AXTER

2022 Carbon Footprint Report

Final NCS Verified Report

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Contents

Introduction

Carbon Footprint Report Overview

The aim of this footprint report and associated works is to calculate the relevant Scope 1, 2 & 3 emissions footprint for all operational activities across Axter. In addition, emissions hotspots across the organisation have then been identified, providing the basis for action across Axter as it seeks to reduce carbon emissions across the organisation.

Axter Limited is a waterproofing design and manufacturing specialists. For more than 30 years, Axter has been working to reshape the future of roof waterproofing and sustainable roof design. Reinforced Bitumen Membrane (RBM) flat and low slope roof waterproofing system technology is at the heart of the business. Axter also specialises in hot melt, single ply and cold applied liquid waterproofing sectors and complement this impressive system range with green roof, blue roof, solar PV and multifunctional sustainable roof system finishes, that safeguard compatibility and single source responsibility.

Partners

Eight Versa

Eight Versa is a consultancy specialising in the quantification of environmental performance and multiple sustainability advisory services across a broad range of industries. Eight Versa aims to use its knowledge and expertise to enable Axter to achieve a measurable impact and plot a roadmap to become a more sustainable business.

Natural Carbon Solutions

Natural Carbon Solutions (NCS) is a certification body with comprehensive and third party verified carbon Footprinting and offsetting standards. It integrates multiple global and national standards to create a holistic Footprinting methodology which is relevant for all sectors, anywhere in the world. Whether for an organisation, building, product or event, the clarity and practicality of its four-step process enables a carbon Footprinting and reduction journey for every entity. NCS also hosts a bespoke offsetting portfolio comprising premium carbon credits that not only sequester carbon but provide measurable long-term gains for the environment such as enhanced biodiversity and other ecosystem services.

Executive Summary

Summary of Carbon Footprint

This footprint report details the operational carbon footprint of Axter for the 2022 reporting year. Total Greenhouse Gas (GHG) emissions for the organisation have been calculated following Natural Carbon Solutions methodologies that harmonise and align best-practice methodologies from across the sector, including the GHG Protocol and requirements of ISO 14064-1:2018.

This footprint report forms a key part of Axter's sustainability strategy and will allow the organisation to accurately quantify their operational emissions. The findings from this footprint report should be used to shape the organisations sustainability

Total Scope 1, 2 and Scope 3 emissions across Axter for the 2022 reporting year amount to 1,584.7 tCO_2e:

- Scope 1 emissions: 27.8 tCO_2e
- Scope 2 emissions: 8.0 tCO_2e
- Scope 3 emissions: 1,548.9 tCO_2e

The following sources of emissions have been identified as key emissions hotspots across the organisation:

Hotspot 1: Emissions from Downstream Transportation and Distribution (Scope 3): 701.3 tCO_2e

Hotspot 2: Emissions from Purchased Goods and Services (Scope 3): 322.0 tCO_2e

Hotspot 3: Emissions from Business Travel (Scope 3): 108.7 tCO_2e

Axter Ltd 2022 Carbon Footprint (tCO$_2$e)

Figure 1:
Total Scope 1,2 and 3 Emissions

- 🟢 **Total Scope 1 Emissions**
- ⚪ **Total Scope 2 Emissions**
- 🟢 **Total Scope 3 Emissions**

27.8

8.0

1,584.7
tCO$_2$e

1,548.9
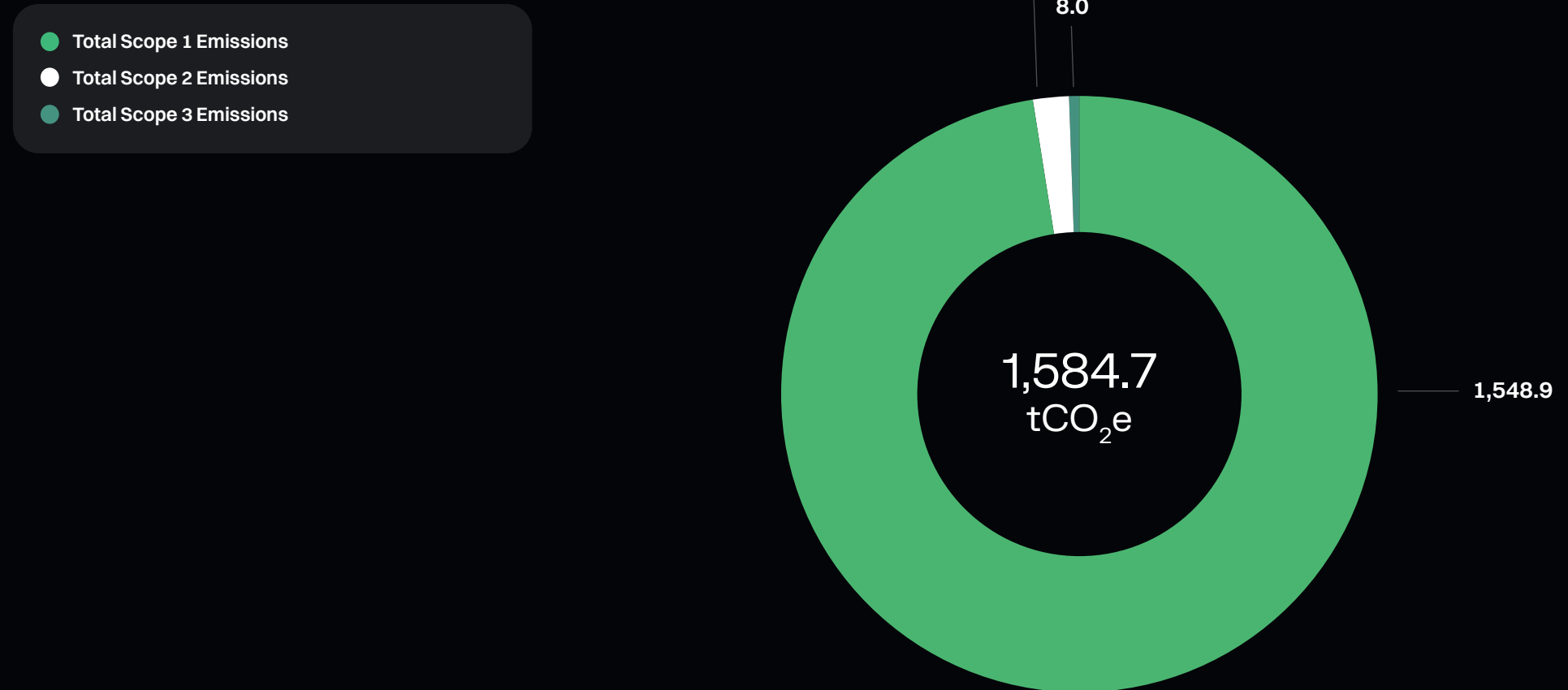
Carbon Footprint Methodology

Greenhouse Gas (GHG) Protocol and ISO14064 Standard

The methodology and calculations that have been used throughout this footprint report align with industry best practice guidance that is issued as part of ISO 14064-1:2018 and GHG protocol methodologies. A description of these methodologies is provided to the right.

- The GHG Protocol standard provides guidance for organisations who are looking to prepare a robust corporate-level GHG emissions inventory.

- It is the most widely used reporting standard and covers the accounting and reporting of the following seven GHGs covered by the Kyoto Protocol: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PCFs), sulfur hexafluoride (SF6) and nitrogen trifluoride (NF3).

- The methodology behind the GHG Protocol allows an organisation to report their carbon emissions in tonnes of Carbon Dioxide equivalent (tCO_2e), a reporting unit that considers the seven GHGs listed above.

- ISO 14064-1:2018 is an ISO standard that provides guidance for organisations who are working towards quantifying and reporting their GHG emissions and removals.

- The standard provides details on the key principles and requirements that should be followed when designing, developing, managing, and reporting organisational-level GHG inventories.

- Aligning to the approaches detailed in this standard will therefore ensure that any GHG inventory developed aligns with industry guidance and best practice.

Calculation approach

Datasets used for the purposes of this footprint calculation have been collected by Axter using direct sources where available. Figure 2 provides an overview of the calculation process that is used to quantify individual sources of emissions. Direct activity data provided by Axter is used, and emission factors for the dedicated reporting year are then applied to quantify total emissions from individual sources. Where consumption and primary activity data has not been provided, robust assumptions have been used to quantify total emissions.

A full breakdown of the sources and assumptions used for the purposes of this footprint calculation are provided in Appendix 2.

Analysis of results

Results from the footprint calculation have been broken down by emissions source and scope, as the data provided allows. Emissions have been categorised according to Scope 1, 2 and 3 emissions following best practice guidance provided by the GHG Protocol.

Selection of quantification approach

The appropriate quantification methodology has been selected in order to minimise uncertainty and yield accurate, consistent, and reproducible results. A quantification model has been developed to quantify the GHG emissions. Credible quantification tools provided by the GHG Protocol have been used where applicable.
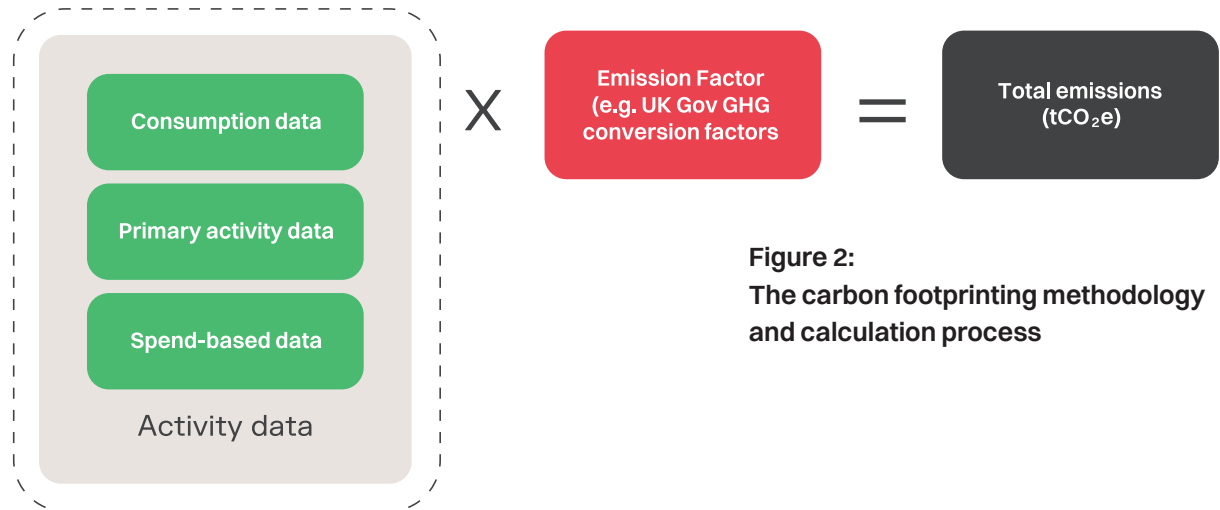
Figure 2:
The carbon footprinting methodology and calculation process

Carbon Footprint Reporting Boundary

In alignment with ISO 14064-1:2018 guidance, the organisational boundary of the assessment is initially defined using one of the following consolidation approaches: Equity share: the organisation accounts for its portion of GHG emissions and/or removals from respective facilities. Financial control: the organisation accounts for all GHG emissions and/or removals from facilities over which it has financial control. Operational control: the organisation accounts for all GHG emissions and/or removals from facilities over which it has operational control. An operational control approach has been selected for this carbon footprint assessment.

Reporting Boundary

Once an organisational boundary has been set, the reporting boundaries of the assessment are then agreed according to GHG Protocol guidance, which is outlined in Figure 3. The seven GHG emissions included under the GHG Protocol are categorised according to the following scopes:

Scope 1 (Direct).
Scope 2 (Indirect).
Scope 3 (Indirect, Upstream, Downstream).

Eight Versa have worked closely with the project team at Axter to define a robust reporting boundary for this carbon footprint assessment. Appendix 2 provides a full breakdown of the GHG Inventory for Axter.
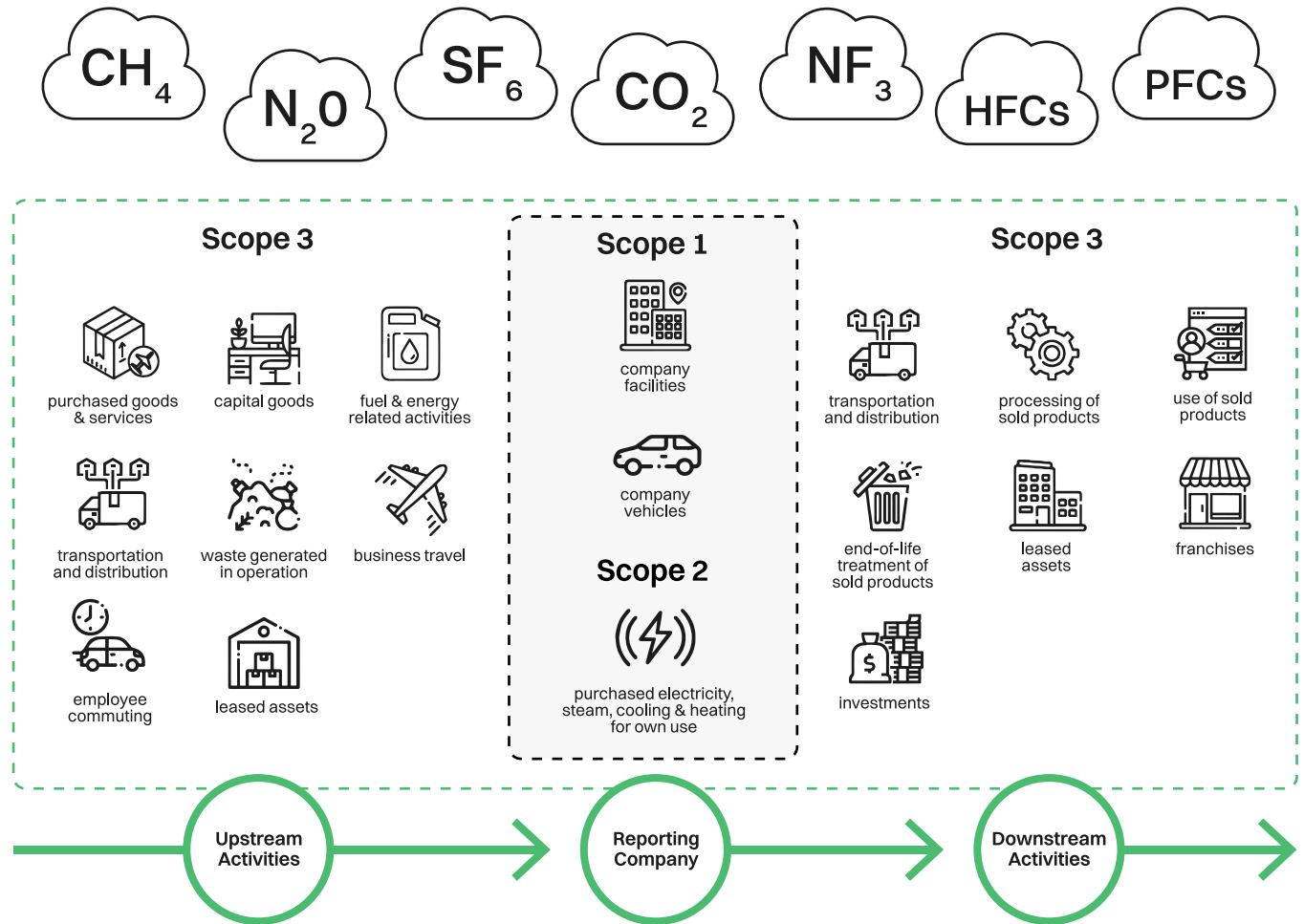

Figure 3: Overview of the GHG Protocol reporting boundaries

The following diagram indicates the sources of emissions that have been included in this carbon footprint assessment for Axter. Those sources of emissions that were deemed to be material to operations across Axter during the 2022 reporting year have been included in this footprint calculation, based on the operational control approach as defined by the GHG Protocol.

Scope 1
Direct

- Stationary fuel combustion
- Vehicle fuel consumption
- Fugitive emissions

Scope 2
Indirect

- Purchased electricity
- Purchased heat or steam

Scope 3
Indirect

Upstream

- Purchased goods and services
- Capital goods
- Fuel and energy related activities
- Upstream transportation and distribution
- Waste
- Business travel
- Employee Commuting
- Upstream leased assets

Downstream

- Downstream transportation and distribution
- Processing of sold goods
- Use of sold products
- End of life treatment of sold products
- Downstream leased assets
- Franchises
- Investments

Sources of Axter's emissions included in this carbon footprint

Sources of Axter's emissions included in this carbon footprint

Scope 1 and 2 Emissions

Executive Summary Total
Scope 1 and 2 emissions across Axter during the 2022 reporting year amount to 35.8 tCO$_2$e.

● **Scope 1**

During the 2022 reporting period, Axter had no gas consumption across their offices, therefore stationary combustion was excluded from this assessment. In addition to this there were no leaks or top ups of refrigerant gases across Axter's sites, hence the exclusion of fugitive emissions sources from this baseline carbon footprint for 2022. During 2022, Axter operated 12 vehicles (Mobile Combustion) which produced 27.8 tCO2e contributing 78% to the organisations total Scope 1 and 2 emissions.

Scope 1 Total: 27.8 tCO$_2$e

● **Scope 2**

This category accounts for the emissions associated with electricity consumption across Axter owned and operated sites. As Axter only moved into their current offices part way through 2022, a number of assumptions were taken to represent emissions generated during a full year of Axter occupying the office space and a full year of electricity consumption. These assumptions are detailed in Appendix 2.

Scope 2 Total: 8.0 tCO$_2$e

Scope 1 and 2 Emissions (tCO$_2$e)

Figure 4: Total Scope 1&2 emissions of Axter (tCO$_2$e)

- ● Scope 1
- ○ Scope 2

8.0

27.8

35.8
tCO$_2$e
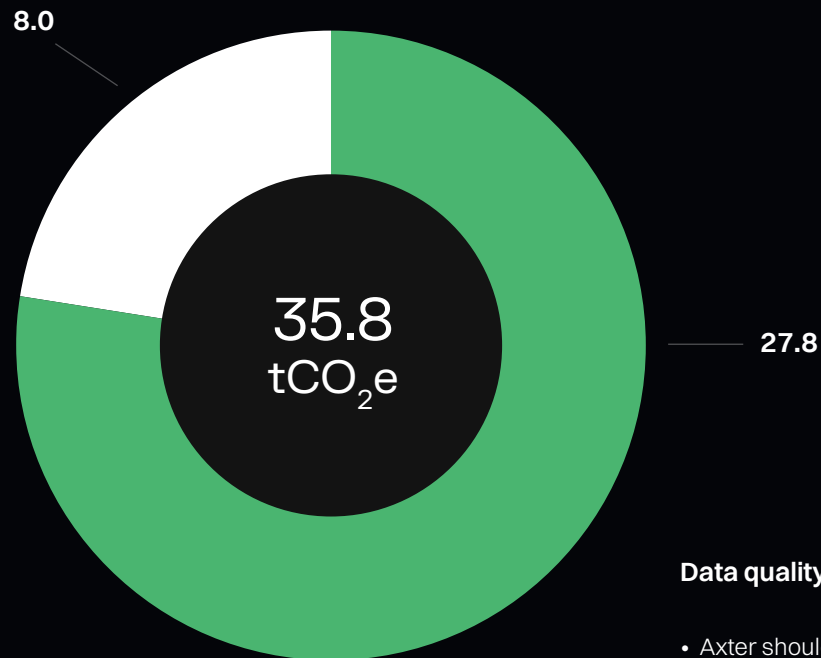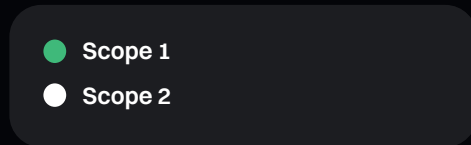
Data quality recommendations

• Axter should look to continue to track the mileage completed by company cars and track data on fuel consumption with records of the engine size of each vehicle.

• Axter should ensure that all buildings have accurate and up to date records of kWh electricity consumption, this will help maintain accurate footprint calculations for future assessments.

Scope 3 Emissions

Scope 3
Emissions Breakdown

• **Scope 3 emissions across Axter arise to 1,548.9 tCO$_2$e**, accounting for 98% of the total carbon footprint for the organisation.

• A breakdown of all Scope 3 emissions sources included in this assessment is shown in Figure 5.

• It is clear from this analysis that **Downstream Transportation and Distribution is the largest source of Scope 3 emissions**, accounting for 45% (701.3 tCO$_2$e) of total Scope 3 emissions.

• The identification of emissions hotspots across the organisation will allow Axter to prioritise targeted action towards reducing overall emissions from these categories.

Scope 3 Emissions Breakdown (tCO$_2$e)

Figure 5: Breakdown of total Scope 3 emissions of Axter (tCO2e)

Category	tCO2e
Downstream T&D	701.3
PG&S	322.0
Business travel	108.7
Upstream T&D	105.3
End-of-life treatment	96.8
Capital goods	95.4
Processing of sold products	58.4
Employee vommuting	33.8
Upstream leased assets	15.5
Fuel and energy-related activities	9.6
Waste	2.2
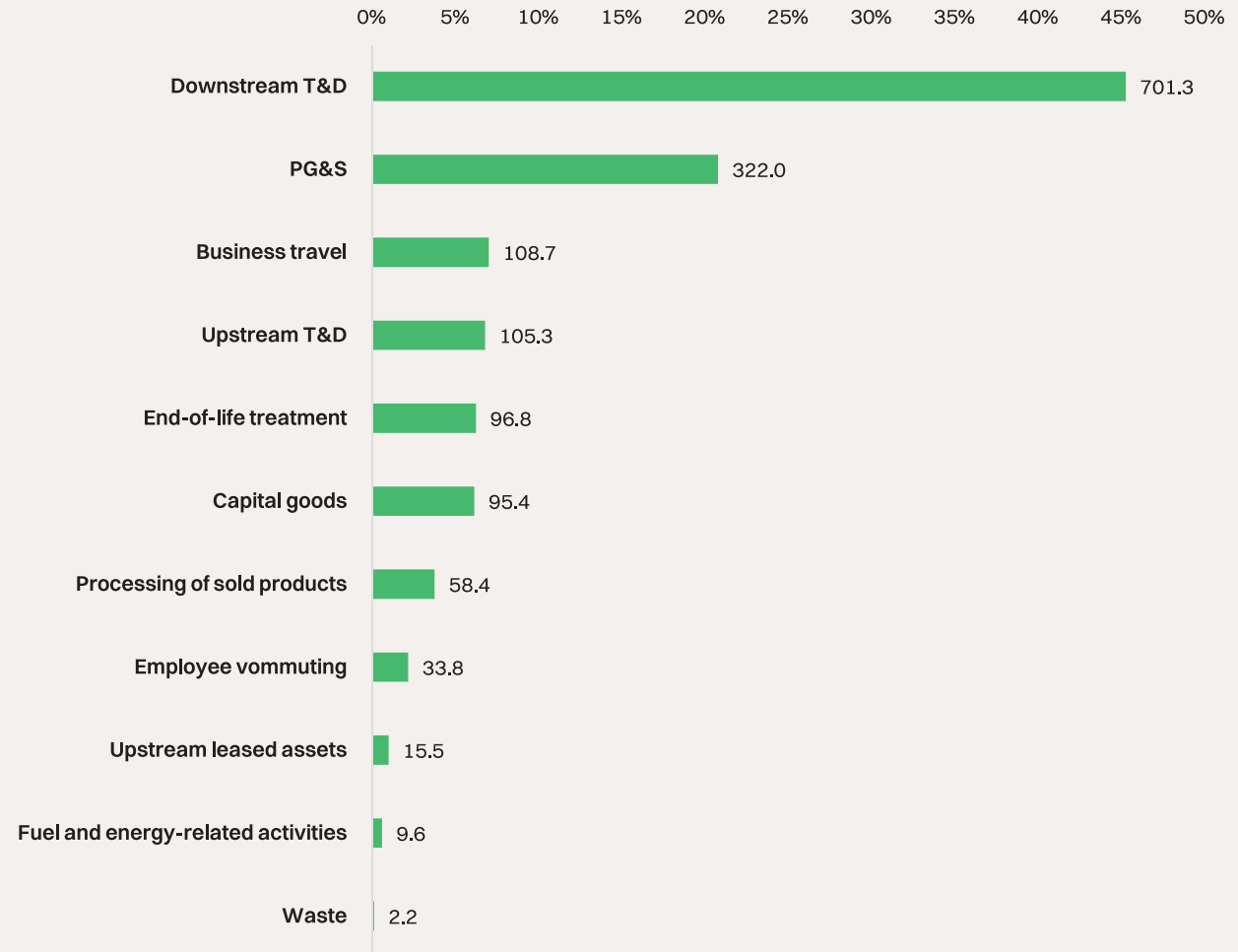
Scope 3.1
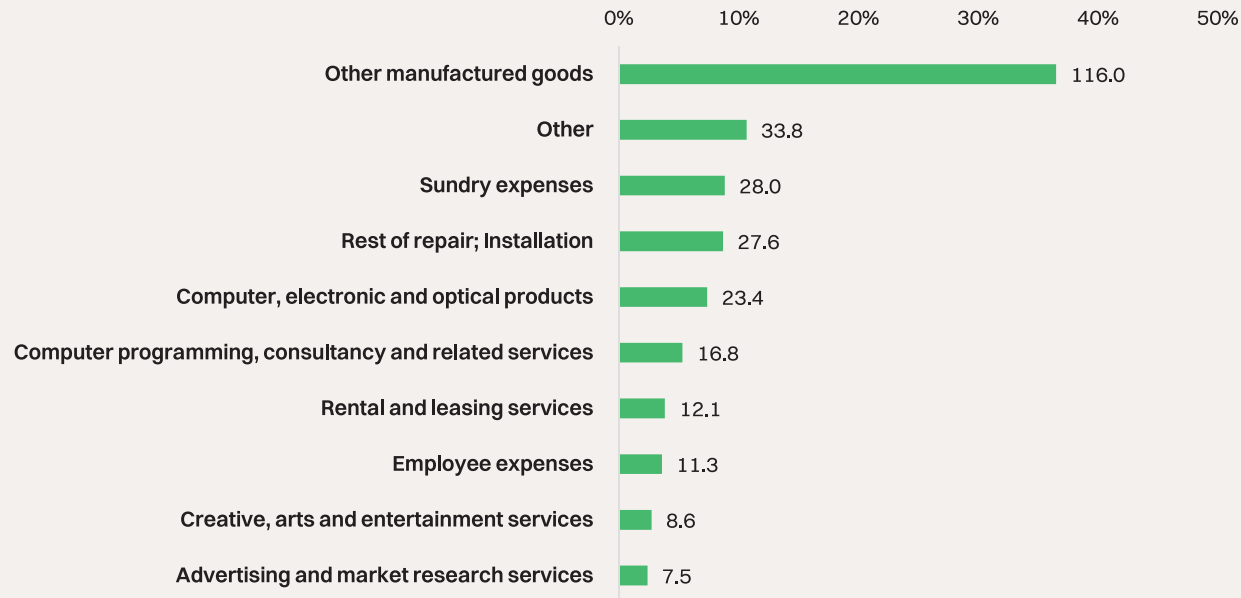# Purchased Goods & Services Emissions

Details regarding the upstream emissions from operational purchased goods across Axter are provided to the right.

• This section considers the upstream emissions associated with the production and processing of all operational related goods purchased by Axter during the 2022 reporting year.

• Emissions from this category have been calculated using financial data covering the total spend associated with individual products, as shown in Figure 6.

• Figure 6 provides an overview of the emissions associated with operational related goods procured across 2022, categorised according to their overall spend per supplier across Axter. The majority of emissions are associated with manufactured goods that were purchased by Axter during the 2022 reporting period.

Total Scope 3.1a Purchased Goods and Services:
Core Operations Emissions 322.0 tCO$_2$e

Emissions from Top 10 Spend Categories across Axter Ltd (tCO$_2$e)

Figure 6: Purchased Goods and Services emissions (tCO$_2$e)

Category	tCO$_2$e
Other manufactured goods	116.0
Other	33.8
Sundry expenses	28.0
Rest of repair; Installation	27.6
Computer, electronic and optical products	23.4
Computer programming, consultancy and related services	16.8
Rental and leasing services	12.1
Employee expenses	11.3
Creative, arts and entertainment services	8.6
Advertising and market research services	7.5

Data quality recommendations

Axter now have an initial understanding of the total emissions associated with purchased goods. Recommendations to reduce these emissions include:

• Engaging with individual suppliers to obtain supplier specific cradle-to-gate emissions data, where possible. A cradle-to-gate approach is an assessment methodology which seeks to quantify the partial life cycle emissions of an individual product/service, from resource extraction through to final manufacturing.

• As an initial recommendation, a hybrid approach may be adopted, whereby Axter seek to obtain supplier specific emissions data for selected, high-value items which represent 10% of total spend across the organisation.

• Axter should look to engage with individual suppliers of high-value items to obtain supplier specific cradle-to-gate emissions data, where possible.

Scope 3.2
Capital Goods

Details regarding the upstream emissions associated with Capital Goods purchased across Axter during 2022 are provided to the right.

This category considers the upstream emissions associated with the production and processing of all capital goods purchased by Axter during the 2022 reporting year.

Emissions from capital goods have been calculated using financial data covering the total spend associated with individual services.

Total Scope 3.2 Capital Goods Emissions: 95.4 tCO$_2$e

Capital Goods
(tCO$_2$e)

Figure 7: Operational Purchased Goods and Services: Services emissions (tCO$_2$e)

Data quality recommendations

Axter now have an initial understanding of the total emissions associated with Capital Goods. Recommendations to reduce these emissions include:

• Axter should encourage service providers to begin measuring their Scope 1 and 2 emissions.

• Axter can then use these Scope 1 and 2 figures to apportion out their overall contribution from services purchased by the organisation.

Scope 3.3
Fuel and Energy-related Activities Emissions

This category covers the upstream emissions associated with the production of fuels and energy that are purchased and consumed by Axter (Scope 1 and 2 emissions) across the reporting year.

- Upstream emissions from purchased fuels (Gas)

- Upstream emissions from purchased electricity (considering the emissions from fuels used to generate electricity that is consumed across Axter)

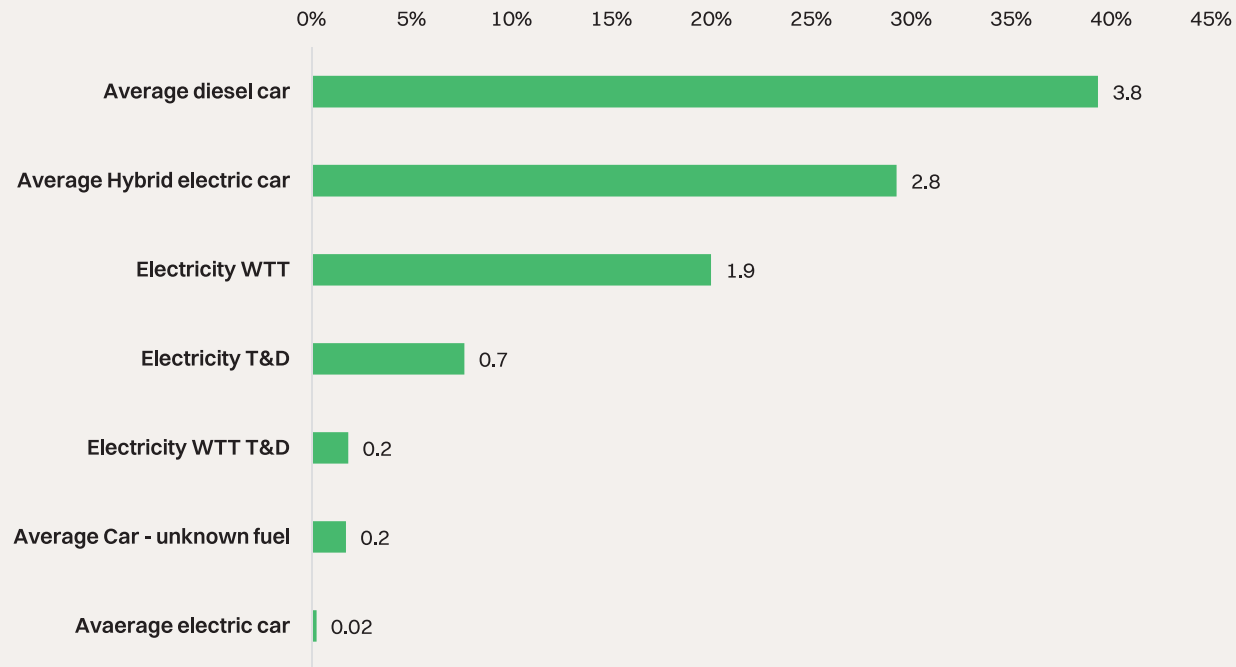- Transmission and distribution losses from purchased electricity

Emissions from this category arise to tCO_2e. Upstream emissions associated with the use of an average diesel car represents the largest source of emissions, totalling 3.8 tCO_2e, 39% of total emissions from this category, as shown in Figure 12. This figure represents the emissions associated with the extraction and production of fuels used to generate electricity that is consumed by Axter, in addition to transmission and distribution losses.

Following the guidance of the GHG Protocol, an organisation must report on their Scope 1 and 2 emissions using a location-based approach, which takes into account national-level emission factors. Regardless of whether an organisation has switched to green electricity supply, they are encouraged to continue reporting their emissions using a location-based approach to carbon accounting.

Total Scope 3.3 Fuel and Energy Related Activities Emissions: 9.6 tCO_2e

Fuel and Energy Related Activites (tCO$_2$e)

Figure 8: Fuel and Energy Related Activities emissions (tCO$_2$e)

Category	tCO$_2$e
Average diesel car	3.8
Average Hybrid electric car	2.8
Electricity WTT	1.9
Electricity T&D	0.7
Electricity WTT T&D	0.2
Average Car - unknown fuel	0.2
Avaerage electric car	0.02

Data quality recommendations

• Axter should continue to collect robust records of gas, fuel and electricity consumption across the organisation. This will ensure that calculations for Scope 1, 2 and Scope 3 fuel and energy related activities emissions are reliable and representative of consumption across the organisation.

Scope 3.4
Upstream Transportation and Distribution Emissions

This category covers the emissions associated with the transportation and distribution of products completed by logistics suppliers on behalf of Axter.

The emissions from this category have been calculated using the weight and distance data provided by transportation and distribution suppliers used by Axter during the 2022 reporting period.

Deliveries completed by Axter were the top contributors to the emissions within this category, accounting for 47.1 tCO_2e (45%). These deliveries consist of goods supplied directly by Axter to customers with all deliveries starting in Courchelettes, France.

A total of 352 deliveries were completed during 2022 which fall within scope of this category. This generated a total of 105.3 tCO_2e, contributing 6.6% to Axter's total 2022 Carbon Footprint.

Total Scope 3.4 Upstream Transportation & Distribution Emissions: 105.3 tCO_2e

Upstream Transportation and Distribution (tCO$_2$e)

Figure 9: Upstream Transportation and Distribution emissions (tCO$_2$e)
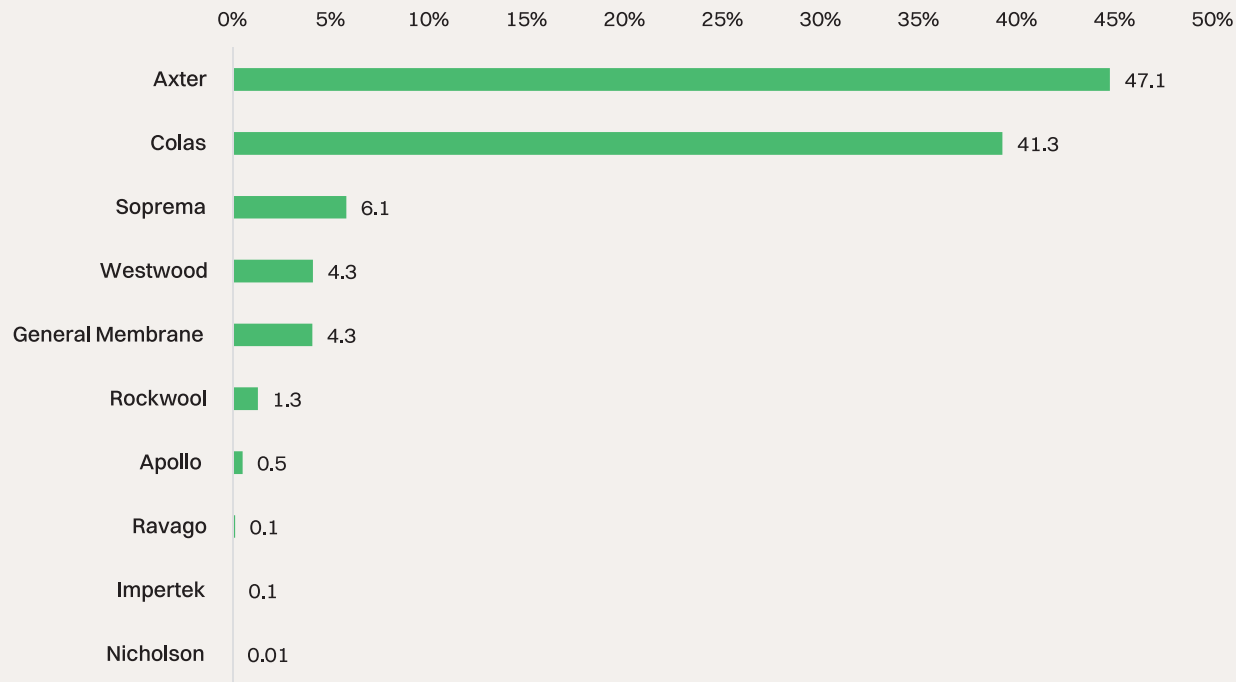
Data quality recommendations

• As a priority, Axter should now engage with selected suppliers/couriers to request information on the fuel consumption from journeys associated with delivering goods and services to Axter sites.

• To support this Axter should continue to collect supplier specific information regarding the type of vehicle used and overall distance travelled by their suppliers when transporting purchased products to Axter sites.

Scope 3.5
# Operational Waste and Water Emissions

This category includes emissions from the disposal of both solid waste and wastewater across Axter in 2022.

• This category utilises the UK Government emission factors for waste. For waste that is recycled or treated via combustion, the emission factors used only account for the transportation and preparation of waste materials prior to the treatment process taking place. For waste that is sent to landfill, the emission factors provided by the UK Government cover the whole life cycle of the waste that is generated.

• The largest source of emissions from waste are associated with general waste, which contributed 1.3 tCO_2e (Figure 10).

Total Scope 3.5 Waste Emissions: 2.1 tCO_2e

Waste Emissions (tCO$_2$e)

Figure 10: Operational waste disposal and treatment emissions (tCO$_2$e)

General waste	1.3
Mixed recycling	0.8
Sanitary waste	0.007
Confidential waste	0.005
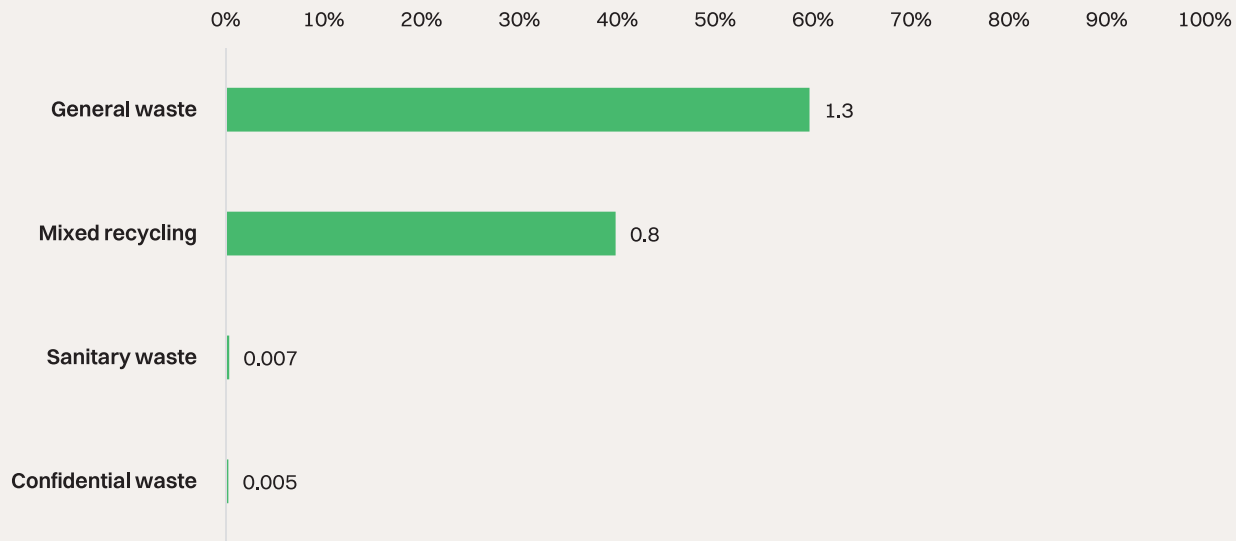
Data quality recommendations

• Axter should aim to develop/use a centralised data collection system that tracks the volume of waste generated across all sites to ensure that the data used in future calculations is accurate and reflective of actual figures.

• Axter should continue to track the total amount of waste generated through all operations, recording; type of waste, weight of waste collected, number of collections per year and disposal method used for each type of waste.

Water Emissions

• Upstream emissions associated with the supply and treatment of water used across Axter arise to 0.12 tCO_2e (Figure 11). The largest source of emissions from water use across Axter is associated with effluent water (wastewater), which accounts for 65% of emissions (0.08 tCO_2e).

• This category considers the scope 1&2 emissions of wastewater management companies that collect and treat wastewater generated across Axter sites during the 2022 reporting period.

Total Scope 3.5 Wastewater Emissions: 0.12 tCO_2e

Wastewater and Water Supply Emissions (tCO$_2$e)

Figure 11: Water supply and treatment emissions (tCO$_2$e)

- ● Water Consumption
- ○ Wastewater

0.08

0.04

0.12
tCO$_2$e
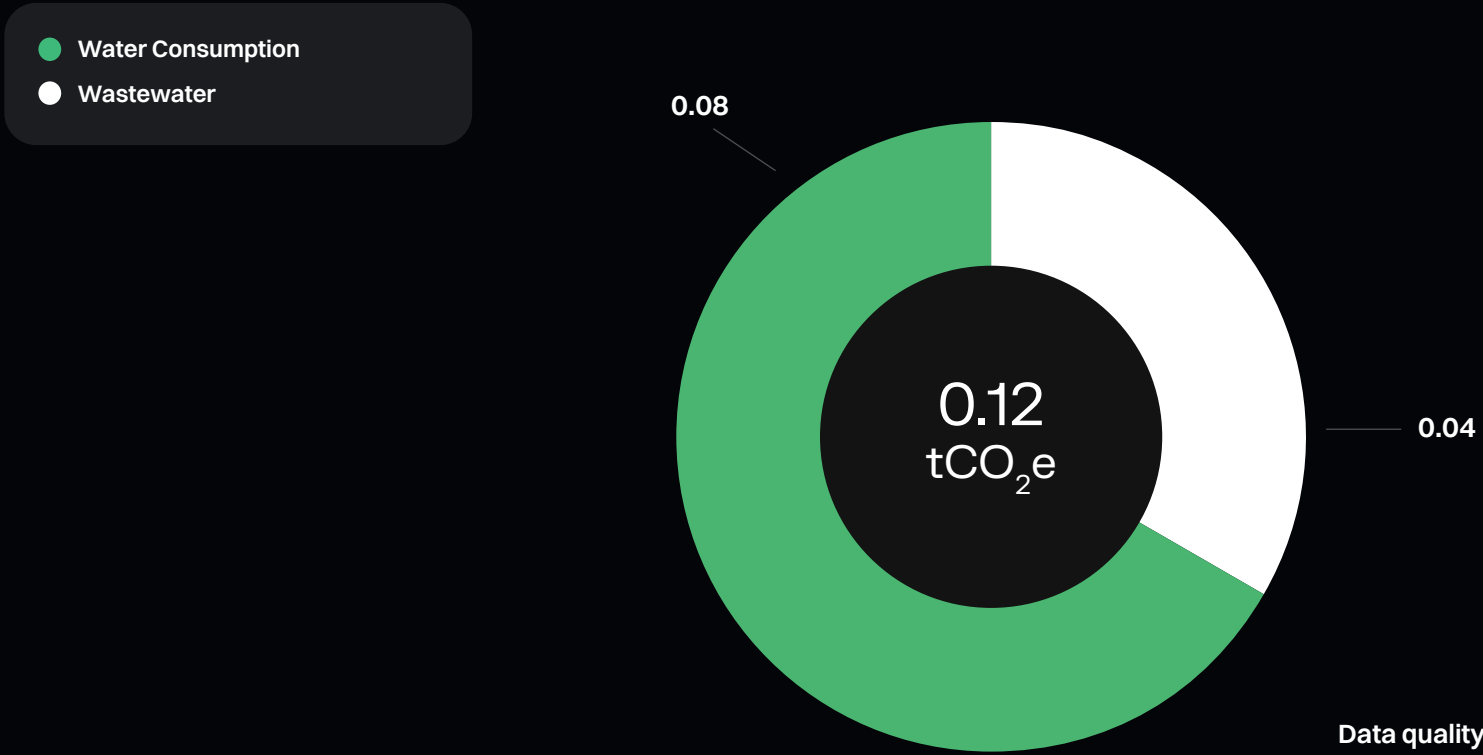
Data quality recommendations

• Axter should look to keep consistent records of water invoices in order to accurately track water consumption across all sites along with wastewater collection. This will remove the need to use averages for consumption data where actual water metre readings are not available.

Scope 3.6
Business Travel Emissions

This category includes emissions from journeys completed by Axter employees for business related activities in vehicles/modes of transport owned or operated by third parties, such as the use of National Rail services.

Emissions from employee overnight stays in hotels have also been included in this assessment.

• Financial data has been used to calculate the emissions associated with business mileage, mileage, travel expenses and fuel. Axter should seek to collect primary data on all journeys relating to business travel from these categories for future footprint calculations. Primary data was provided for all hotel stays and flights completed in 2022.
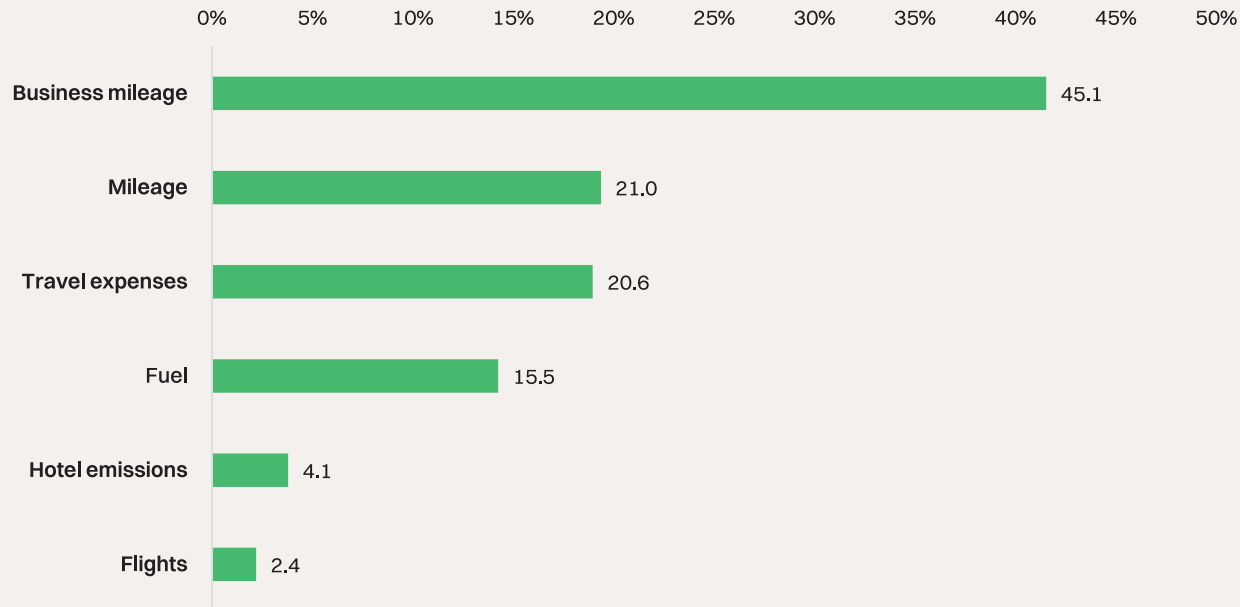
• The largest source of emissions is associated with business mileage that was claimed back as an expense by Axter employees, which accounts for 42% of total emissions from business travel (45.1 tCO_2e). A total of 129,910 miles were claimed as business miles during the 2022 reporting period.

• Flights taken in 2022 were the lowest contributor to this category, this is due to only 16 flights (including return) being taken which equates to 6,865 miles. It is still advised that Axter reduce the number of flights taken each year where possible to mitigate emissions from this category.

Total Scope 3.6 Business Travel Emissions: 108.7 tCO_2e

Business Travel (tCO$_2$e)

Figure 12: Business Travel emissions (tCO$_2$e)

Category	Value
Business mileage	45.1
Mileage	21.0
Travel expenses	20.6
Fuel	15.5
Hotel emissions	4.1
Flights	2.4

Data quality recommendations

• Axter should work towards collecting more in-depth records of journeys completed as part of business travel across the organisation. Data should include a full breakdown of the distance travelled, vehicle/mode of transport used, fuel consumption (if available), overall frequency of these journeys, and the location and number of overnight hotel stays.

• Axter should look towards gathering all datasets for this category through a centralised Business travel booking system which accurately records all journeys completed by employees across the organisation.
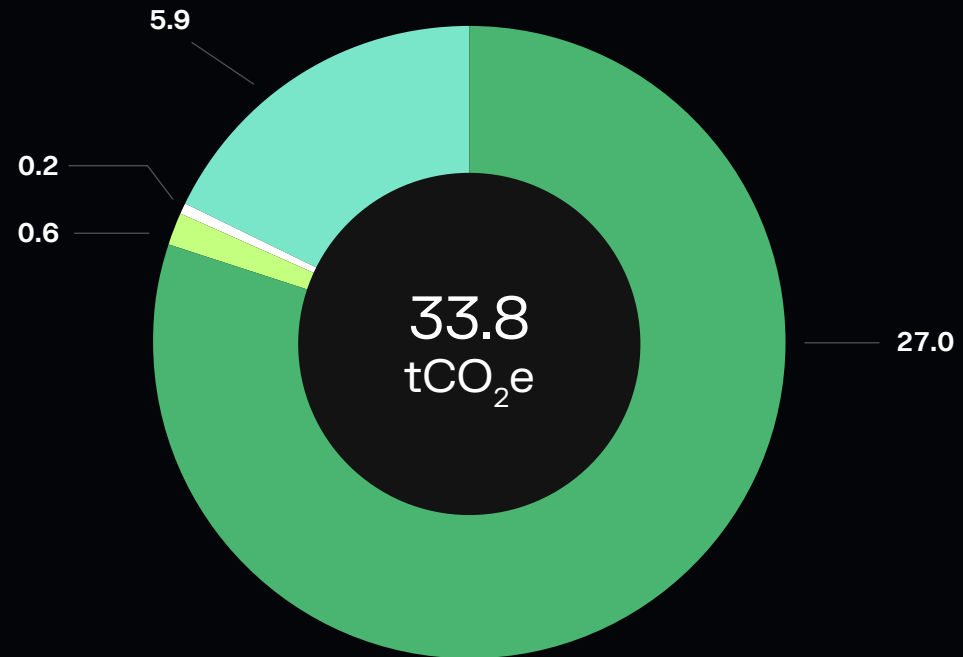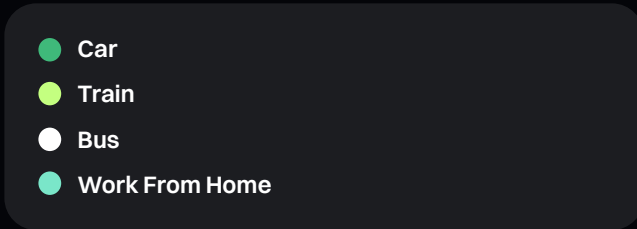
Scope 3.7 Employee Commuting Emissions

Details of the emissions associated with Employee Commuting are provided here:

• This category includes emissions from employees commuting from their homes to the workplace. This category also accounts for the emissions generated by employees while working from home as Axter adopted a hybrid working style for employees during 2022.

• Emissions have been calculated using employee postcode data, in addition to information on the mode of transport used by employees commuting to Axter sites. Please refer to Appendix 2 for a description of assumptions used for this calculation.

• Emissions relating to employees working from home considers the emissions generated from the assumed electricity and heating consumption of individual employees.

• Results from the Employee Commuting Survey (15 responses) and the Working from Home Survey (9 responses) have been extrapolated to account for all employees across Axter during the 2022 reporting year (35 employees).

• The majority of emissions associated with this category are generated from employees using cars to commute into Axter offices, accounting for 80% (27 tCO2e) of this category shown in Figure 17.

Total Scope 3.7 Employee Commuting Emissions: 33.8 tCO$_2$e

Employee Commuting (tCO$_2$e)

Figure 13: Employee Commuting emissions (tCO$_2$e)

- ● Car
- ● Train
- ● Bus
- ● Work From Home

5.9

0.2

0.6

33.8
tCO$_2$e

27.0

Data quality recommendations

• A number of assumptions have been used in order to calculate emissions from employee commuting. To improve the accuracy of footprint calculations going forward, Axter should seek to develop an annual staff commuting survey and ensure all employees complete the survey each year moving forward. Primary data of this nature can then be used directly for on-going footprint measurements.

• Axter should focus on collecting data from employees which quantifies the overall distance travelled whilst commuting to the workplace, the frequency of travel, alongside the transport modes used whilst commuting.

Scope 3.8
Upstream Leased Assets

Details of the emissions associated with upstream leased assets across Axter are provided here:

• This category covers the Scope 1 and 2 emissions associated with assets that were leased by Axter from a third-party organisation during 2022 (Upstream Leased Assets).

• Figure 14 quantifies the Scope 2 electricity emissions from the leased warehouse space. No gas was consumed at the warehouse during 2022.

• Electricity invoice data was not available for the leased site during the 2022 reporting year. Benchmarks for electricity consumption based on floor area provided by CIBSE were applied to account for the Scope 2 emissions.

Upstream Leased Assets (tCO$_2$e)

Figure 14: Emissions associated with upstream leased office spaces (tCO$_2$e)
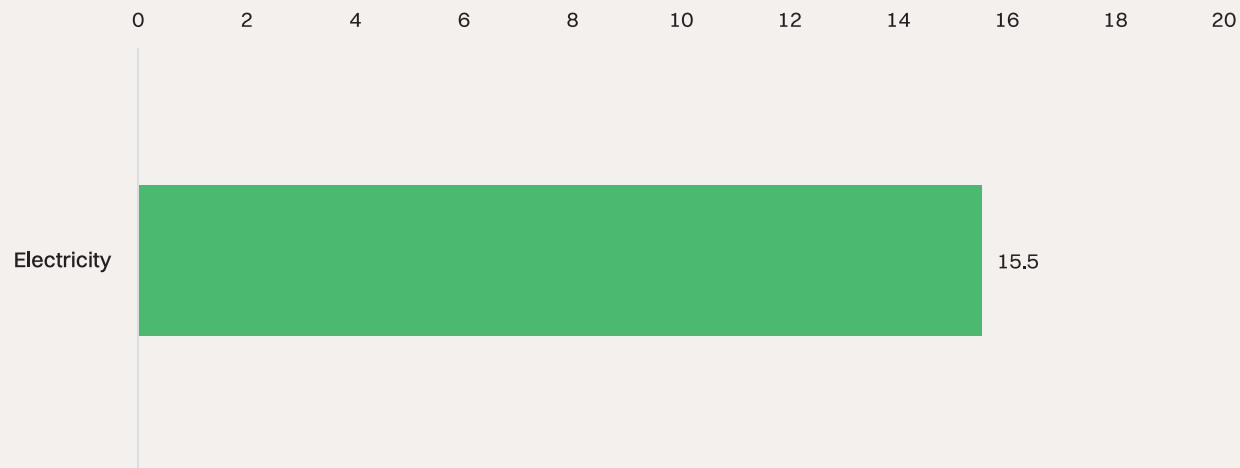
Data quality recommendations

• For all leased assets across the organisation, Axter should work closely with the building operator/tenant to ensure that robust Scope 1 and 2 consumption data is being recorded. This will help to improve the reliability of Scope 3 footprint calculations across the organisation.

• Axter should engage directly with their building providers and hold one to one meetings with key representatives. This will allow Axter to set out their organisational needs and help to encourage landlords to consider measures that will help reduce operational building emissions. As an example, Axter could suggest that selected buildings are subject to in-depth energy assessments to help identify energy efficiency opportunities across office spaces.

• Axter could also consider looking into the adoption of 'Green Leases'. These can be an effective way through which both tenants and landlords can agree to share datasets and collaborate with one another to reduce operational emissions from selected leased assets.

Scope 3.9
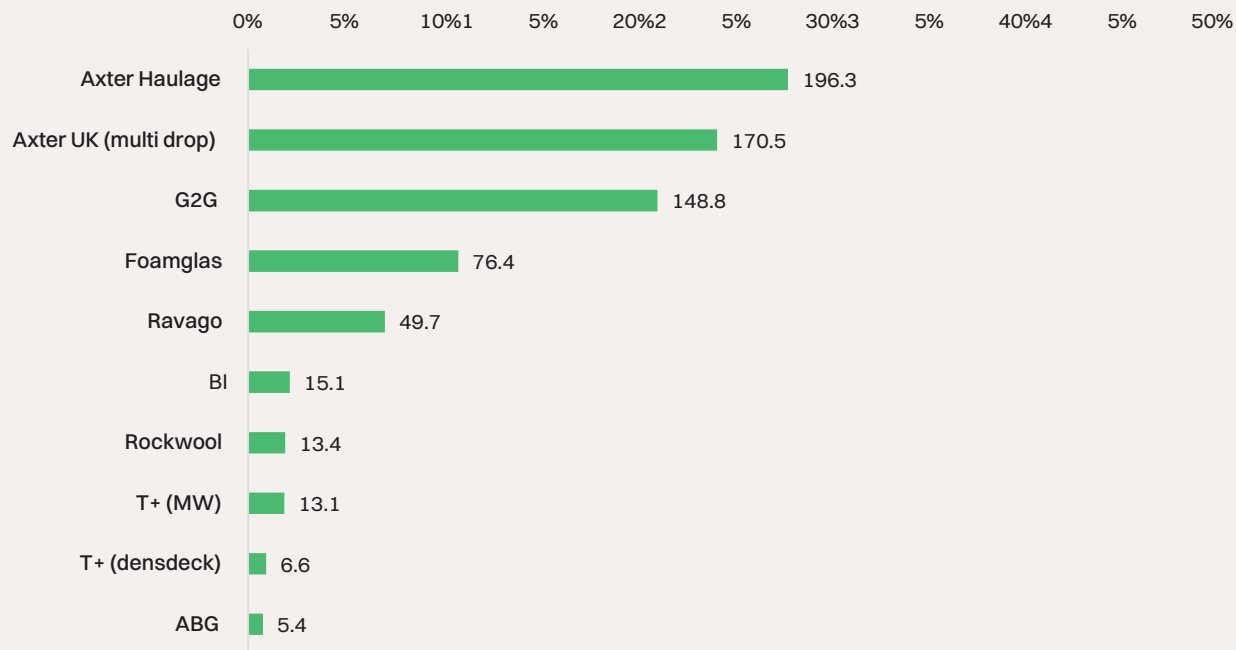# Downstream Transportation and Distribution Emissions

Details of the emissions associated with downstream transportation and distribution services are provided here.

• This category considers the downstream emissions from journeys that are used to transport Axter products to the consumer in vehicles not owned or operated by Axter. This category is different from upstream transportation and distribution as the consumer pays for these journeys.

• The emissions from this category have been calculated using the weight and distance data provided by transportation and distribution suppliers used by Axter during the 2022 reporting period.

• A total of 3,732 deliveries were completed during 2022 which fall within scope of this category. This generated a total of 701.3 tCO_2e. Figure 15 highlights the emissions from the top 10 suppliers that provided a postal and courier service for Axter at the expense of the customer – these top 10 suppliers account for 695.2 tCO_2e (99.1%) of total emissions from this category.

Total Scope 3.9 Downstream Transportation and Distribution Emissions: 701.3 tCO_2e

Downstream Transportation and Distribution: Top 10 Suppliers (tCO$_2$e)

Figure 15: Downstream Transportation and Distribution emissions (tCO$_2$e)

Supplier	tCO$_2$e
Axter Haulage	196.3
Axter UK (multi drop)	170.5
G2G	148.8
Foamglas	76.4
Ravago	49.7
BI	15.1
Rockwool	13.4
T+ (MW)	13.1
T+ (densdeck)	6.6
ABG	5.4

Data quality recommendations

• As a priority, Axter should now engage with selected suppliers/couriers to request information on the fuel consumption from journeys associated with delivering goods and services to Axter sites.

• To support this Axter should continue to collect supplier specific information regarding the type of vehicle used and overall distance travelled by their suppliers when transporting purchased products to Axter sites.

Scope 3.10
Processing of Sold Goods Emissions

This category seeks to quantify the emissions associated with the processing of sold intermediate products before use by the end consumer. Therefore, the emissions associated with the installation of roofing solutions sold by Axter in the 2022 reporting year are included here.

• For this category, emissions are generated from the use of four tools during the installation of each roofing solution during 2022. Emissions were calculated based on the quantity of fuel consumed by each tool during each roofing installation. The tools used are;

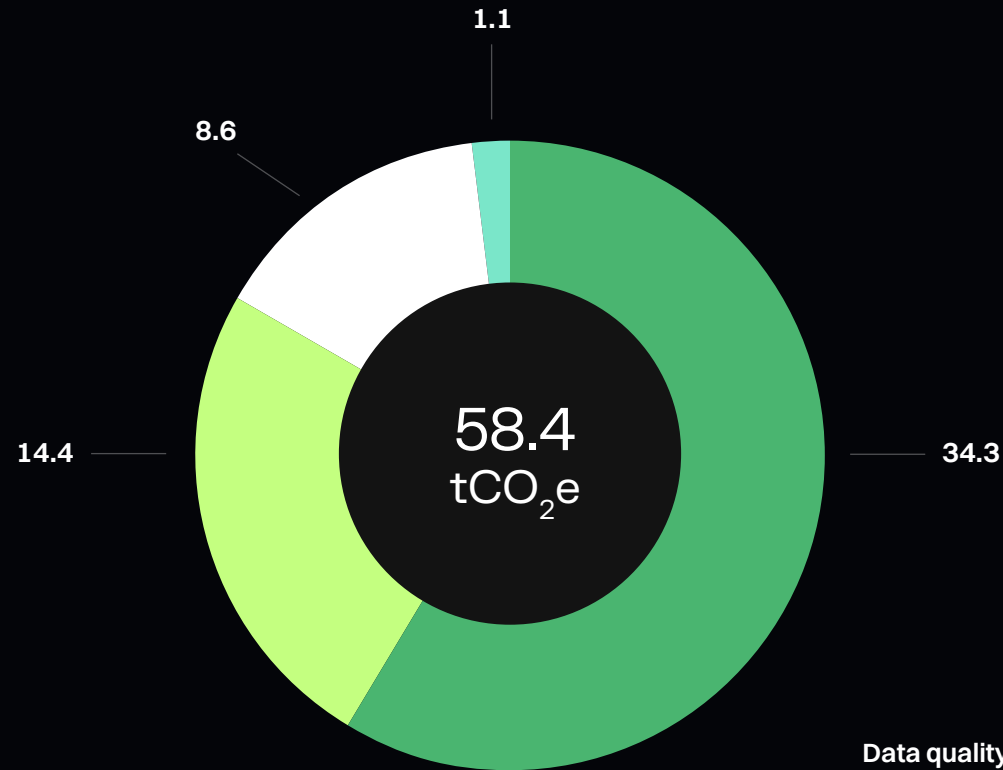• Sievert Promatic Roofing Gas Blow Torch Kit (LPG)
• Sievert Promatic 3356 Large Detail Power Burner (LPG)
• Sievert Promatic 3350 Small Detail Power Burner (LPG)
• Leister TRIAC ST Roofing Kit LITE 120v (Electricity)

• Please see Appendix 2 for a full breakdown on the methodology used to calculate carbon emissions for this category.

Total Scope 3.10 Processing of Sold Goods Emissions: 58.4 tCO$_2$e

Processing of Sold Goods (tCO$_2$e)

Figure 16: Processing of Sold
Goods emissions (tCO$_2$e)

Legend:
- Sievert Promatic 3356 Large Detail Power Burner
- Sievert Promatic 3350 Small Detail Power Burner
- Sievert Promatic Roofing Gas Blow Torch Kit
- Leister TRIAC ST Roofing Kit LITE 120v

58.4 tCO$_2$e

1.1
8.6
14.4
34.3

Data quality recommendations

• Axter should track all tools used for installations of each roofing solution sold and log the amount of fuel consumed by each tool per installation.

Scope 3.12
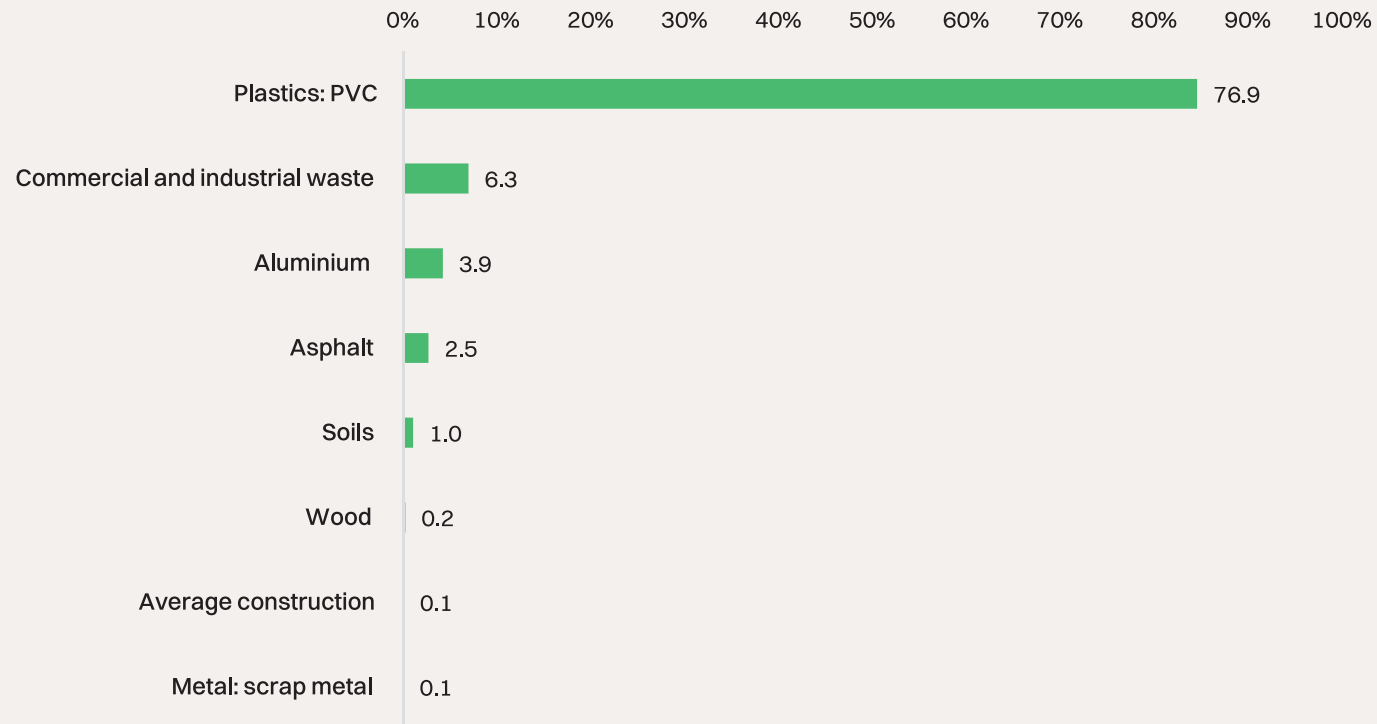# End-of-Life Treatment of Sold Products Emissions

Total Scope 3.12 End of Life
Treatment of Sold Products:
96.8 tCO$_2$e

A breakdown of the emissions associated with the end-of-life treatment of products sold by Axter is provided below:

• This category includes emissions from the waste disposal and treatment of products sold by Axter at the end of their life. For products that are recycled or treated via combustion, the emission factors used only account for the transportation and preparation of waste materials prior to the treatment process taking place. For products that are sent to landfill, the emission factors provided by the UK Government cover the whole life cycle of the waste that is generated.

• Figure 20 highlights the emissions associated to the end-of-life treatment of materials directly sold by Axter during 2022. Emissions from the end-of-life treatment of materials sold by Axter in 2022 totals 90.3 tCO$_2$e.

• A number of assumptions and proxies have been used in order to calculate emissions associated with this category, please refer to Appendix 2.

End-of-Life Emission from Sold Products (tCO$_2$e)

Figure 17: End-of-Life Emission from Sold Products
(tCO$_2$e)

Category	Value
Plastics: PVC	76.9
Commercial and industrial waste	6.3
Aluminium	3.9
Asphalt	2.5
Soils	1.0
Wood	0.2
Average construction	0.1
Metal: scrap metal	0.1

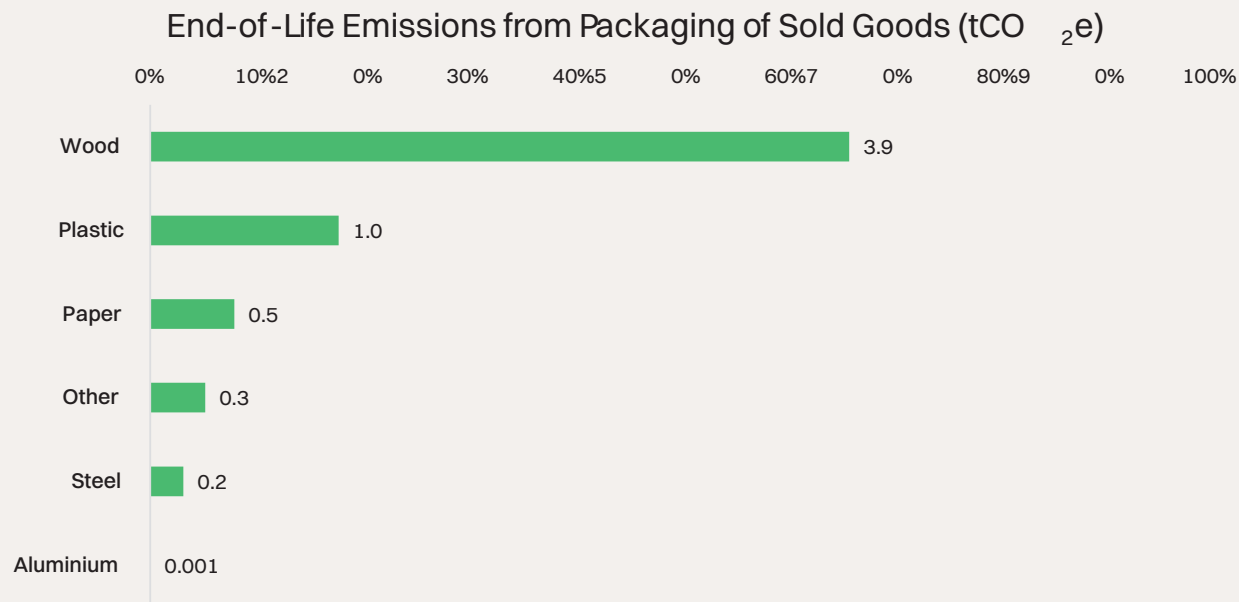# End-of-Life Emissions from Packaging of Sold Goods (tCO$_2$e)

• Figure 18 shows the emissions related to the end-of-life treatment of the packaging in which Axter products were sold in. Emissions from the end-of-life treatment of packaging materials for items sold by Axter in 2022 totals 5.9 tCO$_2$e.

Figure 18: End-of-Life Emission from Packaging of Sold Products (tCO$_2$e)

End-of-Life Emissions from Packaging of Sold Goods (tCO$_2$e)

Material	Value
Wood	3.9
Plastic	1.0
Paper	0.5
Other	0.3
Steel	0.2
Aluminium	0.001

Data quality recommendations

• The waste disposal method and end-of-life treatment of sold products is not currently tracked by Axter for all products sold each year. Axter should seek to collect primary data for all sold products relating to end-of-life treatment for future footprint calculations to improve accuracy, where possible.

• Axter should continue to collect/request product-level cradle to grave data from all product manufacturers they purchase items from moving forward, this will help Axter to enhance understanding of emissions across the value chain for future reporting years.

Appendix 1 Carbon Footprint Methodology

Carbon dioxide equivalent (CO$_2$e)
The universal unit of measurement used to compare the emissions from various types of greenhouse gases (GHG) based on their global warming potential (GWP).

Carbon footprint
Absolute sum of all emissions and removals of greenhouse gases caused directly and indirectly by a subject either over a defined period or in relation to a specified unit of product or instance of service and calculated in accordance with a recognised methodology.

Emissions Hotspot
An activity/building/service within an organisation that is responsible for an unusually intense concentration of greenhouse gas emissions (GHG). These areas within an organisation are therefore useful to identify when aiming to reduce emissions as they help to focus resources during the energy efficiency measures decision process.

Global warming potential (GWP)
Value describing the radiative forcing of one unit of a given GHG relative to one unit of CO$_2$ over a given time period.

Greenhouse gas (GHG)
Gas that contributes to the greenhouse effect by absorbing infrared radiation. Kyoto Protocol lists these as: carbon dioxide (CO$_2$), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3).

Reporting year - Application period
Period of time between the baseline date and the first qualifying date or between successive qualifying dates, for which a declaration in respect of carbon neutrality is made.

Appendix 2: GHG Data Inventory

The following Scope 1 and 2 emissions sources have been included in this carbon footprint assessment:

Emissions Source	Description of Data Provided	Key Assumptions Used	Data Quality Improvement
Scope 1	**Stationary Combustion** There is no gas consumption at the office space used by Axter. **Mobile Combustion** Axter had 12 leased vehicles during 2022. Data was provided on the vehicle type, fuel type and mileage completed by each vehicle. **Refrigerant Gas** Axter confirmed there was no top up of refrigerant gases during the 2022 reporting period.	Data was provided on the vehicle type, fuel type and mileage completed by each vehicle. This allowed for the application of passenger vehicle emission factors from the 2022 UK Government Database. Refrigerant gases have been excluded from this assessment, Axter confirmed that there was no top up or leak of refrigerant gas during the 2022 reporting period.	Axter should look to maintain up to date and complete invoice records for all leased vehicles and record any top up of refrigerant gases that take place in the future.
Scope 2	Axter only moved into their current offices in August/September of 2022, this meant invoice data for electricity consumption could only be provided for 4 months prior to them moving in. As a result, the floor area of the office space was provided and BSRIA benchmarks were applied in order to calculate the anticipated electricity consumption (kWh).	As primary data was only available for 3 months of 2022, benchmarks provided by BSRIA were applied to estimate electricity consumption (kWH) across the whole of the 2022 reporting period to reflect 'business as usual' conditions. In addition, there was PV array on the roof of the office building used by Axter. In total this generated 43,546 kWh of renewable electricity (1,266 kWh was exported back to the national grid). Of this total, 27% was portioned to Axter in the reporting year, this was accounted for in the total electricity consumption for Axter across 2022.	Axter should work with their landlord to track monthly electricity consumption (kWh).

The following Scope 3 emissions sources have been included in this carbon footprint assessment:

Emissions Source	Description of Data Provided	Key Assumptions Used	Data Quality Improvement
3.1 Purchased Goods and Services	Axter provided a full breakdown of all goods and services purchased throughout the 2022 reporting year. Spend data provided was initially broken down by total spend per supplier, employee expenses and sundry expenses. This data was then categorised by type of product being purchased, alongside the total amount spent on individual goods/services.	The spend-based methodology has been used to calculate the emissions associated with purchased goods and services, using emission factors from the DEFRA EEIO database. This approach considers the total value that has been spent on each type of good or service, alongside it's key characteristics (e.g., whether it is plastic, paper, IT support or management consultancy). An emission factor from the database has therefore been applied to each individual item and calculated on $kgCO_2e/£$ basis. This database collates emission factors for different types of goods and services on a kgCO2e/£ basis. These emission factors have therefore been used to calculate the emissions from Purchased Goods and Services taking into consideration the total value spent on each item.	Axter should work towards engaging with individual suppliers to obtain supplier specific cradle-to-gate emissions data, where possible. A cradle-to-gate approach is an assessment methodology which seeks to quantify the partial life cycle emissions of an individual product, from resource extraction through to final manufacturing. As a priority, Axter should now work towards engaging with selected suppliers to understand their Scope 1 and 2 emissions. This will provide Axter with the opportunity to move away from using financial-based estimates and towards an approach which apportions the total Scope 1 and 2 emissions of a supplier to Axter based on the overall value of purchased goods and services across the reporting year.
3.2 Capital Goods	A breakdown of all Capital Goods procured during the reporting year and the associated cost of each product has been provided for this footprint assessment.	The spend-based methodology has been used to calculate the emissions associated with purchased goods and services, using emission factors from the DEFRA EEIO database. This approach considers the total value that has been spent on each type of good or service, alongside it's key characteristics (e.g., whether it is plastic, paper, IT support or management consultancy). An emission factor from the database has therefore been applied to each individual item and calculated on $kgCO_2e/£$ basis.	Axter should work towards engaging with individual manufacturers to obtain supplier specific cradle-to-grave emissions data, where possible. A cradle-to-grave approach is an assessment methodology which seeks to quantify the whole life cycle emissions of an individual product, from resource extraction through to final waste disposal and treatment of the product.

Emissions Source	Description of Data Provided	Key Assumptions Used	Data Quality Improvement
3.3 Fuel and Energy related activities	Axter provided data on 12 owned or leased vehicles which were used throughout 2022. Mileage data was provided for the vehicles used. There was no gas consumption at the offices used by Axter in 2022. Invoices for electricity were only available for one quarter of 2022 (May-Sept). Benchmark data was used as an alternative to extrapolate Axter's electricity consumption across the whole of 2022.	This category covers the upstream emissions associated with the production of fuels and energy that are purchased and consumed by Axter (Scope 1 and 2 emissions) across the reporting year. Upstream emission factors which take into account these Scope 1 and 2 emissions across Axter have been applied in order quantify emissions from fuel and energy related activities. These emission factors are taken from the UK Government emission factor database and applied to the primary data that has been provided as part of the Scope 1 and 2 footprint calculation.	Axter should ensure that Scope 1 and 2 consumption data collected for footprint assessments are accurate and up to date.
3.4 Upstream Transportation and Distribution	Axter provided data on 352 upstream deliveries completed in 2022. Data was provided on the total distance travelled, the weight of each delivery and the type of vehicle and fuel used.	As data on weight and distance was provided by Axter it allowed for the application of emission factors taken from the UK Government's 2022 database. As both weight (tonnes) and distance (km) were available, emissions were calculated on a per tonne per km basis. Data was also provided on the load of each delivery and how much of each delivery was comprised of Axter products. This allowed for the grouping of data based on the load %. For deliveries where the load was less than 50%; the emission factor for HGV Articulated (>3.5-33 tonnes) - 50% Laden was applied. Where the load was more than 50%; HGV Articulated (>3.5-33 tonnes) - 100% Laden.	Axter should look to continue to track the weight and distance travelled for each upstream delivery completed on behalf of the organisation. Obtaining information on the volume of fuel consumed on individual journeys is the most accurate approach towards calculating emissions for this category.

Emissions Source	Description of Data Provided	Key Assumptions Used	Data Quality Improvement
3.5 Waste	Data was provided from waste providers responsible for collecting and managing waste across Axter in 2022. Data was given on the type of waste, the number of collections and the size of bins. Data was not provided on the weight of waste at each collection. No data was available for water consumption and wastewater. Industry benchmarks were used to estimate data for this category.	UK Government emission factors for waste and water supply/treatment for the 2022 reporting year have then been applied, based on benchmark estimates used to calculate water consumption and wastewater based on the floor area of Axter's office space in 2022. Assumptions on how different waste collected from Axter was disposed of were also made for this assessment, based on the type of waste being collected. It was also assumed that each waste bin collected was full upon collection by Axter waste supplier. Density conversion factors were used for each type of waste to calculate the weight of each waste collection. The UK Government's emission factors for recycling and combustion of waste, are only accounting for the transportation and preparation of waste materials prior to the treatment process taking place - this is only applicable to combustion and recycling processes. For landfill, the emission factors that the UK Government provide cover the whole life- cycle emissions from waste being on landfill.	Axter should continue to ensure that consumption records for waste, the supply water and wastewater are up to date and appropriately account for any changes to the organisation and waste streams (size, buildings, operations). Axter should also look to track the exact weight of waste being collected for each waste stream. Axter should look into zero waste to landfill waste suppliers. Axter should ensure full and complete water invoices are maintained throughout the year.
3.6 Business Travel	Axter provided data on expenses claimed back to the organisation from employees completing business related activities. This information detailed the type of expense claim and associated amount spent. Financial data was provided for all travel related expenses. Data was also provided data on accommodation relating to location, number of nights and number of employees. Point data was provided for all flights completed in 2022 as well.	The spend-based methodology has been used to calculate the emissions associated with travel and accommodation expenses, using emission factors from the DEFRA database for the 2022 reporting year. This database collates emissions factors for accommodation services and various travel types (air, railway, road, and water transport) on a $kgCO_2e/£$ basis. These emission factors have therefore been used to calculate the business travel emissions based on the total value spent on each item. UK Government emission factors were used to calculate the emissions associated with overnight stays in hotels which accounts for the location of the overnight stay, the number of employees involved and the duration of the stay.	Where travel is completed and expensed back, Axter should look to track the distance covered for all journeys, the type of vehicle used, and the type of fuel used where possible. This will allow for more granular emissions calculations and remove the need and application of financial data.

Emissions Source	Description of Data Provided	Key Assumptions Used	Data Quality Improvement
3.7 Employee Commuting	Results from a 2022 Employee Commuting Survey developed by Eight Versa and sent to selected employees at Axter have been used for this calculation. Axter gathered 15 responses to the standard employee commuting survey, which focused on identifying the distance travelled by all employees to the workplace, alongside the mode of transportation used for these journeys, alongside the number of days employees commute each week. Eight Versa also created a tailored survey for remote workers. Data was provided on the number of days worked and whether both equipment and heating were used whilst working remotely. Axter provided 9 responses.	Results from the Employee Commuting Survey (15 responses) have been extrapolated to account for 20 employees across Axter that commute into work during the 2022 reporting year. Results from the Remote Working Survey (9 responses) have been extrapolated to account for 15 employees across Axter that worked from home during the 2022 reporting year. Data was provided in both quantitative and qualitative form; as a result, these had to be converted numerically in order to complete the analysis for this calculation.	To improve the accuracy of footprint calculations going forward, Axter should seek to develop an annual staff commuting survey and ensure as many employees complete the survey as possible. Primary data of this nature can then be used directly for on-going footprint measurements.
3.8 Upstream Leased Assets	During the 2022 reporting year, Axter had one Upstream Leased Asset which was a warehouse space. Axter did not have monthly consumption data for electricity (kWh) for the leased asset. The was no gas consumption at the warehouse in 2022. Instead, floor area was provided for the warehouse which allowed for the calculation of electricity consumption at both sites using benchmarks provided by CIBSE.	Axter confirmed that the leased warehouse uses only electricity. Floor area was provided by Axter which allowed for the calculation of the floor area of the site. From this the CIBSE benchmark for electricity consumption (kWh/m2) were applied for the architectural type 'Storage Facility'. From this the UK Governments emission factor for electricity has been applied.	Axter should work with asset providers to identify and collect building-level Scope 1 and 2 emissions data for all buildings leased across the organisation. Axter should work with storage providers to identify and collect building-level Scope 1 and 2 emissions data.

Emissions Source	Description of Data Provided	Key Assumptions Used	Data Quality Improvement
3.9 Downstream Transportation and Distribution	Axter provided data on the origin of the delivery, the destination and weight data for each delivery completed in 2022. Data was also provided on the type of vehicle used for each delivery.	Using the data provided, the distance-based methodology, recommended by the GHG protocol, has been applied. This approach involves determining the mass, distance and transport mode of each shipment made by individual suppliers, then applying an appropriate mass-distance emission factor for all vehicles used. It was assumed that all deliveries were completed using HGV Rigid (>3.5 - 7.5 tonnes) - 100% laden. As data on weight and distance was available for each journey emission factors were applied on a per km per tonne basis.	Axter should work closely with selected postal couriers to better understand the type of vehicle used and the levels of fuel consumption associated with individual journeys to transport Axter products to individual customers. Axter should also look to continue to keep detailed records of all deliveries, with data on the various types of transport used, the distance completed by each mode of transport, the type of fuel consumed, and the weight of each delivery.

Emissions Source	Description of Data Provided	Key Assumptions Used	Data Quality Improvement
3.10 Processing of Sold Products	Axter provided a list of 4 tools which are used for all roofing installations in 2022. Tool specification was provided for each, with data outlining the installation rate, type of fuel consumed, fuel consumption per sqm installed. Axter also provided the total sqm of roofing installed across 2022.	Axter provided the following list of tools used for each roofing installation during 2022; •Sievert Promatic Roofing Gas Blow Torch Kit •Sievert Promatic 3356 Large Detail Power Burner •Sievert Promatic 3350 Small Detail Power Burner •Leister TRIAC ST Roofing Kit LITE 120v Based on the tool spec and total amount of roofing installed (m2) in 2022, Eight Versa were able to calculate the number of hours each tool was used for across the reporting period, which allowed for the calculation of the amount of fuel consumed by each tool. From this emission factors from the UK Governments 2022 database were applied to analysis the emissions associated with the use of each tool while installing Axter's roofing solutions.	Axter should work closely with their installation team and ensure detailed records are kept of each tool used for every kitchen installation, the duration each tool is used for and how much electricity is consumed for each kitchen installation. Axter should continue to track and record data on all tools used for each roofing installation, tracking the amount of fuel consumed by each tool during the installation process.
3.12 End of Life Treatment of Sold Products	Axter provided weight data on all the items sold during the 2022 reporting year. Data was also provided on the weight and type of packaging materials used for each sold unit in 2022.	The total weight of each product sold by Axter during the 2022 reporting year has been calculated, using primary data provided as part of the assessment. The method of waste disposal for each product has been assumed based on the type of product that was sold (i.e., plastic, wooden or metal-based product). The appropriate waste disposal emission factor from the 2022 UK Government Emission Factor Database has then been applied. The UK Government's emission factors for recycling and combustion of waste, are only accounting for the transportation and preparation of waste materials prior to the treatment process taking place - this is only applicable to combustion and recycling processes. For landfill, the emission factors that the UK Government provide cover the whole life-cycle emissions from waste being on landfill.	Axter should collaborate with industry associations or trade bodies to identify what assumptions have been made by other organisations in order to calculate the emissions from the end-of-life treatment of sold products across the market. Axter should encourage all suppliers of products to report on and complete a cradle to grave product life cycle assessment. This will allow Axter to begin quantifying the End-of-Life emissions from all products sold across future reporting years.

Appendix 3: Excluded Emissions Sources

Scope 1-3 Category	Reason for Exclusion
Stationary Combustion (Scope 1)	There are no emissions associated to this category as Axter offices do not use gas – they only run off electricity.
Refrigerant Gas (Scope 1)	There are no emissions associated to this category as there was no top up of refrigerant gases during 2022.
Use of Sold Products (Scope 3.11)	There are no emissions associated with directly using the goods sold by Axter.
Downstream Leased Assets (Scope 3.13)	Axter did not have any downstream leased assets during the 2022 reporting year.
Franchises (Scope 3.14)	Not applicable to company operations.
Investments (Scope 3.15)	Not applicable to company operations

Appendix 4: Uncertainty Analysis

Following Guidance from the GHG Protocol, the qualitative and quantitative uncertainty of the data used has been assessed:

• Uncertainties associated with greenhouse gas inventories can be broadly categorised into scientific uncertainty and estimation uncertainty. Scientific uncertainty arises when the science of the actual emission and/or removal process is not sufficiently understood. For example, many of the direct and indirect emissions factors associated with global warming potential (GWP) values that are used to combine emission estimates of different greenhouse gases involve significant scientific uncertainty.

• Analysing and quantifying such scientific uncertainty is extremely problematic and is likely to be beyond the scope of most company's inventory efforts. Estimation uncertainty arises any time greenhouse gas emissions are quantified. Therefore, all emission or removal estimates are associated with estimation uncertainty.

Qualitative Analysis: **Good**

Quantitative Analysis: **157%**

Figure 19: Uncertainty Analysis for Axter 2022 carbon footprint

Uncertainty Analysis: Error Bars

Upper Uncertainty:
2,491.6 tCO$_2$e

Calculated Footprint:
1,584.7 tCO$_2$e

Lower Uncertainty:
1,007.9 tCO$_2$e