



Nottingham
City Council

Energy
Services



Carbon Management Plan Ashfield District Council

Nottingham City Council Energy Services

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Report Details

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Glossary

ADC	Ashfield District Council
AMR	Automated Meter Reading
Baseload	Energy consumption when a building is unoccupied and, for utilities used for heating, when <i>heating degree days</i> equal 0. This is the load which is always there and never switched off.
BAU	Business as usual
CHP	Combined heat and power
CMP	Carbon Management Plan
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent emissions
GHG	Greenhouse gas
Gross emissions	Overall greenhouse gas emissions. These can be reduced through taking measures to reduce, for example, electricity or gas consumption.
HDD	Heating Degree Day. A measure of how far below and for how many days the outside air is below 15.5°C. For example, if the outside air temperature is 14.5°C for 2 days, this would be 1 degree * 2 days = 2 Heating Degree Days. These are added up to give a total for a certain period (e.g. month, year). Used to help quantify likely demand for energy needed to heat a building.
KPI	Key Performance Indicator
NI185	National Indicator 185 (CO ₂ reduction from local authority operations) included Scope 1 and 2 emissions. The set of national indicators included 198 indicators, of which Local Strategic Partnerships (usually led by local authorities) were required to set targets against 35. The national indicators were introduced in 2008 and abolished in 2010.
Net emissions	Reported in addition to the <i>gross emissions</i> . Net emissions reflect reductions which are not reflected in the total emissions, for example, exporting renewable energy generation.
Organisational Boundary	The border of a company's own operations and influence.
PV	Photovoltaics
ULEV	Ultra Low Emissions Vehicles

Introduction

Globally, climate change has become a cause for concern, with human activities dangerously increasing greenhouse gas emissions. Ashfield District Council (ADC) recognises that we have a responsibility to act and reduce our own contribution to climate change and achieve net zero emissions. In order to meet our aims we have conducted a full greenhouse gas analysis of the Council's own operational emissions and produced this Carbon Management Plan.

ADC has already made considerable progress in reducing its emissions through multiple different projects, including installing solar PV on many council owned buildings, operating smarter working practices in council offices and launching a Climate Change Officer Working Group to collaboratively drive reductions in carbon emissions. Also, Council decision making now includes assessments of impact on sustainability and the environment. The impacts of these projects, actions, and other influential factors (discussed throughout this report) has meant that ADC emissions have already reduced by 25% since 2015/16¹.

This Carbon Management Plan analyses the trends of remaining ADC emissions and sets out key actions for ADC to take to reduce them, as well as actions to improve data quality and monitoring of ADC emissions footprint. Alongside reducing the Council's own emissions, ADC recognises the importance of supporting the decarbonisation of the whole Ashfield District, in line with UK Government targets of achieving net-zero by 2050 and the international target of keeping global temperature rise well below 2°C, and will act where it can to influence and assist the wider district to meet such targets.

Emissions Reporting Boundary

Ashfield District Council (ADC) is reporting its full greenhouse gas emissions profile, following the Greenhouse Gas (GHG) Protocol. This methodology is compliant with UK Government reduction targets, Global Covenant of Mayors and the Carbon Disclosure Programme (CDP).

ADC emissions are reported here across three different scopes²:

- | | |
|----------------|--|
| Scope 1 | Direct emissions from ADC controlled or owned sources |
| Scope 2 | Indirect emissions from the generation of purchased energy used by ADC |
| Scope 3 | Indirect emissions associated with the value chain of the council, both upstream into the council and downstream out of the council. |

The type of organisational boundary set by ADC determines which emissions are included in each scope. Ashfield District Council has chosen to use an operational control boundary, meaning emissions are reported in scope 1 and 2 where ADC has full authority to introduce and implement operational policy³. This boundary best represents emissions for which ADC has the ability to influence greenhouse gas emissions from its own assets and operations.

¹ Not including ADC investment emissions – see section 2

² https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf

³ <https://www.zerowastescotland.org.uk/sites/default/files/Organisational%20Boundaries%20-%20carbon%20management%20plans.pdf>

The majority of emissions reported in scope 1 and 2 are not impacted by the type of organisational boundary chosen. One of the most important considerations is with how leased assets are treated. Under operational control, assets that the council leases from external companies are deemed to be under ADC's operational control and as such are included in Scope 1 and 2 emissions. Meanwhile, assets that the council owns but leases out to external parties are considered not to be under its operational control and are included as scope 3 emissions.

The calculation methodologies for each category of ADC emissions vary depending on the availability of data (see Appendix 3 and 4). Some methods use specific data (e.g. Scope 1 and 2 consumption data), whilst other categories use spend-based approaches (e.g. purchased goods and services). Actions to improve data quality and emissions monitoring for ADC to enact are outlined in Section 10.

It is important to note that ADC has chosen to report its full greenhouse gas footprint as carbon dioxide equivalences, this includes carbon dioxide (CO₂) and wider greenhouse gas emissions such as methane and nitrous oxide. In doing so, the council aims to reduce emissions associated with its estate, travel, services and consumption. The GHG Protocol outlines 15 categories to report scope 3 emissions⁴; 9 of these being applicable to the local authority (see Appendix 4).

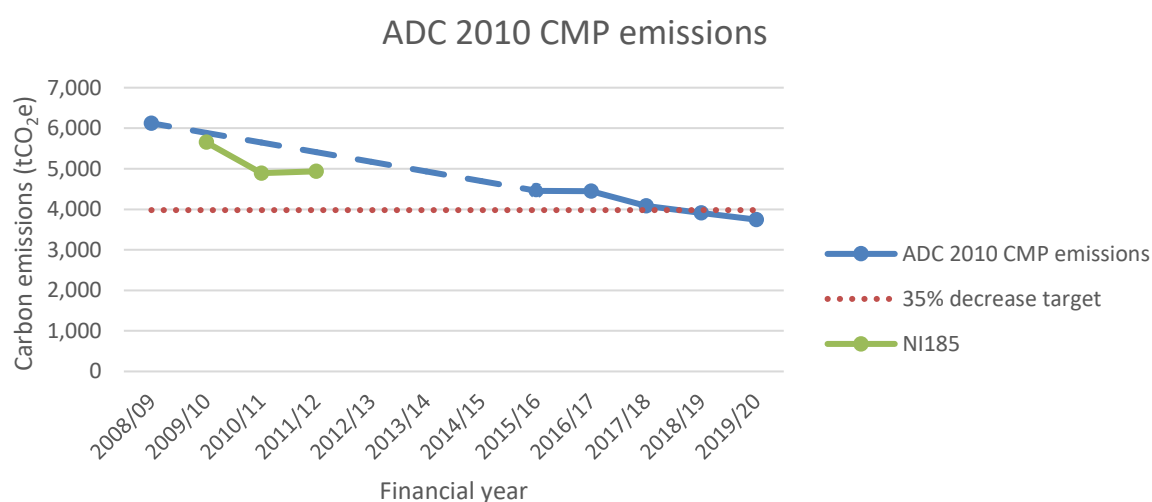
Following Chapter 5 of the GHG Protocol Corporate Standard, the base year 2015/16 emissions for ADC have been calculated to include emissions from Ashfield Homes⁵. As the emissions have transferred from Ashfield Homes to Ashfield District Council, without any change in emissions released to the atmosphere, the emissions are also transferred from one organisation's inventory to the other.

⁴ http://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf

⁵ Emissions for Ashfield Homes for example includes utility use in communal areas, and purchased goods and services (Scope 3 category 1) for example which might be used for repair, maintenance or retrofit of these homes. However, the tenants' energy bills (and the reductions from these energy saving measures) are not estimated or included within this report.

1. Review of Existing Strategies and Targets

Ashfield District Council (ADC) set out a vision in 2010 to become *'one of the best and greenest councils in the UK and East Midlands, delivering on sustainability and meeting its climate change targets'* and with this the 2010 Carbon Management Plan (CMP) set the target to reduce ADC emissions by 35% from 2008-9 baseline by April 2015⁶. This included baseline data collected for National Indicator (NI) 185, with additional categories, such as waste, fugitive emissions, employee commuting, business travel, water use, and utility consumption in other outsourced assets. Based on the emissions calculations later in this report for the equivalent categories as the original CMP report, by April 2015 a 27% reduction was achieved⁷.



In July 2019, ADC committed to do everything possible to combat climate change, including committing to a robust climate change strategy.

Since the 2010 target and the 2019 commitment, ADC have delivered a number of different projects, helping them on their journey to reducing the Council's operational emissions. These include:

Achievement	Achievement Description
Sustainability Assessments	Sustainability assessments, implications and impacts are now included in all relevant decisions and reports to committees.
Energy Analysis	Nottingham City Council commissioned to carry out: energy audits and data analysis, solar PV desktop studies and detailed analysis into viable PV projects.
Council Scope 1, 2 and 3 emissions baseline	Nottingham City Council commissioned to calculate and analyse ADC's full scope 1, 2 and 3 baseline for the Council's own operations.
Climate Change Officer Working Group	Open to all departments, key attendees from officers that have the most direct impact on climate change. This includes officers from: Assets &

⁶ For the emissions reported by ADC in 2008-9.

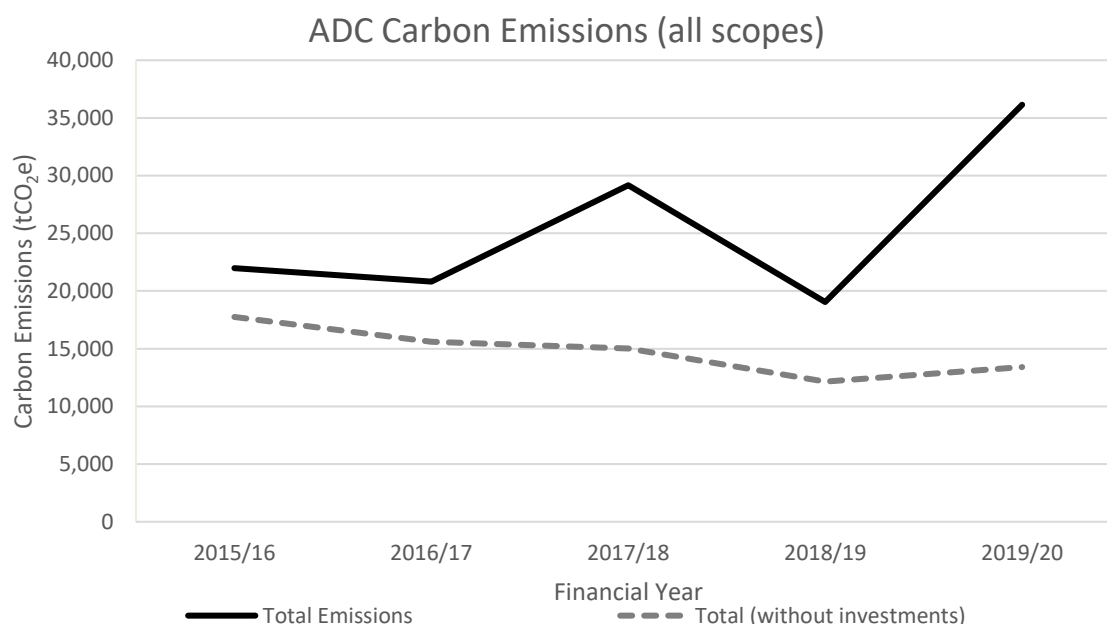
⁷ The original 2010 CMP target and baseline were reported in CO₂, whilst later NI185 and the analysis within this report are calculated in CO₂e. CO₂e emissions will be slightly larger than CO₂ emissions, and slightly greater than the 27% reduction may therefore have been achieved in April 2015.

Achievement	Achievement Description
	Investments, Place & Well Being, Waste & Environment, Planning & Building Control, Procurement and Finance.
Partnerships	ADC collaboratively works with other councils, Local Energy Partnership (LEP), Midlands Energy Hub (MEH), Local Authorities Energy Partnership (LAEP), Department of Business, Energy and Industrial Strategy (BEIS), APSE Energy, Nottinghamshire Lead Energy Officers Group. These partnerships enable ADC to share ideas and knowledge, working collaboratively to meet common goals.
Area Wide Emissions	Analysis of indicative emissions for the Ashfield DC local area, through BEIS data for local authorities, Tyndall Centre Carbon Budget Tool and the SCATTER tool.
Employee Surveys	Surveys to gather employee views and ideas for carbon emissions reductions and to gather data on employee commuting habits.
Energy Provision	Procure green, clean electricity and renewed all ADC energy frameworks in 2020.
Environmental	Nearing the completion of an Environmental Charter; successful bids for Towns Fund funding to facilitate cleaner and greener Towns and infrastructure, encouraging increased walking and cycling; planting 1000 trees per year (2020 to 2023).
Waste and Recycling	Responded to the Government's Waste Strategy, refined the Council's approach to waste to ensure it will meet and hopefully exceed 2023 targets – jointly with Veolia, the County and all other District Councils.
Non-domestic Assets	Successful bid for funding from the Public Sector Decarbonisation Fund, for solar PV; on-going review into non-domestic assets, maximising usage of assets and reducing ADC's carbon footprint.
Planning	Developing a Local Plan to incorporate climate change requirements
Procurement	Reviewed strategic procurement and contracts to maximise efficiencies and cost avoidance, with an on-going consideration of the implications and impacts on the environment.
Buildings and Offices	Transitioned to smarter working, alongside the Council's review of office space, resulting in reduced office accommodation requirements. In addition, ADC is developing a self-serve approach for frontline services and facilitating remote access/electronic communications to reduce travel for customers; carbon and energy savings on paper purchase, printing and disposal/recycling requirements.
Flood Protection	Worked with Nottinghamshire County Council to install flood protection measures to Council and privately owned properties considered 'at risk'.

2. Overview of ADC Emissions

Ashfield District Council total net carbon emissions (for all scopes)⁸ in 2019/20 were 36,137 tCO₂e, 64% more than in 2015/16. This increase is as a result of Scope 3 investment emissions (see Scope 3 category 15 investments section). Removing investment emissions from this total demonstrates that for all other scopes and categories, ADC emissions reduced by 24% since 2015/16, with an annual average reduction of 6.1%.

Total net carbon emissions for ADC (including investments) equates to 63.3 tCO₂e per ADC employee, an 87% increase since 2015/16. Not including investments, this is 23.5 tCO₂e per employee, a reduction of 14% since 2015/16⁹.



Scope 1 and 2 emissions for the Council include direct emissions from ADC controlled sources and indirect emissions from the generation of purchased energy.

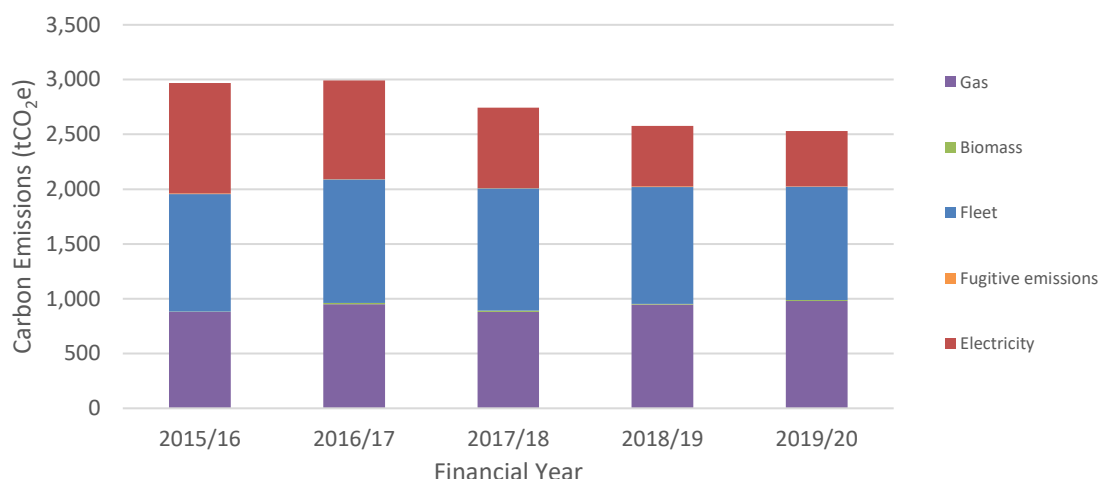
Between 2015/16 and 2019/20 financial years, ADC reduced scope 1 and 2 emissions by 14.8%. These emissions are broken down further by their source in the graph below. Over this same period, gas emissions have increased by 11%, whilst fleet emissions have reduced by 4% and electricity emissions by 50%.

In 2019/20, these emissions accumulated to 2,531 tCO₂e, 7.0% of ADC's full carbon footprint (19% of ADC's carbon footprint, not including investments). Emissions from fleet use contributed the largest proportion of these emissions (41%), followed by gas use (39%), electricity use (20%) and biomass use and fugitive emissions (<1%).

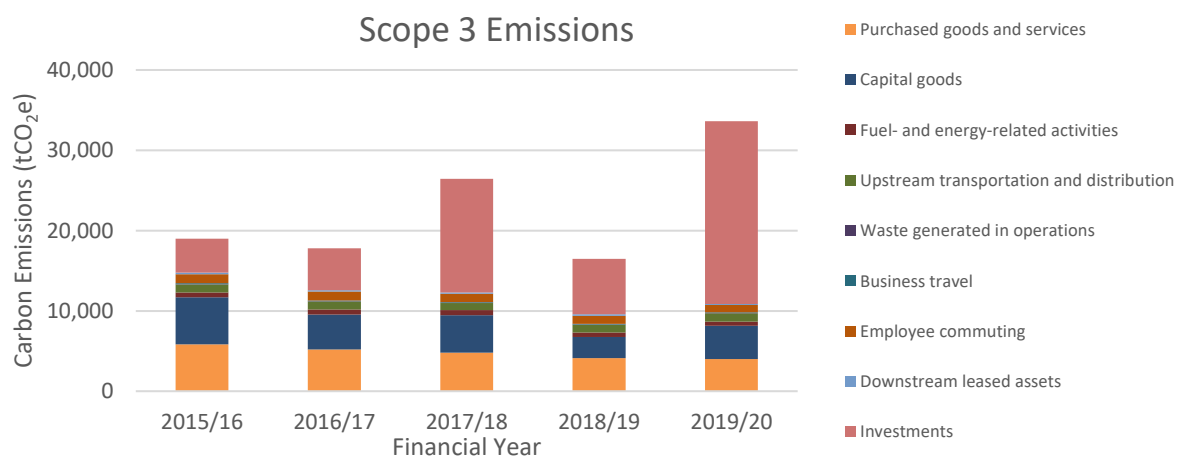
⁸ See Appendices 1 and 2 for explanation of gross emissions, net emissions and total net emissions presented in this report.

⁹ Over this same period the number of employees has reduced from 650 to 571 (12% reduction)

Scope 1 and 2 Emissions



Since 2015/16, ADC Scope 3 emissions have increased by 77% to 33,607 tCO₂e in 2019/20. This increase is as a result of changes to ADC scope 3 investment emissions (See Section 5: Scope 3 category 15 investments). If investment emissions were removed from this total, the remaining scope 3 emissions have reduced by 26% since 2015/16. ADC scope 3 emissions are split by source in the graph below. 2019/20 scope 3 emissions were dominated by investments (68%), followed by capital goods (12%), purchased goods and services (12%), upstream transport and distribution (3%), employee commuting (3%) and all other categories (2%)¹⁰. Of the Scope 3 emissions categories, it should be noted emissions from investments and capital goods can fluctuate to a much greater extent year-on-year due to particular investments or large scale purchases in a particular year. This affects the trend in overall emissions seen.

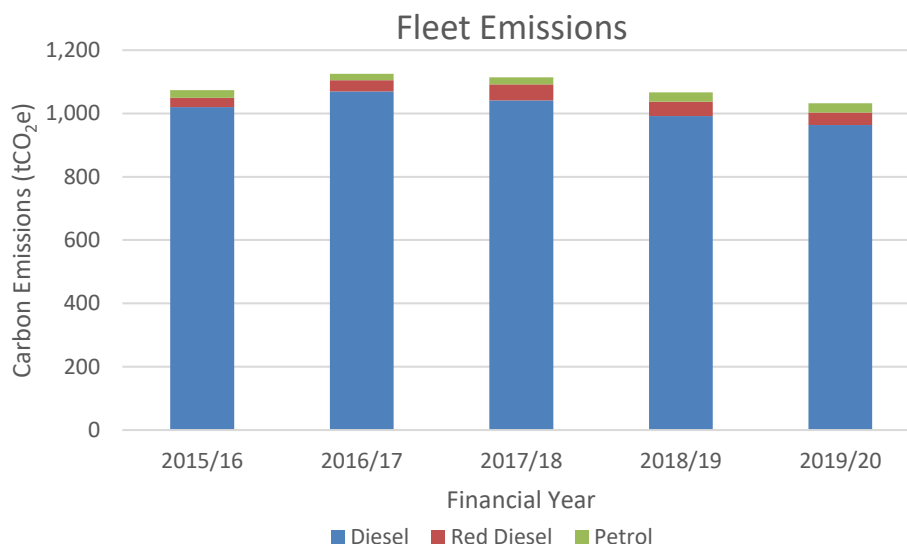


¹⁰ See each category in section 5 for changes to category emissions since 2015/16

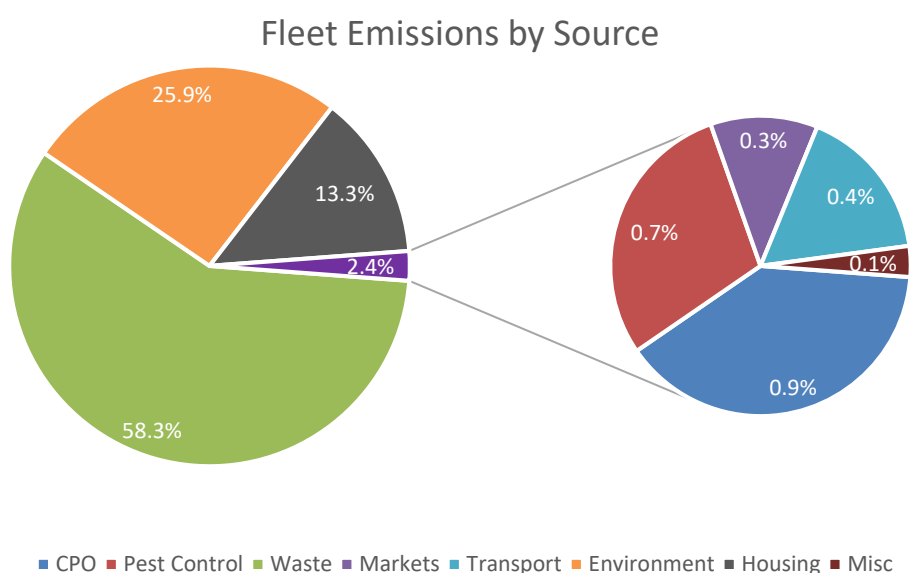
3. Scope 1 and 2 Emissions

Fleet Emissions

In 2019/20, emissions from fleet accounted for 40.8% of ADC's Scope 1 and 2 emissions (1033 tCO₂e). Fleet emissions have reduced by 3.8% compared to 2015/16, despite a 2.4% increase in the total number of fuel claims. The 2019/20 fleet emissions mix is dominated by 93.3% diesel, 3.9% red diesel and 2.9% petrol, similar to the last five year period.



Fleet emissions can be split further based on each ADC service that use fleet vehicles. The Waste service dominate the fleet emissions sources (58.3%), alongside Environment (25.9%) and Housing (13.3%), with other sectors making up the remaining 2.4% of emissions.



Gas Emissions

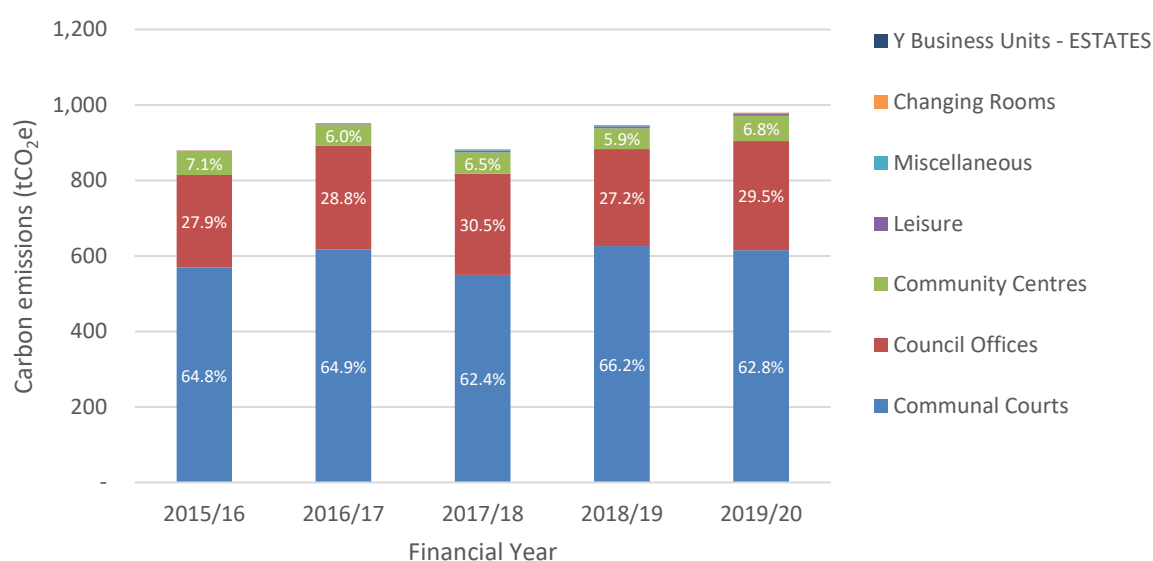
In 2019/20, emissions from gas consumption accounted for 38.7% of ADC's Scope 1 and 2 emissions.

There was no gas consumption data for the Ashfield Homes sites for 2015/16 and up to October 2016. This data has therefore been estimated from a calculated monthly average for these sites for data up to March 2020. Similarly, for other sites with missing historic utility data, a monthly average per site has been backfilled.

In 2019/20, the Housing 'Sheltered accommodation' Courts accounted for 62.8% of emissions from gas consumption, Council Offices 29.5% and Community Centres 6.8%. As with electricity consumption, these relative proportions have remained similar for the past 5 years. Gas emissions have however increased by 11.8% from 2015/16 to 2019/20. The reasons for this are explored further in the following trend analysis (Section 4).

Individual high gas consumption buildings have been further analysed in the Energy Consumption Analysis report completed November 2020 by NCC Energy Services. This found 15 sites accounted for approximately 90% of the estate's total gas consumption. As would be expected, this includes the larger Offices, the Northern depot, and the Housing 'Sheltered accommodation' courts.

Emissions from gas consumption



Electricity Emissions

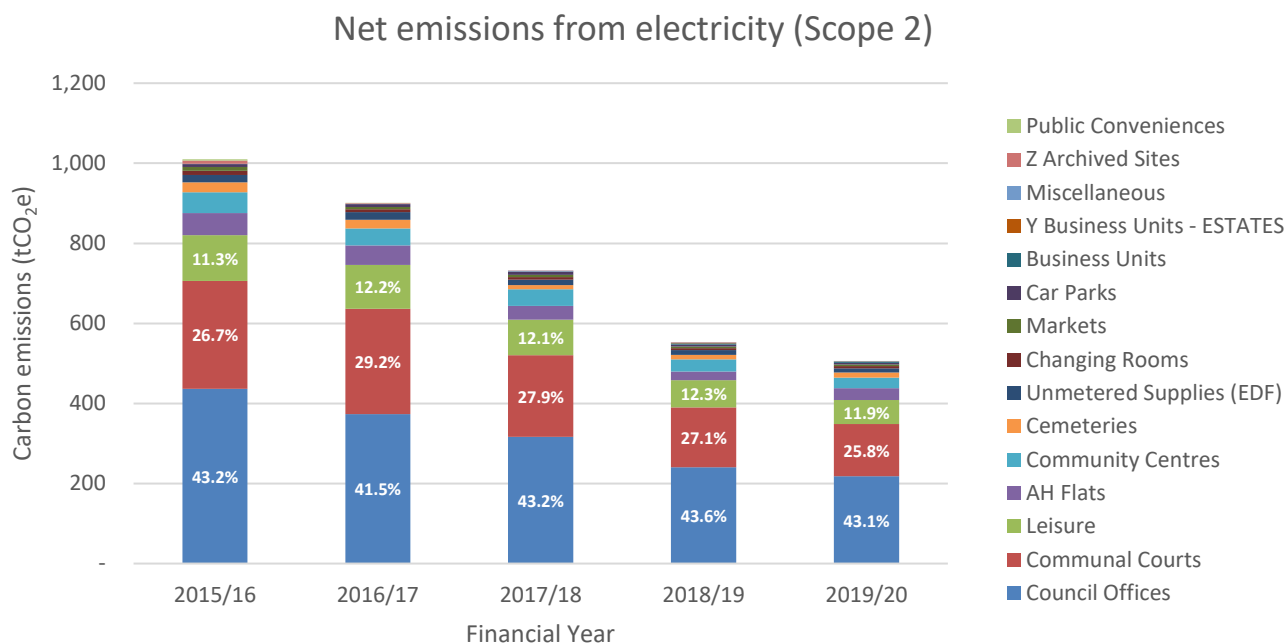
In 2019/20, emissions from electricity emissions accounted for 20.0% of ADC's Scope 1 and 2 emissions. As with gas consumption, there was no electricity consumption data for the Ashfield Homes sites for 2015/16 and up to October 2016. This data has therefore been estimated from a calculated monthly average for these sites for data up to March 2020. Similarly, for other sites with missing historic electricity data, a monthly average per site has been backfilled.

In 2019/20, Council Offices accounted for 43.1% of net electricity emissions, Communal Courts 25.8%, Leisure¹¹ 11.9%. These proportions of emissions have been similar for the past 5 years, however

¹¹ Leisure site group excludes leisure centres, as utility consumption is paid for by the leisure centre operator

between 2015/16 and 2019/20, net electricity emissions¹² have decreased by 49.9%. The reasons for this are explored further in the following trend analysis.

Individual high electricity consumption buildings have been further analysed in the Energy Consumption Analysis report completed November 2020 by NCC Energy Services. This found 16 sites accounted for approximately 75% of the estate's total electricity consumption.



Biomass Emissions

In 2019/20, emissions from biomass accounted for 0.3% of ADC's Scope 1 and 2 emissions. ADC have two biomass boilers at Titchfield Court and Sherwood Court, which use wood pellets with gas back-up. The emissions from the gas back-up are captured within the gas emissions. In 2019/20, 83% of the biomass emissions are from the Sherwood Court biomass boiler, consistent with the greater mass of wood pellets burnt.

Fugitive Emissions

In 2019/20, fugitive emissions accounted for 0.2% of ADC's Scope 1 and 2 emissions. Fugitive emissions are from fleet air conditioning units, air conditioning units (in buildings), and fridges. Fleet air conditioning units account for 97% of fugitive emissions. As there is no change in the number of air conditioning units since 2015/16 to 2019/20, this is the case for each year in the reporting period.

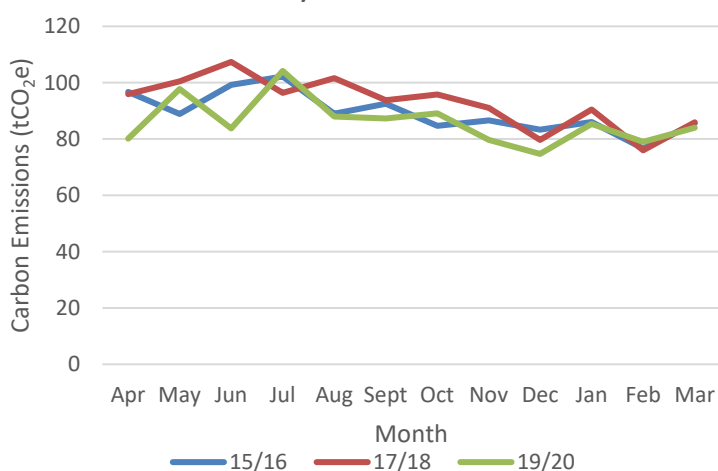
¹² Emissions for Ashfield District Council's operational estate from electricity consumption, excluding electricity consumption from solar PV generated onsite.

4. Scope 1 and 2 Trend Analysis

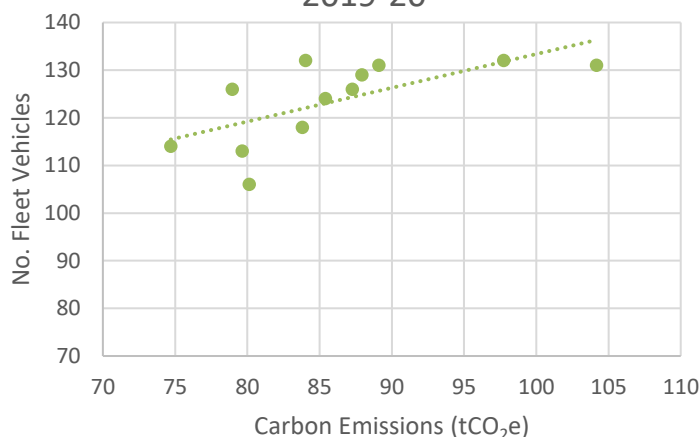
Fleet emissions trend analysis

The below graphs demonstrate that ADC fleet emissions fluctuate seasonally, with higher emissions during Spring and Summer months, compared to Autumn and Winter months. This can be explained by looking at the total number of fleet vehicles in operation during each month, which increase during Spring/Summer and decrease during Autumn/Winter. This is demonstrated by the highly correlated emissions data with the number of fleet vehicle in 2019/20. This is caused by an increase in fleet vehicles, such as agricultural and ride-on mowers, during the warmer Spring and Summer months, which are not used/used less during Autumn and Winter.

Monthly Fleet Emissions

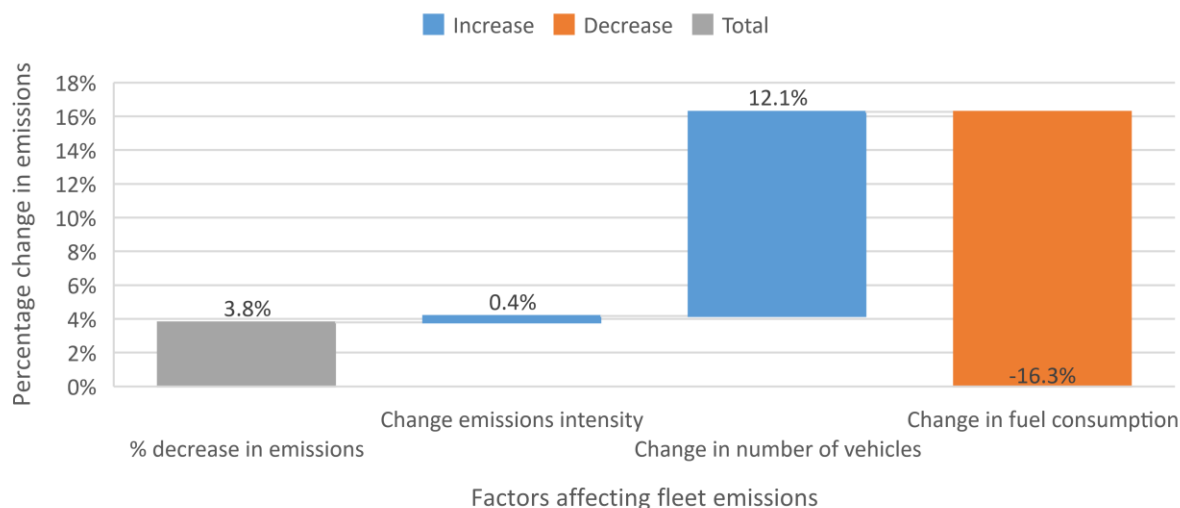


2019-20



Since 2015/16, there has been a 3.8% decrease in emissions from fleet vehicles. This is a result of a 4.2% decrease in overall fuel consumption, balanced with a small (0.4%) increase in fuel emissions intensity. Of the 4.2% decrease in overall consumption, 16.3% is due to a decrease in fuel consumption, whilst there has been a 12.1% increase in the number of vehicles.

Scope 1 Fleet emissions trend analysis

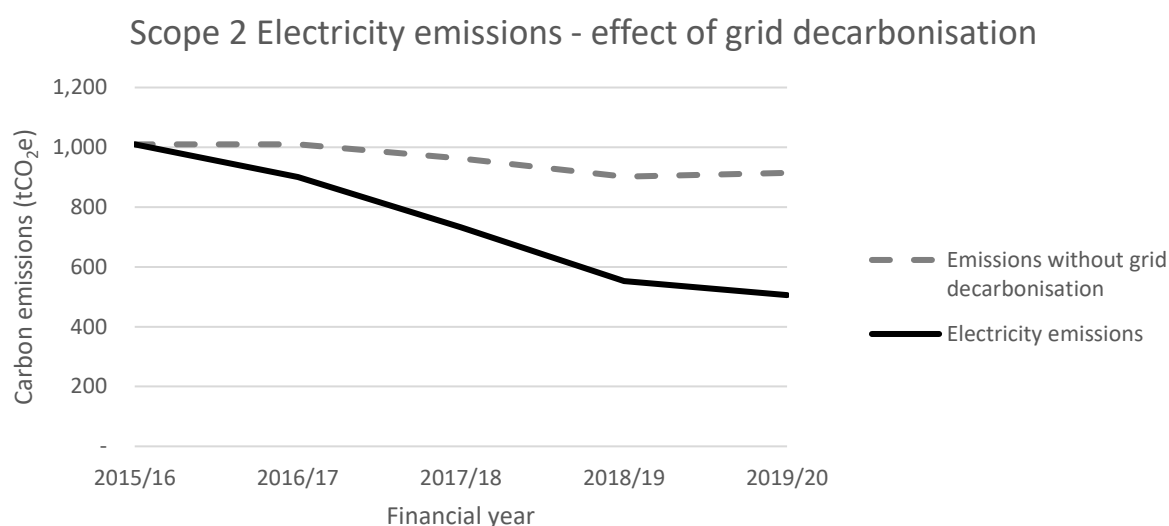


Grid Decarbonisation

The net carbon emissions presented in this report incorporate annual changes in the carbon intensity of the national electricity grid, as recommended by the GHG Protocol. It is important to note that between 2015 and 2019, the carbon intensity of the UK electricity national grid has decreased by 45%. This is known as greening of the grid.

During this time, Ashfield District Council's emissions from electricity have decreased by 50%. Of this 50% emissions reduction observed, 81% of this is due to greening of the grid, and the remaining 19% is due to reductions in electricity consumption. This has been assisted by an increase in electricity generation on site during this period.

The national grid carbon intensity factor is expected to continue to decrease as the mix of electricity sources nationally become lower carbon. If ADC maintains the same electricity consumption this would result in lower emissions in future years¹³. Equally, reductions in electricity consumption in the future would have less of an impact than in previous years on reducing ADC carbon emissions, due to the greening of the electricity grid.



Changing assets

Of the 9.4% decrease in electricity consumption observed (as noted above in Grid Decarbonisation), 30.2% of this is due to changes in the number of assets included in the ADC estate.

Under the operational control boundary, buildings which are under ADC's operational control are included in the Scope 1 and 2 emissions figures, whilst those which are financially owned by ADC, but for example leased out, are included within ADC's Scope 3 Downstream Leased Assets category.

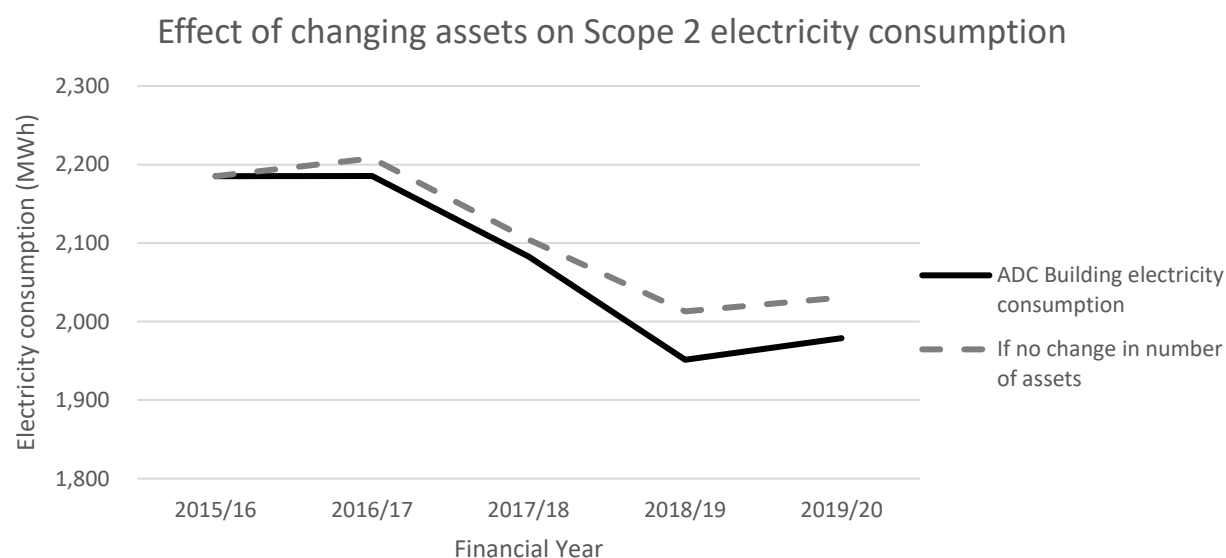
¹³ Electricity emissions presented in this report are calculated using a location-based approach. The Government's Environmental Reporting Guidelines require that Scope 2 electricity emissions are reported using location-based grid average emissions factors. The location-based emissions reflect the average emission of the grid where the energy consumption occurs and is calculated using UK Electricity grid average factors, used within this report. However, market-based emissions reflect a contractual entitlement to claim an emissions rate, allowing for a reduced emission figure where, for example, a renewable energy tariff is backed by certificates to track attributes associated with energy generation. Ashfield District Council switched to a green tariff for half hourly sites from October 2020, and all other non-domestic non-half hourly sites from April 2021. This reduced market-based figure can be reported in addition to the location-based approach in future years.

As new buildings have also been invested in and come under ADC's operational control since 2015/16, these have been included in ADC's figures. Similarly, buildings which have been leased out, or sold, have moved out of ADC's Scope 1 and 2 emissions.

This shifting asset list has impacted upon ADC's Scope 1 and 2 emissions, although have only impacted upon electricity consumption, as no sites with gas consumption have been affected by changing assets.

5 sites with electricity consumption have been added (2 in 2016, 1 in 2017, 1 in 2018, 1 in 2019). These have collectively added an average annual consumption of 5.0MWh by 2019/20 (1.28tCO₂e). However, 13 sites with electricity have been lost from Scope 2 (2 during 2015/16, 4 in 2016/17, 1 in 2017/18, and 6 in 2018/19). Collectively, these had 130.6MWh electricity consumption in 2015/16. The number of assets at the end of 2019/20 was 191.¹⁴

If there had been no change in number of assets during the reporting period (2015/16 – 2019/20), electricity consumption may have been as shown in the graph below¹⁵.

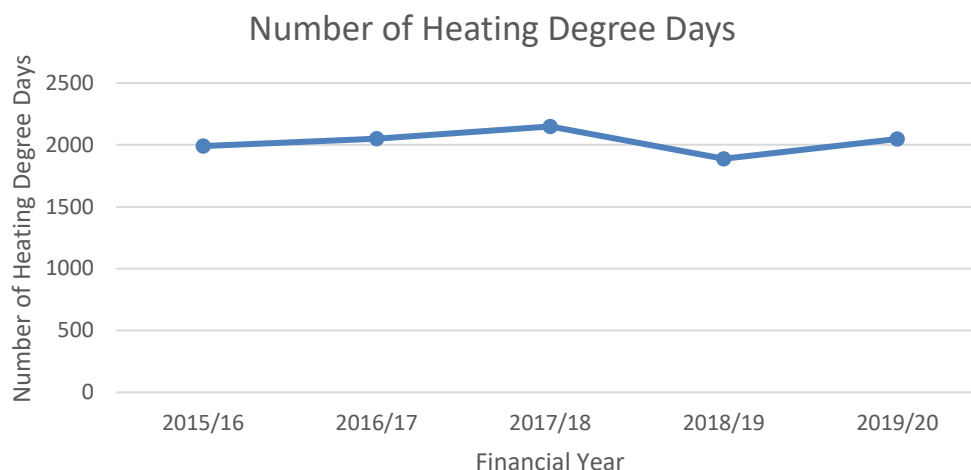


Weather

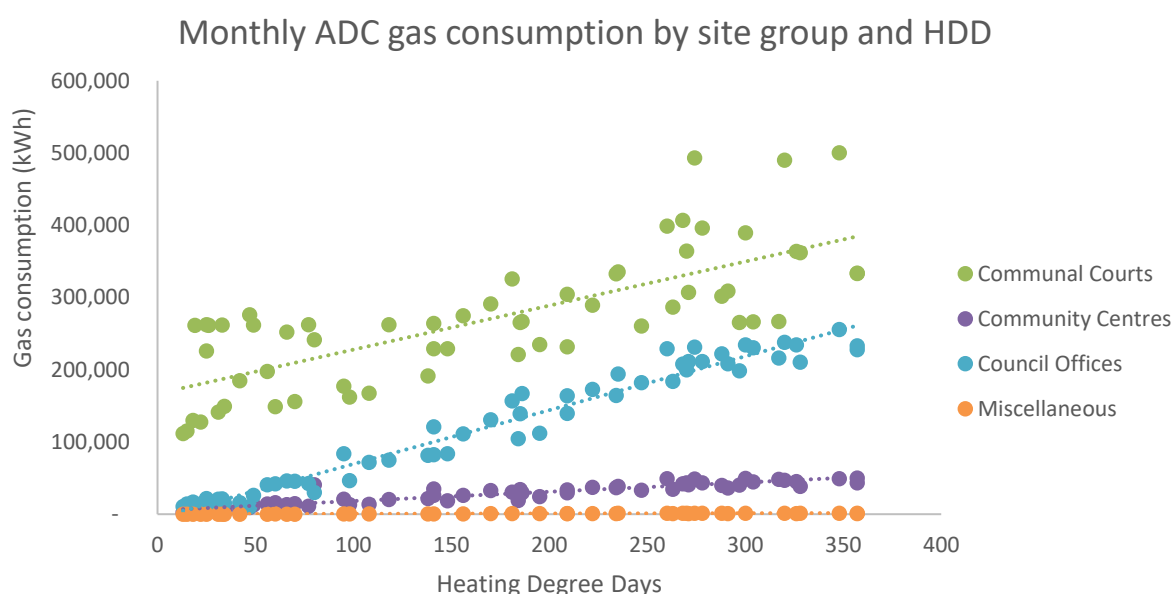
The weather we experience each year varies, which can significantly affect emissions from gas consumption. For instance, a colder winter will result in more fuel being used for heating; whilst a warmer winter will have a lower demand for heating, meaning less fuel is used and fewer emissions as a result. The change in the weather experienced can be measured with Heating Degree Days (HDD). A heating degree day is a measure of how far below and for how many days the outside air is below a certain temperature. The graph below shows the number of heating degree days per year for 15.5°C for the East Pennines region, where it is clear 2018/19 financial year was a warmer year than average.

¹⁴ At some points during each year, the number of assets may have been higher, and electricity use for all sites under the Scope 2 boundary have been included in calculated emissions for the portion of the year they were in scope.

¹⁵ This takes total electricity consumption, divided by number of assets in that year, and multiplied by number of assets in 2015/16. This therefore ignores improvements in efficiency, and focuses on changes as a result of loss and gain of sites.



Analysing these heating degree days against the energy consumption for Ashfield District Council site groups of buildings suggests communal courts, community centres, council offices and miscellaneous are all dependent on weather for the quantity of gas used. Overall, these sites' gas consumption can be considered on average 60% weather-dependent and 40% baseload.

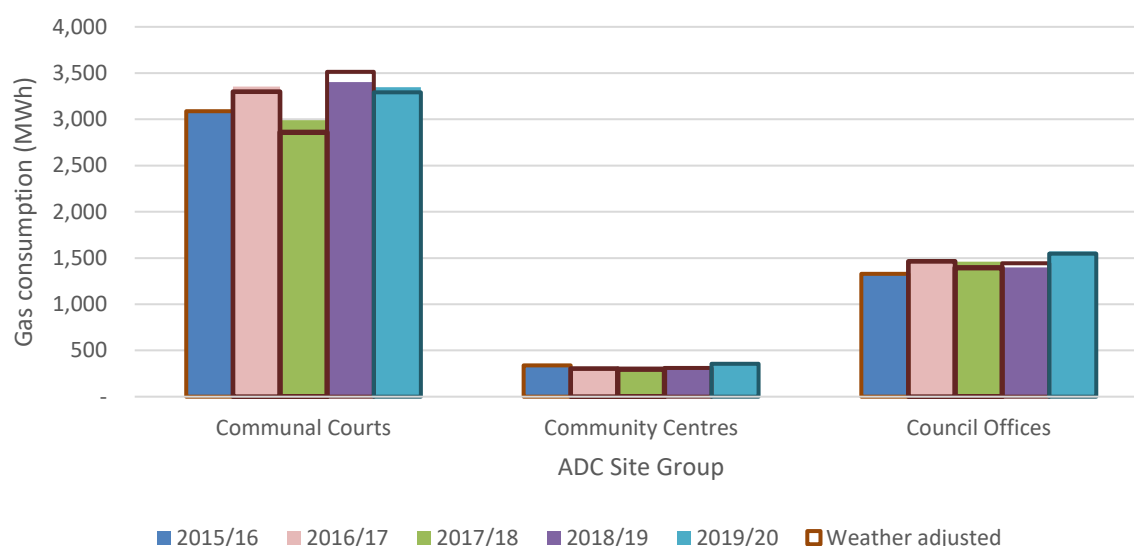


Plotting gas consumption against HDD for Leisure, Business Units, and Changing Rooms (not shown) does not show a correlation, suggesting other uses of gas, poor controls or misuse/override which may need further investigation.

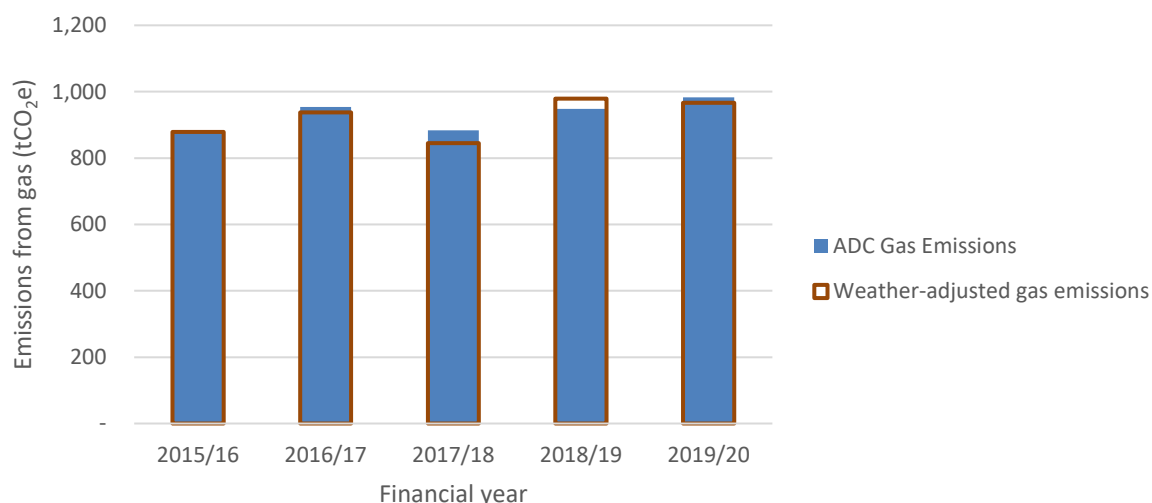
The graph below indicates how accounting for the weather impacts the emissions profile for gas for the site groups which have the majority of ADC's consumption. Solid bars show the recorded gas consumption, whilst the open bars indicate what these would be if corrected for the weather, based on the average weather-dependency for these sites. As in most cases the bar heights are similar, adjusting for weather has little impact on the trends seen in gas consumption, and therefore

emissions. Overall, when gas use is adjusted for the weather, gas consumption has still increased by 10% (rather than 12%). As the carbon intensity of gas emissions has stayed constant over the years, this has a similar impact on gas emissions (10% increase when weather-adjusted, 12% increase without weather corrections). This demonstrates that of the 12% increase in gas emissions observed, 16% is due to changes in the weather, with the remaining 84% due to other increases in gas consumption¹⁶.

Gas consumption - weather corrected



Weather dependency on gas emissions



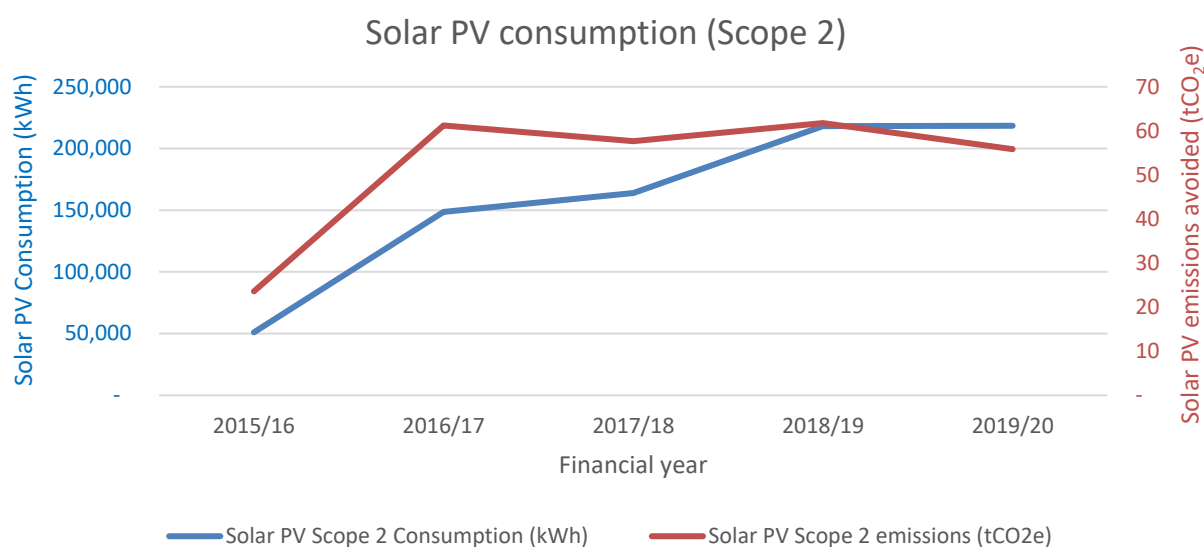
For electricity, however, the vast majority of consumption is not affected by varying amounts of heating due to the weather (average 75% of electricity consumption is baseload).

¹⁶ These weather-dependent relationships are explored further for individual high usage sites in the Energy Consumption Analysis reports.

Renewables

Ashfield District Council have installed numerous solar installations across their estate, as well as three CHP systems, and two biomass boilers¹⁷. As a result, Ashfield has been able to use local low carbon electricity and heat instead of using it from the national grid, saving both money and carbon.

The rate of electricity consumption¹⁸ from local solar has risen by 428% since 2015/16 to 218,411 kWh in 2019/20. Looking at the trend in CO₂e saving per year from these installations, it is clear that the trend initially followed a similar trend to the annual solar PV consumption. Most recently, this carbon saving has started to slow and level off. This is due to the greening of the grid making the emissions difference between local generation and the national grid smaller. Despite this, 55.8 tCO₂e was prevented in 2019/20 due to consumption of local solar PV generation. This accounts for 7.7% of the decrease in electricity consumption seen between 2015/16 and 2019/20.

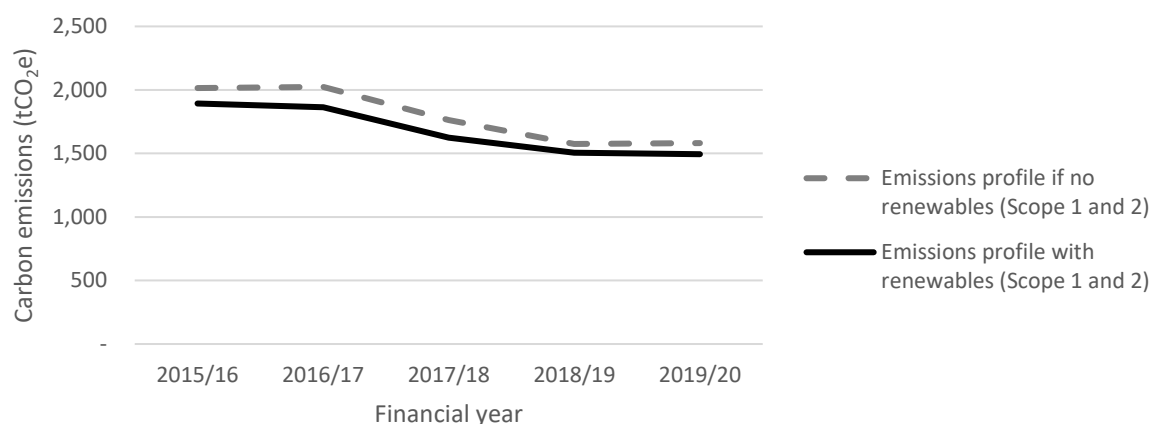


¹⁷ CHP systems at Langton Court and Beauvale Court, Micro CHP at Desmond Court, Biomass boilers at Titchfield Court and Sherwood Court

¹⁸ Solar PV generation minus PV exported to the grid

Without these renewable installations (solar, CHP, biomass boilers), emissions from electricity and gas are estimated to have been on average 7% higher than with the installations.

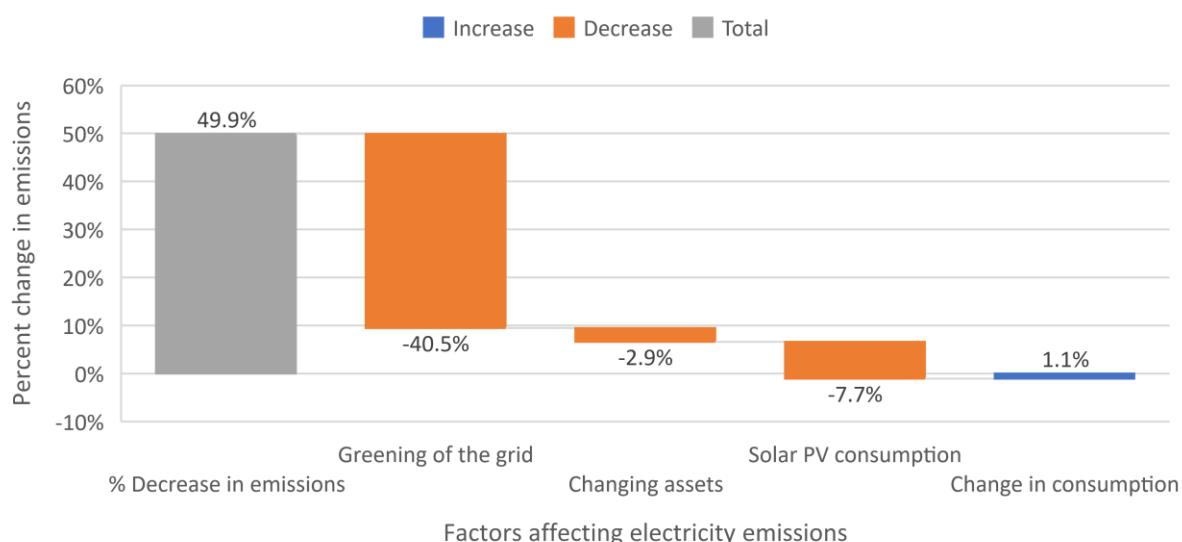
ADC Emissions - impact of renewables



Electricity emissions trend analysis summary

Combining the above trend analysis for electricity indicates of the 49.9% decrease in emissions from electricity consumption observed from 2015/16 to 2019/20, 40.5% is due to greening of the grid, 7.7% due to an increase in consumption of solar PV electricity, 2.9% is due to a change in the number of assets. These decreases mask that the remaining changes are due to a 1.1% increase in electricity consumption that has also occurred during this time period.

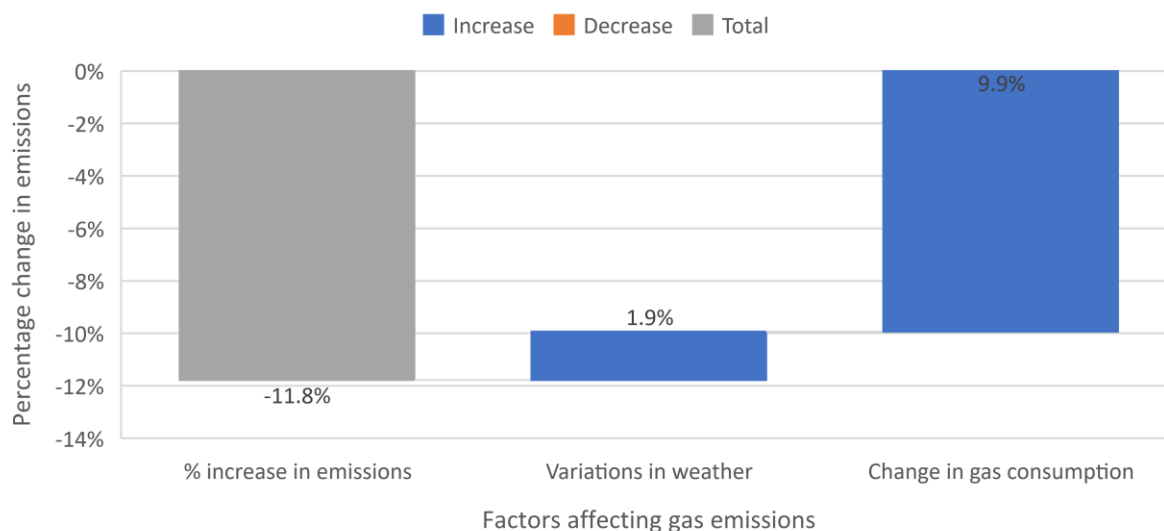
Scope 2 Electricity emissions trend analysis



Gas emissions trend analysis summary

Gas emissions have increased by 11.8% from 2015/16 to 2019/20. 1.9% of this increase is due to the weather experienced, with the remaining 9.9% due to other increases in gas consumption. This may be due to a variety of factors, which would require further investigation. Possible reasons are covered further within the Energy Consumption Analysis Report completed November 2020 by NCC Energy Services.

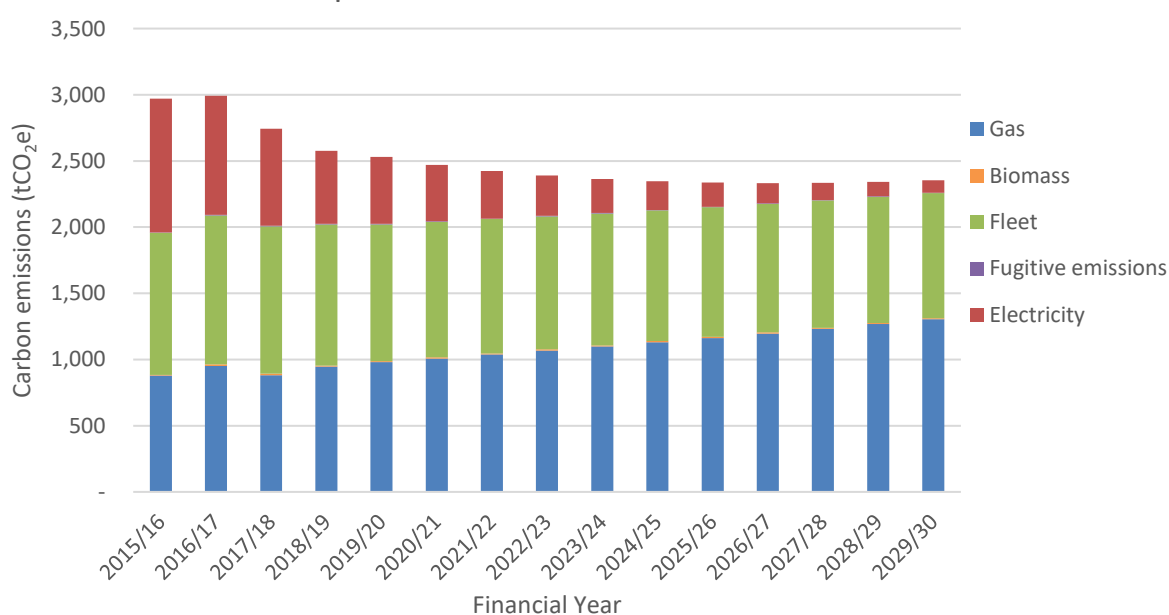
Scope 1 Gas emissions trend analysis



Business as usual projections

Based on scope 1 and 2 historic emissions trends, future emissions can be extrapolated out to 2030 to demonstrate ADC's business as usual emissions. The graph below demonstrates ADC scope 1 and 2 emissions would remain at 2,353 tCO₂e in 2029/30, just 21% less than in 2015/16. Electricity emissions would reduce by the greatest amount (<100 tCO₂e remaining in 2029/2030), in line with trends discussed in Section 4. Fleet emissions would also reduce slightly (12% lower than in 2015/16), meanwhile gas emissions would increase, in line with the historic increase in ADC gas emissions. The resulting impact of this is that emissions would continue to decrease until 2027/28, after which emissions will begin to increase, due to the annual increase in gas emissions going above the annual reduction in electricity and fleet emissions.

Scope 1 and 2 Business as Usual Emissions



5. Scope 3 Emissions

Category 1: Purchased Goods and Services

Emissions from purchased goods and services accounted for 11.9% of total Scope 3 emissions in 2019/20 and 11.1% of Ashfield District Council's overall Scope 1-3 footprint. Since 2015/16, emissions from purchased goods and services have decreased by 32%.

Spend data has been categorised by SIC code¹⁹, and covers 37 of these. Emissions from 23 of the SIC code categories have less than 1% share of total emissions each year, and sum to between 4.6-5.8% each year; these have been grouped as 'Other' in the graph below.

In 2015/16, over half of emissions (51.2%) were from repair and installation (2990.7tCO₂e).

In 2016/17, repair and installation similarly accounted for a large proportion of emissions (33.6%), as well as other chemical products (29.2%).

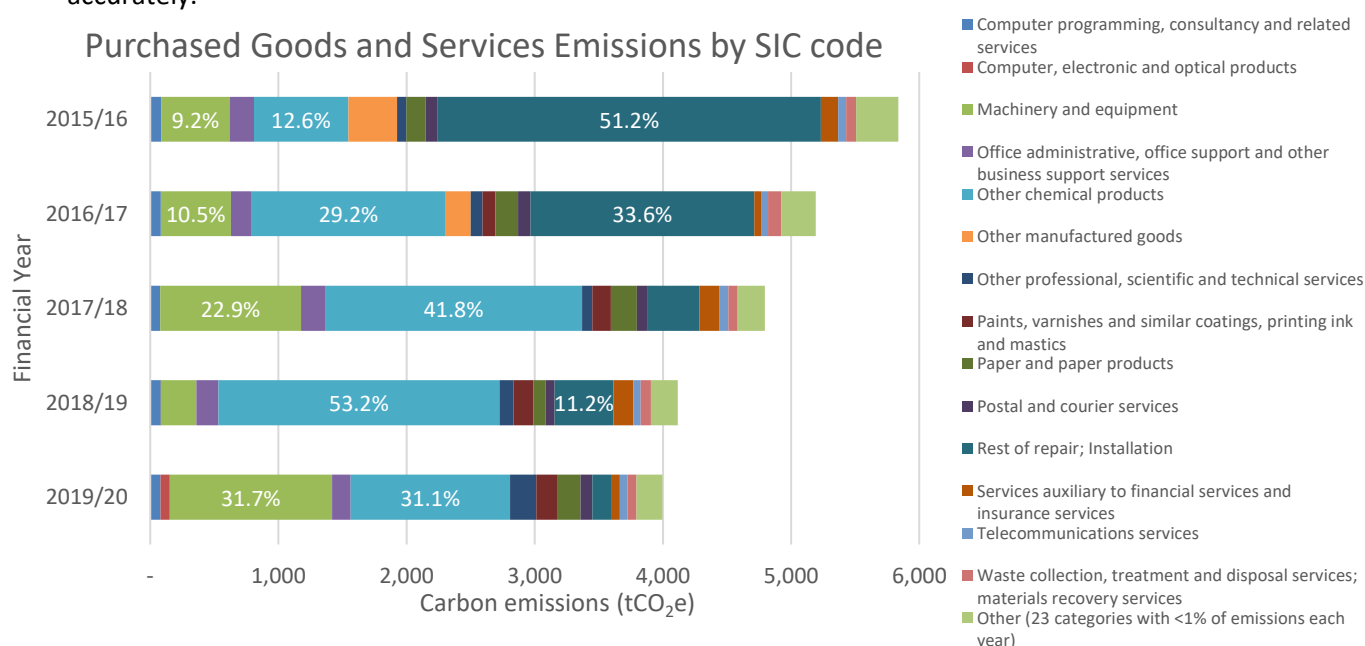
In 2017/18, repair and installation no longer contributes the most emissions, rather Other chemical products (41.8%) and machinery and equipment (22.9%).

In 2018/19, over half of emissions were from purchase of Other chemical products (53.2%).

In 2019/20, the greatest emissions contributions were again split between Other chemical products (31.1%) and machinery and equipment (31.7%).

Data in this category is calculated from spend data for purchased goods and services, and water meter data for water supply²⁰. The calculation of emissions related to water supply is considered robust, however there are large limitations in the spend data used for calculating emissions from the remaining goods and services. Going forwards, acquiring more supplier-specific data (e.g. quantity or mass of units purchased) will enable improvements in this area to be calculated and reported more accurately.

Purchased Goods and Services Emissions by SIC code



¹⁹ UK Standard Industrial Classification 2007 of economic activities

²⁰ Emissions from supply of water account for 0.2% of emissions from purchased goods and services in 2019/20, and less than 0.1% of total ADC emissions (Scopes 1-3). For further detail on water emissions, see Appendix 5.

Category 2: Capital Goods

Emissions from capital goods accounted for 12.3% of total Scope 3 emissions in 2019/20 and 11.5% of Ashfield District Council's overall Scope 1-3 footprint.

Total cradle-to-gate²¹ emissions of purchased capital goods are all included in the year of acquisition. Major capital purchases in one year can therefore mean emissions from capital goods fluctuate significantly between years. 2018/19 has much lower emissions from capital goods than other years, this reflects the much lower spend on capital goods in this financial year. Despite this, emissions from purchased capital goods have decreased by 29.2% from 2015/16 to 2019/20.

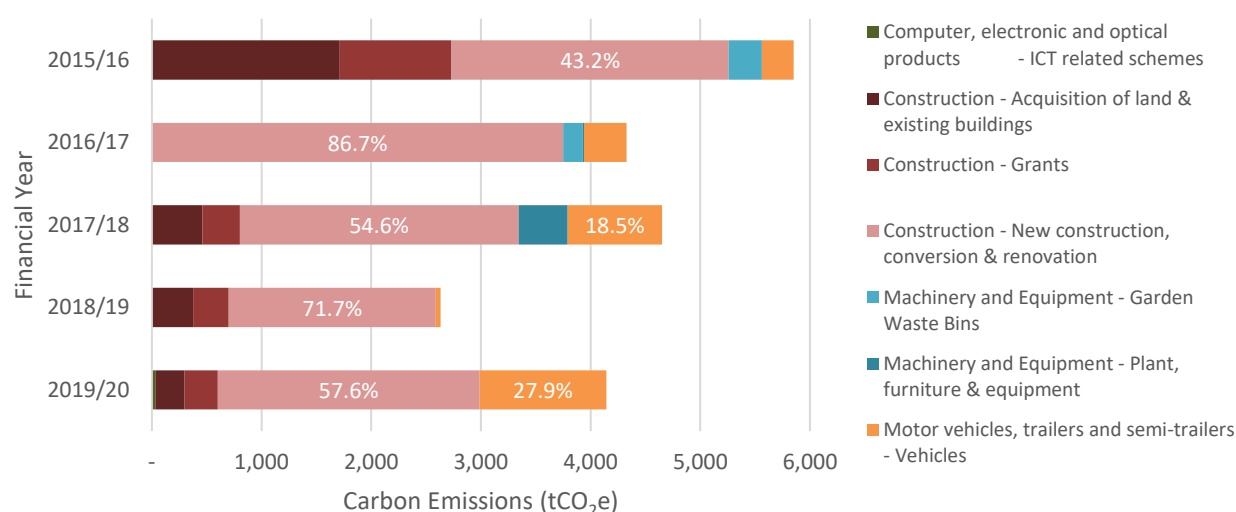
Spend data has been categorised by type of capital spend, which cover 4 SIC codes: Construction; Motor vehicles, trailers and semi-trailers; Machinery and Equipment; and Computer, electronic and optical products.

In all years, over 70% of emissions are from purchase of capital goods related to construction. The largest proportion of these emissions is from capital spend related to new construction, conversion and renovation, accounting for over 70% of these emissions in all years since 2016/17. In 2015/16, 48% of emissions from capital goods related to construction, were from new construction, conversion and renovation.

In 2019/20, after emissions from purchase of capital goods related to construction, emissions from purchase of capital goods related to motor vehicles, trailers and semi-trailers vehicles account for the next largest proportion of emissions (27.9%).

In 2017/18, 9.6% of capital goods emissions was from plant, furniture and equipment, reflecting the greater spend on this type of capital than in other years. This included spend on a glass recycling project (70.2%) and vehicle tracking system (14.9%).

Capital Goods Emissions by SIC Code and Type of Capital Spend



²¹ Cradle-to-gate refers to the upstream life cycle of a product from resource extraction (cradle) up until it leaves the factory (to be transported to the customer/reporting organisation).

Category 3: Fuel- and Energy-Related Activities

Emissions from fuel and energy-related activities accounted for 1.5% of total Scope 3 emissions in 2019/20 and 1.4% of Ashfield District Council's overall Scope 1-3 footprint.

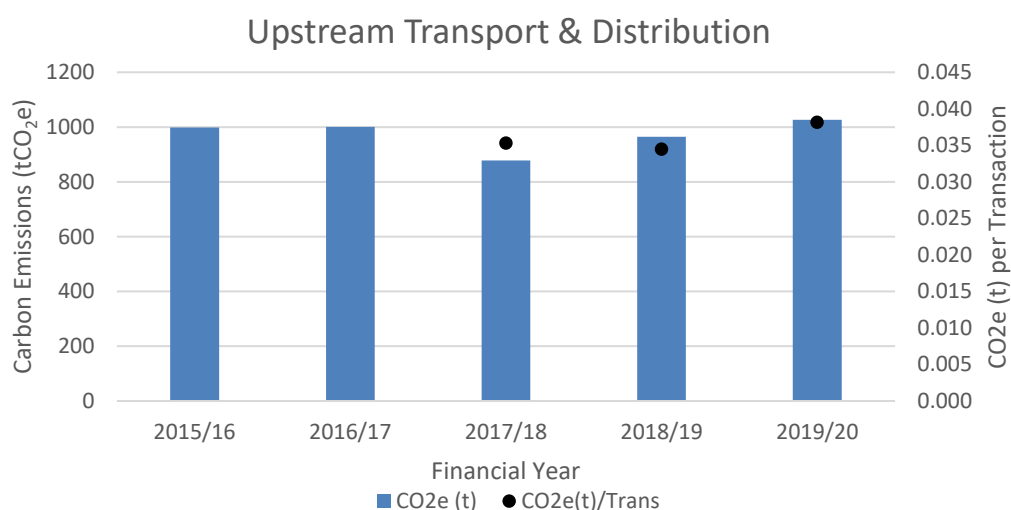
These emissions are related to the production of energy, and for electricity, the transmission and distribution losses for purchased energy. Emissions are therefore the result of the gas, electricity, fleet use, and biomass usage, as covered for Scope 1 and 2 emissions²². Emissions for fuel- and energy-related activities have decreased by 16% since 2015/16. The trends in emissions from fuel- and energy-related activities reflect the proportions of emissions and trends highlighted for these categories earlier in the Scope 1 and 2 emissions trend analysis (Section 4).

Category 4: Upstream Transport and Distribution

Emissions from upstream transportation of goods accounted for 3.1% of total Scope 3 emissions in 2019/20 (1027 tCO₂e) and 2.8% of ADC's overall Scope 1-3 footprint.

The distance between the supplier postcode and ADC has been used to calculate journey distances, due to limited data available it is assumed that all UK-derived products have been transported by an average laden HGV. ADC do not hold information for 2015/16 and 2016/17 financial years; the data for these years have been estimated based on averages of data for the last three year period.

Upstream transportation and distribution emissions have increased 2.79% than estimated 2015/16 upstream transport and distribution emissions²³. Since 2017/18, upstream transportation emissions have increased each year due to greater total distances being travelled. The last three years of data indicate emissions per delivery into ADC are in the region of 0.035 to 0.038 tCO₂e.



Improvements to this data could be made through improving supplier specific data, such as the vehicle and fuel type used to deliver goods and the exact distances travelled. In addition, these calculations do not currently include storage in warehouses and distribution/retail facilities. Including this data would provide a fuller picture of emissions, and would likely increase the percentage share of the total Scope 3 emissions.

²² Scope 1 and 2 emissions for the Council include direct emissions from ADC controlled sources and indirect emissions from the generation of purchased energy

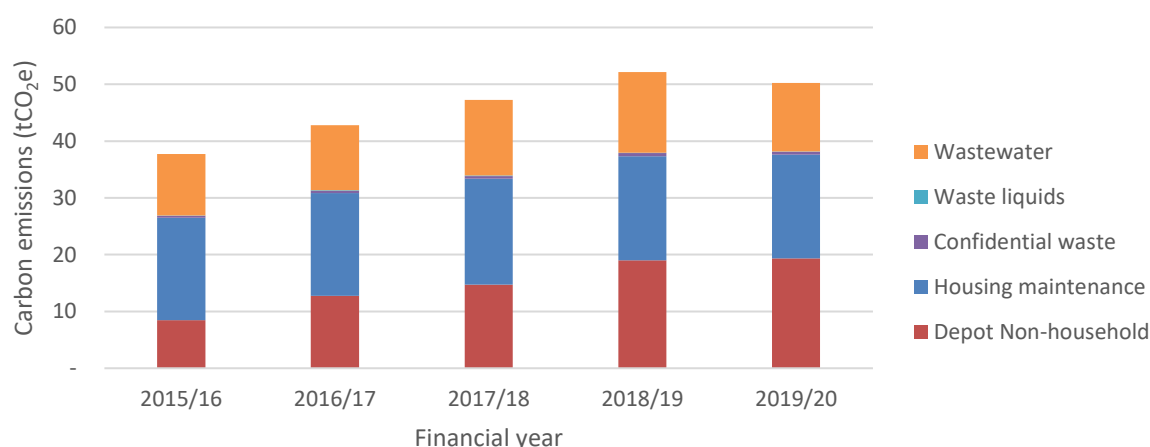
²³ These calculations should be treated as indicative, where an improvement to reduce upstream transport and distribution may not be picked up in this estimation method.

Category 5: Waste generated in operations

Emissions from waste generated in operations account for 0.1% of total Scope 3 emissions in 2019/20 and 0.1% of Ashfield District Council's overall Scope 1-3 footprint. Since 2015/16, emissions from waste generated in operations has increased by 33%.

Waste data has been categorised by source of the waste, as split by Ashfield District Council. Waste generated in operations also includes wastewater. The quantity of wastewater is assumed to be the same as the water supplied to Ashfield District Council, however water supply from allotments is excluded from wastewater calculations. Housing maintenance waste, depot non-household waste, and wastewater collectively account for 99% of waste emissions. Confidential waste and waste liquids account for the remaining 1% of emissions. The emissions associated with running refuse lorries is included within this emissions footprint for Ashfield District Council (Scope 1 Fleet emissions), however the domestic waste collected is not.

Waste emissions by source of waste



In 2015/16, housing maintenance (48%) and wastewater (29%) emissions account for the greatest proportion of emissions, with a much lower proportion from depot non-household (22%).

Emissions from depot non-household waste increases from 8.5 tCO₂e in 2015/16 to 19.35 tCO₂e in 2019/20. This is an increase of 129%, and results in 2019/20 having the greatest proportion of waste emissions from any category being from depot non-household waste.

This increase in emissions is as a result of the increase in waste tonnage, for both general waste and recycling (157% and 33% increases respectively). The emission factors stay broadly consistent year on year, and have little impact on the overall emissions.

In contrast, the emissions from the other predominant categories of waste (housing maintenance, wastewater) stay much more constant year on year. The housing maintenance waste was only available for 2019/20, and has been assumed to be a consistent tonnage for the previous four years. Wastewater volume has increased by 12% between 2015/16 and 2019/20, however in comparison to

other waste streams has a much lower emissions intensity, and as a result this increase in waste has less of an impact on overall waste emissions²⁴.

In considering these emissions, it should be noted that only the end-of-life disposal is taken into account in these waste emissions figures, and these should not be used to determine the relative lifecycle merit of different waste management options. This is in line with the Greenhouse Gas Protocol. For example, the benefits of energy recovery and recycling are attributed to the end user of the recovered energy or recycled goods, rather than the waste producer. As such, when considering waste emissions only, both these end destinations have the same emissions intensity (i.e. 1 tonne of general waste and 1 tonne of recycling will both have same volume of waste emissions).

Category 6: Business Travel

Business travel includes any travel that is required to attend meetings, conferences, training and running of key council services (e.g. home visits), as well as emissions from staying in hotels. Emissions from business travel account for 0.2% of total Scope 3 emissions in 2019/20 and 0.2% of Ashfield District Council's overall Scope 1-3 footprint.

ADC's business travel emissions in 2019/20 equated to 71.65 tCO₂e. This can be broken down further by the mode of travel, which demonstrates that car journeys dominate the emissions mix, with a 96% share of business travel emissions from 241,271 claimed miles. The remaining 4% of emissions came from an estimated 43,682 miles of rail journeys in 2019/20, as a result of the low carbon nature of train travel compared to using a car.

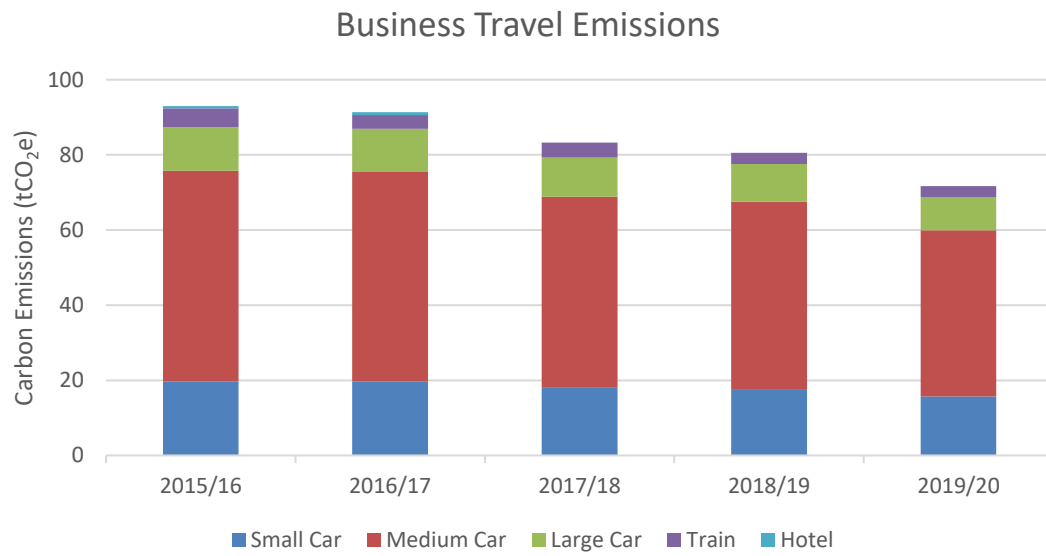
Car journeys can be separated out further, assuming the same mix in employees' cars for business travel as for commuting, to demonstrate that 16.9% of business travel emissions come from small cars, 47.5% from medium cars, and 9.5% from large cars.

Overtime, ADC emissions from business travel have reduced by 23% since 2015/16. All forms of business travel have reduced alongside this reduction in emissions: 53,220 fewer miles were claimed for car journeys (saving 20% of emissions), £5,450 less was spent on rail journeys (saving 2.4% of emissions) and ADC no longer have any hotel stays (saving 0.6% of emissions).

²⁴ It is assumed that water supply to allotments has no corresponding wastewater



Further business travel may occur by bicycle or foot, however these have no associated carbon emissions.



Category 7: Employee Commuting

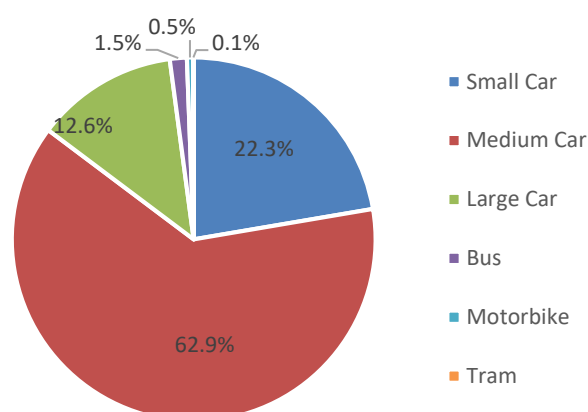
Emissions from employee commuting account for 2.8% of total Scope 3 emissions in 2019/20 and 2.6% of Ashfield District Council's overall Scope 1-3 footprint.

A 2020 survey demonstrated how 138 ADC employees (24.2% of all ADC employees) commuted to work. The results of this survey show that single occupancy car journeys were the most common method of transport (92.5%), followed by Tram (4.1%), Bus (2.1%), Motorbike (0.8%) and Walking/Cycling (0.6%)²⁵.

ADC employee commuting emissions have been calculated using the results of this survey and scaling up the survey emissions to represent the full ADC workforce. In 2019/20, ADC commuting emissions were 935.71 tCO₂e.

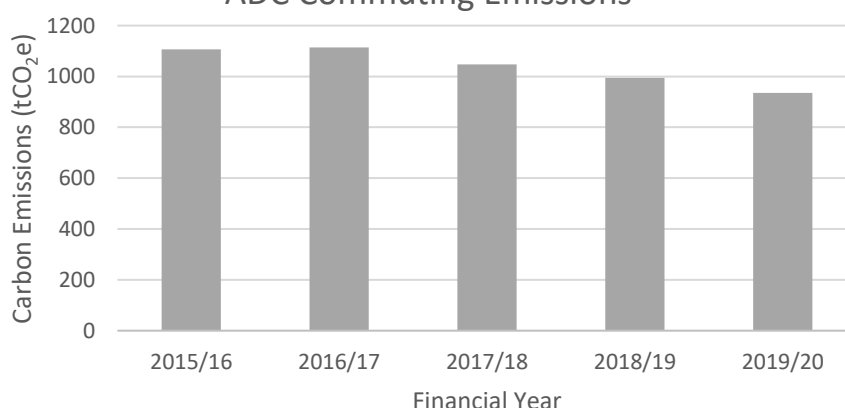
When broken down into mode of transport, single occupancy car journeys make up the majority of ADC commuting emissions (97.9%). Large cars make up 12.6% of these emissions, medium cars 62.9% and small cars 22.3%²⁶. The remaining commuting emissions result from Bus (1.5%), Motorbike (0.5%) and Tram (0.1%) journeys.

ADC Commuting Emissions Mix (2019/20)



Over the last five years ADC commuting emissions have reduced by 15.4% since 2015/16. 79% of this emissions reduction is due to a decrease in the number of ADC employees and 21% reduction in the emissions intensity associated with different transport modes²⁷, between 2015/16 and 2019/20.

ADC Commuting Emissions



It is clear that for ADC to reduce its employee commuting emissions, efforts must be made to reduce single occupancy car journeys, encouraging employees to, where possible, walk or cycle to work or use low carbon transport, such as the bus or tram.

²⁵ ADC employee commuting mix is presented as a percentage of the total number of commuting days per week, taking into account the mode of transport and the number of days ADC employees commute per week.

²⁶ Size of car engine determines the split between small, medium and large cars, as outlined in [BEIS conversion factor methodology](#).

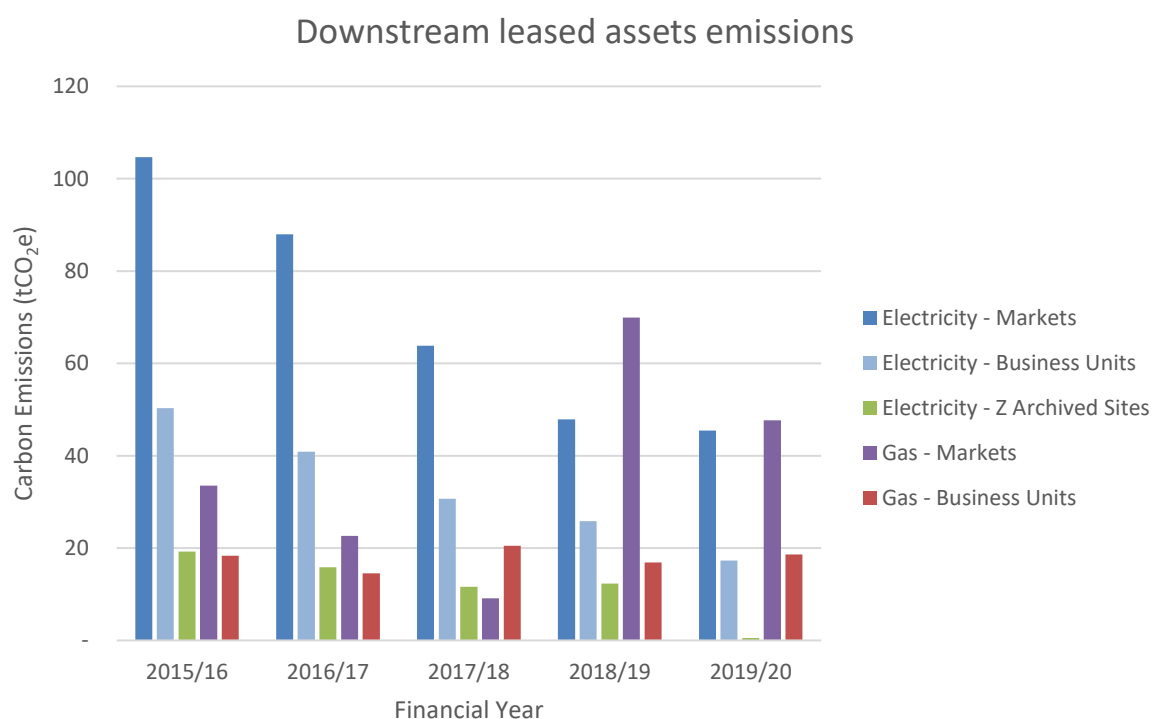
²⁷ 2020 commuting mix remains unchanged throughout the five year period.

Category 13: Downstream Leased Assets

Emissions from downstream leased assets account for 0.4% of total Scope 3 emissions in 2019/20 and 0.4% of Ashfield District Council's overall Scope 1-3 footprint. Since 2015/16, emissions from downstream leased assets have decreased by 42.7%.

Downstream leased assets consists of emissions from the operation of Ashfield District Council's owned assets leased out to external parties. Under an operational organisational boundary, anything the council operates through a lease from an external company (category 8) will fall under scope 1 and 2. Meanwhile, assets the council owns but leases out to external parties fall under category 13 of scope 3. Where ADC have responsibility for the utility bills of Downstream Leased Assets, the costs will be either recharged to the leaseholder(s) or the cost will be covered under a service charge to the leaseholder(s).

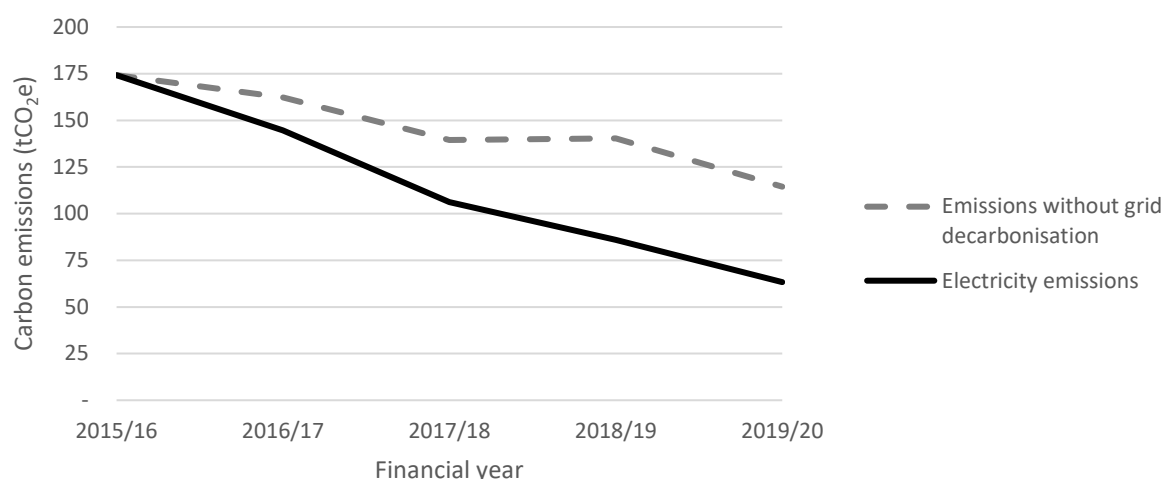
Ashfield's downstream leased assets which there is data for includes gas and electricity consumption. It is assumed none of these assets have refrigeration or air conditioning units.



As discussed in the utility trend analysis for Scope 1 and 2 emissions, the emissions from downstream leased assets could also be affected by grid decarbonisation (electricity), weather, renewables (solar PV), as well as changing levels of gas and electricity consumption at the sites.

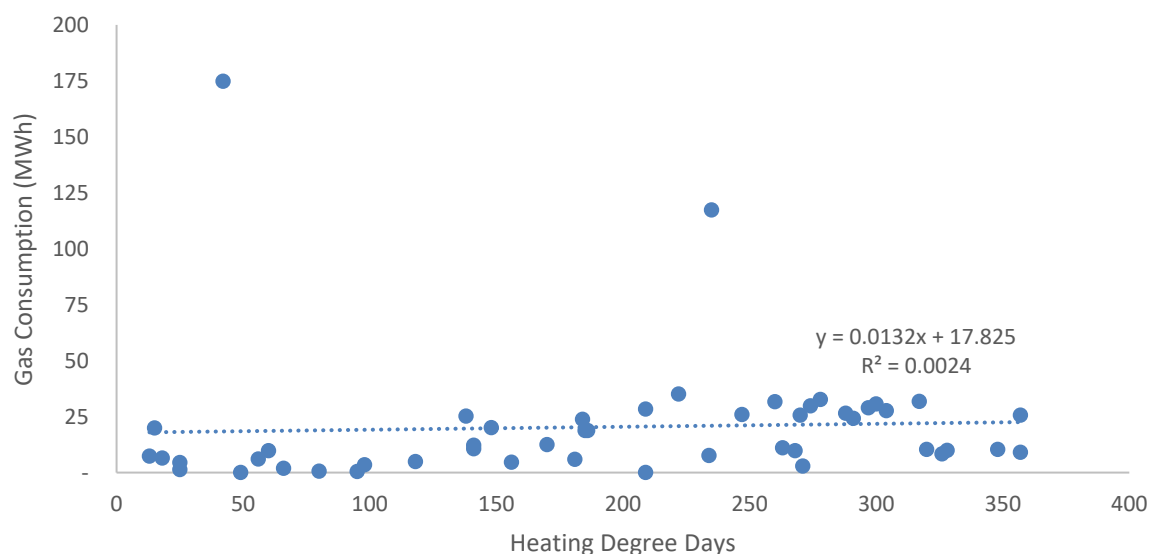
Downstream leased assets electricity emissions have decreased by 64% between 2015/16 and 2019/20, and of this, 46.1% has been due to grid decarbonisation, with the remaining 53.9% due to other changes in consumption. Additionally, 1 business unit (of four), and 1 former site (of two) have been lost during 2019/20 from the downstream leased assets category, reducing electricity consumption (no impact on gas consumption).

Downstream leased assets - effect of grid decarbonisation



Downstream leased assets emissions from gas consumption have increased by 28% between 2015/16 and 2019/20. Gas consumption had been decreasing between 2015/16 and 2017/18, however a significant increase in Idlewells Markets Hall (Markets site group) gas consumption in 2018/19 and 2019/20 has resulted in increased emissions. This site is considered further in the Energy Consumption Analysis – Gas report, however it should be noted, this analysis considers only from April 2018 onwards, and thus whilst recognises the significant subsequent decrease from August 2019 onwards, does not note this sustained period of high usage during 2018/19 as an anomaly compared to prior years. Analysis of the weather dependency of this site over the five years suggests there is not a correlation between weather and gas consumption²⁸, suggesting other uses of gas or poor controls (units are sub-let by ADC to small businesses) which may need further investigation.

Idlewells Market Hall Weather Dependency



²⁸ This is also the case if ignore the two anonymously high readings for June 2018 and February 2019.

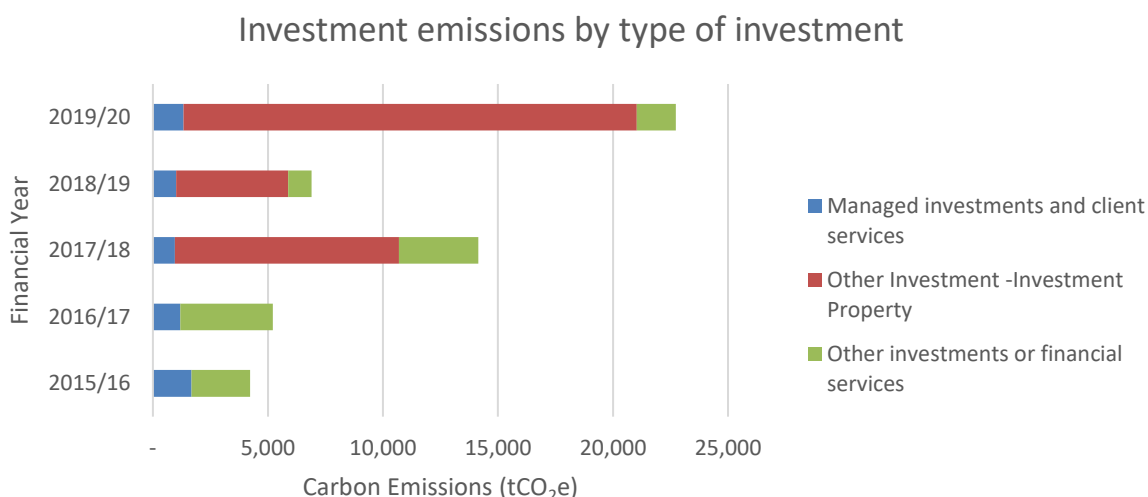
Category 15: Investments

Emissions from investments account for 67.6% of total Scope 3 emissions in 2019/20 and 62.9% of Ashfield District Council's overall Scope 1-3 footprint. Since 2015/16, emissions from investments have increased by 438%.

In the Greenhouse Gas Protocol, investments are split into five categories:

- Equity investment & debt investment without known use of proceeds
- Project finance & debt investments with known use of proceeds
- Project finance (where initial sponsor/lender)
- Managed investments and client services
- Other investments or financial services

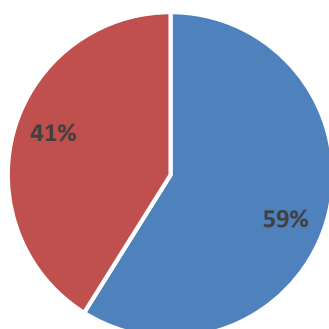
Data for the last two of these have been provided by Ashfield District Council and are included in the estimate of emissions from investments. Based on the data received, other investments or financial services has been further split into investment properties, and remaining other investments or financial services.



Emissions from managed investments and client services remains broadly consistent year on year in comparison to the other categories. These emissions have decreased by 21% from 2015/16 to 2019/20. All emissions in this category are from financial intermediation.

Emissions from other investments or financial services also decreased by 34% from 2015/16 to 2019/20. This reflects a 45% decrease in these investments over the same time period. In 2019/20, 59% of these investments were from investing in the financial intermediation sector, and 41% from public admin and defence, and social security. Due the comparatively lower emissions impact of financial intermediation sector however, this only accounts for 39% of the emissions from other investments or financial services.

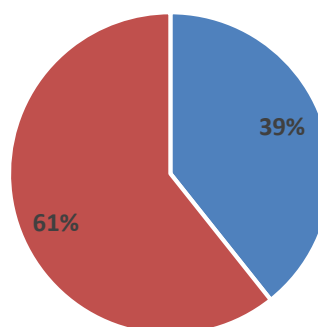
Other investments or financial services split by investment value (£) 2019/20



■ Financial Intermediation

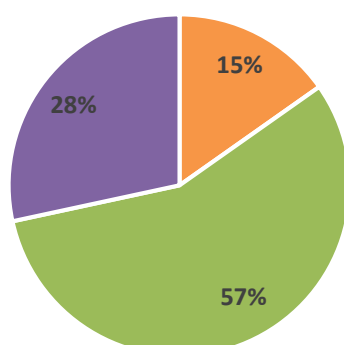
■ Public Admin and defence; compulsory social security

Other investments or financial services split by tCO₂e 2019/20



There were no emissions from investment properties in 2015/16 and 2016/17, however from 2017/18 onwards they account for over two thirds of investment emissions each year, and rising to 87% of investment emissions in 2019/20. The emissions values reflect the quantity of investment spend in these years. In 2019/20, the greatest investment by value was properties in the public admin and defence, and social security sectors (57%), then transport equipment (28%), and properties for health and social work (15%). Due to the comparatively higher emissions impact from the transport equipment sector however, there is the joint highest impact in emissions from both investments in transport equipment, and the public admin sectors (44% each). Property investments in the health and social work sector account for the remaining 12% of emissions.

Investment property split by investment value (£) 2019/20

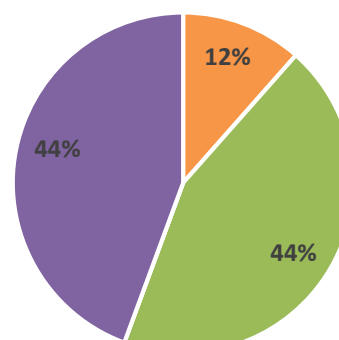


■ Health and social work

■ Public Admin and defence; compulsory social security

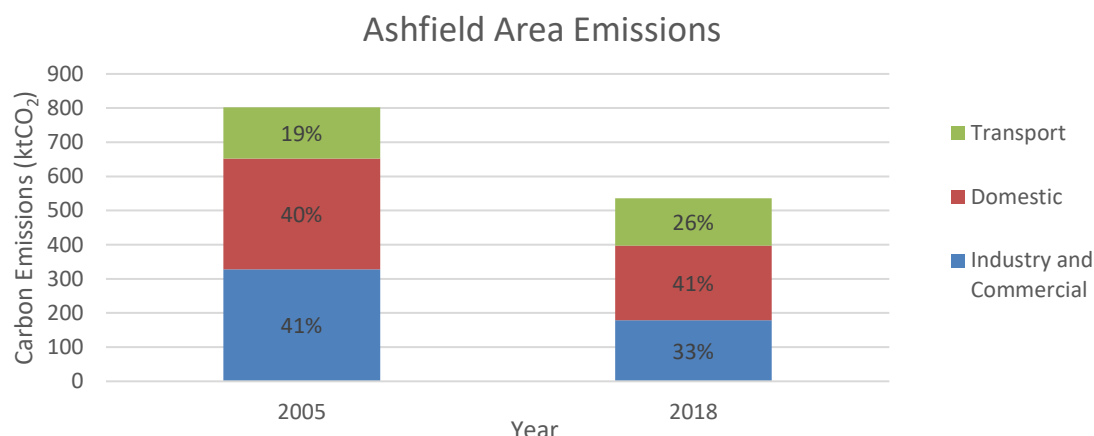
■ Transport Equipment (Rail network development and repair)

Investment property split by tCO₂e 2019/20



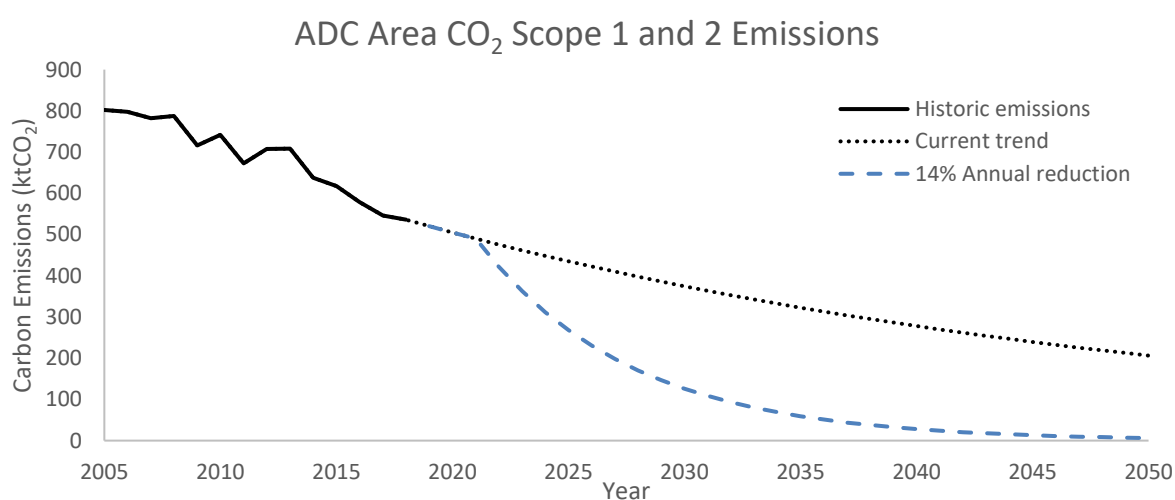
6. Wider Context: Ashfield Area Emissions

Ashfield District's area Scope 1 and 2 emissions accounted for 536 thousand tonnes of carbon dioxide (ktCO₂) in 2018²⁹, 33.2% less than in 2005. The 2018 emissions mix was 41% domestic, 33% industrial & commercial and 26% from the transport sector. This demonstrates that the domestic share of emissions has stayed relatively the same since 2005, compared to a reduction in industrial and commercial emissions and an increase in the transport sectors share. Ashfield area's Scope 1, 2 and 3 emissions were 770 ktCO₂e in 2018³⁰.



Over the last 14 year period, Scope 1 and 2 emissions have on average reduced by 2.94% per year. If this trend was to continue Ashfield area emissions would still be 375 ktCO₂ in 2030 and 206 ktCO₂ in 2050. This demonstrates the need for Ashfield's area emissions to reduce at a greater rate and magnitude than the historic trend.

The Tyndall Centre suggests the Ashfield area has a carbon budget of 4 MtCO₂ for Scope 1 and 2 emissions between 2020 and 2100. If Ashfield emissions continued on the historic trend, this budget would be used up during 2028. All emissions past this point would be contributing to a dangerously warmer world. In order to keep emissions below this carbon budget and achieve net zero emissions by 2050, in line with national targets, annual emissions reduction rates must be in the region of 14% per year, from 2022 to 2050.



²⁹ These emissions account for scope 1 and 2 area emissions as identified by BEIS CO₂ emissions for local authorities

³⁰ These emissions account for scope 1, 2 and 3 area emissions as identified by SCATTER CO₂e emissions for local authorities. This uses some different source data to the BEIS inventory, and is not directly comparable.

7. Summary of Key Carbon Reduction Findings and Recommendations

Contracted by Ashfield District Council, NCC Energy Services have also completed:

1. Energy analysis report, analysing past energy consumption across the highest consuming sites in the Ashfield Council estate.
2. Solar feasibility studies outlining two clear cases installing solar PV systems at Hucknall Leisure Centre and Lammas Leisure Centre. Additionally, further preliminary proposals are outlined for other sites as part of the Ashfield estate³¹.
3. A series of 6 energy audits across the Ashfield District Council internal property portfolio (key archetypes), assessing the current efficiency status of the selected properties and recommending improvement measures to save money and reduce carbon emissions with a view to enabling a more sustainable portfolio to be developed going forward.

For the energy analysis report, key recommendations on monitoring have been made, which are included in Section 9. The energy analysis report is intended to prompt investigations into gas or electrical equipment and controls at the various sites. In some cases this identifies where there may be an opportunity to improve the efficiency of the building, and in others identifying a recent change that has taken place which has impacted the energy consumption. Investigating these may help to reduce energy consumption, and thus carbon emissions.

Not all increases in consumption are indications of a problem, e.g. if occupancy levels or opening hours of a building have increased due to business needs then energy usage will likely follow suit. However it is then important to re-baseline the site's consumption so that this extra 'necessary' consumption is taken into account.

Understanding why the energy usage changed is key to correcting extant issues, preventing reoccurrence of past issues and knowing which measures/initiatives have provided meaningful reductions for both energy and carbon.

The main carbon saving recommendations from parts 2 and 3 of the wider NCC Energy Services contracted works are summarised in the table below with their potential carbon savings³². Note, this is based on singular measures and calculations do not include interdependencies between measures so figures demonstrate an absolute maximum. A full implementation plan would be required if ADC wanted the actual achievable based on order of installation. Further information on the recommendations are included within the respective reports.

To note, this only includes the carbon savings included within the above listed NCC Energy Services' works, and is not an exhaustive list of carbon recommendations for the full ADC estate. The approach will need to be replicated across the remaining estate to establish overall potential savings. The table below also includes key recommendations at Leisure Centres, which are not part of this Carbon Management Plan report.

³¹ ADC have since contracted NCC Energy Services to undertake a Stage 2 feasibility study of one of these sites (Northern Depot).

³² Carbon savings demonstrated are based on 2019 UK Government GHG conversion factors: Gas kgCO₂e 0.18385 Electricity kgCO₂e 0.2256 + 0.0217 (losses). Solar PV figures are adjusted from the solar feasibility proposals to be consistent with other values in the table (inclusion of loss savings).

Recommendation	Annual Carbon Saving (kgCO₂e)
Northern Depot – Admin Building	
Replace existing immersion water heater with a gas fired hot water heater	3,941
Replace residual non LED lighting with LED equivalents	1,046
Northern Depot – Building 1	
Replace 2no. mains gas Andrews Water Heaters with Heat Pump Hot Water Cylinders	4,369
Install PIR sensors in suitable areas (Toilets and store rooms)	1,840
Replace residual non LED lighting with LED equivalents	1,145
Northern Depot – Building 2	
Install lighting sensors in suitable areas	6,015
Replace residual non LED lighting with LED equivalents	3,695
Northern Depot Site Wide	
Improved energy management practice (electricity)	4,612
Improved energy management practice (gas)	6,305
Install Solar PV array to South East facing pitched roofs	16,097
Replace 3no. roller doors with high performance fast action roller shutters	11,858
Kingsway park	
Improved energy management practice (electricity)	941
Install PIR sensors in all suitable areas	340
Install a minimum of 300mm mineral wool to pitched roof, flat ceiling joist spaces.	1,495
Replace residual non LED lighting with LED equivalents	3,728
Install a split unit, air source heat pump to the Café.	1,922
Replace existing systems with heat pump water heaters	3,210
Install 11.05 kWp Solar PV to South and East facing pitched roof space	5,508
Watnall Road Community Centre	
Replace existing boiler with air source heat pump (air to air)	7,422
Improved energy management practice (electricity)	80
Improved energy management practice (gas)	868
Install timer to hot water heater	298
Replace residual non LED lighting with LED equivalents	879
Install 16 kWp Solar PV system	4,255
Brand court	
Improved energy management practice (electricity)	1,266
Install PIR sensors in all suitable areas (Corridors and Stairwells)	4,214
Replace residual non LED lighting with LED equivalents	4,658
Replace Creda Comfortair electric warm air heaters with split unit air source heat pumps in communal area	4,036
Install cavity wall insulation	16,743
Upgrade or install loft insulation to a minimum depth of 300mm	1,476
Replace Creda Sensor Plus storage heaters to flats with high retention storage heaters	9,981
Brierley Road	
Replace existing storage heaters with split unit air source heat pump (air to air)	7,896
Install PIR sensors in suitable areas (Toilets and store rooms)	99

Replace residual non LED lighting with LED equivalents	406
Install 16 kWp Solar PV system on Unit 6 west facing roof	4,139
Install 30.4 kWp Solar PV system on Unit D south facing roof	8,020
Broomhill Cemetery	
Install 5.76 kWp Solar PV system on east facing roof	1,446
Idlewells Market Hall	
Install 65.28 kWp Solar PV system	16,990
Mill House Community Centre	
Install 13.12 kWp Solar PV system	2,781
Watnall Road Offices	
Install 11.7 kWp Solar PV system	2,762
Sutton Lawn Park Visitors	
Install 25.6 kWp Solar PV system	12,910
Council offices	
Improved energy management practice (electricity)	4,324
Improved energy management practice (gas)	6,246
Replace existing conventional gas condensing heating system with air or ground source heat pumps	65,863
Install PIR sensors in all suitable areas (Toilets, Meeting / Interview room and Kitchens)	16,717
Replace residual non LED lighting with LED equivalents	14,011
Install an additional 28.8kWp Solar PV	6,434
Leisure Centre Recommendations (emissions from leisure centres not included within CMP report)	
Hucknall Leisure Centre	
Install 62.4 kWp Solar PV system	14,319
Lammas Leisure Centre	
Install 119.6 kWp Solar PV system	28,516

8. Carbon Management Action Plan

Based on the preceding analysis, below are high-level short, medium and long term actions to reduce internal emissions for ADC, subject to funding and available resources. Actions related to monitoring and data improvements to enact and fulfil the CMP are included in Section 10.

High level actions to reduce ADC emissions	Timescale
Fleet use	
Increase the share of ADC's ULEV fleet, including the share of electric machinery, such as strimmers and lawn mowers.	Medium term
Conduct a fleet management review and use to improve the efficiency of Council fleet including an in-depth assessment into key fleet use sectors: Waste, Environment and Housing.	Short term
Investigate further use of telematics to inform behaviour change campaigns	Short term
Gas & electricity consumption	
Reduce energy consumption, particularly gas, for example through employee behavioural change campaigns and investment in new technologies.	Medium term
Ensure ADC's estate is as energy efficient as possible, including through invest to save practices where available (e.g. SALIX finance)	Medium term
Increase the proportion of renewable energy generation to help decarbonise heating for the ADC estate (e.g. shift away from gas heating sources to heat	Medium term

pumps), and maintain these to ensure operating effectively. Recommendations were included for 6 archetype properties as part of the energy audits.	
Install solar PV systems at Hucknall Leisure Centre and Lamas Leisure Centre, as outlined in the NCC Solar feasibility studies	Medium term
Install solar PV on all viable ADC properties. Preliminary proposals completed by NCC Energy Services and summarised in Section 7 outline some properties where solar may be feasible	Medium term
Investigate electricity storage for the ADC estate to allow maximum use of locally generated energy	Medium term
Ensure low cost technologies, for example replacing any residual non-LED lighting as suggested in the NCC Energy Services audits, are rolled out across ADC's estate to reduce energy use.	Medium term
Fugitive emissions	
Consider creating guidance for use of air conditioning systems in ADC buildings and vehicles.	Medium term
Procurement of Good and Services, and Capital Goods	
Assess ADC's procurement framework to include considerations of travel distances, methods of transport and fuel type to transport goods and services to the Council.	Medium term
Promote low carbon and sustainable procurement, including the addition of required net-zero and sustainability related questions and KPIs. Consider review of Contract Procedure Rules/Sustainability Policy, and implement Procurement Guidance.	Medium term
Investigate the potential to include technologies to improve water efficiency, such as rainwater harvesting, grey water systems, and water efficient technologies.	Short term
Improve behaviours to reduce water demand, for example through behavioural change campaigns	Short term
Waste Generated in Operations	
Reduce the total volume of waste generated where possible through greater reuse, and behavioural change campaigns	Medium term
Investigate why there has been significant increases in total volume of depot non-household waste, and aim to reduce and reuse where possible.	Medium term
Investigate the potential to increase water reuse, for example through grey water recovery systems to reduce wastewater	Short term
Investigate ways to eliminate the remaining waste going to landfill and implement into ADC policy	Long term
Business Travel	
Consider ULEV pool cars for business travel use and other carbon reduction options.	Medium term
Encourage, and assist (where possible) low carbon modes of business travel (e.g. train travel compared to single occupancy car travel).	Medium term
Employee Commuting	
Promote car sharing to reduce single occupancy car journeys.	Medium term
Increase the number of available electric vehicle charging points for council staff and prioritise ULEV car parking spaces.	Short term
Continue to refine the 'agile' agenda to reduce the need to commute (e.g. home/flexi working) and the need to travel for business (e.g. conference calls).	Short term
Assess ways to promote low/zero carbon methods of transport for staff e.g. increase the number of places for safe cycle storage and assess the available public transport services.	Short term

Investments	
As the largest proportion of ADC's emissions, consider undertaking a detailed analysis of investment emissions.	Medium term
Investigate ways to reduce investment emissions (for example sector investing in) and implement into ADC policy.	Long term
Additional Council Actions	
Consider establishing Green Champions who actively promote actions towards ADC's carbon reduction ambitions within their own work and service area.	Short term
Carry out Carbon Literacy/Awareness Training for ADC employees.	Short term
Assess alternative investment/income sources for taking climate action e.g. Carbon offset funds and green bonds/investment.	Short term
Area Wide Actions	
Implement Towns Fund or other funding projects to facilitate improved infrastructure, including encouraging increased walking and cycling, investigating methods of reducing transport emissions within the ADC area, such as increasing the uptake of active travel, reducing the need to travel by car, reviewing the available public transport and improving low carbon transport infrastructure provisions (E.g. EV charging and cycle lanes).	Ongoing
Reduce the amount of waste generated in the area (E.g. Reuse, reduce and recycle), alongside eliminating waste going to landfill, refining the Council's approach to waste to ensure it meets the Government's Waste Strategy, and aim to exceed 2023 targets.	Ongoing
Conclude the development of, and implement, the Local Plan, incorporating Climate Change requirements.	Ongoing
Improve the energy efficiency of Council and private buildings (commercial & households), reduce energy demand and increase the uptake of low carbon or renewable heating sources; including bidding for relevant funding to facilitate.	Ongoing
Conclude the completion of the Environmental Charter.	Ongoing
Encourage and assist (where possible) increase of local, affordable and accessible low carbon and renewable energy generation across the ADC area.	Ongoing
Investigate methods of removing carbon from the atmosphere, such as tree planting and woodland management.	Ongoing
Investigate potential actions to ensure resilience to future climate change impacts (e.g. floods and heatwaves).	Ongoing
Investigate ways to improve biodiversity across the area, such as creating a bee friendly district, improving habitat networks, increasing woodland cover and eco-friendly agricultural practices.	Ongoing

9. Carbon Management Plan Targets

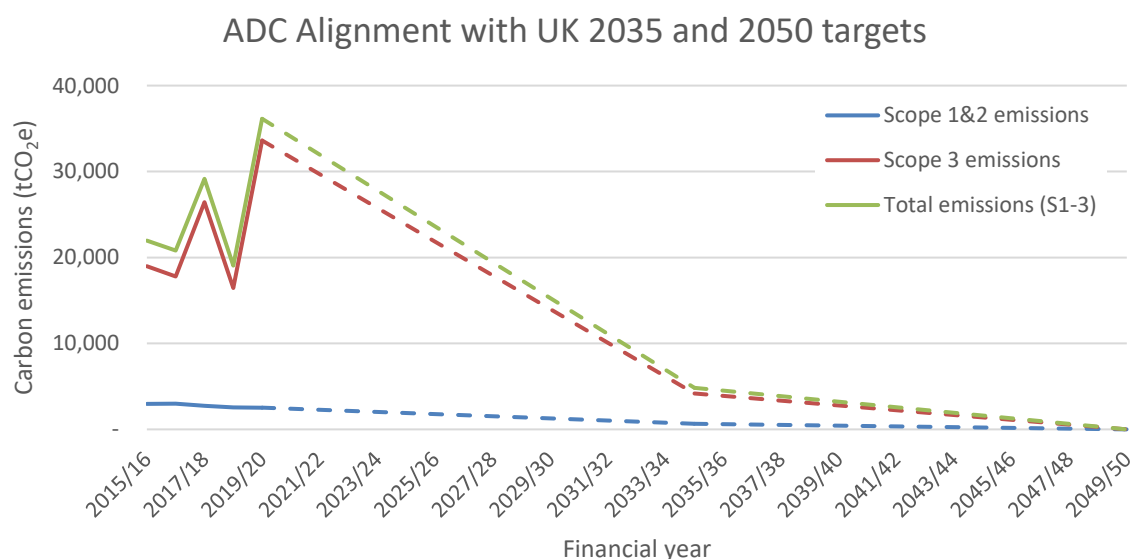
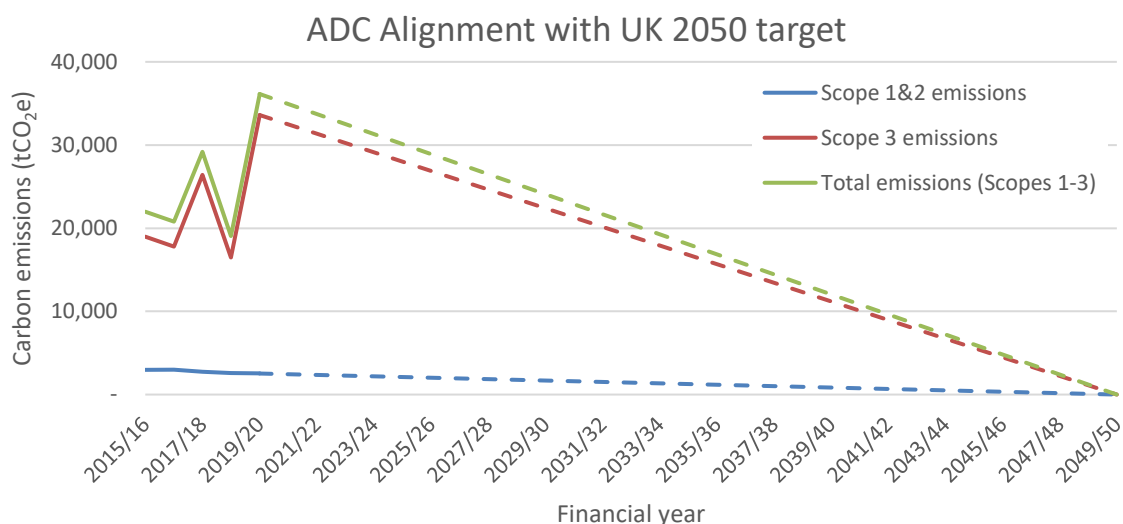
Further to this report, Ashfield District Council will look to set its Carbon Management Plan targets. This might include setting an interim target year towards carbon neutrality, and addition targets for each emissions category.

In June 2019, the UK government set the UK a target to reduce net greenhouse gases by 100%, relative to 1990 levels by 2050. In April 2021, this was updated to set an interim 78% reduction target by 2035.

Ashfield District Council's emissions baseline is 2015/16, and below are two example graphs indicating the emissions reductions required if adopting these national targets for ADC emissions. These assume equal rates of reduction for all emission categories, though greater emissions reductions in one area

may facilitate a slower reduction in other categories (Appendix 6 Target setting tool). Although the focus should be on reducing emissions from their source, where possible, some emissions may require carbon offsetting to reach carbon neutral.

High level short, medium and long term actions to reduce emissions are covered in Section 8, and recommendations for suitable metrics and monitoring are covered in Section 10.



10. Recommendations for Suitable Metrics and Monitoring

It is recommended that once the Carbon Management Plan is enacted, regular monitoring occurs, including an annual calculation of internal emissions to track progress against the 2015/16 baseline.

This would be aided by the development of Key Performance Indicators (KPIs), for example normalised metrics against FTE, turnover or m², to continue to track emissions consistently despite changes that may be occurring to the ADC organisation or estate. These should be reported as appropriate through ADC's governance structure.

Further data recommendations for monitoring of specific emissions categories are included below. These will help ensure ADC are able to track any changes in emissions. Priority should be given to those which help monitor the largest proportion of emissions, as these will provide the greatest insight. The energy analysis report³³ completed by NCC Energy Services for ADC analysed energy consumption across the highest consuming sites in the ADC estate, identifying actions related to each to investigate trends in energy consumption and to resolve data issues. Some general monitoring recommendations from this are also included in the table below. Improving energy consumption monitoring can help proactively identify anomalies, reduce over-consumption, and therefore emissions.

As with the overall carbon footprint, emissions metrics should be developed where relevant for each of these categories of emissions to help track trends over time. Some suggestions are included in the table below, subject to funding and available resources.

Data and metric recommendations	Priority
Targets	
Review and implement interim and end-year CMP targets to reach carbon neutrality for ADC	High
Fleet	
Consider emissions per total number of fleet vehicles as an ADC CMP KPI	High
Gas & electricity consumption (including downstream leased assets)	
For future energy management and control of utility budgets it is recommended that a similar analysis approach is used as throughout the Energy Analysis Report as part of a regular energy monitoring program using the latest available data (typically on a weekly or monthly basis) to supplement the existing monitoring software, either covering the whole ADC estate or a subset of the highest consuming sites as identified in the Energy Analysis Report. This would assist with identifying changes in consumption and trends, potentially reducing overspend, energy consumption and carbon emissions, and improving knowledge of the estate.	High
It is recommended that half-hourly gas and electricity consumption data is obtained for a greater number of sites in the ADC estate. This allows for more accurate and responsive monitoring as well as allowing checks of the daily consumption patterns that may highlight further opportunities for energy and carbon savings. This would require the installation of smart meters/automated meter readings (AMRs) and discussions with the energy supplier to obtain the data on a regular basis.	High
As discussed in Section 4 of the Energy Analysis Report, the accuracy of the energy monitoring would be improved if more regular data for on-site renewables or generation can be obtained – preferably at the same frequency as the metered gas/electricity data for the site. This is particularly important for the biomass boilers and solar PV arrays where only quarterly data is currently available.	High
Consider emissions per m ² as an ADC CMP KPI	High
Consider undertaking an employee working from home survey to capture data related to net increases in an employee's energy use whilst working from home during 2020-21 ³⁴ .	High
Fugitive emissions	

³³ For further details please see ADC_EnergyConsumptionAnalysis.pdf

³⁴ Following an operational boundary, energy use as a result of employees working from home would be included in ADC's emissions footprint.

Investigate and improve data for fleet air conditioning units and fridges (e.g. refrigerant type, charge).	Low
Procurement of Good and Services	
Increase and improve supplier-specific data for purchased goods and services (e.g. quantity or mass of units purchased), with specific data on upstream transport (e.g. vehicle & fuel type, distance travelled, number of products per order) and distribution (e.g. storage in warehouses and distribution facilities).	High
Investigate the emissions that arise from the storage of goods coming into ADC in warehouses, distribution and retail facilities.	High
Consider purchased goods and services emissions per procurement spend as an ADC CMP KPI	Medium
Consider upstream transportation and distribution emissions per order as an ADC CMP KPI	Medium
Capital Goods	
Total cradle-to-gate emissions of purchased capital goods are all included in the year of acquisition. Major capital purchases in one year can therefore mean emissions from capital goods fluctuate significantly between years. It is suggested that a CO ₂ e/£ spent on capital goods is used as an ADC CMP KPI.	Medium
Business Travel	
Consider business travel emissions per journey as an ADC CMP KPI. This may require further data for example the number of business mileage claims and train tickets booked.	Medium
Employee Commuting	
Conduct (bi)annual employee commuting surveys for a high proportion (>60%) of ADC employees, including fuel type, distance travelled and number of days commuting per week.	Medium
Investments	
Consider investment emissions per investment value as an ADC CMP KPI	Medium
As the largest proportion of ADC's emissions, consider undertaking a detailed analysis of investment emissions.	Medium
If applicable to ADC, source data for the remaining categories of investments as defined in the GHG Protocol to provide a fuller estimate of the emissions from investments (equity investment & debt investment without known use of proceeds; project finance & debt investment with known use of proceeds; project finance where initial sponsor/lender).	Medium

11. Disclaimer

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Appendix 1 – Full ADC Emissions Table

Scope 1 (tCO ₂ e)	2015-16	2016-17	2017-18	2018-19	2019-20	Exclusions/justifications where relevant
Gas	879.12	951.28	880.48	945.95	979.53	
Biomass	4.01	11.77	12.28	8.33	8.78	CH ₄ and N ₂ O only; CO ₂ emissions from biomass combustion are reported outside of scopes.
Fleet	1,073.4	1,125.8	1,113.9	1,066.3	1,032.7	
Fugitive emissions	3.84	3.84	3.84	3.84	3.84	
Scope 1 Total	1,960.3	2,092.7	2,010.5	2,024.4	2,024.9	
Scope 2 (tCO ₂ e)	2015-16	2016-17	2017-18	2018-19	2019-20	
Electricity						
<i>Location-based approach</i>	1,033.53	961.71	789.91	614.13	561.59	
Scope 2 Total (Location-based approach)	1,033.5	961.7	789.9	614.1	561.6	
Scope 3 (tCO ₂ e)	2015-16	2016-17	2017-18	2018-19	2019-20	
Purchased goods and services	5,844.86	5,200.16	4,804.81	4,126.83	4,004.17	Includes procurement (spend based data) and water supply (m3).
Capital goods	5,851.14	4,327.23	4,651.96	2,632.96	4,143.22	
Fuel- and energy-related activities	621.25	651.31	650.81	565.07	539.38	
Upstream transportation and distribution	998.84	1,000.24	877.85	964.03	1,026.72	Does not include data for storage of goods in warehouses
Waste generated in operations	37.71	42.79	47.22	52.14	50.25	
Business travel	92.99	91.34	83.28	80.55	71.65	
Employee commuting	1,106.22	1,114.45	1,047.57	995.02	935.71	
Upstream leased assets						
Downstream transportation and distribution						
Processing of sold products						
Use of sold products						
End-of-life treatment of sold products						
Downstream leased assets	227.98	183.86	137.37	174.44	130.89	Includes solar consumption at grid intensity (location-based approach)
Franchises						
Investments	4,224.94	5,212.81	14,147.57	6,899.86	22,730.47	
Scope 3 Total	19,005.9	17,824.2	26,448.4	16,490.9	33,632.5	
Tonnes CO ₂ e						
Gross emissions (using Scope 2 location-based approach)	22,000	20,879	29,249	19,129	36,219	
Exported renewable electricity production	-	-	0.6	0.9	0.7	
Renewable electricity generated from owned or controlled sources	23.6	61.2	57.6	61.8	55.8	
Renewable energy-related activities	5.8	16.7	18.5	24.6	24.6	
Renewable electricity generated from downstream leased assets	1.9	2.0	1.7	1.7	1.3	
Offsets						
Woodland Carbon units						
Net emissions	21,969	20,799	29,170	19,041	36,136	
Emissions outside of scopes 1-3						
Biomass (tCO ₂)	106.76	314.69	337.77	193.21	196.25	

Appendix 2 – ADC net emissions values included in analysis

Within the report, the net emissions per category are analysed. These take the total gross emissions as presented in Appendix 1, minus emissions reductions from renewable consumption. The emissions however are slightly greater than the 'Net emissions' as shown in Appendix 1, as exported renewable electricity production has not been taken off the emissions for any one category; these emissions are taken off the overall gross footprint to give the true net emissions.

tCO ₂ e		2015/16	2016/17	2017/18	2018/19	2019/20
Scope 1	Gas	879.12	951.28	880.48	945.95	979.53
	Biomass	4.01	11.77	12.28	8.33	8.78
	Fleet	1,073.35	1,125.80	1,113.88	1,066.32	1,032.74
	Fugitive emissions	3.84	3.84	3.84	3.84	3.84
Scope 2	Electricity (<i>net, location-based approach</i>)	1,009.95	900.49	732.28	552.37	505.77
Scope 3	Purchased goods and services	5,844.86	5,200.16	4,804.81	4,126.83	4,004.17
	Capital goods	5,851.14	4,327.23	4,651.96	2,632.96	4,143.22
	Fuel- and energy-related activities (<i>net</i>)	615.50	634.56	632.33	540.47	514.76
	Upstream transportation and distribution	998.84	1,000.24	877.85	964.03	1,026.72
	Waste generated in operations	37.71	42.79	47.22	52.14	50.25
	Business travel	92.99	91.34	83.28	80.55	71.65
	Employee commuting	1,106.22	1,114.45	1,047.57	995.02	935.71
	Downstream leased assets (<i>net</i>)	226.06	181.81	135.70	172.79	129.59
	Investments	4,224.94	5,212.81	14,147.57	6,899.86	22,730.47
Total emissions (in CMP report analysis)		21,968.5	20,798.6	29,171.0	19,041.4	36,137.2

Appendix 3 - Scope 1 and 2 Emissions Methodology Table

The table below outlines how these sources of Scope 1 and 2 emissions have been applied in calculating Ashfield District Council's carbon footprint.

Scope 1 and 2 Emissions source	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
Gas & electricity consumption	<p>Emissions calculated using monthly consumption data</p> <p><u>Calculation Assumptions:</u></p> <ul style="list-style-type: none"> Took out leased assets, except where data included for void periods. Part leased assets remain included in the dataset, as unable to split what proportion is under operational control or not. <p>Data backfilling:</p> <ul style="list-style-type: none"> Average per month calculated for data which is available for each site up to March 2020. This monthly average is used to infill missing data where backfilling is required, as indicated by ADC by the key on the provided spreadsheet. Credits/reimbursement are included in yearly totals, so that overall totals for year are accurate. 	<p>ADC spreadsheet Energy Consumption – For NCC 02.02.21 Gas and electricity consumption per month</p> <p>ADC spreadsheet 1) Combined Summary v2 01.02.20 (SPV Installations)</p>	BEIS Conversion factors: advanced set; 2015 to 2019 figures
Biomass consumption	<p>Emissions calculated using biomass fuel delivery amounts (wood pellets).</p> <p><u>Calculation Assumptions:</u></p> <ul style="list-style-type: none"> Emissions are included for the financial year in which the wood pellets delivery date was during. 	ADC Energy Consumption and Renewables Info Biomass – Titchfield Court, Biomass – Sherwood Court)	BEIS Conversion factors: advanced set; 2015 to 2019 figures
Fleet	<p>Emissions calculated using litres of fuel consumed.</p> <p><u>Calculation Assumptions:</u></p> <ul style="list-style-type: none"> Diesel and Petrol average biofuel blend emissions factors used. Red Diesel does not hold its own conversion factor and therefore given the same factor as normal diesel. AdBlue discounted in fuel use due to insufficient emissions intensity factors for AdBlue and specific vehicle types. This should be investigated further. Vehicles of low frequency or unidentified have been identified as miscellaneous. 	<p>3a) Non-Housing 5 Year Fuel Report Fleet fuel consumption per month per vehicle</p> <p>3b) Housing 5 Year Fuel Report Fleet fuel consumption per month per vehicle</p>	BEIS Conversion factors: advanced set; 2015 to 2019 figures

Scope 1 and 2 Emissions source	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
Fugitive emissions	<p>Screening Method used to calculate fugitive emissions.</p> <p><u>Calculation Assumptions:</u></p> <ul style="list-style-type: none"> As with gas and electricity consumption, air conditioning and refrigeration units in part leased assets remain included in the dataset, as unable to split what proportion of these assets are under operational control or not. Some units have R22 as a refrigerant. R22 is not included as a greenhouse gas under the Montreal and Kyoto Protocols, and is therefore not covered within the GHG Protocol. As such, this is not included in ADC's calculated footprint. Assumed the refrigerant type in fridges is R410A. This has one of the lowest global warming potentials (GWP), and may therefore be an underestimate of these emissions. R410A is also considered a greenhouse gas, though there is the potential that the refrigerant is not covered within the Kyoto Protocol, and therefore would not be included in the emissions inventory. Charge (for fridges) and annual leakage rate per type of unit (fridge, air conditioning) use the average of the range given in the IPCC Good Practice Guidelines and Uncertainty Management in National Greenhouse Inventories (2000). These have a wide range, and the value used can result in highly variable outcome, hence the average is used consistently for each year in this report. Assumed the refrigerant type in fleet air conditioning units is R134a, with an average charge of 1kg. Assumed charge has been based on internet sources, as no range is given for average charge in the IPCC Good Practice Guidelines and Uncertainty Management in National Greenhouse Inventories (2000). As indicated by ADC, assumed no change in last 5 years in number and type of air conditioning units in buildings, fleet air conditioning units, or numbers and size of fridges. 	<p>Air Con List for NCC Air conditioning units on buildings, number and size of fridges, number of fleet air conditioning units (20/21)</p>	<p>GWP from Table 1 in the GHG Protocol Fugitive emissions calculator tool (GWPs from IPCC Second Assessment Report (1995) and ASHRAE Standard 34).</p>

Appendix 4 - Scope 3 Emissions Methodology Table

The table below outlines how the GHG Protocol Scope 3 categories have been applied in calculating Ashfield District Council's carbon footprint.

Scope 3 Category		Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
1	Purchased goods and services	Yes	<p>Spend-based calculation method used for purchased goods and services, with water supply calculated from monthly water meter data.</p> <p>Spend deflated to 2011 equivalent values to be consistent with emission factors. Deflation rates taken from Government's National Statistics – GDP Deflators at market prices, and money GDP.</p> <p><u>Calculation Assumptions:</u></p> <p>Spend data:</p> <ul style="list-style-type: none"> Changed analysis code D103 from SIC Code 17; 18 to 17 only. This has the higher emissions factor (1.18 kgCO₂e/£ vs 0.58 kgCO₂e). <p>Water consumption data:</p> <ul style="list-style-type: none"> Took out leased assets, except where data included for void periods. Part leased assets remain included in the dataset, as unable to split what proportion is under operational control or not. This is consistent with gas and electricity consumption with these sites also included in Scope 1 and 2 emissions, rather than split between Scopes 1 and 2, and Scope 3. Data backfilling: Average per month calculated for data which is available for each site up to March 2020. This monthly average is used to infill missing data where backfilling is required, as indicated by ADC by the key on the provided spreadsheet. Credits/reimbursement are included in yearly totals, so that overall totals for year are accurate. 	<p>ADC spreadsheet 1) Combined Summary v2 01.02.20, worksheet 1. Purchased Goods and Services Spend per SIC Code per financial year</p> <p>ADC spreadsheet Energy Consumption – For NCC 02.02.21 Water consumption per month</p>	<p>UK Government 'Table 13 – Indirect emissions from the supply chain', 2011 figures.</p> <p>BEIS Conversion factors: advanced set; 2015 to 2019 figures</p>

Scope 3 Category		Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
2	Capital goods	Yes	<p>Spend-based calculation method used for capital goods.</p> <p>Spend deflated to 2011 equivalent values to be consistent with emission factors. Deflation rates taken from Government's National Statistics – GDP Deflators at market prices, and money GDP.</p>	<p>ADC spreadsheet 1) Combined Summary v2 01.02.20, worksheet 2. Capital goods</p> <p>Spend per SIC Code and type of capital spend per financial year</p>	UK Government 'Table 13 – Indirect emissions from the supply chain', 2011 figures.
3	Fuel- and energy-related activities	Yes	<p>Average data method used to calculate upstream emissions of purchased fuels, upstream emissions of grid electricity, and transmission and distribution losses of grid electricity.</p> <p>Assumptions during calculation are the same as for each of the individual sources covered in the Scope 1 and 2 methodology table (excluding fugitive emissions which are not included in Scope 3 category 3).</p>	<p>ADC spreadsheet Energy Consumption – For NCC 02.02.21</p> <p>Gas and electricity consumption per month</p> <p>3a) Non-Housing 5 Year Fuel Report</p> <p>Fleet use per month</p> <p>3b) Housing 5 Year Fuel Report</p> <p>Fleet use per month</p> <p>ADC spreadsheet 1) Combined Summary v2 01.02.20</p> <p>(SPV Installations)</p> <p>ADC Energy Consumption and Renewables Info</p>	BEIS Conversion factors: advanced set; 2015 to 2019 figures

Scope 3 Category		Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
				Biomass – Titchfield Court, Biomass – Sherwood Court)	
4	Upstream transportation and distribution	Yes	<p>Emissions for upstream transportation only are provided. These have a large number of assumptions, and should be treated as an indicative figure only. It has been assumed that all UK-derived products have been transported by an average-laden HGV; and all imported products by freight short haul flight. The distance between the supplier’s postcode and ADC has been used to calculate the distance of travel.</p> <p>Emissions in this category do not include storage in warehouses, distribution & retail facilities. Including this data would provide a fuller picture of emissions.</p> <p><u>Calculation assumptions:</u></p> <ul style="list-style-type: none">Average of figures for 2019/20, 2018/19 and 2017/18 used to calculate data for 2016/17 and 2015/16.Postcodes that did not compute a distance were discounted from the analysis.	<p>Revised postcodes on Upstream data 23.03.21</p> <p>Number of transactions per supplier postcode per financial year 2017/18 to 2019/20</p>	BEIS Conversion factors: advanced set; 2015 to 2019 figures
5	Waste generated in operations	Yes	<p>Emissions are calculated using the waste-type-specific method. This includes calculations for each waste type and the specific waste treatment method.</p> <p>Wastewater data is from water consumption data, however water supply to allotments is excluded from wastewater calculations.</p> <p><u>Calculation assumptions:</u></p> <p>Housing maintenance:</p> <ul style="list-style-type: none">Weight of waste is included in the financial year in which the skip was delivered (rather than collected).	<p>5a) Waste Data 5yrs – Housing Maintenance 2019-2020</p> <p>5b) Waste Data 5 yrs – Depot – non-housing</p> <p>5c) Confidential Waste 5 yrs</p>	BEIS Conversion factors: advanced set; 2015 to 2019 figures

Scope 3 Category		Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
			<ul style="list-style-type: none"> Waste data was only provided for 2019-20. It has been assumed the same proportions and weight of waste were generated each of the prior 4 years. This has not been scaled by FTE or number of properties at Ashfield District Council. The end destination of each waste type has been assumed, and assumptions run past the waste team at Ashfield District Council. <p>Depot – non-housing:</p> <ul style="list-style-type: none"> The waste from silt traps, and petrol/oil interceptors has been converted from tonnes of waste to volume of waste. In doing so, it has been assumed that the average composition of the waste is predominantly water. This results in a larger volume than might be the case, and thus would be an overestimate of emissions from this part of the waste. These wastes go to a physio-chemical treatment plant, and are therefore treated as wastewater in the carbon emission calculations, however are included within the ‘Depot – non-housing’ waste category. <p>Confidential waste:</p> <ul style="list-style-type: none"> Confidential waste is assumed to all be paper, unless specifically described otherwise. For example, it has been assumed all elections and clearance confidential waste is paper. <p>Waste liquids:</p> <ul style="list-style-type: none"> Within the Greenhouse Gas Protocol Scope 3 Standard, waste generated in operations includes solid waste and wastewater only. However, the waste liquid volumes provided have been included within the calculations for Ashfield District Council’s footprint. Based on information from Ashfield District Council, those waste liquids which are hazardous (determined by EWC code) are assumed to have been incinerated. Non- 	<p>5d) Waste liquids etc. Jan 2018-Oct 020</p> <p>ADC spreadsheet Energy Consumption – For NCC 02.02.21 Water consumption per month</p>	



Scope 3 Category		Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
			<p>hazardous waste liquids are assumed to have been recycled. In the absence of other appropriate emissions factors to use, 'commercial and industrial waste' has been used to provide an estimate of what these emissions may be.</p> <ul style="list-style-type: none"> Data was provided for 2018/19 and 2019/20, and an average of these weights were used for the three preceding years. The assumptions for wastewater are the same as those outlined for water supply in Category 1: Purchased Goods and Services. <p>Landfill emissions factor methodology note:</p> <ul style="list-style-type: none"> The UK government's conversion factors occasionally have methodological updates. This is separate to updating the factors annually each year to reflect the most recent data. In 2016, the emissions landfill factors were updated to reflect a more recent source of data in the BEIS' published conversion factors. The estimate for methane capture from landfill waste increased by 61% as a result of this change, which affects all landfill emissions for most organic materials. In 2017, the emissions landfill factors were again updated, with emissions from landfill taken directly from DEFRA's landfill emissions calculation model for methane emissions from landfill, with the addition of collection and transport emissions³⁵. The methodology for 2017 onwards is completely different to that for 2015 and 2016, and is not comparable. This only affects the waste emissions reported for asbestos and inert waste from housing maintenance, as the only sources of waste assumed to go to landfill. 		

³⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/650244/2017_methodology_paper_FINAL_MASTER.pdf

Scope 3 Category		Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources																																
			<div>Waste end destination assumptions:</div> <table><tr><th>Waste type</th><th>End destination assumption</th></tr><tr><td>Asbestos</td><td>Landfill</td></tr><tr><td>Confidential waste (media / ink cartridges)</td><td>Recycled</td></tr><tr><td>Confidential waste (paper)</td><td>Recycled</td></tr><tr><td>General waste</td><td>Incineration</td></tr><tr><td>Glass</td><td>Recycled</td></tr><tr><td>Green waste</td><td>Incineration</td></tr><tr><td>Inert</td><td>Landfill</td></tr><tr><td>Mixed timber</td><td>Incineration</td></tr><tr><td>Non-hazardous WEEE</td><td>Incineration</td></tr><tr><td>Plasterboard</td><td>Recycled</td></tr><tr><td>Recycling</td><td>Recycled</td></tr><tr><td>Scrap metal</td><td>Recycled</td></tr><tr><td>Silt trap & petrol/oil interceptor</td><td>Disposed of at a Physio-Chemical Treatment Plant</td></tr><tr><td>Waste liquids (hazardous)</td><td>Incinerated</td></tr><tr><td>Waste liquids (non-hazardous)</td><td>Recycled</td></tr></table>	Waste type	End destination assumption	Asbestos	Landfill	Confidential waste (media / ink cartridges)	Recycled	Confidential waste (paper)	Recycled	General waste	Incineration	Glass	Recycled	Green waste	Incineration	Inert	Landfill	Mixed timber	Incineration	Non-hazardous WEEE	Incineration	Plasterboard	Recycled	Recycling	Recycled	Scrap metal	Recycled	Silt trap & petrol/oil interceptor	Disposed of at a Physio-Chemical Treatment Plant	Waste liquids (hazardous)	Incinerated	Waste liquids (non-hazardous)	Recycled		
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6	Business travel	Yes	<p>Combination of distance based method for business miles claimed, and spend-based method for rail fares and hotel stays expenditure.</p> <p>Emissions from business travellers’ hotel stays are calculated by number of nights stayed in hotels in each country.</p> <p><u>Calculation assumptions:</u></p> <ul style="list-style-type: none">Assumed car business mileage claimed has the same proportion of car type as employees answered in ADC’s 2020 employee commuting survey.	ADC spreadsheet 1) Combined Summary v2 01.02.20, worksheet 6 Business mileage, 6&7 Business Travel, 1. Purchased Goods and Services (hotels)	BEIS Conversion factors: advanced set; 2015 to 2019 figures																																

Scope 3 Category		Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
			<ul style="list-style-type: none"> Small (<1.4l), medium (1.4l - 2.0l) and large car (>2l) defined using BEIS Conversion Factor Methodology. Converted rail expenditure to distance travelled using Office of Rail and Road (ORR) Table 1210 – Revenue per passenger kilometres and per passenger journey Estimated average cost per night for a hotel near Nottingham from Hotels.com 		
7	Employee commuting	Yes	<p>Emissions calculated using number of employees, the number of days employees used to travel to work (pre-COVID-19), the average commuting time and mode of transport from ADC's 2020 Employee Commuting Survey.</p> <p><u>Calculation assumptions:</u></p> <ul style="list-style-type: none"> Survey results have been scaled up based on the proportion of survey respondents and total employees. Small (<1.4l), medium (1.4l - 2.0l) and large car (>2l) defined using BEIS Conversion Factor Methodology. Total average commuting distance and time, alongside percentage share of method of transport used to determine the distance per year travelled per mode of transport by survey respondents. 	ADC spreadsheet 1) Combined Summary v2 01.02.20, worksheet 6&7 commuting	BEIS Conversion factors: advanced set; 2015 to 2019 figures
8	Upstream leased assets	No (Assigned to scope 1 and 2 emissions)	Reported within scope 1 and 2 emissions	N/A	N/A
9	Downstream transportation and distribution	No	ADC do not manufacture products to a significant scale, that are then sold downstream to customers and therefore emissions are not reported for this category.	N/A	N/A
10	Processing of sold products	No	ADC do not manufacture products to a significant scale, that are then sold downstream to customers and therefore emissions are not reported for this category.	N/A	N/A

Scope 3 Category	Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
11 Use of sold products	No	ADC do not manufacture products to a significant scale, that are then sold downstream to customers and therefore emissions are not reported for this category.	N/A	N/A
12 End of life treatment of sold products	No	ADC do not manufacture products to a significant scale, that are then sold downstream to customers and therefore emissions are not reported for this category.	N/A	N/A
13 Downstream leased assets	Yes	<p>Downstream leased assets have been calculated from monthly gas and electricity consumption.</p> <p><u>Calculation assumptions:</u></p> <ul style="list-style-type: none"> Leased assets included, except where data included for void periods Data excludes assets marked as leased but with data for void periods only. These assets are included in Scope 1 and 2 emissions. Data excludes part leased assets, as unable to split what proportion is under operational control or not. These part leased assets are included in Scope 1 and 2 emissions. <p>Data backfilling:</p> <ul style="list-style-type: none"> Average per month calculated for data which is available for each site up to March 2020. This monthly average is used to infill missing data where backfilling is required, as indicated by ADC by the key on the provided spreadsheet. Credits/reimbursement are included in yearly totals, so that overall totals for year are accurate. 	<p>ADC spreadsheet Energy Consumption – For NCC 02.02.21 Monthly gas and electricity consumption</p> <p>ADC spreadsheet 1) Combined Summary v2 01.02.20 (SPV Installations)</p>	BEIS Conversion factors: advanced set; 2015 to 2019 figures
14 Franchises	No	There are no franchises to ADC and therefore there are no emissions to report within this category	N/A	N/A



Scope 3 Category		Applicability to ADC	Methodology and Assumptions (where relevant)	Data Sources	Emissions Factor Data Sources
15	Investments	Yes	<p>Average investment balance per financial year used to provide a high level estimate of emissions from investments.</p> <p><u>Calculation Assumptions:</u></p> <ul style="list-style-type: none"> Used average GBP to USD conversion rate (average per month averaged over financial year). Rates from https://www.ofx.com/en-gb/forex-news/historical-exchange-rates/yearly-average-rates/ 	<p>ADC spreadsheet 1) Combined Summary v2 01.02.20 (15 Investments categories, 15a Treasury Investments)</p>	<p>Conversion factors are from Quantis Scope 3 Evaluator tool (https://quantis-suite.com/Scope-3-Evaluator/), which is based on the GHG Protocol. These use the World Input-Output Database (WIOD) (http://www.wiod.org/new_site/home.htm). Factors use the most recent available (2009) for a high level estimate.</p>

Appendix 5 – Emissions from water

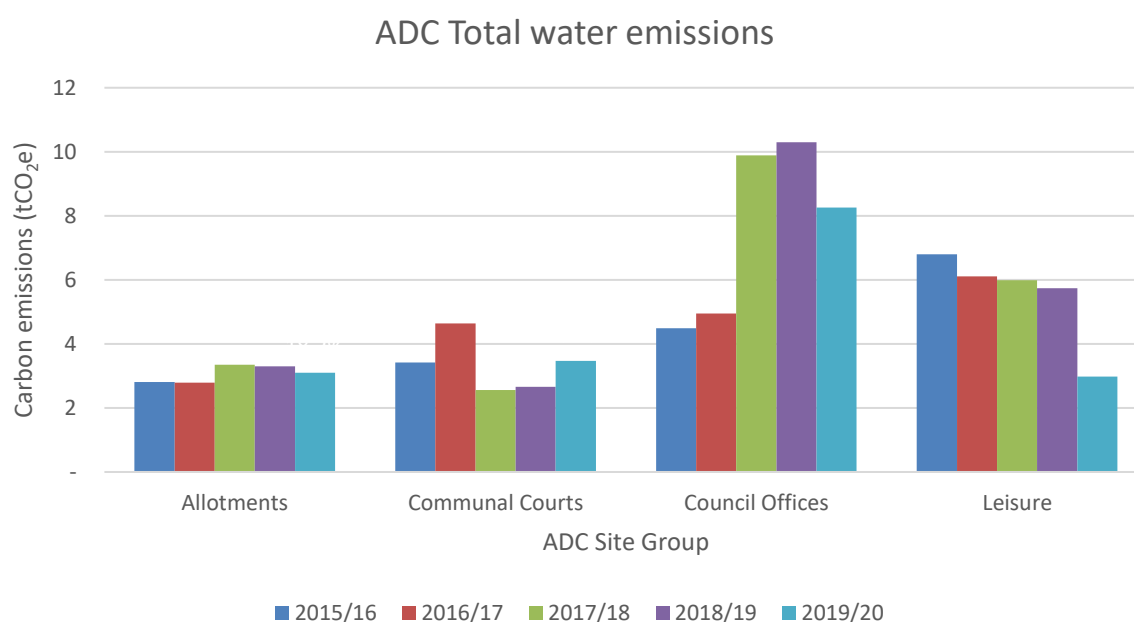
In the GHG Protocol, water emissions are split between water supply (in Scope 3 category 1) and water treatment (in Scope 3 category 5).

Combining the emissions from water supply and treatment, total water emissions accounted for 0.063% of total Scope 3 emissions in 2019/20 and 0.058% of Ashfield District Council's overall Scope 1-3 footprint.

In 2019/20, emissions from supply of water (8.96 tCO₂e) account for 0.2% of emissions from purchased goods and services in 2019/20. Emissions from water treatment (12.06 tCO₂e) account for 24.0% of emissions from waste generated in operations.

Since 2015/16, four ADC site groups have accounted for over 85% of all water emissions: Council Offices, Communal Courts, Allotments and Leisure³⁶. These four site groups should be a focus for actions to reduce water consumption and wastewater³⁷. In 2019/20, the greatest proportions of water use come from Council Offices (39.3%), followed by Communal Courts (16.5%), Allotments (14.8%) and Leisure (14.2%).

In the graph below, historic billing and water leak issues may account for the large increase in water emissions from Council Offices in 2017/18, and the drop in emissions from Leisure sites in 2019/20.³⁸



³⁶ Does not include Leisure Centres as outside of ADC's operational control

³⁷ It is assumed that there is no wastewater from allotments requiring treatment

³⁸ Historic billing and water leak issues at Northern Depot (Council Offices site group); historic billing issues at Sutton Lawn Park (Leisure site group).



Appendix 6 – ADC Target Setting Tool

An example tool which can be used to aid target setting for ADC's emissions is included as a separate spreadsheet.