

# Appendix 2

## Carbon Footprint & Organisational Boundary

### Baseline Year

#### Organisational Boundary

In line with the World Resources Institute Greenhouse Gas Protocol, the **organisational boundary** sets out which assets are to be included in the footprint and how any shared assets will be accounted for.

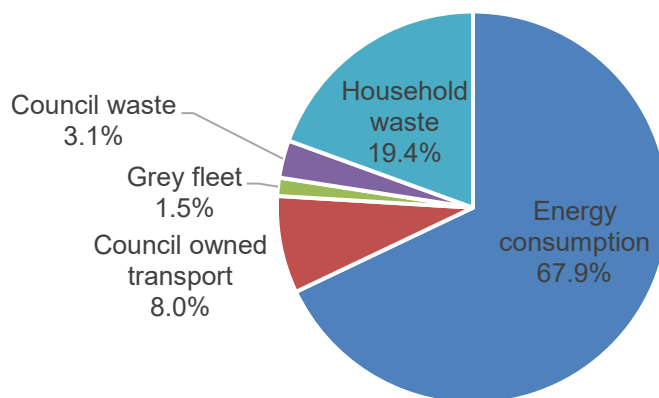
The organisational boundary is defined for each emissions source below.

1. Emissions from Council owned transport;
2. Emissions from grey fleet transport (staff car mileage);
3. Emissions from heat, power and water from Council operations (e.g. energy consumption);
4. Emissions from household waste; and
5. Emissions from Council waste.

**The baseline year for this Climate Change strategy is the 2012/2013 financial year.**

Based on the organisational boundary outlined above, the Council's carbon footprint for 2012/13 was 32,961 (tonnes of carbon dioxide equivalent) tCO<sub>2</sub>e. A breakdown of the emissions share is detailed within the Appendix and also displayed below;

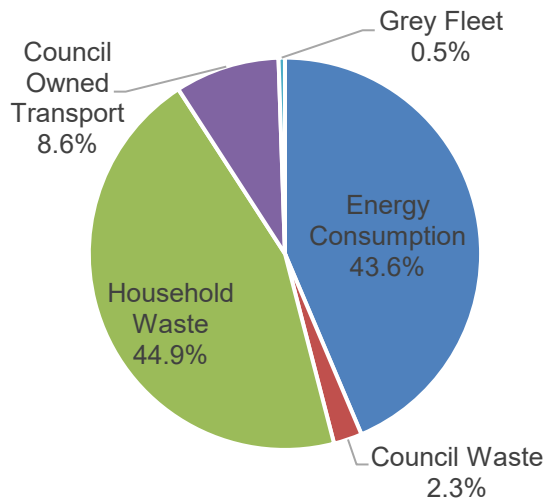
**Share of emissions in 2012/13**



#### 'Status Quo' monitoring scenario

The last year of reporting was completed in November 2019 for the 2018/19 financial year. The total footprint of 26,266 tCO<sub>2</sub>e can be broken down as follows:

### Share of emissions in 2018/19



It is worth noting here that the significant change in household waste and Council waste emissions since 2012/13 are largely down to large fluctuations in waste emission factors. Household waste consumption (tonnage) has seen a small increase, while Council waste consumption (tonnage) has reduced slightly since 2012/13.

The Council previously set a target to reduce its calculated 2012/13 baseline carbon footprint by 5,061 tCO<sub>2</sub>e by the end of 2019/20. This equates to a percentage reduction of 15.4%.

Since 2012/13 and the most recent reporting year (2018/19), a 20.3% reduction in emissions has already been achieved so this target therefore has already been met and exceeded over two years in advance.

### 2012/13 Baseline Year

**The baseline year for this Climate Change strategy is the 2012/2013 financial year.**

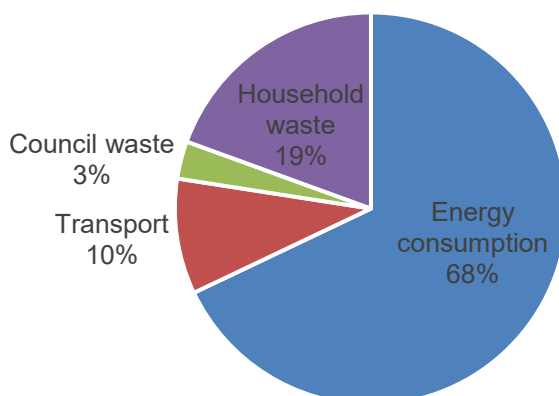
Based on the scope outlined above, the Council's carbon footprint baseline, for 2012/13 was 32,961 tCO<sub>2</sub>e. The table and graph below illustrate the components of that footprint in terms of carbon emissions:

Emission source	Activity	2012/13 Emissions (tCO <sub>2</sub> e)	Share
Grid electricity	Energy consumption	13,593	41.2%
Natural gas	Energy consumption	5,051	15.3%
Gas oil	Energy consumption	3,544	10.8%
Water	Energy consumption	190	0.6%
Diesel	Transport	2,401	7.3%
Car mileage (Grey Fleet)	Transport	471	1.4%
Petrol	Transport	111	0.3%
Kerosene	Energy consumption	15	0.0%
Council waste	Council waste	1,020	3.1%
Household waste	Household waste	6,411	19.4%

Emission source	Activity	2012/13 Emissions (tCO <sub>2</sub> e)	Share
Commuting	Transport	24	0.1%
Gas oil	Transport	131	0.4%
<b>Total</b>		<b>32,961</b>	<b>100%</b>

\* Emission factors provided by BEIS to calculate this footprint

### Share of emissions in 2012/13



### 'Status Quo' monitoring scenario

The table below shows the progress from the baseline year to the latest reporting year (2018/19). A 20% reduction in emissions has already been achieved:

Year	Emissions (tCO <sub>2</sub> e)	% Annual reduction	% Reduction from baseline
<b>2012/13</b>	32,961		
<b>2013/14</b>	31,931	-3.1%	-3.1%
<b>2014/15</b>	31,451	-1.5%	-4.6%
<b>2015/16</b>	32,549	3.3%	-1.2%
<b>2016/17</b>	28,387	-12.6%	-13.9%
<b>2017/18</b>	26,433	-5.9%	-19.8%
<b>2018/19</b>	26,264	-0.5%	-20.3%

The last year of reporting was completed in November 2019. The total footprint of 26,264 tCO<sub>2</sub>e can be broken down as follows:

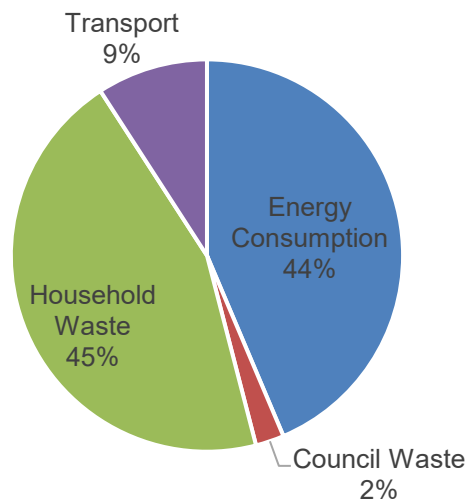
Emission source	Activity	2018/19 Emissions (tCO <sub>2</sub> e)	Share
Grid electricity	Energy consumption	6,154	23.4%
Natural gas	Energy consumption	4,635	17.7%
Gas oil	Energy consumption	480	1.8%
Water	Energy consumption	185	0.7%
Diesel	Transport	2,190	8.3%

Emission source	Activity	2018/19 Emissions (tCO <sub>2</sub> e)	Share
Car mileage (Grey Fleet)	Transport	136	0.5%
Petrol	Transport	76	0.3%
Biomass	Energy consumption	4	0.0%
Council waste	Council waste	617	2.4%
Household waste	Household waste	11,787	44.9%
<b>Total</b>		<b>26,264</b>	<b>100%</b>

\* Emission factors provided by BEIS to calculate this footprint

\*\* Does not include kerosene or commuting in 2018/19 although these emissions were negligible

### Share of emissions in 2018/19



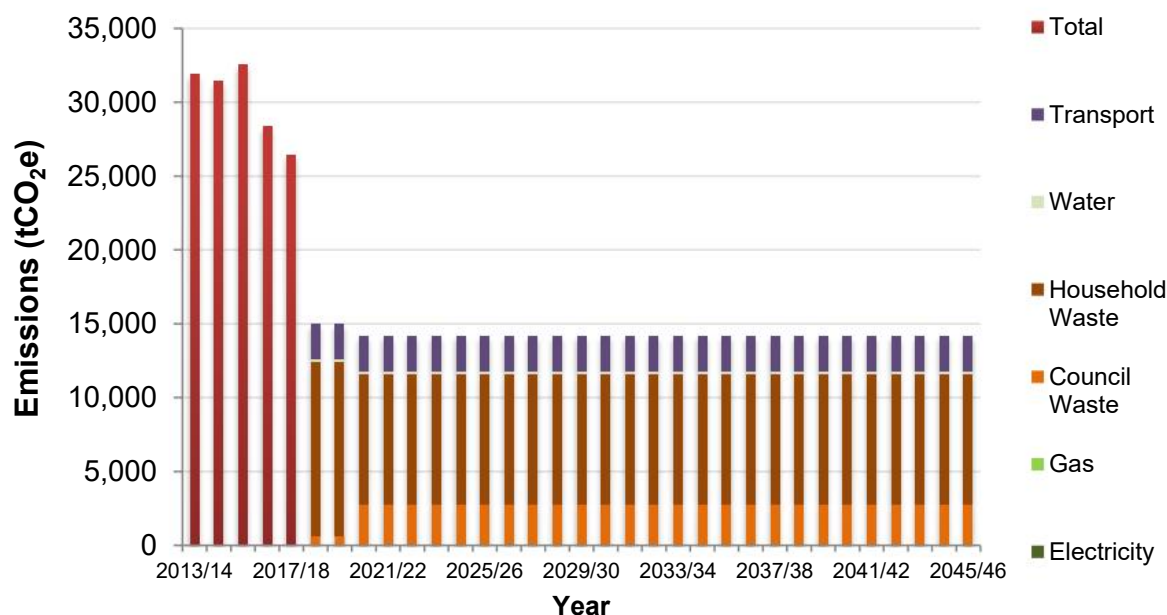
It is worth noting here that the significant change in household waste and Council waste emissions since 2012/13 is largely down to large fluctuations in waste emission factors. Household waste consumption (tonnage) has seen a small increase, while Council waste consumption (tonnage) has reduced slightly since 2012/13.

### Consideration of future emissions projections

The graph below shows both the reported emissions from 2012/13 to 2018/19 and then the 'Status Quo' monitoring scenario projection out to 2045/46. This scenario represents a 'Status Quo' case and assumes no further work is done between now and 2045 to reduce carbon emissions other than work/projects that have already been carried out and as the electricity grid becomes decarbonised, including efficiencies to internal combustion engines within vehicles, etc. It also accounts for known future estate changes and other organisational changes that will impact emissions.

Please note, the 'Status Quo' scenario makes some broad assumptions about the future of the electricity grid factor out to 2045/46. All other emission factors remain equal to the latest UK emissions factor dataset as published in 2019 by BEIS.

### Historic emissions and BAU projection



Grid Electricity (kWh) - Generation + Transmission & Distribution losses		
Financial Year	kg CO <sub>2</sub> e/kWh	Source
2018/19	0.3072	Conversion Factors for Company Reporting 2018
2019/20	0.2773	Conversion Factors for Company Reporting 2019
2020/21	0.25319	Conversion Factors for Company Reporting 2020
2021/22	0.143973988	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2022/23	0.136487789	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2023/24	0.114810129	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2024/25	0.107985515	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2025/26	0.110973054	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2026/27	0.111334347	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2027/28	0.107784291	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2028/29	0.097670797	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2029/30	0.105490596	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2030/31	0.099682999	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2031/32	0.090531224	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2032/33	0.085465594	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
2033/34	0.076053887	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>

		emissions-projections
<b>2034/35</b>	0.063736642	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
<b>2035/36</b>	0.059706996	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
<b>2036/37</b>	0.050854735	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
<b>2037/38</b>	0.041229154	<a href="https://www.gov.uk/government/collections/energy-and-emissions-projections">https://www.gov.uk/government/collections/energy-and-emissions-projections</a>
<b>2038/39</b>	0.041229154	Assumed flat hereafter as no further data available
<b>2039/40</b>	0.041229154	Assumed flat hereafter as no further data available
<b>2040/41</b>	0.041229154	Assumed flat hereafter as no further data available
<b>2041/42</b>	0.041229154	Assumed flat hereafter as no further data available
<b>2042/43</b>	0.041229154	Assumed flat hereafter as no further data available
<b>2043/44</b>	0.041229154	Assumed flat hereafter as no further data available
<b>2044/45</b>	0.041229154	Assumed flat hereafter as no further data available
<b>2045/46</b>	0.041229154	Assumed flat hereafter as no further data available

Emission projections for grid electricity, accounting for the decarbonisation of the grid lowering carbon Conversion Factors.

### Energy Consumption from Heat and Power

The type of fuel used is also important as each type emits different amounts of carbon. The table below shows that in terms of energy consumption from heat and power, over half of the energy used in the Council in 2018/19 was from natural gas supplies and over 40% from electricity, indicating that heating and lighting of Council owned properties are a major contributor to emissions and therefore significant reductions from these areas will be required to meet 2045 targets.

Fuel used	kWh	% share
Natural gas	25,196,802	53.3%
Grid electricity	20,032,901	42.3%
Gas oil	1,735,431	3.7%
Biomass	257,530	0.5%
Renewable electricity	89,843	0.2%
<b>Total</b>	<b>47,312,507</b>	<b>100%</b>

### Annual Emissions reduction pathway to net zero

In order to achieve net zero by 2045, the Council will be required to:

- Achieve a 3.5% annual reduction (versus 2012/13 baseline) every year up until 2030/31; and
- Achieve a 2.6% annual reduction (versus 2012/13 baseline) every year after 2030/31 (out to 2045/46).<sup>1</sup>

<sup>1</sup> Post 2030/31 annual reduction is reduced as the Scottish Government aims to have achieved close to decarbonisation of the electricity grid by 2030 and therefore savings will be harder to come by after this point (projects to reduce electricity emissions will no longer be effective in terms of carbon mitigation).