

SDDC

Annual Carbon Reduction Progress Report

Project: Climate and Environment Action Plan 2021-30

Team: Environmental Services

Date: June 2023

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Version Control

Version	Description of version	Effective Date
0.1	DRAFT	May 2023

Approvals

Approved by	Date
Matt Holford, Head of Environmental Services	13/06/2023

Associated Documentation

Description of Documentation	
Climate and Environment Strategy	2019
Climate and Environment Action Plan 2021-30	2021 -2030
UK local authority and regional CO2 emissions national statistics	2015 - 2019

Executive Summary.

Carbon emissions are a direct result of energy (fossil fuel) consumption. By supporting the reduction of energy consumption, South Derbyshire District Council’s (SDDC) have the potential to meet their carbon reduction commitments with the co-benefit of significantly reducing their energy costs.

This 2023 Annual Carbon Report details and estimates the main carbon emission sources resulting from the Councils direct activity (In-house) and those resulting from the whole of South Derbyshire (District-wide) during the 2022/23 financial year.

The estimation and analysis of both In-house and District-wide carbon emissions helps to evidence the effectiveness (or otherwise) of the delivery of the SDDC’s Climate and Environment Action Plan (2021-30) and the progress the Council is making towards its carbon neutral targets.

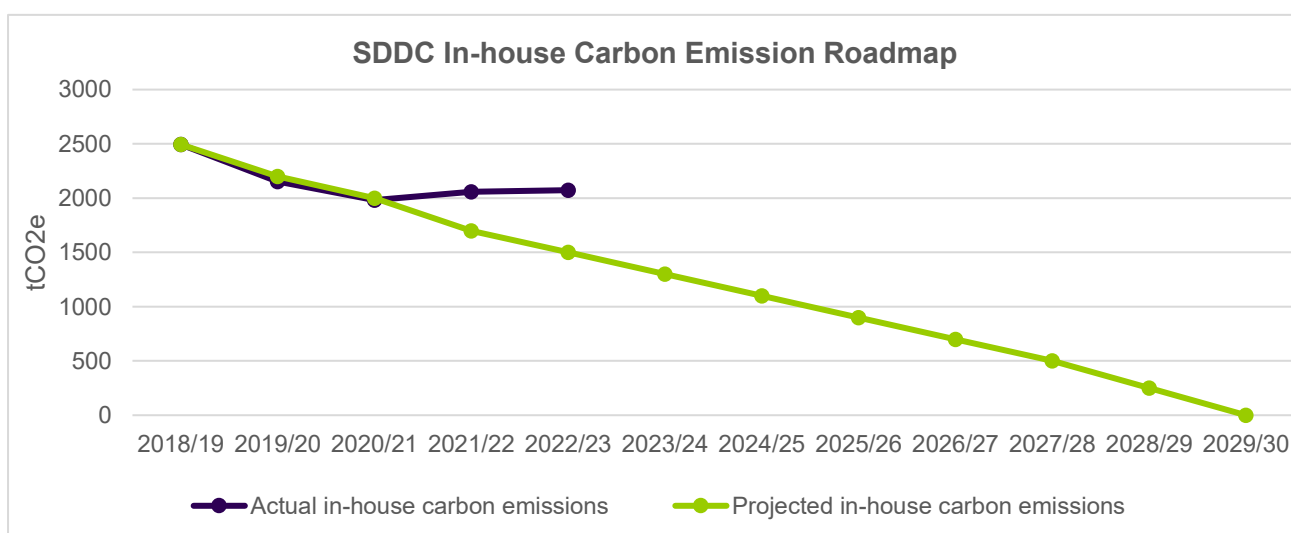
In-house carbon emissions for 2022/23 – summary

The annual In-house carbon emissions resulting from the Council’s own activity (heat, refrigerants, electricity across the public estate and vehicle fleet fuel) for 2022/23 is **2,074 tonnes of carbon dioxide (CO2e)**, which is 420 tCO2e (17%) below the baseline year of 2018/19. This is a direct result of the Climate and Environment actions that the Council is taking. The table below shows the annual In-house carbon emissions for each year, from 2018/19 to 2022/23.

Year	2018/19	2019/20	2020/21	2021/22	2022/23
SDDC In-house carbon emissions (tCO2e)	2,494	2,154	1,982	2,066	2,074

Although SDDC’s In-house carbon emissions have reduced as a direct result of the actions the Council have and are taking, these reductions have flatlined over the last two years. The flatlining of the last two years illustrate that to further reduce In-house carbon emissions the Council needs to tackle the high emission sources (public buildings, leisure centres and vehicle fleet) detailed later in this report.

The graph below shows the projected Council’s roadmap to carbon neutral by 2030 (green line) compared to the actual reduction in carbon emissions (blue line). This illustrates this flatlining effect and demonstrates the scale of the challenge required over the next seven years. The Councils stated



aim is to reduce its In-house carbon emissions by 2,074 tCO₂e per year to meet its carbon neutral target by 2030.

District-wide carbon emissions for 2022/23 – summary.

The Council has committed to supporting residents, businesses, households, and the travelling public to reduce carbon emissions across the South Derbyshire District to carbon zero by 2050. The UK local authority greenhouse gas emissions national statistics are published by the Department for Energy Security and Net Zero (DESNZ) and the table below shows the latest District-wide carbon emissions resulting from all sectors are 542,000 tCO₂e which has reduced by just over 16.5% from the 2018 baseline.

Year	2017	2018	2019	2020
SDDC District-wide carbon emissions (tCO ₂ e)	660,000	649,000	628,000	542,000

The Council is currently taking direct action to support the reduction of District-wide carbon emissions through the work it is doing around the energy efficiency of houses, the installation of an electric vehicle charging network and the actions around improving the natural capital across South Derbyshire through tree planting and green space habitat improvement actions.

This report is the first time that SDDC have attempted to estimate the carbon emission reduction from direct District-wide action. There is no approved and verified methodology for this calculation, therefore the data is presented with some caution. However, it is important to at least estimate the impact that the Council is having in installing EV charge points, developing tree planting schemes and improving and tracking habitat gain in the green spaces it owns (see Appendix 6). This has the potential to help deliver the Council’s commitments for supporting South Derbyshire to be carbon neutral by 2050.

Later in this report the main in-house emission sources and district-wide emission sectors are identified and linked to the actions that are or need to be delivered to ensure the Council meets its commitments.

Finally, the report summarises recommendations for the next steps that should be included in the annual review of the Climate and Environment Action Plan to increase its effectiveness.

1. Context

South Derbyshire District Council (SDDC) has a key role to play in tackling climate change, setting out clear aspirations and commitments to reduce carbon emissions across South Derbyshire.

As part of these commitments, SDDC has been collating and monitoring its annual in-house and district-wide carbon emissions since 2018/19 (emission baseline) to evaluate the progress of delivering its Climate and Environment Action Plan (2021-30).

The Councils In-house carbon emissions are calculated using the Local Government Associations (LGA) reporting guidance and the District-wide carbon emissions are obtained from the UK Government’s National Statistics that were last published in 2022 for the 2005 to 2020 period.

In line with the DEFRA Environmental Reporting Guidelines and the Department for Business, Energy, and Industrial Strategy (BEIS) (2020) reporting guidance, Council in-house carbon emissions are categorised into Scope 1, Scope 2, or Scope 3 emissions, as detailed below:

Definition of In-house Scope 1, 2 and 3 Emissions

Category	Description	Energy consumption source
Scope 1	Direct emissions – directly controlled by Councils.	Metered heat (gas) consumed for public buildings. Refrigerants used for public buildings. Fuel used in SDDC vehicle fleet
Scope 2	In-direct emissions – directly controlled by Councils	Metered electricity – emissions from producing the electricity.
Scope 3	In-direct emissions – only influenced by Councils	Grey mileage – employee business mileage Employee mileage commuting to work. Water and wastewater usage Waste disposal Supply chain – purchased goods and services

2. SDDC In-house Carbon Emission Reporting (Scope 1, 2 and 3)

The In-house carbon emissions detailed in this annual report are based on the Council’s energy consumption during the financial year 2022/23 and are calculated as tonnes of equivalent carbon dioxide (CO2e). The Council monitors, tracks, and reports on Scope 1, 2 and 3 carbon emissions, although its In-house carbon neutral commitments are confined to Scope 1 and 2 only. The breakdown of In-house (Scope 1, 2 and 3) carbon emissions which result from the activities that the Council is in control of and are shown in Table 1 below.

Table 1: Scope 1,2 & 3 Annual Carbon Emissions by emission source

tCO23	Scope 1			Scope 2	Scope 1 & 2	Scope 3				Scope 3	Scope 1, 2 & 3
	Heat	Cooling	Fleet	Electricity	Total	Grey Fleet	Commuting	Waste/ Water	Supply chain	Total	Total
2018-19	811	485	722	476	2,494	54	86	30	6,192	6,362	8,857
2019-20	651	348	742	414	2,154	54	86	31	6,145	6,316	8,471
2020-21	492	351	837	294	1,982	27	39	26	8,131	8,223	10,205
2021-22	655	359	818	238	2,066	36	40	19	8,148	8,243	10,308
2022-23	629	359	828	258	2,074	24	40	22	8,414	8,499	10,573

Progress of SDDC’s In-house carbon emission reduction (Scope 1,2 & 3):

Progress is measured relative to the 2018/19 emission baseline (2,494 tCO2e), main highlights are:

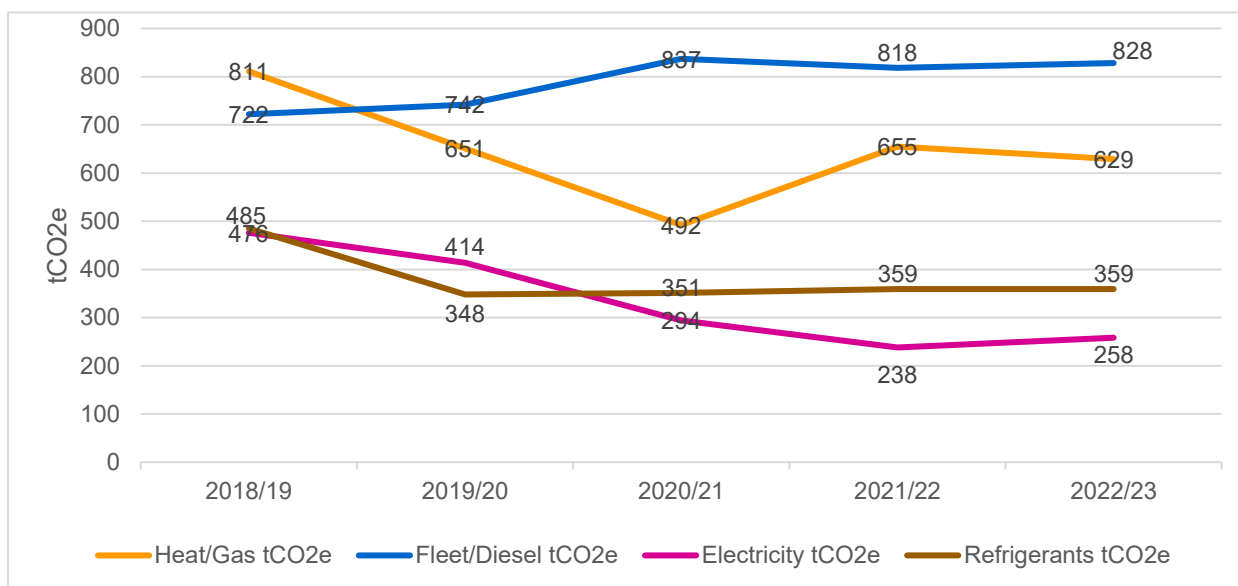
- Scope 1 & 2 annual carbon emissions (SDDC commitment)
 - Have reduced by 426 tCO2e (17%) compared to the 2018/19 emission baseline.
 - Have increased by 8 tCO2e (0.4%) from 2021/22 due to the increase in fleet fuel and overall electricity use.

- Are up 92 tCO₂e (4.6%) compared to lockdown year.
- To achieve carbon neutral by 2030 SDDC needs to reduce its in-house carbon emissions by a yearly average of 296 tCO₂e from 2023 to 2030.
- Scope 3 annual carbon emissions
 - Grey fleet (employee business mileage) has reduced by 33% on prior year – probably driven by significant increases in fuel price.
 - Supply chain carbon emissions are increasing year on year, primarily a result of the increase in housing decarbonisation work being completed by the Council over the last few years. These works generate a short-term increase in carbon emissions but will deliver much bigger long term savings in carbon.

2.1 The main SDDC In-house carbon emission sources (Scope 1 and 2)

The total SDDC in-house carbon emissions (Scope 1 and 2) shown in Table 1 are from all the main operational areas of energy consumption under Council control (fleet vehicle fuel, heat/gas, electricity, and refrigerants from public buildings). The SDDC In-house carbon emissions sources are illustrated in Figure 2 below:

Figure 2: Source Specific Scope 1 and 2 Emissions



Progress of the main SDDC In-house carbon emission sources:

Progress of each of the individual In-house carbon emission sources above as compared to the 2018/19 emission baseline, are:

- Heat/gas emissions have reduced (4%) compared to prior year and is 22% lower than the 2018/19 baseline, largely due to actions taken to reduce gas consumption at the Leisure Centres.
- The vehicle fleet emissions have increased by 1.2% compared to prior year and are up by 15% on the baseline year. This is largely due to the increase in the number of refuse collection

vehicles required by bringing in control of previously outsourced contracts. Fleet emissions are the Council’s largest In-house carbon emission source.

- Emissions from refrigerants are the same as prior year and stable.
- Emissions from electricity use have increased slightly (8%) compared to prior year but are significantly below (47%) the baseline year.
- Apart from the vehicle fleet, all other carbon emission sources have kept significantly below the pre-Covid levels.

Between 2019 and 2021, Covid19 lockdowns significantly reduced carbon emissions as most employees worked from home and residents were in lockdown. This significantly reduced the heating and electricity consumption in all public buildings, especially the two leisure centres at Greenbank and Etwall. During 2021 to 2023, as employees and residents find the new ‘normal’, energy consumption has increase slightly as new hybrid working develops and residents return to the leisure centres, resulting in slight growth in carbon emissions post Covid.

2.2 Public Building carbon emissions by location (Scope 1 and 2)

As well as showing the carbon emission sources, this report details the carbon emissions by the main individual high emitting public building locations. The combined carbon emissions from the heating and powering of public buildings (gas, electric and refrigerants) contribute 60% of the Council’s in-house totals. Reducing the energy consumption of individual high energy consumption public buildings has a significant impact on emission reductions as well as reducing the operating energy costs. Figures 3 and 4 below show the comparisons between the main Council public buildings:

Figure 3: Annual Electricity Carbon Emissions by Building

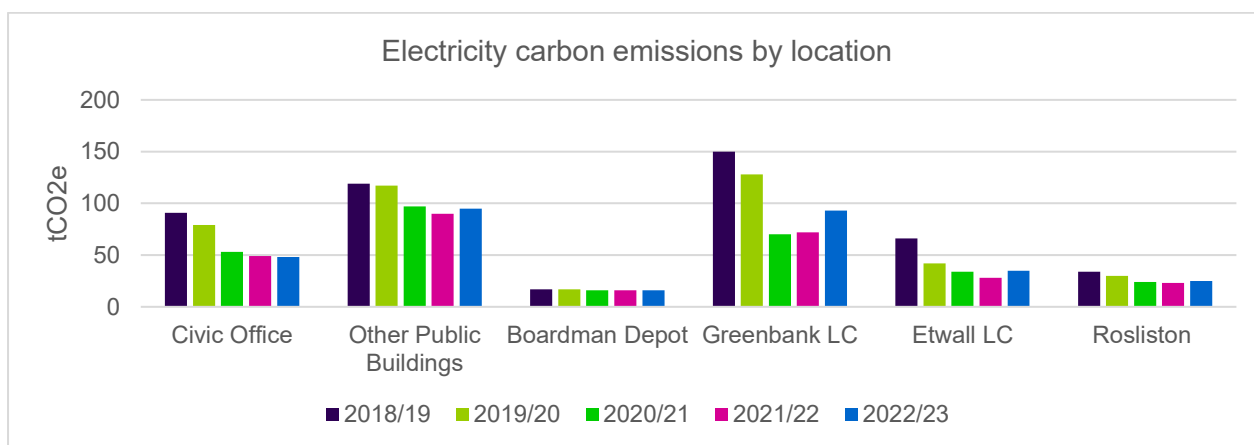
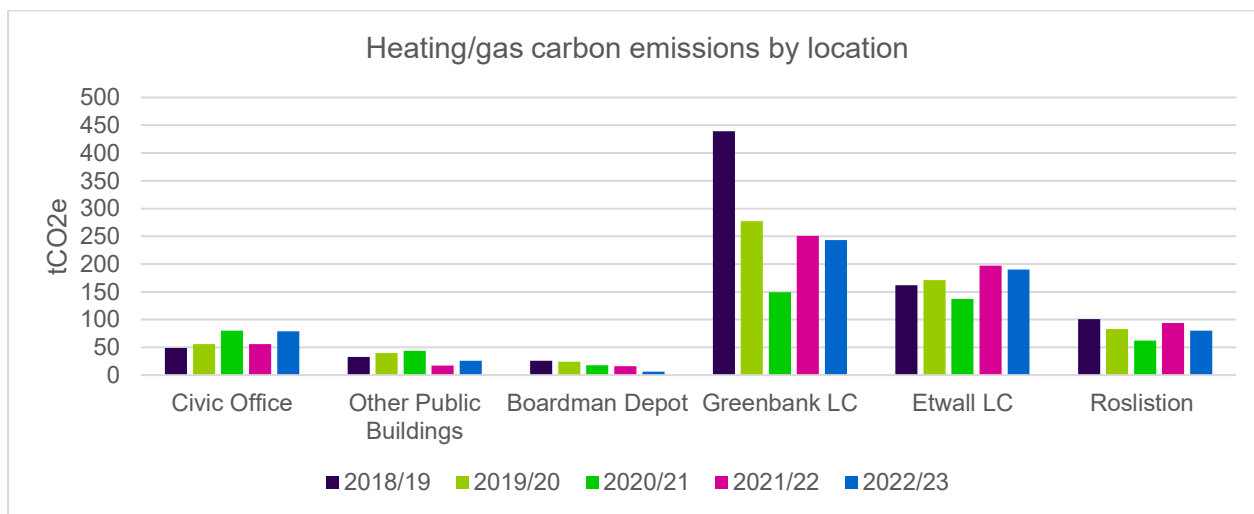


Figure 4: Annual Natural Gas Carbon Emissions by Building



Progress of carbon emissions reduction from the high gas/electric public buildings:

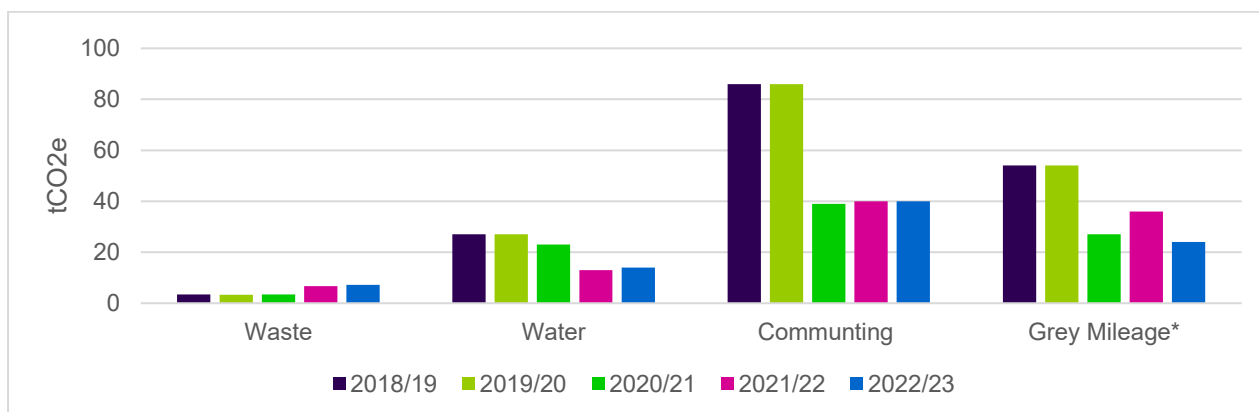
Energy consumption is a significant operational cost to the running of all the Council’s public estate, especially the individual buildings identified in this report. Gas consumption at the six operational locations emits approximately three times the amount of carbon as that caused by electricity consumption.

- Electricity carbon emissions from high consuming buildings
 - Overall electric emissions from all high consuming buildings have shown significant reductions from the baseline year.
 - The two Leisure Centres have shown increases in electric emissions on prior year.
- Heating/gas carbon emission
 - All buildings have been showing reductions of heating/gas emissions apart from the Civic Offices, whose heating/gas emissions have increased on prior year as more employees are working at the offices compared to Covid lockdown.
 - Heat/Gas emissions at the Leisure Centres have reduced slightly on prior year because of direct action being taken to reduce heat/gas consumption (pool covers, pool temperatures, etc)
 - Although the heat/gas consumption of the Leisure Centres has reduced slightly on prior year, they are by far the highest gas consuming locations because of the high energy demands of swimming pools and the low energy efficiency of the buildings, especially Greenbank.
- Overall, the Leisure Centre’s are by far the highest carbon emitter locations.
 - Each Leisure Centre on average uses double the amount of electricity and triple the amount of heating/gas than the Civic Offices.
 - Carbon emissions from heating/gas in the Leisure Centre’s are double that of electricity emissions.
 - Both Leisure Centres reduced emissions in the first year of Covid lockdown but increased significantly in the second year as they opened to the public.
 - Heating/gas of the two Leisure Centres are the most significant single contributors to the Council’s in-house carbon emissions after those of the vehicle fleet.

2.3 Scope 3 In-house carbon emission sources

Scope 3 in-house carbon emissions can only be influenced by the Council, unlike Scope 1 and 2 emissions that can be directly controlled. The Scope 3 carbon emissions can be split into those connected to the Council’s activities (waste, water, commuting and grey fleet mileage) and those emissions resulting from the Council’s procurement of goods and services from its supply chain. Figure 5 below shows the Scope 3 emissions resulting from the Councils waste, water consumption, employee commuting and grey mileage (employees business mileage).

Figure 5: Scope 3 carbon emissions resulting from Council in-house activities



Grey Mileage* is the SDDC business mileage of employees using their own vehicles.

The other element of Scope 3 carbon emissions is those resulting from the SDDC Supply Chain. These scope 3 emissions are generated by other supplier organisations as part of the process of providing goods and services to the Council. The table below shows the estimated carbon emissions from the Council’s supply chain over the last four years.

Table 6: Estimated scope 3 Supply Chain Emissions

Scope 3	2018/19	2019/20	2020/21	2021/22	2022/23
Supply Chain carbon emissions	6,362 tCO2e	6,316 tCO2e	8,223 tCO2e	8,243 tCO2e	8,449 tCO2e

Progress of reducing Scope 3 carbon emissions:

- Scope 3 emissions from waste, water, commuting and grey mileage:
 - All these scope 3 carbon emissions reduced because of the Covid19 lockdown.
 - Carbon emissions from employees commuting to work has reduced by over 50% for the past two years because of Covid lockdown and working from home.
 - Grey mileage emissions have reduced by 33% over prior year, most likely to be driven by different ways of meeting (MS Teams etc) and the significant increase in fuel prices.
 - Carbon emissions from water have reduced with increased numbers of employees working from home.
- Scope 3 Supply Chain emissions
 - Supply chains emissions are, over three times the size of the Council’s total In-house scope 1 & 2 carbon emissions.

- Supply Chain carbon emissions are increasing year on year.
- The increases in 2020/21 to 2022/23 are a result the additional building sector works that are being delivered to support the decarbonisation of social and residential housing by Novus, Westville & Renuvo. Construction and building sector activity are one of the highest carbon emission sectors. Ultimately this work will deliver long term carbon savings.

3. South Derbyshire District-wide carbon emission reporting

The South Derbyshire area has a carbon footprint that results from the activity of district-wide businesses, transport, buildings, homes, households, residents and all the vehicles travel across the district. The Council as part of its carbon neutral targets has committed to support the reduction of these district-wide emissions to carbon neutral by 2050 in line with the UK Governments legislation.

3.1 The main District-wide carbon emission sources

Local Authority district-wide carbon emission reporting is completed by the Office of National Statistics and gives the annual carbon emissions in ktCO₂ categorised into the sectors whose activities result in carbon emissions.

The South Derbyshire District-wide carbon emissions are categorised into the main carbon emission sectors of Industry, Commercial, Public Sector, Domestic Transport and Land use and are shown in Table 7 below:

Table 7: District-wide Carbon Emissions Sources (kt CO₂e)

Sector carbon emissions (kt CO ₂)	2017	2018	2019	2020
Industry	136	120	112	97
Agriculture	23	25	25	24
Commercial	31	30	28	25
Public Sector	15	15	14	13
Domestic	152	151	149	146
Transport	313	309	310	248
Net emissions (forestry, crops, grass)	-10	-10	-11	-10
Total	660	649	628	542
SDDC Emissions/head tCO₂e	6.4	6.2	5.9	4.9

(Local Authority territorial CO₂ emissions – GOV.UK)

Progress of reducing District-wide carbon emissions:

The Council’s Climate and Environment Action Plan (2021 - 2030) has 18 specific actions for delivering carbon emissions reduction across the district. These range from supporting households to make their homes more energy efficiency, developing an electric vehicle charging infrastructure, running tree planting schemes, improving the districts natural habitats to engaging with business and community groups to advise and encourage carbon reduction measures. The carbon emission reductions from the Council delivering these district-wide actions are detailed in the Appendix and support the progress in carbon emission reductions shown in the table above:

- District-wide carbon emissions have reduced by 4.4% since 2017/18
- Largest reduction of carbon emission source is the Commercial sector.

- Highest carbon emission sources in South Derbyshire are the Transport sector and the Domestic (Residential) sectors.
- Lowest carbon emission source in South Derbyshire is Agriculture sector, although it is showing no decrease in emissions year-on-year.
- The carbon sequestration by natural sources is increasing year-on-year.
- Overall, the South Derbyshire emissions/population head on average is reducing year-on-year.

In terms of comparisons with other local authorities, table 8 below shows the total carbon emissions and the emissions per head of all other district councils in Derbyshire:

**Table 8: Derbyshire Annual Carbon Emissions Estimate
(1.2 Local Authority territorial CO2 emissions – GOV.UK)**

Local Authority	Total emissions (ktCO2e)			Emissions/Head of population		
	2018	2019	2020	2018	2019	2020
South Derbyshire	649	628	542	6.2	5.8	4.9
N E Derbyshire	510	497	435	5.0	4.9	4.3
High Peak	2,855	2,875	2,667	30.9	30.7	28.8
Erewash	536	514	464	4.6	4.5	4.0
Derbyshire Dales	519	501	436	7.2	6.9	6.0
Chesterfield	445	431	396	4.3	4.1	3.8
Bolsover	945	929	824	11.9	11.5	10.1
Amber Valley	647	629	566	5.1	4.9	4.4
Derby	1,184	1,109	1,021	4.6	4.3	4.0
Derbyshire CC	7,108	7,004	6,329	8.9	8.7	7.8

Highlights of district-wide emissions compared to other local authorities:

- The latest figures shows that South Derbyshire is responsible for 542,000 tCO2e annual carbon emissions (270 times more than the Councils In-house emissions).
- District wide carbon emissions have reduced by 16% since the baseline year of 2018/19
- Carbon emissions are reducing in all areas of Derby and Derbyshire year on year.
- Carbon emissions in South Derbyshire have reduced per head of population by 21% since 2017/18, one of the highest across Derbyshire.
- South Derbyshire has the fifth highest carbon emissions in Derbyshire, after High Peak, Bolsover, Derby City and Amber Valley.

4. Overall Achievement Summary

Although SDDC must make some key decisions around the decarbonisation of their public buildings, leisure centres and vehicle fleet, there are some major achievements in their approach to reducing their In-house and District-wide carbon emissions.

In-house progress summary.

Achievement	Summary
Council tracking carbon emissions	Annual in-house Scope 1, 2 and 3 emissions tracked, and 2018/19 emission benchmark established.

Council Annual Carbon Reporting established.	This is the second Annual in-house and District-wide carbon emission report, showcasing established governance.
Overall in-house carbon emissions have reduced year-on year	Against 2018/19 benchmark, the 2022/23, the In-house scope 1 & 2 carbon emissions have reduced by 17%
Most of the in-house Scope 1 and 2 emissions are reducing year-on-year	Emissions from heat/gas, refrigerants and electricity have all reduced significantly from the 2018/19 baseline. Only fleet vehicle emissions have increased.
Most in-house Scope 3 emissions are reducing year-on year	Emissions from waste, water, employee commuting and grey fleet are showing reductions from the baseline year.
District-wide emissions are reducing year-on year	District-wide emissions have reduced by 4% since the 2017/18 benchmark
SDDC has started to track Scope 3 Supply Chain emissions	Scope 3 Supply Chain carbon emissions are over three times the size of SDDC in-house emissions
District-wide emissions per head of population are reducing	Emissions per head of population have reduced by 23% from the 2017/18 benchmark.
Compared to other districts in Derbyshire	The total emissions of South Derbyshire are the fifth highest in Derbyshire, the reduction in emissions per head of population is one of the highest.

District-wide progress summary

Achievement	Summary
District-wide emissions are reducing year-on year	District-wide emissions have reduced by 4% since the 2017/18 benchmark
District-wide emissions per head of population are reducing	Emissions per head of population have reduced by 23% from the 2017/18 benchmark.
Compared to other districts in Derbyshire	The total emissions of South Derbyshire are the fifth highest in Derbyshire, the reduction in emissions per head of population is one of the highest.
The Council has installed 42 EV charging bays across South Derbyshire.	The annual carbon displaced is 51.7 tCO ₂ e (the equivalent amount of carbon that would result from using a petrol/diesel car).
The Council has retrofitted a total of 42 private homes throughout South Derbyshire using the LAD/HUG funding schemes	This has led leading to more energy efficient homes and a carbon emission reduction of 92.4 tCO ₂ e
Tree Planting Schemes	Since 208/19 SDDC has co-ordinated the planting of 8,577 tree saplings that has the potential to sequester (absorb) 86 tCO ₂ per year

Although SDDC still has a long way to go to achieve carbon neutrality, this 2022/23 Annual Carbon Report illustrates that SDDC has established progress in reducing and supporting its In-house and District-wide carbon emission reduction journey.

5. Recommendations

This Annual Carbon Report also demonstrates what else needs to be done to ensure the carbon neutral targets and commitments will be met. The following recommendations and next steps are required to support SDDC’s carbon neutral journey:

Recommendations	Next Steps
<p>That management, leadership and elected members understand and are aware of the Council’s high carbon emitting sources and locations for both In-house and District-wide carbon emissions.</p> <p>That the above stakeholders are also aware of which emission sources are reducing, static or increasing on an annual basis because of the Council’s activity.</p>	<p>That management, leadership and elected members are aware that without the reduction of these high emitting sources/locations, SDDC will not meet its carbon neutral commitments.</p> <p>Council decisions will have to be made on the next steps required for these sources and locations if the carbon neutral commitments are to be met.</p>
<p>Stakeholders are aware of the individual highest carbon emission sources resulting from the Council’s In-house activities:</p> <ul style="list-style-type: none"> • Vehicle Fleet • Heat/Gas consumption in public sector buildings 	<p>The replacement vehicle fleet transitions to low or zero carbon over the next 8 years.</p> <p>The public sector buildings identified as high emission sources need retrofitted energy efficiency measures, low carbon heating installed &/or where appropriate the development of new zero carbon buildings.</p>
<p>Stakeholders are aware of the highest carbon emission SDDC locations in priority order of carbon emissions:</p> <ol style="list-style-type: none"> 1. Greenbank Leisure Centre 2. Etwall Leisure Centre 3. Civic Offices 4. Rosliston Forestry Centre 5. Boardman Depot 	<p>Council decisions need to be made on the decarbonisation of these locations and plans for renewable energy sources and energy efficiency measures need to be developed for each of these locations.</p> <p>Level of investment required to decarbonise will need to be established.</p>
<p>Stakeholders are aware of the scale of Scope 3 Supply Chain carbon emissions.</p>	<p>To establish next steps for tackling the Supply Chain emissions</p>
<p>Stakeholders are aware of the largest District-wide carbon emission categories</p>	<p>Ensure the actions that SDDC are taking are aligned to the largest District-wide carbon emission sectors for South Derbyshire</p>
<p>Stakeholders are aware of the carbon emission tracking of the actions that SDDC are taking across the district and the positive impact these are having in supporting the district-wide</p>	<p>Verify the methodology of carbon emission estimation and the potential to use these carbon emission reductions in any offsetting process.</p>

commitments to carbon neutrality by 2050 – see Appendix 6	
Stakeholders are aware of how other Districts are reducing their district-wide emissions	Compare SDDC District-wide actions with all other Districts to include any specific best practice actions SDDC are missing.
That this Annual Carbon Report is used in reviewing individual decarbonisation actions & their effectiveness. This evaluation is then used in the annual update of the Climate & Environment Action Plan	Feed recommendations and learnings of this Report into the Climate and Environment Action Plan reviewing programme.

6. Appendix - District Wide Carbon Emission Reductions through SDDC Action

This is the first year that SDDC have started to monitor the carbon emissions reductions / displacement resulting from the delivery of the main district wide actions. These direct actions that the Council is taking within the Transport Sector, the Domestic (residential) Sector and the Net Emissions (carbon sequestration) Sectors are detailed below:

SDDC owned EV charge points – District-wide carbon emissions displaced

Over the last two years, the Council has installed 42 charging bays, the table below shows the quantity of carbon displaced, based on the charge point usage at each charge point.

The annual carbon displaced is the equivalent amount of carbon that would result from a petrol/diesel car.

In 2022/23 the installation & use of EV charge points across South Derbyshire has supported the displacement of 51.7 tCO₂e.

Car Park	2021/22	2022/23
Bus Station	6329	29,139
Rink Drive	8363	10,797
Arnold Close	204	1067
Hilton	0	6508
Hatton	0	3532
Melbourne Assembly Rooms	0	705
Total carbon (kgCO₂e) displaced	14896	51,748
Annual Carbon displaced (tCO₂e)	14.9	51.7

Housing retrofit programme – District-wide carbon emissions reduced

SDDC are delivering a few funding schemes (LADs/HUGs) that are supporting residents (private homeowners and private rentals) to retrofit energy efficiency measures. There are several caveats around these schemes including the main ones of householder income being less than £30k and the homes must have an EPC rating of D or higher, with the aim that the efficiency measures selected will get them to an EPC rating of C.

The reduction in EPC ratings increase the energy efficiency and reduces the carbon emissions from heating these homes.

Throughout the 2022/23 financial year a total of 42 private homes throughout South Derbyshire were retrofitted through these schemes, leading to more energy efficient homes and a carbon emission reduction of 92.4 tCO₂e

SDDC are also delivering a scheme to reduce carbon emission and improve thermal efficiency in its own housing stock through the Social Housing Decarbonisation Fund (SHDF). The first phase of this scheme is nearing completion at the time of the production of this report and funding has been approved for a SHDF Phase 2. No data is currently available for the carbon savings achieved through SHDF Phase 1, although they can reasonably be assumed to of a similar magnitude to those achieved in the private sector.

Tree Planting Programme – carbon sequestration (carbon emissions removed)

Every year SDDC deliver a tree planting programme (the ‘Free Tree Scheme’), the table below shows the number of trees planted per year. Although the science of how trees sequester carbon is established, the estimations of carbon sequestered per tree is complex and varies on age, density of woodland, tree species and climate. There are no specific or verified calculations around this emerging analysis, but a typical ‘rule of thumb’ estimation is that a tree will sequester 10kgs per tree per year for the first 20 years of its life.

Since commencing the tree planting in the base year of 2017/18, the tree planting schemes now have the potential to sequester (soak up) 85.78 tCO₂e per year.

	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
Trees Planted	610	1,733	1,490	1,280	1,687	1,777	8,577
CO ₂ sequestration per year (kg)	6,100	17,330	14,900	12,800	16,870	17,770	85,770
SDDC Tree sequestration cumulative Total per year (tCO ₂ e)	6.1	23.43	38.33	51.13	68.0	85.78	

SDDC owned Green Spaces – carbon sequestration (carbon emission removed)

SDDC owns and manages 862.56 hectares of green spaces across South Derbyshire of varying habitat types. Green spaces (natural habitats) play a vital role in tackling climate change as healthy

ecosystems soak up (sequester) significant amounts of carbon by the vegetation or surrounding soils.

Natural England have completed a review of evidence (NERR094) and have collated carbon flux sequestration coefficients by various habitats that have been used in the following calculations. Where no carbon flux coefficients have been established for certain habitats, the carbon sequestration has been zeroed.

Habitats	Area (m ²)	Flux coefficient (tCO ₂ e ha y)	Carbon sequestered (tCO ₂ e)
h2a - Hedgerow (priority habitat) (m)	28.05	-1.99	-0.06
h2b - Other hedgerow (m)	865.8	-1.99	-1.72
g1- Other Lowland Grassland (m ²)	3268.97	0	0
g3a- Lowland neutral meadow (m ²)	6585.35	0	0
g3c- Other neutral grassland (m ²)	133044.28	0	0
g4- Modified grassland (m ²)	140777.03	-0.36	-50.68
h3h- Mixed scrub (m ²)	14223.99	0	0
f2e-Reedbeds (m ²)	924.7	-12	-11.1
f2f- Other fen marsh and swamp (m ²)	1713.52	-0.93	-1.59
w1g6-Line of trees (m)	395.84	-1.99	-0.79
w1d-Wet woodland (m ²)	11057.87	n/a	0
w1g- Other woodland (broadleaved) (m ²)	442691.25	-7	-3099
w1g- Other woodland (broadleaved) (m ²)	36110.48	-11	-397.2
w2b- Other Scots pine woodland (m ²)	18918.8	n/a	0
r1a-Eutrophic standing water (m ²)	27342.3	n/a	0
u1a-Open mosaic on previously developed land (m ²)	24624.34	n/a	0
TOTAL	862572.57		-3562.14

There is no verified or established methodology for calculating carbon sequestration rates of various habitats and the use of flux coefficients is still in the research and development phase. However, the above calculations showing the potential of the Councils’ owned green spaces sequestering (soaking up) an indicative 3,562 tCO₂e per annum show the huge potential that improving the Councils own land assets could deliver towards the national net zero goal.