Netherlands Enterprise Agency

The Netherlands NationalArrangements: QA/QC programme

Commissioned by the ministry of Economic Affairs and Climate Policy

>> Sustainable. Agricultural. Innovative. International.

The Netherlands National Arrangements: QA/QC programme

Version: 1.0

Date: 14/11/2023

Netherlands Enterprise Agency (RVO)

in cooperation with PRTR

Abbreviations and acronyms

CBS	Statistics Netherlands
CRF	Common Reporting Format
CRT	Common Reporting Tables
ETF	Enhanced transparency framework under the Paris Agreement
EZK	Ministry of Economic Affairs and Climate Policy
ER	Emissie Registratie *(English: PRTR)*
EU	European Union
GHG	Green House Gases
GR	Governance Regulation (Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action)
IenW	Ministry of Infrastructure and Water Management
IPCC	International Panel on Climate Change
LNV	Ministry of Agriculture, Nature and Food Quality
NIE	National Inventory Entity, the Single National Entity for the Netherlands
NIR	National Inventory Report
PRTR	Pollutant Release and Transfer Register *(Dutch: Emissieregistratie (ER))*
RIVM	National Institute for Public Health and the Environment (*Dutch*: *Rijksinstituut voor Volksgezondheid en Milieu*)
RVO	Netherlands Enterprise Agency *(Dutch: Rijksdienst voor Ondernemend Nederland*); Government agency, that is a.o. assigned as Single National Entity (NIE) from 1 January 2014 onwards; previously named: NL Agency
QA	Quality Assurance
QC	Quality Control
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change

Contents

1 INTRODUCTION AND SCOPE

General

Under the United Nations Framework Convention on Climate Change (UNFCCC), Annex 1 Parties have to report annually an inventory of greenhouse gas emissions and sinks. Since 2015 Annex 1 Parties under the Convention need to have in place and maintain a national inventory arrangement.[1] Under the Paris Agreement all parties are obliged to have a national arrangement for reporting. Additionally, under EU regulation Member States have to operate, and seek to continuously improve, a national inventory system in accordance with UNFCCC requirements on national systems. This obligation is included in the Governance Regulation (GR) and elaborated in implementing acts. An important obligation is the elaboration and implementation of a quality assurance and quality control (QA/QC) plan, in line with the 2006 IPCC reporting guidelines.

This document outlines the QA/QC programme for the Netherlands inventory and national system, including:

- The quality objectives established (chapter 2)
- The organisation and elements of the QA/QC system (chapter 3)
- The QA/QC plan (chapter 4).

The QA/QC programme is based on previous experiences with the inventory process, including relevant information and results from internal and external evaluation and review processes such as the UNFCCC reviews. As detailed below, more information on the recent experiences from reviews and improvement actions is provided in other documents (for instance in the annual internal memo 'Main QA/QC experiences inventory [year]' by RVO).

Revised structure

Previously, this programme covered a fixed period of about one year and the entire document was updated on a yearly basis. From 2023 onwards, a slightly revised structure is incorporated (as agreed by the Advisory Board NIE). As the core aspects of the QA/QC programme are cyclical, the programme is described with a more indefinite time frame to enable a broader time-horizon. Outcomes of specific QA/QC activities continue to be reported in the relevant sections of the NIR. At the same time, the yearly experiences from reviews and improvement actions will still be captured at

[1] Similar to the earlier requirement under the Kyoto Protocol to have in place a National System for the estimation of greenhouse gas emissions and sinks.

a more granular level in the annual internal memo [2] 'Main QA/QC experiences inventory' (RVO) shared with the Advisory Board. This internal document should describe in a concise manner towards the Advisory Board the key actions taken that year and reflection on the implementation thereof, as well as incorporate learnings from (bi)yearly reviews and evaluations. Any practical considerations therein will subsequently feed into finetuning of the overall QA/QC programme. As such, the programme will continue to be reviewed as part of the evaluation and improvement cycle and is to be updated as appropriate in line with relevant reporting guidelines from the EU and UNFCCC.

Quality

The concept of quality in this context requires a proper understanding of the intended use of the inventories. The inventory system should not only produce good and reliable figures, it should also demonstrate to the intended users (notably UNFCCC) that these are of high quality, suitable as a basis for accounting and elaborated as required in the applicable guidelines. This QA/QC programme focuses on the ability to meet these requirements and to enable continuous improvement. Through an annual evaluation and improvement cycle, it will be assessed whether the quality objectives and requirements are met and where improvements may be realised. An important input will be the feedback from 'users', including the results from reviews.

Definitions used in this document are those defined under UNFCCC, IPCC and EU. The international requirements with regard to QA/QC are further elaborated in e.g. the IPCC Guidelines[3] (IPCC, 2006 & 2019), the requirements for National Arrangements and the guidelines under the EU Governance Regulation.

[2] The annual document 'Main QA/QC experiences inventory [year]' (RVO) can be made available to reviewers upon request.

[3] 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme; & 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Published: IGES, Japan

2 OBJECTIVES AND GENERAL APPROACH

2.1 QA/QC OBJECTIVES

The IPCC requires that the QA/QC programme should support an inventory that can be readily assessed in terms of quality and completeness and contributes towards improving transparency, accuracy, consistency, comparability and completeness of the inventory. The IPCC Guidelines (2006) set out these indicators of inventory quality as follows:

- **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. …
- **Completeness**: Estimates are reported for all relevant categories of sources and sinks, and gases. Geographic areas within the scope of the national greenhouse gas inventory are recommended in these Guidelines. Where elements are missing their absence should be clearly documented together with a justification for exclusion …
- **Consistency**: Estimates for different inventory years, gases and categories are made in such a way that differences in the results between years and categories reflect real differences in emissions. Inventory annual trends, as far as possible, should be calculated using the same method and data sources in all years and should aim to reflect the real annual fluctuations in emissions or removals and not be subject to changes resulting from methodological differences. …
- **Comparability**: The national greenhouse gas inventory is reported in a way that allows it to be compared with national greenhouse gas inventories for other countries. This comparability should be reflected in appropriate choice of key categories … and in the use of the reporting guidance and tables and use of the classification and definition of categories of emissions and removals presented in [the IPCC Guidelines] …
- **Accuracy**: The national greenhouse gas inventory contains neither over- nor under-estimates so far as can be judged. This means making all endeavours to remove bias from the inventory estimates … (IPCC Guidelines, 2006, Volume 1 – section 1.4)

In addition to the above listed indicators from the IPCC guidelines, following the example of other Parties[4], a supplemental indicator of inventory quality termed '**Robustness'** is introduced. This concerns the resilience of inventory activities in the

[4] See for instance 'Quality manual for the Danish greenhouse gas inventory' (2020).

face of potential changes in personnel or the availability of data: “Robustness implies arrangement of inventory work as regards e.g. inventory experts and data sources in order to minimise the consequences of any unexpected disturbance due to external and internal conditions. A change in an external condition could be interruption of access to an external data source and an internal change could be a sudden reduction in qualified staff, where a skilled person suddenly leaves the inventory work” (Nielsen et al., 2020). A robust greenhouse gas inventory is prepared for, and able to adequately manage, such disruption without deterioration in quality. Robustness can for instance be considered in terms of adequacy of (financial/IT/human) resources, as well as the extent to which data processing is automated or reliant on manual actions from specific personnel.

The overall objective of this programme is that the annual inventories and National Arrangement are of sufficient quality for their intended uses and for meeting the requirements under UNFCCC, IPCC and EU. This objective is further elaborated below into more specific quality objectives related to the above-mentioned principles, as well as overall effectiveness and timeliness.

The following specific quality objectives are in place:

a) To annually (by March 15th) elaborate a national inventory that meets the requirements with regard to *transparency, accuracy, consistency, comparability,* and *completeness*

b) To annually update (by April, 15th), if appropriate, the description of the National System, the set of methodology reports and the set of descriptions of relevant procedures.

c) To ensure that *quality* of the inventory is sufficiently measured and controlled, during actual preparation of the inventory, by:

- implementing annually the agreed QC procedures as part of the inventory process
- document, annually by April 15th, the implemented QC activities, their results and any corrections applied
- assessing, annually by September 30th, the experiences with the QC procedures and, if needed, planning the required improvements

d) To assure that *quality* objectives are met and regularly evaluated by implementing QA procedures, as scheduled in this QA/QC programme, that comply with UNFCCC requirements and enable evaluation by not-directly involved staff

e) To improve *consistency* and *transparency* by updating and improving the (description of) uncertainty estimates and sector QC.

f) To improve *quality*, *effectiveness* and *robustness* of the National System by implementing the audits as scheduled in the programme and annually, by October 30th, evaluate the results.

g) To update and, if appropriate, improve the assessment of *accuracy*, by:

- yearly update of the information for Tier 1 uncertainty analyses in the NIR
- at intervals of about 5 years, unless required earlier[5], update the Tier 2 uncertainty analyses

h) To facilitate *continuous improvement* by implementing an annual evaluation and improvement cycle in accordance with the defined procedure

The objectives will be reviewed annually and updated, if appropriate.

2.2 GENERAL APPROACH

To ensure high quality and continuous improvement, the annual inventory process is implemented as a cyclical project (see also SenterNovem, 2005 and EZK, 2022). This cycle is a key quality management tool, based on the iterative Deming cycle of plan-do-check-act. Figure 1 illustrates the steps and the QA/QC tools used in each step, which are described in more detail below.

[5] E.g. if changes in sources do require an earlier assessment. This will be evaluated annually.

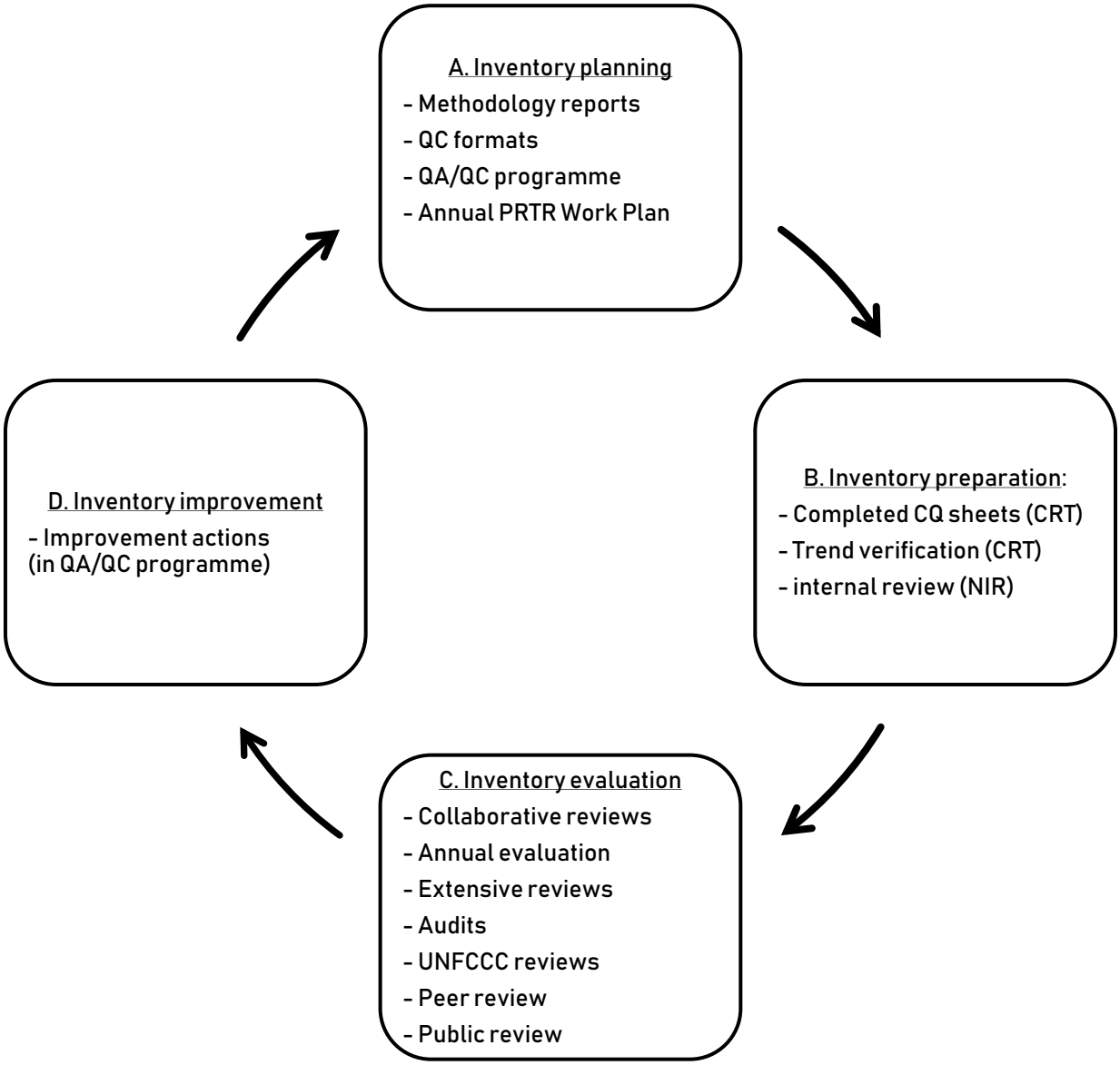

Figure 1: QA/QC management cycle.

Step A: Inventory planning – planning and selection of methods.

This step encompasses the annual planning (these activities usually take place in the second half of the year, in preparation for the submission in the following year). Relevant QA/QC tools include the set of planning documents, updated annually as part of the evaluation and improvement cycle:

- ***Methodology Reports***, describing methodologies and processes for estimating emissions and sinks. These methodology reports replaced the system of Monitoring Protocols that was used until 2014. The methodology reports are annually reviewed and approved by the National Inventory Entity and the PRTR project leader at RIVM. They are also made accessible on the national system website (http://english.rvo.nl/nie) and listed in annual PRTR working plans. The

methodology reports are submitted annually to the UNFCCC as an annex to the NIR and they form an integral part of the inventory.

- ***Methodological changes***; as part of the planning phase, a procedure is in place for proposed methodological changes across the different sectors that may have a significant impact on emissions. These are inventoried at an early stage amongst the project leads for each sector through a form in which the project lead offers a short summary of the topic, relevant gas(es), new insights and a first rough indication of the expected impact and range in terms of emissions. These forms with proposed methodological changes are collated and submitted to the Advisory Board NIE.
- ***QA/QC programme***, updated as necessary, and planning of activities and improvement projects.
- ***Annual Working Plan*** of the Pollutant Release and Transfer Register (PRTR) providing more detail on planning of the PRTR process, including the working procedures to be used and documentation/registration sheets to be applied.

Step B: Inventory preparation & inventory management

This step involves key elements of the primary process, i.e. preparing the estimation of emissions and sinks, preparing the inventory tables, and preparing the NIR document, as well as various inventory management actions such as archiving, facilitating access to relevant information and responding timely to requests for clarification. The main QA/QC tools in this step are:

- ***QC checks*** during the regular process (on non-confidential and confidential data). The checks performed and the results are documented.
- ***Trend analysis workshop:*** This workshop brings together experts from each of the sectoral teams for the purpose of checks and improvements of the draft CRT data. The workshop results are documented.
- ***Review of the draft NIR*** before submission to the UNFCCC, consisting of internal review/checks of the draft. Answers supplied and possible changes applied are documented.

Step C: Inventory evaluation

This step assesses experiences of the ongoing cycle, using all relevant inputs such as results of QA/QC checks, outcomes of internal and external reviews, etcetera. The main QA/QC tools in this step include:

- ***Review processes under UNFCCC***; These are not a part of the national process as such, but an important input for further improvements. The improvements recommended by the UNFCCC Expert Review Team (ERT) and the responses with potential actions already (or still to be) undertaken by the Dutch inventory compilers

towards these recommendations are tracked through chapter 10 of the NIR. This helps assure that the course of action towards resolving any points identified by the ERT is adequately documented and maintained as an improvement point for as long as necessary.

- ***Review processes under the EU;*** Similar to the UNFCCC review process, these are not a part of the national process as such but offer useful input for further improvements based on the issues highlighted by the EEA and expert interaction through the Q&A. On a more occasional basis, intra-European collaboration may also take place on the initiative of Member States (e.g. with a number of countries coming together to compare and check their respective inventories for specific areas), which similarly offers relevant input for possible improvements.
- ***Audits:*** as set out in the IPCC guidelines (2006, Volume 1 - Chapter 6), audits can be used to evaluate how effectively the inventory compiler complies with the QC specifications outlined in the QC plan and whether data quality objectives have been met. This includes consideration of the *robustness* of the inventory process.
- ***Peer review:*** In line with the IPCC guidelines, the expert peer review seeks to ensure that the inventory's results, assumptions, and methods are reasonable as judged by those knowledgeable in the specific field. A sector or category is selected each year, taking into consideration the IPCC recommended approach that key categories or any categories where significant changes in methods have taken place should be prioritized. The findings and recommended improvements from peer reviews are documented in a report and the main findings are summarized in chapter 10 of the NIR for the subsequent year.
- ***Public review*** which opens up the review process to a broader audience and can help supplement expert peer reviews
- ***Annual internal evaluation*** of the GHG inventory process, including the resilience of inventory activities in the face of potential changes in personnel, resources or the availability of data, in line with the *robustness* indicator of inventory quality.

Step D: Inventory improvement

During this step, the outcomes of Step C, the inventory evaluation, are assessed and decisions are made on any improvement actions for the next and/or subsequent cycle(s). One of the tools used towards this end is the NIR issue list; recommendations for improvements from the various yearly review processes listed above are to be collated and maintained within this overarching issue list, which offers an additional basis for tracking the implementation of recommended improvements from different sources over a longer period of time.

3 ORGANISATION, PROCESS AND QA/QC SYSTEM

3.1 OVERALL PROCESS AND QA/QC

The national system is described in detail in the Eighth National Communication (EZK, 2022, Chapter 3). This chapter focuses on the responsibilities related to QA/QC in annual inventory process and national system, both for the system as a whole (sections 3.2 and 3.3) and for each of the basic steps of the primary process (sections 3.4 to 3.7). The steps are illustrated in figure 2. This figure shows that for removals and sources for LULUCF the data are not yet incorporated in the PRTR database but is imported in the CRF/CRT database through the inventory compiler.

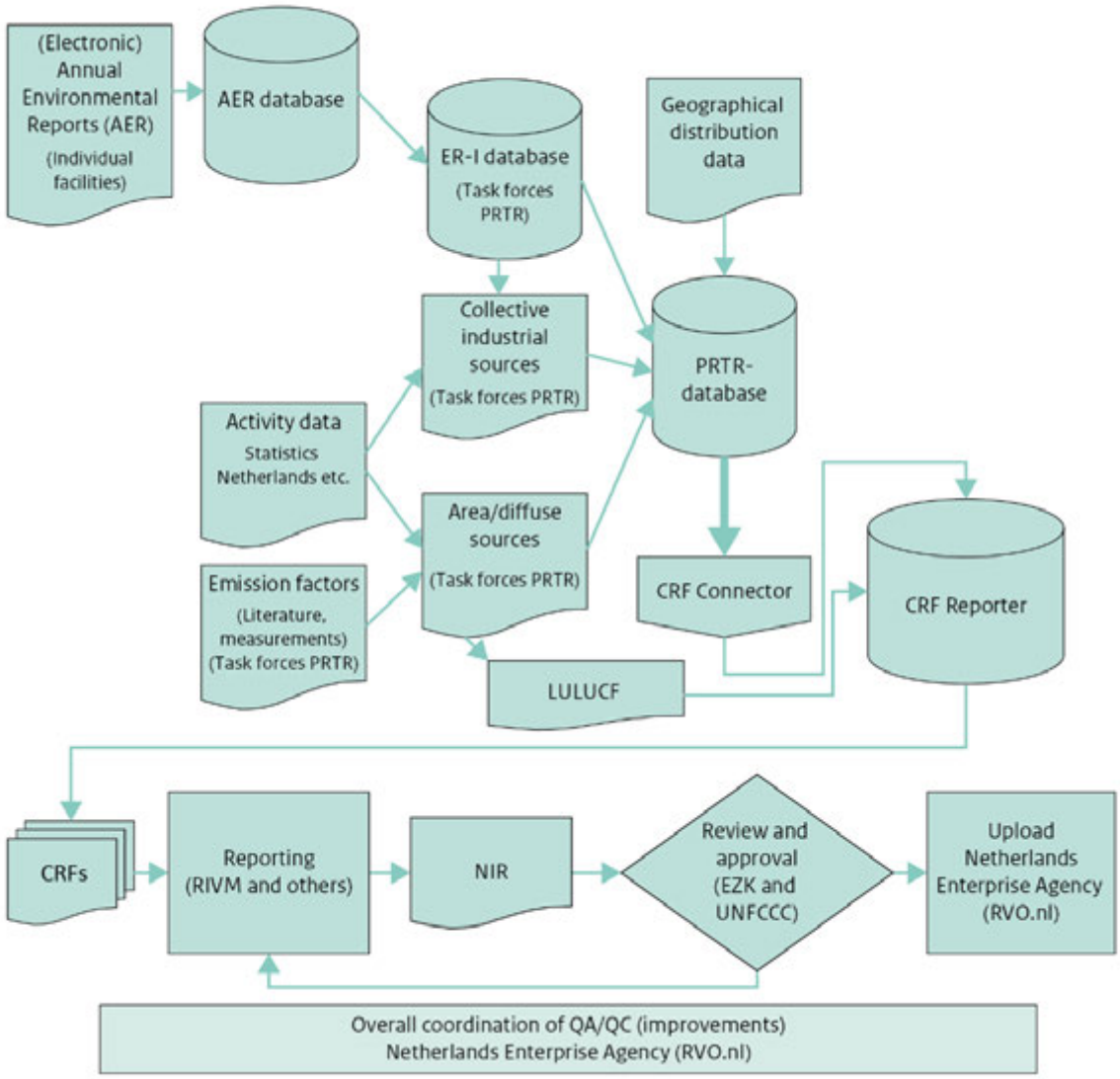

Figure 2: Schematic overview of main steps in primary process.

3.2 OVERALL RESPONSIBILITY FOR CLIMATE CHANGE ISSUES

The Ministry of Economic Affairs and Climate Policy (EZK) is the coordinating Ministry with overall responsibility for Climate Change issues, including those related to monitoring and reporting. The Ministry is responsible for developing legislation, where appropriate, and holds responsibility for the formal approval of the CRT and NIR. In line with the previous assignment of RVO as National Inventory Entity[6] (NIE) under the Kyoto Protocol, RVO has also been assigned as the single national entity with overall responsibility for the national inventory under the UNFCCC reporting guidelines[7].

3.3 RESPONSIBILITY FOR PRTR PROJECT

The Ministry of IenW periodically outsources the Pollutant Release and Transfer Register (PRTR), aimed at estimating emissions of some 650 emission sources in the Netherlands. These estimates are also the basis for the GHG estimates in the Netherlands. From 2010 onwards RIVM has been contracted for these tasks. Responsibility for the approval of the Annual Working Plan of the PRTR lies with the interdepartmental steering group (*Strategisch Beraad*) in which the commissioning ministries participate, namely the Ministries of Infrastructure and Water Management (IenW), Economic Affairs and Climate Policy (EZK) and Agriculture, Nature and Food Quality (LNV).[8]

3.4 OVERALL COORDINATION OF QA/QC

RVO, as NIE, is responsible for the overall co-ordination of the QA/QC for inventory and national system[9] and of the development and maintenance of the national system. The related responsibilities include:

- Assessing the quality of the outputs of the inventory process
- Coordinating elaboration and regular updates of the QA/QC programme
- Coordinating and supervising the implementation of the QA/QC programme and its objectives
- Advising the Ministry of Economic Affairs and Climate Policy (EZK), chair of the Advisory Board of the NIE, on the introduction of methodological changes following proposals by the PRTR. A procedure in this field is in place since 2008.

---

[6] National inventory entity as meant in UNFCCC guidelines for national systems under Art. 5 of the Kyoto Protocol

[7] Single national entity as mentioned in UNFCCC reporting guidelines (Decision 24/CP.19 Annex I, section F)

[8] More information on the (renewed) governance structure of the Emission Registration (ER) can be found in the PTRT Annual Working Plan and on the ER website: www.emissieregistratie.nl/over-emissieregistratie/organisatie

[9] RVO acts as overall QA/QC coordinator. Coordinating person within RVO: Jorieke Rienstra. RVO, P.O.Box 8242, 3503 RE Utrecht, The Netherlands. Phone: + 31 6 46 18 12 87. E-mail: Jorieke.Rienstra@rvo.nl

- Regularly assessing and, where needed, stimulating improvement of QA/QC of other involved (outside) organisations [10] (this task is implemented jointly with PRTR). In 2021 an update was made of the description of QA/QC of the outside agencies (Wanders et al, 2021). Every 4 years this document will be updated.
- Implementing appropriate QA activities (peer reviews, etc.) and providing transparent information on these activities and the results
- Implementing audits to improve the process and evaluate its results
- Coordinating the evaluation and improvement cycle in the National System (jointly with the PRTR)
- Coordinating the improvement programme and the 'maintenance' of the national system.

3.5 RESPONSIBILITIES FOR QUALITY IN DATA SUPPLY

Basic data used for emission estimates come from various sources and include:

- Data from individual companies that submit environmental annual reports (legally required or submitted within the framework of covenants). Quality of the data is the responsibility of the companies. Competent authorities (usually those that are responsible for the permits, in most cases regional authorities) are responsible for validation of the data. Where these individual company data hold information on activity data and emissions of sufficient quality and transparency, these data are used in emission estimates.
- Statistical data provided under (legal) arrangements that are not specifically GHG related, e.g. from Statistics Netherlands (CBS), (agricultural) institutes from the Ministry of Agriculture, Nature and Food Quality (LNV) and Rijkswaterstaat Environment (waste). Provision of the relevant data is assured in covenants. These data suppliers are responsible for the quality of their own data and activities.
- Additional greenhouse gas related data, provided by other institutes and consultants, specifically contracted by the PRTR or RVO to provide information on sectors, not sufficiently covered in above data sources. QA/QC for these consultants and institutes may be influenced directly in the contracts and can be seen as a delegated responsibility.
- Basic LULUCF data (e.g. Forest Inventories, Forests statistics and land use maps), that have a different routing compared to the other basic data (see figure 2). QA/QC

[10] The prime responsibility for their 'own' QA/QC lies with the involved institutes. These should elaborate and implement appropriate procedures. The names of the outside agencies are the following: Wageningen Environmental Research (WEnR), CBS/Statistics Netherlands, Rijkswaterstaat Environment (Waste Management Department), Wageningen UR Livestock Research and Netherlands Organisation for Applied Scientific Research (TNO).

for these data are described in the description of QA/QC of the outside agencies (Wanders et al, 2021).

3.6 RESPONSIBILITIES FOR QUALITY IN DATA PROCESSING

The Pollutant Release and Transfer Register (PRTR) is responsible for collecting and checking input data, elaborating estimates for GHG emissions and sinks and providing annual estimates in the CRT. Major decisions on priorities and methodologies are made within, respectively, the PTRT Strategic Council (*Strategisch Beraad*, which is concerned more with the overall financial and policy framework) and the Tactical Council (*Tactisch Beraad*, which looks at the planning, organization and execution of activities within the boundaries set by the strategic council). The PRTR is responsible for QC in data processing and CRT, as well as for QC checks on input data. This includes responsibility for:

- Implementing QC activities (on non-confidential and confidential data) that comply with applicable IPCC guidelines (IPCC, 2006 & 2019) and with the PRTR annual working plan (PRTR, 2022)
- Implementing QC agreements with relevant outside agencies. Covenants, contracts or other agreements may be used to support this process.
- Further assessing the possibility for improved quality control of data from industrial enterprises (by using data from EU-ETS emission reports).

The resulting estimates and reports are supplied to the NIE and to EZK.

3.7 RESPONSIBILITIES FOR QUALITY IN REPORTING

Based on the CRT, the National Inventory Report is prepared. The ER/PRTR project is responsible for providing the text of the NIR, including trend analysis and the sectoral chapters, involving experts from other organisations. The resulting report is supplied to the RVO (NIE) and to EZK. RVO provides inputs on institutional and QA related aspects and on planned improvements.

RVO is also responsible for performing QA activities on the final draft before submission to the EU and the UNFCCC, including organizing a public review and contracting ‘third parties’ for peer reviews.

3.8 APPROVAL, SUBMISSION AND REVIEW

Formal approval before submission to the UNFCCC needs to be given by the Ministry of Economic Affairs and Climate Policy (EZK). RVO coordinates the final submission to the UNFCCC and the follow-up process with the UNFCCC. The UNFCCC subsequently carries out a review process. RVO (NIE) performs the portal function towards UNFCCC and EU regarding the NIR, the co-ordination of responses to questions for clarification and facilitating the review process.

4 QAQC PLAN

4.1 GENERAL ASPECTS

This chapter outlines the QA/QC activities to be implemented. In selecting activities, it takes into account general considerations, such as practicality, acceptability, cost-effectiveness and existing experience. The activities are grouped as follows:

- Quality control (QC) (§ 4.2)
- Quality assurance (QA) (§ 4.3)
- Documenting and archiving (§ 4.4)
- Evaluation and improvement (§ 4.5)

To illustrate how these activities are undertaken in practice throughout the year, an indicative annual time frame for the activities is included in the overview tables.

4.2 QUALITY CONTROL ACTIVITIES

Quality control activities aim at measuring and controlling the quality of the inventory and the reports as they are being developed. They should also ensure sufficient and transparent documentation on the national system and the inventory process to support confidence in the quality of the annual inventories.

The activities are listed in table 1 and are meant to fulfil the quality objectives a), b) c), d) and h), as mentioned in section 2.1 of this programme. The box below defines a series of specific requirements that should be met for the NIR.

The NIR should comply with UNFCCC requirements, as well as with the following (in some cases additional) requirements:

- *Transparency:* provide summary information on QA/QC procedures performed and the results thereof, including relevant results from intra-EU collaborative review processes
- *Completeness*: annually document and report the required information on all relevant sources and removals, in accordance with the guidelines
- *Consistency*: provide explanations of major trends, recalculations and variations in time series
- *Comparability*: enable comparison with similar data sets in other relevant EU countries and clarification in major areas where differences occur

- *Accuracy*: provide key source analyses for the Netherlands and a quantitative assessment of uncertainties, in accordance with the UNFCCC and EU guidelines
- *All principles*: information on how recommendations from UNFCCC reviews are being dealt with and on improvements with regard to each of the inventory principles

Not specifically mentioned, but implemented in the PRTR process (since NIR 2010) is the acceleration of critical emission data activities; this leads to more time in the end of the process cycle to check and improve consistency between NIR and CRT.

Key on 'tasks and responsibility' indications in tables

- if one organisation is mentioned, responsibility lies with this organisation. Others may advise or provide other inputs
- if more than one organisation is mentioned with a slash (e.g. PRTR/RVO) it is a joint responsibility, usually a decision on which both have to approve
- if more than one organisation is mentioned with a + sign (e.g. PRTR+RVO), the first mentioned organisation takes the lead, however the other(s) are part of the 'team' and need to provide timely input and cooperation in implementing the project successfully

Table 1: QC activities

QC	***Activities and procedures***	***Deadline within annual cycle***	***Responsibility***
1.	**Annual QC, including updating (if needed) of National System [11] related documents** including general description, methodology reports, QC procedures and ot0her key procedures.		
	• performing annual QC[12]	Whole year	PRTR + others

[11] In accordance with relevant guidelines under the Convention (for inventory system).

[12] An important element of the QC checks is the comparison of the emissions in the last year and the emissions in the previous year. According to the 2006 IPCC Guidelines (Volume 1, chapter 6) the emission estimates for all source categories or sub-source categories that show greater than 10% change in the last year compared to the previous year have to be checked. The Netherlands has chosen for a lower limiting value: 5% changes at target

	• deciding on any amendments in updates in methods and/or national system documentation	November 15	PRTR/ RVO/ EZK
	• updating methodology reports, national system	April 15	RVO + PRTR
	• Update tier 1 uncertainty analysis	March 15	PRTR + RVO
	• Update tier 2 uncertainty analysis (see row 2 of this table)	March 15	PRTR + RVO
	• Compile the methodology reports per sector	January - February	PRTR
	• Review draft methodology reports and approve the final methodology reports	January – March	RVO/PRTR
	• Description of sector specific QC will be included in the methodology reports	March 15	PRTR
	• Perform the Monte Carlo analysis (Tier 2 uncertainty analysis), using the software in the PRTR database. Results will be used in setting priorities for improvement	March 15	PRTR
	• Submit methodology reports attached as annex to the NIR	April 15	RVO

group level, and 0.5% at levels concerning the national total (please note that this figure does not refer to the threshold of significance with regard to potential over- or underestimates in inventory data as adhered in EU/UNFCCC reviews, which amounts to 0.05 per cent of total national greenhouse gas emissions for the year under review). In these cases the work package leaders give explanations for the identified changes. The work package leaders send these explanations to the secretary of the PRTR project, who archives them centrally.

4.3 QUALITY ASSURANCE ACTIVITIES

QA activities in general assess the quality of the inventory, including whether the quality objectives are met. As indicated in the IPCC guidelines (2006), it is good practice for QA procedures "to include 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". In this sense QA focuses on critical points in the process and contributes to identification of improvement needs.

Whereas the expert peer review looks at the entirety of results, assumptions and methods of the inventory for a specific sector/ topic and whether these can be deemed reasonable by experts in the field, the IPCC guidelines (2006, Vol. 1 – Ch. 6) describe audits as being focused less on the calculation results and more on the actual procedures taken in the development of the inventory and available documentation thereof. As such they can help verify how effectively the inventory development process complies with the specifications and steps outlined in the QC plan. This includes consideration of the resilience of inventory activities in the face of potential changes in personnel, resources or (the availability of) data.

The planned yearly QA activities are listed in table 2, and are aimed at meeting specific quality objectives mentioned under e) and f). QA activities also feed into the evaluation and improvement cycle. QA activities should be carried out by staff not directly involved in the inventory process. In the Netherlands there is an organisational distinction between the actual data processing and the overall QA/QC co-ordination (and QA activities). The latter is primarily the responsibility of RVO (NIE). Where other involved organisations have QA processes in place within their own institutes, RVO will not duplicate these, but rather review them to ascertain whether these processes meet the requirements of the QA/QC plan (and build further on these as needed).

The QA actions include two types of actions:

- the annual actions, such as internal review, peer review and audit;
- The actions that take place on a more periodic basis or over a longer timeframe, such as activities concerning the staggered implementation of the 2019 IPCC refinement to the 2006 IPCC Guidelines (IPCC, 2019).

In addition to the mentioned QA activities, important feedback on quality comes from the UNFCCC review process (although these reviews as such should not be considered part of the Parties 'own' QA/QC).

Table 2: QA activities

QA	***QA Activities and procedures***	***Deadline within annual cycle***	***Responsibility***
1.	**Basic (peer expert) review** of CRT/NIR		
	a. Perform internal, peer and public reviews NIR	March 1	RVO

QA	*QA Activities and procedures*	*Deadline within annual cycle*	*Responsibility*
	b. Implement improved trend verification incl. IEF	March 15	
	c. Implement improved methodology in response to recommendations from earlier reviews, in order to solve issues identified in three successive reviews (at least)	April 15	PRTR/RVO RVO/PRTR
2.	**Audits**		
	a. Implement internal audits (in combination with mutual review if possible)	November 30	RVO(+PRTR)
	b. Update audit schedule for next cycle	March 15	RVO
3.	**Extensive review process/future monitoring**		
	a. Activities concerning the implementation of the 2019 IPCC Refinement	December 31	RVO + PRTR
4.	**Verification**:		
	a. include information on results of QA actions in the NIR	March 15	RVO
	b. follow-up activities in the field of inverse modelling as a tool to verify and improve calculated emissions in the inventory (depending on available budget). PRTR plans to deliver an annex to the NIR 2027.	December 31	RVO + PRTR
5	**Outside agencies**		
	a. outside agencies archive the reports of internal audits as far as GHG activities are involved	December 31	Outside agencies
	b. Further appointments are made to ensure that GHG activities are actually included periodically in internal audits	December 31	PRTR + RVO
	c. Documentation on QAQC of outside agencies is updated as necessary (at least every five years), in line with the 2006 IPCC Guidelines	July 1	RVO + PRTR

4.4 ARCHIVING, DOCUMENTATION AND FACILITATING REVIEWS

This group includes activities on documentation, archiving and access to non-confidential information for review and clarification purposes (objective g). For these purposes, among others a website on the National System is maintained by RVO, under assignment of EZK, and in close cooperation with the PRTR. Since 2014 the location of the National System website is http://english.rvo.nl/nie. The activities essentially follow an annual cycle.

Table 3: Documentation and archiving

AD	*Archiving and documentation*	*Deadline within annual cycle*	*Responsibility*
1.	**Document and archive relevant information** on inventory, QA/QC programme, QA/QC activities, reviews and (planned) improvements		
	• Implement annual documentation and archiving (in annual project file) as agreed	June 30	All involved parties
2	**Facilitate reviews and request for clarification**		
	• Provide access according to procedure	As appropriate	RVO + PRTR
	• Respond to requests for clarification in timely manner (from UNFCCC and EU)	As appropriate	RVO + PRTR
	• Facilitate UNFCCC and EU reviews	September	RVO + PRTR

As described in the Netherlands' National System confidential information is not centrally archived, but only maintained and archived by the work package leader. Furthermore, the confidential information is accessible by the project leader, the project secretary and the replacement of the work package leader. It is available on request for UNFCCC review in line with the CP decision and the code of practice.

4.5 EVALUATION AND IMPROVEMENT

This group of activities is directed at facilitating continuous improvement. The listed activities should contribute towards meeting objectives number i). After each inventory cycle the methodology reports are updated, if applicable. Specific requirements for methodology reports and procedures are illustrated in the text box.

The methodology reports and procedures should comply with the following inventory principles:

- Transparency: they include, or provide easy access to, all non-confidential information, relevant for reviews under UNFCCC and EU
- Completeness: they include all relevant sources and sinks, incl. those related to EU LULUCF regulation
- Consistency: they maintain consistent time series and enable clear identification of the effects of major developments and policies
- Comparability: the methods and formats comply with the guidelines under UNFCCC and EU
- Accuracy: they include the use of tier 2 or higher methods for national key sources, to the extent required by the UNFCCC guidelines[13], and, to extent possible and practicable, also for other EU key sources; and they enable annual quantitative uncertainty estimates.

Based on the experiences in previous inventory cycles and reviews, improvement actions are implemented in ongoing development. In addition, the annual evaluation cycle is performed in line with the activities under table 4:

Table 4. Evaluation and improvement activities

EI	***Evaluation and improvement programme***	***Deadline within annual cycle***	***Responsibility***
1	**Annual evaluation and improvement cycle**		
	• evaluative meeting	June 30	RVO+ PRTR
	• planning meeting incl. working plan next cycle	October 15	PRTR +RVO
	• update QA/QC programme	November 30	RVO
2	*Various other improvement actions,* described already in the previous sections and tables on QC and on QA activities		

[13] Taking into account the specific circumstances, including the current state of knowledge, data availability, timeliness and cost effectiveness

5 REFERENCES

EZK (Ministry of Economic Affairs and Climate Policy), 2022

Eighth Netherlands' National Communication under the United Nations Framework Convention on Climate Change, December 2022

IPCC, 2006

2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, Published: IGES, Japan.

IPCC, 2019

2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Published: IGES, Japan

Nielsen et al., 2020

Nielsen, O.-K., Plejdrup, M.S., Winther, M., Gyldenkærne, S., Thomsen, M., Nielsen, M, Mikkelsen, M.H., Albrektsen, R., Hjelgaard, K. & Bruun, H.G. 2020. Quality manual for the Danish greenhouse gas inventory. Version 3. Aarhus University, DCE – Danish Centre for Environment and Energy, 44 pp. Scientific Report No. 406 http://dce2.au.dk/pub/SR406.pdf

PRTR, 2022, Annual Working Plan (for inventory cycle CRF 2023) (In Dutch), December 2022

PRTR, 2023 Guidelines for Quality Assurance (in Dutch, 'Handreiking Kwaliteitsborging Emissieregistratie') (internal memo)

RVO, 2021: QA/QC Programme 2021/2022 (Period October 1st,2021-December 31st, 2022)

RVO, 2022: Main QA/QC experiences inventory 2022 (cycle 2021-2022) (internal memo)

SenterNovem, 2005: Description of the National System

(update of this document is included in EZK, 2022 Eighth Netherlands' National Communication under the United Nations Framework Convention on Climate Change, December 2022)

Wanders et al, 2021

Wanders, J., M. van Aar, B. Bongers, B. ten Cate, A. Denneman, R. Dröge, B. van Huet, D. Wever, (2021): QA/QC of outside agencies in the Greenhouse Gas Emission Inventory. Update of the background information in the Netherlands National System. RIVM report 2020-0066 Bilthoven.

This is a publication of:

Netherlands Enterprise Agency
Prinses Beatrixlaan 2
PO Box 93144 | 2509 AC The Hague
T +31 (0) 88 042 42 42
Contact us
www.rvo.nl

This publication was commissioned by the ministry of economic Affairs and Climate Policy.

Publication number: RVO-044-2024/RP-DUZA

NL Enterprise Agency is a department of the Dutch ministry of Economic Affairs and Climate Policy that implements government policy for agricultural, sustainability, innovation, and international business and cooperation. NL Enterprise Agency is the contact point for businesses, educational institutions and government bodies for information and advice, financing, networking and regulatory matters.

Netherlands Enterprise Agency is part of the ministry of Economic Affairs and Climate Policy.