

ZENITHJET

GREENHOUSE GAS INVENTORY

ZENITHJET

2021 REPORTING YEAR

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Executive Summary

This report outlines the greenhouse gas (GHG) emissions footprint associated with Zenith Jet's operation for the year 2021. The organizational boundary selected for the accounting followed the operational control approach, and the operational boundary included Scopes 1 and 2, and a number of selected scope 3 emissions.

The total GHG emission footprint was calculated to be 18.72 tonnes (t) of carbon dioxide equivalent (tCO₂e). The breakdown of the footprint by scope is summarized in table 1 below:

Table 1: GHG footprint summary

Source	CO ₂ e (tonnes)	Percentage of total (%)
Scope 1: Direct Emissions	8.32	44.46
Scope 2: Indirect emissions from purchased electricity	3.21	17.12
Scope 3: Other indirect emissions	7.19	38.42
Total	18.72	100.00

To better visualize the contribution of the GHG emissions of each scope towards Zenith Jet's footprint, figure 1 below illustrates the breakdown by scope.

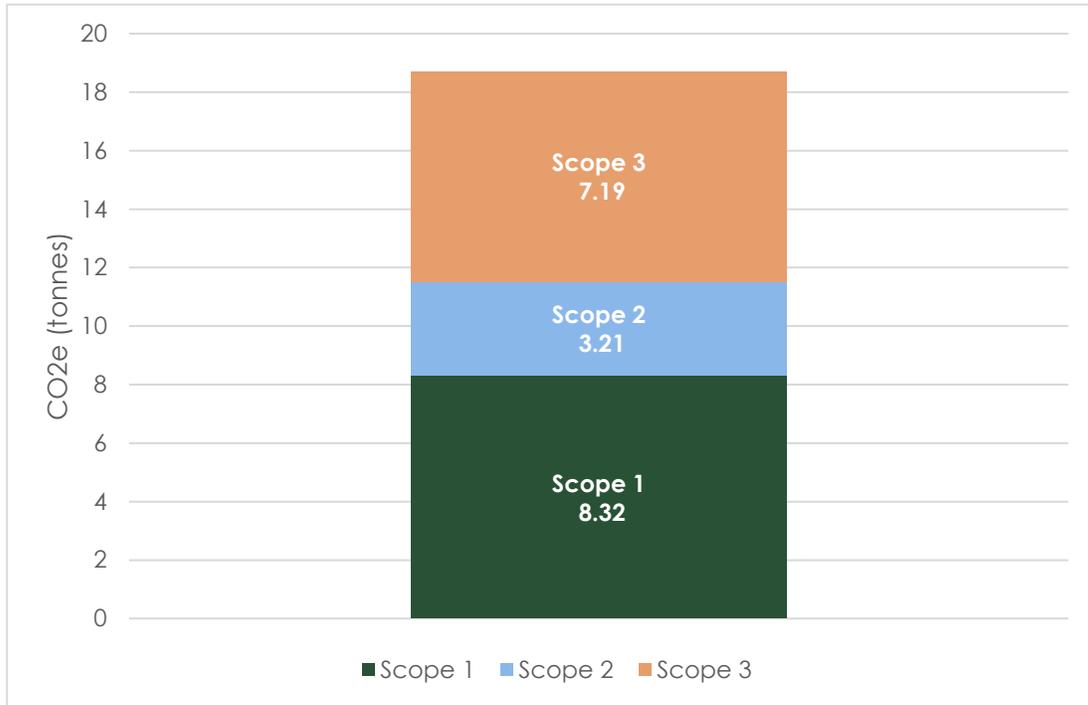


Figure 1: Footprint breakdown by scope

Scope 1 had the highest contribution to GHG emissions, accounting for 44.46% of the total footprint. Conversely, scope 2 had the least contribution with just 17.12% of the total footprint.

1. Introduction

Zenith Jet is the leading technical services consulting firm for business aircraft owners, operators, and corporate flight departments. Founded in 2008, Zenith Jet has been providing technical and operations expertise to help clients manage their aircraft more efficiently.

Zenith Jet is pleased to present its first GHG Inventory Report for the 2021 year. This 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 below:

Table 2: Company Information

Website	https://zenithjet.com/
Business Sector	Business Aviation Technical & Completions Oversight
Reporting Period	1 st January 2021 to 31 st December 2021

2. Methodology

This carbon footprint report has been prepared in full accordance with the World Business Council for Sustainable Development (WBCSD) and World Resources Institute's (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. The GHG accounting and reporting principles of the standard are:

- **Relevance:** the GHG inventory must convey the GHG emissions of the organization in an appropriate manner and serves the decision-making needs of internal and external users.
- **Completeness:** Ensure that all sources of emissions and activities within the chosen boundary are reported. Any exclusions should be appropriately justified.
- **Consistency:** The application of accounting approaches, inventory boundaries and calculation methodologies that are consistent is necessary to allow for meaningful comparisons of GHG data over time.
- **Transparency:** All the report content should be presented in a factual and coherent manner. Any relevant issues and/or assumptions should be addressed clearly.
- **Accuracy:** The data, GHG measurements, estimates, or calculations should all be as precise as possible, producing information that is credible with reasonable level of assurance.

3. GHG INVENTORY DESIGN AND DEVELOPMENT

3.1 Organizational Boundary

In setting organizational boundaries, a company selects an approach 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 reporting GHG emissions.

For corporate reporting of GHG emissions, two distinct approaches can be taken: Equity Share Approach and Control Approach. The equity share 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 of an operation.

Zenith Jet has chosen to use the operational control for the purposes of consolidating and reporting GHG emissions. The reason for choosing this approach is the full responsibility that Zenith Jet takes for the GHG emissions from operations and facilities over which it has operational control. These facilities include the head office located in Montreal, Canada and another office located in Atlanta, US.

Using this approach, this Carbon Footprint Report includes emissions from the following operations:

Table 3: Facility Information

Facility Name	Facility Address	Area (m ²)	Headcount
Zenith Jet Head Office	7575 Trans Canada Route #620, Saint-Laurent, Quebec H4T 1V6	102	6
Atlanta Office	1715 McCollum Parkway, NW Bldg. 700 2nd Floor Kennesaw, GA. 30144	42	1
Total		144	7

3.2 Operational Boundary

Operational Boundaries requires choosing the scope of emissions that will be reported. There are three scopes of emissions that can be reported:

Scope 1: Direct GHG Emissions from company owned or controlled assets.

Scope 2: Indirect GHG Emissions from purchased electricity or steam.

Scope 3: Other indirect GHG Emissions from the operation of the company.

According to the GHG Protocol Corporate Reporting Standard, 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 2021 include direct emissions resulting from Zenith Jet's owned or controlled equipment and emissions from purchased electricity as well as selected indirect emissions. A summarized list of the emission sources and activities are presented in Table 4 below:

Table 4: Emission Categories and sources

Scope	Emission Category	Emission Source
Scope 1	Stationary Combustion	Energy used for heat and electricity generation
Scope 1	Mobile Combustion	Cars owned by the company
Scope 2	Electricity	Purchased Electricity
Scope 3	Transportation	Employee Commute
Scope 3	Transportation	Business Travel

3.3 Reporting period and Base Year

This assessment report details the scope, data, and results from Zenith Jet's GHG inventory for calendar year 2021, from January 1 – December 31, 2021. In conformance with the GHG Protocol, Zenith Jet must select an inventory base year to allow for like-to-like comparisons over time and allows tracking progress to a given target. However, since 2021 was Zenith Jet's first inventory, it was decided that 2021 would be the selected base year with the possibility of changing it in the future. This is due to the pandemic which affected the operation activities and could have significantly reduced the emissions as compared to normal operation.

4. Calculation Methodology

According to the GHG-P and ISO Standard 14064-1 Section 4.3.3, GHG emissions can be calculated based on GHG activity data multiplied by GHG emission or removal factors.

$$\text{GHG Activity Data} \times \text{GHG Emission Factor} = \text{GHG Emissions}$$

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.

4.1 Global Warming Potential (GWP)

As required by best practice in organizational GHG accounting and the chosen WBCSD/WRI GHG Protocol, all seven Kyoto Protocol greenhouse gases have been included where applicable and material. 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. They are used in GHG accounting to convert individual greenhouse gas emissions totals to a single standardized unit useful for comparison – carbon dioxide equivalent, or CO₂e.

Global warming potential values were sourced from the Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5 2013), the most recent IPCC report available at the time of assessment. The Kyoto Protocol GHGs (or categories of GHGs) and their respective GWPs are listed in the table below.

Table 5: GWPs according to the IPCC 5th assessment report (IPCC, AR5 2013)

GHG	Chemical Formula	100-Year GWP
Carbon Dioxide	CO ₂	1
Methane	CH ₄	28
Nitrous oxide	N ₂ O	265
Hydrofluorocarbons (HFCs)	Several	Several
Perfluorocarbons (PFCs)	Several	Several
Nitrogen trifluoride	NF ₃	16,100
Sulfur hexafluoride	SF ₆	23,500

5. Results

The results for the GHG emissions associated with Zenith Jet were calculated and summarized in the table below. Please note that due to rounding of numbers, the figures may not add up exactly to the total provided. It is also important to note that the Scope 2 emissions calculated are the values for both the market and location-based approach. Both approaches have the same outcome due to the absence of renewable energy purchase instruments and contracts such as renewable energy certificates, renewable power contracts, and green tariffs.

Table 6: Detailed overview of GHG emissions

Source		CO2e (tonnes)	Total CO2e (tonnes)	% of total	
Scope 1	Stationary Combustion	Natural Gas	1.73	8.32	9.22
		Diesel	0.00		0.00
		Refrigerant	0.00		0.00
	Mobile Combustion	Gasoline	6.60	35.24	
Scope 2	Electricity	Purchased Electricity	3.21	3.21	17.12
Scope 3	Transportation	Employee Commute	0.88	7.19	4.71
		Business Travel	6.31		33.71
Total			18.72	18.72	100

The total GHG emissions associated with Zenith Jet's operation and activities was estimated to be 18.72 tonnes of CO₂e. It is important to note that the Scope 2 emissions only accounted for 17.12% of the emissions. The reason comes down to Quebec's hydropower resources. Hydro-Quebec reports that more than 99% of its electricity is generated from water, a clean and renewable source of energy.

Figure 2 below shows the breakdown of emissions by scope. Scope 1 emissions were the most representing approximately 45%, followed by scope 3 emissions which were 38%, and the least emissions were the scope 2 emissions.

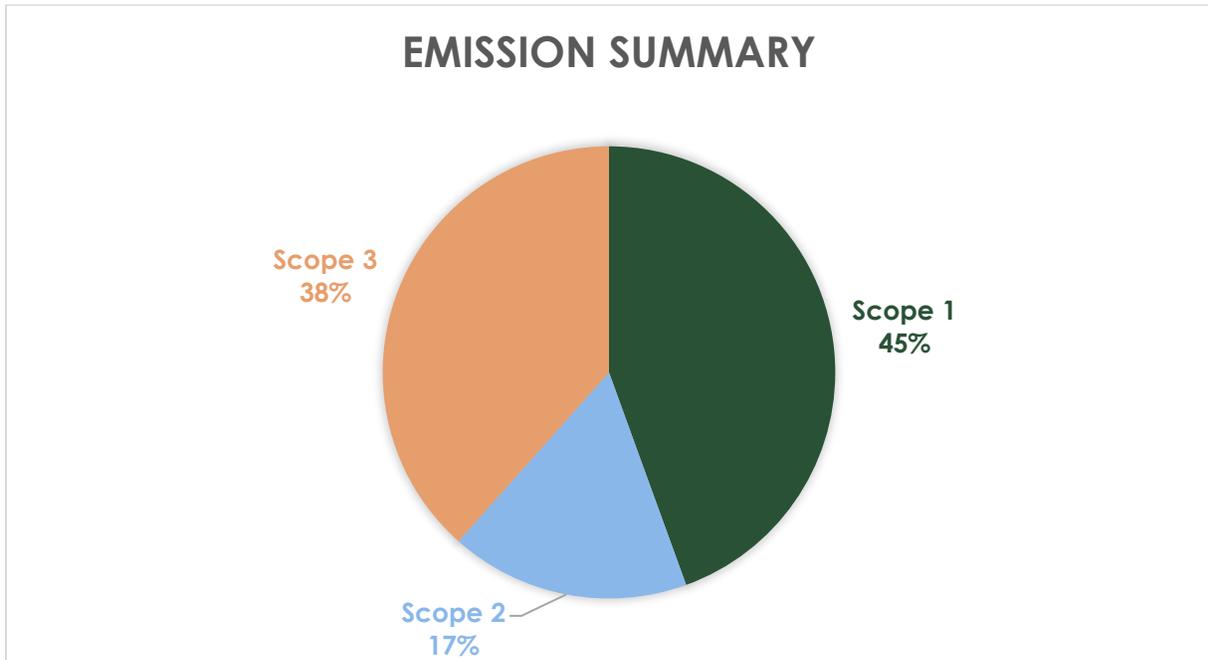


Figure 2: Emission breakdown by scope

Figure 3 below illustrates the breakdown of the emissions by category. More than half of the emissions were associated to mobile combustion and business travel, having emissions of 6.6 and 6.31 tCO₂e respectively. On the other hand, the category having the least emissions was employee commute with just 0.88 tCO₂e due to the employees working from home most of the year because of the pandemic.

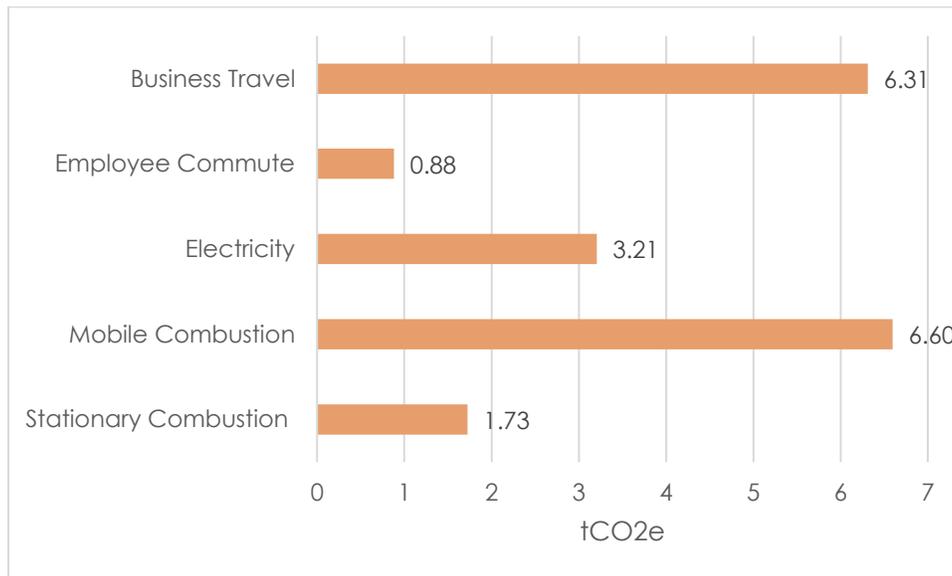


Figure 3: Emission breakdown by category

6. Conclusion and Recommendation

6.1 Conclusion

In conclusion, the process of calculating the 2021 GHG footprint for Zenith Jet was completed in conformance with the GHG protocol standard. Zenith Jet has gone to all reasonable lengths to ensure the accuracy of this report. The activity data was compiled for utility bills and other records whenever it was available. However, in other cases when some data was missing, a conservative approach was followed to make extrapolations or justified assumptions (refer to Annex). The calculation of the total GHG emissions resulted in a footprint of 18.72 tCO₂e. The highest % of the emissions were associated with scope 1 emissions (45%), out of which mobile combustion contributed 35.24%. Selected scope 3 emissions were also calculated, including employee commute and business travel. Business travel was the second most contributor of emissions with a 33.71% of the total emissions. The scope 2 emissions only accounted for 17.12% and that is thanks to the hydro power used to generate electricity.

6.2 Recommendation

Given that the 2021 inventory is the first for Zenith Jet, there are several recommendations that would help in producing a more inclusive and accurate inventory.

Installing sub meters in the office buildings would result in exact utility consumption by Zenith Jet and hence more accurate calculations for scope 1 and 2 emissions. Moreover, refrigerant data was not provided by the building owner which should be accounted for due to the high potency of their GWP. In addition, having a log that tracks the exact distance driven per employee per year would be very beneficial in having more precise activity data for both mobile combustion and employee commute.

Annex 1

Emission Factors

Table 7: Emission Factor Sources

Emission Activity	Emission Factor source
Stationary Combustion	<ul style="list-style-type: none"> - Canada NIR 2021 - 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	<ul style="list-style-type: none"> - Canada NIR 2021 - 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	<ul style="list-style-type: none"> - Canada NIR 2021 - 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, March 9, 2018 (<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, March 9, 2018 (<https://www.epa.gov/climateleadership/center-corporate-climate-leadership-ghg-emission-factors-hub>).
- UK DEFRA, Business Travel - air, 2019

Annex 2

Data Assumptions and Extrapolations

Due to the absence of sub-metering system in the Zenith Jet office building, an assumption was made to allocate the energy consumption for Zenith Jet based on the office space area. The total area of the building was 82014.33 ft², and the office space area for Zenith Jet was 2645 ft² from January until end of August 2021. Starting September, the office space was reduced to 1091 ft². As a result, a factor was calculated to resemble Zenith Jet's energy allocation as a percentage of the total energy consumption. The percentage was calculated to be 2.59% using the formula shown 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 the Atlanta office. A proxy for energy consumption was calculated by office area and extrapolation was used based on the office area in Atlanta which was 447.7 ft².

Zenith Jet was not able to provide the exact mileage driven during 2021, thus a conservative estimate was made by each employee along with the fuel efficiency of each car and the fuel consumption was estimated for mobile combustion and employee commute categories.

According to the building owner, no refrigerants were refilled during the 2021 year, consequently an assumption was made that no refrigerant leaks were available.