BRITISH COLUMBIA PUBLIC SECTOR EMISSIONS REPORTING: QUALITY CONTROL AND QUALITY ASSURANCE GUIDANCE DOCUMENT

FOR PUBLIC SECTOR ORGANIZATIONS

January 2025

Version 2.0

Ministry of Energy and Climate Solutions

Table of Contents

List of Tables

List of Figures

1. Introduction

1.1 Background

Under B.C.'s Carbon Neutral Government (CNG) program, legislated under the Climate Change Accountability Act (CCAA), all provincial public sector organizations (PSOs) must achieve carbon neutrality. This requirement applies to provincial government (Ministry) operations as well as crown corporations, health authorities, post secondary institutions and school districts across the province of British Columbia.[1] All PSOs need to perform the following key tasks to comply with the Province's Carbon Neutral Government Regulation (*CNGR*):

1. Measure greenhouse gas (GHG) emissions
2. Plan and implement carbon reduction initiatives
3. Invest in carbon reduction offset projects to achieve carbon neutrality
4. Report publicly

1.2 Quality Assurance and Quality Control Definitions

Quality Assurance (QA): Plans and procedures designed to ensure that data are as accurate and reproducible as possible. For example, use of data collection templates to ensure that data have been properly entered, preventing errors.

Quality Control (QC): Measures that regulate data collection processes and the standard operating procedures of the data, such as procedures for collecting samples or making sure tools are accurate. The quality control requirements improve accuracy and reduce uncertainty of the data.

1.3 The need for Quality Assurance and Quality Controls

To meet international quality standards, PSOs should establish processes to support relevant, complete, consistent, transparent and accurate reporting.

For newly established PSOs or those who have experienced staff turnover, GHG data collection and reporting may be new, and formal GHG accounting standards might be unfamiliar. BC offers this document as guidance for the collection and compilation of consumption data from public sector buildings, fleets, paper and fugitives, in addition to business travel for the provincial government.

By applying the guidance in this document, PSOs are less likely to have material misstatements, errors or omissions in their annual GHG reporting.

[1] PSOs encompass provincial government entities funded through the Consolidated Revenue Fund (e.g., ministries, special offices, tribunals) and broader public sector agencies – health authorities, school districts (K-12), colleges and universities, and Crown corporations under the Government Reporting Entity.

1.4 Document purpose

The objective of this manual is to help PSOs develop processes, in line with international quality standards, for collecting and reporting high quality energy, fuel and paper (and business travel for provincial government) consumption data for GHG emissions measurement. Additionally, it provides guidance on developing governance structures to ensure these processes are appropriately managed and maintained. The processes and structures are designed to support self-certification and verification of public sector consumption data reporting.

1.5 Document audience

This guidance document is intended to provide advice for individuals within PSOs who are involved in or responsible for reporting consumption data from building, fleet, paper and fugitives (and business travel for provincial government), under the *CCAA* and *CNGR*.

1.6 Document structure

This guidance begins with an overview of key quality control and quality assurance concepts, then describes the application of these concepts using the GHG Reporting Framework. After identifying which controls may apply to different parts of the framework, this guidance then explains how an organization can customize controls to their specific situation or needs. The appendix provides examples of common risks associated with each part of the GHG Reporting Framework and suggests controls to manage those risks.

2. Key GHG quality reporting concepts

2.1 Section objective

This section describes key quality control concepts to help PSOs design and implement customized controls for reliable reporting.

2.2 GHG reporting principles

The World Resource Institute (WRI) and World Business Council for Sustainable Development (WBCSD) identified five key accounting reporting principles for quality reporting: relevance, completeness, consistency, transparency, and accuracy. These principles are defined as follows.[2]

1. **Relevance** – Ensure the GHG inventory appropriately reflects the company's emissions and meets the decision-making needs of users – both internal and external to the company.
2. **Completeness** – Report all GHG emission sources and activities within the inventory boundary, disclosing and justifying any exclusions.

[2] The World Resource Institute/World Business Council for Sustainable Development. *GHG Protocol: A Corporate Accounting and Reporting Standard*, Revised Edition, p 7

3. **Consistency** – Use consistent methodologies for meaningful comparisons of emissions over time, documenting any changes.
4. **Transparency** – Present all relevant issues in a factual and coherent manner, with a clear audit trail, and disclose assumptions, methodologies and data sources used.
5. **Accuracy** – Quantify GHG emissions as precisely as possible, minimizing uncertainties to support decision-making.

PSOs should design and implement controls to ensure GHG data is relevant, complete, consistent, transparent and accurate. The Climate Action Secretariat engages a third-party verifier to review the GHG reporting of selected PSOs each year. The verifier assesses the PSOs' GHG reports based on these five reporting principles.

2.3 Customizing controls to suit the PSO

There is no uniform approach or a list of standard controls for ensuring quality GHG reporting. Controls must be tailored to each organization's reporting structure and size. Section 7 provides an overview of the processes PSOs can use to design and implement custom controls for GHG reporting.

2.3.1 Reporting structure

The design of the GHG reporting function determines where the PSO assigns the responsibilities and accountabilities for data and reporting. Organizations must decide whether to follow a centralized or decentralized reporting structure:

- **Centralized**: A few key individuals in the PSO handle all reporting tasks, such as collecting, compiling and reporting GHG consumption data.
- **Decentralized**: Many individuals across the PSO are involved in reporting-related tasks (eg. collecting and submitting data), but key individuals of the organization compile and report the data.

The reporting design structure can be highly centralized, decentralized, or a combination of both. The selected reporting structure will affect the PSO's control strengths and weaknesses and the type of controls needed. For example, a highly decentralized model may lead to inconsistent reporting due to several individuals handling the data. In this circumstance, the PSO should implement controls to standardize procedures and provide training to ensure consistency.

2.3.2 Size of organization

PSOs rely on data sources,[3] such as fuel consumption records and electricity bills, to help calculate their emissions and create GHG reports. The size of a PSO can impact how GHG reporting responsibilities are divided and how data is managed. The design of the reporting structure, whether centralized or decentralized, determines how data is captured, compiled, reported, and certified. These processes are influenced by the number of roles involved and how data is handed over

[3] Data Sources are discussed in more detail in Section 2.4 **GHG reporting resources**

between individuals. Effective data handover from those capturing the data to those reporting will minimize data errors and omissions. It is an important part of a properly controlled GHG reporting process.

The number of data handovers may depend on the size of the PSO and the design of the PSO's reporting structure:

- **Smaller organizations**: May only have one data handover from the data collector of all emission sources to the person responsible for data compilation, reporting, and archiving for the entire PSO.
- **Larger organizations:** May have several data handovers, including those from various individuals collecting data for different emission sources (e.g. building, fleet, paper and fugitives), to the individual compiling of the data, to the individual responsible for uploading and certifying all the PSO's data, to the one archiving the data.

The number of data-handovers influences what controls PSOs implement. For example, in a small organization where the same person handles both data collection and the final review, there is a risk of inadequate segregation of duties. In this circumstance, the PSO should implement controls for independent reviews by individuals that are not involved with data collection, or document double-checking processes.

2.4 GHG reporting resources

GHG reporting infrastructure: The Clean Government Reporting Tool (CGRT) is a web-based tool managed by the provincial government. The PSO's identified Data Collector enters the consumption data into CGRT, which applies a standard methodology for calculating and reporting public sector GHG emissions.

GHG Data Sources: Data Sources provide the evidence that support the total emissions calculations. Typical data supporting the four emission categories are described in Table 1.

Table 1: GHG Reporting Categories and Supporting Data Examples

	Category	Examples of supporting data
1.	Buildings	• Utilities invoices or usage reports • Lists of leased or owned buildings/office spaces • Total property floor area and % used by the PSO • Buildings sold or acquired during the reporting period • Leases closed or signed during the reporting period • Subleases signed and to whom (Note that the PSO is responsible for reporting the emissions of a building they lease to another organization that is not a PSO) • At times, Utility Vendor Disclosure Authorization Forms may need to be obtained from landlords to access energy usage data for leased buildings

	Category	Examples of supporting data
2.	Fleet	• Lists of vehicles leased or owned, with description of intended use (e.g. operations, business travel); type of vehicle, type of fuel used • Data from an outsourced vehicle management company • Fleet purchases made using vendor specific fuel cards • If applicable, mileage records, gas consumptions totals, odometer readings
3.	Fugitives	• Maintenance records, including mass of refrigerant added to the equipment • Equipment inventories, including type of equipment, maximum refrigerant capacity, type of refrigerant, electrical load
4.	Paper	• Invoices from vendors, showing the type and quantity of paper purchased • Purchasing records from Accounts Payable

2.5 Control types

PSOs can implement various types of controls to have an effective GHG reporting structure. Below are examples of these controls.

2.5.1 Preventative vs. detective controls

Preventative Controls aim to prevent errors from occurring in the first place. Examples of preventative controls include:

- Requiring a specific 'unit of measure' with the related GHG source data.
- Requiring CGRT users receive training on how to upload data into CGRT before they begin.
- Having another person review the data before the responsible person enters the data.

Detective Controls aim to identify errors that have already occurred. Examples of detective controls include:

- Periodically reconciling paper purchase invoices with supplier statements.
- Regularly scheduling reviews of consumption data for reasonableness and completeness. Identified gaps or inconsistencies should be investigated, correcting any errors found and documenting the review performed.
- Comparing current year data with the previous year data to identify any anomalies.

A well controlled GHG reporting process should have a combination of both preventative and detective controls in place.

2.5.2 Manual vs. automated controls

Manual Controls are predetermined activities that are performed by employees. Examples of manual controls include:

- Validating that all fleet inventory listed in CGRT corresponds with PSO's asset records.

- Reconciling year end consumption data against Data Collectors' total to ensure they match; management reviews and investigates significant variances.

Automated Controls are built into systems to ensure that established control objectives will be met. Once automated system controls have been properly set up, they do not require employee interaction to function. Examples of automated controls include:

- Formulas built into spreadsheets to minimize manual calculation/compilation errors.

  Despite being automated, it is a best practice to occasionally monitor and test automated system controls to ensure formulas are operating correctly, and to lock them down to prevent accidental manipulation.

Manual controls are generally considered less effective than automated controls due to the potential for human error, however even a heavily automated reporting process should have manual checks performed to verify automated controls.

2.5.3 Quality controls, quality assurances and audits

Quality Controls are activities carried out by those that collect and/or produce the data, to ensure accuracy from the start.

Quality Assurances are activities performed by individuals not directly involved with reporting the data. These activities provide a secondary layer of oversight, helping to confirm that the data collected and reported meets the required standards. Quality assurance focuses on reviewing and validating data for completeness, consistency and reliability, and helps for setting the tone and clear expectations for data quality in the organization.

Internal Audit (IA) is a review within an organization of the accuracy of GHG reports and the effectiveness of Quality Controls and Quality Assurance. Internal audits or checking should be performed by those external to the reporting function. Errors found during audits may indicate an opportunity to improve the controls. Some organizations may also engage a third-party verifier in advance of self-certification and verification, however, this is optional.

PSOs should establish and strive to improve Quality Control and Quality Assurance processes. Audits should be used as complementary activities to assess effectiveness and identify gaps. Using an internal audit team to examine the quality control and quality assurance procedures, followed by completing the self-certification checklist, will increase the organization's confidence in the GHG statement and strengthen its GHG reporting.

3. GHG quality reporting framework

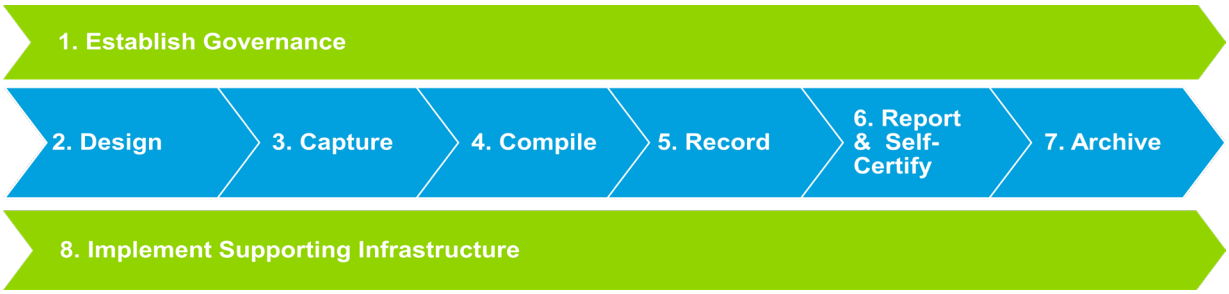
3.1 Section objective

This section outlines how to implement quality control and assurance across the organization and throughout reporting process to enable quality GHG reporting.

3.2 Introducing the framework

PSOs can use this GHG Quality Reporting Framework (Framework)[4] (see Figure 1) as a guide to help design and implement effective processes and controls that support complete and accurate GHG reporting.

Figure 1: GHG Quality Reporting Framework



3.2.1 Organization-wide controls

Governance and **Supporting Infrastructure** (identified in green) influence the entire organization. Establishing a governance structure and supporting systems/tools is essential for creating an environment that ensures quality reporting across the PSO.

Organization-wide controls may include:

- A documented GHG reporting governance structure in a policy,
- Systems that automate the reporting process,
- Automated controls such as lock down functions.[5]

[4] The Framework has been designed with leading risk management theory in mind. It builds off the control model published by the Committee of Sponsoring Organizations (COSO) (a leading risk management think tank). The COSO control model outlines how organizations can develop a reporting control structure. The model is widely used in internal financial audit and controls, so the Framework is aligned with what is already in place at many PSOs.

[5] Documents or data can be automatically protected based on their status, condition, or location. For example, they may move to a specific location or become read-only once they reach a certain stage, preventing further revisions without specific permissions. This automated "locking" process is triggered by criteria like workflow status, rather than being manually applied to the file itself.

3.3 Process-specific controls (key process controls)

The Framework components in the middle band of Figure 1 (identified in blue), are the specific sub-processes necessary for accurate GHG reporting. Controls are needed to address the issues described in Table 2 for each reporting sub-process within the system. PSOs should design each process to align with one or more of the GHG reporting principles.

Table 2: Key Reporting Processes

Process-Specific Controls	Related control issues
2. Design	How is the overall reporting structure set up to meet *CNGR* requirements?
3. Capture	How is all relevant data captured accurately and on time?
4. Compile	How is data compiled and aggregated for reporting?
5. Record	How is data prepared for reporting and recorded into CGRT for traceability?
6. Report & Self-Certify	How is the GHG report reviewed, validated and self–certified?
7. Archive	How is data documented and retained for future verification?

Sections 4 to 6 describe the key concepts for developing quality controls for each Framework component.

4. Establish governance

4.1 Section objective

This section provides guidance on how to create a governance and monitoring structure that supports quality GHG reporting.

4.2 Defining a GHG reporting governance structure

An effective GHG reporting governance structure sets the tone for the organization. A weak or poorly defined governance structure can lead to unclear roles and responsibilities, missed or duplicated activities, insufficient resources, and a lack of oversight, resulting in errors and poor data quality. In contrast, a well-defined governance structure ensures accountability, effective oversight, and a culture of quality reporting.

Key benefits of a strong governance structure include:

- Clear roles and responsibilities to avoid missed or duplicated tasks,
- Well-resourced reporting teams to minimize errors,
- Improved management oversight to catch reporting errors early, and

- Enhanced data quality and consistency across the organization.

4.3 GHG reporting roles

Roles and responsibilities in the GHG reporting process vary by PSO, depending on the size and complexity of the organization. Smaller PSOs tend to have flatter structures, where one person may take on more than one role, while larger organizations are more stratified, with separate individuals assigned to perform specific tasks.

Climate Change Accountability Report (CCAR) Signatory: The CCAR Signatory is an individual at the Executive-Level who is responsible for strategic oversight and accountability of the PSO and ensuring GHG reduction and reporting activities are in alignment with the with organization's sustainability goals, corporate policies and regulatory requirements.

Carbon Neutral Government (CNG) Primary Contact: The CNG Primary Contact is typically responsible for the financial accountability of the PSO at a senior level. Ideally, they are independent from the data collection and entry processes. Their primary responsibilities are to provide oversight of the data collection policies, process, and associated control activities. They also perform an important authorization role, reviewing and authorizing the final signing off on the accuracy and completeness of consumption data. The CNG Primary Contact is ultimately responsible for ensuring that CGRT Site Administrators and CGRT Data Collectors have the necessary skills and capabilities, and:

- Their responsibilities are included in their job descriptions, and
- They have adequate time to complete their site administration, data collection and reporting duties.

The CNG Primary Contact is responsible for reporting the emission data as part of preparing the organization's annual CCAR and for validating and certifying the quality of that data. They should be at the executive or management level, or an individual normally responsible for public disclosure.

CGRT Site Administrator: The CGRT Site Administrator is responsible for the overall coordination of the organization's GHG reporting efforts in CGRT by designing and maintaining business processes for capture, compilation, recording, reporting, and archiving data. They:

- Setup sites in CGRT,
- Setup Portfolio Manager (optional),
- Assign users and collection periods to CGRT sites,
- Provide oversight over data collection from each of the Data Collectors
- Ensure data was uploaded to CGRT appropriately,
- Check the GHG report generated by CGRT for accuracy, and
- Ensure the related documentation/evidence is in place for the CNG Primary Contact to authorize self-certification of the data.

CGRT Data Collector: Ideally, the CGRT Data Collector is a separate individual from the CGRT Site Administrator. The role of the Data Collector is to collect and, when appropriate, aggregate usage data related to the emission category(ies) for the period, and enter or upload the data in CGRT. For example, a buildings data collector is responsible for collecting electricity and heating invoices for their buildings and entering the data from those invoices into CGRT.

Figure 2 below illustrates typical GHG reporting roles and responsibilities for a medium to large PSO. Figure 3 illustrates typical GHG reporting roles and responsibilities for small PSOs.

Figure 2: Sample Roles and Responsibilities for GHG Reporting in a Medium to Large PSO

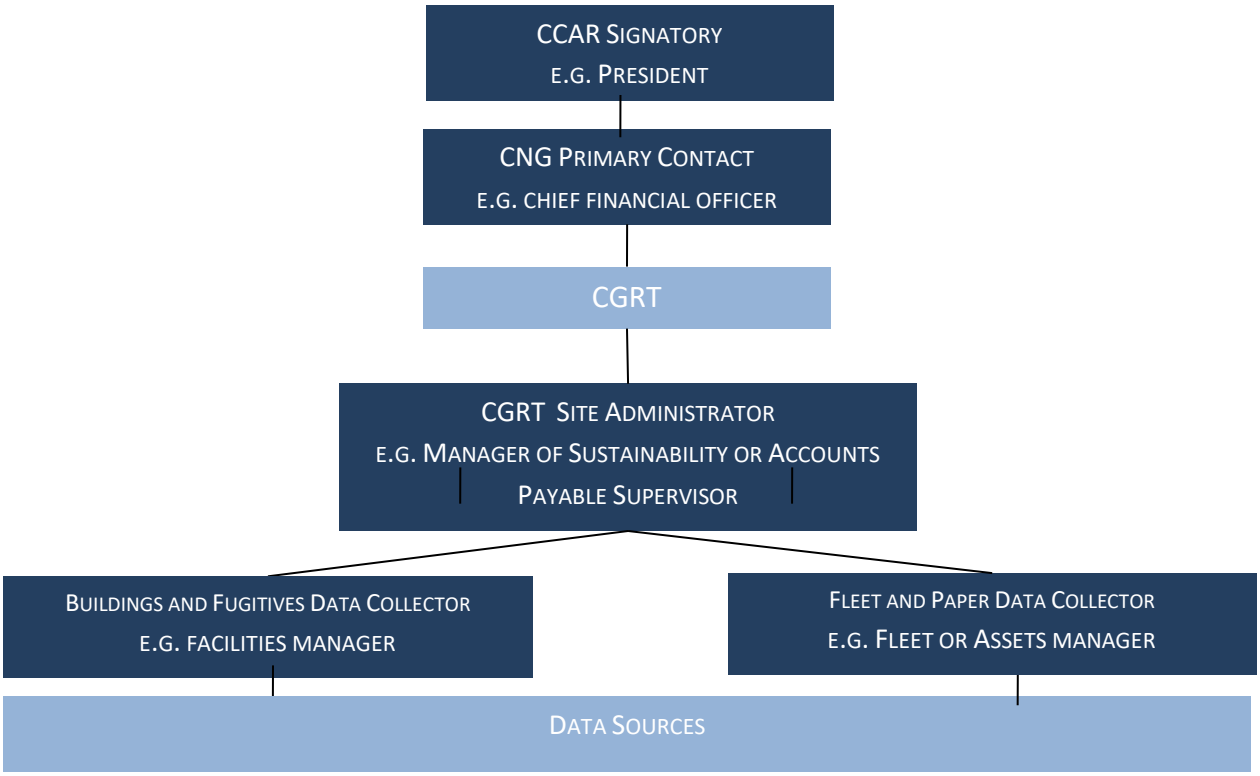
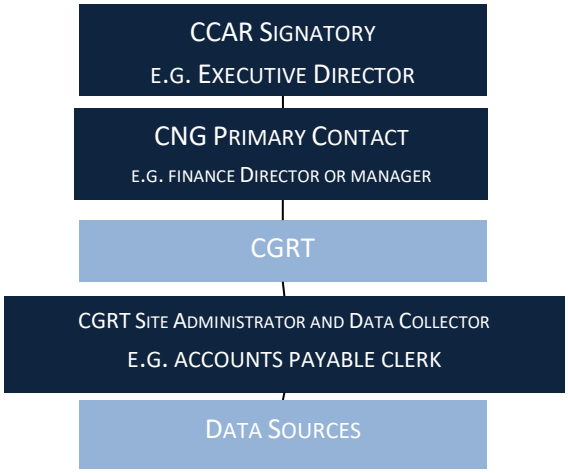


Figure 3: Sample Roles and Responsibilities for GHG Reporting in a Small PSO



4.4 Documenting a GHG reporting governance structure and process

Documented reporting standard operating procedures (SOPs) help people understand and execute their GHG reporting roles and responsibilities. SOPs ensure consistency in reporting practices, reduce the risk of errors, provide clear instructions, and streamline onboarding when staff turnover occurs.

This is particularly important when:

- The PSO has numerous internal and external stakeholders involved in the reporting process, including internal staff or external data providers, such as B.C. Hydro or FortisBC,
- The reporting process involves multiple data handoffs, and
- Data requirements are complex and require detailed instructions.

Procedures should be sufficiently detailed to define roles and responsibilities across the organization and map data flows from the Data Collector to the CNG Primary Contact. It is particularly important to have clear standard operating procedures for Data Collectors to minimize the potential for error at the start of the process. Typical details provided to Data Collectors in a GHG reporting procedures document are described in Table 3.

Table 3: Typical Details in Data Collector Standard Operating Procedures (SOPs)

Types of details in SOPs	Examples
Name of GHG category	Paper from Facility A
Type of GHG data required	Invoices for paper purchases
GHG data unit of measure	Reams/packages of paper (1 ream/package = 500 sheets)
Consumption data source	Invoices pulled from Accounts Payable database
Individual responsible for data capture	Facilities Manager at facility A: John Smith

Types of details in SOPs	Examples
Reporting period	Invoices for paper purchased within calendar year (January 1st to December 31st)
Reporting timeline	Report all invoices for the previous calendar year no later than April 30th to meet CNGR requirements (or consider quarterly reporting)
Data handoff	Provide invoices to Manager of EHS: James Miller
Data retention requirements	Send original invoices with consumption data to Site Administrator for retention; data is to be retained for 7 years (In many cases this work is already being completed by Accounts Payable staff).
Data quality control activities	On a quarterly basis, invoices will be reconciled against supplier summary statements. (In many cases this work is already being completed by Accounts Payable staff).

Procedures should also include steps to ensure high-quality GHG reporting. Typical content in GHG reporting SOPs includes:

- Introduction, purpose of document and directions on how to use it,
- Interpretations, assumptions, and decisions on reporting boundaries as described in the CNG program scope webpage,
- PSO roles and responsibilities for GHG reporting,
- Contact information for people responsible for GHG reporting across the PSO,
- Overview of reporting process, governance, oversight & change management procedures,
- Entity wide Quality Assurance / Quality Control activities and a data retention policy, and
- Infrastructure maintenance processes.

4.5 Communication and training

Getting stakeholders involved in the development or updating of procedures can increase their acceptance and use. Once established or updated, PSOs should clearly communicate the SOPs to both internal and external stakeholders. Stakeholders should be notified in advance about the requirement to use the documents, the value of the initiative, and consequences if procedures are not followed.

SOPs should be maintained in a central location by the CNG Primary Contact and CGRT Site Administrator so that outdated versions are not being used. Version status should be clearly noted so users know if they are using an outdated document. Procedures should be easily accessible, and a glossary should be included to support those unfamiliar with GHG reporting terminology. Stakeholders and staff should receive training if they have insufficient skills to execute their responsibilities.

5. Develop quality control procedures

5.1 Section objective

This section provides guidance on developing quality controls that address risks throughout specific GHG reporting process steps, including Design, Capture, Compile, Record, Report and Self-Certify, and Archive. For further direction on each process step, including control objectives, examples of what can go wrong, and illustrative controls see Appendix A, Tables 5 - 10.

5.2 Design

The Design step involves creating a GHG reporting process that meets *CNGR* requirements. It includes defining the PSO's reporting boundaries, identifying emission sources, and documenting procedures for monitoring, collecting, reporting and retaining GHG data.

Key control areas in this step are outlined below. Also see Appendix A, Table 5.

Establish reporting boundary – Define the areas on which an organization will report. Under the *CNGR*, reporting requirements have been mandated for emissions from Buildings, Fleet, Fugitives, and Paper consumption. Document interpretations, assumptions, and decisions about reporting boundaries for consistent application. Information on reporting boundaries under *CNGR* can be found on the Carbon Neutral Government program scope webpage.

Completeness of process design – Ensure that data capture, recording and compilation processes cover all required sources. When there are various sources and methods of collecting this data (e.g. invoices from corporate outsource fuel suppliers, and expense reports), all sources must be covered.

Standard Operating Procedures (SOPs) – Provide staff and stakeholders with access to relevant guidance and system documentation when completing their roles and responsibilities. Document procedures clearly so they can be understood without the original author. This means the material should stand alone, and not require further input to be understood.

5.3 Capture

Capture refers to the process of gathering all primary data required for uploading into CGRT, which supports the completion of the GHG Report (generated in CGRT). This may include:

- Manually collecting invoices of all paper purchases from suppliers,
- Working with a supplier to provide one aggregated invoice for various office locations,
- Establishing an automated process where supplier information is pulled from a database that tracks purchasing information.

In this step, PSOs develop controls to ensure data collected is complete, timely and accurate. Related control areas are outlined below. Also see Appendix A, Table 6.

Completeness – This component deals with ensuring that data collected is complete and has quality checks in place. For example, if a manual process of gathering invoice data from suppliers is used, SOPs are in place to review that all invoices have been included.

Timeliness – This refers to ensuring data is captured in time for the reporting period and requires data owners to be notified in advance of deadlines to ensure collection and submission of all GHG data.

Accuracy – This area supports that the source data is as accurate as possible and addresses any identified inaccuracies to an acceptable level. When designing accuracy controls, individuals are more likely to make the effort to validate the data if they are required to provide primary data documentation and/or sign off on its accuracy.

5.4 Compile

The Compile step involves:

1. Aggregating and classifying all captured data from various emission sources, and
2. Reconciling the data to ensure no errors are present.

In this step PSOs develop controls that address risks tied to accurate data compilation, proper classification in line with regulatory requirements, and thorough reconciliation. Related control areas are outlined below. Also see Appendix A, Table 7.

Accuracy - Ensure data is accurately compiled, with regular checks on spreadsheet configurations and the use of formulas and emission factors.

Classification – Ensure data is consistently categorized according to reporting requirements, with clear documented guidance for decisions or interpretations. For example, fleet vehicle classification should be consistent, and if there is any confusion, the PSO should decide how these will be treated and document the decision for future reporting.

Reconciliation – Regularly match current period records with historic and forecasted data to check its accuracy. Identified anomalies should be investigated and any errors identified should be corrected. Regular reconciliation and analysis of data can significantly reduce the number of errors needing to be corrected near the end of reporting periods.

5.5 Record

The Record step involves entering all captured and compiled data into CGRT. This can be done manually by making individual entries into CGRT or uploading multiple entries at a single time into CGRT using the CGRT Bulk Load Template Generator. Some data can be entered automatically. For example, BC Hydro electricity and Fortis BC natural gas building consumption data can be automatically recorded using ENERGY STAR Portfolio Manager. In the Record step, PSOs develop control areas that address risks outlined below. Also see Appendix A, Table 8.

CGRT entry – The recording process is prone to manual entry errors because individuals are often under time constraints to meet reporting deadlines. Cross-checking data manually entered into CGRT against source data reports can reduce the risk of such errors.

Cut-off – This refers to the risk of data being recorded in the wrong period. Consumption data rarely aligns with the GHG reporting period, as invoices or usage data may span multiple periods, and some data may arrive late or overlap. Processes must be developed to deal with such situations, removing data where necessary and estimating data that is not available. A degree of judgment may be required to correct cut-off issues and should be informed by an experienced person and/or clearly defined guidance.

Occurrence – Occurrence speaks to whether recorded data reflects actual consumption. This is especially relevant to data where estimates have been made or there is a high risk of double counting. Automated controls and reasonableness checks can help to identify errors. For example, a high natural gas bill in the middle of a hot summer may be unreasonable since it is unlikely that heating was used. This may indicate that the invoice contains an error and represents emissions that did not occur.

Validation –This ensures the reliability of data. Site Administrators and the CNG Primary Contact are responsible for complete, accurate and documented consumption data and cannot blindly rely on the data obtained from the Data Collector. Validation activities are essential to ensure data integrity prior to recording it in CGRT.

Review and validation controls ensure each data stream is appropriately analyzed and reviewed in accordance with the documented process prior to upload into CGRT. For example, assurance testing procedures such as interviewing, observing, or corroborating can be used for validation.

As data is submitted for recording and upload, it should be subject to review by the Site Administrator and/or CNG Primary Contact. Data should be presented with context, such as performance trends compared to historic or forecasted data, to identify and question any anomalies.

Since the CNG Primary Contact and CCAR Signatory are typically individuals in senior management positions, it is unlikely that they will have time to perform in-depth validation of the accuracy of consumption data being reported. As such, organizations typically rely on evidence that controls are in place throughout the reporting process and that these controls have been executed by responsible individuals.

5.6 Report and Self-Certify

In this step, PSOs develop controls to ensure the GHG data entered into CGRT is accurate and submitted correctly. These controls support management's review and validation of the GHG report (generated in CGRT) and completion of a self-certification checklist. Related control areas are outlined below. Also see Appendix A, Table 9.

Management review and Self-Certification - Since CGRT converts the consumption data into GHG emissions on behalf of the PSO, PSOs must review the GHG report and validate it for reasonableness. The process for this is as follows:

1. The CNG Primary Contact reviews the GHG report and supporting documentation for accuracy and reasonableness,
2. The CNG Primary Contact reviews the statements on the CGRT Self-Certification Checklist, then authorizes the CGRT Site Administrator to complete the Self-Certification Checklist on behalf of the organization, and
3. The CGRT Site Administrator submits the CGRT Self-Certification Checklist, thereby validating the data is complete and accurate and that the GHG report has been reviewed.

The CNG Primary Contact does not need to be a subject matter expert in GHG quantification methodologies. Their review is a reasonableness check as to whether the GHG report makes sense. Any issues found should be immediately brought forward to the Clean Government team via email at Carbon.Neutral@gov.bc.ca.

The CCAR Signatory and CNG Primary Contact rely on management and staff to ensure that processes and resources are in place and that data reporting SOPs are followed. However, the CNG Primary Contact is often ultimately responsible for providing appropriate oversight to ensure that the PSO's submissions are true, accurate, and complete.

5.7 Archive

The Archive step involves documenting and retaining GHG data to provide sufficient evidence for future verification. This includes documenting the reporting process and securing all documents for the required seven years. Related control areas are outlined below. Also see Appendix A, Table 10.

Documentation – PSOs must create an audit trail that traces reported data back to its source (eg. fuel invoices) and documents the entire GHG reporting process, including control activities. The documentation for the audit trail should be electronic, backed-up and, where relevant, align with established financial accountability systems.

Retention – Retention controls ensure GHG reports, self-certification documents and supporting materials are securely stored for seven years. A copy of the documentation should be stored electronically in a manner/location separate from the original documents, and should be backed up on a periodic basis.

6. Implement supporting infrastructure

6.1 Section objective

This section lists infrastructure options available to PSOs to capture, compile and record their consumption data. It also provides guidance on how to build controls in a manual process.

6.2 GHG reporting infrastructure options

The type of information technology systems used to capture, compile and record consumption data determines the level of controls needed to ensure data quality and accuracy. Many accounting packages currently used by Accounts Payable staff may be appropriate for this purpose, and these can be categorized into four broad categories:

1. Excel spreadsheets that are formatted to suit reporting purposes,
2. "Custom Build" data systems that have been designed and built to suit the organization,
3. "Off the Shelf" emissions management systems, and
4. Enterprise Resource Planning (ERP) systems.

The use of spreadsheets is likely to be the most manual process of the system options, while the use of an ERP system should be the most automated. Many systems will have their own automated controls built in to increase data accuracy.

In general, the more automated controls built into the reporting process, the better quality the data, as automation reduces manual errors from transcription, data handover, and manipulation.

No matter what level of reporting automation has been implemented, process controls will be required to compliment and supplement automated controls. Over-reliance on automated controls may cause key process control gaps to go unaddressed. The above technology solutions are options to support data capture and compilation before entry into CGRT.

6.3 Building automated controls into a manual process

PSOs that rely on the use of spreadsheets should try to automate reporting controls using existing spreadsheet functionality to reduce the risk of errors.

Examples of automated controls for spreadsheets include:

- Entering formulas into spreadsheet to automate any calculations required for data compilation/aggregation and locking down cells that contain formulas
- Diligently labelling all data rows/columns and locking down labelled cells so report structure cannot be changed
- Include units of measure in data row/column labels
- Setting value restrictions (e.g. fuel supplies are inserted in L)
- Restricting access to certain sections of the spreadsheet for specific stakeholders (e.g. Data Collector can only access aggregated data on spreadsheet)

Even with extensive automated controls in place, manual process controls such as validation and reconciliation will still be needed to ensure accuracy.

7. Custom quality control development process

7.1 Section objective

This section is intended to provide a process PSOs can use to design and implement custom controls for GHG reporting.

7.2 Quality controls development process

Below is a high level three step approach PSOs can use to design controls to drive quality GHG reporting across their organization.

Step 1. Identify GHG reporting risks

Based on the key control components listed in the GHG Quality Reporting Framework, identify risks in the existing reporting process by conducting a process walk through of all data categories that make up the GHG inventory. Interview relevant stakeholders, from the Data Collector to the CNG Primary Contact, to trace how data moves from being captured to being recorded into CGRT and archived for retention purposes. When identifying reporting risks, keep in mind the "What Can Go Wrong" examples listed in Appendix A. All significant reporting risks that have been identified should be documented for further analysis and potential treatment. For an example of how an identified GHG reporting risk is documented, refer to the first column of Table 4, below.

Step 2. Define control objectives

For each significant risk identified, define a control objective to manage that risk to provide direction on what controls are needed. Control objectives should aim to improve GHG reporting quality by meeting one or more of the five key quality accounting reporting principles: relevance, completeness, consistency, transparency, and accuracy. Identifying which principles are being addressed makes it easier to develop appropriate controls. For an example of how a control objective is documented, refer to the second column of Table 4 below.

Step 3. Develop customized controls

Develop customized controls that treat the specific risk identified and help satisfy the related quality reporting principle(s). When designing a control, keep in mind all the different control options listed in the GHG Reporting Quality Concepts section of this document (e.g. automated, manual, preventive, detective, etc.). Typically, an organization will have several options of appropriate controls to choose from. PSOs should select controls based on a review of existing resources, capabilities, the severity of the risk identified, and the level of effort required to address the risk. When designing controls, it should be noted that controls and risks are managed together. Strong controls in one section of the reporting process may compensate for weak controls in another section. For example, if a PSO has relatively weak quality controls when it comes to data capture and recording, it may compensate by having strong quality assurance controls to review and validate that all relevant data has been captured and recorded. For an example of how a selected control is documented, refer to the third column of Table 4 below.

Note that customized controls should be formalized in a GHG reporting procedures document/policy and assigned to specific individuals.

As this control development process only provides high level guidance, it is encouraged that PSOs engage their internal audit team or staff with controls experience when developing customized GHG reporting controls.

Table 4: Developing Custom Quality Controls

GHG reporting risk identified	Control objective	Control to be developed to address risk
The Manager of Sustainability currently reviews the *CNGR*, interprets it and assesses the reporting requirements for the PSO. There is no management or legal review process in place to review the regulation and assess whether it has been properly interpreted. This results in a risk of misinterpretation of the *CNGR* and correspondingly, the risk of incomplete GHG reporting.	• CNG Primary Contact confirms that the PSO's reporting boundary has been appropriately defined to meet the *CNGR*. • Needs to address the following reporting principles: relevance and completeness.	• CNG Primary Contact reviews the reporting requirements of the *CNGR* and confirms that the PSO's reporting boundary has been appropriately defined to meet the *CNGR* requirements. In case of uncertainty, evidence of the review is retained. • A representative from the legal department reviews the *CNGR* and confirms that it has been properly interpreted. A review of any updates to the *CNGR* is conducted on a periodic basis. • Provide contact information of the appropriate department representative within the procedures document to allow stakeholders to readily access direction or legal assistance as needed when implementing GHG reporting procedures.

Appendix A: Illustrative Control Objectives

Table 5: Illustrative Design Control Objectives

Control area / objective	Examples of what can go wrong	Illustrative controls
Establish reporting boundary: Ensure understanding of the Carbon Neutral Government program scope, and develop systems to ensure reporting is complete.	• The reporting scope of the *CNGR* is not fully understood and not all in scope items are included in reporting. • Buildings are missed due to an unstructured approach to aligning the reporting boundary with regulation (e.g. CGRT Site Administrator at a university forgot to include an off-campus Research Institute) • Buildings are missed due to a misinterpretation of *CNGR* scope (e.g. an investment building is not included in the PSO's reporting boundary because it is located outside of B.C.) • Boundary definitions related to regulations are misinterpreted (e.g. fleet vehicles used for operations versus business travel). • Out of scope emission source is included in the reporting boundary • Changes in operations/assets are not identified by GHG reporting team (e.g. a Crown has recently subleased space in one of its leased Buildings to another PSO, and this decision is not reflected in the Report). • Changes in regulations go unnoticed and are not incorporated	• Reporting scope has been reviewed and understood by the CNG Primary Contact and CGRT Site Administrator and any other relevant groups, such as facilities, purchasing or legal to ensure it conforms with regulatory requirements and all relevant assets have been identified • The *CNGR* requirements are monitored on a continuous basis and the applicability of any change in requirements is assessed • A process is in place to capture ongoing changes to the asset base (e.g. number and type of vehicles owned and leased throughout the reporting period; Buildings sold and new buildings acquired throughout the reporting period; changes to % of leased space by a PSO in buildings throughout the reporting period, etc.) • Appropriate training and clear interpretation of requirements are provided to those tasked with establishing and maintaining reporting boundary, including the CGRT Site Administrator and CGRT Data Collector
Completeness of process design: identify and map in-scope emissions data sources and design data-capturing processes using appropriate methods	• The process is not designed to capture all required data for complete reporting (e.g. The process is not designed to advise the GHG reporting team of buildings sold or new buildings acquired) • The process is not designed to make the required data available (e.g. Executives who use fleet leased by a PSO do not expense the gas mileage, and therefore the associated emission cannot be quantified using typical procedures,) • Infrastructure used to monitor data sources is inaccurate or missing (e.g. The majority of in-scope paper is purchased from a central supplier by a PSO, but rural locations purchase office paper from local vendors and do not track this separately)	• CNG Primary Contact provides a clear interpretation of completeness to those individuals identifying emission data sources across the in-scope emission categories • Process should be designed to capture all relevant data that will be required to enable GHG reporting • If estimation is used, it should be documented
Documentation of procedures: formalize and describe the GHG reporting procedures and controls	• Informal data collection process provides inadequate guidance to new staff who collect data (e.g. new CGRT Data Collector obtains energy usage reports for the same buildings that were reported on last year, without updating the asset base for this year) • Insufficient guidance around data requirements is provided to CGRT Data Collector resulting in incomplete/inaccurate data (e.g. lack of clarity as to fleet used for operations vs. fleet used for business travel)	• The organizational boundary, emission sources, methods and criteria, and roles/responsibilities related to GHG reporting are documented in a carbon reporting procedures document • Version controls, standard naming conventions and standard directory structures are applied to all CGRT upload sheets and all support documents • An archiving system is in place to ensure retention of records for 7 years

Table 6: Illustrative Capture Control Objectives

Control area / objective	Examples of what can go wrong	Illustrative controls
Completeness of data capture: capture all relevant emission data during the reporting period as per *CNGR* criteria	• Data sources are missed due to gaps in emissions data capturing processes (e.g. paper purchased data located in Accounts Payable system only contains cost data and not type of paper and quantity data as needed) • Data sources are incomplete because data requirements are not clearly defined for the Data Collector (e.g. Data Collector is only providing fuel usage for vehicles but not equipment, such as that used for lawn maintenance) • No data is collected for some in-scope assets (e.g. no data is collected for buildings where actual energy data is not available, as opposed to collecting data such as square footage of the building, age/type of building, etc. that would enable estimation of the GHG emissions)	• Map all data received to emissions data sources and responsible Data Collector within reporting procedures document • Where present, management systems (e.g. Oracle, SAP) that are integrated with primary data capture systems and have manual checks in place to ensure all automatic data transfers occur as designed • Utilize actual rather than estimated data if available, however, if actual data is not available collect data that will enable estimation of the GHG emissions
Timeliness: capture data to enable timely recording and reporting	• Hard copy invoices from suppliers do not arrive in time to meet reporting deadlines • IT Infrastructure (e.g. Automated Supplier Payment System) is undergoing maintenance and not operating in time to meet reporting deadlines	• Provide detailed requirements to Data Collectors regarding the timeframe of emissions data sources they are required to report. Require checklist sign off that these requirements have been met • Management system provides automated reminders of reporting deadlines
Accuracy: capture data accurately	• Data capture has errors due to mistakes in invoices provided by supplier and resulting discrepancy is never reconciled • Hard copy invoices from suppliers are transcribed into an electronic version with errors reducing the accuracy of the data capture	• The Data Collector reviews GHG source data for reasonableness, identifies inconsistencies, investigates and corrects any errors found and documents the review performed prior to finalizing GHG source data • Minimize utilization of hard-copy source documents and the number of transcription points; institute self review or QA (where feasible) of the transcribed documents

Table 7: Illustrative Compile Control Objectives

Control area / objective	Examples of What Can Go Wrong	Illustrative Controls
Accuracy: compile data using accurate calculations and processing data accurately	• Aggregated emissions are inaccurate due to formulas not calculating accurately (e.g. a subtotal field of gasoline used by 5 mid size vehicles is capturing only 4 of the vehicle fields)	• Perform regular reconciliations between the compiled document (e.g. aggregated Excel spreadsheet) and the original data documentation. • Reconciliation documentation is kept for audit purpose. • Exceptions are investigated timely and resolved adequately.
Classification: compile data using appropriate and consistent categorizations	• Aggregated data are inaccurate due to inclusion of inappropriate data or exclusion of required data • Aggregated data is misclassified due to misinterpretation of definitions, resulting in flawed reporting (e.g. heating fuel for buildings owned but leased to another PSO are mistakenly included when data is aggregated) • Data is erroneously aggregated because classification definitions are not updated as changes occur in regulations.	• Clear definitions regarding data classification categories are provided to the CGRT Site Administrator and Data Collector to minimize errors related to misinterpreting guidance procedures • Classification activities are conducted by a single individual that is properly trained on updated regulations
Reconciliation: compare aggregated data to historic/forecasted data, and if possible, reconcile to other reports	• Compiled data is not reconciled to examine if changes to primary data have occurred (e.g. estimated data is used and never updated to actual data) • Compiled data is not reviewed and data transfer errors in aggregation process go undetected	• Site Administrator reconciles information compiled against other systems and reports, any discrepancies are investigated and addressed. • Reconciliation procedure is documented and approved by management.

Table 8: Illustrative Record Control Objectives

Control area / objective	Examples of what can go wrong	Illustrative controls
CGRT Entry: prepare and record data into CGRT input sheets	• Data is mistakenly changed when being transferred from aggregated database into recording format due to manual entry errors	• Implement a check list process to ensure *CNGR* requirements have been met prior to transcribing final data into CGRT input sheets • CGRT Site Administrator compares Data Collector calculations to their own calculations • Reviewer validates figures against prior years and forecasted data • Implement a secondary review process where a qualified individual examines final data for completeness and accuracy prior to submission
Occurrence: document that captured data reflects real activities/consumption	• Data is erroneously transcribed twice into database resulting in a misstatement of emissions	• Information system/spreadsheet has the ability to run a variance analysis to detect patterns of repeated data entry • A process is in place to reconcile estimates with actual consumption
Validation: validate source data	• Data captured has errors due to manual mistakes when Data Collector transcribes primary source data into spreadsheet • Data recorded may not be reconciled to changes that have occurred to primary data (e.g. supplier issued erroneous invoice and the correct figures have never been edited in GHG tracking spreadsheet)	• Validation of data-input (e.g. reconciling against another similar data-stream including comparing totals over longer time periods) • Running variance/error reports on data recorded • Validate data transcribed into spreadsheet against primary source

Table 9: Illustrative Report and Self-Certify Control Objectives

Control area/ objective	Examples of what can go wrong	Illustrative controls
Management Review and Authorization of Self-Certification: review and validate GHG report and its evidence for self-certification	• Lack of management oversight creates poor control culture where little importance is placed on accuracy and completeness of consumption data • Submission and GHG report are not reviewed and validated by management resulting in errors going unnoticed • CNG Primary Contact authorizes self-certification of flawed or incomplete data	• A review session/discussion is conducted by the Site Administrator with the CNG Primary Contact to allow them to make an informed decision prior authorizing self-certification • An escalated signoff is prepared by key individuals throughout the reporting cycle confirming the completion of the tasks they are responsible for

Table 10: Illustrative Archive Control Objectives

Control area/ objective	Examples of what can go wrong	Illustrative controls
Documentation: document data to provide a complete audit trail from point source data to final report	• Documentation contains outdated versions of invoices from suppliers that do not coincide with emissions reported • Data documentation of primary source data is incomplete • Interpretation of regulations and how they were applied was never documented	• Documentation plan is listed in GHG reporting procedures manual and communicated to all stakeholders • Documentation file is reviewed by CGRT Site Administrator/management upon conclusion of report • Validation is conducted by CGRT Site Administrator to review if invoices documented reconcile with data within final report
Retention: make arrangements to retain data securely for duration stipulated by *CNGR* requirements	• Documentation is never stored in a separate location and is erased by Data Collector because they are unaware of retention requirements • All documentation (including originals and copies) are stored in the same location and accidentally destroyed due to fire	• Documentation is in line with current Accounts Payable procedures wherein: ○ Documentation (copies and originals) are stored in separate locations ○ Documentation is stored off site and periodically backed up ○ If documentation storage is outsourced, contract terms with third party stipulate that the PSO retains ownership right to data and can access it whenever needed

Appendix B: Glossary of Terms and Acronyms

Note: Definitions derived from:

- International Organization for Standardization (2019), ISO 14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions.
- Market Advisory Committee to the California Air Resources Board (2007), "Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California", Glossary (available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2010/capandtrade10/capv3apph.pdf)
- The Climate Registry (2019), *General Reporting Protocol*, Glossary (available at https://theclimateregistry.org/wp-content/uploads/2023/11/grp2023.pdf)
- World Business Council for Sustainable Development and World Resources Institute (2004), *The Greenhouse Gas Protocol*, pp. 96-102.

Abbreviation or Acronym	Definition
CAS	Climate Action Secretariat
CCAR	Climate Change Accountability Report
CNG	Carbon Neutral Government
CNGR	Carbon Neutral Government Regulation
Emission factor	GHG emissions expressed on a per unit activity basis (e.g., metric tons of CO_2 emitted per million Btus of coal combusted, or metric tons of CO_2 emitted per kWh of electricity consumed).
Emissions	The release of greenhouse gases into the atmosphere.
Fugitive emissions	Intentional or unintentional releases from the production, processing, transmission, storage, and use of fuels and other substances, that do not pass through a stack, chimney, vent, exhaust pipe or other functionally equivalent opening (such as releases of sulfur hexafluoride from electrical equipment; hydrofluorocarbon (HFC) releases during the use of refrigeration and air conditioning equipment; landfill gas emissions; and CH_4 leakage from natural gas transport).
Greenhouse gases (GHGs)	A wide variety of gases that trap heat near the Earth's surface, slowing its escape into space. For B.C. public sector reporting purposes, relevant gases are identified in the Carbon Neutral Government Regulation and include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), perfluorocarbons (PFCs) and hydrofluorocarbons (HFCs).
GHG Report	Refers to the report generated in the Clean Government Reporting Tool (within the 'Analytics' tab and then the 'Intelligence Center' menu), which provides the final emissions data needed for the Climate Change Accountability Report. This report consolidates total emissions from all sources: buildings, fleet, paper, and, for the provincial government, business travel.
Inventory	A comprehensive, quantified list of an organization's GHG emissions and sources. For the purposes of this document, an inventory may also refer to a comprehensive, quantified list of an organization's buildings or fleet.

Abbreviation or Acronym	Definition
Office Paper	Multipurpose copy paper for use in laser printers, fax machines and photocopiers or multifunction devices.
PSO	A B.C. public sector organization subject to the government's carbon neutral commitment under the *Climate Change Accountability Act*.
Quality Assurance (QA)	Plans and procedures to ensure that data are as precise and reproducible as possible. For example, use of data collection templates to ensure that data have been properly entered to prevent errors.
Quality Control (QC)	Measures regulating the data collection processes and the standard operating procedures of the data, such as procedures for sample collection and instrument calibration. The quality control requirements improve the accuracy and reduce the uncertainty of the data.
Self-certification	A systematic, objective and documented process whereby an organization self-certifies that their GHG assertion is correct.
Verification	A systematic, independent and documented process for the evaluation of a greenhouse gas assertion against agreed verification criteria verification criteria.
Verification Body	Competent and independent person, or persons, with responsibility for performing and reporting on the verification process.

Annex 1: Document Version Control

Date	Page(s)	Update(s)
2024-11	ALL	• Updated terminology from SMARTTool to Clean Government Reporting Tool • Updated logo on title page • Updated font and headers to align with B.C design guidelines • Updated CNG Program roles to reflect current titles • Updated ministry name to Ministry of Energy and Climate Solutions