**National GHG Inventory Inception Memorandum Template**

## Description

This document provides a template for drafting a **National Inventory Inception Memorandum (Memo)**. This memo, when customized to your national circumstances, can be distributed by the National Inventory Coordinator (NIC) to provide guidance to those working on the National GHG inventory. This document is part of **EPA’s National GHG Inventory Toolkit,** a supplementary resource to EPA’s *Developing a National GHG Inventory System Template Workbook*, to be used by key members of a national inventory team[[1]](#footnote-1) to design and develop a successful and sustainable national GHG inventory system.

## Purpose

The purpose of this memo is to assist the National Inventory Coordinator (NIC) in providing guidance to a country’s inventory compilers - those responsible for preparing emissions/removals estimates and associated text for the sectors included in the National Inventory. This template can be used as a guide to outline the goals, expectations, and roles and responsibilities of team members during the inventory development cycle, based on existing institutional arrangements and national circumstances. The memo should specify the inventory team’s expected work plan and schedule (including key milestones for interim and final products), documentation procedures, spreadsheet and data management practices, and QA/QC and uncertainty estimation procedures. The document should also reference methodological guidelines for the National Inventory, and identify planned improvements compared to the previous inventory. This memo should be completed and distributed by the NIC.

Throughout the memo, instructions are provided in GREEN, and example text is provided in each section. This template is provided as an example; each NIC is strongly encouraged to modify as much text as they feel appropriate for their country’s national circumstances.

This template provides examples of content for the following memo sections:

* Introduction
* Work Plan and Schedule
* Inventory Structure and Team Member Responsibilities
* Documentation Procedures
* Data Management
* Narrative Text Instructions
* QA/QC Requirements
* Uncertainty Analysis

**MEMORANDUM**

|  |  |
| --- | --- |
| **DATE** | *[Add Date]* |
| **TO:** | Sector Leads, QA/QC Coordinator, Uncertainty Coordinator, and other relevant staff and consultants. |
| **FROM:** | National Inventory Coordinator and/or National Inventory Compiler |
| **SUBJECT:** | Inventory Preparation Procedures for *[add year]* |

# Introduction

*In the section below, you should provide a brief introduction to this memorandum and the National Inventory reporting process, including important considerations and prioritized items.*

## Purpose of the Memorandum

**Example text:**

The purpose of this memorandum is to provide guidance to those responsible for preparing emissions/removals estimates and associated text for *[country]*’s National Inventory. The United Nations Framework Convention on Climate Change (UNFCCC) requires most non-Annex I countries to develop and submit a National GHG Inventory every two years (<http://unfccc.int/national_reports/non-annex_i_natcom/items/2716.php>). This memo includes this inventory work plan and schedule, as well as the planned documentation procedures, spreadsheet and data management practices, and QA/QC and uncertainty estimation procedures. It also references the methodological guidelines for the National Inventory and identifies planned improvements for this Inventory.

## Overview Prioritized Items

**Example text:**

The National Inventory Coordinator (NIC) has recommended several areas of the National Inventory development process to be prioritized and/or improved for this inventory. Below is a list of areas for focus and improvement. If anything is unclear from this memo, please contact the NIC as early as possible to avoid misinterpretations or misunderstandings.

**Inventory Software**

* Sector leads are encouraged to use existing National GHG Inventory software to help them implement accurate methodologies for calculating GHG emissions. The Inventory software is also a useful tool to facilitate data collection, documentation and archiving. The UNFCCC software is the official means of reporting estimates to the UN. The IPCC software and ALU tool are GHG calculation tools and exported GHG estimates from these tools can be imported into the UN software.
* *The UNFCCC developed Excel-based software to facilitate non-Annex I reporting of their GHG inventory estimates. This version, released in 2005, uses Tier 1 methods for estimating GHG emissions and removals for all source categories according to the 1996 IPCC Guidelines. The UN has recently updated this software into a web-based application that provides a greater degree of flexibility in usage, and can accommodate methodological changes that might occur with switching to IPCC Good Practice Guidance methodologies for non-Annex I countries, for example. Access to the Excel-based software is available at:* [*http://www.ipcc-nggip.iges.or.jp/public/gl/software.html*](http://www.ipcc-nggip.iges.or.jp/public/gl/software.html) *and access to the web-based application is available at:* [*http://unfccc.int/national\_reports/non-annex\_i\_national\_communications/non-annex\_i\_inventory\_software/items/7627.php*](http://unfccc.int/national_reports/non-annex_i_national_communications/non-annex_i_inventory_software/items/7627.php)*. These tools are the official means of reporting estimates to the UN.*
* *The IPCC 2006 Guidelines software (http://www.ipcc-nggip.iges.or.jp/software/index.html) is a calculation tool with modules to calculate emissions using Tier 1 methods for all sectors consistent with IPCC 2006 Guidelines. Results should be exported from the IPCC software to the UNFCCC software (*[*http://unfccc.int/national\_reports/non-annex\_i\_national\_communications/non-annex\_i\_inventory\_software/items/7627.php*](http://unfccc.int/national_reports/non-annex_i_national_communications/non-annex_i_inventory_software/items/7627.php)*), the official means of reporting estimates to the UN.*
* *The ALU Software (*[*http://www.nrel.colostate.edu/projects/ALUsoftware/*](http://www.nrel.colostate.edu/projects/ALUsoftware/)*) is a calculation and data management tool that can be used to estimate emissions/removals using Tier 2 methods from Agriculture and Forestry related activities consistent with the Revised 1996 GL, IPCC Good Practice Guidance (2000 and 2003).*
* In addition to these software options, the Methods and Data Documentation template should be used to facilitate and supplement documentation.

**Use of the U.S. EPA’s *Developing a National GHG Inventory System Template Workbook* and EPA’s National GHG Inventory Toolkit**

* The U.S. EPA developed the [National GHG Inventory System Template Workbook](http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html) to assist countries to produce high-quality and sustainable national inventory management systems. Once complete, the templates provided in the workbook will provide a comprehensive documentation of each component for managing the development of the GHG inventory. Their application has been integrated into the procedures described through this memo. Take note of particular sections of the templates listed below, which should be completed and submitted to the NIC at the same time you submit your sector estimates. This will support the production of a more transparent, accurate, consistent, comparable, and complete GHG inventory.
  + Institutional Arrangements (Applicable sectoral tables include 1.3, 1.4, 1.5, 1.6 or 1.7)
  + Methods, Data, and Documentation (All tables are applicable to every sector)
  + Quality Assurance and Quality Control (Complete Table 3.2 and Table 3.3 for key categories within sector, and also complete Table 3.4 if an external review is conducted)
  + Archiving Systems (Review archiving recommendations in Sections 4.2 and 4.3, and complete the section for category lead list in Table 4.1)
  + National Inventory Improvement Plan (Review and contribute to Section 6.4 on potential category improvements)

**Documentation**

* National Inventory archive materials should be provided to the NIC along with your sector estimates and should include documentation of methods and data used in the inventory. Refer to Sections 4 and 5 of this memo, as well as the US EPA Archiving Template mentioned above.

**Inventory Resources**

* [UNFCCC resource guide for preparing National Communications of Non-Annex I parties](http://unfccc.int/resource/docs/publications/09_resource_guide3.pdf)
* [Selected training materials and methodological documents](http://unfccc.int/national_reports/non-annex_i_natcom/training_material/methodological_documents/items/349.php)
* [Relevant guidelines and manuals for National Communications and Biennial Update Reports for Non-Annex I parties](http://unfccc.int/national_reports/non-annex_i_natcom/guidelines_and_user_manual/items/2607.php)

# Work Plan and Schedule

*The NIC should list the major milestones and deliverables for the National Inventory in the table provided below. This table identifies the main activities, the lead team member for each activity, the expected due date for each activity (an example timeframe is included for each), as well as the resources available to help complete each task. This table should be modified to account for national circumstances. The example inventory cycle diagram below the table provides a visual overview of the tasks involved with inventory development. These tasks, and others, should be specified in the table below.*

**Work Plan and Schedule for Inventory Development**

| Activity | Activities and Responsibilities | Lead[[2]](#footnote-2) | Due Date[[3]](#footnote-3) | Relevant Resources |
| --- | --- | --- | --- | --- |
| 1 | Finalize and document Institutional Arrangements, and identify experts for sectoral working groups and inventory peer review.   * Complete the Institutional Arrangements Template. | **NIC, Sector leads** | *For example, 1-2 months from start* | *EPA Institutional Arrangements (IA) Template* |
| 2 | Prior to kick-off/inception meeting, revise and complete this memo and additional portions of the EPA [National GHG Inventory System Template Workbook](http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html) that will apply to all sectors. For example, the NIC should develop the QA/QC and archiving plans for the inventory. Some sections like the MDD template will need to be completed by category leads during inventory development. | **NIC, Sector leads** | *1-2 months* | [*EPA National GHG Inventory System Template Workbook*](http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html) *(all templates)* |
| 3 | Hold inception meeting with key inventory team members and all Sector Leads to:   * Ensure readiness of the team to conduct the inventory * Discuss sectors and categories to be included in the inventory * Communicate which years inventory estimates will be reported (e.g. 2005 and 2010) * Communicate which guidelines will be used (for example, the 2006 IPCC Guidelines) * Communicate the software that should be used for the inventory * Discuss what needs to be submitted to the NIC, and schedule * Distribute and review the inception memo and any additional general inventory guidance * Distribute and review category preparation instructions and any additional supporting materials (e.g. template for narrative text) * Discuss any issues or concerns | **NIC, Sector leads** | *1-2 months* | *National Inventory Inception Memo Template (in EPA Toolkit)* |
| 4 | Review IPCC methods and good practice guidance. Consider whether additional training of staff is needed. | **NIC, Sector Leads** | *1-2 months* | [*IPCC Guidelines*](http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html)  [*UNFCCC Consultative Group of Experts Training Materials for Each Sector*](http://unfccc.int/national_reports/non-annex_i_natcom/training_material/methodological_documents/items/7914.php) |
| 5 | NIC should work with Sector Leads to find and distribute any available materials from the previous National Communication or National Inventory. | **NIC** | *1-2 weeks* | [*Sector Lead Roles and Responsibilities*](http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html) *(in EPA Toolkit)* |
| 6 | Each Sector Lead should:   * Review the relevant section(s) of the previous national communication * Review previous inventory to determine priorities for this inventory. Pay attention to discussions of problems or potential future improvements. Review inventory sections, spreadsheets, and other relevant files. * Assign staff responsibilities (i.e., collecting data, developing estimates, coordinating consultant(s), working with ministries providing data, etc.) * Determine data availability, quality, and barriers to collection * Choose methods, identify activity data, approaches for filling data gaps, emission factors, and conversion factors. * Send any necessary official communication to request data | **Sector Leads and sector working groups** | *1-2 months* | *EPA Methods & Data Documentation (MDD) Template*  *Sector Lead Roles and Responsibilities (in EPA Toolkit)*  [*IPCC Guidelines*](http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html) |
| 7 | Determine methods and compile activity data and emission factors (e.g. data should include activity data, emission factors and relevant uncertainty parameters).  Use MDD template to document methods and data. | **Sector Leads** | *1-2 months* | [*IPCC Guidelines*](http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html)  *EPA Methods & Data Documentation (MDD) Template*  *Review reporting and documentation sections of* [*IPCC Good Practice GL/2006 GL*](http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html) *for each emission/removal category* |
| 8 | Complete emission calculations and prepare narrative text to be included in the inventory | **Sector Leads** | *2 months* | *Sector Lead Roles and Responsibilities (in EPA Toolkit)* |
| 9 | Recalculate emission estimates for previous inventory years (if applicable) and explain changes in narrative text | **Sector Leads** | *1 month* | *Sector Lead Roles and Responsibilities (in EPA Toolkit)* |
| 10 | Complete internal quality control (QC) procedures, including additional internal reviews as described in the QA/QC plan | **Sector Leads, QA/QC Coordinator** | *1 month* | *EPA Description of QA/QC Procedures Template*  [*Review QA/QC sections of IPCC Good Practice GL/2006 GL for each emission/removal category*](http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/6_2_QA_QC.pdf) |
| 11 | Complete external quality assurance (QA) procedures (e.g., stakeholders, advisory committee) including any additional external reviews as described in the QA/QC plan | **Sector Leads, QA/QC Coordinator** | *1-2 months* | *EPA Description of QA/QC Procedures Template* |
| 12 | Revise GHG estimates and narrative text based upon QA/QC reviews | **Sector Leads** | *1-2 weeks* | *Sector Lead Roles and Responsibilities (in EPA Toolkit)* |
| 13 | Complete Uncertainty Analysis (if applicable). Document Uncertainty methods using MDD Template. | **Sector Leads, Uncertainty Coordinator** | *2-4 weeks* | *EPA Methods & Data Documentation (MDD) Template,*  [*IPCC Uncertainty Chapter*](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_3_Ch3_Uncertainties.pdf) |
| 14 | Compile sector narratives into one document | **NIC** | *1-2 weeks* | *NIC Roles and Qualifications (in EPA Toolkit)* |
| 15 | Perform Key Category Analysis (KCA) on GHG estimates. Conduct a Level Analysis, and conduct a Trend Analysis if multiple years of data are available.  Use the EPA materials to learn more about conducting a KCA (the webinar), to do the analysis (the tool), and to document the results (the template). | **NIC** | *1 week* | [*EPA KCA Webinar Part 1*](http://youtu.be/Ftx1U6q4mNE)  [*EPA KCA Webinar Part 2*](http://youtu.be/s-5gGkWdcXQ)  *EPA* [*Key Category Analysis (KCA) Tool*](http://www.epa.gov/climatechange/Downloads/EPAactivities/EPA-KCA-Tool-v2.4.4.xls)  *EPA Key Category Analysis (KCA) Template*  [*Review IPCC Chapter on Key Category Analysis*](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_4_Ch4_MethodChoice.pdf) |
| 16 | Prepare the draft inventory chapter or report. Perform internal QC checks. | **NIC, QA/QC Coordinator** | *2-3 weeks* | *EPA Description of QA/QC Procedures Template*  [*Review IPCC QA/QC of Inventory Systems*](http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/6_2_QA_QC.pdf) |
| 17 | Address comments from QC review and finalize inventory chapter or report. | **NIC** | *2-3 weeks* |  |
| 18 | Submit inventory to the UNFCCC as part of the NC or BUR. | **NIC** | *1-2 weeks* |  |
| 19 | Archive all inventory files both electronically and physically (with hard copy printouts).  Follow the archiving plan developed using EPA Description of the Archiving System (AS) Template.  Compile all the completed templates for a complete documentation inventory processes, methods, data, etc.  At a minimum, archives should include:   * description of institutional arrangements * descriptions of the data assessment and manipulation processes, including the sources of data that were evaluated; * why a particular data source was chosen for use in the inventory and possibly why others were not chosen; * what assumptions were made in manipulating or choosing data for final use; * references for the data; * why recalculations were made and what those recalculations were; and responses to internal and external review comments; * major draft and final versions of spreadsheets and the National Inventory Chapter of National Communication or Biennial Update Report (BUR) | **NIC** | *1 month* | [*EPA National GHG Inventory System Template Workbook*](http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html) *(all templates)*  *The MDD and AS templates can be particularly helpful here.* |
| 20 | Determine potential improvements for the next inventory, and document into a plan | **NIC to lead with input from all inventory team members** | *2-4 weeks* | *EPA National Inventory Improvement Plan NIIP (NIIP) Template* |

**Example Inventory Cycle**



# Inventory Structure and Team Member Responsibilities

*This section provides a potential outline of the National Inventory organization and provides a place for the NIC to identify the key team members responsible for compiling estimates for each sector. The purpose of this section is to clarify to your inventory team which person and/or ministry is responsible for developing GHG estimates for each sector. Two expanded options are provided in Appendix I at the end of this memorandum (for 2006 and 1996 IPCC Guidelines) if the NIC provides more detailed assignments within each sector (that table can then replace this basic structure). The Institutional Arrangements template (specifically, Table 1.2 of that template) should be completed and used as a reference in identifying/designating the Sector Leads.*

**Example Inventory Structure according to 2006 IPCC Guidelines (Basic)**

| **Sector** | **Lead** |
| --- | --- |
| Energy |  |
| Industrial Processes and Product Use (IPPU) |  |
| Agriculture, Forestry, and Other Land Use (AFOLU) |  |
| Waste |  |
| **Other Sections (fill in if applicable)** |  |
| QA/QC |  |
| Uncertainty |  |
| Archiving |  |

Location of Institutional Arrangements Template: include reference to completed Institutional Arrangements Template for your country (where this information is documented), including location of completed template, version, date, etc.

*If the 1996 IPCC Guidelines are being used, the table below and Option 2 in the Appendix is more appropriate.*

**Example Inventory Structure according to 1996 IPCC Guidelines (Basic)**

| **Sector** | **Lead** |
| --- | --- |
| Energy |  |
| Industrial Processes |  |
| Solvent and Other Product Use |  |
| Agriculture |  |
| Land-Use, Land-Use Change and Forestry |  |
| Waste |  |
| **Other Sections (fill in if applicable)** |  |
| QA/QC |  |
| Uncertainty |  |
| Archiving |  |

Location of Institutional Arrangements Template: include reference to completed Institutional Arrangements Template for your country (where this information is documented), including location of completed template, version, date, etc.

# Documentation Procedures

*Comprehensive documentation is crucial to the long-term sustainability of regular high-quality National Inventories. In this section, provide instructions for inventory staff on how to document the National Inventory. This section can summarize the responsibilities based on procedures and plans you have developed through application of the Archiving System template. For example, you can adapt and distribute the Methods and Data Documentation template to identify what elements should be documented for each category in your National Inventory and reference its application below.*

## General Responsibilities

**Example Text:**

Comprehensive and detailed documentation will ensure that the National Inventory is transparent and reproducible, and that high quality inventories can continue to be developed in future years.

* Every primary data element (e.g., activity data, emission factors, carbon coefficients, etc.) should have a reference⎯published or unpublished⎯for the source of the data. There should be no non-calculated values in the spreadsheets that are not referenced, other than unit conversion factors and constants.
* Everything should have a date of completion, especially all spreadsheet printouts.
* Each Sector Lead should ensure that the Methods and Data Documentation Template is completed for their sector (attached to this memo).
* Additional details are in the *[Country]* Archiving plan.

## Inventory Archive

*The Inventory archive is a comprehensive collection of all references/sources of information used to produce the National Inventory. This collection includes activity data sources, websites, online databases, email correspondence, and telephone conversations, among others. It is good practice to compile and safeguard the archive. The archive should be kept in physical and/or electronic form and completed while the National Inventory estimates are finalized. Use the Archiving Systems template (specifically Table 4.1) to define tasks, responsibilities, and a schedule for archive development for the archiving coordinator as well as Sector Leads. The plan developed in the template can then be summarized in this section.*

**Example Text:**

In addition, we will be preparing an electronic archive, which will include all references used to estimate emissions from categories and to produce the Inventory. The archive will serve as a repository for additional documentation and explanation of your categories. The e-archive is located on the shared drive, in the folder titled “GHG Inventory for *[Country’s Inventory for TNC or BUR1]*”. Key archive materials should include the following; a comprehensive list of materials to be submitted is in the Archiving Plan *[Refer to the Archiving System Template (Table 4.1)]:*

* Documentation of institutional arrangements.
* A list of all citations/references used.
* A copy of each reference should be submitted to the NIC along with a narrative describing each reference, and a web link if available.
  + For a report: copies of the cover page and most relevant pages may be sufficient. If the entire report was used extensively, then a copy of the cover page will suffice.
  + For an online database: PDF or Excel files with the relevant data tables are ideal. If it is too time-intensive to collect or if there are a large number of spreadsheets, it may be sufficient to provide a link to the database along with the appropriate search criteria and your contact information.
  + For personal communication: documenting personal communications where information was exchanged or collected (activity data, emission factors, methodologies), such as email correspondence, telephone conversations, or personal communication via in-person meetings.
    - For email correspondence: a copy of the email is sufficient.
    - For phone conversations: If a phone conversation is held where data is received or decisions on data are discussed, the contact information of the person contacted is needed, including the date contacted, the contact’s name, title, organization, phone number, email address, location address, as well as a description of the purpose or subject of conversation, and a brief summary of the conversation itself including any outcomes of the meeting. [Complete the contact report attached to this memo]
    - For in-person meetings: a short memorandum including the relevant information or data and the contact information of both parties will be necessary. [Complete contact report attached]
  + For confidential business information: submit a placeholder for this information including your contact information. The placeholder should provide a reference but acknowledge that the physical data is confidential and not to be shared or included in the archive. Also submit any confidential business information agreements.
* Any additional discussion about uncertainty analyses and recalculations.

# Data Management

*In this section, you should provide requirements and suggestions for managing inventory spreadsheets. The spreadsheets should be designed so that new team members with little to no previous inventory experience can easily update category emission estimates. Please list your requirements/suggestions below.*

*The summary provided here should be consistent with your Archiving Plan, specifically the Archive Procedures section of the template that includes information on the management of files, data and document retention, and storage mechanisms. All relevant plans developed from use of the templates (Archiving, QA/QC, etc.) should be referenced in this section as resources for more information.*

*If your country does not use spreadsheets to perform the main National Inventory calculations, this section should be re-written to be relevant to the inventory software and/or calculation files used.*

**Example Text:**

The following points are guidelines for managing inventory spreadsheets. If any of these guidelines are unclear, please contact the NIC. Complete guidelines for data management are in the Archiving Plan (specific archiving procedures are in Section 4.3.2 in the Archiving System template)

* If available, all Sector Leads will use spreadsheets from the previous Inventory. These have been provided to you by the NIC. Each Sector Lead will be asked to submit the sector/category spreadsheet once estimates are finalized. If historical estimates are revised, then the spreadsheet estimates should reflect those revised numbers.
* Every primary data element (e.g., activity data, emission factors, carbon coefficients, etc.) should have a reference⎯published or unpublished⎯for the source of the data, and this reference should be identified in the spreadsheet, as well as documented in the Methods and Data Documentation Template. There should not be values in the spreadsheets that are not referenced (i.e., no hard wired values), other than unit conversion factors and constants either through an Excel comment or cell note. The data sources will be provided as part of each sector’s archive submission.
* Do not enter values such as conversion factors or other numbers inside cell formulas. You should enter each value in separate cells and perform calculations using formulas that refer to those cells. Users should be able to understand the parameters for each value (e.g., units). Such practices are more transparent to others viewing and using the spreadsheets in the future.
* Create automatic look-up tables or pull down menus that limit permissible entries, or in some cases, automatically enter data.
* Use cell protection in spreadsheets so that fixed data cannot accidentally be changed, and build in electronic checks to highlight possible problems.
* When the estimates have been completed, electronic copies of each sector or category’s spreadsheet(s) must be sent to the NIC and *[insert Archiving Coordinator, if applicable]*. Once the spreadsheet(s) have been transferred, these spreadsheets become the official version to which any future changes should be made. If changes are required after the spreadsheet has been submitted, contact the Inventory Coordinator so that changes can be made to the official version. Please provide every “linked” supporting spreadsheet that is used.
* Make efforts to label and “organize” the spreadsheets where possible, keeping it in mind that they should be as transparent as possible (i.e., someone unfamiliar with it should be able to open it and quickly extract information and understand on the estimation procedures).

# Narrative Text Instructions

*Provide instructions to your inventory team for drafting the National Inventory text. Below is some example text, although country circumstances will vary greatly here depending on whether previous narrative text is available and if portions can be used, or whether all new text is needed.*

**Example Text:**

These instructions provide a framework for preparing the text for the National Inventory.

***Option 1:*** *If previous text is available and still mostly relevant, the following text might be appropriate.*

**Example Text:**

Text from the previous National Inventory will be provided to each sector lead to update for the current inventory. If these files are not received, please contact the NIC.

* Everyone must use the MS Word versions of the write-ups and annexes provided at the beginning of the Inventory cycle after the inception meeting via the NIC. If there are any questions regarding the files, please contact the NIC immediately. Each text section will have been edited to fit into a standard and consistent format and writing style. No changes should be made to the formatting, styles, margins, etc. currently in the MS Word documents. Sector leads can simply revise the text and add columns to tables for the most recent data.

***Option 2:*** *If previous text is not available (or will not be used), the following text might be appropriate.*

**Example Text:**

The NIC will provide a template for preparing text. Sector leads should develop their own content and report the appropriate sector or category discussion as well as a description of the data received, arrangements to collect and archive data, methodology for preparing estimates, the results themselves, and any additional information available including but not limited to efforts to make these actions a continuous process or information on the roles of the institutions involved.

All text should be written to correspond to the structure described below in “Sector Reporting.” Contact the NIC if you have any questions regarding the narrative.

## Sector Reporting

*This section provides instructions to Sector Leads for developing their inventory chapters. For the inventory chapter or report, Sector Leads should include text that briefly describes each category, the institutional arrangements involved in activity data collection, the methodology for estimating emissions, and the documentation and archiving procedures for the data.* ***It is important to note that if the*** [***U.S. EPA’s Template Workbook***](http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html) ***is completed during the inventory cycle, the resulting documentation will contain most of the information necessary to complete the narrative for describing institutional arrangements and for the sector chapters for the National Inventory text. The Methods and Data Documentation template is particularly useful here****. Suggestions on additional information to provide in the text that is not included in the template workbook are listed below.*

**Example Text:**

The following list provides suggestions on additional information that can be provided in category chapter text.

* Discussion of the emissions/removals category and pathway (i.e., characteristics of category, and how emissions/removals occur).
* Description of the national trend in emissions from one inventory year to another (e.g., rate of change), if available, with a brief explanation of why this trend is occurring.
* A simple table with estimates of emissions of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O) by emissions/removals in units of mass (gigagrams or Gg).
* Description of methods and data sources.
* Description of uncertainty, and uncertainty analysis (if performed).
* Any recalculations from the previous inventory.
* Recommendations for additional tables and/or graphics to be included with the text in addition to basic emission estimates are also welcome. Please confer with the NIC.

# QA/QC Requirements

*This section should explain the requirements for the QA/QC activities for the Inventory. The completed QA/QC Procedures template will provide information on QA/QC requirements that can be summarized and referenced here.*

**Example Text:**

As part of QA/QC for the inventory, all sector leads must:

* Conduct a Tier 1 QA/QC analysis on all categories within your sector. At a minimum, each Sector Lead should complete Table 3.2 within the Template Workbook entitled "**General (Tier 1) QC Activities,**" including supplying all documentation used in the checks (e.g. contact reports, supplemental report, other comments). If a QA/QC Plan has already been developed, refer to the QA/QC Plan.
* Submit completed Tier 1 QA/QC checklist to [insert QA/QC coordinator].
* Depending on resource availability, conduct a Tier 2 QA/QC. Refer to Table 3.3 within the Template workbook entitled “Category-specific (Tier 2) QC Procedures” is recommended for key categories. However, Tier 2 checks may not be possible to for all key categories, due to resource constraints. Sector leads should continue to implement a multiyear plan to conduct a Tier 2 analysis on key categories.
* Additional details are in the *[Country]* QA/QC plan provided as an attachment to this memo.

Continue to review the [IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories for QC](http://www.ipcc-nggip.iges.or.jp/public/gp/english/8_QA-QC.pdf), data management, and other recommendations for good practices for each category. Contact the QA/QC and Uncertainty Coordinator for any questions regarding data collection for uncertainty or QA/QC.

# Uncertainty Analysis

*This section should explain the requirements for the Uncertainty Analysis activities for the Inventory. Uncertainty estimates are encouraged for Non-Annex I countries, but not required.*

**Example Text:**

The inventory system is designed and operated to ensure the quality of the inventory through planning, preparation and management of inventory activities. As part of this approach, quality assurance (QA) and quality control (QC) procedures, coupled with uncertainty analysis (if applicable), are designed to enhance and continually improve inventory quality over time. Sector leads should continue to build on past efforts for the current GHG Inventory, while ensuring compliance with the UNFCCC reporting guidelines.

## Uncertainty

**Example Text:**

* ***Optional:*** Conduct a Tier 1 uncertainty analysis on all sources. If an uncertainty tab is not included in the sector or category spreadsheets, see the Tier 1 uncertainty formulae attachment for details on required data. Default uncertainty values are provided in Chapters 2 through 5 of the IPCC Good Practice Guidance and Uncertainty Measurement in National Greenhouse Gas Inventories as well as the IPCC Emission Factor Database[[4]](#footnote-4), however country-specific parameters for activity factors and emission factors can be used based on expert judgment, published references, periodic emissions measurements, and continuous emissions monitoring. Document all sources of uncertainty estimates; where expert judgment is used, please document the expert elicitation process.
* ***Optional:*** Where possible, a Tier 2 Monte Carlo analysis is the preferred approach to quantifying uncertainty and should be undertaken, particularly for key categories, or where a Tier 1 uncertainty analysis is not possible (e.g., a correlation exists between data points, or the data are not normally distributed). It is realized that a Tier 2 analysis can be very resource intensive, and may not be possible to complete for all key categories for the current Inventory. Sector leads should continue to implement a multiyear plan to conduct a Tier 2 analysis on key categories. Tier 2 Monte Carlo analyses should include all sources and sub-sources included in the emission estimate and should report the 2.5 and 97.5 percent lower and upper bounds in units of Tg CO2 Eq. and percentages for a 95 percent confidence interval. If a Tier 2 Monte Carlo analysis is performed, please also provide the Inventory Coordinator with all relevant uncertainty Excel spreadsheets, raw data on model variables used to develop the Monte Carlo analysis for all model simulations, and/or the @RISK software data files.
* If additional analyses are undertaken or a more detailed written discussion of the uncertainty results is desired, please consider including such materials as additional information for your sources in the “docket.” The current length of the report requires us to limit further expansion of the uncertainty section, but the “docket” should be considered a useful tool to be able to provide this additional information to interested parties.

**Appendix I: UNFCCC Greenhouse Gas Emission/Removal Categories**

Option 1: List of GHG categories from 2006 IPCC Guidelines, by sector and category lead[[5]](#footnote-5)

|  |  |  |
| --- | --- | --- |
| **Greenhouse Gas Categories** | | |
| **1** | **Energy** | **Category Lead** |
| 1.A | Fuel combustion activities |  |
| 1.A.1 | Energy industries |  |
| 1.A.2 | Manufacturing industries and construction |  |
| 1.A.3 | Transport |  |
| 1.A.4 | Other sectors |  |
| 1.A.5 | Non-specified |  |
| 1.B | Fugitive emissions from fuels |  |
| 1.B.1 | Solid fuels |  |
| 1.B.2 | Oil and natural gas |  |
| 1.B.3 | Other emissions from energy production |  |
| 1.C | Carbon dioxide transport and storage |  |
| 1.C.1 | Transport of CO2 |  |
| 1.C.2  1.C.3 | Injection and storage  Other |  |
| **2** | **Industrial processes and product use** |  |
| 2.A | Mineral industry |  |
| 2.A.1 | Cement production |  |
| 2.A.2 | Lime production |  |
| 2.A.3 | Glass production |  |
| 2.A.4 | Other process uses of carbonates |  |
| 2.A.5 | Other (please specify) |  |
| 2.B | Chemical industry |  |
| 2.B.1 | Ammonia production |  |
| 2.B.2 | Nitric acid production |  |
| 2.B.3 | Adipic acid production |  |
| 2.B.4 | Caprolactam, glyoxal and glyoxylic acid production |  |
| 2.B.5 | Carbide production |  |
| 2.B.6 | Titanium dioxide production |  |
| 2.B.7 | Soda ash production |  |
| 2.B.8 | Petrochemical and carbon black production |  |
| 2.B.9 | Fluorochemical production |  |
| 2.B.10 | Other (please specify) |  |
| 2.C | Metal production |  |
| 2.C.1 | Iron and steel production |  |
| 2.C.2 | Ferroalloys production |  |
| 2.C.3 | Aluminum production |  |
| 2.C.4 | Magnesium production |  |
| 2.C.5 | Lead production |  |
| 2.C.6 | Zinc production |  |
| 2.C.7 | Other (please specify) |  |
| 2.D | Non-energy products from fuels and solvent use |  |
| 2.D.1 | Lubricant use |  |
| 2.D.2 | Paraffin wax use |  |
| 2.D.3 | Solvent use |  |
| 2.D.4 | Other (please specify) |  |
| 2.E | Electronics industry |  |
| 2.E.1 | Integrated circuit or semiconductor |  |
| 2.E.2 | TFT flat panel display |  |
| 2.E.3 | Photovoltaics |  |
| 2.E.4 | Heat transfer fluid |  |
| 2.E.5 | Other (please specify) |  |
| 2.F | Product uses as substitutes for ozone depleting substances |  |
| 2.F.1 | Refrigeration and air conditioning |  |
| 2.F.2 | Foam blowing agents |  |
| 2.F.3 | Fire protection |  |
| 2.F.4 | Aerosols |  |
| 2.F.5 | Solvents |  |
| 2.F.6 | Other applications (please specify) |  |
| 2.G | Other product manufacture and use |  |
| 2.G.1 | Electrical equipment |  |
| 2.G.2 | SF6 and PFCs from other product uses |  |
| 2.G.3 | N2O from product uses |  |
| 2.G.4 | Other (please specify) |  |
| 2.H | Other |  |
| 2.H.1 | Pulp and paper industry |  |
| 2.H.2 | Food and beverages industry |  |
| 2.H.3 | Other (please specify) |  |
| **3** | **Agriculture, forestry, and other land use** |  |
| 3.A | Livestock |  |
| 3.A.1 | Enteric fermentation |  |
| 3.A.2 | Manure management |  |
| 3.B | Land |  |
| 3.B.1 | Forest land |  |
| 3.B.2 | Cropland |  |
| 3.B.3 | Grassland |  |
| 3.B.4 | Wetlands |  |
| 3.B.5 | Settlements |  |
| 3.B.6 | Other land |  |
| 3.C | Aggregate sources of non-CO2 emissions sources on land |  |
| 3.C.1 | Emissions from biomass burning |  |
| 3.C.2 | Liming |  |
| 3.C.3 | Urea application |  |
| 3.C.4 | Direct N2O emissions from managed soils |  |
| 3.C.5 | Indirect N2O emissions from managed soils |  |
| 3.C.6 | Indirect N2O emissions from manure management |  |
| 3.C.7 | Rice cultivations |  |
| 3.C.8 | Other (please specify) |  |
| 3.D | Other |  |
| 3.D.1 | Harvested wood products |  |
| 3.D.2 | Other (please specify) |  |
| **4** | **Waste** |  |
| 4.A | Solid waste disposal |  |
| 4.A.1 | Managed waste disposal sites |  |
| 4.A.2 | Unmanaged waste disposal sites |  |
| 4.A.3 | Uncategorized waste disposal sites |  |
| 4.B | Biological treatment of solid waste |  |
| 4.C | Incineration and open burning of waste |  |
| 4.C.1 | Waste incineration |  |
| 4.C.2 | Open burning of waste |  |
| 4.D | Wastewater treatment and discharge |  |
| 4.D.1 | Domestic wastewater treatment and discharge |  |
| 4.D.2 | Industrial wastewater treatment and discharge |  |
| 4.E | Other (please specify) |  |
| **5** | **Other** |  |
| 5.A | Indirect N2O emissions from atmospheric deposition of nitrogen in NOx and NH3 |  |
| 5.B | Other (please specify) |  |

Option 2: List of GHG categories from 1996 IPCC Guidelines, by sector and category lead[[6]](#footnote-6)

|  |  |  |
| --- | --- | --- |
| **Greenhouse Gas Categories** | | |
| **1** | **Energy** | **Category Lead** |
| 1.a | Fuel combustion (sectoral approach) |  |
| 1.a.1 | Energy industries |  |
| 1.a.2 | Manufacturing industries and construction |  |
| 1.a.3 | Transport |  |
| 1.a.4 | Other sectors |  |
| 1.a.5 | Other (please specify) |  |
| 1.b | Fugitive emissions from fuels |  |
| 1.b.1 | Solid fuels |  |
| 1.b.2 | Oil and natural gas |  |
| **2** | **Industrial processes** |  |
| 2.a | Mineral products |  |
| 2.b | Chemical industry |  |
| 2.c | Metal production |  |
| 2.d | Other production |  |
| 2.e | Production of halocarbons and sulphur hexafluoride |  |
| 2.f | Consumption of halocarbons and sulphur hexafluoride |  |
| 2.g | Other (please specify) |  |
| **3** | **Solvent and other product use** |  |
| 3.a | Product Use |  |
| **4** | **Agriculture** |  |
| 4.a | Enteric fermentation |  |
| 4.b | Manure management |  |
| 4.c | Rice cultivation |  |
| 4.d | Agricultural soils |  |
| 4.e | Prescribed burning of savannahs |  |
| 4.f | Field burning of agricultural residues |  |
| 4.g | Other (please specify) |  |
| **5** | **Land-use change and forestry** |  |
| 5.a | Changes in forest and other woody biomass stocks |  |
| 5.b | Forest and grassland conversion |  |
| 5.c | Abandonment of managed lands |  |
| 5.d | CO2 emissions/removals from soil |  |
| 5.e | Other (please specify) |  |
| **6** | **Waste** |  |
| 6.a | Solid waste disposal on land |  |
| 6.b | Waste-water handling |  |
| 6.c | Waste incineration |  |
| 6.d | Other (please specify) |  |
| **7** | **Other (please specify)** |  |
|  | Memo items |  |
|  | International bunkers |  |
|  | Aviation |  |
|  | Marine |  |
|  | CO2 emissions from biomass |  |

1. Includes any full time staff, part time staff, and consultants. [↑](#footnote-ref-1)
2. “Lead” is the person(s) responsible. This may have been defined in Section 1.2 of the Institutional Arrangements Template. [↑](#footnote-ref-2)
3. The NIC should determine due dates (with day/month/year). Example timeframes for each activity have been suggested. [↑](#footnote-ref-3)
4. Default emission factors in the IPCC’s Emission Factor Database are available online at: <http://www.ipcc-nggip.iges.or.jp/EFDB/main.php> [↑](#footnote-ref-4)
5. This is the person responsible for developing the GHG estimates for each category. [↑](#footnote-ref-5)
6. This is the person responsible for developing the GHG estimates for each category. [↑](#footnote-ref-6)