

Introduction to the Toolkit for Building National GHG Inventory Systems

Remote Training on the Building of Sustainable National Greenhouse Gas Inventory

Management Systems

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Ricardo Energy & Environment, on behalf of the U.S. Environmental Protection Agency

October 7th 2024

Housekeeping

Chat and Q&A

- Please feel free to introduce yourselves in the Chat channel Name, Country, Organization and Role
- Please place questions in the chat channel or wait to ask them in the Q&A

Recording

Today's session will be recorded, so you can view it again later

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Agenda

10 min	Welcome and Introduction	UNFCCC Sina Wartmann
35 min	Template 1: Intro to the GHGI Toolkit & GHG Inventory Planning	Ross Hunter
10 min	Q&A	Ross Hunter
5 min	Break	
5 min	Mentimeter poll on Inventory compilation Institutional Arrangements	Serena Churchill
25 min	Template 2: Institutional Arrangements	Sina Wartmann
15 min	Q&A	Sina Wartmann
5 min	Conclusions and Next Webinairs	

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Team Introductions













Overview



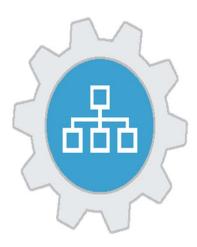
Introduction to GHG Inventory Management Systems and the Toolkit



Enhanced Transparency Framework



Inventory Planning Template



Institutional Arrangements Template

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National Inventory Management System

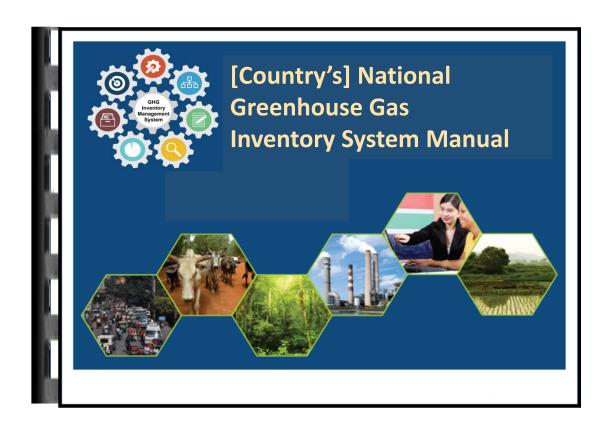
- Organize the steps and arrangements needed to prepare national inventories
- Transition from a project-based approach to an institutional approach that can prepare inventories regularly
- Critical starting point for building inventories that are more transparent, accurate, complete, consistent, and comparable (TACCC)
- Efficiently use time and resources over the long term



Completed templates become a National Inventory System Manual

What are templates?

- Serve as a starting point for a national inventory
- Contain the outline of an inventory system- you provide the details
- The final product will be a manual for your country to refer to for the next national inventory



Benefits of the National Inventory System Templates

Completing the templates will help you	which yields these benefits
Document critical information about inventory plans and procedures	Improve Transparency and Credibility
Define inventory tasks and development stages	Break down work into discrete tasks
Accommodate varying levels of national capacity	Different priorities and roles based on budget and staff capacity
Clarify roles and responsibilities of individuals and institutions	Easier accountability and role development
Identify priorities for future improvements	Continuous improvement and refinement
Provide a clear starting point for future inventories	 Help establish a sustainable national system that Meets TACCC principles Enables transition to ETF commitment of submitting a Biennial Transparency Report (BTR) every 2 years

Key Components of an Inventory Management System



- !

Template 1. Inventory Planning



This template will help you:

- Document inventory compilation schedule and workplan
- Track progress on completing each template

Supporting Resources

 National Inventory Inception Memorandum Template

Template 2. Institutional Arrangements



This template will help you:

- Assess and document strengths and weaknesses
- Promote institutionalization of the inventory process
- Ensure long-term integrity of the inventory

Supporting Resources

- National GHG Inventory Coordinator: Responsibilities and Qualifications Guide
- Sector Lead Roles and Responsibilities Guide for Energy, IPPU, Agriculture, LULUCF, and Waste
- Memorandum of Cooperation Template
- Statement of Work Template

Template 3. Methods and Data Documentation



This template will help you:

- Organize and document methodologies, activity data, and emission factors
- Identify future improvements
- Provide valuable documentation of inventory categories for future reference

Supporting Resources

 Confidentiality Agreement and Amendment Template

Template 4. QA/QC Procedures



This template will help you:

- Provides a guide to establish cost-effective quality assurance and quality control (QA/QC) procedures
- Define roles and tasks of inventory staff
- Includes general and category-specific checks, as recommended by IPCC

Supporting Resources

- Appendix 1: QA/QC Checklists
- Appendix 2: Expert Review Elicitation Template

Template 5. Key Category Analysis (KCA)



This template will help you:

- Identify the most important sources and sinks in the national GHG inventory
- Focus and prioritize inventory improvement

Supporting Resources

Key Category Analysis Tool

Template 6. Archiving System



This template will help you:

- Create a complete, accessible, and costeffective archiving system
- Provide the critical starting point for future inventories
- Increase the transparency of the inventory

Supporting Resources

Archiving Procedures Checklist

Template 7. National Inventory Improvement Plan



This template will help you:

- Identify future improvements, based on the needs identified in the 6 other templates
- Prioritize improvements that enhance your inventory's transparency, accuracy, completeness, comparability, and consistency (TACCC) over time

Supporting Resources

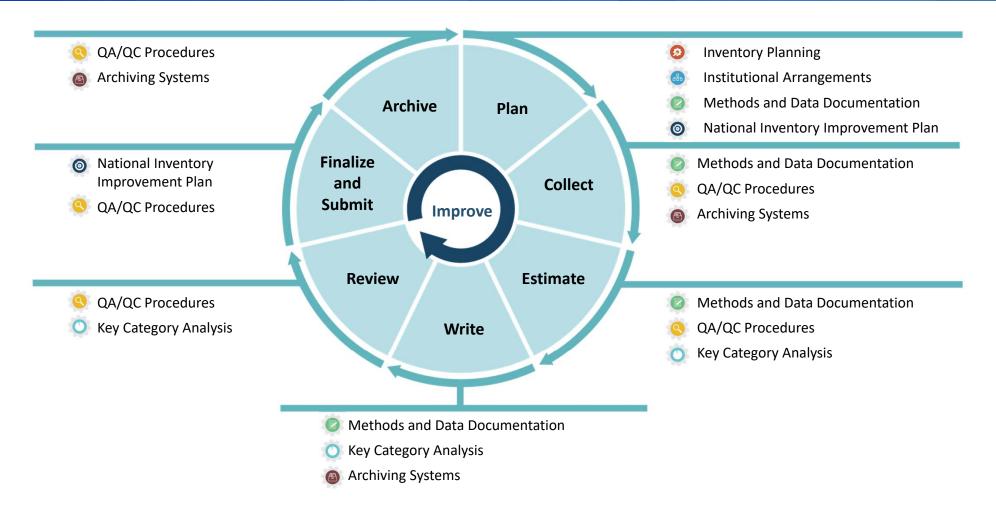
Inventory Progress Indicator (IPI) Tool

How to Access the Templates

- Templates are available in English on the U.S. EPA Toolkit for Building National GHG Inventory Systems website:
 - o https://www.epa.gov/ghgemissions/toolkit-building-national-ghg-inventory-systems
- Templates are available in French and Spanish upon request.
 - Contact: ghgi.transparency@epa.gov
- *Note: Individual templates will be translated as they are updated. Some templates may only be available in English through the end of calendar year 2024.



Inventory Compilation Cycle & the Templates



Toward Common Reporting and Review

Previous Reporting Framework (Before 2024)

Enhanced Transparency Framework (2024 Onward)

Annex I Parties (Developed Countries)

- National Communications (NCs), detailed reporting tables
- Biennial Reports (BRs), detailed reporting tables
- Annual GHG Inventories (GHGIs), detailed reporting tables
- Technical Expert Review of all reports, Multilateral Assessment (MA) for BRs

Non-Annex I Parties (Developing Countries)

- National Communications (NCs)
- Biennial Update Reports (BURs)
 - National GHGIs (chapter in BUR/NC, 1996 IPPC Guidelines/IPCC GPG, summary tables)
 - International Consultation and Analysis (ICA)

All Parties*

- Reporting requirements under Modalities, Procedures, and Guidelines (MPGs)
- Biennial Transparency Reports (BTRs)
 - National GHGIs (standalone or BTR chapter, 2006
 IPCC Guidelines, detailed reporting tables)
 - Progress toward Nationally Determined Contributions (NDCs)
 - GHG Emissions Projections
- Areas of Improvement
- Technical Expert Review
- Facilitative Multilateral Consideration

*With flexibility to developing country parties that need it in light of their capacities.

Templates Help Meet ETF Requirements

Modalities, Procedures, and Guidelines: each Party shall report on...

- "National entity or focal point with overall responsibility for the inventory"
- "Division of specific responsibilities"



• Activity data, choice and development of methods, emission factors, data sources and references.



 "Quality assurance/quality control (QA/QC)"



Templates Help Meet ETF Requirements

Modalities, Procedures, and Guidelines: each Party shall report on...

 "Key categories for the starting year and the latest reporting year"



 "Archiving of all information for the reported time series"



"Planned inventory improvements"





How this Template Will Help!

Inventory Planning will help the inventory team:



- Create a national GHG inventory schedule and record due dates for key stages of inventory compilation
- Track progress on completing the templates

Case Study: How to Get Started

Background: Country X has compiled inventories periodically in the past on a project basis and is now preparing to compile their inventory every 2 years to meet their commitments under the Paris Agreement. The National Inventory Coordinator (NIC) has been identified and is starting the inventory planning process.

Next Steps:

- The NIC will develop a detailed work plan and schedule that includes each stage of the compilation schedule (Table 1-1 in Template 1 and Inventory Inception Memo).
- The NIC will assign tasks to document the inventory management system in the templates and track progress in the Overall Template Progress summary table (Table 1-2 in Template 1).

Step 1: Inventory Compilation Schedule

Table 1-1. Inventory Compilation Schedule

	Stage	Due date (e.g., Month, day, and year)	Comments		
	Plan				
Improve	Collect			chive Plan	
	Estimate		Arch		
	Write		Finalize	IMPROVE	
	Review		and Submit		
	Finalize & Submit				
	Archive		Review	Estimate Write	

Example of Table 1-1

Table 1-1. Inventory Compilation Schedule

Improve	Stage	Due date (e.g., Month and year)	Comments
	Plan	June 2022	 Sector leads: update list of planned improvements by June 15 Inventory kick-off meeting on June 30
	Collect	December 2022	 Notify NIC of any new sources/sinks or GHGs to add to GHGI by December 31
	Estimate	First Draft: June 2023 Second Draft: April 2024	Sector leads: to minimize version control issues, make sure to use the latest inventory compilation files provided at kick-off
	Write	First Draft: October 2023 Second Draft: June 2024	For each category, clearly specify which IPCC tier methodology is used
	Review	First Draft: January 2024 Second Draft: October 2024	QA review period: January 1-January 31. 2024
	Finalize & report	December 2024	• BTR submission deadline is December 31, 2024
	Archive	February 2025	Sector leads: save all references (AD, EF) to inventory archive by February 15

Step 2: Overall Template Progress

Table 1-2. Overall Template Progress

Template	Summary of progress towards completing the template	Obstacles and possible solutions	Status
1. Inventory Planning			
2. Institutional Arrangements			
3. Methods and Data Documentation			
4. QA/QC Procedures			
5. Archiving System			
6. Key Category Analysis			
7. National Inventory Improvement Plan			

Tip: Revisit this table before initiating the next inventory cycle to recall and address or avoid obstacles.

Example of Table 1-2

Table 1-2. Overall Template Progress

Template	Summary of progress towards completing the template	Obstacles and possible solutions	Status
1. Inventory Planning	Inventory Compilation Schedule		In Progress
	is completed. Template Progress		
	table is being updated regularly.		
2. Institutional Arrangements	Sector Leads are compiling	Obstacle: need more	In Progress
	tables 2-3 for respective sectors.	disaggregated IPPU AD	
		Solution: engage statistics	
		ministry, industry associations.	
3. Methods and Data			Not Started
Documentation			
4. QA/QC Procedures			Not Started
5. Archiving System			Not Started
6. Key Category Analysis			Not Started
7. National Inventory			Not Started
Improvement Plan			

Supporting Template: National GHG Inventory Inception Memorandum

- NIC can customize the inception memo template to provide general guidance and convey the detailed schedule to the inventory compilation team (i.e., sector leads, QA/QC coordinator, uncertainty coordinator, consultants).
- Participants may have more than one role, depending on staff resources.
- Components include:

Inventory Inception Memorandum

To: Inventory compilers, QA/QC coordinator, etc.

Subject: Inventory Preparation Procedures for 2022-2024

- 1. Introduction
- 2. Work Plan and Schedule
- 3. Inventory Structure and Team Member Responsibilities
- 4. Documentation Procedures
- 5. Data Management
- 6. Instructions for the Report Text
- 7. QA/QC Requirements
- 8. Uncertainty Analysis*

...

^{*} EPA is considering developing a new resource to help conduct uncertainty analyses. Please send any suggestions or feedback: ghgi.transparency@epa.gov.

Action Items for Inventory Planning

- 1. Establish a suitable schedule for each stage of the compilation cycle
 - Consult with key stakeholders in your inventory as needed (e.g., your management, sector leads/compilers, data providers) to understand data availability and other needs or constraints.
- 2. Track progress towards completing all templates to ensure useful documentation of national GHG inventory system
- Prepare an inception memorandum for your GHG inventory to convey important guidance and due dates to your inventory compilation team
 - Coordinate the compilation teams and manage the inventory compilation cycle

Next Presentations

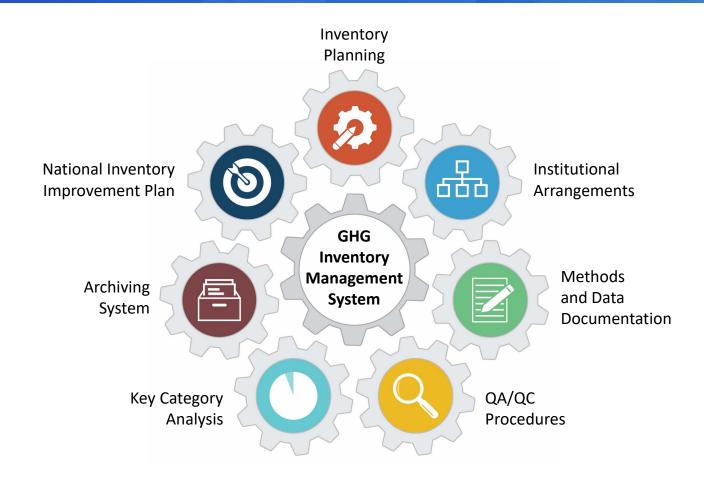


Questions?



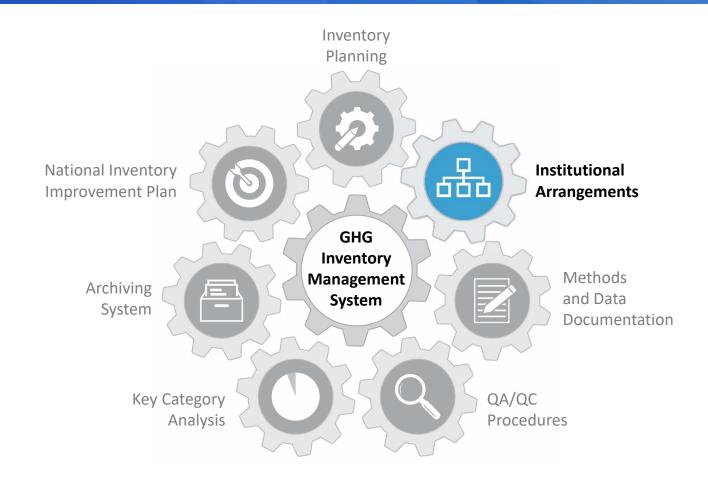
Institutional Arrangements





Institutional Arrangements



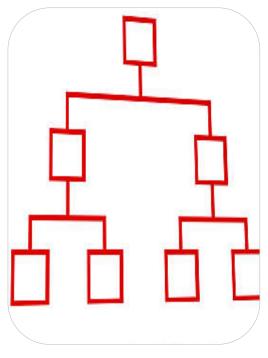


Overview

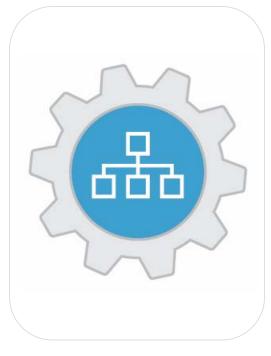




What are Institutional Arrangements (IA)?



Introduction to IAs



Review of the Template

What are Institutional Arrangements?



- They are formal or informal institutional and procedural agreements between the lead inventory agency, national inventory management team, and other institutions.
- They are specific to the circumstances of each nation.
- They define the responsibilities associated with preparing the national inventory, including which agencies and experts will provide data for the inventory.

What are the Major Benefits of Institutional Arrangements?









Provide structure and confidence in the inventory process.

Designate agency or person responsible, so inventory compilers can be confident that data is available.

Clarify roles and responsibilities early in the process. The Inventory team knows who will lead what.

What should you be aware of?





Conflicts of Responsibility



Unassigned Responsibility

Poll Questions - Mentimeter



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www.menti.com

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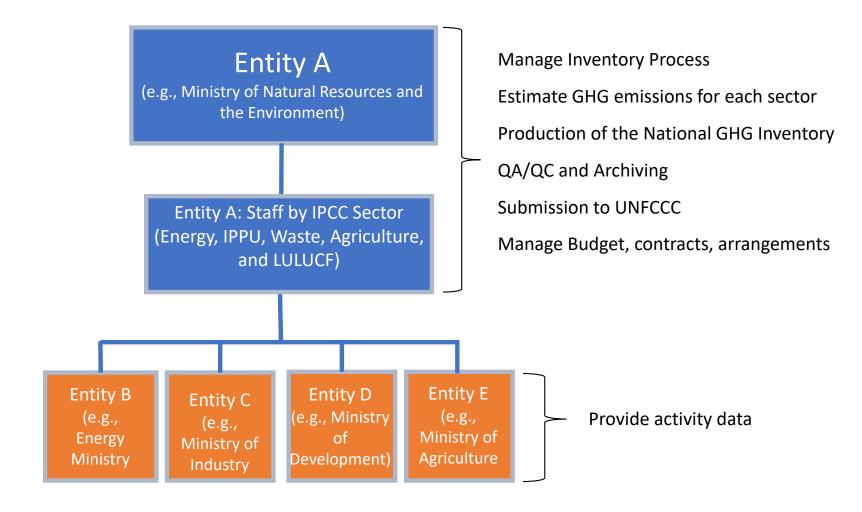
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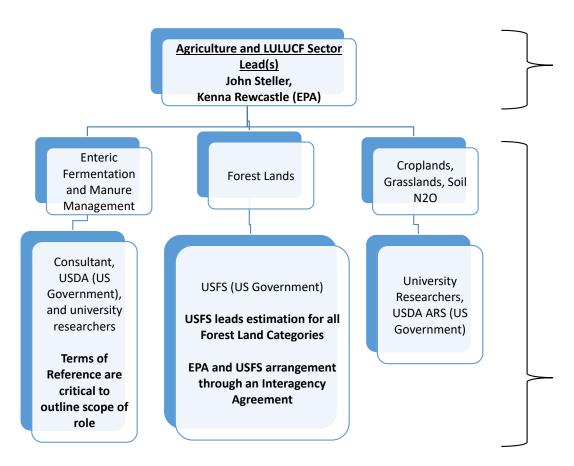
Institutional Arrangement Structures: Example A





Institutional Arrangements: U.S. Agriculture and LULUCF Sector example





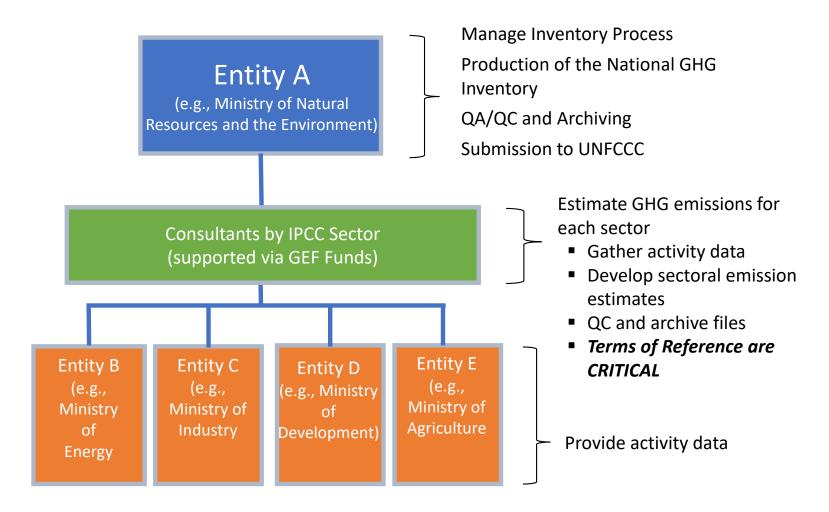
Source leads manage each source category's estimate development:

- Fully versed in IPCC Guidelines
- Determine methodology, coordinate data sources, manage improvements
- Manage arrangements, including interagency agreements, contracts w/ consultants and other arrangements (formal/informal as required) with data providers, manage sectoral budget

Includes compilation and QC support, engaging with data providers

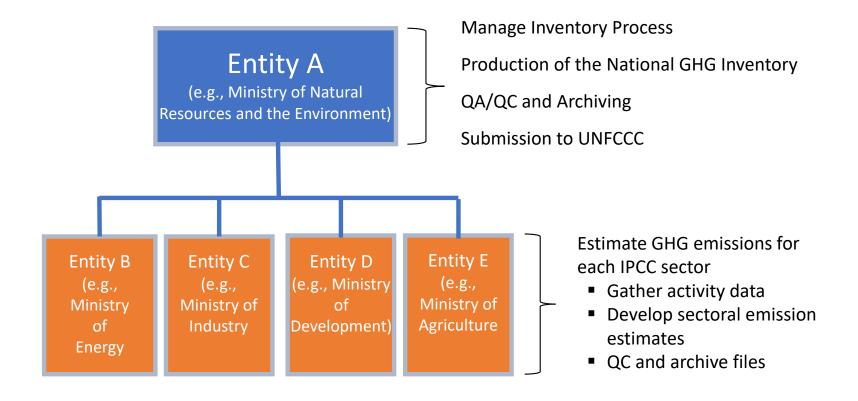
Institutional Arrangement Structures: Example B





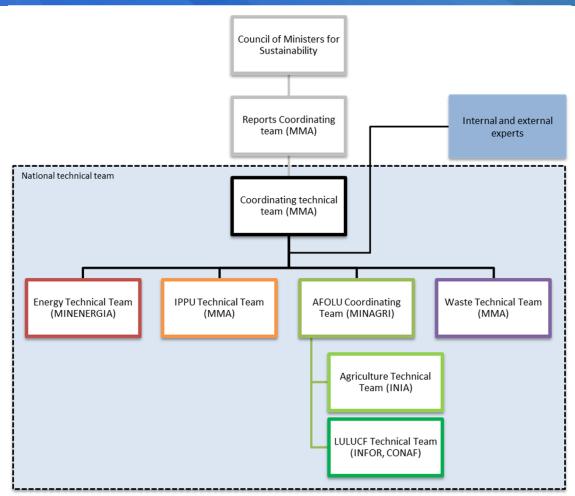
Institutional Arrangement Structures: Example C





Institutional Arrangements: Example Chile

- Sectoral GHG estimation resides with line ministries
- Ministry of the Environment (MMA) coordinates, compiles and finalises GHG inventory
- Additional "reports coordinating team" ensures alignment with other UNFCCC reporting



Questions to Consider for Identifying Institutional Arrangements



- 1. What processes do you have already in place?
- 2. Have roles and responsibilities for each source/sector been defined and assigned?
- 3. How can existing arrangements be improved and what arrangements might work best for your country?
- 4. Do you have a central coordination agency?

Institutional Arrangements Workbook can help guide you through these questions and document your arrangements and national circumstances!



How this Template Will Help!



The *Institutional Arrangements* template will help the inventory team:



- Identify the current inventory management team and their respective roles and responsibilities,
- Establish and what formal or informal arrangements exist by each sector
- Document your institutional strengths
- Identify improvements to existing institutional arrangements or the need for new arrangements

Step 1: Identify current inventory management team

In **STEP 1**, identify the current inventory team members, per your national circumstances, and what roles need to be filled

Personnel

Inventory Director/ Coordinator

Subject Matter Experts (ex. compilers)

Additional Entities Involved in the Inventory

Personnel who can direct overall implementation of QA/QC and archiving system

Personnel who can conduct/ direct implementation of uncertainty analysis



Possible Roles

Inventory Coordinator or Lead

Sector or Category Leads

QA/QC and Archiving Coordinators

Uncertainty Analysis
Coordinator

The same person can have multiple roles. Not all roles are full time!



Step 1: Identify current inventory management team



Table 2.1: Designated Inventory Agency

Designated National GHG Inventory Preparation Agency/Organization	UNFCCC Focal Point (Name) and UNFCCC Focal Point Agency	Arrangements/relationship between Inventory Agency/Organization and UNFCCC Focal Point Agency, if different	

Example of Table 2-1



Table 2.1: Designated Inventory Agency

Designated National GHG Inventory Preparation Agency/Organization	UNFCCC Focal Point (Name) and UNFCCC Focal Point Agency	Arrangements/relationship between Inventory Agency/Organization and UNFCCC Focal Point Agency, if different
U.S. Environmental Protection Agency (EPA)	Jane Doe., U.S. Department of State (DOS)	Agreement between DOS and EPA for roles regarding the GHG Inventory. The U.S. Department of State serves as the overall focal point to the UNFCCC, and EPA's OAP serves as the National Inventory Focal Point for this report, including responding to technical questions and comments on the U.S. Inventory

Step 1: Identify current inventory management team



Table 2.2: National Inventory Leads/Coordinators

Role	Name	Organization	Contact Information	Comments
National Inventory Coordinator				
Energy (Stationary sources) Sector Lead				
Energy (Mobile sources) Sector Lead				
Energy (Fugitive sources) Sector Lead				
Industrial Processes and Product Use (IPPU) Sector Lead				
Agriculture Sector Lead				
Land Use, Land Use Change, and Forestry (LULUCF) Sector Lead				
Waste Sector Lead				
Archiving Coordinator				
Etc.				

Example of Table 2-2



Table 2.2: National Inventory Leads/Coordinators

Role	Name	Organization	Contact Information	Comments
National Inventory Coordinator	M. Dez	EPA	Email and phone #	
Energy (Stationary sources) Sector Lead	V. Camo	EPA – OAP	Email and phone #	MOU with EIA for data collection
Energy (Mobile sources) Sector Lead	S. Rob	EPA – OTAQ	Email and phone #	OTAQ leads GHG estimation
Energy (Fugitive sources) Sector Lead	M. Heinz	EPA	Email and phone #	
Industrial Processes and Product Use (IPPU) Sector Lead	A. Chuo	EPA – OAP	Email and phone #	Coordinate with USGS for data
Agriculture Sector Lead	J. Smith	EPA	Email and phone #	Coordinate with USDA
Land Use, Land Use Change, and Forestry (LULUCF) Sector Lead	T. Worth	EPA	Email and phone #	Interagency agreement between EPA and USFS
Waste Sector Lead	L. Apple	EPA	Email and phone #	
Archiving Coordinator	M. Dez	EPA	Email and phone #	
Etc.				

Step 1: Identify current inventory management team



Step 1 also provides space for users to insert institutional arrangement diagrams which can be updated over time.

United States Greenhouse Gas Inventory Institutional Arrangements 1. Data Collection 2. Emissions 3. Inventory Calculations 4. Inventory Compilation **Energy Data Sources** Submission **U.S. Environmental** U.S. Environmental U.S. Department **Protection Agency Protection Agency** of State Agriculture and Inventory Compiler Other U.S. LULUCF Data Sources **U.S. Environmental Government Agencies Protection Agency** (USFS, NOAA, DOD, USGS, FAA) Industrial Processes and Product Use Data **United Nations** Sources Framework Convention on **Climate Change** Waste Data Sources

Figure 2.1: Institutional Arrangements of the United States

Step 2: Provide Sectoral roles and arrangements

Complete one version of this table for each Inventory sector.

Table 2-3: Institutional arrangements for [sector, e.g., Energy (Stationary Sources)]

Role	Organization	Name	Contact Information	Comments
Technical coordinator				
Staff compiling estimates				
Expert reviewer(s)				
Institution(s) providing data				
Reporting manager(s)				
QA/QC Manager(s)				
Uncertainty Assessment Manager(s)				
Other				



Who completes this table: National Inventory Coordinator (NIC) and Sector Leads

Example of Table 2-3

Table 2-3: Institutional arrangements for Energy (Stationary Sources)

Role	Organization	Name	Contact Information	Comments
Technical coordinator	EPA	V. Camo	Phone number, email	
Staff compiling estimates	DOD, EPA-OTAQ, FHA	S. Rob, C. Baggio	Phone number(s), email(s)	
Expert reviewer(s)	University of DC	M. Johnson	Phone number, email	Identified by EPA Sectoral Leads
Institution(s) providing data	DOE, EIA, FHA, DOD	P. Lindstrom; T. Jones; R. Yates	Phone number(s), email(s)	Formal MOU set up between EPA and DOE
Reporting manager(s)	EPA	V. Camo	Phone number, email	
QA/QC Manager(s)	EPA	V. Camo	Phone number, email	Internal EPA role, formalized in kick-off memo
Uncertainty Assessment Manager(s)	Consultant XYZ	M. Zuma	Phone number, email	Formalized through contract
Other				



Who completes this table: National Inventory Coordinator (NIC) and Sector Leads

Step 2 – Questions to ask for each category



- Is it an informal arrangement for data collection (e.g., written or verbal communication with staff)?
- How will the budget be allocated for each sector?
- How was the request for activity data made? Is there a need to change this approach?



What level of management should you send the requests for compilation assistance/review?

- Is there a formal legal contract between the organizations? Is one needed?
 - What communication with the data provider is needed? Do you need to have regular meeting with the experts, data providers, and other key contributors to explain the background and purpose of the inventory?
 - What is the motivation for the organization to share its data and information with the inventory agency?

Step 3: Note your Institutional Strengths

Table 2.4: Strengths in management structure of national GHG inventory system

Sector	Strengths in management structure of National Inventory System	Key conditions for maintaining strengths	Staff in charge of managing arrangements		
Energy (stationary sources)					
Energy (mobile sources)	Strengths in management	gaement structure of nation	anal GHG inventory system		
Energy (fugitive sources)	Table 2.4 instructi	* Strengths in management structure of national GHG inventory system Table 2.4 instructions: For each sector, describe in what way institutional arrangements that support inventory preparation are well established and likely do not require improvement. For example, communications			
IPPU					
Agriculture		between the institutions may be active and positive, the institutions may have worked together before and have a good working relationship, or data may be collected and managed adequately.			
LULUCF					
Waste					
Other (Optional)					



Who completes this table: National Inventory Coordinator (NIC) and Sector Leads

Step 3: Provide improvements to Institutional Arrangements



Table 2.5: Potential improvements in management structure of national GHG inventory system

Sector	Po	otential improvement	Staff in charge of leading this improvement	Priority of improvement (Low, Medium, High)			
Energy (stationary sources)							
Energy (mobile sources)		•	ement Table 2.5 instruction nal arrangements within ed	s: Taking key categories and ach sector into account,			
Energy (fugitive sources)		describe potential ways to enhance those institutional arrangements.					
IPPU		 Consider whether any important tasks for inventory preparation have no been assigned or delegated, and determine whether they could be. Also 				been assigned or delegated, and determine whether they	whether they could be. Also
Agriculture		consider whether the <u>Memorandum of Cooperation (MoC)</u> supporting template from EPA's Toolkit may help improve the institutional					
LULUCF		arrangements for each sector. Where you decide it may be helpful, record this decision as a needed step in this column.					
Waste							
Other (Optional)							

Who completes this table: National Inventory Coordinator (NIC) and Sector Leads

Case Study: Agriculture Sector

- Background: Country X uses a combination of consultants, national agencies, and public institutions for data provision, QA/QC, and uncertainty analyses
- **Issue**: The consultant assisting to update data may have questions about the statistics in a report
- **Resolution**: The sector lead and the supporting consultant can use their relationships with the other national agencies and public institutions to get answers efficiently.

Case Study Cont.

Role	Name	Organization	Contact Information	Comments
Agriculture Sector Lead	S. Costa	Institute for Biotechnology	S.Costa@mail. gov	
Consultant responsible for categories 3D Agricultural Soils and 3H Urea Application	L. Taylor	Public Environmental Institute	L.Taylor@emai l.com	Personal contract for provision of consultancy services
Data Provider	Varies	National Bureau for Agriculture Statistics	agstats@mail. gov	The information is provided to the Environment Agency in accordance with stipulations of the memo on establishment of the National Monitoring and Reporting System of greenhouse gas
Consultant responsible for quality assurance	E. Barnes	Institute of Soil Science	E.Barnes@em ail.com	Personal contract for provision of consultancy services

Communicating inventory roles, milestones, etc.



- ✓ Identify inventory roles, responsibilities, and data needs
- ✓ Identify institutions and specify positions responsible for meeting those needs
- Establish necessary arrangements (e.g. Contracts for supporting consultants, arrangements with key stakeholders (data providers, reviewers, etc.))
- Communicate overall timeline, roles, outputs and specific interim deadlines
- Review and improve process

Inventory Inception Memorandum

To: Inventory compilers, QA/QC coordinator, etc.

Subject: Inventory Preparation Procedures for 2022-2024

- 1. Introduction
- 2. Work Plan and Schedule
- 3. Inventory Structure and Team Member Responsibilities
- 4. Documentation Procedures
- 5. Data Management
- 6. Instructions for the Report Text
- 7. QA/QC Requirements
- 8. Uncertainty Analysis*

...

Institutional Arrangements Supporting Templates



- ✓ National GHG Inventory Coordinator: Responsibilities and Qualifications Guide: Roles and key responsibilities for the National GHG Inventory Coordinator.
- √ 5 Sector Lead Roles and Responsibilities Guides: Roles and key responsibilities for each Sector Lead (one guide for each IPCC Sector).
- ✓ Memorandum of Cooperation Template: Used for drafting an agreement between two entities.
- ✓ Scope of Work Template: Used by a lead inventory agency to develop a request for proposal or task order request for services.

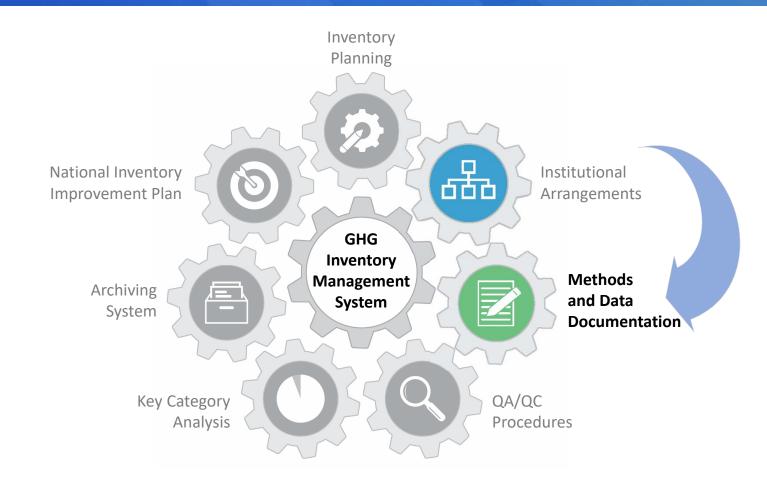
Action Items for Institutional Arrangements



- Assign specific responsibilities for establishing Institutional Arrangements (IAs)
- 2. Identify all current and desired IAs
 - If working with consultants, the Memorandum of Cooperation and the Sample
 Scope of Work included in the template can help establish effective relationships
- Communicate arrangements with sector staff! If staff know the setup, they will be able to follow it more easily
- 4. Identify potential improvements to IAs
 - This will make the National Inventory Improvement Plan (Template 7) much easier

Next template...







Thank You For Your Attention!

For questions & more information, email: ghgi.transparency@epa.gov



Toolkit for Building National GHG Inventory Systems https://www.epa.gov/ghgemissions/toolkit-building-national-ghg-inventory-systems