Harborough District Council District Emissions Report 2020/21

September 2021

Introduction

Harborough District Council declared a Climate Emergency in July 2019. This followed on from many years working on action plans devised as part of the Local Government Association initiative; “Climate Local”, which Harborough District Council committed to in 2013.

A Climate Emergency Action Plan is in preparation, but the final consultation has been delayed by the Covid-19 pandemic.

This report brings together information on the greenhouse gas emissions for the whole of Harborough District for 2020/21, based upon various UK Government datasets. It helps to set the scene for the areas of action identified for the forthcoming action plan.

Harborough District

Harborough District is a mainly rural district covering an area of 238 square miles of south and east Leicestershire. It is within the East Midlands Region, bordering Warwickshire to the west, Northamptonshire to the south and Rutland to the east. The district’s population is estimated as 93,807 in 2019 mid-year population[1]. The population is split between the two market towns of Market Harborough and Lutterworth, large villages of Broughton Astley, Great Glen, Kibworth and Fleckney, and Bushby, Thurnby and Scraptoft which part of Leicester’s Principal Urban Area. The remaining population live in the smaller rural settlements, many of which have a population of less than 500.

The district is generally affluent and people are generally healthier than the England average[2]. The district has an aging population this trend is expected to grow over the next few years to 2030. Housing in the district is made up of a higher proportion of detached homes than the England average. Homes also tend to be larger and many properties were built before 1900.

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[1] https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/middlesuperoutputareamidyearpopulationestimates published October 2019

[2] https://www.localhealth.org.uk/#bbox=434253,314436,66088,41119&c=indicator&view=map7 published 2019

Most companies in the district are small and medium enterprises (SMEs) and have smaller numbers of employees. The exception to this is the logistics hub around Magna Park close to Lutterworth. Many residents in the district commute to nearby larger cities and towns for employment.

Harborough is relatively poor in biodiversity and geodiversity terms. 1.21% of the district's area is covered by Sites of Special Scientific Interest (SSSI) while a further 0.42% is covered by Local Wildlife Site (LWS) designations. There are several SSSIs in the east of the District protecting the remains of ancient woodland which are of high nature conservation, landscape and historical importance. The District has one geological SSSI, the Tilton Railway Cutting. The total area of woodland is 2497ha or 4.21% of the district compared to 10% in England.[3]

Greenhouse Gas Emissions in Harborough District

Greenhouse gases

There are a number of gases that act as greenhouse gases. Carbon Dioxide (CO_2) is the most abundant and as it is part of a complex carbon cycle it can remain in the atmosphere for may hundreds of years. In recent years the concentration in the atmosphere has risen from around 300 parts per million(ppm) in the 1950s to over 400ppm now.

Methane (CH_4) is an important naturally occurring greenhouse gas, produced by waste decomposition. It is present in the atmosphere at much lower concentrations than CO_2, currently around 1800 parts per billion (ppb), an increase from around 700ppb in pre-industrial times. Methane is, however, a more potent greenhouse gas and is around 25 time stronger than CO_2. Methane remains in the atmosphere for a shorter time, with a lifespan of around 12 years.

Nitrous Oxide (N_20) is a by product of combustion and is also an important greenhouse gas. It remains in the atmosphere for 100s of years and is about 300

[3] Harborough Local Plan 2011 -2031 Adopted Local Plan | Harborough Local Plan 2011-2031 | Harborough District Council

times as potent as CO_2. Atmospheric concentrations, however, are low at around 324ppb and are increasing more slowly than CO_2 or methane.

Fluorinated gases are man-made gases for industrial processes. They exist in the atmosphere in very low concentrations but have high greenhouse gas potential and remain in the atmosphere for 1000s of years. Local data for sources and concentrations is not available for fluorinated gases.

Carbon Emissions

The emissions data for Harborough District from 2019 is the most recent data available for monitoring emissions[4]. This data includes all emissions from the area. Road transport remains the largest source of emissions, accounting for 55% of the overall emissions from the district, as shown in Figure 1. Transport has shown a steadily increasing proportion of the total emissions, but has begun to reduce overall, falling to 322.8kT this year. The industry and domestic sectors have also continued to fall. The emissions from land use, land use change and forestry (LULUCF) have become negative, i.e. more carbon is stored than emitted (-12.3kT). Overall emissions have decreased from 815.9kT in 2005 to 575.2kT in 2019.

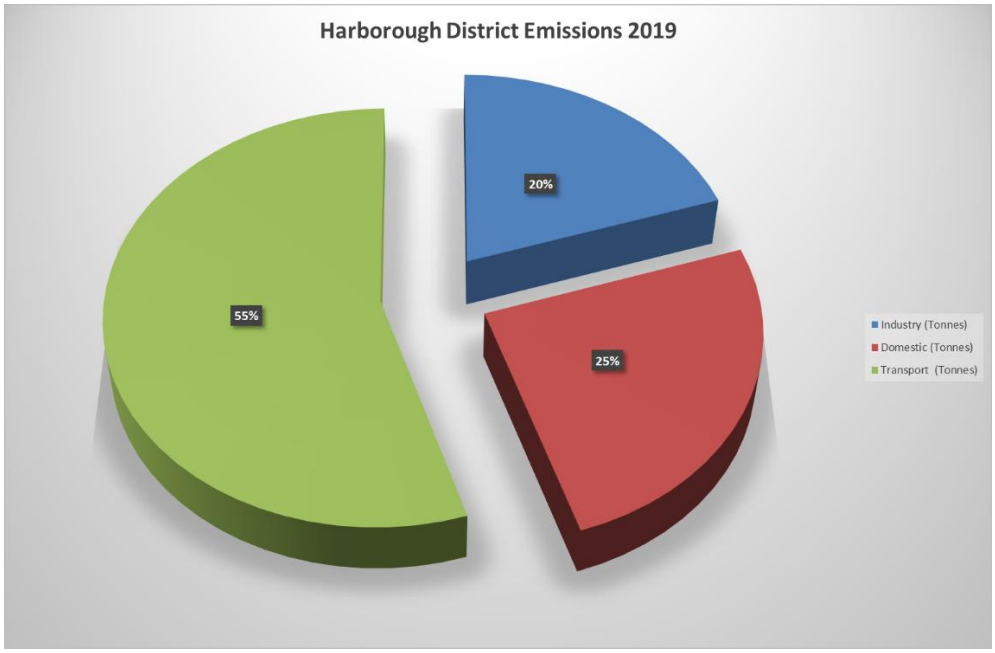

Figure 1: Harborough District Emissions by Sector 2019[5]

[4] UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2019 - GOV.UK (www.gov.uk)published June 2020.

[5] **LULUCF means Land Use, Land-Use Change and Forestry**

Harborough's per capita emissions, of 6.1 tonnes, has decreased by 39.5% since 2005. This is a greater percentage drop than Leicestershire or the East Midlands but less than UK. Harborough's per capita emissions are higher than Leicestershire (5.9), East Midlands (6.0), England (4.9) and UK (5.2). The table below shows the emissions per capita for each of the sectors, from 2005 to 2019 (the latest date for which figures are available).

Date	Industry (Tonnes)	Domestic (Tonnes)	Transport (Tonnes)	LULUCF (Tonnes)	Total (Tonnes)
2005	2.7	2.7	4.7	0.0	**10.1**
2006	2.6	2.7	4.6	0.0	**9.9**
2007	2.4	2.6	4.5	0.0	**9.6**
2008	2.5	2.6	4.2	0.0	**9.3**
2009	2.2	2.4	4.0	0.0	**8.6**
2010	2.3	2.5	3.9	-0.1	**8.7**
2011	2.0	2.2	3.8	-0.1	**8.0**
2012	2.2	2.3	3.7	-0.1	**8.2**
2013	2.1	2.3	3.8	-0.1	**8.1**
2014	1.9	1.9	3.9	-0.1	**7.6**
2015	1.7	1.8	3.8	-0.1	**7.2**
2016	1.5	1.8	3.8	-0.1	**7.0**
2017	1.4	1.6	3.8	-0.1	**6.6**
2018	1.3	1.6	3.6	-0.1	**6.4**
2019	1.2	1.6	3.4	-0.1	**6.1**

Table 1: Harborough District CO2 emission per capita by sector 2005 to 2018 (source**:** https://www.gov.uk/government/collections/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics)

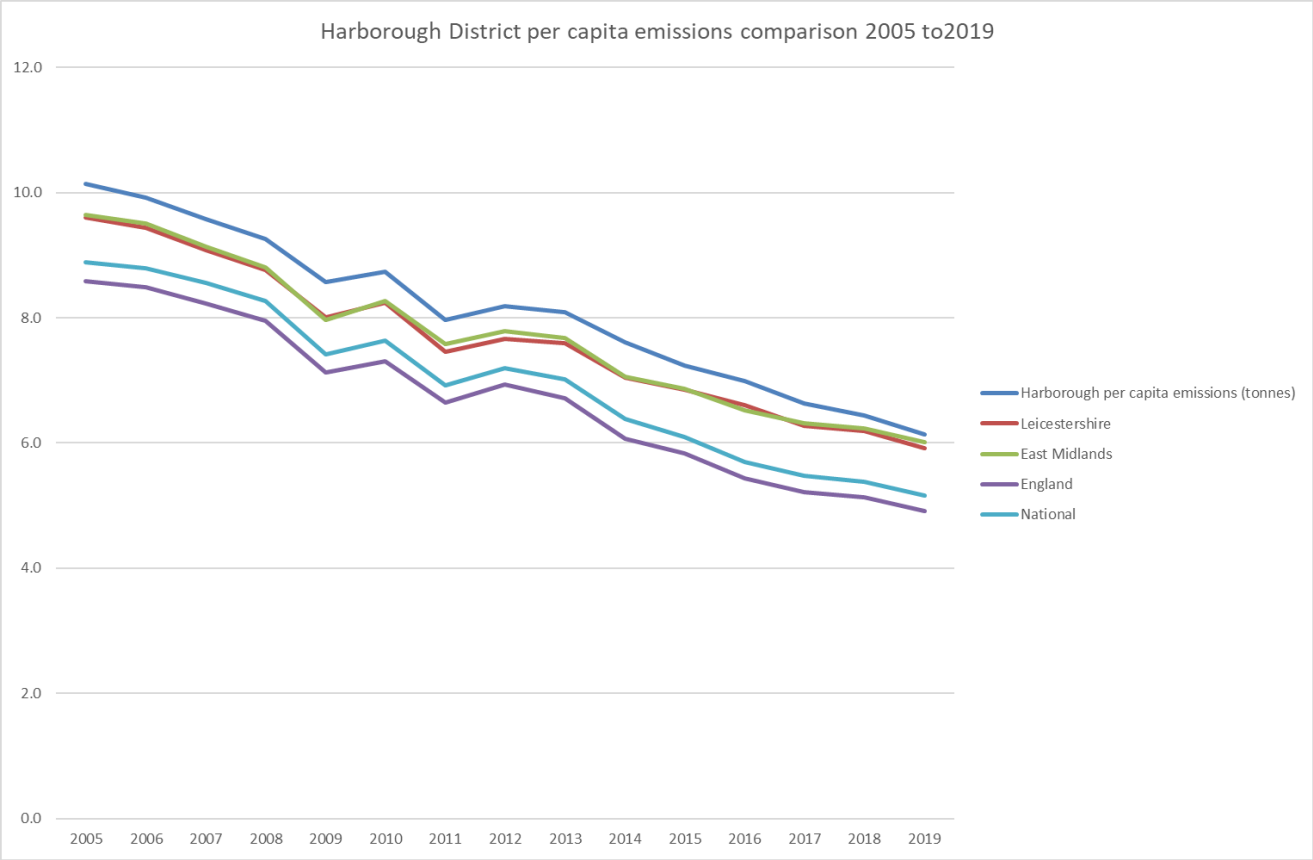

Figure 2: Harborough District Per Capita total emissions 2005 to 2019
(Sourcehttps://www.gov.uk/government/collections/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics)

Data is also available for emissions from a local area that the local area is responsible for. This data removes the contribution from very large industry, motorways, rail travel and land use. The emissions in Harborough District are then reduced. Industrial emissions are reduced slightly from 117.2kT to 110.1kT. Domestic emissions remain the same. Transport emissions are reduced by almost half at 165.9kT compared to 322.8kT. The per capita emissions are then 4.8T, which is lower than Leicestershire (5.1) and much closer to the national (4.2). However, transport emissions on minor roads are still increasing and are now comparable with emissions for A roads. Local transport is a serious issue for progress on district emissions.

A new tool Carbon Place Based Calculator PBCC (carbon.place) illustrates how Harborough District compares to England using 2018 data, see figure 3. The tool shows which activities contribute most to emissions.[6] It also highlights the point we need to reach by 2032 to meet the Committee on Climate Change budget, highlighting the scale of the task.

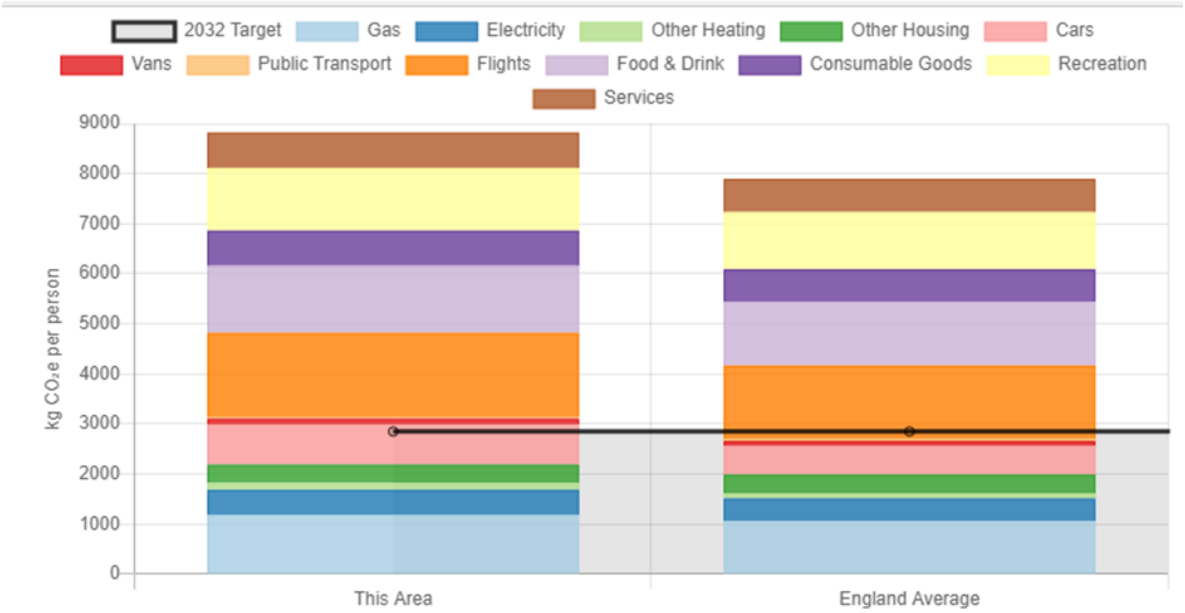

Figure 3 Harborough District Emissions by sector compared to England 2018 - Carbon Place data

The tool also shows how emission per head vary across Harborough District. Some parts of Harborough district have very high per capita emissions as shown in Figure 4. The tool allows further information to be gleaned for the different areas of the district.

[6] *Morgan, Malcolm, Anable, Jillian, & Lucas, Karen. (2021). A place-based carbon calculator for England. Presented at the 29th Annual GIS Research UK Conference (GISRUK), Cardiff, Wales, UK (Online): Zenodo.* ***http://doi.org/10.5281/zenodo.4665852***

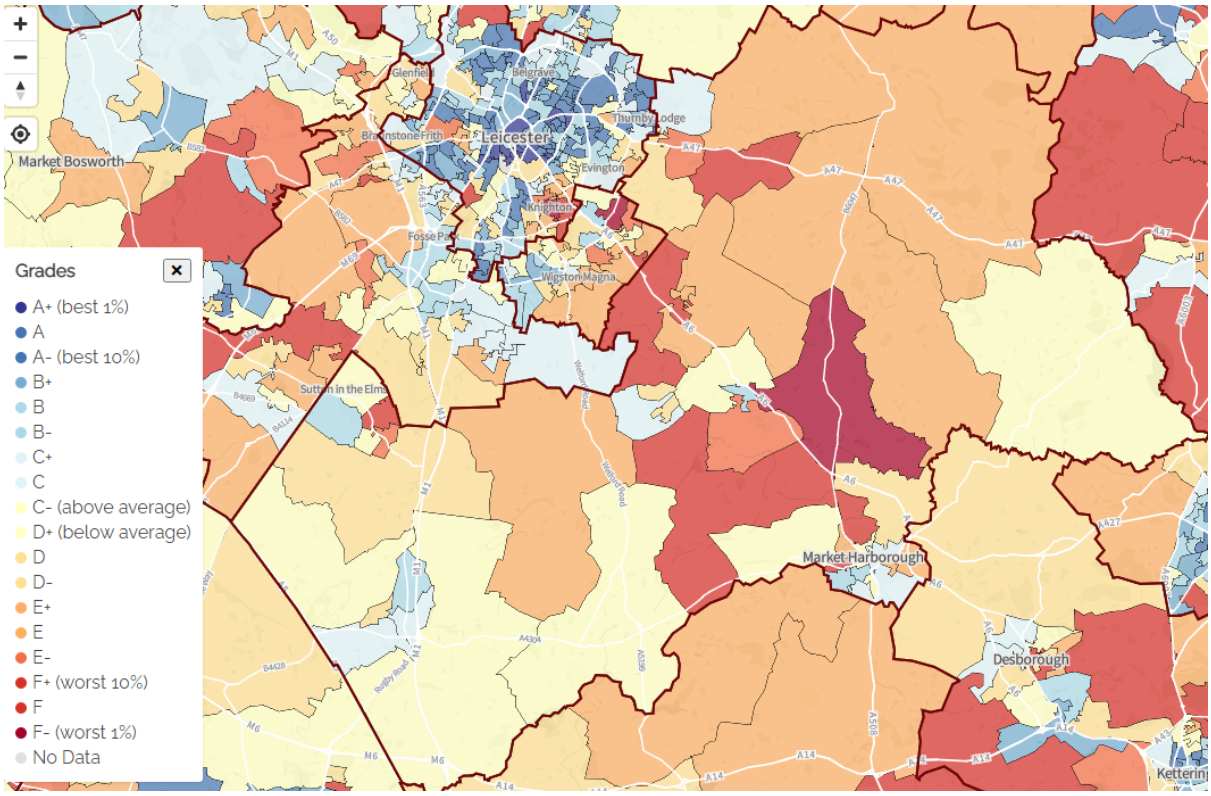

Figure 4: Harborough district per capita emissions 2018 for Lower Super Output Areas

Emissions of Methane

Methane emissions in Harborough District come mainly from waste and agriculture. The west of the district is more intensively farmed, and methane emissions are higher there. There are a number of small sites associated with waste disposal which add significantly to the methane emissions. There are two point sources linked to an anaerobic digestion plant and associated electricity generation plant at Cotesbach. The two plant are responsible for 0.134 Tonnes and 0.213 Tonnes respectively.

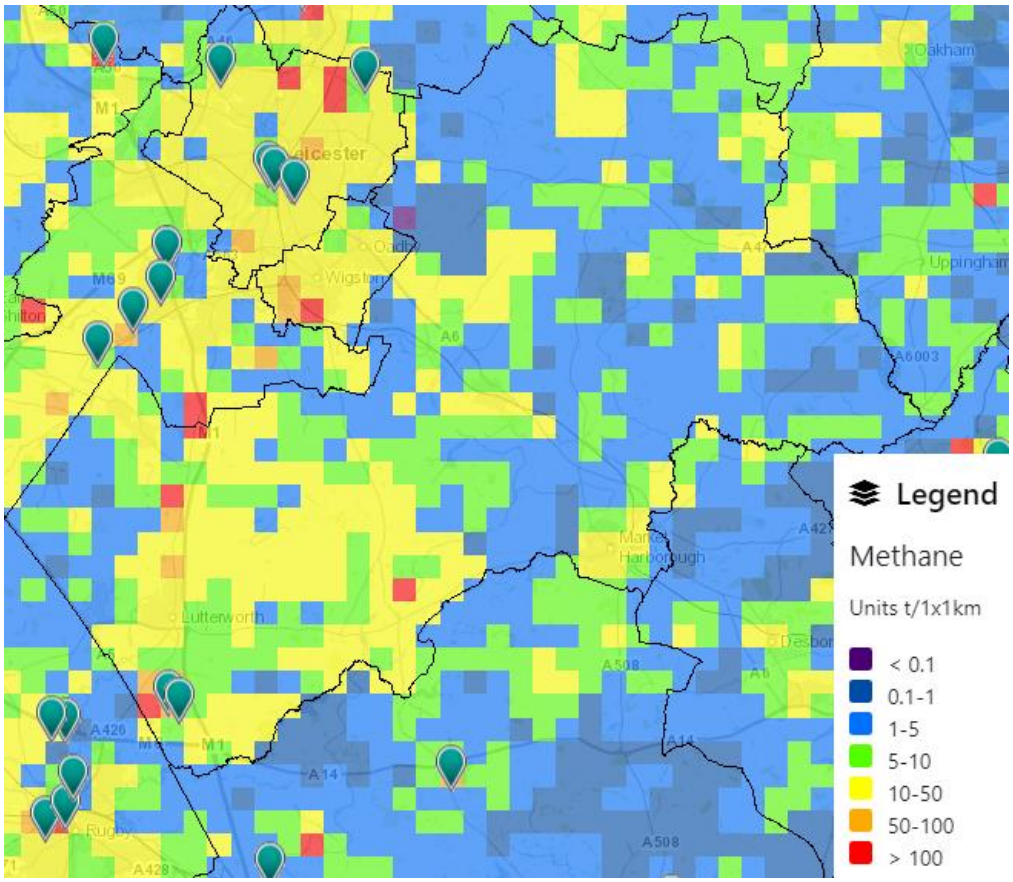

Figure 5: Methane emissions (all sources) across Harborough District (source NAEI https://naei.beis.gov.uk/emissionsapp/)

Nitrous Oxide

Nitrous oxide is mainly associated with combustion processes and in Harborough District the highest concentrations are associated with the M1 motorway and the M1/M6 interchange. There are also emissions associated with the Cotesbach landfill gas generation, with 0.013 and 0.020 Tonnes per year measured.

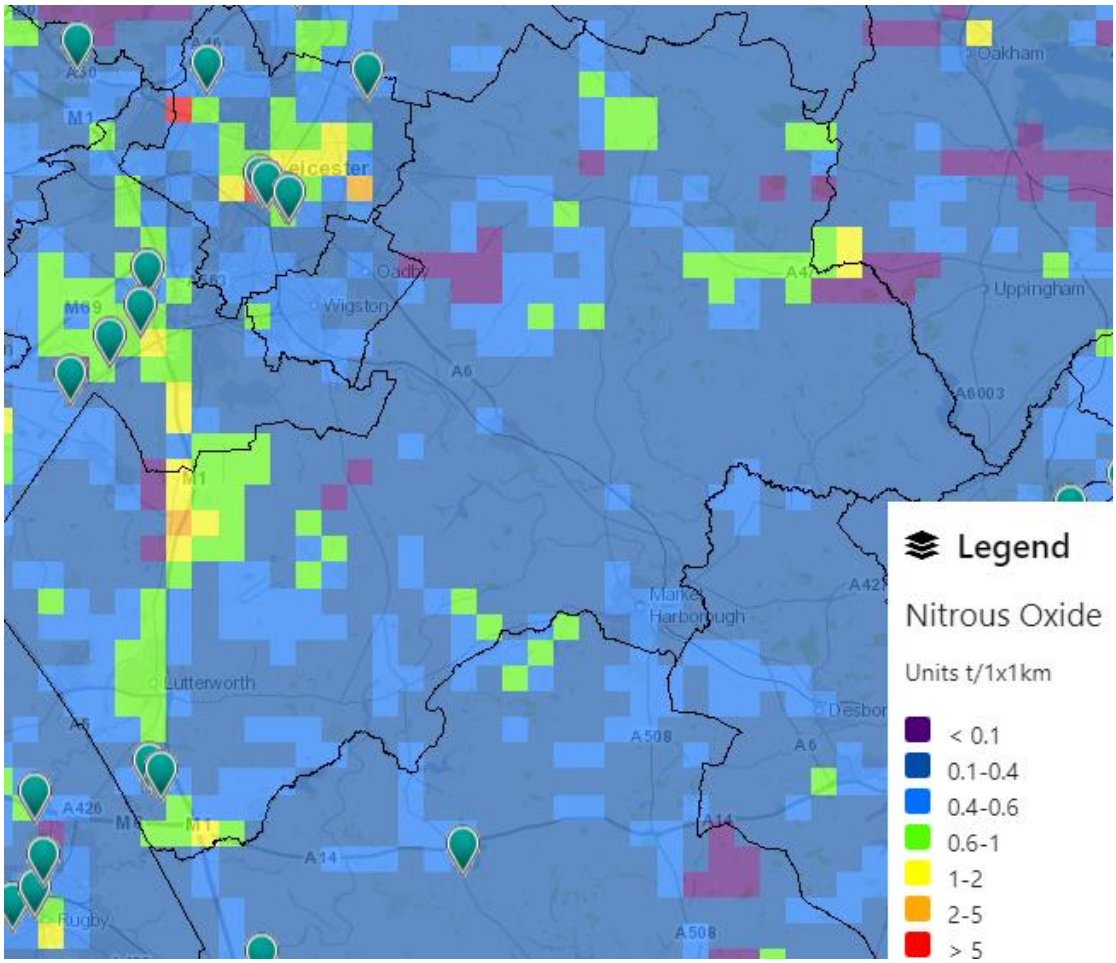

Figure 6: Nitrous Oxide emissions (all sources) across Harborough District (source NAEI https://naei.beis.gov.uk/emissionsapp/)

Local trends impacting emissions from each sector.

Domestic

There are a large number of rural detached properties in Harborough District. There is a much higher proportion of detached properties than nationally and far fewer flats. In addition, a large proportion of properties were built before 1900. There are currently approximately 37,500 dwellings in the district, with a growth rate of over 550 per year new dwellings anticipated in the Local Plan.

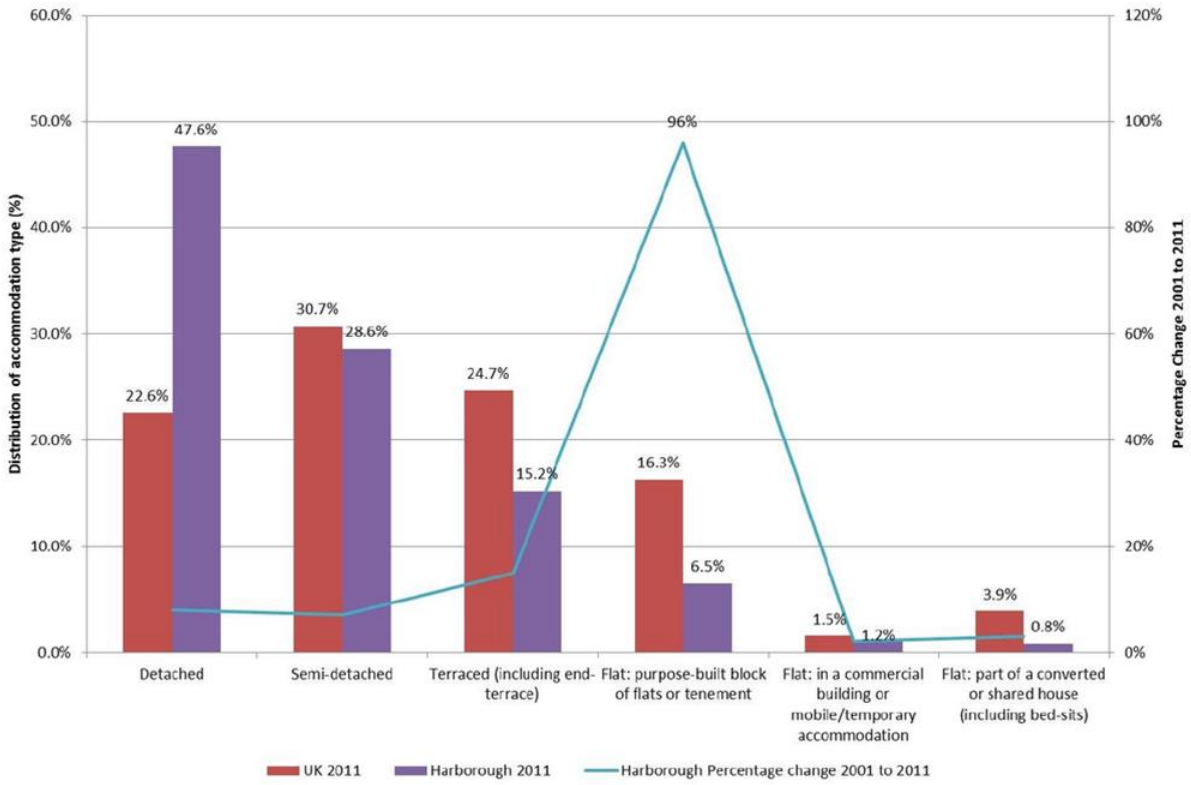

Figure 7: Distribution of housing types across Harborough District compared to UK 2011 (Source Census 2011).

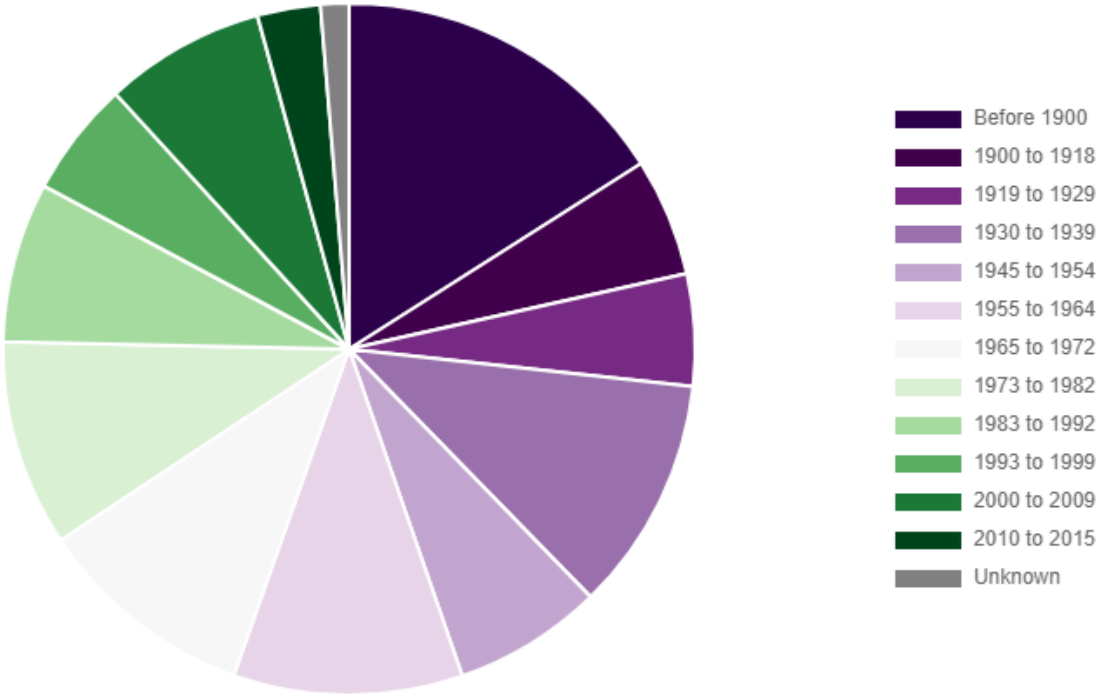

Figure 8: Build period of domestic properties in Harborough District – source LA Reports | PBCC (carbon.place)

Electricity and gas consumption are close to the national average and gas is the main heating fuel. However, there are a large number of homes that rely on oil or electricity for their heating needs. This is due to the rural nature of the district, with some villages having little or no access to the national gas grid. Government statistics indicate that over 5,000 homes (or 13%) in the district, were not connected to the gas network in 2018 (https://www.gov.uk/government/statistics/sub-national-estimates-of-households-not-connected-to-the-gas-network).

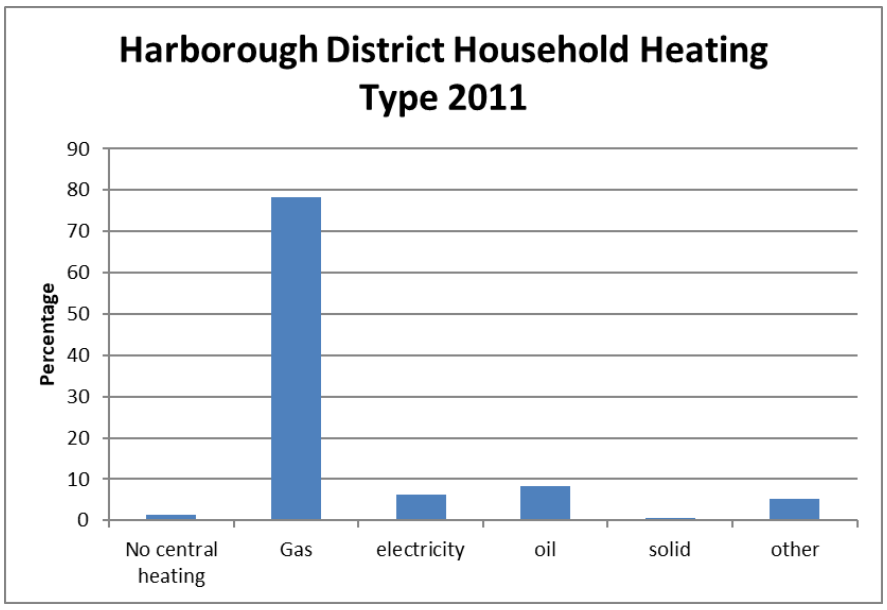

Figure 7: Harborough District household heating type (source: Census 2011)

Based on Government data the average domestic energy consumption across the district has reduced year on year. This trend is shown both for electricity consumption and gas consumption. This is related to increasing energy efficiency of homes.

Year	Mean domestic electricity consumption (kWh)	Mean domestic gas consumption (kWh)
2005	5223	21,513
2006	5087	20,524
2007	5029	19,866
2008	4804	19,170
2009	4707	17,590
2010	4716	17,468
2011	4660	16,447
2012	4612	16,425
2013	4495	16,001
2014	4472	15,561
2015	4400	15,379
2016	4316	15,292
2017	4283	15,470
2018	4138	15,169
2019	4085	15,094

Table 2: Harborough District Domestic Electricity and Gas Consumption
(Source https://www.gov.uk/government/statistical-data-sets/regional-and-local-authority-electricity-consumption-statistics-2005-to-2011 and https://www.gov.uk/government/statistical-data-sets/gas-sales-and-numbers-of-customers-by-region-and-local-authority)

The Fuel Poverty Strategy for England has included a new fuel poverty indicator - Low Income Low Energy Efficiency (LILEE) to replace the previous Low Income High Costs (LIHC) that had been used to 2019. This means that 2019 data is not completely comparable to the earlier data. The number in fuel poverty in 2019 has increased to 9.7%, or around 3,625 homes. However, Harborough district is lower than the England average (13.4%). Harborough District figures have reduced from above the England average to considerably below, with the gap even more marked for the new indicator. Harborough is lower than the Leicestershire average (11.2%) and the East Midlands average (13.9%).

Harborough District has been proactive in promoting ECO energy efficiency improvements across the district, with almost 1000 homes receiving loft or cavity wall insultation, leading to a saving of over 31,000T over the 20 year lifetime of the measures. This activity seems to have made a positive impact on fuel poverty numbers in the district, which is now much lower than the England average.

Year	Estimated number of Households	Number of Households in Fuel Poverty	Harborough %	England %	Indicator
2011	35,280	4,046	11.5	11.1	LIHC
2012	35,646	3,794	10.6	10.7	LIHC
2013	35,616	2,799	7.9	10.5	LIHC
2014	35,756	2,993	8.4	10.5	LIHC
2015	35,804	3,546	9.9	11.0	LIHC
2016	35,919	3,176	8.8	11.1	LIHC
2017	36,677	2,517	6.9	10.9	LIHC
2018	37,075	3,285	8.9	10.3	LIHC
2019	**37,494**	**3,625**	**9.7**	**13.4**	**LILEE**

Table 3: Numbers of Households in Fuel Poverty[7]

[7] Fuel poverty sub-regional statistics - GOV.UK (www.gov.uk) published June 2021

Industry

Harborough District has no large industrial installations and emissions are spread between, gas, electric, other fuels and agriculture. Emissions from electricity use have shown the greatest reduction. Agriculture emissions (from energy use, not land based emissions) have remained fairly steady.

Data indicates that Harborough District has significant employment in transport and storage, including the large logistics development at Magna Park, near Lutterworth. Other significant employment types are wholesale and retail, agriculture, chemical manufacture, administration, and mining and quarrying.

Renewable Energy

There are a number of renewable energy installations across Harborough District. There are two commercial wind farms, Low Spinney 8MW and Swinford at 22MW. In addition, there are a number of smaller on farm turbines that contribute to a total of 32.4MW of installed capacity. There are 1,558 solar photovoltaic installations; including a number of large (>1MW) field-based solar installations, giving a total capacity of 16.2MW[8]. There is one anaerobic digestion (499 kW) and two landfill gas sites with capacity of 5.6MW. There is 14.9MW installed capacity of plant biomass. Harborough has no hydropower capacity due to a lack of resource.

	Installed capacity MW				
	PV	Wind	AD	Landfill Gas	Biomass
2014	5.6	31.9	0.5	5.6	
2015	7.4	32.2	0.5	5.6	
2016	10	32.2	0.5	5.6	
2017	14.4	32.2	0.5	5.6	4.5
2018	17.1	32.4	0.5	5.6	14.9
2019	16.2	32.4	0.5	5.6	14.9

Table 4 Installed Capacity of Renewable Energy

From April 2014 to October 2020, 51 accredited non-domestic Renewable Heat Incentive (RHI) projects have been deployed. This has delivered an increased capacity to 9MW. Harborough has the third highest installed capacity in Leicestershire, behind Melton and Hinckley and Bosworth. Harborough has 285

[8] https://www.gov.uk/government/statistics/regional-renewable-statistics Renewable electricity by local authority 2015updated September 2018

accredited domestic RHI installations[9]an increase of 19 and the second highest number in Leicestershire behind Northwest Leicestershire. RHI is due to end in March 2022.

Transport

There are an estimated 382 plug in electric vehicles in Harborough district at the end of 2020[10]. This has doubled since the end of 2019. Electric Vehicle ownership is due to increase rapidly over the next few years, with a projection of round 3,000 in service in the district by 2025.

In 2019/20 Harborough District Council installed 6 charging points in various public car parks across the district (3 in Market Harborough, 1 in Lutterworth, 1 in Broughton Astley and 1 in Kibworth). In 2020/21, in spite of lockdown, the use of the chargers increased significantly, with an increase of 60% of carbon savings.

All Chargers	2020/21	2019/20	2018/19
Carbon saving kg	3935.72	2481.36	491.85
Energy Consumption kWh	7068.90	4430.70	878.30
Cost £	£978.63	£616.25	£117.80
Number of charges	887	908	181

Table 5 Harborough public EV charging summary data

In addition, there are a further 6 charging points at new Grow on Centre, office accommodation owned by Harborough District Council. This compliments a further 3 charging points which were installed at Harborough Innovation centre. In total, Harborough District Council has 15 accessible charging points. There are a total of 32 publicly accessible charging points, across the district, of which 3 are rapid devices. Harborough District has the second most charge points of any district in Leicestershire (April 2021[11]) and the highest number of chargers per 100,000 head of population in the county (34.1).

[9] https://www.gov.uk/government/statistics/rhi-monthly-deployment-data-october-2018 data for RHI deployment updated October 2018

[10] All vehicles (VEH01) - GOV.UK (www.gov.uk)

[11] Electric vehicle charging device statistics: April 2021 - GOV.UK (www.gov.uk)

People cycling and walking[12] for travel or leisure, in Harborough district, is similar to the England average. Data from 2018/19 indicate that over 70% of people walk at least once a week. More people walk for leisure, with almost 60% walking once a week for leisure but only around 30% walking once a week for travel. There are fewer people cycling, with around 10% cycling for travel or leisure, which is a little lower than the England average. Again, more people cycle for leisure, with almost 9% cycling once a week for leisure, but only 3.5% cycling for travel once a week.

Waste

In 2020/21 Harborough District generated 39,936.7 Tonnes of household waste, which equates to 425.73kg per household. In all, 21,287.3 Tonnes of residual waste was not composted, reused or recycled and was mainly sent to landfill. A total of 18,787.3 Tonnes or 46.9% was recycled reused or composted. Of this 25.94% was recycled and 20.63% was composted or anaerobically digested.

Land-use and environment

Harborough District is an agricultural area, with mixed farming, including dairy, beef and arable. Harborough is relatively poor in biodiversity and geodiversity terms. 1.21% of the district's area is covered by Sites of Special Scientific Interest (SSSI) while a further 0.42% is covered by Local Wildlife Site (LWS) designations. There are several SSSIs in the east of the district protecting the remains of ancient woodland which are of high nature conservation, landscape and historical importance. The district has one geological SSSI, the Tilton Railway Cutting. The total area of woodland is around 2497ha or 4.21% of the district compared to 10% in England.

In the main the SSSIs and woodland is concentrated in the area known as High Leicestershire, to the north and east of the district. Here are the remnants of Leighfield forest, an ancient hunting forest.

[12] Walking and Cycling Statistics (https://www.gov.uk/government/collections/walking-and-cycling-statistics)

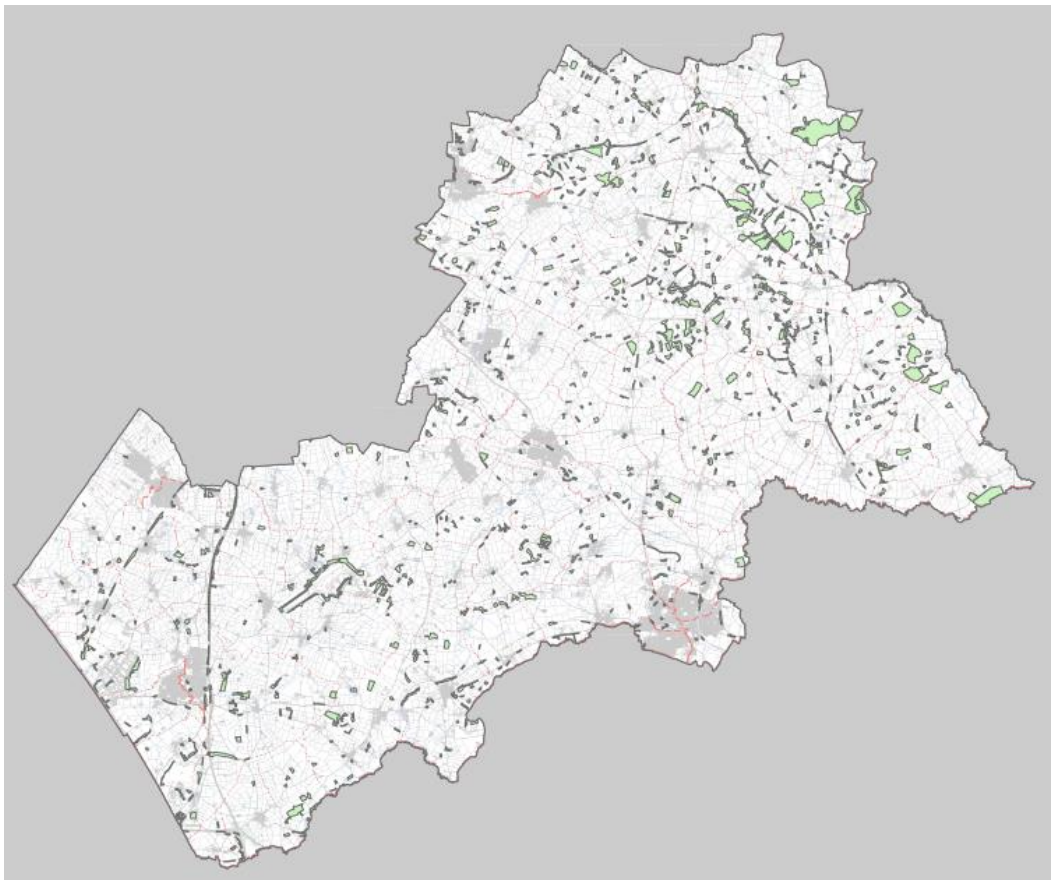

Figure 10 Woodland in Harborough District