



Carbon Emission update 2021-22

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1 Executive Summary

Flintshire County Council's target is to become net zero carbon by 2030.

In order to gauge progress towards this target, carbon emissions are tracked and reported on an annual basis. By understanding what the sources of carbon emissions are, the Council can formulate strategic priorities to mitigate climate change.

The progress detailed within the report allows us to pinpoint areas where data collection methods need to be improved, focus investment and decision making on areas that are not performing as expected, and review projected forecasts to take us to our 2030 goal.

The methodology used to determine the Council's carbon footprint is based on Welsh Government guidance 'Welsh Public Sector Net Zero Reporting Guide Version 2, 2022'.

Some of the methodology used within this process has already changed year on year since the baseline calculation was made in 2018/19. Introduction of new measures into the calculation can confuse and undermine the progress that the Council is making in its carbon reduction activities. Due to this, this progress report follows the sources of carbon emission as detailed in our in-scope baseline footprint calculations.

The total carbon emissions for 2021/22 before removing carbon offset from our land was 46,493tCO₂e. This is a 1% increase on carbon emissions based on our 2018/19 baseline and is due to the increase in emissions from Procurement. The methodology adopted for emissions from procurement is based on value of spend, and therefore an increase in Council spend will reflect an increase in carbon emissions.

All other sources of carbon have seen reductions above the targeted 9% and 8% as detailed in the climate change strategy.

Focus must be given to adoption of a more effective and accurate methodology for determining the Council's emissions from supply chain.

2 Our Baseline

Everything we do has an effect on the environment we live in; from burning fossil fuels for heating to collecting kerbside waste and recycling. Flintshire County Council reports its carbon footprint to Welsh Government as tonnes of carbon dioxide equivalent (tCO₂e) within its organisational and operational boundaries. This plan relates to the Council's internal operations which are:

- Buildings owned and operated by the Council including offices, depots, schools, community centres, care homes, public conveniences and street lighting. This includes heating, electricity and water use within these facilities.
- Fleet vehicles owned by the Council,
- Business travel for work,
- Employee commuting,
- Procurement of goods and services.

The scope excludes:

- Domestic properties,
- Buildings owned by us that are leased out and operated by third parties,

In order to establish where we are and where we need to be, we first need to look at our baseline figures. In 2018/19 we were able to capture the data set out below. Figure 1 below shows a breakdown of GHG emissions by emission source for 2018/19.¹

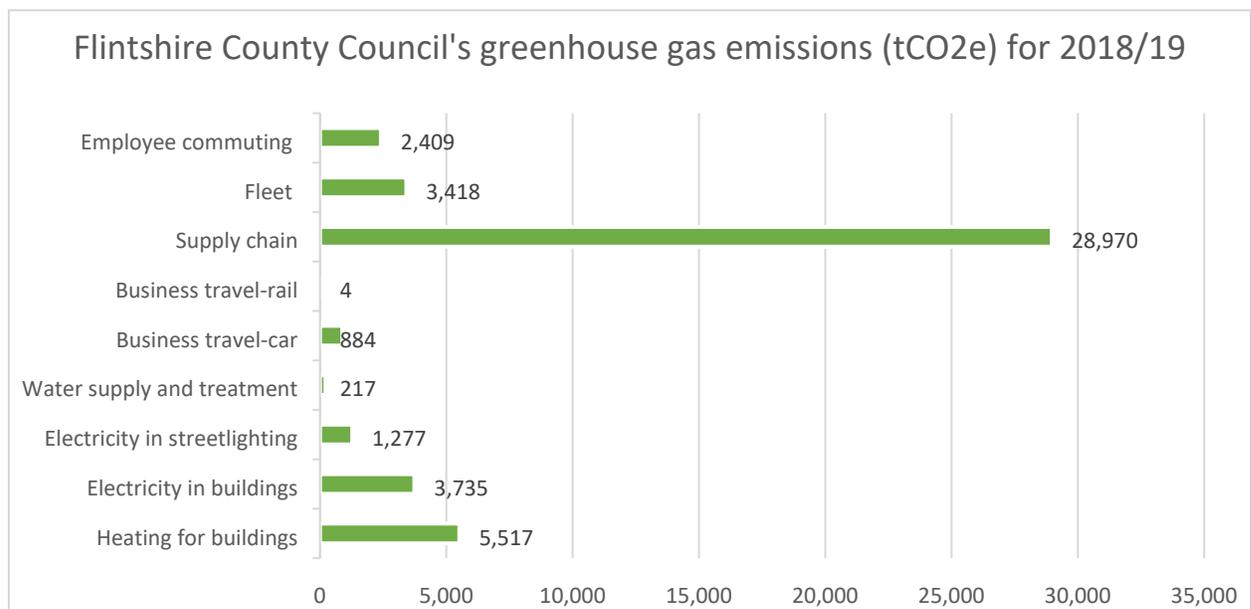


Figure 1: Flintshire County Council's GHG emissions for 2018/19 baseline

¹ It should be noted that the data has been collected using the best available methods at that time, and therefore the expectancy is that data accuracy will improve with emerging methodologies.

As these figures suggest, the biggest contributors to the Council's carbon footprint in 2018/19 were:

- Supply chain; procurement of goods and services: 62%
- Heating for buildings: 12%
- Electricity in buildings: 8%
- Fleet: 7%
- Employee commuting: 5%²

The Council produced 1,664 tonnes of waste in 2018-19 from its operations, however all waste collected by the Council, including operational waste, was either recycled or sent to energy from waste plants for incineration when it cannot be recycled. All green waste is composted. Therefore the only carbon emissions related to waste are included in the 'Fleet' data through waste collection vehicles.

Supply chain; procurement of goods and services equates to 62% of our baseline carbon emissions total. The Council understands that there are actions that can be taken to reduce these emissions through decision making processes and supplier engagement, however this figure will only see significant reductions if the appropriate investment, policy and infrastructure is provided and developed by the Government.

From this data we understand that our baseline carbon emissions for 2018/19 were 46,434 tCO₂e.

In 2018/19, the Council reported an estimated 1,500 tCO₂e absorbed from its land assets. However, this figure has been estimated based on two specific land types – grassland and woodland/forest – with a common value factor used to determine the absorption of carbon. As yet, no formal baseline figures have been calculated for our land assets to determine more accurate absorption figures and therefore this action is a priority in realizing the true benefits of our land to both carbon sequestration and wider habitat richness.

The 2018/19 carbon absorption total can be removed from our emissions total as a 'carbon offset'. Therefore to meet our net zero carbon goal, the total carbon emitted by the Council, minus the total carbon absorbed from Council owned and operated land, must equal zero by 2030. In 2018/19 the balance of carbon emissions was 44,934 tCO₂e.

² Note this data has a high level of inaccuracy due to the calculation methodology used

3 Carbon Emissions for 2021/22

The Council now has carbon emission data for four financial years as shown in Figure 2 below. The total carbon emissions for 2019/20 saw a 1% reduction on the 2018/19 baseline. The total carbon emissions for 2020/21 saw a 17% reduction on the 2018/19 baseline. The total carbon emissions for 2021/22 saw a 1% increase on the 2018/19 baseline.

Emissions reductions in 2021/22 were made across all sources except supply chain where there was a 12% increase on 2018/19 baseline. The methodology adopted for calculating our carbon emissions is mandated by Welsh Government. The methodology for calculating carbon emissions from supply chain is based on the value of spend. Therefore if the Council spends more money one year than a previous year then the consequential emissions will be higher. This is not an ideal or accurate method to calculate these emissions and work must be carried out to improve the recording of actual emissions related to contracts to improve this data accuracy.

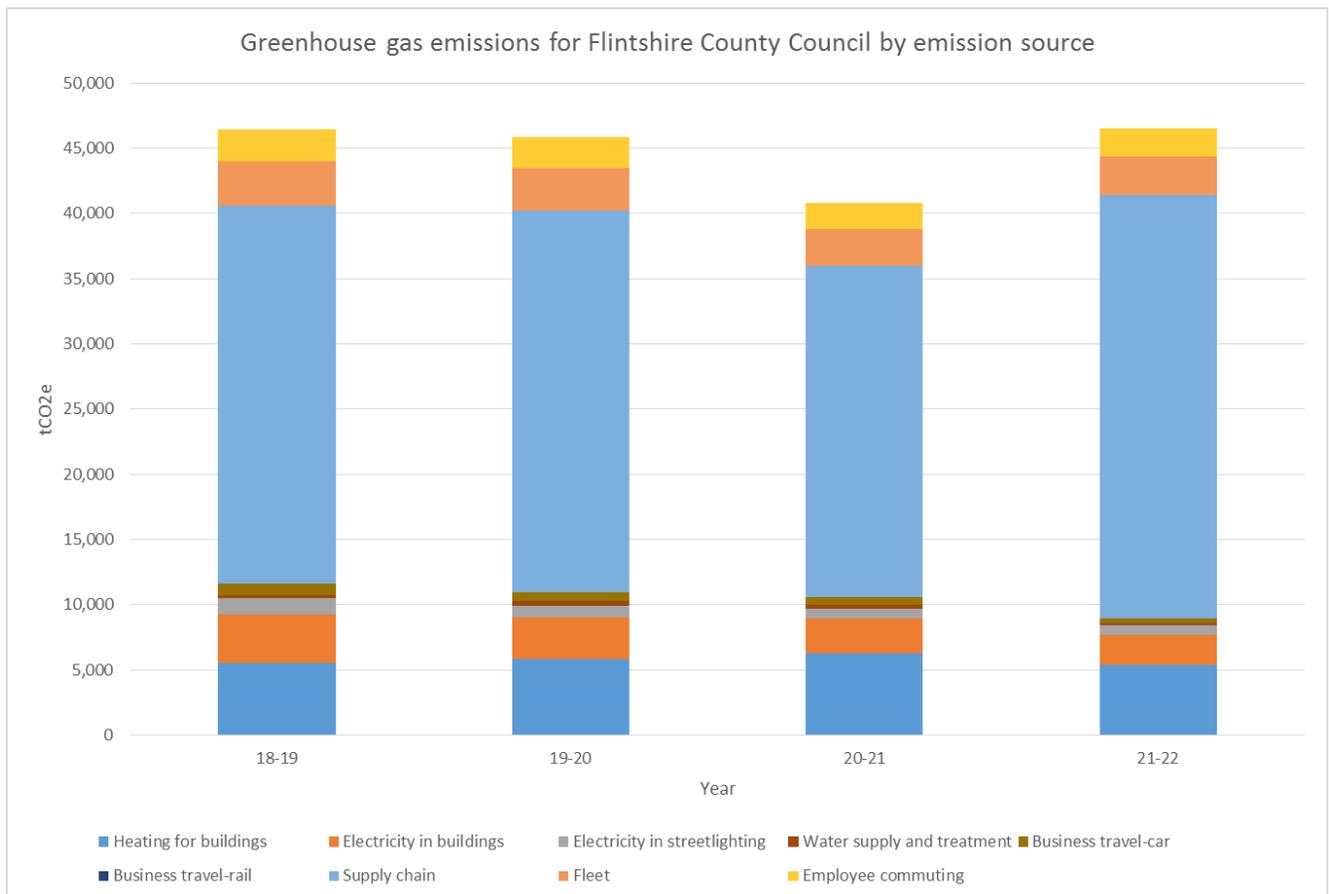


Figure 2: Flintshire County Council GHG emissions over past 4 financial years by emission source

Aside from supply chain, compared to 2018/19 baseline, we saw a 3% reduction in heating from buildings, 37% reduction in electricity in buildings, 44% reduction in electricity from street lighting, 51% reduction in business travel and 15% reduction from fleet. This is reflective of the projects carried out during this reporting year by further reducing emissions from buildings through renewal of heating sources, management of heating controls, other energy efficiency measures and building-mounted renewable energy generation. Emission reductions in business travel and fleet reflect the continuation of hybrid working across the county, and the use of intelligent route mapping for Streetscene and maintenance services.

The methodology used to determine emissions from business mileage and employee commuting continue to have a high level of deviation due to gaps in data records. Data recorded within mileage claims needs to be strengthened so that actual vehicle and fuel types can be captured. This will allow for more accurate calculation of emissions from business travel. An employee survey to determine methods of travel into the workplace and frequency of travel would allow more accurate estimates of related emissions, and the subsequent impact of home working.

The methodology to determine emissions from water use also have a high level of deviation. These figures are currently calculated using invoice cost values. Being able to capture actual water usage figures would improve the accuracy of emissions from water usage across our buildings.

Figure 3 below shows our actual emissions and the milestones we hope to reach between now and 2030. We are currently aiming for a 60% emission reduction in Buildings, 80% emission reduction in Mobility & Transport and 60% reduction in Procurement by 2030.

	Baseline tCO ₂ e	Actual Reduction	Targeted Reduction	
Theme	2018/19	2021/22	2024/25	2029/30
Buildings	10,747	13%	35%	60%
Mobility & Transport	6,716	16%	50%	80%
Procurement	28,970	24% increase	30%	60%

Figure 3: Flintshire County Council Carbon Emission Milestones to 2030

To achieve these milestones we set annual targets in each theme as detailed below in Figure 4. The target percentage reduction is compared to the 2018/19 baseline. We overachieved on our reduction targets in Buildings and Mobility & Transport, and underachieved in Procurement as detailed previously.

Theme	2018/19 Baseline tCO ₂ e	2021/22 target tCO ₂ e % reduction	2021/22 actual tCO ₂ e	2021/22 actual tCO ₂ e
Buildings	10,747	9%	8,543	13% reduction
Mobility & Transport	6,716	9%	5,504	16% reduction
Procurement	28,970	8%	32,446	24% increase

Figure 4: Flintshire County Council Carbon Emission Targets for 2021/22

4 Land Use emissions

Land use emissions are determined using the Welsh Government’s methodology, emission factors for each land type, and our internal knowledge of land types under our ownership and control. Depending on usage, land can have positive or negative net carbon emissions. Settlements and croplands are net emitters while forests and grassland absorb and store carbon. Wetlands and peatlands also have the potential to absorb and store carbon depending on their condition, however the Welsh Government methodology does not currently include emission factors for these land types.

The emission breakdown from our land types can be seen in Figure 5. We are working to better understand and map our land assets so that we can ensure this data is accurate. This exercise also helps us to identify areas of land that could be beneficial for carbon off setting, natural flood defence and biodiversity net gain.

Land Type	Land area ha	Emission factor	Total kg CO2e
Forest land	151.68	-5.420194632	-822135.1219
Grassland	479.91	-1.44069199	-691402.4928
Settlements	1.23	2.104948644	2589.086832
Wetlands	78.91	N/A	

Figure 5: Breakdown of Flintshire County Council Land Types and Carbon impact 2021/22

Figure 6 shows the 2021/22 emissions and removals of kgCO2e based on the above methodology. By increasing the quantity of forest land and grassland we can increase the amount of carbon that we absorb and store. The pan-Wales decarbonisation network are working with Welsh Government to improve the data and emission factors associated with different land types to better reflect the assets that we have within Flintshire land.

Land based emissions Categories	Units of kgCO ₂ e	
	Emissions	Removals
Total land based emissions	2,589	- 1,513,538

Figure 6: Summary of Flintshire County Council land based emissions/removals 2021/22

5 Renewable Energy generation

The Council continues to invest in renewable energy generation both within its building assets and large scale solar farms. Investing in renewable energy that is consumed onsite allows a reduction in energy used from the grid. This saving is demonstrated in the emissions from electricity use. Investing in renewable energy that is exported into the grid assists in the local and national decarbonisation of energy provision moving us away from reliance on energy generated by burning of fossil fuels. Figure 7 below shows the energy generated and exported from each of our current renewable energy source types.

Renewables	Units of kWh	
	Total generated	Total exported
Onsite renewables – Solar PV mounted	636,395	159,099
Onsite renewables – Wind mounted	10,922	2,731
Onsite renewables – Biogas CHP (Landfill gas turbines)	1,614,723	1,614,723
Onsite renewables – Solar PV ground mounted	721,081	721,081
Renewables	2,983,121	2,497,634

Figure 7: Flintshire County Council Renewable Energy Generation 2021/22

6 Next steps and recommendations

It is the role of the Climate Change Committee to oversee and review the progress made against the Council's ambition to become net zero carbon by 2030. The Committee will continue to develop the Climate Change strategy and action plan and oversee implementation of its delivery.

There are areas of the collection and interpretation of carbon emission data that need to be strengthened over the coming year in order to achieve more meaningful data on the Council's carbon emissions. These areas include business mileage, employee commuting, home working, water use and procurement as detailed within this report.

Officer working groups for each of the key themes continue to work through the action plan, troubleshooting, identifying resource needs and developing business cases where necessary.

Appendix 1 - Glossary

Biodiversity: The variety of plant and animal life that make up our natural world or a particular habitat.

Carbon Dioxide Equivalent (CO₂e): the equivalent amount of carbon dioxide that would produce the same amount of global warming over a 100 year timescale.

Carbon Store: the amount of carbon stored in the natural environment such as soil, woodland, peatland etc. These may also be described as carbon sinks.

Council assets: buildings and land owned by Flintshire County Council.

Decarbonisation: reducing the carbon intensity and greenhouse gas emissions of an activity or service or wider organization.

Net Zero Carbon: Emissions of greenhouse gases are balanced by the removal of greenhouse gases from the atmosphere such as by trees, peatland and carbon capture and storage technologies.

Offsetting: A reduction in GHG emissions (e.g. wind turbines replacing coal) or an increase in carbon storage/GHG removal enhancement (tree planting, peatland restoration) outside of the GHG emissions boundary of an organisation that is used to compensate GHG emissions occurring within the organisation's boundary

Sequestration: Removing carbon dioxide from the atmosphere and then storing it, usually through environmental processes such as photosynthesis, absorption by soil, oceans etc.