Methods and Data Documentation

Remote Training on the Building of Sustainable National Greenhouse Gas Inventory Management Systems

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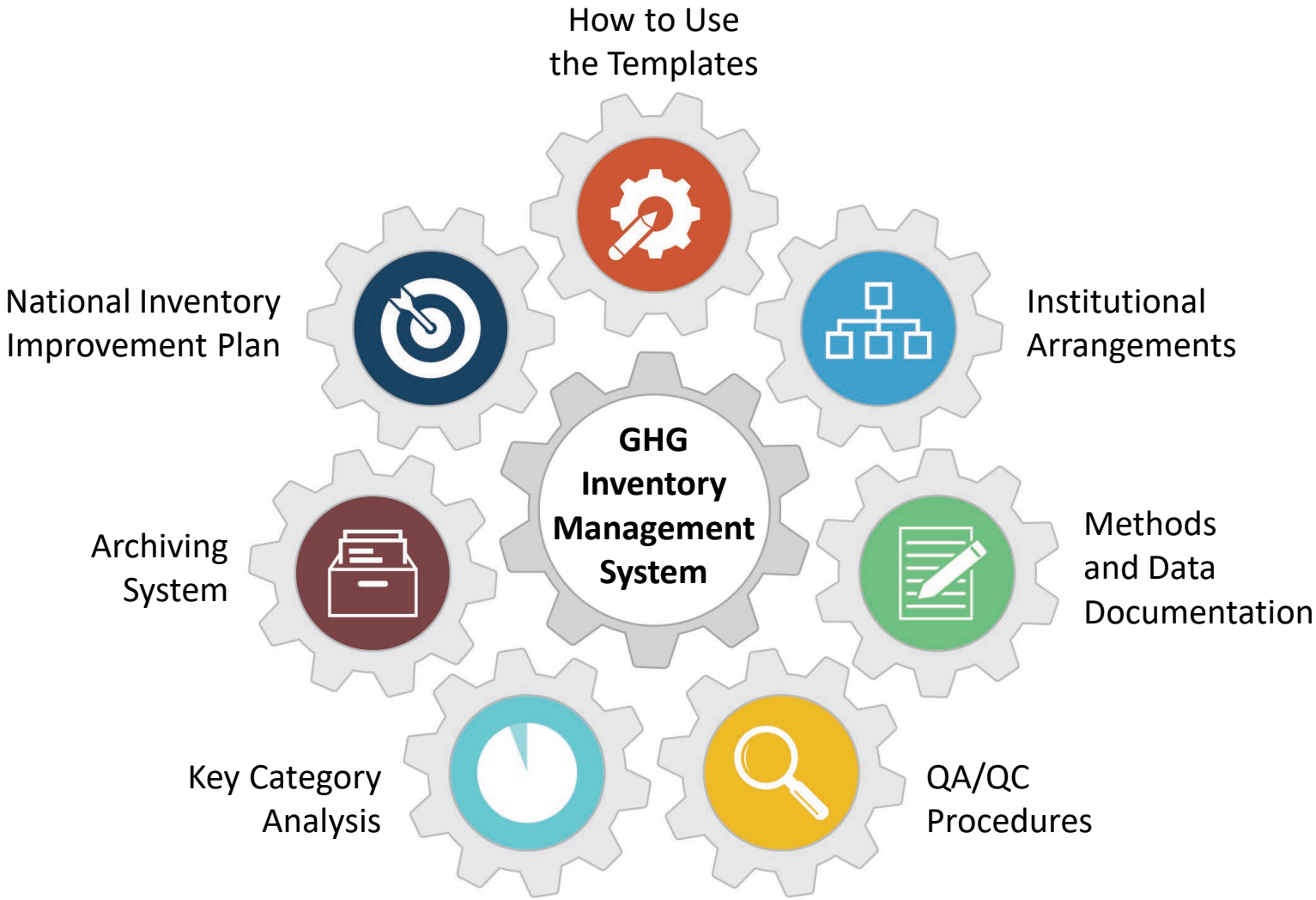
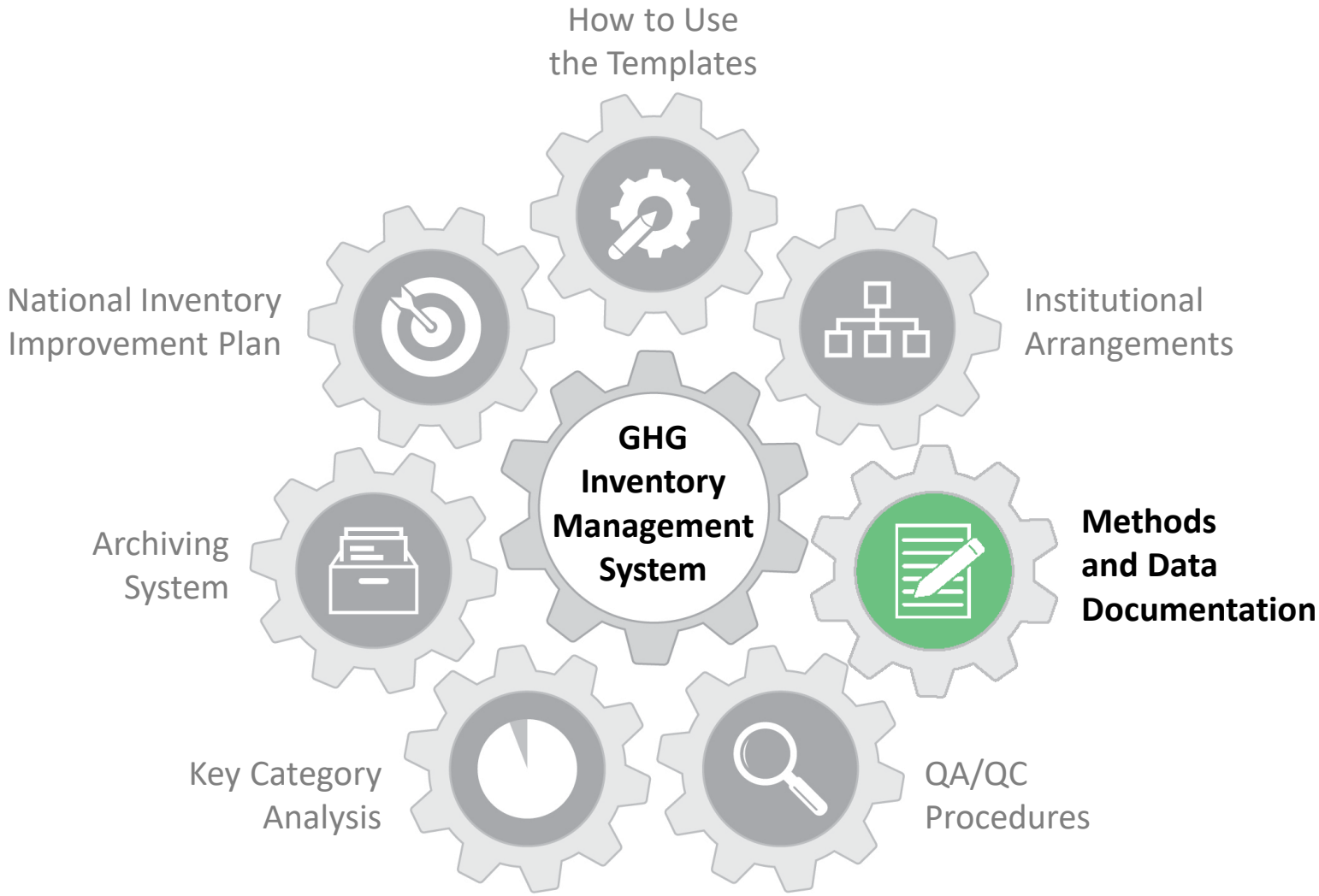
U.S. Environmental Protection Agency

November 17, 2021

Developing a Sustainable National GHG Inventory System



Methods and Data Documentation (MDD)



Poll Question #1

In the process of preparing your inventory estimates and reviewing past materials, have you been found any of these activities challenging?

a) Determining what methodology was used for an estimate
b) Finding the origin of an emission factor or activity data
c) Identifying equations used to develop an estimate
d) All of the above

Respond using Mentimeter link in the chat!

Overview

Introduction to Methods and Data Documentation

What to Document

Review of the Template

Why document methods and data?

Good documentation of methods and data helps to:

- Instill transparency in the inventory; the critical T in the ETF (Enhanced Transparency Framework)
- Train new team members
- Improve reproducibility for yourself and inquiries (e.g. government, expert, peer reviews, or public inquiry)
- Serve as starting point for future inventories
- Satisfy documentation requirements in IPCC Guidelines

MDD continues to be an important part of Inventory Guidelines

From Volume 1, Chapter 1. Introduction of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

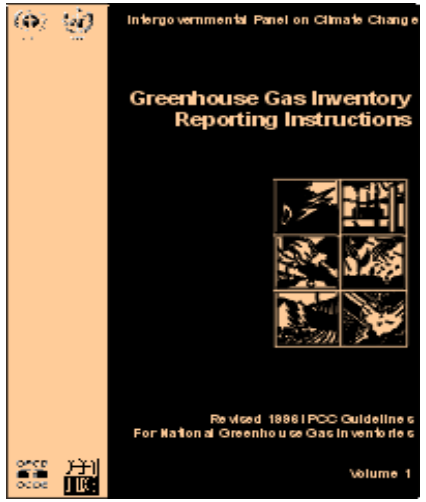
1.4 INVENTORY QUALITY

These *guidelines* provide guidance on ensuring quality on all steps of the inventory compilation – from data collection to reporting. They also provide tools to focus resources on the areas where they will most benefit the overall inventory and encourage continuous improvement. Experience has demonstrated that using a *good practice* approach is a pragmatic means of building inventories that are consistent, comparable, complete, accurate and transparent – and maintaining them in a manner that improves inventory quality over time. Indicators of inventory quality are:

Transparency: There is sufficient and clear documentation such that individuals or groups other than the inventory compilers can understand how the inventory was compiled and can assure themselves it meets the *good practice* requirements for national greenhouse gas emissions inventories. Documentation and reporting guidance is provided in Chapter 8, Reporting Guidance and Tables, of Volume 1 and in the respective chapters of Volume 2-6 (see also Volume 1, Chapter 6, QA/QC and Verification).

Documentation of National GHG Inventories reported under Current MRV System

Revised 1996 Guidelines



STEP 4 DOCUMENTATION

Prepare text to accompany the inventory which should:

- describe any differences from IPCC source/sink category structure;
- describe any differences from IPCC default methods for the estimation of greenhouse gases and precursors;
- clearly describe the estimation methods, as well as major assumptions that may not have been captured in the worksheets , for all greenhouse gases contained in the inventory;
- provide complete references to all data sources used to construct the inventory;
- highlight any new or interesting data sources, references or research findings used to construct the inventory;
- describe any significant changes in emission factors and other assumptions from those used in previous inventories that have been submitted.

You are also invited to report any difficulties you faced in developing and reporting the inventory (e.g. lack of data, lack of resources etc.).

Documentation of National GHG Inventories reported under Current MRV System

IPCC Good Practice Guidance Chapter 3: Industrial Processes

3.1.1.2 Reporting and documentation

It is *good practice* to document and archive all information required to produce the national emissions inventory estimates as outlined in Chapter 8, Quality Assurance and Quality Control, Section 8.10.1, Internal Documentation and Archiving. Some examples of specific documentation and reporting relevant to this source category are provided below:

Tier 2 Method

For Tier 2, this includes the following data:

(i) Clinker production and CaO content of clinker;

(ii) Data on non-carbonate feeds to kiln;

(iii) Cement kiln dust losses (indicate if default values were used).

Tier 1 Method

For Tier 1, this includes the following data:

(i) Cement production by type;

(ii) Clinker import/exports;

(iii) Clinker/cement ratio by type of cement (indicate if default values were used);

(iv) CaO content of clinker (indicate if default values were used);

(v) Cement kiln dust losses (indicate if default values were used).

Documentation of National GHG Inventory Estimates in current MRV System and Future ETF

2006 IPCC Guidelines for
National Greenhouse Gas Inventories
Volume 3
Industrial Processes
and Product Use

2.2.3.2 REPORTING AND DOCUMENTATION

It is *good practice* to document and archive all information required to produce the national emissions inventory estimates. Specific documentation and reporting relevant to this source category follow.

TIER 1 METHOD

In addition to cement production data, the quantity of clinker imports and exports also should be reported. Any information regarding the CaO content of clinker should be documented, including use of default values different from those discussed in section 2.2.1.2.

TIER 2 METHOD

Tier 2 documentation should include a description of how clinker production was estimated by the reporting entity (i.e., directly weighed, weight determined by volume of clinker pile, calculated from raw material inputs, etc.) and at what level the activity data were collected (i.e., plant level or national level). The method (e.g., country specific or IPCC default) for determining the CaO content of clinker should be documented along with any plant-specific information regarding the quantity and type of non-carbonate feeds to the kiln, such as slags or fly ash. All procedures used to quantify and determine the degree of calcination of CKD should be documented. Where the assumption that emissions of CKD are equal to 2 percent of emissions from clinker production is made, this should be transparently reported.

TIER 3 METHOD

When documenting the Tier 3 method it is important to document all the procedures undertaken and methodologies used to identify the weight fraction and identities of all carbonates, including carbonates incorporated in any clay, shales, sandstone or other supplementary raw materials, consumed as raw materials, along with the corresponding emission factors.

Estimating total emissions from carbonate inputs can overestimate emissions if the carbonates are not fully calcined. Any corrections should be documented. This includes documenting the fraction calcination of the raw materials and the quantity and fraction calcination of the CKD.

It is likely that plants will find it impractical to undertake chemical analyses of all raw material inputs on a daily basis for the purpose of CO_2 calculations. Instead, a full investigation will take place at each facility on a number of occasions throughout the year to fully characterise the carbonate inputs. Facilities will likely develop a relationship between carbonate input and clinker production that will be applied to the plant's routine calculation of clinker output for intervening periods. In addition to identifying all procedures used to calculate emissions from the carbonate inputs, all steps necessary to identify the relationship between carbonate input and clinker production should be documented.

All underlying information should be documented and reported, it is not considered *good practice* to report just final emissions estimates.

Documentation of National GHG Inventory Estimates in current MRV System and Future ETF

2006 IPCC Guidelines for
National Greenhouse Gas Inventories
Volume 1
General Guidance
and Reporting

8.2.7 Time series

It is *good practice* to complete all the reporting tables (summary, sectoral, cross-sectoral) for each year in which an inventory is available.

8.4 OTHER REPORTING

In addition to reporting tables listed in Section 8.3, it is *good practice* to report tabular information on recalculations (see Table 5.2 in Chapter 5, Time Series Consistency, of this Volume).

Additional documentation is needed to ensure the transparency of inventories as part of an inventory report document. An inventory report should clearly explain the assumptions and methodologies used to facilitate replication and assessment of the inventory by users and third parties. Transparency can be ensured through following the guidance on documentation of each category described in the sectoral Volumes 2-5, and for Tier 1 methods by completing the worksheets. Countries using higher tier methods should provide additional documentation in addition to, or instead of the worksheets. Such explanatory information should include cross-references to the tables.

The documentation should include a description of the basis for methodological choice, emission factors, activity data and other estimation parameters, including appropriate references and documentation of expert judgements. The inventory report should also include information on the implementation of a QA/QC plan, verification, splicing of methodologies, recalculations and uncertainty assessment as well as other qualitative information relative to data collection, uncertainty, identification of *key categories* and recalculation mentioned in the correspondent documentation section of the sectoral volumes.

What Should Be Documented?

Method Choice
Equation, reference, justification for selecting method

Activity Data
Type of activity data, values, units, year (s) of data, references, QA/QC procedures performed on data

Emission Factors
Sources/references, values, reasoning for emission factor choice, spreadsheets, models, justification for factor

Uncertainty*
Category, relative lower and upper bound, and lower and upper emission estimate

Document All Methods and Data by Inventory Year for Easy Retrieval and Use

* EPA is considering developing additional resources on uncertainty. Please send any suggestions or feedback: ghgi.transparency@epa.gov.

Methods and Data Documentation in the National Inventory Compilation Cycle

- Save all compilation files and references to create an inventory archive
- Backup the archive

- Inventory inception meeting
- Start with previous inventory, if available
- Review and implement improvement plan
- Identify Activity Data and choose methodologies

- Finalize inventory
- Develop improvement plan
- Publish/submit inventory for UNFCCC reporting on time

- Collect Activity Data, Emission Factors
- QC all data

- Conduct & document QA/QC procedures, such as basic peer review
- Revise estimates, based on QA/QC findings

- Estimate emissions & removals
- Implement QC procedures
- Revise estimates, based on QA/QC findings
- Conduct uncertainty & key category analyses

- Document methodological approaches and references
- Write inventory report

Why document methods and data?

Good documentation of methods and data helps to:

- Instill transparency in the inventory; the critical T in the ETF (Enhanced Transparency Framework)
- Train new team members
- Improve reproducibility for yourself and inquiries (e.g. government, expert, peer reviews, or public inquiry)
- Serve as starting point for future inventories
- Satisfy documentation requirements in IPCC Guidelines

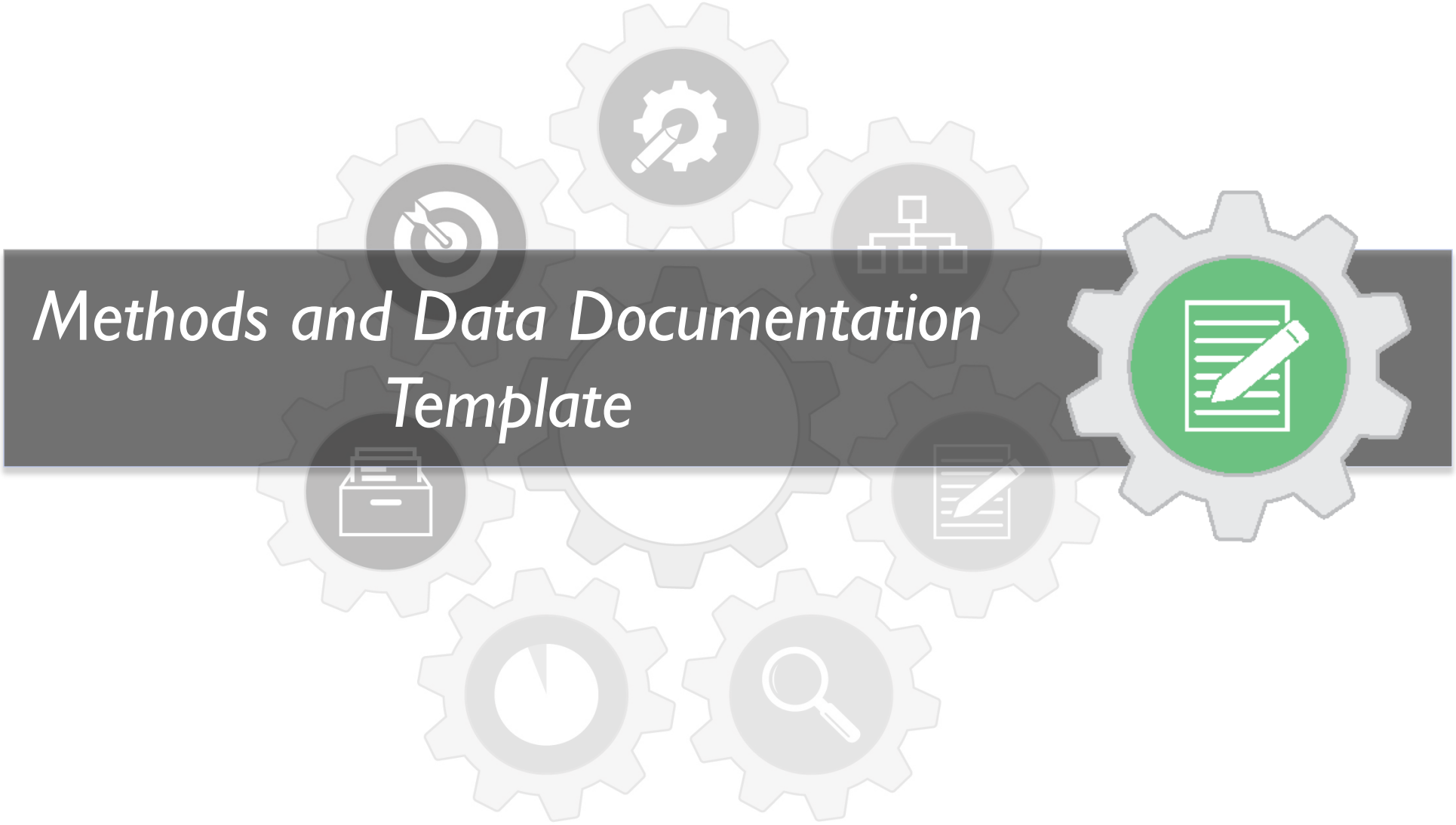
Poll Question #2

How would you describe the current state of documentation of methods and data for your sector or inventory?

a) Well-documented across all sectors
b) Documentation is partially complete
c) Minimal documentation
d) I don't know.

Respond using Mentimeter link in the chat!

Methods and Data Documentation Template



How This Template Will Help!

The Methods and Data Documentation Template will help the inventory team:

- Document general information about each source/sink
- Identify method choice and provide descriptions
- Document activity data
- Document emission factors
- Identify potential improvements

Step 1: Provide Category Information

Category 1: [Insert category sector, code, and name, e.g., "Energy: 1A3Bi Cars"]

Table 3-1. General information

Key category in the previous GHG inventory: *Record Yes or No*			
Greenhouse gases and tiers, as reported in the previous inventory:			
Gases reported *Record the GHG emitted/removed.* *Example: CO_2, CH_4, or N_2O*	*Key category* *Record Yes if the GHG named at left was a key category. Otherwise, record No.*	*Activity data Tier* *Record the tier level used for activity data.* *Example: Tier 1, 2, or 3*	*Emission factor Tier* *Record the tier level relating to the emission factor.* *Example: Country-specific, or default factor*
Category description/definition: *Record the (sub)category description in line with the 2006 IPCC Guidelines and a clear reference to the section or table in the 2006 IPCC Guidelines.* *Example: Emissions from automobiles so designated in the vehicle registering country primarily for transport of persons and normally having a capacity of 12 persons or fewer. (Source: Volume 2, Energy, Mobile Combustion, Table 3.1.1 https://www.ipcc-nggip.iges.or.jp/public/2006Guidelines/pdf/2_Volume2/V2_3_Ch3_Mobile_Combustion.pdf)*			

Who completes this table: Sector/Category Leads for each sector

Example of Table 3-1

Energy: Fossil Fuel Combustion (CRF Source Category 1A)

Table 3-1: Category Information

Key category in the previous GHG inventory:	Yes		
Greenhouse gases and tiers, as reported in the previous inventory:			
Gases reported	*Key category*	*Activity data Tier*	*Emission factor Tier*
CO_2	Yes	Tier 3	Country-specific
CH_4	…	…	…
N_2O	…	…	…
Category description/definition: Emissions from stationary combustion are specified for a number of societal and economic activities, defined within the IPCC sector 1A, Fuel Combustion Activities. Emissions from the combustion of fossil fuels for energy include the gases CO_2, CH_4 and N_2O and comprise the vast majority of energy-related emissions, with CO_2 being the primary gas emitted in the United States..			
Relevant national circumstances: The direct combustion of fuels by stationary sources in the electricity generation, industrial, commercial, and residential sectors represent the greatest share of U.S. greenhouse gas emissions. 2010 emissions from stationary combustion was 28.9 Tg CO2 Eq, an increase of 9.2 Tg CO2 Eq (46.9 percent) from 1990. CH_4 and N_2O emissions from stationary combustion made up 4 percent of the U			

Who completes this table: Sector/Category Leads for each sector

Step 2: Describe Method Choice

Table 3-2. Methodology

Greenhouse gas: *Record the specific gas or gases to which the below methodology relates. Example: CH_4*	
Equation and parameters: *Present the equation for the estimation of emissions/removals under this category and describe variables and describe its key parameters. Where several equations apply or equations are complex, a reference to the source complemented by any relevant assumptions about its application will suffice. Example: First order decay model as in Equation 3.1 of Chapter 3 of Volume 5 (Waste) of the 2006 IPCC Guidelines using default activity data and default parameters. Assumptions: No CH_4 capture takes place.*	
Reference: *List the source of the equation, including full title, chapter, and page number/equation number. Example: Equation 3.1 of Chapter 3 of Volume 5 (Waste) of the 2006 IPCC Guidelines.[2]*	
How and why this method was chosen: *Describe why this methodology is most appropriate for your country and how it was chosen. Appropriateness should be based on the IPCC decision trees, including considerations like data availability and cost-effectiveness. Describe the institutions/departments involved in the choice. Example: There is very little information on historical waste disposal amounts and waste composition available, therefore, a Tier 1 approach was chosen, allowing the use of default factors.*	

Who completes this table: Sector/Category Leads for each sector

Example of Table 3-2

Table 3.2: Methodology for Stationary Combustion, Wood Consumption

Greenhouse gas: *Record the specific gas or gases to which the below methodology relates. Example: CH_4*	CH_4 and N_2O
Equation and parameters: CH_4 and N_2O emissions from stationary combustion were estimated by multiplying **wood consumption data** by **emission factors (**utilizing a Tier 1 methodology).	
Reference: For the CH_4 and N_2O estimates, wood consumption data for the United States was obtained from EIA's Annual Energy Review (EIA 2011a). Tier 1 default emission factors for these three end-use sectors were provided by the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC 2006).	
How and why this method was chosen: The tier 1 method was chosen due to lack of country-specific emission factors.	
Known limitations**:** Using a Tier 1 approach will not allow accurate estimation of CH_4 generation from historical or current combustion disposal.	

Who completes this table: Sector/Category Leads for each sector

Step 3: Document Activity Data

Table 3-3. Activity data general information, values, and QA/QC

Type of Activity data:	
Reporting unit: *This should be the unit in which the data are reported for estimating emissions/removals. Example: metric tons.*	
Appropriateness to national circumstances: *State how these specific activity data were chosen. Example: The National Cement Association compiles production data from all of its members.*	
Time series covered: *Record the years for which the activity data are available. Example: 2001-2013*	
Reference (if applicable): *If the activity data are from a publication, record the full reference. Example:* 2013. National Cement Association Annual Report	
Date of provision *Record the date of receipt of the activity data. Example: August 29, 2016*	
Source of data *Record the source of the activity data, e.g. the institution and department that provided it. Example: National Cement Association*	
Contact details *Record the name, email address, and phone number of the contact person at the entity which provided the data. If applicable, ensure that this information is recorded in Template 2. Institutional Arrangements, or that Template 2 refers to this template. Example: John Smith, john.smith@example.com, +12 3456 7890*	
Basis for data provision: *State the basis upon which data are provided, e.g., voluntary provision, legal requirement, data sharing agreement, or a memorandum of cooperation or understanding. (If you used the Confidential Business Information (CBI) Agreement or Memorandum of Cooperation (MoC) supporting templates from EPA's Toolkit for Building a National GHG Inventory System, cite the final MoC or CBI agreement developed from use of those or other templates here.) Example: Voluntary provision*	
Coverage:	

Who completes this table: Sector/Category Leads for each sector

Step 3: Document Activity Data (continued)

Table 3-3. Activity data general information, values, and QA/QC

State whether the activity data cover all emissions or removals in the category. Example: The national cement association claims to cover all clinker production at the national level.								
Adjustments applied to activity data: *Explain any adjustments applied to the original activity data received from the data source to make it usable for the calculation, e.g., unit conversion or gap-filling. Example: The data were provided in kg and recalculated to t.*								
Activity data values: *Extend or modify the years as necessary to cover your time series.*								
1990	1991	1992	1993	1994	1995	1996	1997	1998
1999	2000	2001	2002	2003	2004	2005	2006	2007
2008	2009	2010	2011	2012	2013	2014	2015	2016
2017	2018	2019	*[insert as needed]*					
The activity data values in the rows above are derived from the files listed here:				*List all files from which the activity data values above come, and indicate where these files are located, and whom to contact in order to access these files.*				
Quality control measures *Indicate in the following rows what quality control measures you have applied to the activity data indicated above. Add additional rows if you need to describe additional QC activities. Before adding any additional quality control measures, refer to Template 4. QA/QC. For suggestions about quality control activities, see chapter six of volume 1 of the 2006 IPCC Guidelines.[3] In case of data gaps or problems with time series consistency, refer to chapter five of volume 1 of the 2006 IPCC Guidelines.[4]*								
Comparison with trend: *Describe the results of the comparison of the new activity data with the previous trend, e.g. what developments were expected based on projecting the trend of past activity data values, what developments happen in the real activity data? Example: Trend indicated a further increase by 3%. Real development is an increase by 5%.*								
Comparison with other datasets (e.g., IEA or FAO) *Compare both level and trend of your activity data with the data in other datasets. Describe the result of the comparison, e.g. to which extent your data deviates from the level and trend of the other dataset. Example: Good alignment of trend with the International Energy Agency (IEA) or Food and Agriculture Organization of the United Nations (FAO) database(s)*								
Are all data entered correctly into models, spreadsheets, etc.? *Record Yes or No. If No, describe the corrective actions taken. Example: No, 2013 value contained typo. Corrected.*								

Who completes this table: Sector/Category Leads for each sector

Step 4: Document Emission Factors

Table 3-4. Emission factors/carbon stock change factors (EF/SCF) general information, values, and QA/QC

Type of EF/SCF: *Record a descriptive title for the EF/SCF.*	
Reporting unit: *This should be the unit in which the EF/SCF is reported for estimating emissions/removals.*	
Appropriateness to national circumstances: *State how this specific EF/SCF was chosen.*	
Time series covered: *Record the years for which the EF/SCF is available.*	
Reference (if applicable): *If the EF/SCF is from a publication, record the full reference.*	
Date of provision: *Record the date of receipt of the EF/SCF.*	
Source of EF/SCF: *Record the source of the EF/SCF, e.g., the institution and department that provided it.*	
Contact details: *Record the name, email address, and phone number of the contact person at the entity which provided the EF/SCF.*	

Who completes this table: Sector/Category Leads for each sector

Step 4: Document Emission Factors (continued)

Table 3-4. Emission factors/carbon stock change factors (EF/SCF) general information, values, and QA/QC

EF/SCF values: *Extend or modify the years as necessary to cover your time series.*								
1990	1991	1992	1993	1994	1995	1996	1997	1998
1999	2000	2001	2002	2003	2004	2005	2006	2007
2008	2009	2010	2011	2012	2013	2014	2015	2016
2017	2018	2019	[insert as needed]					
The EF/SCF values in the rows above are derived from the files listed here:				*List all files from which the EF/SCF values above come, and indicate where these files are located, and whom to contact in order to access these files.*				
Quality control measures *Indicate in the following rows what quality control measures you have applied to the EF/SCF values indicated above. Add additional rows if you need to describe additional QC activities. For suggestions about quality control activities, see chapter six of volume 1 of the 2006 IPCC Guidelines.[5] Before adding any additional quality control measures, refer to Template 4. QA/QC. In case of data gaps or problems with time series consistency, refer to chapter five of volume 1 of the 2006 IPCC Guidelines.[6]*								
Comparison to IPCC default factor: *If not using an IPCC default factor, compare the EF/SCF to the 2006 IPCC Guidelines default factor, and explain any differences.*								

Who completes this table: Sector/Category Leads for each sector

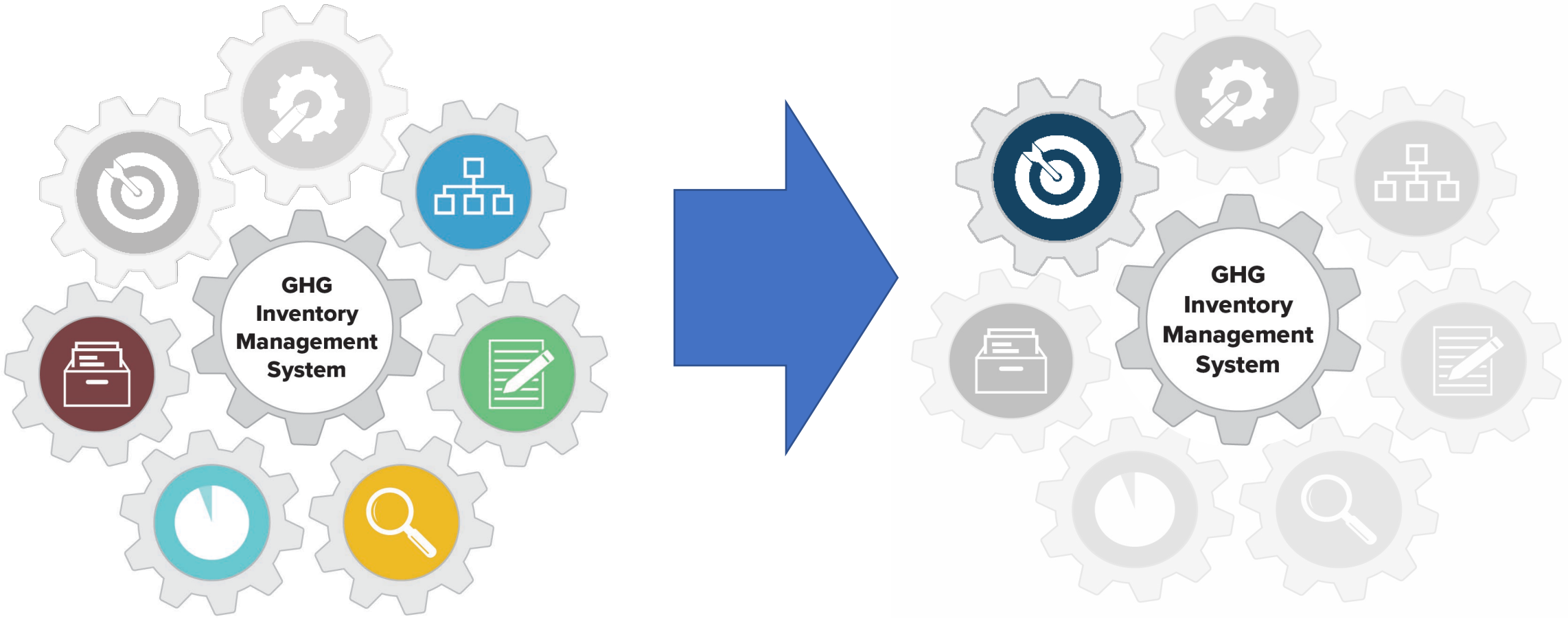
Step 5: Identify Potential Methods and Data Improvements

Table 3-5. Improvement options related to methodologies and data

Improvement No.	Category sector *Example: Energy, AFOLU, IPPU, or Waste*	Category code and name *Example: 1A3Bi Cars*	Key category in the previous GHG inventory: *Record Yes or No*	Relevant GHG inventory principle *Example: Transparency, Accuracy, Completeness, Consistency, or Comparability*	Potential Improvement *Record in detail what the improvement entails, i.e. what will be changed and what impact this will have. Example: Replace proxy activity data (projected clinker production) with actual time series activity data collected from a recently completed industrial sector survey covering years 2012-2018.*
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

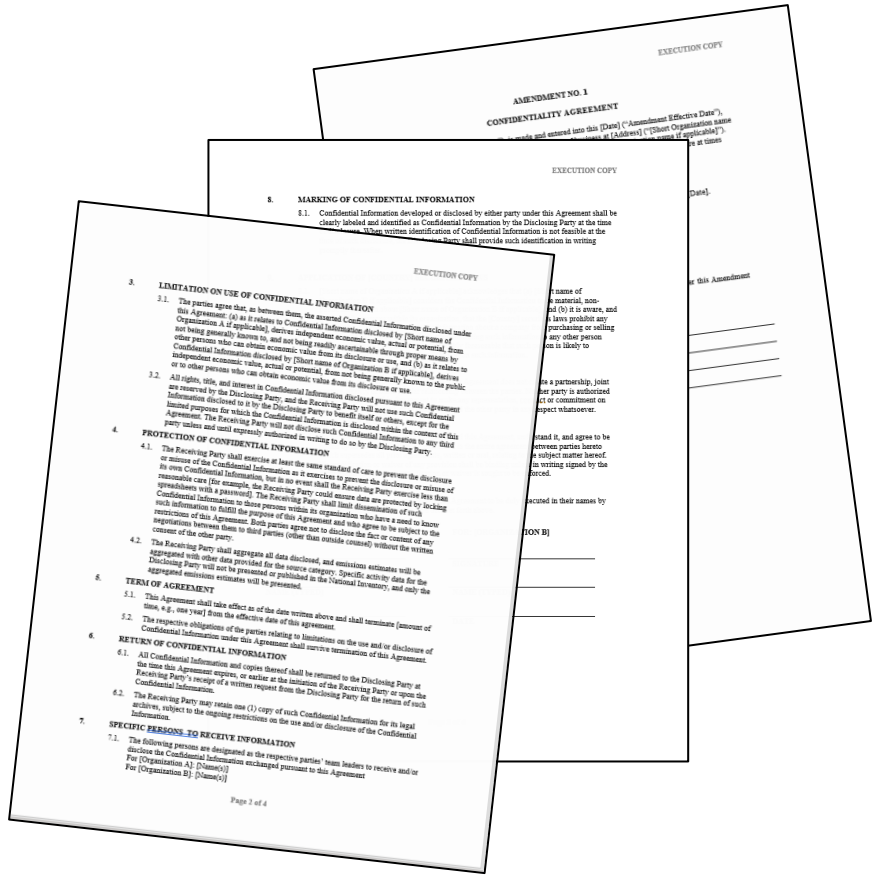
Who completes this table: Sector/Category Leads – category lead identifies category specific improvements, sector lead consolidates across the sector

Improvements Tie Into National Inventory Improvement Plan Template (template 7)



Supporting Template: Confidentiality Agreement and Amendment Template

- A confidentiality agreement or contract can be useful when working with a data provider that is supplying confidential information for the inventory.
- Customize the template to the specific agreement you would like to develop and to allow for your country-specific circumstances related to the use of confidential business information.



FAO GHG Data Management Tool (GHG-DM Tool)

Excel spreadsheets containing a comprehensive list of activity data (AD) and parameters needed to complete Tier 1 (and some Tier 2) estimations of all categories within AFOLU, Energy, IPPU, and Waste.

- Helps GHG inventory compilers manage AD and parameters, and communicate data needs with data providers

File Home Insert Draw Page Layout Formulas Data Review View Help

B2 | Table to collect information on Activity data needed for AFOLU GHG emissions estimates

Table to collect information on Activity data needed for AFOLU GHG emissions estimates
3A - Livestock
Tier 1

Legend:
Cells to be filled in by data providers/receivers

Category	Category code	Activity data	Unit	Note/Definition	Period	Date of provision	Source of data	Contact details	Basis for data provision	Comment
Name of the category as indicated in the 2006 IPCC Guidelines	*Code of the category as indicated in the 2006 IPCC Guidelines*	*Data on the magnitude of a human activity resulting in emissions or removals taking place during a given period of time*	*Unit in which the data are reported for estimating emissions/removals.*	*Any additional information and definition that would help data provider to deliver the correct data*	*Use the usual convention to define an interval 1990-1995; and separated with comma the single years 1998, 2000.*	*Record the date of receipt of the activity data (DD/MM/YYYY). Example: 29/08/2019.*	*Record the source of the activity data, e.g. the institution and department that provided it. Example: National Statistics Office.*	*Record the name, email address, and phone number of the contact person at the entity which provided the data.*	*State the basis upon which data are provided, e.g., voluntary provision, legal requirement, data sharing agreement, or a memorandum of cooperation or understanding.*	*Describe the activity data provided.*
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1ai and 3A2ai	Dairy cows - annual average population	Head							
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1aii and 3A2aii	Other cattle - annual average population	Head							
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1b and 3A2b	Buffalo - annual average population	Head							
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1c and 3A2c	Sheep - annual average population	Head							
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1d and 3A2d	Goats - annual average population	Head							
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1e and 3A2e	Camels - annual average population	Head							
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1f and 3A2f	Horses - annual average population	Head							
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1g and 3A2g	Mules and Asses- annual average population	Head							
Enteric Fermentation (CH4) and Manure Management (CH4 and N2O)	3A1h and 3A2h	Swine - annual average population	Head	Further disaggregation is desirable in Market Swine and Breeding Swine. For livestock categories that live less than 1 year (e.g., piglets and some market swine), information could be reported on total animal slaughtered per year. In that case, annual average population could be estimated as number of						

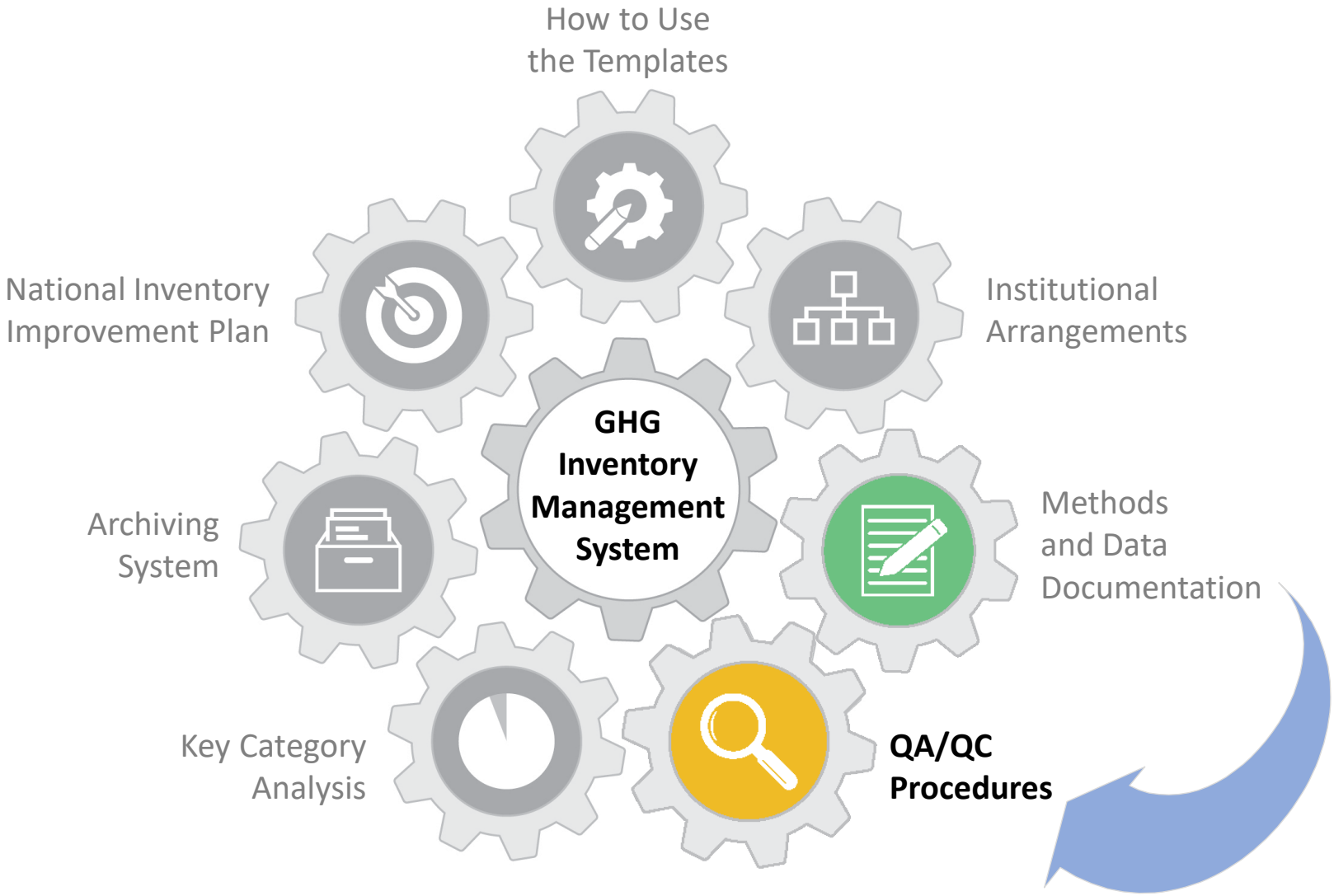
ABOUT | 3A Livestock - Tier 1 | 3A Livestock - Tier 2 | 3B Land, 3D1 HWP - Tier 1 | 3C Aggregat ...

https://www.fao.org/climate-change/our-work/what-we-do/transparency/tools-resource/en/
Questions? Contact ETF@fao.org

Action Plan from Methods and Data Documentation

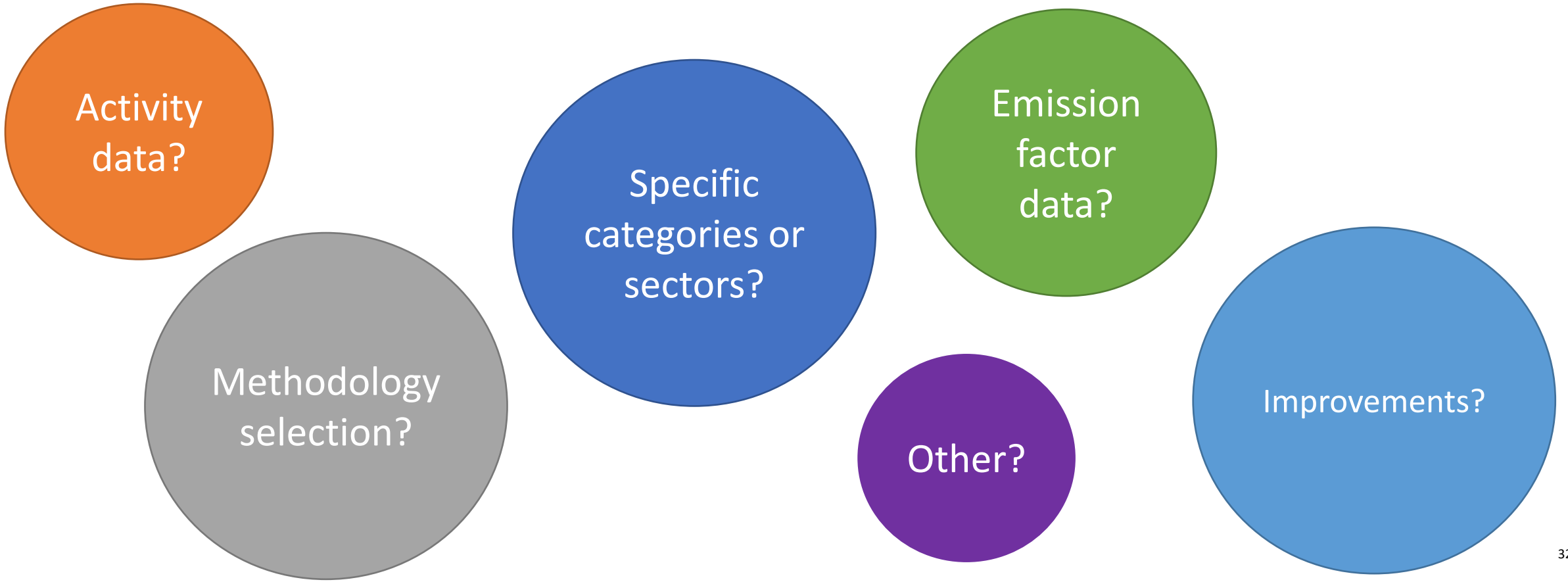
1. Gather general information about the categories in your sector.
2. As you identify the method choice for each category, document it.
3. As you collect activity data and emission factors, methodically document information about that data.
   - Document QC measures as you review the data.
4. Identify potential improvements to methodologies and data.

Next template…



Discussion Question

What would you like to document better in the inventory or your particular sector? What do you think will be more difficult? Easier?



Thank You For Your Attention!

Amanda Chiu

ghgi.transparency@epa.gov

Toolkit for Building National GHG Inventory Systems

https://www.epa.gov/ghgemissions/toolkit-building-national-ghg-inventory-systems