

Appendix C:

Greenhouse Gas report comparison 2018/19 to 2021/22

Greenhouse gas (GHG) emissions assessment was undertaken in accordance with guidance published by the Department of Business, Energy, and Industrial Strategy (BEIS), including the GHG protocol and includes scope 1, 2 and 3 emissions.

Scope 1 – Direct GHG (Greenhouse Gas) Emissions, where the emission occurs directly from sources controlled or operated by the Council, for example the gases emitted from a boiler flue as a result of burning natural gas for heating.

Scope 2 – Electricity - indirect GHG Emissions, where the consumption of a utility on site has a direct bearing on the emissions offsite. This predominantly relates to electrical consumption but can also include district heating and cooling.

Scope 3 – Other indirect GHG Emissions, where emissions are a consequence of the activities of the Council but occur from sources not owned or controlled by them. Scope 3 is a very wide category and includes all emissions sources not included in the other two scopes, such as the leisure centre operations, the transport emissions from the vehicles used in recycling and waste collection and ground maintenance. Scope 3 also includes emissions associated with disposal of waste generated by our own estate, water consumption, grey fleet (employees using their own vehicles on Council business).

Greenhouse gas emissions (GHG) are also reported in units of carbon dioxide equivalents (CO₂e). This allows the impact of each of the seven main greenhouse gasses to be expressed in terms of the amount of CO₂ that would create the same amount of warming, allowing easy comparison of the impact of different emission types.

Throughout this report, all greenhouse gas emissions are given in terms of carbon dioxide equivalent.

Emissions by Operation:

The Council's total carbon emissions tonnes of carbon (tCO₂e) per year. (21% reduction)

2018/19 4,724 tCO₂e

2021/22 3,724 tCO₂e

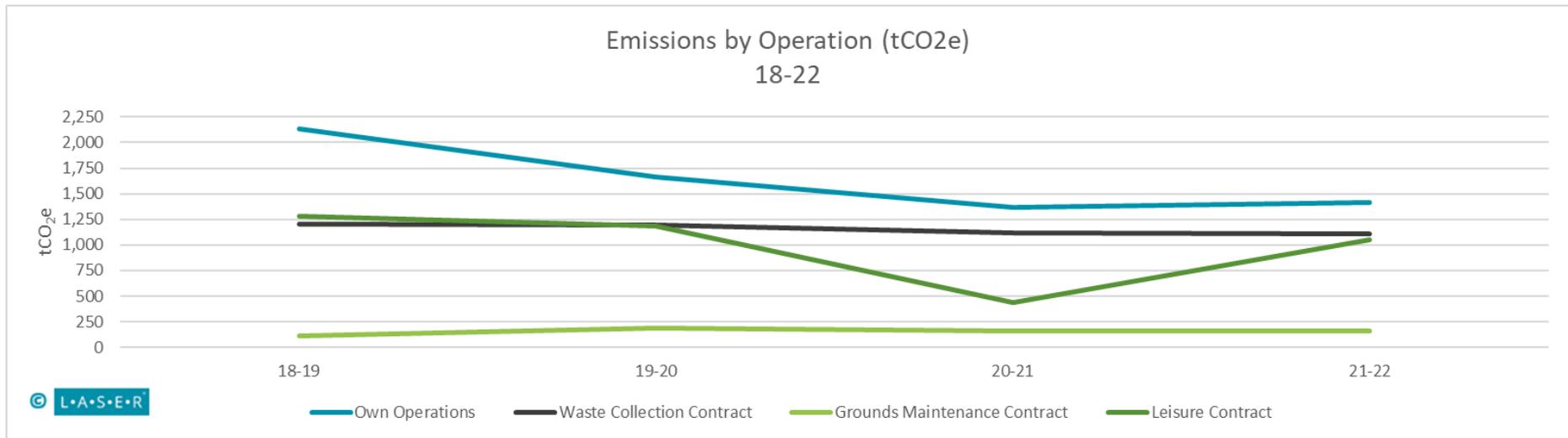


Fig 1: Emissions by Operation 2018 - 2022

Key findings:

TWBC's own operations, have seen a decline overall in emissions - some of this is due to consumption reduction, however an improved electricity factor has also had a significant impact.

The emissions associated with the household waste collection contract have remained overall consistent which is related to the datasets used, (due to availability), the same data has been used for periods 18-19 and 20-21, and 21-22 uses data from 20-21.

There has been slight rise in emissions for the ground's maintenance contract - this is mainly due to an increase in road diesel consumption, and it is linked to improved data gathering.

The impact of covid can be seen for the leisure centre with associated emissions dipping significantly for 20-21.

Data clarification:

The data for 18-19 has been updated to include emissions associated with 'well to tank' (WTT) and 'transmission and distribution losses' (T&DL). The 'emission factors' originally used for 18-19 have also been revised. These updates have been made to ensure that a like for like comparison can be carried out across the periods and is in accordance with guidance issued on how to measure and report on greenhouse gas. Therefore, the carbon footprint for 18-19 has increased to 4,724 tCO₂e from 3,507 tCO₂e. WTT and T&DL contribute an additional 605 tCO₂e and revised emission factors make up the remaining 612 tCO₂e.

Transmission and distribution losses are emissions associated with the energy losses which occur from supplying electricity from the power plant to the end user.

Well-to-tank are emissions that occur from fuel extraction, refining and transportation prior to combustion by the end user – this includes gas, fuels for stationary combustion (generators), fuel used in both owned vehicles and grey fleet.

WTT and T&DL are now included – GHG accounting has progressed enabling more accurate reporting with the convention to now include such scope 3 measurements

The grid electricity emissions factor is related to the proportion of renewable electricity in the grid steadily rising over the years, and the associated reduction in carbon emissions from grid electricity.

Improved accuracy - Biomass: The original 18-19 carbon footprint used the wood chip emissions factor. The revised 18-19 footprint now uses the factor for wood pellets; therefore, the associated emissions have increased from 0.5 to 7.0 tCO₂e.

Emissions by Scope & Source:

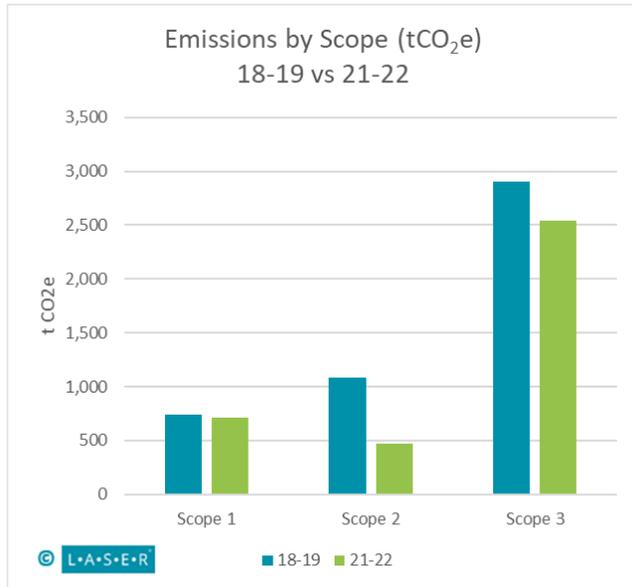


Fig 2: Emissions by Scope

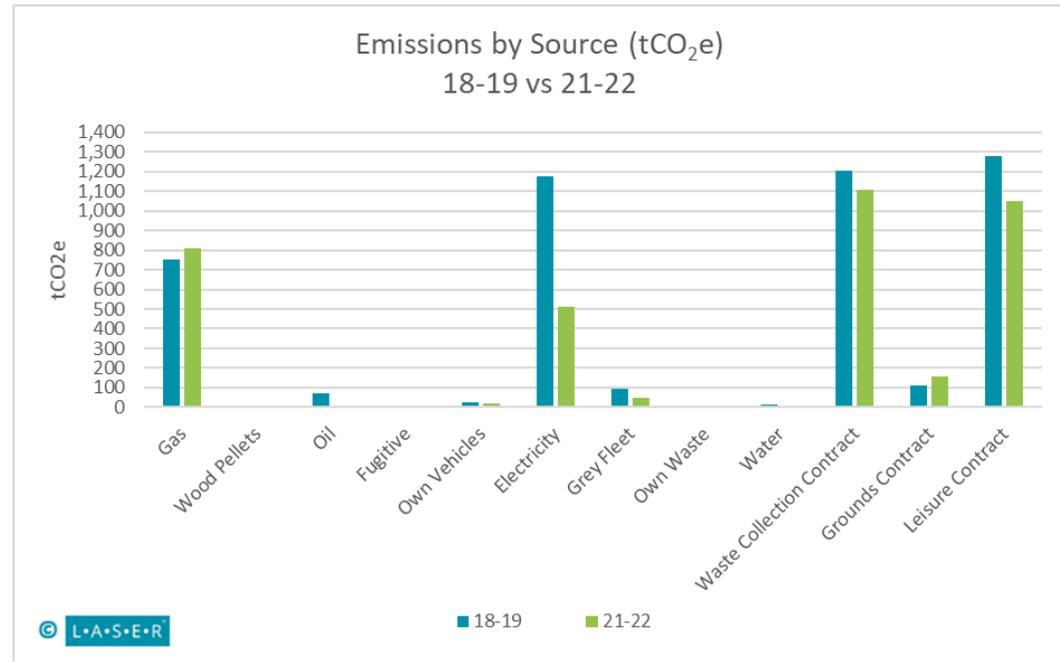


Fig 3: Emissions by Source

Findings:

All scopes have seen a drop in emissions, especially scope 2 which comprises of emissions associated with electricity.

All sources have seen a drop in emissions apart from council gas use and the grounds maintenance contract fuel use.

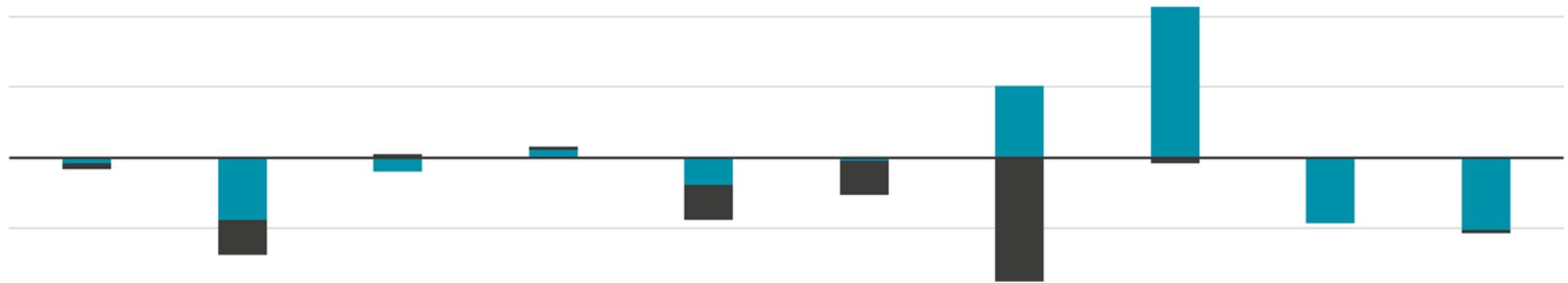
Comparison of top ten emission sources 18-19 vs 21-22:

Fig 4 and fig 5 below provide a comparison of the changes in consumption for the councils top ten emission sources.

Comparison of Top 10 Emission Sources (tCO₂e)
18-19 vs 21-22



Influence of Changes in Consumption and Emission Factors



| | Waste Collection & Street Cleaning Contract | TWBC Own Operations Electricity Buildings | Leisure Contract Gas | TWBC Own Operations Gas | Leisure Contract Electricity | TWBC Own Operations Electricity UMS | TWBC Own Operations Ice Rink | Grounds Maintenance Contract Road Diesel | Grounds Maintenance Contract Equip Petrol | TWBC Own Operations Grey Fleet Petrol Medium |
|--|---|---|----------------------|-------------------------|------------------------------|-------------------------------------|------------------------------|--|---|--|
| ■ % Change in Emissions Factor (18-22) | -3.796% | -24.766% | 2.377% | 2.377% | -24.766% | -24.766% | -88.074% | -3.796% | 0.253% | -2.430% |
| ■ % Change in Consumption (18-22) | -4.33% | -44.38% | -10.03% | 5.09% | -19.55% | -2.00% | 50.71% | 106.94% | -46.31% | -51.40% |

Comparison of consumption and emission for the top ten sources:

In the first chart a negative value indicates a reduction in emissions and a positive value indicates an increase in emissions. The second chart above shows the impact of changes in consumption and emission factors. A negative value indicates a reduction in consumption and an improved emissions factor, and a positive value indicates an increase in consumption and a worsened emissions factor.

Household waste collection and street cleaning contract (linked to fuel use only), shows a small decrease in amount of fuel use and in the emissions factor associated with the fuel, (mix of biofuels in purchased fuel has increased hence improved factor).

The large reduction in emissions for the Council's electricity consumption is clearly visible (overall total of -58.2%). The emissions factor has improved, but consumption has also dropped some of this is linked to energy efficiency improvements, majority impact from consumption reduction though from covid and working from home.

An increase in carbon emissions can be seen in the Council's gas use (overall increase of 7.6%), this is linked to gas use in the Amelia Scott building, during the 'fit out', (by this time the Council had become the bill payer).

The grounds maintenance contract has also seen an increase in road diesel use (overall increase of 99.1%), which is due to an increase in consumption, linked to improved data recording.

Whilst the amount of fuel use for the ice rink has increased, the emissions factor has improved significantly as diesel hydrogenated vegetable oil is used instead which also has a better combustion rate efficiency. Hence the overall significant reduction in the emissions from the ice rink (-82.0%). The emissions factor associated with the renewable diesel for the ice rink plays a significant role in emission reductions and it manages to offset the considerable rise in consumption.

Natural gas overview:

Space heating, water heating and crematoria use are the primary uses of natural gas by the Council. The emissions associated with the use of natural gas are determined by the mix of sources used to make up the UK grid supply of gas. As a result, the carbon factor associated with natural gas does fluctuate slightly. However, whereas the electricity emission factor is improving year on year due to the increase in the mix of renewables this is not the case for natural gas. Gas will remain a significant emitter of carbon and hence the priority to decarbonise, through schemes such as the public sector decarbonisation grant scheme.

Carbon Reduction Pathway:

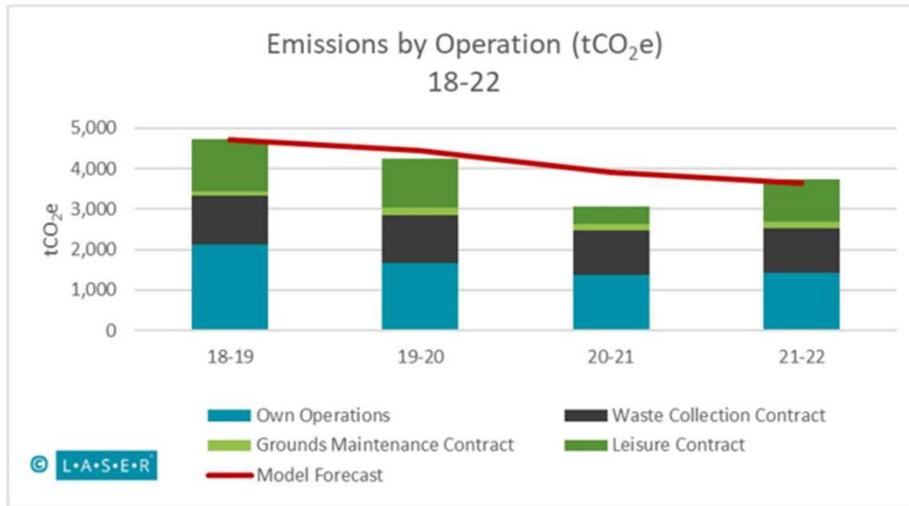


Fig 6: Actual emission reduction up to 2021-22

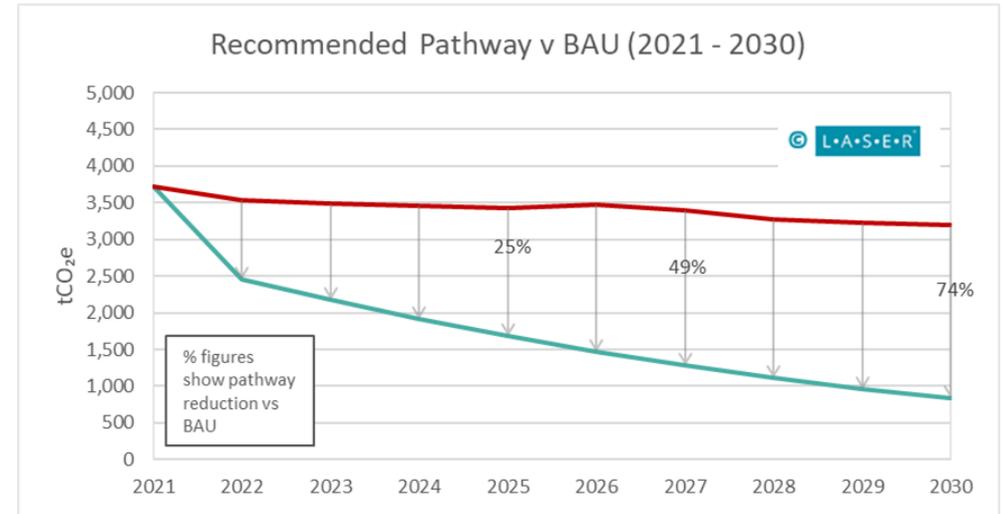


Fig 7: Recommended pathway to emission reduction up to 2030

Findings:

Figure 6 sets out the emissions achieved to date. With figure 7 detailing the recommended pathway to get as close to net zero as possible by 2030, based on the previous modelling work undertaken and the data available at the time.

The red line depicts business as usual (BAU) if no additional carbon reduction measures are taken.

The carbon reduction pathway considered the various reduction opportunities available to the Council including, energy efficiency, renewable energy generation, procurement of green energy and off-setting.

Whilst there has been a reduction it is not in line with the recommended pathway as set out in figure 7 to get as close as possible to net zero by 2030. By 2022 emissions should be closer to 2,500 tCO₂e, whereas emissions are currently at 3,700 tCO₂e.

Summary:

There has been an overall reduction in carbon emissions of 1,000 tCO₂e from 2018-19 to 2021-22. Whilst there has been a reduction it is not in line with the recommended pathway to being carbon neutral by 2030. By 2022 emissions should be closer to 2,500 tCO₂e, whereas emissions are currently at 3,700 tCO₂e.

The pandemic has had an impact on consumption and potentially on funding available to support carbon reduction projects.

Significant progress in carbon reduction will be required now and continue over the next 8 years if the ambition of being carbon neutral by 2030 is to be met.

Next steps own estate and operations:

Monitoring and assessment:

Monitoring and assessment of the Council's consumption and greenhouse gas emissions is ongoing to enable progress towards meeting the 2030 carbon neutral goal to be assessed.

Good quality data is vital to monitor consumption and emission reduction, hence improvements to data collation is to be progressed including the development of dashboards to highlight trends, interventions, and the direction of travel.

Carbon reduction projects:

Some progress is being made and specifically related to the Council's property portfolio. With the award of the Low Carbon Skills Fund (LCSF), heat decarbonisation assessments plans have been completed. Equally, through funding from the Public Sector Decarbonisation Scheme (PSDS), some decarbonisation works are due to start, (anticipated start date towards the end of quarter 3 or beginning of quarter 4), at the Deport and Weald Sports centre.

Behavioural change and other generic improvements such as encouraging and supporting mileage reduction and good practices will continue to be promoted and developed further.

Some improvements have been made to the town hall and assembly hall roof.

However, apart from the works listed above no other specific energy efficiency works are currently programmed. Therefore, continuing to apply for funding opportunities for example through the PSDS will be critical to enable energy efficiency improvements to be made.

Assessing the carbon impact of each project will also enable informed decisions making.

Whilst there has been some reduction in emissions, it is however significantly behind the recommend reduction pathway approach. It is clear more 'up front' and 'greater' action is required if the steady rate of reduction in emissions is to be delivered.

Options review and modelling update:

A significant number of properties have had assessments carried out as to the potential decarbonisation opportunities. Key contracts have also been extending, which may alter the timings of when carbon reduction measures can be implemented.

Therefore, the next step is to review the previous models on the various carbon reduction opportunities and update these with the latest more detailed information. This will enable the Council to update its path to continual improvement in carbon and energy management, driving down energy and fuel spend and the associated carbon dioxide emissions.

This modelling is currently being progressed and will be reported in due course.