How’s Chichester District doing regarding reducing greenhouse gas emissions and what needs to be done up to 2030

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Executive Summary

The Chichester District Council has launched a Let's Talk Climate Change consultation that is going to inform the new Climate Emergency Action Plan (CEAP). This is to replace the current one that expires in 2025. The new plan is to run from 2025 to 2030.

To get an understanding of how the Chichester District is doing, the Government published Local Authority territorial greenhouse gas emissions estimates 2005-2022 was analysed (https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-statistics-2005-to-2022).

A target reduction of greenhouse gas emissions by 2030 was devised based on the Climate Change Committee's proposed pathway to net zero by 2050.

The current national policies regarding heating by heat pumps, and electric vehicles, were investigated to see what impact these would have on the Chichester District emissions if they were adopted at the rate these national policies stipulate.

It transpires that the emissions reduction due to adopting the national policies are sufficient for the Chichester District to meet the proposed target by 2030! The CDC CEAP does not have to deliver any emissions reductions!

Chichester District Emissions analysis

The following chart shows the emissions (relative to 2005) between 2005 and 2022 of Chichester District, compared with the national UK emissions, as reported in the Climate Change Committee's (CCC) 2024 Progress Report to Parliament:

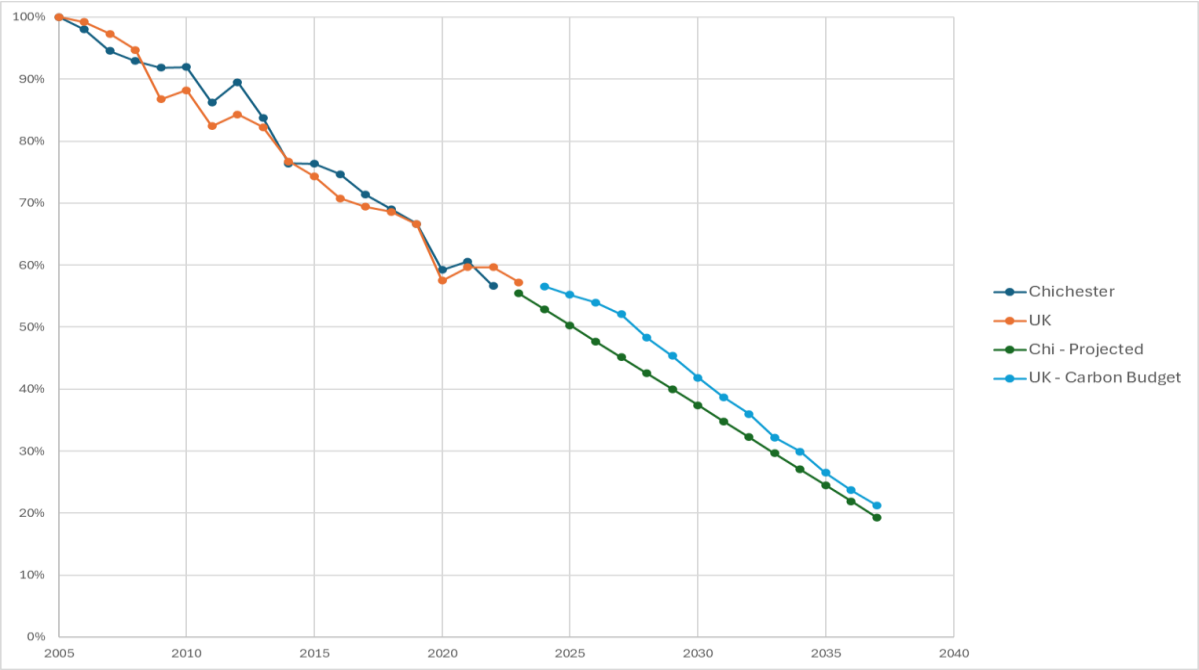

Figure 1 Chichester District and UK Emissions

The CCC report also contained the carbon budget targets up to 2037, so the Chichester District emissions were linearly extrapolated to 2037 – these are shown on the chart.

So, up to 2022, Chichester District is following the UK emissions trajectory and if the district continues this rate of reduction then it should be slightly ahead of target for the 2037 carbon budget target.

Emissions sources

Delving into the actual emissions in Chichester District between 2005 and 2022 shows where the emissions are occurring:

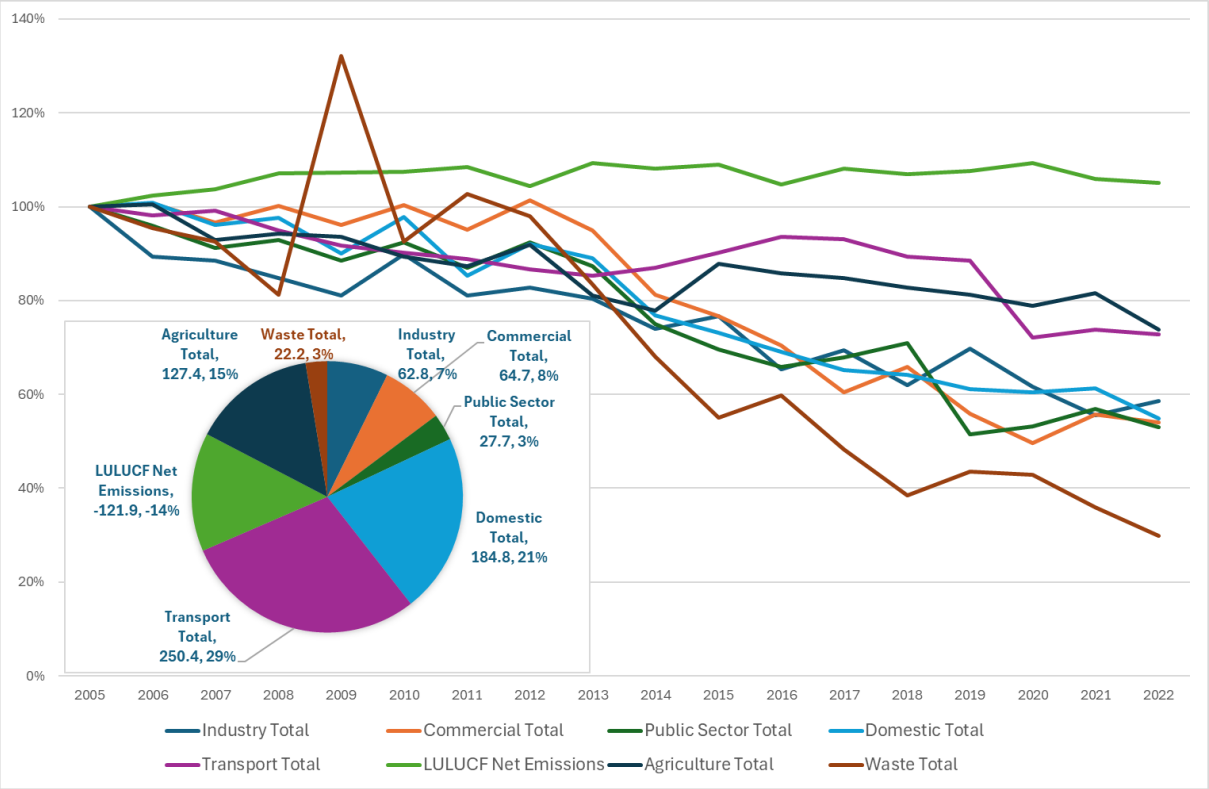

Figure 2 Emissions in Chichester District between 2005 and 2022

The outlier Waste shows the best decline due to the methane off gassing from landfills depleting, but is only 3% of the whole.

LULUCF

The other outlier, Land Use, Land Use Change and Forestry (LULUCF), is taking carbon out of the atmosphere so it is good that it has increased:

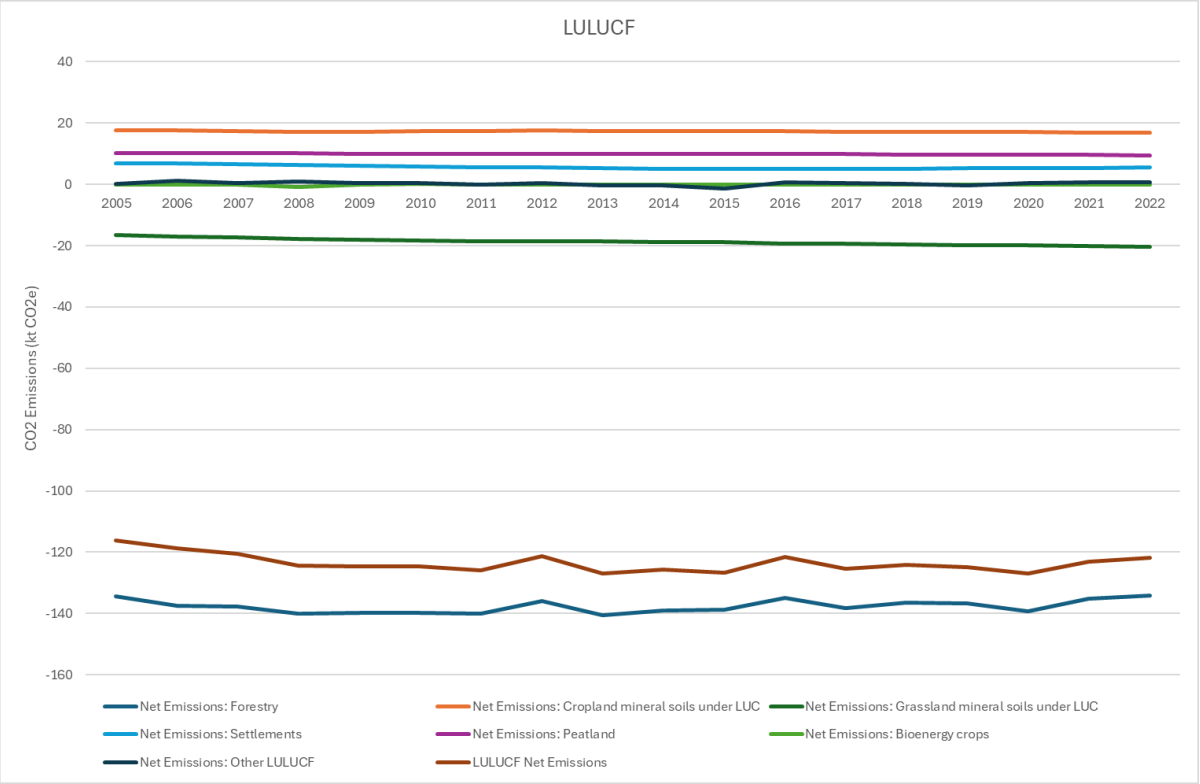

Figure 3 Emissions from Land Use, Land Use Change and Forestry (LULUCF)

Net Emissions: Forestry hasn't increased at all in this period, the biggest increase has been in Net Emissions: Grassland mineral soils under LUC, which in itself is pleasing, but for forestry to remain the same is somewhat disappointing, perhaps due to ash dieback?

Domestic emissions

There are 4 emission sources that seem to be reducing at a similar rate: Industry, Domestic, Public sector and Commercial. However, only Domestic is a significant contributor (21%), and comprises of 3 energy types. ('Other' is mainly fuel oil):

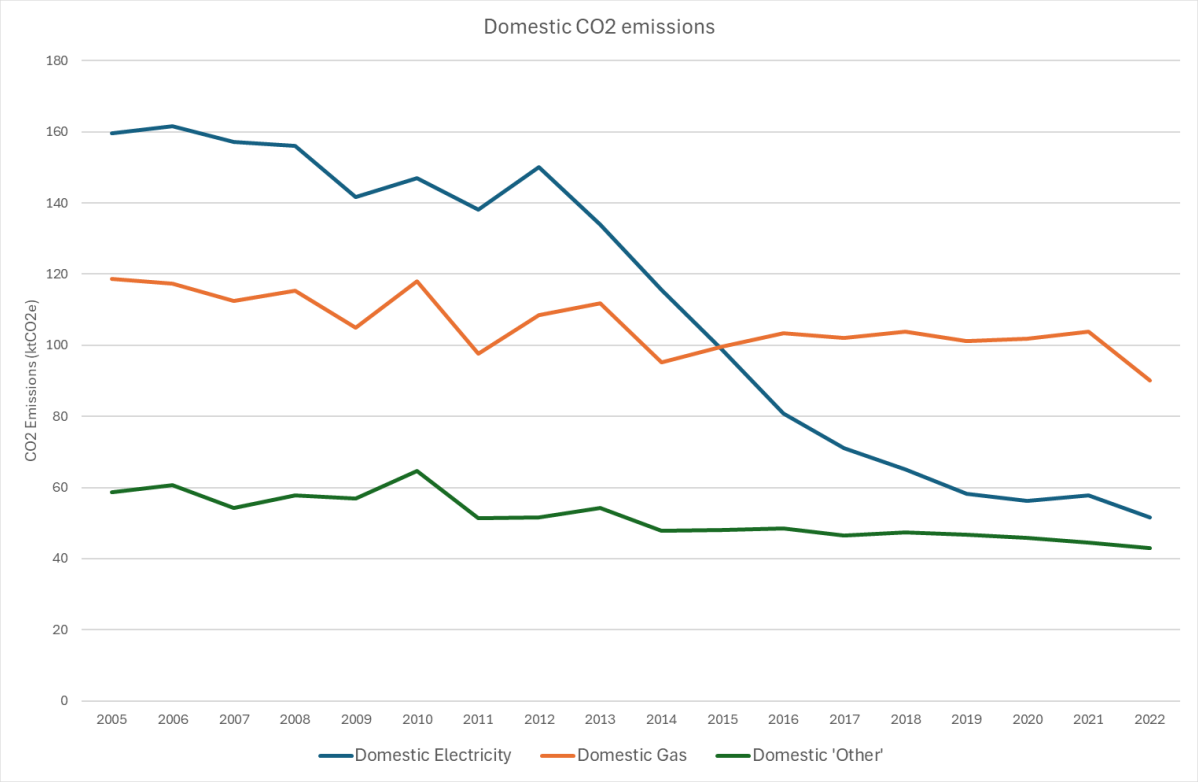

Figure 4 Domestic CO2 emissions

This really exemplifies the significant reduction in the carbon intensity of electricity, due to the greatly increased penetration of renewable energy sources.

The last 2 contributors, Transport (29%) and Agriculture (15%) are both significant sectors, but show slower reductions.

Agriculture

Livestock is the greatest source within Agriculture, with 'Other' (fuel oil and machinery) and Soil, close by:

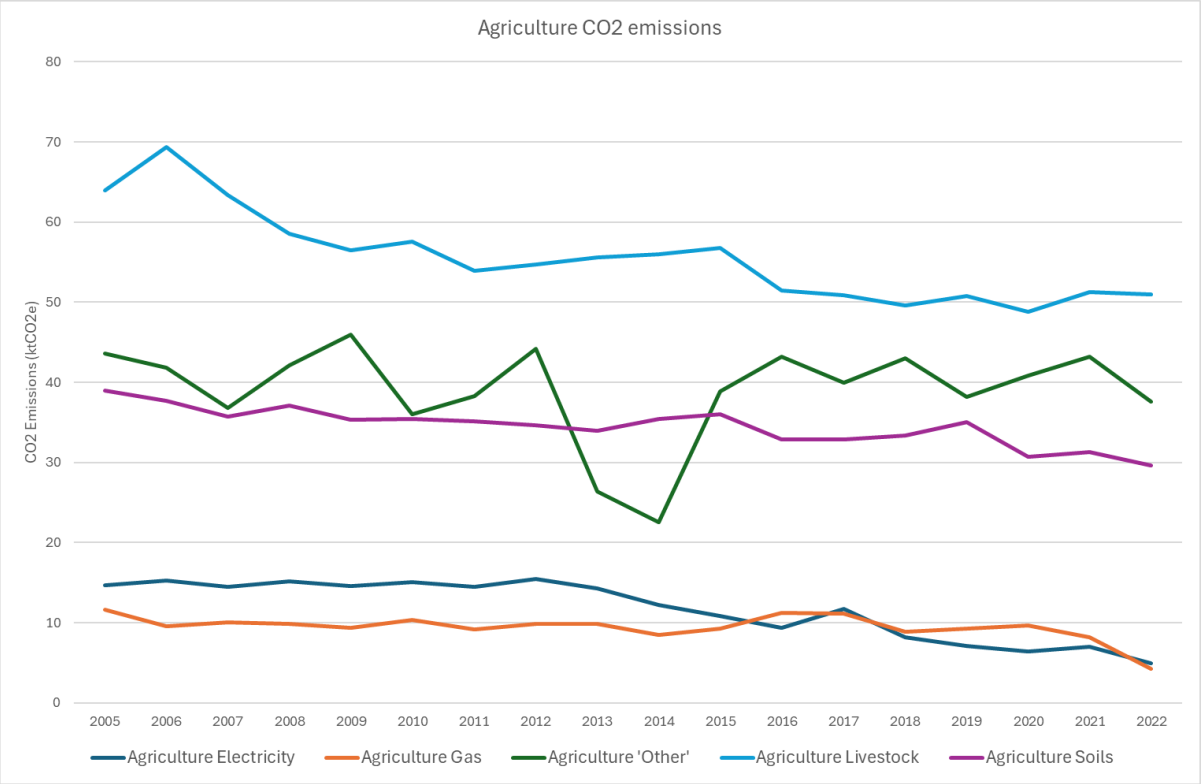

Figure 5 Agriculture CO2 emissions

Electricity and Gas are smaller emissions sources, so the significant carbon reduction of electricity has a smaller affect.

Transport

Transport is dominated by Road Transport:

Figure 6 Transport CO2 emissions

CDC Climate Emergency Action Plan

To understand the impact of the proposed projects in the current consultation/survey, which broke down its proposed projects into very low, low, medium or high carbon savings a year and low, medium or high cost, the following analysis used the following assumptions:

	Low	**Medium**	**High**
Cost estimates as presented in consultation	Less than £5,000	£5,000-£50,000	Over £50,000
Actual cost used in analysis	£5,000	£50,000	£100,000

Table 1 Project cost estimates

	Very low	**Low**	**Medium**	**High**
Carbon savings a year in tCO_2e (tonnes carbon dioxide equivalent)	Less than 10	10 - 99	100 – 1,000	Over 1,000
Benchmarked against the UK resident's carbon footprint	Less than one person's annual carbon footprint	One to ten people's annual carbon footprint	Ten to 100 people's annual carbon footprint	More than 100 people's annual carbon footprint
Number of residents emissions used in analysis	1	10	100	1000

Table 2 Project carbon savings

Consultation document location	Cost	Description	Carbon savings
5.5	£5,000.00	Housing decarbonisation	100
5.6	£5,000.00	Street tree planting schemes for new developments	10
5.6	£5,000.00	Green Travel Plans for New Developments	100
5.7	£5,000.00	Climate Champions	1000
5.7	£5,000.00	Youth engagement	1
5.7	£5,000.00	Quarterly networking event for public sector employers and large other not-for-profit organisations	1000
5.7	£5,000.00	Identify/produce template climate change policies for community organisations to incorporate into their procedures	10
5.8	£5,000.00	Taxi licensing	100
5.10	£50,000.00	Two secure cycle storage facilities	10
5.10	£50,000.00	Fund a feasibility study for part of a new cycling, wheeling, and walking route which runs across council land in Oaklands Park.	0
5.11	£50,000.00	Tree strategy officer	100
5.12	£50,000.00	Place a greater focus on work to help the district to better cope with changing weather patterns.	10
5.14	£100,000.00	Local Area Energy Plan (LAEP)	1000
5.15	£100,000.00	Increase car club provision	100
5.16	£100,000.00	Land-based carbon offsets	1000
5.16	£100,000.00	Marine-based carbon offsets	1000
5.17	£100,000.00	Housing decarbonisation strategy implementation	1000
Total Cost	**£740,000.00**	**Total number of people's carbon saved**	**6541**

Table 3 Projects evaluation

Target reductions by 2030

As mentioned in the consultation document, "The council doesn't have control over most of these emissions". Exemplified by the projects in the consultation document, if they were all implemented and achieved the reductions assumed in the analysis, they would only reduce emissions by about 10%, whereas to follow the rate of reduction between 2005 and 2022 a reduction of a third is required between 2022 and 2030.

Carbon emissions 2022 (ktCO2e)	617.9	
Target carbon emissions 2030 (ktCO2e)	408.2	
Required reduction in emissions (ktCO2e)	209.7	34%

Table 4 Target reductions by 2030

So an analysis of the district wide emissions was carried out.

Electricity

The Government has announced that it is aiming to reduce emissions from the electricity to 0 by 2030. This is an ambitious target, so in the analysis, it was assumed that emissions from electricity would only reduce by 95%, not 100%:

Electricity emissions 2022 (ktCO2e)	118.0
Electricity emissions reduction by 2030	95%
Reduction in carbon emission (ktCO2e)	112.1

Table 5 Electricity reductions by 2030

Gas and 'Other'

Emissions from Gas and 'Other' (fuel oils) is mainly due to the emissions caused by the combustion of fossil fuels in boilers to provide heat. Both can be replaced by heat pumps which are powered by electricity. So, the reductions achieved by replacing a proportion of the boilers with heat pumps in the period 2022-30 was modelled.

The previous Government had a target of installing 600,000 heat pumps by 2028. The typical number of gas boilers installed in a year is 1.5 million, so that implies a 40% target for heat pumps. (https://www.uswitch.com/energy/boiler-statistics/). 72,000 heat pumps were installed in 2022, i.e. 5% (https://post.parliament.uk/research-briefings/post-pn-0699/#:~:text=Heat%20pumps%20are%20a%20key%20technology%20for%20achieving,by%202028%20and%2072%2C000%20were%20installed%20in%202022.).

If it is assumed that a boiler lasts 15 years, then 6.7% of boilers are replaced every year. Also, if it is assumed that the proportion of boilers that are replaced with heat pumps increases linearly between 2022 and 2028, then onto 2030. Then by 2030 17% of heaters would be heat pumps.

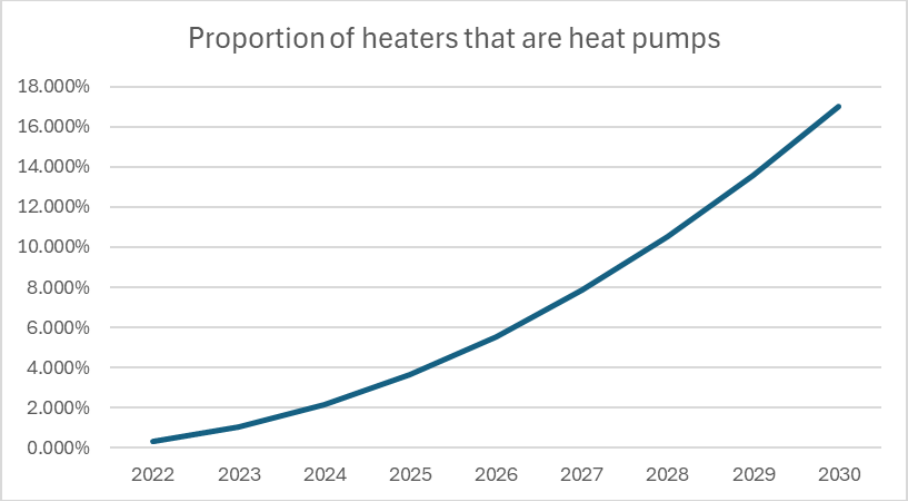

Figure 7 Proportion of heaters that are heat pumps

Road transport

Road transport can be replaced by Electric Vehicles (EVs). The previous Government had policy targets of 80% of new cars in 2030 would be Battery Electric Vehicles (BEVs). Also, 70% of new Light Commercial Vehicles (LCVs) would be BEVs. NB The new Government may improve these so that all new cars in 2030 are BEVs, but that policy hasn't been announced yet. (https://www.gov.uk/government/news/government-sets-out-path-to-zero-emission-vehicles-by-2035)

In July 2024 the Society of Motor Manufacturers and Traders (SMMT) published their UK new car and van forecast, containing actual vehicle sales and forecasts to 2024 and 2025. https://www.smmt.co.uk/2024/08/uk-new-car-and-van-forecast-july-2024/

It was assumed that these proportions increased linearly to 2030. It was also assumed that cars last 15 years and LCVs 10 years. Hence, by 2030 25% of cars and LCVs would be BEVs.

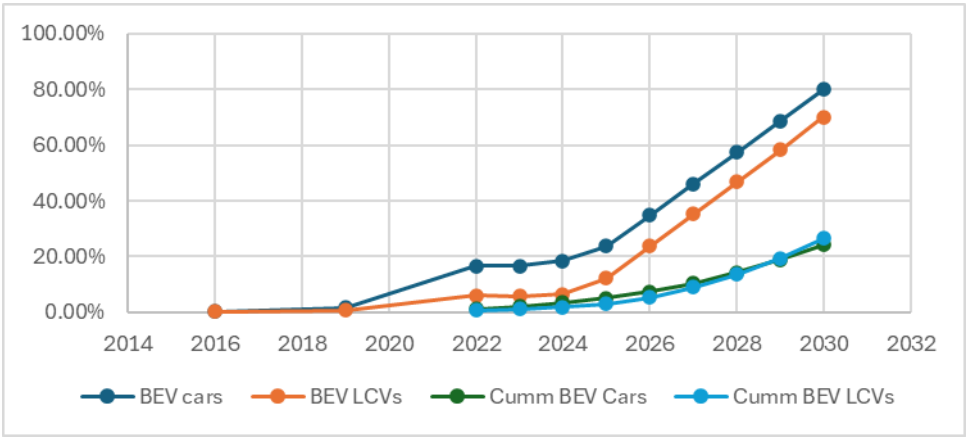

Figure 8 Annual and cummulative EVs

Modelling reductions due to electrification of heat and road transport

	Emissions 2022 (ktCO2e)	Proportion replaced 2022-30	Proportion reduction in carbon emissions	Actual reduction in carbon emissions (ktCO2e)
Gas	165.1	17%	16%	26.7
'Other'	65.9	17%	16%	10.6
Road transport	246.9	25%	23%	57.5
Total				94.8

Table 6 Modelling reductions due to electrification of heat and road transport

All using the same assumption that there will be a 95% reduction in the carbon emissions from electricity.

LULUCF

And how much more carbon emissions can be sequestered by changes in LULUCF? Comparing 2022 with 2005 shows that LULUCF hasn't changed, although in that period year to year changed has ranged from -4% to +5%. But for this analysis it's assumed that there is no change.

LULUCF (ktCO2e)	-121.9
Proportion increase by 2030	0%
Increase by 2030 (ktCO2e)	0

Table 7 Emissions reductions of LULUCF

Agriculture Livestock

Between 2005 and 2022 agricultural livestock reduced by 20%. If this rate of reduction continued till 2030, then between 2022 and 2030, emissions from Agricultural Livestock would reduce by 10.4ktCO2eq

Required success of CDC CEAP

So, how successful does the CDC Climate Emergency Action Plan (CEAP) must be to meet the target?

Total reduction in carbon emissions without CDC CEAP (ktCO2e)	217.3
Required reduction in emissions (ktCO2e)	209.7
Required reduction in carbon emissions in CDC CEAP (ktCO2e)	-7.6

Table 8 Required success of CDC CEAP

That is all the emission reductions from the district due to national policies and the continued reductions from Agricultural Livestock are more than is required for Chichester District to meet the target to follow the Climate Change Committees proposed pathway - the CDC CEAP doesn't have to deliver any reductions!

Carbon Emissions based on Consumption

However, this is not the complete story as there is another way to look at carbon emissions and that is based on consumption. In which case this analysis only looked at 42% of the emissions caused by the residents of Chichester!

Consumption of goods and services - Purchase of goods	18%
Consumption of goods and services - Use of services	8%
Consumption of goods and services - Other consumption related emissions	5%
Food and diet - Meat and fish	13%
Food and diet - Other food and drink	6%
Housing - Mains gas	12%
Housing - Electricity	7%
Housing - Oil	7%
Housing - LPG	1%
Housing - Biomass	0%
Housing - Coal	0%
Travel - Flights	8%
Travel - Public transport	3%
Travel - Private transport	12%
Waste - Waste	1%
Considered in analysis	42%

Table 9 Carbon Emissions based on Consumption

Data from the Community Carbon Calculator Impact tool (https://impact-tool.org.uk/)

This Impact tool also showed that the territorial and consumption emissions were very similar, so by addressing the territorial emissions Chichester District is mitigating the emissions caused by its consumption.