# The NET-ZERO Challenge

## Technical Guide

Version 2.0

Environment and Climate Change Canada
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Canada

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# Document revision history

| Version | Publication date | Summary of changes |
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| 2.0 | October 2025 | • Reorganization of sections<br>• Updates to glossary<br>• Update to participation tiers<br>• Updated guidance on climate-related financial disclosures<br>• Updated guidance on the use of offset credits<br>• New sections on nature-based climate solutions, sustainable jobs and adaptation<br>• New quantifying emissions annex<br>• Feedback from consultations Winter 2025 |
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# Abbreviations

$CH_4$: Chemical formula for methane

$CO_2$: Chemical formula for carbon dioxide

$CO_2$ eq: Carbon dioxide equivalent

CSDS: Canadian Sustainability Disclosure Standard

ESG: Environmental, social and governance

GHG(s): Greenhouse gas(es)

GHGRP: Greenhouse Gas Reporting Program

GWP: Global warming potential

HFC: Shorthand for a group of chemicals called hydrofluorocarbons

ICROA: International Carbon Reduction and Offset Alliance

ICVCM: Integrity Council for the Voluntary Carbon Market

IFRS: International Financial Reporting Standards

IPCC: Intergovernmental Panel on Climate Change

ISO: International Organization for Standardization

ITMO: Internationally transferred mitigation outcomes

kt: Kilotonne(s)

LULUCF: Land use, land-use change and forestry

Mt: Megatonne(s)

$N_2O$: Chemical formula for nitrous oxide

PFC: Shorthand for a group of chemicals called perfluorocarbons

PPA: Power purchase agreements

REC: Renewable energy credit

SBTi: Science-Based Targets initiative

SIF-NZA: Strategic Innovation Fund – Net Zero Accelerator

$SF_6$: Chemical formula for sulfur hexafluoride

SME: Small- and medium-sized enterprise

TCFD: Task Force on Climate-Related Financial Disclosures

UNEP FI: United Nations Environment Programme Finance Initiative

UNFCCC: United Nations Framework Convention on Climate Change

# Glossary of terms

**Absolute emissions reduction target:** A target defined by a percentage reduction in absolute emissions over time relative to a base year, for example, reduction of emissions by 45% below 2005 levels by 2030.

**Anthropogenic emissions:** Emissions caused by human activities.

**Avoided emissions:** Emissions reductions that occur outside of a product's life cycle or value chain, but as a result of the use of that product (World Resources Institute).

**Base year:** A year in history against which a company's emissions are tracked over time to compare it with future emissions. It must be a consecutive twelve months, either as a full calendar year or consecutive over two calendar years.

**Bottom-up approach:** A process by which a company selects a target based on possible future scenarios underpinned by robust assumptions on prices, economic factors, policy environment, and technological developments.

**Carbon dioxide equivalent ($CO_2$ eq):** A unit of measure for comparison between greenhouse gases (GHGs) that have different global warming potentials (GWPs). This unit of measure allows other GHGs to be expressed in terms of the GWP of one unit of $CO_2$. To express GHG emissions in units of $CO_2$ eq, the quantity of a given GHG is multiplied by its GWP.

**Carbon-neutral:** Condition in which during a specified period there has been no net emission of GHGs to the atmosphere as the carbon footprint of the subject has been counterbalanced by offsetting (ISO 14068).

**Carbon sequestration:** The process of storing carbon in a carbon sink (see definition on *carbon sink*).

**Carbon sink:** A reservoir (natural or human, in soil, ocean, and plants) where a greenhouse gas is stored. (IPCC Special Report: Global Warming of 1.5°C).

**Climate transition plan** (climate-related transition plan): An aspect of an entity's overall strategy that lays out the entity's targets, actions or resources for its transition towards a lower-carbon economy, including actions such as reducing its greenhouse gas emissions (IFRS2) (see *net-zero plan*).

**Decarbonization:** The process of reducing carbon dioxide emissions from a product, process, facility, or sector.

**Deforestation:** Conversion of forest land to non-forest land use.

**Direct emissions:** Emissions from sources that are owned or controlled by a company (GHG Protocol 2004: 97).

**Downstream emissions:** Emissions from downstream activities associated with the operations of a company, including processing of sold products, use of sold products, investments, franchises, downstream transportation and distribution, end-of-life treatment of sold products, and downstream leased assets.

**Emissions intensity reduction target:** A target defined by a reduction in emissions relative to productivity or economic output, for example, reduction of emissions per barrel of oil produced by 25% between 2020 and 2030.

**Emission factor:** A value that quantifies an average amount of emissions associated with an activity. For more details on Canada-specific emission factors, see the latest National Inventory Report for Canada.

**Emissions:** The release of greenhouse gases into the atmosphere.

**Emissions inventory:** A quantified list of a company's greenhouse gas emissions and sources.

**Energy efficiency:** A measure of how effectively energy is used for a given purpose. It is a ratio or other quantitative relationship between an output of performance, service, goods, commodities, or energy, and an input of energy.

**Energy-related greenhouse gas emissions (ERGE):** GHG emissions calculated from the conversion of energy consumption to the equivalent carbon emissions. May include both scope 1 and scope 2 emissions and may be included in energy management systems.

**Environmental, social, and governance criteria:** The criteria are a set of standards for a company's operations that global investors are increasingly using to screen potential investments. Environmental criteria consider how a company performs as a steward of nature. Social criteria examine company relationships with employees, suppliers, customers, and the communities in or near operations.

Governance relates to the overall leadership, executive pay, audits, internal controls, and shareholder rights of a company.

**Equity share:** One approach a company may use to define the organizational boundary of their GHG emissions inventory (see *inventory boundary*). Equity share reflects a company's economic interests in an operation. Typically, the share of economic risks and rewards that a company has in an operation is aligned with their percentage of ownership in that operation (GHG Protocol 2004: 17).

**Financial control:** One approach a company may use to define the organizational boundary of their GHG emissions inventory (see *inventory boundary*). Financial control is when the organization has the ability to direct the financial and operating policies of an operation with a view to gaining economic benefits from its activities (GHG Protocol 2004: 17).

**Fugitive emissions:** Emissions resulting from the intentional or unintentional releases of GHGs, for example, equipment leaks from joints, seals, packing, and gaskets; methane emissions from coal mines and venting; hydrofluorocarbon emissions during the use of refrigeration and air conditioning equipment; and methane leakages from gas transport (GHG Protocol 2004: 98).

**Global warming potential (GWP):** Allows the comparison of the global warming impacts of different gases or particles (such as black carbon). It is a measure of how much energy the emissions of 1 tonne of a gas or particle will absorb over a given period of time, compared to the emissions of 1 tonne of carbon dioxide. For the purposes of net-zero planning, use of 100-year GWP is recommended.

**Greenhouse gas (GHG):** A gas that absorbs and re-emits radiation, resulting in the greenhouse effect, which contributes to a warming climate. For the purposes of this guidance and for the Net-Zero Challenge, GHGs include all of those that are subject to reporting for the Greenhouse Gas Reporting Program. As of 2021, this includes carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), sulphur hexafluoride ($SF_6$), 13 different hydrofluorocarbons (HFCs), and 7 different perfluorocarbons (PFCs).

**GHG emissions base year:** The first GHG emissions inventory reported in the first net-zero plan serves as the initial GHG emissions base year.

**GHG emissions inventory:** See *emissions inventory*.

**GHG emission reduction:** quantified decrease in GHG emissions between a base year scenario and the GHG project.

**GHG removal:** The withdrawal of GHGs from the atmosphere by GHG sinks as a result of deliberate human activities quantified as the difference between a base year scenario and the GHG project, for example, enhancing biological carbon sinks or carbon capture technology to achieve long-term removal and storage.

**GHG reservoir:** component, other than the atmosphere, that has the capacity to accumulate GHGs and to store and release them (ISO: 14064-2).

**GHG sink:** process that removes a GHG from the atmosphere (ISO: 14064-2).

**Indirect emissions:** Emissions that are a consequence of the activities of a company but occur at sources owned or controlled by another company (GHG Protocol 2004: 99).

**Inventory boundary:** Allows a participant to determine what sources of emissions are the result of their activities and accordingly, what emissions will need to be addressed in order to reach net-zero emissions by 2050. Generally, the inventory boundary includes geographical boundaries and organizational boundaries.

**Land-use change:** Land-use change involves a change from one land use category to another, for example, the conversion of forest land to cropland.

**Mitigation (of climate change):** A human intervention to reduce emissions or to enhance sinks.

**Mitigation strategy:** A practice, process, or technology that contributes to mitigation, for example, enhancing energy efficiency and adopting renewable energy sources.

**Mobile combustion:** Combustion of fuels by transport, for example, cars, trucks, buses, trains, airplanes, ships.

**Net-zero emissions:** Achieving net-zero emissions means that anthropogenic emissions of greenhouse gases into the atmosphere are balanced by anthropogenic removals of greenhouse gases from the atmosphere over a specified period; for organizations, net-zero GHG emissions is commonly considered as the condition in which emissions have been reduced such that only residual emissions remain, and offsetting is restricted to removal credits only (ISO 14068).

**Net-zero plan:** For the purposes of the Net-Zero Challenge, a net-zero plan includes an emissions inventory and base year, interim targets, descriptions of the considered pathways and mitigation strategies, and an outline of how net-zero planning will be

incorporated into a company's governance structure (see *climate transition plan*).

**Offset credits:** Represent GHG emissions reductions or removals generated from activities that are additional to what would have occurred in the absence of the offset project (that is, generated from activities that go beyond legal requirements and a business-as-usual standard). Each offset credit generated by an offset project represents one tonne of carbon dioxide equivalent ($CO_2$ eq) reduced or removed from the atmosphere.

**Operational boundaries:** The boundaries that determine the direct and indirect emissions associated with operations owned or controlled by a company, in addition to the value chain emissions that are the result of upstream and downstream emissions associated with the operations of a company. This assessment allows a company to establish which emission scopes and sources should be identified and quantified in their net-zero planning and reporting.

**Operational control:** One approach a company may use to define the organizational boundary of their GHG emissions inventory (see *inventory boundary*). Operational control is when an organization has the full authority to introduce and implement its operating policies at an operation (GHG Protocol 2004: 17).

**Organizational boundaries:** The boundaries that determine the operations owned or controlled by a company, depending on the consolidation approach taken (equity share, operational control, or financial control).

**Participant:** For the purposes of the Net-Zero Challenge, a participant is any company or association that signs the commitment letter and agrees to fulfill the requirements of the Net-Zero Challenge.

**Process emissions:** Emissions generated from physical or chemical processes in industry and manufacturing, for example, perfluorocarbon emissions from aluminum smelting, carbon dioxide emissions from calcination in cement production, and nitrous oxide emissions from nitric acid production.

**Reforestation:** Planting of forests on lands that have previously contained forests but that have been converted to some other use.

**Scenario:** A plausible description of how the future may develop, based on a coherent and internally consistent set of assumptions about key driving forces (for example, rate of technology change, prices) and relationships. Scenarios are neither predictions nor forecasts (IPCC SR15 2018: 557).

**Scope:** Defines the operational boundaries in relation to direct and indirect emissions (GHG Protocol 2004: 101).

**Scope 1 emissions:** A company's direct emissions, principally the generation of electricity, heat, or steam, physical or chemical processing, transportation, and fugitive emissions (GHG Protocol 2004: 101).

**Scope 2 emissions:** A company's indirect emissions associated with the purchase of electricity, heating/cooling, and steam for own consumption (GHG Protocol 2004: 101).

**Scope 3 emissions:** A company's indirect emissions excluding those covered in scope 2. Also known as value chain emissions (GHG Protocol 2004: 101).

**Small- and medium-sized enterprise (SME):** An independent, non-subsidiary company with 499 staff or fewer. "Staff" is defined as any paid employees, except for self-employed individuals or contract employees.

**Stationary combustion:** Burning of fuels to generate electricity, steam, heat, or power in stationary equipment such as boilers, furnaces, etc.

**Top-down approach:** Process by which a company selects a target and then determines how to achieve it.

**Upstream emissions:** Emissions from upstream activities associated with the operations of a company, including purchased goods and services, capital goods, fuel- and energy-related activities, upstream transportation and distribution, waste generated in operations, business travel, and employee commuting.

**Value chain:** All business processes or activities involved in the production of a good or service for the market, from conception to end use and beyond. A simplified value chain would include corporate services (for example, marketing, logistics), research and development, inputs, assembly, distribution, sales, and after-sales service.

**Value chain emissions:** These are indirect emissions that may exist upstream or downstream of a company's operations. Value chain emissions are also known as scope 3 emissions.

# Measurement units

**Table 1:** Common metric measurement units

| Measurement | kilogram (kg) | tonne (t) | kilotonne (kt) | megatonne (Mt) |
|---|---|---|---|---|
| **gram (g)** | 0.001 kg | 0.000 001 t | 0.000 000 001 kt | 0.000 000 000 001 Mt |
| **kilogram (kg)** | 1 kg | 0.001 t | 0.000 001 kt | 0.000 000 001 Mt |
| **tonne (t)** | 1,000 kg | 1 t | 0.001 kt | 0.000 001 Mt |
| **kilotonne (kt)** | 1 000 000 kg | 1,000 t | 1 kt | 0.001 Mt |
| **megatonne (Mt)** | 1 000 000 000 kg | 1 000 000 t | 1,000 kt | 1 Mt |

Given that the Net-Zero Challenge is a made-in-Canada program, participants are required to use metric measurements (see

**Table 1** above) when reporting their GHG emissions.

# The Net-Zero Challenge: an overview

## Why plan for net-zero by 2050

Achieving net-zero emissions requires support from all parts of our society. Companies and organizations operating in Canada are integral to achieving net-zero emissions by 2050. To support emissions reductions in Canada, the Government of Canada established and administers the Net-Zero Challenge.

**Canada's climate targets**

- 40-45% below 2005 levels by 2030
- 45-50% below 2005 levels by 2035
- Net-zero by 2050

The science shows that it is vital that the world does more to address climate change and keep the Paris Agreement target of limiting temperature rise to 1.5°C above pre-industrial levels and follow a faster timeline. Understanding the urgency to act, the Government of Canada is committed to reducing Canada's greenhouse gas (GHG) emissions by 40-45% from 2005 levels by 2030, 45-50% below 2005 levels by 2035 and putting Canada on a path to reach net-zero emissions by 2050. The *Canadian Net-Zero Emissions Accountability Act* establishes in law Canada's emissions reduction target and holds the federal government accountable to the public as it charts the country's path to net-zero emissions by 2050. As part of the framework established by this Act, in March 2022, the Government of Canada released its 2030 Emissions Reduction Plan, which provides a comprehensive roadmap to help reach Canada's climate targets.

## What is the definition of net-zero emissions

According to the *Canadian Net-Zero Emissions Accountability Act*, net-zero emissions means that "anthropogenic emissions of greenhouse gases into the atmosphere are balanced by anthropogenic removals of greenhouse gases from the atmosphere over a specified period".[1] For the purposes of the Net-Zero Challenge, companies are expected to set a net-zero target and develop a plan aligned with this definition.

**Net-zero GHG emissions**

Means that anthropogenic emissions are **balanced** by anthropogenic removals

## What is the business value of committing to net-zero emissions

Besides emissions reductions, there are other positive outcomes of adopting net-zero commitments:

- reducing business costs through improved energy efficiency
- increasing investor and public confidence
- responding to changing consumer demands and attract new customers
- improving competitiveness in a decarbonizing global economy
- supporting employee recruitment, engagement, and retention
- stimulating innovation and change
- increasing resilience to climate risks
- safeguarding resources for future generations
- improving business alignment with policy and regulation on climate change

[1] Canada Justice Laws, *Canadian Net-Zero Emissions Accountability Act*, (2021).

## What is the Net-Zero Challenge

The Net-Zero Challenge (the "Challenge") is an initiative that encourages businesses and organizations to plan to develop and implement credible and effective plans to transition their facilities and operations to **net-zero emissions by 2050, or earlier**. The Challenge builds on the momentum of global initiatives, while offering a made-in-Canada approach.

## What are the Net-Zero Challenge's objectives

- Reduce greenhouse gas emissions from all sectors in the economy
- Normalize net-zero planning (or transition planning) so that it becomes the default business practice
- Build momentum for net-zero commitments through guidance, lesson sharing, collaboration, and leadership
- Position Canadian industry to be green and competitive in the global net-zero economy

## When and how to join

Businesses and organizations can join the Net-Zero Challenge at any time.The first step to join the Challenge is by identifying your participation stream and signing the Commitment Letter indicating that you commit to develop a plan for net-zero emissions by 2050 and that you will fulfill the requirements of the Net-Zero Challenge.

### Who can join?

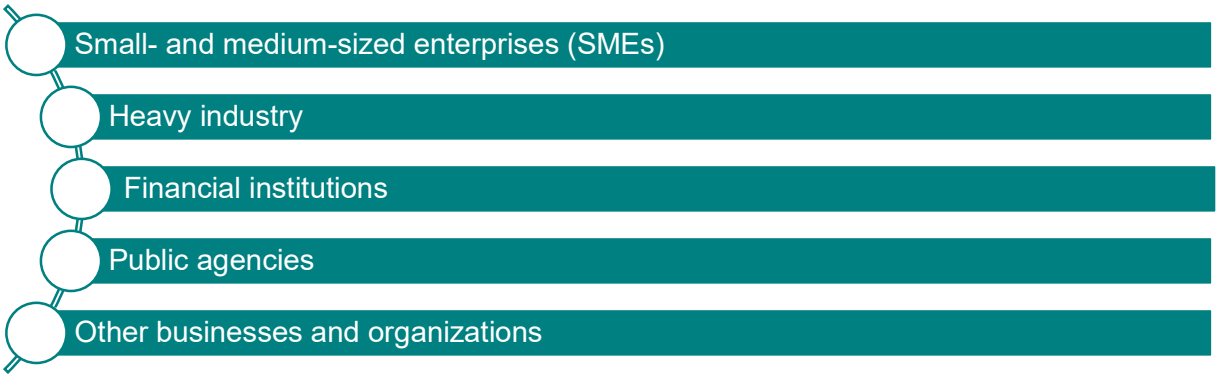
All businesses and organizations with operations in Canada – including domestic and multinational companies, small- and medium-sized enterprises (SMEs) and other organizations – can join the Net-Zero Challenge. Industry associations can also join the Challenge and encourage their members to participate and support them in the development of their net-zero plans.

## What is the community of practice

The Net-Zero Challenge is building a community of practice around net-zero planning in Canada, where issues can be discussed and addressed, ideas and best practices can be shared, and participants can communicate and collaborate to further their own net-zero plans and actions. This includes informal collaboration with industry and business associations, academics and universities, environmental non-government organizations, foundations, and more. The Challenge is open to working with any interested parties to help build this community of practice, to develop resources, and to encourage ambition and progress in net-zero planning. The Challenge will continue to provide technical guidance and resources, all of which can be found on the Net-Zero Challenge website.

## What are the participation streams

The Net-Zero Challenge has the following participation streams: (See Section 2.3 – Participation streams for more information.)




## What are the participation requirements

By signing a Commitment Letter, companies agree to meet the minimum program requirements (for more information, see Section 3.1 – Minimum requirements), and report to the Net-Zero Challenge program within the designated timelines (for more information on reporting timelines, see Section 3.2 – Program steps and timelines).

### Participation requirements

- Public commitment to planning for emissions reductions to net-zero by 2050, including base year GHG emissions inventory, interim targets, and annual progress.
- Reporting to the Net-Zero Challenge via the Preliminary, Comprehensive, and Annual Questionnaires.

## What are the benefits of joining the Net-Zero Challenge

- **Made in Canada:** National program for net-zero planning adapted to the Canadian context.
- **Credible:** A trusted framework and access to a rigorous technical guide and expert support.
- **Public recognition:** Recognition on the Environment and Climate Change Canada (ECCC) website and social media platforms, and visibility at public events.
- **Simple reporting and no financial cost to participate:** Reuses existing company reports and aligns with international initiatives. There is no cost to participate in the Net-Zero Challenge, unlike many international initiatives.
- **Federal procurement and funding:** Participation in the Net-Zero Challenge is one of the conditions for Government of Canada contracts over $25M and may be considered in federal funding programs.
- **Community of practice:** Access to the Net-Zero Challenge team for questions and meetings, as well as to Government of Canada and third-party guidance documents and best practices, and a network of fellow participants through roundtables, webinars, and the LinkedIn community of practice.

# Purpose and target audience

This technical guide is intended to be used by all participants. It has two main purposes:

(i) to describe the basics of the Net-Zero Challenge, including how to join and the minimum requirements for participation, net-zero plans, reporting and achieving Net-Zero Participation tiers

(ii) for companies and organizations new to net-zero planning, to provide descriptive guidance on developing a greenhouse gas (GHG) emissions inventory, conducting scenario analysis and identifying mitigation strategies

This guide was designed by Environment and Climate Change Canada for a broad audience. The language has been simplified and technical terms explained, to the extent possible. This guide can be considered a midpoint between a purely technical document and a plain language document.

# 1.0 Introduction

## 1.1 Context

Getting Canada to net-zero emissions by 2050 will require collaboration and innovation across all parts of society, including the private and sectors. Unlocking further emissions reductions and planning now for a net-zero future is essential for Canada to remain competitive in an increasingly low-carbon global economy, and it will support Canada's climate objectives.

The Government of Canada's Net-Zero Challenge is a non-regulatory initiative open to companies and organizations, including public agencies, which have operations in Canada. The Net-Zero Challenge aims to support GHG emissions reductions and the transition towards a low-carbon economy in Canada. It offers a made in Canada approach built on internationally and nationally recognized methodologies, standards, guidelines, protocols and initiatives. These include, but not limited to, the Greenhouse Gas (GHG) Protocol, International Organization for Standardization standards and guidelines (14064 series, 14068 and IWA42/14060), the International Transition Plan Network, the International Financial Reporting Standards Foundation, the Principles for Responsible Investment, the Science Based Targets initiative, the Canadian Sustainability Standards Board, Canada's Greenhouse Gas Reporting Program (GHGRP), the Strategic Assessment of Climate Change, and the Federal Greenhouse Gas Offset System.

By complementing and leveraging the best international and national guidance and programs, the Net-Zero Challenge builds on the momentum of the net-zero planning already underway by many companies and organizations across Canada. The Challenge takes into account that net-zero planning is an ongoing process and will be different for each participant, keeping in mind that the ultimate goal remains the same—achieving net-zero emissions. It also seeks to align with existing reporting requirements and minimize duplication. The design, development, and implementation of the Net-Zero Challenge is informed by ongoing engagement with interested partners and stakeholders.

## 1.2 Objectives

There are four key objectives for the Net-Zero Challenge. The first objective is to **normalize net-zero planning** so that it becomes a default business practice. Internationally, net-zero planning or emissions

reductions planning is a large part of “transition planning” or “climate transition planning”.[2,3] Organizations are encouraged to engage in the *transition planning* needed to reach net-zero. This means identifying specific and realistic ways that companies and other organizations can reduce their emissions in the short-term, and identifying the longer-term investments needed to accelerate emissions reductions in the future. Thorough planning will help companies ensure that their plans are actionable and are not simply an exercise in counting emissions. Companies that align their transition plan with their overall business strategy will drive effectiveness and capture opportunities for value creation in the long term.

The second objective is to **build momentum** by providing guidance—such as that found in this technical guide—and encouraging leadership in net-zero planning. Both the private and public sectors have a leadership role to play as we reduce emissions in Canada.

The third objective is to **position Canadian industry** to be competitive in the global net-zero economy.

The fourth and final objective is the primary desired outcome—**reducing greenhouse gas emissions** from industry and other sectors on the journey to reaching net-zero emissions by 2050.

# 2.0 Joining the Net-Zero Challenge

## 2.1 Who can join

All organizations with operations in Canada, including domestic and multinational companies and corporations, public agencies, and small- and medium-sized enterprises, can join the Net-Zero Challenge. Industry associations can also join the Challenge and can encourage their members to participate as well as support them in the development of their net-zero plans.

**Who can join the Net-Zero Challenge?**

Any of the following organizations with operations in Canada are eligible to join the Net-Zero Challenge:

a. companies or their Canadian subsidiaries
b. public agencies and other organizations
c. facilities reporting to Canada’s Greenhouse Gas Reporting Program and/or with significant emissions

### 2.1.1 Joining as a multinational company

Multinational companies that have a subsidiary in Canada can join the Challenge. The subsidiary must have at least one Canadian office or facility, with staff located in Canada.

For multinational companies, joining at the parent company level is strongly encouraged as it allows net-zero plans to encompass multiple facilities and operations, thus capturing as many GHG sources

[2] Transition Plan Taskforce, *Disclosure Framework,* (2023).
[3] International Financial Reporting Standards Foundation, *IFRS 2 Share-based Payment*, (2025).

as possible. However, individual facilities within a larger parent company may join the Challenge independently. Individual facilities that are interested in joining the Net-Zero Challenge program are invited to contact the Net-Zero Challenge to discuss eligibility criteria.

### 2.1.2 Joining as a small- and medium-sized enterprise

Companies of all sizes can join the Challenge, including small- and medium-sized enterprises which for the purpose of the Net-Zero Challenge are defined as any independent, non-subsidiary companies with 499 staff or less. “Staff” is defined as any paid employees, except for self-employed individuals or contract employees.

### 2.1.3 Joining as a public agency

Any public agency, defined as an organization or body providing services to the public on behalf of the government or other public agency, is eligible to join the Net-Zero Challenge. Public agencies include for example transit authorities, post-secondary institutions, public school boards, health authorities, public utilities. There is a specific participation stream for public agencies (see Section 2.3 – Participation streams).

## 2.2 How to join

To become a participant, a company must complete, sign, and submit a Commitment Letter to the Net-Zero Challenge. Commitment Letters must be signed by a person with the authority to ensure compliance with the participation requirements, such as the Chief Sustainability Officer, the Chief Executive Officer, or another member of the company’s senior executive (C-suite level) leadership with similar responsible control of the organization's emissions.

Participants will receive an onboarding email from the Net-Zero Challenge confirming that they have joined the program. The onboarding date – communicated in the onboarding email received by each participant – will be the start date for each individual participant and will be associated with their questionnaire due dates.

Participants will receive a Participant Letter within a month of joining the program that is signed by the Assistant Deputy Minister of ECCC, confirming their onboarding date and their participation in the Challenge. The Net-Zero Challenge will send regular reminders to participants regarding questionnaire due dates.

## 2.3 Participation streams

The Challenge has the following participation streams, with the table below providing definitions and examples for each stream.

**Table 2:** Participation streams

| Stream name | Definition | Examples |
|---|---|---|
| **Small- and medium-sized enterprises (SMEs)** | Businesses that employ 499 or less employees. “Employees” are defined as any paid staff except self-employed or contract employees. | Any business ranging from 1 to 499 employees. |

| | | |
|---|---|---|
| **Heavy industry** | Businesses that are typically associated with higher emissions. They tend to have higher capital costs and use and produce large industrial products, equipment, facilities, processes, etc. | Extractors and manufacturers of oil and gas, fossil-fueled electricity, petrochemicals, iron and steel, aluminum, cement, etc. |
| **Financial institutions** | Businesses that deal primarily with financial and monetary transactions such as deposits, loans, investments, insurance, and currency exchange. | Banks, asset managers, asset owners, pension funds, insurance companies, etc. |
| **Public agencies** | Any organization or body providing services to the public on behalf of the government or other public agency. | Transit authorities, post-secondary institutions, public school boards, health authorities, public utilities, etc. |
| **Other businesses and organizations** | All other businesses and organizations that do not fall under the other streams. | Construction, engineering, consulting firms, IT and tech, transportation, Crown Corporations, non-profit organizations, etc. |

### 2.3.1 Definition of SMEs and other businesses

There can sometimes be uncertainty as to which stream to select when companies are completing and signing their Commitment Letter. Companies that are unsure whether they are an SME or "other business and organization" should refer to the table below.

**Table 3:** Definition of SMEs and other businesses

| Type of net-zero plan | Canadian employees | Global employees | Total employees | Stream |
|---|---|---|---|---|
| Canadian-specific **or** global net-zero plans | ≤499 | ≤499 | ≤499 | SME |
| Canada-specific **or** global net-zero plans | 500+ | 1+ | 500+ | Other |
| Canadian-specific net-zero plan | ≤499 | 1+ | 500+ | SME |
| Global net-zero plan | ≤499 | 1+ | 500+ | Other |

## 2.4 Joining with an existing net-zero plan

Some participants will already have company targets and/or net-zero plans developed when they join the Net-Zero Challenge. Multinational companies may also wish to join using a parent company net-zero target and plan. Companies are welcome to use these targets and plans, so long as they meet the minimum requirements of the program (see Section 3.1 – Minimum requirements) and companies can complete the preliminary and comprehensive participation questionnaires.

Multinational companies joining with a parent company net-zero target and plan are strongly encouraged to develop a Canada-specific net-zero plan, or to release net-zero information about their Canadian facilities and operations. This is also one of the criteria in the Net-Zero Challenge Participation Tiers (see Section 3.3 – Net-Zero Challenge participation tiers).

Furthermore, many companies may be signatories or provide disclosure to other similar initiatives, such as the Science Based Targets initiative, the Carbon Disclosure Project, and partner initiatives under the United Nations Race to Zero Campaign. The Net-Zero Challenge encourages participants to continue using these other programs and initiatives. Participants should be aware that details they provide on their net-zero plans, GHG emissions inventory, and targets to these other initiatives can be used as evidence in the questionnaires to satisfy the minimum requirements of the Net-Zero Challenge.

The Net-Zero Challenge will always strive to seek alignment with other net-zero initiatives and programs to reduce the reporting burden on participants.

## 2.5 Joining as a carbon neutral or a net-zero company

Companies that have already achieved carbon neutral or net-zero status are welcome to join the Net-Zero Challenge. “Carbon neutral” is commonly considered as a condition in which during a specified period there has been no net emission of GHGs to the atmosphere as the carbon footprint of the subject has been counterbalanced by offsetting. “Net-zero emissions” is commonly considered as having reduced emissions so that only residual emissions remain and offsetting is restricted to removal credits only, over a specific period of time.

Participants that are already carbon-neutral or net-zero are required to include the information requested in the Net-Zero Challenge questionnaires to confirm that they meet the minimum requirements of the program. This includes the following information in the participation questionnaires: the base year GHG emissions inventory, a public announcement of the year that they achieved carbon neutral or net-zero emissions, information on any use of carbon credits including reductions and removals, and any interim targets to reduce the remaining emissions to absolute zero, if applicable. Carbon neutral or net-zero companies that join the Net-Zero Challenge benefit from evaluation of their carbon neutral or net-zero status, based on program requirements, and ongoing efforts to further reduce or remove emissions. They also benefit from GoC recognition for their efforts, and collaboration and leadership opportunities within the community of practice.

## 2.6 Science Based Targets initiative

The Science Based Targets initiative (SBTi) develops standards, tools, and guidance which allows companies to set GHG emissions reduction targets in line with what is needed to keep global heating below catastrophic levels and reach net-zero by 2050 at the latest.

If a company’s net-zero commitment, including its near and long term targets, have been assessed and approved by the SBTi against its Corporate Net-Zero Standard, they can join the Net-Zero Challenge via an accelerated process.

To join the Challenge via the SBTi accelerated process, companies must select this option in the Commitment Letter and submit an SBTi Accelerated Process Questionnaire to the program. To maintain participation in the Net-Zero Challenge, participants that join through the SBTi accelerated process must submit the SBTi Accelerated Process Questionnaire annually to confirm that they are in good standing with the SBTi.

If companies that join the Challenge via the SBTi accelerated process are interested in achieving a higher Participation Tier, they must provide additional evidence of meeting the criteria required for recognition. Interested companies may contact the Net-Zero Challenge to learn more.

# 3.0 Administrative elements

## 3.1 Minimum requirements

Although the Net-Zero Challenge is a non-regulatory initiative, there are several minimum requirements that participants must meet in order to remain in the Challenge. These minimum requirements help to ensure there is a level of rigour and ambition in net-zero planning.

The Challenge is designed to help companies and organizations develop their net-zero plans. Therefore, it does not assume that participants would have all of this information prepared upon joining the program. The minimum requirements are gradually introduced to ensure that participants have the time to complete the necessary steps for credible and rigorous net-zero planning.

**Summary of the minimum program requirements**

1. A **base year GHG emissions inventory for Scope 1, 2, and if applicable, scope 3 emissions**
2. A **public commitment to planning for net-zero emissions** by 2050, or earlier
3. Information on **corporate governance** linked to net-zero planning
4. **Publicly announced interim emissions reductions targets**
5. Information on **mitigation strategies**
6. Report on any planned or existing **offset credit use**
7. Annual progress reporting

Participants that meet the minimum requirements of the program will be designated as “Bronze” (see Section 3.3 – Net-Zero Challenge participation tiers). However, the demonstration of increased ambition and rigour in net-zero planning can result in recognition in a higher tier.

More detailed information on the minimum requirements is found throughout this guide and are preceded by words such as **must, will**, or **shall**. Additional information and considerations, which do not impact an organization’s participation in the Net-Zero Challenge, can be found in Section 8.0 – Other considerations. These sections use words such as **should, encouraged**, or **may.**

Failure to meet any of these minimum requirements will result in the re-consideration of a participant’s status in the Challenge (see Section 3.8 – Failure to meet minimum program requirements).

### 3.1.1 Scopes 1, 2, and 3

**All participants must include scope 1 and 2 emissions** in their net-zero plans and GHG emissions inventory, and **some participants must include some scope 3 emissions**. If a participant does not have scope 1 or 2 emissions to report, this must be explained in the participation questionnaires. For more information on the definition of scope 1, 2, and 3 emissions, see Section 4.0 – Emissions sources.

**All participants are encouraged to include as many categories of scope 3 emissions** as possible. Participants are required to indicate which scope 3 emissions categories are included in their GHG

emissions inventory. The Greenhouse Gas Protocol (GHG) defines 15 distinct scope 3 categories that participants can select from.

SMEs and heavy industry are not required but are strongly encouraged to include scope 3 emissions as much as possible – unless they have neither scope 1 nor scope 2 emissions, in which case they **must** report at least one category of scope 3 emissions. Financial institutions are strongly encouraged to include scope 3 category 15 emissions. All other participants **must** include some scope 3 emissions.

Participants that include more scope 3 emissions categories than required can achieve recognition in higher Net-Zero Participation Tiers. Section 4.0 describes how to identify and quantify emissions sources within the three emissions scopes. For all participants, the most relevant scope 3 emissions categories, and scope 1 and 2 emissions, must be presented separately and included in the GHG emissions inventory. See Table 8 for criteria to identify relevant scope 3 emissions categories.

Participants that wish to inventory all scope 3 emissions categories and target a % of scope 3 emissions rather than one or more categories should contact the Net-Zero Challenge program.

### 3.1.2 Greenhouse gases to include

GHGs include a range of gases, with carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$) being the most common, accounting for over 98% of total GHG emissions in Canada. For the Net-Zero Challenge, **where relevant and to the extent possible**, net-zero plans, interim targets, and the GHG emissions inventory should cover all the GHGs that are subject to reporting to the Greenhouse Gas Reporting Program (GHGRP). This includes carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), sulphur hexafluoride ($SF_6$), 13 different hydrofluorocarbons (HFCs), and seven (7) different perfluorocarbons (PFCs).[4]

However, for most Net-Zero Challenge participants, the relevant greenhouse gases will be only carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$). In 2023, more than 98% of facilities reporting to the GHGRP reported having emissions of carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$). In comparison, 7% of facilities reported having emissions of other listed GHGs.

The GHGRP publishes an annual notice on reporting requirements that list the specified GHGs. Emission factors break down the emissions by the relevant GHGs present in common activities. This means that participants relying solely on emission factors to calculate their GHG emissions do not need to be concerned about whether they have covered all the relevant gases listed above—this work has been done in the development of emission factors.

All the identified GHGs that fall within the participant's operational boundaries should be quantified separately and then reported as a total in $CO_2$ equivalent ($CO_2e$). GHGs can be converted to $CO_2e$ by using the GHG's global warming potential (GWP) metric. The GWP is a common metric that was developed to allow comparisons of the warming impacts of different GHGs relative to $CO_2$. Participants should use the 100-year GWPs from the latest IPCC Assessment Report: GHG Protocol: IPCC Global Warming Potential Values. However, values from IPCC Assessment Report 5 are also acceptable and are currently used by Canada's GHG Reporting Program (most recently published in December 2023 - Canada Gazette, Part 1, Volume 157, Number 49: SUPPLEMENT 1).

[4] Note that in instances where the disaggregated emission factors for the GHGs listed here are not available, emissions can be calculated using the $CO_2e$ emission factors for the activity.

## 3.2 Program steps and timelines

As mentioned in the minimum requirements section above, the program requirements are gradually introduced to participants. There are specific timelines for the different milestones or steps of the Challenge that participants must meet to remain in the Challenge. The key steps are as follows:

**Table 4:** Timelines for participants

| Step | Timeframe | Due date | Details |
|---|---|---|---|
| **Step 1:** sign a Commitment Letter | To join the Challenge | N/A | **Participants pledge to:**<br>• commit to planning for net-zero emissions by 2050 or earlier<br>• set two interim targets<br>• develop net-zero plans<br>• submit the participant questionnaires on time<br><br>**Note:** After joining, participants receive a Participant Letter that is signed by an Assistant Deputy Minister of Environment and Climate Change Canada. |
| **Step 2:** submit a Preliminary Questionnaire | After joining | 12 months after joining the Challenge | **Minimum requirements:**<br>• Develop a base year GHG emissions inventory for scope 1 and 2 emissions, and if applicable, scope 3 emissions<br>• A public commitment to plan for net-zero GHG emissions, by 2050 or earlier<br>• Information on corporate governance |
| **Step 3:** submit a Comprehensive Questionnaire | Any time after or at the same time as the Preliminary Questionnaire | 24 months after joining the Challenge | **Minimum requirements:**<br>• A publicly announced first interim GHG emissions reduction target (by 2035)<br>• Mitigation measures for all applicable emissions scopes with % of anticipated emissions reductions<br>• Details on any planned offset credits<br><br>**Note:** Participants can achieve a Net-Zero Challenge participation tier after the submission of the Comprehensive Questionnaire. |
| **Step 4:** submit an Annual Questionnaire | No earlier than 11 months after submitting the Comprehensive Questionnaire | **First Annual Questionnaire:** 18 months after submitting the Comprehensive Questionnaire | **Minimum requirement:**<br>• Report on any changes annually |

| | | | |
|---|---|---|---|
| | | **Subsequent Annual Questionnaires:** 12 months after previous Annual Questionnaire | |

It is not mandatory to wait to submit either the Preliminary or Comprehensive Questionnaires. They can be submitted as soon as the participant has been enrolled in the Net-Zero Challenge, and the questionnaires can be submitted simultaneously.

Once a participant has achieved net-zero GHG emissions status, they must continue to submit the appropriate questionnaires to remain in the Challenge.

## 3.3 Net-Zero Challenge participation tiers

The minimum requirements of the Net-Zero Challenge establish the framework for creating a rigorous and credible net-zero plan. Participants that demonstrate an additional level of ambition in their net-zero plan can achieve a higher Net-Zero Tier by meeting specific requirements as per **Table 5** below. All other participants in the Challenge who are meeting the minimum requirements of the program will be designated as "Bronze."

Net-Zero Tiers can only be assigned after the evaluation of the Comprehensive Questionnaire (Section 6.0), which is due within 24 months of submitting the Commitment Letter to the Net-Zero Challenge. The tier status of each participant will be published on the Net-Zero Challenge website.

For participants aiming to achieve a higher tier status, **Table 5** below provides the list of requirements.

**Table 5:** Requirements for Net-Zero Challenge tiers: Bronze, Silver and Gold

| **NZC program requirements and participation tiers** | |
|---|---|
| **Bronze** *(minimum program requirements)* | Public commitment to plan for net-zero GHG emissions by 2050 or earlier for scope 1 and scope 2; and for scope 3 emissions (as applicable) |
| | GHG base year inventory disaggregated and in absolute terms for scope 1 and 2 emissions; and in absolute, intensity or a range of estimates for scope 3 emissions (as applicable) |
| | Corporate governance strategy for sustainability |
| | Interim targets for scope 1 and 2 emissions; and if applicable, scope 3 emissions; interim targets should be disaggregated and can be in absolute or intensity terms. For the first interim target:<br>• The minimum reduction required for scope 1 and 2 emissions is a maximum 40% deviation from a straight-line path to net-zero<br>• There is no minimum reduction required for scope 3 emissions<br>**Note**: Participants who wish to measure and target a % of scope 3 emissions across several categories must contact the program. |
| | Mitigation strategies indicating % of emission reductions expected for scope 1 and 2 emissions; and for scope 3 emissions (as applicable) |

| | |
|---|---|
| | If used, carbon offset reductions and removals, PPAs and RECs must be accounted for separately.<br>**Note**: If used, it is strongly encouraged to purchase offsets only from the following in order: 1) the compliance system, 2) the voluntary system with a CCP label from ICVCM, and 3) the voluntary system with a standard endorsed by ICROA (national or international). |
| **Silver** | A Canadian net-zero plan |
| | For the first interim target:<br>• 40% absolute emissions reduction for scope 1 and 2<br>or<br>• 20% absolute emissions reduction for a meaningful category of scope 3 emissions<br>**Notes**:<br>1. Participants that have neither scope 1 nor scope 2 emissions **must** meet the scope 3 condition for this participation tier requirement. Similarly, participants that are exempt from reporting scope 3 emissions **must** meet the scope 1 and 2 conditions for this participation tier requirement.<br>2. "Meaningful" is defined as one of the highest emitting categories for the participant. |
| | 50% of offsets used (reductions or removals) must be from the federal/provincial compliance systems, or the voluntary system either with a CCP label from ICVCM or a standard endorsed by ICROA (national or international) |
| **Gold** | Third-party assurance of a participant's emissions inventory and all applicable targets by a third party organization accredited by either the Standards Council of Canada (SCC) or ANSI National Accreditation Board (ANAB)<br>Note: SMEs are exempt. |
| | For the first interim target:<br>• 50% absolute emissions reduction for scope 1 and 2<br>or<br>• 30% absolute emissions reduction for a meaningful category of scope 3 emissions<br>**Notes**:<br>1. Participants that have neither scope 1 nor scope 2 emissions **must** meet the scope 3 condition for this participation tier requirement. Similarly, participants that are exempt from reporting scope 3 emissions **must** meet the scope 1 and 2 conditions for this participation tier requirement.<br>2. "Meaningful" is defined as one of the highest emitting categories for the participant. |
| | 100% of offsets used (reductions or removals) must be from federal/provincial compliance systems, or the voluntary system either with a CCP label from ICVCM or a standard endorsed by ICROA (national or international) |

The new tier system will be phased in:

- current program participants can select the previous tier system or the new tier system in 2025 and 2026
- new participants will be evaluated using the new tier system upon joining the program

- the new tier system will be applied to **all** participants beginning January 1, 2027

## 3.4 Participants with facilities reporting to the GHGRP

Participants that have facilities reporting to the GHGRP must include the aggregate total emissions reported to the GHGRP from all these facilities for scope 1 or submit scope 1 emissions for their Canadian operations. In their reporting to the Net-Zero Challenge, companies must provide this information for the base year that they are using (that is, provided in the Preliminary and Comprehensive Questionnaires) and for each subsequent Annual Questionnaire. Participants with facilities reporting to the GHGRP are recommended to review Canada's Greenhouse Gas Quantification Requirements and the Technical Guidance for reporting data to the Greenhouse Gas Reporting Program.

For example, a multinational company with three facilities reporting to the GHGRP that joins the Net-Zero Challenge with a global net-zero plan must provide their global scope 1 emissions in their GHG emissions inventory **and** the total emissions from those three facilities reported to the GHGRP **or** their total Canadian scope 1 emissions. If the same multinational company were to join the Net-Zero Challenge with a Canada-specific net-zero plan, then they would only have to provide their total Canadian scope 1 emissions.

This requirement is to ensure that at least some information is reported on Canadian domestic emissions, particularly from large industrial emitters. This requirement does not apply to participants that do not have facilities reporting to the GHGRP.

## 3.5 Financial institutions

Financial institutions must develop net-zero plans that include and consider the emissions of their investments, one of the categories of scope 3 emissions, and, if applicable their lending portfolios, as defined by the UNEP FI Net-Zero Banking Alliance or the Science Based Targets initiative. Investment and lending emissions must at least include the scope 1 and scope 2 emissions of the companies in which the investments and loans are made.[5]

There are several global initiatives targeted to the financial sector that provide guidance on identifying, accounting, and setting interim targets for scope 3 emissions. Some of these are net-zero initiatives and others are "Paris-aligned."[6] Financial institutions can refer to and follow the guidance provided by reputable initiatives, so long as their net-zero plans specify a net-zero target. In particular, financial institutions may refer to initiatives such as the Paris Aligned Investment Initiative, the Net-Zero Asset Owner Alliance, the Net-Zero Banking Alliance, and the Net-Zero Asset Managers Initiative, among others. Banks may also wish to consult the United Nations Environment Programme Finance Initiative's (UNEP FI) Guidelines for Climate Target Setting for Banks, which also underpins the Net-Zero Banking Alliance. In addition, financial institutions can consult the guidance provided by the Partnership for Carbon Accounting Financials. Canadian financial institutions should refer to Guideline B-15: Climate

[5] This aligns with GHG Protocol guidance for Category 3. It is encouraged to also include scope 3 emissions, where these emissions are significant. (See GHG Protocol, *Technical Guidance for Calculating Scope 3 Emissions* (2013), p. 136. GHG Protocol Standards Scope 3 Calculation Guidance.

[6] That is, requiring targets aligned with limiting global warming to well-below 2°C above pre-industrial levels, as per the goals of the Paris Agreement, adopted at COP 21 in Paris in 2015.

Risk Management published in March 2023 by the Office of the Superintendent of Financial Institutions and currently being updated to ensure it is interoperable with CSSB standards.[7]

For the preliminary and comprehensive net-zero plans, financial institutions participating in the Net-Zero Challenge may develop their scope 3 GHG emissions inventory base year[8] progressively on a sector-by-sector basis, where data allows. Participants should prioritize sectors based on their GHG emissions or financial exposure in their portfolio. If this approach is chosen, the GHG emissions inventory must be updated in the comprehensive plan and then in annual progress reporting until all or a substantial majority of carbon-intensive sectors are included, as per UNEP FI guidelines or Science Based Targets initiative guidelines. This GHG emissions inventory must be completed at least one year prior to the date of the first interim target. In cases where one or more sectors are excluded, this must be justified and explained.

Financial institutions are strongly encouraged to develop loans, investments, insurance products that prioritize and reward low-carbon economic activities of their clients. Financial institutions have an opportunity to render their services in a way that incites a decarbonized economy.

See Section 6.2.5.4 – Scope 3 emissions and financial institutions for guidance on mitigation strategies specific to the financial sector.

## 3.6 Submitting net-zero plan information

Participants submit questionnaires attesting to the development of their preliminary and comprehensive net-zero plans, along with evidence supporting their answers. For each response in the questionnaires, participants must provide evidence in support of their response. It is expected that participants will be able to use publicly available information to provide evidence to most, if not all questions.

Participants submit their completed questionnaires to the Net-Zero Challenge program. The Net-Zero Challenge will acknowledge receipt of the questionnaires and will use the responses and evidence provided in each questionnaire to verify whether a participant meets the minimum requirements of the Net-Zero Challenge. Following the submission and review of the Comprehensive Questionnaire, Environment and Climate Change Canada will notify participants of their placement in the participation tiers.

To promote accountability and transparency, participants are encouraged to publish information about their net-zero plans on their websites in an accessible format.

## 3.7 Public disclosure

In order to promote transparency and credibility of net-zero plans and targets, participants are **strongly encouraged** to publicly disclose as much of their net-zero planning as possible on their websites, and to report on their progress annually. At a minimum interim and net-zero targets must be publicly stated. Participants are encouraged to publish stand-alone net-zero reports (that is, the net-zero plan information is not embedded in sustainability, ESG, or annual reports) in order to provide complete transparency on their net-zero plan and progress towards net-zero emissions.

[7] Letter to Industry – We are Updating Guideline B-15 for the Final CSSB Standards - Office of the Superintendent of Financial Institutions, February 2025.
[8] Category 15 and, if applicable, lending activities. For scope 1 and 2 emissions, financial institutes participating in the Challenge must follow the same guidelines that apply to all other streams.

In its simplest form, a stand-alone net-zero plan should be a downloadable document that includes all the required elements in the Preliminary (see Section 5.0 – Preliminary Questionnaire) and Comprehensive Questionnaire (see Section 6.0 – Comprehensive Questionnaire). If the stand-alone plan is produced when participants are required to provide annual progress reporting, then it should also include all elements required in the Annual Questionnaire (see Section 7.0 – Annual Questionnaire).

**Evaluated and accepted Net-Zero Challenge questionnaires and non-confidential resources provided by participants as evidence to meet the program requirements can be made available to the public upon request to Environment and Climate Change Canada.** These documents will be provided in PDF format. It is therefore advisable that participants use publicly available information and links as evidence in their reporting as much as possible.

Participants' names will be published on the Net-Zero Challenge website once they join the Challenge. New participants will be listed as "Committed." After submission and review of the Comprehensive Questionnaire, participants that meet the minimum program requirements will be listed as "Bronze", while those that meet additional ambition requirements will be recognized with a higher tier, either "Silver" or "Gold" (as appropriate). Participants that have achieved net-zero emissions will also be recognized on the website.

## 3.8 Failure to meet minimum program requirements

If a participant does not meet the minimum requirements or timelines (for example, interim and net-zero targets), their participation in the Net-Zero Challenge will be re-considered. In such cases, the participant will be informed that they do not meet the minimum requirements or that they have missed a deadline (for example, for submitting the Preliminary Questionnaire). The participant will have six months, beginning from the date of notification, to work with the Net-Zero Challenge to resolve the situation. During this time, the participant will receive guidance and support, if applicable, to meet the requirements.

If the situation is resolved, then the participant will continue to be a participant. If the situation is not resolved, then the participant will be removed from the Net-Zero Challenge. At this point, the participant's name and participation tier will be removed from the Net-Zero Challenge website. Participants will be informed in writing if they are removed from the program.

In the future, other Government of Canada programs may be informed if a participant is not meeting the Net-Zero Challenge requirements or if the participant is removed from the program, if and only if such programs have a link to the Net-Zero Challenge. Once a participant is officially removed from the program, they cannot use the Net-Zero Challenge as a form of recognition for their environmental and climate commitments and/or performance and may no longer be eligible to bid on federal government contracts greater than $25M.

## 3.9 Reinstatement in the Net-Zero Challenge

If a former participant wishes to return to the Net-Zero Challenge, the company may join the program after a six-month period. Following the six-month period, the participant will be required to submit the following two documents: (1) a newly completed and signed Commitment Letter; and (2) the next questionnaire that was required by the participant prior to their removal from the program. The

participant will only be reinstated to the program once the questionnaire has been reviewed and approved by the Net-Zero Challenge program.

For example, if a participant was removed before receiving approval of their Preliminary Questionnaire, then in order to rejoin the program, the company must wait six months before submitting a new Commitment Letter and a new Preliminary Questionnaire, which must be approved by the Net-Zero Challenge program before the company can be reinstated as a participant.

Similarly, if a participant was removed after receiving approval for both their Preliminary and Comprehensive Questionnaires, but before the approval of an Annual Questionnaire, the company would be required to wait six months and then submit the Annual Questionnaire, which would need to be approved by the Net-Zero Challenge program.

Once the appropriate questionnaire has been approved, the company will receive confirmation that they have been reinstated as a participant. The participant will be added to the Net-Zero Challenge website and will receive a new Participant Letter.

# 4.0 Emissions sources

A key component to achieving net-zero emissions is quantifying GHG emissions, as this information is critical to provide a starting point for net-zero planning. The following section provides more details about these emissions sources.

The GHG Protocol Corporate Accounting and Reporting Standard has categorized emission sources into three parts: direct emissions caused by the company (scope 1), indirect emissions generated from energy that the company purchases (scope 2), and indirect emissions tied to upstream and downstream activities from the supply chain (scope 3). These emissions are also described in ISO 14064-1.

**Table 6:** Overview of emissions scopes

| Emissions type | Scope | Definition | Examples |
|---|---|---|---|
| **Direct emissions** | **Scope 1** | Emissions from operations that are owned or controlled by the reporting company | • **Stationary combustion:** Emissions from combustion in stationary sources (for example, boilers, furnaces, and turbines)<br>• **Mobile combustion:** Emissions from combustion of fuels in transportation (for example, company-owned fleet)<br>• **Process emissions:** Emissions from physical or chemical processing<br>• **Fugitive emissions:** Equipment leaks, methane from coal mines and venting emissions from the use of refrigeration and air conditioning equipment, and methane leakages from gas transport |
| **Indirect emissions** | **Scope 2** | Emissions from the generation of purchased or acquired electricity, steam, heating, or cooling | • **Electricity purchased from the grid** (for example, electricity, steam, heating, cooling) |

| | | | |
|---|---|---|---|
| | | consumed by the reporting company | **Note**: These emissions are generated elsewhere but are used by the proponent. |
| | **Scope 3** | All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions | • Business travel<br>• Purchased goods and services<br>• Employee commuting<br>• Fuel- and energy-related activities<br>• Upstream and downstream transportation and distribution<br>• Waste generated in operations<br><br>**Note**: See Table 8 for the full list of scope 3 categories. |

## 4.1 Scope 1 emissions

**Scope 1 emissions are direct emissions** – any emissions directly resulting from operations under a company's control. Scope 1 emissions principally result from the types of activities undertaken by a company as described in the Table below, but this list is not exhaustive.

**Table 7:** Types of scope 1 emissions

| Type of activity | Description | Notes |
|---|---|---|
| Stationary combustion sources | Emissions from stationary combustion (for example, electricity, heat, or steam) sources that are owned and/or controlled by the company.<br>**Examples**: Generators, boilers, furnaces, burners, turbines, heaters, incinerators, engines, flares) | Purchased electricity, heat, or steam are **scope 2** emissions |
| Mobile combustion sources | Emissions from the transportation of materials, products, waste, and employees through fuel combustion that the company owns and/or controls.<br>**Examples**: Company-owned trucks, trains, ships, airplanes, buses, and cars | Business travel and employee commuting are **scope 3** emissions (categories 6 and 7, respectively) |
| Physical or chemical processing | Emissions from the manufacturing or processing of chemicals and materials from sources that are owned and/or controlled by the company.<br>**Examples**: Cement, petrochemicals, fire suppression equipment | Purchased cement or petrochemicals are **scope 3** (category 1: purchased goods and services) |
| Fugitive emissions | Emissions from intentional or unintentional releases (for example, equipment leaks from joints, seals, packing, and gaskets; methane emissions from coal mines and venting hydrofluorocarbon [HFC] emissions during the use of refrigeration and air conditioning equipment; and methane leakages from gas transport) | |

| | | |
|---|---|---|
| Refrigeration and air conditioning | Any cooling equipment like air conditioners and refrigerators | |
| Land-use change | Emissions from human-caused land-use changes, such as deforestation and changing land for farming.<br>**Examples**: Clearing trees for a mining or construction site | |

## 4.2 Scope 2 emissions

**Scope 2 emissions are indirect emissions** from electricity, heating, cooling, steam, or hydrogen that a company **purchases for its own use**.[9] These purchased forms of energy include the direct transfer of these energy forms as well as electricity from electricity grids. Participants can refer to GHG Protocol guidance on scope 2 emissions for more details.

**Example:** Company ABC owns an office and purchases the electricity for the building from the local provincial grid. The emissions associated with the purchased electricity are scope 2 emissions.

## 4.3 Scope 3 emissions

Scope 3 emissions, also referred to as value chain emissions, include "all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions."[10] Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization. By definition, the scope 3 emissions of one organization are the scope 1 and/or 2 emissions of another organization. Depending on the reporting organization, value chain emissions can represent the majority of an organization's total GHG emissions.[11]

The GHG Protocol defines 15 distinct scope 3 categories—eight (8) upstream and seven (7) downstream (see **Table 8** below). Not every category will be relevant to every participant. For example, investments (category 15) are often mainly applicable to the financial sector, and only some businesses have franchises (category 14).

**Table 8:** Scope 3 emissions categories

| | Scope 3 category | Examples |
|---|---|---|
| **Upstream activities** | 1) Purchased goods and services | Emissions from purchased cement, paint, timber, uniforms, etc. |
| | 2) Capital goods | The life-cycle emissions of equipment, machinery, buildings, facilities, vehicles. |
| | 3) Fuel- and energy-related activities | Emissions from the extraction, production, and transportation of fuels used by the organization. |

[9] When these forms of energy are produced and made by the company itself, they are considered scope 1 emissions. If a company purchases and sells this energy, then the emissions are considered scope 3 emissions.
[10] GHG Protocol, *Corporate Value Chain (Scope 3) Accounting and Reporting Standard*, p. 28.
[11] U.S. United States Environmental Protection Agency, *EPA Center for Corporate Climate Leadership: Scope 3 Inventory Guidance*, (2021).

| | | |
|---|---|---|
| | 4) Upstream transportation and distribution | Emissions from inbound logistics and transportation of goods to the organization. |
| | 5) Waste generated in operations | Emissions from third-party disposal and treatment of waste generated by the organization (garbage, recycling, composting, wastewater, etc.). |
| | 6) Business travel | Emissions from employees traveling for work, but not to and from work. |
| | 7) Employee commuting | Emissions from employees traveling to and from work.<br>If applicable, emissions from teleworking (for example, kWh of gas, electricity consumed). |
| | 8) Upstream leased assets | Emissions from vehicles, properties, equipment, etc. that are leased to the organization.<br>See Section 5.1.2.1 below for more information. |
| **Downstream activities** | 9) Downstream transportation and distribution | Emissions from the transportation of products sold by the organization. |
| | 10) Processing of sold products | Emissions from further processing or use of an organization's sold products. |
| | 11) Use of sold products | Emissions from the use of products sold by the organization (for example, fuel consumed in the use of vehicles, apparel, food, etc.). |
| | 12) End-of-life treatment of sold products | Emissions from the waste disposal of products sold by the organization. |
| | 13) Downstream leased assets | Emissions from assets that are owned by the organization and leased to others. |
| | 14) Franchises | Emissions from businesses licensed to sell or distribute the organization's goods and services. |
| | 15) Investments | Emissions from the organization's investments (for example, equity investments, debt investments, managed investments, etc.). |

More detailed explanations and information for each of the 15 categories can be found on the GHG Protocol website.

**Why include scope 3 emissions**

Although scope 3 emissions can seem daunting and difficult to quantify and address, consider this:

- **small decisions have a big impact:** Switching to selling a lower-emitting product can be a cost-effective way to have a big emissions impact, as customers' decisions to switch to a lower-emitting product amplifies the impact

- **it supports customers looking to lower their carbon footprint** or join the zero-waste movement: Reducing product packaging cuts scope 3 emissions and helps customers reduce their waste
- it sets up a **virtuous cycle** as one company's scope 3 is another company's scope 1 and/or 2
- for buildings and industry, scope 3 emissions are **at least twice as much** as direct emissions

## 4.4 Avoided emissions

In alignment with international best practices, **avoided emissions cannot be counted** towards a participant's net-zero target, as participants are expected to count and report on their direct and indirect emissions, following GHG Protocol guidance.

Avoided emissions are defined as emission reductions that result from the use of the product or service, but that occur outside of the product's life cycle or value chain.[12] This refers to products and services that avoid GHG emissions compared to other products and services on the market, by enabling emissions reductions or providing a low-emission version of an existing product or service. Currently, these avoided emissions are not officially recognized in the GHG Protocol.

# 5.0 Preliminary Questionnaire

As noted in Section 2.2 – How to join, the first step to joining the Net-Zero Challenge is to complete, sign, and submit a Commitment Letter to the Net-Zero Challenge. Participants then have up to 12 months from joining to submit their Preliminary Questionnaire, although it can be submitted earlier and may also be submitted simultaneously with the Comprehensive Questionnaire. For more details on the timelines, see Section 3.2 – Program steps and timelines.

The following sections provide information for all three minimum requirements of the Preliminary Questionnaire.

**Preliminary Questionnaire minimum requirements**

1. A base year GHG emissions inventory
2. Public commitment to planning for net-zero emissions
3. Corporate governance

## 5.1 Base year GHG emissions inventory

The first of the three minimum requirements for the Preliminary Questionnaire is a base year GHG emissions inventory. The initial GHG emissions inventory is the base year or starting point for the net-zero plan. It clearly shows the gap between a participant's current emissions and their aspiration for net-zero emissions by 2050. The more accurate the inventory, the more accurate the estimate of the gap to net-zero.

[12] World Resources Institute, *"Do We Need a Standard to Calculate 'Avoided Emissions?'"*, by Laura Draucker (2013).

A base year GHG emissions inventory is an account at one point in time that serves as a reference point against which a company's emissions will be measured in the future, namely for its interim and net-zero targets. Inventories are based on annual emissions, using fuel consumption, energy use, and other sources of emissions that are measured over one year—either a calendar year or consecutive 12 months over two calendar years. Participants are encouraged to use only one single base year for their scope 1, 2, and/or 3 emissions. Should the scope 3 emissions base year be from newer data than the scope 1 and 2 emissions, then participants may use a separate base year for scope 3 emissions that must be reported in the Preliminary Questionnaire and plan.

Participants must state the base year of the inventory with their scope 1, 2, and/or 3 emissions presented separately as part of their Preliminary Questionnaire and plan. Participants must also state their base year emissions in absolute terms (for example, XXX tCO2e) for scope 1 and scope 2 emissions. The scope 3 base year emissions may be expressed as absolute terms, emissions intensity, or as a narrow range of estimates including a description on the confidence level of those estimates.[13] Participants must ensure that Scope 1, 2, and 3 emissions (as applicable) are presented disaggregated, or separately, in their base year inventory. Participants can consult the United States Environmental Protection Agency's (US EPA) Scope 1, 2 and 3 Emissions Inventorying and Guidance when developing their GHG inventory.

**Some participants will already have a base year GHG emissions inventory** and may already be reporting on it annually. The base year inventory may be used even if it dates back several years and only includes a portion of their scope 3 emissions, so long as the emissions included meet the minimum requirements for scope 1 and 2, and if applicable, scope 3. If the company or organization wishes to expand its scope 3 emissions to include further categories, then the participant will need to re-calculate its scope 3 emissions, which can be done without re-calculating their scope 1 and 2 GHG emissions inventory. For participants with an existing base year GHG emissions inventory, see Section 5.1.1 – Participants with an existing base year GHG inventory.

**For those who do not already have a base year GHG emissions inventory**, the first inventory that is developed will serve as their base year. The base year should be set as close to the present date as possible, but no earlier than five years prior to developing the preliminary plan. The selected base year should align with the participant's operational goals and should be a year for which the company or organization can get complete and accurate information. For participants new to developing a base year GHG emissions inventory, see Section 5.1.2 – Developing or updating a base year GHG emissions inventory.

There may also be participants that are **not yet fully operational** and are generating partial or no emissions. These participants must have projected regular operational emissions expected to begin within five years of developing their preliminary plan, or six years from the date of joining. Therefore, an organization must wait until their expected operation date is a maximum of six years from joining the program. For companies not yet in operation, they are expected to include an estimate of projected emissions in their Preliminary Questionnaire and all subsequent questionnaires until they are able to measure actual emissions during operation. Participants that are not yet in operation cannot be recognized with a Participation Tier until the company is in normal operations and has emissions to report.

As per Section 6.3.6 – Reporting and accounting for credit transfers, participants must report and account for all operations that may result in access to, or generation of offset credits.

[13] GHG Protocol, *Quantitative Inventory Uncertainty*, (2022)

### 5.1.1 Participants with an existing base year GHG emissions inventory

Some participants will already have a base year GHG emissions inventory for their company. **It is not necessary to establish a new inventory;** however, participants are required to ensure that their GHG emissions inventory meets the requirements of the Net-Zero Challenge and are encouraged to improve the accuracy and breadth of their inventories, where possible.

**Requirements for an existing base year GHG emissions inventory**

- Ensure that you have a **baseline GHG emissions inventory** (see Section 5.1), for all the required emissions scopes, with a clearly stated **base year**
- **Ensure that your GHG emissions inventory** accounts for scope 1, scope 2 and where applicable, scope 3 emissions (see Section 3.1.1)
    - if your company only has an inventory for scope 1, you will need to do an inventory, including a base year, for scope 2 (all participants)
    - if your participation stream requires you to include certain scope 3 emissions categories, or if you voluntarily choose to include additional scope 3 emissions categories, then you will need to do a base year inventory for those scope 3 emissions
    - for Stream 2 participants, the scope 3 GHG emissions base year inventory may be developed progressively following guidelines established by other initiatives (see Section 3.5)
- Ensure that your base year GHG emissions inventory **reports scope 1 and 2 emissions in absolute terms**. Scope 3 emissions may be expressed in absolute terms or by other means
- In the base year GHG emissions inventory, scope 1 and 2 emissions must be presented disaggregated or separately from one another, and the most relevant **scope 3 emissions categories must be presented disaggregated, or separately,** from scope 1 and 2 emissions
- If there are changes to the GHG emissions baseline (see Section 5.1), or the GHG emissions inventory boundaries (see Section 5.1.2.1), participants should provide an explanation

### 5.1.2 Developing or updating a base year GHG emissions inventory

For participants that are new to developing a base year GHG emissions inventory, three key steps explained in the following sections are:

1. determining the boundary of the base year inventory
2. identifying the GHG emissions sources within those boundaries

3. quantifying the GHG emissions from those sources—either directly (for example, monitoring and measuring) or indirectly (for example, using emission factors)

Participants may use third-party tools and calculators to quantify their GHG emissions for the base year inventory. Participants may hire a third-party company to calculate their base year GHG emissions inventory and use this for their participation in the Net-Zero Challenge.

If a participant does not have scope 1 or 2 emissions, they **must** report on at least one scope 3 category to ensure that they have reported emissions that can be reduced to net-zero by 2050, or earlier.

An example of how to identify and quantify GHG emissions can be found in Annex A.

#### 5.1.2.1 Step one: setting inventory boundaries

The first step for developing a base year GHG emissions inventory is to set the organizational boundaries. Organizational boundaries refer to how to define the company or corporation for the purposes of establishing a GHG inventory. These boundaries are easily defined for smaller organizations that wholly own all their operations, though it is a more complex task for larger corporations. The GHG Protocol Corporate Standard describes three standard approaches to define these boundaries: equity share, operational control, and financial control. Participants may use any of these approaches when defining their organizational boundary.

**Table 9:** Base year GHG emissions inventory boundaries

| Boundary | Description |
|---|---|
| **Equity share** | Percent of ownership: Accounts for emissions based on the equity share the company holds in the operation. For example, Company ABC would report 60% of the emissions if it owns 60%. |
| **Operational control** | When a company or subsidiary has the full authority to introduce and implement operating policies then it must report 100% of the emissions from each operation under its operational control, regardless of its financial stake. |
| **Financial control** | Directs financial and operational policies for economic benefit; financial control is often indicated by voting rights, financial reports etc.<br><br>**Note:** Emissions from joint ventures where the partners have joint financial control are accounted for based on the equity share approach; if a business is treated as a subsidiary in the parent's financial reports, then the parent company is considered to have financial control. |

If a company or organization is using office space(s) and/or vehicle(s) that are leased to them, then they should categorize those emissions under scope 1, 2, or 3 based on whether they have either financial or operational control over the leased asset(s).

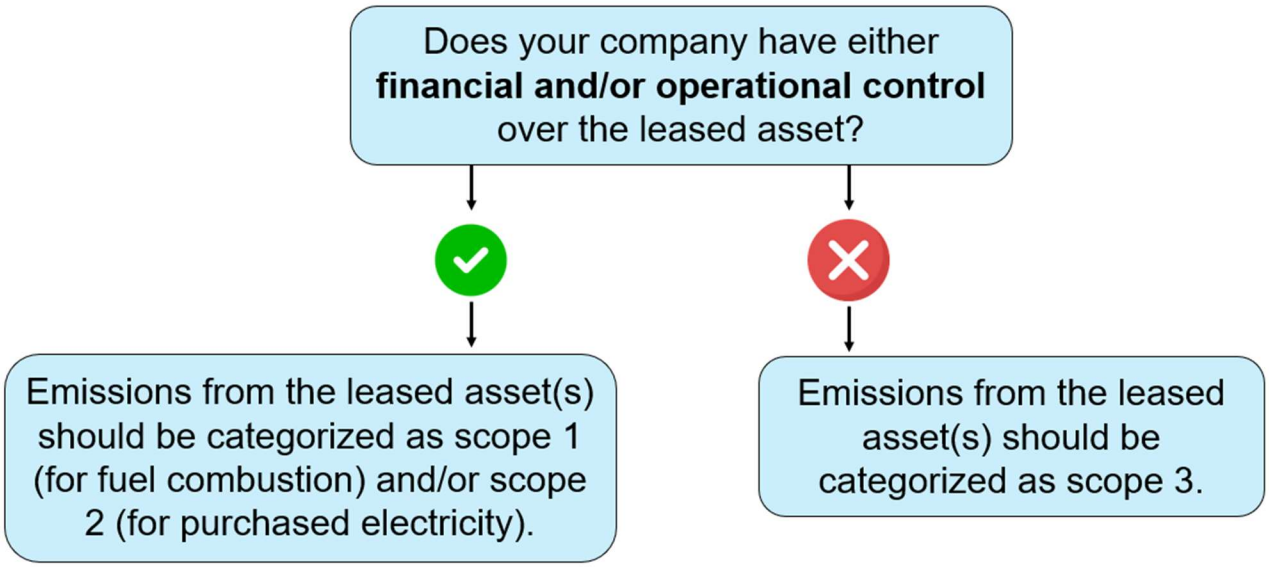



**Figure 1:** How to categorize emissions scopes for leased assets

Participants in the Challenge may refer to the GHG Protocol's Appendix F – Categorizing GHG Emissions Associated with Leased Assets for more information.

#### 5.1.2.2 Step two: identifying GHG emissions sources

The second step to develop a base year GHG emissions inventory is to identify the sources of the GHG emissions for each scope of emissions.

> For example, a company may determine that they do not have any direct or scope 1 emissions since they operate in an office space; have scope 2 emissions via their electricity use; and their company's work is linked to five of the scope 3 categories (see Section 4.3 – Scope 3 emissions for more information).

The methodology to identify the GHG emissions sources for each scope is detailed below.

##### 5.1.2.2.1 Identifying scope 1 emissions

All participants will need to identify their direct emissions—also known as scope 1 emissions—from one or more of the types of activities listed in Table 7. Each participant will have a different proportion of emissions from each category. For instance, process emissions are usually only relevant to certain industry sectors.

Many participants, such as office-based organizations, may not have any scope 1 (direct) emissions. In that case, participants must explain in their Net-Zero Challenge questionnaires that they do not have any direct emissions.

There are no specific methodologies for identifying scope 1 emissions; rather participants should have an understanding of where their direct emissions come from given their operations and given the descriptions of common direct emissions sources. Participants are encouraged to be as broad as possible when identifying their scope 1 emissions and should include even the smallest of sources in their GHG emissions inventory.

#### 5.1.2.2.2 Identifying scope 2 emissions

All participants will need to identify their scope 2 emissions, which are emissions from purchased energy and brought into the company's organizational boundary (for example, from the grid). Participants should determine their energy sources for any electricity, steam, heating, and cooling that is used but not generated on-site.

For participants that are leasing their property and that have limited or no control over their scope 2 emissions, please review Figure 1 and/or Appendix F to the GHG Protocol Corporate Standard for more information on which scope of emissions to use.

Certain participants may not have any scope 2 emissions. In that case, participants must explain in their Net-Zero Challenge questionnaires that they do not have any scope 2 emissions.

#### 5.1.2.2.3 Identifying scope 3 emissions

As explained in Section 3.1.1 – Scope 1, 2, and 3, some participants must include some scope 3 emissions categories while others are encouraged to do so.

Scope 3 emissions include all indirect emissions in the value chain, and the GHG Protocol recommends that companies focus on those that have the most significant GHG emissions and offer the most significant emissions reduction opportunities.[14] At the same time, companies are encouraged to include as many of the relevant scope 3 categories as possible to form a fuller and more accurate picture of their GHG emissions.

The GHG Protocol suggests a set of criteria that companies can use to identify relevant scope 3 emissions activities. These criteria are outlined in **Table 10** below. After identifying relevant scope 3 emissions activities and quantifying those emissions, companies can better assess which scope 3 emissions categories are the most relevant to their organization.

**Table 10:** Criteria for identifying relevant scope 3 emissions activities

| Criteria | Description of activities |
|---|---|
| Size | They contribute significantly to the company's total anticipated scope 3 emissions |
| Influence | There are potential emissions reductions that could be undertaken or influenced by the company |
| Risk | They contribute to the company's risk exposure (for example, climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, and reputational risks) |
| Stakeholders | They are deemed critical by key stakeholders (for example, customers, suppliers, investors or civil society) |
| Outsourcing | They are outsourced activities previously performed in-house, or activities outsourced by the reporting company that are typically performed in-house by other companies in the reporting company's sector |
| Sector guidance | They have been identified as significant by sector-specific guidance |

[14] GHG Protocol, *Technical Guidance for Calculating Scope 3 Emissions*, (2013), p. 11.

| | |
|---|---|
| Spending or revenue analysis | They are areas that require a high level of spending or generate a high level of revenue (and are sometimes correlated with high GHG emissions) |
| Other | They meet any additional criteria developed by the company or industry sector |

#### 5.1.2.3 Step three: quantifying GHG emissions

The third and final step for developing a base year GHG emissions inventory is to quantify each respective scope of emissions. As noted previously, the scope 1 and 2 emissions must be in absolute terms (for example, XXX tCO2e), while the scope 3 base year emissions may be expressed either as absolute terms, an emissions intensity, or as a narrow range of estimates including a description on the confidence level of those estimates.

Participants may reference Annex A for an example on how to quantify and calculate their base year scope 1 and 2 emissions. Details on how to quantify these emissions for each scope is provided in the sections below.

##### 5.1.2.3.1 Quantifying scope 1 emissions

To quantify scope 1 emissions, participants will need their bills or receipts from their identified direct emission sources (for example, gas, diesel, etc.) for the applicable base year. They will then need to calculate the emissions using resources such as the National Inventory Report. See Annex A for an example of the full calculation.

Monitoring and measuring GHG emissions is critical for quantifying emissions, and thus participants with the capacity to do this are encouraged to do so. The GHG Protocol provides guidance for carrying out GHG emissions inventories and the Green House Gas Reporting Program's Canada's Greenhouse Gas Quantification Requirements could be considered the gold standard for quantifying scope 1 emissions.

Multinational companies developing global net-zero plans should use country-specific or activity-specific emission factors whenever possible. The GHG Protocol provides several on-line calculation tools and calculation guidance, including cross-sector tools, for common emissions sources like stationary combustion and transportation, and sector-specific tools for certain industries.

Special consideration is needed when calculating emissions from biogenic sources such as plants and plant materials, animal waste, wood, biologically derived organic matter in municipal and industrial wastes, landfill gas, and others. See Section 8.1 – Biogenic carbon accounting for more information.

##### 5.1.2.3.2 Quantifying scope 2 emissions

To quantify scope 2 emissions, participants need to determine their total consumption of these purchased energy forms on an annual basis. For electricity purchased from the grid, participants can simply refer to their utility bills to determine consumption. As with scope 1 emissions, emission factors can be used to quantify the emissions from this consumption. Canada's latest National Inventory Report includes electricity emission factors reflecting the Canadian and provincial averages (found in Part 3, Annex 13 of the National Inventory Report). Participants may also use more localized emission factors should the information be available.

For guidance on determining the quantity of steam, heat and cooling, and for complex electricity situations (for example, shared buildings), refer to the GHG Protocol's guidance for scope 2. For participants that lease their space, refer to Appendix F to the GHG Protocol Corporate Standard.

#### 5.1.2.3.3 Quantifying scope 3 emissions

Scope 3 emissions are the most difficult to estimate as the assets associated with these emissions are not owned or controlled by the company or organizations. Nevertheless, good faith estimates can be made using the latest available guidance and best practices. It is also acceptable to determine a range of estimates for scope 3 emissions and describe the confidence level in these estimates.

Participants are encouraged to refer to the GHG Protocol's guidance on scope 3 to help estimate these emissions. Additional resources are listed on the Net-Zero Challenge website.

## 5.1.3 Resources for base year GHG emissions inventories

There are several helpful international resources that may be used by participants developing and updating their base year GHG emissions inventories:

The GHG Protocol is the most widely used standard for GHG accounting (that is, counting emissions to construct a GHG emissions inventory). The GHG Protocol identifies, explains, and provides options for GHG emissions inventory best practices. Many other initiatives, such as the Science Based Targets initiative and the United Nations Race-to-Zero Campaign refer to the GHG Protocol and use its terminology. The Net-Zero Challenge also references the GHG Protocol and recommends that participants follow its guidance to develop and update their GHG emissions inventory.

Participants can use other widely accepted methodologies and tools to develop their GHG emissions inventory. For example, financial institutions participating in the Challenge may want to use financial sector-specific tools, such as those developed by the Partnership for Carbon Accounting Financials. Participants can also refer to the Strategic Assessment of Climate Change and the associated technical guides for additional guidance on GHG quantification and the assessment of Best Available Technologies/Best Environmental Practices. If a participant is developing a Canada-specific GHG emissions inventory, it is preferred that they use Canada-specific guidance where it exists, such as Canadian emission factors as published in the most recent National Inventory Report.

Participants may wish to use the International Organization for Standardization 14064 standard for quantifying, monitoring, reporting, and verifying GHG emissions, including ISO 14064-1 (GHG emissions and removals for organizations—corporate level), , and ISO 14064-3 (validation and verification of GHG statements). The ISO 14064 standard is also largely complementary to the GHG Protocol and participants could benefit from using both sets of guidance. Specifically, if a participant wishes to have their GHG emissions inventory verified by an accredited third-party, it is recommended that they use the ISO 14064-1 standard to ensure that their GHG emissions inventory is developed in a way that can be easily verified and compared to the inventories of other organizations.

Furthermore, the International Organization for Standardization has developed Net Zero Guidelines, which Net-Zero Challenge participants are **encouraged** to reference when developing their net-zero targets. The Guidelines set a common path for:

- the definition of “net-zero” and related terms (for example, greenhouse gas removals, offsetting, value chain, etc.)
- clarifying the differences in scope between direct emissions, indirect emissions from purchased energy, and other indirect emissions arising from an organization’s activities
- high-level principles for all actors who want to achieve climate neutrality
- actionable guidance on getting there as soon as possible, by 2050 at the very latest

- transparent communication, credible claims, and consistent reporting on emissions, reductions and removals

ISO/TC 207/SC 7 (the ISO Greenhouse Gas and Climate Change Management committee) is developing these guidelines into a verifiable International Standard to meet the demands of businesses around the world to demonstrate compliance, and address calls for greater clarity and accountability in the market to reduce greenwashing. This Standard – ISO 14060 Net Zero Aligned Organizations – is currently in development as of 2025.

Participants may also refer to ISO 14068-1 (Climate change management – Transition to net zero Part 1: Carbon neutrality) which provides principles, requirements, and guidance for carbon neutrality, including quantifying, reducing, and offsetting carbon emissions using an approach that prioritizes reductions and removals before offsetting.

## 5.1.4 Changes to the base year GHG emissions inventory

In the future, changes to the base year GHG emissions inventory **may be needed** due to changes to the company (for example, mergers, acquisitions, expansions), or changes to the calculation scope or methods (for example, adding scope 3 emissions categories or more accurate measurement), or other reasons.

Explanations for both acquisitions and divestments are provided in **Table 11** below:

**Table 11:** Acquisitions and divestments

| **Acquisitions** |
|---|
| **Example:** Company A joins the Net-Zero Challenge in 2023, using 2019 as their base year. In 2024, they acquire another company (Company B). Once the acquisition is complete, Company A (which is now both companies) should recalculate its base year emissions by taking Company B's emissions from that year into account.<br>**Potential scenarios:**<br>**A.** Company A's base year inventory was 40 $tCO_2e$ in 2019, and Company B's base year was 15 $tCO_2e$ in 2019. They would now combine both baselines for that year and explain the acquisition to the Challenge, indicating that the base year emissions are now 55 tons for 2019.<br>**B.** Company B only began operating in 2021, which is after Company A's base year (2019). Company A's base year inventory (40 $tCO_2e$) therefore does not change given that there are no additional emissions from Company B to be added for that base year. That said, Company A must indicate that they acquired Company B in 2024 in their next Net-Zero Challenge questionnaire. Company A then has two options: (i) they select 2024 (or later) as their new base year as it includes both companies; or (ii) they leave 2019 as their base year and mark an "increase" in emissions for the year 2024.<br>**C.** If it is too challenging to calculate the 2019 emissions for Company B, it is recommended that the newly merged company select another base year for which the calculation is possible for both companies. |
| **Divestments** |

**Example**: If Company A divests or splits, therefore becoming Companies A and B, then it would remove all of what is now Company B's emissions from its base year inventory and reporting.

**More specifically:** Company A's base year emissions were 65 $tCO_2e$ in 2022, but then divested in 2023 to become Company A and Company B. It would remove what is Company B's emissions (20 $tCO_2e$ in 2022), making Company A's new base year emissions 45 $tCO_2e$ in 2022.

It is recommended that participants recalculate the base year when the cumulative change in emissions is 5% or more of the base year. If this occurs, participants should update their base year inventory and include an explanation of the changes in their next Net-Zero Challenge questionnaire.

## 5.2 Public commitment to plan to achieve net-zero emissions

The second minimum requirement for the Preliminary Questionnaire is a public commitment to plan for net-zero emissions by 2050, or earlier. All participants in the Net-Zero Challenge agree to publicly commit to plan for net-zero emissions by 2050 or earlier for their scope 1, scope 2, and, if applicable, scope 3 emissions. Participants can choose to be even more ambitious by choosing an earlier target year or by aiming to achieve negative emissions by 2050.

The public net-zero commitment must include all emissions that are contained within the GHG emissions inventory, including scope 1, scope 2, and scope 3 emissions, as applicable. Financial institutions participating in the Challenge are required to include scope 3 category 15 in their reporting, while all other participants (excluding SMEs and heavy industry) are required to include at least one category of scope 3 emissions. All participants are encouraged to include as many categories of scope 3 emissions as possible.

The public commitment to plan for net-zero emissions must be stated either on the company's website or LinkedIn page, although it is strongly encouraged to use the website. The public commitment must include the company's name, the target year (for example, 2050), and information about scope 1, 2, and 3 emissions, where applicable.

Note that providing the link to the Net-Zero Challenge's list of participating companies and/or stating the company has "joined the Net-Zero Challenge" with no further details of their net-zero commitments is not acceptable evidence for meeting the minimum program requirements.

Once ready, companies can choose to set an absolute emissions reduction, or an emissions intensity net-zero target. The net-zero target can be a single target for all emissions, or it can be a set of targets for each emissions scope. For example, a participant can have an absolute net-zero target for all their emissions, including scope 1, scope 2, and scope 3. Alternatively, a participant can also have a set of targets, including an absolute emissions reduction target of net-zero by 2050 for their scope 1 and/or scope 2 emissions, and an emissions intensity target of net-zero by 2050 for their scope 3 emissions.

Companies may also choose to have different net-zero commitment years for each emissions scope, providing that the years are prior to or by 2050. For example, a participant can have a net-zero by 2040 target for their scope 1 and 2 emissions, and a net-zero by 2050 target for their scope 3 emissions.

It is strongly recommended that participants set an absolute emissions reduction net-zero target for all of their emissions.

## 5.3 Corporate governance

The third and final minimum requirement for the Preliminary Questionnaire is corporate governance. As part of the preliminary net-zero plan, participants must provide a description of their corporate governance strategy. This should demonstrate how net-zero planning, emissions reductions targets, and, more broadly, climate change risks and opportunities, are incorporated into business and/or investment decisions. Some questions that could be considered include:

- how will the net-zero plan be incorporated into capital investment decisions to ensure that the right investments are made in a timely manner (for example, when there is a capital stock turnover) to allow the company to meet its emissions reduction targets
- what role does the board, and the executive leadership have in overseeing net-zero planning and implementation
- have climate-related responsibilities been assigned to management-level positions or committees
- has the board been made aware and have knowledge of climate risks
- how is management informed about progress on implementing and meeting the targets of the net-zero plan
- for participants that have an Energy Management System, how can this framework be leveraged to drive energy efficiency improvements and align operational strategies with the organization's corporate governance strategy

In addition, many companies have found it useful to have Environmental, Social, and Governance (ESG) criteria as a metric in executive compensation. Companies are encouraged to consider linking net-zero planning and/or ESG criteria to executive compensation, where possible. It is recommended that participants consult the guidance developed by Principles for Responsible Investment when considering how to integrate ESG issues into executive pay.

There are no specific criteria that participants must present in their net-zero plan to demonstrate that they are meeting this requirement, since a corporate governance strategy may look different for each participant. Rather, participants must simply provide evidence that there is publicly available information on their corporate governance strategy and how it considers the net-zero plan, for example, describes management's commitment and demonstrates progress toward achieving stated goals.

# 6.0 Comprehensive Questionnaire

As noted in Section 3.2 – Program steps and timelines, the Comprehensive Questionnaire must be submitted within 24 months of joining the Challenge. It may also be submitted simultaneously with the Preliminary Questionnaire. Participants receive a participation tier after submitting their Comprehensive Questionnaire and their participation level will be re-evaluated each time they submit an Annual Questionnaire.

The following sections provide information on the three minimum requirements of the Comprehensive Questionnaire.

**Comprehensive Questionnaire minimum requirements**

1. Publicly available first interim target for all appropriate scopes
2. Evidence of mitigation strategies
3. Reporting of use of offset credits, PPAs, and RECs, if applicable

# 6.1 First interim target

The first of the three minimum requirements for the Comprehensive Questionnaire is a **publicly announced** first interim target. The first interim target must cover all scope 1 and 2 emissions, and any applicable scope 3 emissions.

## 6.1.1 Definition of an interim target

Selecting interim targets based on mitigation strategies and anticipated reductions along the path to net-zero is a key component of a credible net-zero plan. Interim targets help to map progress towards net-zero.

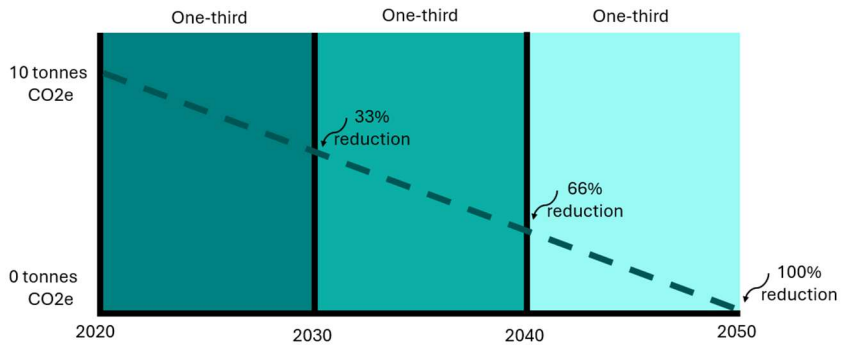



**Figure 2:** Interim targets

The Net-Zero Challenge requires participants to identify mitigation strategies to inform and set interim targets to ensure that they are on a successful path to net-zero. Figure 2 provides an example of a straight-line path to net-zero, with two interim targets.

A set of interim targets refers to multiple targets that collectively include all emissions contained within the GHG emissions inventory, including scope 1, scope 2, and scope 3 emissions, where applicable. Interim targets are anchored to a specific year, although the target and years may vary. For example, a first interim target might be a 50% reduction target for scopes 1 and 2 and 40% for scope 3 by 2030. The identification of interim targets is based on selecting viable mitigation strategies to determine emissions reductions.

## 6.1.2 Requirements for interim targets

Similarly to the net-zero target, the interim targets must also be publicly announced on the company's website or LinkedIn page, although publishing on the website is the preferred approach. The public interim targets must include the company name, its target (%), the applicable scopes for the target, the mitigation strategies to be used to achieve the reductions, and the target year(s).

Example of a publicly announced interim target: “Company ABC commits to reducing its scope 1 emissions 25% by 2030 by switching from a natural gas boiler to a commercial heat pump, and its scope 2 emissions by 18% by 2030 by increasing its efficiency of electricity use.”

The Net-Zero Challenge stipulates a few key parameters (see **Table 12** below for both the first and second interim targets to ensure that they meet a minimum level of credibility and rigour. Participants are encouraged to be as transparent as possible when publicly disclosing their interim targets.

**Table 12:** Key parameters for interim targets

| Parameter | First interim target | Second interim target |
|---|---|---|
| **Sequence** | Participants must have two stipulated sets of **sequential interim targets**, which are at different points in time – such as 2035 and 2045 | |
| **Net-zero target** | Required by all participants, except for those with a **net-zero target for the year 2030 or earlier** | Required by all participants, except for those with a **net-zero target for the year 2040 or earlier** |
| **Setting the targets** | Must be defined and publicly announced as part of the **Comprehensive Questionnaire** | May be left undefined until required, and then it must be publicly announced |
| **Timelines** | Must be set **at least five years** from the date of joining the Challenge, but **no later than 2035** | Must be set **at least five years** from the date of the first interim target, but **no later than 2045** |
| **Anchored dates** | Interim targets must be **anchored to specific years**, such as 2030 and 2040. Participants can choose the years providing that they adhere to the other requirements above | |
| **Emissions scopes to include** | Interim targets must include **all GHG emissions** in the GHG emissions inventory<br>• Participants must set interim targets for **each scope** required by their participation stream and for any **additional scope 3 emissions** categories voluntarily included in their net-zero plan<br>• Participants may have a combined (aggregated) **scope 1 and 2 target** but are strongly encouraged to identify separate scope 1 and 2 targets<br>• Participants must have separated (disaggregated) scope 3 targets for their **most relevant scope 3 emissions categories** | |
| **Mitigation strategies** | Mitigation strategies should be described for each scope of emissions with the % of emissions reductions expected | |
| **Maximum deviation** | The target for scope 1 and 2 emissions must meet a **maximum deviation** of 40% from the straight-line path as described below in Section 6.1.4<br>• Scope 3 emissions do not have a maximum deviation | Further guidance on the second interim target is currently under development and will be shared once finalized |
| **Modifying targets** | Interim targets can be modified, if necessary, in an Annual Questionnaire | |
| **Target type** | Emissions reduction targets can be stated in terms of **absolute emissions** reductions **or emissions intensity**, as described below in Section 6.1.3 | |

## 6.1.3 Target type

Planning for emissions reduction targets can be stated in terms of **absolute emissions or emissions intensity** reductions. Companies may set their interim targets in either manner, although an absolute emissions reduction target is preferred. Companies can also use a combination of target types in their interim targets. For example, a participant can have an absolute reduction target for their scope 1 and/or scope 2 emissions and an emissions intensity target for their scope 3 emissions.

An **absolute emissions reduction target** is based on total emissions and is expressed as a percentage reduction relative to a base year, irrespective of any other metric. For example, Canada's emissions reductions target under the Paris Agreement is an absolute emissions reductions target: "Canada will reduce its economy-wide GHG emissions by 40-45% below 2005 levels by 2030."

An **emissions intensity reduction target** specifies emissions reductions relative to productivity or economic output. For example, this type of reduction target could be the percentage of emissions per unit sold. This type of target can be expressed as "Company ABC will reduce its emissions intensity by 40% by 2030."

Although the examples above are expressed as percentages, this is not a mandatory requirement. Interim targets can be expressed as a specific reduction amount (for example, 5 tonnes), so long as it is measurable against the base year GHG emissions inventory and meets the other parameters described above.

## 6.1.4 Selecting a first interim target

Participants in the Net-Zero Challenge must have two sets of interim targets, unless their net-zero target date is set for 2040 or earlier (see **Table 12**). A set of interim targets refers to multiple targets that collectively include all emissions contained within the GHG emissions inventory, including scope 1, scope 2, and scope 3 emissions. Each set of interim targets must be anchored to a specific year. For instance, the first interim target might include one target for scope 1 and 2 emissions and a separate target for scope 3 emissions, and both targets are meant to be achieved by the year 2030.

Figure 3 provides an example of a straight-line pathway to net-zero with two interim targets, with a 2020 base year and 2050 as the net-zero target year. This would mean that emissions need to be reduced by one third (33%) each decade. In the example below (see Figure 3A), total emissions are reflected on the y-axis – which in this case is a starting baseline of 10 tonnes. The x-axis is in years, starting from the base year (2020) to the net-zero target (2050). The company can therefore draw a straight-line between the two points. In drawing a straight-line between the two points, the interim targets require a 33% reduction by 2030, a 66% reduction by 2040, and a 100% reduction by 2050 (that is, net-zero).

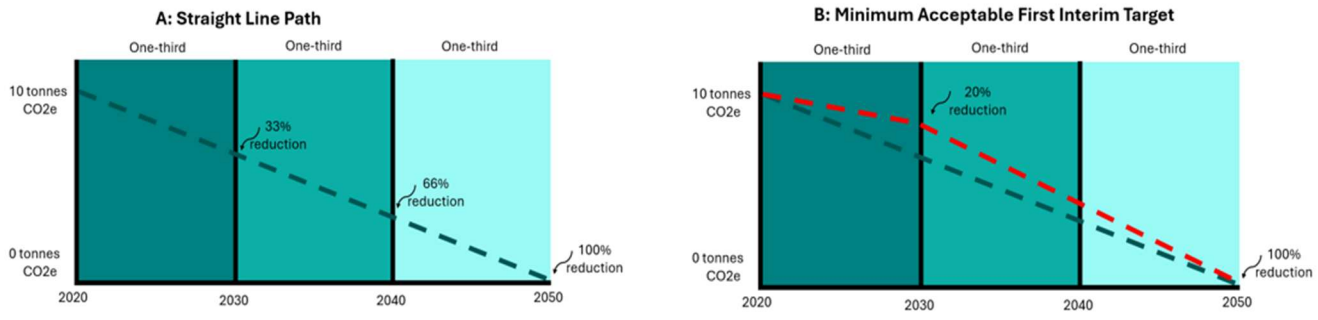


**Figure 3:** Choosing a first interim target

The Net-Zero Challenge requires the first interim target to have a minimum level of ambition. Figure 3A describes the straight-line path to net-zero. Figure 3B describes the maximum deviation for the first interim target based on the straight-line path described in Figure 3A. Note that for an intensity target, the unit of the y-axis will be tonnes CO2e/activity output instead of tonnes CO2e only.

Given that the pathway to net-zero will look different for everyone, participants are allowed to have a maximum deviation of **up to 40%** from the straight-line path for the first interim target for scope 1 and 2 emissions. This is to accommodate the varying challenges in achieving net-zero while ensuring a minimum level of ambition for **scopes 1 and 2**. The calculation for the maximum deviation is explained in Section 6.1.5 – Calculating the maximum deviation for the first interim target. Although encouraged, there is no maximum deviation for **scope 3** emissions, since these emissions can be difficult to reduce. There is no minimum deviation, since participants are encouraged to be as ambitious as possible with their first interim target. Deep, early reductions are encouraged as much as possible to enable the world to stay on a pathway for 1.5°C.

In the example provided in Figure 3B, the participant wants to set their first interim target for 2030. Based on their base year (2020) and net-zero target year (2050), the participant would need a 33% emissions reduction target if they were to use the straight-line path and a 20% emissions reduction target if they were using the maximum deviation calculation (see Section 6.1.5).

The first interim target requirements are to ensure a minimum level of reductions of scope 1 and 2 emissions by 2030. Further reductions are highly encouraged where viable mitigation strategies exist. As detailed above in **Table 12**, fewer interim targets are required for participants targeting net-zero by 2030 and 2040.

## 6.1.5 Calculating the maximum deviation for the first interim target

The maximum deviation for the first interim target is calculated based on the straight-line path to net-zero, with the equations being as follows:

$$y = mx + b$$

Where:

**y** is the emissions at the target year

**m** is the slope of the line

**x** is the number of years from the base year to the target year

**b** is the y-intercept at the target year

As mentioned in Section 6.1.4 – Selecting a first interim target, participants in the Net-Zero Challenge are allowed to have a maximum deviation of **up to 40%** from the straight-line path for the first interim target, if necessary. The first interim target can therefore be calculated by applying a factor of 0.6 to the slope of a straight-line path from the base year to net-zero. This calculation will provide an equation of a line, and the participant can input the first interim target year to determine emissions in that year.

$$y_1 = m_1 x_1 + b_1$$

Details of the steps:

**Step 1:** Determine the slope ($m_1$) and apply the 0.6 factor

$$m_1 = 0.6 * \left(\frac{0 - Base\ year\ emissions}{Netzero\ target\ year - Base\ year}\right)$$

**Step 2:** Determine the y-intercept ($b_1$)

$$b_1 = Base\ year\ emissions$$

**Step 3:** Determine the number of years from the base year to the interim target ($x_1$)

$$x_1 = First\ interim\ target\ year - Base\ year$$

**Step 4:** Place the inputs into the equation and solve for the emissions at the interim target year ($y_1$)

$$y_1 = m_1 x_1 + b_1$$

**Step 5 (optional):** Calculate the first interim target as a reduction percentage

$$\% = 100 - \left(\frac{First\ interim\ target}{Base\ year\ emissions}\right) * 100$$

This percentage indicates the first interim target's minimum reduction of emissions from the base year (also known as the maximum deviation).

Note that this calculation is only used to determine the maximum deviation for the first interim target and should not be used to determine the second interim target or to describe the pathway to net-zero. Participants are strongly encouraged to have a first interim target that is much more ambitious than this permitted deviation. Note that for an intensity target, the unit will be tonnes CO2e/activity output instead of tonnes CO2e only for an absolute target.

#### 6.1.5.1 Calculation example for the maximum deviation allowed for the first interim target

The following is the calculation for the first interim target, using the same years and numbers from Figure 3.

In this example, the participant has the following base year and target years:

**Base year emissions:** 10 tonnes

**Base year:** 2020

**First interim target year:** 2030

**Net-zero year:** 2050

Details of the steps:

Calculating the first interim target emissions requires finding the inputs for the equation and then applying a factor of 0.6 to the slope:

$$y_1 = m_1 x_1 + b_1$$

**Step 1:** Determine the slope ($m_1$), and apply the 0.6 factor

$$m_1 = 0.6 * \frac{0 - Base\ year\ emissions}{Netzero\ target\ year - Base\ year}$$

$$m_1 = 0.6 * \left(\frac{0 - 10\ t}{2050 - 2020}\right)$$

$$m_1 = -0.2\ t/year$$

**Step 2:** Determine the y-intercept ($b_1$)

$$b_1 = Base\ year\ emissions$$

$$b_1 = 10\ t$$

**Step 3:** Determine the number of years from the base year to the interim target ($x_1$)

$$x_1 = First\ interim\ target\ year - Base\ year$$

$$x_1 = 2030 - 2020$$

$$x_1 = 10\ years$$

**Step 4:** Place the inputs into the equation and solve for the emissions at interim target year ($y_1$)

$$y_1 = m_1 x_1 + b_1$$

$$y_1 = -0.2 * 10 + 10$$

$$y_1 = 8\ t$$

**Step 5 (optional):** Calculate the first interim target as a reduction percentage

$$\% = 100 - \frac{8\ t}{10\ t} * 100$$

$$\% = 20\%$$

This company's maximum deviation for their first interim target is therefore 20% by 2030 as opposed to 33%, which would be the figure for their straight-line path. The participant must therefore target 8 tonnes or more of emissions reductions at the first interim target year of 2030, representing an emissions reduction target of 20% from the base year.

## 6.2 Evidence of mitigation strategies

The second minimum requirement for the Comprehensive Questionnaire is to provide evidence of mitigation strategies (see Section 6.2.2 - Identifying mitigation strategies) for each of the applicable emissions scopes.

In order to determine the best mitigation strategies, participants are encouraged to conduct scenario analysis. To be clear, participants are **encouraged** but **not required** to conduct scenario analysis. Scenario analysis serves as the framework for identifying and modelling different pathways to net-zero. Scenarios are not predictions of what will happen in the future, but instead are narratives of plausible descriptions of the future, since different scenarios are based on different inputs and assumptions.

Scenarios can form the basis for identifying a pathway to net-zero and selecting interim targets. The end point (for example, net-zero by 2050) is pre-determined and participants will need to identify a plausible pathway to reach this goal. Participants are encouraged to use a bottom-up approach for scenario analysis, in which possible mitigation strategies that can be implemented in the short-term are identified, and expected actual emissions reductions are determined from there.

## 6.2.1 Developing in-house scenario analysis

Developing scenarios in-house can allow for a tailored approach that includes details specific to the participant's business. Below are SBTi principles[15] that can be used to ensure that net-zero scenarios are credible and effective:

| Plausible | Consistent | Responsible |
|---|---|---|
| Based on a credible narrative. The higher the plausibility of the scenario, the more likely the scenario might be realized. | Built with logic rather than with assumptions or parameters that ignore current trends without a logical explanation. | Developed to be objective, while giving no regard to the organization's preferences. |

When creating in-house scenarios, participants should draw on credible national sources such as ECCC's Biennial Transparency Review 1 report, the Canada Energy Regulator, or the National Inventory Report to inform various inputs. Participants may wish to refer to global scenarios developed by external sources such as the Intergovernmental Panel on Climate Change and the International Energy Agency.

For more targeted scenarios, consider using regional sources such as publicly available utility data from the Ontario Energy Board (OEB) or the Alberta Electric System Operator (AESO). For technology cost data, consider using regional resources such as The Toronto 2030 district buildings tool for commercial building decarbonization, or the US National Renewable Energy Laboratory's Annual Technology Baseline for technology costs and projections. Energy benchmarking can also be used to evaluate how a given facility is performing in terms of energy use and energy-related emissions compared to its peers. The ENERGY STAR for Industry program can provide participants with performance indicators for their consideration.

#### 6.2.1.1 Timeline for scenarios

Participants are encouraged to think about their scenarios in the near-term (that is, 2025-2030), mid-term (that is, 2030-2040), and long-term (that is, 2040-2050):

- when designing **near-term** scenarios, participants should identify mitigation strategies that are currently available and implementable, assuming the current policy, socio-economic, infrastructure, and technology environment continues into the near-term
- in the **mid-term**, participants should continue to identify realistic mitigation strategies, while making modest assumptions about the direction of policies and socio-economic factors and the development and implementation of infrastructure and technology

[15] Science Based Targets initiative, *Foundations of Science-Based Target Setting*, (2019), p. 10-11.

- in the **long-term**, participants can make more ambitious assumptions about the future but should avoid making assumptions that completely overturn existing trends without a logical explanation

It is important to note that scenario analysis is an iterative process. Participants will need to continually assess their scenarios and adjust their assumptions and mitigation strategies based on changing information.

Scenario analysis should take assumptions (Section 6.2.1.2 – Assumptions for scenario analysis) and mitigation pathway development (Section 6.2.1.3 – Use of mitigation strategies as inputs for pathway development) into consideration to develop a potential path to net-zero by 2050.

#### 6.2.1.2 Assumptions for scenario analysis

Some scenarios will make assumptions to model a pathway to net-zero emissions. These assumptions may include the following external conditions:

- policies and regulations (for example, carbon pricing, offset credits, GHG emissions regulations)
- socioeconomics (for example, expected prices or costs, population growth)
- infrastructure (for example, future availability of clean electricity, hydrogen pipelines)
- technology (for example, when known but nascent technology will become commercially viable; the potential for technology that is in the research, design, and development (RD&D) phase)

"Relevant" assumptions are those that have the potential to impact the choice of mitigation strategies or that could influence the modelled pathway in some other way. When making assumptions on policy, economics, infrastructure, and technology during the development of scenarios, participants should make more modest assumptions, especially in the present and near-term.

The table below provides an example of what making these assumptions might look like in practice. It is important to note that the preferred scenario is one that uses the most modest assumptions possible and that prioritizes early emissions reductions.

**Table 13:** Examples of scenario analysis assumptions

| Assumption | Result | Timeline |
|---|---|---|
| **Green technology that is currently in R&D becomes commercially available** | 30% reduction of scope 1 emissions | By 2040 |
| **Canada's grid becomes net-zero** | 70% reduction of scope 2 emissions | By 2050 |
| **Suppliers reduce emissions/achieve net-zero emissions** | 40% reduction of scope 3 emissions | By 2050 |

#### 6.2.1.3 Use of mitigation strategies as inputs for pathway development

It is possible to develop a pathway by only modelling the chosen mitigation strategies. This may be sufficient to identify a reasonable—and actionable—pathway, without taking into consideration a broader context, especially for participants with a relatively small gap between their starting point and net-zero. For more information about identifying mitigation strategies, see Section 6.2.2 – Identifying mitigation strategies.

When creating a net-zero pathway, there are a few key internal inputs that should be included:

1. the GHG emissions base year (the pathway starting point)
2. mitigation strategies
3. net-zero emissions by 2050, or earlier (the pathway end point)

**Table 14:** Examples of pathway mitigation strategies

| Mitigation strategy | Result | Timeline |
|---|---|---|
| **Transition to electric vehicle fleet** | 34% reduction of scope 1 emissions | By 2030 |
| **Reduce business travel** | 20% reduction of scope 3 emissions | By 2030 |
| **Reduce energy demand and displace with solar panels** | 30% reduction of scope 2 emissions | By 2033 |
| **Upgrade furnace with more efficient model** | 15% reduction of scope 1 emissions | By 2035 |

Since pathway mitigation strategies will determine what the target could, or should be, there will likely be adjustments to strategies to align with targets.

### 6.2.2 Identifying mitigation strategies

Mitigation strategies that maximize the likelihood of successfully reaching net-zero are critical. Generally, strategies should prioritize engaging in emissions reductions as early as possible. However, careful attention should also be given to whether or not an identified mitigation approach or investment, particularly those that require large capital expenditures, will result in an asset or system that is only partially decarbonized once deployed at maximum potential.

Potential mitigation strategies can be modelled to determine how they impact emissions reductions based on different assumptions, which can then help participants select the best pathway to net-zero. Important questions that could be asked to determine this might include:

- does the approach significantly reduce emissions from a process or a practice, eliminating essentially all emissions
- will there be a potential to fully decarbonize this practice in the future using this approach
- is the approach or technology scalable
    - for example, electrification of a portion of a company's fleet may be more expensive per tonne of GHGs reduced than an alternative in the near-term but could enable the building of internal expertise and infrastructure that helps broader adoption in future
- are there substitutes or alternative approaches that give similar GHG benefits in the near term but that will be better aligned with a net-zero economy
- will an investment enable further widescale adoption of another net-zero technology

While emissions reductions may not be realized immediately, participants are encouraged to begin making the necessary investments as early as possible to build momentum towards net-zero systems.

Mitigation strategies that include early actions and that result in early emissions reductions should be prioritized whenever possible, as these are involved in the most likely pathways for Canada and the world to meet net-zero by 2050.

Mitigation strategies should also be prioritized by the quantity of emissions reductions they achieve. Mitigating actions can be conceptualized according to three categories, which have a hierarchy to their actions, as outlined in **Table 15** below.

**Table 15:** Hierarchy of mitigation strategies

| Hierarchy | Strategy | Definition |
|---|---|---|
| First strategy | Avoid emissions | Actions that avoid creating emissions in the first place or that eliminate emissions at their source |
| Second strategy | Reduce emissions | Actions that work to reduce the number of emissions coming from a source |
| Third strategy | Offset emissions | Actions that reduce or remove GHG emissions in the atmosphere and are issued offset credits from an offset system or program, which can then be used to compensate for residual emissions. |

Participants can use any methodology they wish to identify mitigation strategies. A good place to start is your base year emissions (Section 5.1.2). Are there certain parts of your operations that contribute more to GHG emissions than others? Interventions here (if feasible) could have an outsized impact on scope 1 and 2 emissions. One recommended methodology is the Best Available Technologies/Best Environmental Practices Determination process described in Environment and Climate Change Canada's Technical Guide Related to the Strategic Assessment of Climate Change.

## 6.2.3 Minimum requirements for mitigation strategies

Participants **must provide information on planned mitigation strategies** and specify the percentage of anticipated emissions reductions from the mitigation strategies for each applicable scope of emissions.

The following sections provide examples of mitigation strategies that may be used for each scope of emissions.

Participants are encouraged to focus their attention on their direct (scope 1) emissions and applicable mitigation measures first, given that these are within the company's or organization's direct control. Mitigation strategies to achieve reductions in indirect emissions (scope 2 and scope 3) are important but may be more difficult to achieve due to the ability to control or influence them.

## 6.2.4 Examples of mitigation strategies

There are a wide range of mitigation strategies that can be deployed to reduce scope 1, 2, and 3 emissions. This section provides a list of some examples. Participants are encouraged to consult resources produced by reputable organizations to inform their mitigation strategies, such as the International Energy Agency, United Nations reports, Government of Canada documents, Canada's Net-Zero Advisory Body, and think-tanks.

**Table 16:** Examples of mitigation strategies

| Emissions scopes | Examples of mitigation strategies |
|---|---|
| **Scope 1** | • Electrification and energy-efficient heating and cooling systems<br>• Zero-emission vehicles for company fleet<br>• Use of clean technologies:<br>  ○ renewable energy<br>  ○ capturing fugitive methane leaks<br>  ○ switching to cleaner fuels<br>  ○ carbon capture, utilization, and storage |
| **Scope 2** | • Reduce demand, where possible<br>• Employ energy-efficiency measures:<br>  ○ implement an energy management system to improve efficiency of energy consumption<br>  ○ using less air conditioning<br>  ○ installing energy-efficient appliances or lightbulbs<br>  ○ investments in renewable energy produced on-site<br>• For any remaining emissions, participants may enter into off-site power purchase agreements, participate in utility green power programs, or purchase Renewable Energy Credits |
| **Scope 3** | • Supplier engagement<br>• Procurement policies and choices<br>• Product and service design<br>• Customer engagement<br>• Business model innovation<br>• Optional policies<br>• Investment strategies |

It is recognized that plans to reduce scope 3 emissions will likely be the most imprecise of the three scopes. Participants should make their best estimate of how their actions—whether engaging suppliers or finding cleaner procurement options—will reduce their emissions. As these actions are implemented, the net-zero plans can be refined and corrected to reflect their actual outcomes.

## 6.2.5 Additional considerations for mitigation strategies

### 6.2.5.1 Regulatory requirements for scope 1 emissions

When identifying mitigation strategies for scope 1 emissions, participants should also be aware of any regulatory requirements that they must meet. This can help participants be more efficient in their net-zero planning by selecting mitigation strategies that simultaneously meet their regulatory requirements and avoid, reduce, or offset their emissions.

For example, the upstream oil and gas sector is subject to the *Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)*, which introduces emissions limits and requires industry to regularly inspect and repair equipment to reduce

emissions. Participants impacted by these regulations might find it more efficient to focus on mitigation strategies that help them meet these requirements earlier on in their net-zero plans, rather than later.

#### 6.2.5.2 Carbon capture utilization and storage (CCUS)

CCUS encompasses a range of technologies designed to capture, transport, utilize, and permanently store $CO_2$. The CCUS process involves the capture of $CO_2$, generally from large point sources, including power generation or industrial facilities that use either fossil fuels or biofuels, or directly from the atmosphere through Direct Air Capture (DAC). Once captured, $CO_2$ can be utilized on-site, compressed for transport, and applied across various industrial uses or injected into geological formations for long-term storage. CCUS is one of few available technologies that can yield significant emissions reductions in hard-to-abate sectors. CCUS can be retrofitted to existing facilities, enabling them to continue operating while reducing emissions. More information on this technology is available from the International Energy Agency and from the Government of Canada's Carbon Management Strategy.

#### 6.2.5.3 Scope 3 emissions and the co-benefits of a circular economy

Resource efficient circular strategies to reduce emissions can be understood as opportunities to use less, use longer, and use again[16]. Incorporating circular strategies as part of a company's value chain could yield notable upstream scope 3 emissions savings. Working with suppliers and prioritizing circular materials – which are, for example, materially-efficient, renewable, directly reused, refurbished, or recycled – in both production-related (for example, feedstock) and non-production-related products (for example, office supplies, furniture) is one strategy to reduce supply chain emissions, particularly in products with high emission factors such as aluminum, cement, steel, certain chemicals, and agricultural imports. Companies can also re-design products and production processes to minimise the waste generated. This strategy has the benefit of potentially reducing scope 3 through decreased volume of inputs (scope 3, category 1) and less need for waste management and treatment (scope 3, category 5). It may also be possible to identify strategies to intensify the use of capital good procured (scope 3, category 2), through for example greater vehicle sharing among employees or reduced office floor space.

Other scope 3 emissions savings could occur from waste minimization along the value chain for downstream scope 3 emissions. For example, retailers can reduce their scope 3 emissions by reducing the plastic packaging of their products, eliminating single-use items, and promoting re-use. Common packaging material such as plastics, paper, and metals contributes GHG emissions at various points along their value chain. By reducing packaging, companies can potentially reduce their downstream category 12 (that is, end-of-life treatment of sold goods) emissions. In addition, companies can design products in a way that aligns with less emission intensive end-of-life treatment [category 12]. Of note, whereas resource-efficiency and circularity can be improved through the sale of more durable products, scope 3 emissions accounting often does not capture GHG reductions from durability improvements and reference to the GHG protocol is recommended.

#### 6.2.5.4 Scope 3 emissions and financial institutions

The primary source of scope 3 emissions for financial institutions are their investment and lending portfolios. As investors and lenders, financial institutions are in a unique position to influence the climate change plans of their clients. As one mitigation strategy, financial institutions could consider divesting

[16] Canadian Climate Institute, *How circularity can contribute to emissions reductions in Canada*, (2023).

from certain high emitting sectors or not investing in new projects in high emitting sectors that do not have sufficient mitigation strategies or net-zero plans in place. For example, the Powering Past Coal Alliance, co-founded by Canada and the United Kingdom in 2017, requires that financial institution members commit to no new financial services and investments for unabated coal power.

One strategy is to enable real-economy transition efforts by financing emissions reductions, particularly in Canada. Financial institutions can enable decarbonization efforts through financing and investment, that is, capital mobilization toward transition and de-carbonization initiatives. The GFANZ framework on transition finance and the UK Transition Finance Market Review outline four key transition financing strategies that financial institutions can use to support capital mobilization.

Another strategy is to work with corporate clients (borrowers and investees) to ensure that they are developing net-zero targets and plans for their scope 1 and 2 emissions, and where possible, scope 3 emissions. To help achieve emissions reductions from scope 3 emissions, participants can encourage other companies in their investment or lending portfolios to develop their own net-zero plans with similar ambitions. For instance, membership and active participation in engagement groups, including Climate Action 100+ and Climate Engagement Canada, can be leveraged to demonstrate planned mitigation strategies for scope 3 emissions.

## 6.3 Reporting offset credit use

The final minimum requirement for the Comprehensive Questionnaire is the reporting of planned or purchased offset credits. If necessary, participants may use offset credits as a strategy to achieve net-zero emissions in the Net-Zero Challenge. Participants should first seek to avoid and reduce as much of their own scope 1, 2, and 3 emissions as possible via mitigation strategies. Participants may use offset reductions, if necessary to achieve interim targets. At net-zero, participants must use offset removal credits to address any residual emissions, from hard-to-abate sources.

### 6.3.1 Offset credits minimum requirements

All participants **must** report whether they plan to use offset credits in their net-zero plans, which scope(s) of emissions they anticipate using those offset credits for, whether they are offset reductions or removals credits, and from which offset credit systems. For participants that plan to purchase or that have already purchased offset credits, they may achieve a higher participation tier based on the source of the offset credits. For more information, see Section 3.3 – Net-Zero Challenge participation tiers.

Some participants may be able to achieve net-zero emissions by 2050 without the use of offset credits, in which case they are not required to provide disclosure for the offset credit criteria in the participation tiers.

All participants **should** ensure that all offset credits used in their net-zero plans follow the guidelines and recommendations outlined in Section 6.3.2. All participants are **encouraged** to be as transparent as possible when it comes to the use of offsets in their net-zero plans.

### 6.3.2 General guidelines for offset credits use

Offset credits can be generated by projects that reduce the amount of GHG emissions released into the atmosphere (for example, landfill methane destruction), as well as from projects that remove carbon dioxide from the atmosphere (for example, nature-based climate solutions such as improved forest management [see Section 8.3 – Nature-based climate solutions]; or technology-based carbon dioxide

removals activities such as direct air $CO_2$ capture and storage). Offset credits can be purchased by a participant from compliance-based or voluntary offset credit systems.

Participants are **strongly encouraged** to prioritize offset use first from compliance-based programs in Canada for example, federal or provincial government offset systems, then from the voluntary carbon market. If purchasing offset credits from the voluntary carbon market, participants are strongly encouraged to purchase credits from domestic programs based on Core Carbon Principles approved by the Integrity Council for the Voluntary Carbon Market (ICVCM), or from domestic offset projects registered under an offset standard/registry endorsed by the International Carbon Reduction and Offset Alliance (ICROA).

Participants should ensure that all offset credits used in their net-zero plan, regardless of whether they are from a compliance-based system or a voluntary program, are high-quality and reflect additional, quantified, verified, unique, permanent, and real emissions reductions.[17] When purchasing credits, participants may also wish to consider the project type as well as other social or economic goals such as job creation, economic opportunities for local and Indigenous communities, and supporting broader efforts related to reconciliation. Environmental co-benefits could also be considered such as habitat restoration, conservation, biodiversity and clean water.

Once purchased, offset credits are retired, voluntarily cancelled, or otherwise removed from circulation in the associated offset system registry. Participants should retain information about the serial numbers of retired offset credits and these serial numbers should be specified in reporting to ensure transparency.

Participants should also ensure that any offset credits used are valid at their time of use and reflect reductions or removals that have high quality and high environmental integrity. Offset credits can only be used if they reflect emissions reductions that have occurred after the participant's base year (for example, if you have a base year of 2015, you cannot use a credit that represents emissions reductions from the year 2014). Participants should aim to use (that is, retire) offset credits that have been issued no more than eight (8) years prior to the date of retirement, because newer offset credits tend to reflect more recent offset protocols and up-to-date quantification approaches.

In addition, if an offset credit is used and is then found to be invalid at a later time, the participant **must** ensure additional replacement offset credits are retired (see Section 6.3.6.2 – Accounting for offset credits).

It is important for participants to be aware of the risks associated with certain project types that may put their offsetting plans at risk. Potential concerns may include offset project types with a high risk of reversal, where stored carbon could be released back into the atmosphere following a reversal event. However, the offset programs that are recommended in Section 6.3.3 ensure that reversal risk is mitigated at the offset program level. These recommended offset programs (compliance and voluntary) have measures to address risks and compensate for reversals. Participants should ensure they understand and consider the liability structure for replacing invalid credits. Some offset systems ensure invalid credits are replaced by the project proponent (seller liability), while other offset systems require that invalid offset credits are replaced by the buyer (buyer liability). Another potential risk is that certain

[17] In line with ISO 14064-2: 2019 *Greenhouse gases - Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements* and the Pan-Canadian Greenhouse Gas Offsets Framework, agreed by the Canadian Council of Ministers of the Environment in 2018.

offset projects may involve technologies or practices that lock in emissions that are inconsistent with net-zero emissions trajectories. Participants are encouraged to avoid such projects.

Offset projects should also be sourced from offset credit systems with effective environmental and social safeguards that ensure projects mitigate impacts to biodiversity, hydrological and/or nutrient cycles, and food security. To limit these risks, participants should ensure the environmental integrity of their carbon credits, regularly revise their offset strategy, and shift offset strategies to those with durable storage (that is, a low risk of reversal). Recommendations for high integrity offset credit systems are listed in Sections 6.3.3 and 6.3.4. Participants may wish to consult the Oxford Principles for Net Zero Aligned Carbon Offsetting to strengthen their offsetting approach.

Carbon removal technologies are becoming increasingly important in net-zero plans as we approach 2050. **However, they should not be used to delay action towards reducing emissions.** Several organizations, including the World Resources Institute, the IEA, and the Intergovernmental Panel on Climate Change (IPCC) have mentioned the importance of using carbon removals to meet global climate goals. Currently, the carbon removal market is nascent, and supply may be constrained. It is important that participants do not fall into mitigation deterrence or lose focus on internal emissions reductions because of a heavy reliance on offset credits.

### 6.3.3 Domestic offset credits

For Canadian facilities and operations, it is strongly recommended that participants use offset credits that are issued by Canadian federal and provincial government offset systems, such as the *Federal Greenhouse Gas Offset System*. Doing so can help ensure that the offset credits meet all of the general guidelines outlined above. It can also help participants to be recognized in the Participation Tiers (see Section 3.3 – Net-Zero Challenge participation tiers).

Those wishing to acquire or use federal or provincial offset credits have several options to do so:

- buyers may purchase the offset credits directly from a project proponent
    - buyers are able to negotiate a price with the seller and may decide to either have the credits transferred to their registry account to use or trade later, or request that the proponent retire or voluntarily cancel the offset credit on their behalf
    - note that no federal or offset system registry account would be needed in the latter case
- buyers may hire a credit broker or trader who will connect project proponents with buyers for a fee
    - the buyer would then be responsible for opening an account in the compliance system registry and retiring/voluntarily cancelling the credit themselves
- buyers may purchase the credits from a credit retailer, who purchases the offset credits and retires them on the buyer's behalf
    - the credits may not be transferred to the buyer, meaning that the buyer may not need a federal or provincial system registry account

For further questions related to the federal and provincial government offset systems, companies may contact the Federal GHG Offset Credit program or the following provincial offset credit programs: the Alberta offset credit program, the British Columbia offset credit program, or the Québec offset credit program.

Participants may also choose to purchase domestic offset credits generated from the voluntary offset market. These offset credits should also meet the general guidelines outlined above. For Canadian operations, it is strongly recommended that participants seek offset credits generated from voluntary offset projects based in Canada that align with the best practices outlined in the Canadian Council of Ministers of the Environment *Pan-Canadian Greenhouse Gas Offsets Framework*. Participants are **encouraged** to first consider offset projects registered under offset protocols that have been assessed by the Integrity Council for the Voluntary Carbon Market for adherence to the Core Carbon Principles, and then offset credits from domestic projects registered under an Endorsed Standard as listed by the International Carbon Reduction and Offset Alliance.

## 6.3.4 International offset credits

Participants **should** prioritize domestic credits. International offset credits **may** be used but it is strongly recommended that these credits be used only for GHG emissions from a participant's international operations. International offset credits should be generated from established and reputable offset systems or programs, and any offset credits used should have high environmental integrity. These offset credits should meet the general guidelines outlined above.

Canada recognizes that internationally transferred mitigation outcomes (ITMOs) under Article 6 of the Paris Agreement have the potential to complement domestic efforts and contribute to sustainable development abroad. Following Canada's strong advocacy of robust international rules for ITMOs to ensure environmental integrity, transparency and the avoidance of double-counting at COP26, efforts are ongoing to develop a federal policy on the use of ITMOs.[18] Given the ongoing work to develop a policy on ITMOs, participants are strongly encouraged to use only domestic offset credits towards making progress on their net-zero targets.

## 6.3.5 Generating and selling offset credits

Participants engaged in the generation and selling of offset credits must ensure that the GHG emissions from their offset projects are accurately accounted for in their GHG emissions inventory. Accounting for offset projects should include all emissions that result from any activity for which credits are awarded, including off-site (that is, leakage) and secondary effects from offset generating projects.

Offset projects undertaken by participants should be registered with either a compliance-based system such as Canada's Greenhouse Gas Offset Credit System, any of the provincial offset systems, or a voluntary-based system ideally under an ICVCM-approved offset credit system and protocol with the core carbon principle label.

## 6.3.6 Reporting and accounting of credit transfers

Participants may undertake GHG mitigation projects within their own operations that may result in access to, or the generation of credits. The following sections provide guidance on how to report and account for these credit transfers.

### 6.3.6.1 Reporting

In line with the GHG Protocol, reports should present relevant information that is complete, consistent, accurate, and transparent. Participants that generate and sell different types of carbon credits (for

[18] Government of Canada, *Canada's 2030 Emissions Reduction Plan - Chapter 4*, (2022).

example, offset credits, emissions allowances, or environmental performance credits such as surplus credits) from GHG mitigation activities taking place within their own operations must take additional steps to report these GHG emissions reductions or removals.

Specifically, participants must transparently report on the generation and sale of any credits produced within their own operations separately from their GHG inventory. Transparency around credit generation and sales will help to create a clear picture of progress towards net-zero targets.

#### 6.3.6.2 Accounting for offset credits

It is a best practice to report on a GHG inventory separately from reporting on progress towards a net-zero target. This means presenting GHG inventory numbers in separate rows or lines from the purchase or sale of offsets, power purchase agreements, or renewable energy certificates. This helps to avoid double counting between GHG emissions reductions and offsets. Double counting is when the same carbon reduction or removal is counted more than once and can occur in three different ways:

i. double issuance is when more than one offset credit is issued for the same reduction or removal
ii. double claiming is when two entities claim the same reduction or removal
iii. double use is when the same offset credit is sold or used more than once, undermining its integrity

Double counting is inherent when the GHG sources from which the reductions or removals occur are included in more than one target for different organizations.[19] This is why reporting offset credit generation, sale, purchase, and use separately from the GHG inventory is important.

In alignment with the GHG Protocol, a GHG inventory should reflect GHG emissions from sources included in the organization's boundary and should not be affected by the use or transfer of offset credits. The transfer of offset credits does not increase the transferors' reported GHG inventory. Likewise, the purchase of offset credits does not decrease the buyer's or transferee's reported GHG inventory. Instead, offset credits are accounted for in the context of reporting progress towards achieving a net-zero target.

Simply reporting offset credit sales may be insufficient to avoid perceptions of double counting. To ensure high levels of environmental integrity, participants that generate offset credits from projects within their own operations that are sold to another entity towards their net-zero targets should consider deducting the GHG emissions reductions associated with offset credits from progress towards its net-zero targets.

A participant that transfers offset credits no longer has ownership over the associated GHG reductions or removals. Instead, the transferee or buyer of those offset credits would count those emissions reductions or removals towards progress of its own net-zero targets,[20] or could otherwise use the offset credits for regulatory compliance. Participants that generate offset credits may also choose to retire all, or a portion of offset credits they have generated from their own operations so that all, or some GHG reductions or removals can be reflected in progress towards achieving that participant's net-zero target.

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[19] Greenhouse Gas Protocol, *A Corporate Accounting and Reporting Standard*, Chapter 8.

[20] This aligns with the *VCMI Claims Code of Practice* v1.10 which states that Carbon credits underpinning Carbon Integrity Claims are not counted towards the internal emissions reduction that company undertakes to meet decarbonization targets. Rather, these purchases are used in support of achieving the company's climate goals and accelerating the collective effort to reach global net-zero emissions.

A participant should consider timing when accounting for offset credit transfers within its own net-zero target. For example, the year in which a particular participant's generated offset credits are sold or transferred should be the same year in which those offset credits are deducted from progress towards its own net-zero target.

#### 6.3.6.3 Accounting for other credits

Similarly, the generation, sale, purchase and use of other credits employed for regulatory compliance do not impact the GHG emissions inventory and should be reported separately. These other credits may include emission allowances, surplus credits, and environmental performance credits.

Emissions allowances are a compliance unit in Quebec's GHG emission cap-and-trade system and need to be submitted by regulated industry for each tonne of GHG emissions released into the atmosphere.[21] Surplus credits are a compliance unit in the federal *Output-Based Pricing System Regulations* and are issued to regulated facilities whose emissions are lower than their applicable emissions limit.[22] Emissions performance credits are a type of compliance unit under *Alberta's Technology Innovation and Emissions Reduction Regulation* and are generated by a regulated facility that reduces GHG emissions below their allowable emissions level specified in the regulation.[23] Other provincial pricing systems have similar credits but may have different names.

## 6.4 Use of Power Purchase Agreements and Renewable Energy Certificates

Participants may consider Power Purchase Agreements (PPAs) and Renewable Energy Certificates (RECs) to contribute to reductions in scope 2 emissions; PPAs are preferred over RECs.

PPAs are long-term contracts (average duration of 10-20 years) between a renewable energy supplier and a business. A PPA contract will guarantee a pre-set number of megawatt-hour (MWh)f per month to be purchased by a business at a contracted price. Physical PPAs occur when a business and a renewable energy project are on the same energy grid, whether that be on- or off-site. Virtual PPAs are an option for participants to agree to pay a contracted price to a renewable energy developer without taking physical delivery of the electricity. The energy supplier will put renewable energy into their grid and the business can claim the GHG benefits.

Participants **may** enter these contractual agreements and certify their "use" of renewable energy to contribute towards the reduction of scope 2 emissions in the Net-Zero Challenge program.

Participants **may** wish to use Renewable Energy Certificates (RECs) to lower their GHG emissions. A REC is provided by an energy supplier to a customer to certify the generation of one MWh of electricity from a renewable energy source (for more information see, Renewable Energy Certificates (RECs) | US EPA). RECs therefore provide organizations with a valid claim that energy was procured from a renewable energy source. RECs are not the same as offset credits; RECs certify the generation of renewable energy, whereas offsets represent emissions that are avoided, reduced, or removed. However, RECs may be a useful option for participants who do not have access to clean electricity grids

[21] Government of Québec, *Reducing big business GHG*, (2025).
[22] Government of Canada, *Output-Based Pricing System*, (2025).
[23] Government of Alberta, *Technology Innovation and Emissions Reduction Regulation*, (2019).

to reduce their scope 2 emissions. The GHG protocol is updating its scope 2 guidance and revisions may implicate how RECs are eligible, used and reported.

In GHG reporting, the use of PPAs and RECs should be accounted for separately in an annual inventory, as is the case for offsets.

## 6.5 Land-use change

The term “land-use change” can cover a wide range of activities and generally refers to human actions that impact how land is used—whether as forests, farms, wetlands or urban developments, among other uses. Some change to how land is used could be relatively neutral in terms of the impact on GHG emissions. However, typically these changes either increase GHG emissions (for example, deforestation) or decrease them (for example, reforestation). To achieve net-zero emissions by 2050, land-use change considerations are important. For example, these changes play a critical role in all mitigation pathways that limit warming to 1.5°C or well-below 2°C in the Intergovernmental Panel on Climate Change (IPCC) Special Report: Global Warming of 1.5°C. [24]

While changes to land use that result in the release of GHG emissions are not included in the GHG Protocol guidance for the corporate accounting of emissions, Net-Zero Challenge participants are **strongly encouraged** to include these emissions when developing and reporting on their net-zero plans. These emissions should be integrated into scope 1, 2, or 3 emissions and targets, as applicable.

Participants **should** disclose which methodology they use to quantify their land-use change emissions. For Canada-specific guidance, participants are encouraged to refer to the technical guidance in the Strategic Assessment of Climate Change. Participants can also refer to the forthcoming Land Sector and Removals Guidance from the GHG Protocol.

## 6.6 Stand-alone net-zero plans for Canadian facilities and operations

As detailed in Section 3.3 – Net-Zero Challenge participation tiers, the Net-Zero Challenge rewards ambition in net-zero planning through the Participation Tiers. Participants are designated as either “Bronze,” “Silver,” or “Gold” after submitting their Comprehensive Questionnaire, and their participation level will be re-evaluated each time they submit an Annual Questionnaire. One way that participants with operations in multiple countries can achieve a higher tier is by having a stand-alone net-zero plan for their Canadian facilities and operations.

Often, net-zero planning information is embedded across multiple company reports, such as an annual or sustainability report, rather than in a single report dedicated to climate action and net-zero planning. In all instances, participants are encouraged to develop stand-alone net-zero plans, whether they are at the global or regional level, as stand-alone plans increase transparency and accountability.

Given that the Net-Zero Challenge is a made-in-Canada approach to net-zero planning, one additional requirement to achieve a higher tier is to publish a stand-alone net-zero plan for all Canadian facilities

[24] The Intergovernmental Panel on Climate Change (IPCC), *Global Warming of 1.5°C*, (2019). *An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*.

and operations. The stand-alone plan for Canadian facilities and operations must include all elements required by the comprehensive net-zero plan (see Section 6.0 – Comprehensive Questionnaire).

Multinational companies that choose to meet this tier requirement are still encouraged to have a net-zero plan for their global facilities and operations in addition to their Canadian facilities and operations. A stand-alone global net-zero plan that contains specific information on the company's Canadian facilities and operations (a Canada section, Annex, Appendix, etc.) and that meets all the requirements mentioned above, will count as a stand-alone net-zero plan for Canadian facilities and operations.

## 6.7 Third-party validation, verification, and assurance

Third-party validation, verification, and assurance can be undertaken on an organization's information (for example, environmental data) by an independent external organization. The third party evaluates assumptions, methodologies, and processes, assesses the accuracy and completeness of data, verifies the reliability of data management procedures and processes, and adheres to protocols and standards for calculating environmental metrics and proposed actions.

The advantages include:

- highlighting risks and opportunities
- increasing credibility, reliability, and accuracy of the data
- increasing trust and legitimacy
- helping to avoid or counter accusations of false or misleading environmental claims

ISO 14064-3 Second edition 2019-4: Greenhouse gases—Part 3: Specification with guidance for the verification and validation of greenhouse gas statements "(the Standard)" should be used by verifiers. The Standard is for the verification and validation of GHG emissions inventories, which includes the base year GHG emissions inventory and all future GHG emissions inventories of the organization that demonstrate progress towards a target, as well as assumptions, limitations, and methods.

ISO 14065 is the accreditation standard that specifies requirements for organizations that verify greenhouse gas (GHG) information. It ensures that third-party verification bodies operate with competence, consistency, and impartiality. The Standards Council of Canada (SCC) and ANSI National Accreditation Board (ANAB) provide accreditation to verification bodies.

In November 2024, the International Auditing and Assurance Standards Board published its International Standard on Sustainability Assurance which is scheduled to take effect in December 2026.

Third party organizations can provide "assurance" which is a measure of confidence that GHG metrics and reduction plans are accurate and complete. Reasonable assurance provides a higher level of assurance on data and information assessed (although not absolute), and limited assurance provides a lower level of assurance on data and information assessed.

Participants who would like to be recognized through the **program's tier system as Gold Tier must provide proof of third-party assurance**. To achieve the tier, participants must:

- use a third party organization accredited by the Standards Council of Canada (SCC) or ANSI National Accreditation Board (ANAB)
- have their emissions inventory verified
- have their applicable targets (for example, interim targets, net-zero target) verified

SMEs are exempt from this tier requirement.

All participants in the Net-Zero Challenge are **encouraged** to have their net-zero plans verified and validated by an accredited third party and seek some level of assurance.

# 7.0 Annual Questionnaire

Participants are required to **report on progress annually** by submitting the Annual Questionnaire. The first Annual Questionnaire must be submitted within 18 months of submitting the Comprehensive Questionnaire. The 18-month timeframe is to allow participants the time to strategically align the submission of these questionnaires with other reporting requirements, such as annual sustainability or ESG reports, should they choose to do so.

Following the submission of the first Annual Questionnaire, participants must submit subsequent Annual Questionnaires on an annual basis—between 11 months after the previous submission, and up to one month after the one-year mark. The Net-Zero Challenge will not accept submissions earlier than this time frame, as the purpose of the Annual Questionnaire is to verify if there have been changes since the last reporting period.

The main purpose of the Annual Questionnaire is to prompt participants to provide information on changes since the last questionnaire was submitted that impact the achievement of GHG emissions reductions and net-zero plans. Net-zero planning is an ongoing process and plans are likely to change significantly between now and 2050. Scenarios and mitigation strategies will need to be adjusted to account for new information (for example, new assumptions, new clean technologies) which may emerge.

**Table 17** below lists the minimum requirements for the annual questionnaire along with references to the relevant sections in this guide.

**Table 17:** Minimum requirements for the Annual Questionnaire

| minimum requirements for the Annual Questionnaire | Section in the Technical Guide |
|---|---|
| Updates to the base year GHG emissions inventory, including any changes to the inventory boundaries | Section 5.1.4 |
| A recent annual GHG emissions inventory, with a clear comparison to the base year inventory. **Note:** The GHG emissions inventory numbers must be reported in separate rows or lines from the purchase or sale of offsets, power purchase agreements, or renewable energy certificates. | Section 5.1 |
| Reiteration of the publicly announced interim targets, including any changes | Section 5.2<br>Section 6.1 |
| Progress on mitigation strategies, including any changes | Section 6.2 |
| Reiteration of offset credit use, including any changes | Section 6.3 |
| Changes to the incorporation of net-zero planning in corporate governance | Section 5.3 |
| Changes to whether the net-zero plan is Canada-specific | Section 6.6 |

The Annual Questionnaire assesses participant progress in achieving interim and net-zero targets. Net-zero plans that do not achieve the minimum emission reductions required for interim, or net-zero targets are not considered to be meaningfully reducing emissions.

Minimum emission reduction requirements are outlined for the first interim target in Section 6.1 of the Technical Guide. Participants will be given a one-year resolution period to meet their interim emissions reduction target or the minimum emissions reduction requirement, before their participation in the program is reconsidered. Given that the first interim target must be set between 2030 and 2035, all participants will have to meet a minimum emission reduction requirement by 2036, at the latest.

Minimum emission reduction requirements for the second interim target will be outlined in future technical guidance. Note that a second interim target:

- is not required if a participant has set their net-zero target for 2040 or earlier
- must be set at least five years from the date of the first interim target, but no later than 2045
- must include all scope 1 and 2 emissions, and any scope 3 emissions categories that are required through the program
- must be anchored to a specific year (for example, 2040)
- must be publicly announced on the company's website or LinkedIn page

Like the other questionnaires, annual progress reporting can be completed using publicly available information. Participants are encouraged to publish progress on the implementation of their net-zero plan publicly, whether as part of another annual report or as a stand-alone report. Annual progress reporting is meant to ensure that participants remain in compliance with the Net-Zero Challenge, to provide transparency, and to assess progress in net-zero planning and implementation.

# 8.0 Other considerations

There are several other considerations that participants may wish to contemplate when developing their net-zero plans and completing their participation questionnaires. The following sections provide details of each which participants are encouraged, but not required, to consider.

## 8.1 Biogenic carbon accounting

Special consideration is needed when calculating emissions from biogenic sources. The following materials are all considered to be biogenic materials:

- plants or plant materials, animal waste, or any product made of either of these, including wood and wood products, charcoal and agricultural residues
- biologically derived organic matter in municipal and industrial wastes
- landfill gas, bio-alcohols, black liquor, sludge digestion gas, animal-derived oils, and plant-derived oils

Participants may create emissions through the combustion of biogenic materials in on-site combustion processes, in waste incineration processes, and in the flaring of landfill gas. These combustion processes will result in scope 1 emissions. However, in these instances, participants should not count $CO_2$ emissions deriving from the combustion of biogenic materials but rather **should only count** the $CH_4$ and $N_2O$ emissions in their GHG emissions inventory. This is because biogenic materials remove $CO_2$ from the atmosphere over their lifetime and thus the release of $CO_2$ back into the atmosphere results in an approximated net-zero exchange of $CO_2$. However, this is not the case for $CH_4$ and $N_2O$ emissions, which therefore still need to be quantified. Participants should be careful in distinguishing between biogenic materials and non-biogenic materials; for example, in waste incineration, there can also be fossil-fuel based carbon materials and the $CO_2$ emissions from these materials should be included.

Furthermore, participants may generate emissions from biogenic materials even when it is not combusted. This can occur through the decomposition of biomass in waste disposal and wastewater treatment processes and in the fermentation of biomass materials. In these instances, the resulting $CO_2$ emissions should not be counted, but any $CH_4$ and $N_2O$ emissions should be counted in the GHG emissions inventory.

The Net-Zero Challenge aligns with the GHGRP on biogenic carbon accounting and further guidance can be found in the GHGRP Technical Guide.

## 8.2 Climate-related financial disclosures

Climate-related financial disclosures are an important part of net-zero planning. They allow businesses to better understand and address their climate-related risks and opportunities.

Some participants in the Net-Zero Challenge are currently subject to disclosure requirements set by relevant regulatory and oversight bodies while others may be subject to them in the future. Specifically:

- the Government of Canada requires federal Crown Corporations to disclose in line with the climate-related financial disclosure recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) or to more rigorous acceptable standards[25]
- the Office of the Superintendent of Financial Institutions (OSFI) has published its guidance on climate risk management for federally regulated financial institutions[26]
- the Canadian Securities Administrators (CSA), the group representing provincial financial regulators, published a consultation draft on climate-related disclosures for public companies in 2021;[27] however, in April 2025[28] they announced that they are pausing their work on the development of a new mandatory climate-related disclosure rule[29]
- in 2024, the Government of Canada announced its intention to bring forward amendments to the *Canada Business Corporations Act* to mandate climate-related financial disclosures for large, federally incorporated private companies while seeking to harmonize its regulations with those that will be required from public companies by securities regulators[30]

Participants that are not subject to mandatory requirements are encouraged to voluntarily disclose in line with requirements applicable to industry peers, or to the latest international or national standards on climate-related financial disclosures, IFRS S2 or CSDS2, respectively.

The International Sustainability Standards Board (ISSB) has published two Sustainability Disclosure Standards, the IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) and IFRS S2 (Climate-related Disclosures). The IFRS Sustainability Disclosure Standards are based on the four pillars of the TCFD.[31]

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[25] Government of Canada, *A Recovery Plan for Jobs, Growth and Resilience*, (2021).
[26] Office of the Superintendent of Financial Institutions, *Climate Risk Management*, (2023).
[27] Canadian Securities Administrators, *Canadian securities regulators seek comment on climate-related disclosure requirements*, (2021).
[28] Canadian Securities Administrators, *CSA issues market update on climate-related disclosure project*, (2024).
[29] Canadian Securities Administrators, *CSA issues market update on climate-related disclosure project*, (2024).
[30] Government of Canada, *Government advances Made-in-Canada sustainable investment guidelines and mandatory climate disclosures to accelerate progress to net-zero emissions by 2050*, (2024).
[31] International Sustainability Standards Board, *ISSB issues inaugural global sustainability disclosure standards*, (2023).

The Canadian Sustainability Standards Board, an organization that works to advance the adoption of sustainability disclosure standards in Canada, used the IFRS S1 and IFRS S2 as baselines to develop the Canadian Sustainability Disclosure Standards "CSDS 1, General Requirements for Disclosure of Sustainability-related Financial Information" and "CSDS 2, Climate-related Disclosures" for Canadian companies.[32] CSDS 1 and CSDS 2 are now part of the *CPA Canada Handbook – Sustainability*.

The standards, guidance, and rules highlighted above include disclosure of scope 1, scope 2, and if applicable, scope 3 emissions, disclosure of climate-related targets, corporate governance, climate risk and risk management, and the impact on business strategy and financial planning.

## 8.3 Nature-based climate solutions

Nature-based climate solutions are actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.[33] [34] These solutions use tools such as restoration, conservation, and improved management of ecosystems to mitigate and adapt to the effects of climate change while supporting biodiversity and human well-being.[35] Research indicates that natural climate solutions and land sector management may reduce the effects of climate change and contribute up to 30% of the climate mitigation required by 2050.

Given the wide range of benefits, participants in the Net-Zero Challenge are **encouraged** to use nature-based climate solutions as possible offset credits, where applicable. Note that this section discusses nature-based climate solutions for mitigation purposes only, and not for climate adaptation. However, nature-based climate solutions focused on climate mitigation may also contribute to adaption, as they achieve multiple benefits. For example, the protection of a wetland for its carbon sequestration capacity will also secure its function to regulate floods, which are increasing under the effects of climate change.

Nature-based climate solutions for climate mitigation vary by ecosystem and focus on preventing GHGs from being released into the atmosphere or removing them from the atmosphere. It is important that these projects are properly planned and managed to ensure the greatest benefit is achieved and to reduce the risk of unintended harm to the environment.

Many countries around the world have included nature-based climate solutions in their net-zero plans. As part of Canada's 2030 Emissions Reduction Plan, the Government of Canada is investing in the Natural Climate Solutions Fund to additionally help achieve its objectives in emissions reductions with nature-based climate solutions. The Fund supports projects that conserve, restore, and enhance wetlands, peatlands, and grasslands to store and capture carbon.

In Canada, there are four major ecosystems that can be used for nature-based climate solutions. For each of these, different approaches—whether protection, restoration, or improvement management – will vary depending on the type of ecosystem. The priority should be to protect threatened ecosystems with high ecological integrity.

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[32] Financial Reporting & Assurance Standards Canada, *Canadian Sustainability Disclosure Standards (CSDS 1 and CSDS 2): Now Available*, (2024).
[33] Government of Canada, *Natural Climate Solutions Fund*, (2024).
[34] United Nations Environment Assembly, *Overview of Nature-based solutions*, (2024).
[35] Government of Canada, *Nature-based climate solutions*, (2025).

**Table 18:** Major ecosystems for nature-based climate solutions

| Ecosystem | Definition | Co-benefits |
|---|---|---|
| Wetlands | Wetlands can sequester high amounts of carbon and are highly productive ecosystems responsible for filtering pollution, flood protection via absorption of excess water, and habitats for fish and wildlife. Wetland nature-based climate solutions should focus on the protection of peatlands and other wetlands from disturbances or land-use changes to maintain these highly valuable carbon sinks and flood protection benefits. Restoration of previously disturbed wetlands is also an option for nature-based climate solutions. | Wetlands store more carbon than any other ecosystem. |
| Grasslands | Grassland habitats have rich biodiversity and carbon storage capabilities, the majority of which is stored as soil organic carbon. Nature-based climate solutions include avoiding the conversion of grasslands or restoring grasslands that had been converted to annual croplands or other land uses and may include some types of cropland and grassland management practices. | Grasslands are home to many Indigenous Nations and are unique habitats for several species of birds who are at risk of extinction. |
| Coastlines | Canada has the largest coastline in the world consisting of the Atlantic, Pacific, and Arctic Oceans. Nature-based climate solutions for coastlines are similar to those for inland freshwater wetlands: manage, protect, and restore ecosystems to improve sequestration capabilities while minimizing GHG emissions, as well as reduce flooding risks from sea level rise and storms. | Coastal ecosystems remove carbon from the atmosphere, can reduce flooding and erosion, and support most of the planet's biodiversity. |
| Forests | Forest carbon pools consist of above- and below-ground biomass, standing and fallen deadwood, and soil organic carbon (including humus, surface litter, and soil mineral layers). Nature-based climate solutions should consist of all approaches: protection, improved management, and restoration activities. The protection or restoration of areas maximizing carbon storage and landscape connectivity can have significant benefits in reducing GHG emissions while conserving biodiversity. | Forests contribute to water quality improvement and regulate precipitation, evaporation, and water flow. |

Investing in nature-based climate solutions can have multiple benefits for businesses and organizations. Protecting ecosystems also protects natural capital and the processes that allow economic sectors to function. 55% of global GDP, equivalent to an estimated $58 trillion, is moderately or highly dependent on nature.[36] Natural climate solutions can provide over one-third of the cost-effective climate mitigation needed between now and 2030 to stabilize warming to below 2°C.[37]

Some benefits, among others, include:

[36] WWF, *2024 Living Planet Report – Executive Summary*, (2024).
[37] Proceedings of the National Academy of Sciences of the United States of America (PNAS), *Natural climate solutions*, (2017), 114(44), 11645–11650.

- creating new revenue streams through offset generation (see Section 6.3.5)
- increase the resilience of nature-based economic sectors, including agriculture
- building brand awareness and enhancing brand reputation
- increasing employee engagement
- improving access to markets which demand stronger environmental standards
- often creating adaptation co-benefits

With regards to nature-based climate solutions, participants are **encouraged** to first protect and conserve, then sustainably manage, and finally restore nature. Net-Zero Challenge participants are **encouraged** to work with established carbon offset registries to ensure the safe implementation of nature-based climate solutions (Section 6.3). Organizations and businesses are strongly **encouraged** to work alongside Indigenous and local communities to integrate Indigenous and local knowledge when applying nature-based climate solutions.

If a NZC participant is generating offset credits as part of implementing a nature-based climate solution project, then the requirements related to the use of offset credits (Section 6.3) should be followed.

## 8.4 Adaptation

Climate change adaptation refers to actions that help reduce vulnerability to expected impacts of climate change such as extreme weather events (for example, storms, wildfires), flooding and sea-level rise, biodiversity loss, and food and water insecurity. Climate adaptation actions can help organizations and communities build resilience and the capacity to prepare for, respond to, and recover from the impacts and disruptions of climate change. Effective adaptation strategies may also deliver climate change mitigation benefits.

Net-zero plans are inherently focused on mitigation, but adaptation actions can help mitigate the risks of climate change. Therefore, participants in the Net-Zero Challenge are **encouraged** to integrate physical risk assessment and align adaptation and mitigation strategies in their net-zero planning, where possible. Reducing disaster risks, particularly through proactive adaptation, is more economical than the cost of responding and rebuilding. The Canadian Climate Institute estimates that every $1 spent on adaptation measures can result in $13-$15 in total benefits.[38]

Businesses and organizations can develop adaptation plans by assessing the impact of various climate risks (for example, extreme heat, flooding, etc.) to determine which practices they should be implementing to enhance their resilience (for example, strengthening insulation systems to adapt to rising temperatures). The use of climate forecasting techniques, via climate and weather data and modeling technology, can help highlight high-level risks, thus revealing vulnerable parts of a business or organization. Most of the risks will be linked to the financial markets, communities, geography, and other case-by-case factors of the organization, its organizations, and its value chains.

Table 19 presents a non-exhaustive list of possible climate adaptation methods.

**Table 19:** Adaptation methods

| Type | Adaptation methods |
|---|---|
| **Organization** | Use of Early Warning Systems to support pro-active planning |
| | Purchase of insurance for extreme weather events |

[38] Canadian Climate Institute, *Climate change adaptation in Canada*.

| | |
|---|---|
| | Modelling of climate risks to create adaptation plans. Ensure the results are incorporated into design, location, and investment decisions of long-life assets |
| | Create partnerships to address systemic challenges to community well-being and economic prosperity (for example, partnerships within a community allows for the joining of forces to handle a climate emergency while reducing negative impacts on the economy) |
| | Evaluate financial services (for example, risk transfer by using a third party) |
| **Nature-based climate solutions** | Wetland restoration and protection |
| | Afforestation (creation of a new forest) |
| | Reforestation (for example, re-establishing tree cover where the number of trees has been decreasing) |
| | Regenerative agriculture |
| | Preservation of coastal land and development |
| | Integrating ecosystem-based approaches such as coastal management into land-use planning |
| **Infrastructure** | Construction of new infrastructure designed and built to withstand climate impacts such as sea-level rise, flooding, or extreme heat |
| | Repair and retrofit current facilities |
| | Strengthen insulation systems |
| | Grid modernization |
| **Efficiency** | Water conservation and/or water efficiency measures (that is, modify water demand) |
| | Modify land use |
| | Monitor operational capabilities and adjust practices appropriately |

Government of Canada resources for climate change adaptation include:

- Canada's National Adaptation Strategy
- Canadian Centre for Climate Services
- ClimateData.ca
- Climate Services Support Desk

For adaptation planning, participants are encouraged to use the ISO 14090 Standards:

- ISO 14090 Adaptation to climate change — Principles, requirements and guidelines for adaptation to climate change
    - This includes the integration of adaptation within or across organizations, understanding impacts and uncertainties, and how these can be used to inform decisions
- ISO 14091 Adaptation to climate change — Guidelines on vulnerability, impacts and risk assessment, which gives guidelines for assessing the risks related to the potential impacts of climate change
    - It describes how to understand vulnerability and how to develop and implement a sound risk assessment in the context of climate change
    - It can be used for assessing both present and future climate change risks
- ISO/TS 14092 Adaptation to climate change — Requirements and guidance on adaptation planning for local governments and communities, which supports local governments and communities in adapting to climate change based on vulnerability, impacts and risk assessments
    - In working with relevant interested parties, it also supports the setting of priorities, and the development and subsequent updating of an adaptation plan

## 8.5 Sustainable jobs

“Sustainable Jobs,” which is referred to internationally as “Just Transition,” is a concept that is associated with the shift to a collaborative and inclusive low-carbon economy. It includes a focus on supporting the workforce and communities via active collaboration between workers, employers, governments, Indigenous partners, communities, and civil society. Businesses and organizations have a critical role to play as key actors in the transition.

Canada passed the *Canadian Sustainable Jobs Act* (the Act) in June 2024. The Act lays out the Government’s approach to sustainable jobs and enshrines into legislation the mechanisms necessary for the Government of Canada to effectively support Canadian workers and communities to seize the historic opportunities of the shift to a low-carbon economy, while fostering the creation of a more sustainable and prosperous future for generations to come. The Act outlines principles to guide the Government of Canada’s approach to building a net-zero economy.

Businesses and organizations play a crucial role in planning, implementing, and supporting action on sustainable jobs, as the private and public sector can contribute to environmental goals, economic growth, and social development. Proactive action on sustainable jobs can support the success of businesses and organizations in planning for and mitigating climate change and transition-related risks, while maximizing opportunities and improving social license.

Participants in the Net-Zero Challenge are encouraged to incorporate sustainable jobs planning in their business strategy, including a commitment to both international and domestic principles. Participants are encouraged to provide evidence of this, including via a public commitment and a plan with supportive actions. Canadian companies are encouraged to embed company-wide accountability on sustainable jobs within their climate strategy, and ensure their approach is based on social dialogue, decent work, labour rights, and addressing employment and workforce challenges and opportunities. Companies with operations outside of Canada should also consider how sustainable jobs principles can be advanced in the international context by cooperating with local governments, workers, and communities.

# 9.0 Future updates to requirements

Environment and Climate Change Canada reserves the right to update the requirements of the Net-Zero Challenge as required, in consultation with stakeholders. This will allow new developments; policy, regulatory, and technological changes, and other factors to be taken into consideration.

For additional program information and net-zero planning guidance, please contact the Net-Zero Challenge.

# ANNEX A: Quantifying emissions

For participants new to quantifying emissions, the following section provides further information on the steps to be taken. It also includes an example of a company completing each step using the most common approach for calculating GHG emissions through the application of emission factors.

**Please note** that the energy used in Step 1 (litres of diesel and MWh of electricity use) within this Annex is reflective of a small- or medium-sized enterprise (SME) based in Manitoba for the year 2022. The example SME has one diesel pick-up truck and purchases electricity from the local Manitoban grid. Participants using this Annex are likely to have different sources and quantities of energy use.

It should also be noted that this Annex was developed when the 2022 National Inventory Report was the most newly available version of the report. Newer versions of the National Inventory Report will have updated emission factors which should be used.

**Step 1 – identifying and collecting activity data**

The first step in quantifying annual emissions is to identify all activities that contribute to the company's scope 1, 2, and 3 GHG emissions and identify the information required to provide details on the usage of each activity. This can be in the form of bills or receipts from purchasing energy products (for example, electricity, gas, etc.), or other documentation such as a company report detailing the physical activities of the company.

**Example:** Company ABC is an SME with one diesel pick-up truck and operations exclusively in Manitoba. For this example, they are calculating their GHG emissions for the base year 2022.

Diesel:

For their diesel truck, Company ABC uses receipts for the year and calculates their total annual diesel usage to be **2 000 litres** in 2022.

Electricity:

For their annual electricity usage, Company ABC looks at hydro bills and finds that their annual electricity usage was **132 MWh** in 2022.

**Step 2 – selecting the emission factors**

Next, the most appropriate emission factors for each activity should be identified. These emission factors are calculated ratios relating GHG emissions to a proxy measure of activity at an emissions source. It is likely that for each activity, there will be a corresponding emission factor for each GHG (for example, $CO_2$, $CH_4$, etc.) which will involve further conversion into $CO_2e$ (carbon dioxide equivalent) using the global warming potentials specified in Section 3.5. It is also possible that for some activities, the emission factors will already be converted to CO2e, meaning that no further conversion is required.

Companies can use source or facility specific emission factors or consult online resources to determine the default emissions factor. For example, the grid carbon intensity of provinces can be found in Canada's National Inventory Report. If participants use the National Inventory Report, it is recommended that participants use the most recent version, as each report shows the emission factors for the past few years, and the figures are often updated as new information and methodologies are

taken into consideration. Participants should use the emission factors for the year they are calculating, when possible.

Some relevant online resources include:

- for electricity: National Inventory Report, Part 3, Annex 13
- for other activities: National Inventory Report, Part 2, Annexes 3 and 6
- US EPA (Scopes 1, 2 and 3 Emissions Inventorying and Guidance | US EPA)
- GHG Protocol Calculation Tools and Guidance
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories

**Example:** Company ABC now researches and notes the applicable emission factors for their energy use, which in their case is diesel use for a light-duty diesel truck (for example, pick-up truck) and electricity in Manitoba.

Diesel:

For diesel usage, Company ABC consults the 2022 National Inventory Report to find the emission factor for their diesel consumption. They find that, as per Part 2 of the National Inventory Report (Table A6-1.15, *Emission Factors for Energy Mobile Combustion Sources*), the emission factors for a "light-duty diesel truck" like theirs are the following:

- **2 680.5 g $CO_2$/L**
- **0.068 g $CH_4$/L**
- **0.022 g $N_2O$/L**

Unlike electricity consumption, these figures are separated by greenhouse gas and will therefore require more steps (Steps 4 and 5) to be converted into $CO_2e$.

Electricity:

For electricity usage, Company ABC consults the 2022 National Inventory Report to determine the consumption intensity of the electricity grid in Manitoba, given that that's the location of their operations. They find that, as per Part 3 of the National Inventory Report (Table A13-8: *Electricity Generation and GHG Emission Details for Manitoba*), the consumption intensity for electricity in Manitoba in the year 2022 was **1.4 g $CO_2e$/kWh**.

Given that this figure is already in $CO_2$ equivalent units ($CO_2e$), Company ABC does not have to complete Steps 4 or 5 for their emissions relating to electricity.

**Step 3 – quantifying the annual emissions**

The annual emissions for each activity per GHG can now be quantified. For this, the usage of each activity identified in Step 1 is multiplied by the appropriate emission factors that were determined in Step 2. The emissions of each of the company's activities can then be summed up for each GHG, resulting in the total emissions for each type of GHG ($CO_2$, $CH_4$, $N_2O$, etc.).

**Example:** Company ABC now uses the information from steps 1 and 2 by multiplying the two figures together per GHG:

$$(\text{consumption}) \times (\text{emissions factor})$$

Diesel:

For diesel usage, Company ABC multiplies the **2 000 litres** from step 1 by the emission factors for each GHG, as identified in Step 2:

**For the $CO_2$:**

$$CO_2\ from\ diesel = (Diesel\ consumption) * (CO_2\ Emissions\ factor)$$

$$CO_2\ from\ diesel = (2\ 000\ L) * \left(\frac{2\ 680.5\ g\ CO_2}{L}\right)$$

$$CO_2\ from\ diesel = \mathbf{5\ 361\ 000\ g\ CO_2}$$

**For the $CH_4$:**

$$CH_4\ from\ diesel = (Diesel\ consumption) * (CH_4\ Emissions\ factor)$$

$$CH_4\ from\ diesel = (2\ 000\ L) * \left(\frac{0.068\ g\ CH_4}{L}\right)$$

$$CH_4\ from\ diesel = \mathbf{136\ g\ CH_4}$$

**For the $N_2O$:**

$$N_2O\ from\ diesel = (Diesel\ consumption) * (N_2O\ Emissions\ factor)$$

$$N_2O\ from\ diesel = (2\ 000\ L) * \left(\frac{0.022\ g\ N_2O}{L}\right)$$

$$N_2O\ from\ diesel = \mathbf{44\ g\ N_2O}$$

Electricity:

For electricity, Company ABC uses the energy consumption of **132 MWh** from Step 1 and multiplies it by the emissions factor of **1.4 $CO_2$e/kWh** identified in Step 2.

Before doing this calculation, Company ABC must first convert their consumption in MWh into kWh so that both figures have consistent units. Given that 1 Megawatt (MW) is 1 000 Kilowatts (kW), the company multiplies their 132 MWh by 1 000:

$$Energy\ consumption\ in\ kWh = 132\ MWh * \frac{1\ 000\ kWh}{MWh}$$

$$Energy\ consumption\ in\ kWh = 132\ 000\ kWh$$

Company ABC can now multiply their energy consumption (in kWh) by the emissions factor:

$$Emissions\ from\ electricity = (Electricity\ consumption) * (Emissions\ factor)$$

$$Emissions\ from\ electricity = (132\ 000\ kWh) * \left(\frac{1.4\ g\ CO_2\ eq}{kWh}\right)$$

$$Emissions\ from\ electricity = \mathbf{184\ 800\ g\ CO_2\ eq}$$

**Step 4 – applying the global warming potential**

The fourth step is to identify the pertinent global warming potentials (GWPs) for the GHGs (for example, $CO_2$, $CH_4$, etc.) that have been quantified and require conversion to CO2e. This is an important step because each GHG has a unique GWP associated with its ability to trap heat in the atmosphere compared to $CO_2$ over a specific time horizon. The GHP Protocol recommends using the values from the latest IPCC Assessment Report—GHG Protocol: IPCC Global Warming Potential Values (see Section 3.1.2). However, values from IPCC Assessment Report 5 are also acceptable and are currently used by Canada's GHG Reporting Program (most recently published in December 2023—Canada Gazette, Part 1, Volume 157, Number 49: SUPPLEMENT 1).

For example, as per the 100-year GWPs according to the IPCC's 6th Assessment Report, methane has a GWP of 29.8, meaning that over 100 years, one kg of methane traps heat in the atmosphere at a rate equivalent to 29.8 kg of $CO_2$. As such, one kg of methane is equal to 29.8 kg of $CO_2e$.

For example, as seen earlier, Company ABC has emissions from different GHGs. Based on the values in the GHG Protocol: IPCC Global Warming Potential Values, the global warming potentials for their GHGs are outlined below.

| GHG | Global warming potential (GWP) |
|---|---|
| $CO_2$ | **1** (no conversion required) |
| $CH_4$ | **29.8** |
| $N_2O$ | **273** |

$CO_2e$, or $CO_2$ equivalent, has no GWP required as it is already converted into $CO_2$ equivalency.

**Step 5 – converting emissions to $CO_2e$**

The fifth step is to convert all the emissions from each GHG into $CO_2e$. To do this, the emissions from Step 3 are multiplied by the GWPs in Step 4.

**Example:** Company ABC multiplies their emissions from Step 3 with the GWPs gathered in Step 4.

$$\text{(GHG emissions) x (GWP per GHG)}$$

Diesel:

Note: Company ABC does not need to complete this calculation for their $CO_2$ given that the GWP is 1, meaning that the number will not be changed by the multiplication below. That said, the multiplication is included in case the example is helpful:

**For $CO_2$:**

$$CO_2e\ from\ diesel's\ CO_2 = (CO_2\ emissions) * (GWP\ of\ CO_2)$$

$$CO_2e\ from\ diesel's\ CO_2 = \left(5\ 361\ 000\ g\ CO_2 * \frac{1\ g\ CO_2e}{g\ CO_2}\right)$$

$$CO_2e\ from\ diesel's\ CO_2 = \mathbf{5\ 361\ 000\ g\ CO_2e}$$

**For $CH_4$:**

$$CO_2e\ from\ diesel's\ CH_4 = (CH_4\ emissions) * (GWP\ of\ CH_4)$$

$$CO_2e\ from\ diesel's\ CH_4 = \left(136\ g\ CH_4 * \frac{29.8\ g\ CO_2e}{g\ CH_4}\right)$$

$$CO_2e\ from\ diesel's\ CH_4 = \mathbf{4\ 053\ 9\ g\ CO_2e}$$

**For $N_2O$:**

$$CO_2e\ from\ diesel's\ N_2O = (N_2O\ emissions) * (GWP\ of\ N_2O)$$

$$CO_2e\ from\ diesel's\ N_2O = \left(44\ g\ N_2O * \frac{273\ g\ CO_2e}{g\ N_2O}\right)$$

$$CO_2e\ from\ diesel's\ N_2O = \mathbf{12\ 012\ g\ CO_2e}$$

Electricity:

This calculation is not required because the emissions factor from Step 2 was already in $CO_2e$.

**Step 6 – total emissions**

The final step is to sum all of the emissions into total g $CO_2e$ to determine their GHG emissions for the base year 2022. In the example below, the company will be separating the emissions based on whether they are scope 1 (direct) or scope 2 (indirect) emissions. Note that this example did not include scope 3 categories, however, the steps needed to calculate the emissions would be similar.

**Example:** Company ABC has now calculated their scope 1 (direct) and scope 2 (indirect) emissions for the base year 2022 into g $CO_2e$. They now sum these figures by scope and present these numbers to the Net-Zero Challenge.

Diesel:

Company ABC owns and operates the light-duty diesel truck, making this their scope 1 (direct) emissions. As per the calculations in Step 5, their total scope 1 emissions are:

$$Total\ scope\ 1\ emissions = \mathbf{5\ 361\ 000\ g\ CO2e} + \mathbf{4\ 053 g\ CO2e} + \mathbf{12\ 012\ g\ CO2e}$$

$$Total\ scope\ 1\ emissions = \mathbf{5\ 377\ 065 g\ CO2e}$$

Electricity:

Company ABC purchases their electricity from the grid, making this their scope 2 (indirect) emissions. As calculated in Step 3, their scope 2 emissions are **184 800 g $CO_2e$**.

Company ABC may also wish to convert their figures into kg (1 000 grams), making their total emissions in 2022 as follows:

$$Scope\ 1\ emissions = \mathbf{5\ 377\ 065\ g\ CO_2e} \div \mathbf{1\ 000}$$

$$Scope\ 1\ emissions = \mathbf{5\ 377\ kg\ CO_2e}$$

$$Scope\ 2\ emissions = \mathbf{1\ 84\ 800\ g\ CO_2e} \div \mathbf{1\ 000}$$

$$Scope\ 2\ emissions = \mathbf{184.8\ kg\ CO_2e}$$