ZENITHJET

2023 CARBON ACCOUNTING REPORT

MARCH 2024

ZENITHJET

A message from our Founder

I am thrilled to share our continued commitment to sustainability and environmental responsibility. Since launching our GHG reporting in 2021, we have offset 200% of our emissions through carefully selected, verified carbon offset projects around the world. This achievement reflects our dedication to minimizing our environmental impact and contributing positively to our planet's health.

Expanding our horizon, we've introduced sustainability services aimed at guiding businesses within and beyond the aviation industry toward sustainable operations. Our expertise in GHG accounting and inventory reporting is now aiding our partners in understanding their environmental impact and devising strategies to mitigate it effectively.

I encourage fellow business leaders to join us in this vital effort. By focusing on reducing both direct operational emissions and those within our value chains, we can drive meaningful change. Together, we have the power to shape a sustainable future.

Nick

Table of Contents

List of Tables

List of Figures

Executive Summary

This report outlines the greenhouse gas (GHG) emissions footprint associated with ZenithJet's operation for the year 2022. The organizational boundary selected for the accounting followed the operational control approach, and the operational boundary included Scopes 1 and 2, and scope 3 emissions.

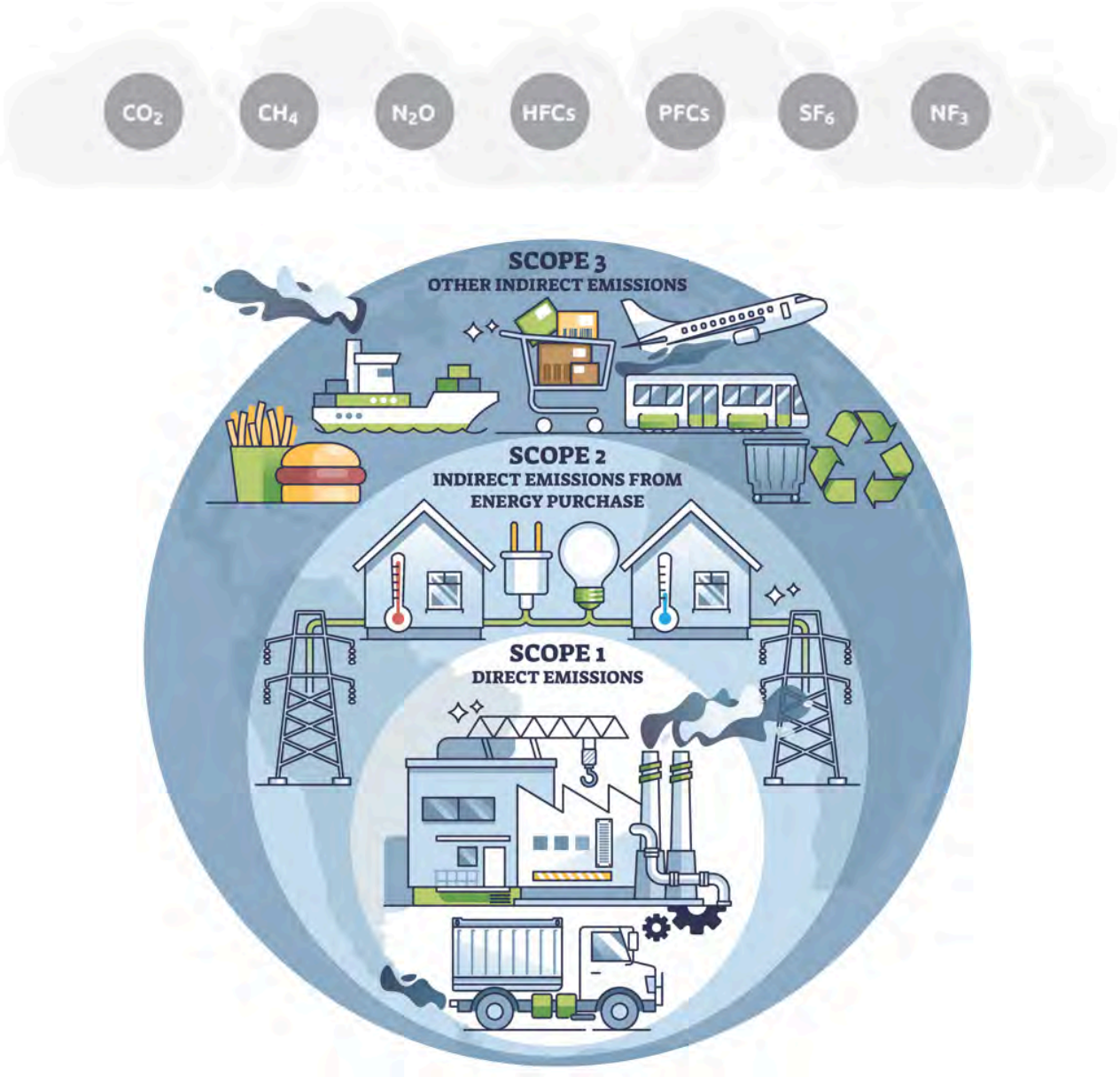

Figure 1: Overview of greenhouse gas emissions

Executive Summary

The total greenhouse gas (GHG) emission was calculated to be 28.69 tonnes of carbon dioxide equivalent (tCO_2e). The breakdown of the footprint by scope is summarized in table 1 below.

Source	Total CO_2e (tonnes) *2021*	Base Year 2022	2023	2023 % Change From Base Year
Scope 1 Direct emissions	*8.32*	4.07	2.62	35.63% ↓
Scope 2 Indirect emissions from purchased electricity	*3.21*	2.82	0.90	68.09% ↓
Scope 3 Other Indirect emissions	*7.19*	36.20	25.17	30.47% ↓
Total	*18.72*	**43.09**	**28.69**	**33.42%** ↓

Table 1: GHG footprint summary

Executive Summary

To better visualize the contribution of GHG emissions to ZenithJet's footprint, figure 1 below illustrates a comparison of annual emissions by scope, in tCO_2e.

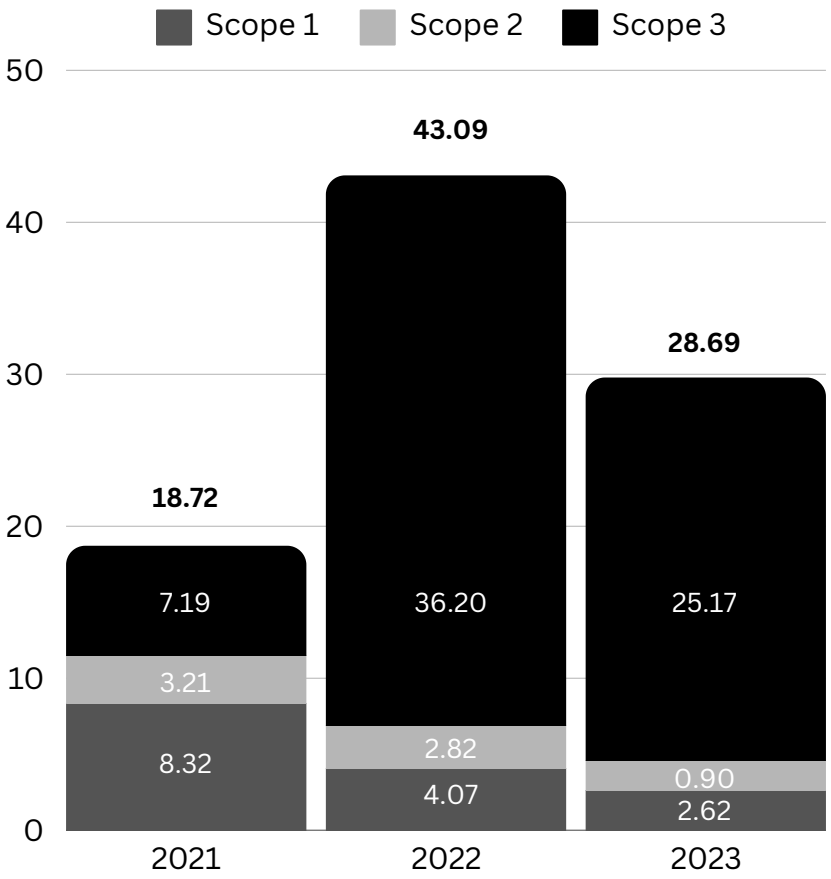

Figure 2: Comparison of annual tCO_2e emissions by scope

In 2023, Scope 3 (at 25.17 CO_2e tonnes) contributed the most to GHG emissions, amounting to 87.73% of ZenithJet's footprint (28.69 CO_2e tonnes in total). Scope 2 (at 0.90 CO_2e tonnes) contributed the least, amounting to 3.15% of the total footprint.

Introduction

ZenithJet is the leading technical services consulting firm for business aircraft owners, operators, and corporate flight departments. Founded in 2008, ZenithJet provides technical and operations expertise to help clients manage their aircraft more efficiently. In 2021, ZenithJet expanded into environmental services, offering GHG measurement to companies looking to better understand their emissions.

ZenithJet is committed to reducing its environmental impact by taking mitigation measures and using carbon offsetting for unavoidable emissions. In 2022, ZenithJet purchased carbon offsets that offset the emissions from 2022 by 200%. ZenithJet will do the same for its measured emissions for 2023.

ZenithJet moves its business forward and promotes environmental initiatives by undertaking to reduce its own environmental footprint while helping clients and companies to realize their own projects.

This third GHG Inventory Report comes as an effort in understanding, managing, and communicating climate change impacts resulting from the organization's activities.

The organization's details, along with the reporting period, are found in Table 2.

Website	zenithjet.com
Business Sector	Business Aviation Technical & Completions Oversight
Reporting Period	January 1, 2030 - December 31, 2023

Table 2: Company Information

Methodology

Generally accepted GHG accounting principles exist to provide a standard basis for reporting a faithful, true, and fair account of a company's GHG emissions. ZenithJet calculated its reported GHG emissions in accordance with the World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI) "Greenhouse Gas Protocol (GHGP): A Corporate Accounting and Reporting Standard" (2004).

The GHGP is the most widely used international carbon calculation methodology compatible with other GHG standards such as the ISO 14064, which also allows for direct integration with national and international GHG registries.

ZenithJet referred to the five Greenhouse Gas Protocol accounting and reporting principles to ensure that its inventory reliably represents its emissions:

Relevance. Inventory conveys emissions in a manner that serves the decision-making needs of internal and external users.

Completeness. All sources of emissions and activities within the boundary are reported, and exclusions are appropriately justified.

Consistency. Accounting approaches, boundaries and methodologies are consistently applied to enable meaningful comparisons of data over time.

Transparency. Report content is presented in a factual and coherent manner. Relevant issues and/or assumptions are addressed clearly.

Accuracy. Data, measurements, estimates, and calculations are precise enough to yield credible information with a reasonable level of assurance.

Methodology

For Scope 1 and 2 reporting, the operational control approach was utilized to identify the relevant operations for the purposes of quantifying emissions. In line with the GHG Protocol, operational control was defined as having the authority to introduce and implement policies over an asset or a location.

Scope 1: Direct GHG Emissions were identified as occurring from sources that are owned or controlled by ZenithJet.

Scope 2: Indirect GHG Emissions were identified as resulting from the generation of electricity, heat, or steam generated off site but purchased by ZenithJet.

For Scope 3 emissions reporting, ZenithJet utilized the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

Scope 3: Other Indirect GHG Emissions were identified as originating from sources not owned or directly controlled by ZenithJet but related to activities.

In brief, scope 1 and 2 emissions were calculated for two sites under ZenithJet's control, and emissions from ZenithJet-owned transportation were included under Scope 1. Emissions outside ZenithJet control (employee commuting and business travel) were accounted for under Scope 3.

Methodology

For Scope 1, two direct emission source categories were identified. The first source was the natural gas used for heating of the buildings in which ZenithJet sites are located. The second source was the fuel use of ZenithJet-owned gasoline combustion vehicles (estimated by collecting data on the amount of fuel consumed in addition to spend-based data for hybrid vehicle and relevant emission factors).

For scope 2, only one indirect emission source category was identified, which was the electricity purchased and consumed during the reporting period according to billing (estimated by taking the metered consumption of the entire building in kWh and dividing by the square footage of occupied office space).

For scope 3, two categories were identified: employee commuting and business travel. Data was collected on the distance, frequency, and mode of commuting and travel, and included rented vehicles and accommodation. (Emissions were calculated using the distance–based method, and appropriate emission factors were applied according to the mode, i.e., automobile, bus, train, plane, or bicycle. Emissions related to accommodation were estimated using the spend-based method.)

GHG Inventory Design and Development

Organizational Boundary

Boundaries are imaginary lines which encircle the emissions that must be listed in a company's GHG inventory. In setting organizational boundaries, a company chooses a method for consolidating GHG emissions and then consistently applies the selected approach to define those businesses and operations that constitute the company for the purpose of accounting and disclosing GHG emissions.

For corporate reporting of GHG emissions, there are two different ways: the Equity Share Approach, and the Control Approach. The equity shares approach accounts for emissions based on financial ownership or economic interest in an operation. The control approach accounts for emissions based on operational or financial control.

ZenithJet has chosen to use the operational control for the purposes of consolidating and reporting GHG emissions, to take full responsibility for the GHG emissions of its operations and facilities. These facilities include the head office located in Montreal, Quebec (Canada) and a satellite office in Atlanta, Georgia (USA).

This carbon accounting report covers the operational emissions of our two facilities:

Facility Name	Facility Address	Area (m^2)	Headcount (2023)
Montreal Office	7575 Trans Canada, Suite 620 Saint-Laurent, QC, H4T 1V6	102	6
Atlanta Office	1715 McCollum Parkway, NW Bldg. 700, 2nd floor, Kennesaw, GA 30144	42	1
Total		144	7

Table 3: Facility Information

Operational Boundary

Operational boundaries are defined by “scopes” (as described under Methodology) which categorize the emissions resulting either directly or indirectly from the company’s operations and activities. ZenithJet operational boundaries includes all activities involving fuel combustion.

According the GHG Protocol (the corporate accounting and reporting standard published by WRI and WBCSD) scope 1 and scope 2 emissions must be reported. Scope 3 emissions are voluntary depending on the availability and reliability of data.

The emitting activities covered in this carbon footprint report for 2023 includes fuel burned in stationary source, fuel burned during transportation, and emissions from purchased electricity as well as other indirect emissions.

A summarized list of emission sources and activities are presented in Table 4.

Scope	Emission Category	Emissions Source / Activity
Scope 1	Stationary Combustion	Fuel Combustion (heat generation)
Scope 1	Mobile Combustion	Fuel Combustion (owned vehicules)
Scope 2	Electricity	Consumption (purchased electricity)
Scope 3	Transportation	Fuel Combustion (employee commuting)
Scope 3	Transportation	Fuel Combustion (business travel)
Scope 3	Accommodation	Consumption (hotel stays)

Table 4: Emissions categories and sources

Reporting Period and Base Year

This assessment report details the scope, data, and results from ZenithJet's GHG inventory for calendar year 2023, from January 1 – December 31, 2023.

In conformance with the GHG Protocol, ZenithJet must select an inventory base year to allow for like-to-like comparisons over time which enable meaningful comparisons for tracking progress towards a given target.

Although 2021 was ZenithJet's first inventory, it was not selected as the base year as it did not represent a "normal" year. (The public health regulations of the COVID-19 pandemic resulted in very little travel taking place.)

In this report, year 2022 was considered as the base year.

Calculation Methodology

To provide a standard basis for reporting a faithful account of the ZenithJet emissions, the reported emissions were calculated in accordance with the Greenhouse Gas Protocol (GHGP). The GHGP is the most widely used international carbon calculation methodology, as it is compatible with other GHG standards such as ISO 14064 and allows for direct integration with national and international GHG registries.

According to the GHGP and ISO 14064-1 Section 4.3.3, emissions can be calculated by multiplying the GHG activity data by the appropriate GHG emission factors:

GHG Activity Data × GHG Emission Factor = GHG Emissions

The GHG emission factor of a specific activity or product represents the sum of all the GHG emissions to air related to this activity or product, which is then converted to kilograms of carbon dioxide equivalent (CO_2e).

This methodology yields a considerable level of certainty as accurate emission factors are available in National Inventory Report and the activity data are available from reliable sources.

Other approved methodologies (such as use of a model, mass balance approach or continuous measurement) were considered cost intensive and not practical for the project.

ZenithJet's GHG emissions were measured in metric tons of carbon dioxide equivalents (tCO_2e) for reporting purposes.

Global Warming Potential

Global warming potentials (GWPs) are factors describing the radiative forcing impact of one unit of a specific greenhouse gas (e.g., methane) relative to one unit of carbon dioxide. GWPs are used in GHG accounting to convert individual emissions totals to a single standardized unit useful for comparison – carbon dioxide equivalent, or CO_2e. The basic equation for estimating emissions is:

GHG Emissions x GWP = carbon dioxide equivalent (CO2e)

Global warming potential values were based on the quantification guidance of Environment and Climate Change Canada (ECCC) which references values provided in the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). According to the ECCC, the IPCC's AR5 values apply to Canada's regulatory reporting of facility emissions as of calendar year 2022.[1]

In alignment with best practice, Kyoto Protocol GHGs have been included where applicable and material. These GHGs and their respective GWPs are listed in table 5.

Common Name	Chemical Formula	Fourth Assessment Report (AR4)	Fifth Assessment Report (AR5)
Carbon Dioxide	CO_2	1	1
Methane	CH_4	25	28
Nitrous Oxide	N_20	298	265
Nitrogen Trifluoride	NH_3	17,200	16,100
Sulfer Hexafluoride	SF_6	22,800	23,500

Table 5: Global warming potentials (GWPs) values relative to CO_2

[1] https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/quantification-guidance/global-warming-potentials.html

Sources of Emissions Factors

Emissions factors are used to convert an activity (such as purchased electricity in kilowatt-hours) to GHG emissions (in metric tons CO_2e). ZenithJet utilized the most accurate emissions factors where available and feasible. Emission factors were obtained from official sources such as Canada National Inventory Report (NIR), U.S. Environmental Protection Agency (US EPA) emission factors hub, and supply chain GHG emission factors.

Data Collection

GHG emissions from Scope 1 were estimated by referring to invoices for natural gas consumption (in m^3) for stationary combustion, and receipts for gasoline consumption (in litres) for mobile combustion, in consideration of relevant emission factors. Total consumed natural gas in Canada and U.S offices was 474.38 m^3 and fuel consumption by passenger cars was 2,459.19 litres in 2023.

Scope 2 GHG emissions were computed in accordance with Canada National Inventory Report (NIR) and Environmental Protection Agency (EPA) emission factors using utility bills to determine the amount of electricity purchased. The combined metered electricity usage for ZenithJet's offices was calculated to be 17,965.12 kWh.

Scope 3 GHG emissions were driven by employee commuting and business travel. Based on data that was available, emissions from this category were computed using both distance-based and spend-based approach. Calculations computed the number of days that ZenithJet employees reported commuting or traveling, the distances traveled between destinations, and the emissions factors of the different modes of transportation. Accommodation during business trips was included as a scope 3 emissions source and considered relevant emission factors of the hotel supply chain.

Results

Overview

ZenithJet's emissions were calculated and summarized in table 6.
Due to rounding, figures may not add up exactly to the total provided.

Scope	Category	Source	tCO_2e	Total tCO_2e	% of Total Emissions
Scope 1	Stationary Combustion	Natural Gas	0.92	2.62	3.21%
	Mobile Combustion		1.70		5.92%
Scope 2	Electricity	Purchased Electricity	0.90	0.90	3.15%
Scope 3	Transportation	Employee Commute	12.58	25.17	43.85%
	Transportation	Business Travel	12.42		0.60%
	Accommodation	Business Travel	0.17		43.27%
Total			**28.69**	**28.69**	**100%**

Table 6: Overview of ZenithJet's emissions

Results

Scope 1 Emissions

Direct GHG emissions, measued in tCO_2e (sources owned/controlled by ZenithJet) are shown in Table 7.

Emissions from natural gas combustion, and from fuel consumption by fleet vehicles, decreased significantly by 2.13% and 46% respectively in comparison to 2022 due to less fuel consumption in 2023.

Total GHG emissions from scope 1 (2.62 tonnes in 2023) showed remarkable reduction since 2021.

Scope 1 Category	Description	*2021 tCO_2e*	Base Year 2022 tCO_2e	2023 tCO_2e
Stationary Combustion	Natural Gas Consumption	*1.73*	0.94	0.92
Mobile Combustion	Gasoline Consumption	*6.60*	3.13	1.70
Total Emissions (tCO_2e)		*8.33*	4.07	2.62

Table 7: Comparison of scope 1 emissions

Scope 2 Emissions

Emissions of this scope are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. Although scope 2 emissions physically occur at the facility where they are generated, they are accounted for in an organization's GHG inventory because they are a result of the organization's energy use.

Scope 2 emissions were quantified by the amount of electricity purchased in 2023. Table 8 shows electricity consumption based on meters located at ZenithJet facilities (calculated according to the percentage of floor area occupied).

Results

Scope 2 Emissions

Activity data is reported in kilowatt-hours (kWh) as it is the unit commonly used by utility bills to measure electricity. Emission factors were necessary to calculate the emissions attributable to electricity and do not include the impact of transmission and distribution losses, or emissions from fuel extraction, or other activities upstream of the generation facility.

Scope 2 Category	*2021*	Base Year 2022	2023
Purchased Electricity (kWh)	*38,839.78*	24,517.34	17,965.12
Total Emissions (tCO_2e)	*3.21*	**2.82**	**0.90**

Table 8: Comparison of scope 2 emissions

ZenithJet was unable to commit to purchasing electricity from renewable sources (because this choice was under the control of external suppliers) and aimed instead to reduce consumption as much as possible every year. As can be seen, ZenithJet utilized electricity 67.98% less than base year (2022).

Results

Scope 3 Emissions

Activities beyond direct operations are shown in Table 9. Emission calculations were based on primary vendor data (where available), economic input-output modeling performed by Climate Earth, Inc., and distance-based data.

Scope 3 Category	*2021*	Base Year 2022	2023
Emissions from Commuting	*0.88*	2.33	12.58
Emissions from Business Travel	*6.31*	33.87	12.59
Total Emissions (tCO_2e)	*7.19*	**36.20**	**25.17**

Table 9: Comparison of scope 3 emissions

Overall, scope 3 emissions decreased by 30.46% in comparison with 2022 due to less business travel.

A significant increase was seen in value chain GHG emissions from 2021 caused by the end of the pandemic that result in shifting to in-person or hybrid working models.

Additionally, staff numbers rose in 2023, which caused a six-fold growth of emissions over the base year of 2022 in the category of employee commuting. The approach to carbon-friendly business travel in 2023 considered both the distance-based method and the spend-based method for calculating emissions.

Accordingly, the following strategies were applied: (1) choose low-emission airlines, as identified by website sustainability policy, (2) buy economy class tickets, and (3) avoid layovers, to decrease the travel distance and to avert emissions associated with the services of a short stay at an extra airport.

Results

Emissions Summary

Figure 3 below displays the summary of emissions by scope. Scope 3 represented the most prevalent release at 87.73% of total emissions, followed by scope 1 at 9.12%, with scope 2 representing the least at 3.15%.

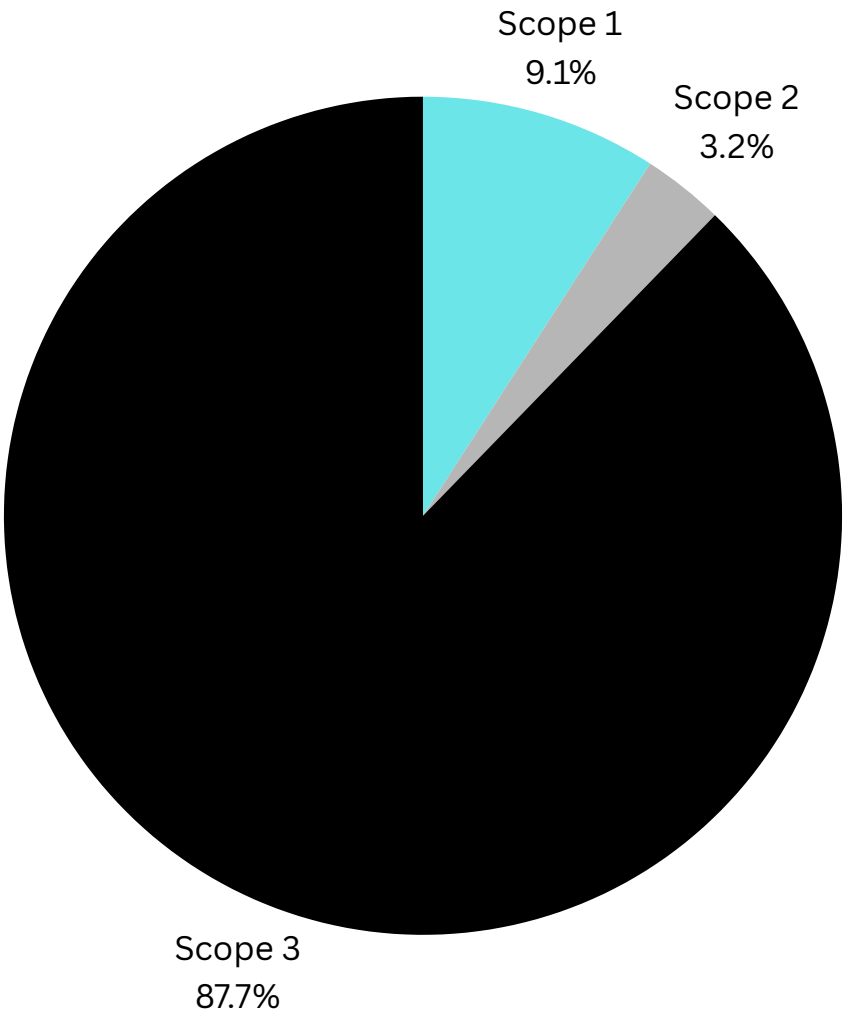

Figure 3: Percentage of 2023 emissions by scope

CONCLUSION & RECOMMENDATIONs

Conclusion

Scope 1
Direct emissions, such as the fuel used by company vehicles and natural gas combustion for heating, made up just 9.12% ZenithJet's total emissions.

In 2023, scope 1 emissions dropped sharply (35.69%) due to lower natural gas consumption for heating, electricity, and fuel combustion by vehicles. Some of the reduction of transportation emissions was attributable to investment in hybrid vehicles.

Scope 2
ZenithJet is proud that a reduction of electricity consumption has resulted in a 67.98% decrease in carbon emissions from purchased electricity compared with usage emissions in 2022. As a result, scope 2 emissions account for less than 5% of ZenithJet total reported carbon footprint in 2023.

Scope 3
There was a significant increase (about 10 tonnes more than base year) in emissions from employee commuting between home and office, attributed to growth in staff.

CONCLUSION & RECOMMENDATIONS

Recommendations

Commensurate with results, the recommendations focus on scope 3 activities (travel and commuting) as they represent the highest percentage of emissions.

Given that scope 3 emissions are defined as being outside direct control, most of the recommended strategies rely on influence and persuasion through guidance and encouragement. Such recommendations are not necessarily expected to achieve direct results but to promote circumstances that foster improvement.

Business Travel

1. Review and discuss survey data to identify where to influence improvement.

2. Promote the selection of sustainable accommodation.
- Develop a travel policy that favors, where feasible, accommodation that is certified to adhere to environmentally friendly practices. (There are many schemes available that certify accommodation, from infrastructure to operations.)[2][3]
- Where a certified accommodation is not feasible, select accommodation that promotes environmental principles such as offering offsets.

3. Promote the selection of sustainable transport.
- Develop a travel policy that favours, where feasible, selecting a travel mode with a lower emissions factor. (E.g., overland vs. air, EV vs. gas car rental.)
- Identify and favour low-emission airlines (e.g., flights using biofuels).[4]
- Fly with carry-on only to reduce impact on fuel consumption by weight.

4. Promote use of technology for meetings and engagements.

[2] https://www.smartmeetings.com/magazine_article/sustainable-hotel-certification-explained
[3] https://www.gstcouncil.org/membership/member-search/
[4] https://www.alternativeairlines.com/biofuel-airlines

CONCLUSION & RECOMMENDATIONS

Recommendations

Employee Commuting

1. Review and discuss survey data to identify where to influence improvement.

2. Influence through promoting telework:
- Develop a company policy that encourages telework where feasible.
- Commit to provide the necessary technological and organizational support.
- Communicate guidance on best practices:
  - The Canadian Center for Occupational Health and Safety has a site devoted to the improvement of teleworking conditions.[5]
  - The Canadian Centre for Cyber Security has tips for remote work.[6]

[5] https://www.ccohs.ca/oshanswers/hsprograms/telework.html
[6] https://www.cyber.gc.ca/en/guidance/telework-security-issues-itsap10016

ANNEX 1 - EMISSION FACTORS

Emission Activity	Emission Factor Source
Stationary Combustion	• Canada NIR 2022 - https://unfccc.int/documents/271493 - (part 2, from various tables for each region) • EPA, "Emission Factors for Greenhouse Gas Inventories https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf
Mobile Combustion	• Canada NIR 2022 - https://unfccc.int/documents/271493 - (part 2, from various tables for each region) • EPA, "Emission Factors for Greenhouse Gas Inventories https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf
Electricity	• Canada NIR 2022 - https://unfccc.int/documents/271493 - (part 3, from various tables for each region) • EPA, "Emission Factors for Greenhouse Gas Inventories https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf
Employee Commute	• EPA, "Emission Factors for Greenhouse Gas Inventories," Table 8 Business Travel and Employee Commuting, 2022 (https://www.epa.gov/climateleadership/center-corporate-climate-leadership-ghg-emission-factors-hub).
Business Travel	• EPA, "Emission Factors for Greenhouse Gas Inventories," Table 8 Business Travel and Employee Commuting, April, 2022 (https://www.epa.gov/climateleadership/center-corporate-climate-leadership-ghg-emission-factors-hub). • UK DEFRA, Business Travel - air, 2021

Table 10: Emission factor sources

ANNEX 2 - Data Assumptions and Extrapolations

Due to the absence of sub-metering system in the Montreal office building, an assumption was made to allocate the energy consumption for this facility based on the office space area. The total area of the building was 82,014.33 ft², and the office space area for the Montreal office was 2,645 ft² from January until end of August 2021. Starting September, the office space was reduced to 1,091 ft². As a result, a factor was calculated to resemble ZenithJet's energy allocation as a percentage of the total energy consumption. The percentage was calculated to be 2.59% using the formula below:

$$\left(\frac{2645}{82014.33} \times \frac{8}{12}\right) + \left(\frac{1091}{82014.33} \times \frac{4}{12}\right) = 2.59\%$$

In a similar manner, an extrapolation was made to estimate the energy consumption in facility 2. A proxy for energy consumption was calculated by office area and extrapolation was used based on the office area in facility 2 which was 447.7 ft².

According to the building owners, no refrigerants were refilled during 2022 or 2023 and consequently an assumption was made that no refrigerant leaks were available.

ZenithJet was not able to provide the exact mileage driven during 2022 or 2023, thus a conservative estimate was made by each employee along with the fuel efficiency of each car and fuel consumption estimated for mobile combustion and distance in km for employee commute categories.