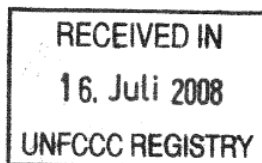


HELLENIC REPUBLIC
MINISTRY FOR THE ENVIRONMENT, PHYSICAL PLANNING
& PUBLIC WORKS
DIRECTOR GENERAL OF ENVIRONMENT



¹⁶
Athens July 16, 2008
Ref: 1367

To: Mr Feng Gao
Secretary to the Compliance Committee
UNFCCC Secretariat

Fax: +49 228 815 1999

E-mail : compliance.committee@unfccc.int
FGao@unfccc.int

Dear Sir,

The Ministry for the Environment Physical Planning and Public Works, in accordance with the final decision of the Enforcement Branch of the compliance Committee of 17 April 2008, submits the plan required by paragraph 18 of the above decision. The plan describes measures to ensure the maintenance of the national system through transitions and arrangements to support an in-country review by the expert review team of the new national system of Greece , coordinated by the secretariat in conjunction with a review of an annual inventory report generated by this national system.



IOANNIS VOURNAS

Director General

cc :

1. Ministry for the Environment
Office of Deputy Minister
Mr St. Kaloyannis
2. Elpida Politi
National Focal Point



HELLENIC REPUBLIC
MINISTRY FOR THE ENVIRONMENT,
PHYSICAL PLANNING AND PUBLIC WORKS

SUBMISSION OF GREECE TO THE COMPLIANCE COMMITTEE
PLAN UNDER SECTION XV OF ANNEX TO DECISION 27/CMP.1

IN ACCORDANCE WITH FINAL DECISION
OF THE ENFORCEMENT BRANCH
CC-2007-1-8/GREECE/EB/17-4-2008

ATHENS,
JULY 2008

PLAN UNDER SECTION XV OF ANNEX TO DECISION 27/CMP.1

TABLE OF CONTENTS

| | |
|---|------------------|
| <i>1. Introduction – Analysis of the causes of non-compliance</i> | <i>3</i> |
| <i>2. National GHG Inventory System</i> | <i>6</i> |
| <i>2.1. General description of the system</i> | <i>6</i> |
| <i>2.2 Roles and Responsibilities</i> | <i>10</i> |
| <i>2.2.1. Ministry for the Environment, Physical Planning & Public Works</i> | <i>10</i> |
| <i>2.2.2 National Technical University of Athens (NTUA) – School of Chemical Engineering</i> | <i>14</i> |
| <i>2.2.3 Government agencies and ministries, international associations, individual private or public industrial companies</i> | <i>16</i> |
| <i>2.3. GHG emissions inventory preparation process</i> | <i>20</i> |
| <i>2.4. Quality assurance – Quality control system</i> | <i>26</i> |
| <i>2.5. National GHG Inventory System Assessment</i> | <i>31</i> |
| <i>3. In-country review of the National System of Greece</i> | <i>34</i> |

1. Introduction – Analysis of the causes of non-compliance

The Ministry for the Environment, Physical Planning and Public Works (henceforth Ministry for the Environment, MINENV) is the governmental body responsible for the development and implementation of environmental policy in Greece. Moreover, according to the Law 3017/2002, with which Greece ratified the Kyoto Protocol, the Ministry for the Environment is responsible for the co-ordination of all ministries involved, as well as of any relevant public or private organization, for the implementation of the provisions of the Kyoto Protocol. The Ministry for the Environment has also been designated competent authority for the implementation of the Kyoto Protocol flexible mechanisms.

In this context, the Ministry for the Environment has the overall responsibility for the national GHG inventory, and the official consideration and approval of the inventory prior to its submission.

Till the beginning of 2007, the entities participating in the system, apart from the Ministry for the Environment which was designated as the national entity for the GHG inventory, were:

- the National Observatory of Athens (NOA), assigned on a contract basis by the Ministry for the Environment the technical responsibility for the compilation of the annual inventory
- other ministries of the Greek government and relevant public or private organizations that were involved in the inventory preparation process.

Since early 2007, taking the advantage of the experience gained during the past years, the Ministry for the Environment, started an effort to further enhance the reliability of the national GHG inventory system, in compliance with the guidelines for national systems under Article 5 /Paragraph 1 of the Kyoto Protocol (decision 19/CMP.1) and the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1), focused mainly on the continuity of the inventory preparation process and the assurance of the timely performance of the system, on enhancing the role of the Ministry in

the whole inventory process, on the institutional, legal and procedural arrangements among the responsible government agencies and other entities, and the technical competence of the staff involved.

The ERT visited Greece the last week of April 2007, thus the in-country review of Greece coincided with this transitional period of the country's effort for reorganisation and improvement of the national system.

The ERT, during its visit, was able to assess the organisation of the National System as described in the Initial Report of Greece submitted in December 2006, and the last submitted GHG inventory. However due to the coincidence of the above-mentioned reorganisation, the ERT concluded in its report FCCC/IRR/2007/GRC/28-12-07, that the national system of Greece does not fully comply with the guidelines for national systems under Article 5, paragraph 1 of the Kyoto Protocol and the guidelines for the preparation of the information required. In particular, it concluded that the maintenance of the institutional and procedural arrangements; the arrangements for the technical competence of the staff; and the capacity for timely performance of Greece's national system is an unresolved problem, and therefore listed it as a question of implementation.

The Hellenic Ministry for the Environment submitted written comments on the report to the UNFCCC Secretariat on the 28th of December 2007, which together with the report were forwarded to the Compliance Committee.

The Enforcement Branch of the Compliance Committee decided to proceed with the question of implementation, and following the expedited procedures contained in section X of Decision 27/ CMP.1, Greece submitted a written submission on the 26th of February 2008 and requested a hearing, which was held during the Enforcement Branch meeting of 4-5 March 2008, with the presence of the Deputy Minister for the Environment and the General Director for the Environment of Greece.

During the hearing, in addition to the information contained in the submission of 26 February, 2008, of the actions taken to address the unresolved problems led to the question of implementation, Greece made a detailed presentation to the Enforcement Branch about the legal, institutional and procedural arrangements in place to ensure the continuation and

enhancement of the national system, together with the presentation of its overall strategy in order to comply with its KP target.

The enforcement branch's preliminary finding, CC-2007-1-6/Greece/EB/6-3-08, although acknowledging the progress reported, stated that the information submitted and presented was not sufficient for the enforcement branch to conclude that the question of implementation has now been fully resolved. It also stated that, a further in-country review of Greece's new national system, in conjunction with a review of an annual inventory report generated by this national system, is required for the enforcement branch to assess present compliance with the guidelines.

Greece forwarded to the enforcement branch a further written submission on 8 April 2008, where, in addition to those already mentioned in the submission of 26 February, 2008, and the detailed presentation to the Enforcement Branch, informed the Branch about

- (a) the assurance of the completeness and timely submission of the inventory through the internal EU coordination.
- (b) the timely submission of the 2008 GHG inventory to the UNFCCC Secretariat, as a self-approval of the maintenance of the system, the technical competence of the staff, and the capacity for timely performance of the national system.
- (c) the conclusion of the transfer of knowledge from the National Observatory of Athens (NOA) to the Climate Team of the Ministry for the Environment and the National Technical University of Athens (NTUA) with a seminar.

The above information was also confirmed by the representatives of Greece to the meeting of the Enforcement Branch on 16-17 April 2008, when the final decision was adopted.

The final decision CC-2007-1-8/Greece/EB/17-4-08, confirmed the preliminary finding, and Greece was declared to be in non-compliance, and not eligible to participate in the mechanisms. Also, as a consequence, Greece has to develop a plan referred to in paragraph 1 of section XV, which it submits herewith.

2. National GHG Inventory system

In the report named “Written Submission of Greece under Section X of Annex to Decision 27/CMP.1”, submitted in February 2008 to UNFCCC secretariat, a description of the Greek National GHG Inventory System was presented. Aspects as the roles and responsibilities of stakeholders and players involved, the inventory preparation process, QA/QC issues and implemented and / or planned improvements of the system were described. In the next sections a description of the new organization structure of the system is given, focusing on the outcomes of this new structure. Key points of interest are the knowledge transfer from the previous to the present structure, the development of capacity within the Ministry for Environment and the ability of the new system for transparency and timely performance.

2. 1 General Description of the System

The Ministry for the Environment, Physical Planning and Public Works (henceforth Ministry for the Environment, MINENV) is the governmental body responsible for the development and implementation of environmental policy in Greece, for the provision of information concerning the state of the environment in compliance with relevant requirements defined in international conventions, protocols and agreements, and the environmental *acquis communautaire*. Moreover, the Ministry for the Environment is responsible for the co-ordination of all ministries involved, as well as of any relevant public or private organization, in relation to the implementation of the provisions of the Kyoto Protocol according to the Law 3017/2002 with which Greece ratified the Kyoto Protocol. The Ministry for the Environment has also been designated competent authority for the implementation of the Kyoto Protocol flexible mechanisms.

In this context, the Ministry for the Environment has the overall responsibility for the national GHG inventory, and the official consideration and approval of the inventory prior to its submission. (National UNFCCC Focal point: Elpida Politi, Address: Villa Kazouli, 241 Kifissias Street, e-mail: epoliti@ekpaa.gr, tel.: +30210 8089275, fax: +30210 8089239).

Since early 2007, the Ministry for the Environment, started an effort to further enhance the reliability of the national GHG inventory system in compliance with the guidelines for national systems under Article 5 /Paragraph 1 of the Kyoto Protocol (decision 19/CMP.1) and the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1), focusing mainly on:

- the enhanced role of MINENV in the inventory planning, preparation and management.
- the institutional, legal and procedural arrangements necessary to perform the functions relating to inventory planning, preparation and management, specified by the decision 19/CMP.1, among the responsible government agencies and other entities,
- the capacity of timely performance of the system,
- the technical competence of the staff involved in the inventory development process,
- the continuity of the inventory preparation process and knowledge management issues.

The organisational structure of the national inventory system with re-defined roles and responsibilities of the entities participating in it is presented in Figure 1. The entities participating in it are:

- The **Ministry for the Environment** designated as the national entity responsible for the national inventory, which keeps the overall responsibility, but also plays a more active role in monitoring the work of the technical consultant for the inventory planning, preparation and management, and overseeing the operation of the GHG national system.

- **The National Technical University of Athens (NTUA) / School of Chemical Engineering**, which has the technical and scientific responsibility for the inventory planning, preparation and management of all sectors, as a technical consultant of the Ministry.
- **Governmental agencies and ministries, international associations, along with individual private industrial companies.** The involvement of these entities is not limited to data providing but also concerns methodological issues as appropriate. However, the technical consultant (NTUA) is responsible for the final decision concerning methodological issues.

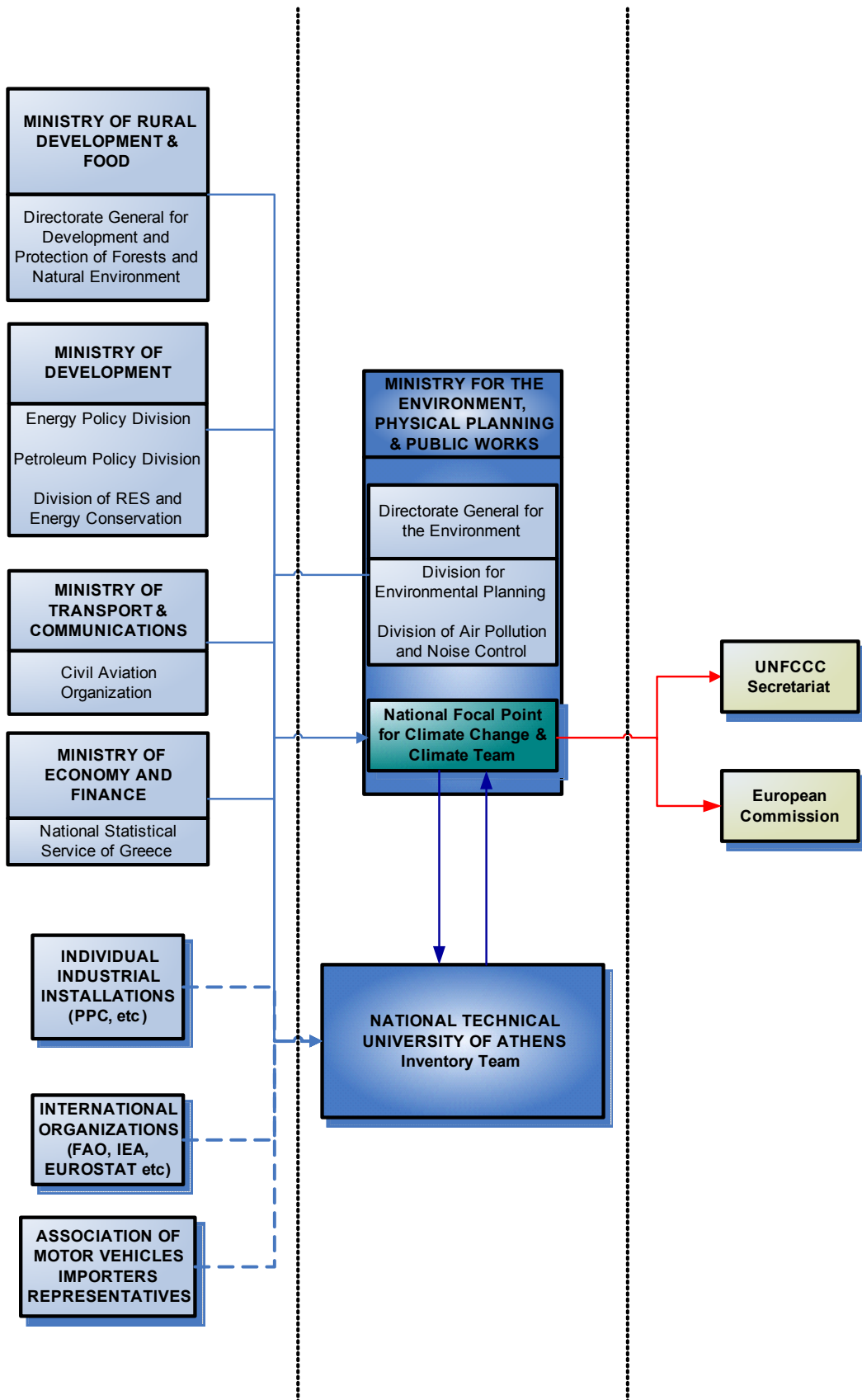


Figure 1. Organizational Structure of the National Inventory System

2.2. Roles and Responsibilities

The roles and responsibilities of the above-mentioned entities are as follows:

2.2.1 Ministry for the Environment, Physical Planning & Public Works

The Ministry for the Environment, as previously stated, is designated as the national entity with the overall responsibility for the national GHG inventory. Among its responsibilities are the following:

- The co-ordination of all ministries and governmental agencies involved, as well as any relevant public or private organization. In this context, it oversees the operation of the National System and decides on the necessary arrangements to ensure compliance with relevant decisions of the COP and the COP/MOP.
- The official consideration and approval of the inventory prior to its submission.
- The response to any issues raised by the inventory review process under Article 8 of the Kyoto Protocol, in co-operation with the technical consultant (NTUA Inventory Team), who has the technical and scientific responsibility for the inventory planning, preparation and management of all sectors, as mentioned above.
- The timely submission of the GHG inventory to the European Commission and to the UNFCCC Secretariat.
- The keeping of the Centralised Inventory File¹, which is delivered to the institute which has the technical responsibility for the inventory planning, preparation and

¹ See section 2.3.

management (currently NTUA) at the beginning of each inventory cycle. The inventory file is kept at the premises of MINENV (Inventory File contact person: Koromila Chryssoula).

- The administration of the National Registry. Greece cooperates with the Member states of the European Union and with the supplementary transaction log and the registry of the European Community by maintaining the national registries in a consolidated system. The administration of the registry is assigned to the National Center for the Environment and Sustainable Development, which reports to the Ministry of Environment and operates under the authority of the latter.

The role of the Ministry for the Environment is not narrowed to the co-ordination of the entities involved in the inventory process and to facilitate the activity data transfer from the data providers to the NTUA's Inventory Team. MINENV has an active role in monitoring and overseeing the inventory process through continuous communication and frequent scheduled and / or ad-hoc meetings with the Inventory Team of NTUA and the competent ministries or other agencies involved. For each inventory sector, a member of the MINENV's Climate team has been assigned as responsible for overseeing NTUA's inventory work and communication with other ministries and other data providing agencies. Furthermore, for expanding the overseeing role of MINENV in the inventory process, the supervision of QA/QC system is performed by Mr Alexandros Karavanas (QA/QC responsible) expert from the National Center for the Environment and Sustainable Development (NCESD), which is supervised by MINENV. The QA/QC responsible is not involved in the day-to-day inventory preparation and compilation. In co-operation with the scientific responsible of NTUA team and the NTUA inventory sector experts, he is responsible for the sound performance of the QA/QC system. (Contact details: Alexandros Karavanas, tel: +30210 8089271, Fax: +30210 8084707).

For the fulfillment of the above-mentioned roles and responsibilities of the ministry a five (5) member team was established, named the MINENV Climate Team, within the Ministry for the Environment, comprising experts with adequate technical and scientific background and experience. The major scope of this team is the development of capacity within the Ministry for Environment, concerning the GHG inventory preparation process and national

GHG system. The experts, personnel of the Ministry, comprising the team are the following :

1. Elpida Politi, National UNFCCC focal point, Co-ordinator
2. Sotiria Koloutsou, alternate Afroditi Kotidou
3. Moraiti Christina, alternate Lasaridis Klimis
4. Balas Dionisios, alternate Koromila Chryssoula
5. Efthymiou Nectaria, alternate Lytras Euthimios

Special attention was given for the complete and successful transfer of knowledge, appropriate data and supporting informative material from NOA, technical consultant of MINENV through 2007, to MINENV and NTUA. More specifically, according to its contract, NOA, the previous technical consultant of MINENV, has delivered all appropriate reports for EU and UNFCCC, as well as special reports dealing with the description and improvement issues of the National GHG Inventory System, the methodologies being used for the preparation of the reports, the working files etc. Thus, as concerns the period up to 2007, the following special reports have been delivered to MINENV and NTUA team.(available in Greek):

1. “Συμπλήρωση του υφιστάμενου συστήματος απογραφής εκπομπών / απορροφήσεων των αερίων που συμβάλλουν στο φαινόμενο του θερμοκηπίου”, Ιούνιος 2005 (Improvement of the National GHG System, June 2005).
2. “Έρευνα για τις δυνατότητες πιστώσεων εκπομπών και το κόστος ανάπτυξης μέτρων – καταγραφής – παρακολούθησης στο πλαίσιο των άρθρων 3.3 και 3.4 του Πρωτοκόλλου του Κιότο”, Δεκέμβριος 2005 (Investigation of the capabilities of Greece for removal credits from the implementation of Articles 3.3 and 3.4 of Kyoto Protocol. Cost of implementation of measures – monitoring mechanism, December 2005).
3. “Μεθοδολογία για τη Σύνταξη Απολογιστικών Εκθέσεων Αναφορικά με την Πρόοδο των Μέτρων Περιορισμού Εκπομπών / Ενίσχυσης Απορροφήσεων”, Ιούνιος 2005 (Methodologies for calculating Emissions Projections and assessing Policies and Measures impact, June 2005).

Moreover, the following calculation tools and databases (working files in excel format), covering all the sectors of the inventory and the whole inventory period, have been delivered to MINENV and NTUA team:

1. 5 working files for Energy sector:
 - Fuel combustion
 - Reference approach
 - Fugitive emissions
 - Road transport
 - International transport
2. 3 working files for Industrial processes and solvents sectors:
 - Industrial processes emissions
 - Solvents
 - Consumption of F-gases
3. 3 working files for Waste sector:
 - Domestic wastewater
 - Industrial wastewater
 - Solid waste
4. Agriculture sector (single working file)
5. 3 working files for LULUCF sector:
 - Forest Land
 - Cropland
 - Reporter
6. Key categories – Uncertainty Analysis working file.

In order to ensure a thorough knowledge transfer from NOA (previous technical consultant) to MINENV and NTUA (current technical consultant), several meetings and ad-hoc communication took place among the three Parties during the last months of NOA's contract. Finally, the whole process of knowledge transfer was completed with a two-days working meeting conducted on 20th and 21st of March 2008 at MINENV's premises. At this meeting, the data, methodologies, models and tools (working excel files, CRF reporter tool, etc) that were used by NOA for the GHG inventory preparation of the 2006

submission (years 1990-2004), along with the emissions projection tools, were extensively discussed between NOA, MINENV climate team and NTUA experts.

2.2.2 National Technical University of Athens (NTUA) – School of Chemical Engineering

The Ministry for the Environment has assigned, on a contract basis, the National Technical University of Athens (NTUA) / School of Chemical Engineering as the national institution that has the overall technical and scientific responsibility for the **planning, preparation and management of the annual national inventory (Inventory Team)**. In this framework, NTUA has the following responsibilities / tasks to fulfill for the GHG inventory preparation:

1. Data collection (activity data and emission factors) for all source / sinks categories that are Energy, Industrial Processes, Solvents and Other Product Use, Agriculture, Land Use, Land Use Change and Forest, and Waste.
2. Reliability check of input data through
 - ✓ the comparison of the same or similar data from alternative data sources and
 - ✓ time-series assessment in order to identify changes that cannot be explained.
3. Selection of the appropriate methodologies according to IPCC guidelines. GHG emissions estimates preparation by applying the methodologies and models having been selected.
4. Data processing and archiving. At the end of each cycle of the inventory preparation, all inventory related information is handled to the MINENV's employee responsible for keeping the Centralised Inventory File (member of the Climate Team), who in turn gives the latest version of all relevant files to the NTUA inventory team at the beginning of the next inventory cycle.
5. Assessment of the consistency of the methodologies applied, inventory improvement – recalculations.
6. Reliability check of results.

7. Key categories analysis.
8. Uncertainty assessment.
9. Preparation of Common Reporting Format (CRF) tables.
10. Preparation of National Inventory Report (NIR).
11. Reporting of the required information according to Article 3 of the Decision 280/2004/EC of the European Parliament and of the Council.
12. Preparation and keeping of Centralised Inventory File which is delivered to the Ministry for the Environment / Climate Team at the end of each inventory cycle.
13. Development of QA/QC procedures.
14. Implementing the QA/QC procedures under the supervision of MINENV.
15. Training the representatives of providing data agencies on inventory issues.

The NTUA co-operates with a number of government agencies and other entities for the preparation of the inventory (see next section). It should be mentioned that this co-operation is not restricted to data collection but it also concerns methodological issues as appropriate. However, the technical consultant (NTUA) is responsible for the final decision concerning methodological issues.

NTUA is also responsible in co-operation with MINENV's Climate Team to perform greenhouse gas balance projections in terms of sources and sinks as a minimum for the years 2010, 2015 and 2020, organized by gas and by sector, according to the national policies and measures adopted.

The names and contact details of the NTUA inventory team follows:

1. Prof. Ioannis Ziomas, Scientific responsible
Address: National Technical University of Athens, School of Chemical Engineering, Heroon Polytechniou 9, Zografos, 157 80 Athens, Greece.
E-mail : ziomas@chemeng.ntua.gr
Tel: +30 210 772 2358
FAX: +30 210 772 3155
2. Prof. Dimitris Marinos-Kouris

- E-mail : marinos@chemeng.ntua.gr
Tel: +30 210 772 3148
FAX: +30 210 772 3155
3. Athina Progiou, Dr Mechanical Engineer
E-mail: athenaproyou@axonenviro.gr
Tel: +30 210 8223083
Fax: +30 210 8238604
4. Ioannis Sempos (Sebos), Chemical Engineer, MBA, NTUA technical staff
E-mail : isebos@mail.ntua.gr
Tel: +30 210 772 3240
FAX: +30 210 772 3155
5. Spyridoula Ntemiri, Chemical Engineer, NTUA
E-mail : spyrdem@chemeng.ntua.gr
Tel: +30 210 772 3149
FAX: +30 210 772 3155
6. Leonidas Kallinikos, Chemical Engineer, NTUA
E-mail : leokalls@central.ntua.gr
Tel: +30 210 772 3240
FAX: +30 210 772 3155

It should be stressed that, when necessary, the above mentioned NTUA's Inventory Team is ad hoc supported by experts either from the NTUA or other institutions.

2.2.3 Government agencies and ministries, international associations, individual private or public industrial companies

The following government agencies and ministries, international associations, individual private or public industrial companies develop and maintain, within their terms of operation, data sets and emission methodology information necessary for the estimation of GHG emissions / removals. Most of these institutes have been used as sources of data since the first submission of greek GHG national inventory. However, new sources of

information are being sought both for further inventory development and improvement (higher Tier methodology usage) and quality control issues.

- The **Ministry for the Environment** provides information and data for Large Combustion Plants (fuel consumption, NO_x and SO₂ emissions – Department of industries), solid waste management (Department of Solid Waste Management) and domestic wastewater handling practices (Department of Water Resources). (Contact persons: Dimitris Chadjidakis, Macheras Ioannis, 147, Patission Street, 11251, Athens, Greece , tel.: +30210 8650053, fax: +30210 8646939)
- The **National Statistical Service of Greece, supervised by the Ministry of Economy and Finance**, represents the main source of information for the estimation of emissions / removals from most of the IPCC source / sink categories (contact person: Ioanna Papanagnou, 46, Pireos str. And Eponiton, 18510 Pireas, Greece, tel: +30210 4852045, fax: +30210 4852453, e-mail: papanag@statistics.gr, and Konstantina Katartzi).
- The **Ministry for Development**, is responsible for reporting and maintaining annual statistical data for energy consumption and production (more specifically: Energy policy division – Solid fuels and electricity; Petroleum policy division – Liquid and gaseous fuels; Division of RES and energy conservation – Renewable energy sources) as well as for providing those data to international organizations such as the International Energy Agency (IEA), the European Statistical Service EUROSTAT, etc (Contact persons: Constantinos Chatzigianakis, Director of Electricity production division, 119, Mesogeion Avenue, 10192, Athens, Greece, tel: +30210 6969450, fax: +30210 6969416, e-mail ChatzigianakisK@ypan.gr, and Xarikleia Piperopoulou, Director in the General Secretariat of Industry, 119, Mesogeion Avenue, 10192, Athens, Greece, tel: +30210 6965820, fax: +30210 6965829, e-mail: piperopouloux@ypan.gr).
- The **Ministry of Rural Development and Food** provides information and data (through the National Statistical Service of Greece which processes primary data

collected by the Ministry) for the main indices and parameters of rural economy (e.g. animal population, cultivated areas, crops production, etc.) and forestry. The GHG emissions / removals of LULUCF sector are prepared by NTUA inventory team by using the model that has been prepared by the previous technical consultant (NOA). As concerns the emissions / removals from activities under Article 3, paragraphs 3 and 4 of the Kyoto Protocol, the Ministry of Rural Development and Food is the responsible entity for the identification and measurement of areas of land subject to these activities and estimation of the respective emissions / removals. The above-mentioned activities are afforestation, reforestation and deforestation, which are mandatory according to Article 3.3, along with the elected one forest land management, according to Article 3.4. (Contact persons: Eirini Nikolaou, and Panagiotis Drougas, General Directorate of Forests, 31, Chalkokondili str., Athens, tel: +30210 2124728, fax: +30210 2125240122, e-mail: xa31u037@minagric.gr, xa31u025@minagric.gr).

- The **Ministry of Transport and Communications** provides information and data for the vehicle fleet and its technical characteristics. The Civil Aviation Organization, supervised by the Ministry of Transport and Communications, provides information on Landing and Take-off cycles for both domestic and international aviation (Contact persons: Anastasios Kokkinos, General Director of Civil Aviation Organisation, tel: +30210 8916555, fax: +30210 8983226 and Panagiotis Tselikas, tel: +30210 6508233. fax: +30210 6508200). Data from the **Association of Motor Vehicles Importers Representatives** are supplementary to the official data and are only used in cases where official data are temporarily not available. The above-mentioned data are used by NTUA experts for the preparation of GHG emissions. As concerns emissions from road transport the model COPERT III is being used.

- Data are also obtained from **International Organizations as the United Nations Food and Agricultural Organization (FAO)** from which data on the annual consumption of fertilizers are collected, the **EUROSTAT**, the **International Iron**

and Steel Institute, the International Energy Association. These data are supplementary to the data collected from the aforementioned data providers.

In GHG inventory submission of 2008, for the years 2005 and 2006, the verified emission reports of the installations covered by the emissions trading Directive, were first used, obtained from MINENV. The use of these reports will further improve the consistency, comparability and accuracy of the inventory.

Furthermore, individual industrial companies / installations, either public or private, as Power Public Corporation, cement plants, etc, constitute a data source for the GHG inventory preparation. However, these data are used supplementary to the above mentioned data sources (e.g. for QC).

As concerns the framework for the co-operation between the NTUA Inventory Team and the MINENV Climate Team and the other entities described above, is based on:

- a circular released by MINENV entitled “Structure of the National GHG Inventory- Roles and Responsibilities”
- written communication between MINENV’s deputy minister Mr Stavros Kalogiannis and his respective ministers of the other ministries involved.

The above-mentioned document includes a description of each entity’s responsibilities, concerning the inventory preparation, data providing or other relative information. This formal framework has improved the collaboration between the entities involved, assuring the timely collection and quality of the activity data required and solving data access restriction problems raised due to confidentiality issues. The appointment of the specific above-mentioned contact persons by the involved relevant ministries, as responsible to collaborate with the MINENV Climate Team and NTUA Inventory Team has definitely facilitated the inventory preparation process.

Moreover, another supporting action for the improvement of the inventory system, is the organization of working groups and/or training seminars for the representatives/contact persons of the entities involved in the inventory system. The implementation of this action is a responsibility of NTUA Inventory Team. Becoming familiar with the activity data and

information required and their impact on the quality, completeness and timely performance of the inventory, data providers will contribute to the minimization of time delays and the improvement of the quality of the data needed.

2.3. GHG emissions inventory preparation process

The preparation of the Greek GHG emissions inventory is based on the application of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, as elaborated by the IPCC good practice guidance.

Under the new structure of GHG inventory system presented in previous sections, the national inventory submission of 2008 has been timely completed (CRF tables delivered to UNFCCC secretariat on 7th of April 2008 and NIR report on 14th of April 2008). Furthermore, an estimation of GHG emission projections for years 2010-2020 and an assessment of policies and measures impact on GHG emissions reduction have been estimated for reporting according to Article 3 of the Decision 280/2004/EC of the European Parliament and of the Council (submitted on 1st June 2008). This work will serve as groundwork for the 5th national communication preparation process.

The compilation of the inventory is completed in three main stages (**Figure 2**), while the timetable for the completion of those stages in the annual inventory cycle is presented in **Figure 3**.

Stage 1: the first stage, performed by NTUA experts, consists of data collection and check for all source/sink categories,. The main data sources used are the National Statistical Service of Greece (NSSG), the government agencies involved and large private enterprises as described in section 2.2.3.

Quality control of activity data includes among others, the comparison of the same or similar data from alternative data sources (e.g. National Statistical Service of Greece and International Iron & Steel Institute for steel production) as well as time-series assessment in order to identify changes that cannot be explained. In cases where problems and/or inconsistencies are identified, the

agency's representative / contact person, responsible for data providing, is called to explain the inconsistency and/or help solving the problem. The quality control of activity data is performed by NTUA experts according to QA/QC procedure **AI 01** for the archiving of inventory information process, entitled "Centralised archiving of inventory information" (see Table 1).

Stage 2: After the completion of the check and verification of the input data reliability, emissions/removals per source/sink category are estimated by NTUA experts. This stage also includes the evaluation of the emission factors used and the assessment of the consistency of the methodologies applied in relation to the provisions of the IPCC Guidelines, the IPCC Good Practice Guidance and the LULUCF Good Practice Guidance. Finally, the NTUA team transform the emissions estimates to the format required by the CRF Reporter, by NTUA experts.

Quality control checks, when at this stage, are related to time-series assessment as well as to the identification and correction of any errors / gaps while estimating emissions / removals and filling in the CRF Reporter.

Stage 3: The last stage involves the compilation of the NIR and its internal (i.e. within NTUA) check. The **official approval procedure** follows for one month period of interactions between the Inventory Team (NTUA) and the Climate Team (MINENV), starting on the 1st of February of the year of submission. During this period, the NTUA Inventory Team has to revise the report according to the observations and recommendations of the Climate Team. On the basis of this interaction process, the final version of the report is compiled and then the Ministry for the Environment submits the NIR to the European Commission and to the UNFCCC Secretariat.

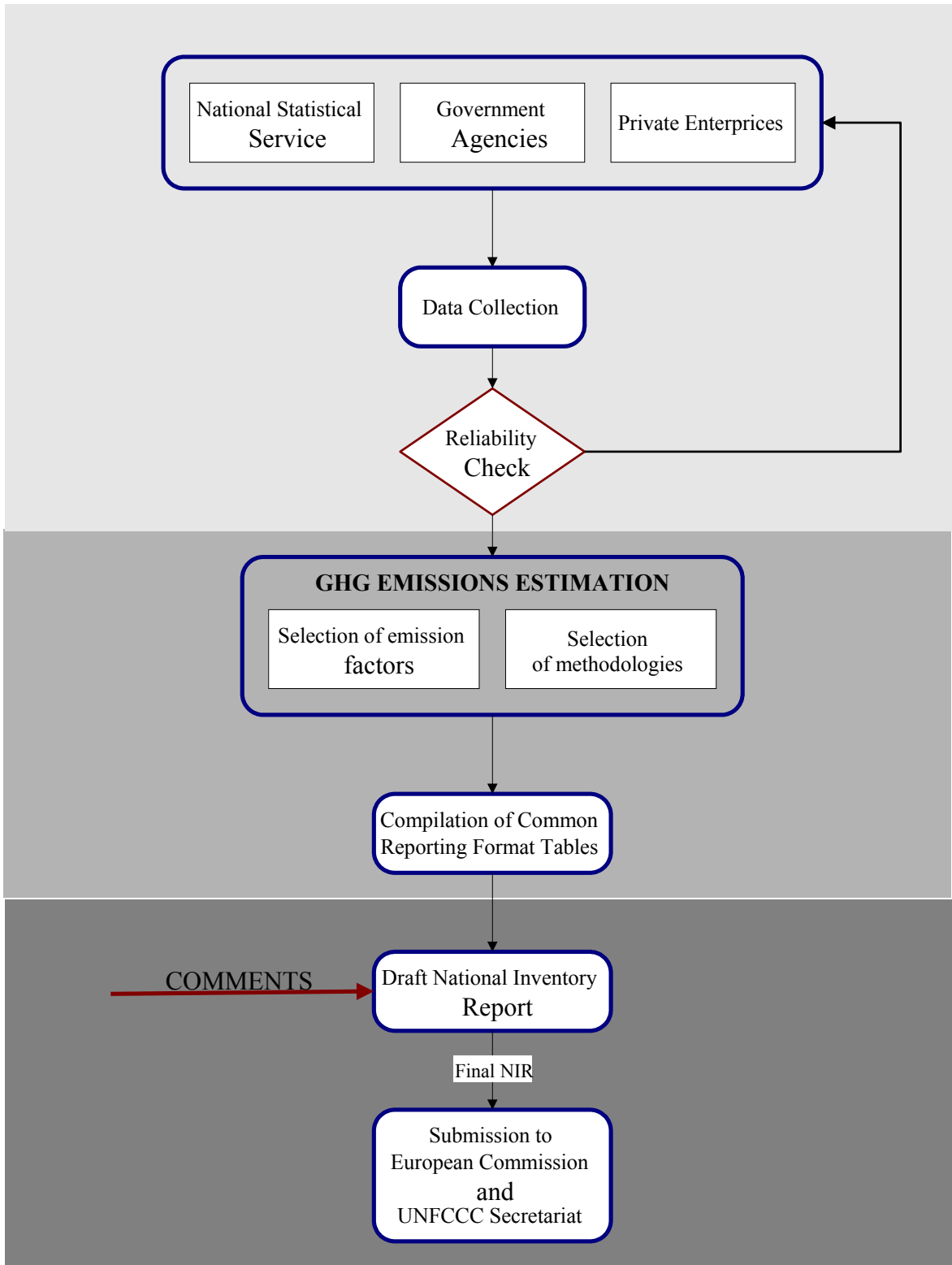


Figure 2. GHG emissions inventory preparation process in Greece

As shown in the timetable, the government agencies and ministries and the individual private or public industrial companies referred in section 3.3 should have collected and delivered to the MINENV Climate team and the NTUA inventory team the respective activity data needed for the inventory (for year X-2) and any changes in activity data for the period 1990 to year X-2, within the time period of May to November of year X-1 (X is the submission year of CRF tables and NIR referred to X-2 GHG emissions inventory).

The information related to the annual GHG emissions inventory (activity data, emission factors, analytic results, compilation in the required analysis level of the CRF tables) is stored in MS Excel spreadsheets.

In addition and within the context of the Quality Assurance/Quality Control system developed, two master files have been organized aiming at the systematic and safe archiving of inventory information: the Input Data File and the Centralised Inventory File.

- Each NTUA sector expert is responsible for the keeping of the Input Data File of his/her sector, which contains (in electronic format and/or hard copy) all input data and parameters that are necessary for the estimation of GHG emissions/removals. Input data are mainly activity data. Data are stored according to Quality Control Process procedure QC 04 entitled “Input data record keeping”.
- The Centralised Inventory File includes all information relevant to the GHG emissions/removals inventory. At the end of each stage of the inventory preparation, all inventory related information is handled to the person responsible for keeping the Centralised Inventory File (member of the Climate Team), who in turn gives the latest version of all relevant files (calculation files and NIR) to the Inventory Team at the beginning of the next inventory cycle.

More specifically the information stored in the Centralised Inventory File includes:

- All the reports, the Input Data Files of all sectors, the working files used for emissions/removals estimation, the working files containing the application models used, key categories and uncertainty estimation working files.
- Communication data.
- Final versions of the NIR.
- CRF tables in electronic format and a hard copy of the CRF tables for the last year covered by each submission.
- XML file and database of CRF reporter.
- Expert review reports.
- Any comments from the public review of the inventory.
- All the forms – documentation derived during the implementation of the QA/QC procedures.

2.4. Quality assurance – Quality control system

The development and the implementation of an inventory Quality Assurance / Quality Control (QA/QC) plan represents a key tool for meeting the objectives of National Systems under Article 5 Paragraph 1 of the Protocol as described in Decision 19/CMP.1.7.

With the Protocol's application, it is expected that the pressure upon national GHG emissions inventories will increase and therefore quality management would be essential to comply with the requirements of (a) producing transparent, consistent, comparable, complete and accurate emissions estimates, (b) establishing a reliable central archiving system concerning all necessary information for GHG emissions inventories development and (c) compiling national reports according to the provisions of the adopted decisions.

In this framework, a QA/QC system is being implemented since April 2004. It has been developed by the previous technical consultant (NOA) and is still being used by NTUA. A revision of the system is planned to be performed according to the experience that it will be gained from 2008 and 2009 submission. As mentioned above, the supervision of QA/QC system is performed by MINENV. The system is based on the ISO 9001:2000 standard and its quality objectives, as stated in the quality management handbook, are the following:

1. Compliance with the IPCC guidelines and the UNFCCC reporting guidelines while estimating and reporting emissions/removals.
2. Continuous improvement of GHG emissions/removals estimates.
3. Timely submission of necessary information in compliance with relevant requirements defined in international conventions, protocols and agreements.

The accomplishment of the above-mentioned objectives can only be ensured by the adaptation and implementation by all the members of the Inventory Team (see **Figure 4** for

the flow chart of activities concerning emissions inventory within the NTUA), of all the QA/QC procedures included in the plan for:

- ↪ data collection and processing,
- ↪ applying methods consistent with IPCC Good Practice Guidance and LULUCF Good Practice Guidance for calculating / recalculating emissions or removals,
- ↪ making quantitative estimates of inventory uncertainty,
- ↪ archiving information and record keeping and
- ↪ compiling national inventory reports.

The QA/QC system developed covers the following processes (see **Table 1** for the list of procedures within each process and **Figure 5** for the relationship between the processes and the activities of the inventory team):

- ↪ **QA/QC system management**, comprising all activities that are necessary for the management and control of the inventory agency in order to ensure the accomplishment of the above-mentioned quality objectives.
- ↪ **Quality control** that is directly related to the estimation of emissions and covers all inventory sectors. The process includes activities related to (a) data inquiry, collection and documentation, (b) methodological choice in accordance with IPCC Good Practice Guidance, (c) quality control checks for data from secondary sources and (d) record keeping.
- ↪ **Archiving inventory information**, comprising activities related to centralised archiving of inventory information and the compilation of the national inventory report.
- ↪ **Quality assurance**, comprising activities related to the different levels of review processes including the review of input data from experts, if necessary, and comments from the public
- ↪ **Estimation of uncertainties**, defining procedures for estimating and documenting uncertainty estimates per source / sink category and for the whole inventory.

↪ **Inventory improvement**, that is related to the preparation and the justification of any recalculations made. Relative procedures with inventory improvement are QM01 “System Review”, QM02 “System Improvement, QM06 “Non compliance – Corrective and preventive actions” and II01 “Recalculations management”.

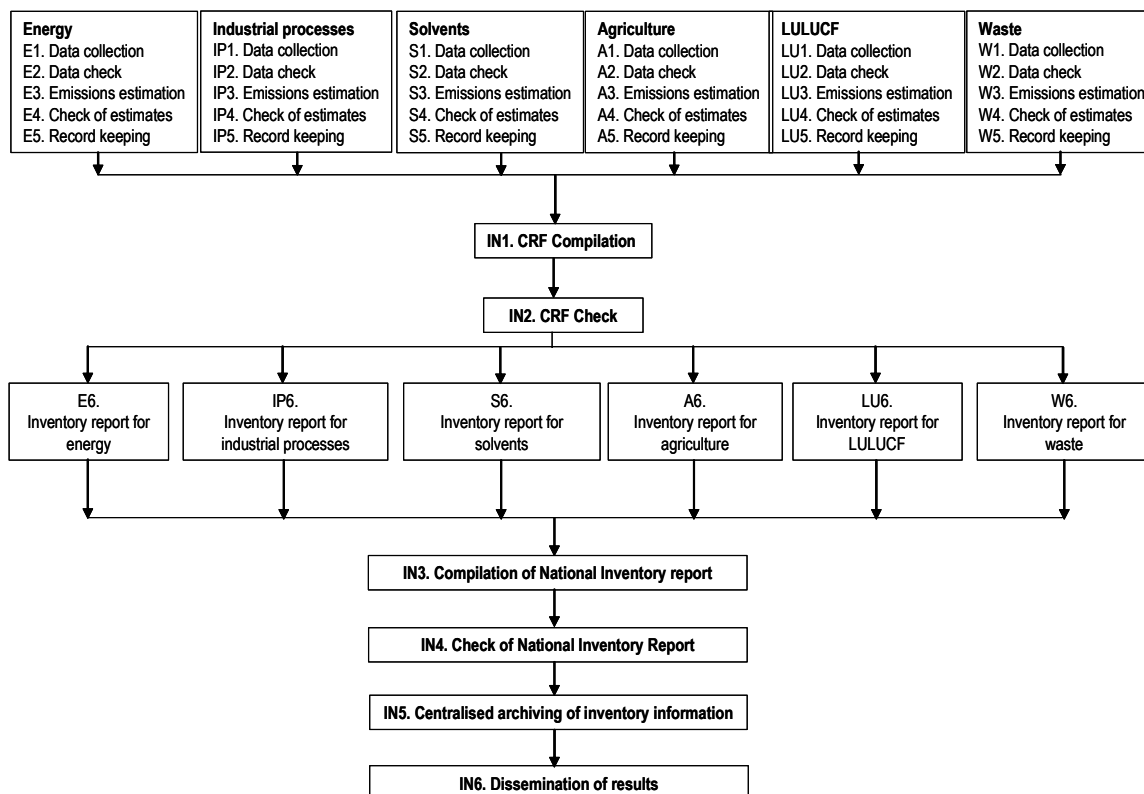


Figure 4. Flow chart activities concerning the GHG emissions inventory

Table 1. Quality assurance / quality control procedures for the Greek GHG emissions inventory

| Process | Procedure code | Procedures |
|---|-----------------------|---|
| Quality management | QM 01 | System review |
| | QM 02 | System improvement |
| | QM 03 | Training |
| | QM 04 | Record keeping |
| | QM 05 | Internal reviews |
| | QM 06 | Non compliance – Corrective and preventive actions |
| | QM 07 | Supplies |
| | QM 08 | Quality management system |
| | QM 09 | Documents control |
| | QM 10 | Internal communication |
| Quality control | QC 01 | Data collection |
| | QC 02 | Estimation of emissions / removals |
| | QC 03 | Data quality control check |
| | QC 04 | Input data record keeping |
| Archiving of inventory information | AI 01 | Centralised archiving of inventory information |
| | AI 02 | Compilation of reports |
| Quality assurance | QA 01 | Expert review of input data and parameters |
| | QA 02 | Expert review of GHG emissions / removals inventory |
| | QA 03 | Review from public |
| Estimation of uncertainties | EU 01 | Uncertainty analysis |
| Inventory improvement | II 01 | Recalculations management |

The implementation of the plan started in April 2004 and the first internal review was carried out in June 2004, following procedures and manuals (available only in Greek) developed by in house staff and outside consultants.

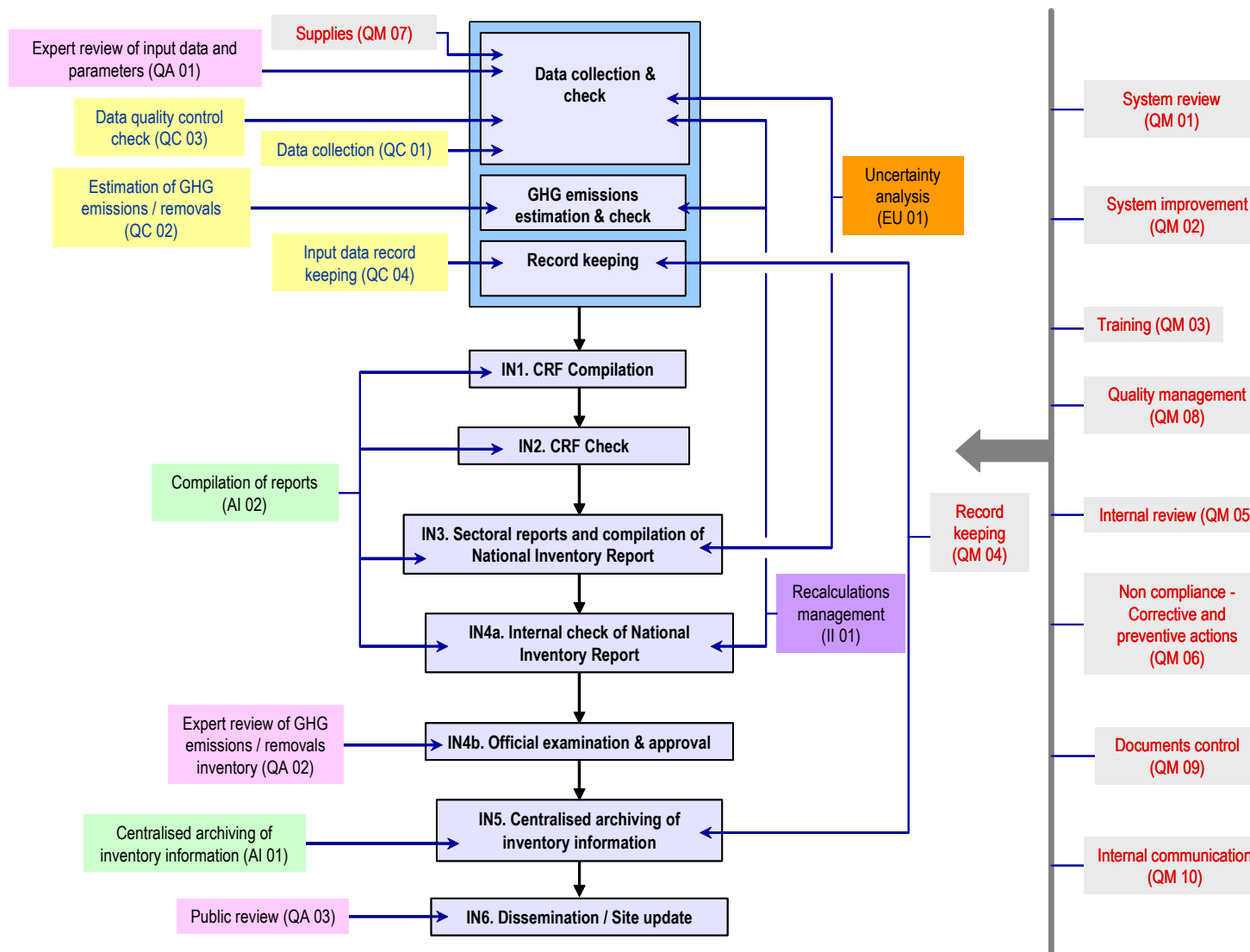


Figure 5. QA/QC processes and procedures and inventory related activities

2.5. National GHG Inventory System Assessment

In this section the outcomes of the new structure of national GHG inventory system presented in “Written Submission of Greece under Section X of Annex to Decision 27/CMP.1”, submitted in February 2008 are summarised in Table 2. As mentioned above, the scope of the new structure was the enhancement of the performance of the national GHG inventory system, so as to ensure the full compliance with the guidelines for national systems under Article 5 / Paragraph 1 of the Kyoto Protocol (decision 19/CMP.1) and for the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1).

A supporting action of the system, not described previously, is **the review of the national inventory system by independent experts**. This action will definitely contribute to tracking shortcomings of the system and will improve the evaluation of the quality and completeness of the inventory. Given the limited number of local experts who have experience in the IPCC methodologies for emission estimation, MINENV examines a potential co-operation with experts of another Annex I country.

Table 2. Assessment of National GHG Inventory System

| Actions | Results – Gains |
|---|--|
| Decentralization of inventory system structure. Active participation of Ministry for the Environment. Keeping of Centralized Inventory File in MINENV premises. | <ul style="list-style-type: none"> ➤ Establishment of institutional, legal and procedural arrangements necessary for the functions of national system. ➤ Ensuring of the continuity of the inventory preparation process and knowledge transfer. ➤ Capacity development within MINENV premises. |
| Establishment of Climate Team within Ministry for the Environment. | <ul style="list-style-type: none"> ➤ Ensuring of technical competence of the staff involved |
| Redefinition of official consideration and approval of the inventory. | <ul style="list-style-type: none"> ➤ Establishment of institutional, legal and procedural arrangements necessary for the functions of national system. |
| Contractual obligation of each technical consultant to deliver special reports dealing with data and methodology issues and working files to MINENV | <ul style="list-style-type: none"> ➤ Ensuring of the continuity of the inventory preparation process and knowledge transfer |
| Contractual obligation of each technical consultant for performing seminars to MINENV and data providers' staff (a two-days seminar was conducted on 20 th and 21 st of March 2008 at the National Center for the Environment and Sustainable Development by NOA) | <ul style="list-style-type: none"> ➤ Ensuring of the continuity of the inventory preparation process and knowledge transfer ➤ Capacity development within MINENV premises |
| Establishment of a formal co-operation with data providing agencies. Specific contact person appointment. | <ul style="list-style-type: none"> ➤ Ensuring effective co-operation between involved entities in the inventory. ➤ Ensuring capacity of the system for timely performance. |
| Execution of working groups – seminars of data providing agencies' representatives / contact persons (one working group was taken place on 15 th of April 2008) | <ul style="list-style-type: none"> ➤ Effective co-operation between involved entities in the inventory. |
| Implementation of QA/QC system – supervision by MINENV | <ul style="list-style-type: none"> ➤ Ensuring capacity of the system for timely performance. ➤ Improvement of consistency, comparability and accuracy of inventory. |

| Actions | Results – Gains |
|--|--|
| Use of activity data from verified emission reports of the installations covered by the emissions trading Directive. | ➤ Improvement of consistency, comparability and accuracy of inventory. |
| Review of the system by independent experts (planned) | ➤ Improvement of transparency, consistency, comparability and accuracy of inventory. |

3. In-country review of the National system of Greece

Greece, in cooperation with the UNFCCC Secretariat, is preparing for the in-country review of its new national system, coordinated by the secretariat in conjunction with the review of the 2007 and 2008 inventory submissions.

Greece confirmed the dates of the review (8-13 September 2008) with the Secretariat by its letter signed by the Director General of Environment, dated 23 May 2008. By this letter, Greece informed the secretariat that the contact person for the related arrangements will be the National Focal Point.

The venue of the review will be the premises of MINENV in Kifissia (Epavlis Kazouli).

More specifically, MINENV has arranged the following :

- The first day, the Deputy Minister for the Environment, Mr. Stavros Kaloyiannis, will meet the ERT
- The Climate Team and the NTUA team will be present during the whole review week.
- The representatives/focal points of the competent Ministries and the QA/QC supervisor will be present the first day of the review and available for the whole review period for any further data or clarification needed.
- All files are archived in the venue of the review.
- Is in close co-operation with the Secretariat in order to finalise the agenda and proceed to the necessary logistics arrangements in order to meet all needs of the ERT for travel, stay and excellent working conditions.

Annex I. Responsibilities / roles per entity involved in the National GHG Inventory System

| Responsibilities / Roles | Responsible Entity | Experts of Responsible Entity (ies) | Supervisor from MINENV side |
|--|---|---|--|
| Overall responsibility for the national GHG inventory | Ministry for the Environment | 1. Elpida Politi | |
| Official consideration and approval of the inventory prior to its submission | Ministry for the Environment | 1. Elpida Politi (Climate Team) | |
| Technical and scientific responsibility for national GHG inventory (inventory planning, preparation and management) | NTUA (technical consultant) | 1. Ioannis Ziomas | |
| Overseeing of the processes concerning the inventory preparation and management, CRF and reports compilation. QA/QC procedures preparation and implementation under the supervision of MINENV. | NTUA (technical consultant) | 1. Ioannis Sempos | Elpida Politi |
| QA/QC supervision | Ministry for the Environment | 1. Alexandros Karavanas | |
| Energy Sector: Data collection and QC check, application of models (COPERT III), emission estimation and QC check, record keeping, inventory report compilation and QC check | NTUA (technical consultant) | 1. Ioannis Sempos 2. Athina Progiou | Nectaria Efthymiou Euthimios Lytras |
| Energy Sector: data providing | 1. Ministry for Development, 2. Civil Aviation Organization, | 1. Constantinos Chatzigianakis 2. Anastasios Kokkinos 3. Panagiotis Tselikas 4. Dimitris Chadjidakis | Nectaria Efthymiou Euthimios Lytras |

| Responsibilities / Roles | Responsible Entity | Experts of Responsible Entity (ies) | Supervisor from MINENV side |
|---|---|--|--|
| | 3. Ministry of Transport and Communications 4. Ministry for the Environment | | |
| Industry Sector: Data collection and QC check, emission estimation and QC check, record keeping, inventory report compilation and QC check | NTUA (technical consultant) | 1. Spyridoula Ntemiri | Sotiria Koloutsou Afroditi Kotidou |
| Industry Sector: data providing | 1. Ministry for Development, 2. Ministry for the Environment 3. National Statistical Service of Greece 4. ICAP | 1. Xarikleia Piperopoulou 2. Dimitris Chadjidakis 3. Ioanna Papanagnou | Sotiria Koloutsou Afroditi Kotidou |
| Solvents Sector: Data collection and QC check, emission estimation and QC check, record keeping, inventory report compilation and QC check | NTUA (technical consultant) | 1. Ioannis Sempos | Afroditi Kotidou |
| Solvents Sector: data providing | 1. National Statistical Service of Greece | 1. Ioanna Papanagnou | Afroditi Kotidou |
| Agriculture Sector: Data collection and QC check, emission estimation and QC check, record keeping, inventory report compilation and QC check | NTUA (technical consultant) | 1. Leonidas Kallinikos | Dionisios Balas Chryssoula Koromila |

| Responsibilities / Roles | Responsible Entity | Experts of Responsible Entity (ies) | Supervisor from MINENV side |
|--|--|--|---|
| Agriculture Sector: data providing | <ol style="list-style-type: none"> 1. National Statistical Service of Greece 2. Ministry of Rural Development and Food 3. United Nations Food and Agricultural Organization (FAO) | <ol style="list-style-type: none"> 1. Ioanna Papanagnou 2. Eirini Nikolaou, and Panagiotis Drougas | <p>Dionisios Balas</p> <p>Chryssoula Koromila</p> |
| Waste Sector: Data collection and QC check, emission estimation and QC check, record keeping, inventory report compilation and QC check | NTUA (technical consultant) | <ol style="list-style-type: none"> 1. Leonidas Kallinikos | <p>Moraiti Christina</p> <p>Klimis Lasaridis</p> |
| Waste Sector: data providing | <ol style="list-style-type: none"> 1. Ministry for the Environment 2. National Statistical Service of Greece | <ol style="list-style-type: none"> 1. Ioannis Macheras 2. Ioanna Papanagnou | <p>Moraiti Christina</p> <p>Klimis Lasaridis</p> |
| LULUCF Sector (report under convention): Data collection and QC check, emission estimation and QC check, record keeping, inventory report compilation and QC check | NTUA (technical consultant) | <ol style="list-style-type: none"> 1. Ioannis Sempos | <p>Dionisios Balas</p> <p>Chryssoula Koromila</p> |
| LULUCF Sector (report under convention): data providing | <ol style="list-style-type: none"> 1. National Statistical Service of Greece 2. Ministry of Rural Development and Food | <ol style="list-style-type: none"> 1. Ioanna Papanagnou 2. Eirini Nikolaou, and Panagiotis Drougas | <p>Dionisios Balas</p> <p>Chryssoula Koromila</p> |

| Responsibilities / Roles | Responsible Entity | Experts of Responsible Entity (ies) | Supervisor from MINENV side |
|---|---|---|--|
| LULUCF Sector (report for the KP, art 3.3 & 3.4): Development of a methodology for estimation of emissions/sinks, data collection and QC check, emission estimation and QC check, record keeping, inventory report compilation and QC check | Ministry of Rural Development and Food | <ol style="list-style-type: none"> 1. Eirini Nikolaou 2. Panagiotis Drougas | |
| LULUCF Sector (report for the KP, art 3.3 & 3.4): CRF compilation | NTUA (technical consultant) | <ol style="list-style-type: none"> 1. Ioannis Sempos | Dionisios Balas Chryssoula Koromila |
| Uncertainty assessment | NTUA (technical consultant) | <ol style="list-style-type: none"> 1. Leonidas Kallinikos | Nectaria Efthymiou |
| Key categories analysis | NTUA (technical consultant) | <ol style="list-style-type: none"> 1. Spyridoula Ntemiri | Nectaria Efthymiou |
| CRF and National Inventory Report compilation and QC checks | NTUA (technical consultant) | <ol style="list-style-type: none"> 1. Spyridoula Ntemiri 2. Leonidas Kallinikos 3. Ioannis Sempos | Nectaria Efthymiou |
| Preparation and keeping of Centralized Inventory File which is delivered to the Ministry for the Environment / Climate Team at the end of each inventory cycle. | NTUA (technical consultant) Ministry for the Environment | <ol style="list-style-type: none"> 1. Spyridoula Ntemiri 2. Leonidas Kallinikos 3. Ioannis Sempos 4. Chryssoula Koromila (MINENV) | |
| Training the representatives of providing data agencies on inventory issues. | NTUA (technical consultant) | <ol style="list-style-type: none"> 1. Leonidas Kallinikos 2. Spyridoula Ntemiri 3. Ioannis Sempos | |