



**sustainable** direction  
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# Gelder Group

*Main Office Carbon Footprint 2022*

*9<sup>th</sup> May 2023*

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**Authorisation Sheet**

**Client: Gelder Group**


**Project: Main Office Carbon Footprint**

Version: 3.0 Final for issue


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## Summary

Gelder Group has asked Sustainable Direction to update the carbon footprint assessment of Group's Head Office, based at Sturton by Stow in Lincolnshire. The purpose is to build upon the carbon footprint undertaken last year and quantify the current carbon footprint, to help them understand how their head office is moving towards becoming Carbon Neutral

The carbon footprint assessment has been undertaken in accordance with the internationally recognised Greenhouse Gas Protocol. All scope 1 and 2 emissions associated with Head Office activities have been included, as well as contribution from readily quantifiable Scope 3 activities. The assessors recognise that there is an opportunity to further refine the assessment through inclusion of additional aspects of the value chain (e.g. raw materials used in construction of projects, consumables, downstream use of assets, investments, etc.)

The results indicate that the annual carbon footprint is approximately 1,166 tonnes CO<sub>2e</sub>/yr.

The largest emitters by far are the diesel fleet vehicles, totalling 82% or 960 tonnes of all emissions when this is added to the petrol car business travel of 12% or 143 tonnes it is clear to see that vehicular use is the biggest emitter at 94% or 1,103 tonnes.

Emissions from oil and electricity usage is comparable at approximately 27 tonnes CO<sub>2e</sub>/yr and 32 tonnes CO<sub>2e</sub>/yr respectively. This is a reduction of 3 tonnes CO<sub>2e</sub>/yr from 2021 for oil and a further 3 tonnes CO<sub>2e</sub>/yr for electricity. The electricity reduction is primarily a result of decarbonisation by the grid.

An additional 2.1 tonnes CO<sub>2e</sub>/yr is being reported from construction waste. This shows an improvement in data collection and that the Gelder Group is moving towards carbon reporting business wide and not just their head office operations.

Carbon emission rates associated with paper usage and water usage are insignificant in the overall footprint. Whilst it is always considered important to reduce any impact (this is aligned with a Net Zero strategy), these sources are not significant, and effort may be better targeted initially to matters regarding travel.

In the 2021 footprint vehicle emissions were defined as scope 3 based on the data presented to us but in 2022 the data better aligns to a scope 1 categorisation and has therefore been moved. This accounts for the large difference presented in Figure 3.

In 2021 construction waste was not reported. The reporting process has been improved and construction waste that is not produced by the Head Office but passes through the premises by way of skips in the car park has been reported upon.

The positive news is there is a 1.55% reduction in CO<sub>2e</sub> even though more data fields are being reported upon.

We understand that the Gelder Group has undertaken a programme of replacing the windows at its Head Office to more thermally efficient models. We expect to see a reflection of the savings made in the 2023 reporting period.

Gelder Group has fitted solar panels during this reporting period and will be used to prevent the carbon emissions from the electricity used on the head office site. If the solar panels are sufficient and generating in the correct time periods to cover 100% of the electrical power this would reduce Gelder Group's carbon footprint by 3% or 35.4 tonnes CO<sub>2e</sub>, and although this is a significant carbon saving it is not the main carbon emitting activity.

We expect to see these gains during the 2023 reporting period.

Gelder Group is committed to being environmentally proactive and has planted 3,500 native trees on the land surrounding their head office, as previously reported.

We understand that as these trees were planted before they put a reporting system in place they cannot be used as an offset; however, it is worth noting that the Woodland Carbon Code indicates that a typical tree in a UK mixed woodland (Sycamore, Ash, Birch - SAB) absorbs an average of 10 kg of CO<sub>2</sub> per year for 50 years<sup>1</sup>. Therefore 3,500 trees will offset 35 tonnes of CO<sub>2</sub> per year for 50 years. This equates to 3% of Gelder's total carbon emissions per year for 50 years. The current planted trees therefore could contribute to carbon capture of approximately 1.5 years of emissions (assuming no change to the annual emission rate calculated).

We understand the Gelder Group has been undertaking a consultation period to redesign the environmental park to improve and expand on it. We expect these changes to happen during the 2023 reporting period.

Finally, Gelder completed its 2021 report late in 2022, so was not able to implement changes that would have helped their 2022 Footprint. This update confirms that there remains opportunity to reduce and focus will be on vehicle use (noting a replacement cycle is not yet happening and obtaining electric or hydrogen vehicles have a long delay).

The other main change for 2023 reporting will be a move to defining an approach to report project carbon emissions, whether Gelder's or a client's actual footprint.

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<sup>1</sup> Derived from Woodland Carbon Code calculator, through UK mixed woodland planting strategy ([www.woodlandcarboncode.org.uk](http://www.woodlandcarboncode.org.uk))

## 1. Introduction

### 1.1 Introduction

Gelder Group has asked Sustainable Direction to update its carbon footprint assessment for 2022 to help them understand how its head office Carbon Footprint has changed and how they are progressing on its journey to becoming Carbon Neutral.

Gelder Group's Head Office based at Sturton by Stow in Lincolnshire. The head office has an area footprint of 743m<sup>2</sup> and a total floor area of 1,042m<sup>2</sup>. There are 68 employees working at this location and they have a total workforce of 253 employees across the business.

The property comprises a modern detached two storey office building providing open plan and private rooms over ground and first floors together with associated 26m<sup>2</sup> kitchen and WC facilities. In addition, there is a garage and stores building that is currently used as a plant & vehicle workshop and building supplies stores. There are also four cabins that are currently used as offices and storage. Internal finishes include carpeted floors, painted plastered walls and suspended ceilings incorporating motion sensor LED lighting.

Gelder Group has been environmentally proactive since 2008 at least and has a 15-acre environment park where they have planted approximately 3,500 native trees, has beehives and maintains a nature conservation lake that hosts fishing competitions.

An onsite Photo Voltaic array (comprising both ground mounted PV and on-building roof mounted PV) has been installed and commissioned.

### 1.2 What is a Carbon Footprint?

A carbon footprint is the total amount of greenhouse gases (GHG), including carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and ozone (O<sub>3</sub>) generated by an organisation's activities as an individual, event, organisation, service, place or product. The sum of GHG is expressed as carbon dioxide equivalent (CO<sub>2e</sub>) Greenhouse gases that can be emitted through the burning of fossil fuels, land clearance, the production and consumption of food, manufactured goods, materials, wood, roads, buildings, transportation and other services. CO<sub>2e</sub> is measured in kg or Tonnes. The carbon footprint looks at all areas of activities including power, transport and waste as shown in Figure 1: Carbon Footprint Activities

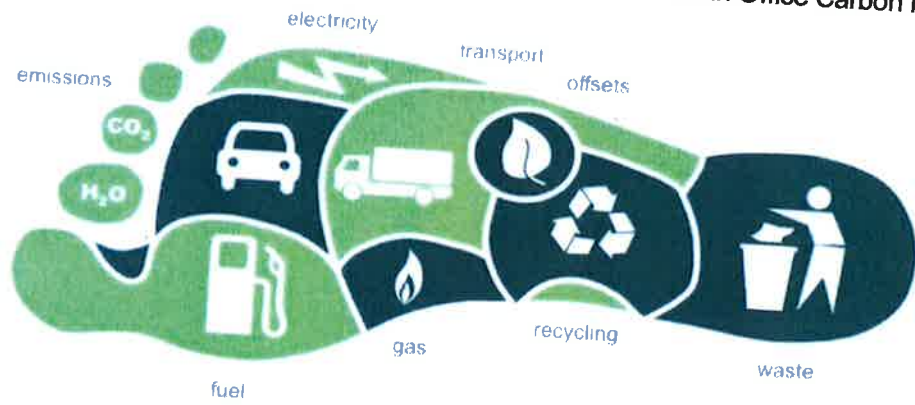


Figure 1: Carbon Footprint Activities



## 2. Methodology

### 2.1 Scope 1, 2 and 3

The carbon footprint assessment has been undertaken in accordance with the internationally recognised Greenhouse Gas Protocol.

Any assessment should clearly state the boundaries of the assessment – i.e. what is included, and what is not included. Routinely discussed are three categories of emission referred to as Scope 1, Scope 2 and Scope 3 emissions, defined as follows:

- **Scope 1:** direct emissions from sources that an organisation owns or controls – for example:
  - burning fuel in a vehicle engine,
  - use of natural gas or fuel oil in a space and hot-water heating system,
  - refrigerant losses from a cooling system.
- **Scope 2:** indirect emissions associated with energy used within the assessed organisation – for example:
  - For the majority of organisations this is limited to emissions associated with generation of electricity,
  - Emissions associated with supply of steam, heating or cooling from a third party.
- **Scope 3:** other emissions from sources owned or controlled by other entities in the value chain – for example:
  - materials suppliers
  - third-party logistics providers,
  - waste management suppliers,
  - travel suppliers,
  - lessees and lessors,
  - employees,
  - customers.

These scopes are graphically presented in Figure 2: Scope 1, 2 & 3.

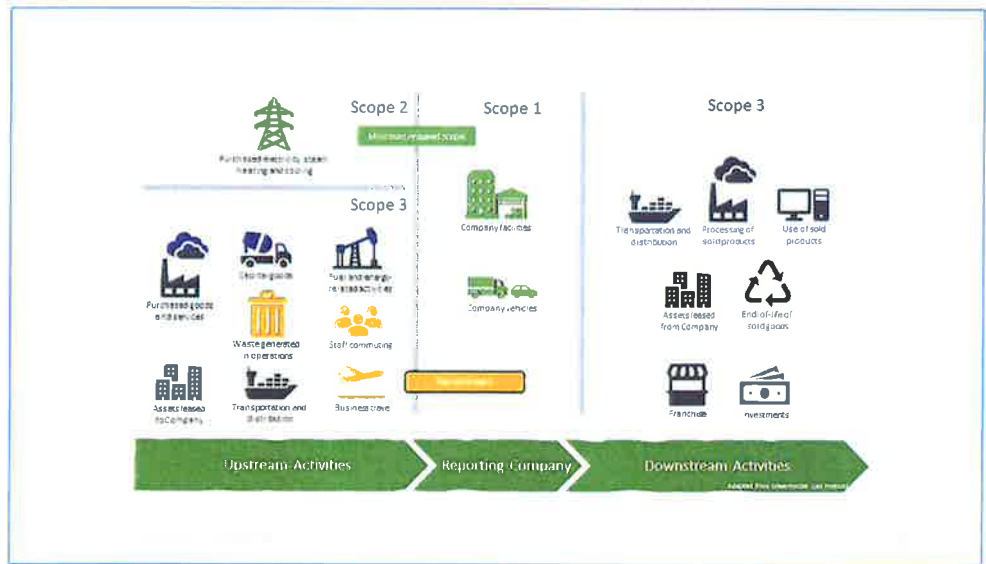


Figure 2: Scope 1, 2 & 3

As a minimum a carbon footprint must include Scope 1 and 2 sources. In preparing the carbon footprint for Gelder Group head office additional aspects of Scope 3 have been included, as highlighted in yellow on the diagram.

Carbon foot printing should be repeated at least annually and should be continually refined as processes and data recording improves. Consequently, over time one may anticipate that more elements of Scope 3 contribution will be included within scope.

This report builds on the report issued for the 2021 Carbon footprint.

## 2.2 Location and Market Based Assessment

The Greenhouse Gas protocol enables organisations to report their carbon footprint following both a location-based and market-based strategy (former is mandatory, latter is optional).

These strategies principally apply to consideration of the carbon intensity of electricity consumed ( $\text{kgCO}_{2e}/\text{kWh}$ ). The location-based approach requires the reporting organisation to reference the national average carbon intensity on the grid network. In the UK in 2022 this was  $0.193\text{kgCO}_{2e}/\text{kWh}$ . As the UK electricity generation infrastructure has closed coal-fired power stations, shifted to gas-fired power stations, increased biomass usage and has increased the renewable energy generating capacity, the overall carbon intensity has decreased.

In the UK's electricity market it is possible for organisations (and domestic supplies) to contract to a 100% renewable tariff<sup>2</sup>. Adopting the location - based strategy would not allow an organisation to properly reflect the impact of procuring low-/no-carbon within the carbon footprint. The market-based strategy does permit the use of the carbon intensity metric provided by the supplier. Ordinarily this will be used to evidence that the carbon footprint of an organisation is lower as a result of proactive procurement decisions.

Organisations may therefore report the market-based assessment alongside the location-based assessment.

## 2.3 Key Performance Indicators

Whilst the purpose of undertaking a carbon footprint assessment is often the determination of the overall annual greenhouse gas emission of an organisation, the exercise should also be utilised for identifying opportunities for improvement. As with any other business management process, the use of Key Performance Indicators can be useful for benchmarking and assessing performance. This may facilitate internal comparison as well as comparison with external references.

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<sup>2</sup> Note that not all renewable tariffs are equal. Some electricity suppliers invest in installation, commission and operation of their own renewable energy generating infrastructure; others buy "renewable" electricity on the wholesale market and resell to customers – evidence should be provided from the supplier to confirm the provenance and correct allocation of renewably generated supply.

Selecting the most relevant metric(s) is important to make sure that they are meaningful and effective. Typical KPIs regarding carbon include:

- Tonne CO<sub>2e</sub> / unit revenue
  - Depends on size of business and footprint
  - Recommend: Tonne CO<sub>2e</sub> / £m
- Tonne CO<sub>2e</sub> / Full Time Equivalent (FTE) Employee
- Tonne CO<sub>2e</sub> / unit floor area
  - Recommend: Tonne CO<sub>2e</sub> / m<sup>2</sup>

Other KPI relevant to Gelder may be considered appropriate.

The results below include the above KPI metrics.

## 2.4 Data

All our calculations have been based on data supplied by Gelder Group. These include:

- Utilities
  - Electricity - we have 12 months electric bills from Total.
  - Oil – we have 10 months of oil billing records.
  - Water – we have 2 water bills
  - Wastewater – we have been informed that all wastewater from the head office is discharged to a Klargester Treatment Plant and discharged directly to controlled surface waters.
- Fleet Travel (including Commercial Vehicles, and company owned cars)
  - We have received fuel usage and emissions records for all company vehicles for 12 months, including distance claimed and fuel Type (diesel, HVO, etc)
  - Gelder Group changed its tracker company during this reporting period so it was not possible to distinguish between Fleet Travel and Business Travel, however we are confident that we have covered all diesel and petrol emissions.
- Paper usage
  - We have a 12-month record of number of reams of paper purchased
    - Paper size (A4, A3, etc)
    - Paper weight (80gsm, 100gms, etc.)
    - Paper type (sustainably sourced - FSC, PEFC; standard; recycled)
- Ink
  - We have a 12-month record of ink purchased.
- Construction Waste
  - Additionally, we have included construction waste that passes through, though not generated by, Gelder Group's head office. This data was not available last year and so represents a measurable improvement in data collection.

**2.5 Calculations**

We analysed the data provided by the Gelder Group via a series of excel calculations and using BEIS published emissions factors<sup>3</sup> which has shown a total carbon footprint of 1,166 tonnes of CO<sub>2e</sub> produced per year. Figure 3 shows how the CO<sub>2e</sub> is split between scopes 1, 2 and 3.

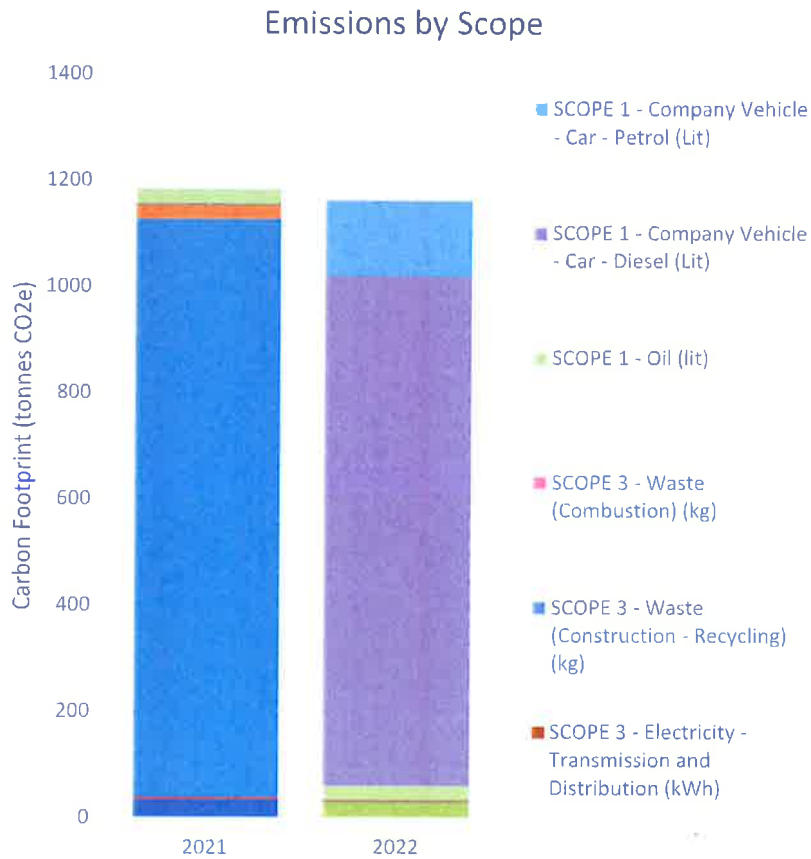


Figure 3: Head Office Annual Carbon Footprint Comparison by Scope

In the 2021 footprint vehicle emissions were defined as scope 3 based on data presented to us, and in 2022 the data better aligns to a scope 1 categorisation and has therefore been moved. This accounts for the large difference presented in Figure 3 above.

In 2021 construction waste was not reported. The reporting process has been improved and construction waste that is not produced by the Head Office but passes through the premises by way of skips in the car park has been reported upon.

The positive news is there is a 1.55% reduction in CO<sub>2e</sub> even though more data fields are being reported upon.

<sup>3</sup> Greenhouse gas reporting: conversion factors 2022 - GOV.UK ([www.gov.uk](http://www.gov.uk))

Main Office Carbon Footprint

Figure 4: Emission by Source clearly shows that fleet diesel usage is by far the biggest contributor to the total CO<sub>2e</sub> emissions.

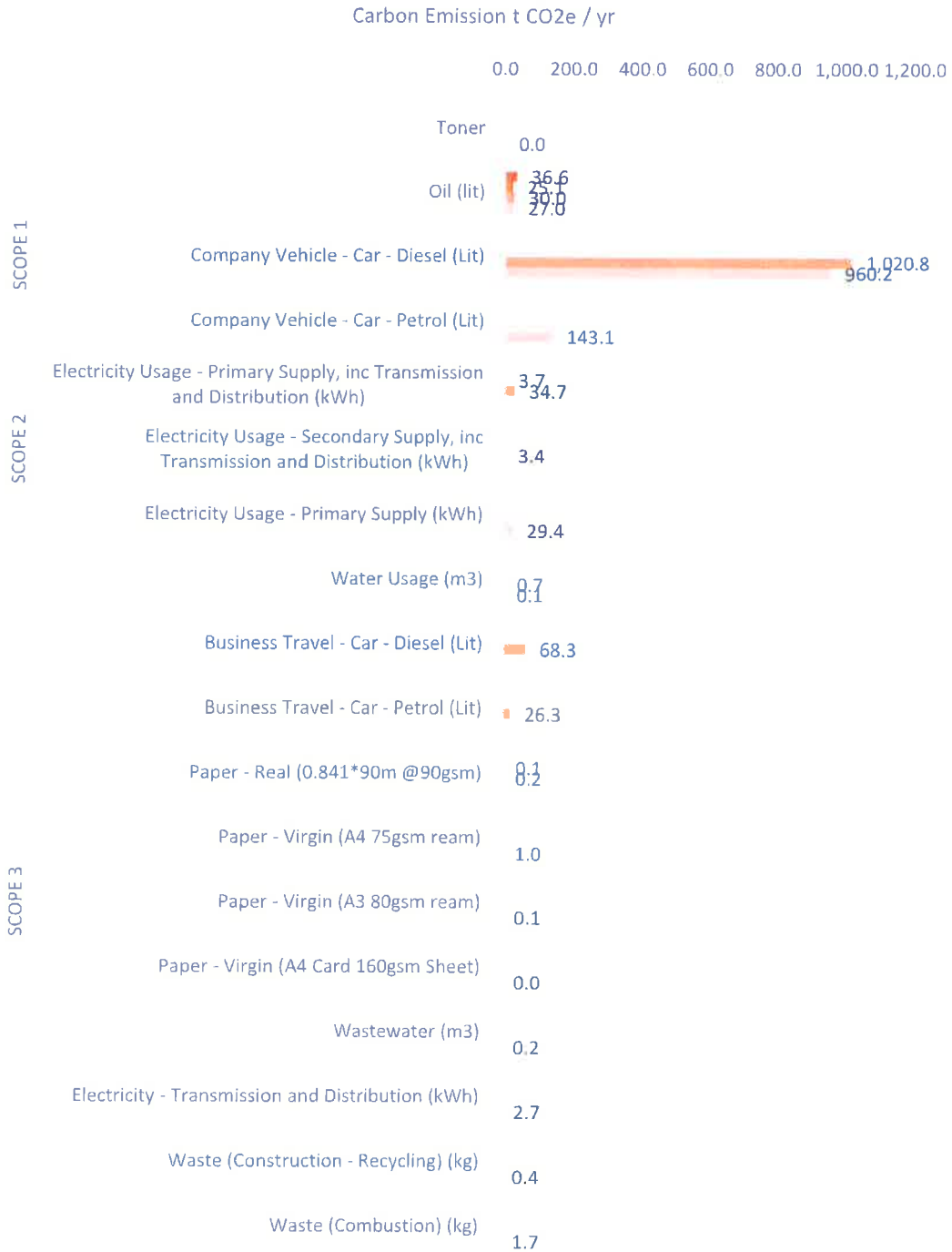


Figure 4: Emission by Source

### 3. Results

#### 3.1 Results

Table 1: Carbon Emissions by Type below, summarises the calculated by scope.

The results indicate that the annual carbon footprint is approximately 1166 tonnes CO<sub>2e</sub>/yr.

Sum of Carbon Emission (t) - Location Row Labels	Column Labels			Grand Total
	SCOPE 2	SCOPE 3	SCOPE 1	
<b>- 2022</b>	<b>29.4</b>	<b>6.2</b>	<b>0.0</b>	<b>1130.3</b>
Water Usage (m3)		0.1		0.1
Oil (lit)			27.0	27.0
Electricity Usage - Primary Supply (kWh)	29.4			29.4
Paper - Virgin (A4 75gsm ream)		1.0		1.0
Paper - Virgin (A3 80gsm ream)		0.1		0.1
Paper - Virgin (A4 Card 160gsm Sheet)		0.0		0.0
Toner		0.0		0.0
Wastewater (m3)		0.2		0.2
Electricity - Transmission and Distribution (kWh)		2.7		2.7
Waste (Construction - Recycling) (kg)		0.4		0.4
Waste (Combustion) (kg)		1.7		1.7
Company Vehicle - Car - Diesel (Lit)			960.2	960.2
Company Vehicle - Car - Petrol (Lit)			143.1	143.1

Table 1: Carbon Emissions by Type

Based on the data provided, emissions from vehicles accounted for (1,003 tonnes CO<sub>2e</sub>/yr) of the annual footprint,

Emissions from oil and electricity usage is comparable at approximately 27 tonnes CO<sub>2e</sub>/yr and 32 tonnes CO<sub>2e</sub>/yr respectively. This is a reduction of 3 tonnes CO<sub>2e</sub>/yr from 2021 for oil and a further 3 tonnes CO<sub>2e</sub>/yr for electricity. The electricity reduction is primarily a result of decarbonisation by the grid.

An additionally 2.1 tonnes CO<sub>2e</sub>/yr is being reported from construction waste. This shows an improvement in data collection and that the Gelder Group are moving towards carbon reporting business wide and not just their head office operations.

Carbon emission rates associated with paper usage and water usage are insignificant in the overall footprint. Whilst it is always considered important to reduce any impact (this is aligned with a Net Zero strategy), these sources are not significant, and effort may be better targeted initially to matters regarding travel.

Figure 5: Percentage of Emissions by Type clearly shows that fleet diesel usage accounts for the largest share of the carbon footprint.

**Percentage of CO2e**

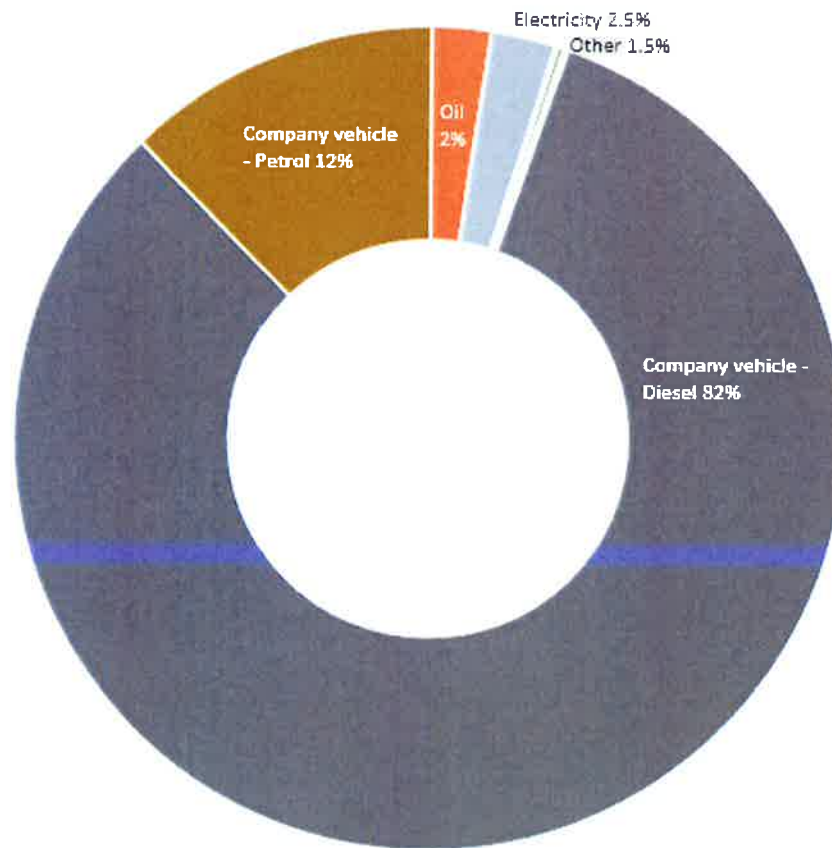


Figure 5: Percentage of Emissions by Type

The Carbon intensity of 37.4 tonnes/£m revenue is a useful benchmark to start measuring improvements. Careful consideration should be afforded when comparing performance of different organisations, to ensure that such comparisons are fair and credible. However, by way of context: a progressive logistics and retail business (£65m annual revenue), that had prioritised decarbonisation across its 130-vehicle fleet was achieving <20 tonnes/£m.



## 4. Conclusions and Improvements

### 4.1 Diesel Usage

The largest emitters by far are the diesel fleet vehicles, totalling 82% or 960 tonnes of all emission when this is added to the petrol car business travel of 12% % or 143 tonnes it is clear to see that vehicular use is by far and away the biggest emitter at 94% or 1,103 tonnes.

### 4.2 Solar PV Panels

Gelder Group have fitted solar panels during this reporting period and will be used to prevent the carbon emissions from the electricity used on the head office site. If the solar panels are sufficient and generating in the correct time periods to cover 100% of the electrical power this would reduce Gelder Group's carbon footprint by 3% or 35.4 tonnes although this is a significant carbon saving it is not the main carbon emitting activity.

We expect to see these gains during the 2023 reporting period.

It may be worth considering investing in energy storage solutions to use the power generated on site at time the sun is not shining. In the short- to medium-term this is most likely viable using batteries or hot water (although there are limited processes that have a hot water requirement).

Furthermore, additional PV may be beneficial for powering a future EV fleet (although in all likelihood vehicles will be offsite, operating during PV generating periods and will not be available charge necessitating an alternative form of energy storage).

### 4.3 Comparison 2021 / 2022

Sum of Carbon Emission (t) - Location	Column Labels			
Row Labels	SCOPE 1	SCOPE 2	SCOPE 3	Grand Total
<b>2021</b>	<b>30.0</b>	<b>38.1</b>	<b>1116.2</b>	<b>1184.2</b>
Water Usage (m3)			0.7	0.7
Business Travel - Car - Diesel (Lit)			1089.1	1089.1
Business Travel - Car - Petrol (Lit)			26.3	26.3
Oil (lit)	30.0			30.0
Paper - Real (0.841*90m @90gsm)			0.2	0.2
Electricity Usage - Primary Supply, inc Transmission and Distribution (kWh)		34.7		34.7
Electricity Usage - Secondary Supply, inc Transmission and Distribution (kWh)		3.4		3.4
<b>- 2022</b>	<b>1130.3</b>	<b>29.4</b>	<b>3.5</b>	<b>1163.2</b>
Water Usage (m3)			0.1	0.1
Oil (lit)	27.0			27.0
Electricity Usage - Primary Supply (kWh)		29.4		29.4
Paper - Virgin (A4 75gsm ream)			1.0	1.0
Paper - Virgin (A3 80gsm ream)			0.1	0.1
Paper - Virgin (A4 Card 160gsm Sheet)			0.0	0.0
Wastewater (m3)			0.2	0.2
Electricity - Transmission and Distribution (kWh)			0.0	0.0
Waste (Construction - Recycling) (kg)			0.4	0.4
Waste (Combustion) (kg)			1.7	1.7
Company Vehicle - Car - Diesel (Lit)	960.2			960.2
Company Vehicle - Car - Petrol (Lit)	143.1			143.1

#### 4.4 Windows

We understand that the Gelder Group has undertaken a programme of replacing the windows at its Head Office to more thermally efficient models. We expect to see a reflection of the savings made in the 2023 reporting period.

#### 4.5 Environmental Park

Gelder Group are committed to being environmentally proactive and has planted 3,500 native trees on the land surrounding their head office.

We understand that as these trees were planted before they put a reporting system in place they cannot be used as an offset; however, it is worth noting that the Woodland Carbon Code indicates that a typical tree in a UK mixed woodland (Sycamore, Ash, Birch - SAB) absorbs an average of 10 kg of CO<sub>2</sub> per year for 50 years<sup>4</sup>. Therefore 3,500 trees will offset 35 tonnes of CO<sub>2</sub> per year for 50 years. This equates to 3% of Gelder's total carbon emissions per year for 50 years. The current planted trees therefore could contribute to carbon capture of approximately 1.5 years of emissions (assuming no change to the annual emission rate calculated).

When it comes to woodland carbon, the initially planted trees are not the only players – once established and become a self-sustaining ecosystem, woodland will accumulate carbon in leaf litter layer and soil, naturally regenerated understory shrubs, saplings, the herbaceous cover on the ground, and even dead wood continue to hold on to the carbon for many years, much of it incorporated into the soil during decomposition.

Bird and bat boxes have been installed to further encourage species to utilize the woodland habitat. A lake has also been created which encourages amphibians and a further variety of wildlife to thrive.

We understand the Gelder Group have been undertaking a consultation period to redesign the environmental park to improve and expand on it. We expect these changes to happen during the 2023 reporting period.

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<sup>4</sup> Derived from Woodland Carbon Code calculator, through UK mixed woodland planting strategy ([www.woodlandcarboncode.org.uk](http://www.woodlandcarboncode.org.uk))

#### 4.6 Carbon Neutral, Net Zero, Carbon Negative

As the Gelder Group continue their journey towards being a sustainable business it may be useful to reflect on what this journey could look like. Figure 6: Carbon Neutral, Net Zero, Carbon Negative shows the steps needed to become Carbon Positive. That is, absorbing more carbon than is produced on an annual basis.

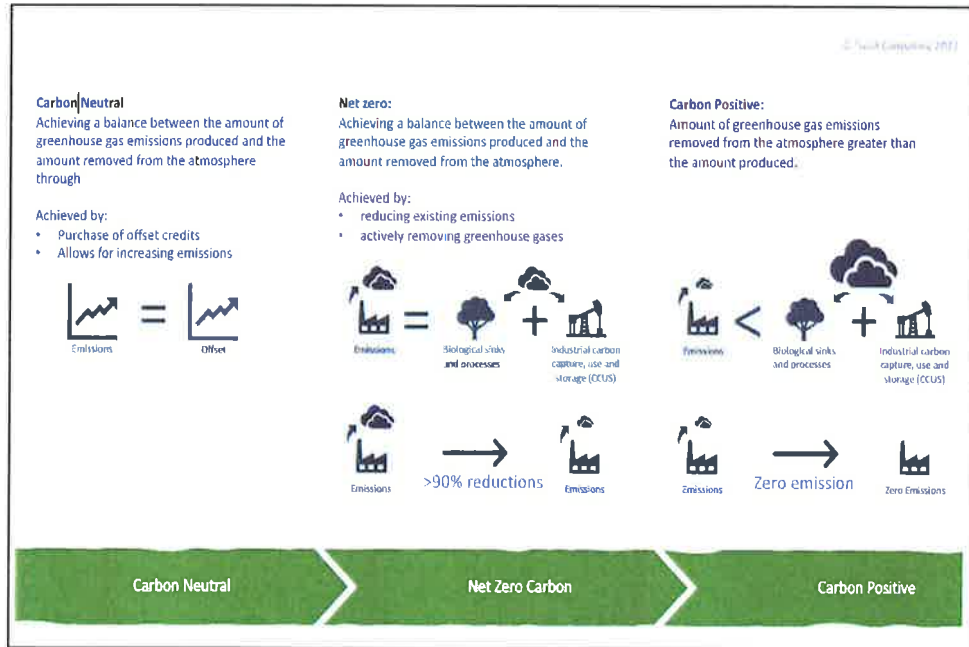


Figure 6: Carbon Neutral, Net Zero, Carbon Negative