

Report to Climate and environment emergency executive panel
18 December 2019

Item

5

Report of Director of place
Subject Carbon Footprint Report 2018-19

Purpose

To consider the council's carbon footprint report 2018-19

Recommendation

To note the outcomes of the carbon footprint exercise.

Corporate and service priorities

The report helps to meet the corporate priorities for great neighbourhoods, housing and environment, inclusive economy, and people living well.

Financial implications

No new financial implications. Funding for specific proposals would be subject to a separate approval process at the appropriate time.

Ward/s: All wards

Cabinet member: Cllr Kevin Maguire – Safe and sustainable city environment

Contact officers

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Background documents

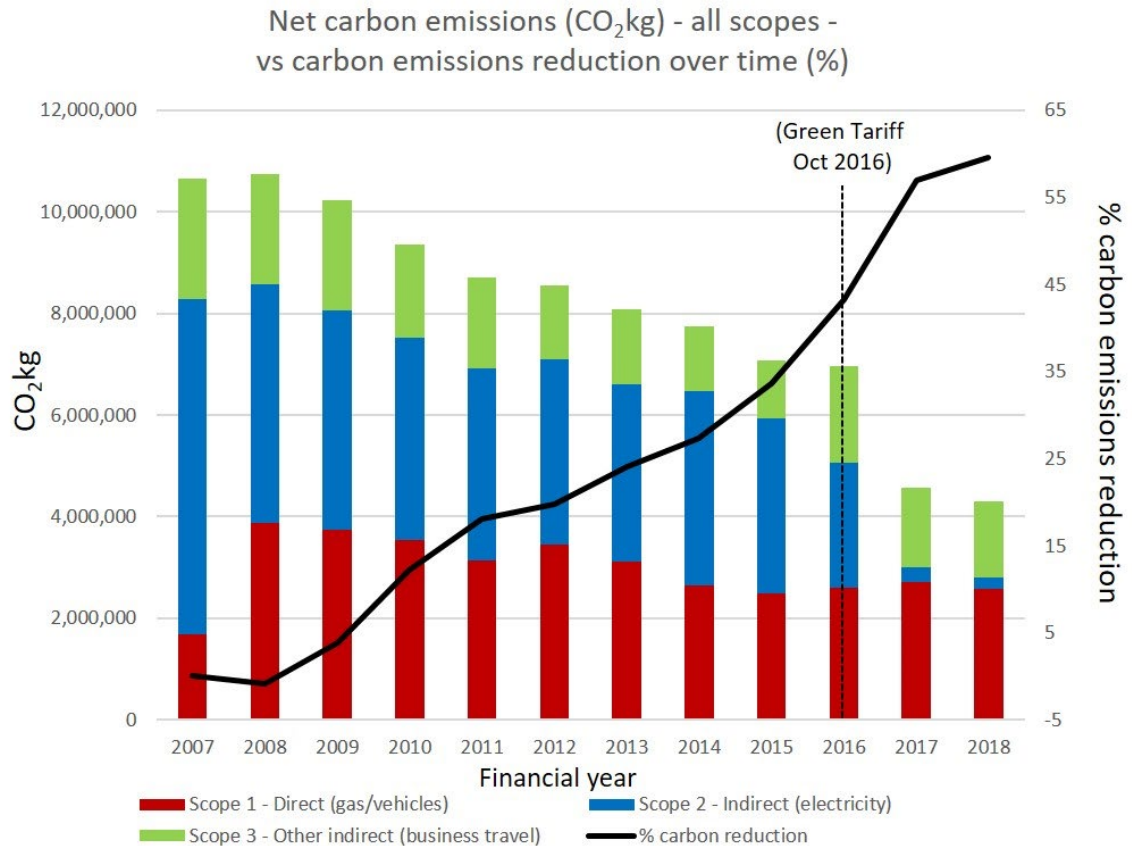
None

Carbon Footprint report 2018-19

Background

1. In 2008-09 the council produced its first Carbon Management Plan and set a target to achieve a 30 per cent reduction in carbon emissions by 2013-14 (using a 2006-07 baseline). In total over the five year period a reduction of 24 per cent (29 per cent when weather corrected) was achieved using previous conversion factors. Following the production of the council's second Carbon Management Plan; this target has been re-set to achieve a total reduction of 40 per cent in carbon emissions over the next 5 years (from the 2006/07 baseline).
2. By using a carbon conversion factor emissions from vehicle use (litres/km) and gas and electricity (kWh) use can be directly compared and the amount of carbon emissions reported as CO₂kg emitted.
3. In previous years, officers have been requested to present the council's energy consumption (kWh, litres/km) alongside the carbon emissions figures (kgCO₂^e). Therefore both sets of figures have been provided in this report on the understanding that although these figures are related they are not directly comparable due to the use of carbon conversion factors which are influenced by factors at a national level.
4. In order to minimise the effect of spikes in data in any year, we have compared this year's figures to a five year average figure. This makes comparison over time fairer as it seeks to smooth any sharp increases or decreases in any given year, which can happen when one year is directly compared with another and does not allow the scope for a trend over time.
5. The council reduced its carbon footprint by an additional 2.6 per cent over the period 1 April 2018 to 31 March 2019. This equates to a reduction of 455,041kg or 455 tonnes CO₂^e. The annual reporting period follows the financial year, not the calendar year.
6. This brings the total reduction, against a 2007 baseline, to 59.6 per cent. It should be noted that in October 2016, the council switched to an OFGEM accredited Green Tariff for its electricity supply. The impact of this was to immediately remove all the carbon emissions relating to electricity use in council assets. This is reflected on Graph 1 as the sudden drops in Scope 2 carbon emissions and corresponding increase in percentage carbon emissions reductions in 2016-17 and 2017-18. These large emissions decreases can, of course, only be realised once, rather than year on year.
7. The 59.6 per cent carbon emissions reduction far exceeds the 40 per cent carbon target set in the council's 2015-19 environmental strategy. This is shown on Graph 1 below. The bars show a clear trend for an overall reduction in CO₂kg over time, across all scopes. The secondary axis shows the council's progression towards its 40 per cent carbon emissions reduction target, and beyond.

Graph 1.0: Carbon emissions by scope:



8. Table A gives an overview of the figures for the 2018-19 period. The data is split in to scopes, as specified by the DECC/Defra carbon footprint requirements and detailed below. The third column of Table A shows the amount of energy use either in kWh, litres of fuel used, or km travelled. The fourth column shows this year's figures as a percentage increase or decrease against a 5 year average from 2013 to 2018 in order to allow for one off anomalies in reporting. The fifth column shows the amount of carbon emissions produced by each factor of each scope in the 2018-19 period. Finally, the sixth column shows this year's figures as a percentage increase or decrease against a 5 year average from 2013 to 2018.

Definition of Scopes 1 to 3:

9. **Scope 1 emissions: *Process emissions (owned buildings)***, Data obtained from utility bills (kWh). ***Process emissions (contractor-operated buildings)***, Data obtained from contractor's energy records (kWh). ***Fuel use (owned vehicles)***, Data obtained from fuel invoices (litres).

Scope 2 emissions: *Electricity emissions (own buildings)*, Data obtained from utility bills (kWh). ***Electricity emissions (contractor-operated buildings)***. Data obtained from contractor's energy records (kWh).

Scope 3 emissions: *Business travel (grey fleet and contractors)*, Data obtained from officer and member business mileage claim forms (km). ***Public transport***, Data obtained from officer and member business mileage claim forms (km). ***Fuel use in contractor vehicles***, Data obtained from contractor fuel records (litres).

Table A: Carbon emissions reduction vs energy used against 5 year average

Scope	Detail	2018-19 energy use	Inc/ dec on 5 year average (2013-18)	2018-19 carbon emissions (kgCO ₂)	Inc/ dec on 5 year average (2013-18)
1	Gas council owned buildings	13,882,559 (kWh)	Decrease (3.69%)	2,553,836 (kgCO ₂)	Decrease (4.0%)
	Gas contractors	111,175 (kWh)	Decrease (13.2%)	18,564 (kgCO ₂)	Decrease (5.1%)
	Fuel council managed vehicles	10,359 (litres)	Decrease (54.3%)	2,516 (kgCO ₂)	Decrease (91.3%)
	Total Scope 1 emissions (kgCO₂)			2,576,804	Decrease (5.1%)
2	Electricity council owned buildings	6,331,077 (kWh)	Decrease (7.69%)	152,769 (kgCO ₂)	Decrease (34.3%)
	Electricity contractors	240,467 (kWh)	Decrease (29.56%)	68,069 (kgCO ₂)	Decrease (54.2%)
	Total Scope 2 emissions (kgCO₂)			220,838	Decrease (91.9%)

Scope	Detail	2018-19 energy use	Inc/ dec on 5 year average (2013-18)	2018-19 carbon emissions (kgCO ₂)	Inc/ dec on 5 year average (2013-18)
3	Grey fleet (km)	73,407 (km)	Decrease (8.17%)	11,838 (kgCO ₂)	Decrease (28.3%)
	Public transport (km)	42,215 (km)	Decrease (18.6%)	2,495 (kgCO ₂)	Decrease (55.7%)
	Contractors data (litres)	725,200 (litres)	Increase (-5.43%)	1,485,419 (kgCO ₂)	Increase (-2.6%)
	Total Scope 3 emissions (kgCO₂)			1,499,753	Increase (-2.0%)
	Total emissions – All Scopes (kgCO₂)			6,953,249	Decrease (38.1%)

Scope 1 emissions:

10. Overall there has been a 3.69 per cent decrease in gas use (kWh) across council owned assets when compared with the average of the previous 5 years. The trend is for a year on year reduction since 2007.
11. In the period 2018-19 there was an overall reduction in gas use by contractors of 13.2 per cent against an average of the previous 5 years. We continue to work with contractors to monitor their energy use, but we do not monitor their data for them, and rely upon contractors to provide accurate data.
12. There was a decrease of 54.3 per cent on the fuel used by staff through the council owned fleet against the previous five year average figure. This is largely thought to be attributable to the rationalisation of the council's fleet over the past couple of years and the introduction of hybrid vehicles. For local journeys, as an alternative to pool car and taxi use, pool bikes were introduced to the fleet in 2012 and most recently two electric bikes have been added to the fleet.

Scope 2 emissions:

13. There was a decrease of electricity consumption in kWh of 7.69 per cent across the council's portfolio of properties compared to the five year average figure. However, when we consider the carbon reduction figure (kg CO₂) for

the same period this shows a saving of 94.1 per cent against a 5 year average. There are two reasons for this sharp decrease against the average. Firstly, due to the carbon conversion factor which we are required by DECC/DEFRA to use when reporting the annual carbon footprint of the council. The following 'carbon conversion factor' section gives more details on this. Secondly, in October 2016 the council switched to a 'Green Tariff' which has OFGEM approved and this has resulted in a sharp decrease in carbon emissions from electricity consumed as part of council operations.

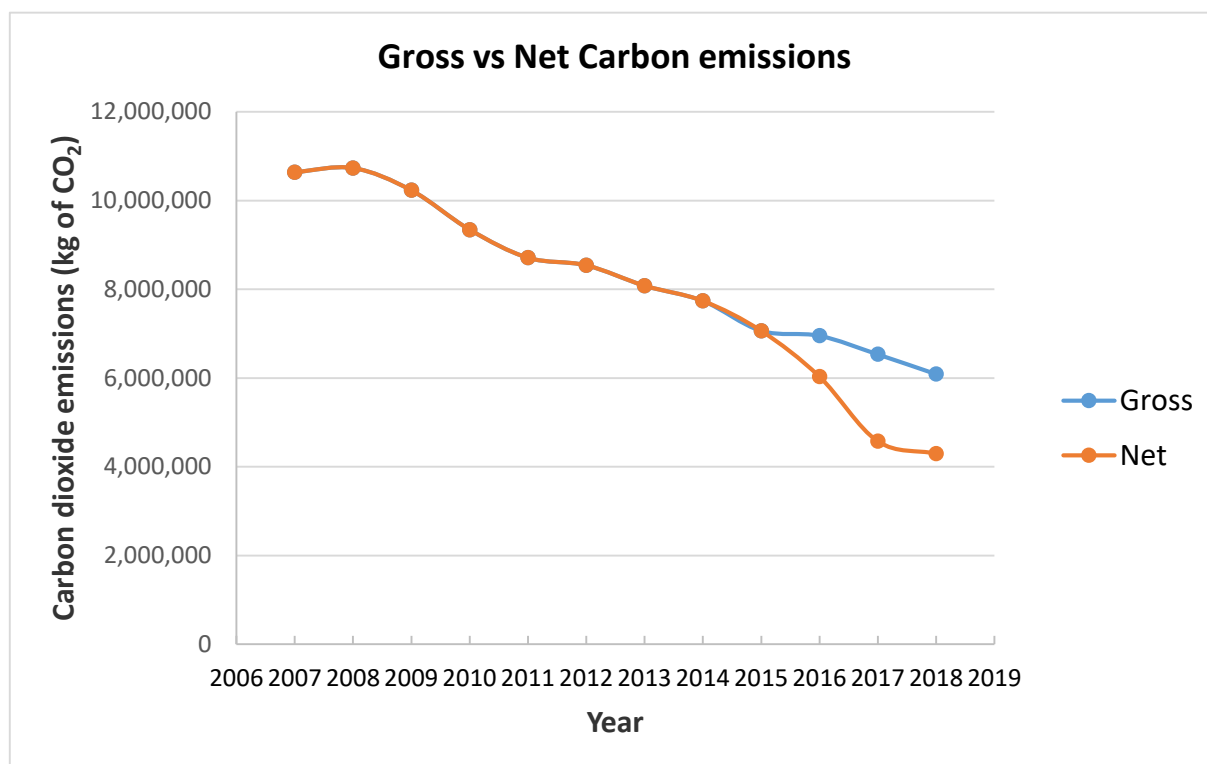
14. Officers continue to work with NPS to look for further opportunities to further reduce electricity and gas consumption across the council's assets. We have implemented a wide range of energy saving projects across our portfolio since 2008 and over time it is becoming increasingly more challenging to find new opportunities. However, we are currently engaged in this exercise as part of updating the council's Carbon Management Plan, which will be valid for the next 4 years.
15. Current projects under consideration include:
 - Server room upgrades and AC reduction investigations
 - Sheltered Housing plant room upgrades – including boilers, pumps, building management system
 - LED lighting upgrade and smart fittings at St Andrew's car park
 - Landlord lighting LED upgrade
 - District lighting LED upgrade
16. This year has seen a decrease of 29.56 per cent in electricity use by our contractors against a 5 year average. The contractors we work with are not always the same each year and the sizes of the contracts also fluctuate depending on demand from the council. Which makes it difficult to accurately compare data year on year.

Carbon conversion factor:

17. The carbon conversion factor allows litres of fuel consumed, km travelled and kWh of energy used to be compared to one another by measuring the carbon emissions produced during each activity. Carbon emissions are measured in kg of CO₂. In 2014 DECC/ DEFRA updated their kgCO₂ conversion factor. Instead of using a 5 year rolling average figure for electricity reporting they now use a 1 year average figure. The reason for the change was to make reporting easier for those companies who report energy use on a frequent basis.
18. DBEIS reported that *"The UK electricity factor is prone to fluctuate from year to year as the fuel mix consumed in UK power stations (and auto-generators) and the proportion of net imported electricity changes. These annual changes can be large as the factor depends very heavily on the relative prices of coal and natural gas as well as fluctuations in peak demand and renewables."*

19. The trend over time is for a decrease in the amount of electricity which is produced at coal-fired power stations. And an increase in electricity which is produced from renewables or nuclear power stations. The effect of this is that electricity production has less carbon emissions associated with it. The figures for the 2017 carbon conversion factor bear this out too.
20. This factor is outside of the council's control, but did affect our annual carbon emissions figure quite profoundly, prior to the council switching to an OFGEM accredited Green Tariff in October 2016. And will continue to impact the carbon emissions associated with contractor electricity consumption. Graph 2.0 clearly shows the impact on carbon emissions associated with electricity consumption, since the council's decision to purchase electricity via a Green Tariff in 2016. Net emissions are gross emissions minus the electricity purchased via the green tariff. However, it is encouraging to note that gross emissions also continue to fall over time, albeit at a slower rate.

Graph 2.0: Gross vs Net Carbon emissions over time:



21. The council's efforts to reduce energy use through the introduction of energy efficient technologies, behaviour change and building rationalisation continue. This will either:
- (a) compound any changes in the national grid energy mix which assist with 'greening the grid', thereby further reducing emissions;

- (b) help to counterbalance changes in the national energy mix which may lead to an increase in carbon emissions at a grid level.

We may be 'winners' some years and 'losers' in other years. In order to provide a more accurate picture for members it is intended continue to provide the energy use data e.g. kWh, litres fuel consumed, km travelled alongside the carbon emissions data.

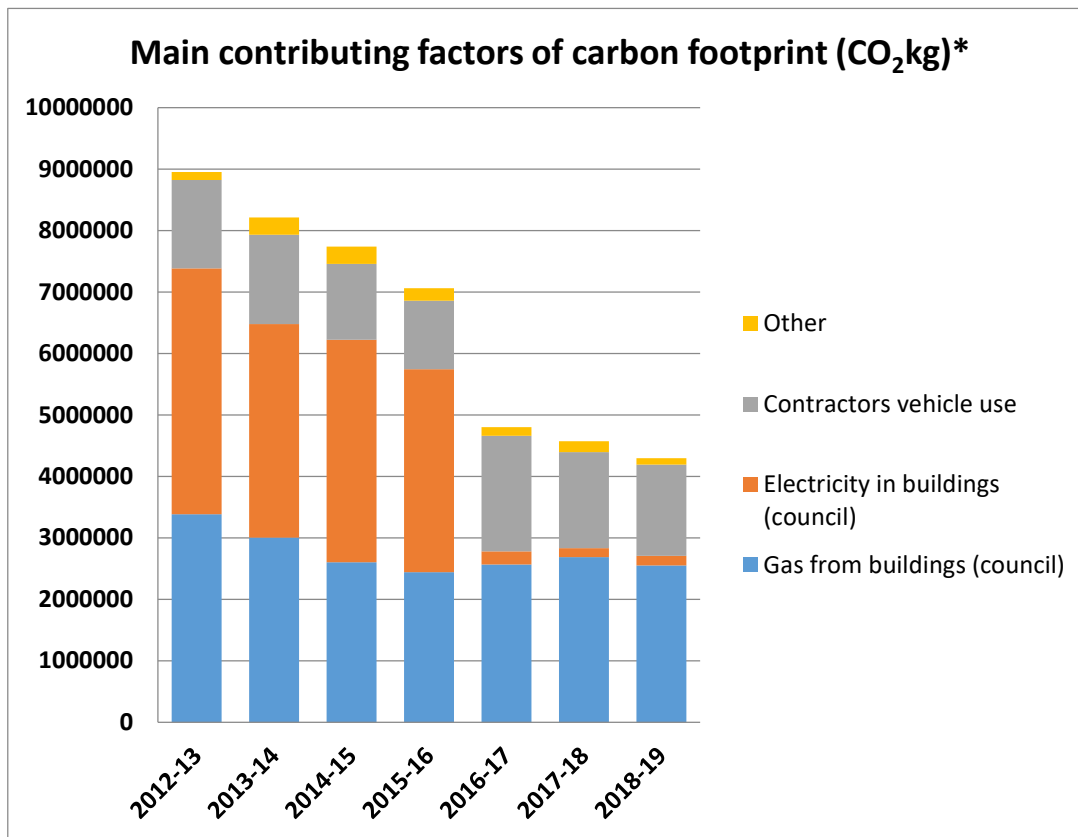
Scope 3 emissions:

- 22. There has been a drop in the use of grey fleet by staff, where they use their own cars for council duties (18.1 per cent decrease against the five year average). There has also been a decrease in the use of public transport (trains, taxis, planes) by staff (8.1 per cent decrease against the five year average). However, there has been an increase the amount of carbon emissions generated by contractors fuel use (an increase of 5.43 per cent against the five year average). This is likely due to an increase in major contractors during this reporting period, as building projects and demolition projects were delivered.

Further considerations:

- 23. The majority of the council's carbon emissions comes primarily from 3 main sources: Gas consumption in council buildings, Electricity consumption in council buildings and contractor fuel use, as shown below on Graph 3.0.
- 24. The impact of the introduction of the OFGEM accredited green tariff can be seen by the large drop in electricity related carbon emissions from 2016 onwards. CO₂ emissions relating to gas have remained fairly stable over the past few years. And emissions relating to contractor fuel use have reduced in recent years, despite an increase in 2016-17.
- 25. Gas and electricity consumption in council assets are more within the direct control of the council. And energy consumption can be reduced by continuing to implement energy efficiency technologies across our estate, although it is doubtful that this is sustainable and can continue indefinitely. In addition, we can encourage energy saving behaviour amongst staff, and continue to install renewable energy schemes, where possible. Some of the energy reduction achieved can also be attributed to building rationalisation. Contractor fuel use is more challenging for the council to control. And the delivery of additional contracts for regeneration and development projects can temporarily create an increase in carbon emissions for the duration of the project, which leads to fluctuations in figures over time.

Graph 3.0: Main contributing emissions sources over time:



*net emissions for electricity used in council buildings from October 2016, following the introduction of the Green Tariff.