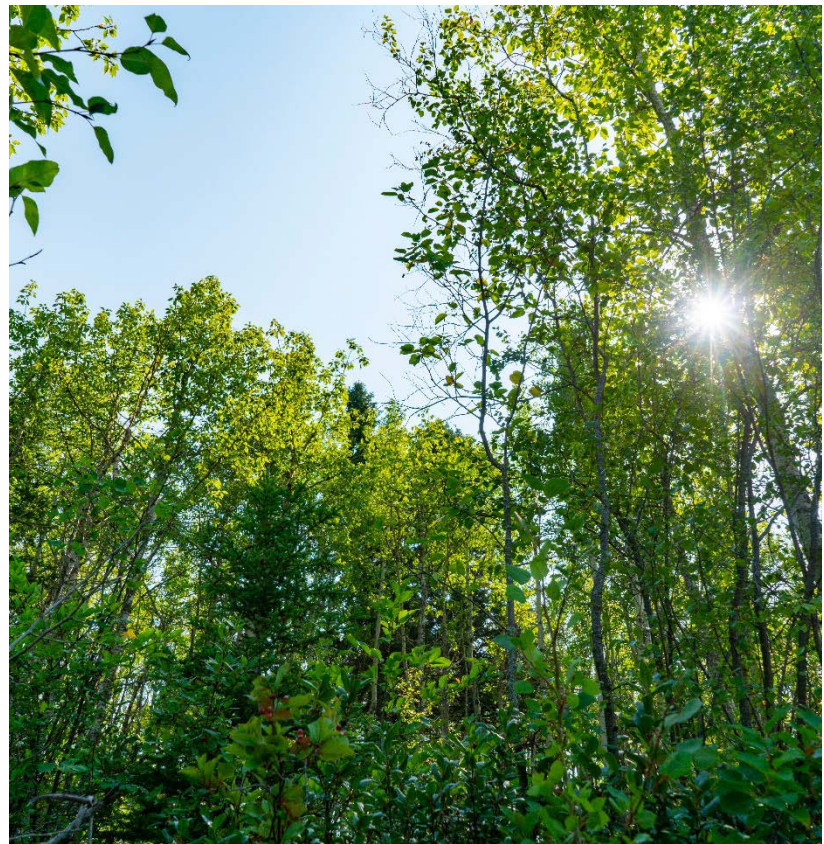


# Greenhouse Gas Baseline Inventory Report

NOVEMBER 2020



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## President's Message



We are fortunate to live and work in Alberta, a province with an abundance of natural resources and talent. As Albertans, we have a history of using this talent to find solutions to a multitude of technical and environmental issues in the oil and gas industry. For twenty years, this is a process that Rangeland has been proud to be a part of.

However, it has also become increasingly clear that climate change has emerged as a new challenge and that we all need to find ways to do things better. Rangeland is determined to pull our weight.

Therefore, we are proud to publish our first ever voluntary greenhouse gas inventory. This inventory tells us how large our climate change impact is and identifies where our largest sources of emissions are, providing us with the information to plan an effective response that will enable us to reach a lower carbon future.

By completing this inventory, and including direct emissions (Scope 1), indirect emissions (Scope 2) and a comprehensive accounting of value chain emission sources (Scope 3), we know we remain leaders in our field and at the forefront of our energy industry.

As a company, a province, and a society, addressing the climate change challenge is not just the right thing to do, it also provides us with new opportunities.

Together, we can build a new future.

Ron Daye,  
President  
Rangeland Engineering

### Summary

Rangeland Engineering is proud to present our first greenhouse gas inventory. This is a voluntary report and has been developed following the international best practice guidance contained in the GHG Protocol from the World Business Council for Sustainable Development (WBCSD).

We have made every effort to be as comprehensive as possible in developing this inventory. As such, we have not only quantified direct (also known as Scope 1) and indirect (Scope 2) emissions, which are mandatory sources for reporting under the GHG Protocol, but have also chosen to quantify 14 value-chain (Scope 3) emission sources across seven categories.

Our inventory covers the following sources:

1. Building heating and hot water
2. Vehicle fleet
3. Refrigerant leaks from building cooling
4. Electricity consumption
5. Purchased goods and services (specifically, office paper and water)
6. Capital goods (IT assets and office furniture)
7. Fuel and energy activities (upstream extraction and processing of fossil fuels and electricity)

8. Upstream transportation and distribution (courier services)
9. Waste disposal (landfill and wastewater)
10. Business travel (flights, car rentals, hotel stays and coach hire)
11. Commuting, including telecommuting

Our 2019 baseline footprint was 641 tonnes CO<sub>2</sub>e, or around 5.5 tonnes CO<sub>2</sub>e/FTE staff. Of this, our major emission sources are electricity consumption, commuting, and building heating and hot water. Together, these make up around four-fifths of our baseline footprint.

We have endeavoured to use the best available data for this inventory and to make our inventory as complete as possible. However, we understand there are several improvements to data collection that could be made to improve the accuracy of our quantification in future years and we will be working on this with internal and external stakeholders.

Our leadership team is committed to setting a GHG reduction target and adopting an action plan to achieve this target. We will be reporting on our carbon footprint, our target and our action plan, on an annual basis from this point onwards, beginning with a 2020 inventory early in 2021.

## Our Greenhouse Gas Inventory

This inventory serves as our baseline – the starting point against which our progress to a lower carbon footprint will be measured. Our inventory covers the 2019 calendar year and we plan to report our progress in improving our inventory and in reducing our greenhouse gas emissions annually.

### Methodology

Our inventory was developed following international best practice as contained in the World Business Council for Sustainable Development/World Resources Institutes' GHG Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) ('the Protocol'). It has been supplemented with guidance from the Corporate Value Chain (Scope 3) Accounting and Reporting Standard: Supplement to the GHG Protocol Corporate Accounting and Reporting Standard ('the Scope 3 standard').

### Included and Excluded Scopes, Categories and Emission Sources

In line with the GHG Protocol and the Scope 3 Standard, Rangeland's inventory has been quantified by, and is reported in, several 'Scopes'. Each Scope is then subdivided into one or more specific 'Categories', each of which is made up of one or more specific emission sources.

There are three Scopes, and it is mandatory under the Protocol to report Scope 1 and 2 emissions. The three Scopes are:

1. Direct emissions - this comprises emissions that are directly emitted by Rangeland's operations, including fossil fuels combusted for heat and power from Rangeland's leased offices and its small vehicle fleet, and also direct leakage of emissions (known as fugitive emissions) into the atmosphere from cooling systems at Rangeland's leased offices.
2. Indirect energy emissions - this comprises emissions that are indirectly emitted by Rangeland's operations, due to Rangeland's consumption of imported energy. In practice, this means electricity used as Rangeland's leased offices.
3. Value-chain emissions - this comprises emissions that are indirectly emitted upstream or downstream in the supply chain from Rangeland, due to Rangeland's operations. There are 15 categories of Scope 3 emissions. Reporting of Scope 3 emissions is voluntary under the Protocol, but Rangeland has opted to report as many of these as possible to ensure our inventory is as accurate, complete, and useful as possible.

Table 1 - on the next page - outlines which Scopes and Categories have been included in our inventory, as well as the specific emission sources that have been quantified in each category. This is also shown as a graphic in Figure 1, page 7.

## Rangeland Engineering Greenhouse Gas Baseline Inventory

**Table 1 – Scopes, Categories, and Emission Sources**

Scope & Category	Description	Included or excluded?
1-1 - Stationary Combustion	Any fuel combusted on-site for providing space heating, hot water, cooking fuel, backup power (i.e. in an emergency generator) etc.	Included. Natural gas for building heating and hot water
1-2 - Mobile Combustion	Any fuel combusted in company vehicles (not that electric vehicles are captured under Scope 2).	Included. Gasoline and diesel for company vehicles.
1-3 - Fugitive Emissions	Leakage of refrigerant gases from building cooling or refrigeration systems.	Included. Refrigerants from building cooling.
2 - Indirect Emissions	Emissions from energy that is used by the organization but that is generated off-site e.g. electricity from the grid, steam/heat/cooling from district energy systems.	Included. Grid electricity for building power.
3-1 - Purchased Goods and Services	Emissions from resource extraction, production and transportation of purchased goods or services (that are not included in categories 2-8).	Included. Office paper and water.
3-2 - Capital Goods	Emissions from resource extraction, production and transportation of capital goods purchased or acquired by the company.	Included. IT assets and office furniture.
3-3 – Fuel & Energy Activities	Upstream emissions associated with fuel and energy used by the company (i.e. resource extraction, processing, transportation).	Included. Extraction and processing of fossil fuels associated with 1-1, 1-2 and 2.
3-4 – Upstream Transportation & Distribution	Emissions associated with transportation and distribution of products directly purchased or acquired, and transportation and distribution services purchased.	Included. Courier services
3-5 – Waste generated in Operations	Emissions associated with treatment and disposal of waste from company operations. This can include emissions from transportation of waste.	Included. Garbage to landfill and wastewater.
3-6 – Business Travel	Emissions associated with staff travelling for work e.g. to conferences, client meetings, project sites, between offices, etc. This can optionally also include emissions associated with stays in hotels e.g. heating, power, etc.	Included. Flights, car rentals, coach rentals and hotel stays.
3-7 – Commuting	Emissions associated with staff travelling for work e.g. to conferences, client meetings, project sites, between offices, etc. This can optionally also include emissions associated with stays in hotels e.g. heating, power, etc.	Included. Commuting including telecommuting.
3-8 – Upstream Leased Assets	Emissions associated with assets (e.g. office space, vehicles, etc.) that the company leases from others (and that are NOT already included in Scope 1 or 2).	Included. Leased offices are included in 1-1, 1-3 and 2.
3-9 – Downstream Transportation & Distribution	Emissions from transportation and distribution of products sold (if not paid for by reporting company).	Excluded. Not applicable as Rangeland does not make products for transportation/delivery.
3-10 – Downstream Transportation & Distribution	Emissions from transportation and distribution of products sold (if not paid for by reporting company).	Excluded. Not applicable as Rangeland does not make products for transportation/delivery.
3-11 – Use of Sold Products	Emissions from the end use of products sold by reporting company.	Excluded. Not applicable as Rangeland does not make a product that results in emissions during use.
3-12 – End-of-life Treatment of Sold Products	Emissions from end-of-life decommissioning, treatment and disposal of products sold by reporting company.	Excluded. Not applicable as Rangeland does not make a product that must be decommissioned
3-13 – Downstream Leased Assets	Emissions associated with assets (e.g. office space, vehicles, etc.) that the company leases to others (and that are NOT already included in Scope 1 or 2).	Excluded. Not applicable as Rangeland does not lease assets to others.
3-14 – Franchises	Emissions from the operation of franchises (and that are NOT already included in Scope 1 or 2). May apply to franchisee or franchisor.	Excluded. Not applicable as Rangeland is neither a franchisee nor franchisor.
3-15 – Investments	Emissions from investments (and that are NOT already included in Scope 1 or 2). Most of this category is applicable to financial institutions, such as commercial banks or public development banks, for example.	Excluded. Not applicable as Rangeland does not operate subsidiaries/JVs, provide project financing or provide managed investment/client financial services.

# Rangeland Engineering Greenhouse Gas Baseline Inventory

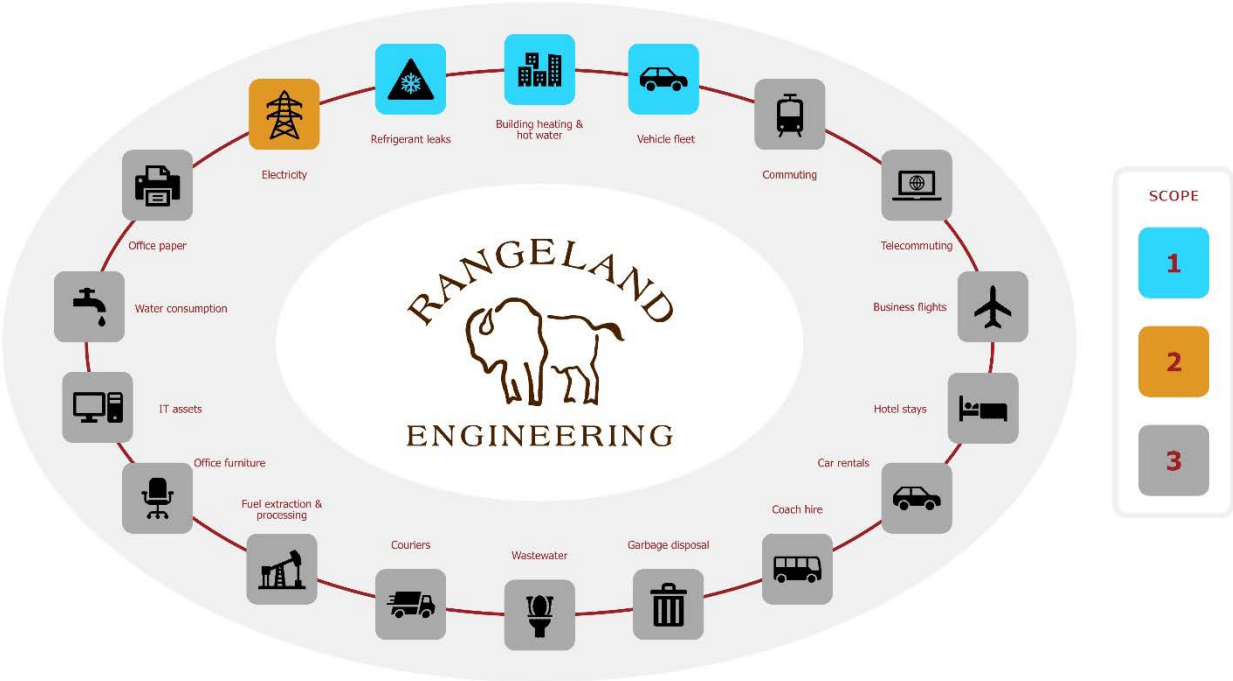


Figure 1 – What’s in Our Inventory?



## Gases Included and Global Warming Potentials

Our inventory includes four different GHGs:

1. Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>) and Nitrous Oxide (N<sub>2</sub>O), all of which are by-products of combusting fossil fuels)
2. R410A, which is a refrigerant gas used in building cooling systems.

100-year Global Warming Potentials (GWPs) for these GHGs have been taken from the Intergovernmental Panel on Climate Change (IPCC)'s fifth Assessment Report, Table 8.A.1, which represents the most current climate science. These factors are used for reporting purposes to equate each GHG released into the common unit of tonnes of carbon dioxide equivalent (tonnes CO<sub>2</sub>e). The GWPs are shown in Table 2. This shows, for example, that over the course of 100 years, a single tonne of methane has an impact on the climate, equivalent to 28 tonnes of carbon dioxide.

Table 2 – Global Warming Potentials

GHG	Global Warming Potential (GWP)
CO <sub>2</sub> – Carbon Dioxide	2
CH <sub>4</sub> – Methane	28
N <sub>2</sub> O – Nitrous Oxide	265
R410	2088

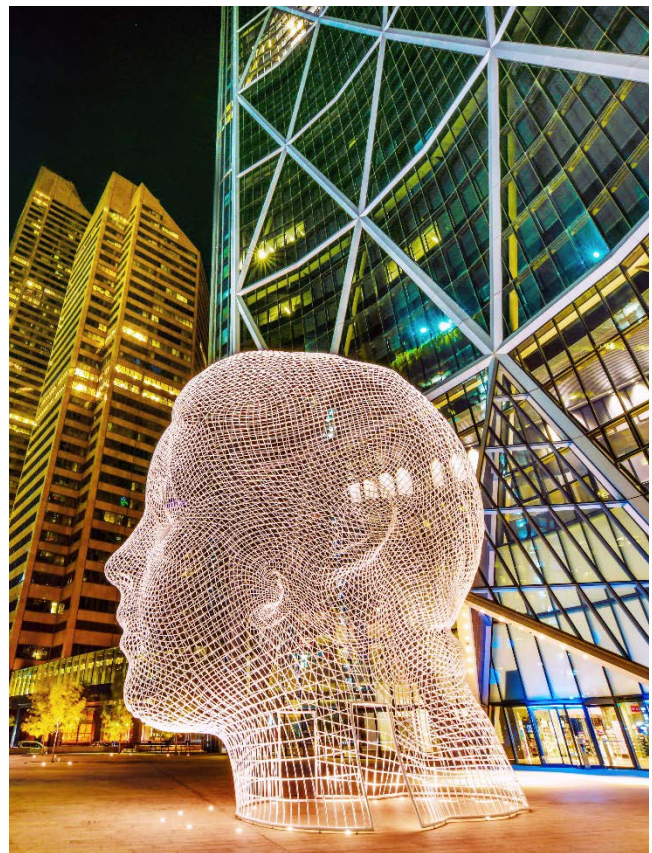
## Emission Factors, Calculation Methods and Data Sources

Emission factors for our inventory have been taken from a variety of good practice sources. Where possible, we have used real, measured data as the basis for quantifying our GHG emissions footprint.

However, some key data was not available to us and had to be estimated. For example, the building in which our Calgary office is located was sold to a new landlord and a new building manager took over the building operations in 2020. Despite our best efforts, our new building manager was unable to provide data relating to natural gas, electricity, refrigerants, water consumption, waste or wastewater.

Wherever the quality of the data that makes up our inventory can be improved, we have taken note of this and will be actively working to improve this in the future.

Table 3 (next page) summarizes the emission factor sources, calculation methods and data sources used in our inventory.





## Rangeland Engineering Greenhouse Gas Baseline Inventory

**Table 3 – Scopes, Categories and Emission Sources**

Scope & Category	Key Emission Factor Sources	Key Data Sources	Calculation Basis
<b>1-1 - Stationary Combustion</b>	Environment and Climate Change Canada (2020). National Inventory Report, 1990-2018	Office areas from lease agreements, energy intensity benchmark data from Natural Resources Canada National Energy Use Database for Alberta Offices, natural gas consumption for Grand Prairie from partial year utility invoices.	For Calgary, emissions calculated based on benchmark energy intensity of offices (GJ/m <sup>2</sup> ) and occupied floor area (m <sup>2</sup> ). For Grand Prairie, emissions calculated based on daily average consumption from partial year's utility invoices.
<b>1-2 - Mobile Combustion</b>	Environment and Climate Change Canada (2020). National Inventory Report, 1990-2018	Vehicle make/mode/year/fuel type from vehicle registration records. Combined fuel efficiencies from Natural Resources Canada Fuel Consumption Ratings Search Tool. Distance estimated.	Emissions calculated on the basis of fuel volume(L) and type. Fuel volume was estimated based on distance travelled (km) and fuel efficiency of vehicles (L/100 km).
<b>1-3 - Fugitive Emissions</b>	IPCC Good Practice Guidelines, Table 2, Default Assumptions	Cooling system size, mass of refrigerant charge and refrigerant type estimated based on similar buildings from other GHG inventories.	Emissions calculated on the basis of assumed annual leakage rates in accordance with the GHG Protocol Tool "Calculating HFC and PFC Emissions from the Manufacturing, Servicing, and/or Disposal of Refrigeration and Air-Conditioning Equipment", version 1.0.
<b>2 - Indirect Emissions</b>	Environment and Climate Change Canada (2020). National Inventory Report, 1990-2018	Office areas from lease agreements, energy intensity benchmark data from Natural Resources Canada National Energy Use Database for Alberta Offices, electricity consumption for Grand Prairie from partial year utility invoices.	For Calgary, emissions calculated based on benchmark energy intensity of offices (GJ/ m <sup>2</sup> ) and occupied floor area (m <sup>2</sup> ). For Grand Prairie, emissions calculated based on daily average consumption from partial year's utility invoices.
<b>3-1 -Purchased Goods and Services</b>	For office paper, Environmental Paper Network Paper Calculator Version 4.0. For water, Environment Canada (2017). Greenhouse Gas and Criteria Air Contaminants Calculator.	For office paper (number of sheets), Rangeland purchasing records. For per capita water consumption, Open Calgary datasets for water withdrawals and population data (2018).	For office paper, emissions calculated on the basis of number of sheets consumed and recycled content of those sheets. For water, emissions calculated on the basis of annual average water withdrawals per capita, pro-rated for the number of hours/year an average employee is in the office.
<b>3-2 - Capital Goods</b>	For furniture, Statistics Canada. Table 38-10-0098-01 Direct plus indirect energy and greenhouse gas emissions intensity, by industry. For IT Assets, Dell.com - Product Carbon Footprint Assessments	For furniture, supplier receipts from Rangeland purchasing records. For IT assets, Rangeland IT records.	For furniture, emissions calculated on the basis of expenditure. For IT assets, emissions calculated on the basis of life-cycle emissions (minus use-phase emissions) for the number of each specific make/model of desktops/laptops purchased.
<b>3-3 – Fuel &amp; Energy Activities</b>	Government of Alberta (2019) Carbon Offset Emission Factors Handbook, v2.0, November 2019	As per scope/categories 1-1, 1-2 and 2.	Emissions calculated on the basis of fossil fuels consumed in scope/categories 1-1, 1-2 and 2.
<b>3-4 – Upstream Transportation &amp; Distribution</b>	Statistics Canada. Table 38-10-0098-01 Direct plus indirect energy and greenhouse gas emissions intensity, by industry.	Courier receipts from Rangeland purchasing records.	Emissions calculated on the basis of expenditure.

# Rangeland Engineering Greenhouse Gas Baseline Inventory

**Table 3 – Scopes, Categories and Emission Sources**

Scope & Category	Key Emission Factor Sources	Key Data Sources	Calculation Basis
<p><b>3-5 – Waste generated in Operations</b></p>	<p>Open Calgary datasets on Community Wide Greenhouse Gas Inventory – “Solid Waste” and “Wastewater”(2018) – together with Open Calgary dataset on Waste Per Capita and population data (2018) used to calculate emissions factors per tonne solid waste and emissions per capita for wastewater.</p>	<p>Waste per capita from Open Calgary dataset, staff numbers from Rangeland HR records.</p>	<p>For waste, emissions calculated on the basis of annual average waste disposal per capita, pro-rated for the number of hours/year an average employee is in the office. For wastewater, emissions calculated on the basis of annual average wastewater emissions per capita, pro-rated for the number of hours/year an average employee is in the office.</p>
<p><b>3-6 – Business Travel</b></p>	<p>For car rentals and coach rentals, Environment and Climate Change Canada (2020). National Inventory Report, 1990-2018 For air travel, 2018 BC. Methodological Guidance for Quantifying Greenhouse Gas Emissions, Jan 2019: Table 27 For hotel stays, UK Government GHG Conversion Factors for Company Reporting, Version 1.3, 2019</p>	<p>For car rentals, annual travel agent bookings report. For coach rentals, receipts from Rangeland purchasing records. For air travel, annual travel agent bookings report and data on non-travel agent bookings from Rangeland’s internal records. For hotel stays, annual travel agent bookings report.</p>	<p>For car rentals, emissions calculated on the basis of fuel volume (L). Fuel volume was estimated on the basis of an assumed distance travelled per rental-day. For coach rentals, emissions calculated on the basis of fuel volume (L). Fuel volume was estimated on the basis of known distance travelled (km) and assumed fuel efficiency of transportation mode (L/100 km). For air travel, emissions calculated on the basis of known passenger-kilometers (psgkms) on short-haul, medium-haul and longhaul flights. For hotel stays, emissions calculated on the basis of room-nights per country.</p>
<p><b>3-7 – Commuting</b></p>	<p>For most travel modes, Environment and Climate Change Canada (2020). National Inventory Report, 1990-2018.</p>	<p>Voluntary commuting survey completed by Rangelanders in 2020. Almost 50% of staff completed this survey. Results were extrapolated to the whole staff complement.</p>	<p>Emissions calculated on the basis of fuel volume (L) and type. Fuel volume was estimated on the basis of known distance travelled (km) and assumed fuel efficiency of transportation mode (L/100 km).</p>



## Results

Our 2019 carbon footprint was 641 tonnes of carbon dioxide equivalent. Slightly under two-fifths of our GHG emissions came from our value-chain (Scope 3) sources, and almost the same again from electricity consumption for our offices (Scope 2). The remaining quarter came from our direct (Scope 1) sources.

Our top three biggest emission sources were:

1. Electricity consumption (38%)
2. Commuting (23%)
3. Building heating (21%)

Together, these made up over four-fifths of our footprint. The remaining fifth of our emissions was spread among the remaining categories, as shown in Figure 2.



On an FTE basis, our baseline emissions were 5.5 tonnes CO<sub>2</sub>e/FTE.

A detailed breakdown of our emissions by source is shown in Figure 3 and Table 4 on the next page.

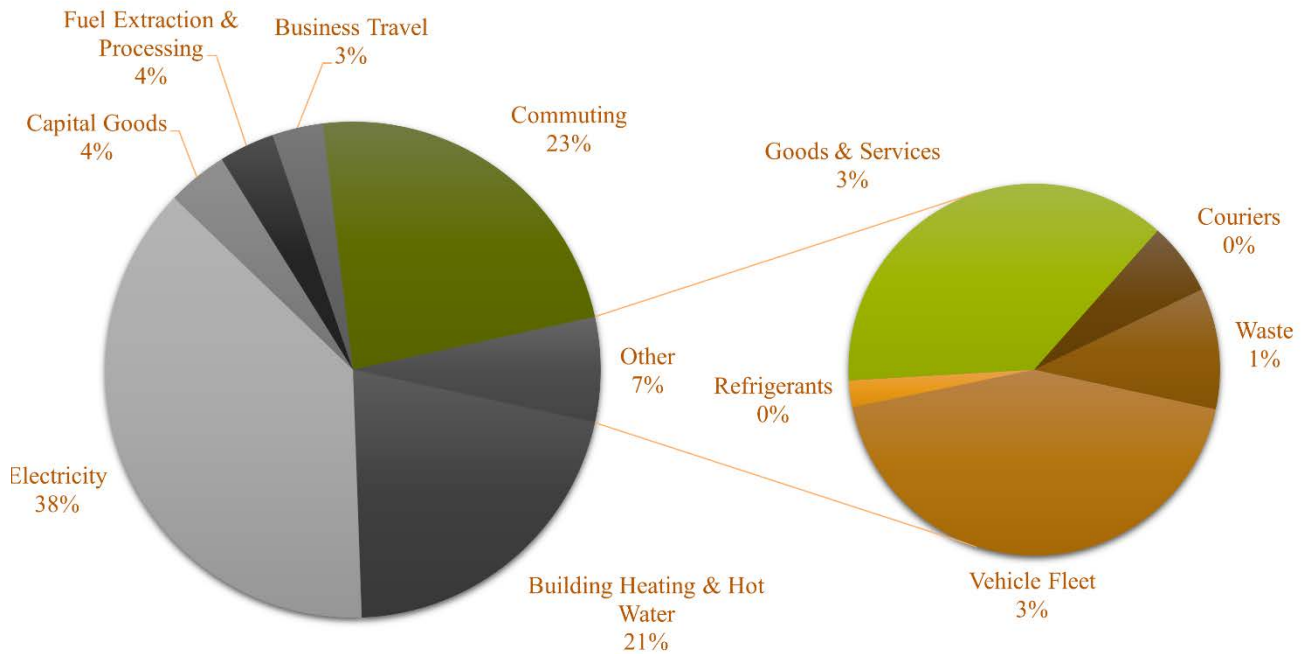


Figure 2 – Our Baseline GHG Inventory, by Source Category

# Rangeland Engineering Greenhouse Gas Baseline Inventory

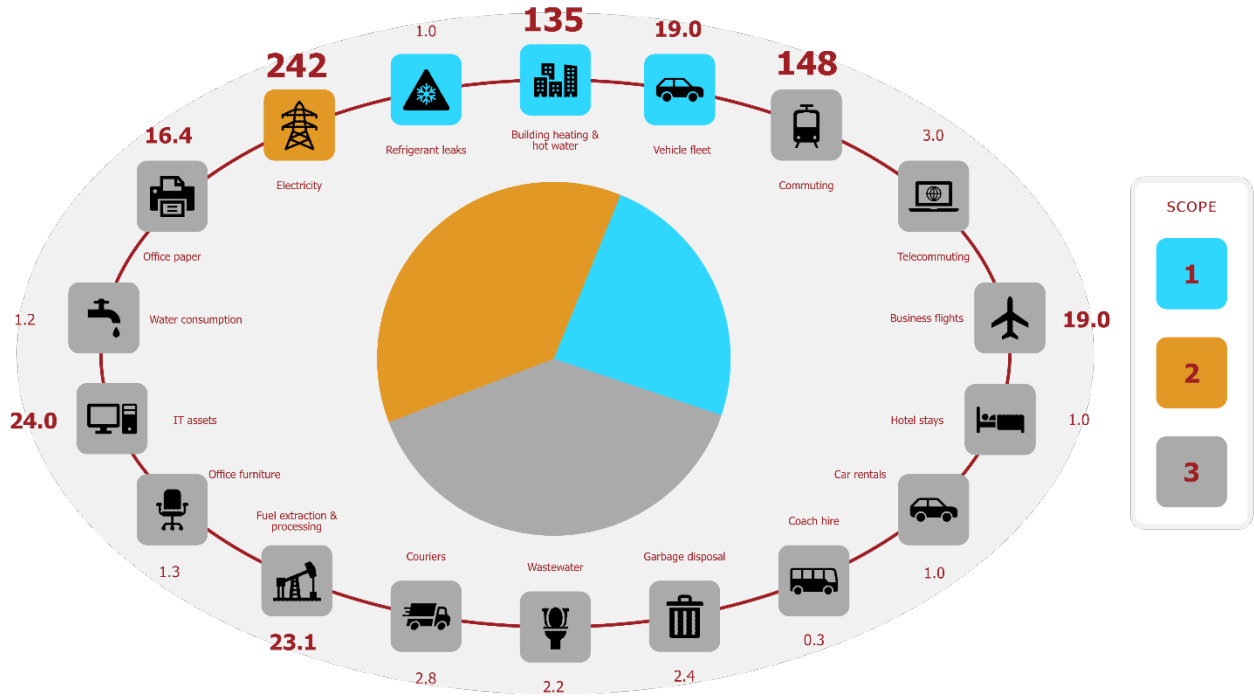
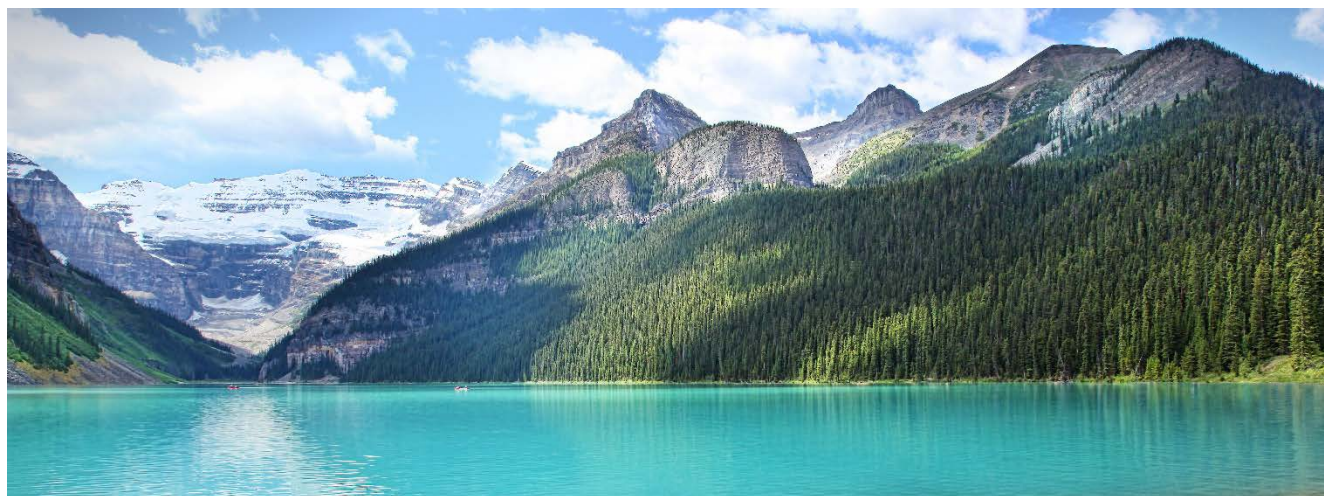


Figure 3 – Our Baseline GHG Inventory, by Detailed Source

Table 4 – Our Baseline GHG Inventory, by Detailed Source (in Rank Order)

Emissions Source	Emissions (tonnes CO2e)	Emissions Source	Emissions (tonnes CO2e)
Electricity	242	Couriers	2.8
Commuting	148	Garbage Disposal	2.4
Building Heating & Hot Water	135	Wastewater	2.2
IT Assets	24.0	Office Furniture	1.3
Fuel Extraction & Processing	23.1	Water Consumption	1.2
Business Flights	19.0	Car Rentals	1.0
Vehicle Fleet	19.0	Hotel Stays	1.0
Office Paper	16.4	Refrigerants	1.0
Telecommuting	3.0	Coach Hire	0.3



### Next Steps

#### Annual Inventory Update

Rangeland will produce an Annual Inventory Update Report. Each year, this report will quantify our carbon footprint and compare the Reporting Year against this, our Baseline Year, in order to identify and track our progress.

The first Reporting Year will be the calendar year 2020. We expect that our 2020 Annual Inventory Update Report will be produced in late Spring 2021.

#### Inventory Data Improvements

We have endeavored to use the best available data for this inventory and to make our inventory as complete as possible. However, we understand there are several improvements to data collection that could be made to improve the accuracy of our quantification.

We will work to improve these data collection systems internally, as well as with our external service providers, as we begin the process of quantifying our 2020 inventory.

Inventory data improvements will be reported in our first Annual Inventory Update Report.

#### Target Setting and Action Planning

Now that we understand how large our carbon footprint is, and the significance of each Scope/category, Rangeland has committed to setting a carbon reduction target and developing an action plan to meet that target.

Our initial steps include:

- Setting up an internal Green Room Committee, which will evaluate and propose GHG reduction and data collection improvement actions
- Based on the work of the Green Room Committee, to adopt a GHG reduction target for 2021 onwards
- To work with our building landlord to evaluate how our Scope 1 (building heating and hot water & refrigerants), Scope 2 (electricity) and Scope 3 (fuel and energy activities) GHG emissions can be cost-effectively reduced

- To initiate a company-wide drive to reduce Scope 3 (office paper) emissions by developing and implementing policies such as defaulting to double-sided printing
- To initiate a company-wide drive to reduce Scope 2 (electricity) and Scope 3 (IT Assets) GHG emissions associated with our IT equipment through the development of green procurement and use policies
- To evaluate ways to encourage the use of public transit, post-pandemic, to reduce our Scope 3 (commuting) emissions.

## Acknowledgments

Many thanks are due to Rangelanders for their participation in the voluntary commuting survey.



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