows the intensity ratios per capita and per km² for all Hertfordshire Local Authorities

Local Authority	Total (ktCo2e)	Per capita (tCo2e)	Per km ² (ktCO2e)
Broxbourne	362.1	3.7	7.0
Dacorum	699.3	4.5	3.3
East Herts	717.9	4.8	1.5
Hertsmere	666.7	6.2	6.6
North Herts	684.4	5.1	1.8
St Albans	896.7	6.0	5.6
Stevenage	376.7	4.2	14.5
Three Rivers	552.9	5.9	6.2
Watford	411.9	4.0	19.2
Welwyn Hatfield	598.9	5.0	4.6

WHBC has the fourth lowest emissions rate per km², and the sixth lowest emissions per capita in Hertfordshire.

5 YEAR ON YEAR COMPARISON

5.1 Annual comparison

GHG emissions have been consistently reported since the baseline year of 2005.

Table 3 and figure 2 illustrates the recent history and state of emissions in the borough and highlights the steady decline in emissions from 2005 to 2021.

Table 3. INSERT landscape table

Figure 2 Annual borough wide emissions from 2005 to 2021

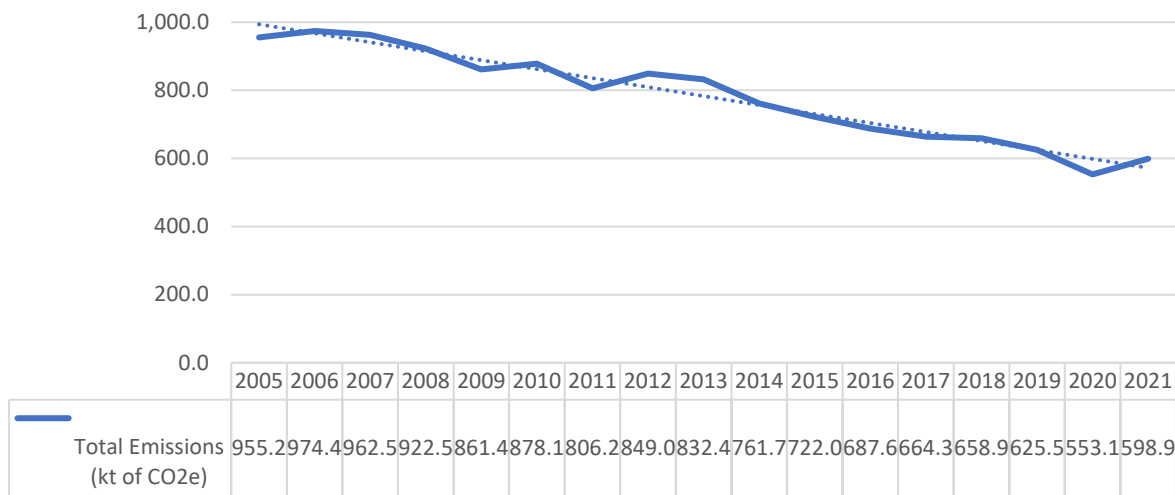


Table 4 highlights the year on year percentage change in GHG emissions from 2005 (the baseline) to the most recent calendar year (2021).

Table 4 Emission percentage change from the previous year and the baseline year

Year	% change from previous year	% change from baseline (2005)
2021	8%	-37
2020	-12	-42
2019	-5	-35
2018	-1	-31
2017	-3	-30
2016	-5	-28
2015	-5	-24
2014	-8	-20
2013	-2	-13
2012	5	-11
2011	-8	-16
2010	2	-8
2009	-7	-10
2008	-4	-3
2007	-1	1
2006	2	2
2005	N/A	N/A

There has been an emissions reduction in all but 3 of the past 17 years, namely in 2010, 2012 and 2021.

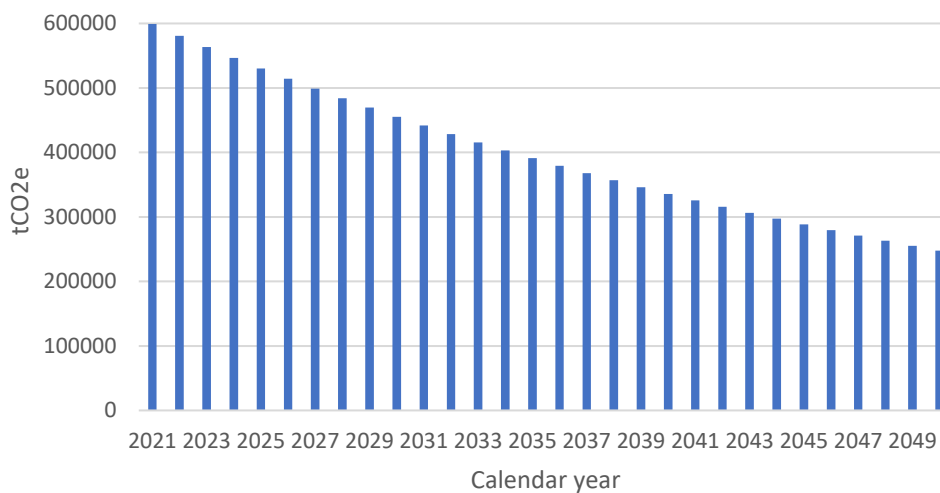
Emissions in 2021 increased from 2020 by 8%, most likely as a result of the impacts of the Covid 19 Pandemic, which resulted in national restrictions and closure of public buildings in 2020. This led to a drastic change in how people worked and lived their daily lives.

It should be noted that emission levels in 2021 did not exceed pre covid levels of 2019, and since the baseline year of 2005, there has been a 37% decrease in overall emissions.

6 TRAJECTORY

We have targets to be net zero as an organisation by 2030 and as a borough by 2050. The data, therefore, clearly demonstrates the scale of the challenge we face within our community.

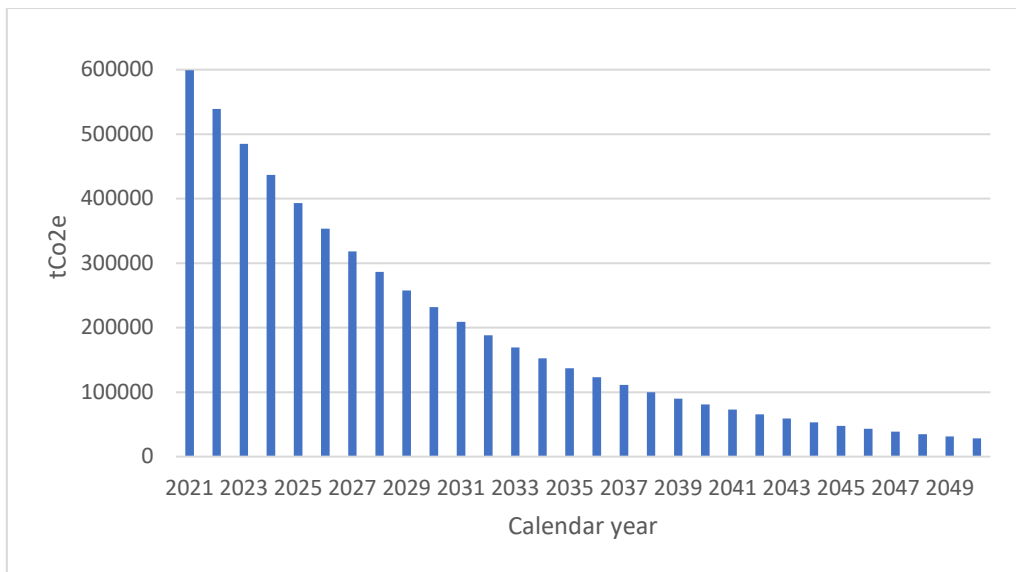
Figure 3 Reduction trajectory based on the historical average of 3% reduction per year



The average annual reduction rate from 2005 to 2021 is 3%. If we apply this reduction rate to create a future scenario, we would have just under 250,000 tCo2e of unabated emissions in 2050.

We would require at least a 10% year on year reduction in order to keep our aspirations of being a net zero borough by 2050 attainable.

Figure 4 Reduction trajectory based on a 10% reduction per year



Under this trajectory, we would still have 28,211.69 tCo2e of unabated emissions that would require offsetting.

It is clear we need to introduce large scale interventions, have access to funding sources and gain a high uptake of widespread behavioural change in order to achieve our borough wide net zero target of 2050.

APPENDIX A - THE BREAKDOWN OF ACTIVITY DATA FOR THE WELWYN HATFIELD DISTRICT DATING BACK TO 2005.

ktCO2e Breakdown	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Industry Electricity	37.33	39.79	39.04	38.74	36.95	39.13	37.34	41.13	38.76	33.14	28.36	21.38	32.07	39.49	38.30	29.52	32.53
Industry Gas	14.94	14.02	12.34	12.14	10.46	11.89	9.60	10.70	11.51	9.86	9.92	8.85	8.07	10.80	12.21	12.06	14.45
Large Industrial Installations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.08	0.29	0.55	0.21	0.19	0.19
Industry 'Other'	33.19	34.57	32.97	29.42	31.76	42.07	35.93	36.19	38.86	39.51	32.89	32.14	30.54	33.80	28.98	24.72	26.59
Industry Total	85.46	88.38	84.35	80.30	79.17	93.09	82.87	88.02	89.13	82.51	71.25	62.45	70.96	84.64	79.69	66.50	73.77
Commercial Electricity	156.49	166.83	163.66	162.42	154.92	164.05	156.55	172.42	162.50	138.92	118.90	95.05	70.39	60.79	53.85	47.18	53.67
Commercial Gas	35.60	33.41	29.41	28.95	24.94	28.34	22.89	25.51	27.44	23.50	23.64	25.59	22.87	17.82	15.70	16.85	19.79
Commercial 'Other'	1.31	1.32	1.12	1.36	1.35	1.19	1.25	0.93	0.98	1.17	1.06	0.97	1.04	2.00	1.76	1.00	1.19
Commercial Total	193.40	201.56	194.19	192.73	181.21	193.58	180.69	198.86	190.92	163.59	143.61	121.61	94.30	80.61	71.31	65.03	74.65
Public Sector Electricity	18.94	20.19	19.80	19.65	18.75	19.85	18.94	20.86	19.66	16.81	14.39	13.62	17.29	18.33	16.31	14.65	17.64
Public Sector Gas	29.11	27.32	24.05	23.67	20.39	23.17	18.71	20.86	22.43	19.21	19.33	17.19	21.13	26.49	23.25	23.26	26.22
Public Sector 'Other'	6.97	5.06	4.53	3.28	3.08	2.98	3.42	2.85	3.00	2.93	0.59	0.65	0.71	0.65	0.54	0.46	0.48
Public Sector Total	55.01	52.56	48.38	46.60	42.22	46.00	41.07	44.57	45.10	38.95	34.31	31.45	39.13	45.46	40.10	38.36	44.33
Domestic Electricity	109.68	115.62	115.12	109.66	99.69	102.72	98.18	104.06	94.83	80.34	68.75	55.93	48.37	44.06	39.39	37.91	38.74
Domestic Gas	146.67	142.60	135.97	140.32	129.99	143.82	118.37	129.93	134.78	112.50	118.76	124.01	118.96	120.07	118.11	118.28	124.06
Domestic 'Other'	8.20	7.89	7.90	8.48	7.84	8.38	7.84	7.57	7.89	7.35	7.41	7.34	7.41	7.51	7.10	6.90	6.80
Domestic Total	264.54	266.11	258.99	258.46	237.52	254.92	224.39	241.55	237.51	200.19	194.92	187.28	174.75	171.65	164.59	163.09	169.60
Road Transport (A roads)	62.07	62.70	63.48	61.58	58.15	57.15	56.81	55.52	55.81	58.06	58.19	59.52	57.41	56.03	54.33	42.36	44.84
Road Transport (Motorways)	114.04	119.26	120.04	117.84	108.93	99.15	102.65	106.15	105.23	107.22	109.67	111.63	109.75	106.29	104.71	89.65	96.66
Road Transport (Minor roads)	98.00	104.58	106.87	96.93	92.36	88.69	86.62	85.60	84.08	85.48	85.73	88.02	92.37	87.90	83.61	67.82	69.34
Diesel Railways	7.72	7.74	7.39	7.42	7.47	7.57	7.31	7.37	7.23	7.38	7.29	7.25	7.17	6.77	6.95	5.28	5.72
Transport 'Other'	1.58	1.69	1.66	1.67	1.52	1.46	1.43	1.41	1.43	1.42	1.39	1.32	1.32	1.32	1.45	1.45	1.48
Transport Total	283.41	295.98	299.45	285.45	268.41	254.01	254.82	256.05	253.78	259.55	262.27	267.74	268.01	258.32	251.05	206.55	218.04

ktCO2e Breakdown	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Net Emissions: Forest land	-15.76	-15.91	-15.96	-16.19	-16.33	-16.52	-16.56	-16.08	-16.20	-16.29	-16.12	-16.17	-16.10	-16.07	-16.00	-15.93	-15.84
Net Emissions: Cropland	2.10	2.12	2.05	1.90	2.11	2.10	2.06	2.17	2.10	2.05	2.02	2.07	2.13	2.14	2.15	2.20	2.23
Net Emissions: Grassland	-1.53	-1.59	-1.67	-1.74	-1.78	-1.70	-1.72	-1.81	-2.05	-1.74	-2.28	-1.98	-2.26	-2.20	-2.36	-2.43	-2.46
Net Emissions: Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Emissions: Settlements	3.70	3.67	3.57	3.60	3.42	3.55	3.47	3.36	3.22	3.18	3.22	3.48	3.20	3.51	3.26	3.13	3.11
Net Emissions: Harvested Wood Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Emissions: Indirect N2O	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
LULUCF Net Emissions	-11.40	-11.63	-11.92	-12.36	-12.49	-12.49	-12.67	-12.28	-12.85	-12.72	-13.09	-12.53	-12.95	-12.54	-12.88	-12.97	-12.89
Agriculture Electricity	0.51	0.54	0.53	0.53	0.50	0.53	0.51	0.56	0.53	0.45	0.38	0.35	0.70	0.94	0.86	0.55	0.60
Agriculture Gas	0.68	0.63	0.56	0.55	0.47	0.54	0.43	0.48	0.52	0.45	0.45	0.38	0.43	0.36	0.78	0.42	0.61
Agriculture 'Other'	1.77	1.74	1.77	2.03	1.88	1.74	1.53	1.85	1.55	1.63	1.82	1.69	1.79	1.78	1.59	1.54	1.80
Agriculture Livestock	4.69	5.50	4.48	4.61	4.45	4.36	4.32	4.23	4.38	4.46	4.52	4.60	4.68	4.55	4.81	4.47	4.32
Agriculture Soils	3.57	3.62	3.29	3.69	3.54	3.42	3.48	3.38	3.87	3.90	3.52	3.74	3.38	3.33	3.95	3.13	3.13
Agriculture Total	11.22	12.03	10.63	11.40	10.84	10.59	10.28	10.51	10.85	10.88	10.70	10.76	10.98	10.96	12.00	10.11	10.45
Landfill	67.94	63.07	71.84	53.44	47.98	31.69	17.66	14.55	10.62	10.76	9.93	10.63	10.56	11.31	11.32	8.27	12.27
Waste Management 'Other'	5.61	6.28	6.62	6.45	6.53	6.74	7.07	7.13	7.35	8.00	8.08	8.19	8.59	8.51	8.39	8.25	8.74
Waste Management Total	73.55	69.35	78.46	59.89	54.51	38.43	24.73	21.69	17.96	18.76	18.01	18.81	19.15	19.82	19.71	16.52	21.00
Grand Total	955.18	974.35	962.52	922.46	861.39	878.14	806.18	848.96	832.40	761.70	721.97	687.58	664.33	658.91	625.57	553.18	598.96
% Difference from 2005 emissions total	0	2.01	0.77	-3.43	-9.82	-8.07	-15.60	-11.12	-12.85	-20.26	-24.42	-28.02	-30.45	-31.02	-34.51	-42.09	-37.29
% Difference from previous year	0.00	2.01	-1.21	-4.16	-6.62	1.94	-8.19	5.31	-1.95	-8.49	-5.22	-4.76	-3.38	-0.82	-5.06	-11.57	8.27
Population ('000s, mid-year estimate)	103.20	105.10	106.69	107.44	108.43	109.63	110.73	111.38	112.34	113.15	114.19	116.43	117.48	117.61	117.99	118.72	119.54
Sum of Area (km2)	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54	129.54
Per Capita Emissions (tCO2e)	9.26	9.27	9.02	8.59	7.94	8.01	7.28	7.62	7.41	6.73	6.32	5.91	5.65	5.60	5.30	4.66	5.01
Sum of Emissions per km2 (ktCO2e)	7.37	7.52	7.43	7.12	6.65	6.78	6.22	6.55	6.43	5.88	5.57	5.31	5.13	5.09	4.83	4.27	4.62
National Total (ktCO2e)	656,867.3	649,603.2	634,904.3	614,046.7	558,455.6	571,129.5	525,842.8	544,172.6	531,229.2	491,490.8	475,077.9	449,383.5	437,824.4	430,745.5	416,856.7	376,807.8	399,046.1