Ipswich Borough Council Greenhouse Gas Emissions Report 2021-22

IPSWICH
BOROUGH COUNCIL

Contents

1. Report Background

Local authorities in England have been requested by Government to measure and report annually upon the greenhouse gas (GHG) emissions arising from their own activities. This Annual Greenhouse Gas Report follows HM Government Environmental Reporting Guidelines with emissions broken down into three scopes and reported in Carbon Dioxide Equivalent (CO_2e), calculated using the UK Government's 2021 carbon conversion factors.

Ipswich Borough Council is a second tier Local Authority; its Head Office is Grafton House, 15-17 Russell Road, Ipswich, Suffolk IP1 2DE. The report covers the annual period 1st April 2021 to 31st March 2022.

2. Methodology and Scope of Reporting

This 2021/22 Greenhouse Gas Report covers emissions from Ipswich Borough Council's own estate and operations, accounting for emissions arising from electricity and gas consumption, vehicle fleet fuel use, business travel and water supply and disposal.

Social housing owned by the Borough is outside of the scope of the report and energy used in communal areas of sheltered housing and blocks of flats is also excluded.

In line with the Environmental Reporting Guidelines, carbon emissions are broken down into direct and indirect emissions. These are categorized as Scope 1, Scope 2 and Scope 3 according to which activity and fuel, or energy use, they arise from.

Scope 1: direct emissions which arise from the activities of an organisation and include fuel combustion on site, such as that consumed by gas boilers and fleet vehicles.

Scope 2: indirect emissions arising from electricity purchased and used by the organisation; such emissions are created during the production of the energy i.e. at a power plant, which is eventually used by the organisation.

Scope 3: other indirect emissions from activities of the organisation, occurring from sources that they do not own or control. In this GHG report, these cover emissions associated with business travel by employees, hired vehicles, water supply and disposal, and those associated with the 'Transmission and Distribution' (T&D) of electricity purchased by the organisation.

Further guidance and a consensus among Public Sector bodies will enable wider reporting of Scope 3 emissions in future years.

GHG emissions are expressed as tonnes of CO2 equivalents (tCO_2e). This is a unit of measurement used to indicate the global warming potential of a greenhouse gas, expressed in terms of the global warming potential of one unit of carbon dioxide. The UK Government's 2021 Carbon Conversion Factors have been applied to the units of energy and fuel consumption to calculate the associated emissions.

3. GHG Emissions Statement

The Council's total gross greenhouse gas emissions for the year, 2021/22 has been calculated to be **4,013** tCO_2e as shown in Table 1 below: -

Scope	Emissions Type	Emissions (tCO_2e)	Percentage of Total Emissions
Scope 1	Natural Gas	1,928.99	48.1%
	Council Fleet (diesel)	883.99	22.0%
	Mobile Machinery	54.89	1.4%
Scope 2	Electricity	1,021.78	25.5%
Scope 3	Employee business travel	3.98	0.1%
	T&D Losses	97.24	2.4%
	Water	22.27	0.6%
Total Emissions		***4,013.14***	***100%***

Table 1: Emissions Summary

Transmission and Distribution Losses (T&D) refers to the emissions of electricity lost from the system during delivery of purchased electricity. These emissions are calculated using a 'Transmission and Distribution loss' factor, tabled in the Government's 2021 Carbon Conversion Factors.

Ipswich Borough Council purchases its grid electricity via EDF's 'Zero Carbon for Business' tariff, a low-carbon nuclear source. However, Environmental Guidelines followed in this report do not allow this to be reported as a reduced emission source for its Scope 2 electricity.

4. Intensity Measurement

The Census 2021 data available from The Suffolk Office of Data & Analytics records a population within Ipswich Borough of 139,642. An intensity ratio of 'kilograms of CO_2e per resident' has been calculated to be **28.74 $kgCO_2e$** attributable to the reported activities of Ipswich Borough Council per resident for this period.

5. Breakdown of GHG Emissions

Of the total 4,013 tCO_2e for the period 2021/22, 48% has been calculated to be attributable to Scope 1 emissions arising from natural gas used for the heating of Council operated buildings. Grid electricity use accounts for 27.9% of emissions (and includes the Scope 2 electricity use in buildings, as well as the electric vehicle charging points at Grafton House and Gipping House and the associated Scope 3 T&D emissions).

Fleet mileage (including short term hire vehicles) accounts for 22% of total GHG emissions, mobile machinery for 1.4% and employee business travel (based on mileage claims for car travel) <1%.

A breakdown of emissions is provided in Figure 1 below.

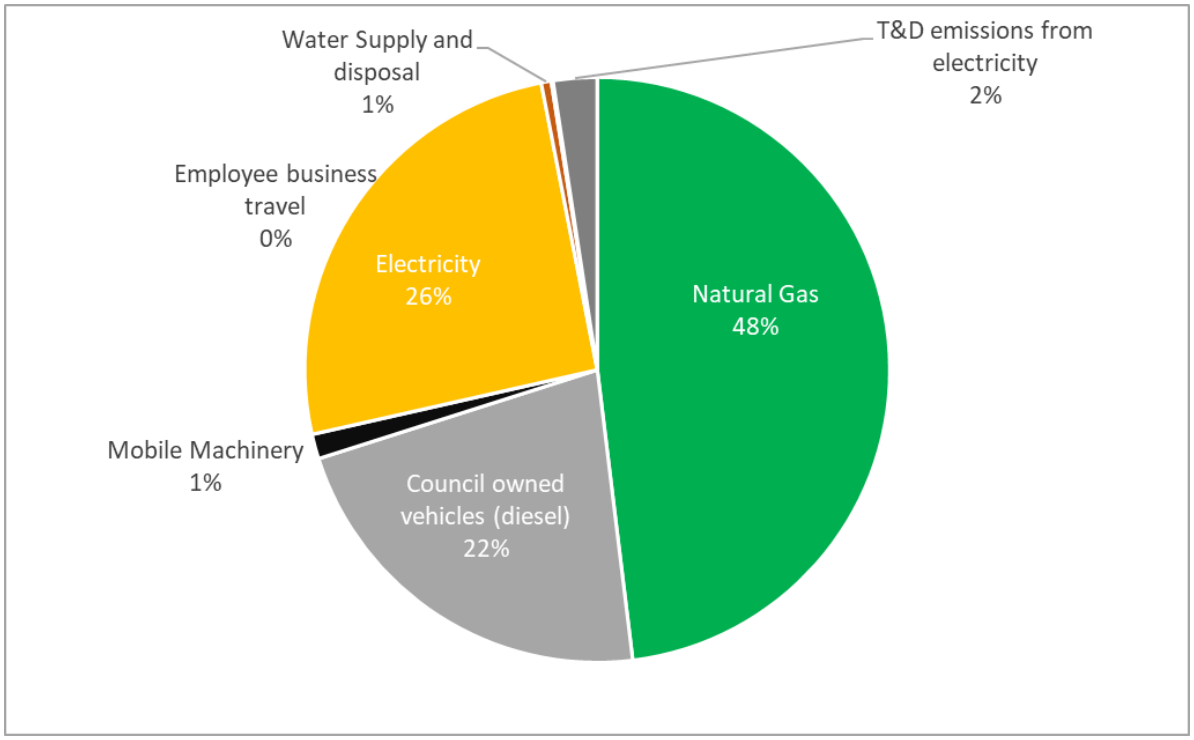

Figure 1. Breakdown of GHG Emissions.

6. Gas Consumption in Buildings

Of the total 4,013 tCO2e for the period 2021/22, **48.1%** has been calculated to be attributable to Scope 1 emissions arising from natural gas.

Data indicates that approximately **76%** of emissions attributable to gas consumption are emitted by the top 5 CO2 – emitting buildings.

Consumption by the Corn Exchange for 21-22 is misleading as unreported consumption was carried forward from 20-21 due to this building not having a meter capable of automatic reading.

Figure 2 below illustrates the level of emissions by building.

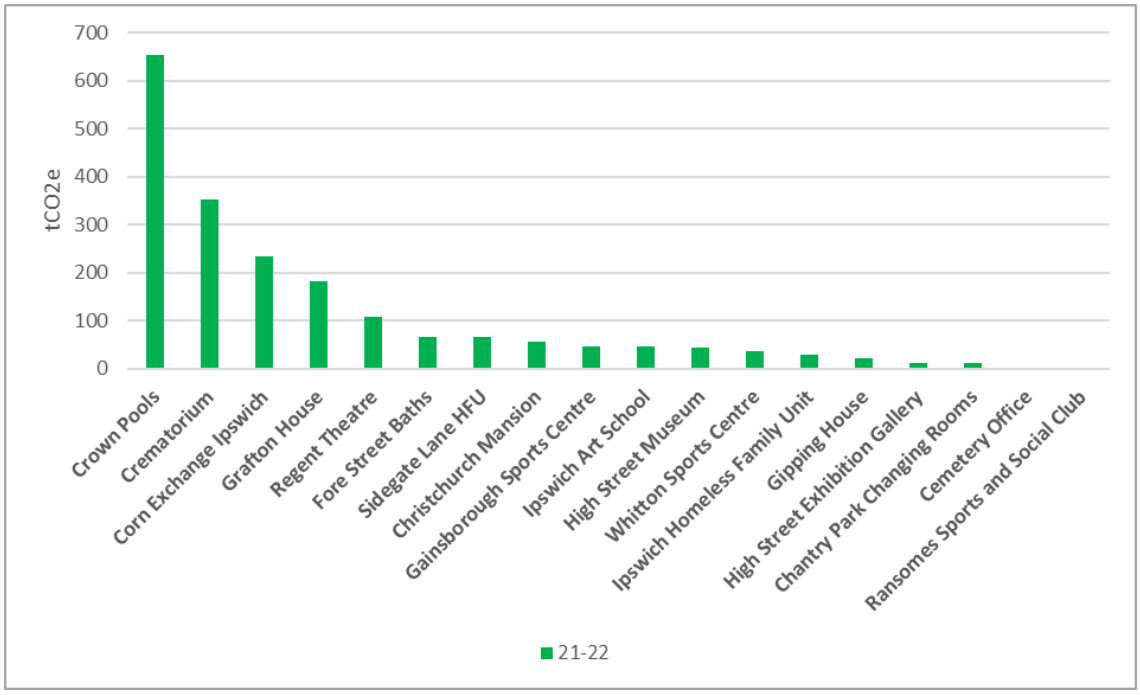

Figure 2. Natural Gas emissions by building

Figure 3 below compares gas consumption emissions across the last 3 reporting periods. Influences on annual fluctuations in CO2 tonnage are not easily identifiable, although the Covid 19 pandemic has had a considerable impact on building usage and therefore emission levels.

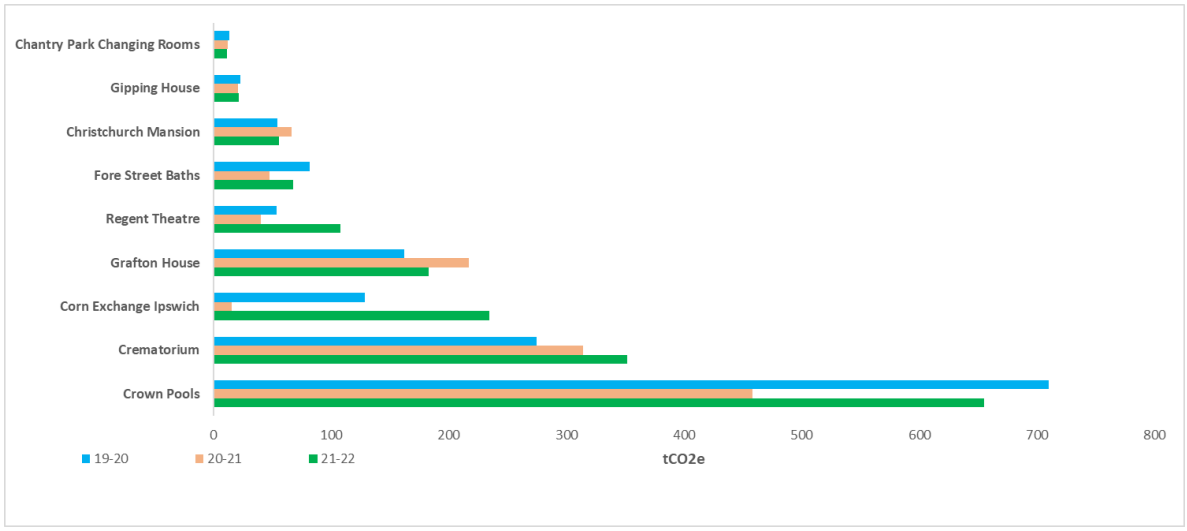

Figure 3. Natural Gas emissions by building – Year on year comparison

7. Electricity Consumption in Buildings

Scope 2 Grid electricity consumption accounts for **25.5%** of reported tCO_2e emissions and Electric vehicle (EV) consumption is included in this figure, as all IBC EVs are charged directly from IBC building meter points.

Figure 4 below shows electricity consumption emissions relative to individual corporate buildings:

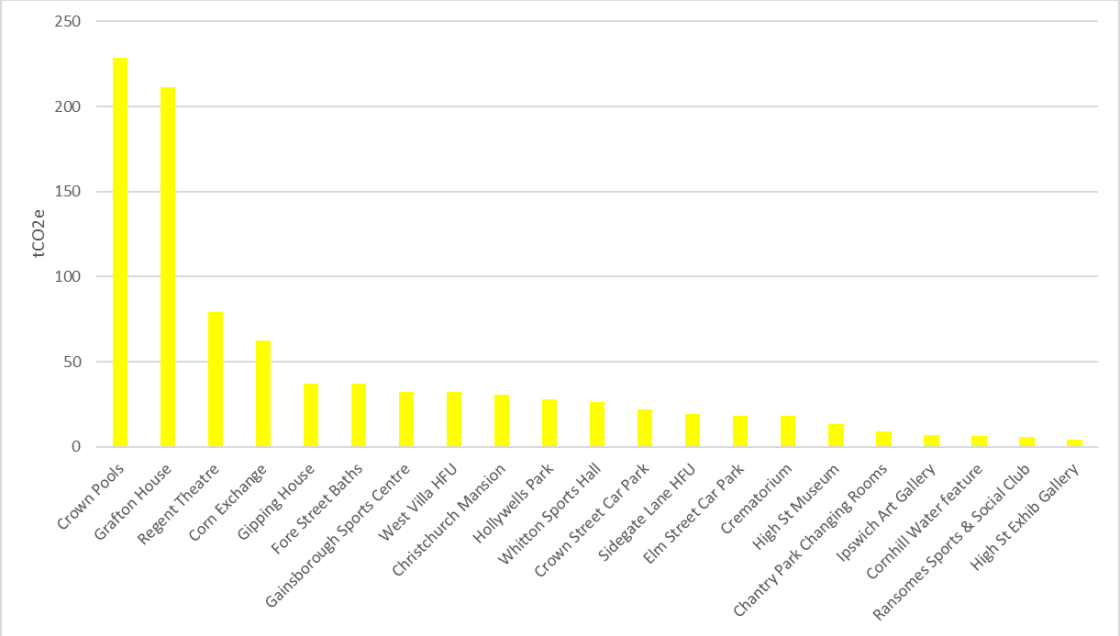

Figure 4. Electricity emissions by building

Figure 5 below compares electricity consumption emissions across the last 3 reporting periods. Influences on annual fluctuations in CO2 tonnage are not easily identifiable, although the Covid 19 pandemic has very likely had an impact on building usage and therefore related tCO_2e.

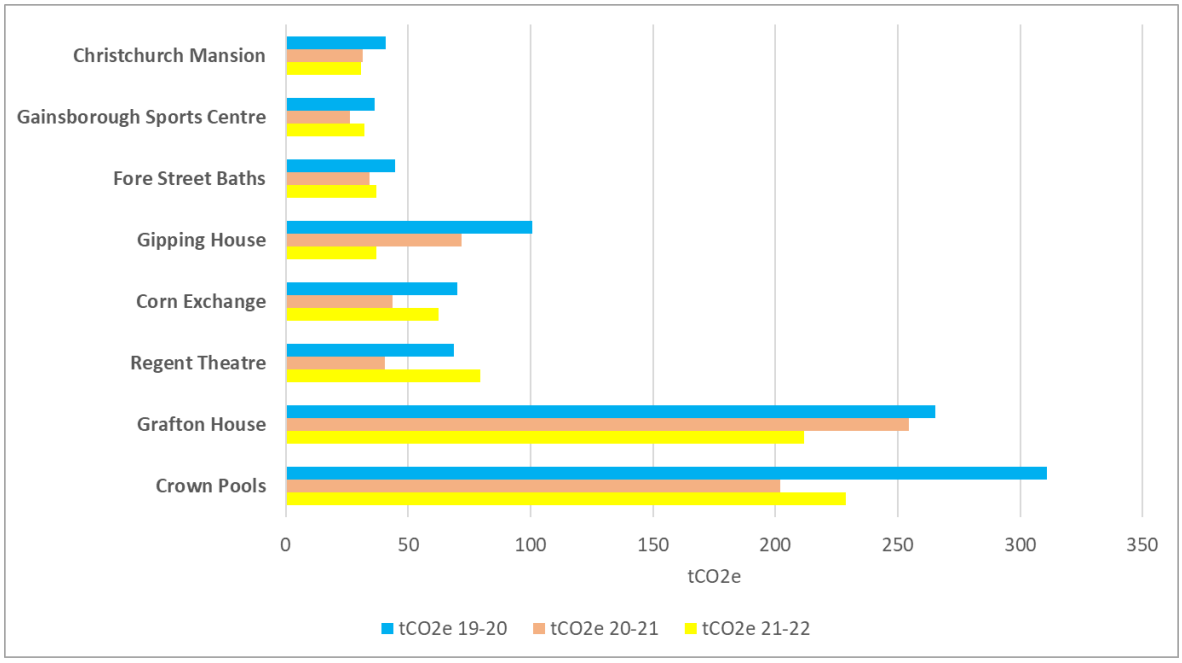

Figure 5. Electricity emissions by building – Year on year comparison

60.6% of Electricity related tCO_2e is attributable to the top 5 buildings (by amount emitted) in this reporting period. Moving to low carbon heating sources to replace natural gas will increase the headline percentage of emissions relating to electricity considerably, as those heating sources will most likely be powered by electricity. As the nation steadily reduces its reliance on fossil fuels to generate electricity, the emissions factor in kgCO2/kWh will also reduce, resulting in considerable overall reductions in tCO_2e attributable to the heating of buildings.

8. Buildings with highest emissions

Table 2 below summarises the total tCO_2e emitted by the top 10 buildings ranked by emissions across the reporting period, which in total equate to 63% of the 4,013 total tCO_2e for the reporting period.

The top three buildings in 2021/22 (Crown Pools, Grafton House, and the Crematorium) were the same in 2020/21 and 2019/20.

Building	Natural Gas	Electricity	Water	Total	% of Total Emissions
Crown Pools	655	229	6.81	890	22%
Grafton House	183	212	0.40	395	10%
Crematorium	352	18	0.08	370	9%
Corn Exchange Ipswich	235	62	0.88	298	7%
Regent Theatre	108	79	0.46	188	5%
Fore Street Baths	68	37	0.73	105	3%
Christchurch Mansion	56	31	0.41	87	2%
Gainsborough Sports Centre	48	32	0.79	81	2%
Whitton Sports Centre	36	26	0.58	63	2%
Gipping House	22	37	0.20	59	1%

Table 2: Top 10 Emissions by building

9. Fleet Emissions

This Scope 1 source of emissions, reduced by using Electric Vehicles where practicable, accounts for 22% of CO2 emissions covered by this report. Table 3 below presents the consumption data by vehicle class; for ease of calculation, emissions attributable to mobile machinery are included and highlighted in red.

Internal Combustion (ICE) vehicle type	tCO2e	Percentage of category	% of Total Emissions
Rigid LGV (Over 17 tonnes)	512.47	57.97%	13%
Diesel van Class III (1.74 to 3.5 tonnes)	187.75	21.24%	5%
Rigid LGV (3.5 to 7.5 tonnes)	69.39	7.85%	2%
Rigid LGV (7.5 tonnes to 17 tonnes)	44.8	5.07%	1%
Mobile Machinery	42.18	4.77%	1%
Diesel van Class II (1.305 to 1.74 tonnes)	27.4	3.10%	1%
Total	883.99		22%

Table 3: Fleet emissions

58% of tCO_2e in this category are attributable to Rigid LGV over 17 tonnes - Refuse Collection vehicles, which is 13% of the total emissions for the reporting period. Electric Vehicle alternatives to the 4 x classes of highest emission vehicles are financially challenging and as such there are no current plans for these classes of vehicles to be replaced with electric variants as part of the vehicle replacement programme. These 4 x classes of vehicle are responsible for 814 tCO_2e which is 20% of the total emissions for the reporting period. Where discounted ex-demonstrator or similar vehicles are available these will be considered at the time and may be procured as one-off single vehicle replacements.

The mileage of the fleet of electric vehicles in the reporting period was 203,858 for which the electricity usage and T&D losses equates to 14.54 tCO_2e. This represents a removal of 33.6 tCO_2e from what would have been an emissions value of 48.14 tCO_2e if diesel fuelled vehicles had been used.

10. Mobile Machinery Emissions

The data in Table 4 above shows that 42.18 tCO_2e were attributable to this Scope 1 source emission category. As mobile machinery becomes due for replacement, research is undertaken to establish the availability and viability of equipment with lower or zero emissions. Where feasible hand-held motorised equipment is being replaced with battery powered alternatives. Although considerable research has been undertaken into replacing larger mobile machinery with zero emission alternatives, the technology hasn't yet developed far enough yet in this area for this type of zero emission equipment to be efficiently used by the Council.

11. Water Emissions

Emissions associated with water consumption and the discharge and treatment of waste water are included in this carbon footprint.

Waste and use of water account for 22.27 tCO_2e, or 0.6% of emissions. Although this represents less than 1% of the total carbon footprint, water use and disposal does have other environmental impacts which are not captured in carbon reporting, such as the depletion of water sources and the potential degradation of natural habitats. Currently, water

meters are not advanced enough to record and report readings more frequently and accurately.

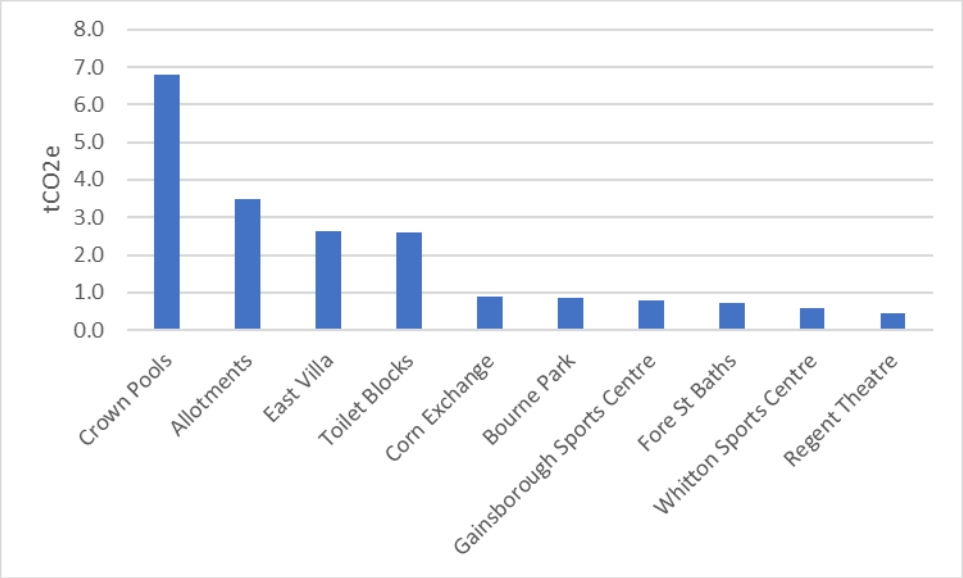

Table 4: Water emissions

12. Electricity Generated from Corporate On-site Photovoltaic Arrays (PV)

In 2021/22 Ipswich Borough Council had solar photovoltaic (PV) systems installed at four corporate sites. Generation meter readings are not available and have therefore been estimated from the size and orientation of each system.

These renewable energy sources generated an estimated total of 104,826 kWh over the year, obviating approximately 30 tCO_2e. It has not been possible to ascertain how much of the electricity generated at these sites is used on site as no data from export meters was available. It has been recommended in the reports for the previous two reporting periods that generation and export data is recorded where possible to enable it to be accurately included in future GHG reporting.

Site	Estimated solar kWh production
Gainsborough Sports	40,000
Whitton Sports Centre	37,000
Crown Pools	17,200
Fore St Baths	10,626
Total	**104,826**

Table 5: Estimated Solar kw/h production