

V I S T A



Greenhouse gas (GHG) accounting report

Red Wing Aviation

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Details

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Acronyms and abbreviations

AC	air conditioning
AR4	IPCC Fourth Assessment Report
BEIS	United Kingdom's Department for Business, Energy and Industrial Strategy
CEDA	Comprehensive Environmental Data Archive
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
eGRID	Emissions and Generation Resource Integrated Database
EUR	euros
GHG	greenhouse gas
GJ	gigajoule
GRI	Global Reporting Initiative
GWP	global warming potential
IPCC	Intergovernmental Panel on Climate Change
IT	information technology
kg	kilogram
km	kilometer
kWh	kilowatt-hour
KPI	key performance indicator
m	meter
m ²	square meter
m ³	cubic meter
MWh	megawatt-hour
N/A	not applicable
pkm	passenger-kilometer
t	metric ton
US	United States
USD	United States dollar

1. Executive summary

This report presents the greenhouse gas (GHG) emissions footprint for Red Wing Aviation's operations in 2021. The accounting followed an operational control approach and considered emissions from scopes 1 and 2, and material categories from scope 3. The office considered in the accounting is located in Minnesota, United States (US).

A summary of key performance indicators (KPIs) is presented in Table 1.

Table 1: Summary of key performance indicators (KPIs)

Number of employees	47	tCO ₂ e/employee	206
Premises area	One office of 446 square meters (m ²)	tCO ₂ e/m ²	21

(Source: South Pole, 2022)

The total GHG emissions of Red Wing Aviation's operations for the calendar year 2021 were 9,580 metric tons of carbon dioxide equivalent (tCO₂e). Table 2 provides an overview of the 2021 GHG emissions by scope. Please note that, due to rounding of numbers, the figures may not add up exactly to the total provided.

Table 2: GHG emissions by emission source

Scope	Emissions (tCO ₂ e)	Percentage (%) of total
Scope 1: direct GHG emissions	3,685	38%
Scope 2: indirect GHG emissions from purchased electricity, heating and cooling	44	0%
Scope 3: other indirect GHG emissions	5,852	61%
Total GHG emissions	9,580	100%

(Source: South Pole, 2022)

The distribution of the 2021 GHG emissions by category is presented in Figure 1. The largest emission sources in 2021 were aviation fuel and business travel, corresponding to 37% and 27% of total emissions, respectively.

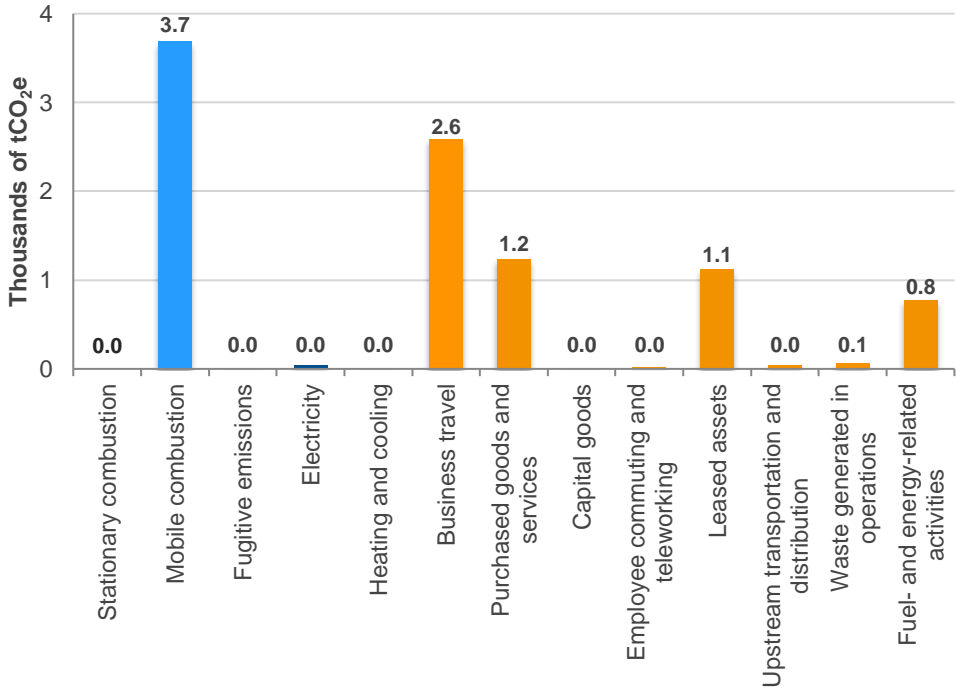


Figure 1: GHG emissions in 2021 by category

(Source: South Pole, 2022)

Figure 2 shows a summary of the total emissions by scope. Scope 3 has the highest contribution to GHG emissions, accounting for 61% of the total footprint.

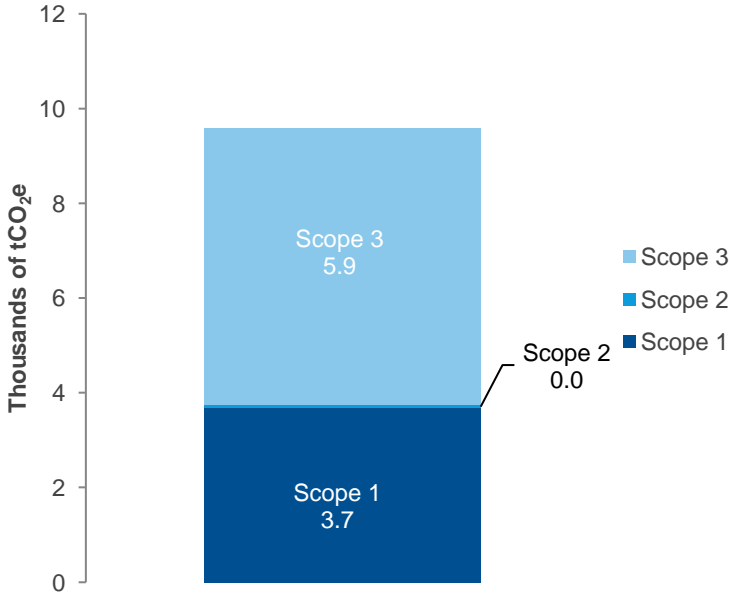


Figure 2: GHG emissions in 2021 by scope

(Source: South Pole, 2022)

1 Introduction

Red Wing Aviation is a business aviation company founded in 2004. This report provides a summary of the GHG emissions from Red Wing Aviation’s corporate operations from January 1 to December 31, 2021. The company information and the reporting period are presented in Table 3.

Please note that Red Wing Aviation is part of Vista Global Holding (Vista), a group integrating private aviation services via an ecosystem of owned brands and participated companies, including VistaJet, XOJET Aviation, XO, Talon Air, Red Wing Aviation, GMJ Air Shuttle and Apollo Jets.

Table 3: Company information

Company information	
Website	www.redwingav.com
Business area	Private flight operator
Reporting period	January 1 to December 31, 2021

(Source: South Pole, 2022)

1.1 Methodology

The GHG accounting and reporting procedure is based on the ‘The Greenhouse Gas Protocol: GHG Protocol: A Corporate Accounting and Reporting Standard – Revised Edition’ (GHG Protocol) and the complementary ‘Corporate Value Chain (Scope 3) Accounting and Reporting Standard’ – the most widely used international accounting tools for government and business leaders to understand, quantify, and manage GHG emissions. The standards were developed in a partnership between the World Resources Institute and the World Business Council for Sustainable Development.

The accounting was based on the principles of the ‘GHG Protocol’:

- **Relevance:** establishing an appropriate inventory boundary that reflects the GHG emissions of the company and serves the decision-making needs of users;
- **Completeness:** including all emission sources within the chosen inventory boundary. Any specific exclusion is disclosed and specified;
- **Consistency:** ensuring meaningful comparison of information over time and transparently documenting changes to the data;
- **Transparency:** guaranteeing data inventory sufficiency and clarity, where relevant issues are addressed in a coherent manner; and
- **Accuracy:** minimizing uncertainty and avoided systematic over- or under-quantification of GHG emissions.

1.2 System boundaries

1.2.1 Organizational boundaries

System boundaries were defined by the control approach, i.e., covering all entities where Red Wing Aviation has operational control. With this approach, Red Wing Aviation is taking ownership of 100% of emissions from facilities and offices over which it has operational control and/or the authority to implement operational policies. The 2021 GHG accounting included an office in Minnesota.

Table 4 shows the countries and offices that were included in the 2021 GHG inventory.

Table 4: Offices included in the 2021 GHG accounting

Country	Location	Area (m ²)	Headcount
United States	Minnesota	446	47
Total		446	47

(Source: South Pole, 2022)

1.2.2 Operational boundaries

Under the 'GHG Protocol', emissions are divided into direct and indirect emissions. Direct emissions are those originating from sources owned or controlled by the reporting entity. Indirect emissions are generated as a consequence of the reporting entity's activities but occur at sources owned or controlled by another entity.

The direct and indirect emissions are divided into three scopes, as found below.

Scope 1

Scope 1 includes all carbon emissions that can be directly managed by the organization (direct GHG emissions). This includes the emissions from the combustion of fossil fuels in mobile and stationary sources (e.g., owned or controlled boilers, power generators and vehicles) and carbon emissions generated by chemical and physical processes, as well as fugitive emissions from the use of cooling and air conditioning (AC) equipment. Table 5 gives an overview of the emission sources considered in scope 1, based on the information provided by Red Wing Aviation.

Table 5: Overview of scope 1 emission sources for 2021

Category	Emission sources	Boundary
Stationary combustion	Generation of electricity and heat	Not applicable (N/A)
Mobile combustion	Company-owned or leased vehicles	Included
Physical or chemical processing	Manufacture or processing of chemicals and materials	N/A
Fugitive emissions	Emissions from the use of cooling systems and AC equipment, leakage from CO ₂ tanks or methane tubes	Included

Scope 2

Scope 2 includes indirect GHG emissions from the generation of purchased electricity, steam, heat or cooling purchased by the organization from external energy providers. Table 6 gives an overview of the emission sources considered in scope 2.

Table 6: Overview of scope 2 emission sources for 2021

Category	Emission sources	Boundary
Electricity	Purchased electricity	Included
Steam	Purchased steam	N/A
District heating	Purchased district heating	Included
District cooling	Purchased district cooling	N/A

Scope 3

Scope 3 includes other indirect emissions that arise along the value chain as a consequence of the reporting company's activities. These emission sources occur in another entity's operations. Examples of scope 3 emission sources include the extraction and production of purchased materials and services, vehicles not owned or controlled by the reporting entity, and outsourced activities and waste disposal.

According to the 'GHG Protocol', companies shall separately account for and report on emissions from scope 1 and 2. Scope 3 is an optional reporting category, but its reporting is often required for climate neutrality labels.

Table 7 gives an overview of the emission sources considered in scope 3.

Table 7: Overview of scope 3 emission sources for 2021

Category	Emission sources	Boundary
Purchased goods and services	Purchased goods (raw materials) and services	Included (e.g., water supply, paper, marketing material and consumables, aircraft maintenance)
Capital goods	Production of capital goods (e.g., machinery, information technology [IT] equipment, etc.)	Included (e.g., IT equipment)
Fuel- and energy-related activities	Upstream life cycle emissions from fuel and electricity generation, incl. transmission and distribution losses	Included
Upstream transportation and distribution	Transportation and distribution of goods and services to the company	Included (air and land)
Waste generated in operations	Waste management of operational waste (landfilling, recycling, etc.)	Included

Category	Emission sources	Boundary
Business travel	Travel and accommodation of employees/contractors	Included
Employee commuting	Employee travel between home and work	Included
Upstream leased assets	Operation of assets leased by the organization (lessee) in the reporting year and not included in scope 1 or 2	Included
Downstream transportation and distribution	Transportation and distribution of products sold by the organization	Not material. Not included
Processing of sold products	Processing of intermediate products sold by the organization	Not material. Not included
Use of sold products	Use of sold goods that require energy to operate	Not material. Not included
End-of-life treatment of sold products	Waste disposal and treatment of sold products	Not material. Not included
Downstream leased assets	Operation of assets owned by the company (lessor) and leased to other entities, not included in scope 1 or 2	Not material. Not included
Franchises	Operation of franchises not included in scope 1 or 2	Not material. Not included
Investments	Operation of investments not included in scope 1 or 2	Not material. Not included

1.3 Data inventory and assumptions

Overall, the data inventory, emission factors, and assumptions are based on the 'GHG Protocol'. The choice of assumptions and emission factors followed a conservative approach. Unless otherwise specified, all emission values in this report are given in metric tons of carbon dioxide equivalent (tCO₂e).

Where activity data of the inventory was lacking, extrapolations and estimations were made. The complete overview of activity data, extrapolations, and estimations is summarized in Annex II.

1.4 Global warming potential (GWP)

Global warming potential (GWP) is a measure of the climate impact of a GHG compared to carbon dioxide over a time horizon. GHG emissions have different GWP values depending on their efficiency in absorbing longwave radiation and the atmospheric lifetime of the gas. The GWP values used in GHG accounting include the six GHGs covered by the United Nations Framework Convention on Climate Change and Kyoto Protocol and combinations of these, as presented in

Table 8. These are the GWP used by the United Kingdom's Department for Business, Energy and Industrial Strategy (BEIS) and are based on the 'Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4)'. Although the 'AR5' is more recent, it has not been accepted internationally by all stakeholders.

Table 8: Applied global warming potentials (GWP)

GHG	GWP (100 years)
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	25
Nitrous oxide (N ₂ O)	298
Hydrofluorocarbons (HFCs)	<u>See IPCC AR4 – Table 2.14</u>
Perfluorocarbons (PFCs)	<u>See IPCC AR4 – Table 2.14</u>
Sulphur hexafluoride (SF ₆)	22,800

(Source: IPCC AR4, 2007)

2 Results

The results of the 2021 GHG emissions accounting are presented as follows:

- 1) Key information according to the Global Reporting Initiative (GRI) in Table 9
- 2) Results of emissions at the corporate level in Table 10

Total emissions in this report refers to the emissions sources covered, as described in Section 1.2. Please note that, due to rounding of numbers, the figures may not add up exactly to the total provided. Also, note that the following figures and tables consider the market-based numbers in scope 2 when calculating emission totals. The market-based numbers consider renewable energy purchase instruments and contracts, such as renewable energy certificates, renewable power contracts, and green tariffs. On the contrary, location-based numbers only consider average regional production emission factors when calculating emissions.

2.1 Corporate-level results

Red Wing Aviation's total emissions in 2021 are 9,580 tCO_{2e}. The key figures according to the GRI are presented in Table 9.

Table 9: Key figures according to the Global Reporting Initiative (GRI)

GRI G4	GRI Standards	Topic	Quantity	Unit
G4-EN3	302-1	Direct energy consumption by primary source	54	GJ
		Aviation fuel	52	GJ
		Petrol	2	GJ
G4-EN3	302-1	Indirect energy consumption by primary source	413	GJ
		Renewable electricity	0	GJ
		Grid electricity	376	GJ
		District cooling	37	GJ
G4-EN15	305-1	Direct GHG emissions (scope 1)	3,685	tCO _{2e}
G4-EN16	305-2	Energy indirect GHG emissions (scope 2)	44	tCO _{2e}
G4-EN17	305-3	Other indirect GHG emissions (scope 3)	5,852	tCO _{2e}
G4-EN18	305-4	GHG emission per employee	206	tCO _{2e} per employee

(Source: South Pole, 2022)

Table 10: GHG emissions by scope and activity for 2021

Activity	Emissions (tCO ₂ e)	Percentage of total (%)
Scope 1: direct GHG emissions	3,685	38%
Stationary combustion	0	0%
Mobile combustion	3,683	38%
Refrigerants	2	0%
Scope 2: indirect GHG emissions from purchased electricity, heating and cooling	44	0%
Electricity	42	0%
Heating and cooling	2	0%
Scope 3: other indirect GHG emissions	5,852	61%
Purchased goods and services	1,236	13%
Capital goods	7	0%
Fuel- and energy-related activities	773	8%
Upstream transportation and distribution	43	0%
Waste generated in operations	66	1%
Business travel	2,587	27%
Employee commuting and teleworking	21	0%
Upstream leased assets	1,119	12%
Total GHG emissions	9,580	100%

(Source: South Pole, 2022)

Figure 3 shows a breakdown of emissions by category. Mobile combustion and business travel represent the most important categories, corresponding to 38% and 27% of total emissions, respectively. Together, these emission categories cover 65% of Red Wing Aviation's total emissions. Other relevant categories include purchased goods and services (13%) and upstream leased assets (12%).

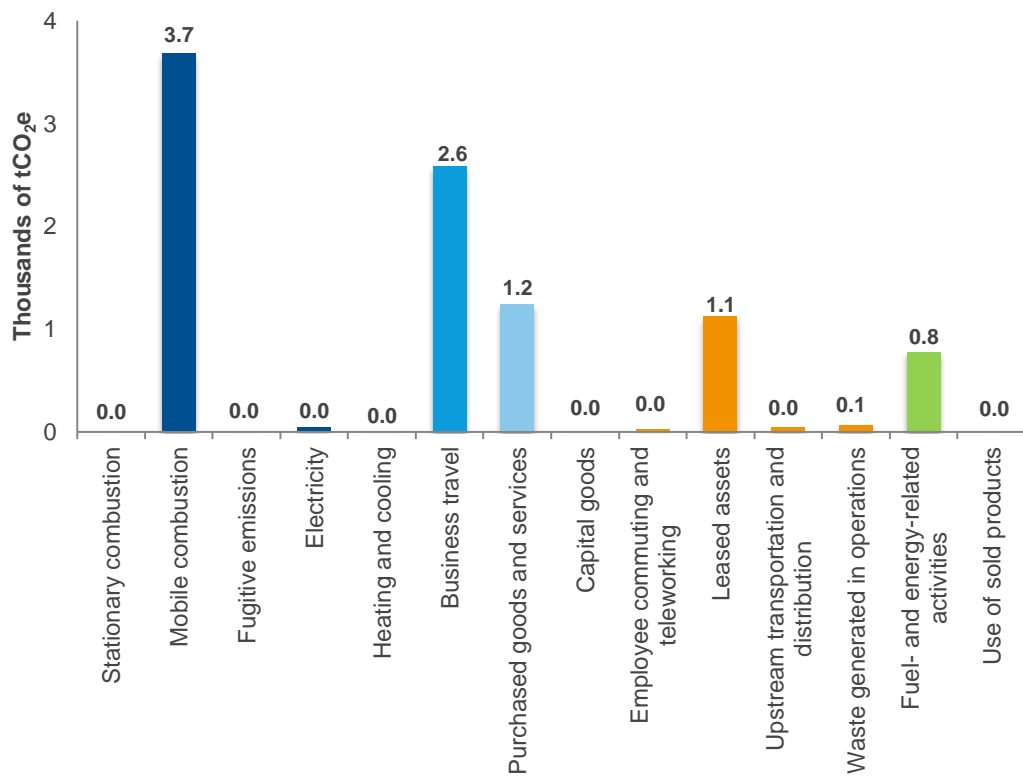


Figure 3: GHG emissions by category for 2021

(Source: South Pole, 2022)

Figure 4 below shows the contribution of each fuel used in Red Wing Aviation’s operations to the energy matrix and its GHG emissions. Red Wing Aviation’s main emission source in 2021 is the consumption of aviation fuel (3,564 tCO₂e), which is reported at a corporate level.

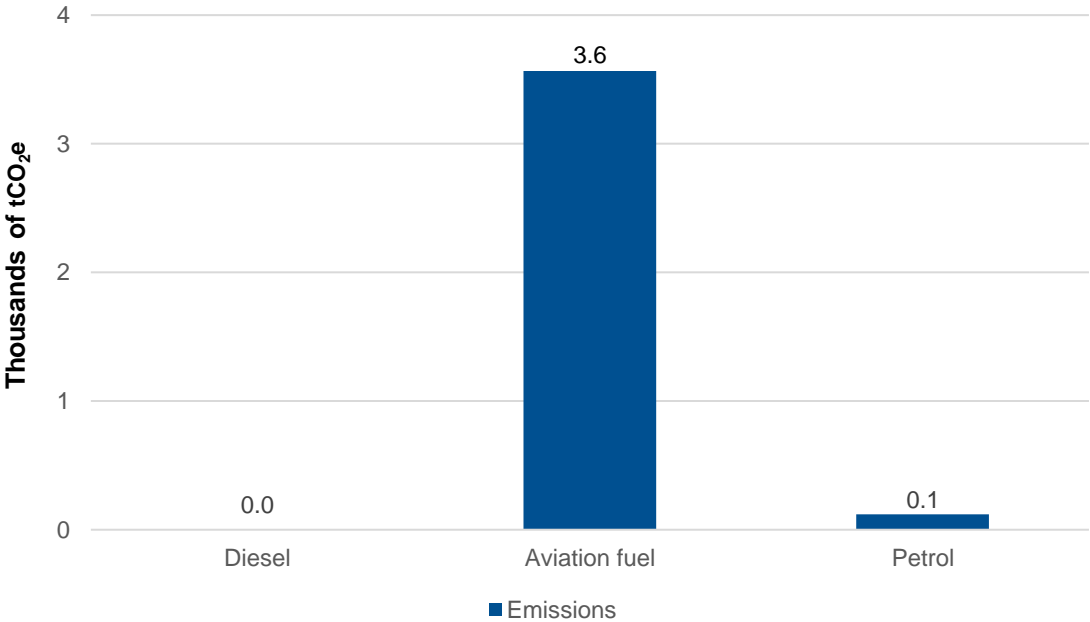


Figure 4: GHG emissions in thousands of tCO₂e

(Source: South Pole, 2022)

3 Conclusions

3.1 Conclusions

The 2021 GHG footprint was estimated in accordance with the 'GHG Protocol'. Where activity data for the inventory was lacking, extrapolations and estimations were made, and the choice of assumptions and emission factors followed a conservative approach. It is best practice to improve the quality of the accounting from each reporting period to the next.

The main emission category is mobile combustion, due to the amount of aviation fuel used in the operations of the fleet. The fifth most relevant emission category is fuel- and energy-related activities, which is a result of the use of fuels and electricity consumption. The category of fuel- and energy-related activities is directly correlated with the category of mobile combustion. This means that if a reduction in aviation fuel use is achieved, or a switch to a fuel with a lower carbon intensity is achieved, the reduced emissions in mobile combustion will be directly reflected in the fuel- and energy-related activities category.

In scope 3, the main emission categories are business travel and purchased goods services. Business travel is particularly high due to medium- and long-haul flights. Purchased goods and services is high due to the emissions resulting from labor costs. However, the calculation of labor costs emission is based on extrapolation, so significant improvements can be made in the data collection.

3.2 Recommendations

For the 2022 GHG accounting estimation, Red Wing Aviation should evaluate whether the following points are relevant for its sustainability strategy. Its implementation could make the data assessment process more efficient and would improve the accuracy of the GHG accounting of the company's operations.

Scope 1 and 2 accounting improvements

Primary activity data on fugitive emissions, such as accounting for refrigerant leakage of AC systems, would improve the accuracy of scope 1 emissions. Due to the magnitude of their GWP, it is necessary to keep a good registry of the refrigerants purchased and consumed by the company's facilities.

Scope 3 accounting improvements

Purchased goods and services and business travel are the most relevant scope 3 categories and should therefore be prioritised for the data collection in the next reporting period.

Labor costs make up the vast majority of the purchased goods and services emissions. Red Wing Aviation did not provide data regarding these categories; therefore, South Pole had to make extrapolations to account for them. Furthermore, South Pole relied on cost-based emission factors from the Comprehensive Environmental Data Archive (CEDA) for the different costs provided by Red Wing Aviation. Ideally, primary data on consumption should be collected to improve the accuracy of the GHG footprint. Using weights is generally much more accurate, as the emission factors based on costs include more assumptions.

2. Annex I

1. Emission factors

Table 11: Emission factors

Activity	Emission factor reference ¹
Stationary combustion, mobile combustion, and fuel-related activities	BEIS, 2021.
Electricity and electricity-related activities	Emissions and Generation Resource Integrated Database (eGRID), 2019; Ecoinvent 3.8.
Refrigerants	IPCC, 2005.
Business travel	BEIS, 2021; CEDA, 2021.
Business accommodation	Cornell Hotel Sustainability Benchmarking, 2021; CEDA, 2021.
Commuter travel	BEIS, 2021.
Teleworking	BEIS, 2021; International Energy Agency (IEA), 2021; eGRID, 2019; Anthesis, 2020.
Global marketing and consumables	CEDA, 2021.
Meal, food and drink products	CEDA, 2021; South Pole Food Database, 2021.
Maintenance labor and materials	CEDA, 2021.
Other purchased good and services	CEDA, 2021; BEIS, 2021; Ecoinvent 3.8; South Pole calculated.
IT equipment	Apple, 2021; Dell, 2021.
IT services	South Pole Cloud Services Database, 2021; CEDA, 2021.
Waste	BEIS, 2021.
Leased assets	CEDA, 2021.

¹ South Pole derives its emission factors from reliable and credible sources. South Pole is not responsible for inaccuracies in emission factors provided by third parties.

3. Annex II

1. Data assumptions and extrapolations

Refrigerants

Red Wing Aviation didn't provide refrigerant usage data. As no data was provided, South Pole estimated refrigerant consumption using the 'GHG Protocol' HFC tool and the following assumptions: two AC units using six kilograms (kg) of refrigerant per charge and an annual leakage of 10%.

Business travel – air

Red Wing Aviation provided a list of flights taken by Red Wing Aviation and VistaJet staff in 2021. The activity data was divided based on the offices' head count.

Business travel – accommodations

Red Wing Aviation provided a list of hotel stays taken by Red Wing Aviation and VistaJet staff in 2021. The activity data was divided based on the offices' head count.

Waste

Red Wing Aviation didn't provide data regarding waste generated in operations. The emissions regarding this category were extrapolated using data from other entities which provided data for this category.

Upstream transportation and distribution

Red Wing Aviation didn't provide data regarding upstream shipments. The emissions regarding this category were extrapolated using data from other entities which provided data for this category.

Purchased goods and services

- **Labor costs:** Red Wing Aviation didn't provide data regarding labor costs. The emissions were extrapolated based on head count using data from other entities which provided data for this category.
- **Cloud services:** Red Wing Aviation didn't provide data regarding cloud services. The emissions were extrapolated based on head count using data from other entities which provided data for this category.
- **Food and catering:** Red Wing Aviation didn't provide data regarding food and catering. The emissions were extrapolated from data provided by VistaJet based on head count.
- **Global consumables on board:** Red Wing Aviation didn't provide data regarding global consumables on board. The emissions regarding this category were extrapolated from data provided by VistaJet based on head count.

4. Annex III

1. Breakdown of emissions by scope and category

Table 12: Breakdown of Red Wing Aviation's GHG emissions by scope and category in 2021

Activity	Consumption	Unit	Emissions (tCO ₂ e)	Percentage of total (%)
Scope 1: direct energy use per primary source			3,685	38%
Stationary combustion			0	0%
Diesel	-	m ³	-	-
Natural gas	-	MWh	-	-
Mobile combustion			3,683	38%
Petrol E5	54,302	liter	119	1%
Aviation fuel	1,400,184	liter	3,564	37%
Refrigerant leakage			2	0%
Refrigerants	Extrapolation	-	2	0%
Scope 2: indirect GHG emissions from purchased electricity, heating and cooling			44	0%
Electricity			42	0%
Grid	104,331	kWh	42	0%
Heating and cooling			2	0%
District heating	10,300	kWh	2	0%
Scope 3: other indirect GHG emissions			5,852	61%
Purchased goods and services			1,236	13%
Crew uniforms	185,360	EUR	58	0%
Paper	520	kg	0	0%
Food and beverage	3,085	EUR	1	0%
Other purchased goods and services	1,052	EUR	0	0%
Water	562,133	liter	0	0%
Cloud services	Extrapolation	-	0	0%

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Activity	Consumption	Unit	Emissions (tCO ₂ e)	Percentage of total (%)
Labor costs	Extrapolation	-	1,036	11%
Food and beverage	Extrapolation	-	3	0%
Other	Extrapolation	-	136	1%
Capital goods			7	0%
IT equipment			7	0%
Laptop – Dell	14	unit	3	0%
iPad	14	unit	4	0%
Fuel- and energy-related activities			773	8%
Well-to-tank and transmission and distribution			773	8%
Electricity grid	104,331	kWh	2	0%
District heating	10,3000	kWh	0	0%
Petrol E5	54,3020	liter	33	0%
Aviation fuel	1,400,184	liter	738	8%
Upstream transportation and distribution			43	0%
Maintenance freight	19,215	USD	13	0%
Air	Extrapolation	-	30	0%
Road	Extrapolation	-	0	0%
Waste generated in operations			66	1%
General	Extrapolation	-	66	1%
Business travel			2,587	27%
Flights			2,411	25%
<463 km	245,838	pkm	67	1%
463–3,700 km	5,432,382	pkm	934	10%
>3,700 km	6,530,036	pkm	1,410	15%
Car rental	8,569	km	2	0%

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Activity	Consumption	Unit	Emissions (tCO ₂ e)	Percentage of total (%)
Taxi	128,741	USD	73	1%
Accommodation	1,942	occupied room	102	1%
Employee commuting and teleworking			21	0%
Car	17,649	pkm	4	0%
Public transport	69,127	pkm	12	0%
Walking/cycling	81,489	pkm	0	0%
Other	0	pkm	0	0%
Working from home	2,590	person-days	6	0%
Upstream leased assets			1,119	12%
Aircraft rental	552,000	USD	1,119	12%
Total GHG emissions			9,580	100%

(Source: South Pole, 2022)

