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**NET ZERO CHALLENGE**

**COMPREHENSIVE NET ZERO PLAN**

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November 2025

Prepared for:

**Environment and Climate  
Change Canada**

## LIST OF ACRONYMS

CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide equivalent
CoreGeo	Core Geoscience Services Inc.
EPA	United States Environmental Protection Agency
GHG	Greenhouse Gases
GHGRP	Greenhouse Gas Reporting Program
NZIC	Net-Zero Implementation Committee
SME	Small- or Medium-Sized Enterprise

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# 1 Introduction

Core Geoscience Services Inc. (CoreGeo), a Yukon-owned environmental consulting firm, specializes in projects tailored for northern climates, including environmental assessments, contaminated site services, and regulatory support. CoreGeo's commitment to environmental stewardship aligns with its participation in Canada's Net-Zero Challenge. This plan outlines CoreGeo's commitment to achieving net-zero Scope 1 and Scope 2 emissions, by 2050, focusing on mobile sources and electricity consumption within its operational boundaries. CoreGeo is also including the most relevant Scope 3 category (business travel) in its inventory and net zero plan.

## 1.1 Administrative Information

- **Company Name:** Core Geoscience Services Inc.
- **Participation Stream:** Stream 3 (All other companies, including small- and medium-sized enterprises)
- **Small- or Medium-Sized Enterprise (SME):** Yes
  - **Number of Employees:** 28
  - **Parent Company:** None
- **Canadian-Based:** Yes
  - **Subsidiary in Canada:** n/a
- **Government Reporting Requirements:** Core Geoscience Services Inc. does not have any facilities reporting to the Government of Canada's Greenhouse Gas Reporting Program (GHGRP).
- **Net-Zero Plan Scope:** Canadian-specific
- **Contact:** info@coregeo.ca | (867) 336-2673

Core Geoscience Services Inc. operates from its headquarters in Whitehorse, Yukon, and serves northern Canadian regions and British Columbia with a commitment to sustainability.

## 1.2 Net Zero Target

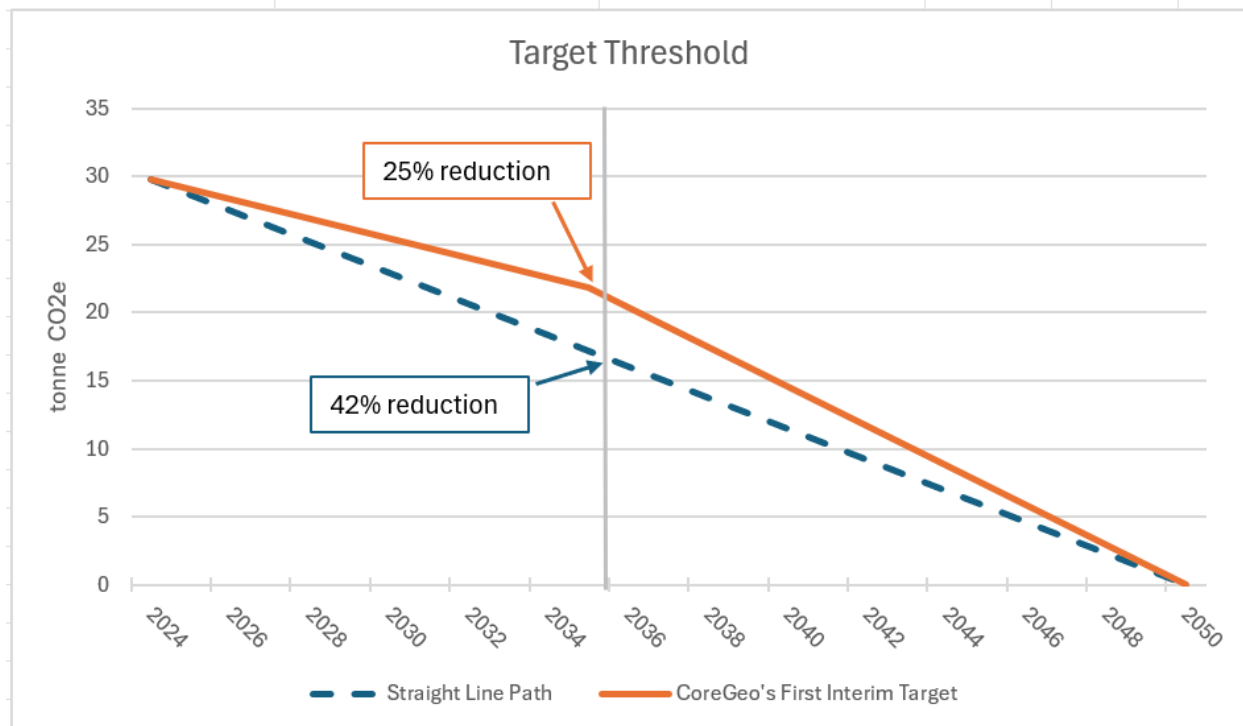
CoreGeo is targeting net-zero GHG emissions by 2050 for its direct operations (Scope 1 and Scope 2) and its most relevant Scope 3 category, in accordance with *Canada's Net-Zero Challenge Technical Guide*. This target encompasses operational emissions associated with mobile equipment, electricity use across all CoreGeo sites, and business travel.

As a Stream 3 participant, CoreGeo has identified business travel as the most significant components of its Scope 3 footprint. While Scope 3 emissions are not subject to the minimum interim-target requirement, CoreGeo will quantify this category annually and develop a separate reduction target as data quality and consistency improve.

### 1.2.1 Interim Target

CoreGeo has established fiscal year 2023-2024 as its baseline period for GHG emissions and has adopted 2050 as the target year for achieving net-zero Scope 1 and Scope 2 emissions. Following the Net-Zero Challenge minimum-ambition threshold, CoreGeo's first interim target year is 2035.

Under a straight-line reduction pathway to net-zero by 2050, emissions would decrease by approximately 42% from 2024 levels by 2035. In accordance with the Challenge's flexibility allowance (up to 40% less than the straight-line trajectory), CoreGeo has set its 2035 interim target at a minimum 25% reduction in Scope 1 and Scope 2 emissions relative to the 2023-2024 baseline. Figure 1 illustrates this target threshold.



**Figure 1: CoreGeo's Interim Target**

For relevant scope 3 emissions (business travel), the interim target is a reduction of 20% by 2035. The interim target serves as a measurable milestone guiding CoreGeo's investment planning, operational efficiency initiatives, and continuous improvement efforts consistent with its long-term net-zero commitment.

## 2 Baseline Greenhouse Gases Inventory

A baseline GHG inventory was conducted for the fiscal year 2023-2024 and was presented in CoreGeo's preliminary Net Zero Plan. The fiscal year 2023-2024 is used as our base year. Sections 2.1 to 2.4 below are reproduced from the preliminary Net Zero Plan for context.

### 2.1 Methods

To establish an accurate baseline greenhouse gas (GHG) inventory, CoreGeo followed a methodology based on the Greenhouse Gas Protocol, supplemented by the U.S. Environmental Protection Agency (EPA) Simplified GHG Emissions Calculator (EPA, 2023). The calculator tool is designed as a simplified calculation method to help organizations estimate and inventory their annual greenhouse gases emissions and is

based on the most current Center for Corporate Climate Leadership Greenhouse Gas Inventory Guidance Documents and the Emission Factor Hub. There are three primary steps in completing a GHG inventory. Each emission source also has these three steps.

- (1) **DEFINE:** The first step in completing a GHG inventory is to determine the boundaries and emissions sources included within those boundaries. After having defined organizational and operational boundaries, determine which emissions sources are relevant to the business.
- (2) **COLLECT:** The second step is to collect data for the defined annual period. The EPA Calculator has help sheets with suggestions and guidance for each emissions source and a general help sheet for data management.
- (3) **QUANTIFY:** The third step is to calculate emissions. The EPA Calculator is designed to complete the emissions quantification step. Once the user enters data in this MS Excel spreadsheet, the emissions will be calculated and totaled on the "Summary" sheet.

CoreGeo chose the most recent complete fiscal year (March 1, 2023 to February 29, 2024) as its baseline year for GHG inventory.

## **2.2 Inventory Boundaries**

### **2.2.1 Geographical Boundaries**

Since CoreGeo is a Canadian-based company and operates exclusively in Canada, its net-zero target and plans are inherently Canadian-specific. This aligns with the Challenge's recommendation that participating companies concentrate on developing domestic net-zero strategies, contributing to the collaborative push toward a low-carbon future in Canada.

### **2.2.2 Organizational Boundaries**

The emissions inventory covers CoreGeo's direct operations, including offices, project sites, and mobile operations, ensuring that activities directly managed by CoreGeo are included.

### **2.2.3 Emissions Scopes**

CoreGeo chose to include the following emissions scopes in its inventory:

- **Scope 1:** Emissions from sources that are owned and controlled by the company;
- **Scope 2:** Indirect emissions from electricity, heating, cooling or steam that a company purchases for its own use; and
- **Scope 3:** Indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. CoreGeo chose to include the single most relevant scope 3 emissions category, namely business travel.

## 2.3 Emissions Sources

### 2.3.1 Scope 1 Emissions

Scope 1 emissions include:

- Stationary Combustion: Facilities that burn fuels on-site (e.g. natural gas, propane, coal, fuel oil for heating, diesel fuel for backup generators, biomass fuels);
- Mobile Sources: Vehicles falling within the organization boundary, i.e. owned by the company (e.g. cars, trucks, propane forklifts, aircrafts, boats);
- Refrigeration and Air Conditioning: Refrigeration or air conditioning equipment (gas) used by the company;
- Fire Suppression: Chemical suppressants used by the company; and
- Purchased Gases: Industrial gases purchased for use in the business (e.g. for manufacturing, testing or laboratories).

In the case of CoreGeo, only mobile sources are applicable under Scope 1. During the 2023-2024 fiscal year, CoreGeo owned two pickup trucks (a 2021 Toyota Tundra and a 2023 Toyota Tundra), and a 2008 Toyota Matrix. CoreGeo occasionally used rental vehicles (pickup trucks) or employees' personal vehicles in addition to company vehicles. CoreGeo also owned two ATVs, one boat, and one snowmobile.

Emissions relative to mobile sources were inventoried by compiling all gas receipts for the year. The average gas price of \$1.7844/L (Yukon Bureau of Statistics, 2024) was used to convert gas expenses into liters and an emission factor of 2.3 kg of CO<sub>2</sub> per liter (NRCan, 2014) was used to calculate emissions. This includes emissions from all company owned and rental vehicles. Note that a very small fraction of purchased fuel would have been used for the company owned Yamaha 2000-watt gas generator but is insignificant compared to fuel used by vehicles.

For employees' personal vehicles, total mileage was compiled for the 2023-2024 fiscal year. Average fuel consumption of 10 L/100 km (NRCan, 2022) was used to convert total mileage in liters and the same factor of 2.3 kg of CO<sub>2</sub> per liter was used to calculate emissions.

Total Scope 1 emissions for the fiscal year 2023-2024 are estimated at **26,916 kg** of CO<sub>2</sub>.

### 2.3.2 Scope 2 Emissions

Scope 2 emissions include:

- Electricity: Facilities that use electricity
- Steam: Steam purchased for heating or cooling the company's facilities

CoreGeo only uses electricity (no steam) at three locations:



- The Whitehorse office
- The Whitehorse field room
- The Little Fox Lake air quality monitoring station

Electricity bills for those three locations were compiled for the fiscal year 2023-2024 and the greenhouse gas intensity of Yukon's electricity grid, measured as the GHGs emitted in the generation of the territory's electric power of 70 grams of CO<sub>2</sub>e per kWh electricity generated in 2022 (Canada Energy Regulator, 2024), was used to calculate resulting emissions.

### **Whitehorse Office**

The Whitehorse Office comprises rented office space in two units on the second floor of a multi-unit building in the downtown area. The two combined units total approximately 2437 square feet. Since electricity is included within rent, an alternative approach using an online energy use calculator, based on Yukon Rates ([Energy calculator | inCharge Yukon](#)), was used to estimate Whitehorse Office energy usage. The following energy using appliances were assumed, based on current office occupancy and use:

- Heating & cooling based on square footage – 1188 kWh/month
- Office appliances:
  - 9 laptop computers – 710 kWh/month
  - 1 laser printer/multifunction device – 9 kWh/month
- Lighting – 48 CFL/LEDs – 750 kWh/month

Whitehorse Office Total – 2657 kWh/month

### **Whitehorse Field Room**

The Whitehorse field room comprises a converted garage building in the downtown area. The space totals approximately 400 square feet. Since electricity is included within rent, an alternative approach using an online energy use calculator, based on Yukon Rates ([Energy calculator | inCharge Yukon](#)), was used to estimate Whitehorse Field Room energy usage. The following energy using appliances were assumed, based on current office occupancy and use:

- Heating & cooling occasional seasonal use – 20 kWh/month
- Lighting – 8 CFL/LEDs – 203 kWh/month

Whitehorse Field Room Total – 223 kWh/month

### **Little Fox Lake Air Quality Monitoring Station**

The Little Fox Lake air quality monitoring station is operated on behalf of Environment and Climate Change Canada and comprises a small building with scientific monitoring equipment. Energy is supplied directly by Yukon Energy Corp, and total energy use total was 5694 kWh for the full year for an average of 474.5 kWh/month.

Using the numbers above, the total energy use at the 3 locations for the fiscal year 2023-2024 was estimated at 40,254 kWh. When multiplied by the greenhouse gas intensity of the Yukon grid of 70 grams of CO<sub>2</sub>e per kWh electricity generated, total Scope 2 emissions for the fiscal year 2023-2024 are estimated at **2,818 kg** of CO<sub>2</sub>e.

### 2.3.3 Scope 3 Emissions

Scope 3 emissions include:

- Business Travel: Employees traveling for business using transportation other than owned or leased vehicles (e.g., commercial airline flights, rental cars, trains);
- Employee Commuting: Employees commuting to work in personal vehicles or public transportation;
- Upstream Transportation and Distribution: Other companies hired to transport products or other materials to or from the company's facilities;
- Waste Generated in Operations: Waste generated that is disposed of in a facility owned by another organization; and
- Offsets: Purchased GHG offsets.

The most relevant Scope 3 category for CoreGeo is business travel. Emissions in this category were estimated by compiling all flights used by CoreGeo staff for business during the 2023-2024 fiscal year. The aircraft type, flight times and passenger count for each flight were tabulated. The fuel burned per hour for each aircraft type was estimated based on emissions factors from the literature (Abbott, 2023; Flex Air Flight School, 2024; Airliners.net, 2024). Total fuel burned was estimated based on flight time and prorated by passenger. CO<sub>2</sub>e emissions were then estimated using an emissions factor of 3.16 kg of CO<sub>2</sub>e per kg of jet fuel combusted (ICAO, 2017).

CoreGeo's Scope 3 emissions for the business travels category and the fiscal year 2023-2024 were **3,117 kg** of CO<sub>2</sub>e.

## 2.4 Summary

Disaggregated and aggregated results are presented in Table 1 below. CoreGeo's combined Scope 1 and Scope 2 emissions for the fiscal year 2023-2024 were 29,734 kg CO<sub>2</sub>e. When including business travel (Scope 3), the total is 32,851 kg CO<sub>2</sub>e. The average Small and medium-sized enterprise (SME) in Canada, which would include small environmental consulting firms, produces an estimated average of 165 tonnes of CO<sub>2</sub> equivalent per business annually, which likely mainly include Scope 1 and 2 emissions (BDC, 2024). Due to the nature of its services, an environmental consulting company's emissions are expected to be lower than the average SME.

**Table 1: CoreGeo's GHG Emissions for the 2023-2024 Fiscal Year**

Emission Scope	kg CO <sub>2</sub> e
Scope 1 Emissions	26,916
Scope 2 Emissions	2,818
Aggregated Scope 1 and 2 emissions	29,734
Scope 3 Emissions – Business Travel	3,117
Total (Scope 1, 2 and 3-Business Travel)	32,851

### 3 Scenario Analysis

The Net Zero pathway is informed by three integrated global and national scenario frameworks, presented in Table 2 below.

**Table 2: Global and National Scenario Frameworks**

Scenario Source	Description	Relevance
IPCC AR6 SSP1-1.9	1.5°C-compatible pathway emphasizing rapid decarbonization and equitable transitions	Benchmark for global best practice
IEA Net Zero by 2050 Roadmap (2023)	Global energy sector transition model	Informs technology and energy system shifts
Canadian Energy Regulator (CER) "Net-Zero 2050" Scenario (2023)	Canada-specific energy, economy, and emissions trajectories	Key national reference for energy supply and demand
Statistics Canada & UNDP Human Development Scenarios	Socio-economic and demographic projections	Used for population, labor, and economic growth assumptions

CoreGeo developed scenarios across four key dimensions—policy, socio-economic, infrastructure, and technology—to capture uncertainties and identify resilient mitigation strategies. The scenarios are grounded in recognized external models and adapted for Yukon's regional context.

- **Policy Scenario:** Ranges from strong federal climate action (carbon pricing at \$170/tonne CO<sub>2</sub>e by 2030) to weak enforcement regimes.
- **Socio-Economic Scenario:** Considers levels of Indigenous collaboration and community investment in workforce training.
- **Infrastructure Scenario:** Envisions accelerated electrification and renewables integration versus stagnant investment.
- **Technology Scenario:** Compares rapid clean-tech innovation adoption to constrained diffusion due to high costs.

In accordance with the NZC Technical Guide (Section 5.0) we conducted scenario analysis to test how different futures might affect our pathway. We developed four scenarios:

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## **Scenario A: “Accelerated Transition” (High ambition, strong global & Canadian policy)**

### **Assumptions**

- Global cooperation, rapid renewables scale-up, falling battery & hydrogen costs (IEA NZE trajectory)
- Canadian federal/provincial/territorial governments adopt strong carbon pricing, electrification mandates, and incentive programmes.
- Yukon grid decarbonises rapidly; charging infrastructure in Yukon expands; remote site renewables become standard.

### **Implications**

- Low-carbon electricity available early → easier building and fleet electrification.
- Cost of EVs, and heat pumps decline rapidly, enabling earlier transition.
- Our advisory service demand grows, enabling reinvestment into decarbonisation.

## **Scenario B: “Policy Lag” (Moderate pace, slower policy implementation)**

### **Assumptions**

- National/global policy weaker; carbon price increases slowly; technology deployment slower. For example, CER analysis suggests current policies project far too shallow reductions.
- Yukon’s remote infrastructure and logistics slow the rollout of chargers and distributed renewables.

### **Implications**

- Cost of transition higher; some electrification delayed; uncertainty for clients.
- There is still business value in efficiency upgrades and consulting services.

## **Scenario C: “Technology & Supply Friction” (High cost, slow tech diffusion)**

### **Assumptions**

- Global supply-chain constraints, commodity price spikes, slower battery/green hydrogen scale. IEA notes that achieving the NZE depends on rapid tech diffusions.
- Remote, cold-climate Yukon conditions present additional challenges for EV performance/truck electrification/onsite renewables

## Implications

- Full fleet electrification delayed; higher capital costs; remote-site reliance on diesel persists for longer.
- Our business model emphasises staged retrofit, hybrid solutions, and remote microgrid design.

## Scenario D: “Resource-Intensive Regional Growth” (High growth + high emissions)

### Assumptions

- Yukon sees a mining/resource-export boom; industrial/logistics emissions rise despite national decarbonisation. Yukon government acknowledges increased mining GHG risk.
- Transport/heavy equipment use grows; remote-site diesel and fuel-intensive logistics expand.

### Implications

- Company operations (travel, site visits, fleet) likely increase emissions unless managed.
- Clients (mining, remote operations) may outsource environmental consulting including decarbonisation—but their emissions growth may offset our reductions.

## 3.1 Policy, Socio-economic, Infrastructure and Technology Assumptions

### 3.1.1 Policy and Regulations

- **Strong Policy Action:** Federal carbon price increases to \$170/tonne CO<sub>2</sub>e by 2030; stringent building codes; zero-emission vehicle (ZEV) mandates.
- **Moderate Policy Action:** Current trajectory under Canada’s 2030 Emissions Reduction Plan.
- **Weak Policy Action:** Limited enforcement, regional disparities in climate regulations.

### 3.1.2 Socio-Economics

- **High Cooperation:** Strong community and Indigenous partnerships; investment in green workforce training.
- **Moderate Transition:** Incremental adaptation of current practices.
- **Delayed Transition:** Economic contraction limits investment in low-carbon infrastructure.

### 3.1.3 Infrastructure

- **Accelerated Electrification:** Major Yukon grid expansion integrating renewables and energy storage.
- **Incremental Improvement:** Gradual adoption of efficiency measures.
- **Stagnant Infrastructure:** Limited upgrades; reliance on existing systems.

### 3.1.4 Technology

- **Rapid Innovation:** Early adoption of carbon capture, e-mobility, and low-carbon building materials.
- **Moderate Innovation:** Existing tech scaled steadily.
- **Constrained Innovation:** Slow diffusion of clean technologies due to high costs.

## 3.2 Mitigation Strategies

### 3.2.1 Scope 1 Emissions

As part of our commitment to achieving Net Zero emissions, we will transition our transportation practices to more sustainable alternatives. This includes adopting electric vehicles (EVs) wherever feasible and replacing gas-powered vehicles with EVs, extended-range electric vehicles (EREVs), or hybrids as they reach the end of their service life. CoreGeo has already demonstrated its commitment to this, as half of our fleet is all-electric. We will also implement fuel-efficient driving techniques, optimize travel routes, and make a conscious effort to reduce unnecessary idling.

We are committed to upgrading our equipment to reduce reliance on fossil fuels. This includes prioritizing the use of battery-powered systems such as Bluetti and Jackery units over traditional gas-powered generators. Where applicable, we will replace gas-powered pumps with electric models to further reduce emissions and improve operational efficiency.

To minimize the environmental impact of field operations, we will favor drone-based surveys over helicopter trips whenever possible. Battery-powered drones offer a significantly lower fuel footprint and align with our sustainability goals while maintaining data quality and coverage.

Scope 1 mitigation measures—including fleet electrification, reduced idling, and replacement of gas-powered equipment—are projected to achieve an estimated 25% reduction in direct (Scope 1) emissions relative to the 2023–2024 baseline by 2035.

### 3.2.2 Scope 2 Emissions

We are committed to transitioning our building operations to renewable energy sources for long term solutions. This includes the integration of solar panels and battery storage systems to reduce reliance on non-renewable power and support sustainable energy use. As part of our ongoing improvements, we have replaced fluorescent lighting with energy-efficient LED fixtures and will continue to upgrade lighting systems to reduce consumption and maintenance costs.

To further enhance building efficiency, we will transition from traditional baseboard heating systems to heat pumps, offering a cleaner and more efficient alternative for temperature control. We will also implement strategies to reduce peak energy demand, such as load shifting, smart scheduling, and the use of energy monitoring tools to optimize usage.

We will also take steps to improve energy efficiency across our facilities and operations. This includes reducing heat and light waste by turning off unused lights, installing motion sensors, using programmable

power bars, and implementing smart thermostats. Timer-controlled lighting in low-use areas such as bathrooms will be introduced to further reduce energy consumption.

In support of broader climate goals, we will explore carbon capture and storage technologies as part of our emissions mitigation strategy. Additionally, we will investigate CO<sub>2</sub> buyback programs, including a potential partnership with Yukon Seed and Restoration (YSR) to offset unavoidable emissions.

Finally, we will assess our building practices against recognized green building standards, including the LEED v5 Scorecard to identify opportunities for continuous improvement. These actions reflect our commitment to sustainable development and responsible environmental stewardship.

Scope 2 mitigation measures—such as transitioning to renewable energy, implementing heat pumps, installing LED lighting and smart controls, and improving overall building efficiency—are projected to achieve an estimated 25% reduction in indirect (Scope 2) emissions relative to the 2023–2024 baseline by 2035.

### **3.2.3 Scope 3 Emissions**

CoreGeo commits to prioritizing virtual participation in conferences and meetings whenever feasible. This approach minimizes the need for air travel and significantly reduces associated carbon emissions. When in-person presence is required, we will make every effort to engage local staff to reduce travel-related impacts and support regional capacity building. For unavoidable air travel, we will pursue credible carbon offset programs, including verified CO<sub>2</sub> credit buybacks, to mitigate the environmental footprint of our business travel.

Scope 3 mitigation measures—including increased virtual participation, use of local staff for in-person events, and the purchase of verified carbon offsets for unavoidable air travel—are projected to achieve an estimated 20% reduction in indirect (Scope 3) emissions relative to the 2023–2024 baseline.

## **4 Corporate Governance Strategy**

CoreGeo is a 100% Yukon-owned environmental and engineering company, founded in 2015 by its two directors, Ethan Allen and Eri Boye, who currently also form the executive leadership. CoreGeo also has an Employee Stock Option Plan (ESOP) and is scheduled to increase the size of its corporate board of directors (board) at specified employee ownership stake thresholds.

CoreGeo's net-zero plan will be incorporated into capital investment decisions to ensure that the right investments are made in a timely manner to allow the company to meet its emissions reduction targets through the following strategy:

- The board will direct executive leadership to oversee net-zero planning and implementation;
- Executive leadership will designate and participate in planning and implementation of climate-related responsibilities to a Net-Zero Implementation Committee (NZIC);
- The NZIC will be responsible for:
  - Planning and implementation of corporate net-zero activities, encouraging employees;

- Conducting GHG Inventories, scenario analysis and recommending mitigation strategies;
- All aspects of net-zero reporting are completed according to schedule and in accordance with the net-zero challenge technical documents; and
- Working with management to inform and assist with implementing and meeting the targets of the net-zero plan.
- The NZIC will provide semi-annual progress updates to executive leadership and an annual report to the Board, summarizing progress against emissions reduction targets and recommending adjustments as needed.
- Executive leadership will be responsible for making decisions on recommendations provided by the NZIC that support the CoreGeo's NZ commitments in a way that supports the overall health and mission of the company.
- CoreGeo's net-zero governance framework and annual progress summaries will be made publicly available through the company website and annual sustainability reporting.
- Capital investment decisions will be informed by the recommendations of the NZIC and in keeping with this Plan.

## 5 Corporate Approval and Signoff

This document was prepared collaboratively by the NZIC and has been reviewed and approved by the executive leadership and board of directors. The collaborative approach is intended to provide:

- **Alignment:** Joint approval ensures that the board and executive leadership are in agreement, preventing internal conflicts and ensuring a unified direction.
- **Accountability:** The signature from both the CEO and the board establishes clear lines of accountability for both the creation and the outcome of the strategy.
- **Oversight:** The board's involvement in the approval process ensures that the strategy has been thoroughly vetted, addresses key risks, and is feasible.



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**Reviewed and Approved by Board of Directors:**

  
Ethan Allen, Corporate Director

  
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