

## Appendix 3: Baseline Carbon Emissions – Data Summary 2022

### Net Zero 2030 – Council Emissions

#### Background

- In January 2022 the first baseline model was created for carbon emissions arising from Council operations during the reporting year 2019.
- Over the last year the initial baseline has been further developed and improved with the inclusion of water supply emissions, fugitive emissions, EV charging, fuel used in on-site electricity generation, staff commuting and home working emissions. See Table 1 for more detail.
- Annual reporting procedures have been introduced and comprehensive annual emissions reports have now been produced for the years 2020, 2021 and 2022.
- An initial “business as usual” forecasting model and carbon budget have also been introduced. As more data becomes available, this model will act as the framework upon which future short and long-term emissions projections will be built, measuring progress and creating a clear and quantifiable “roadmap to net zero.”

<b>Scope</b>	<b>Definition</b>	<b>Included in baseline/annual reporting</b>	<b>To be added to baseline/annual reporting</b>
Scope 1	Emissions arising from sources that an organisation directly controls and is directly responsible for	<ul style="list-style-type: none"> <li>• Gas used in Council buildings</li> <li>• Petrol &amp; diesel used in Council fleet vehicles</li> <li>• Fugitive emissions</li> </ul>	
Scope 2	Emissions arising from the energy that an organisation purchases.	<ul style="list-style-type: none"> <li>• Electricity used in Council buildings</li> <li>• Streetlighting</li> <li>• EV charging</li> </ul>	
Scope 3	Emissions arising from sources that are not directly under an organisation’s control, but that they are indirectly responsible for.	<ul style="list-style-type: none"> <li>• Business travel</li> <li>• Staff Commuting</li> <li>• Home working</li> <li>• Water supply</li> </ul>	<ul style="list-style-type: none"> <li>• Purchased goods and services</li> <li>• Waste generated from operations</li> </ul>

Figure 1: Overview of scope components for calculation and reporting of Council operational emissions and progress on reporting inclusion.

## RMBC Emissions in 2022

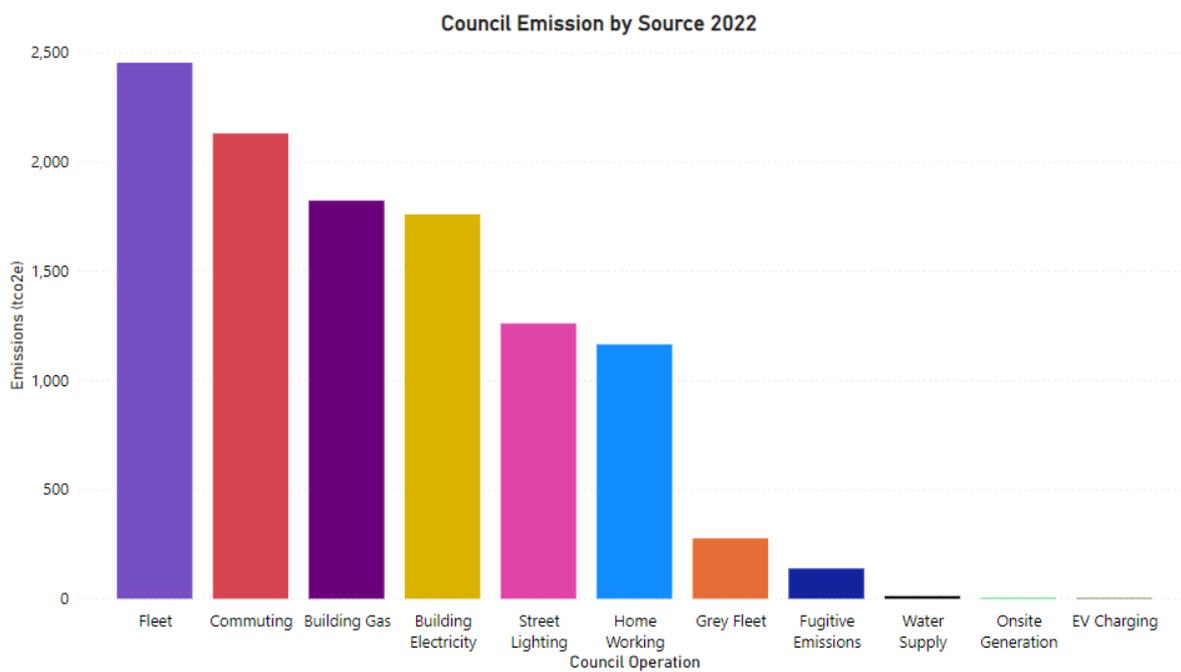


Figure 2: Council emissions by source.

Figure 2 identifies the primary emissions which are linked to the core operation of Council services. These include fleet, gas and electricity for building and street lighting. The inclusion of commuting and home working within the data has shown the significant impact of getting to work on Council emissions.

## RMBC Emissions 2019 - 2022

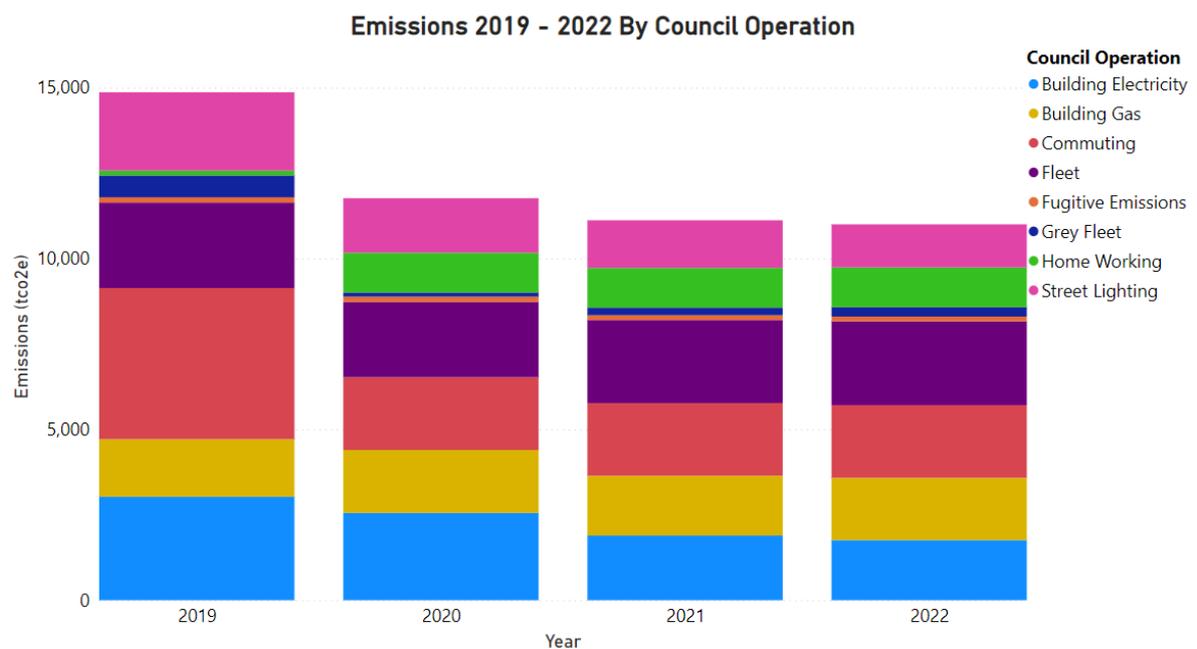


Figure 3: Council emissions by source between 2019 and 2022.

Total Council operational emissions have reduced since 2019 though this reduction has slowed slightly between 2021 and 2022 to approximately 1.2%.

Emissions Scope	Emissions Source	2019 Baseline Emissions (tco2)	2022 Emissions (tco2)	Emissions Reduction 2019 – 2022 (tco2)	Fluctuation % 2019- 2022
<b>SCOPE 1</b>	Building Gas	1680.95	1822.42	-141.47	+8%
	Fleet	2499.18	2453.20	45.98	-2%
	Fugitive Emissions	156.07	138.19	17.88	-11%
	Onsite Electricity Generation	13.99	3.04	10.95	-78%
<b>SCOPE 2</b>	Building Electricity	3031.67	1759.23	1,272.44	-42%
	Street Lighting	2292.47	1259.82	1032.65	-45%
	EV Charging	-	0.51	-0.51	-
<b>SCOPE 3</b>	Grey Fleet	639.35	276.17	363.18	-57%
	Home Working	142.37	1163.63	-1021	+52%
	Staff Commuting	4425.92	2129.8	2296.12	-66%
	Water Supply	30.63	11.70	18.93	-62%
	<b>TOTAL</b>	<b>14898.87</b>	<b>11002.46</b>	<b>3865.78</b>	<b>-26%</b>

Figure 4: A comparison of emissions between 2019 and 2022. Overall emissions are reduced by 26%

Between 2019 and 2022, carbon emissions arising from Council operations fell by over a quarter (26%). This was largely due to a reduction in electricity consumption from council owned buildings (1,272 tCO<sub>2</sub> reduction) and streetlighting (1,033 tCO<sub>2</sub> reduction). However, the biggest reduction in emissions came from staff commuting (2,296 tCO<sub>2</sub> reduction) as more staff have moved to hybrid working arrangements (see Figure 3 and 4).

There has likely been a substantial impact of COVID-19 on these figures as the years of 2020 and 2021 are considered anomalous due to the unusual government led policy changes in place. These restrictions have now been lifted and between 2021 (11,151.55 tCO<sub>2</sub>) and 2022 (11,017.17tCO<sub>2</sub>), total emissions have reduced by 1.2%. This provides a more accurate representation of the likely trajectory of emissions as the Council returns to pre-pandemic conditions.

## Emissions Forecasting

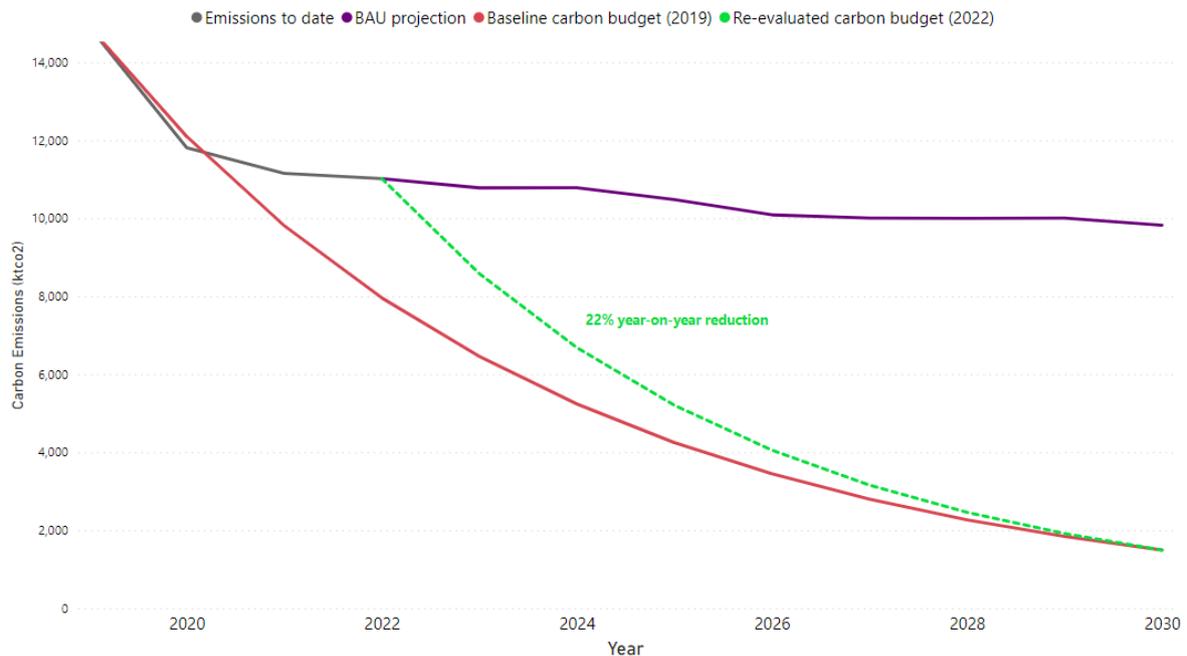


Figure 5: Emissions forecast considering 'business as usual' operations and carbon budget based on 2022 emissions data.

A carbon budget is recommended by the Green House Gas Protocol to place a restriction on the recommended annual carbon dioxide an organisation should emit between its baseline year and net zero target year. Carbon budgets (or cumulative multi-year goals, as they are often referred to) are recommended by the Greenhouse Gas Protocol's Mitigation Goal Standard, which is the most commonly used international standard for greenhouse gas reduction. The UK Government have adopted one for the UK's Net Zero by 2050 target. This budget also provides an indication as to whether the Council remains on track to meet its net zero targets and supports planning activities for the year ahead.

Although RMBC remained within the carbon budget in 2020, emissions in 2021 and 2022 have risen above the advised budget. Although emissions arising from Council building gas and electricity are expected to see a steeper drop in certain years than others (following specific decarbonisation activity due to allocation of funding), remaining within a refined carbon budget for the current year would require an average carbon saving of 22% each year between now and 2030.

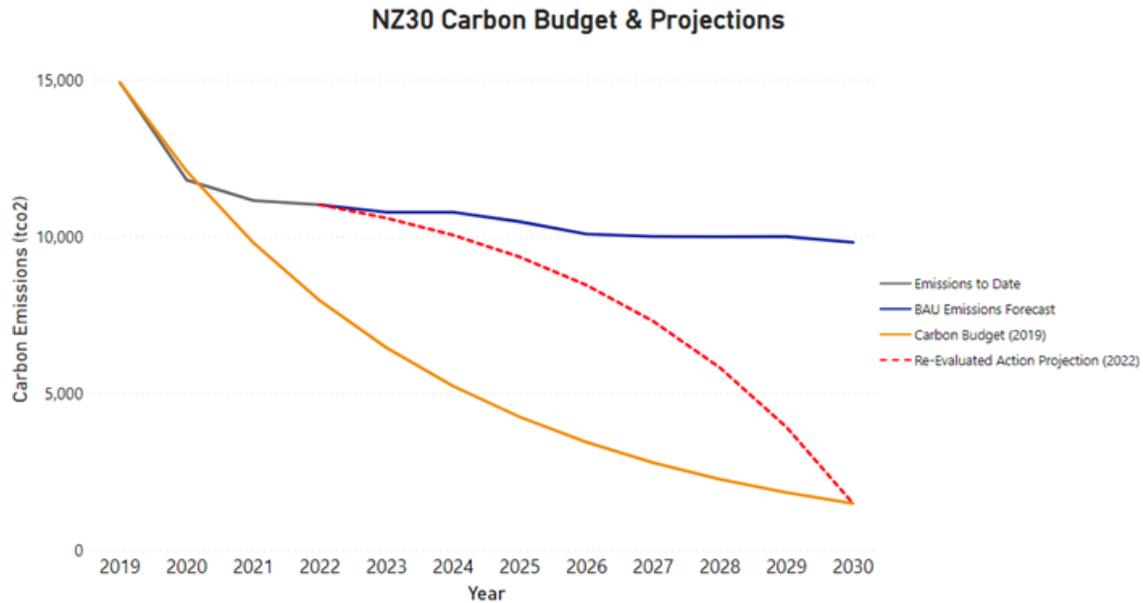


Figure 6: A re-evaluated action projection model based on realistic project implementation.

Figure 6 shows a more realistic projection modelling based on decarbonisation project plans and implementation time frames. This is based on the likelihood that carbon savings of each project will be realised retrospectively post project go-live and not necessarily in the year of implementation or payment. In addition, activities towards electrification where in-house green generation of power is not appropriate (e.g., solar panels) will produce carbon emissions until the national grid becomes decarbonised thereby creating a lag before positive impact. In these cases, the localised air quality benefits of removing gas combusting appliances will be observed before an impact on the carbon footprint is realised.

### **Net Zero 2040 – Borough-Wide Emissions**

#### **Background**

- Since 2005 BEIS (Department for Business, Energy & Industrial Strategy) have annually published UK local authority and regional estimates of territorial carbon emissions.
- There is a two-year lag on the release of data, meaning the latest publication relates to emissions from 2020.
- 2021's BEIS data publication was used to inform the 2018/19 baseline for the Council's NZ40 target. Each annual release will be used to create an annual report to measure Rotherham's progress towards NZ40.
- Waste Management and Agriculture sectors have been added to the latest BEIS data release in 2021, as well as being retrospectively added to the data from previous years. This has allowed us to both include it within our most recent annual report and to retrospectively modify our 2018/19 baseline model.

## Borough-Wide Emissions 2005 – 2020

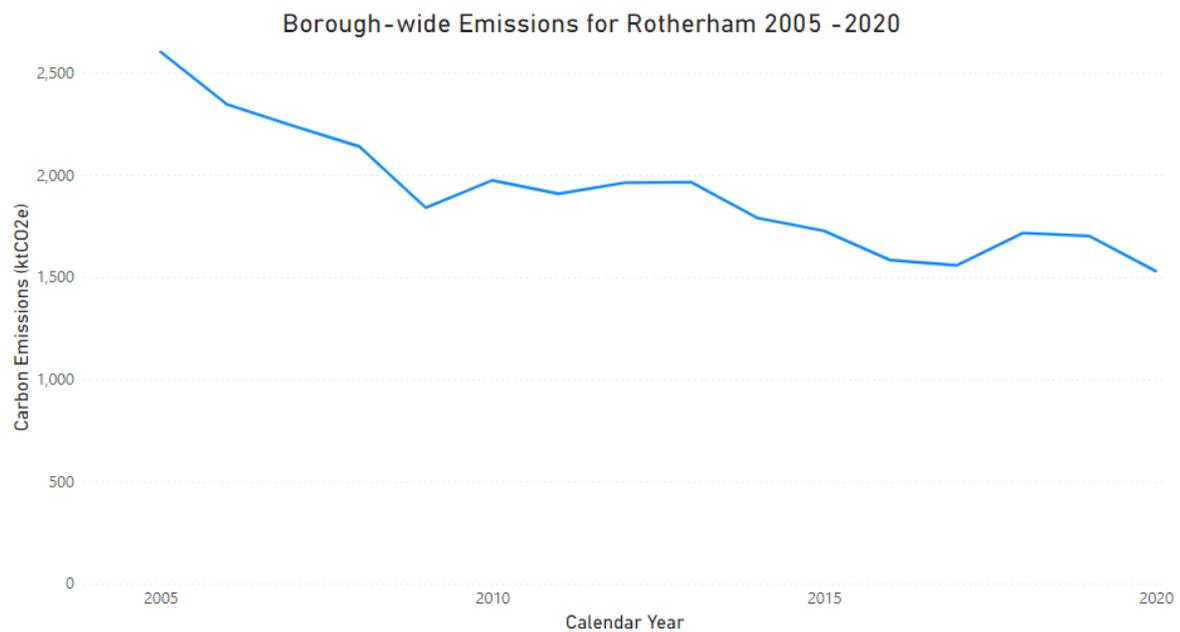


Figure 7: Emissions from within the Rotherham Borough between 2005 and 2020.

In the 15 years between 2005 and 2020, carbon emissions decreased by 41% from 1,529.07 ktCO<sub>2</sub>e to 2,603.33 KtCO<sub>2</sub>e with an average annual reduction of 3%.

## Borough-wide Emissions 2019 vs 2020

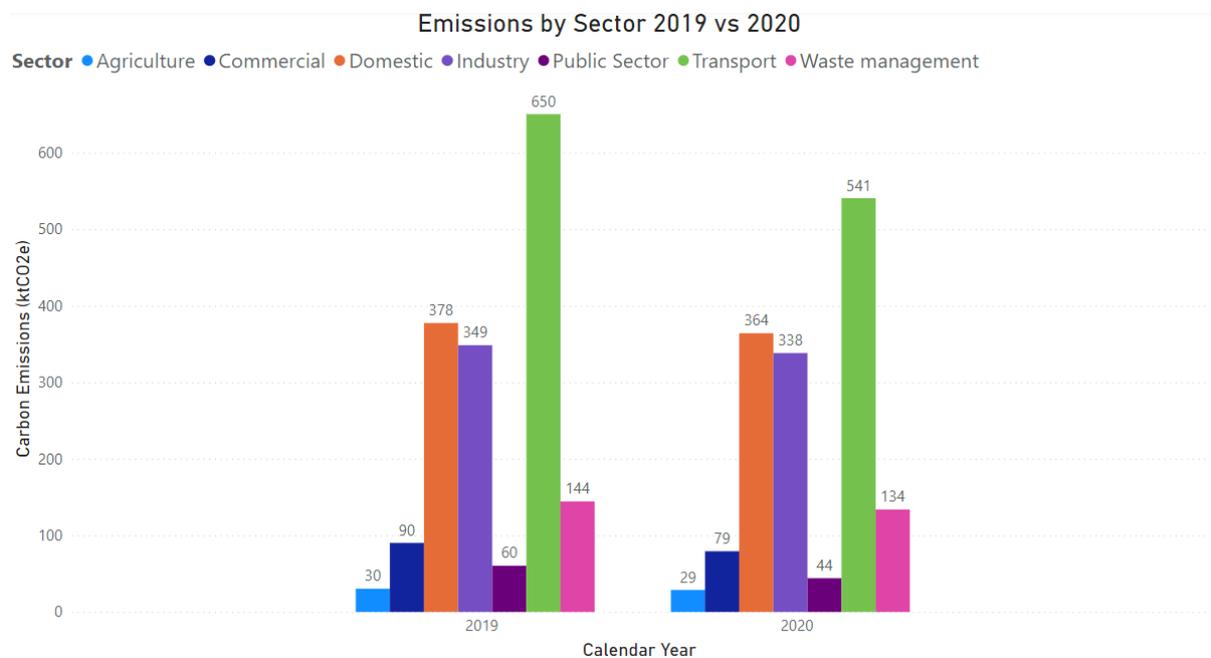


Figure 8: Sector based emissions 2019 vs 2020.

Overall CO<sub>2</sub> emissions between 2019 and 2020 decreased by 173 ktCO<sub>2</sub>e – a 10.14% decrease. This is over three times the average annual reduction in emissions, which is largely due to the effects of the pandemic and subsequent lockdown measures put in place across the UK.

As would be expected, considering the lockdown rules which were introduced in February 2020, the sectors which saw the largest decline between 2019 and 2020 were those of transport (17% decrease) and commercial (12%).

With the existence of a two-year time lag on the data, there is much speculation as to how these figures may have changed as lockdown measures have eased. It is expected that there could be a substantial rise in emissions arising from transport.

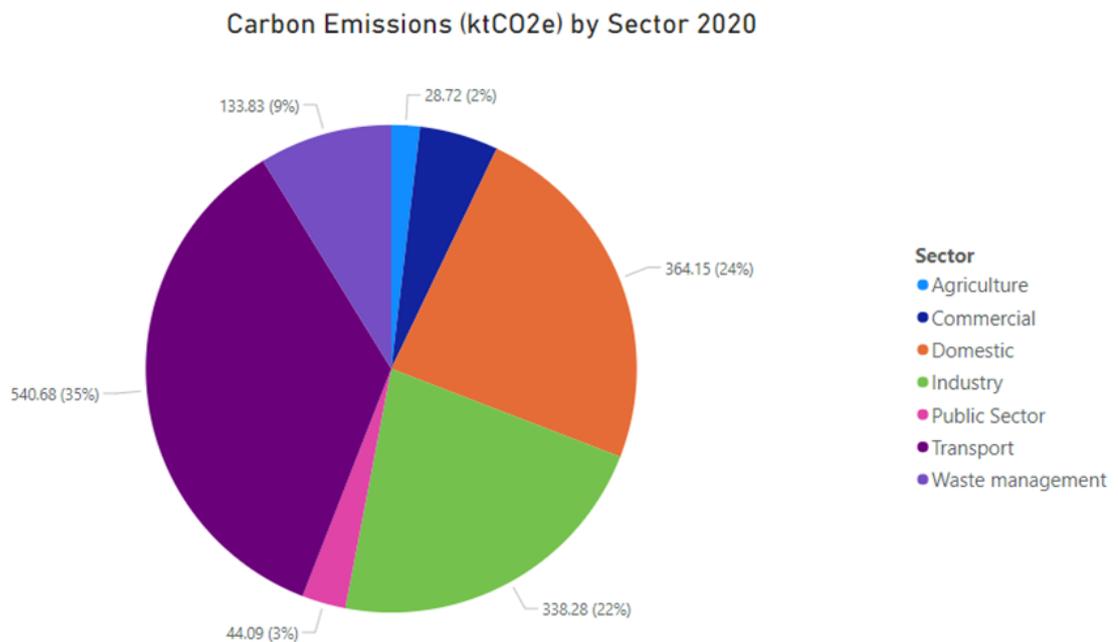


Figure 9: Sector make up of Rotherham’s Carbon Emissions from 2020.

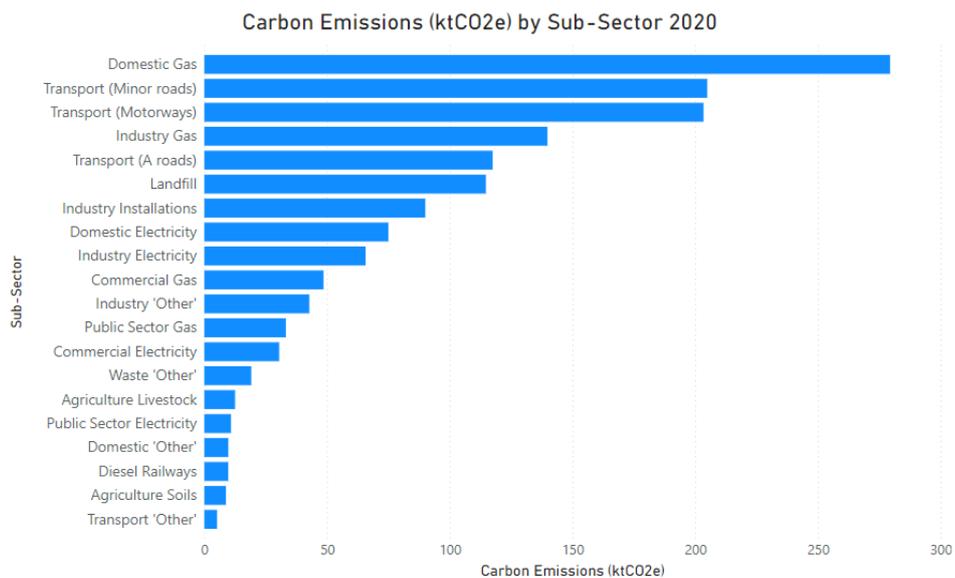


Figure 10: Sub-Sector Carbon emissions for Rotherham.

Figures 9 and 10 provide further information on the sector make-up of Rotherham Carbon emissions, including percentage composition of the total footprint for the borough. Transport, Domestic and Industry form the largest components indicating where action towards Rotherham Borough Net Zero 40 targets would be best placed.