

GHG Emissions Management

LINKING GHG EMISSIONS MANAGEMENT TO CORPORATE STRATEGY, RISK AND PERFORMANCE

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What is the issue?

The Paris Agreement set a goal to limit average global warming to 2 degrees Celsius by 2100, and to pursue efforts to limit warming further to 1.5 degrees Celsius. Globally, we have experienced approximately 1 degree Celsius of warming above pre-industrial levels. Temperatures in Canada, however, have risen twice the global average. In order to meet the Paris Agreement target, experts suggest we must cut global greenhouse gas (GHG) emissions by 45 per cent by 2030 and aim for net-zero emissions by 2050.

Why is it important?

Increased attention on GHG emissions and reporting by global capital markets (e.g., investors, insurers, credit rating agencies, financial regulators) will require organizations to adopt a low emissions mindset and enable a cultural shift towards lowering carbon footprints to achieve a competitive advantage through improved efficiency, operational cost savings and capitalizing on increasing demand for low-carbon products and services.

What can be done?

Organizations will need to establish appropriate GHG emissions management systems along with tools to identify, implement, measure, monitor and report on GHG emissions. This will require organizations to harness markets, innovate and integrate technology into business strategies, risk management and performance measurement.

Who is this guideline for and how can it be applied?

This guideline is intended for Chartered Professional Accountants (CPAs) working in industry (e.g., operational, management accounting and reporting roles), for CPAs and business professionals in leadership roles, and for Boards of Directors. While the primary audience for this guidance is public and private companies, many concepts are also relevant to governments, crown corporations and not-for-profit organizations.

Overview

This MAG was developed as a practical guidance document to accompany CPA Canada's [A Primer for CPAs on Greenhouse Gas \(GHG\) Emissions Management Systems](#). The primer is a recommended pre-reading for this MAG and case study. The primer provides an overview of climate change mitigation, the need for GHG emissions management, and roles that CPAs play.



How GHG emissions trends impact businesses

Concerns about the financial impacts of climate-related risks have pushed climate change into the mainstream amongst global capital markets. There are two types of climate-related risk:¹

1. Transition risks are related to the transition to a lower carbon economy, including:
 - policy risks: associated with regulating activities that produce high levels of GHG emissions, such as carbon pricing and coal phase-out regulations.
 - legal risks: associated with increased climate-related litigation when organizations fail to do their part to mitigate climate change.
 - technology risks: associated with improvements and innovations in new and existing technologies that have the potential to displace traditional ways of doing business.
 - market risks: associated with changing supply and demand for high-emitting products and services.
 - reputation risks: associated with changing consumer and societal perceptions of an organization's contribution to GHG emissions and transition to a lower-carbon economy.
2. Physical risks are acute and chronic:
 - Acute physical risks include climate-related events, such as the increasing frequency and severity of extreme weather.
 - Chronic physical risks refer to long-term shifts in climate patterns, such as sea level rise and chronic heat waves.

There are also opportunities created by the transition to a lower-carbon economy, including:

- resource efficiency (e.g., activities to reduce GHG emissions)
- diversification of energy sources to include renewable energy and battery storage
- new products and services that address the low carbon transition and capitalize on changing consumer and producer preferences

¹ Derived from the final recommendations report of the Task Force on Climate-related Financial Disclosure (TCFD).



- new markets created for lower carbon products and services via collaboration with governments, development banks, small businesses and entrepreneurs
- increased resilience to climate-related impacts by addressing physical risks

It is possible for transition and physical risks to increase over time, depending on the pace and scale of global efforts to reduce GHG emissions. For example, if Paris Agreement targets are not met, physical risks will increase. If aggressive action is taken on a global scale to reduce GHG emissions, transition risks will increase. In both cases, companies must monitor emerging trends and responses from the capital markets, governments and society.

Capital market responses

Central banks, investors, stock exchanges, securities regulators, credit rating agencies, insurers and lenders (collectively referred to as capital market participants) are increasingly concerned about the implications a changing climate will have on financial stability, from physical risks of extreme weather to transition risks associated with changing markets, technologies and consumer demands.

In December 2015, the Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosure (TCFD). The TCFD's mandate is to develop recommendations for consistent and comparable voluntary disclosures by companies so investors are aware of climate-related risks and opportunities, as well as the strategies companies had for addressing them.

Released in June 2017, the [final TCFD recommendations](#) have quickly become the “gold standard” within global capital markets for disclosing the financial implications of climate change. [The recommendations have been endorsed](#) by more than 1,000 public and private sector organizations, including global financial firms responsible for assets of over \$118 trillion. The TCFD recommended that companies disclose Scope 1 and Scope 2 GHG emissions and, if applicable, Scope 3 GHG emissions.²

The following table summarizes initiatives underway to address climate change by central banks, investors, stock exchanges, securities regulators, credit rating agencies, insurers and lenders, all of which have implications for GHG emissions measurement and reporting.

² See definitions of Scope 1, 2 and 3 GHG emissions in Step 2B below.



TABLE 1 - CAPITAL MARKET PARTICIPANT INITIATIVES TO ADDRESS CLIMATE CHANGE AND GHG EMISSIONS

Capital market participants	Initiatives to address climate change and GHG emissions
Central banks	<p>Network of Central Banks and Supervisors for Greening the Financial System is a collaboration of 46 global central banks aimed at greening the financial system and strengthening financial sector efforts to achieve Paris Agreement targets. The Bank of Canada joined the network in 2019.</p> <p>Bank of Canada 2019 Financial System Review identifies climate change as a top vulnerability to Canada's economy and committed to undertake further research to determine the macroeconomic impacts of climate-related risks.</p>
Investors (includes asset owners and asset managers)	<p>United Nations Environment Program (UNEP) Finance Initiative (FI) TCFD Pilot with Investors is a pilot project with 20 of the world's leading investors, including several Canadian investors such as the Caisse de dépôt et placement du Québec (CDPQ) and Desjardins. The program is focused on developing scenarios, models and metrics to enable scenario-based analysis of climate-related risks and opportunities.</p> <p>Climate Action 100+ is an Investor-led initiative with more than 450 investors with over \$40 trillion in assets under management (AUM), which is focused on ensuring the world's largest corporate GHG emitters are taking action on climate change.</p> <p>Net-Zero Asset Owner Alliance was organized by the UNEP FI, where investors with over \$2 trillion in AUM are focused on aligning their portfolios with the 1.5-degree Celsius target in the Paris Agreement.</p> <p>Investor Group on Climate Change is a collaboration of institutional investors with over \$2 trillion in AUM working toward a climate-resilient, net-zero emissions economy by 2050.</p>
Stock exchanges	<p>Sustainable Stock Exchanges Initiative is a peer-to-peer learning platform for exploring how exchanges (in collaboration with investors, regulators, and companies) can enhance corporate transparency, and ultimately performance, on environmental, social and governance (ESG) issues and encourage sustainable investment. The Toronto Stock Exchange (TSX) and TSX Venture Exchange joined in 2019.</p>
Securities regulators	<p>Canadian Securities Administrators (CSA) issued three staff notices related to reporting on climate change and environmental risks by public companies:</p> <ul style="list-style-type: none"> • CSA Staff Notice 51-358 - guidance on reporting on climate change-related risks, including GHG emissions • CSA Staff Notice 51-354 - report on findings of a review of climate-related disclosure by Canadian public companies and investors needs for climate-related information for decision-making • CSA Staff Notice 51-333 - guidance on reporting of financially material environment-related risks, including climate change



Capital market participants

Initiatives to address climate change and GHG emissions

Credit rating agencies

Standard & Poor's released an [ESG Risk Atlas](#) to provide an overview of sector and country risk exposure to ESG factors, including climate change. **S&P also published an explanation** of how ESG factors, including climate change, are considered in credit ratings.

Moody's released an [Environmental Risks Global Heatmap](#) to show the exposure of different sectors to environmental risks, including climate change and GHG emissions. Moody's recently [purchased a climate data firm](#), signalling new scrutiny of climate-related risks in credit ratings assessments.

Fitch Ratings launched an [integrated scoring system](#) which shows how environmental, social and governance (ESG) factors, including climate change, impact individual credit rating decisions.

Insurers

UNEP FI TCFD Pilot with Insurers is a [pilot project](#) with 16 of the world's largest insurers, including two Canadian insurers, The Co-operators and TD Insurance. Their work is focused on developing risk assessment tools for the insurance industry to better understand the impacts of climate change on their business.

Lenders

UNEP FI TCFD Pilot with Banks is a [pilot project](#) with 16 of the world's leading banks, including two Canadian banks, TD and RBC. Similar to the insurers' group, their work is focused on transition and physical risk assessments to enable a scenario-based analysis of climate-related risks and opportunities.

UNEP FI Principles for Responsible Banking was [launched by 130 banks](#) from 49 countries, representing more than \$42 trillion in assets focused on accelerating climate action, including reducing GHG emissions to meet Paris Agreement targets.

Government responses

The Paris Agreement targets are predicated on the commitments of national governments to reduce GHG emissions based on the best available climate science. Carbon pricing is an [increasingly common government policy](#) used to achieve GHG emissions reductions. It sends a price signal to markets to deter entities from emitting and encourage investment in low-carbon innovations and solutions, especially in sectors with high emissions.

CPA Canada's primer provides significant detail of government responses to meet Paris Agreement targets, including an overview of the Pan-Canadian Framework on Clean Growth and Climate Change. Readers are encouraged to review Table 1 in the primer to become familiar with existing federal and provincial/territorial regulations on carbon pricing and GHG emissions reporting for Canadian facilities.

Carbon pricing can be in the form of a direct levy (or tax) or through the establishment of a cap-and-trade system that allows trading of carbon offsets among market participants. Carbon offsets enable companies that reduce their GHG emissions to sell their excess credits to other market participants, thereby generating a revenue stream and a direct financial incentive to reduce GHG emissions below the capped amount allocated by the cap-and-trade system.



There is growing attention to carbon offsets and discussions on establishing global trading systems to meet the Paris Agreement targets. This continues to evolve on a global level, with several established regional systems demonstrating the efficacy of cap-and-trade systems as a market-based mechanism to reduce GHG emissions by creating real financial incentives for companies.

Beyond regulations, Canada's federal government acknowledged the need for increased private sector engagement in reducing GHG emissions. It established the [Expert Panel on Sustainable Finance](#)³ to promote awareness of climate-related risks amongst Canadian capital market participants and to advance the TCFD recommendations in Canada. In April 2018, the Expert Panel released its final report, which included recommendations to move capital into products and services for transitioning to a lower-carbon economy, emphasizing the importance of reducing GHG emissions in order to remain globally competitive. The final recommendations acknowledged the importance of cultivating a knowledgeable financial ecosystem, specifically mentioning the crucial role of accountants in enabling the robust disclosure, reporting and auditing of climate-related risks and opportunities.

Societal responses

Society is increasingly focusing on the issue of climate change and the impacts of GHG emissions on current and future generations' ability to meet basic human needs, such as clean air and water. Employees and customers are showing [increased interest](#) in working for and buying from companies that are addressing the world's biggest sustainability challenges. Climate action is [Goal 13](#) of the 17 [UN Sustainable Development Goals](#) (SDGs). It is arguably the most urgent SDG, as it links with nearly every other SDG on the list.

Consumers are increasingly voting with their dollars, pushing companies to demonstrate progress in reducing GHG emissions and working toward achieving Paris Agreement targets. This trend is being driven by younger generations, namely millennials and Generation Z. For example, [42 per cent of millennials](#) said they have begun or deepened a business relationship because they perceived a company's products or services to have a positive impact on society and/or the environment.

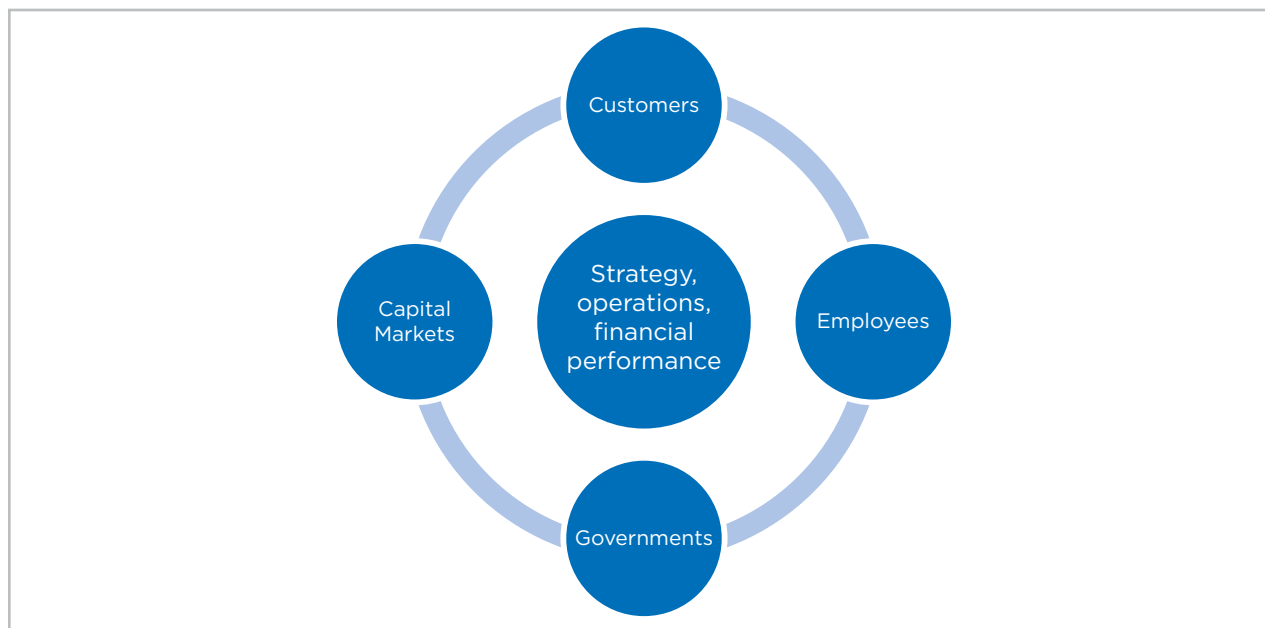
When it comes to attracting and retaining employee talent, there is [clear evidence](#) that environmental issues are a factor for younger generations. Youth climate strikes around the world, led by climate activist Greta Thunberg (who was named [TIME Magazine's Person of the Year in 2019](#)), illustrate the importance of this issue to younger generations. In September 2019, [more than 7.6 million](#) people took to the streets to strike for climate action – the biggest climate mobilization in history. In the not-so-distant future, these younger generations will enter the workforce seeking to work for companies that align with their values and beliefs, which will have implications for companies seeking to attract and retain talent.

3 While there is no universally accepted definition of "sustainable finance," the [expert panel](#) defines it as "capital flows (as reflected in lending and investment), risk management (such as insurance and risk assessment) and financial processes (including disclosure, valuation and oversight) that assimilate environmental and social factors as a means of promoting sustainable economic growth and the long-term stability of the financial system."



Deloitte's [annual millennial survey](#) documents the impact of younger generations' preferences to work for organizations that align with their values. In order for companies to attract and retain talent, companies must be aware of this mindset shift given that Generation Z is the [largest cohort in human history](#). Its impact on organizations will only continue to grow as they enter the workforce, make their own purchasing decisions and invest their savings in alignment with their values.

MULTI-STAKEHOLDER VIEW OF GHG EMISSIONS PERFORMANCE



Opportunities for accountants

Typically, accountants are not involved in sustainability and GHG emissions reporting. Sustainability reporting is separate from financial reporting (where CPAs typically work) and organizations are often siloed by function. Increasingly, companies are being pushed to establish cross-functional teams to respond to climate-related risks and opportunities, and CPAs have an opportunity to be the hub to link climate-related risks and GHG emissions with core strategy, risk management and performance activities.

There are several important roles for CPAs in helping their organizations to establish effective GHG emissions management systems. CPAs have the necessary skills and competencies to link GHG emissions with corporate strategy, risk management, and performance measurement and management. CPAs have expertise in internal and external reporting, including the underlying processes and controls to ensure accurate, reliable and timely information. Below is a summary of detailed roles for CPAs in leadership positions across all organizational levels and functions.



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CLIMATE-CHANGE MITIGATION STAGE

Roles for CPAs	Motivate action	Plan action	Implement action	Assess performance	Respond to market and stakeholders
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CPAs in leadership positions

- Examples:**
- Ensure the board is educated about GHG emissions management.
 - Comment on policy alternatives.
 - Integrate GHG emissions mitigation considerations into organizational strategy, risk management and decision-making.
 - Set GHG emissions reduction targets and develop organization-wide action plans.
 - Establish accountability structures for mitigation goals and targets.
 - Embed GHG mitigation into business functions and processes, including compensation.

Roles for CPAs at all levels

- | Examples: | Examples: | Examples: | Examples: |
|---|--|---|---|
| <ul style="list-style-type: none"> • Identify GHG mitigation risks and opportunities. • Develop the business case for GHG mitigation actions based on regulatory environment and stakeholder input. | <ul style="list-style-type: none"> • Support development of GHG emissions reduction targets and action plans. • Estimate costs and benefits of GHG mitigation activities. • Evaluate the impact of carbon pricing on capital expenditure decisions. | <ul style="list-style-type: none"> • Participate in carbon markets trading and appropriate accounting for transactions. • Track ROI on GHG emissions reduction investments and compare to plan. | <ul style="list-style-type: none"> • Establish key performance indicators (KPIs) for mitigation targets. • Establish systems and internal controls over GHG emissions data and KPIs. • Measure impacts of GHG emissions on assets, liabilities, revenues, and expenses. • Perform internal audit of GHG emissions data, systems, and reports. |
| | | | <ul style="list-style-type: none"> • Contribute to external GHG emissions reporting (government, financial, and voluntary). • Contribute to internal GHG emissions reporting. • Engage third-party assurance providers for GHG emissions data and systems. |



Here are some tips for successfully establishing a GHG emissions management system:

- Link the GHG emissions management with overall corporate strategy, enterprise risk management, and financial reporting processes.
- Embed into existing processes rather than siloed separately.
- Integrate the GHG emissions management system into existing processes and KPIs. Even GHG emissions calculation spreadsheets (build in checks for models).
- Establish a strong tone at the top, which is key for organizational buy-in.
- Involve multiple parts of the organization to enable a cross-functional effort that includes stakeholder engagement activities.

Implications for companies

Stakeholders are pressuring companies to measure and reduce GHG emissions to address climate change, a trend that is likely to continue into the foreseeable future as the global economy transitions, to become less carbon intensive and more climate resilient. As a result, business as usual is no longer an option. Businesses must become resilient, adaptable and innovative to achieve long-term sustainable value, or risk losing access to capital, talent and social licence to operate.

Public and private companies

Institutional investors are increasingly considering climate change-related factors in investment analysis, engagement and proxy voting decisions. As a result, GHG emissions analysis is required for investors to allocate capital across asset classes.

Further, since investors are adopting the TCFD recommendations, they are beginning to ask companies to provide GHG emissions information in corporate reports so they can disclose it to their clients and beneficiaries.

In the absence of company-reported GHG emissions (and other climate-related disclosures, such as the TCFD recommendations), capital market participants are purchasing this research from third-party providers, such as MSCI and Sustainalytics. For companies that do not disclose their GHG emissions, these third parties estimate it based on proxy data. In fact, only [about 35 per cent of the data inputs](#) in MSCI's ESG Ratings model are derived from voluntary company disclosures.

As noted in [Table 1](#) above, collaborative investor initiatives, such as [Climate Action 100+](#), are targeting companies with high GHG emissions in an effort to enhance GHG reporting and reduce overall emissions.





Key findings from CPA Canada's *[Progressive Investors and Corporate Disclosure](#)* publication:

- Investors view climate-related risks as pervading all sectors and geographies. As a result, the default view is that climate-related issues are material unless otherwise demonstrated.
- Whether a company believes climate-related financial information to be material or not, investors want disclosure about the following from all companies:
 - governance, high-level risk management, and strategic assessment; without such disclosure, investors are uncertain as to whether management and the board have concluded this information is immaterial or whether they have overlooked it
 - GHG emissions scopes 1 and 2
- Some highlights of specific metrics and targets mentioned by interviewees were:
 - financial impact of carbon taxes (current and projected)
 - GHG emissions Scopes 1 and 2 (absolute and intensity-based emissions); some are beginning to assess Scope 3 emissions
 - methane emissions, a particularly potent GHG
 - targets and achievements in reducing GHG emissions
- Every investor and bond rating organization interviewed bought climate-related financial data from third-party data providers. However, investors preferred receiving data directly from companies.

Investors are not the only driving force behind companies' efforts to measure and reduce GHG emissions. Leading global organizations recognize that reducing GHG emissions can directly and indirectly impact:

- corporate strategy: e.g., companies in high-emitting industries, such as oil and gas, face a threat to their core business models
- risk management: e.g., GHG emissions can create new risks such as divestment from investors, increased pressure from NGOs, and negative media attention
- performance: e.g., reducing GHG emissions often results in increased efficiencies, lower operational costs, and subsequently stronger financial performance

Large global companies, such as [Walmart, Nike, and Adidas](#), have set [science-based targets](#) to reduce GHG emissions in their operations and across their supply chains.

Small- and medium-sized companies are also seeing the benefits of measuring and reducing GHG emissions in the form of reduced operating costs (e.g., energy bills), improved public reputation, and increased employee engagement (e.g., offering incentives to employees who make their work commutes more energy efficient). This is important for a country like

Canada, in which [99 per cent of enterprises are small to medium companies](#), most of which are privately held. The case study for this MAG details an actual Canadian company that has improved its bottom line as a result of undertaking strategic efforts to reduce GHG emissions.

Governments, crown corporations, and not-for-profit organizations

As with private companies, society's increasing calls for action on climate change also impact governments, crown corporations and not-for-profit organizations. While these entities do not have investors in the traditional sense, they are impacted by broader developments in global capital markets, such as central banks' views on climate risks and credit rating agencies' incorporation of climate-related issues into credit ratings for cities and crown corporations. This makes measuring and reducing GHG emissions strategically important to these entities, however the impacts on strategy, risk, and performance differ relative to public and private companies.



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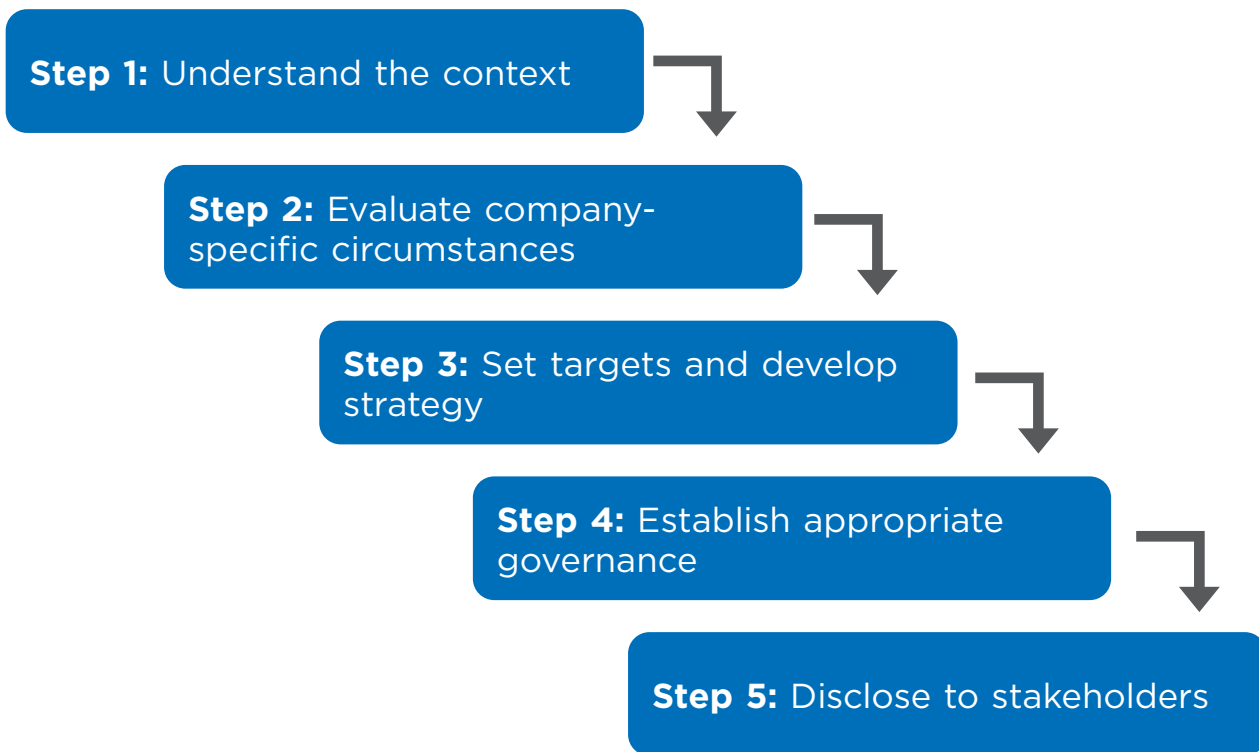
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How can companies get started on measuring their GHG emissions? The visual below provides an overview of the five-step process for establishing a comprehensive GHG emissions management system within a company.



The five steps are derived from the 10 questions included in the primer, denoted in text boxes in the following section of this guidance document.



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Applying GHG Emissions Management to Your Organization

Step 1: Understand the context

Primer Q1: What are the relevant regulatory requirements for GHG emissions reporting?

Primer Q2: Is participation in a GHG emissions reporting program mandatory or voluntary?

The first step includes assessing the relevant regulatory requirements in operating jurisdictions and determining whether the company has a compliance obligation. Beyond regulatory requirements, this step involves stakeholder mapping to identify parties interested in the company's GHG emissions and their desired information channels (e.g., annual report, sustainability / CSR report, website, social media).

Step 1A – Assess regulatory requirements

The questions below will help determine if a mandatory regulatory compliance obligation exists.

Questions to ask	Process guidance
<p>Federal regulations</p> <p>Does any single facility located in Canada exceed 10,000 tonnes of GHG emissions annually?*</p>	<p>If yes, a compliance obligation exists under the federal Greenhouse Gas Reporting Program (GHGRP). The company must submit an annual report on GHG emissions.</p> <p>If no, a compliance obligation does not exist at the federal level. Proceed to the next set of questions on provincial regulations below.</p>



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Questions to ask	Process guidance
<p>Provincial regulations</p> <p>Does the organization have operations in Alberta, British Columbia, Manitoba, Ontario or Quebec?</p> <p>For facilities located in these provinces, does any single facility exceed 10,000 tonnes of GHG emissions annually?*</p>	<p>If yes, refer to Table 1 in the primer for details on applicable GHG emissions reporting regulations. (Note: the same threshold applies for provincial regulations as federally.)</p> <p>If no, it is not mandatory to report GHG emissions to the government. The company should consider if other stakeholders are interested in its GHG emissions information (see Step 1B).</p>

*Organizations may need to complete a GHG emissions inventory to determine whether facilities currently exceed, or are expected to exceed, this threshold. The GHGRP requires companies to self-assess and self-report the GHG emissions of their facilities if they exceed the threshold. The federal government does not notify companies of this compliance obligation unsolicited.

Step 1B – Assess stakeholder interest in GHG emissions

A company’s stakeholders (e.g., employees, customers, suppliers, local communities) might also be interested in its GHG emissions information. While many companies start measuring and monitoring GHG emissions in response to mandatory reporting regulations, there are many valid reasons for voluntarily reporting GHG emissions. The questions and process guidance below will help guide companies in assessing whether stakeholders want GHG emissions reported voluntarily.

Questions to ask	Process guidance
<p>Which of the following company stakeholders have expressed interest, directly or indirectly, in the company’s GHG emissions?</p> <ul style="list-style-type: none"> • investors • financial regulators • credit rating agencies • insurers • customers • employees • suppliers • local communities • other(s) 	<p>Develop a stakeholder map that identifies those groups with an interest in the company’s GHG emissions and their influence on the company:</p> <div style="text-align: center;"> <p>The diagram is a 2x2 matrix with 'Influence' on the vertical axis and 'Interest' on the horizontal axis. The four quadrants are labeled as follows: Top-Left (Keep satisfied), Top-Right (Manage), Bottom-Left (Monitor), and Bottom-Right (Keep informed). The 'Keep informed' quadrant is highlighted in a lighter blue color.</p> </div> <p>Those with a “high” rating on either axis are priority stakeholders. The company should consider voluntarily reporting on GHG emissions.</p>

Questions to ask

For each priority stakeholder group identified in stakeholder mapping above, the company should consider the following questions to better understand its use case for GHG emissions information:

- What is this stakeholder group's main motivation for seeking GHG emissions information?
- How will these stakeholders use the GHG emissions information, if disclosed?
- How important is it for the company to set targets to reduce GHG emissions to meet expectations of these priority stakeholders?

In determining whether to voluntarily report on GHG emissions to stakeholders identified above, the company should undertake a cost/benefit analysis:

- How much will it cost the company to prepare a GHG emissions report?
- How many stakeholders are interested in this information?
- What are the risks of not reporting GHG emissions?
- Where do priority stakeholders obtain information about the company's GHG emissions?

Process guidance

In answering these questions to assess the use case(s) of priority stakeholders, the company should consider the following sources of information as a starting point:

- **Investors:** stated policies (e.g., responsible investment policies) on integrating GHG emissions into investment analysis and buy/hold/sell decisions; outreach and engagement with the company on GHG emissions-related issues. Proxy voting policies and history.
- **Financial regulators:** positions on GHG emissions reporting, including issuing reporting guidance for issuers; stated plans for mandatory GHG emissions reporting.
- **Credit rating agencies:** integration of GHG emissions into creditworthiness assessments of companies.
- **Insurers:** public statements on exclusions of "high emitting" industries; increasing premiums due to extreme weather events.
- **Customers:** surveys on impacts of GHG emissions on purchasing preferences and decisions, as well as brand loyalty impacts.
- **Employees:** surveys on employer attraction and retention; studies on productivity impacts of working for companies aligned on values.
- **Suppliers:** codes of conduct and stated policies of key vendors as it relates to GHG emissions targets and performance.
- **Local communities:** support for, or resistance to, new projects or facilities in a community.

In answering each question, the following sources of information may be useful starting points for the company:

- **Data availability:** There is a need to gather data to prepare a GHG emissions inventory. The company should take an inventory of the existing data points it collects to determine data gaps required to complete the inventory, and should assess the cost of collecting this data and preparing report(s) to meet stakeholders' information needs.
- **Stakeholder base:** As a guideline, the more priority stakeholders that seek the company's GHG information, the stronger the impetus to provide it.
- **Risks of not reporting:** When a company does not report its GHG emissions, it risks having its emissions estimated by third-party ESG research and ratings providers (e.g., MSCI, Sustainalytics). Further, stakeholders may assume the company has not prioritized its GHG emissions due to inaction, creating reputational risks due to lack of transparency.
- **Location:** Companies have a variety of options for voluntary reporting of GHG emissions, such as the annual report, sustainability/CSR report, website and social media. The company should consider where it should report GHG emissions information to minimize additional reporting burden on the company. For example, if the company already prepares a sustainability report, this is a logical place to include GHG emissions information.



Step 2: Evaluate company-specific circumstances

Primer Q3: What GHG emissions reporting framework is applicable?

Primer Q4: Is third-party verification required for GHG emissions reports?

Primer Q5: What types of GHG emissions are relevant for my industry and/or business?

Primer Q6: What is the appropriate scope and boundaries for GHG emissions reporting?

This step includes an assessment of the company's specific circumstances to define the scope and boundaries to measuring GHG emissions. This step will build on the regulatory requirements and stakeholder mapping from Step 1 by assessing what this broader context means, specifically, for the company.

Step 2A - Understand reporting frameworks and third-party verification requirements

The table below provides questions and process guidance to identify the most appropriate reporting framework for GHG emissions disclosure and determine whether the organization requires, or should consider, third-party verification of GHG emissions.

Questions to ask	Process guidance
Is the applicable GHG emissions reporting framework outlined in the applicable regulations? In answering this question, refer to the outputs of Step 1A.	<p>If yes, use the prescribed GHG emissions reporting framework.</p> <p>If no, the most commonly used GHG emissions reporting framework is the Greenhouse Gas (GHG) Protocol. For public and private companies, their Corporate Standard provides requirements and guidance for preparing an organization-wide GHG emissions inventory.</p>
Do the applicable regulations require the company to obtain a third-party review of its reported GHG emissions? In answering this question, refer to the outputs of Step 1A and Step 1B.	<p>If yes, review regulations to determine:</p> <ul style="list-style-type: none"> • specified level of assurance (limited vs. reasonable) • frequency of third-party reviews (typically annual) • requirements for third-party verifiers (e.g., ISO 14065 certified firm, ISO 14064-3 certification for Lead Verifier, P.Eng. or CPA designation for Lead Verifier/Signing Authority) <p>In selecting a third-party verifier, consider the experience, skills, and anticipated level of effort relative to company size. Many public accounting firms offer third-party reviews of GHG emissions reports.</p>



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Are any of the key stakeholders identified in Step 1B seeking a third-party review of the company's GHG emissions?

If yes, consider the cost/benefit to obtaining voluntary third-party assurance. If no, third-party review is likely not required at this time.

In making a voluntary assessment on whether to obtain third-party verification of the GHG emissions, the company should consider:

- costs associated with completing third-party review – firm selection, internal time and resources to provide data and respond to inquiries as part of third-party review, and travel costs for site visits (if required)
- benefits to having GHG emissions third-party verified – enhancements to reputation, credibility, and reliability of GHG emissions reporting by the company

Typically, organizations preparing a first-time report are not expected to have their GHG emissions verified by a third-party. It is important to revisit the expectation for third-party review of GHG emissions annually with stakeholders, given that emissions reporting is a continuous process as stakeholder expectations and level of sophistication evolve over time.

Step 2B: Establish organizational scope and boundaries

There are two main approaches⁴ to setting boundaries for an organization's GHG emissions inventory:

- **Equity share approach:** accounts for GHG emissions from operations according to its equity share in the operation, which reflects the extent of ownership rights to the risks and rewards flowing from an operation.
- **Control approach:** accounts for 100 per cent of GHG emissions from operations over which the organization has control. This approach does not account for GHG emissions from operations in which the organization has an ownership interest but no control. Control can be defined as:
 1. **Financial control** – An organization has financial control over the operation if it can direct the financial and operating policies with a view to gaining economic benefits from its activities.
 2. **Operational control** – An organization has operational control if it or one of its subsidiaries⁵ has the full authority to introduce and implement its operating policies at the operation.

⁴ The GHG Protocol and ISO 14064 reporting frameworks both use the same terminology for organizational boundaries.

⁵ Refer to Table 1 in the GHG Protocol (Corporate Standard) for an overview of financial accounting categories.



There are three scope levels for GHG emissions reports:⁶

- 1. Scope 1:** direct GHG emissions from operations (e.g., GHG emissions from owned or controlled facilities).
- 2. Scope 2:** indirect GHG emissions from the generation of purchased energy.
- 3. Scope 3:** other indirect GHG emissions from business activities (i.e., GHG emissions that are a consequence of the activities of the company but occur from sources not owned or controlled). Examples include employee business travel and commuting to work.

Most organizations include Scope 1 and 2 GHG emissions in their reporting. The GHG Protocol requires Scope 1 and 2 emissions to be included in an inventory. Scope 3 emissions are of growing importance to stakeholders, specifically in high-emitting sectors (e.g., oil and gas). By nature, Scope 3 emissions are typically more burdensome for quantification and data collection given the company does not own or control those activities, so it is important to consider the cost/benefit of providing this information.

The nature of the company and its operations, as well as the context established in Step 1, will inform which GHG inventory approach is optimal. Below are some factors to consider in setting the organizational scope and boundaries:

- **Regulatory requirements:** The outputs from Step 2A will determine if the regulation prescribes the boundaries and scope, or if they are left to the company's discretion.
- **Substance over form:** The organization's GHG emissions should reflect its unique operating circumstances and business model.
- **Industry guidance:** Some industry associations (e.g., [Mining Association of Canada](#)) provide tailored guidance for companies to assess the boundaries and scope of emissions reports.
- **Link with financial reporting:** If the organization's GHG emissions are likely to be financially material, it is important to consider alignment of report timing to financial reports and consider inclusion in core financial and regulatory reports (if publicly traded).
- **Link with operating and financial performance:** If the organization has set GHG emission reduction targets (see Step 3 below), the control approach and Scope 1 and 2 emissions reporting is ideal. The company should only be held accountable for GHG emissions under its control.
- **Stakeholder interest:** The organization should consider if any of the key stakeholders identified in Step 1A have an interest in a specific scope or boundaries for the GHG emissions inventory.

⁶ The GHG Protocol and ISO 14064 reporting frameworks both use the same terminology for scopes.



Step 2C: Identify GHG emissions sources and activity data

Once the boundaries and scope have been defined, the organization must identify its sources of GHG emissions⁷ to determine the data requirements to complete the calculations. The boundaries and scope established in Step 2B will help identify the organizational activities that drive GHG emissions.

Many operational activities produce one or more types of GHG emissions. Activities that produce GHG emissions are often sector- and company-specific. Refer to Table 2 in the primer for details on the different types of GHG emissions and examples of commercial activities that produce these emissions. There are four common sources of an organization's GHG emissions:⁸

- 1. Stationary combustion:** combustion of fuels in stationary equipment (e.g., boilers, furnaces, burners, turbines, heaters, incinerators, engines, flares).
- 2. Mobile combustion:** combustion of fuels in transportation devices (e.g., cars, trucks, buses, trains, airplanes, boats, ships, barges, vessels).
- 3. Process emissions:** emissions from physical or chemical processes (e.g., CO₂ from the calcination step in cement manufacturing, CO₂ from catalytic cracking in petrochemical processing, PFC emissions from aluminum smelting).
- 4. Fugitive emissions:** intentional and unintentional releases (e.g., equipment leaks from joints, seals, packing, gaskets, as well as fugitive emissions from coal piles, wastewater treatment, pits, cooling towers, and gas processing facilities).

From a practical standpoint, the most common sources of Scope 1 and Scope 2 activity data related to stationary and mobile combustion are:

- **electricity consumption** (e.g., electricity and natural gas invoices for operational sites and company office buildings)
- **fuel consumption** (e.g., fuel logs, fuel invoices for vehicles/fleet, heavy and stationary equipment)

For organizations with industrial and manufacturing processes, operations and facilities that result in process and fugitive emissions, additional data will be required to calculate these emissions.

Step 2D: Calculate GHG emissions inventory

The information gathered in Step 2C will be used to calculate and quantify the GHG emissions inventory. The standard formula for calculating an organization's GHG emissions is as follows:

$$\text{Source Activity Data} \times \text{Emissions Factor} \times \text{Global Warming Potential} = \text{GHG emissions (CO}_2\text{e)}$$

⁷ If the organization has any carbon sinks (i.e., sources of negative GHG emissions), these should also be included.

⁸ This information is included in the GHG Protocol (Corporate Standard), Chapter 6, page 41.



The elements of this formula are defined as follows:

- **Source activity data:** This information, gathered as part of Step 2C, reflects the GHG emissions sources to be included in the GHG inventory along with consumption data for the reporting period.
- **Emissions factor:** An emission factor is used to convert source activity data (e.g., kWh of electricity, litres of diesel fuel) into GHG emissions. The emission factor represents the estimated emissions intensity of the activity, which varies by geographical location. The most commonly used emission factors are prescribed by the UN [Intergovernmental Panel on Climate Change \(IPCC\)](#).
- **Global warming potential (GWP):** Used to convert different types of GHGs into equivalent tonnes of carbon dioxide (CO₂e), the GWP differs by GHG type, meaning some GHGs are more potent in their contribution to climate change than others.⁹ Determining the total tCO₂e emissions of a reporting entity then becomes a simple matter of multiplying the annual tonnes of each gas emitted by its GWP value. For example, one tonne of methane emissions is about 25 times more potent than one tonne of carbon dioxide emissions (or 25 tonnes of CO₂e).
- **GHG emissions:** Absolute GHG emissions are typically expressed in carbon dioxide equivalents (tonnes of CO₂e) to enable comparability over time and consistency across organizations.

Using a spreadsheet is a cost-efficient way to quantify GHG emissions. It is beneficial to include spreadsheet controls to enable data inputs and lock formulae to avoid calculation errors. Many organizations offer templates for GHG quantification.¹⁰

Step 3: Set targets and develop strategy

Primer Q7: Will the organization set targets for GHG emissions reductions?

Primer Q8: What is the organization's strategy for managing GHG emissions?

This step focuses on linking GHG emissions management with business strategy and risk management to drive long-term value creation. It also includes guidance for establishing a multi-year action plan, including establishing key performance indicators for ongoing monitoring and reporting.

⁹ Table 2 in the primer includes the GWP for each type of GHG (e.g., methane, nitrous oxides).

¹⁰ Table 3 in the GHG Protocol (Corporate Standard) has an overview of cross-sector and sector-specific GHG calculation tools available. These tools also provide standardized emission factors based on physical location.



Step 3A: Assess context

To determine whether to set a voluntary GHG emission reduction target,¹¹ the organization should evaluate the needs of key stakeholders identified in Step 1B above. If relevant, a GHG target can help raise internal awareness about the business risks and opportunities presented by climate change.

The following checklist provides a set of initial questions to help organizations determine if a voluntary target would be beneficial. As a guideline, if you answer “Yes” to more than five of these questions, consider setting a GHG target.

Questions	Yes/No
1. Does the company operate in a high-emitting sector (e.g., oil and gas, transportation, buildings, electricity, steel, cement and aluminum manufacturing, agriculture, waste management ¹²)?	
2. Does the company expect more stringent regulation on GHG emissions in the future?	
3. Are the company’s GHG emissions significantly higher than those of its peers?	
4. Have sector peers set GHG reduction targets?	
5. Are cost savings available from GHG reduction activities (e.g., energy efficiency)?	
6. Do any key stakeholders want the organization to reduce emissions and/or set a target in response to climate change?	
7. Do GHG emissions pose a reputational risk to the company?	
8. Does the company have a leadership opportunity to demonstrate corporate responsibility to its key stakeholders by setting a target?	
9. Are there any opportunities to participate in voluntary carbon offset markets to generate revenue from GHG reduction projects?	
10. Are there R&D opportunities to develop low carbon products and solutions?	

Step 3B: Set GHG reduction targets (if applicable)

The guidance in this section applies to organizations that have set a GHG emissions reduction target. For organizations that have decided not to set a target, proceed to Step 3D below.

¹¹ There are regulations that set performance-based standards for certain sectors and facility types. If the company is subject to these types of regulations, this should be the minimum standard for the GHG reduction target.

¹² Sectors are based on emissions breakdown by sector in *Canada’s National Inventory Report, 1990–2017*.

There are four key considerations in setting GHG emission reduction targets:¹³

1. Target type: Determine whether to set an absolute or intensity-based target:

Target type	Example	Pros	Cons
<p>Absolute: reduction in total GHG emissions over a specific period.</p>	<p>Reduce GHG emissions by 30 per cent from 2010 levels by 2030.</p>	<ul style="list-style-type: none"> achieves real and transparent GHG reductions to mitigate climate change is viewed favourably by stakeholders concerned about climate change 	<ul style="list-style-type: none"> does not allow for direct comparison against sector peers is difficult to achieve if company growth is linked to GHG emissions (as with as high-emitting sectors)
<p>Intensity-based: reduction in the ratio of GHG emissions relative to an economic output of a business activity (e.g., revenue, assets).</p>	<p>Reduce CO₂e emissions per million dollars of revenue by 25 per cent by 2025.</p>	<ul style="list-style-type: none"> rewards performance-based efforts to reduce GHG emissions such that companies operating in high-emitting sectors can demonstrate progress enables leveled comparison to sector peers and over time 	<ul style="list-style-type: none"> does not necessarily result in absolute GHG reductions may be difficult to identify single intensity metric for companies with diverse business models and operations Susceptible to volatility of economic variable underlying intensity metric (e.g., revenue).

2. Baseline year: Determine the year that will represent the baseline for future GHG emissions reductions. Typically, the baseline year is the first-year inventory of the organization since it is the first year of measurable GHG emissions data.

3. Target year: Determine the timeline for GHG emissions reductions by establishing a target year for the goal to be achieved. For companies with long-term capital planning, a longer time horizon may be more suitable. In some cases, an organization will set a near-term target, as well as a longer-term target to establish a long-term plan to sustained GHG reductions, to enable them to measure progress over different time periods.

4. Percentage reduction: Determine the ambitions and feasibility of GHG reductions by establishing an achievable reduction. Consider the following sources of information in determining the percentage reduction:

¹³ Refer to Chapter 11 of the GHG Protocol (Corporate Standard) for more detailed guidance on target-setting.



- results from the company's baseline GHG inventory; this will help determine where most of the emissions are coming across departments, functions, and site locations
- benchmarking against sector peers that have set public targets and referencing any industry-led initiatives for guidance
- recommended targets from key stakeholders

Step 3C: Establish an action plan, including KPIs for monitoring

Once the company has set a GHG reduction target, it is important to establish an action plan to achieve the target, including identifying key performance indicators (KPIs) that will monitor progress. The following table outlines key components of a GHG reduction action plan.

Action plan component	Guidance
State GHG reduction target	Use the target determined in Step 3B above as the foundation for the organizational action plan.
Assessment of emission reduction opportunities	<ul style="list-style-type: none"> • Using the baseline GHG inventory, identify the top sources of GHG emissions across departments, functions and site locations. • Rank and plot on a graph the company's sources of GHG emissions for their relative cost of reductions (e.g., changing lightbulbs vs. retrofit of heavy equipment) and the type of emission reduction targets (i.e., % or absolute reduction). • Identify the top five to 10 opportunities for cost efficient, high-impact GHG reductions to make meaningful progress toward the target.
List of priority actions	<ul style="list-style-type: none"> • Identify low-hanging fruit, such as energy efficiency, to achieve quick and cost effective GHG reductions. • Prioritize the emission reduction opportunities identified above to establish timelines for action to reduce GHG emissions. Timelines should be based on the target year and percentage reduction. • Establish pathways to demonstrate how the company will meet GHG reduction goals through specific, concrete actions with associated timelines and accountabilities. See Step 4 below.
List of key performance Indicators (KPIs) for measuring and monitoring	<ul style="list-style-type: none"> • Identify existing business KPIs used to manage key strategic business risks and opportunities. There may be an overlap with existing KPIs that can be linked to GHG reduction activities and achievement of the target. • Review guidance on GHG-related metrics and indicators such as the TCFD Implementation Guidance and SASB Standards. These are commonly-used metrics for reporting to investors on GHG topics.



Once complete, many organizations publish their action plans to demonstrate leadership, corporate responsibility, transparency, accountability and a commitment to reducing GHG emissions to their stakeholders.

Step 4: Establish appropriate governance

Primer Q9: What is the role of leadership in GHG emissions management?

This step focuses on how the company establishes a “tone at the top” in relation to GHG emissions management. It includes guidance on establishing clear accountabilities, internal controls, and procedures over GHG data collection and reporting. This is particularly important when the company has set a target and published its action plan.

Step 4A: Establish formal accountability

Given that many companies are just getting started in measuring and monitoring their GHG emissions, it is important to establish formal roles and responsibilities across relevant departments and functions. If GHG emissions pose a strategic risk or opportunity for the organization, it is important to establish documented management processes, policies, and oversight accountabilities for the organization to respond effectively.

In many cases, it may have been management or the board of directors that initiated the organization’s GHG emissions inventory. Investors are increasingly engaging with companies’ senior leadership on the strategic importance of reducing GHG emissions, which garners board attention. If the board has identified climate-related risks and GHG emissions to be financially material, there should be formal processes for providing this information to the board (or a designated committee of the board) on a recurring basis, along with accompanying narrative to provide context for GHG emissions.

It is likely that actions to reduce GHG emissions along with the reporting of emissions data and KPIs are to span multiple departments and organizational functions. As such, many companies establish internal cross-functional committees to gather knowledge, data and insights from various facets of the business. Internal committees should have formal charters that include accountabilities.

Step 4B: Establish data collection systems, internal controls and processes for GHG emissions reporting

Once relevant data points have been identified to complete the annual GHG emissions inventory, the company should develop process documentation (e.g., narrative, flow chart) to explain how data is collected, reviewed, organized and reported. This documentation should explain how the company ensures the accuracy, reliability and completeness of data underlying its GHG calculations. In some cases, the internal audit function within an organization may be able to support this exercise. If the company requires a third-party review, or if it plans to obtain a voluntary review in the future, this process documentation will be beneficial.



Where data gaps exist, the organization should evaluate the cost/benefit of establishing methods to collect this data versus estimating it. In many cases, a reasonable estimate can be made based on alternate data available within the organization (e.g., electricity invoices). If new data will be collected, or if existing data is collected without any internal controls, establish appropriate internal processes and procedures to ensure accuracy, reliability, and completeness.

If GHG emissions are a material risk to the organization, they should also be included in the company-wide risk assessment process, as with any other business risk.

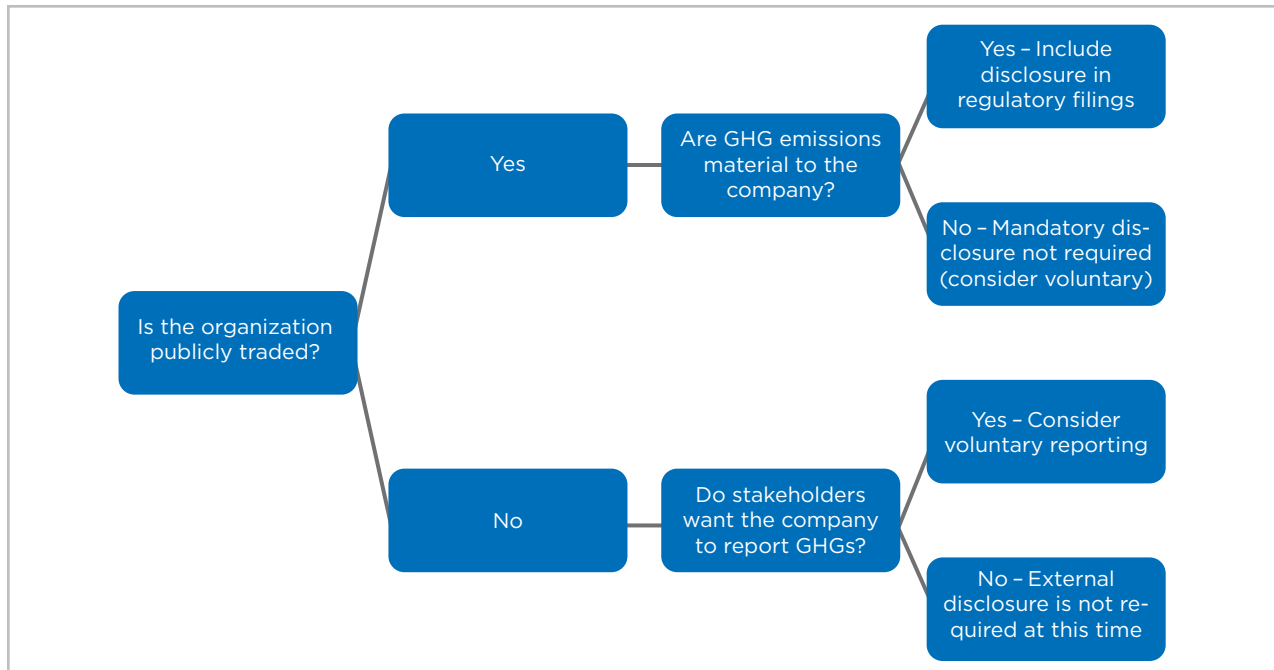
Step 5: Disclose to stakeholders

Primer Q10: Is external disclosure to capital providers necessary?

This step focuses on reporting and disclosure of GHG emissions to stakeholders identified in Step 1. It includes guidance to determine what GHG information should be disclosed to different stakeholder groups and where this information should be reported.

Step 5A: Determine if external disclosure is required or voluntary reporting is desirable

The decision tree below will help determine whether external disclosure is required, and if not, whether voluntary reporting is desirable for the company based on the information needs of its stakeholders. This decision tree should be revisited at each reporting period to determine if organizational circumstances have changed.



Step 5B: Determine reporting framework(s)

Once the company has determined if GHG emissions reporting is mandatory or voluntary, it must decide where and how this information should be disclosed and reported to different audiences. The table below outlines the most commonly used standards and frameworks for GHG emissions reporting:

Reporting framework	Report type	Audience	Location
Task Force on Climate-related Financial Disclosure (TCFD) Recommendations	Voluntary	Investors and other capital market participants	Included in mainstream financial filings (e.g., 10-K) or other investor-focused reporting (e.g., standalone ESG reports)
Sustainability Accounting Standards Board (SASB) Standards	Voluntary	Investors and other capital market participants	Included in mainstream financial filings (e.g., 10-K) or other investor-focused reporting (e.g., standalone ESG reports)
Carbon Disclosure Project (CDP)	Voluntary (survey)	Investors, customers, businesses, and policy makers	Survey response via CDP database
Global Reporting Initiative (GRI)	Voluntary	Broad stakeholders including customers, suppliers, employees, and communities	Standalone report
GHG emissions Footprint Report	Voluntary	As desired based on target audience (tailored approach)	Standalone report or company website



Key Learnings

There are many compelling strategic, operational and financial reasons for companies to reduce GHG emissions. Climate change is a complex global challenge that requires collaboration and action by all levels of the public and private sectors, as well as by civil society. All types of organizations should measure GHG emissions and establish processes and systems for ongoing monitoring and reporting (including setting targets to reduce GHG emissions over time).

By following the five-step process, organizations can establish effective GHG emissions management systems that directly link with corporate strategy, enterprise risk management, and financial performance and reporting. The key is setting the tone: emphasizing that reducing GHG emissions is an organizational priority, highlighting the strategic importance of GHG reductions to the company's long-term sustainability and ensuring the meaningful integration of reduction efforts across existing systems and processes.



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Resources

Readers are encouraged to refer to Appendix A of the primer for useful resources. Additional resources are below, including new financial reporting resources released since the primer was published.

Technical GHG emissions quantification

- [Environment and Climate Change Canada, *Technical Guidance on Reporting GHG emissions*](#)
- [United States Environmental Protection Agency, *Guide to Greenhouse Gas Management for Small Business & Low Emitters*](#)
- [ISO 14064-1: Part 1, “Organization Level GHG emissions Inventory Guidance”](#)
- [ISO 14064-2: Part 2, “Project Level GHG emissions Inventory Guidance”](#)
- [ISO 14064-3: Part 3, “Third-Party Validation and Verification”](#)
- [ISO 14065: “Requirements for Third-Party Validation and Verification Firms”](#)
- [*Greenhouse Gas \(GHG\) Protocol*](#)

Reporting and risk management guidance

- [*TCFD Implementation Guide - Using SASB Standards and the CDSB Framework to Enhance Climate-related Financial Disclosure in Mainstream Reporting*](#)
- [*TCFD Annex: Implementing the Recommendations of the TCFD*](#)
- [*TCFD Good Practice Handbook*](#)
- [*Science-Based Targets*](#)
- [*COSO and the World Business Council for Sustainable Development \(WBCSD\), *Applying Enterprise Risk Management to Environmental, Social and Governance-related Risks**](#)



Financial reporting resources

- [CPA Canada, *Progressive Investors and Corporate Disclosure*](#)
- [CPA Canada, *Disclosing the Impact of Climate Change: A Process for Assessing Materiality*](#)
- [CSA Staff Notice 51-358: *Reporting of Climate Change-related Risks*](#)



About the author

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