Training Workshop: Preparation and Reporting of Results of National GHG Inventories under the ETF of the Paris Agreement

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Topic: Management of QA/QC and documentation material

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What do we want?

Overall: A high-quality inventory of anthropogenic emissions and removals of greenhouse gases that is credible & convincing

IPCC Indicators of quality based on TACCC principles:

- Transparency
- Accuracy
- Completeness
- Consistency
- Comparability

What do we need?

1. A good QA/QC system
2. Tools to focus resources on where we get the maximum benefit
   - ➢ Key Category Analysis
   - ➢ Uncertainty Management
3. An inventory plan covering QA/QC, timing, deliverables and stakeholder involvement
   Consistent management to achieve this

What is “QA/QC”?

QA/QC = Quality Assurance and Quality Control

Generally, in the context of ISO, Manufacturing, Service industries, Mechanism contributes/ensures **CONTINUOUS IMPROVEMENT**

In the context of GHG Inventory

- MPG (18/CMA.1)
- The IPCC guidelines for GHG inventories

"QA/QC" in MPG (5/CMA.1)

- Chapter II. National inventory report of anthropogenic emissions by sources and removals by sinks of GHGs: B. National circumstances and institutional arrangements

Paragraph: 19. Each Party shall report on the following functions related to inventory planning, preparation and management:
(a) Its national entity or national focal point with overall responsibility for the national inventory;
(b) Its inventory preparation process, including division of specific responsibilities of institutions participating in the inventory preparation to ensure that sufficient activity data collection, choice and development of methods, emission factors and other parameters are in accordance with the IPCC guidelines referred to in paragraph 20 below and these MPGs;
(c) Its archiving of all information for the reported time series, including all disaggregated emission factors and activity data, all documentation about generating and aggregating data, including quality assurance/quality control (QA/QC), review results and planned inventory improvements;
(d) Its processes for the official consideration and approval of the inventory.

E. Reporting guidance

1. Information on methods and cross-cutting elements

Paragraph 46. Each Party shall report the QA/QC plan and information on QA/QC procedures already implemented or to be implemented in the future, in accordance with paragraphs 34–36 above.

Report
- QA/QC plan
- QA/QC implementation

"QA/QC" in MPG (5/CMA.1)

Chapter II. National inventory report of anthropogenic emissions by sources and removals by sinks of GHGs
C. Methods
6. Quality assurance/quality control

QA/QC plan

§34. Each Party shall elaborate an inventory QA/QC plan in accordance with the IPCC guidelines referred to in paragraph 20 above, including information on the inventory agency responsible for implementing QA/QC; those developing country Parties that need flexibility in the light of their capacities with respect to this provision are instead encouraged to elaborate an inventory QA/QC plan in accordance with the IPCC guidelines referred to in paragraph 20 above, including information on the inventory agency responsible for implementing QA/QC.

- General / Category-Specific QC procedures
- QA Peer Review

§35. Each Party shall implement and provide information on general inventory QC procedures in accordance with its QA/QC plan and the IPCC guidelines referred to in paragraph 20 above; those developing country Parties that need flexibility in the light of their capacities with respect to this provision are instead encouraged to implement and provide information on general inventory QC procedures in accordance with its QA/QC plan and the IPCC guidelines referred to in paragraph 20 above. In addition, Parties should apply category-specific QC procedures in accordance with the IPCC guidelines referred to in paragraph 20 above for key categories and for those individual categories in which significant methodological changes and/or data revisions have occurred. In addition, Parties should implement QA procedures by conducting a basic expert peer review of their inventories in accordance with the IPCC guidelines referred to in paragraph 20 above.

Reference Approach

§36. Each Party should compare the national estimates of CO_2 emissions from fuel combustion with those obtained using the reference approach, as contained in the IPCC guidelines referred to in paragraph 20 above, and report the results of this comparison in its national inventory report.

"QA/QC" in the 2006 IPCC guidelines

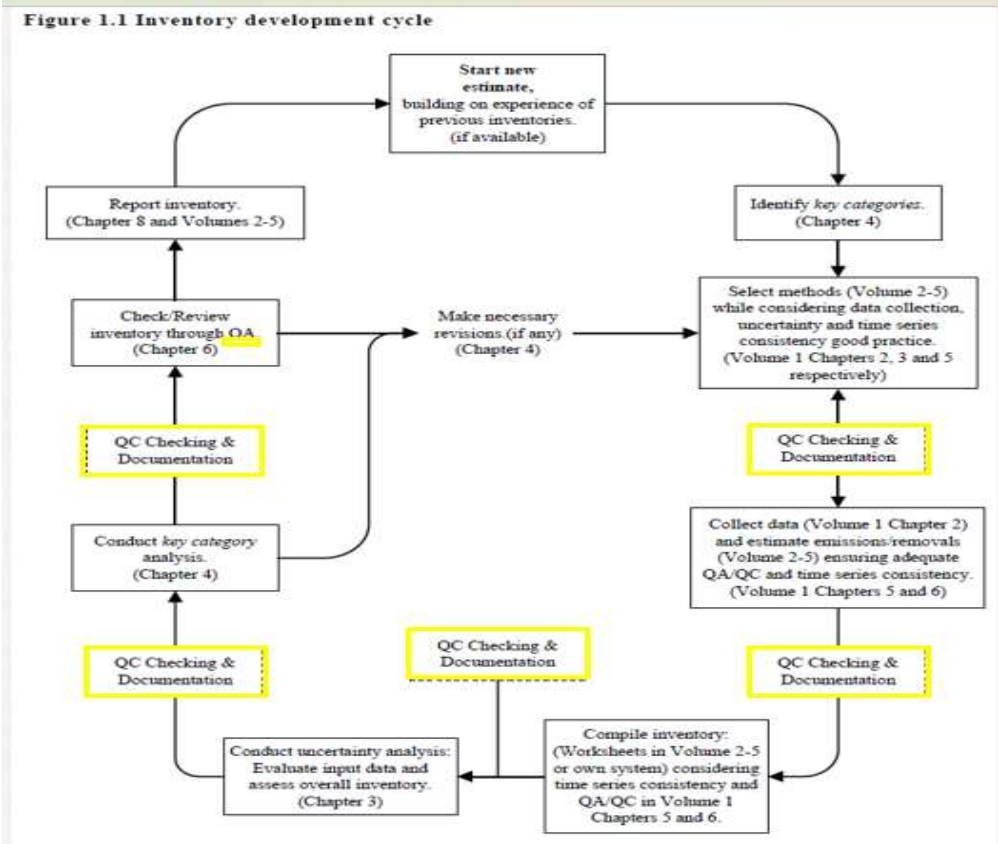
Documentation is important

Why "QA/QC"?

The periodic review and revision of the QA/QC plan is an important element to drive the continued inventory improvement.
(6.5 QA/QC PLAN)

To enable continuous improvement to inventory estimates
(6.11.1 Internal documentation and archiving)

Part of Inventory development plan
(1.5 Compiling An Inventory)



What is "QC"?

- System of routine technical activities to assess and maintain the quality of the inventory as it is being compiled
- Performed by personnel compiling the inventory
- QC system is designed to:
  - Provide routine and consistent checks to ensure data integrity, correctness, and completeness
  - Identify and address errors and omissions
  - Document and archive inventory material and record all QC activities

What is "QA"?

Planned system of review procedures conducted by personnel not directly involved in the inventory compilation/development process (preferably by independent third parties)

Performed upon a completed inventory following the implementation of QC procedures

- Verify that measurable objectives were met
- Ensure that the inventory represents the best possible estimates given the current state of scientific knowledge and data availability
- Support the effectiveness of the QC programme

In summary what are the differences between “QA” and “QC”?

6.6 GENERAL QC PROCEDURES

General QC procedures include generic quality checks related to calculations, data processing, completeness, and documentation that are applicable to all inventory source and sink categories. Table 6.1, General inventory level QC procedures, lists the general QC checks that the inventory compiler should use routinely throughout the preparation of the inventory. …

6.8 QA PROCEDURES

Quality assurance comprises activities outside the actual inventory compilation. *Good practice* for QA procedures includes reviews and audits to assess the quality of the inventory, to determine the conformity of the procedures taken and to identify areas where improvements could be made. QA procedures may be taken at different levels (internal/external), and they are used in addition to the general and category-specific QC procedures described in Section 6.7.

- EXPERT PEER REVIEW
- AUDITS

TABLE 6.1
GENERAL INVENTORY QC PROCEDURES

QC Activity	Procedures
Check that assumptions and criteria for the selection of activity data, emission factors, and other estimation parameters are documented.	• Cross-check descriptions of activity data, emission factors and other estimation parameters with information on categories and ensure that these are properly recorded and archived.
Check for transcription errors in data input and references.	• Confirm that bibliographical data references are properly cited in the internal documentation. • Cross-check a sample of input data from each category (either measurements or parameters used in calculations) for transcription errors.
Check that emissions and removals are calculated correctly.	• Reproduce a set of emissions and removals calculations. • Use a simple approximation method that gives similar results to the original and more complex calculation to ensure that there is no data input error or calculation error.
Check that parameters and units are correctly recorded and that appropriate conversion factors are used.	• Check that units are properly labelled in calculation sheets. • Check that units are correctly carried through from beginning to end of calculations. • Check that conversion factors are correct. • Check that temporal and spatial adjustment factors are used correctly.
Check the integrity of database files.	• Examine the included intrinsic documentation (see also Box 6.4) to: - confirm that the appropriate data processing steps are correctly represented in the database. - confirm that data relationships are correctly represented in the database. - ensure that data fields are properly labelled and have the correct

What is “QA/QC plan”?

- The plan should, in general, **outline the QA/QC and verification activities** that will be implemented and the institutional arrangements and responsibilities for implementing those activities.
- The plan should include **a scheduled time frame for the QA/QC activities** that follows inventory preparation from its initial development through to final reporting in any year.
- The QA/QC plan is **an internal document to organize and implement QA/QC** and verification activities that ensure the inventory is fit for purpose and allow for improvement.
- Once developed, it **can be referenced and used in subsequent inventory preparation,** or modified as appropriate (notably, when changes in processes occur or on advice of independent reviewers).
- As part of the QA/QC plan, it is *good practice* to accommodate **procedural changes and a feedback of experience**. Conclusions from **previous reviews** need to be used to improve the procedures.
- The **periodic review and revision of the QA/QC plan** is an important element to drive the continued inventory improvement.

Summary of “QA/QC”

QA/QC is for continuous improvements

Under MPG, the following elements are required for reporting

- QA/QC plan
- QC procedures, etc.
- Reference Approach

Practically QA/QC is useful for inventory compilers

Documentation/Record of QA/QC are important and will help you in the continuous improvements and Technical Expert Review

The 2006 IPCC GL provides;

- Explanations on QA/QC
- Examples of general/category-specific QC procedures
- Good Practice helps to produce quality inventories.
- Keep in mind the indicators of quality “TACCC”.
- QA/QC and verification activities should be integral parts of the inventory process.

CBIT-GSP
CLIMATE TRANSPARENCY

Partnership on Transparency
in the Paris Agreement

Thank you for your attention!

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