

National Greenhouse Gas Inventory System in Finland

Preface

Statistics Finland has prepared this description of Finland's Greenhouse Gas Inventory System as part of the reporting to the United Nations Framework Convention of Climate Change (UNFCCC) to facilitate the estimation of Finland's assigned amount for the commitment period pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol and to demonstrate Finland's capacity to account for its emissions and assigned amount.

In accordance with the Government resolution of 30 January 2003 on the organisation of climate policy activities of Government authorities Statistics Finland assumed the responsibilities of the National Authority for Finland's greenhouse gas inventory 1.1.2005.

In Finland the National System as intended in the Kyoto Protocol (Article 5, paragraph 1) is based, besides regulations concerning Statistics Finland, on co-operation and agreements between Statistics Finland and expert organisations, the Energy Market Authority, as well as the responsible ministries.

This report describes the legal, institutional and procedural arrangements of the National System in Finland, including parties to the system and their responsibilities as well as the quality management methods of the inventory. Reporting protocols describing the division of responsibilities and tasks in preparing the inventory are appended. Activities of Statistics Finland as the National Authority are also listed.

This report has been reviewed by the ministries participating in the High Level Working Group of Government Officials on the national implementation issues of the Kyoto Protocol headed by the Ministry of Trade and Industry. The Cabinet Committee on European Union Affairs approved on 27 October 2006 the procedure to submit the report to the European Commission and the UNFCCC.

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Summary

Purpose of the National System

The National System supports compliance with the Kyoto Protocol. In addition to the annual estimation, reporting and archiving of greenhouse gas emissions and removals, the system contributes to the production of estimates on the actual effects of the climate policy and forecasts for future development.

In Finland the National System is established on a permanent footing in place of the previous, workgroup-based estimation and reporting of greenhouse gas emissions and removals. The National System guides the development of emission/removal estimation, reporting and archiving in the manner required by the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the EU Monitoring Mechanism.

The National System ensures the transparency, consistency, comparability, completeness, accuracy and timeliness of greenhouse gas inventories. The quality requirements are fulfilled by implementing consistently the inventory quality management procedures.

Parties to the National System and the regulation basis

The Government resolution of 30 January 2003 on the organisation of climate policy activities of Government authorities assigns Statistics Finland as the National Authority responsible for Finland's greenhouse gas inventory.

In Finland the National System as intended in the Kyoto Protocol (Article 5, paragraph 1) is based, besides regulations concerning Statistics Finland, on agreements with Statistics Finland and expert organisations on the production of the emission estimates and documentation for the national inventory report, and on co-operation and agreements with the responsible ministries as well as the Energy Market Authority. The Energy Market Authority is responsible for the national registry in Finland.

The Ministerial Workgroup on Climate and Energy Policy considered the proposal on Finland's greenhouse gas inventory system on 19 November 2004. Statistics Finland assumed the responsibilities of the National Authority for Finland's greenhouse gas inventory from the beginning of the year 2005.

Statistics Finland as the National Authority for the inventory

Statistics Finland as the general authority of the official statistics of Finland is independently responsible for the preparation and submission of Finland's greenhouse gas inventory to the UNFCCC and to the European Commission. In its activity as the National Authority for the greenhouse gas inventory the Statistics Finland Act and the Statistics Act are applied.

Statistics Finland defines the placement of the inventory functions in its working order. Statistics Finland has set up an advisory board to which representatives from the expert organisations, the Energy Market Authority and the responsible Government ministries have been invited. The advisory board reviews the achieved quality of the inventory and decides about changes to the inventory's division of responsibilities and tasks as agreed for the reporting sectors. In addition, the advisory board co-ordinates and supervises horizontal research and review projects related to the development of the inventory and reporting. It co-ordinates also international co-operation in this area (UNFCCC, IPCC, EU), including inventory reviews.

Statistics Finland as the National Authority is in charge of the preparation of the national greenhouse gas inventory and its quality management in the manner intended in the Kyoto Protocol. As the National Authority Statistics Finland also bears the responsibility for the general administration of the inventory and communication with the UNFCCC, reviews of the Finnish inventory, and publishes and archives the inventory results.

Responsibilities of expert organisations

According to the Government resolution, Finland's inventory system includes besides Statistics Finland the expert organisations that have previously taken part in the preparation of the greenhouse gas inventory. With regard to this co-operation, separate agreements have been made with the Finnish Environment Institute (SYKE), Agrifood Research Finland (MTT) and the Finnish Forest Research Institute (Metla). Statistics Finland acquires also parts of the inventory as a purchased service.

The agreements confirm the division of responsibilities and tasks as recorded in the reporting protocols. These specify the procedures for the annual estimation of emissions and removals as well as quality management co-ordinated by Statistics Finland. The reporting protocols are based on the responsibility areas of the different expert organisations and on Finland's established practice for the compilation of the greenhouse gas inventory. The sectors for which Statistics Finland is responsible are also defined in the reporting protocols.

Statistics Finland has set up an inventory working group comprising all expert organisations producing the emission and removal estimates. The inventory working group agrees on annual tasks, quality objectives and timetables to produce the inventory in accordance with the reporting protocols. The group acts also as a forum for exchange of information on decisions and guidance from the UNFCCC, including the UNFCCC review process, and the EU monitoring mechanism. It evaluates also the need for improvement of the inventory and prepares proposals on these to the advisory board.

The role of the responsible ministries in the inventory system

The resources of the National System for expert organisations are channelled through the relevant ministries' performance guidance (Ministries of the Environment and of Agriculture and Forestry).

In addition, other ministries participating in the preparation of the climate policy advance in their administrative branch that the data collected in management of public administration duties can be used in the greenhouse gas inventory.

In accordance with the Government resolution, the ministries produce the data needed for international reporting on the content, enforcement and effects of the climate strategy. Separate agreements have been made on co-operation between Statistics Finland and the ministries. The structure of the inventory system corresponds to the horizontally organised preparation of Finland's climate policy.

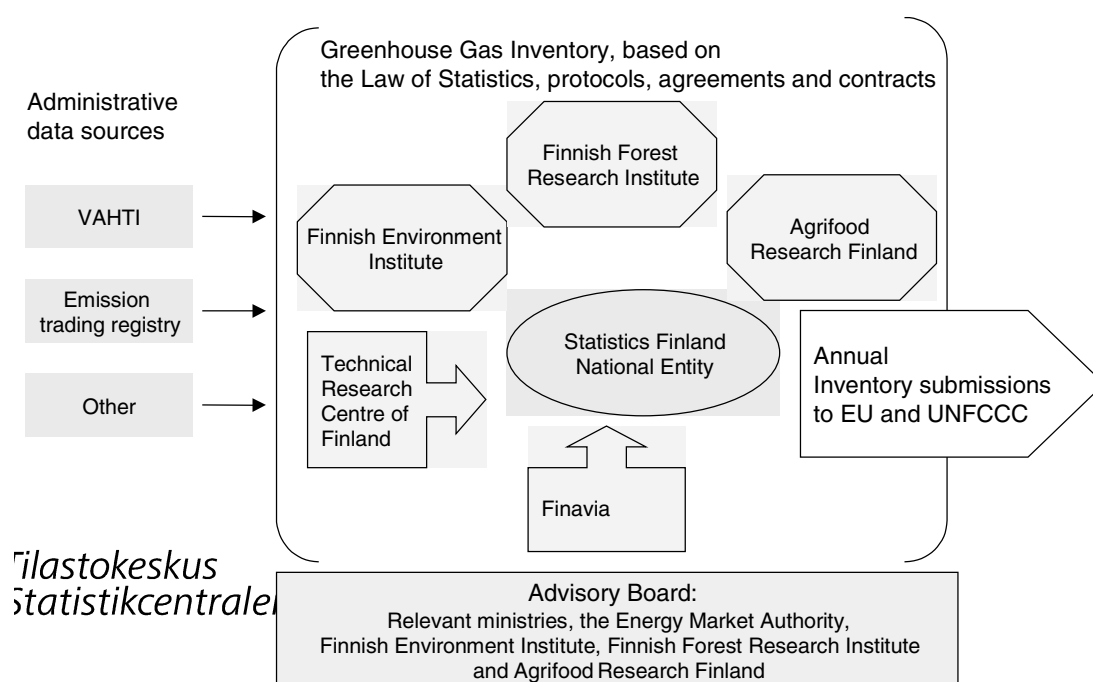


Figure 1. National Greenhouse Gas Inventory System in Finland.

Quality management and improvement of the inventory

The quality of the inventory is ensured in the course of the calculation and reporting work. The requirements, principles and elements due to the international agreements and guidelines are integrated directly into the institutional and functional practical solutions of Finland's National System, i.e. into its organisation and processes. Explicit inventory documentation produces the required evidence on the functionality of the inventory system and its compliance with existing requirements for the Parties to the Framework Convention on Climate Change and the Kyoto Protocol, and for the collaboration between EU Member States.

In addition, in attending to the special requirements of the IPCC and UNFCCC guidelines concerning greenhouse gas inventories, the production of a high-quality inventory is supported by the application of the principles and elements included in the general standard for quality management systems ISO 9001:2000.

Preparation, compilation and reporting of the annual inventory consist of four main stages: planning, preparation, evaluation and improvement.

Inventory documentation comprises the basic documents of the inventory system, the sector-specific calculation documents and the whole inventory level documents of the annual inventory process.

1. Purpose of the National System

1.1. Obligations to the UNFCCC and the Kyoto Protocol

Finland has made a commitment to follow the United Nations Framework Convention on Climate Change (UNFCCC) that entered into force on 21 March 1994. In 1997 the legally binding Kyoto Protocol was approved under the UNFCCC, and the EU and Finland ratified it in May 2002. With these agreements Finland is obliged, as part of the European Community's common emission target, to limit its emissions of greenhouse gases¹ in the first commitment period, i.e. from 2008 to 2012 to the same average level as the emissions for 1990.

The Kyoto Protocol (Article 5, paragraph 1) requires that the parties have in place a National System by the end of 2006 at the latest for estimating anthropogenic greenhouse gas emissions by sources and removals by sinks and for reporting and archiving the results. In the Decision of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions (280/2004/EC) it is required that Member States establish a national greenhouse gas inventory system as fast as possible and by the end of 2005 at the latest and that the Commission adopts the EC's inventory system by 30 June 2006.

In accordance with the Government resolution of 30 January 2003 on the organisation of climate policy activities of authorities Finland's inventory system was already launched by the end of the year 2004.

1.2. Functions of the National System

The National System defined in the in the UNFCCC Decision 20/CP.7 and the Decision 19/CMP.1 (Guidelines for National Systems under Article 5, paragraph 1, of the Kyoto Protocol) supports compliance with the Kyoto Protocol. It produces the annual estimates of the national greenhouse gas emissions and removals in accordance with Article 7, paragraph 1 and facilitates the review of the information as required by Article 8 of the Protocol, and assists in the continuous improvement of the inventory. The eligibility to use the Kyoto mechanisms is also based on the quality assessment and approval of the reporting produced by the National System.

The EU's greenhouse gas monitoring mechanism (280/2004/EC) combines annual greenhouse gas inventories, the climate strategy and the evaluation of the effect of the policy measures, and planning of new measures into a dynamic process. The Commission decision of 10 February 2005 on the implementing provisions of the monitoring mechanism (2005/166/EC) specifies in detail the content of the reports to be submitted to the Commission. By means of the monitoring system, common EU reports can be prepared for the UNFCCC.

The National System guarantees that the data are not only in compliance with the inventory principles and other requirements, but that they are also officially approved. In Finland the National System is established on a permanent footing in place of the previous, workgroup-based emission estimation and it guides the development of emission estimation to meet the requirements of the agreements.

In setting up Finland's National System, experiences of other Nordic Countries and the Netherlands were used for establishing the administrative arrangements of emission monitoring.

Finland has implemented the National System as described below, on the basis of **the following general functions of the national system specified in the Annex to the Decision 19/CMP.1** (Guidelines for National Systems under Article 5, paragraph 1, of the Kyoto Protocol):

(a) Establish and maintain the institutional, legal and procedural arrangements necessary to perform the functions defined in these guidelines for national systems, as appropriate, between the Government agencies and other entities responsible for the performance of all functions defined in these guidelines;

(b) Ensure sufficient capacity for timely performance of the functions defined in these guidelines for national systems, including data collection for estimating anthropogenic greenhouse gas emissions by sources and removals by sinks and arrangements for technical competence of the staff involved in the inventory development process;

(c) Designate a single national entity; with overall responsibility for the national inventory;

(d) Prepare national annual inventories and supplementary information in a timely manner in accordance with Article 5 and Article 7, paragraphs 1 and 2, and relevant decisions of the COP and/or COP/MOP;

¹ The greenhouse gases included in the Kyoto Protocol are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), halogenated hydrocarbons (HFC and PFC compounds) and sulphur hexafluoride (SF₆). HFCs, PFCs and SF₆ are also called F-gases.

(e) Provide information necessary to meet the reporting requirements defined in the guidelines under Article 7 in accordance with the relevant decisions of the COP and/or COP/MOP.

To meet the objectives of the National System and perform the above-described general functions, each country has to carry out special functions connected to the planning, preparation and management of the inventory. The designated National Authority (see c above) has the responsibility of these functions, which will be detailed in Section 4.

1.3. Quality requirements of the greenhouse gas inventory

The National System must ensure the transparency, consistency, comparability, completeness and accuracy of greenhouse gas inventories. The EU's decision on the monitoring mechanism also requires timeliness of the inventory. The quality requirements are fulfilled by implementing consistently the inventory quality management procedures.

The transparency of the inventory means that the methodologies, assumptions and references used in the inventory are documented clearly so that the evaluation and where necessary, replication of the inventory would be possible on the basis of the documentation.

The consistency of the inventory requires that the used methodologies are the same both in the inventory base year and in the years following it, and that consistent data sets have been used as the basis for emission and sink estimates. When the methodology changes, recalculation of the inventory must be performed transparently in accordance with the IPCC Good Practice Guidance.

The comparability of the inventory requires that the methodologies (IPCC guidelines) and the mode of presentation (CRF tables) agreed by the Conference of the Parties to the UNFCCC are used in the inventory calculation and reporting. The emission source and sink classification must follow the IPCC guidelines on the level of summary and sectoral tables.

The completeness of the inventory means both regional completeness and that the inventory covers all the emission sources, sinks and gases and all the significant emission source and sink categories mentioned in the IPCC guidelines.

The accuracy of the inventory measures the exactness of emission or removal estimates, so that the estimates are neither systematically over or under estimating the actual emissions or sinks and also, that uncertainties are reduced as much as practicable.

The timeliness of the inventory requires preparation and reporting of the inventory in the agreed annual schedule.

2. Legal arrangements of the inventory system in Finland

Finland has reported national greenhouse gas emission data to the UNFCCC since 1994 and to the European Commission since 1999. In addition, National Communications have been submitted to the UNFCCC in the years 1995, 1997, 2001 and 2006.

The Ministry of the Environment was responsible for the reports to the UNFCCC in accordance with the Government's division of labour until 1.1.2005, when Statistics Finland took over the responsibility of the national greenhouse gas inventory. The Ministry of the Environment continues to be responsible for the National Communication, although Statistics Finland compiles the report technically.

2.1. Government resolution

The Government resolution of 30 January 2003 on the organisation of climate policy activities of Government authorities assigns Statistics Finland as the National Authority responsible for Finland's greenhouse gas inventory. This is confirmed with a written agreement between the Ministry of the Environment and Statistics Finland. A notification of the implementation of the National System assigning Statistics Finland as the National Authority of the National System was sent to the UNFCCC and the European Commission on 14 January 2005.

The Government resolution defines the structure and the principal responsible bodies for Finland's National System. In the resolution, the National System as intended in the Kyoto Protocol is defined to comprise the national inventory unit at Statistics Finland, the contractual arrangements with different expert organisations and the entire production system of greenhouse gas emission and removal statistics and reporting.

Statistics Finland as the National Authority is in charge of the compilation and finalisation of the national inventory report (NIR) and the Common Reporting Tables (CRF) and of their submission to the UNFCCC Secretariat and the EC Commission. The inventory data and the documentation needed for the national inventory report and other reports are prepared by the inventory unit with its contracting parties. The present description of the National System specifies its structure and the division of responsibilities and tasks. The Framework Convention on Climate Change and the EU's monitoring mechanism also require such description as part of reporting.

The Government resolution specifies also the responsibilities of different ministries for the preparation and reporting of climate policy. The Ministry of Trade and Industry is in charge of the descriptions and evaluation of the policy actions and of the preparation of the scenario assessments needed in the National Communication, and other reports. The ministries involved in the preparation of the climate policy produce data on the content, enforcement and effects of the climate strategy in their own sectors for the National Communication. Statistics Finland compiles technically the National Communication for consideration by the Ministerial Workgroup on Climate and Energy Policy before submission to the UNFCCC. Statistics Finland is in charge of the printing of the approved report. The Ministry of the Environment submits the National Communication to the UNFCCC.

The Fourth the National Communication was submitted to the UNFCCC 10.2.2006. The report on Demonstrable Progress under the Kyoto Protocol was also submitted to the UNFCCC around the same time. The Ministry of Trade and Industry prepared this report.

The climate policy organisations mentioned in the Government resolution will be responsible for other reporting, especially evaluation of the compliance with the Kyoto Protocol and the reports required by the EU's monitoring mechanism on the national climate strategy and its effects, as well as the reports on the impacts of different measures. Statistics Finland assists in the technical preparation of the reports.

2.2. Statistics Finland Act and Statistics Act

The Statistics Finland Act (24 January 1992/48) assigns Statistics Finland with the duty to compile statistics and reports describing the conditions in the society and to provide for the general development of official statistics in collaboration with other Government authorities. Statistics Finland also performs other duties that may be assigned to it by decree or order.

In the performance targets agreed with the Ministry of Finance Statistics Finland is committed to function as the National Authority for the inventory.

The Statistics Act (23 April 2004/280) defines the national statistical service authorities and it regulates the principles of data collection, compilation of statistics, confidentiality and release of data and other issues steering the

national statistical service. Statistics Finland as the general statistical authority compiles those statistics whose collection has not been specifically assigned to some other authority. Statistics on the environment are not assigned to any authority.

The above-mentioned regulations are applied to the functioning of Statistics Finland as the National Authority for the greenhouse gas inventory as specified in the Kyoto Protocol.

Statistics Finland as the general statistical authority is independently responsible for the greenhouse gas inventory to the UNFCCC and to the European Commission. This includes the annually supplied national inventory reports under the Convention (UNFCCC Decisions 18/CP.8, 13/CP.9 and 14/CP.11), as well as the national greenhouse gas inventory information in accordance with Article 7, paragraph 1 of the Kyoto Protocol (UNFCCC Decision 22/CP.7 and Kyoto Protocol Decision 15/CMP.1)). These reports are not considered yearly by the Ministerial Workgroup. The regulations and operating principles related to the national statistics service lend support to the preparation of the greenhouse gas inventory in line with the requirements. The government will approve the report for the establishment of Finland's assigned amount.

2.3. Statistics Finland's working order

Statistics Finland's working order (1 June 2005) specifies the operating organisation, organisation units and their duties, Statistics Finland's management and settlements of issues, presentation of matters and some other procedures. Statistics Finland determines the placement of inventory tasks in its working order.

Statistics Finland has set up an advisory board to support the inventory unit. Representatives from the expert organisations, the Energy Market Authority and the responsible Government ministries have been nominated to Advisory Board.

The advisory board decides on changes to the inventory's division of responsibilities and tasks agreed in the reporting protocols attached to this description. In addition, the advisory board reviews the achieved quality of the inventory, deals with longer term research projects and studies connected to the development of the inventory and reporting and the responsibilities of international co-operation in this area (UNFCCC, IPCC, EU), including inventory reviews.

2.4. Agreements and other arrangements

According to the Government resolution, Finland's inventory system includes besides Statistics Finland the expert organisations that have previously taken part in the greenhouse gas inventory. Separate agreements are made on this co-operation.

The agreements with the expert organisations specify the division of responsibilities and tasks recorded in the reporting protocols and the role of Statistics Finland's in co-ordination of the preparation of the annual greenhouse gas inventory and in its quality management. The protocols are based on the responsibility areas of different expert organisations and Finland's established practice for the compilation of the greenhouse gas inventory. The reporting protocols were prepared in 2004 according to Table (1) and they are presented in the Annex to this description. Quality management procedures and documentation are discussed in Section 4.

Statistics Finland acquires parts of the calculation and development work from expert organisations as a purchased service. The estimation of emissions from transportation is based on continuous input from VTT (Technical Research Centre of Finland) and Finavia (former Civil Aviation Administration). The continuance of the input is ensured with framework agreements between Statistics Finland and VTT, and Statistics Finland and Finavia. The responsibilities and tasks are specified in the Reporting Protocol B, as well as annual contracts specifying the tasks, taking development and improvement needs into consideration.

Statistics Finland has set up an inventory working group comprising all expert organisations producing the emission and removal estimates. The inventory working group agrees on annual tasks, quality objectives and timetables to produce the inventory in accordance with the Reporting Protocols. The group acts also as a forum for exchange of information on decisions and guidance from the UNFCCC, including the UNFCCC review process, and the EU monitoring mechanism. It evaluates also the need for development and improvement of the inventory and prepares proposals on these to the advisory board.

Agreements between Statistics Finland and the responsible ministries (Ministry of the Environment, the Ministry of Trade and Industry and the Ministry of Transport and Communication) have been made to confirm the co-operation and division of work in accordance with the Government resolution.

Statistics Finland and the Energy Market Authority have also signed an agreement defining the collaboration, tasks and responsibilities related to reporting related to the national registry and reporting of Kyoto Protocol units.

Table 1. Reporting protocols and their responsible organisations in 2004

Reporting protocols	Responsible organisations
A. Point sources, stationary combustion – fuel combustion in point sources, such as power plants, heating boilers, industrial combustion plants and processes	Statistics Finland
B. Mobile sources – transport and off-road machinery	Technical Research Centre of Finland (VTT), Finavia (as purchased service)
C. Other fuel combustion (agriculture, households, services, public sector, etc.)	Statistics Finland
D. Fugitive emissions from fuels	Statistics Finland
E. Emissions from industrial processes	Statistics Finland
F. Emissions of F-gases	Finnish Environment Institute
G. Emissions of non-energy NMVOCs (non-methane volatile organic compounds)	Finnish Environment Institute
H. Emissions from agriculture, non-combustion emissions	Agrifood Research Finland (MTT)
I. Emissions from land use and land use change	Finnish Forest Research Institute, Agrifood Research Finland
J. Emissions from waste treatment	Finnish Environment Institute
K. Other emissions	Statistics Finland

3. Parties to the National System and their responsibilities

3.1. Statistics Finland's responsibilities as the National Authority

On the basis of the performance targets agreed with the Ministry of Finance and within the limits allowed by the budget, Statistics Finland has undertaken the responsibility for the functions listed below:

- co-ordination of the annual greenhouse gas inventory, compilation of the results and their reporting according to the guidelines of the UNFCCC and the EU greenhouse gas monitoring mechanism and by following the schedules;
- preparation of Statistics Finland's contribution to the inventory in accordance with the reporting protocols A. (Point Sources, Stationary Combustion), C. (Other fuel combustion), D. (Fugitive emissions from Fuels), E. (Emissions from industrial processes), and K. (Other emissions);
- administration of Finland's greenhouse gas inventory system, including maintenance of the agreements and reporting protocols and preparation for the meetings of the advisory board and the inventory working group;
- co-ordination and compilation of the inventory uncertainty assessments and preparation of the key category analyses;
- co-ordination of the inventory quality management (QA/QC procedures) and preparation of the inventory improvement plan;
- co-ordination of the archiving of inventory-related data;
- co-ordination of communication and feedback to the expert review teams during UNFCCC reviews of the Finnish greenhouse gas inventory including practical arrangements during in-country reviews ;
- production of Finland's contribution to the EC inventory and participation in co-operation according to the decision on a monitoring mechanism (Article 8);
- publishing of the inventory results according to the annual plan and production of summarised inventory data in Finnish;
- participation in the working groups under the Climate Change Committee in matters related to the EC inventory system;
- national co-ordination of the expert work for international development of the inventory related issues (UNFCCC, IPCC; EU) as agreed yearly in the advisory board;
- calculation of the annual indicators in accordance with the implementing provisions of the EU's greenhouse gas monitoring mechanism (Article 7).

Statistics Finland compiles the report to the UNFCCC to facilitate the estimation of Finland's assigned amount pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol, for the commitment period and to demonstrate Finland's capacity to account for its emissions and assigned amount. The report will be submitted to the UNFCCC by 31 December 2006. Statistics Finland also compiled the corresponding Draft report to the European Commission due 15 January 2006.

To comply with the requirements to report supplementary information under Article 7, paragraph 1 of the Kyoto Protocol, Statistics Finland ensures the inclusion of following information in the annual inventory reports:

- information on steps taken to improve estimates in areas previously adjusted, if applicable;
- information of emissions and removals from land use, land-use change and forestry activities under Article 3, paragraph 3, and elected Article 3, paragraph 4 activities;

Statistics Finland supplies information to the national register recording Finland's assigned amount units according to the Kyoto Protocol, as necessary. Information derived from the register on transfers and acquisitions of emission reduction units (ERUs), certified emission reductions (CERs), temporary certified reductions (tCERs), long-term certified emission reductions (lCERs), assigned amount units (AAUs) and removal units (RMUs) will be reported to the UNFCCC in conjunction with the annual inventory submissions, based on information and documentation provided by the Energy Market Authority.

3.2. *Responsibilities of expert organisations in the inventory system*

In addition to Statistics Finland, the Finnish Environment Institute (SYKE), Agrifood Research Finland (MTT) and the Finnish Forest Research Institute (Metla) participate in the inventory preparation as part of their official duties. The expert organisations are committed in the agreements they have concluded with Statistics Finland:

- to produce emission estimations following the division of responsibilities and tasks defined in the reporting protocols and according to the UNFCCC guidelines in force;
- to follow the inventory quality management procedures co-ordinated by Statistics Finland and to produce for it the required documents (including descriptions of inventory calculation by CRF category and internal documentation) and to be responsible for archiving its own original data;
- to provide responses and feedback, where necessary, to the UNFCCC inventory reviews.

In addition, the expert organisations take account of Statistics Finland's publication plan when they publish inventory results and background data. The organisations have the possibility to nominate their representatives to the advisory board set up by Statistics Finland and present annually to the advisory board a plan on their participation in international collaboration for the development of the inventory and on the resources needed for that.

3.3. *Purchased services*

Statistics Finland commissions as a purchased service, within the limits allowed by its budget and with consideration to the rules on competitive tendering:

- estimation of emissions in the transportation category
- projects related to the improvement and development of the inventory
- work requiring special knowledge.

The estimation of emissions from transportation is based on long-term framework agreements and annual contracts with VTT and Finavia. The responsibilities and tasks of VTT and Finavia are specified in reporting protocol B. These organisations take also part in the work of the inventory working group.

3.4. *Agreements with the responsible ministries*

Statistics Finland and the Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Transport and Communications and Ministry of Trade and Industry have concluded agreements on the co-operation.

The resources for the expert organisations of the National System come through the relevant ministries (Ministries of the Environment and of Agriculture and Forestry). In their performance guidance the ministries ensure the resources needed by the organisations participating in the inventory (Finnish Environment Institute, Finnish Forest Research Institute and Agrifood Research Finland) for their contribution according to the inventory reporting protocols.

The ministries can in their administrative branches advance that Statistics Finland uses the data collected through public administration duties for the greenhouse gas inventory. Statistics Finland and the expert organisations use in the greenhouse gas inventory the following administrative data produced under the ministries, aiming to utilise as high-quality emission and activity data as possible:

- the environmental administration information system (VAHTI), from the sector of the Ministry of the Environment
- traffic data from the Finnish Maritime Administration, VR-Group and the Finnish Road Administration, from the sector of the Ministry of Transport and Communications
- plant-specific monitored emission data from the emission trading registry established for the EU Emission Trading Scheme from the Energy Market Authority, from the sector of the Ministry of Trade and Industry (in the 2007 submission, or later)
- agricultural data collected by Tike, the Information Centre of the Ministry of Agriculture and Forestry.

The quality of the administrative records is primarily the responsibility of the Government agencies and ministries. The inventory quality criteria are also applied to these (see 1.3).

Ministries provide the information on policy measures, scenarios and the Kyoto mechanisms to be included in the reports to the European Commission (Articles 8 to 11) and the UNFCCC, which according to the Government resolution ministries produce in their preparation of the climate policy.

Finland will include information under Article 3, paragraph 14 of the Kyoto Protocol on how it is striving to minimize adverse impacts in developing countries in implementing its commitments mentioned in Article 3, paragraph 1 of the Kyoto Protocol in the inventory submission in 2010. The Ministry of Trade and Industry will provide the information needed for this reporting.

4. Procedural arrangements

4.1. Quality management

The objective is that the inventories produced by the Finland's National Greenhouse Gas Inventory System and the reporting on them are of high quality. High quality means that the greenhouse gas inventory is in compliance with the requirements and produces for the Parties to the Framework Convention on Climate Change in usable form the information needed about Finland on its advancement in fulfilling the obligations to the Convention and the Kyoto Protocol. The information needs of the EU's monitoring mechanism of greenhouse gases are also met.

The starting point for accomplishing high quality for the greenhouse gas inventory is consideration of the expectations and requirements directed to the inventory. The inventory principles, that is, transparency, consistency, comparability, completeness, accuracy and timeliness, are dimensions of the quality for the inventory and form the set of criteria for assessing it.

The quality of the inventory is ensured in the course of the compilation and reporting. The requirements, principles and elements rising from international agreements and guidelines are integrated directly into the institutional and functional as well as practical solutions of Finland's greenhouse gas inventory system, i.e. into its organisation and processes. Explicit inventory documentation produces the required proof on the functionality of the inventory system and its compliance with existing requirements for the Parties to the UNFCCC and the Kyoto Protocol, and for the collaboration between EU Member States.

In addition, the consideration of the specific requirements of the guidelines concerning greenhouse gas inventories, production of a high-quality inventory is supported by the application of the principles and elements stated in the general standard for quality management systems ISO 9001:2000, that facilitates international comparability of the quality management of Finland's greenhouse gas inventory system.

As the National Authority, Statistics Finland is responsible and has the resources for the co-ordination of the quality management measures for the partners of the National System and for the quality management of the greenhouse gas inventory at the national level. The inventory working group is established to advance communication between the inventory unit and the expert organisations in charge of the different sectors. An electronic quality manual including guidelines, annual plans, templates, documentation of methodologies and work processes and checklists of QA/QC procedures supports the co-ordination of the inventory quality management. An extranet application for information exchange between the partners of the National System and the inventory unit's Internet pages open to the public have also been introduced.

Specific functions of the National System

Sections 12 to 17 of the guidelines for national systems (UNFCCC Decision 20/CP.7 and Kyoto Protocol Decision 19/CMP.1) list the specific functions related to the inventory planning, preparation and management to be performed by the national system, which will assist in the attainment of the objectives set for the national systems and in the performance of their general functions (see 1.2).

Practical quality management solutions made in Finland's Greenhouse Gas Inventory System are based on the accomplishment of the specific functions of the national systems. The quality management activities aim for a robust inventory process and for systematic, continuous, fact-based improvement of the inventory.

The quality management activities are a management tool for the inventory unit, which directs and steers Finland's greenhouse gas inventory system to fulfil the specific functions defined for national systems to produce an inventory meeting the requirements. Quality management comprises practical solutions with which

- a systematic inventory process is established, where the inventory planning stage is followed by the inventory preparation, evaluation and improvement stages
- planned inventory evaluations (basic review / extensive review) are made – in accordance with the guidelines, preferably by an independent party – before the submission of the inventory
- the inventory is documented and archived according to the requirements
- partners of the inventory system and their responsibilities and tasks in the inventory process are itemised
- standards for the inventory quality requirements (transparency, consistency, comparability, completeness, accuracy and timeliness) are set annually in the inventory planning stage and they are recorded as the quality objectives of the inventory

- quality assurance and quality control activities to be made during the inventory processes required for attaining the quality objectives are planned and they are recorded as the quality control/quality assurance plan
- compliance with the IPCC guidelines and good practice is ensured in identification of the key categories, preparation of emission estimates, uncertainty assessment, recalculations and in quality control and quality assurance implementation
- planned general Tier 1 level quality control procedures are performed
- for key categories and categories, where significant methodological changes have occurred, the Tier 2 level quality control procedures are applied, where possible.
- the review processes of the inventory are enabled
- the inventory and the inventory process are improved continuously on the basis of reviews, and experience and factual knowledge gained, and e.g. quality control checks and quality assurance evaluations in order to meet the set quality objectives.

4.2. Reporting of the annual inventory

The UNFCCC and the EU's greenhouse gas monitoring mechanism require Finland to submit annually a National Inventory Report (NIR) and Common Reporting Format (CRF) tables. The reported data indicate consistently the emissions during the year before the last (x-2).

The organisation of the preparation and reporting of Finland's greenhouse gas inventory and the duties of its different parties are detailed in the previous section (3). The expert organisations acting as the parties to the inventory system are in charge of the inventory data of the reporting sectors according to the reporting protocols. Statistics Finland as the National Authority compiles from the data produced by expert organisations national reports meeting the requirements of the UNFCCC, the Kyoto Protocol and the EU's monitoring mechanism and submits them to the UNFCCC Secretariat and to the European Commission.

The preparation of the annual inventory follows the schedule of the reporting. In the EU's monitoring mechanism the national inventory from the year (x-2) is submitted to the Commission by 15 January. Member States may complement and update their submission by 15 March. The joint EU inventory is compiled from the Member States' submissions and it is supplied to the UNFCCC Secretariat by 15 April. The Commission uses the inventory data submitted annually by Member States also when evaluating the progress of the Community towards the set greenhouse gas emission objectives. Finland's final greenhouse gas inventory for the year (x-2), identical with the data submitted to the Commission by 15 March, is submitted to the UNFCCC Secretariat by 15 April.

Table 2. Reporting of Finland's annual greenhouse gas inventory to the EU's monitoring mechanism and to the United Nations Framework Convention on Climate Change

Function	Reporting	Time period
Submission of the CRF tables and the National Inventory Report(NIR)	The EU's greenhouse gas monitoring mechanism / European Commission	15 January
Submission of updated and complementary inventory data and the final NIR	The EU's greenhouse gas monitoring mechanism / European Commission	15 March
Submission of the CRF tables the National Inventory Report (NIR)	UNFCCC, Kyoto Protocol / UNFCCC Secretariat	15 April

4.3. Quality management process

The compilation and reporting for the annual inventory consist of four main stages: planning, preparation, evaluation and improvement.

The quality management of inventory is a continuous process (Fig. 2) that starts from the consideration of the inventory principles presented in the UNFCCC and in the EU's decision on a mechanism for monitoring community greenhouse gas emissions, that is, transparency, consistency, comparability, completeness, accuracy and timeliness. In addition, the principle of continuous improvement is included. The setting of concrete annual quality objectives is based on this consideration. The next step is elaboration of the QA/QC plan and implementing the appropriate quality control measures (e.g. routine checks, documentation) focused on meeting the quality objectives set and fulfilling the requirements. In addition, the quality assurance procedures are planned and implemented. In the improvement phase of the inventory, conclusions are made on the basis of the realised QA/QC process and its results.

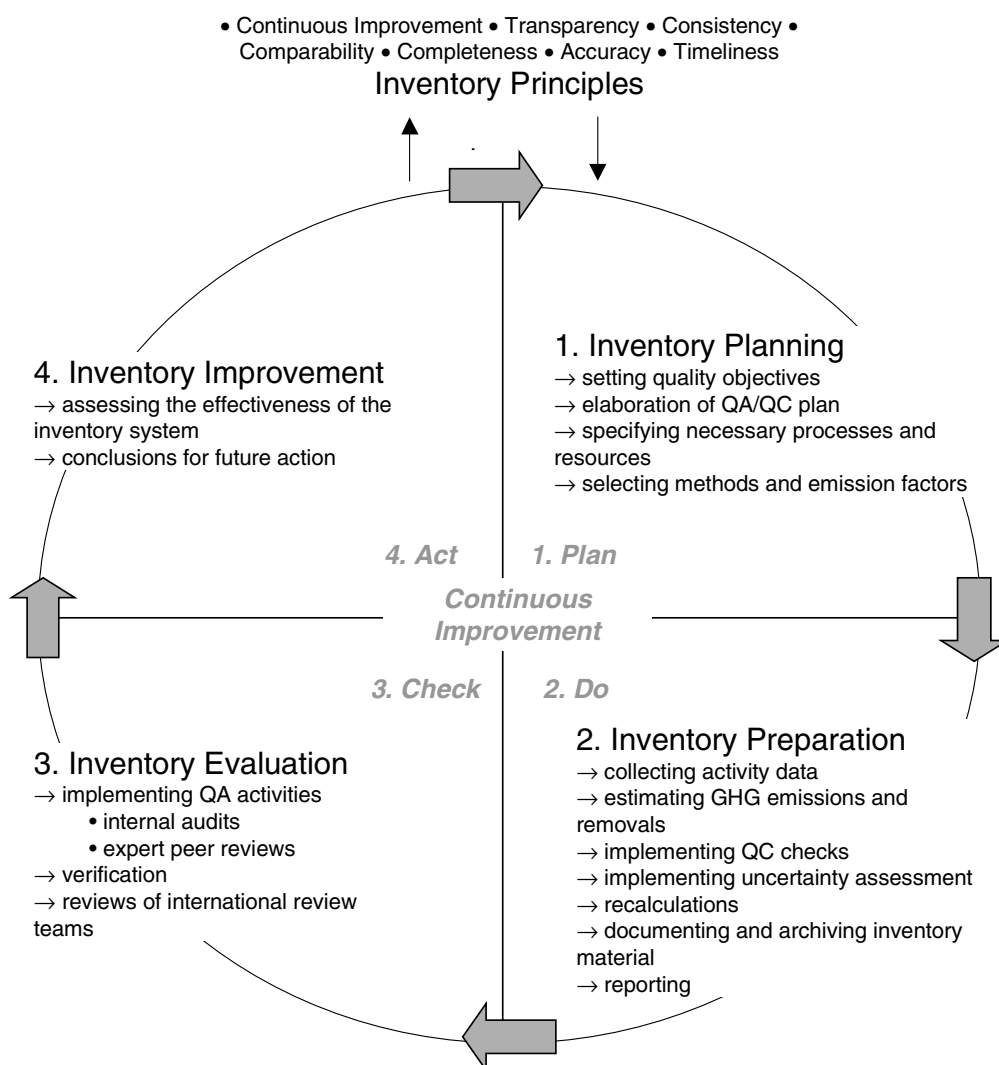


Figure 2. Quality management process of the Finnish greenhouse gas inventory.

Inventory planning

At the inventory planning stage the methodological and organisational solutions for the coming inventory round are made, the resources are reserved for the inventory work and the schedules are decided. In addition, the inventory quality objectives are set and the inventory quality assurance and quality control plans are made.

At the planning stage the inventory unit drafts an annual general plan for compilation of the inventory and supplies it to the expert organisations responsible for the calculation sectors. The annual general plan for inventory compilation specifies the schedules for the coming inventory round and the procedures of the inventory unit in the compilation and reporting of the inventory. In addition, the quality objectives relating to the entire inventory are recorded in the plan, as are the planned quality control checks and quality assurance evaluations.

Inventory preparation

The inventory preparation stage comprises inventory calculation and compilation, the quality control checks and uncertainty assessments performed during it according to the quality control plan. In addition, the stage also includes the production and archiving of internal documentation for the calculation and reporting on the inventory results.

Inventory Quality Control (QC) is a set of routine technical activities to measure and supervise the quality of the inventory as it is being prepared. The purpose of quality control is to provide routine and consistent checks to ensure data integrity, correctness and completeness, to identify and address errors and omissions, and to document and archive the inventory material and record all QC activities.

The quality control activities comprise general (Tier 1) methods, such as accuracy checks on data acquisition and calculation and the use of approved standardised procedures for emission calculations, measurements, estimating uncertainties, archiving information and reporting. The general inventory QC procedures concern all the source categories of Finland's greenhouse gas inventory and also the total inventory.

The general inventory QC checks and the related procedures are in accordance with Table 8.1 of the IPCC Good Practice Guidance.

In addition to general QC checks, category specific QC checks (Tier 2) are applied for the key categories and categories with significant changes in the methodology or source data. These category specific QC activities comprise technical reviews of the source categories, activity data, emission factors and methods.

The CRF tables are produced as a result of the inventory preparation stage. Expert organisations supply the estimates and other data needed in the CRF tables using the CRF Reporter (as sector experts) to the inventory unit in accordance with the reporting protocols. The inventory unit compiles the sectoral data in the CRF Reporter (as the inventory compilers) and produces the full set of the CRF tables. The inventory preparation stage also involves production of the contributions concerning inventory documentation to be compiled into the National Inventory Report (NIR). Once the inventory calculations are completed, the expert organisations update the sections of the National Inventory Report to take into account any changes and recalculations by CRF category and information on planned inventory improvement measures. The inventory unit compiles the contributions and complements it with the updates in the general parts (summaries, description of trends, key category analyses, uncertainties of the whole inventory and other general cross-cutting issues).

Inventory evaluation

The quality assurance activities of the inventory recorded in the QA/QC plan are performed at the inventory evaluation stage.

Quality Assurance (QA) required of the inventory comprises a planned system of review procedures. Where possible, the review should be made by personnel not directly involved in the inventory compilation process. The reviews preferably by an independent third party should be performed after the implementation of QC procedures to the finalised inventory.

The goal of the inventory QA procedures is to verify that quality objectives are met, to ensure that the inventory represents the best possible estimate of emissions and sinks given the current state of scientific knowledge and data available, and to support the effectiveness of the QC programme.

The inventory QA system comprises actions, which differ from one another in their viewpoints and timings: internal self-evaluations, peer reviews, audits, data verifications, system reviews by an independent party and international reviews.

In **internal self-evaluations** experts in their specific calculation sectors and the inventory unit on the level of whole inventory examine the actual activity and results attained and compare them with the objectives set and the plans made.

Peer reviews are performed by an external expert or expert group, where the reviewers are experts in other calculation sectors of the greenhouse gas inventory system or external experts.

In the **audits** made by the inventory unit, the representative of the unit reviews the activity and results of a certain calculation sector. The audit can be directed to topical or otherwise important factors (documentation and archiving of the calculation, recording of changes, compliance with the QA/QC plan, etc.).

Emission and activity data are **verified** by comparing them with other available data compiled independently of the greenhouse gas inventory system.

In **system audits** the conformity of the inventory quality management system is evaluated objectively to the requirements of the ISO 9001 standard. System audits are conducted by external auditing organisations.

The review teams co-ordinated by the UNFCCC Secretariat carry out **international reviews** of the inventory according to the annual schedule after the submission of the annual inventory report. The reviews may take the form of written reviews (centralised or desk reviews) produced in September or October, or expert reviewer team visits to locations (in-country reviews) according to a separately agreed schedule. The National Authority co-ordinates the participation of the parties to the Finland's greenhouse gas inventory system in the reviews, as well as responses to the issues raised by the expert review teams. The expert review teams produce yearly an independent review report on Finland's greenhouse gas inventory.

Documentation and archiving

Inventory documentation consists of inventory data and metadata (data explaining the calculated estimates). This information is summarised in the National Inventory Report.

Documentation has a key role in inventory quality management. Meeting the requirement on the transparency of the inventory necessitates systematic documentation and it enables external evaluation of the inventory. The documentation aims to facilitate replication of the inventory during the review process, should it be necessary. Documentation also stands as evidence of compliance and functionality of the National System. In addition, continuous, fact-based improvement of the inventory is steered by an analysis of the materials accumulated during the inventory process.

The inventory documentation system consists of the following document types:

1. The *basic documents of the National System* that are produced, updated and archived by the National Authority according to Statistics Finland's archiving system (the system is described below):
 - description of Finland's Greenhouse Gas Inventory System
 - reporting protocols
 - agreements and orders related to the calculation
 - quality manual.
2. The annual *inventory process documents by reporting sector*, which are produced, updated and archived in the expert organisations responsible for the sectors according to the reporting protocols, such as:
 - primary material for the calculation
 - internal documents for the calculation.
3. The whole *inventory level documents* of the annual inventory process, which are produced, updated and archived in the inventory unit according to Statistics Finland's archiving system.
 - the general plan for compiling the inventory
 - internal documents for compiling the inventory
 - the set of CRF tables and the National Inventory Report (NIR)
 - the inventory improvement plan.

The main archives of the greenhouse gas inventory unit are at Statistics Finland. The main archive's purpose is to fill the specific functions mandated in the guidelines for national systems (Decision 19/CMP.1, paragraphs 16 and 17): it holds all important data, models and documentation needed in inventory development. Being situated in a single location, it aims to facilitate efficient review of the inventory, and fast responses to questions posed by expert review teams during reviews. The greenhouse gas inventory unit has prepared a plan for archive creation that describes the records being archived and the manner they are preserved. According to the plan, the archival takes place in May each year, after completion and submission of the inventory. This is when paper copies and electronically archived data are

handed to the Library of Statistics, a division of Statistics Finland responsible for the preservation of records. In addition to the guidelines for national systems, Statistics Finland need to comply with general record management duties laid down in Finnish legislation (for instance, the Archives Act 831/1994).

In addition to the main archive, the expert organisations have archives located in their own facilities. The expert organisation's archival procedures are described in the sector-specific chapter of the Finland's national inventory report. Typically, these organisations keep records of the calculations and related data on hard disks of the experts' desktop workstations, with copies on backed up network servers. Also electronic copies on CD-ROMs are produced. Some of the expert organisations have implemented their archival procedures according to their own archive creation plans, with designated record identification numbers and systems for electronic storage and retrieval of records.

Uncertainty assessments and key category identification

UNFCCC reporting guidelines on annual inventories set the requirement for quantitative uncertainty assessment of all data used in the inventory. In practice, the IPCC Good Practice Guidance outlines the methods and reporting formats for this task. Uncertainties of the base year and the most current year emission levels are estimated, as well as the uncertainty of the emissions trend (defined as percentage change between the two years).

Results of the uncertainty assessment are used in identifying so-called key categories. These categories are important, by definition, in terms of the level or the trend of emissions. Thus, the assessment of uncertainties has an important role in planning inventory improvements.

The national application of the Tier 2 method to estimate uncertainties outlined in the IPCC Good Practice Guidance were developed by the Technical Research Centre of Finland (VTT). VTT also performed the uncertainty assessment until in 2005, when this task was transferred to Statistics Finland. Further development of the VTT uncertainty model (the KASPER model) is done at Statistics Finland. This is necessary since the inventory is continuously improved and developed.

The key category analyses are done according to the requirement in the UNFCCC Guidelines, using the IPCC Tier 2 methodologies. The results of the key categories are reported in the annual inventory submissions. The results of the key category analyses are used in prioritising improvements of the inventory, choice of methodologies including and in implementing QA/QC activities.

Inventory improvement

In the inventory improvement stage conclusions are made on the measures needed to improve the inventory based on the observations of the inventory evaluation stage of the quality management process, key category analyses obtained through uncertainty assessments, the review feedback received from the UNFCCC Secretariat on the previous inventory, and other accumulated data, e.g. issues raised in the QC checks or international or bilateral comparisons.

The improvement of the greenhouse gas inventory aims to develop calculation and reporting of the inventory so that the inventory fulfils the quality objectives set for it and to produce reliable estimates of the emissions of greenhouse gases in the different emission categories.

Statistics Finland co-ordinates the development of the inventory's different sectors. Each expert organisation has the primary responsibility for the development of its own sector. The advisory board of the inventory handles horizontal development projects and the resources needed for development.

The expert organisations record the planned inventory improvement measures into the source-specific sections of the National Inventory Report. Statistics Finland compiles yearly an inventory improvement plan for the whole inventory. In addition to the improvement measures by CRF category the inventory improvement plan includes horizontal inventory development projects, and those located at the interfaces of different reporting sectors. The advisory board considers the inventory improvement plan before starting the next inventory round.

The development of the inventory typically contains the following procedures, which can be separate or partly overlapping:

- methodological revisions
- new data sources
- updating of emission factors
- reallocation of emissions
- inclusion of missing emission sources in the calculation

– improvement of documentation.

Implementation of inventory improvements requires resources (funding, expertise and time). Especially the development of new data collection systems, estimation methodologies or country-specific emission factors are often very resource consuming in all mentioned aspects.

Examples significant investments in inventory improvements undertaken in recent years are the research programme on “Greenhouse gas emissions from the use of peat and peatlands in Finland (2001 - 2005) and the review and measurement project to improve the CH₄ and N₂O emission factors from fuel combustion (2004 - 2005). The results have improved the accuracy and quality of the inventory significantly.

4.4 *Recalculations*

Recalculations are to done to implement methodological improvements in the inventory, including changes in activity data collection and emission factors, to include new source or sinks categories in the inventory, or to correct for identified errors, omissions, overlaps, or inconsistencies in the time series.

Recalculations are based on the annual evaluation of the inventory preparation and improvement needs, including input from the QA activities and UNFCCC reviews. Methodological changes are discussed and evaluated in the inventory working group and advisory board before being implemented. The implemented changes are documented in CRF Reporter and the National Inventory Report in accordance with the IPCC good practice reports and the UNFCCC Guidelines. Reasoning for the recalculations is given and the implications are estimated. The changed estimates are peer reviewed and validated to the extent possible. Changes in methodologies are implemented for the whole times series. When data needed in the recalculations are available only for the inventory year, or a number of recent years, the time series are recalculated using the methods given IPCC good practice reports on recalculation techniques. The changes will be reflected in the reporting protocols and agreements between Statistics Finland and the participating expert organisations, as necessary.

Recalculations due to correction for errors, omissions, overlaps, or inconsistencies in the time series are always encouraged. The inventory unit should be informed of any recalculation done and its reasons. The documentation is done in the CRF Reporter and the National Inventory Report as mentioned above.

References and sources

Commission Decision of 10 February 2005 laying down rules implementing Decision 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol (2005/166/EC).

IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2000.

IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry, 2003.

Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

UNFCCC Decision 20/CP.7 and Kyoto Protocol Decision 19/CMP.1. Guidelines for national systems under Article 5, Paragraph 1, of the Kyoto Protocol.

UNFCCC Decision 22/CP.7 and Kyoto Protocol Decision 15/CMP.1. Guidelines for the preparation of information required under Article 7 of the Kyoto Protocol.

UNFCCC Decision 18/CP.8. and Decision 13/CP.9. Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I. UNFCCC Reporting guidelines on annual inventories.

UNFCCC Decision 14/CP.11. Tables on the common reporting format for land use, land-use change and forestry.

VTT 2003: Monni Suvi & Syri Sanna. Uncertainties in the Finnish 2001 Greenhouse Gas Emission Inventory. VTT Research Notes 2209.

VTT 2004: Monni, Suvi. Uncertainties in the Finnish 2002 Greenhouse Gas Emission Inventory, VTT Working Papers: 5.

ANNEX

Reporting protocols for the greenhouse gas inventory in Finland

A. Point Sources, Stationary Combustion

Scope and definitions

Point sources are defined as combustion of fuels in stationary combustion plants, including e.g. power plants, district heating plants, industrial boilers and other industrial combustion units and processes.

Point sources belong to the following branches of industry:

C 10–14 Mining and quarrying

D 15–37: Manufacturing

E 40: Electricity, gas and steam and hot water supply.

CRF reporting categories

Emissions from point sources are reported in CRF categories

1.A.1. Energy Industries

1.A.2. Manufacturing Industries and Construction

Organisation and responsibilities

The responsible unit for the calculation is Statistics Finland.

Estimation methods

Emissions from point sources are calculated using the ILMARI calculation system of Statistics Finland.

Emissions are calculated at as detailed a level as possible using company, site, plant, boiler and process-specific data obtained from various sources. Emission data are partly reported directly by companies, partly calculated from fuel consumption. The calculation is consistent with the IPCC Tier 2 approach. All emission components that are reported to the UNFCCC (CO₂, CH₄, N₂O, CO, NMVOC, NO₂ and SO₂) are calculated using the same system and same level of detail.

Data sources and responsible organisations

The most important information sources are the Regional Environment Centres' VAHTI database, Statistic Finland's statistics on energy consumption and energy production, and statistics compiled by federations in the energy sector.

Annual schedule

Calculation of emissions from point sources begins in August and is completed by the end of October. The calculation depends on the completion of annual data input in the VAHTI database, where the target schedule is the beginning of June. In practice, checking of unit-specific data and acquisition of additional information requires around 2 to 3 months.

B. Mobile Sources

Scope and definitions

Mobile sources include road transportation, aviation, navigation, railways and drivable and moveable working machinery. Vehicles of civil transportation belong to this protocol irrespective of the branch by which they are used or owned.

CRF reporting categories

Emissions from mobile sources are reported in CRF categories

- 1.A.3.a. Civil Aviation
- 1.A.3.b. Road Transportation
- 1.A.3.c. Railways
- 1.A.3.d. Navigation
- 1.A.3.e. Other transportation / Other off-road machinery

1.A.2.f. Manufacturing Industries and Construction / Construction machinery

- 1.A.4.c. Other sectors /Agricultural machinery
- 1.A.4.c. Other sectors / Forest machinery
- 1.A.4.c. Other sectors / Fishing vessels

International Bunkers / Aviation
International Bunkers / Marine

Organisation and responsibilities

VTT performs the emission calculation of transportation as an outsourced service, and obtains emission data on aviation from Finavia. Statistics Finland is responsible for integrating the results as part of the reporting to the UNFCCC and total energy balance, and for co-ordination of the calculation.

The results from the model of each transport mode are collected into VTT's LIPASTO model. The summary results needed for the inventory are fed into the ILMARI calculation system at Statistics Finland.

Evaporation of fuel from cars is calculated at VTT from data on traffic performance. The emission data are sent to the Finnish Environment Institute, where they are integrated as part of the calculation of Protocol G and reporting in the CRF category 1.B.2.a. (Fugitive Emissions from Fuels / Oil, NMVOC).

The calculation models by transport mode and the responsible organisations are

- ILMI, civil aviation / Finavia
- MEERI, navigation / VTT
- RAILI, railways / VTT
- LIISA, road transportation / VTT
- TYKO, off-road machinery / VTT
- International bunkers / Statistics Finland

Estimation methods

Emission calculation of mobile sources is performed using a specific calculation model for each mode of transportation. The calculation models are based on the measured traffic performance of each form of transport or, where such data are unavailable, on estimated traffic performances and data on vehicle stock.

The calculation is mainly consistent with the IPCC Tier 2 and Tier 3 approaches.

All emission components that are reported to the UNFCCC (CO₂, CH₄, N₂O, CO, NMVOC, NO₂, and SO₂) are calculated using the same system.

For detailed description of the calculation see: <http://lipasto.vtt.fi/indexe.htm>

Data sources and responsible organisations

In addition to calculations performed at VTT and CAA, the following data sources are used in the inventory:

- Finnish Road Administration: datafile of traffic performance on public roads from the national road register (separate query from the register)
- Finnish Maritime Administration : port traffic service data, fuel consumption of ice-breakers, fishing vessels (previously recorded by the Ministry of Agriculture and Forestry)
- State Provincial Office of Western Finland: data on leisure boats from the boat register (separate query from the register)
- VR Ltd: datafile of gross tonne kilometres by rail section

Responsible organisations for the other data sources used in the calculation:

- Cities of Helsinki, Espoo and Vantaa: street traffic performance
- Traffic Information Centre: forecasts on car sales
- Finnish Oil and Gas Federation: statistics on sales of liquid fuels
- Statistics Finland: vehicle file from the vehicle register

Annual schedule

The calculations using the LIPASTO model are performed by the end of March (in the year following the calculation year), when the ILMI data also have to be available.

The schedule for the LIPASTO calculations demands acquisition of the main data (traffic performance, stock) during February.

Projections done in 2000 are used in the calculation for off-road machinery (TYKO). Because the data change very little annually the calculation is updated only periodically (at intervals of a few years) under a separate assignment.

The data are sent to Statistics Finland by the end of August.

C. Other Fuel Combustion

Scope and definitions

Other fuel combustion includes, e.g., fuels used for space heating in different sectors (agricultural, residential, commercial, institutional, etc), fuels used by the defence forces and coastguard, and other non-specified use of fuels.

Other fuel combustion also includes statistical corrections of total fuel consumption.

CRF reporting categories

Emissions from other fuel combustion are reported in CRF categories

1.A.4. Fuel Combustion Activities / Other sectors

1.A.5. Fuel Combustion Activities / Other

All emission components that are reported to the UNFCCC (CO₂, CH₄, N₂O, CO, NMVOC, NO₂, and SO₂) are calculated using the same system and the same level of detail.

Data sources and responsible organisations

The responsible unit for the calculation is Statistics Finland.

Estimation methods

Emissions from other fuel combustion are calculated using the ILMARI calculation system of Statistics Finland based on fuel consumption figures. The availability of fuel consumption statistics for the purpose of annual energy statistics determines the level of detail used in the calculation.

The calculation is mainly consistent with the IPCC Tier 1 approach.

Data sources and responsible organisations

The main data sources for the calculation are those of energy statistics. The most important ones are statistics on fuel consumption or fuel sales compiled by federations in the energy sector, Statistics Finland's model for the calculation of energy for space heating, data on the building stock and on the fuel use of different types of military vehicles and equipment.

Annual schedule

Emission calculation of other fuel combustion is done during autumn and has to be completed by the end of October. The calculation depends on the completion of other fuel consumption data (Protocols A and B) and annual energy statistics.

D. Fugitive Emissions from Fuels

Scope and definitions

In Finland, fugitive emissions comprise emissions from oil refinery, storage and distribution of oil products and distribution and transmission of natural gas.

CRF reporting categories

Fugitive emissions from energy production and distribution are reported in CRF categories

- 1.B.1. Fugitive Emissions from Fuels / Solid fuels (Not occurring at present)
- 1.B.2. Fugitive Emissions from Fuels / Oil and natural gas

The emission compounds to be reported include direct greenhouse gases (CO₂, CH₄, N₂O) and non-methane, volatile organic compounds (NMVOC). Calculation of NMVOCs comes under Protocol G.

Data sources and responsible organisations

The responsible unit for the calculation is Statistics Finland.

Estimation methods

The calculation is consistent with the IPCC Tier 1 approach.

Data sources and responsible organisations

The calculation is based on the energy statistics of Statistics Finland and on a separate, plant-specific data collection.

Annual schedule

The data is produced by the end of October.

E. Emissions from Industrial Processes

Scope and definitions

Emissions from industrial processes mean non-combustion emissions from industrial processes.

CRF reporting categories

Emissions from industrial processes are reported in CRF categories

2(I).A. Industrial processes / Mineral Products

2(I).B. Industrial processes / Chemical Industry

2(I).C. Industrial processes / Metal Production

2(I).D. Industrial processes / Other Production

The emission components that are reported are direct greenhouse gases (CO₂, CH₄, N₂O) and sulphur compounds (SO₂).

Data sources and responsible organisations

The responsible unit for the calculation is Statistics Finland.

Estimation methods

Emissions are calculated using a simple equation: emission = activity data * emission factor. Either production or consumption data are used as activity data. The emission factors are IPCC defaults or country or plant-specific factors.

The calculation is consistent with the IPCC Tier 1 and Tier 2 approaches.

Data sources and responsible organisations

The calculation is based on Statistics Finland's statistics on manufacturing and partly on a separate, plant-specific data collection. In respect of sulphur compounds, the main data source is the Regional Environment Centres' VAHTI database.

Annual schedule

The data have to be ready by the end of October.

F. Emissions of F-gases

Scope and definitions

Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) are F-gases.

CRF reporting categories

Emissions of F-gases are reported in the following categories:

- 2.C. Industrial processes/ Metal production
- 2.F. Industrial processes/ Consumption of Halocarbons and SF₆

Category 2.F is divided into several sub-categories (see Data sources below).

The complete list of the F-gases in the CRF tables can be found in a report of Teemu Oinonen: Finnish 2002 Inventory of HFC, PFC and SF₆ Emissions. The report is available on the Internet at: <http://www.environment.fi>, keyword FE686.

Organisation and responsibilities

The F-gases emission inventories are compiled at the Chemicals division of the Finnish Environment Institute.

Estimation methods

The methods used in the inventory are described in detail in the earlier mentioned report. The inventory uses the Tier 1a, Tier 1b and Tier 2 methods. The Chemicals division of the Finnish Environment Institute provides annually a full description of how the emission inventory has been compiled for the five main sources (refrigeration, foam blowing, aerosols, electrical equipment and other).

Data sources and responsible organisations

The data used in the F-gases emission inventory are obtained directly from corporate entities, which numbered altogether 800 in the inventory of the year 2003.

The vast majority of the information is collected from companies in the refrigeration business. Other data sources are the metal and electric industries (magnesium die casting and semiconductor manufacturing), electrical engineering (gas insulated switchgear and circuit breakers), plastics industry (foam products, etc.) and companies importing other products (for instance, refrigerants and refrigeration equipment, extinguishing agents in fixed fire fighting systems, shoes).

Annual schedule

Preparations for the data collection are started in December and the F-gases emission inventory is finished by the end of June. The information is sent to Statistics Finland in September.

G. Emissions of Non-energy NMVOCs (Non-methane volatile organic compounds)

Scope and definitions

In this protocol, non- methane volatile organic compounds refer to emissions of NMVOCs developed in sectors other than energy combustion. The emissions of NMVOCs from fuel consumption are presented in protocols A to C.

CRF reporting categories

Data on NMVOC emissions are reported in the following CRF categories:

- 1.B.2. Fugitive Emissions from Fuels / Oil and Natural Gas

- 2.A. Industrial processes / Mineral Products
- 2.B. Industrial processes / Chemical Industry
- 2.C. Industrial processes / Metal Production
- 2.D. Industrial processes / Other Production

- 3.A. Solvent and Other Product Use / Paint Application
- 3.B. Solvent and Other Product Use / Degreasing and Dry Cleaning
- 3.C. Solvent and Other Product Use / Chemical Products, Manufacture and Processing
- 3.D. Solvent and Other Product Use / Other

Organisation and responsibilities

The NMVOC emission inventories are compiled at the Environment Management division of the Finnish Environment Institute.

Evaporation of fuel from cars is calculated at VTT from data on traffic performances. The emission data are sent to the Finnish Environment Institute, where they are integrated into the calculation of this protocol and reporting in the CRF category 1.B.2.a. (Fugitive Emissions from Fuels / Oil, NMVOCs).

Estimation methods

Due to the incoherence of the emissions sector, many different methods are used in the inventory.

Data sources and responsible organisations

Emissions are calculated at as detailed a level as possible using the following data sources:

- Regional Environment Centres' VAHTI database (point sources)
- Questionnaires to companies (non-VAHTI companies are asked for information on their chemical and product use or emissions)
- Industry federations (data on products or emissions)
- Customs statistics
- Expert institutes

Annual schedule

The NMVOC inventory is started with questionnaires in June and is completed by the middle of November. The inventory is dependent on the completion of annual data input in the Regional Environment Centres' VAHTI database. Completion of the inventory (acquiring and checking the data, and the calculation itself) takes about three months.

H. Emissions from Agriculture (non-combustion emissions)

Scope and definitions

The Emissions from Agriculture sector includes CH₄ emissions from enteric fermentation of domestic livestock and from manure management, and N₂O emissions from manure management and agricultural soils.

Agricultural emissions do not include combustion emissions

CRF reporting categories

Agricultural emissions are reported in the following CRF categories:

- 4.A. Enteric Fermentation (reported gas: CH₄)*
- 4.B. Manure Management (reported gases: CH₄ and N₂O)*
- 4.D. Agricultural Soils (reported gas: N₂O)*
- (4.F. Field Burning of Agricultural Residues, not reported)*

Organisation and responsibilities

Agrifood Research Finland (MTT)

Estimation methods

Emissions from agriculture are calculated with the model developed by the Technical Research Centre of Finland (VTT) (Microsoft Excel).

Calculation of agricultural emissions follows the IPCC guidelines. Tier level 2 methods are in use in calculating emissions from Enteric Fermentation and CH₄ emissions from Manure Management (Cattle). Other emission sources are calculated by using Tier level 1 methods.

Emission factors are mainly IPCC default factors.

Detailed documentation on annual calculation processes under the MTT's reporting responsibility will be delivered to Statistics Finland.

Data sources and responsible organisations

Activity data used in calculations is received mainly from the following information sources:

- Publications of the Ministry of Agriculture and Forestry (Yearbook of Farm Statistics, Maataloustilastotiedote and Tietokappa) and the Matilda database. The information received annually from these data sources include animal numbers (excluding horses), crop yields, volume of N fertilisers sold annually and fat content of milk.

Other information sources used in calculations:

- Finnish Trotting and Breeding Association (Suomen Hippos) (number of horses)
- Finnish Environment Institute, VAHTI database of Finland's environmental administration (amount of N from sewage sludge applied annually to fields)
- Pro Agria (agricultural expert organisation in Finland) (annual milk production of dairy and mother cows, length of pasture season, weights (cattle), daily weight gain, mature weight)
- MTT Environmental Research (area of cultivated organic soils)

- Literature (distribution of different manure management systems, N excretion in manure during the year)

Annual schedule

Collection of data begins in May and data will be delivered to Statistics Finland by the 15 November.

I Emissions from Land Use and Land Use Changes

Part Ia. Responsibilities of the Finnish Forest Research Institute (Metla) in the Reporting to the United Nations Framework Convention on Climate Change

Scope and definitions

In the reporting to the United Nations Convention on Climate Change, the Finnish Forest Research Institute is responsible for reporting greenhouse gas emissions and removals from Land Use, Land Use Changes and the Forestry Sector from the following IPCC land use categories and land use changes as agreed with Agrifood Research Finland (MTT):

- Forest land
- Cropland
- Grassland
- Wetlands
- Settlements
- Other land

Starting from the 2006 inventory submission, area data from the different land-use categories and land-use changes between them will mainly be based on data by the IPCC classification of the National Forest Inventory (NFI). Additionally, the data registers of the Information Centre of the Ministry of Agriculture and Forestry and the total land area statistics of the National Land Survey of Finland will be utilised.

Greenhouse gas emissions and removals are reported for all the land use categories and for the following carbon pools as applicable: aboveground biomass, belowground biomass, litter, dead wood and soil.

CRF reporting categories

Forest Land 5A

5.A.1 Forest land remaining Forest land

5.A.2 Land (cropland, grassland, wetlands, settlements or other land) converted to Forest land

Cropland 5B

5.B.1 Cropland remaining Cropland (MTT is responsible for soil estimates)

5.B.2 Land converted to Cropland (Metla is responsible for tree biomass estimates) (reported gas: CO₂)

Grassland 5C (MTT is responsible for soil estimates)

5.C.1 Grassland remaining Grassland (reported gas: CO₂) (MTT is responsible for soil estimates)

5.C.2 Land (forest land, wetlands, settlements) converted to Grassland (Metla is responsible for tree biomass estimates, if notable)

Wetlands 5D

5.D.1 Wetlands remaining Wetlands (optional so far, possible soil estimates)

5.D.2 Land (forest land, cropland, grassland, settlements, other land) converted to Wetlands (including estimates from peat production)

Settlements 5E

5.E.1 Settlements remaining Settlements (optional so far, possible area estimates)

5.E.2 Land (forest land, wetlands, cropland, grassland, other land) converted to Settlements (tree biomass estimates, if notable)

Other Land 5F

5.E.1 Other land remaining Other land (area estimates)

5.E.2 Land (forest land, wetlands, settlements) converted to Other land (tree biomass estimates, if notable) (Rare in Finland)

Aggregate estimates for all conversions of land to a specific land use category may be reported when data are not available for reporting them separately.

In addition, the Finnish Forest Research Institute is responsible for the reporting of the following data required in the CRF tables 5(I) – 5(V):

5(I) Direct N₂O emissions from N fertilisation on forest land

5(II) N₂O emissions from drainage of soils (optional so far)

5(V) Biomass burning (if notable)

Organisation and responsibilities

The Finnish Forest Research Institute (Metla)

Estimation methods

Changes in carbon pools from the above mentioned land use categories will be calculated in accordance with the IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry (IPCC GPG LULUCF). The estimation methods used are mainly consistent with the GPG LULUCF Tier level 2 and 3 methods. Metla produces emission estimates using the data currently available. The estimates and methods will be revised and improved, as new data become available. Detailed documentation about the annual calculation processes under Metla's reporting responsibility will be delivered to Statistics Finland.

Biomass (below- and aboveground)

National method, Tier level 3 method (either biomass models or biomass expansion factors). Tree biomass exists on forest land and to a small extent on the wetlands that do not meet the criteria of Forest land. Metla is also responsible for the biomass estimates of forested former croplands.

Litter

Forest land: Tier level 2 and 3 methods. (At the moment there are only methods for the humus layer, while production models for stand canopy litterfall and ground vegetation litterfall are under preparation).

Dead wood

Forest land: Tier level 3 method

Soil

Tentative plan for Forest land: Tier level 2 and 3 methods. Measured data on the amount of organic carbon in the mineral soil of the sample plots of the NFI can be used as input data to derive regression equations relating soil carbon concentration to the NFI variables, or the dynamic soil model Yasso can be used. Reporting can also be done for Wetlands.

Data sources and responsible organisations

Biomass: (below- and aboveground): NFI, information provided by sampled roundwood purchasers, Metla is responsible for the calculations.

Dead wood: NFI, Metla is responsible for the calculations.

Litter: NFI, expert estimates, separate measurement data (or IPCC default emission factor if Tier level 1 method is chosen), Metla is responsible for the calculations.

Soil: NFI, Metla is responsible for the calculations.

Stock changes in litter, deadwood and soil carbon pools are calculated and reported with the Yasso model (Liski et al. 2004). Dead wood and plant matter calculated from the forest inventory data will be used as input data for the Yasso model (Peltoniemi et al. 2004, Integrated 2004). Application of methods for the reporting is in progress. The methods will be ready to be applied to the inventory submission of 2006 (data for the year 2004).

Stock changes in litter and soil pools on drained peatlands are calculated with the help of litterfall input derived from forest resource (inventory) data, and emission factors produced in the research programme "Greenhouse impacts of the use of peat and peatlands in Finland".

Stock change of dead wood pool on peatlands is calculated in a way similar to the one used for mineral soils.

Annual schedule

Activity data of harvest removals will be collected during the preceding year and forest resource (inventory) data between 1 May and 15 October. The data from the preceding year will be calculated by the end of September. The calculation results will be entered into the CRF tables during October and delivered to Statistics Finland by 15 November.

Reporting under the Kyoto Protocol (Articles 3.3 and 3.4)

The Finnish Forest Research Institute will prepare for the reporting of emissions and removals under Article 3.3 and elected activities under Article 3.4 of the Kyoto Protocol. The details of the reporting methodology have not been outlined in a reporting protocol yet.

Part Ib. Responsibilities of Agrifood Research Finland (MTT) in the Reporting to the United Nations Framework Convention on Climate Change

Scope and definitions

In the reporting to the United Nations Convention on Climate Change, Agrifood Research Finland is responsible for reporting greenhouse gas emissions and removals from Land Use, Land Use Changes and the Forestry Sector from the following IPCC land use categories and land use changes as agreed with the Finnish Forest Research Institute (Metla):

- Forest land
- Cropland
- Grassland
- Wetlands
- Settlements
- Other land

Starting from the 2006 inventory, the submission of area data from the different land use categories and the land use changes between them will mainly be based on data on the IPCC classification of the National Forest Inventory (NFI). Additionally, the data registers of the Information Centre of the Ministry of Agriculture and Forestry and total land area statistics of the National Land Survey of Finland will be utilised.

Greenhouse gas emissions and removals are reported for all the land use categories and for the following carbon pools as applicable: above ground biomass, below ground biomass, litter, dead wood and soil.

CRF reporting categories

Cropland 5B

5.B.1 Cropland remaining cropland (soil estimates)

5.B.2 Land (grassland, wetlands, settlements, forest land) converted to Cropland (soil estimates) (reported gas: CO₂) (Metla is responsible for tree biomass estimates)

Grassland 5C

5.C.1 Grassland remaining Grassland (reported gas: CO₂)

5.C.2 Land (cropland, wetlands, settlements, forest land) converted to Grassland (soil estimates) (reported gas: CO₂) (Metla is responsible for tree biomass estimates)

Settlements 5E

5.E.2 Land (cropland, grassland) converted to Settlements (reported gas: CO₂)

Other land 5F

5.F.2 Land (cropland, grassland) converted to Other land (reported gas: CO₂)

Aggregate estimates for all conversions of land to a specific land use category may be reported when data are not available for reporting them separately.

In addition, Agrifood Research Finland is responsible for the reporting of the following data required in the CRF tables 5(III) – 5(V):

5(III) N₂O emissions from disturbance associated with land use conversion to cropland

5(IV) Carbon emissions from agricultural lime application

(5(V) Emissions from biomass burning from the area of the MTT's reporting responsibility (i.e. cropland, grassland) are marginal and are not currently reported in the Finnish inventory)

Organisation and responsibilities

AgriFood Research Finland, (MTT) (Environmental Research, Soils and Environment)

Estimation methods

Changes in carbon pools from the above mentioned land use categories will be calculated in accordance with the IPCC Good Practice Guidance for Land Use, Land Use Changes and Forestry (GPG LULUCF). The estimation methods used mainly correspond with the GPG LULUCF Tier level 1 and 2 methods. Initially, Tier level 1 methods are used in the calculations, while Tier level 2 methods can be introduced if more national data come available. Detailed documentation about the annual calculation processes under the MTT's reporting responsibility will be delivered to Statistics Finland.

CO₂ emissions arising from carbon stock changes in soil (mineral soil, organic soil, liming) are calculated in the Cropland category. In addition, N₂O emissions from land conversion to cropland are calculated.

The MTT does not produce emissions estimates from tree biomass stock changes. As agreed, Metla produces CO₂ emissions estimates from tree biomass stock change, if notable. Carbon stock changes in biomass (annual plants), litter and dead wood will not be reported.

Data sources and responsible organisations

Cropland 5.B

5.B.1 Cropland remaining Cropland (reported gas: CO₂)

Soil:

Mineral soil:

- IPCC method, Tier level 1, GPG LULUCF as data source.
- Mineral soils are divided into activity classes, with default reference carbon stock for each activity class, MTT or GPG LULUCF as data sources.

Organic soil:

- IPCC method, Tier level 1, GPG LULUCF as data source
- The total area of cultivated organic soils is divided into different vegetation zones, MTT as data source
- National emission factors

Liming:

- Amount of lime applied to fields annually, data source the Finnish Liming Association
- Emission factor, GPG LULUCF as data source

Biomass (below- and aboveground):

Change in belowground biomass will not be reported, change in aboveground biomass will be reported, Metla will produce stock change estimates of tree biomass, where notable.)

5.B.2 Land converted to Cropland

Soil: See 5.B.1 Cropland remaining Cropland

Biomass: Change in aboveground biomass will be reported, if notable, Metla will produce stock change estimates of tree biomass, if notable.

Grassland 5C

5.C.2 Land (cropland, wetlands, settlements, (forest land: soil)) converted to Grassland (reported gas: CO₂)

Soil: See 5.B.1 Cropland remaining Cropland

Biomass: Change in aboveground biomass will be reported, if notable, Metla will produce stock change estimates of tree biomass, if notable)

Settlements 5E

5.E.2 Land (cropland, grassland) converted to Settlements (reported gas: CO₂)

Soil: See 5.B.1 Cropland remaining Cropland

Biomass: Change in above ground biomass will be reported, if notable, Metla will produce stock change estimates of tree biomass, if notable)

IPCC default value: aboveground biomass after conversion is zero

Other Land 5F

5.E.2 Land (cropland, grassland) converted to Other land (reported gas: CO₂)

Soil: Soil carbon stock on land converted to Other land has IPCC default value of zero after conversion

Biomass: Change in aboveground biomass will be reported, if notable, Metla will produce stock change estimates of tree biomass, if notable.

5(III) N₂O emissions from disturbance associated with land use conversion to cropland

- IPCC method, Tier level 1, IPCC GPG LULUCF as data source
- C/N ratio, IPCC default value or national value
- IPCC default or national emission factor

5(IV) Carbon emissions from agricultural lime application

- Amount of lime applied to fields annually, data source the Finnish Liming Association.
- Emission factor, GPG LULUCF as data source.

Annual schedule

- Collection of activity data, 1 May-30 September.
- Entering data into the CRF tables and updating of the NIR (to be agreed with Metla), 1 October-31 October. Delivery to Statistics Finland by 15 November.

J. Emissions from Waste Treatment

Scope and definitions

Emissions from solid waste disposal on land are calculated in this category. Emissions from the burning of waste in landfills do not occur in Finland.

Emissions from waste incineration with energy recovery are reported in the energy sector and the reporter is Statistics Finland. Waste incineration without energy does not occur in Finland.

The waste sector includes also CH₄ and N₂O emissions from municipal (domestic) and industrial wastewater handling plants and uncollected domestic wastewater. The N₂O emissions generated from the nitrogen input of fish farming are also included in the Finnish inventory.

CRF reporting categories

Emissions of waste management are reported in the following CRF categories

6.A. *Waste / Solid Waste Disposal on Land*

6.B. *Waste / Waste Water Handling*

6. C *Other /Composting*

Organisation and responsibilities

The emission inventories from waste treatment are compiled at the Environment Management division of the Finnish Environment Institute.

Estimation methods

Emissions from landfills

The method used to calculate methane emissions is called FOD (First Order Decay, Tier 2) which considers delay times in the forming of methane emissions. The emission sources include solid waste disposal sites containing solid municipal, industrial, construction and demolition wastes, and municipal (domestic) and industrial sludges which contain biologically decomposable carbon.

NMVOC emissions are estimated from documented records.

Emissions from wastewater treatment

The method corresponds to the IPCC Guidelines with one exception; methane emissions from wastewater and sludge treatment are calculated using combined activity and emission factor data. The emissions from sludge disposal on land are estimated and reported in the Solid waste disposal on land (landfills) subsector.

Emissions from composting

The method is based on the 2006 IPCC Guidelines (Tier 1).

Data sources and responsible organisations

Emissions from landfills:

The activity data used in the calculation are derived from the Regional Environment Centres' VAHTI database and from the Finnish Biogas Plant Register (Kuittinen & Huttunen 2004).

For the beginning of the 1990s, the disposal data (amount and composition) on industrial, construction and demolition waste are based on the surveys and research by Statistics Finland (Vahvelainen & Isaksson 1992; Isaksson 1993; Puolamaa et al. 1995) and the Technical Research Centre of Finland VTT (Perälä & Nippala 1998; Pipatti et al. 1996).

Before the year 1990, waste amounts are estimated based on the method given in the report of VTT (Tuhkanen 2002).

Emissions from wastewater treatment:

The activity data used in the calculation are derived from the Regional Environment Centres' VAHTI database directly or as revised by the Environment Management division.

Emissions from composting:

The activity data used in the calculation are derived from the Regional Environment Centres' VAHTI database directly or as revised by the Environment Management division.

Annual schedule

The waste inventory with checkings is carried out during autumn and is finalised by the beginning of November. The inventory is dependent on the completion of annual data input in the Regional Environment Centres' VAHTI database. Completion of the inventory (acquiring and checking of the data, and the calculation itself) takes about two months.

K. Other Emissions

Scope and definitions

This protocol comprises all emission sources not mentioned earlier. The contents and definitions will be reviewed as improvements are made to the inventory.

CRF reporting categories

Emissions from the use of nitrous oxide in different sectors are reported in the CRF category 3 Solvent and other product use

Emissions from use of fuels in the non-energy sector are currently reported in the CRF category 7, Other. The objective is to revise the estimates in the near future so that they can be reported in the CRF categories 2(I) A–D.

Organisation and responsibilities

The responsible unit for the calculation is Statistics Finland.

Estimation methods

There are no specific Tier methods for this category. Emissions are calculated by combining available plant level data and statistics on total amounts. The method is comparable to the Tier 1 and Tier 2 methods of other emission sources.

Data sources and responsible organisations

The calculation is based on the energy and manufacturing industry statistics of Statistics Finland and on a separate, plant-specific data collection. In future, other data sources will be included if necessary.

Annual schedule

The data is produced by the end of October.