

Southwark Climate Change Action Plan

Data Refresh & Updates

June 2022

v3.1

Prepared for Southwark Council by Anthesis



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INTRODUCTION

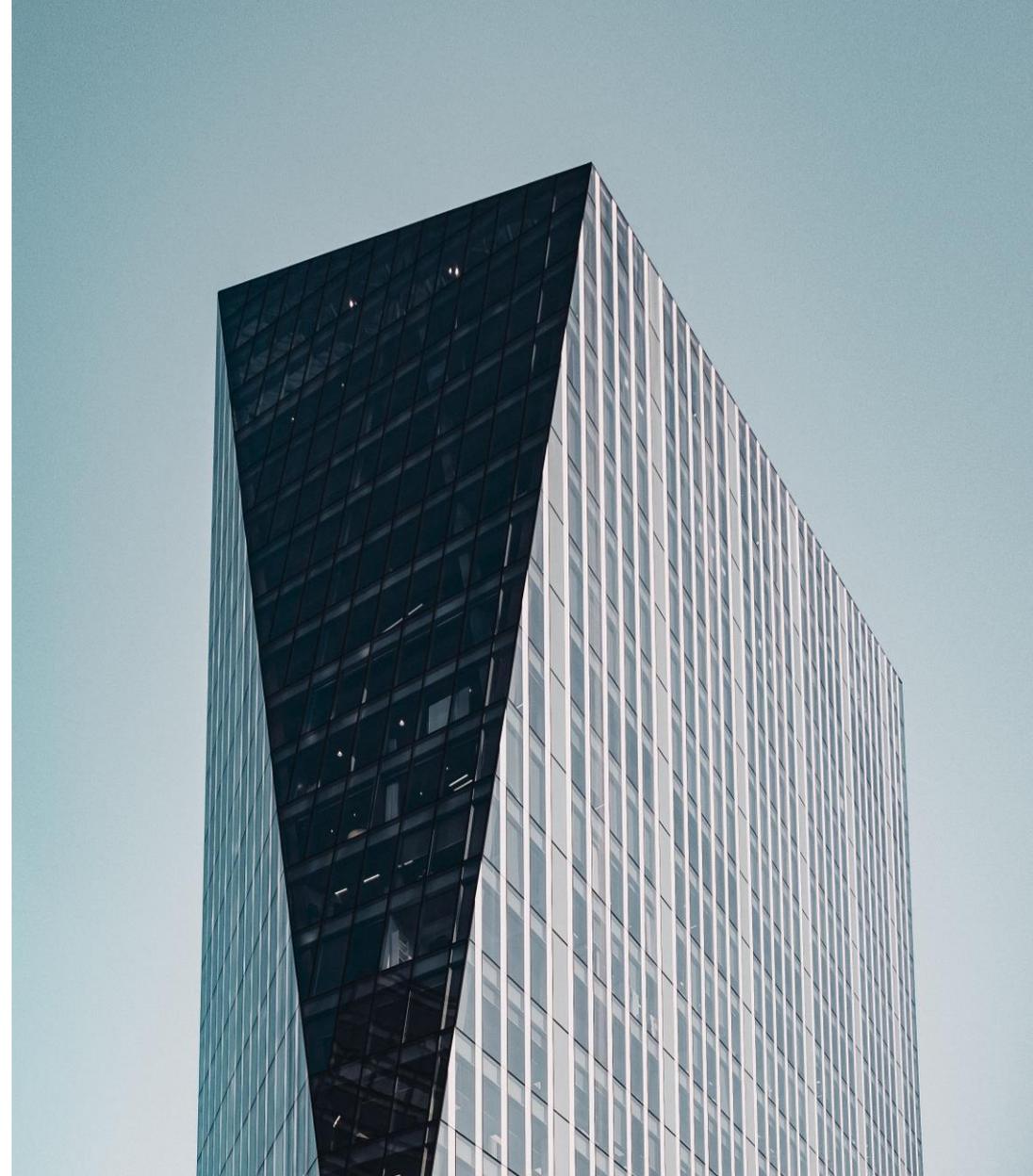
This report has been commissioned by Southwark Council to support in the ongoing reporting of the borough's Climate Strategy and Action Plan. This report provides updates to emissions analysis first performed in Spring 2021 and is structured as follows:

- **Chapter 1** presents an updated footprint for the council's own operations, from financial year 2020/21.
- **Chapter 2** presents an updated footprint and pathways progress for borough-wide emissions, with new analysis from SCATTER.
- **Chapter 3** presents best practice guidance and advice on future reporting, based on conversations with the council and past footprinting experience.

Report objectives

This report is intended to be used by the Southwark Climate Change Team, with key data and figures included within the updated Climate Strategy & Action Plan. The report has the following objectives:

- To allow the council to include the most up-to-date emissions statistics in its Strategy and Action Plan publication
- To build capacity and understanding within the council for future reporting years in order to allow the council to lead its own emissions reporting in future years
- To continue to inform priorities for project delivery within the council and maximise focus on those projects that have the potential to reduce emissions the most



1 – COUNCIL'S OWN EMISSIONS ANALYSIS

1.1 – SUMMARY

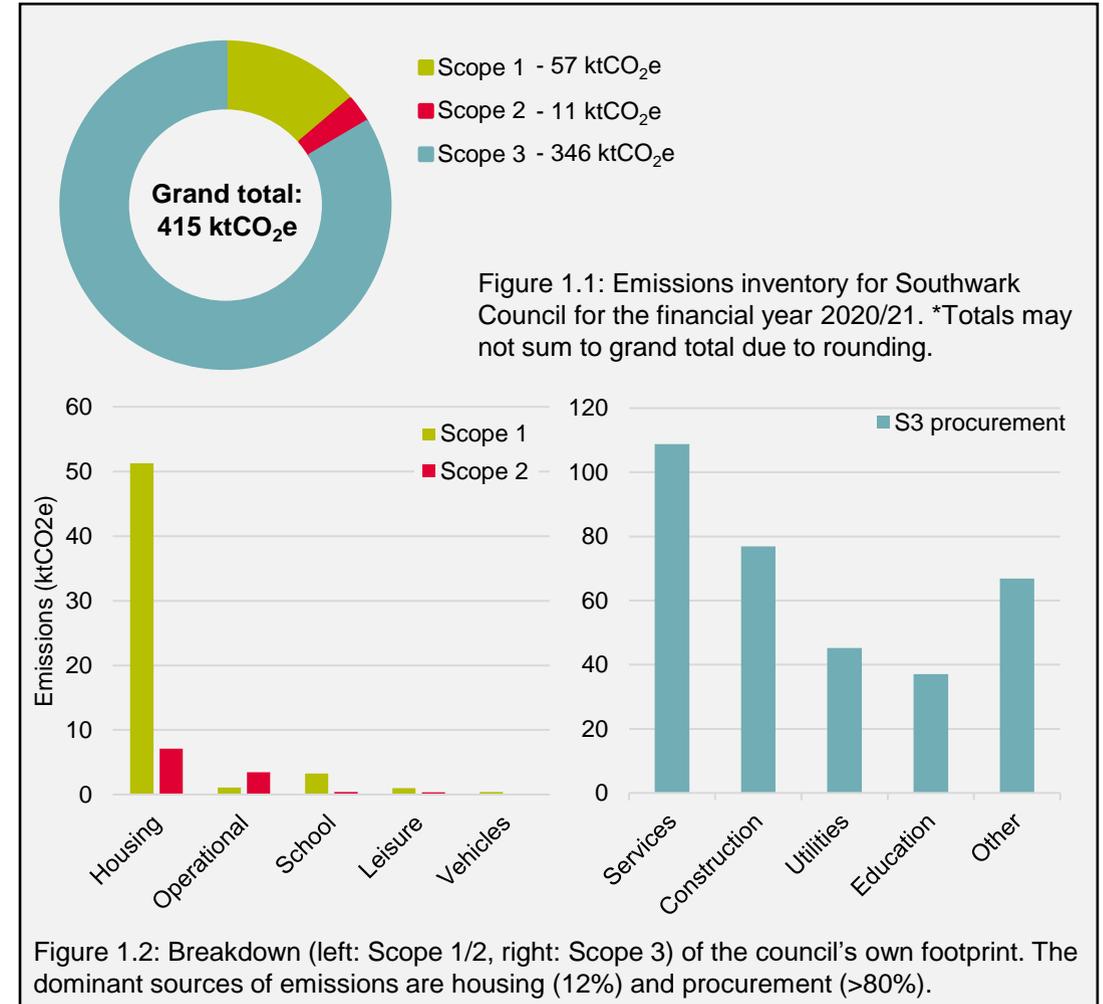
Analysis of Southwark Council's operations and assets shows a council's own footprint of **415 ktCO₂e**. The major contributors to this total are the council's buildings (recorded under Scope 1 & 2) and the council's procurement (recorded under Scope 3). Together these two emissions groups make up over 97% of the overall profile.

Understanding the council's emissions is an important step in leading the borough's transition to net zero. The method used to calculate this footprint is aligned to the [Greenhouse Gas Protocol](#) and is based on the following sources of emissions:

- Vehicle fleet
- Buildings and other owned/ leased assets
- Employee commutes
- Procurement spend

Council's Own Footprint

- The majority of the council's own footprint (84%) is a result of Scope 3 contributions, most notably from the council's procurement. A much smaller contribution stems from the council's owned building stock, in particular council-owned social housing. Emissions have been grouped according to the extent of the council's *operational control*.
- Compared to last year's footprint, emissions from the council's estate have fallen from ~72 ktCO₂e to ~68 ktCO₂e, due largely to the falling grid factor for electricity consumption. Fleet emissions also fell, from 0.47 ktCO₂e to 0.42 ktCO₂e.
- Overall, emissions have fallen from 432 ktCO₂e to 415 ktCO₂e.
- Not all Scope 3 categories have been assessed as part of this analysis – readers are directed to the GHG Protocol for more details on these categories. A full list of the activities defined by this footprint, as well as a full scope split, can be found in Appendix 1A.



1 – COUNCIL'S OWN EMISSIONS ANALYSIS

1.2 – SCOPE 1/2 EMISSIONS

Scope 1 Emissions

Primarily, Scope 1 emissions arise from the consumption of gas in council buildings across the borough. The council has included a wide range of buildings within its operational boundary; homes, operational council buildings such as offices and schools. Council-owned housing makes up 92% (51 ktCO₂e) of the contribution to Scope 1 emissions, compared to 6% (3 ktCO₂e) from schools and a small contribution from operational council buildings. Leisure centres also make a small contribution (<1 ktCO₂e) to the total.

A much smaller contribution is made by council-leased vehicles, which are responsible for <0.5 ktCO₂e across various service vehicle types. The contribution of Scope 1 emissions towards the council's footprint equates to roughly 14% of the total footprint.

Scope 2 Emissions

Scope 2 emissions stem primarily from the purchase of electricity in council-owned buildings. Once again, households form the majority of the overall total (63%, 7 ktCO₂e), with streetlighting (17%, 2 ktCO₂e) and operational buildings (13%, 1.5 ktCO₂e) also making significant contributions. Smaller contributions come from schools (4%, 0.4 ktCO₂e) and leisure centres (3%, <0.4 ktCO₂e).

The contribution of Scope 2 emissions towards the council's total is small, however, making up under 3% of the total footprint. These emissions have also been reported under a location-based approach. This treats all purchased electricity as "grid-average" and does not account for specific contracts the council may have which supply low-carbon renewable electricity. Figure 1.3 shows the individual buildings which make up the most significant contribution to these totals.

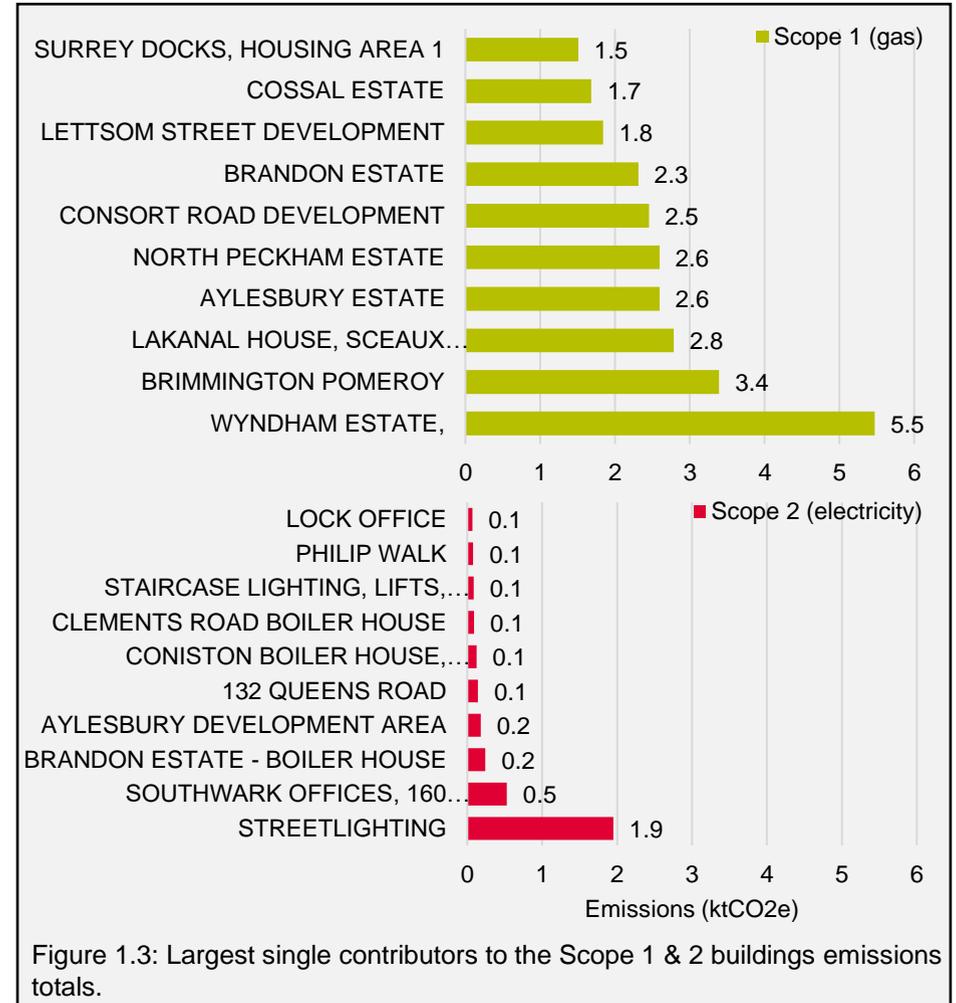


Figure 1.3: Largest single contributors to the Scope 1 & 2 buildings emissions totals.

1 – COUNCIL'S OWN EMISSIONS ANALYSIS

1.2 – SCOPE 1/2 EMISSIONS

Data Quality

Analysis of the council's footprint for the FY2020/21 was completed using a combination of available real data and a number of projected statistics.

Figure 1.4 shows the proportion of data from buildings that was available compared against estimated or projected data.

Estimated data was calculated depending on the available raw data. These were as follows:

- **Median Estimates** – This was used when both the previous year and following year data was available. A median value for FY2020/21 consumption was estimated based on the average of those points.
- **Trend Analysis** – Where only the previous year estimates were available, a multiplier factor was applied to give an estimate for FY2020/21. This factor was based on real data changes in consumption for available similar building types.
- **Supplier Estimates** – Energy supplier estimates were used where the supplier had estimated the year's energy usage rather than taking an exact meter reading and median estimates and trend analysis were not applicable.
- **Prior Year Figures** – Previous year energy usage was used where there was no available reference point to apply any of the above methods e.g., School electricity usage.

Using estimated data to this extent may materially impact the accuracy of the emissions total for the council's estate, particularly when reporting across a period as atypical as FY2020/21. The council should prioritise the inclusion of real data across all activities when completing its footprint in the next reporting cycle.

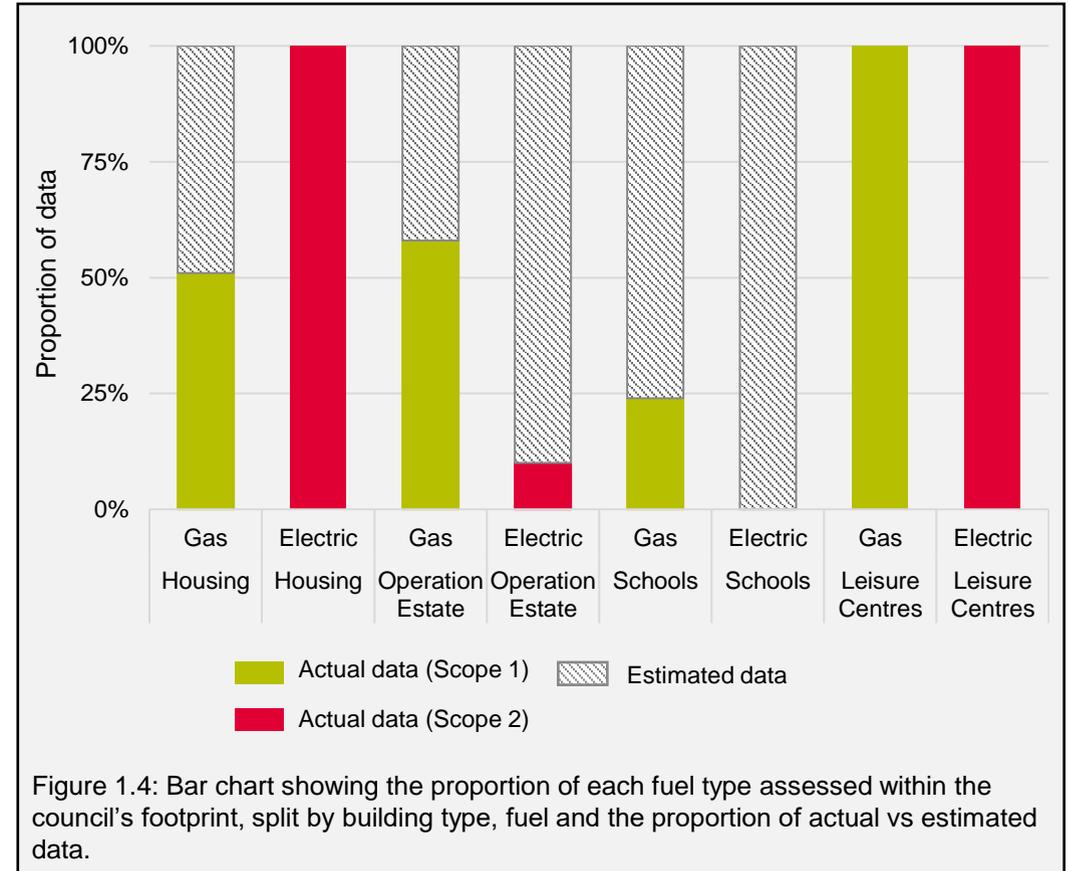


Figure 1.4: Bar chart showing the proportion of each fuel type assessed within the council's footprint, split by building type, fuel and the proportion of actual vs estimated data.

Actual data has been taken from meters within buildings, provided by the council. No further modification has been made during analysis. *Estimated data* is based on projections and assumptions.

1 – COUNCIL'S OWN EMISSIONS ANALYSIS

1.3 – SCOPE 3 EMISSIONS

The dominant emissions in the council's footprint are categorized under Scope 3. We have estimated Scope 3 contributions from the following sources:

- Council procurement
- Buildings
- Staff commutes (assessment of hybrid working emissions shown in Appendix 6)

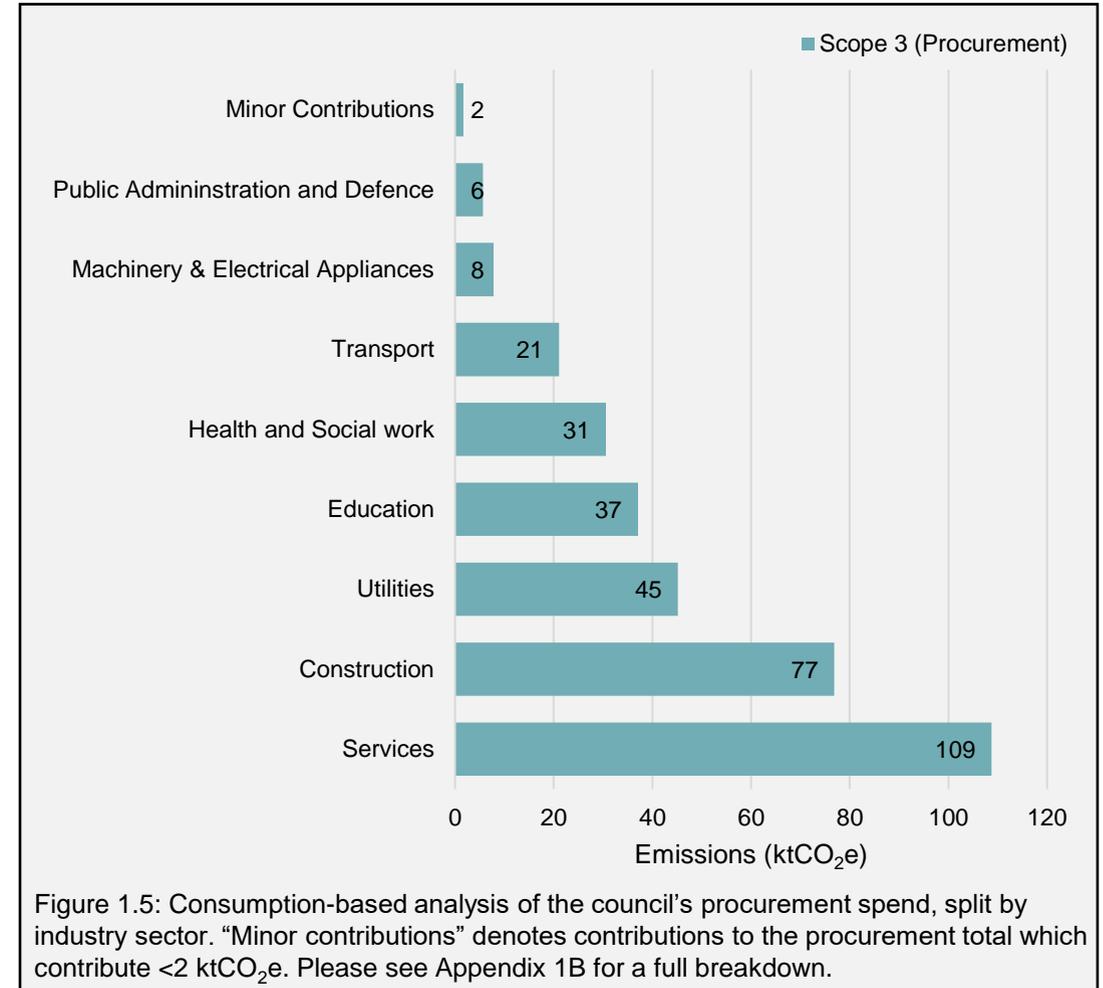
Emissions from procurement

Emissions associated with council procurement have been estimated to be 335ktCO₂e. They have been calculated using the same methodology as in the previous carbon analytics report, with updated statistics on expenditure and emissions factors. Figure 1.5 provides a breakdown of the council's procurement spend and the associated contribution to Scope 3 emissions. A full data table of this analysis can be found in Appendix 1B.

Key suppliers to the council

Figure 1.7 overleaf shows the top-ranking suppliers to the council based on both spend and emissions. There is a significant overlap between the suppliers which are used most frequently by the council and their related emissions, with 7 suppliers appearing in both top ten graphs, shown in Figure 1.7. It should also be noted that 7 of the top 10 suppliers for the FY20/21 also appear in the top 10 for the FY19/20.

Energy suppliers LASER Energy and Npower rank within the top ten suppliers by emissions, with LASER Energy the single largest contributor to the council's Scope 3 emissions from procurement. It should however be acknowledged that these emissions may overlap with Scope 1 & 2 given they relate to the provision of mains electricity and gas at council sites.



1 – COUNCIL'S OWN EMISSIONS ANALYSIS

1.3 – SCOPE 3 EMISSIONS

Using this data: leisure centre case study

This procurement analysis serves as a starting point for better estimates based on more specific engagement with individual suppliers and contract holders. This should be based on fuel consumption data. The FY2020/21 procurement spend emissions should not be compared to the previously assessed FY2019/20 procurement spend emissions, as it will only show spending trends and not accurate emissions trends.

Emissions from leisure centres can be estimated based on meter readings taken at site, as well as through using contract data from council suppliers. Meter reading data is a more accurate measure of emissions.

The below chart shows how the procurement analysis gives an estimate for supplier emissions from Everyone Active, the council's leisure centre partner, compared against "real" data taken from meter readings at leisure centre sites across the borough. The disparity in emissions totals serves to underline the importance of engaging with suppliers for consumption data in order to improve the accuracy of emissions from procured goods and services.

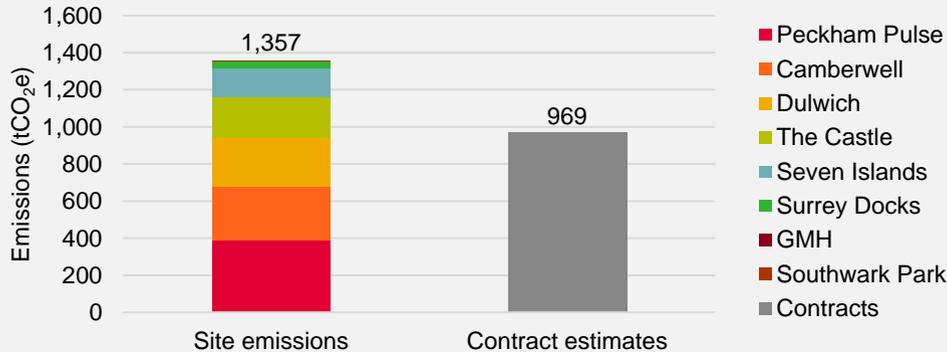


Figure 1.6: Comparing fuel consumption data emissions taken from on-site meter readings and emissions estimated using contract data.

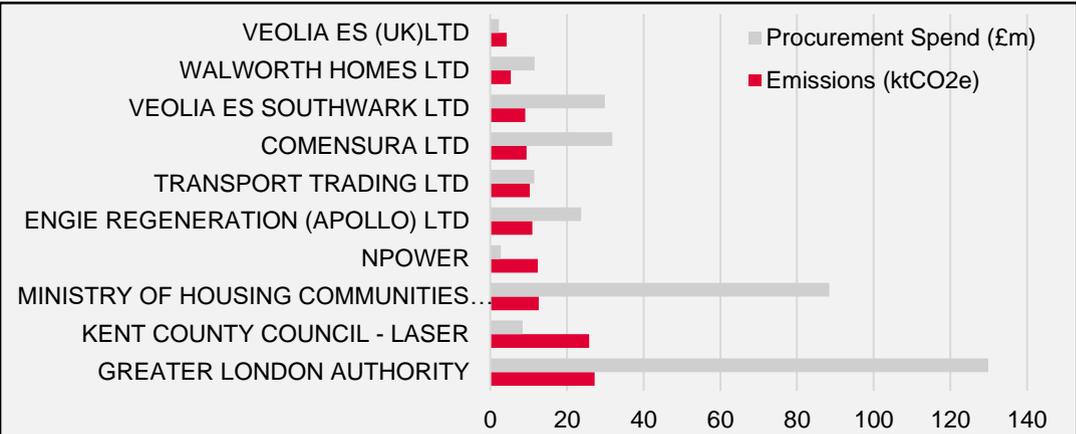


Figure 1.7: The top ten most significant suppliers used by the council in terms of GHG emissions (top) and outright spend (bottom).

1 – COUNCIL'S OWN EMISSIONS ANALYSIS

1.3 – SCOPE 3 EMISSIONS

Employee Commuting

Employee commuting contributes <0.5% (0.9 ktCO₂e) to the council's overall emissions profile, but the emissions total comparing the FY19/20 to 20/21 has increased by 1%. Despite the impacts of the pandemic, this can be attributed to a number of improvements to the methodology based on the availability of more data:

- Both full- and part-time employees were accounted for, with the total number of employees assessed for commutes being over 3 times larger than the previous year.
- COVID-19 had a large impact on the number of trips taken per employee, this impacted 82% of staff working from home or hybrid working. 18% of staff were classed as 'frontline' and it was assumed that they worked entirely in-person. This split of frontline vs. non-frontline workers is based on data supplied by the council.
- Postcodes were used to estimate the distance of a commuting journey for each employee.
- A more localised modal split was used to better represent a typical London commute (shown right in the distribution of transport modes).

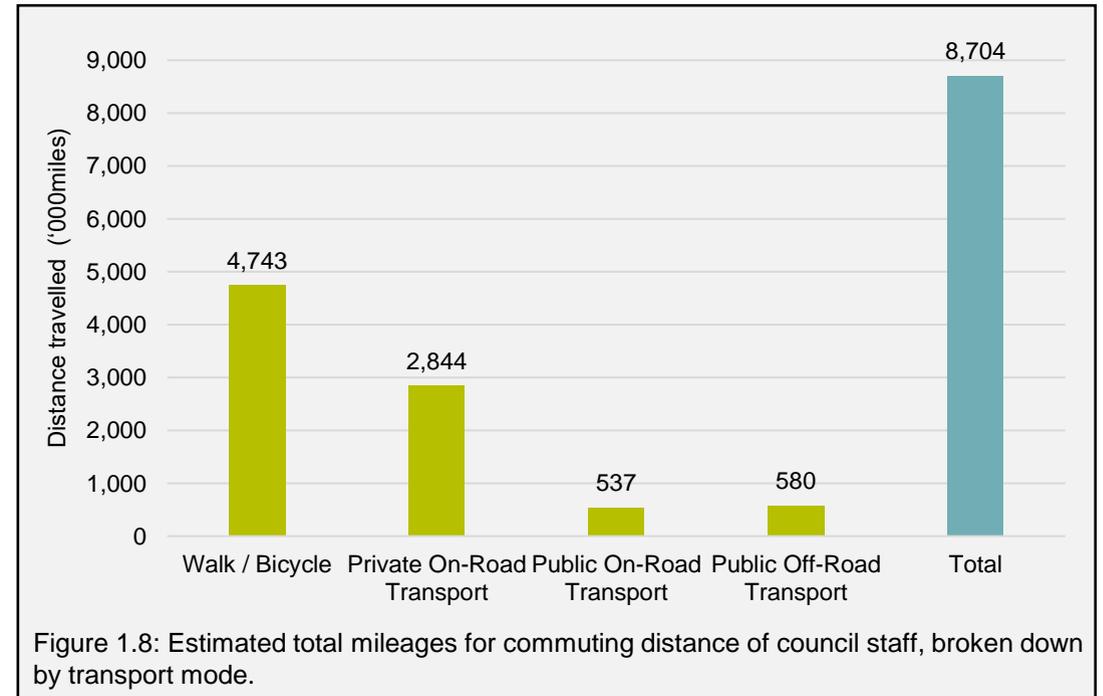
An estimate for the additional emissions from home-working can be found in Appendix 6.

Scope 3 emissions from buildings

Scope 3 emissions from buildings contribute 2.6% (10.5 ktCO₂e) to the council's overall emissions profile.

Significant changes were recognized in WTT (Gas Well-To-Tank) emissions as well as T&D (Electricity Transmission and Distribution) as a result of changes to the emissions factors from BEIS:

- The gas WTT emissions factor increased ~23% from the previous year.
- The electricity T&D emissions factor decreased ~6% from the previous year.



2 – BOROUGH-WIDE EMISSIONS ANALYSIS

2.1 – 2019 SCATTER INVENTORY UPDATE

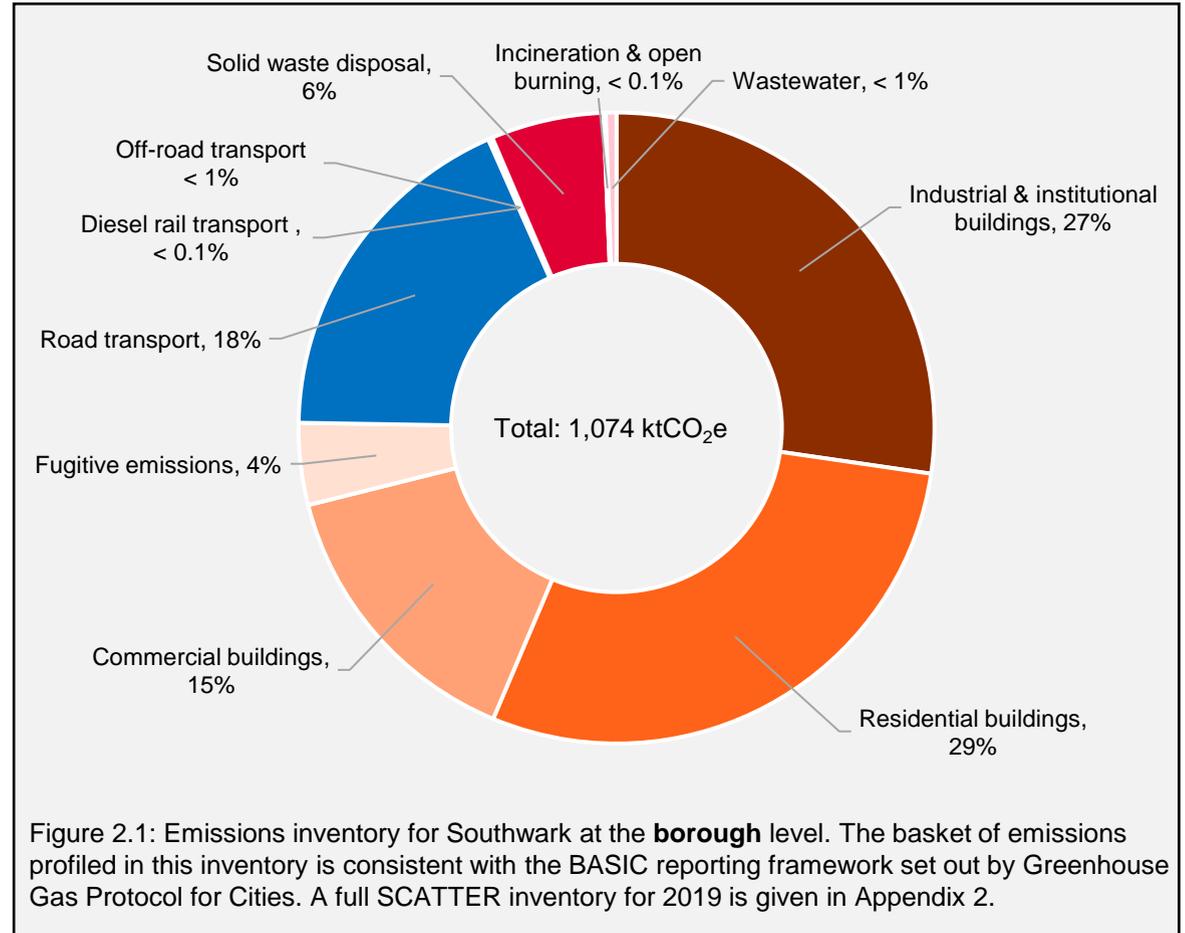
In 2019, Southwark’s buildings, transport and waste disposal were responsible for emissions totalling 1,074 ktCO₂e. The majority resulted from buildings (75%) and transport (18%).

This emissions inventory has been calculated using the SCATTER Inventory tool and is compliant with the BASIC reporting standards set out in the Greenhouse Gas Protocol for Cities. The activities for which emissions are reported in Figure 2.1 are consistent with those reported in the original carbon analytics report published in 2021. Changes in the emissions recorded under each category are down to the following:

- Reduction in the grid factor for electricity, which reduces emissions from purchased electricity by around 27% per unit of consumption between 2019 and 2017.
- Year-to-year variations in underlying activity.
- Changes and improvements to the methodologies behind each emissions estimate (see Appendix 4).

2019 represents the most recent reporting year for borough-wide emissions based on the available datasets, which are published two years in arrears in many cases.

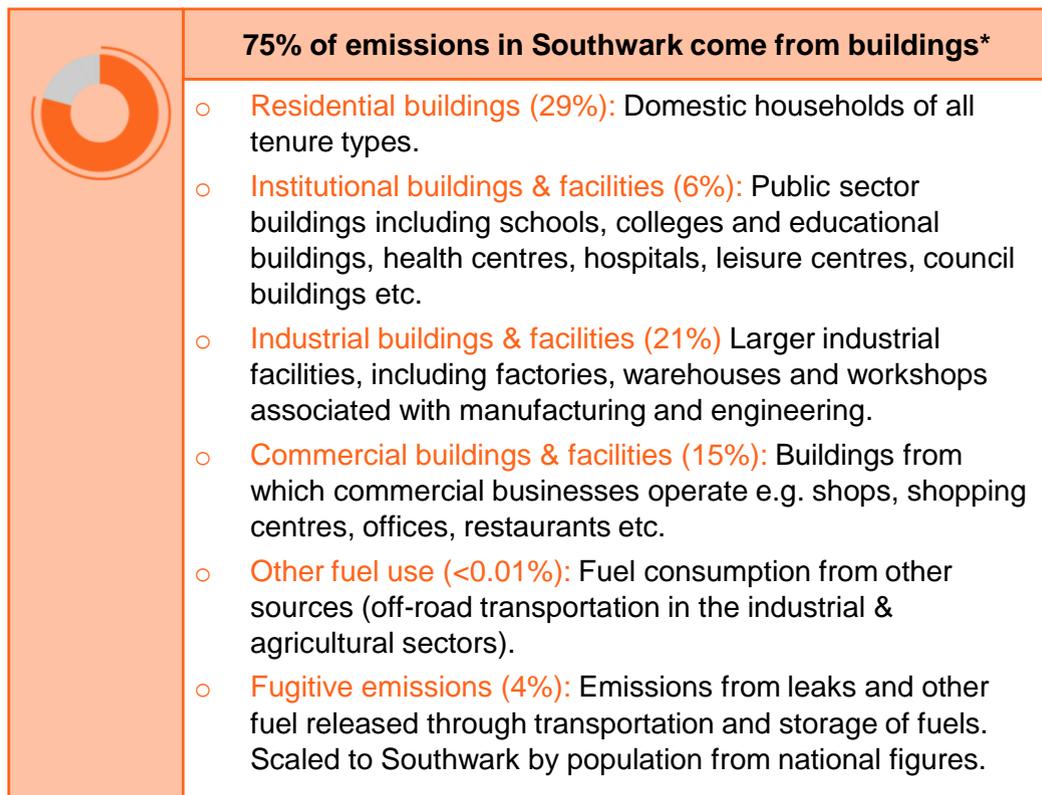
For the full list of emissions recorded under SCATTER please see Appendix 2. In 2018, borough-wide emissions from these categories totaled 1,142 ktCO₂e. An equivalent doughnut chart and data table for 2018 emissions can also be found in Appendix 3.



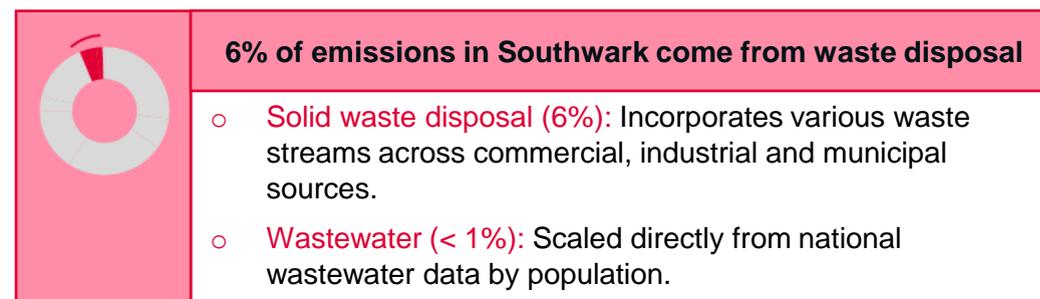
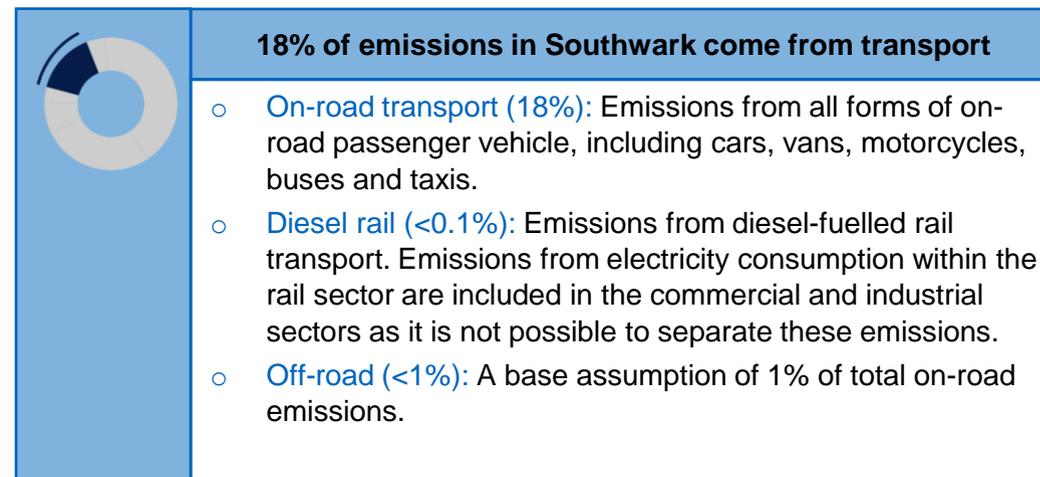
2 – BOROUGH-WIDE EMISSIONS ANALYSIS

2.1 – 2019 SCATTER INVENTORY UPDATE

The following tables demonstrate the profile of each emissions sector and explain the sources of emissions included in each:



*Please see Appendix 4 for a note describing changes in the proportion of industrial, institutional and commercial buildings emissions.



2 – BOROUGH-WIDE EMISSIONS ANALYSIS

2.2 – CONSUMPTION-BASED EMISSIONS UPDATE

Consumption-based analysis is carried out using statistics for economic activity and national data for consumption-based emissions.

Due to the national dataset for 2019 consumption-based emissions being unavailable until its public release in June 2022, we have not completed an estimate for the borough-wide consumption-based emissions.

Updated analysis will be added here once the requisite data has been published by DEFRA.

This is a placeholder for updated borough-wide consumption-based emissions that will be updated upon publication of the requisite data.

2 – BOROUGH-WIDE EMISSIONS ANALYSIS

2.3 – BOROUGH-WIDE PATHWAYS UPDATE

Updated pathways

In 2020/21, the council commissioned work into future emissions pathways for borough-wide emissions. This was completed using the EnergyPRO model, which provides estimates for emissions from buildings and on-road transport at each year up to 2030 according to different scenarios of activity in the borough.

Figure 2.3 opposite shows the EnergyPRO “All measures” scenario. Plotted alongside these bars is a progress-to-date which shows the borough’s emissions from 2018 and 2019 according to SCATTER. As was the case in 2021, there are some emissions categories assessed by SCATTER that do not appear in EnergyPRO and emissions have been mapped between the two pieces of software to produce this chart.

Progress against modelling

This analysis shows the following:

- SCATTER data indicates a reduction of 18% in 2019 emissions against 2017 levels in the emissions categories that are covered by the model.
- This reduction is largely down to the decarbonization of the national grid as well as methodological changes and source data updates in the SCATTER inventory tool. Refer to Section 2.2 for more detail, as well as the full data tables in Appendix 2.
- The “All measures” scenario in EnergyPRO projected reductions of 23% in 2019 against 2017 levels.

A comparison between the “Business as usual” scenario modelled within EnergyPRO can be found in Appendix 5. More details on the EnergyPRO modelling can be found in the carbon analytics report published in 2021.

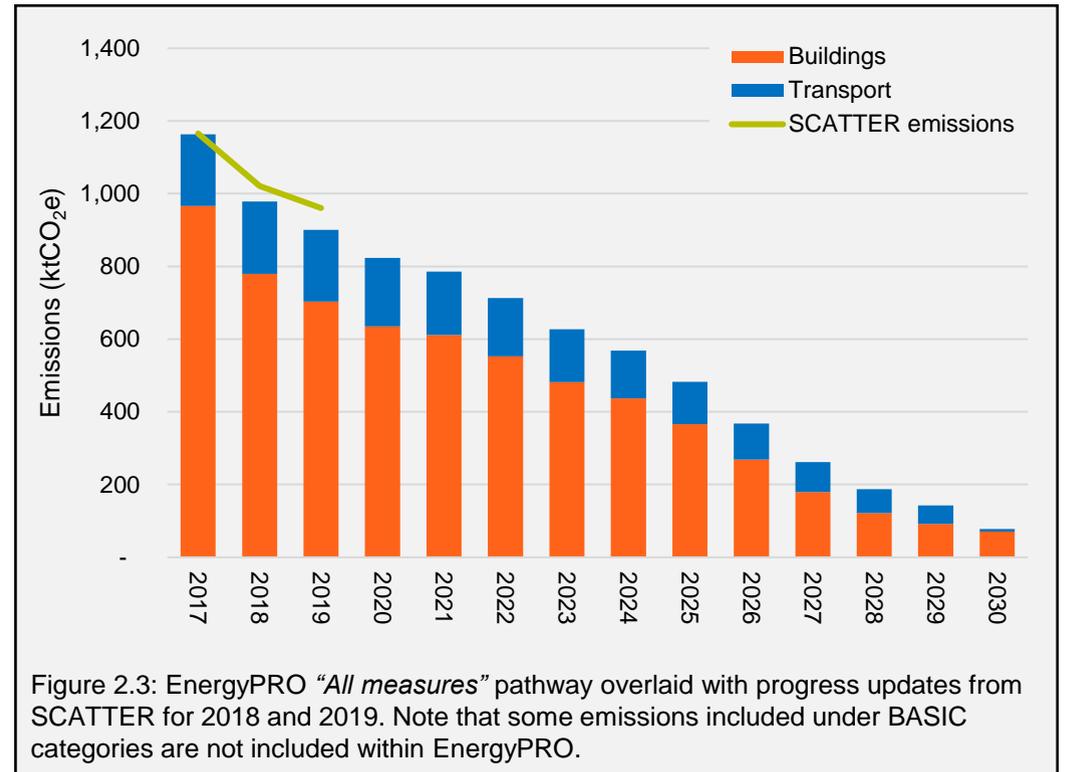


Figure 2.3: EnergyPRO “All measures” pathway overlaid with progress updates from SCATTER for 2018 and 2019. Note that some emissions included under BASIC categories are not included within EnergyPRO.

3 – GUIDANCE FOR FUTURE REPORTING

In future years, the council wishes to take the emissions reporting process “in-house”, with footprints being completed by analysts internally. This chapter sets out guidance and best practice on completing these footprints, based on conversations with the council team.

A more detailed supplementary annex has been provided to the council in conjunction with this report.

Reporting the borough’s Scope 1 & 2 emissions

The council will be able to report the borough-wide Scope 1 & 2 emissions annually using the free-to-access online SCATTER tool. The full SCATTER dataset is available for download along with guidance on how to report to the Global Covenant of Mayors and CDP, which the tool is aligned with.

This report, and the report from 2021, highlight which emissions sources are required for reporting under the Greenhouse Gas Protocol’s BASIC framework. This can be found in Appendix 2.

New functionality on the site (launching Summer 2022) will allow local authorities to compare past year emissions and updates to the methodology and source data are published alongside new data each year.

Assessing the council’s Scope 1 & 2 emissions

It is important that the council reassess its operational boundary each year. Having a full and clear understanding of the council’s operations across different teams and departments is an important prerequisite for accurately reporting emissions:

- Changes to contractual arrangements may warrant the amendment of previously out-of-scope activities into Scope 1 (and vice versa). There may also be justification to include some activities currently under Scope 3 as Scope 1, on the basis of demonstrating council leadership and maximising emissions reductions e.g. buildings which the council leases.
- Many properties had very low energy values. It is important to validate that these are definitely vacant, as opposed to being improperly recorded. In particular with housing, this could be done by assigning houses with an average value. How this has changed could also be assessed over the previous two-year periods and corroborated with buildings managers for reasonableness.
- Many of the electricity values used are forecasts made by the council’s energy providers. These appeared to be quite optimistic when comparing against Anthesis assumptions. We would therefore encourage the council to:
 - a) consider applying an adjustment to your building stock to account for the high value of forecasts
 - b) proactively seek actual meter readings from your tenants/energy suppliers (possibly accelerating smart metering integration)
- As the council adopts increasing amounts of renewable energy to meet its energy demand, it should also ensure that it reports Scope 2 emissions appropriately. As outlined in the GHG Protocol, it is standard practice to include both market- and location-based emissions from Scope 2 sources:
 - *Location-based emissions* estimates account for electricity consumption according to the average grid factor for a region.
 - *Market-based emissions* estimates account for electricity consumption after consideration of contractual arrangements (e.g. green tariffs) and are often much smaller than location-based estimates as a result.

3 – GUIDANCE FOR FUTURE REPORTING

- The council should also begin recording its consumption of refrigerant gases, which typically contribute 1-5% of an organisation's Scope 1 & 2 footprint.

These considerations ensures proper completeness when calculating emissions.

Assessing the council's Scope 3 emissions

The council also wishes to estimate the extent of its Scope 3 footprint, which incorporates emissions created in the council's supply chain and downstream services. Scope 3 emissions are typically much larger than Scope 1 and 2 emissions but are also much more challenging to treat since they rely on collaborative work with suppliers to both measure and mitigate.

Staff commuting and home-working

Estimating emissions from staff commuting is typically informed by an annual staff survey which gathers data on the number of journeys made, the distance travelled and the mode of transport taken. These pieces of information can then be combined to calculate an emissions estimate from commuting.

According to the GHG Protocol, emissions from home-working are recorded under the same emissions category as employee commuting and both activities are reported together.

Since the onset of COVID-19, the increased extent of home-working means that the council should consider these additional emissions impacts alongside commuting. Estimating emissions from home working considers additional energy usage from electronic equipment at home as well as additional heating in colder weather.

Interpreting consumption-based emissions analysis

The consumption-based emissions analysis published in this report is best used as a tool to highlight emissions hotspots within the council's supply chain and contracts. This forms the basis for further investigation and engagement with different suppliers and contracts.

The method applies nationally-derived emissions factors for expenditure in given industry sectors and is not sensitive to the specific nuances of suppliers' products and processes.

This limitation means that the totals quoted for certain industry sectors are likely to vary from the real-world performance of the council's suppliers.

Reporting supplier emissions to achieve better estimates for Scope 3

There is a strong overlap between mitigating the council's own Scope 3 emissions and the reduction in borough-wide Scope 1 & 2 emissions, since many of the council's suppliers operate within the borough. Improving the estimate of the council's Scope 3 footprint requires engaging with suppliers to disclose their Scope 1 & 2 emissions.

The accuracy of the council's estimate for emissions from procured goods and services ultimately relies on suppliers measuring the emissions created as a result of the council's contract. This is also a means through which the council can better categorise its Scope 3 emissions e.g., being able to distinguish between the broad category of "*Procured Goods and Services*" and the more specific category of "*Waste Generated in Operations*".

By engaging in discussions with its larger suppliers, the council can better plan how to reduce their emissions through a better understanding of its Scope 3 footprint.

CONCLUSIONS & RECOMMENDATIONS

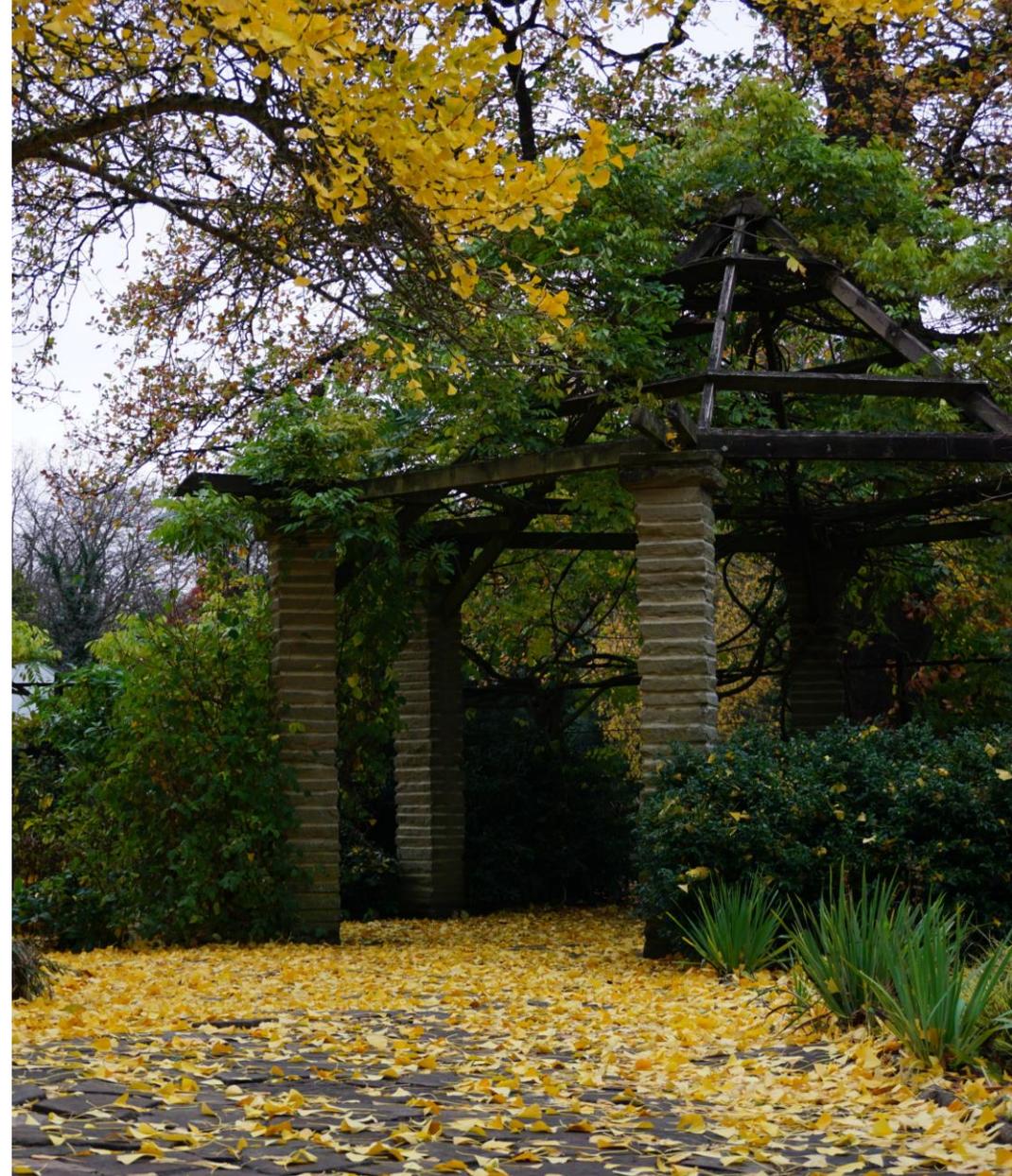
This report provides updates to borough-wide and council's own emissions profiles for publication in the updated Climate Strategy & Action Plan, as well as advice and guidance on best practice for the council's reporting in future years.

To progress the council's ambitions to strengthen its emissions monitoring & reporting ahead of future cycles, we recommend the following to improve the council's data collection practices:

- Develop an appropriate means of regular emissions data monitoring across council teams and begin year-round conversations with relevant officers on their data monitoring & reporting techniques.
- Engage with key suppliers and determine what support is required to improve visibility over their own Scope 1 & 2 footprints, that the council may better define its own Scope 3 impacts. This also serves as a useful entry point into conversations around borough-wide emissions mitigation.
- Ensure that new projects designed alongside the Action Plan follow robust data management principles in order to properly allow the council to report its progress.

Useful resources for emissions reporting & accounting

- [SCATTER](#) and the LGA [Greenhouse Gas Accounting Tool](#)
- GHG Protocol for [Cities](#) and [organisational Scope 3 guidance](#)



Appendices

Appendix 1 – Council’s own emissions

Appendix 2 – 2019 BEIS & SCATTER Data Tables

Appendix 3 – 2018 SCATTER Inventory & Data Table

Appendix 4 – Updates to SCATTER’s data & methodology 2017-19

Appendix 5 – Progress against EnergyPRO baseline scenario

Appendix 6 – Homeworking Emissions Assessment

APPENDIX 1A: COUNCIL'S OWN EMISSIONS

Table 1: Emissions breakdown by source and activity (2020-2021).

Emission source					
Scope 1		Activity Data	Unit	tCO ₂ e	% of total emissions
Buildings & Other Assets	Natural Gas	309,007	MWh	56,598	13.65%
	Gas Oil	0	MWh	0	0.00%
Vehicle Fleet	Small Van (petrol)	405,589	Miles	140	0.03%
	Medium Van (SWB)	615,614	Miles	227	0.05%
	Large Van (Transit)	36,786	Miles	12	0.00%
	Large Van (3.5t cage tipper)	114,824	Miles	41	0.01%
Total Scope 1 emissions				57,018	13.75%
Scope 2		Activity Data	Unit	tCO ₂ e	% of total emissions
Buildings & Other Assets	Purchased Electricity	53,374	MWh	11,333	2.73%
Vehicle Fleet	Small Van (Electric)	18,278	Miles	1	0.00%
Total Scope 2 emissions				11,334	2.73%

Emission source					
Scope 3		Activity Data	Unit	tCO ₂ e	% of total emissions
Buildings & Other Assets	Natural Gas – WTT	309,007	MWh	9,687	2.34%
	Gas Oil – WTT	0	MWh	0	0.00%
	UK Electricity – T&D	53,374	MWh	1,003	0.24%
Employee Commute	Walk/Bicycle	4,742,612	Miles	0	0.00%
	Private On-Road Transport	2,843,817	Miles	784	0.19%
	Public On-Road Transport	536,679	Miles	87	0.02%
	Public Off-Road Transport	580,430	Miles	30	0.01%
Procurement Spend	Input/Output	£1,091	Million GBP	334,727	81.02%
Total Scope 3 emissions				346,318	83.52%
Total emissions (Scope 1, 2 & 3)				414,670	100%

Assumptions note

Figures may not sum directly due to rounding.

APPENDIX 1B: COUNCIL'S PROCUREMENT SPEND

Table 2: Procurement spend emissions summary

Category	Emissions (tCO2e)	Procurement Spend (k£)	Proportion of emissions
Services	108,749	572,744	32.5%
Construction	76,880	164,479	23.0%
Utilities	45,183	14,143	13.5%
Education	37,068	172,013	11.1%
Health and Social work	30,581	94,369	9.1%
Transport	21,109	23,650	6.3%
Machinery & Electrical Appliances	7,814	31,050	2.3%
Public Administration and Defence	5,627	15,291	1.7%
Minor Contributions (See Below)	1,718	3,019	0.5%
Grand total	334,727	1,090,757	100%

Table 3: Services breakdown

Category	Emissions (tCO2e)	Procurement Spend (k£)	Proportion of services emissions
Other service activities	39,790	133,487	37%
Services from membership organisations	38,602	268,638	35%
Insurance and pension funds	12,921	48,802	12%
Banking and finance	12,709	89,082	12%
Legal, consultancy, other business activities	2,808	17,972	3%
Real estate activities	1,499	13,542	1%
Printing matter and related services	420	1,221	0.4%
Services sub-total	108,749	572,744	100%

Table 4: Minor contributions breakdown

Category	Emissions (tCO2e)	Procurement Spend (k£)	Proportion of emissions
Post And Telecommunications	604	1,561	0.2%
Sewage and Refuse Services	456	338	0.1%
Material/Chemical Use	371	494	0.1%
Hospitality & Catering	164	332	0.0%
Manufactured Goods & Recycling	115	287	0.0%
Fuels	7	7	0.0%
Grand total	1,718	3,019	0.5%

APPENDIX 2: 2019 BEIS AND SCATTER DATA TABLES

Sector	Scope 1 & 2 Emissions, ktCO ₂
Industry and Commercial Electricity	183.3
Industry and Commercial Gas	108.7
Large Industrial Installations	0.3
Industrial and Commercial Other Fuels	8.3
Agriculture	0.1
Domestic Electricity	91.9
Domestic Gas	201.3
Domestic 'Other Fuels'	3.9
Road Transport (A roads)	100.4
Road Transport (Motorways)	-
Road Transport (Minor roads)	125.2
Diesel Railways	0.5
Transport Other	1.1
LULUCF Net Emissions	-0.9
Grand Total	824.1

IE	= Included Elsewhere
NE	= Not Estimated
NO	= Not Occurring
	Included within BASIC
	Not included within BASIC
	2019 data not yet available

Sub Sector	Direct (ktCO ₂ e)	Indirect (ktCO ₂ e)	Other (ktCO ₂ e)
Residential buildings	199.51	112.25	43.65
Commercial buildings & facilities	48.94	109.31	22.96
Institutional buildings & facilities	40.03	23.73	8.81
Industrial buildings & facilities	96.48	133.16	33.52
Agriculture			
Fugitive emissions	45.04	0.00	0.00
On-road	194.75	IE	IE
Rail	0.39	IE	0.09
Waterborne navigation	NO	IE	IE
Aviation	NO	IE	176.03
Off-road	1.94	0.00	NE
Solid waste disposal	61.56	0.00	IE
Biological treatment	NO	0.00	IE
Incineration and open burning	1.25	0.00	IE
Wastewater	5.79	0.00	NO
Industrial process	129.51	-	0.00
Industrial product use	0.00	-	NE
Livestock			
Land use			
Other AFOLU	NE	0.00	0.00
Electricity-only generation	NO	-	NO
CHP generation			
Heat/cold generation	NO	-	0.00
Local renewable generation	0.02	NO	NO
Sub-total	825.21	378.45	285.06
	Grand total: 1,488.72		

Notes:

- BEIS 2019 data (far left) and SCATTER 2019 data (near left) are compiled using different methodologies.
- Within the SCATTER model, national figures for emissions within certain sectors are scaled down to a local authority level based upon a series of assumptions and factors.

What do the different emissions categories mean within SCATTER?

Direct = GHG emissions from sources located within the local authority boundary (also referred to as Scope 1). For example petrol, diesel or natural gas.

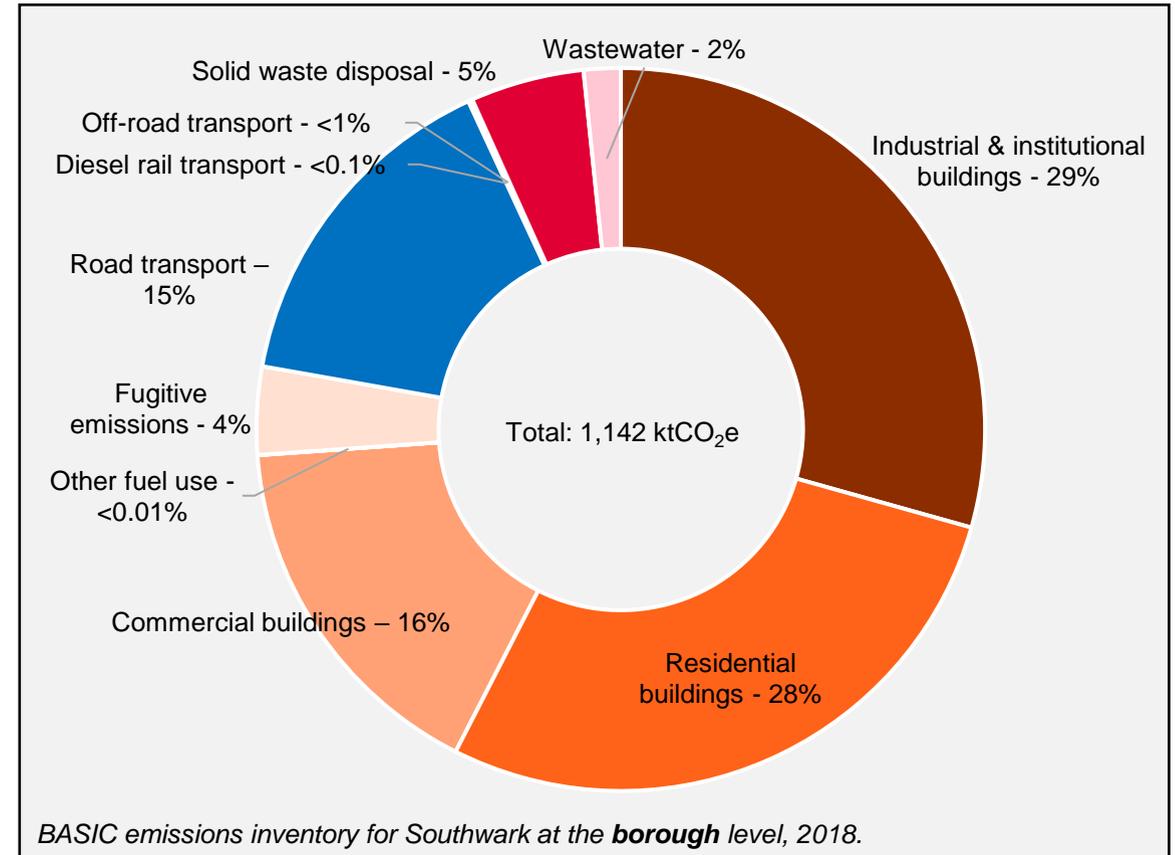
Indirect = GHG emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the local authority boundary (also referred to as Scope 2).

Other = All other GHG emissions that occur outside the local authority boundary as a result of activities taking place within the boundary (also referred to as Scope 3). This category is not complete and only shows sub-categories required for CDP / Global Covenant of Mayors reporting.

APPENDIX 3: 2018 SCATTER INVENTORY & DATA TABLE

Sub Sector	Direct (ktCO ₂ e)	Indirect (ktCO ₂ e)	Other (ktCO ₂ e)
Residential buildings	196.09	124.98	48.04
Commercial buildings & facilities	48.64	138.26	29.08
Institutional buildings & facilities	39.65	30.02	10.34
Industrial buildings & facilities	96.96	168.77	41.51
Agriculture	0.10	0.00	0.02
Fugitive emissions	44.83	0.00	0.00
On-road	175.02	IE	IE
Rail	0.39	IE	0.09
Waterborne navigation	NO	IE	IE
Aviation	NO	IE	163.41
Off-road	1.75	0.00	NE
Solid waste disposal	57.62	0.00	IE
Biological treatment	NO	0.00	IE
Incineration and open burning	NO	0.00	IE
Wastewater	18.68	0.00	NO
Industrial process	144.83	-	0.00
Industrial product use	0.00	-	NE
Livestock	0.05	0.00	0.00
Land use	-0.54	0.00	0.00
Other AFOLU	NE	0.00	0.00
Electricity-only generation	NO	-	NO
CHP generation	0.46	-	0.08
Heat/cold generation	NO	-	0.00
Local renewable generation	0.01	NO	0.25
Sub-total	824.57	462.02	292.58
	Grand total: 1,579.16		

In 2018, Southwark's buildings, transport and waste disposal were responsible for emissions totalling 1,142 ktCO₂e.



APPENDIX 4: UPDATES TO SCATTER'S DATA & METHODOLOGY 2017-19

Implications of method updates on Southwark's footprint

Updating the sources used to estimate emissions in Southwark is an important part of improving the accuracy of monitoring and reporting emissions. Each year, the methodology and source data within SCATTER is reviewed to ensure that the most up-to-date statistics are being used to estimate emissions.

This leads to changes in emissions totals from one year to the next in certain categories. Changes to the data sources for stationary energy and waste disposal are in the most significant categories to have an impact on overall emissions totals. Changes in small emissions categories do not have major material impacts to the overall footprint since their emissions are very small relative to other sectors. This is true even in the case of significant percentage changes in the emissions data.

It is occasionally the case that there are large changes in the reported figures and underlying data. These are discussed in more detail below.

Changes within BASIC categories

Stationary energy

- Source data change has resulted in an average increase in emissions of +12%, due to changes in BEIS *Energy Consumption in the UK* (ECUK) datasets. This is the result of local authorities no longer reporting 'Bioenergy & Waste' and 'Industrial Energy Consumption' data.

- Differences have been reported regarding industrial coal, commercial petroleum products, and industrial & commercial gas.
- Linked to this, fuel classifications between building types has been reclassified, meaning that some emissions previously classified under industrial & institutional buildings have been grouped under commercial buildings instead.
- Within the ECUK dataset, publication revisions have resulted in changes to the *distribution* of non-domestic energy consumption for all local authorities. The overall consumption data is, however, consistent.

Transport

- Updates to ECUK data have resulted in an average total reduction of 10% for petroleum use within rail. Rail transport emissions are a very small contributor to Southwark's overall footprint.

Waste

- Waste is now split between population when it is reported by unitary authority or county. As there have been changes in the distribution of waste away from landfilling across many local authorities, this is resulted in a reduction of emissions disproportionate to the change in waste volume. This has resulted in an average change of +6% change across the data set.
- Changes to source data on renewables means local generation changes are observed between years for many local authorities. The average change in this dataset is +66%. However, emissions totals in this category are very small, meaning the impact on the overall borough-wide total is also small.

APPENDIX 4: UPDATES TO SCATTER'S DATA & METHODOLOGY 2017-19

Changes within small emissions categories

Industrial Processes and Product Use (IPPU)

- Substantial changes are the result of improved BEIS industrial fuel consumption data by local authority. The average change in inventory entries is significant (+237%) but the overall emissions from this category are very small, so the impact on the borough-wide footprint is low.

Agriculture, Forestry & Other Land Use

- Land Use, Land Use Change & Forestry (LULUCF) source data from government/ Ricardo has been updated, with an average change across the dataset of -16%.
- DEFRA source data updates have resulted in changes to land use emissions.
- Livestock accounting method improvements have changed allocation rules between dairy & non-dairy cattle for regional authorities where granular data was not provided. Cattle data is now assigned per hectare area rather than straight split, causing an average change of +1%.

Energy Generation

- New power stations listed in local authorities have resulted in significant changes in local generation where relevant. BEIS has provided new data for power station locations some sites have been re-allocated to correct local authorities in the *Digest of UK Energy Statistics* (DUKES) datasets.
- Combined heat & power source data changes have impacted the percentage of fuel inputs from national averages (DUKES dataset 7.2), resulting in average change across the dataset of -1%.

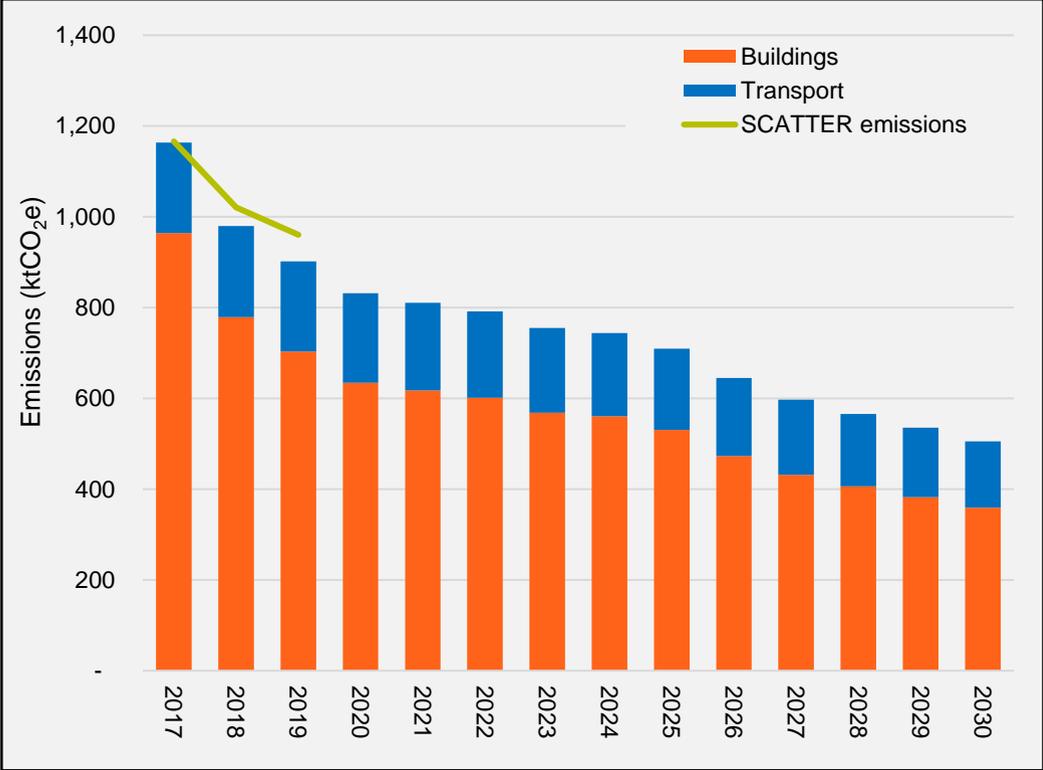
- Increased generation in some areas is also attributable to additional sites or increased capacity of existing sites, overall resulting in an average change of -12% across the dataset.

Glossary

- Business, Energy & Industrial Strategy (BEIS) – government department responsible for publishing data on emissions
- Department of Environment, Food & Rural Affairs (DEFRA) – government department responsible for publishing various activity data used in SCATTER emissions analysis
- Land Use, Land Use Change & Forestry (LULUCF) – net emissions from carbon “sinks” such as soils and trees
- Industrial Processes and Product Use (IPPU) – emissions from industrial practices such as mineral and chemical production
- Energy Consumption in the United Kingdom (ECUK) – Dataset which describes how energy is consumed across the UK in different sectors, such as in buildings or transport.
- Digest of United Kingdom Energy Statistics (DUKES) – Dataset which describes how energy is consumed across the UK in different sectors, such as in buildings or transport.

APPENDIX 5: PROGRESS AGAINST ENERGYPRO BASELINE SCENARIO

EnergyPRO “Business as usual” pathway overlaid with progress updates from SCATTER for 2018 and 2019. Note that some emissions included under BASIC categories are not included within EnergyPRO. The “Business as usual” scenario projects a 22% reduction in emissions in 2019 versus 2017 levels.



APPENDIX 6: HOMEWORKING EMISSIONS ASSESSMENT

Estimating emissions from staff commutes also includes consideration of home-working. This method accounts for the following:

- Electricity consumption from a lamp, monitor and laptop setup
- Gas consumption from additional heating of the home during the working day
- Seasonal variation in heating and lighting demand

Emissions can then be found by multiplying this additional demand by the relevant conversion factors. These calculations are shown in the tables below:

Source	Power rating (kW)	Usage (hr)	Emissions (kgCO ₂ e)
Lamp (Spring)	0.04	8	0.07
Lamp (Winter)	0.08	8	0.14
Laptop	0.05	8	0.08
Monitor	0.05	8	0.08
Heating (gas boiler, Spring)	35	2	12.82
Heating (gas boiler, Winter)	35	4	25.64

These figures represent one home-worker on one day. To estimate the annual emissions across all of the council's home-workers, we made assumptions on the number of front-line workers and the overall number of working days that council staff worked from home, after accounting for lockdowns and a hybrid working pattern.

The split between Spring and Winter days was taken as 50:50, given that lockdown periods matched almost exactly over those calendar months.

Period	Emissions (tCO ₂ e)		
	Electrical equipment	Heating	Total
Spring days	89	4,781	4,870
Winter days	114	9,562	9,676
Grand total	203	14,344	14,546

The resulting calculations estimate emissions on the scale of 15ktCO₂e from home-working during FY2020/21, due largely to the extensive lockdown periods.

However, this figure is based on very general assumptions of energy consumption in the home and would be very difficult to independently verify. Reporting home-working emissions alongside staff commutes is optional under the GHG Protocol and the above estimates have not been included in the full analysis given in Chapter 1 on this basis.

The council does not presently collect primary data for this activity, but in the future this could be done as part of a staff commute survey. As evidenced above, the major determinant in these emissions is the extent to which home workers heat their homes during the day (>98% of the total estimate). Gathering exact data is extremely challenging, given it relies on domestic meter readings during a very specific time of the day in the homes of council staff.

The extent to which the council can influence these emissions is also limited. For staff who live in the borough boundary, the emissions are categorized under borough-wide Scope 1 & 2 emissions anyway and are captured by SCATTER.

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