

# A Closer Look at the GHG Protocol Observations and Implications for Standards Setters and Regulators

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A CLOSER LOOK AT THE GHG PROTOCOL

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## Introduction

Greenhouse gas (GHG) emissions are perhaps the most widely tracked, cited and written about environmental disclosure. Companies tout their net-zero plans. Financial institutions make efforts to decarbonize portfolios. Yet, most people know little about how GHG emissions are measured and whether disclosures are comparable over time and across organizations.

Further, with securities regulators globally moving to make emission disclosure mandatory for many entities, along with the recent creation of the International Sustainability Standards Board (ISSB), it is important to understand how emissions are measured and disclosed. To that end, the Institute for Sustainable Finance (ISF) and CPA Canada have joined forces to prepare an overview of emissions disclosure practices and an introduction to the most widely used standards and guidance for GHG accounting and reporting developed by the Greenhouse Gas Protocol (GHG Protocol). This report provides the following:

- background on the GHG Protocol and its standard-setting process
- an overview of the key features of the GHG Protocol's Corporate Accounting and Reporting Standard
- information on how the GHG Protocol standards and guidance are being used
- observations and implications for standard setters and regulators

This report aims to inform potential preparers and users of emissions disclosure, policy makers, standard setters, regulators and others and to spur important additional research into key aspects of emissions disclosure and standards that require closer attention.

This report was based on desktop research, review of emissions disclosures provided through CDP (formerly the Carbon Disclosure Project), and interviews with stakeholders involved in the preparation and assurance of GHG emissions information. Further information on CDP data and stakeholder interviews is provided in the Appendix.

This report reflects our understanding based on a high-level review of information publicly available. We have not sought verification of the content from the GHG Protocol or the related organizations.

We value your views and feedback. Comments about this paper should be addressed to:

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## What Is the GHG Protocol?

The GHG Protocol is a multi-stakeholder partnership of businesses, non-governmental organizations (NGOs), governments and others convened by the World Resources Institute (WRI), which is a U.S.-based environmental NGO, and the World Business Council for Sustainable Development (WBCSD). The mission of the GHG Protocol is to develop internationally accepted greenhouse gas accounting and reporting standards.<sup>1</sup>

The GHG Protocol has been recognized and referenced by regulators and sustainability standards setters globally:

- The Canadian Securities Administrators (CSA) issued a [consultation on climate-related disclosure](#), which includes questions on the use of the GHG Protocol by Canadian public companies.
- The U.S. Securities and Exchange Commission (SEC) issued a [Proposed Rule to Enhance and Standardize Climate-Related Disclosures for Investors](#), which frequently references the GHG Protocol and bases the proposed GHG emissions disclosure rules on concepts used in the GHG Protocol.
- The ISSB released a [Climate-related Disclosures Exposure Draft](#), which proposes that the GHG Protocol be applied to measure GHG emissions.

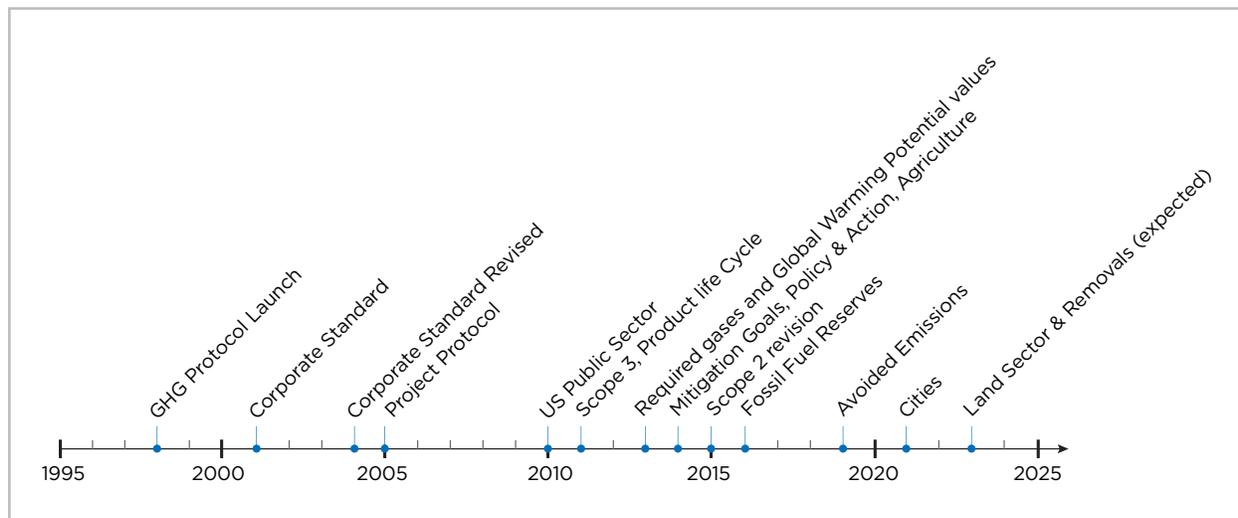
### [The IFRS Foundation's International Sustainability Standards Board](#)

[In 2021, the International Financial Reporting Standards \(IFRS\) Foundation created the ISSB to deliver a comprehensive global baseline of sustainability-related disclosure standards for the capital markets. The new board will operate alongside the International Accounting Standards Board \(IASB\).](#)

The GHG Protocol was launched in 1998 to fill the need for an international standard for corporate GHG accounting and reporting. It includes a total of seven standards designed to provide a framework for businesses, governments and other entities to measure and report their GHG emissions. The first standard released in 2001 by the GHG Protocol was the Corporate Accounting and Reporting Standard.<sup>2</sup>

The GHG Protocol also has released three additional standards for companies and organizations: the Corporate Value Chain (Scope 3) Standard, which goes in depth on accounting for indirect emissions (referred to as “Scope 3”); the Product Standard, which looks at life cycle emissions at the product level; and the Project Protocol, which provides principles, concepts and methods for climate change mitigation projects. The GHG Protocol also develops and publishes guidance on how certain sectors can apply the GHG Protocol standards.<sup>3</sup>

Below is a timeline presenting the major standards and guidelines released by the GHG Protocol.



As the timeline highlights, the GHG Protocol has been extended over time to cover the public sector and examine additional topics. However, this report focuses on the Corporate Standard, as it is the most recognized and widely used.

## GHG Protocol Creation and Development

The GHG Protocol was created by the WRI and WBCSD, and its team comprises staff from both organizations.<sup>4</sup>

### World Resources Institute

WRI is a global non-profit organization with headquarters in Washington, D.C., which “works on practical solutions that improve people’s lives and ensure nature can thrive.”<sup>5</sup> WRI has 1,400 staff in 12 international offices. The institute relies on donor support and publishes its financials annually to “highlight fiscal accountability and promote transparency.”<sup>6</sup>

### World Business Council for Sustainable Development

WBCSD is a global CEO-led community of over 200 of the world’s leading sustainable businesses with headquarters in Geneva, Switzerland. The group works to accelerate system transformations for a net-zero, nature-positive and more equitable future by engaging with executives and sustainability leaders.<sup>7</sup> Details on the WBCSD’s funding model could not be found on their website.

## Funding

Funding for the GHG Protocol comes from the private and public sectors. A full listing of funders can be found on the GHG Protocol website and includes organizations such as the Walmart Foundation, U.S. Environmental Protection Agency, Shell, Environment Canada and Microsoft.<sup>8</sup>

## Development and updating process

The GHG Protocol's original Corporate Standard team was composed of three members from WRI and three members from WBCSD. The Corporate Standard also relied on external experts for the development process, with core advisors from a variety of organizations such as the Big Four accounting firms, the United Nations Framework Convention on Climate Change (UNFCCC) and the U.S. Environmental Protection Agency. The Revision Working Group also had representation from both the private and public sectors.

Documents released after the original Corporate Standard, such as the Product and Scope 3 Standards, have more documentation regarding the development and consultation process. For example, the Corporate Value Chain (Scope 3) Standard has prior drafts, a timeline of events, a list of all stakeholders involved, and a Governance Plan.<sup>9</sup> The Governance Plan notes that the process will occur “through an open, transparent, inclusive, multistakeholder process.” Further, the document states that the goal is to reach consensus, but “on the occasion that the Steering Committee and Working Groups are unable to reach a consensus, WRI and WBCSD retain the authority to make a final decision.” It is unclear from our research what “consensus” means and what would happen in the event of a disagreement between WRI and WBCSD.<sup>10</sup> We did not see any information about voting processes.

Steering Committee members were invited to participate based on their commitment to the GHG Protocol's objectives, demonstrated engagement in international standard development, level of expertise in GHG emissions, and stakeholder and geographic diversity, including representation from developing countries, business, government and environmental NGOs.

Overall, details on the process for appointing individuals to standard-setting teams and the consistency of the process for issuing new or amended standards were unclear.

## The Corporate Standard

The Corporate Standard is a 116-page document containing “requirements and guidance for companies and other organizations preparing a corporate-level GHG emissions inventory,” which covers the accounting and reporting of the six greenhouse gases covered by the Kyoto Protocol.

A GHG inventory is defined within the Corporate Standard as a “quantified list of an organization’s GHG emissions and sources.”<sup>2</sup>

The Corporate Standard outlines approaches for dealing with events such as divestments and acquisitions and setting organizational and operational boundaries for the purpose of accounting for and reporting GHG emissions. The GHG Protocol also provides a number of calculation tools (Excel-based templates) to assist in calculating GHG emissions.<sup>12</sup>

The Corporate Standard has various objectives:

- To help companies prepare a GHG inventory that represents a true and fair account of their emissions through the use of standardized approaches and principles
- To simplify and reduce the costs of compiling a GHG inventory
- To provide business with information that can be used to build an effective strategy to manage and reduce GHG emissions
- To increase consistency and transparency in GHG accounting and reporting among various companies and GHG programs<sup>2</sup>

The Corporate Standard specifies that it is written primarily from the perspective of a business developing a GHG inventory. However, it specifies that it applies equally to other types of organizations with operations that give rise to GHG emissions (e.g., NGOs, universities and government agencies).

## Materiality

Materiality assessments are critical to making decisions about measurement and deciding what information to disclose and how to present it. The concept of materiality is addressed in the context of GHG emissions verification and is included in Chapter 10 Verification of GHG Emissions. The guidance on materiality states that “information is considered to be material if, by its inclusion or exclusion, it can be seen to influence any decisions or actions taken by users of it.” The guidance identifies a “rule of thumb” – “an error is considered to be materially misleading if its value (i.e., GHG emissions values) exceeds 5% of the total inventory for the part of the organization being verified.”<sup>2</sup>

## Features of the standard

The Corporate Standard contains requirements and guidance. Although some subsections are labelled as a standard, no chapter as a whole is labelled as such. It is noteworthy that the **calculating GHG emissions chapter** is labelled as **guidance**. The term “shall” is used in the chapters containing standards to clarify what is required to prepare and report a GHG inventory in accordance with the Corporate Standard.

*“I think the gaps relate to the fact that this is a guidance document. It’s not supposed to answer every question or be very prescriptive, and I think people have started to notice gaps in the sense that they have started to ask questions about how to handle certain things as the standard has become the focus of securities law and is starting to be rolled into actual legal requirements.”*

**Tyson Dyck, Torys LLP**

The following chapters contain standards and guidance:

- GHG Accounting and Reporting Principles
- Setting Organizational Boundaries
- Setting Operational Boundaries
- Tracking Emissions Over Time
- Reporting GHG Emissions

There are 10 pages of standards material out of the total 116 pages.

The following chapters contain guidance only:

- Business Goals and Inventory Design
- Identifying and Calculating GHG Emissions
- Managing Inventory Quality
- Accounting for GHG Reductions
- Verification of GHG Emissions
- Setting GHG Targets

## Amendments and revisions

The first edition of the Corporate Standard was published in 2001. It was revised for the first time in 2004. This revision included additional guidance, new appendices and a new chapter on setting GHG targets. The 2004 revised version of the Corporate Standard is still the most recent version; however, additional standards, amendments and guidance have been released.

- 2011 - [\*Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard \(Scope 3 Standard\)\*](#)  
The Scope 3 Standard provides requirements and guidance for companies and other organizations to prepare and publicly report a GHG emissions inventory that includes indirect emissions resulting from value chain activities (i.e., Scope 3 emissions). The Scope 3 Standard was particularly substantial; it was created over a three-year period and involved 2,300 participants from 55 countries, 96 members of a technical working group, and 34 companies from various industries that tested the standard prior to its launch.<sup>10</sup>
- 2013 - [\*Required Greenhouse Gases in Inventories: Accounting and Reporting Standard Amendment \(Corporate Standard Amendment\)\*](#)  
The Corporate Standard Amendment amends requirements regarding the GHGs to include in inventories, as well as the way the emissions of those GHGs should be reported within inventories.
- 2014 - [\*GHG Protocol Agricultural Guidance \(Agriculture Guidance\)\*](#)  
The Agriculture Guidance interprets the Corporate Standard for the agricultural sector.
- 2015 - the [\*GHG Protocol Scope 2 Guidance \(Scope 2 Guidance\)\*](#)  
The Scope 2 Guidance standardizes how corporations measure emissions from purchased or acquired electricity, steam, heat and cooling (referred to as “Scope 2 emissions”).

The GHG Protocol has public comment periods when they release new guidance. It is unclear whether there are public comment periods for amendments and revisions.

In March 2022, the GHG Protocol announced a review to assess need for additional guidance building on the existing set of corporate GHG accounting and reporting standards. The research is being led by a Concordia University team based in Montreal, Canada.<sup>11</sup>

## Significant Estimates and Judgments in GHG Emission Calculations

### GHG boundaries

GHG boundary decisions are a critical part of GHG accounting and reporting and represent a large part of the Corporate Standard. Selecting which businesses and operations to include for the purposes of accounting for and reporting GHG emissions is referred to within the Corporate Standard as setting “organizational” and “operational” boundaries. These choices help establish an organization’s GHG inventory.

Per the guidance included in Chapter 3 of the Corporate Standard,

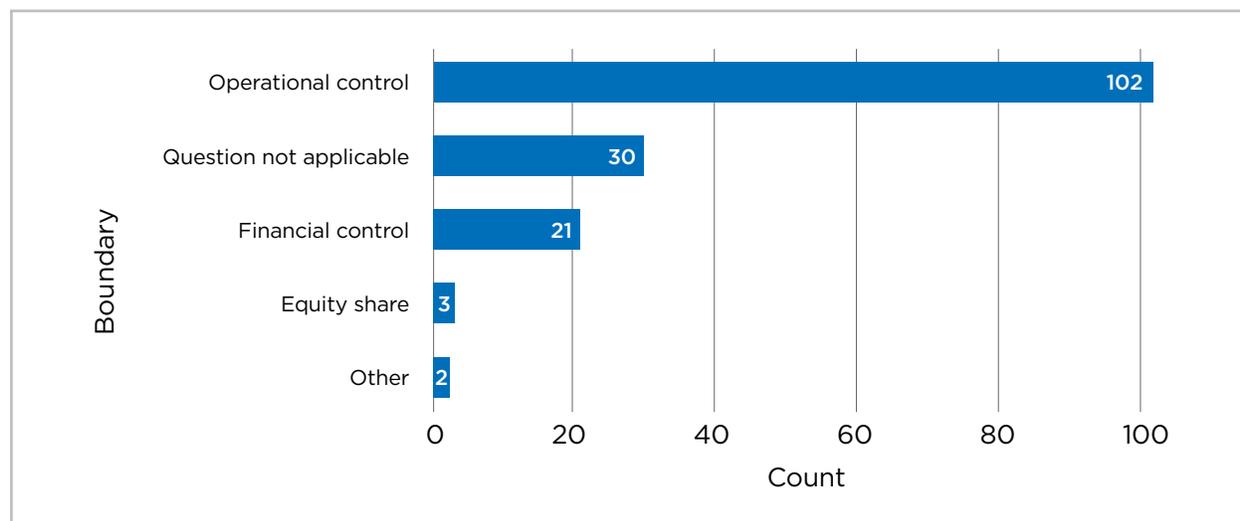
GHG accounting concerns the recognition and consolidation of GHG emissions from operations in which a parent company holds an interest (either control or equity) and linking the data to specific operations, sites, geographic locations, business process, and owners. GHG reporting concerns the presentation of GHG data in formats tailored to needs of various reporting uses and users.<sup>2</sup>

For corporate reporting, the Corporate Standard provides two distinct methods to consolidate GHG emissions: (1) the equity share approach and (2) the control approach. With the equity share approach, a company accounts for GHG emissions from operations according to its share of equity in the operation. Under the control approach, a company accounts for 100 percent of the GHG emissions from operations over which it has control. It does not account for GHG emissions from operations in which it owns an interest but has no control. Under the control approach, the company must choose between the operational control or financial control approaches.<sup>2</sup> Under both approaches, the organizational boundary will be the same if the reporting entity wholly owns all of its operations.

GHG boundaries determined in accordance with the Corporate Standard may not be consistent with consolidation approaches used for financial reporting purposes. Some regulators and standards setters have proposed that specific approaches be used when it comes to GHG boundaries to promote greater consistency and comparability. For example, the SEC’s proposed climate disclosure rule requires the scope of consolidation and reporting to be consistent for financial data and GHG emissions data. The ISSB’s climate-related disclosure exposure draft requires that entities separately disclose Scope 1 and 2 emissions for the consolidated group and for any associates, joint ventures, unconsolidated subsidiaries and affiliates not included in the consolidated group.

We analyzed data provided by CDP’s 2021 climate change data questionnaire to see the frequency of each approach. We find that the operational control approach is overwhelmingly used amongst Canadian companies.

FIGURE 1: CANADIAN COMPANIES' DECISIONS FOR GHG INVENTORY BOUNDARY



Source: Author. Data used to generate the graphic is from CDP 2021 Climate Change Data, question C0.5.

### Emission factors

Emission factors are a core component of estimating an organization's emissions. These factors are representative values that translate business activity into emissions estimates. For example, an emissions factor could translate levels of road or air travel into an emissions estimate.

The GHG Protocol provides a set of default emission factors for the business activities of specific sectors. These default emission factors are "averages based on the most extensive data sets available and are identical to those used by the Intergovernmental Panel on Climate Change (IPCC)."<sup>13</sup> The GHG Protocol acknowledges that if more specific and representative factors for a business' operations exist, then those values should be used instead. This preference for specific, rather than general, emission factors is consistent with Canada's Greenhouse Gas Reporting Program (GHGRP).\*

It is not clear how often the emission factor data is updated, but it appears that some of the information is significantly out of date.†

*"Having further guidance on what is deemed 'best available' emission factors would be useful. As an example, guidance on when new emissions factors are published the day before a company is to report? Should the company update their report?"*

**Naomi Thomas, PwC Canada**

\* The [GHGRP](#) collects information on GHG emissions annually from facilities across Canada. It is a mandatory program for those who meet the requirements.

† The [Emission Factors from Cross-Sector Tools](#) section from the GHG Protocol's [Calculation Tools](#) page appears to have been last updated in 2017.

## Global warming potential

The emissions of each GHG (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, etc.) determined using the emissions factors are then converted into CO<sub>2</sub> equivalents on the basis of their global warming potential (GWP). The GWP metric examines each greenhouse gas' ability to trap heat in the atmosphere compared to carbon dioxide (CO<sub>2</sub>).<sup>14</sup> GWP values<sup>†</sup> can vary based on their time horizon and can also be revised as new research is released.<sup>15</sup>

Originally, the GHG Protocol was not prescriptive regarding the use of GWP values and acknowledged that there is “significant scientific uncertainty” involved. In 2013, the GHG Protocol published a [Required Greenhouse Gases in Inventories: Accounting and Reporting Standard Amendment](#) to provide more explicit guidance about how GWP values should be used.

## Scope 3

The Corporate Standard indicates that Scope 3 estimation is optional, but states that companies may want to focus on accounting for and reporting Scope 3 information for those activities that are relevant to their business and goals, and for which they have reliable information. These activities could include the use of sold products, leased assets, outsourced activities and transport-related activities. It states that “since companies have discretion over which categories they choose to report, Scope 3 may not lend itself well to comparisons across companies.” The Corporate Standard suggests focusing on one or two major GHG-generating activities for the Scope 3 calculation.

The GHG Protocol released a standard focused solely on Scope 3, [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#). It appears that compliance with the Corporate Standard does not require application of the Scope 3 Standard.

*“Sector specificity is really helpful when disclosing scope 3 emissions. That is why Suncor uses guidance from organizations like the International Petroleum Industry Environmental Conservation Association (IPIECA) who have deep knowledge of the sector and provide clear direction on how to navigate the complexity that is scope 3.”*

**Jon Mitchell, Suncor**

† GWP values are numbers that refer to the amount of global warming caused by a substance.

## Other Guidance Used in Canada for Determining and Reporting GHG Emissions

ISO 14064 is also an international standard for quantifying and reporting greenhouse gas emissions. This standard was based on the Corporate Standard. ISO 14064 was first published in 2006, later revised in 2018, and was created to be compatible with the established ISO standards for energy and environmental management.<sup>16</sup> The GHG Protocol and ISO issued a memorandum of understanding, only one year after ISO 14064's release, to jointly promote both global standards.<sup>17</sup>

Canada's National Inventory Report uses a GHG accounting methodology that was developed using guidelines produced by the IPCC.<sup>18</sup>

There is also Environment and Climate Change Canada's Greenhouse Gas Reporting Program (GHGRP), which requires all Canadian facilities that emit more than 10,000 CO<sub>2</sub> eq tonnes per year to submit a report.<sup>19</sup> The program also lists activities and sectors that require additional reporting, such as cement and steel production. This program requires reporting at the facility and not the organization level. Technical guidance is also provided, which includes information on the GHGs and emission sources subject to reporting, along with information on methods for calculating emissions and the required reporting format.<sup>20</sup>

The GHG Protocol also offers a "Built on GHG Protocol" acknowledgement (referred to as "mark") to recognize guidance and standards that have been developed in conformance with the GHG Protocol.<sup>3</sup> These additional publications may help provide guidance and standardization in areas not covered by the GHG Protocol. Some examples of guidance and standards that have been accorded the "Built on GHG Protocol" mark include the following:

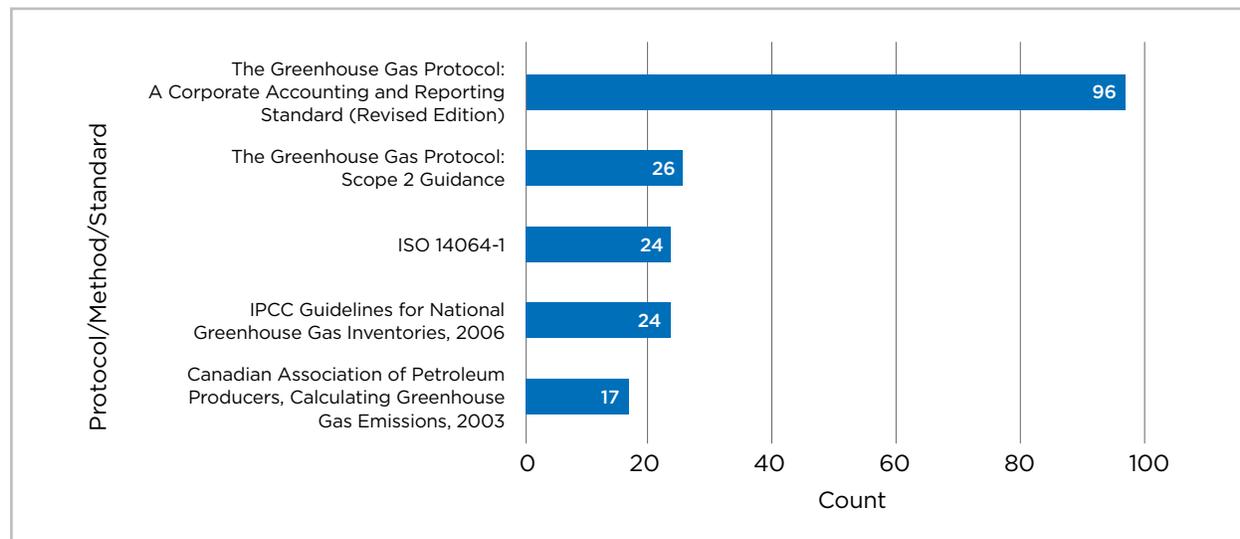
- [Partnership for Carbon Accounting Financials \(PCAF\), The Global GHG Accounting & Reporting Standard for the Financial Industry](#)
- [ENCORD, Construction CO<sub>2</sub>e Measurement Protocol](#) providing guidance for companies within the construction sector
- [GHG Reporting Guidance for the Aerospace Industry](#)
- [Global Logistics Emissions Council \(GLEC\) Framework](#) facilitating emissions accounting for logistics operations

It is not clear how this guidance or any standard implementation issues are considered in the GHG Protocol's standard-setting process.

Any organization developing guidance or a standard based on the GHG Protocol may apply for the mark. A dedicated team at WRI will review the material, ensuring it adheres to the requirements of a GHG Protocol standard and uses consistent terminology. A complete list of materials that have earned the "Built on GHG Protocol" mark can be found on the GHG Protocol's website.

Figure 2 shows that Canadian firms overwhelmingly use the GHG Protocol for GHG accounting purposes. While the GHG Protocol is predominantly used, there are many additional standards/protocols/methodologies currently in use. Some of these are derived from the GHG Protocol.

**FIGURE 2: TOP FIVE STANDARD/PROTOCOL/METHODOLOGY USED BY CANADIAN COMPANIES FOR GHG ACCOUNTING**



*Source:* Author. Data used to generate the graphic is from CDP 2021 Climate Change Data, question C5.2.

*Note:* The graph shows the number of times a standard/protocol/methodology is listed by Canadian companies answering the CDP questionnaire. One company may list more than one standard/protocol/methodology.

## The GHG Protocol in Practice

The GHG Protocol encourages the use of the Corporate Standard by all companies, regardless of their experience with GHG accounting, and has GHG calculation processes with non-technical staff in mind.

In the past, WRI provided several inexpensive or free in-person training sessions dedicated to greenhouse gas accounting, using the Corporate Standard. WRI has recently adapted the sessions into online training modules and live webinars. Through these training sessions, industry professionals may learn principles of GHG accounting – namely, about identifying, calculating and reporting emissions using the GHG Protocol. Additional specialized training is available on topics including Scope 2 emissions, corporate value chain (Scope 3 emissions), and setting and tracking emissions targets.

To gain a better understanding of how the GHG Protocol is implemented in practice, we also surveyed the reports of a group of companies in the Canadian oil & gas sector. We paid particular attention to disclosure about matters such as emission factors and boundaries. We found that the GHG Protocol was usually used in combination with other standards, protocols or methodologies provided by organizations such as the U.S. Environmental Protection Agency and the American Petroleum Institute. We also found that organizations were regularly using more accurate site-specific emission factors. In one instance, an organization noted that it had 1,000+ specific emission factors that it used during their GHG accounting process. Companies that reported using CDP usually had transparent information pertaining to the GHG Protocol's implementation, such as various emission factors and organizational boundaries.

## Assurance

The possibility of requiring assurance over GHG emissions reporting is a key area of focus for regulators and standard setters globally. There are specific assurance standards (e.g., [International Standard on Assurance Engagements \(ISAE\) 3410, Assurance Engagements on Greenhouse Gas Statements](#)), which can be applied for these types of engagements.

The Corporate Standard includes general guidance on the verification of GHG emissions data but does not impose (or even suggest) a mandatory requirement for the verification of such data by an independent third party.

Limited assurance engagements are currently most common for GHG emissions and are conducted by consultants, professional accountants and others. The nature, timing and extent of procedures performed in a limited assurance engagement are more limited compared with what would be necessary in a reasonable assurance engagement.<sup>§</sup>

CPA Canada's [Sustainability Assurance Alert: Third-party Assurance Over Sustainability Information](#) provides additional background on assurance over GHG emissions.

## Observations and Matters for Further Consideration

Our high-level review of the GHG Protocol identified specific areas that require attention:

- *Nature of the GHG Protocol:* The GHG Protocol consists of standards and guidance material. The Corporate Standard contains some material labelled as standards and some material labelled as guidance. This mixed approach could (1) be confusing to preparers and (2) create challenges for assurance providers. It is not clear how new standards and amendments factor into the Corporate Standard either.

<sup>§</sup> Reasonable assurance is a high, but not absolute, level of assurance. For example, an audit of financial statements is a reasonable assurance engagement. Limited assurance is lower than in a reasonable assurance engagement. For example, a review engagement of financial statements is a limited assurance engagement.

- *Development process*: The operations of the GHG Protocol to develop and update the GHG Protocol standards, including due process, independence, funding mechanisms, and the governance structure, are not fully transparent and should be reviewed to determine whether they are appropriate given expanded role of the GHG Protocol.
- *Scope 3*: This area of disclosure is challenging for preparers, and more prescriptive guidance on the calculation of Scope 3 emissions is needed on both calculation issues and what should be disclosed.
- *Other GHG emission guidance and standards*: There is a range of other material available for calculating GHG emissions, which could (1) be confusing to preparers and (2) result in diverse interpretations. There should be more clarity on how this material interacts with the GHG Protocol's core standards.
- *Significant estimates and judgments*: The calculation of GHG emissions is made up of estimates, judgments and information from a variety of sources that are subject to change frequently. In addition, some of the information being used – for example, emissions factors – may be out of date.
- *Materiality*: The definition and guidance on materiality within the Corporate Standard does not align with materiality definitions and guidance referenced in other standards and regulation.
- *Comparability*: Certain areas, such as GHG reporting boundaries, emission factors and the degree that companies can choose which Scope 3 activities to disclose, create a degree of latitude, which could reduce comparability.
- *Assurance*: The findings listed above can result in challenges for providing assurance over GHG emissions.

The following should be considered by standard setters and regulators relying on the GHG Protocol:

- What further analysis needs to be done on the GHG Protocol's suite of standards, their development and their use to ensure that they are fit for purpose in the context of sustainability reporting for the capital markets? For example, does the mix of standards and guidance provide an appropriate basis for reference in a sustainability reporting standard?
- What process will be employed to monitor and review modifications to the GHG Protocol suite of standards?
- What additional guidance is required to assist companies in disclosing their GHG emissions?
- What level of transparency is required from the GHG Protocol over the development process of its standards and guidance?

- Are there more specific requirements needed for the disclosure of assumptions and judgments used in the calculation of GHG emissions?
- Is more industry-specific guidance required?
- What further work is needed on assurance challenges related to GHG emissions disclosures?
- Is there a mechanism in place to raise and address GHG Protocol standards implementation issues? What are the longer-term plans for the GHG Protocol? For example, should it be incorporated into global sustainability standards? Is a new approach needed for GHG reporting standard setting, given its increasing importance?

## Conclusion

The business and reporting environment has changed considerably from when the GHG Protocol was initially established. The GHG Protocol standards are of significance to a broad range of users.

GHG emissions reporting is a complex area that is not well understood. There are decisions that companies make in applying GHG accounting and reporting standards, which can lead to lack of comparability in disclosures that are being made. Although the development of the GHG Protocol has been important and helpful, we believe more work should be done on the GHG Protocol standards and guidance at a global level to ensure that they meet evolving stakeholder needs and expectations. Our review identified a number of important questions that need to be considered by standards setters and regulators relying on the GHG Protocol.

As interest in this area continues to grow, education will be key. Users relying on GHG emissions data would benefit from greater transparency around the various companies' choices made and the methodologies used, accompanied by a warning about (1) the potential lack of comparability and (2) measurement uncertainty associated with the data. We hope that this report encourages readers to learn more about GHG emissions measurement and reporting, and triggers dialogue on how to enhance the quality of GHG information in the marketplace.

## Appendix

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## CDP data

CDP data is from their 2021 Climate Change questionnaire. There were 151 Canadian companies that answered “Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.”

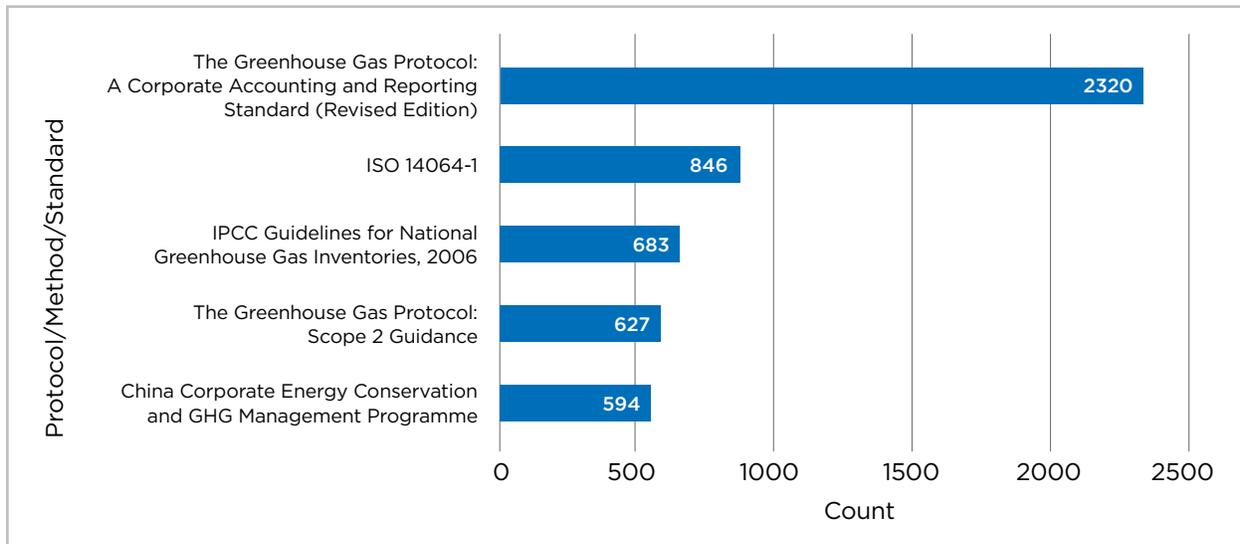
Primary industry	Count
Services	46
Manufacturing	24
Materials	23
Fossil fuels	21
Transportation services	9
Retail	9
Infrastructure	6
Food, beverage and agriculture	5
Power generation	5
Apparel	1
Hospitality	1
Biotech, health care and pharma	1

The data for Figure 1 was obtained from the CDP question “Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.” There were 158 Canadian companies that answered this. The response rate differs slightly from the previous question listed, because the CDP questionnaire is voluntary. A breakdown of these 158 companies by primary industry can be seen below.

Primary industry	Count
Services	49
Manufacturing	26
Materials	23
Fossil fuels	21
Transportation services	9
Retail	9
Infrastructure	6
Food, beverage and agriculture	5
Power generation	5
Apparel	2
Hospitality	2
Biotech, health care and pharma	1

If we remove the restriction for Canadian-only companies, we are left with 5,866 and 5,601 companies for the boundary-choice and methods-used questions, respectively. The CDP questionnaire has large participation worldwide, with 1,084 companies responding from the United States alone. Further (in addition to the U.S.), China, Japan, the U.K., Brazil, South Korea and France – all have more companies responding to the CDP questionnaire compared to Canada. Below are Figures 3 and 4 for all respondents, and we see that a China-specific GHG accounting methodology makes it into the top five. It is unclear why companies choose “not applicable” for the GHG inventory boundary question.

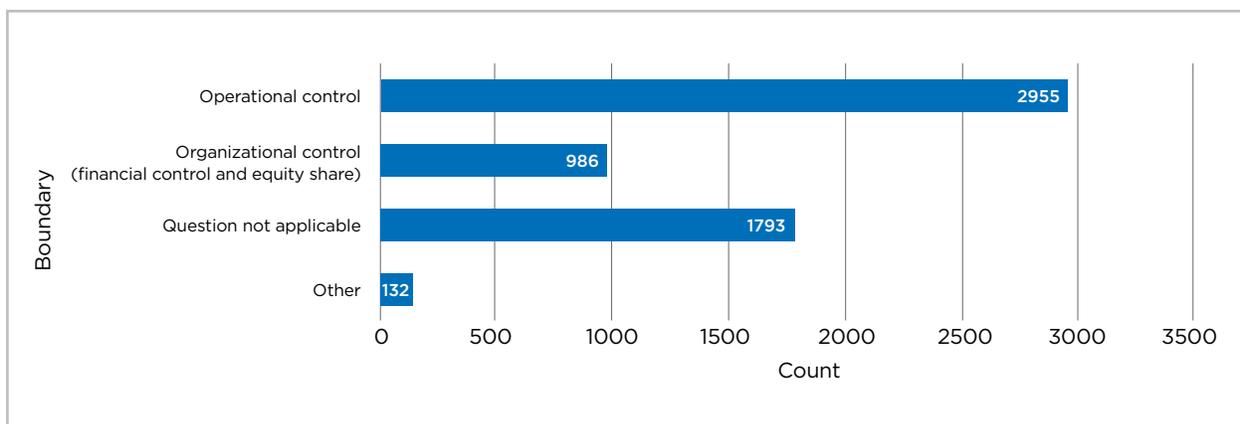
**FIGURE 3: TOP FIVE STANDARD/PROTOCOL/METHODOLOGY USED BY COMPANIES FOR GHG ACCOUNTING**



*Source:* Author. Data used to generate the graphic is from CDP 2021 Climate Change Data, question C5.2.

*Note:* Graph shows the number of times a standard/protocol/methodology is listed by companies answering the CDP questionnaire. One company may list more than one standard/protocol/methodology.

**FIGURE 4: COMPANY'S DECISION FOR GHG INVENTORY BOUNDARY**



*Source:* Author. Data used to generate the graphic is from CDP 2021 Climate Change Data, question C0.5.

## List of interviewees

### **Sarah Marsh**

*Partner, National ESG Report and Assurance Leader, PwC Canada*

### **Naomi Thomas**

*Manager, Sustainability and Climate Change, PwC Canada*

### **Troy McDonald**

*Assistant Treasurer and Risk Management (Sustainability), Tourmaline Oil Corp.*

### **Tyson Dyck**

*Partner, Environmental Lawyer, Torys LLP*

### **Jon Mitchell**

*Vice-President Sustainability, Suncor*