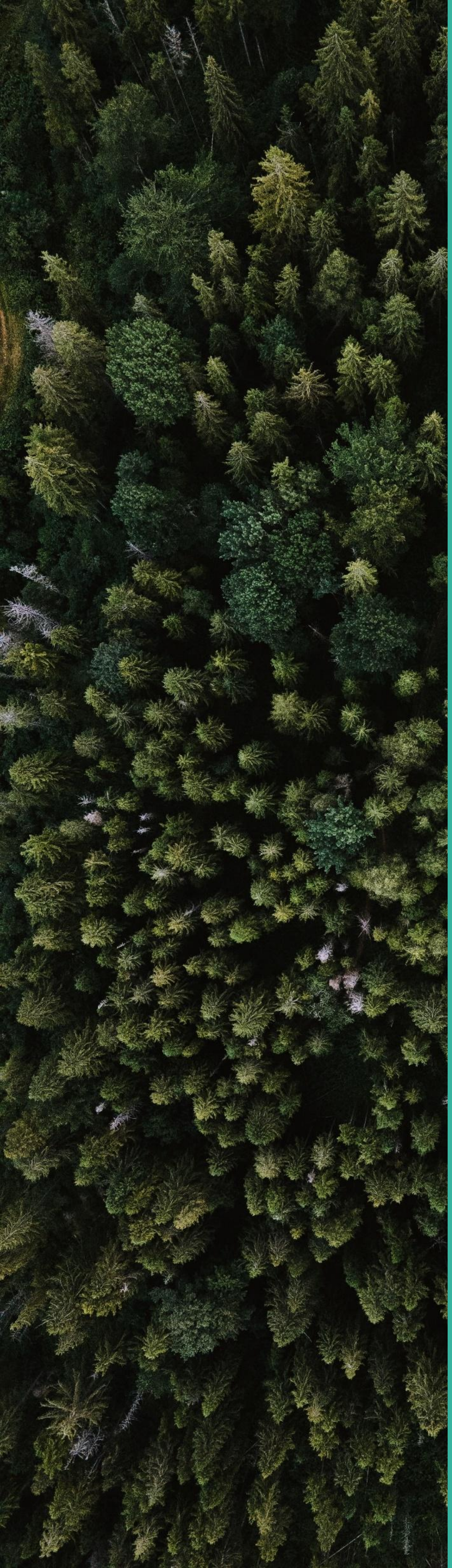
Environmental Impact Assessment

# Greenzest LCA 2024 Report

Greenzest
Purpose driven cleaning for people that care

neutral carbon zone



# Executive Summary

Greenzest retained Neutral Carbon Zone to conduct a service-based Life Cycle Assessment (LCA) across its cleaning services. The LCA was conducted in line with the ISO 14040 standard, the internationally recognised standard for life cycle assessments.

The analysis showed an emissions intensity of **29.48, 8.72** and **29.30 kg$CO_2$e** per clock hour of cleaning for University/Office, Shared workspace/Office, and Office cleaning services respectively, as seen in Table 1. Table 1 also shows the total emissions associated with the sites measured for each service.

| Site type | kgCO2e per day | kgCO2e per staff per day | kgCO2e per clock hour at site | kgCO2e per staff hour at site |
|---|---|---|---|---|
| University/Offices | 106.12 | 5.59 | 29.48 | 1.55 |
| Shared workspace/offices | 31.38 | 6.28 | 8.72 | 1.74 |
| Office | 114.23 | 6.89 | 29.30 | 1.82 |

*Table 1: Service emissions intensities.*

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# Introduction to Life Cycle Assessment

A life cycle assessment (LCA) is a technique for assessing the environmental impacts associated with a product or service across its life cycle. Its application can be used to better understand the contribution of the various life cycle stages to the overall environmental load of the product or service, allowing for improvements and efficiencies to be identified and implemented. It also provides a tool for comparisons between products or services, both for internal and external use.

An LCA consists of four stages:

**Goal and Scope**

The overall aims of the LCA are defined, including why the LCA is being conducted and the LCA boundary for the product or service being assessed.

**Inventory Analysis**

The collection and structuring of the data, including description of all the material and energy flows within the product system or service, including interactions with the environment, raw materials consumed, and emissions.

**Impact Assessment**

The translation of data to impacts using life cycle databases and scientific papers to define the impact.

**Interpretation**

The description of the results and findings, and what it all means.

# Standards & Databases

**Standard**

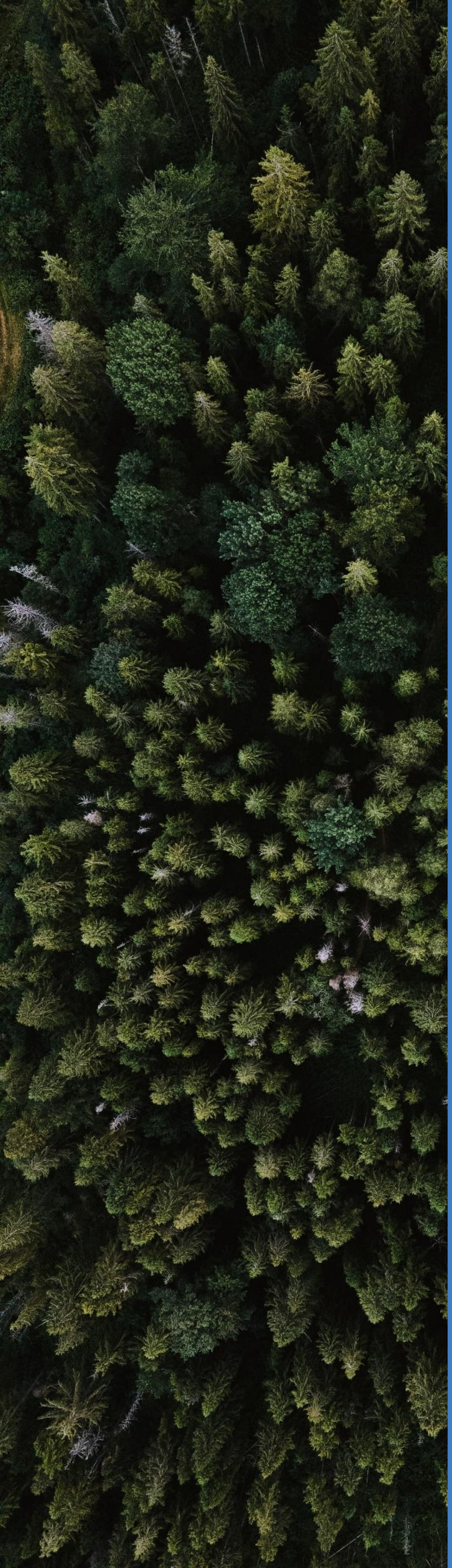
For this LCA, the ISO 14040 Standard (which includes ISO 14044) was used, as this is the internationally recognised standard for assessing the environmental aspects associated with a product or service life cycle. Accordingly, this LCA has been structured around the ISO 14040 principles and procedures and the ISO 14044 requirements and guidelines.

**Emissions Factor Data Bases**

For the emissions calculations of the cleaning service, the following emissions factor databases were used:

➢ DEFRA 2024 (Department for Environment, Food & Rural Affairs): these emissions factors were used for calculations related to energy usage, staff commuting, business travel and well-to-tank and transmission & distribution.

➢ EPA 2021 (Supply Chain Greenhouse Gas Emissions Factors for US Industries and Commodities): these spend-based emissions factors were used for all other spend data since no activity-level data was available. EPA is a recognised emissions factor database that provides emissions factors on a spend-basis across various commodities such as cleaning products.



# Goal & Scope

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## Goal - LCA Objective

The LCA study was conducted on Greenzest school and office cleaning services. It was conducted to understand the environmental impact (carbon emissions) associated with each of the services, as well as identify the potential to further improve the environmental impact of the service moving forward. The results will be communicated to current and future clients, providing them with an emissions estimate associated with one clock hour of cleaning.

Note, the term 'carbon emissions' not only includes carbon dioxide ($CO_2$) but all other greenhouse gases (GHG) covered under good practice reporting (the Kyoto Protocol): methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulphur hexafluoride ($SF_6$).

## Scope and Boundary

Included within the LCA are the following sites:

University/Office

- USSP

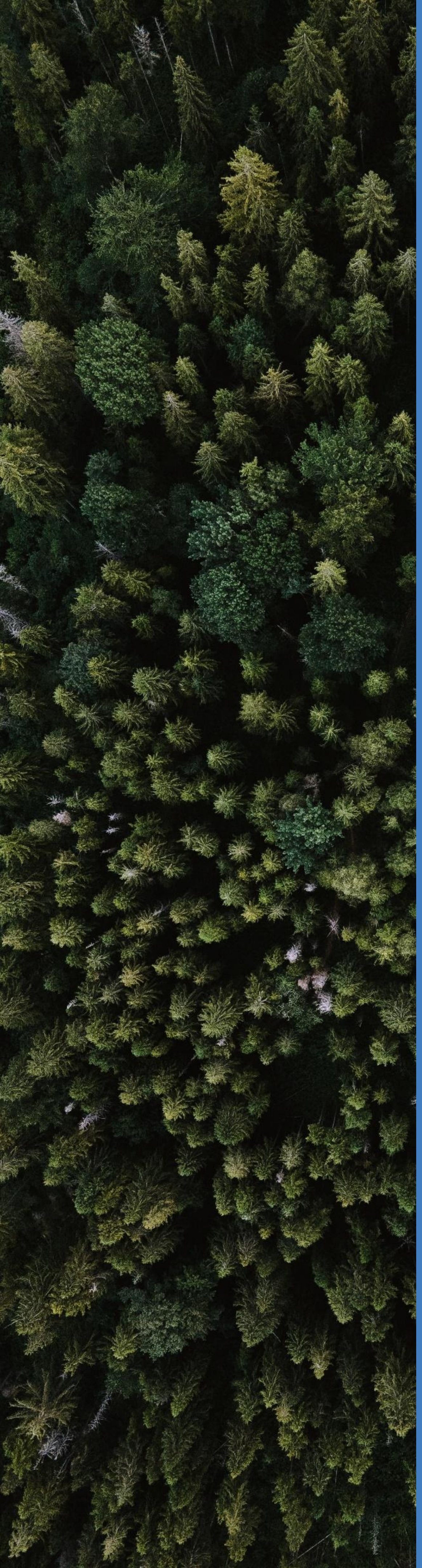
Shared workspace/Office

- GCP X+Why

Office

- Havas
- UMG
- Witan Gate House

Each service provided at these sites includes different activities and processes across the life cycle stages.



# Goal & Scope

The services provided at these sites include different activities and processes across the life cycle stages. The LCA boundary includes the following activities and processes:

**01 Greenzest staff**
Commutes to and from the sites.

**02 Consumables**
Use of products

**03 Machinery**
Energy usage from the use of cleaning equipment.

**04 Subcontractors**
Emissions related to the purchase of services from third party contractors including deliveries made to site.

**05 Well-to-tank (WTT) and transmission & distribution (T&D)**
Associated with the upstream processes of extracting, refining, and transporting raw fuel and energy to vehicles and assets.

**Exclusions and Assumptions**

➢ Any Greenzest-owned equipment used in the transmission of electricity (such as transformers or extension leads) were excluded from the assessment since their consumption is minimal.

# Inventory Analysis

All data was collected through Greenzest data spreadsheets based on the LCA boundary set out in Section *Scope and Boundary*.

Data collected included:

**Staff commuting**
Commuting distances to the site, and number of commutes.

**Use of consumables and other goods**
Type of products used and spend on product consumed.

**Machine usage**
Type and model of machinery used and how many days total the machinery is used.

**Distribution**
Type of vehicle products are shipped in along with the average quantity and distances to the relevant distributors

**Waste**
Spend on waste removal by subcontractors.

The client specified the data period for each of the activities and processes within the data collection spreadsheet, based on data availability.

# Impact Assessment

## Methodology and Modelling

The data provided were treated in line with ISO 14040 standards, by processing the raw data using conversions and calculations to generate the necessary units needed to apply the relevant emissions factors. For example, nominal power consumption and time in use were used to calculate the energy usage associated with a particular piece of machinery, by multiplying the KW consumption by the hours of machinery use, generating a unit of KWH for electricity consumption for which the relevant emissions factor could be applied.

Data was provided for the entire claim duration. Emissions factors were then applied, generating a **kilo of carbon dioxide equivalent** (kg$CO_2$e) emissions intensity for each of the activities and processes. The kg$CO_2$e for each activity and process for each of the sites were then added up to produce a total kg$CO_2$e across each of the services.

This emissions intensity was then translated into kgCO2e per cleaning day, kgCO2e per cleaning staff, kgCO2e per clock hour of cleaning, and kgCO2e per staff cleaning hour at the site

## Data Quality

The raw data provided covered the calendar year 2024. Most data were activity-based or estimated, except for any purchased goods and services, which were provided as spend, which means overall data quality was medium.

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# Interpretation Results

## Sector Overview

**Kilograms of carbon dioxide equivalent (kg$CO_2$e)** were generated for each of the various services. Office cleaning services generated higher emissions intensities as outlined in Table 2.

| Site type | kgCO2e per day | kgCO2e per staff per day | kgCO2e per clock hour at site | kgCO2e per staff hour at site |
|---|---|---|---|---|
| University/Offices | 106.12 | 5.59 | 29.48 | 1.55 |
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*Table 2: Intensity metrics across the services.*

## Sector Emissions Drivers

The emissions drivers for each of the sectors are further outlined in Figures 1, 2 and 3. The primary driver of emissions for all sites was commuting. Water usage accounted for the lowest emissions, contributing 1% or less of the total emissions.

## Emissions Drivers by Site Type

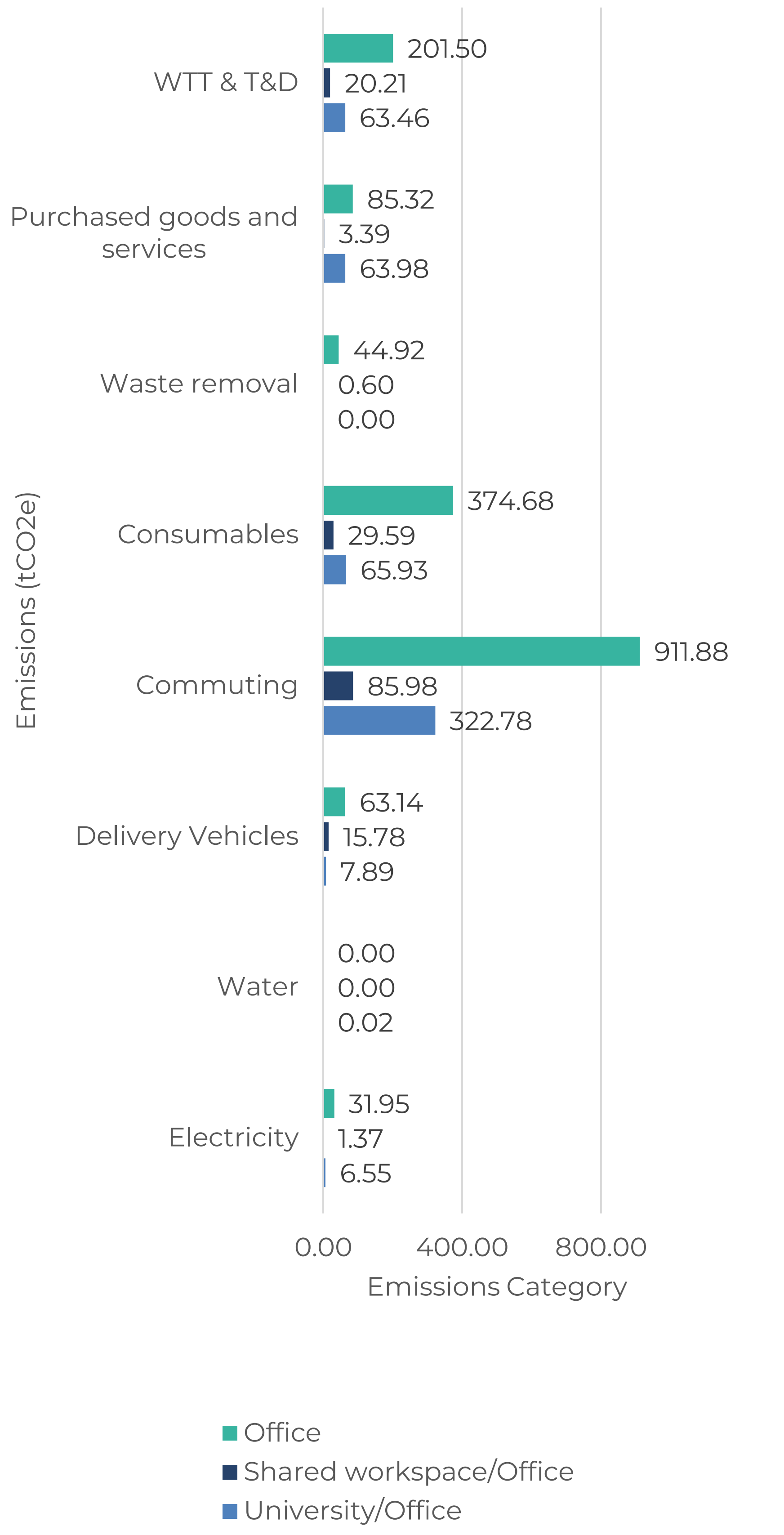


*Figure 1: Emissions driving categories by site type (T$CO_2$e)*

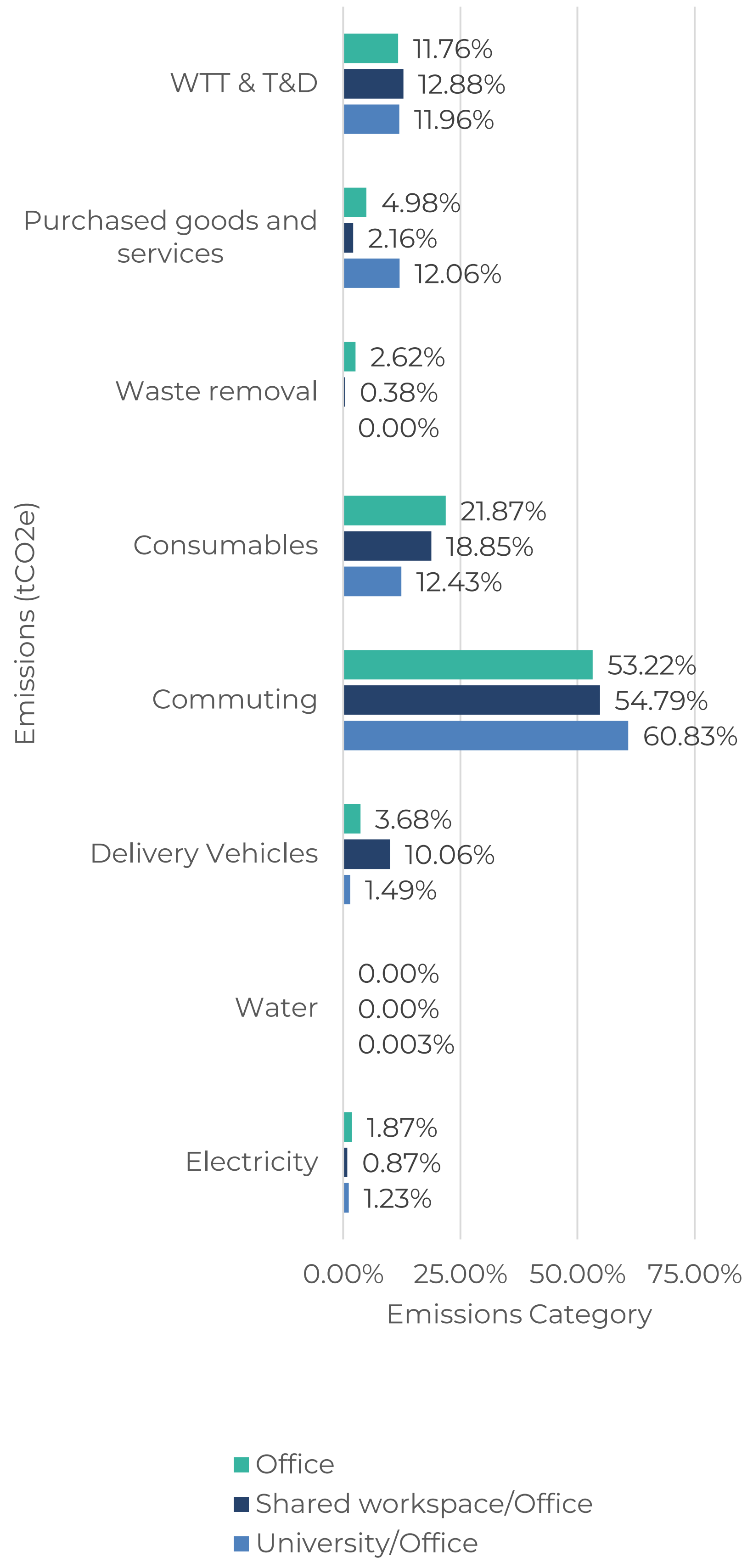


*Figure 2: Emissions driving categories by site type (%)*

# Interpretation Results

## Emissions Drivers by Site

Figure 3 shows that commuting emissions at Witan Gate House accounted for 32.20% of emissions at this site, lower than all other sites, which ranged between 40.89% and 61.71%. This higher percentage is due to a much higher level of spend with subcontractors at this site. This has led to emissions associated with waste removal, and purchased goods and services being much higher at this site than at all others. Water emissions were only captured for USSP.

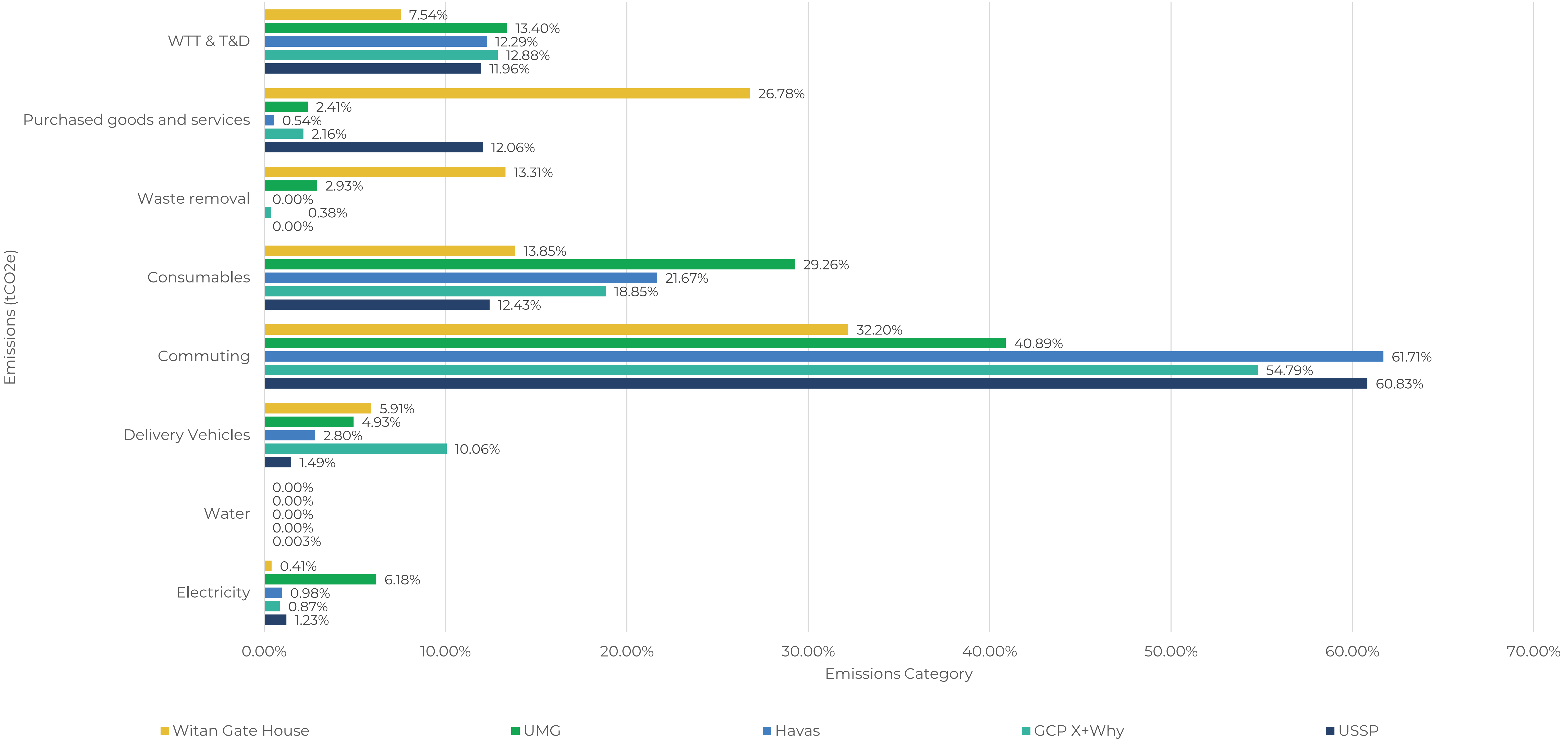


*Figure 3: Emissions driving categories (%) by site.*

# Interpretation Results

1. **Machinery** – Emissions from the use of machinery (relating to electricity and water consumption) for both school and office cleaning accounted for less than 2%. All data provided was based on actuals rather than estimates or spend. To reduce emissions in this area, it is suggested that Greenzest undertake a full review of the equipment used at each site. This would allow them to know they have selected the most efficient models to reduce both electricity consumption and water use where possible.

2. **Consumables** – These emissions have been estimated based on annual spend on goods purchased at each site. A more accurate assessment of these emissions could be made if weekly activity-based data could be provided. This could involve collating specific data around the type and amounts of products used each week and information from these suppliers regarding the emissions associated with the products they supply. This would allow more insight into the best way to reduce these emissions.

3. **Purchased Goods and Services** – Emissions have been calculated using a spend-based approach. It is recommended that activity-based data is collected to increase data accuracy in this area. This would allow a more accurate breakdown of emissions in this category to be created meaning more sustainable options can be explored to decrease the impact of this emissions category.

4. **Commuting** – Commuting emissions, across all sites, were the main emissions driver. These emissions were calculated using activity-based data. However, the response rate was not 100% for some of the included sites, meaning some extrapolation was required. If a complete response could be achieved, data accuracy would be improved. It is recommended that awareness is increased amongst employees so lower emission modes of transport are favoured where available.

5. **Deliveries** – Delivery emissions have been calculated using a known number of deliveries per week. However, the distance of each journey and weight of each consignment has been estimated based on the types of goods purchased by Greenzest. More accurate emissions of this service could be obtained by gathering detailed information from these subcontractors regarding the emissions associated with the service they deliver. This could allow a more detailed understanding of the impact of subcontracting this service.

6. **Waste removal** – Emissions have been calculated using a spend-based approach. It is recommended that activity-based data is collected to increase data accuracy in this area. This could include the number of times waste is collected at site and the disposal routes to allow a more accurate breakdown of emissions in this category. It would also allow a split between waste generated by Greenzest and waste generated by clients.

# Conclusions

The LCA across Greenzest University and office cleaning service lines provides both Greenzest and its clients with an understanding of emissions associated with the services provided. Emissions intensities for each of the services were generated allowing for specific emissions benchmarks to be produced. The "kgCO2e per clock hour of cleaning with Greenzest" emissions intensities could be used in communications with new clients to provide an estimated emissions value, which can be a competitive advantage as regulation on emissions disclosure in the UK increases.

The analysis highlights that emission drivers are similar across both service lines and each individual site, and that there is potential for data quality improvement. For 2024, Greenzest should focus on improving the quality of data provided for the biggest emission drivers highlighted previously so that emissions can be attributed to more specific categories and hence clearer recommendations can emerge, which will help Greenzest reduce its emissions in the future.

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