



Net-Zero Plan

Thackray Williams

Job No: FJ00349179

August 2024

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1.0 Context and Purpose

Adler and Allan (“A&A”) was instructed by Thackray Williams c/o Xeed ESG (the “Client”) to undertake a greenhouse gas (GHG) assessment of its UK operations and set out a Net-Zero Plan.

Thackray Williams is one of the leading law firms in south London and Kent, with offices located in Bromley, London, Sevenoaks and West Wickham. They offer legal services pertaining to family, employment, wills tax and administration, as well as corporate commercial and real estate.

Their operational emissions come from activities conducted at their four sites. Further non-direct emissions come from their purchased goods and services, water usage, and employee commuting.

A baseline GHG assessment has been conducted for the Client covering their Scope 1, 2 and selected Scope 3 emissions between the period of 1st July 2023 – 30th June 2024.

Following this assessment, a reduction pathway has been developed to identify ways in which the Client can reduce their GHG emissions, achieving alignment or surpassing the Science Based Targets Initiative recommendations for carbon reduction.

2.0 Introduction to Climate Change

2.1 What are Greenhouse Gases?

Climate change refers to long term shifts in global temperature and weather patterns. These changes can occur naturally through variations in solar cycles for example. However, since the beginning of the industrial revolution, human activities are believed to be the main driver of climate change, primarily due to the burning of fossil fuels, releasing greenhouse gases (GHGs) into the atmosphere.

GHGs warm the Earth by both absorbing and storing energy; and slowing the amount of energy released to space. GHGs create an additional insulating blanket around the Earth.

Different gases have different properties and, therefore, have different impacts. The two key characteristics are radiative efficiency (the ability to absorb and store energy) and lifetime (how long they stay in the atmosphere).

There are seven major GHGs. Carbon dioxide (CO₂), Methane (CH₄) and Nitrous Oxide (N₂O) are the most abundant single gases. Hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs) are groups of particularly damaging gases which are solely created from industrial processes. Two of the most prevalent perfluorocarbons are Sulphur Hexafluoride (SF₆) and Nitrogen Trifluoride (NF₃) which are provided a category of their own.

Global Warming Potential (GWP) is used to measure the impact of GHGs in a standardised way – comparing all gases to the most abundant GHG – carbon dioxide. This is known as carbon dioxide equivalent (CO₂e). For example, Methane is 25 times more damaging than CO₂. Whilst some hydrofluorocarbons can be up to 15,000 times more damaging.

GWP = How much energy is absorbed by 1 tonne of gas over a 100-year period (relative to CO₂)

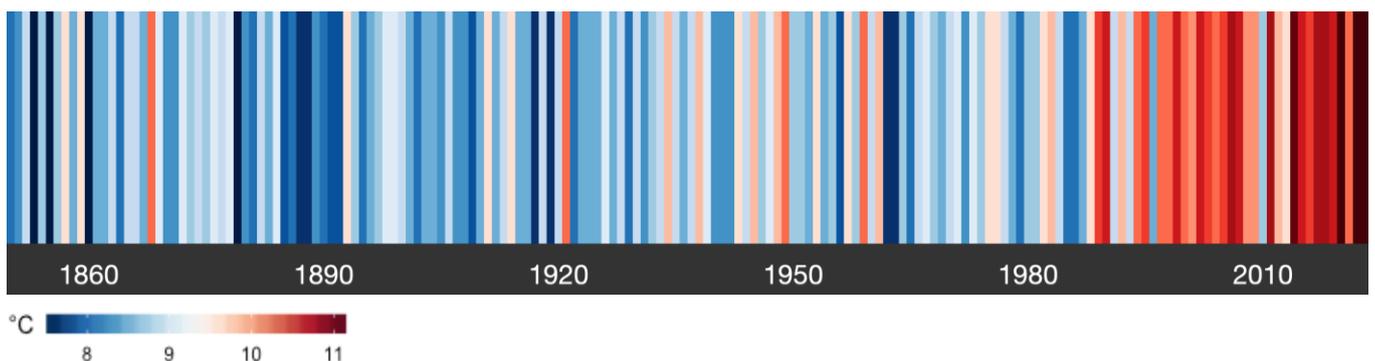
Table 1: Global Warming Potential – Seven Major Greenhouse Gases

Greenhouse Gas	GWP (100 Years)	Greenhouse Gas	GWP (100 Years)
Carbon Dioxide (CO ₂)	1	Hydrofluorocarbons (HFCs)	124 – 14,800
Methane (CH ₄)	25	Perfluorocarbons (PFCs)	7,390 – 17,700
Nitrous Oxide (N ₂ O)	298	Nitrogen Trifluoride (NF ₃)	17,200
		Sulphur Hexafluoride (SF ₆)	22,800

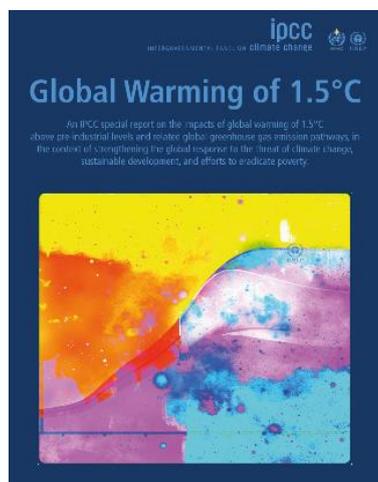
2.2 How Is Our Climate Changing?

Greenhouse gas concentrations are at their highest levels in human history. The graph below illustrates the change in global mean surface temperatures. Nineteen of the hottest years on record occurred since 2000. 2023 was the hottest year ever. This corresponds to the increase in industrialisation and man-made greenhouse emissions.

Figure 1: Average Mean Temperature Increases Since Pre-Industrial Levels (London)



2.3 How Warm Can the World Get Before It's Too Late?



In 2015, at COP21, 196 countries signed a legally binding treaty – known as the Paris Agreement - to limit global warming to more than 2°C above pre-industrialised levels by 2100. Three years later in 2018, the International Panel on Climate Change (IPCC) issued their report on Global Warming which revised the target to no more than 1.5°C. This is the point at which climate change scientists predict that irreversible damage will occur including an increase in droughts, wildfires, more extreme weather events, reduced food yields, sea-level rise, ecosystem decline and species extinctions.

We are currently on course to reach a 3.2°C increase by the end of the century. To limit global warming to 1.5°C, companies, organisations and governments are encouraged to set 'Science-Based Targets'. Current science predicts we need to significantly reduce GHG emissions by at least 50% by 2030; and by at least 90% by 2050. This target is constantly under review and, should we fail to implement sufficient reductions in the short term, we may require much more dramatic action in the future.

2.4 What Activities Generate GHG Emissions?

Our economy is based on fossil fuels. Almost everything we buy and consume has a carbon footprint. In terms of carbon accounting, emissions are split into three 'scopes' depending on how much responsibility we have for their generation.

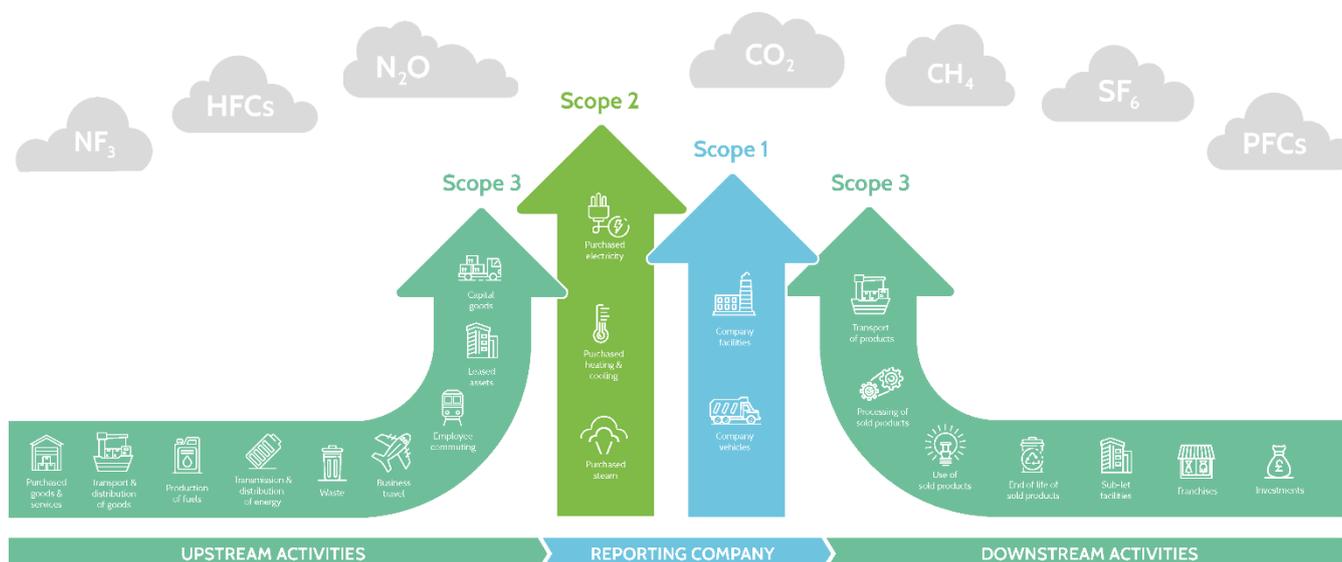
Scope 1 emissions are from directly combusted fuels used for heating buildings and in company vehicles. It also includes fugitive gases (GHGs released directly into the atmosphere) such as methane from livestock and refrigerant leaks.

Scope 2 emissions are from purchased electricity. Whilst your energy provider is responsible for the type of fuel used to generate the electricity, you are the end consumer. You can influence this by choosing another supplier or green tariff.

Scope 3 indirect emissions are from the supply chain. These are goods and services which you procure to deliver your own service (upstream) such as raw ingredients and business travel. It also includes emissions that occur because of your business (downstream) such as shipping of a product to a customer or the end-of-life disposal of packaging.

The diagram below illustrates all the possible emissions sources that a business may be responsible for. Every business is different and therefore not all emissions sources will be relevant. This assessment looks at all three scopes and provides a comprehensive carbon footprint of your business and your supply chain.

Figure 2: GHG Protocol Carbon Scopes



3.0 Scope and Methodology

Thackray Williams' operations consist of facilitating clients with high quality legal services for life and for business. Their operational emissions come from the activities conducted at their four sites. The West Wickham and Sevenoaks sites are directly owned, controlled, and managed by the Client, whereas the Bromley and London sites are rented serviced offices. The Client has some data and control over emissions sources at its Bromley office. All utilities consumption is included in the service charge the Client pays for the London site. Further indirect emissions come from their purchased goods and services, water usage, and employee commuting.

3.1 Scope 1 Emissions

The following Scope 1 (direct) emissions sources have been identified as relevant and material.



Natural Gas

Thackray Williams uses a gas fired central heating system at two of its sites at West Wickham and Sevenoaks.

3.2 Scope 2 Emissions

The following Scope 2 (indirect) emissions sources are included in the scope.



Purchased Electricity

Electricity is purchased from the national grid to power the Sevenoaks, West Wickham, and Bromley offices. Electricity consumption for the London office is included in the service charge. Currently, Thackray Williams uses a regular mixed-fuel tariff for all of their site for which they have direct control.

3.3 Scope 3 Emissions

The following Scope 3 (indirect) emissions sources from the supply chain are included in the scope.



Purchased Goods and Services

Purchased goods and services include paper, stationary, storage services, security services, and cleaning services and coffee.



Water Consumption

Water is supplied to the Sevenoaks and West Wickham offices and is recorded in cubic meters by water meters. Water consumption at the



Business Travel

Business travel including mileage in employees' own vehicles, and trains.



Waste

Waste is disposed of in general waste bins in all four sites. There are no recycling facilities at any of the sites.



Indirect Fuel & Energy Related Activities

Emissions resulting from transmission and distribution losses in the national grid, and well-to-tank emissions associated with the extraction, refining and transportation of fossil fuels.

3.4 Exclusions

The following exclusions have been made:

- Capital goods (large irregular capital expenditure) such as: new vehicles, furniture etc. are excluded from the scope of this assessment as the embodied emissions can often be larger than the company itself and disproportionately skew total emissions. This assessment focuses only on operational day-to-day activities.
- Any procurement spend that has been categorised as “miscellaneous” has been excluded from the scope of this assessment inclusive of remaining office sundries that could not be categorised with an appropriate carbon conversion factor (as calculated by the UK government in 2020). Appropriate cost codes for these purchases will help future calculations of GHG emissions and subsequent decarbonisation plans.

3.5 Estimations

The following estimations and assumptions have been made:

- Natural gas consumption during February 2024, and April 2024 at the West Wickham office have been estimated based on monthly averages.
- Purchased electricity consumption during July 2023, and March 2024 for the Sevenoaks office has been estimated based on monthly averages.
- Waste tonnage has been estimated due to lack of available data.
- Business travel has been estimated based on total annual expenditure. While this expenditure does include both mileage reimbursement and train travel, these are not separated. As such, business travel has been assumed to be entirely employee mileage claims (no public transport) and has been estimate using a mileage reimbursement at 45p/mile.

3.6 Methodology

This assessment has been self-certified to be carried out in general accordance with 'ISO14064-1:2006 Greenhouse Gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.' and 'PAS2050:2001 Specification for the assessment of the life cycle greenhouse gas emissions of goods and services' and the 'GHG Protocol'.

Wherever possible, 'DBEIS/DEFRA - UK Government Conversion Factors for Company Reporting' has been used in line with environmental reporting guidance for United Kingdom operations. In the absence of specific supplier GHG conversation factors, data has firstly been sourced from industry averages or other publicly availability sources and referenced accordingly. Where no such industry averages are available, emissions calculations are based on procurement spend.

This assessment measures, where possible, the carbon dioxide equivalent (CO₂e) emissions associated with business activities. CO₂e includes the main GHGs covered by the Kyoto Protocol: carbon dioxide (CO₂), methane (CH₄), hydrofluorocarbons (HFCs), nitrous oxide (N₂O), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

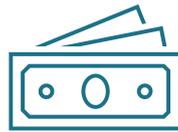
4.0 Emissions Sources

4.1 Gas Consumption

Gas is provided to the Sevenoaks and West Wickham offices for space heating. In total, Thackray Williams consumed **114,234 kWh** of gas between 1st July 2023 and 30th June 2024. The Sevenoaks office consumed **78,740 kWh (£5,598)**, and the West Wickham office consumed **35,495 kWh (£1,391)**. This costs the business a total **£6,989**. Gas consumption is responsible for GHG emissions of **20.89 tCO₂e**.



114,234 kWh



£6,989



20.89 tCO₂e

4.2 Electricity Consumption

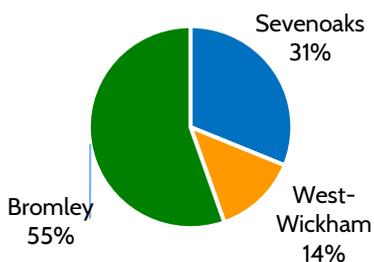
A combined **51,536 kWh** of electricity was consumed by the Client between 1st July 2023 – 30th June 2024. The office in Bromley consumed 28,546 kWh (55%). The Sevenoaks office consumed 16,069 kWh (31%), and the West Wickham office consumed 6,921 kWh (14%).

Electricity consumption for the London office is included in the total service charge. The Client does not have access to separate electricity consumption for this site.

Thackray Williams has one electricity tariff at the Sevenoaks office for its main meter with provider British Gas. According to the recent invoice, the Client is paying £0.30/kWh which equates to an estimated annual cost of **£4,747**. As invoices are unavailable for the Bromley and West Wickham offices, it has been assumed that these tariffs reflect that of Sevenoaks. As such, it is estimated that the electricity consumption at the Bromley and West Wickham offices cost the Client **£8,433** and **£2,045** respectively.

The Sevenoaks tariff has a reported fuel mix of coal (2%), natural gas (17%), nuclear, (26%), renewable (54%) and other fossil fuel sources (1%). When calculating the carbon emissions of electricity consumption, the 2024 UK grid average carbon conversion factor has been applied (0.20705 kgCO₂e/kWh) – this represents 'location-based' emissions. The British Gas emissions factor equates to 0.088 kgCO₂e/kWh which is 56% lower than the UK average – this represents 'market-based' emissions resulting from energy procurement decisions.

If Thackray Williams considered changing their electricity supply to a **100% renewable electricity tariff**, they would be able to reduce their market-based Scope 2 emissions from **8.05 tCO₂e**, to **0tCO₂e**.



Breakdown



51,536 kWh



£15,225



8.05 tCO₂e

Market Based

4.3 Transmission & Distribution

When electricity is purchased from the grid, some energy is lost in the network. This is known as transmission and distribution losses. Whilst the end user of the electricity is not responsible for how efficient the national grid is, it is best practice to account for these losses as it is the end user that creates the demand on the network. 51,536 kWh results in **0.94 tCO₂e** in T&D emissions. Reducing your energy use not only saves emissions from direct use, but also from T&D losses.

4.4 Water Consumption

A total of **159m³** of water was consumed in Sevenoaks and West Wickham. This generated emissions of **0.024 tCO₂e** from the supply of the mains water. 90% of water is assumed to go into drainage resulting in a further **0.028 tCO₂e** from wastewater treatment.



159 m³



0.052 tCO₂e

4.5 Procurement

Excluding miscellaneous purchased goods and services that could not be categorised in terms of carbon emissions, coffee consumption, paper consumption and utilities (gas, electricity, and water), the client spent a total of £165,655 on other purchased goods and services. This ranged from cleaning services to office stationary, to storage facility rental services. The most appropriate carbon conversion factor (as calculated by the UK government in 2020) was then applied to these spend categories. The carbon conversion factors for kgCO₂e/£ spent, cover broad categories and are conservative estimates. However, they do help to identify key carbon hotspots within purchased goods and services, which can then be subjected to further supplier-specific and weight-specific scrutiny. In total, Thackray Williams purchased goods and services account for **38.30 tCO₂e**.



£165,655



38.30 tCO₂e

Table 2: Annual Expenditure – Purchased Goods and Services

Expenditure Category	Total Spent (£)	Estimated GHG Emissions (tCO ₂ e)
Cleaning Services	£31,879	18.11
Stationary	£27,852	20.18
Security Systems	£1,994	0.21

CCTV	£225	0.023
Window Cleaning Services	£1,800	1.02
Boiler Services	£1,200	0.17
Electrician Services	£12,705	1.81
Storage Services (Restore)	£72,000	9.30
Storage Services (Oasis)	£16,000	2.07
Total	£165,655	38.30

4.6 Coffee Beans

Thackray Williams procured **691kg** of coffee and hot chocolate between 1st July 2023 and 30th June 2024. A total of £9,355 was spent by Thackray Williams on coffee and hot drinks. Taking an estimated conversion of 35kgCO₂e per kg of coffee*, coffee accounted for **24.19 tCO₂e**

**figures provided by Nescafe.com*



691 kg



24.19 tCO₂e

4.7 Paper Consumption

Thackray Williams rely on paper documents and printouts across many internal and external workflows. Paper consumption for the company totalled an estimated 838 reams (720x80gsm A4 copier paper, 5x80gsm A3 copier paper, 3x120gsm A4 good white paper, 24x135gsm A4 letterhead paper, 30x135gsm continuation paper, 24x270gsm will folders, and 32x120gsm A4 LPA and Will Paper). This equated to a total weight of approximately 2,379 kg of paper. The carbon emissions for this totalled in **2.60 tCO₂e**.



838 Reams



2,379 kg



2.60 tCO₂e

4.8 Business Travel

Thackray Williams travelled spent £14,491 on travel reimbursement for employees during period from 1st July 2023 – 30th June 2024. This was via a combination of mileage in employee’s vehicles, and public transport, predominately for travel

between the four sites, and home visits to clients. For the purposes of this report, it has been assumed that all business travel has been conducted in cars of average size and unknown fuel types, with a reimbursement of 45p/mile. As such, an estimated 32,202 miles were travelled, accounting for total emissions of **3.89 tCO₂e**.



4.9 Waste

An estimated 1.95 tonnes of waste was generated between 1st July 2023 – 30th June 2024 across the Client’s four sites. Resulting in **0.013 tCO₂e**. While the Client has advised that the majority of waste at these sites is paper waste, there are limited paper recycling facilities across all four sites.

Table 3: Annual Waste

Location	Type	Tonnage	Annual Cost
Bromley	4x 240ltr General Waste	0.78	£216
Sevenoaks	1x 1,100ltr General Waste	0.39	£540
London	1x General Waste	0.39	£1,040
West Wickham	General Waste	0.36	£1,040
Total		1.95	£2,836

4.10 Well-to-Tank

Well-to-Tank (WTT) emissions account from upstream emissions associated with the extraction, refining and transportation of raw fuel sources, prior to combustion. The WTT emissions for Thackray Williams totalled to **6.93 tCO₂e**. Whilst these emissions are the responsibility of third-party manufacturers and suppliers, it is important to include WTT emissions as, by consuming fuel, an organisation is also driving the demand for its production. Where an organisation can reduce its direct reliance on fossil fuels, it can also reduce emissions within the wider supply chain.

WTT emissions can be attributed to the following emissions sources:

- Gas consumption WTT emissions are **3.33 tCO₂e**.
- Purchased electricity WTT emissions are **2.57 tCO₂e**.
- Business train travel WTT emissions are **1.03 tCO₂e**.

5.0 Results

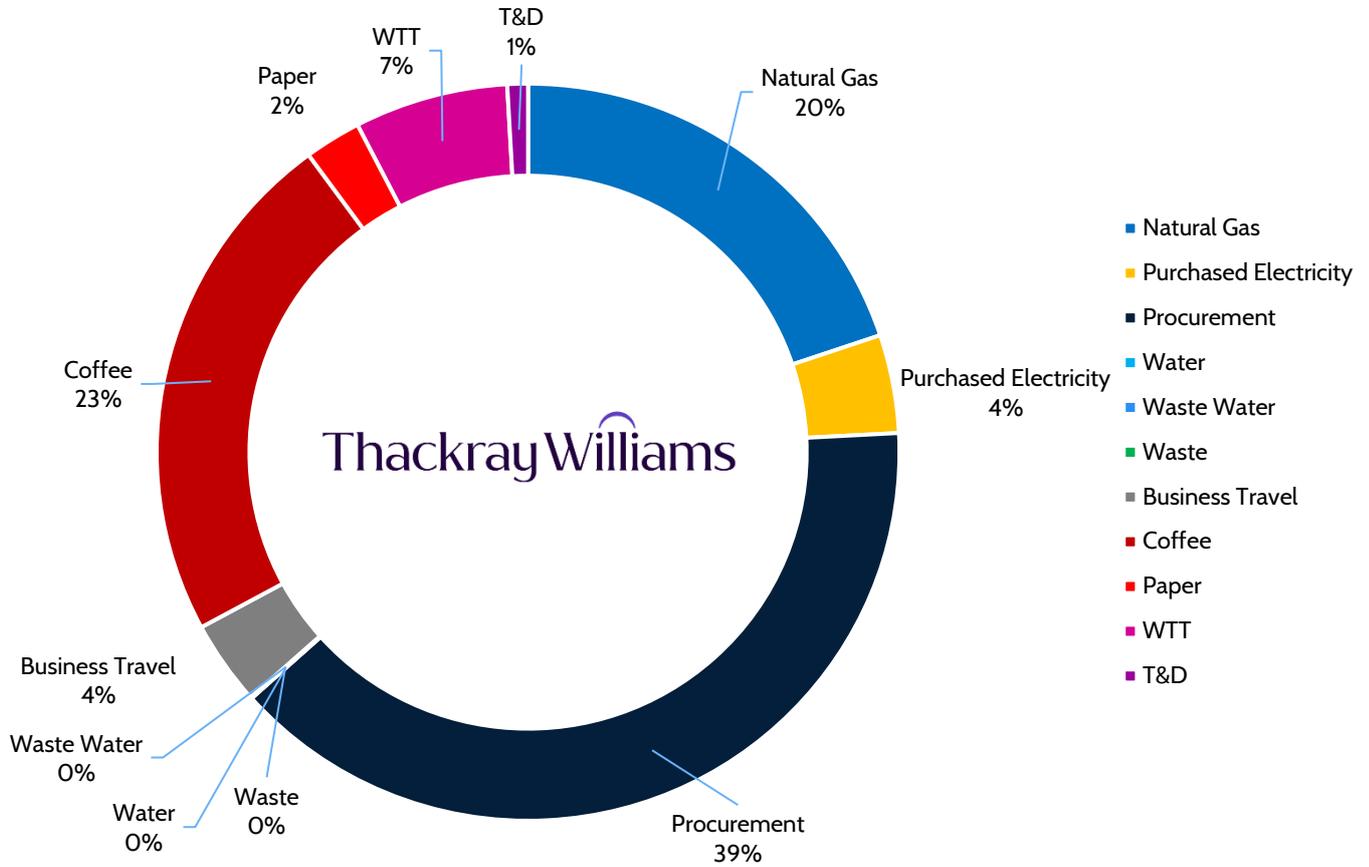
5.1 Summary

A breakdown of all emissions sources is presented in the table below:

Table 3: Summary 2022-23 GHG Emissions Results

Scope		Energy Source	Usage	Units	tCO ₂ e	%
1		Natural Gas	114,234	kWh	20.89	19.86%
2		Purchased Electricity	51,536	kWh	4.54	4.31%
3	Cat 1	Water	159	m ³	0.02	0.02%
	Cat 1	Paper	2,379	kg	2.30	2.47%
	Cat 1	Procurement	172,207	£	41.23	39.19%
	Cat 3	Transmission & Distribution	51,536	kWh	0.94	0.90%
	Cat 3	Well-to-Tank	51,536	kWh	6.93	6.70%
	Cat 5	Wastewater	151	m ³	0.05	0.03%
	Cat 5	Waste	1.95	Tonne	0.01	0.01%
	Cat 6	Coffee	691	Kg	24.19	22.81%
	Cat 6	Business Travel	32,202	miles	3.89	3.70%
		TOTAL	-	-	105.21	100%

Figure 7: GHG Emissions by Source



5.2 Carbon Intensity Ratios

Based on the data for the financial year 2023-24, the annual turnover was £12.44m. Thackray Williams also reported an average of 135 full time equivalent (FTE) employees for the same period. This data has been taken to calculate two overall key performance indicators as below:

£ 8.39 tCO₂e per £m turnover

0.77 tCO₂e per employee

6.0 Recommendations

A summary of the recommendations identified which will help Thackray Williams to reduce their carbon footprint are set out below. Financial savings are estimated based on Thackray Williams' current tariff prices. Other commodity prices are based on the average prices as of July 2024, and are subject to change.

6.1 Switch to Renewable Energy Tariffs

Thackray Williams currently has regular fuel mix tariff agreements with their energy supplier British Gas at their Sevenoaks office. It is assumed that this fuel composition is reflected at their other sites. Swapping this tariff with 100% certified renewable energy, backed by a renewable energy guarantee of origin (REGO), will reduce the carbon emissions associated with electricity consumption by **8.05 tCO₂e**.

This is following a **market-based approach** for measuring carbon emissions, which takes into account the type of electricity purchased. A **location-based approach** does not include the source of electricity and calculates carbon emissions based on the amount of electricity consumed and the average grid fuel mix.

6.2 Energy Awareness Campaign

By providing basic training to staff and materials such as 'switch off' signs near doors and appliances, utility wastage could be reduced by approximately 1% per annum. If this saving were achieved, an approximate total of **0.24 tCO₂e** could be saved per annum.

6.3 Electrify Heating

The Client currently has gas central heating at their Sevenoaks and West Wickham sites. These sites are owned, managed and controlled by the Client, and as such changes to heating systems are possible.

Replacing these two systems with a single, more efficient Air Source Heat Pump could result in significant energy savings. Working with the assumption that for every 100m² a 5kW system is needed, it is estimated that the Client would require a 200kW size system at their West Wickham Site, and a 270kW system at their Sevenoaks site. Installing this could result in an energy saving of 57,246 kWh per year. This equates to a carbon saving of **24.34 tCO₂e** if the Client were to switch to a renewable electricity tariff. This is due to the elimination of natural gas consumption.

6.4 Install Temperature Deadband

Advice published by Mitsubishi states that a 4% saving on air conditioning and heating energy consumption can be achieved for every 1°C set point change. For example, having a set temperature of 20°C and a 1°C deadband either side would mean that the heating and cooling systems would not operate until the temperature falls below 19°C or above 21°C. Installing a 2°C deadband on the proposed air source heat pumps could result in savings of **4,580 kWh per annum**. This would not reduce emissions if the Client were to switch to a renewable energy tariff but could reduce electricity emissions by **1.26tCO₂e** per annum on their current energy tariff. Dead banding is subject to the make and model of heating and cooling systems.

6.5 Improve Grey Fleet Data

Thackray Williams currently reimburses business travel for employee owned vehicles and public transport costs. These, however, are not separated into transport type, nor contain a significant amount of detail about the journey.

Having more in-depth data regarding business travel will allow the Client to better understand how their grey fleet is being used, and therefore will be able to make more targeted and effective action to reduce the overall mileage and associated carbon emissions. Data point that should be considered include:

- Mileage data per vehicle with registration,

- Vehicle type and fuel type per vehicle, • Journey destination, e.g. Sevenoaks office; and
- Categorisation of journey purpose e.g. internal meeting, client meeting, external event, internal event. Data detailing vehicle and fuel type will allow for more accurate carbon and energy reporting. It will also help the Client to plan a transition to a low-carbon grey fleet. Finally, journey destination and purpose will highlight if particular events or employee obligations are causing spikes in mileage data throughout the year.

6.6 Reduce Travel Need by 10%

By encouraging employees to work remotely and/or adopt more video conferencing and other technology solutions can help prevent the need to travel in the first place. If employees were to implement remote working practices and reduce business travel miles (across cars, trains, and flights) by 10%, Thackray Williams could save **0.59 tCO₂e**.

6.7 Increase public transport use by 15%

The Client has advised that the majority of business travel is done to travel to and from office locations and to visit clients. All four sites have access to local train stations and other public transport services, see table 4. The Client may see carbon reductions by opting for public transport to and from these sites. For instance, travel emissions from the Sevenoaks office to the West Wickham office could be reduced by 3.77kgCO₂e per journey if public transport was taken instead of personal vehicles.

Table 4: Public Transport Servies Near Thackray Williams' Offices

Location	Nearest Train station	Distance from Station (km)
Sevenoaks	Sevenoaks Station	1.35
West Wickham	West Wickham Station	0.5
London	London Cannon Street	0.68
Bromley	Bromley North	0.91

According to Net Zero Nation, utilising public transport could save up to 73% in associated carbon emissions. If the Client were to switch 15% of employee mileage to public transport, then Thackray Williams could see a potential carbon reduction of **0.59 tCO₂e**.

6.8 Salary Sacrifice

Salary sacrifice agreement is an agreement between an employer and an employee to reduce the employee's entitlement to cash pay, in return for a non-cash benefit. This benefit could be an electric vehicle lease, for example.

The monthly cost of a lease is taken out of employee's pre-tax pay, helping them to save money on Pay-As-You-Earn (PAYE) tax and National Insurance (NI) contributions. As the pre-tax salary is now lower for the employee, PAYE and NI are deducted from a smaller overall amount, which means a smaller proportion of the employee's overall salary is lost to tax.

There is, however, an additional tax that needs to be paid – Benefit in Kind (BIK) – which is paid by the employee. A key reason why electric vehicles salary sacrifice is gaining popularity is because BIK is currently very low. For the 2023/24 financial year, this tax was set at just 2%. Whilst it is expected that BIK rates will increase over time, it is likely that it will remain low until at least 2028 as the UK Government encouraged uptake on electric vehicles ahead of the ban on new petrol and diesel cars in 2030.

A salary sacrifice agreement is relatively simple to set up but does require a change to the terms of the employee's employment contract.

Thackray Williams may decide to implement a salary sacrifice scheme for employees in certain positions or seniority or may open up a scheme for all employees. Alternately, the Client may choose to trial a pilot scheme with employees who contribute significantly towards the Client's total mileage, such as the Solutions team and Sales team, and then open up the scheme for all employees.

One key aspect is to ensure that an arrangement cannot reduce an employee's cash earnings to below the National Minimum Wage. It is the responsibility of the employer to ensure that the minimum wage is maintained at all times.

Whilst there is limited direct benefit for the company a salary sacrifice scheme is a great perk to help attract and retain great talent. It signals a commitment to supporting employees to save money and make a positive step in tackling climate change, which they may have otherwise not had the opportunity to do without the added benefits.

If 50% of the Client's grey fleet were to adopt electric vehicles as part of this salary sacrifice scheme, then the Client could see a carbon reduction of **2.3 tCO₂e**.

6.9 Use Recycled Paper

A total of 2,379kg of virgin paper was purchased and used by the client between 1st July 2023 and 30th June 2024. If the Client were to switch to purchasing recycled paper for office use, they could see potential carbon savings of **0.59 tCO₂e**.

6.10a Go Paperless; Switch to 80gsm Paper

The Client's paper consumption is significant, and as such should focus on transitioning to a paperless business model. By initially switching to 80gsm for all purchased paper products, the Client could see carbon savings of **0.15 tCO₂e**.

6.10b Go Paperless; Reduce Paper Consumption

Following a switch to recycled 80gsm paper, the Client should continue to follow a paperless business model by reducing paper consumption. This can be done by switching to electronic forms of communication. If the Client were to reduce 50% of their paper consumption, carbon savings of **1.23 tCO₂e** could be achieved.

6.10c Go Paperless; Digitise Records

Following a switch to recycled 80gsm paper and a significant reduction in paper consumption, the Client should continue to follow a paperless business model by digitising paper records. Currently, the Client spends £88,000 a year on storage facilities, and this accounts for 11.36 tCO₂e of associated emissions. If the Client were to digitise 75% of their paper records, carbon savings of **8.52 tCO₂e** could be achieved.

6.11a Net Zero Suppliers; Storage Facilities

As Scope 3 procurement accounts for approximately 37% of total emissions, where reduction is not possible, the Client should ensure that they source suppliers and services that align with Thackray Williams' Net Zero journey. By sourcing Net-Zero storage facilities, Thackray Williams could see an estimated 90% savings in carbon emissions, or **2.56 tCO₂e**

6.11b Net Zero Suppliers; Services

As Scope 3 procurement accounts for approximately 37% of total emissions, where reduction is not possible, the Client should ensure that they source suppliers and services that align with Thackray Williams' Net Zero journey. By sourcing Net-Zero Window Cleaning, Boiler Servicing and Electrician services, Thackray Williams could see an estimated 90% savings in carbon emissions, or **2.70 tCO₂e**

6.12 Improve Recycling Facilities

While transitioning to a paperless business model, the Client should prioritise proper disposal of the paper products they do consume. The Client has been advised that paper at all four sites is disposed of in general waste bins. As such, the Client should focus on implementing recycling initiatives for staff and accessible recycling bins at each site. This would reduce carbon emissions associated with the production, transport and distribution of virgin paper.

6.13 Switch to Carbon Negative Coffee

A total of 691kg of coffee and hot chocolate was purchased by the Client, or a total of **24 tCO₂e**. This equates to approximately 5.1kg of coffee per employee per year. As coffee makes up a considerable proportion of the Client's carbon footprint, a concerted effort to reduce coffee associated emission should be made. Switching to carbon neutral or negative coffee suppliers would eliminate coffee associated emissions in its entirety. There are numerous carbon neutral and carbon negative suppliers in the UK, including but not limited to; Kiss the Hippo, Truemark, and Carbon Neutral Drinks. A total **24 tCO₂e** could be saved by making this switch.

6.14 Reduce Stationary Consumption

Following digitisation of work practices, the Client is likely to see a natural reduction in stationary purchases. Assuming a 50% reduction in stationary purchases, the Client could also see a carbon reduction of approximately **10.09 tCO₂e**. This assumes the Client does not change suppliers or significantly alter the type of stationary they order currently.

6.15 Switch to Sustainable Stationary Alternatives

Following a reduction in stationary consumption, the Client should focus on ensuring the remaining stationary used is from a sustainable origin, or procured from a supplier that aligns with Thackray Williams' Net-Zero targets. According to Paperwise, switching to sustainable alternatives can save up to 47% on carbon emissions. As such, if Thackray Williams were to switch to sustainable alternatives they could see a carbon reduction of **4.74 tCO₂e**.

6.16 Switch to Sustainable Cleaning Products

According to Unilever, non-fossil fuel derived cleaning products have a carbon footprint 46% lower than their fossil fuel derived equivalents. As such, the Client should focus on procuring cleaning products and services that are sustainable and non-fossil fuel derived. In doing so, the Client could see a carbon reduction of **8.33 tCO₂e**.

6.17 Install Voltage Optimisers in Sevenoaks and West Wickham Offices

Official average supply of electricity from the national grid is 230V. However, actual supply from the grid can fluctuate up to an average of 242V. As most appliances are rated at 220V, many appliances are being supplied more electricity than required. Installing voltage optimisers regulate the voltage entering the building from the grid to around 220V. Any excess voltage received from the grid is returned and not used on-site, therefore lowering the site's energy consumption. It is estimated that a voltage optimiser can reduce electricity consumption of appliances by an average of 13%. The Better Buildings Partnership released a case study in 2019 demonstrating the benefits of installing voltage optimisers in commercial buildings. This case study showed the average capital cost for a voltage optimiser installation was around £20,000, however other sources have recommended costs as low as £1,500.

Installing a voltage optimiser after the above reductions at the West Wickham, Bromley, and Sevenoaks sites could further reduce electricity consumption by a combined **9,385 kWh** a year. This equates to a carbon saving of **2.58 tCO₂e** per year. It must be noted that if grid electricity consumption decreases considerably, for example through the use of solar PV, the savings provided by the voltage optimiser will also decrease.

6.18 Solar PV Installation at Sevenoaks and West Wickham

The London and Bromley sites are rented shared serviced offices, not owned by the Client, and thus have been excluded from potential solar PV installations for Thackray Williams. The West Wickham office, however is owned by the Client. The Sevenoaks site is rented, however these offices are not shared with other businesses, and the Client has good relations with the landlord.

Both the West Wickham and Sevenoaks sites have potential for two solar PV systems each. The West Wickham site has potential to house a combined 6.2kWp system (one 3.6kWp and one 2.6kWp) on the South and Southeast facing rooftops. These could generate up to 5,900kWh per year. This equates to a carbon saving of 1.36 tCO₂e per annum.

The Sevenoaks site has potential to house a combined 11.2kWp system (one 7.6kWp and one 3.6kWp) on the South and Southeast facing rooftops. These could generate up to 12,000kWh per year. This equates to a carbon saving of 2.36 tCO₂e per annum.

All solar PV recommendations must be subject to a structural survey of the Site.

Figure 8: West Wickham potential Solar PV installation



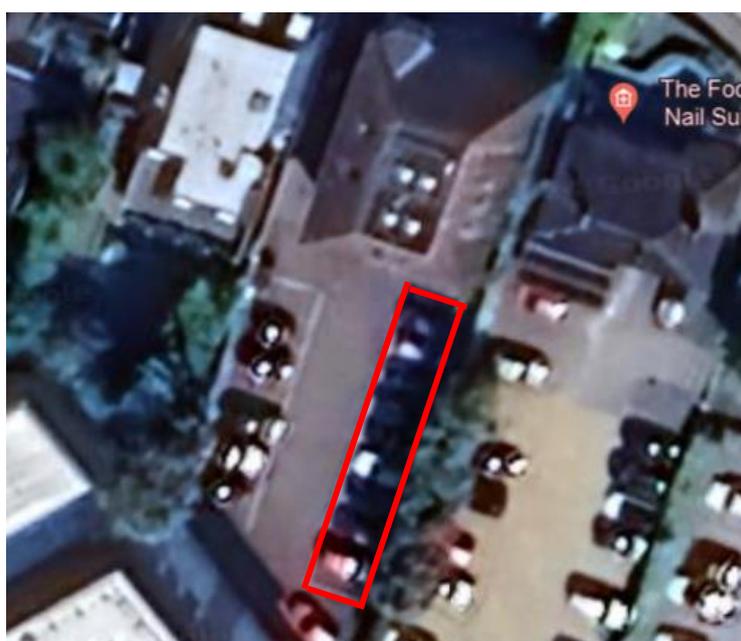
Figure 9: Sevenoaks potential Solar PV installation



6.19 Solar PV Canopy Installation at Sevenoaks

A desktop feasibility assessment for Solar Photovoltaic (PV) panels has been conducted to indicate the potential suitability to generate renewable energy at the Site. To further the rooftop installations outlined above, the Client may consider a canopy PV system to be constructed over the car park, which would hold the panels and tilt them south. It is understood that the canopy could hold a potential 23.6kWp solar PV system covering approximately 118m². Installing solar PV systems may result in a total energy generation of 25,000 kWh or a carbon saving of 10.6 tCO₂e. The efficiency of solar PV systems typically diminishes by 0.5% per year due to panel degradation. All solar PV recommendations must be subject to a structural survey of the Site.

Figure 10: Sevenoaks potential Canopy Solar PV installation



7.0 Summary of Recommendations

7.1 Table of Recommendations

A summary of the recommendations identified is provided below. For optimum effectiveness, some recommendations are best done in conjunction with other complimentary actions. Conversely, where a recommendation to upgrade equipment with a more efficient alternative is implemented first, the savings associated with energy management recommendations may take longer to pay back, due to lower power ratings. Carbon savings are calculated using 2024 UK GHG factors.

Table 5: Summary of Recommendations

Recommendation	Predicted Annual Saving		Implementation Cost	Payback (years)
	Financial (£)	Carbon (tCO ₂)		
Switch to a 100% REGO backed Renewable Energy Tariff	-	8.05	-	-
Energy Awareness Campaign	-	0.24	£0	Immediate
Switch to Electric Heating Systems	+£9,922	24.34	£10,000	-
Install Temperature Deadbands on New Heating Systems	£1,570	1.26	£0	Immediate
Improve Business Mileage Data	-	-	-	-
Reduce Travel Need by 10%	£1,449	0.59	£0	Immediate
Increase Public Transport Use by 15%	-	0.59	-	-
Salary Sacrifice	-	2.30		
Use Recycled Paper	-	0.59	-	-
Go Paperless; Switch to 80gsm Paper	-	0.15	-	-
Go Paperless; Reduce Paper Consumption	£3,625	1.23	-	-
Go Paperless; Digitise Records	£88,000	8.52	-	-
Net Zero Suppliers; Storage	-	2.56	-	-
Net Zero Suppliers; Services	-	2.70	-	-
Implement Recycling Initiatives and Facilities	-	-	-	-
Switch to Carbon Neutral/Negative Coffee	-	24.00	-	-
Reduce Stationary Consumption	-	10.09	-	-
Switch to Sustainable Stationary	-	4.74	-	-
Swich to Sustainable Cleaning Products	-	8.33	-	-
Install Voltage Optimisers	£2,815	2.58	£15,000	5
Install Solar PV systems	£5,370	4.93	£56,700	10.56
Install Canopy PV Systems	£7,500	6.88	£28,000	3.73
Total	£100,407	114.67	£109,700	

8.0 Net-Zero Roadmap

If the above recommendations are implemented in the prioritised order set out below, Thackray Williams could achieve a total reduction of **99.03tCO₂e** with a 97% reduction in residual emissions.

Conservative figures have been applied throughout to provide realistic recommendations. If Thackray Williams were to increase their impact in reductions the carbon savings would increase.

Figure 11: Decarbonisation Action Plan (tCO₂e)

