Gosport Borough Council greenhouse gas emissions 2021-22

Introduction

Gosport Borough Council has set an aspiration to be carbon neutral for its own operations by 2050. To track our progress towards this and help inform actions to achieve the target, annual greenhouse gas emissions have been calculated for each financial year since 2019/20. This report summarises the emissions for the 2021/22 financial year.

Emissions included

Scopes

Emissions are classified into three scopes for reporting purposes, as follows.

- Scope 1 emissions are those released directly by an organisation.
- Scope 2 emissions are those released to generate electricity used by an organisation.[1]
- Scope 3 emissions cover all other emissions generated outside an organisation, to provide services or materials used by the organisation.

The target set in the Council's Climate Change Strategy for emissions to reach net-zero by 2050 covers scope 1 and 2 emissions only. This report is therefore limited to these emissions. However, it should be noted that at least 70% of local authority emissions can be expected to fall under scope 3[2], with a recent report putting this figure at 96%[3].

Scope 1 emissions come from two sources.

- Emissions from combustion of fuel by Council-owned vehicles and in Council-owned buildings.
- Leaks of refrigerant gases, mostly from air conditioning units owned by the Council.

Leaks of refrigerant gases are not included in this report due to the difficulty of collecting this information and their minimal levels.

Renewable electricity

The Council switched to a 100% renewable electricity tariff in October 2020. Where a renewable tariff is used, there are two options available for reporting scope 2 emissions.

- **Location based** reporting does not differentiate between renewable and non-renewable electricity. This reflects the fact that the emissions per kilowatt-hour conversion figure provided by BEIS is based on the carbon intensity of the overall UK electricity supply, including any renewable generation. The sum of the location based emissions figures from

[1] Scope 2 also covers emissions associated with other energy services used by an organisation, such as district heat, steam or cooling networks. Electricity is the only externally generated energy used by the Council, so for simplicity this document treats scope 2 as covering electricity consumption only.
[2] Source: https://www.carbontrust.com/news-and-events/news/local-authority-climate-emergency-whats-next [accessed 17/7/22]
[3] Source: https://www.oxygen-finance.com/councils-supply-chains-responsible-for-over-43-7m-tonnes-of-co2/ [accessed 17/7/22]

all users in the UK would therefore match the country's total emissions from electricity generation.

- **Market based** reporting treats renewable electricity as having zero emissions.[4] This acknowledges the role that renewable electricity tariffs have in increasing demand for renewables and so driving down the carbon intensity of the overall UK electricity supply over time.

BEIS guidance states that location based reporting should be treated as mandatory, while organisations may choose to include market based reporting as well. Both location based and market based calculations are provided in this report.

Methodology

The methodology used follows best practice guidance from BEIS, which is based on the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard. It can be summarised as follows.

1. Collection of usage data for all relevant energy use.
2. Conversion from usage to greenhouse gas emissions using "carbon intensity" conversion factors provided by BEIS.
3. Calculation of gross and net emissions totals.

Collection of data

Petrol and diesel used for Council vehicles (scope 1)

BEIS provides conversion figures for either vehicle mileage (taking into account vehicle type and fuel used), or alternatively for petrol and diesel usage. Both options have advantages and disadvantages; calculating emissions directly from fuel usage is more accurate but harder to align to the financial year. The calculations in this report are based on the actual fuel usage.

Usage (amount and type) is obtained from fuel purchase invoices. All invoices within the 2021/22 financial year have been taken into account. Some fuel purchased before the start of the financial year would have actually been burned and generated emissions within the year, while some fuel purchased near the end of the year would not have generated emissions until the 2022/23 financial year. It is assumed that these two inaccuracies approximately balance each other out, and that provided the same method is used each year, comparisons between years will be valid.

Many purchases were for cans of diesel or petrol rather than fuel for specific vehicles. In these cases, it is not possible to determine whether the fuel was used in vehicles or other equipment. For simplicity, all fuel purchased in cans has been attributed to DSO vehicles.

For consistency with previous years, fuel used by the community safety van has been excluded from the calculations since this is a Community Safety Partnership vehicle. The van is almost entirely used for Partnership events and emissions associated with it are minimal (approximately 0.2% of the total emissions from Council vehicles).

[4] Emissions due to electricity transmission and distribution losses are included in market based reporting; however these come under scope 3 since they are treated as emissions from the electricity distributor, rather than emissions directly due to generating the electricity used by the Council.

Gas used for space and water heating in Council buildings (scope 1)

Usage has been taken from automatic meter readings, which specify the energy content of the gas used. This aligns with the conversion figure provided by BEIS which specifies the CO_2 equivalent emissions for each kWh of energy content of the fuel. The majority of energy contracts for Council buildings are managed by Portsmouth City Council, which has provided the usage figures for these buildings.

Diesel used for electricity generation in Council buildings (scope 1)

As part of its covid-19 response, the Council provided temporary portacabin homeless accommodation, which were in place for the first few months of the 2021/22 financial year. These were entirely powered using a diesel generator, and usage data for this is based on fuel purchase invoices and delivery records.

All invoices within the 2021/22 financial year have been taken into account. Since the portacabins were in place before the start of the financial year, this means the emissions reported will be slightly below those actually generated by combustion of the fuel during the financial year. The error is expected to be less than 15% since the first delivery of fuel in the 2021/22 financial year was on 15th April, and the portacabins were in use until 5th July.

Electricity purchased from the grid for Council buildings and other sites (scope 2)

Electricity usage is based on invoices which specify the amount of energy purchased each month. The majority of energy contracts for Council buildings are managed by Portsmouth City Council, which has provided the usage figures for these buildings.

Invoices for Fortune House showed zero usage between April and August. Usage for these months has therefore been estimated based on usage for the same months in previous years and changes in usage from previous years for the other months.

<u>Conversion from usage to greenhouse gas emissions</u>

The calculation of greenhouse gas emissions uses conversion figures provided by BEIS. The figures are updated each year and the 2021 figures have been used for this report. This follows the BEIS guidance which states that where reporting is aligned to the financial year, the conversion figures applying for the majority of the financial year should be used. The conversion figures specify the "carbon intensity" of each activity that generates emissions, allowing the amount of "CO_2 equivalent" emissions to be determined. CO_2 equivalent emissions specify the amount of CO_2 that would have the same climate impact over 100 years as the emissions of all the greenhouse gases actually generated by each source.

<u>Calculation of gross and net emissions totals</u>

Once the conversion factors have been used to generate a consistent measure of emissions from all activities, these emissions can simply be summed to generate the Council's gross emissions total.

BEIS guidance allows a net total to be reported in addition to the gross total. The net total is calculated by subtracting from the gross total emissions from elsewhere that the Council's activities have prevented or offset.

The only potentially relevant factor is the solar photovoltaic (PV) installations on four Council buildings, from which some electricity is sold back to the grid. However, these installations are owned by Portsmouth City Council, so this offsetting applies to its emissions rather than the Gosport Borough Council emissions. The remaining electricity generated by the solar PV installations is reported below for information, since this is electricity that would otherwise have been purchased from the grid and therefore increased the gross emissions, but it does not offset any of the gross emissions actually generated.

Note that for the avoided emissions reported below, there was an issue with the export meter in Woodlands House which resulted in zero generation being recorded for June, July and September. The values reported below use estimates for these months based on generation for the same months in previous years and changes in generation from previous years for the other months.

Results

Total emissions

The total location based emissions calculated for the 2021/22 financial year are **808 tCO_2e**. Market based emissions were **461 tCO_2e**. Location based emissions would have been 18 tCO_2e higher without the solar PV installations.[5] (Market based emissions would not have been affected since renewable electricity was used for the whole of the financial year.)

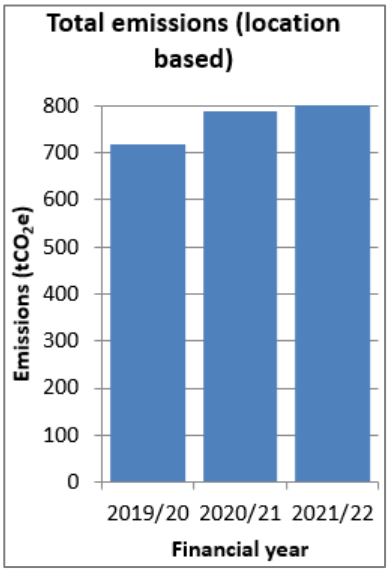
This compares with location based emissions of 790 tCO_2e and market based emissions of 599 tCO_2e in the 2020/21 financial year. Emissions have therefore **increased by 2%** using location based reporting, while they have **fallen by 23%** using market based reporting. However, it should be noted that this increase in location based emissions includes factors such as the new grounds maintenance DSO that were not present last year. These are analysed in detail below.

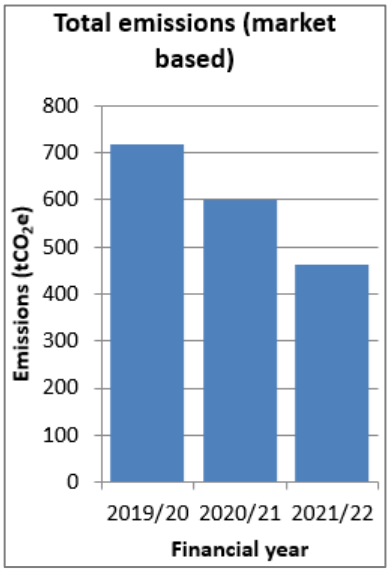
[5] This is an estimated figure due to the issue with the Woodlands House export meter.

Changes to emissions over time

Summary

The following charts show how total emissions have changed since the Council started measuring emissions in 2019/20.





Impact of covid-19

The Council's emissions in the 2020/21 financial year were impacted by the covid-19 pandemic, with additional emissions due to the temporary homeless accommodation in Walpole Park car park, reduced electricity usage in the Town Hall, and increased electricity usage in supported and general needs housing.

These impacts were considerably reduced in 2021/22. The temporary homeless accommodation only contributed an additional 10 tCO_2e of emissions before it was removed on 5th July 2021. Electricity consumption in the Town Hall returned to a level 16% higher than in 2019/20. Electricity usage in supported and general needs housing dropped back from 44% above 2019/20 levels in 2020/21, to 21% above 2019/20 levels in 2021/22. However, it is not possible to determine what proportion of these electricity consumption changes were due to the easing of covid restrictions.

Impact of grounds maintenance DSO

In April 2021, grounds maintenance was brought in-house with the establishment of a Direct Service Organisation (DSO). As a result, 70 tCO_2e of emissions that would have been categorised as scope 3 in previous years, and so not included in the emissions reporting, are now categorised as scope 1 and 2. If this service had still been contracted out, scope 1 and 2 emissions would therefore have decreased by 7% using location based reporting and by 35% using market based reporting.

Impact of change to gas usage reporting method

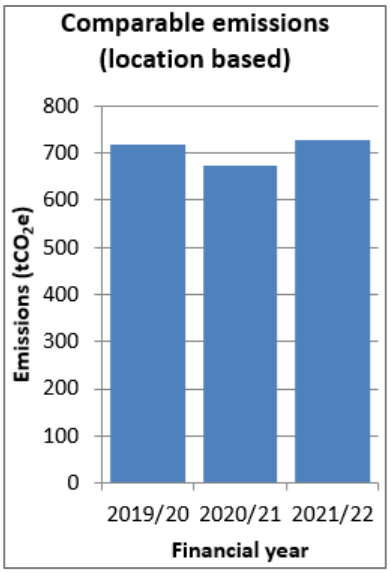
Gas usage has been determined using automatic meter readings, whereas in previous years, it was based on invoices.

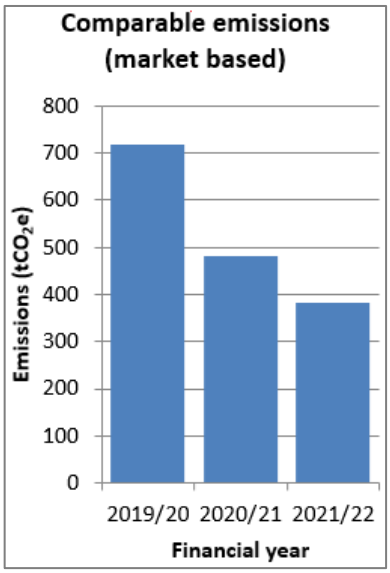
These two methods are not comparable and Portsmouth City Council has advised that automatic meter readings are more accurate. Unfortunately, the impact of this change cannot be determined

since Portsmouth City Council has also advised that invoice data is not compatible between 2020/21 and 2021/22. However, the 2020/21 invoice values were lower than the amount of gas actually used, and therefore emissions reported for 2020/21 would have been significantly higher had they been calculated using automatic meter readings.

Adjusted comparison

Excluding the above factors could be considered to give a better indication of how emissions are changing over time. Since it is not possible to analyse to what extent the changes in electricity consumption were due to covid-19 as opposed to other factors, or changes in gas consumption were due to the change in methodology, no adjustment for these changes can be made. The charts below therefore show how total emissions have changed since 2019/20, excluding emissions from the temporary homeless accommodation in Walpole Park and from the grounds maintenance DSO.





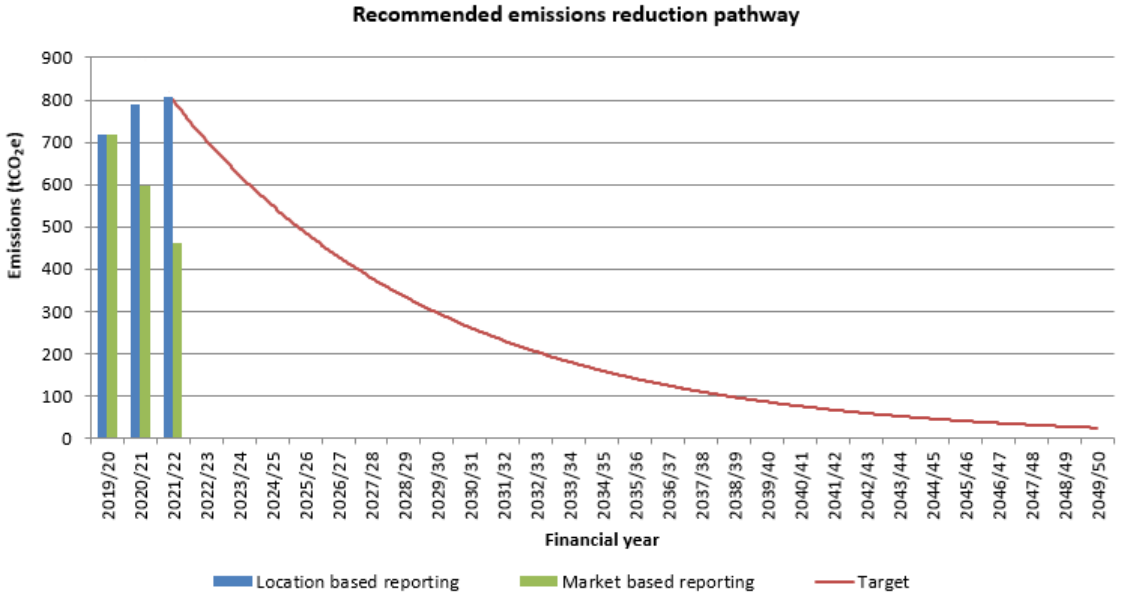
Pathway to achieve net zero target

Since the establishment of the DSO and the change in methodology for gas usage data are substantive changes which will affect emissions reported for the foreseeable future, it is appropriate to use the 2021/22 emissions as a new baseline for calculating a target pathway to achieve the Council's net zero target. However, the emissions from the temporary homeless accommodation are not included in this baseline since they will not be seen in future years.

Target emissions for each year can be calculated by assuming that emissions must decrease by a fixed percentage each year from this baseline, until the 2049/50 financial year[6]. An acceptable level of residual emissions in 2050 must also be assumed, and 25 tCO_2e has been chosen. This is based on 100 tCO_2e being considered as a level of emissions that could be realistically offset (equivalent to approximately 5000 mature trees that would not otherwise have been present), and an estimated 25% of emissions being accounted for by the scope 1 and scope 2 emissions reported here. To reach 25 tCO_2e in the 2049/50 financial year, scope 1 and scope 2 location based emissions need to reduce by an average of 12% each year from 2021/22.

[6] This is considered preferable to setting targets based on a linear reduction, which would become harder to meet as time goes on. This is because the most significant measures are likely to be taken earlier, while at the same time reducing emissions by the same amount would require addressing ever greater proportions of the Council's activities.

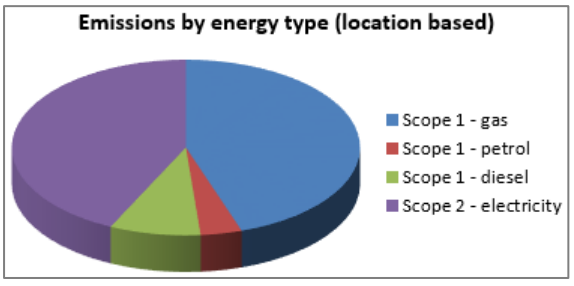
The graph below shows how the emissions for the 2021/22 financial year compare with previous years, and the recommended emissions reduction pathway for future years.

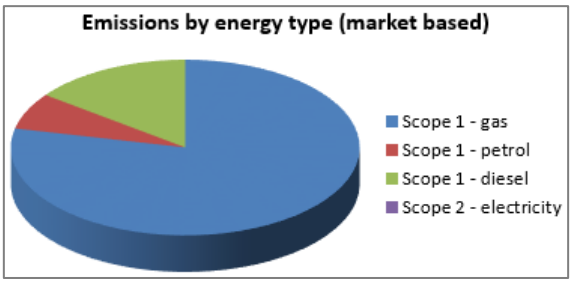


Analysis of emissions by energy type

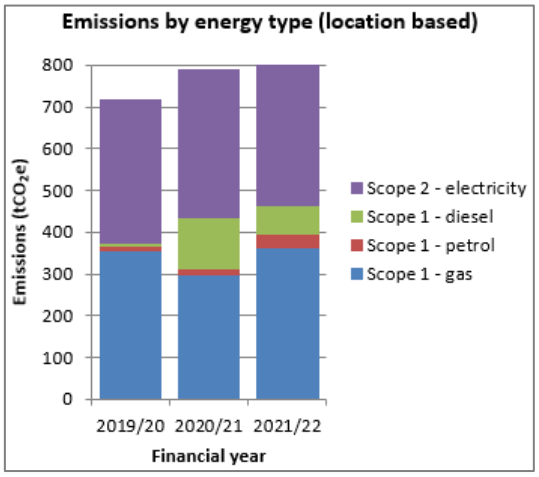
The contribution of each energy type used by the Council to the total 2021/22 emissions is shown below.

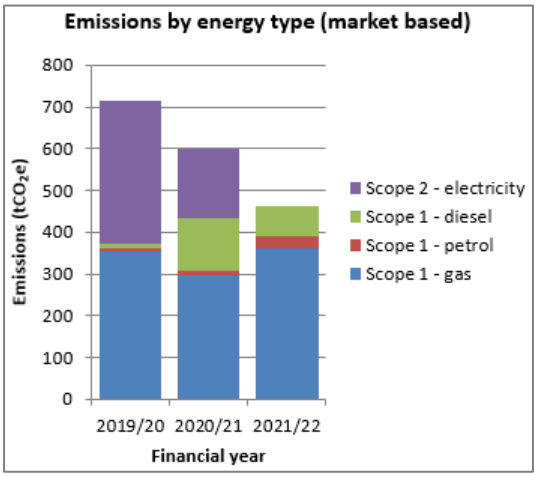
Energy type	Emissions (tCO_2e)	
	Location based	Market based
Scope 1 - gas	362.136	362.136
Scope 1 - petrol	30.985	30.985
Scope 1 - diesel	68.329	68.329
Scope 2 - electricity	346.760	0
Total	**808.211**	**461.451**





The following graphs show how the contribution to the total emissions of each energy type has changed since the 2019/20 financial year.





The changes from the previous year are as follows.

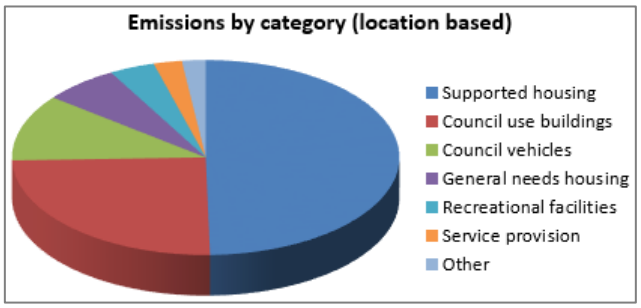
- There has been a 22% increase in the emissions from gas usage, from 297 tCO_2e to 362 tCO_2e. As described above, the majority of this apparent increase is likely to be the result of changes in the way gas usage data was collected.
- The emissions from petrol usage have increased from 13 tCO_2e to 31 tCO_2e. In percentage terms this is a significant increase (130%), but it does not have a substantial impact on the total emissions. Emissions from petrol due to the DSO were 18 tCO_2e and therefore entirely account for this increase.
- Emissions from diesel usage have decreased by 45%, from 124 tCO_2e to 68 tCO_2e. The removal of the temporary homeless accommodation in Walpole Park car park on 5th July 2021 resulted in emissions from this reducing by 107 tCO_2e, whereas emissions from diesel due to the DSO were 51 tCO_2e. These two factors therefore account for the change in emissions.
- Location based emissions from electricity usage have decreased by 2%, from 355 tCO_2e to 347 tCO_2e. This is due to the decrease in carbon intensity of the UK's electricity supply, with electricity usage increasing by 7%.
- Market based emissions from electricity usage have decreased to zero, since renewable electricity was used for the whole year.

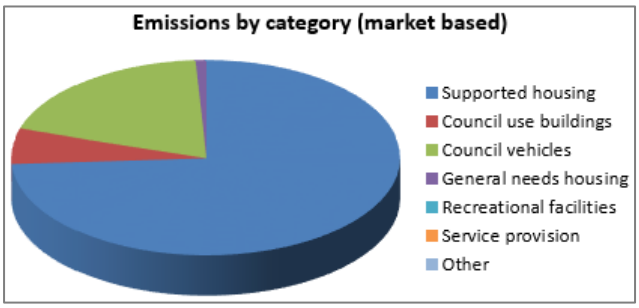
Analysis of emissions by category

Summary

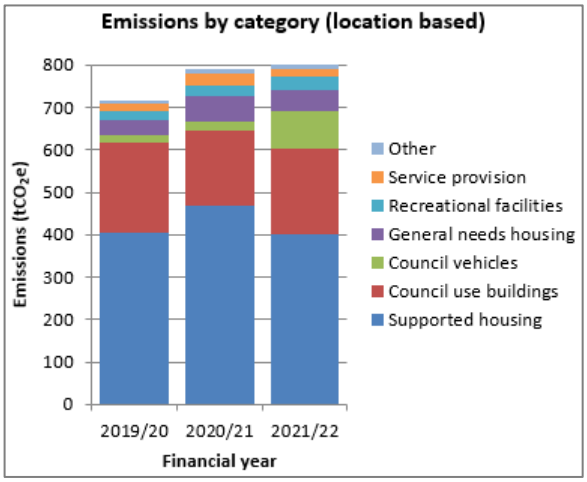
Each source of emissions has been assigned a category to help understand which Council activities are responsible for the most emissions and where there is therefore most scope to reduce emissions. The 2021/22 emissions in each category are shown below.

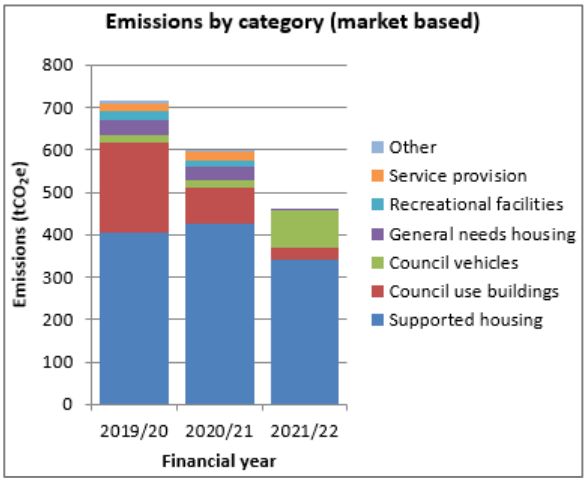
Category	Emissions (tCO_2e)	
	Location based	Market based
Supported housing[7]	401.211	341.666
Council use buildings	200.966	26.463
Council vehicles	89.139	89.139
General needs housing[8]	51.070	4.183
Recreational facilities	30.742	0
Service provision	19.160	0
Other	15.922	0
Total	**808.211**	**461.451**





The following graphs indicate how the contribution to the total emissions of each category has changed from the 2020/21 financial year, although comparisons to previous years should be treated with caution as described above.



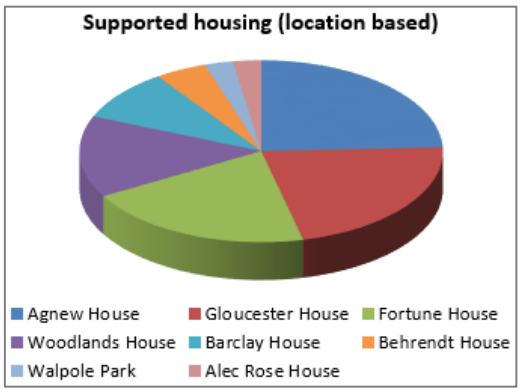


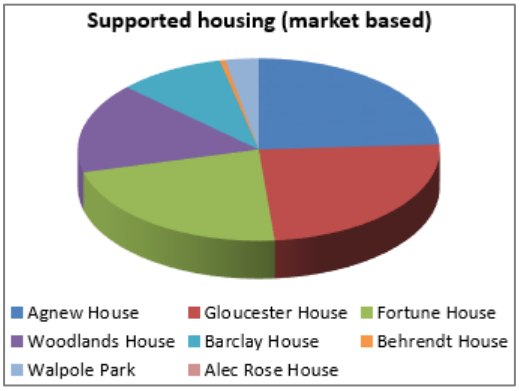
[7] The supported housing category includes sheltered housing, hostels and the temporary homeless accommodation in Walpole Park car park.

[8] The general needs housing category includes all domestic buildings owned by the Council, other than those categorised as supported housing.

Supported housing

Most of the Council's phase 1 and phase 2 emissions are from supported housing, which contributes 50% of emissions using location based reporting, or 74% of emissions using market based reporting. The properties contributing most to this are shown below (Walpole Park refers to the temporary homeless accommodation in Walpole Park car park).[9]





Three of these properties have solar PV installations which have provided zero-emission electricity that would otherwise have been taken from the grid. Under location based reporting, emissions would therefore have been greater from these properties if the solar PV installations had not been present. Market based emissions would not have been affected if the installations had not been present, since purchased electricity is treated as having zero emissions. These emissions savings due to the solar PV installations are detailed below.

Property	Actual location based emissions (tCO_2e)	Additional location based emissions that would have been associated with electricity generated by solar PV installations, if this electricity had been taken from the grid instead (tCO_2e)
Gloucester House	88.206	2.742
Fortune House	82.041[10]	3.587
Woodlands House	58.162	8.236[11]

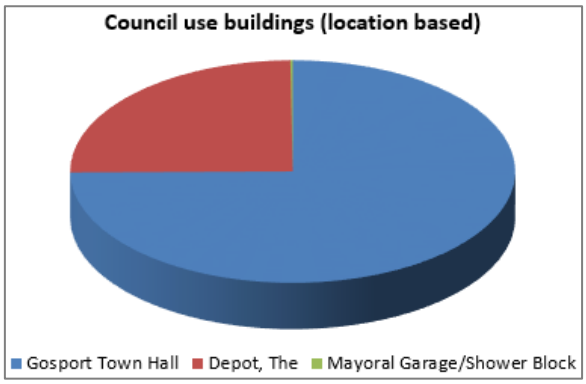
Council use buildings

The next largest category is emissions from Council use buildings, accounting for 25% of emissions using location based reporting, or 6% of emissions using market based reporting. There are three such buildings: the Town Hall and the Depot, which include office space, and the mayoral garage and shower block. The Depot was the only building to contribute to market based emissions, since electricity is the only energy source in the others. The proportion of location based emissions from each of these buildings is shown below.

[9] Note that the location based emissions from Fortune House are an estimate due to the issue with zero usage shown on some electricity invoices. However this is not expected to significantly affect the relative contributions of each building shown here.

[10] This is an estimated figure due to the issue with zero usage shown on some electricity invoices.

[11] This is an estimated figure due to the issue with the export meter.



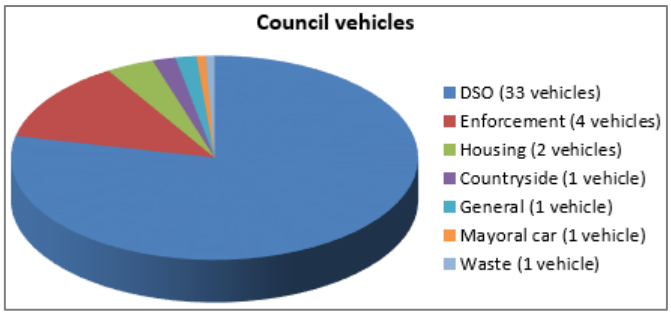
The Town Hall also has a solar PV installation, and the location based emissions savings resulting from this are shown below.

Actual emissions:	**150.430 tCO_2e**
Additional emissions that would have been associated with electricity generated by solar PV installations, if this electricity had been taken from the grid instead:	**3.444 tCO_2e**

Council vehicles

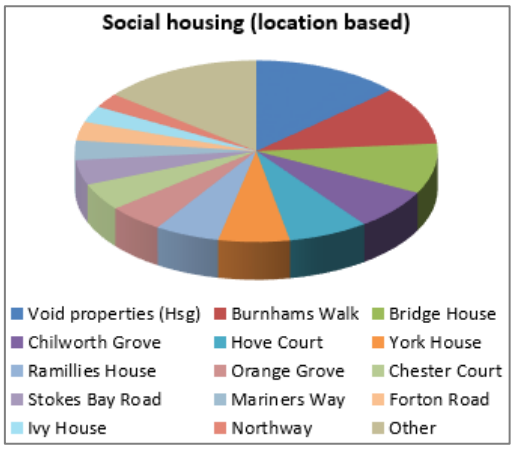
Council vehicles account for approximately 11% of the Council's emissions using location based reporting, or 19% of emissions using market based reporting. Note that this only includes vehicles for which the Council purchases the fuel. Emissions from vehicles used by contractors to provide Council services come under scope 3 and are therefore not covered. Some of these, such as refuse collection vehicles, are typically high emitters of greenhouse gases.

Of the vehicles that contribute to scope 1 emissions, the proportion of emissions due to each category of vehicle usage is shown below. Since there are no emissions from electricity generation in this case, location based and market based figures are identical.



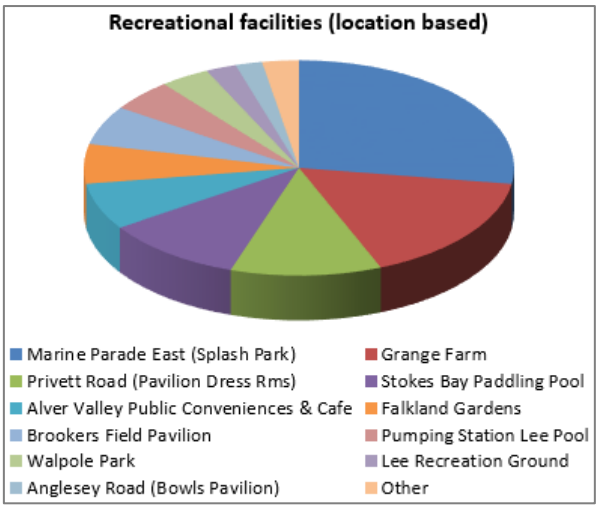
General needs housing

General needs housing contributes 6% of emissions using location based reporting, or 1% of emissions using market based reporting. Only void properties contributed to market based emissions, since for occupied properties, the Council is only responsible for peripheral energy use such as communal and security lighting, which is entirely powered by electricity. The properties contributing most to location based emissions are shown below.



Recreational facilities

Provision of facilities for recreational purposes account for approximately 4% of the Council's location based emissions, and the breakdown of these is shown below. It does not contribute to market based emissions since electricity is the only energy source used.



Service provision

Service provision contributes 2% of emissions using location based reporting, and as above does not generate any emissions based on market based reporting. This category covers provision of essential services for which the Council is responsible, and the largest contributors to these emissions are shown below.