

Carbon Balance Sheet – 2022/23

Produced for Sovereign Housing Association Limited
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Introduction

This report contains Sovereign Housing Association Limited's Carbon Balance Sheet of Scope 1, 2 and 3 emissions for 2022 (April 2022 - March 2023). This Carbon Balance Sheet:

1. Enables Sovereign Housing Association Limited to identify the material emissions sources in its overall value chain and where it can make the most significant impact on global emission reductions.
2. Provides the baseline for making decisions about achieving carbon neutrality and net-zero.
3. Provides Sovereign Housing Association Limited's full Scope 1, 2 and 3 inventory, which is essential for developing a Net-zero strategy and the setting of Science-Based Targets (SBT).
4. Provides a consistent way to report and measure progress year on year.

Key Findings

- Sovereign Housing Association Limited's total greenhouse emissions (Scopes 1, 2 and 3) were 348,022 tCO₂e
- The most significant emissions sources are from the properties that Sovereign Housing Association Limited leases out - this Scope 3 category accounted for 49% of the company's total carbon footprint.
- Emissions embedded in purchased capital goods and other goods and services are also significant contributors to Scope 3 emissions, responsible for 16% of total emissions.
- Scope 1 and 2 emissions are from energy consumption (gas and electricity), transport fuel used in company-controlled vehicles, and represent approximately 3% of total emissions.
- Scope 1 and 2 emissions are within your direct control, and a mix of energy efficiency measures, on-site generation and green energy procurement will enable the company to reduce these emissions over time.
- Scope 3 emissions will be addressed through engagement with suppliers and customers.

Next Steps

This initial Carbon Balance Sheet should be used as a baseline to measure ongoing performance as Sovereign Housing Association look to reduce emissions across their operations. Reporting methodologies should be reviewed to identify opportunities for improvements to support increased accuracy. The outputs of this report should be used to support and develop a net-zero strategy to enable Sovereign Housing Association to drive GHG emissions reductions.

Corporate reporting of GHG emissions

Until recently, most companies have focused on measuring emissions from their own operations and electricity consumption (Scope 1 and 2). Scope 3 accounts for the greenhouse gas (GHG) emissions associated with a company's entire value chain. These are considered indirect emissions as are not under the company's direct control. Scope 3 emissions are broken down into 15 categories which span the entire upstream and downstream activities of a company.

Why calculate Scope 3?

Scope 3 emissions often account for 80% - 99% of a company's total emissions footprint therefore it is important to understand these emissions. Assessing the entire value chain emissions impact can help to identify where to focus reduction activities. Although Scope 3 emissions are technically out with a company's direct control, collaboration and business choices can help to reduce these emissions.

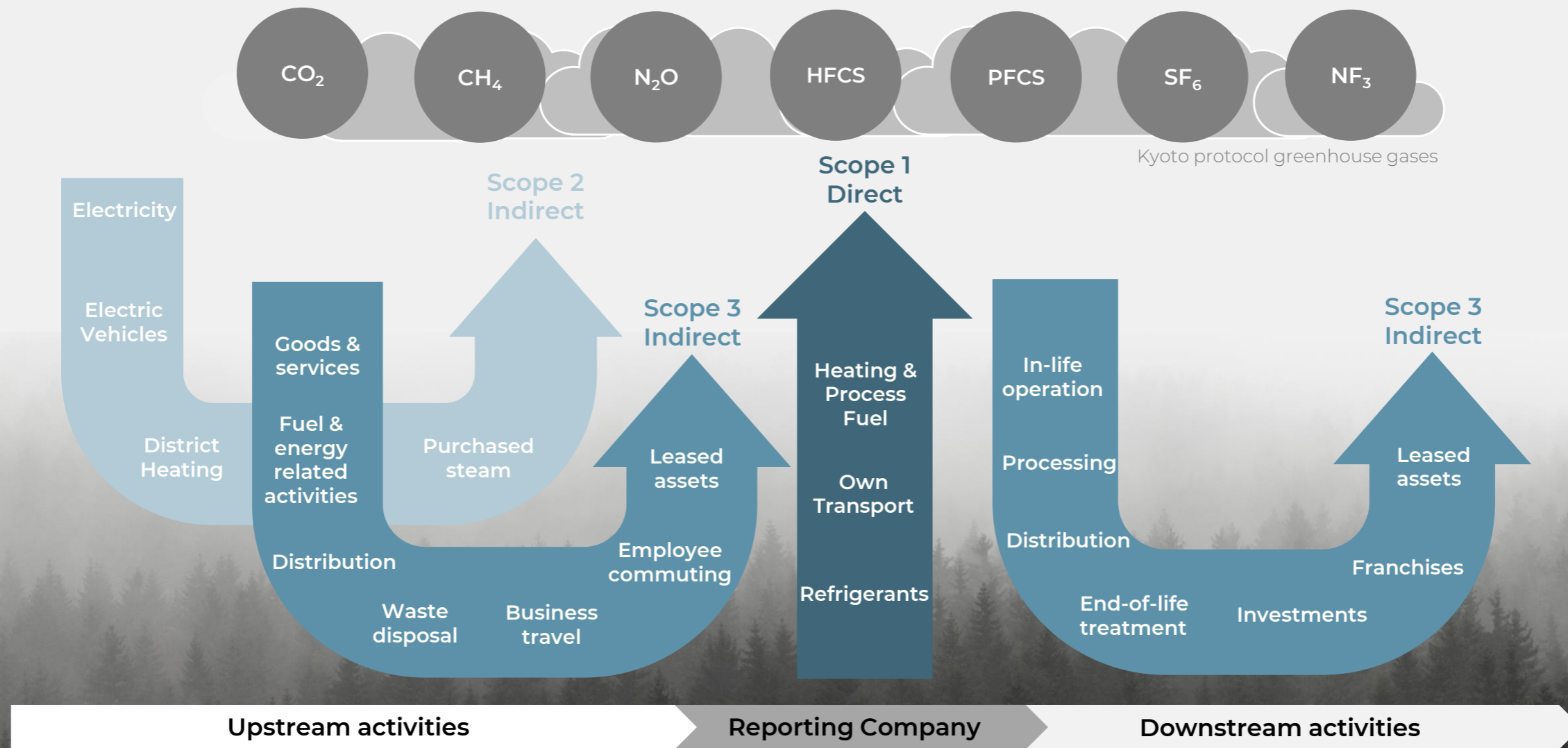


Figure 1: Corporate greenhouse gas (GHG) emission sources

Emissions footprint - summary

This Carbon Balance Sheet contains Sovereign Housing Association Limited's full greenhouse gas (GHG) emissions inventory for 1st April 2022 – 31st March 2023

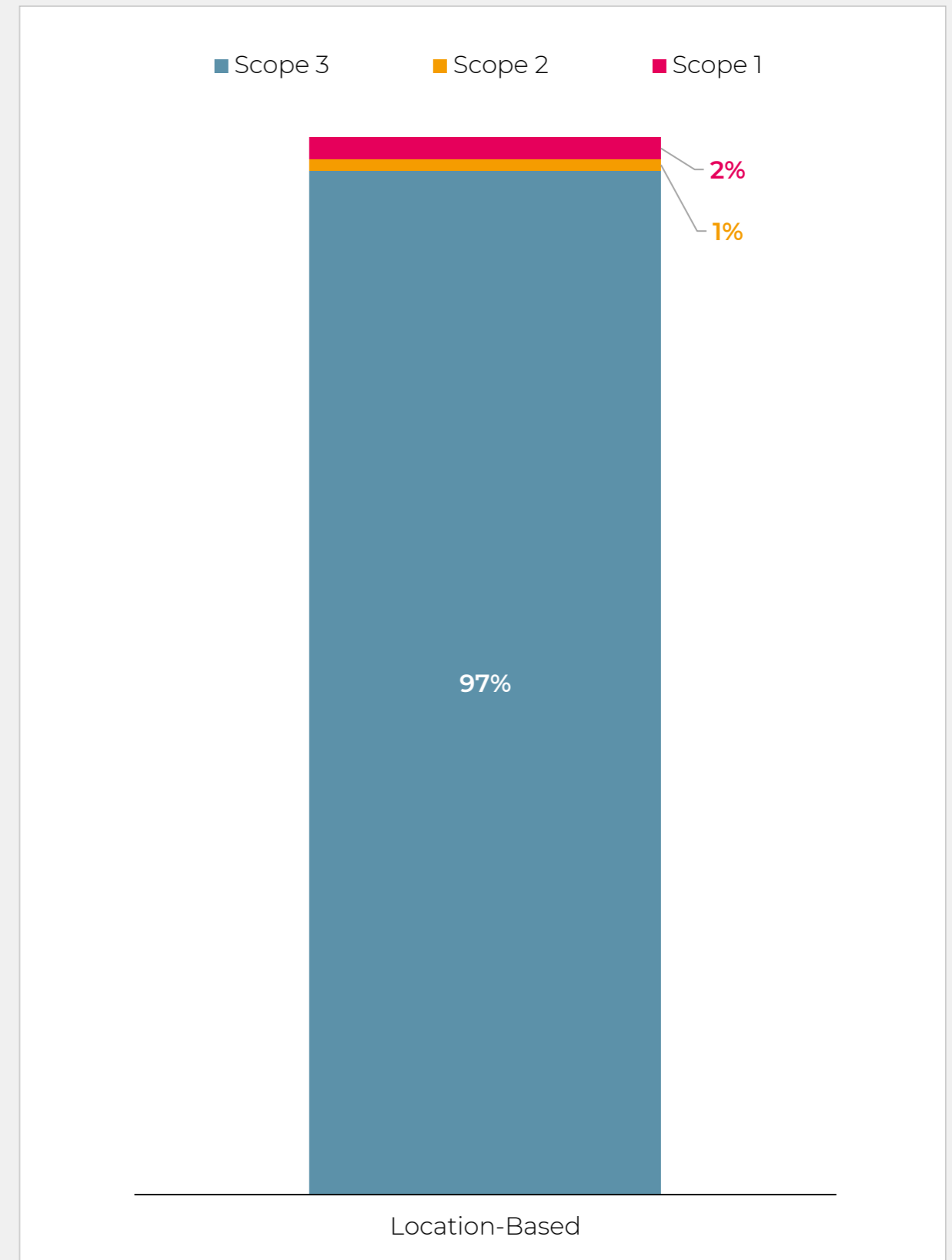
Sovereign Housing Association Limited's emissions are reported on an operational control approach, as defined by the GHG Protocol. All emissions have been calculated following the GHG Protocol's Corporate Accounting and Reporting Standard and the guidelines of the ISO14064-1.

All applicable Scope 3 categories have been quantified.

Table 1: Emissions summary

Emissions Scope	tCO ₂ e (location-based)
Scope 1 ¹	7,280
Scope 2 ¹	3,310
Scope 3	372,037
Total Emissions, All Scopes	382,627
Carbon Offsets ²	0
Net Emissions	382,627

Figure 2: Emissions breakdown by scope and method



¹ Carbon Scope 1 and 2 emissions data has used SECR figures for 2021/22 as 2022/23 figures were not available at time of writing. Calculations and balance sheet will be updated when data is available.

² Carbon offsets can be purchased to be carbon neutral (Scope 1 & 2 emissions only) for approx. £21,883-£547,092 per annum.

Carbon balance sheet – 2022/23

Table 2: Carbon balance sheet

Emissions Scope & Scope 3 Category	Greenhouse gas emissions inventory		Operational analysis tCO ₂ e Operational emissions	Product analysis tCO ₂ e Product emissions
	tCO ₂ e (location-based)	% (location-based)		
Scope 1	7,280	1.90%	7,280	7,280
Natural Gas	3,988	1.04%	3,988	3,988
Transportation (excluding grey fleet)	3,292	0.86%	3,292	3,292
Other Fuels	n/a		n/a	n/a
Scope 2	3,310	0.86%	3,310	3,310
Scope 3	372,037	97.23%	69,493	178,598
1. Purchased Goods & Services	60,811	15.89%	60,811	60,811
2. Capital Goods	1,121	0.29%	1,121	
3. Fuel-related Emissions	2,735	0.71%	2,735	
4. Upstream Transportation and Distribution	512	0.13%	512	512
5. Waste Generated in Operations	1,288	0.34%	1,288	1,288
6. Business Travel	208	0.05%	208	
7. Employee Commuting	2,820	0.74%	2,820	
8. Upstream Leased Assets	n/a		0	0
9. Downstream Transportation and Distribution	n/a			0
10. Processing of Sold Products	n/a			
11. Use of Sold Products	106,978	27.956%		106,978
12. End-of-life Treatment of Sold Products	9,010	2.35%		9,010
13. Downstream Leased Assets	186,556	48.76%		
14. Franchises	n/a			
15. Investments	n/a			
Total All Scopes	382,627	100%	80,083	189,187
All scopes tCO₂e per Revenue £m	905		189	447
All scopes tCO₂e per Revenue FTE	177		37	87
All scopes tCO₂e per Revenue Property	6		1	3

Carbon balance sheet – explanation

The Carbon Balance Sheet contains Sovereign Housing Association Limited's full 2022 greenhouse gas (GHG) emissions inventory. The Scope 3 inventory is divided into the 15 categories established by the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting & Reporting Standard,)and expressed with the following metrics:

1. **tCO₂e (location-based):** absolute GHG emissions from Sovereign Housing Association Limited's operations and value chain for the current reporting year. All GHG have been converted to a CO₂ equivalent basis using the respective GWPs. Scope 1 & 2 emissions were calculated using the location-based reporting methodology. This method calculates emissions associated with fuel and electricity consumption by using UK average emissions intensities. BEIS provides UK emissions factors for fuel and grid electricity annually, which are used in location-based reporting. Scope 3 results were calculated using the approaches and data described in the methodology section.
2. **%:** the percentage that each emissions source makes up of the company's total Scope 1, 2 and 3 emissions. This is presented for both the location-based and market-based emissions footprint.
3. **All scopes tCO₂e per Revenue £m:** an intensity demonstrating the tCO₂e per Revenue £m. This is presented on a location-based, market-based, operational and product approach. Emissions reduction targets are generally required to be achieved on an absolute basis, however tracking emissions on an intensity approach can be useful for short term KPIs and to demonstrate efficiencies.

In addition to the GHG Inventory, two further sections have been added to the Carbon Balance Sheet to provide additional analysis of Sovereign Housing Association Limited's emissions impact.

Operational analysis

This section comprises all Scope 1, 2 and 3 emissions associated with the day to day running of the business. Therefore, emissions associated with the upstream and downstream aspects of sold products are not included in this section.

Product analysis

This section contains all emissions associated with the production of products Sovereign Housing Association Limited sells. This includes upstream emissions associated with raw materials, processing/manufacturing emissions, upstream and downstream transportation, product usage and end of life treatment.

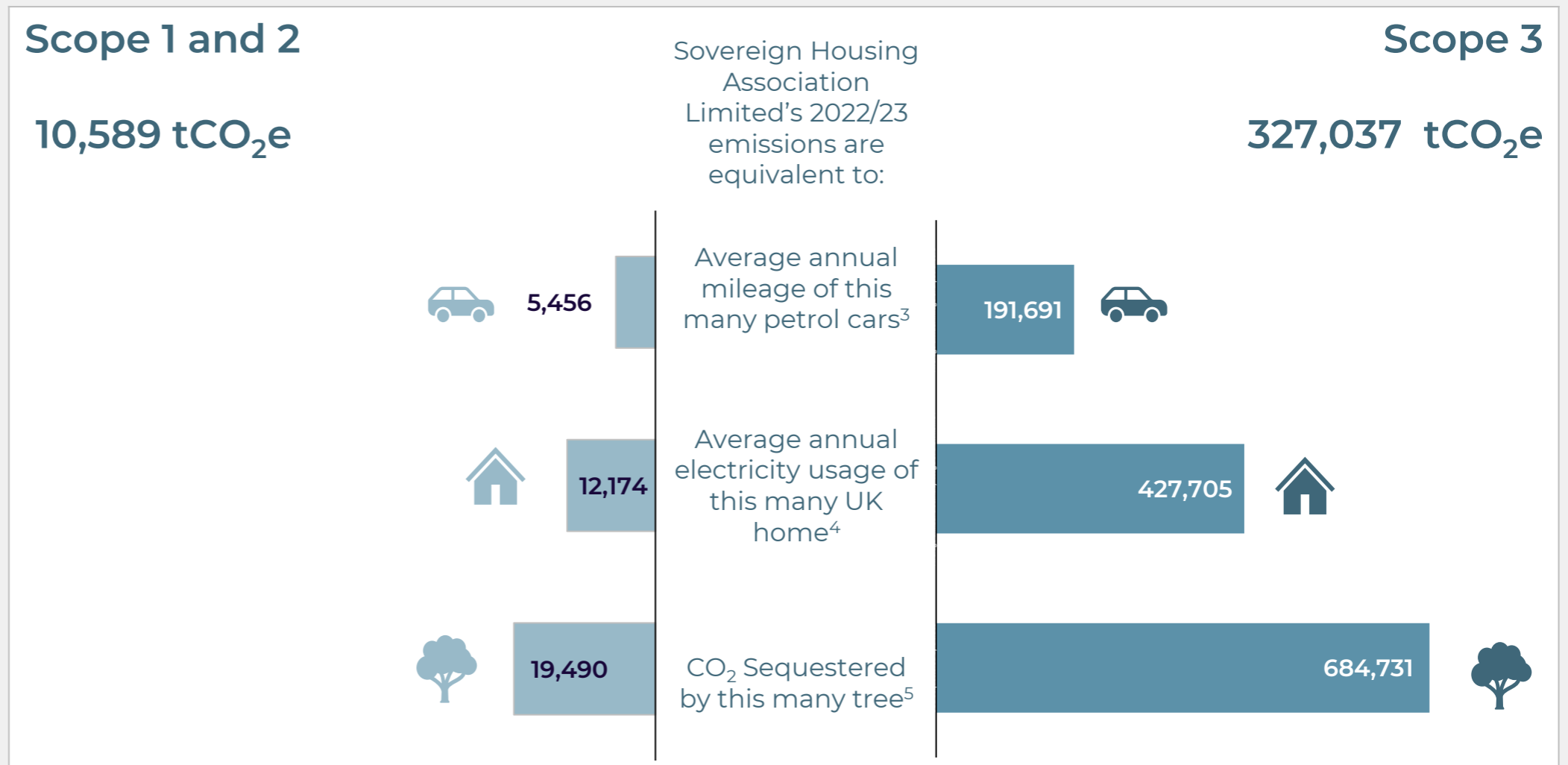


Emissions equivalents

Sovereign Housing Association Limited's emissions are reported on a tonnes carbon dioxide equivalent (tCO₂e) basis. Each greenhouse gas has a different global warming potential (GWP) compared to carbon dioxide (CO₂), for example, methane (CH₄) has a warming potential 28 times that of CO₂. Therefore, to be able to compare the emissions from all of the Kyoto protocol GHGs on a like-for-like basis, they are converted to tCO₂e using their respective GWP.

A tCO₂e is difficult to visualise, therefore we have calculated how many cars and homes would produce the same amount of emissions as your business. On average a petrol car produces 2 tCO₂e across a year and the annual electricity usage of a UK home is responsible for 1 tCO₂e. We have also estimated how many trees would need to be planted to remove the equivalent amount of emissions from the atmosphere. The amount of CO₂ that a tree removes from the atmosphere is hugely variable based on the species and age of the tree, but on average a tree removes about 0.5 tCO₂ from the atmosphere across its lifetime.

Figure 3: Emissions equivalents



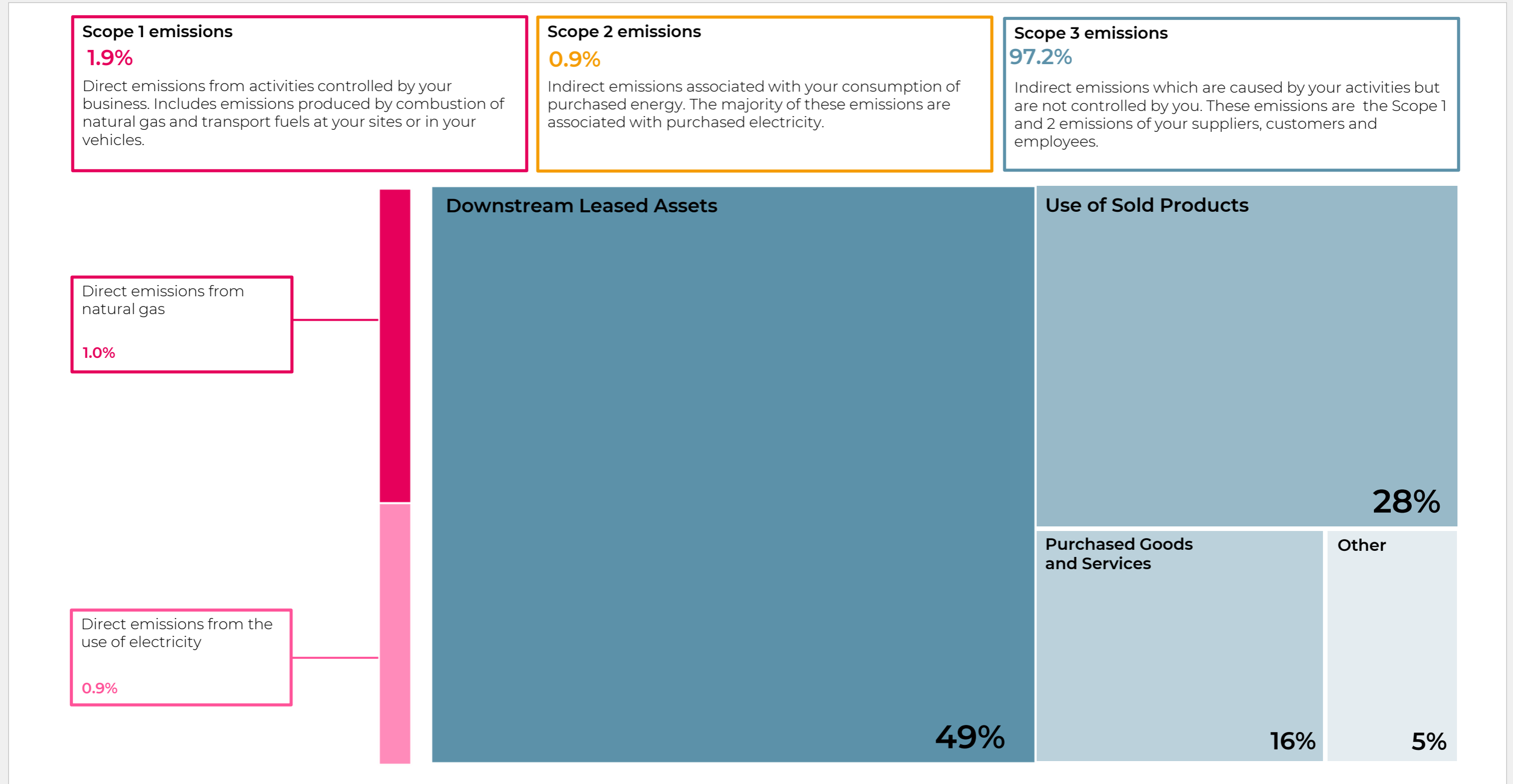
³ Based on average milage and miles per gallon of petrol cars in the UK in 2019.

⁴ Based on average electricity usage in UK homes in 2020.

⁵ Assumes average sequestration over the lifetime of a range of different trees.

Emissions hotspots

Figure 4: Emissions hotspots



Scope 3 emissions analysis

The most significant source of Scope 3 emissions is Downstream Leased Assets (Category 13), accounting for 49% of Sovereign Housing Association Limited’s total GHG emissions. The emissions reported in this category result from the use of natural gas and electricity by occupiers of the homes owned by Sovereign Housing Association and leased to tenants throughout the reporting year. This calculation utilised Sovereign Housing Association’s “Portfolio Carbon Footprint Study” undertaken by Sero and has been extrapolated to the wider property portfolio.

Category 11 – Use of Sold Products is the second highest source of GHG emissions at 28% of total emissions. This category accounts for the emissions emitted during use of any sold products. For Sovereign Housing Association this is related to the homes sold within the reporting year and, following the approach set out for Category 13, has been based upon the Sero “Portfolio Carbon Footprint Study” with home life expectancy as reported within the Verco report “Sovereign Embodied Carbon Assessment” LCA.

Purchased Goods & Services, Scope 3 category 1, accounted for 16% of total emissions. This includes all upstream emissions from the production of purchased products during the reporting year. This will include products like legal services, contractors, IT software and cleaning services.

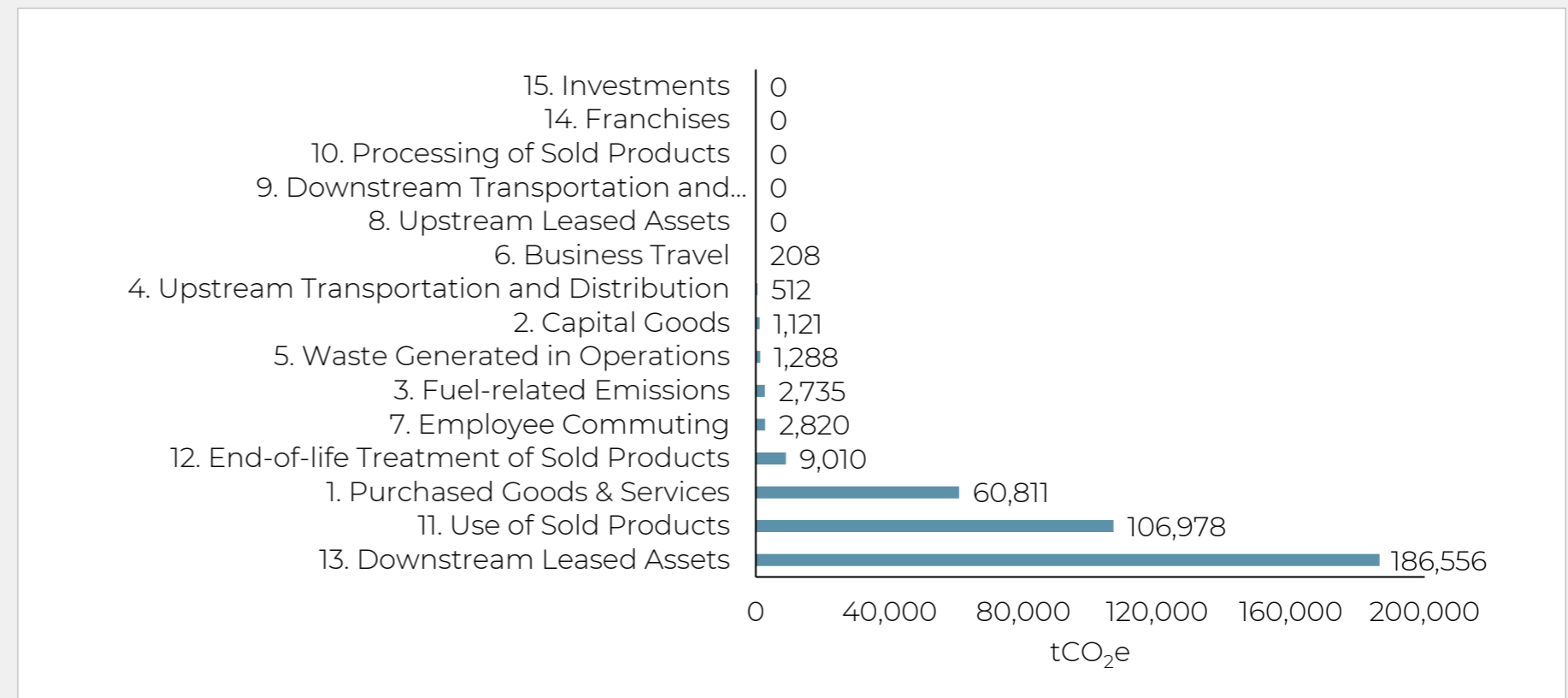
The fourth highest emission source is Category 12 – End of Life Treatment of Sold Products. This includes the emissions from the waste disposal and treatment of products sold at the end of their life. For Sovereign Housing Association Limited it is related to the end-of-life deconstruction and disposal of sold homes once they reach the end of their life. Emissions in this category have been based upon the relevant modules from the Verco “Sovereign Embodied Carbon Assessment” LCA.

The remaining Scope 3 categories accounted for less than 2.5% of total emissions.

Table 3: Material Scope 3 categories

Materiality Rank	Scope 3 Category	Emissions (tCO ₂ e)
1	13. Downstream Leased Assets	186,556
2	11. Use of Sold Products	106,9778
3	1. Purchased Goods & Services	60,811
4	12. End-of-life Treatment of Sold Products	9,010
Total Scope 3 including Remaining Categories		375,333

Figure 5: Scope 3 emissions by category



Data collection recommendations

All applicable Scope 3 categories have been quantified utilising available data and, where necessary, estimations. The guidance in the GHG Protocol has been followed throughout and a summary of the data sources and methodologies used for each category are set out in the methodology section.

As this is the first year Scope 3 emissions have been calculated for Sovereign Housing Association Limited, readily available data was used throughout. Going forward, it is recommended data collection processes are put in place to collection the relevant data on a rolling basis.

Additionally, the areas of data collection that would benefit from improvement in the future to improve the effectiveness of the Carbon Balance Sheet have been identified and are shown in Table 4.

Table 4: Data collection recommendations

Scope 3 Category	Data Collection Recommendations
1: Purchased Goods and Services	<p>Move away from a spend-based approach to an activity or supplier specific data approach. Supplier questionnaires should be used to gather emissions intensities of key goods and/or Scope 1 and 2 emissions data, which can be used in place of broader emission factors.</p> <p>Focus should be given to the emissions related to the design, construction and maintenance of the properties Sovereign Housing Association Limited portfolio and those made available for sale.</p>
2. Capital Goods	As per Category 1
4. Upstream Transportation and Distribution	Gather information on distance travelled per transport type so that an activity-based approach can be used to calculate more accurate transport and distribution emissions.
6. Business Travel	<p>Gather more specific details of employee travel so that an activity-based approach can be used to calculate more accurate business travel related emissions.</p> <p>The use of a central travel system would allow the gathering of the following:</p> <ul style="list-style-type: none"> • Data regarding the origin and destination locations of each journey (or mileage figures if available). • Data regarding the transport mode used for each journey (bus, taxi, rail, air etc.).
11. Use of sold products	The Sero "Portfolio Carbon Footprint Study" that has been used for the calculation of emissions is a significant improvement over publicly available data on housing emissions as it related directly to emissions from Sovereign Housing Association's properties. Improvements to reporting using this data could be made by further interrogation of the data into property groups and applying this to specific groups of homes in the Sovereign portfolio.
13. Downstream Leased Assets	Sovereign Housing Association as part of their commitment to improve the operational efficiency of homes are creating a database of all properties, which will include EPC data. New EPC reports contain estimates on energy use and annual GHG emissions, when this database is available and ready for use it should be utilised for emissions reporting as it will provide property specific emissions data.
12. End-of-life Treatment of Sold Products	The Verco "Sovereign Embodied Carbon Assessment" has been used as the basis for calculations on emissions for the end-of-life treatment of sold properties, with the study providing life-cycle emissions related to a masonry and timber frame home. Data presented in module C, end of life, has been used following a conservative approach, an initial improvement would be to provide the breakdown of construction type for sold homes to allow the selection of the specific LCA.

Data types

The [GHG Protocol Corporate Value Chain \(Scope 3\) Standard](#) is the primary, internationally accepted, method for companies to account for their value chain emissions.

This data request is developed in line with the Corporate Value Chain (Scope 3) Accounting and Reporting Standard which aims to:

- Help companies prepare a true and fair scope 3 GHG inventory in a cost-effective manner
- Help companies develop effective strategies for managing and reducing their scope 3 emissions through an understanding of value chain emissions
- Support consistent and transparent public reporting of corporate value chain emissions according to a standardised requirement

The GHG Protocol defines a number of acceptable methodologies for each of the 15 Scope 3 categories. These methodologies can generally be grouped into average-data based, spend-based, activity-based and supplier-based approaches, however not all approaches are suitable for each category. Data accuracy gradually improves as you move up the Scope 3 methodology hierarchy. In year 1, we will generally use spend-based and activity-based approaches, as these types of data are often readily available. Where supplier data is considered to be easily requested, we will recommend this methodology be used. Going forward, the aim is to move towards more supplier-based data.

- **Average-data based method:** If company specific data is unavailable, companies may use average secondary activity data to estimate emissions, for example using average national commuting patterns to estimate commuting emissions.
- **Spend-based method:** the data to be provided for some categories will revolve around your financial spend on goods, capital goods, third party services etc. For example: estimating emissions for activity by collecting data on the economic value/cost of activity and multiplying it by relevant secondary (e.g. industry average) emission factors (e.g. average emissions per monetary value of goods).
- **Activity-based method:** the data to be provided for some categories will require the provision of quantities, volumes, distance etc. relating to the bespoke category. For example: estimating emissions for activity by collecting data on the mass (e.g. kg), or other relevant units of activity and multiply by the relevant secondary (e.g. industry average) emission factors.
- **Supplier-based method:** collecting emissions data from the suppliers of products or services is the most accurate method to estimate Scope 3 emissions as reflects the actual emissions associated with that specific product or service and doesn't use industry averages. For services, such as waste collection or a flight, the supplier's, for example, Biffa or British Airways, Scope 1 and 2 emissions can be allocated to the reporting company based on share of revenue, for example. For products, product emission intensities on a unit or weight basis can be used to reflect the cradle-to-gate emissions associated with that product.

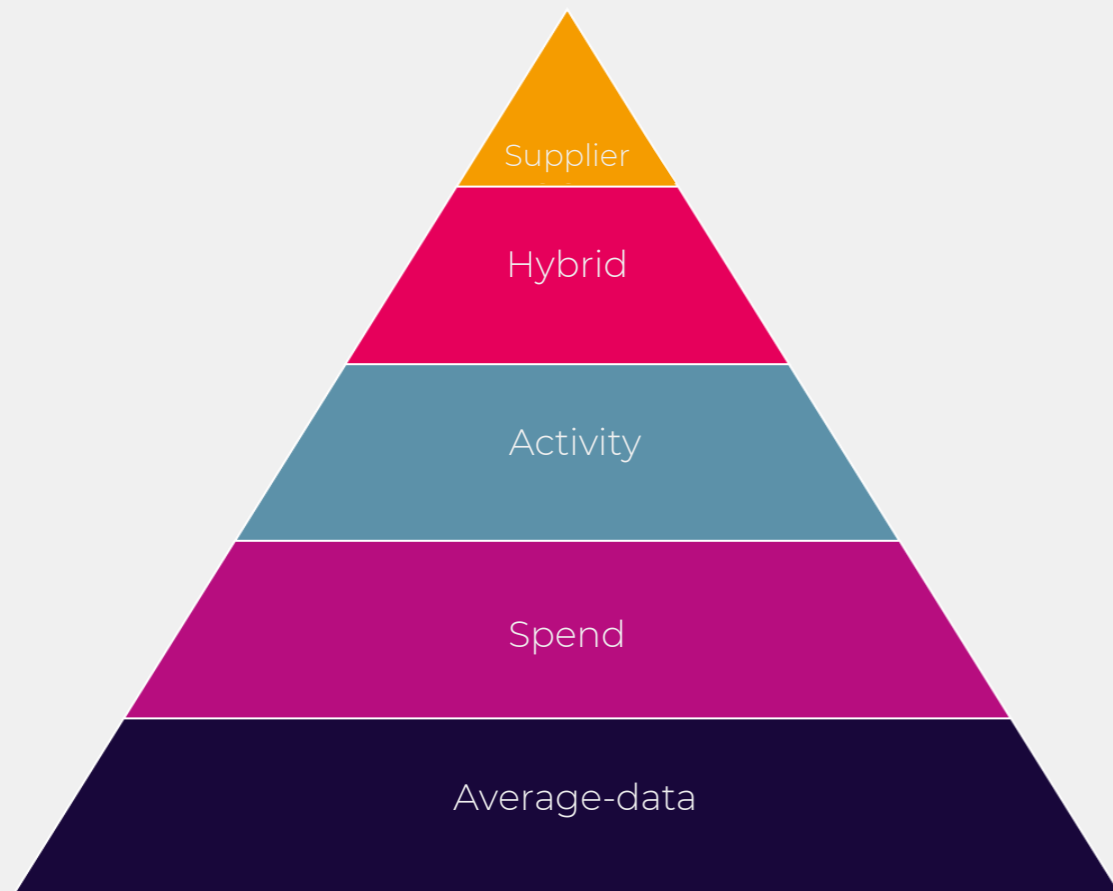


Figure 6: Scope 3 methodology hierarchy

Methodology

This table sets out the applicability of each category, data sources and an overview of the methodology followed for Scope 3 calculations. Unless stated otherwise, all conversion factors are sourced from UK Government (BEIS) GHG Conversion Factors for Company Reporting, v1.0 2021, and include Scope 3 Well to Tank and T&D losses. The Greenhouse Gas Protocol Value Chain methodology is followed in all cases. Well to Tank refers to the emissions associated with extracting raw materials (e.g. oil and gas), processing them into fuels and transporting them to the point of use e.g. the fuel tank or the power station. Transmission & Distribution (T&D) losses represent the electricity consumed and lost in the network between the power generators and the consumers.

Table 5: Methodology, data sources and accuracy rating

Scope 3 Category	Applicable	Data source/s	Method comments	Data quality rating
1: Purchased Goods and Services	Yes	Quantity and weight of purchased goods	<p>Spend-based approach</p> <ul style="list-style-type: none"> Opex. spend converted into £ value of year of conversion factors using Bank of England inflation calculator. Emissions calculated using converted spend and spend-based emissions factors from DEFRA. 	Low/ Medium
2. Capital Goods	Yes	Capex. data, bucketed into categories	<p>Spend-based approach</p> <ul style="list-style-type: none"> Opex. spend converted into £ value of year of conversion factors using Bank of England inflation calculator. Emissions calculated using converted spend and spend-based emissions factors from DEFRA. 	Low/ Medium
3. Fuel-related Emissions	Yes	Electricity, gas and transport fuel consumption data from SECR	<p>Activity-based approach</p> <ul style="list-style-type: none"> Includes Well-to-Tank and T&D losses from direct (Scope 1) and indirect (Scope 2) energy consumption. For natural gas, other fuels and transport fuel consumption, the WTT emissions factors as published by the UK Government were applied to calculate Category 3 emissions. For electricity consumption, the transmission and distribution (T&D), WTT – generation and WTT – T&D emissions factors were applied to calculate category 3 emissions. These losses from other sources are included in their respective categories. 	Medium/ High

Table 5 continued

Scope 3 Category	Applicable	Data source/s	Method comments	Data quality rating
4. Upstream Transportation and Distribution	Yes	Spend on transport of products.	<p>Spend-based approach</p> <ul style="list-style-type: none"> • Spend on transportation services converted into £ value of year of conversion factors using Bank of England inflation calculator. • Emissions calculated using converted spend and spend-based emissions factors from DEFRA. 	Low/ Medium
5. Waste Generated in Operations	Yes	Categorised waste from waste notes. Waste spend data.	<p>Hybrid-based approach:</p> <p>Activity-based approach</p> <ul style="list-style-type: none"> • BEIS 2022 emissions factors for specified types of disposed material and specified disposal routes (recycling, energy recovery/combustion, landfill) used to calculate emissions <p>Spend-based approach</p> <ul style="list-style-type: none"> • Spend on waste services was converted into £ value of year of conversion factors using Bank of England inflation calculator. • Emissions calculated using converted spend and spend-based emissions factors from DEFRA. 	Medium
6. Business Travel	Yes	Transport method spend data.	<p>Spend-based approach</p> <ul style="list-style-type: none"> • Assumptions made on the average cost of a mile per transport mode in order to estimate the total distance travelled by each transport mode. • Assumptions made on average cost of hotel stay in order to estimate number of nights of hotel usage. • Distances and hotel stays converted to emissions using BEIS 2021 emissions factors.. 	Low/ Medium

Table 5 continued

Scope 3 Category	Applicable	Data source/s	Method comments	Data quality rating
7. Employee Commuting	Yes	Employee commuting questionnaire results FTE number	<p>Activity-based approach</p> <ul style="list-style-type: none"> Employee survey used to collect distance travelled, transport type and frequency. Annual emissions calculated for each employee that responded to survey Results extrapolated to account for full number of employees 	Medium/ High
11. Use of Sold Products	Yes	Quantity of properties, weight and operational emission information.	<p>Activity-based approach</p> <ul style="list-style-type: none"> For homes sold in the reporting year, an average emissions tCO₂e per year for each property was used to calculate the emissions of all properties sold. This information on the average emissions per property was taken from Sovereign Housing Association commissioned report, completed by Sero to assess the operational emissions of their portfolio in August 2023. 	Medium
12. End-of-life Treatment of Sold Products	Yes	Quantity, weight and item name of products sold. Product packaging weight and type.	<p>Activity-based approach</p> <ul style="list-style-type: none"> For homes sold in the reporting year, an average emissions tCO₂e per year for each property was used to calculate the emissions of all properties. End-of-life emission information was taken from the relevant Lifecycle Assessment (LCA) modules of Sovereign Housing Association Limited's commissioned report into Masonry and Timber framed homes completed by Verco. 	Medium
13. Downstream Leased Assets	Yes	Energy usage or floor spaced of leased asset	<p>Activity-based approach</p> <ul style="list-style-type: none"> For homes leased in the reporting year, an average emissions tCO₂e per year for each property was used to calculate the emissions of all properties. This information on the average emissions per property was taken from Sovereign Housing Association commissioned report, completed by Sero to assess the operational emissions of their portfolio in August 2023. 	Medium

Table 5 continued

Scope 3 Category	Applicable	Data source/s	Method comments	Data quality rating
8. Upstream Leased Assets	No	N/A	No upstream leased assets.	N/A
9. Downstream Transportation and Distribution	No	N/A	No downstream transportation	N/A
10. Processing of Sold Products	No	N/A	Sold products are final products, homes, and require no further processing	N/A
14. Franchises	No	N/A	No franchises	N/A
15. Investments	No	N/A	No investments	N/A

Glossary

Adjusted Spend: Adjusting the provided spend values for the baseline year 2020 to the year of the spend-based DEFRA databases (2018/2011). This adjusted value is used to calculate the associated carbon emissions.

Carbon Neutral: Carbon neutral means an organisation has purchased an equivalent number of compensatory measures, such as carbon offsets and green energy certificates, to neutralise their GHG emissions

Carbon Offsets: Investing in voluntary carbon offsets funds low-carbon projects that replace high emitting alternatives. Carbon offsets can be used to compensate for the emissions produced by a company.

Embodied Emissions: Embodied emissions are emissions associated with the cradle to gate manufacture of products, for example emissions produced through extraction of raw materials, transportation of material and manufacturing processes.

GHG Protocol: The Greenhouse Gas Protocol is the most widely used standards for calculating greenhouse gas (GHG) emissions.

Global warming potential: (GWP) GWP is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO₂). The larger the GWP, the more that a given gas warms the Earth compared to CO₂ over that time period.

Location-based emissions: Methodology to calculate scope 2 emissions using the average grid emissions factor of a region.

Market-based emissions: Methodology to calculate scope 2 emissions using emissions factors specific to the contractual instruments in place.

net-zero: net-zero requires a concerted effort over time to eliminate GHG emissions, with compensatory measures as a final step for any emissions that can't be reduced. The SBTi net-zero standard requires a 90% reduction in emissions prior to any residual offsets, up to 10% of the baseline, being offset using carbon removal offsets.

SBTi: The Science-Based Targets initiative (SBTi) is the internationally recognised body for validating emissions reduction targets that are in line with the latest climate science.

Scope 1: Emissions from gas usage and transportation fuels (under the company's control).

Scope 2: Emissions associated with the consumption of purchased electricity. Are presented on both a location based (using country average electricity emission factors) and market based (taking into account any purchased renewable generated electricity) approach.

Scope 3: Company's value chain emissions, divided into 15 categories, as established by the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting & Reporting Standard.

tCO₂: Tonnes of carbon dioxide gas released into the atmosphere. This metric is often used when reporting electricity emissions factors.

tCO₂e: Greenhouse gases have different global warming potentials and are converted to a carbon dioxide equivalent for ease of comparison and reporting.

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